UNCLASSIFIED

TECHNICAL MANUAL

for

TRANSMITTING SET, RADIO, MODEL GPT-40K

(AN/FRT-40B)

THE TECHNICAL MATERIEL CORPORATION
MAMARONECK, N.Y. OTTAWA, CANADA

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Issue Date: 1 June 1962

THE TECHNICAL MATERIEL CORPORATION
COMMUNICATIONS ENGINEERS
700 FENIMORE ROAD MAMARONECK, N. Y.

Warranty

The Technical Materiel Corporation, hereinafter referred to as TMC, warrants the equipment (except electron tubes,* fuses, lamps, batteries and articles made of glass or other fragile or other expendable materials) purchased hereunder to be free from defect in materials and workmanship under normal use and service, when used for the purposes for which the same is designed, for a period of one year from the date of delivery F.O.B. factory. TMC further warrants that the equipment will perform in a manner equal to or better than published technical specifications as amended by any additions or corrections thereto accompanying the formal equipment offer.

TMC will replace or repair any such defective items, F.O.B. factory, which may fail within the stated warranty period, PROVIDED:

1. That any claim of defect under this warranty is made within sixty (60) days after discovery thereof and that inspection by TMC, if required, indicates the validity of such claim to TMC's satisfaction.
2. That the defect is not the result of damage incurred in shipment from or to the factory.
3. That the equipment has not been altered in any way either as to design or use whether by replacement parts not supplied or approved by TMC, or otherwise.
4. That any equipment or accessories furnished but not manufactured by TMC, or not of TMC design shall be subject only to such adjustments as TMC may obtain from the supplier thereof.

Electron tubes* furnished by TMC, but manufactured by others, bear only the warranty given by such other manufacturers. Electron tube warranty claims should be made directly to the manufacturer of such tubes.

TMC's obligation under this warranty is limited to the repair or replacement of defective parts with the exceptions noted above.

At TMC's option any defective part or equipment which fails within the warranty period shall be returned to TMC's factory for inspection, properly packed with shipping charges prepaid. No parts or equipment shall be returned to TMC, unless a return authorization is issued by TMC.

No warranties, express or implied, other than those specifically set forth herein shall be applicable to any equipment manufactured or furnished by TMC and the foregoing warranty shall constitute the Buyers sole right and remedy. In no event does TMC assume any liability for consequential damages, or for loss, damage or expense directly or indirectly arising from the use of TMC Products, or any inability to use them either separately or in combination with other equipment or materials or from any other cause.

*Electron tubes also include semi-conductor devices.

PROCEDURE FOR RETURN OF MATERIAL OR EQUIPMENT

Should it be necessary to return equipment or material for repair or replacement, whether within warranty or otherwise, a return authorization must be obtained from TMC prior to shipment. The request for return authorization should include the following information:

1. Model Number of Equipment.
2. Serial Number of Equipment.
3. TMC Part Number.
4. Nature of defect or cause of failure.
5. The contract or purchase order under which equipment was delivered.

PROCEDURE FOR ORDERING REPLACEMENT PARTS

When ordering replacement parts, the following information must be included in the order as applicable:

1. Quantity Required.
2. TMC Part Number.
3. Equipment in which used by TMC or Military Model Number.
4. Brief Description of the Item.
5. The *Crystal Frequency* if the order includes crystals.

PROCEDURE IN THE EVENT OF DAMAGE INCURRED IN SHIPMENT

TMC's Warranty specifically excludes damage incurred in shipment to or from the factory. In the event equipment is received in damaged condition, the carrier should be notified immediately. Claims for such damage should be filed with the carrier involved and not with TMC.

All correspondence pertaining to Warranty Claims, return, repair, or replacement and all material or equipment returned for repair or replacement, within Warranty or otherwise, should be addressed as follows:

THE TECHNICAL MATERIEL CORPORATION
Engineering Services Department
700 Fenimore Road
Mamaroneck, New York

ADDENDUM

TO

TECHNICAL MANUAL

for

TRANSMITTING SET, RADIO

MODEL GPT-40K

(AN/FRT-40 B)

The purpose of this addendum is to provide information necessary to render the GPT-40K manual consistent with latest engineering modifications. Make changes to the manual as indicated below.

a. MODIFICATION OF ANTENNA TUNER

(1) Change all references to Antenna Tuner designation as follows.

OLD	NEW
AT-101	AT-106
AT-102	AT-106
AT-103	AT-106

(2) Change all references for SWR meter (M8206) as indicated below. Also, change approximate resistance given for SWR meter from 2000 ohms to 1800 ohms.

	OLD	NEW
REF SYM	M8206	M8207
TMC PART NO.	MR-146	MR-165

b. MODIFICATION OF BIAS SUPPLY

(1) Change all references to Bias Supply designation as follows:

OLD	NEW
AP-104	AP-117

(2) Change all schematic drawings of Bias Supply to comply with CK-638 supplied with this addendum.

(3) Change parts list for Bias Supply in accordance with following information.

(a) Page 5-1-22, C7508. - Change TMC PART NO.

to CM-100-6. In description for C7508 change 300 wvdc to 500 wvdc.

(b) Page 5-1-22, C7514. - Deleted

(c) Page 5-1-22, C7513. - Change TMC PART NO. to CN108C4243K.

(d) Page 5-1-22. - Add C7517. Description - - CAPACITOR, fixed: mica: .01 uf, ± 10%, char. B; 500 wvdc. TMC PART NO., CM-100-6.

(e) Page 5-1-24, R7529. - Deleted.

(f) Page 5-1-24. - Add R7532. Description - RESISTOR, fixed: composition; 56,000 ohms, ±5%, 1 watt. TMC PART NO., RC32GF563J.

(g) Page 5-1-24. - Add R7533. Description - RESISTOR, fixed: composition; 4700 ohms, ±10%, 1 watt TMC PART NO., RC32GF472K.

(h) Page 5-1-24. - Add R7534. Description - RESISTOR, fixed: composition; 470,000 ohms, ±10%, 1 watt. TMC PART NO., RC32GF474K.

c. MODIFICATION OF POWER SUPPLY FRAME

(1) Change all references to Power Supply frame as follows:

OLD	NEW
AP-103	AP-118

(2) Change all schematic drawings of Power Supply frame to comply with CK-639 supplied with this addendum.

(3) Change cabling diagram figure 4-7-3 to comply with cabling diagram CA-845 supplied with this addendum. Also change all references to CA-539 as follows:

OLD	NEW
CA-539	CA-845

(4) On page 5-1-30, add following item to parts list for Power Supply Frame:

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
F8102	FUSE, cartidge type: time delay; 5 amp.	Interlock fuse	FU-102-5

SYM	DESCRIPTION	FUNCTION	TMC PART NO. (cont)
F8103	Same as F8102	Interlock fuse	FU-102-5

(5) On page 5-1-32, change description and TMC part number entries for T8105 as follows:

SYM	DESCRIPTION	TMC PART NO.
T8105	TRANSFORMER, power, step-up: pri., 6.3v; 3 amps: sec., 220v; 50/60 cps; single phase; insulated for 10,000 VAC: hermetically sealed rectangular can	TF-256

d. MODIFICATION OF PA FRAME

(1) Change all references to PA FRAME designation as follows:

OLD	NEW
AP-102	AP-116
AP-106	AP-116

(2) Change cabling diagram figure 4-7-2 to comply with cabling diagram CA-843 supplied with this addendum. Also, change all references to CA-538 as follows:

OLD	NEW
CA-538	CA-843

ERRATA

GPT-40K (AN/FRT-40B)

Table 1-1-1, Page 1-1-7

Change "1 Capacitor CB-149", "1 Capacitor CB-149", "1 Capacitor CB-158" to "3 Capacitors CB-160".

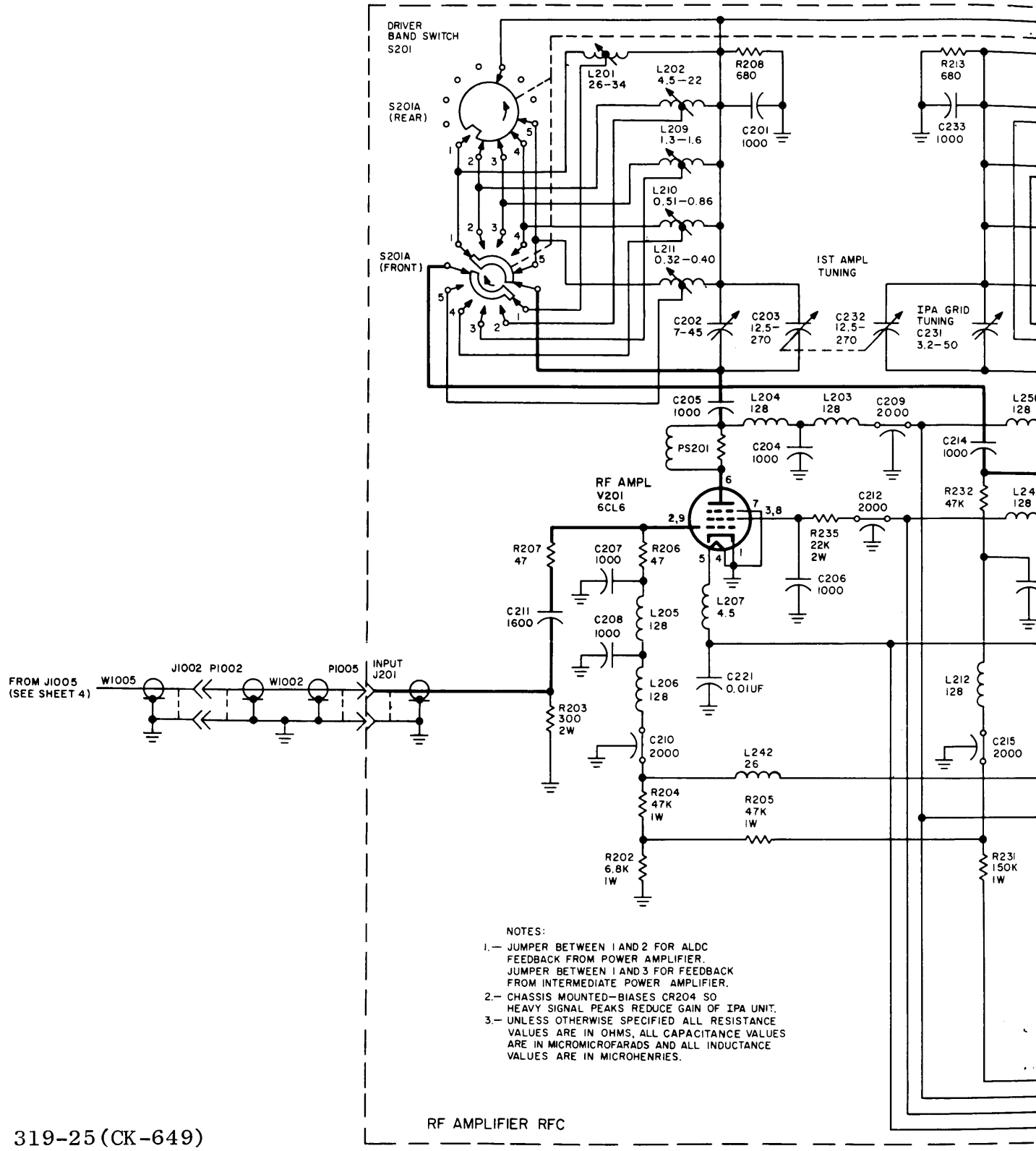
12/6/62

DRIVER BAND SWITCH S201	
POS	FUNCTION
1	2-4 MC
2	4-8 MC
3	8-16 MC
4	16-20 MC
5	20-28 MC

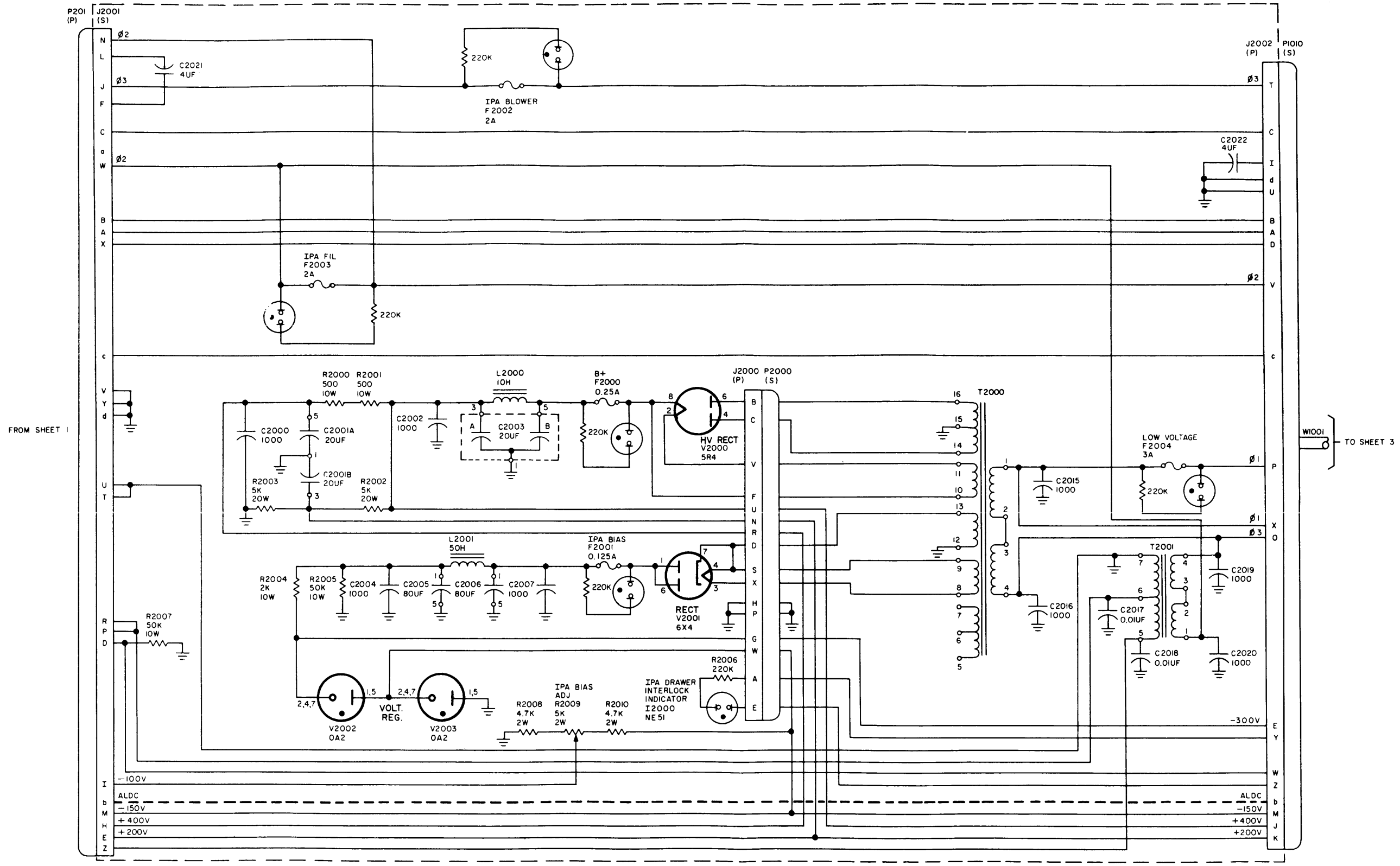
IPA BAND SWITCH S202	
POS	FUNCTION
1	2.0-2.5 MC
2	2.5-3 MC
3	3-4 MC
4	4-6 MC
5	5-8 MC
6	8-12 MC
7	12-16 MC
8	16-20 MC
9	20-28 MC

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	IST AMPL EP X 1V RF
6	IPA EG X 1V RF
7	IPA EP X 100V RF
8	PA EG X 10V RF

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


DRIVER BAND SWITCH S201
S201A (REAR)
S201A (FRONT)
L201 26-34
L202 4.5-22
L209 1.3-1.6
L210 0.51-0.86
L211 0.32-0.40
R208 680
C201 1000
R213 680
C233 1000
1ST AMPL TUNING
C202 7-45
C203 12.5-270
C232 12.5-270
IPA GRID TUNING C231 3.2-50
C205 1000
L204 128
L203 128
C209 2000
PS201
C204 1000
C214 1000
RF AMPL V201 6CL6
C212 2000
R232 47K
R235 22K 2W
C206 1000
R207 47
C207 1000
R206 47
C211 1600
C208 1000
L205 128
L207 4.5
C221 0.01UF
L206 128
C210 2000
L242 26
R204 47K 1W
R205 47K 1W
R202 6.8K 1W
R203 300 2W
L212 128
C215 2000
R231 150K 1W
FROM J1005 (SEE SHEET 4)
W1005
J1002 P1002
W1002
P1005
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 CAPACITANCE VALUES ARE IN MICROMICROFARADS AND ALL INDUCTANCE VALUES ARE IN MICROHENRIES.
RF AMPLIFIER RFC

319-25(CK-649)



319-26(CK-649)

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

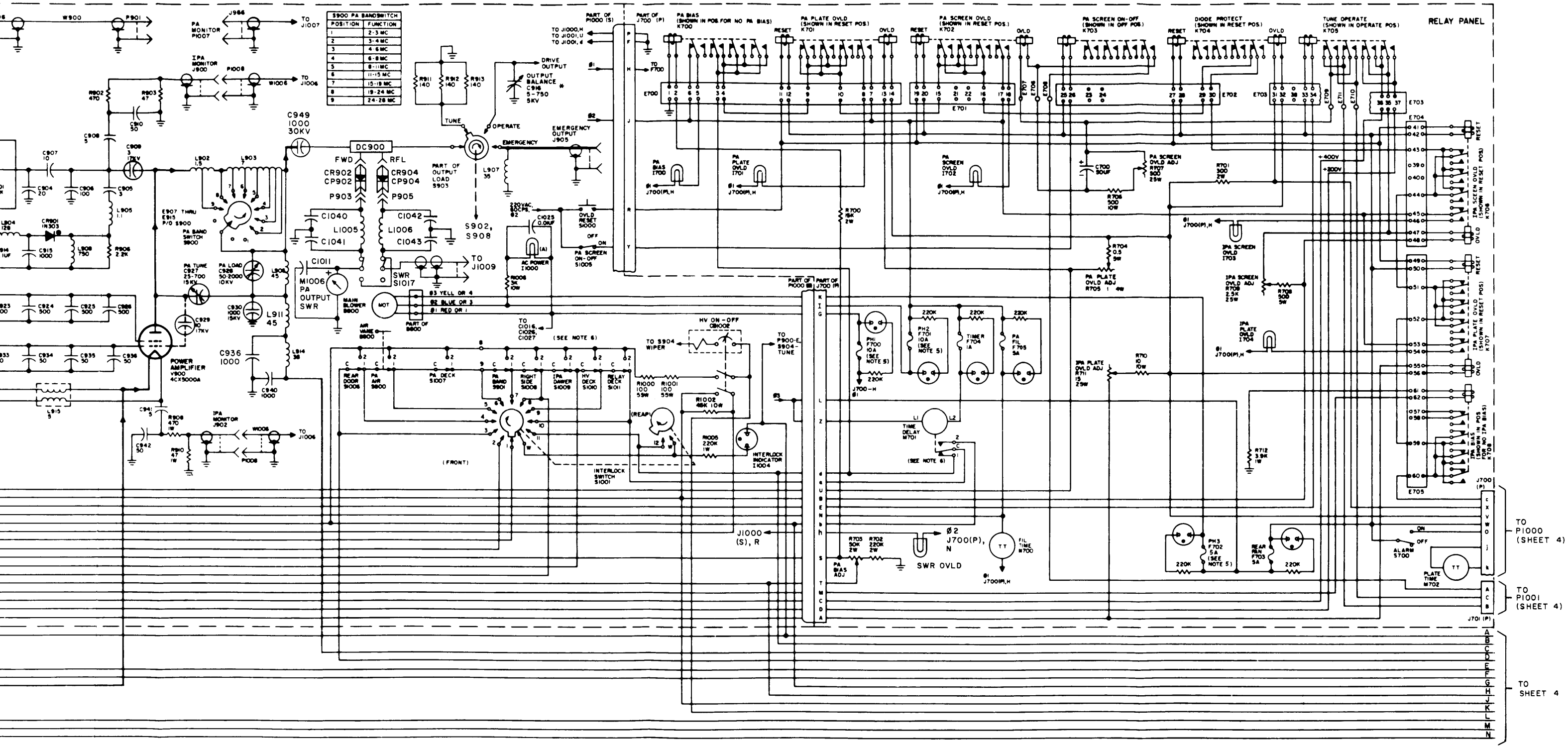
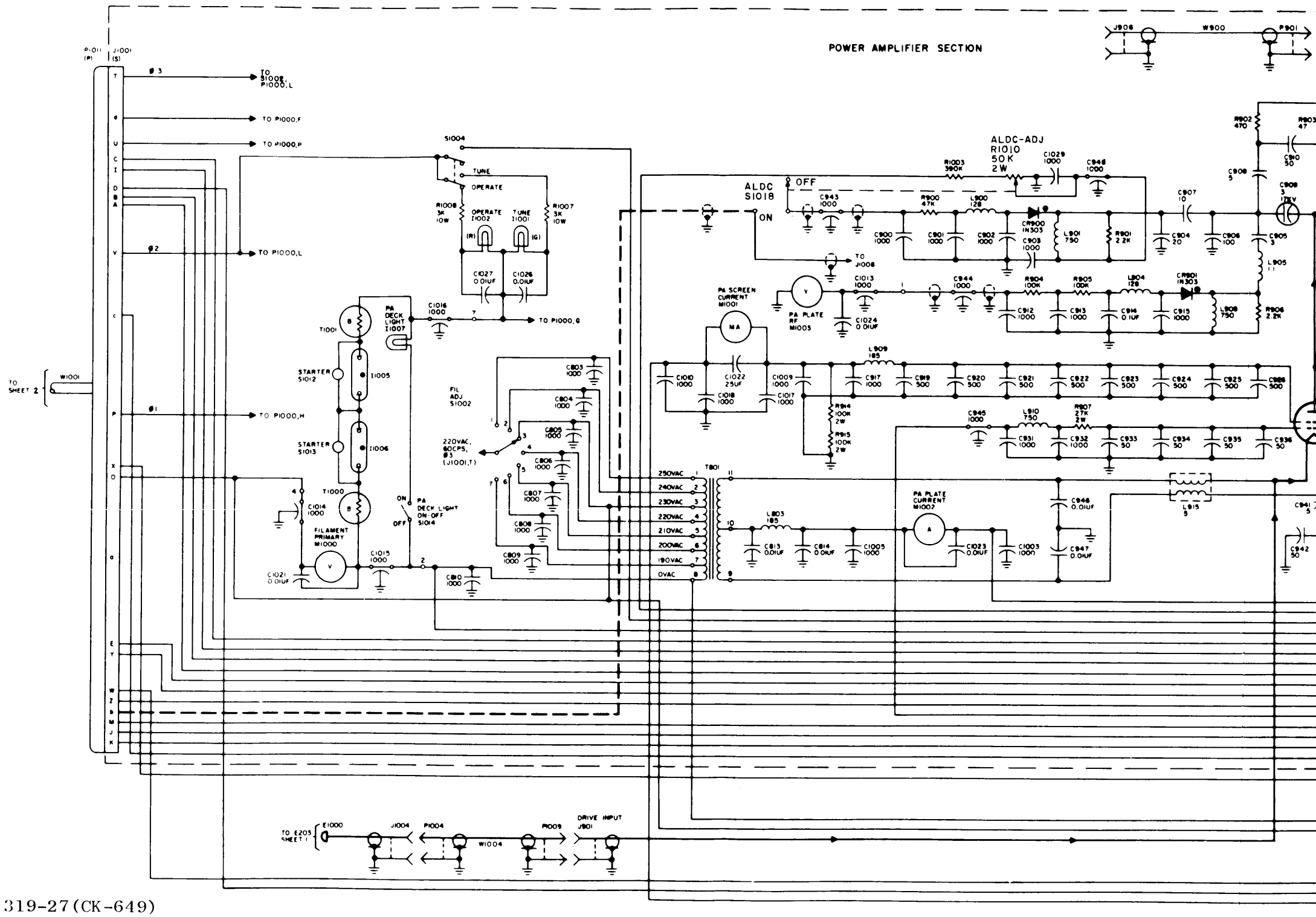


Figure 6-1. GPT-40K Transmitter, Schematic Diagram (Sheet 3 of 9)


POWER AMPLIFIER SECTION
J906
W900
P901
P1011 (P)
J1001 (S)
TO S1002, P1000,L
TO P1000,F
TO P1000,P
TO P1000,L
TO P1000,H
TO P1000,G
TO SHEET 2
W1001
S1004
TUNE
OPERATE
R1008 5K 10W
R1007 5K 10W
OPERATE I1002
TUNE I1001
C1027 0.01UF
C1026 0.01UF
C1016 1000
T1001
PA DECK LIGHT I1007
STARTER S1012
I1005
STARTER S1013
I1006
T1000
C1014 1000
FILAMENT PRIMARY M1000
C1021 0.01UF
C1015 1000
PA DECK LIGHT ON-OFF S1014
ON
OFF
C810 1000
FIL ADJ S1002
220VAC, 60CPS, Ø3 (J1001,T)
C803 1000
C804 1000
C805 1000
C806 1000
C807 1000
C808 1000
C809 1000
ALDC-ADJ R1010 50K 2W
C1029 1000
C945 1000
ALDC S1018
OFF
ON
R1003 390K
C943 1000
R900 47K
L900 12Ø
C900 1000
C901 1000
C902 1000
C903 1000
CR900 IN303
L901 750
R901 2.2K
C907 10
C904 20
C906 100
C908 5
C909 3 12KV
C905 3
L905 1.1
R902 470
R903 47
C910 50
TO J1008
PA SCREEN CURRENT M1001
PA PLATE RF M1003
C1013 1000
C1024 0.01UF
C944 1000
R904 100K
R905 100K
L904 12Ø
CR901 IN303
C912 1000
C913 1000
C914 0.1UF
C915 1000
L908 750
R906 2.2K
C1010 1000
C1022 25UF
C1018 1000
C1009 1000
C1017 1000
L909 185
C917 1000
C919 500
C920 500
C921 500
C922 500
C923 500
C924 500
C925 500
C926 500
R914 100K 2W
R915 100K 2W
C945 1000
L910 750
R907 27K 3W
C931 1000
C932 1000
C933 50
C934 50
C935 50
C936 50
250VAC
240VAC
230VAC
220VAC
210VAC
200VAC
190VAC
0VAC
T801
L803 185
C813 0.01UF
C814 0.01UF
C1005 1000
PA PLATE CURRENT M1002
C1023 0.01UF
C1003 1000
C946 0.01UF
C947 0.01UF
L915 3
C941 5
C942 50
TO E205 SHEET 1
E1000
J1004
P1004
W1004
P1009
DRIVE INPUT J801

319-27(CK-649)

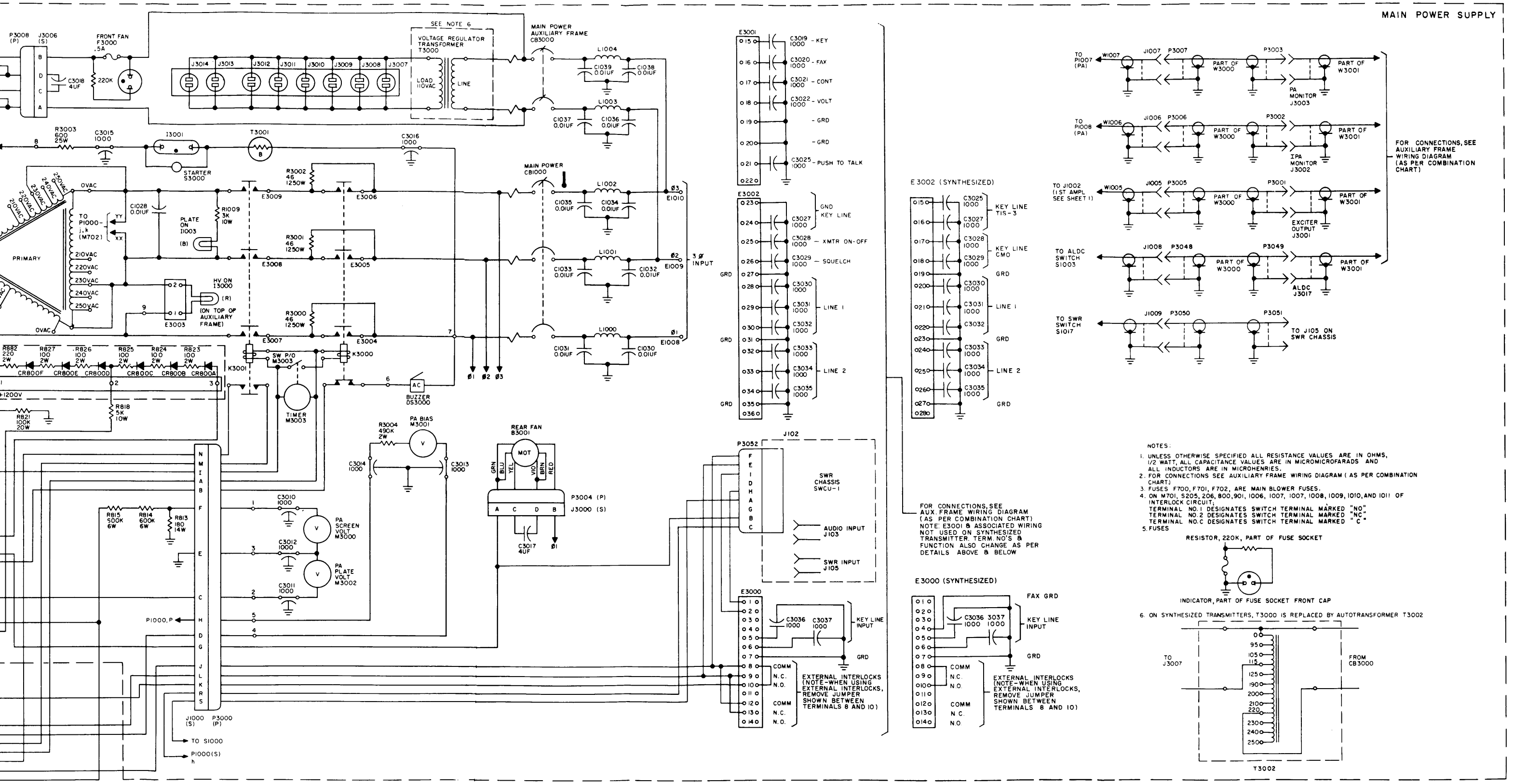
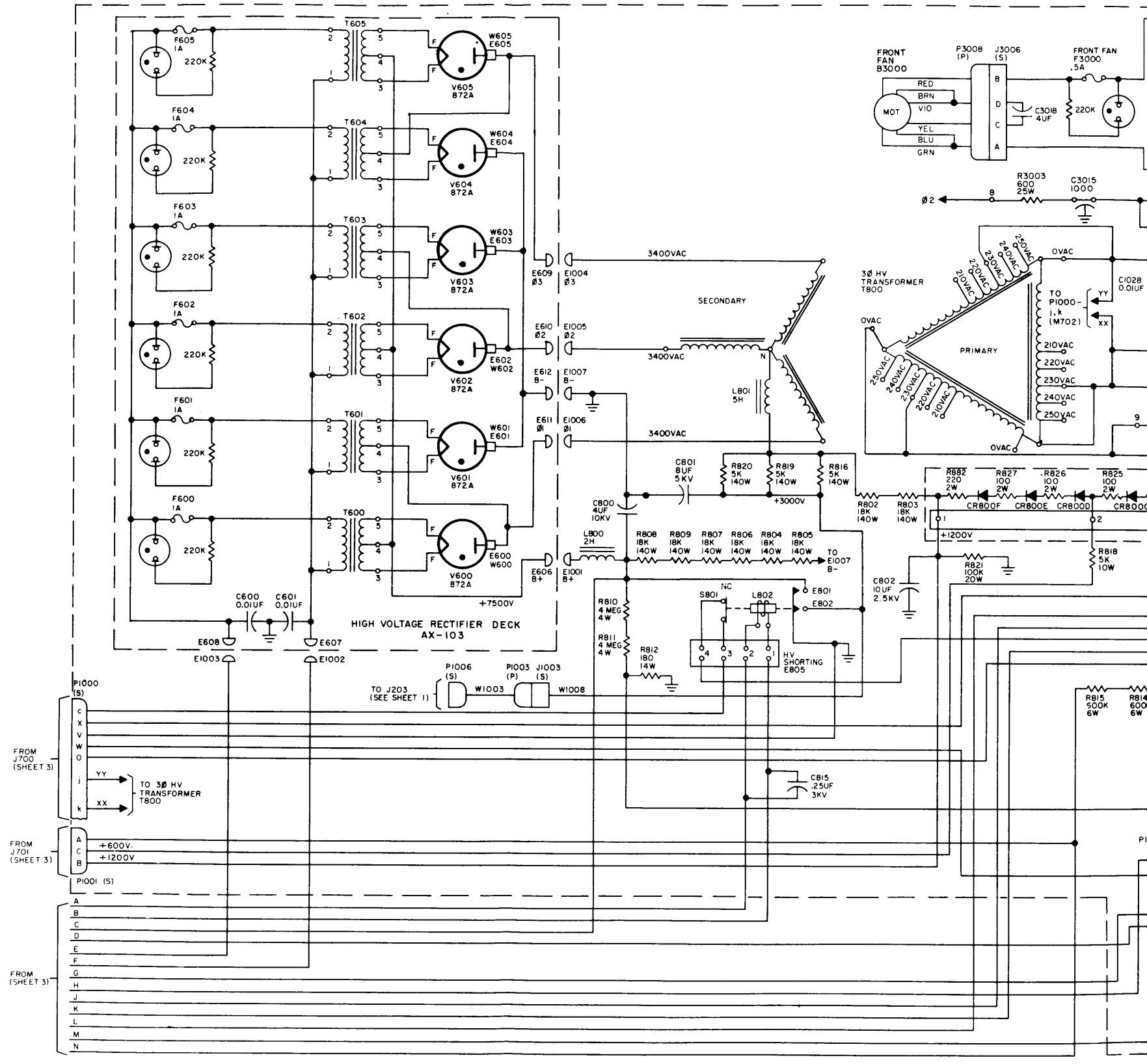


Figure 6-1. GPT-40K Transmitter, Schematic Diagram (Sheet 4 of 9)


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

319-28(CK-649)

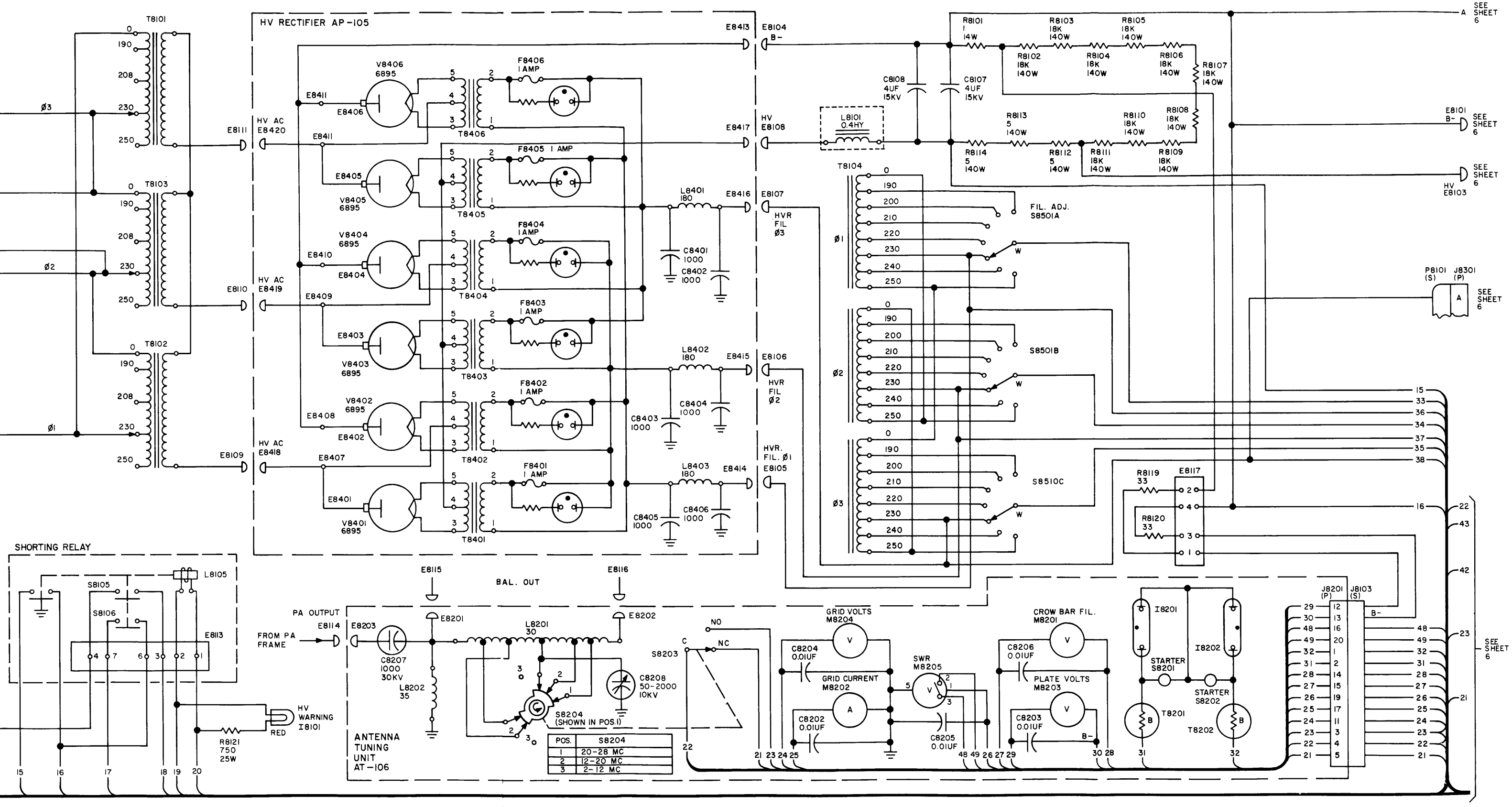
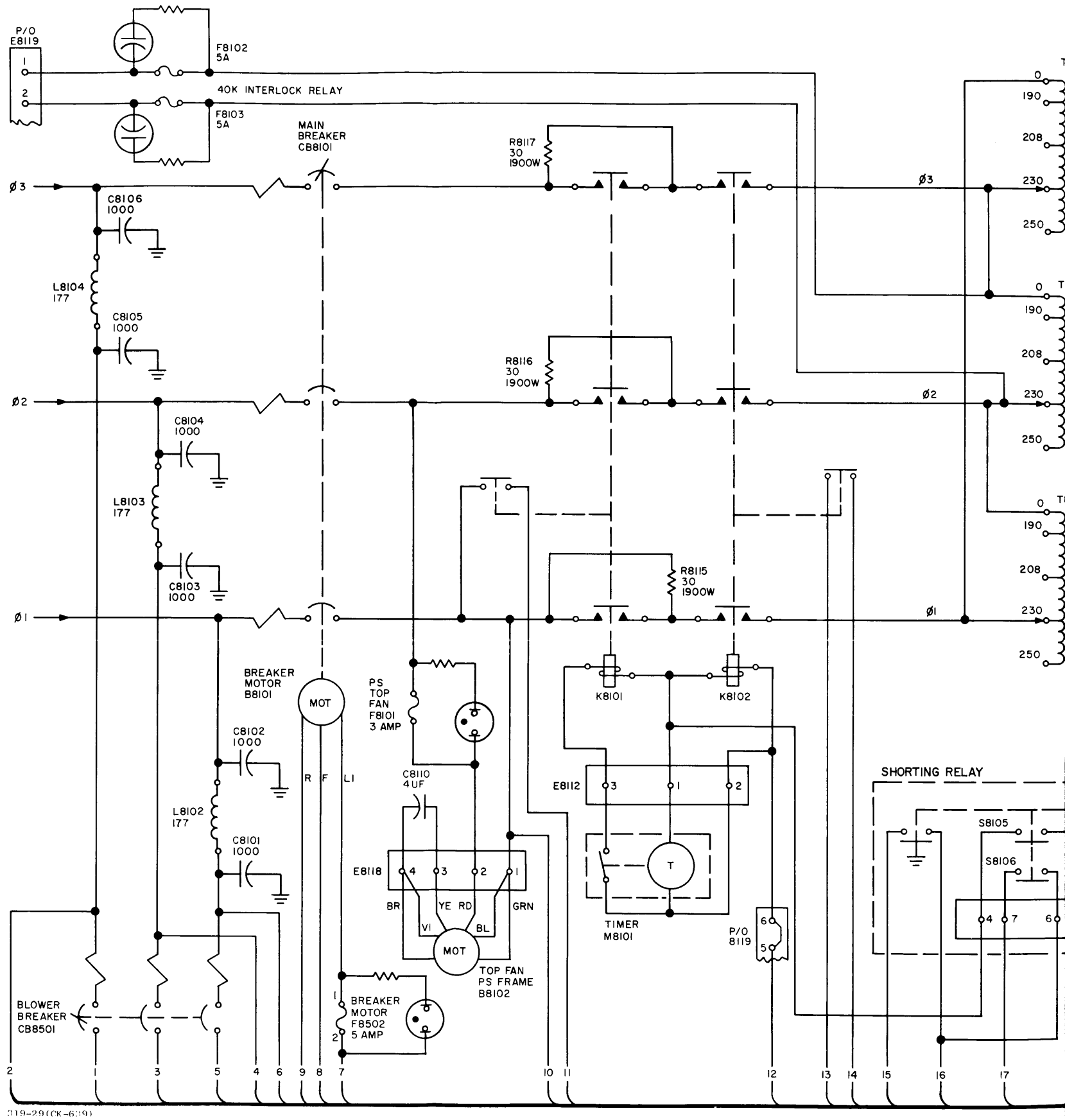
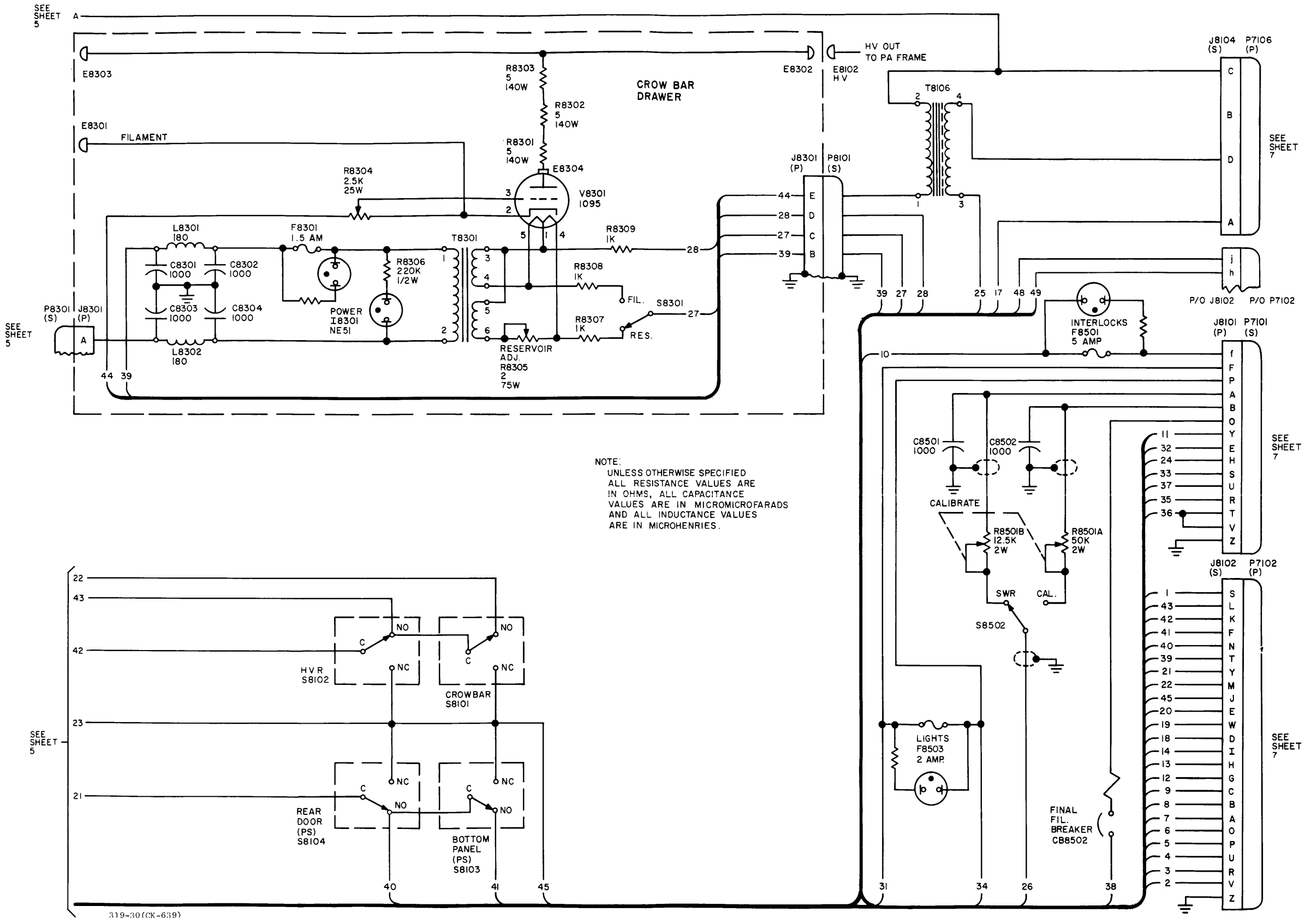


Figure 6-1. GPT-40K Transmitter, Schematic Diagram (Sheet 5 of 9)

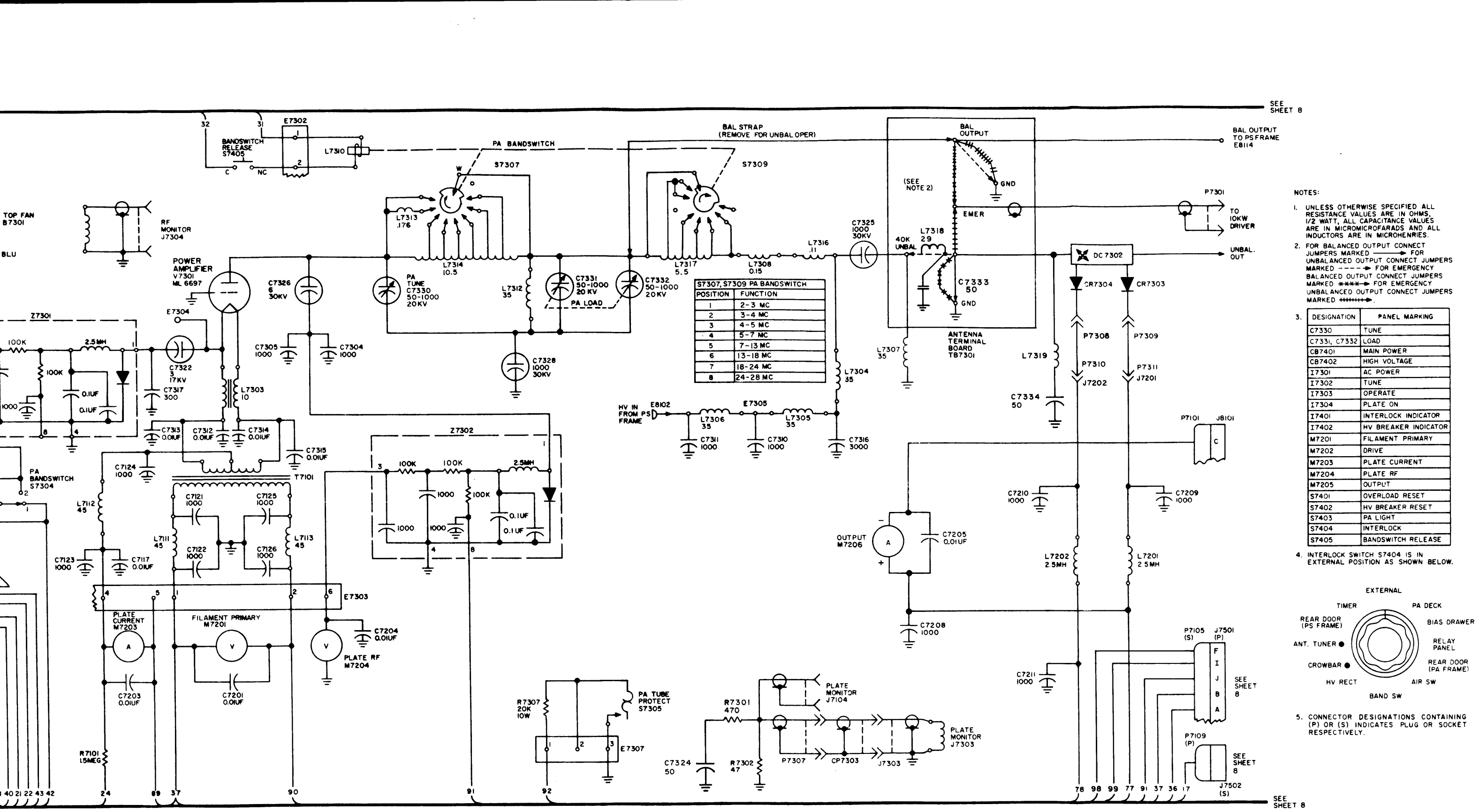

P/O E8119
1
2
F8102 5A
F8103 5A
40K INTERLOCK RELAY
MAIN BREAKER CB8101
R8117 30 1900W
R8116 30 1900W
R8115 30 1900W
Ø3
Ø2
Ø1
C8106 1000
C8105 1000
C8104 1000
C8103 1000
C8102 1000
C8101 1000
L8104 177
L8103 177
L8102 177
BREAKER MOTOR B8101
MOT
PS TOP FAN F8101 3 AMP
C8110 4UF
R F L1
E8118
4 3 2 1
BR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

319-29(CK-6:69)



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

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



NOTES:

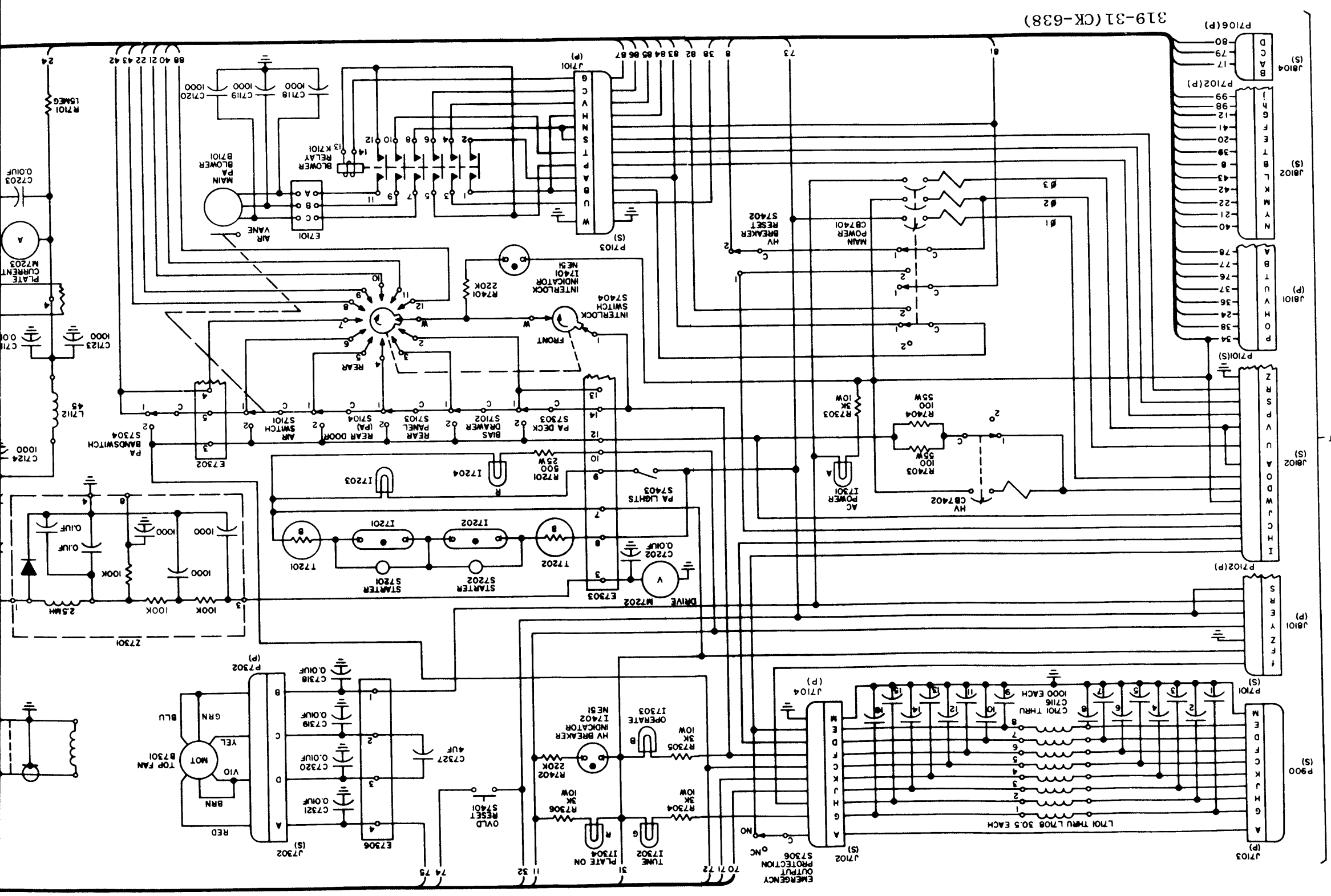
1. UNLESS OTHERWISE SPECIFIED ALL RESISTANCE VALUES ARE IN OHMS, 1/2 WATT, ALL CAPACITANCE VALUES ARE IN MICROMICROFARADS AND ALL INDUCTORS ARE IN MICROHENRIES.
2. FOR BALANCED OUTPUT CONNECT JUMPERS MARKED ——→ FOR UNBALANCED OUTPUT CONNECT JUMPERS MARKED - - - - → FOR EMERGENCY BALANCED OUTPUT CONNECT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

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

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

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

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


P7106(P)
J8104 (S)
P7102(P)
J8102 (S)
J8101 (P)
P7101(S)
SEE SHEET 6
J8102 (S)
P7102(P)
J8101 (P)
P7101 (S)
P900 (S)
J7103 (P)
J7102 (S)
J7104 (P)
P7103 (S)
J7101 (P)
E7101
E7303
E7306
J7302 (S)
P7302 (P)
Z7301
MAIN PA BLOWER B7101
BLOWER RELAY K7101
AIR VANE
MAIN POWER CB7401
HV BREAKER RESET S7402
INTERLOCK SWITCH S7404
INTERLOCK INDICATOR I7401 NE51
FRONT
REAR
R7401 220K
C7101 THRU C7116 1000 EACH
L7101 THRU L7108 30.5 EACH
R7303 3K 10W
R7404 100 55W
R7403 100 55W
AC POWER I7301
HV CB7402
PA LIGHTS S7403
R7201 500 25W
I7203
I7204
I7202
T7201
STARTER S7201
STARTER S7202
DRIVE M7202
C7202 0.01UF
R7303 3K 10W
R7304 3K 10W
R7305 3K 10W
R7306 3K 10W
HV BREAKER INDICATOR I7402 NE51
OPERATE I7303
TUNE I7302
PLATE ON I7304
EMERGENCY OUTPUT PROTECTION S7306
OVLD RESET S7401
C7327 4UF
TOP FAN B7301
C7318 0.01UF
C7319 0.01UF
C7320 0.01UF
C7321 0.01UF
PA BANDSWITCH S7304
AIR SWITCH S7101
REAR DOOR (PA) S7104
REAR PANEL S7103
BIAS DRAWER S7102
PA DECK S7305
C7123 1000
C7124 1000
L7112 45
R7101 15MEG
C7203 0.01UF
PLATE CURRENT M7203
C7118 1000
C7119 1000
C7120 1000
100K
2.5MH
0.1UF
GRN
BLU
YEL
VIO
BRN
RED

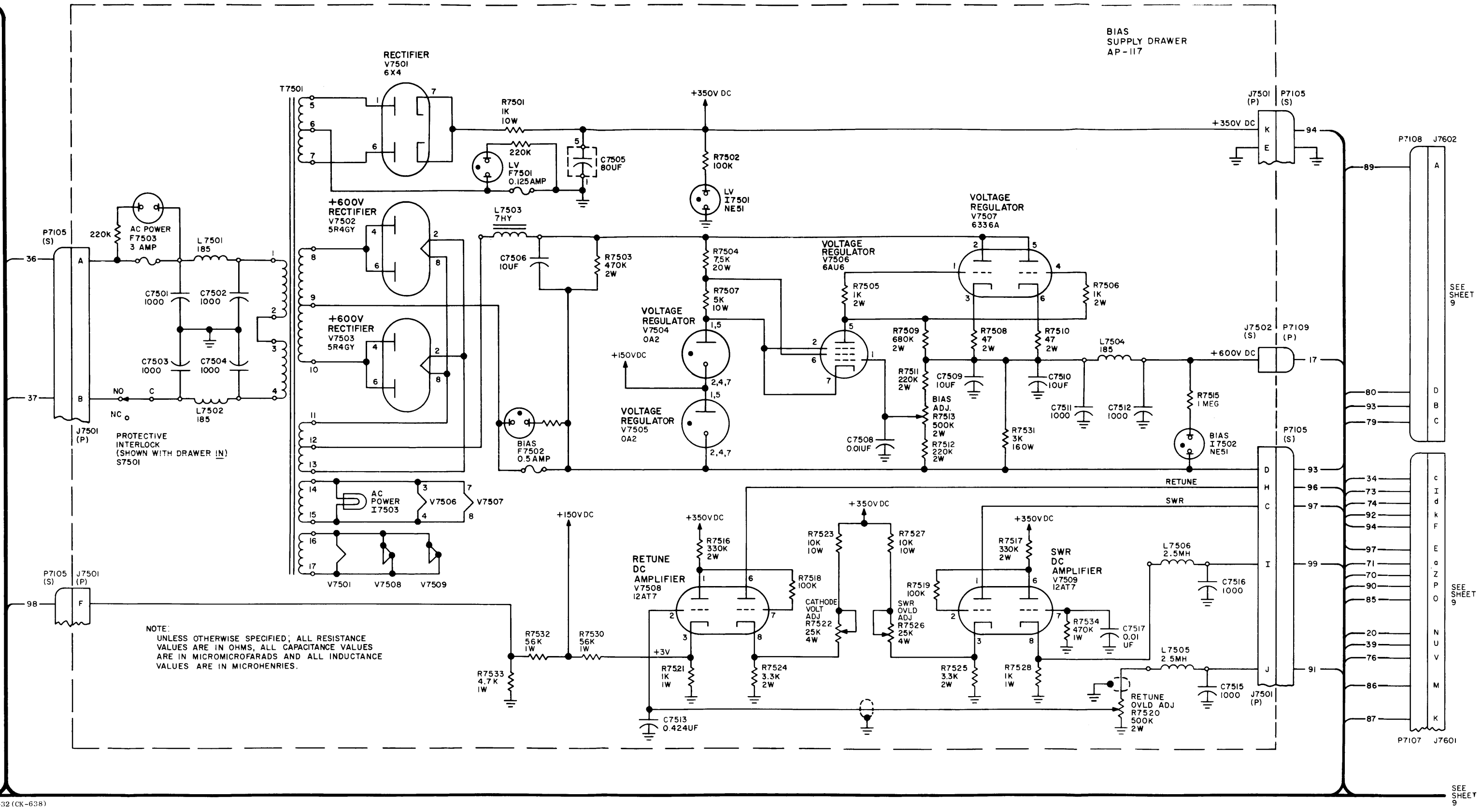
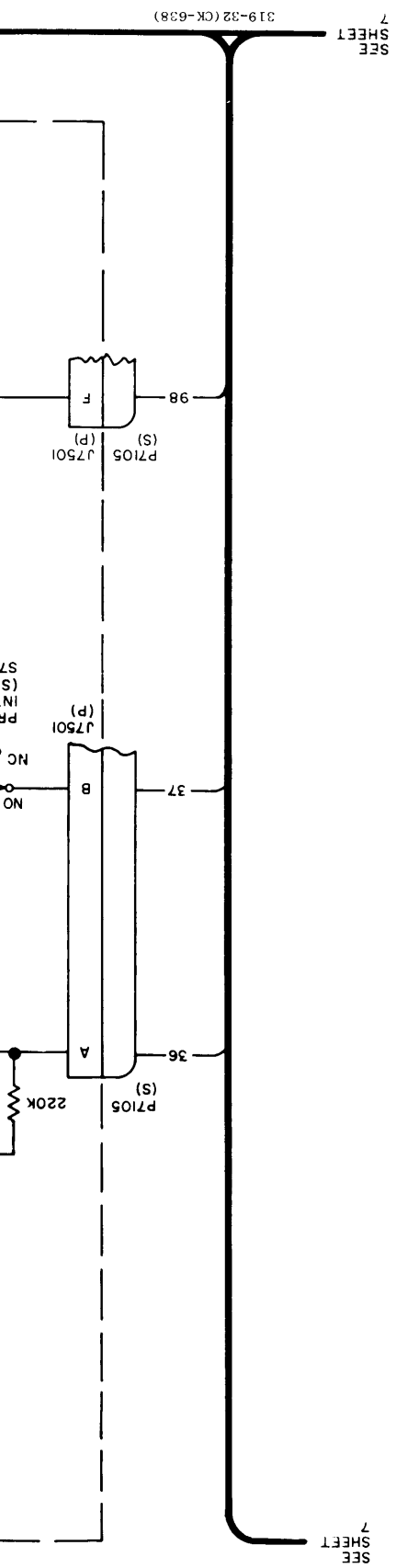


Figure 6-1. GPT-40K Transmitter, Schematic Diagram (Sheet 8 of 9)


SEE SHEET 7
319-32(CK-638)
98
F
P7105 (S)
J7501 (P)
37
B
NO
NC
J7501 (P)
P7105 (S)
36
A
220K
SEE SHEET 7

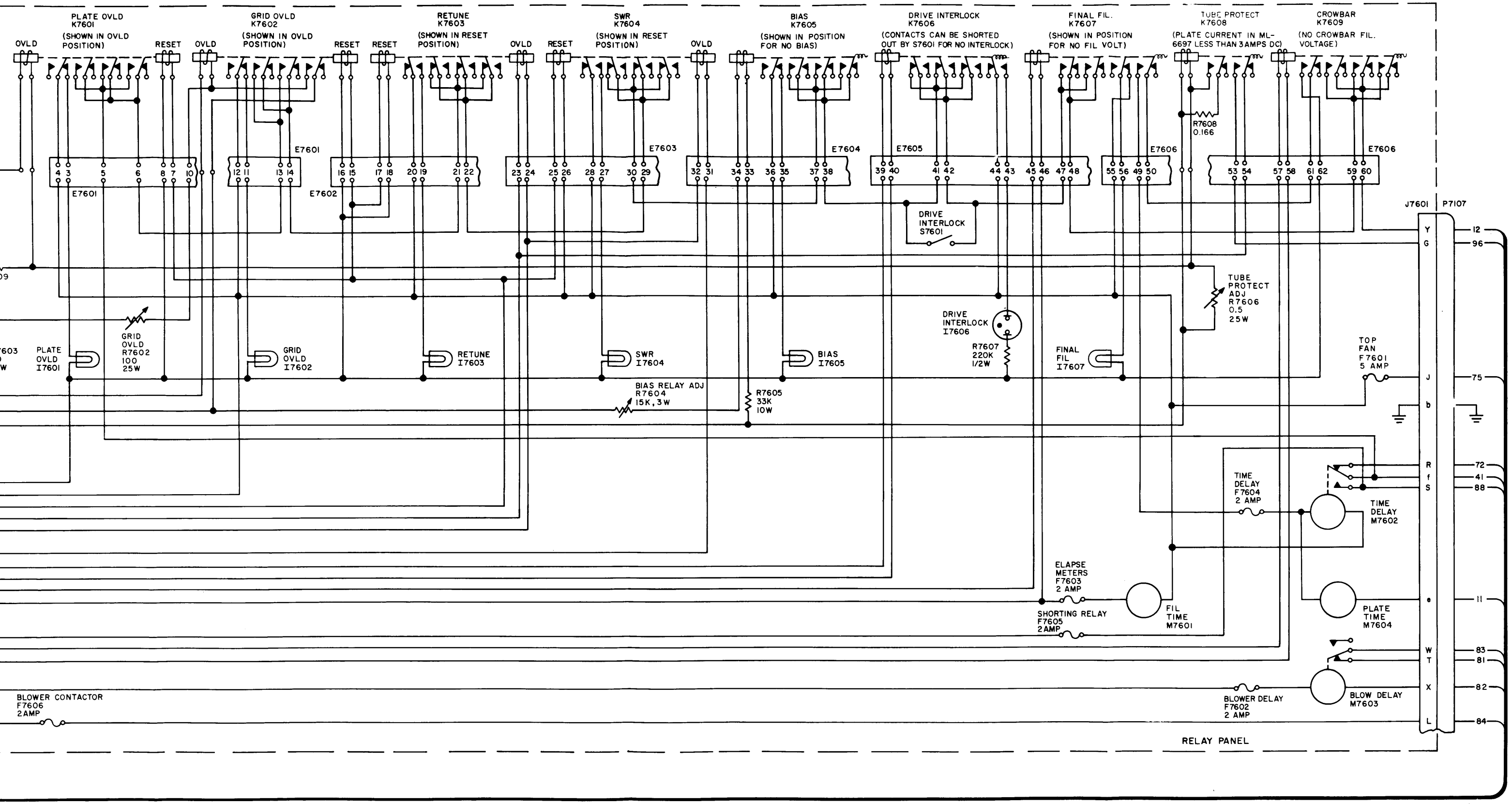
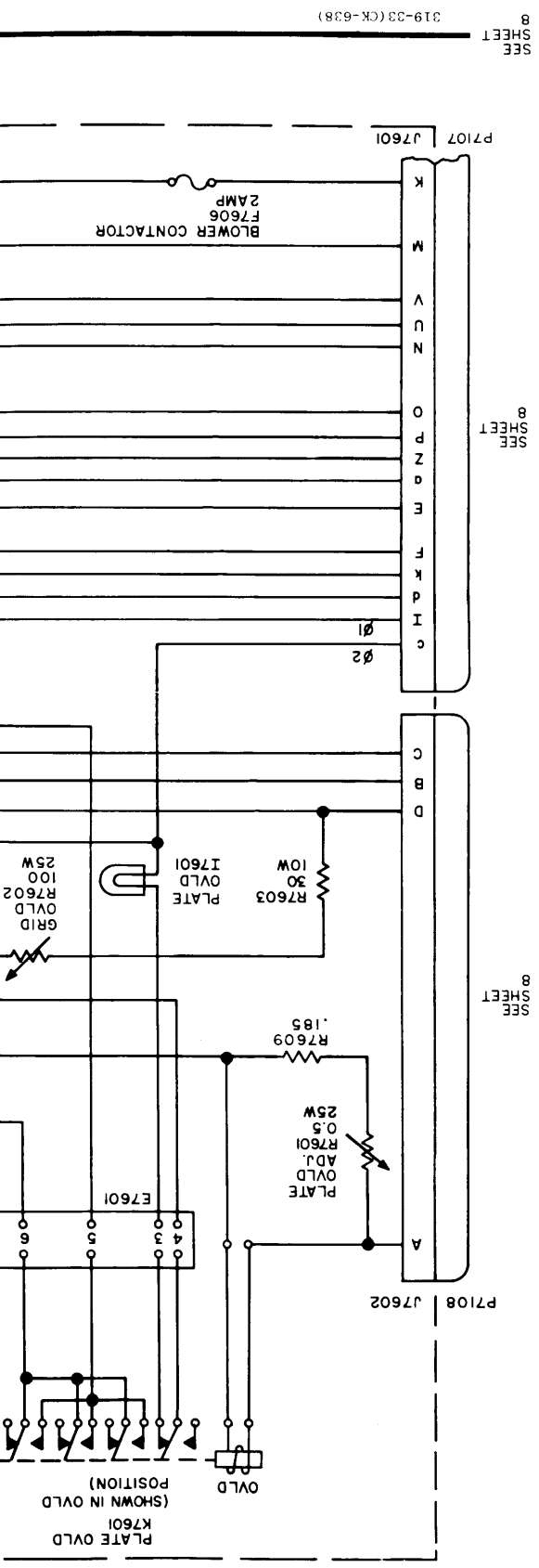


Figure 6-1. GPT-40K Transmitter, Schematic Diagram (Sheet 9 of 9)


SEE SHEET 8
319-33(CK-638)
P7107
J7601
K
M
V
U
N
O
P
Z
Q
E
F
K
D
I
C
Ø1
Ø2
SEE SHEET 8
BLOWER CONTACTOR
F7606
2AMP
C
B
D
SEE SHEET 8
R7603
30
10W
PLATE
OVLD
J7601
GRID
OVLD
R7602
100
25W
R7609
.185
PLATE
OVLD
ADJ.
R7601
0.5
25W
A
P7108
J7602
E7601
4
3
5
6
OVLD
PLATE OVLD
K7601
(SHOWN IN OVLD
POSITION)

CHANGE NO. 1 GPT-40K

INSTRUCTION BOOK CHANGE NOTICE

Date 6-13-63

Manual affected: Transmitting Set Radio Model GPT-40K IN - 130
(AN/FRT-40B)

1. Page 4-7-19-4-7-20 Fig. 4-7-3 Sheet 2 of 2

   a. Item 42 under color column change "Green" to read "Green/shielded"

   b. Item 48 insert "Wh/Red" under color column

   c. Item 129 insert "Tan" under color column

   d. Item 131 change "Wh/Brown" to "Wh/Green"

   e. Add Item 139 to read:

Cond	Color	Terminations	to
139	Orange	Cal/SWR switch	Pin "C" on J8101

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

THE TECHNICAL MATERIEL CORP., 700 Fenimore R ad, Mamar neck, New York

Attn.: Direct r of Eng. Services.

CHANGE NO. 2

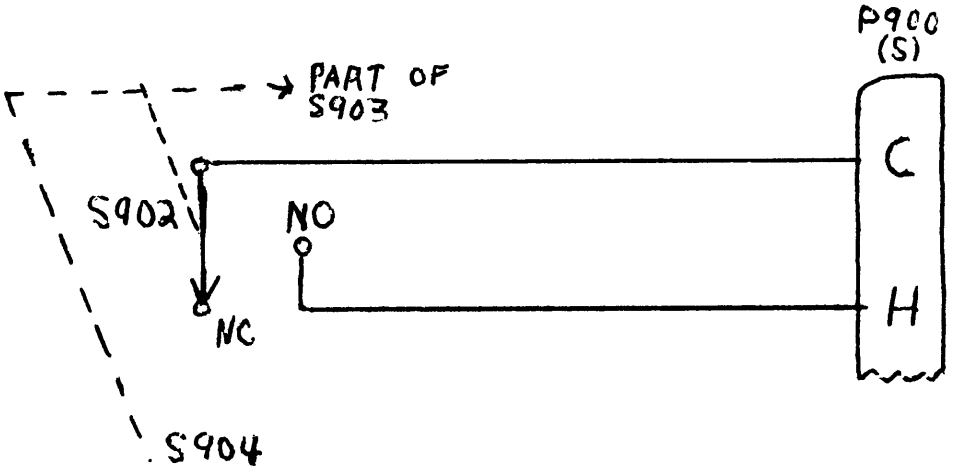
INSTRUCTION BOOK CHANGE NOTICE

Date October 1, 1963

Manual affected: Transmitting Set, Radio Model GPT-40K IN -130

page 4-7-5-4-7-6 Sheet 2 Figure 4-7-1

Section of diagram should appear as illustrated



RECORD OF CORRECTIONS MADE

Change No.	Date of Change	Date Entered	Entered By

FOREWORD

This manual consists of five parts as follows:

Part I: Transmitting Set, Radio GPT-40K, General Description. A short introductory section presenting the overall characteristics of Transmitting Set, Radio, GPT-40K (synthesized or non-synthesized, 2-28 mc), hereinafter referred to as GPT-40K; and referenced data.

Part II: Technical Manual for Transmitting Set, Radio, GPT-10K (synthesized or non-synthesized, 2-28 mc), hereinafter referred to as GPT-10K, consisting of two volumes. These volumes are separately bound in manuals referred to below as items 1, 2, 3, 4. Items 1 and 2 describe GPT-40K's first two frames when the transmitter is excited by conventional exciters and oscillators and has built-in test equipments. Items 3 and 4 describe GPT-40K's first two frames when the transmitter is excited with synthesized units and has no built-in test equipments aside from indicating meters of various types.

Item 1: Volume I, Technical Manual for Transmitting Set, Radio, Model GPT-10K, dated 1 January 1962.

Item 2: Volume II, Technical Manual for Transmitting Set, Radio, Model GPT-10K, dated 1 March 1962.

Item 3: Volume I, Technical Manual for Transmitting Set, Radio, Model GPT-10K, dated 1 January 1962.

Item 4: Volume II, Technical Manual for Sideband Generator, Model SBG-1, and SBG-2, dated 1 March 1962.

It should be noted that the manual entitled "Volume I Technical Manual for Transmitting Set, Radio, Model GPT-10K" dated 1 March 1962 is common to both non-synthesized and synthesized excited transmitters. This means that the larger frame of the two-frame assembly is identical for both types of transmitters. The smaller frame of the two-frame assembly is considerably different in these two cases. In the case of item 2, the exciter and test frame is stacked with conventional type exciters, oscillators, and auxiliary equipment. In the case of item 4, the exciter frame is stacked with frequency-translation units synthesized from a precision 1-mc standard.

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, which make up the GPT-40K's third and fourth frame assemblies. Part IV is common to both non-synthesized and synthesized excited transmitters.

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

Throughout TMC's manuals on GPT-10K and GPT-40K transmitters, associated balanced and unbalanced antennas are frequently referred to, for convenience, as 600-ohm and 50-ohm or 70-ohm antennas respectively. In the latter case, the practical significance of the 50-ohm versus 70-ohm call out is of negligible importance since impedance components of antennas in practice, of the type considered here, vary appreciably with frequency.

Pages, paragraphs and figures are designated as follows:

First numeric designates part number (I, II, ---V), second numeric designates section number (1, 2, 3 etc.), third (and fourth if used) numeric designates page or figure number. For example:

(1) Paragraph 1-1-1 is first paragraph in section 1 of part I.

(2) Page 3-1-4 is fourth page in section 1 of part III.

(3) Figure 1-1-2-a is second figure in section 1 of part I. The letter a indicates associated figures b, c etc.

(4) Table 1-1-5 is fifth table in section 1 of part I.

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PART III — STANDARD GPT-10K'S MODIFICATIONS TO DRIVE GPT-40K (C nt.)

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SECTION 2 — INSTALLATION (C nt.)

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PART IV — PA(40K) AND POWER SUPPLY SECTIONS

SECTION 3 — OPERATOR'S SECTION

SECTION 5 — TROUBLE-SHOOTING

SECTION 6 — MAINTENANCE

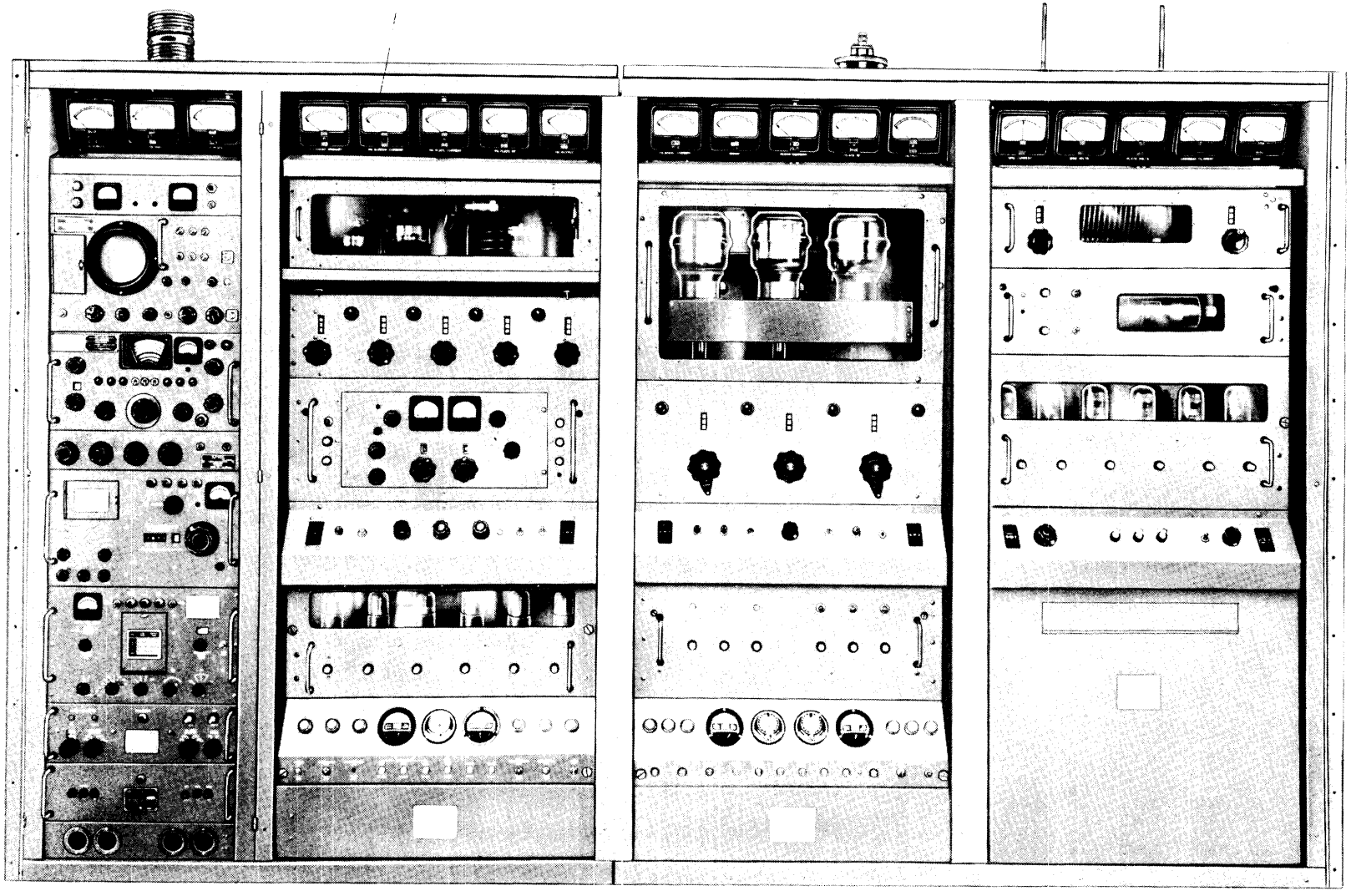


Figure 1-1-1-a. Front View, GPT-40K (Non-Synthesized)

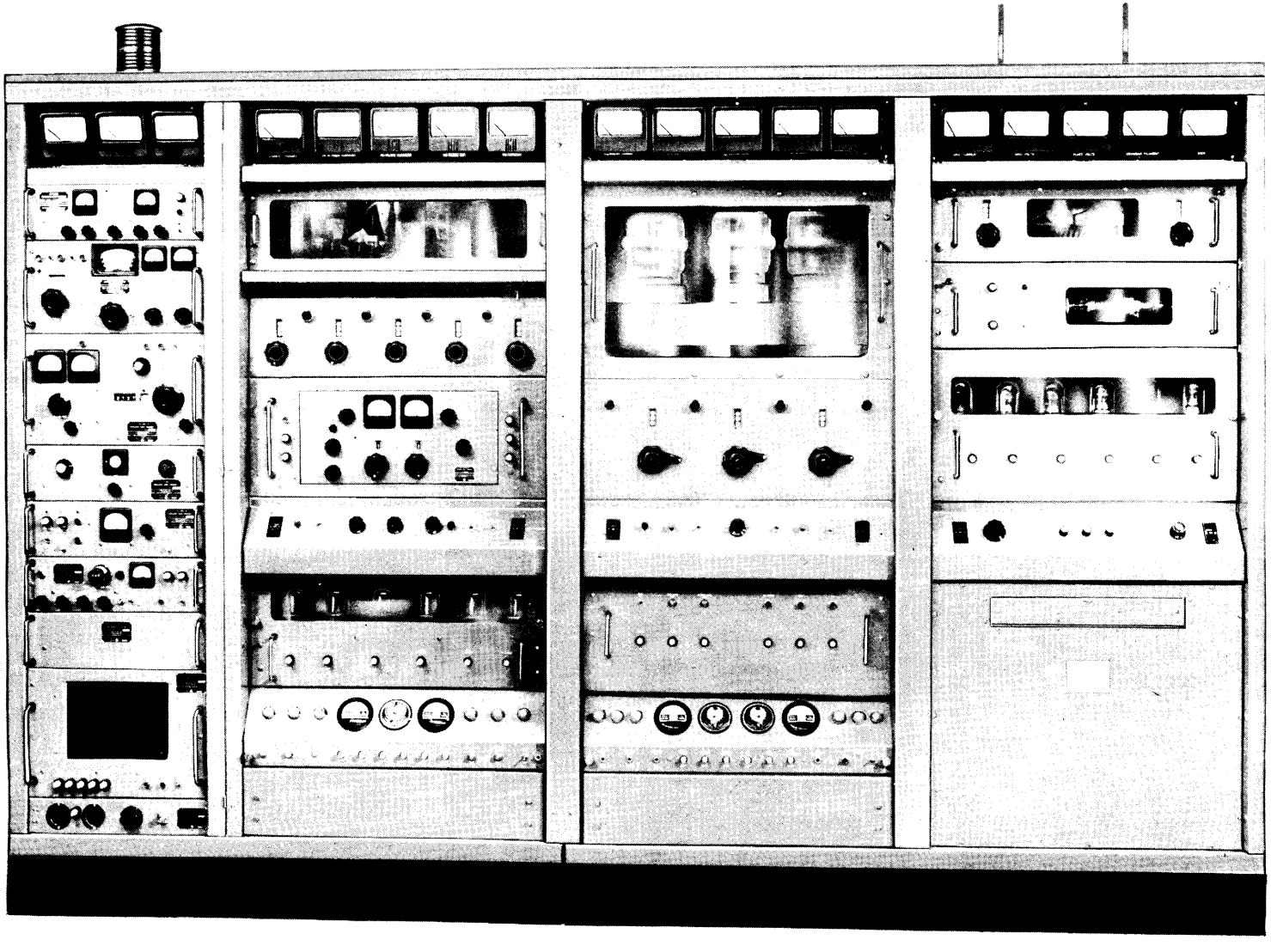


Figure 1-1-1-b. Front View, GPT-40K (Synthesized)

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

1–1–1. 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 2- 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.

Figures 1-1-1-a and 1-1-1-b show that either the non-synthesized or the synthesized GPT-40K consists of the following four frame assemblies.

a. Extreme left: test and exciter equipment.

b. Second from left: transmitter equipment comprising RF linear amplifiers and 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.

Isometric diagrams, figures 1-1-2-a, 1-1-2-b, and 1-1-2-c show the transmitter's modular structure (figure 1-1-2-c being the isometric diagram only of the third and fourth frames of the GPT-40K).

Figures 1-1-3-a and 1-1-3-b are block diagrams 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 or CHG units are the source of RF intelligence receiving phone, teletype, CW, or FAX signals and converting them for RF transmission.

The output of the exciter units is fed to RF amplifiers and 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 1-1-1. 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.

1–1–2. FUNCTIONAL DESCRIPTION.

The GPT-40K units located on the two frame assemblies toward the left (looking toward the front of the GPT-40K) are described in Parts II and III of this volume. The GPT-40K units located on the two frame assemblies toward the right (looking toward the front of the GPT-40K) are described in Part IV of this volume.

1–1–3. REFERENCE DATA.

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

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

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

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

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

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

UNIT	DESIGNATION		QUANTITY PER GPT-40K	APPROXIMATE INSTALLATION DIMENSIONS*			VOLUME*	WEIGHT*
	COMMERCIAL	MILITARY		LENGTH	HEIGHT	DEPTH		
Main Frame Chassis	AX-186	None	1	32	72	33-5/8	52	500 (835)**
Auxiliary Frame Chassis	AX-180 AX-239(S/X)	None	1	21	72	38-5/8	33	385
Base Mount and RF Base Shield	MS-1458-1 MS-2175	None None	1 1	53	6	38	8.5	152
Sides for Frames	MS-2116-1, 2117-1	None	2	38	72	27	43	428
Tops for Frames	MS-1699-1	None	1					
Doors for Main Frame Chassis	MS-2120-1, 2037	None	2					
Doors for Auxiliary Frame Chassis	MS-1648-1, 2119-1	None	2					
Trim Strips	MS-1633, 1634, 1635, 1636, 1637, 1669, 1670, 1671, 1672 (2), 1920 MS-2025 MS-2026 MS-2027 MS-2028 MS-2029 MS-2051 MS-2052 MS-2053 (2)	None	20 pieces					

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

**835 represents frame loaded with control panel, relay panel, meter box assembly sagamore capacitors, relays, etc; 500 represents bare framework.

(S/X) signifies synthesized transmitter.

TABLE 1–1–1. EQUIPMENT SUPPLIED AND PHYSICAL CHARACTERISTICS, GPT–40K (Cont.)

UNIT	DESIGNATION		QUANTITY PER GPT-40K	APPROXIMATE INSTALLATION DIMENSIONS*			VOLUME*	WEIGHT*
	COMMERCIAL	MILITARY		LENGTH	HEIGHT	DEPTH		
Main Power Transformer	TF-203	None	1	24	16	13	4.5	475
Sideband Exciter (S/X)	CBE-1 or CBE-2	0-714/UR None	1	19	5-1/4	12-7/8	0.6	17
Controlled Precision Oscillator (S/X)	CPO-1	AN/URA-31	-	-	-	-	-	-
a. Frequency Amplifier (S/X)	CHG-1 or CHG-2	AM-2505/URA-31 or none	1	19	10-1/2	19-1/4	2.2	40
b. Power Supply (S/X)	CPP-1	PP-2561/URA-31	1	19	5-1/4	16-1/2	0.9	41
c. Controlled Master Oscillator (S/X)	CMO-1 or CMO-2	0-716/URA-31 or none	1	19	10-1/2	18	1.8	45
d. Primary Standard (S/X)	CSS-1	0-715/URA-31	1	19	5-1/4	14-3/4	0.8	16
e. Divider Chain (S/X)	CHL-1	CV-928/URA-31	1	19	5-1/4	15	0.8	9
f. Controlled Oscillator (S/X)	CLL-1	0-717/URA-31	1	19	5-1/4	19	1.1	25
g. Power Supply (S/X)	CPP-2	PP-2562/URA-31	1	19	12-1/4	16	2.1	67
Tone Intelligence Unit (S/X)	TIS-3	TN-39A/UGT	1	19	5-1/4	17-1/8	0.8	26

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

(S/X) signifies synthesized transmitter.

TABLE 1–1–1. EQUIPMENT SUPPLIED AND PHYSICAL CHARACTERISTICS, GPT–40K (Cont.)

UNIT	DESIGNATION		QUANTITY PER GPT-40K	APPROXIMATE INSTALLATION DIMENSIONS*			VOLUME*	WEIGHT*
	COMMERCIAL	MILITARY		LENGTH	HEIGHT	DEPTH		
Transmitting Mode Selector	SBE-3	AN/URA-28	-	-	-	-	-	-
	SBE-2	AN/URA-23	-	-	-	-	-	-
RF Oscillator	AO-101	0-672/URA-28	1	19	8-3/4**	17-1/4	1.5	41
	A-1516	0-503A/URA-23	1	19	8-3/4**	17-1/4	1.5	41
Power Supply (N/S/X)	A-1397	PP-1769/URA-23	1	19	5-1/4**	10-1/4	0.9	38
	A-1397	PP-1769/URA-23	1	19	5-1/4**	10-1/4	0.9	38
Frequency Shift Exciter (N/S/X)	XFX	C-2749/URT	1	19	10-1/2**	18-1/2	1.8	48
Variable Frequency Oscillator (N/S/X)	VOX-5	0-330(B)/FR	1	19	10-1/2**	19-1/4	1.8	65
Frequency Spectrum Analyzer	FSA	AN/URM-116	-	-	-	-	-	-
Analyzer (N/S/X)	SA-2	TS-1236/URM-116	1	19	10-1/2**	20-1/2	1.8	32
Power Supply for SA-2 (N/S/X)	PS-2	PP-2206/URM-116	1	19	8-3/4**	12	0.9	32
Two Tone Generator (N/S/X)	TTG	0-579/URT	1	19	5-1/4**	17-1/4	0.8	19
RF Amplifier with Power Supply	RFC-1 AX-104	None	1	28-3/4	11-3/4**	20-1/2	3.4	100
Isolation Keyer (N/S/X)	AK-100	None	1	19	5-1/4**	9-1/2	0.6	10
High Voltage Rectifier	AX-103	None	1	28-3/4	10-3/4**	16-3/4	2.7	80

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

**Rack mounted space required.

(N/S/X) signifies non-synthesized transmitter.

TABLE 1–1–1. EQUIPMENT SUPPLIED AND PHYSICAL CHARACTERISTICS, GPT–40K (Cont.)

UNIT	DESIGNATION		QUANTITY PER GPT-40K	APPROXIMATE INSTALLATION DIMENSIONS*			VOLUME*	WEIGHT*
	COMMERCIAL	MILITARY		LENGTH	HEIGHT	DEPTH		
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	-	-
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	-	-	-	-	-
8 Bags of Installation Hardware and Plug Buttons	-	-	1 carton	-	-	-	-	-
19 Glass Resistors	-	-	1 carton	-	-	-	-	-
Grounding straps; Door latch plates and brackets; plate covers and adapters; connecting cables	-	-	Loose Items	-	-	-	-	-
Test Sheet	-	-	1	-	-	-	-	-
Instruction Manuals (3 volumes each)	-	-	2	-	-	-	-	-

NOTE

See table 1-1-5 for power requirement of individual units.

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

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

UNIT	DESIGNATION		QUANTITY PER GPT-40K	APPROXIMATE INSTALLATION DIMENSIONS*			VOLUME*	WEIGHT*
	COMMERCIAL	MILITARY		LENGTH	WIDTH	HEIGHT		
The equipment constituting the third and fourth frames of GPT-40K is as follows:								
Power Amplifier Frame	AP-106	-	1	32-1/8	38-3/8	73-1/2	58	650
Power Supply Frame	AP-103	-	1	33	39	74	62	712
Base Mount Base Shield	MS-1996 MS-1999	- -	1 1	64-1/2	38	6-1/2	9.3	177
Top Cover Front Doors Rear Doors	MS-1997 MS-2120-2 (1) MS-2118 (1) MS-2037 (1) MS-1647 (1)	- - - - -	1 1 1 1 1	74	16	42	33	321
Main Power Transformer	TF-211	-	1	22-1/4	9-1/2	27	3.3	585
Main Power Transformer	TF-211	-	1	22-1/4	9-1/2	27	3.3	585
Main Power Transformer	TF-211	-	1	22-1/4	9-1/2	27	3.3	585
Bias Supply Drawer	AP-104	-	1	28-3/4	14-3/4	10-3/4	2.7	75
Antenna Tuning Unit and Meter Panel Drawer	AT-101	-	1	28-3/4	21	14-3/4	5.2	86
Crowbar Drawer	AX-212	-	1	28-3/4	17-1/4	8	2.2	40
High Voltage Rectifier Drawer	AP-105	-	1	28-3/4	18-3/4	14	4.5	111

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

TABLE 1–1–1. EQUIPMENT SUPPLIED AND PHYSICAL CHARACTERISTICS, GPT–40K (Cont.)

UNIT	DESIGNATION		QUANTITY PER GPT-40K	APPROXIMATE INSTALLATION DIMENSIONS*			VOLUME*	WEIGHT*
	COMMERCIAL	MILITARY		LENGTH	WIDTH	HEIGHT		
Oil Filled Capacitors (C8107 and C8108)	CP-107	-	2	12	9-1/2	12-1/2	0.8	116
Transformer (L8101)	TF-5016	-	1	9-3/4	8	17-3/4	0.8	127
Main PA Tube (V7301)	ML-6697	-	1	21	8-1/2	8-1/2	0.9	45
Filament Transformer (T7101)	TF-215	-	1	12-3/8	8-1/2	11-5/8	0.7	129
Main Band Switch				13	13	29	3.2	48
1 Choke	CL-271	-	1					
1 Resistor	RW-119G1RO	-	1					
10 Resistors	RW-118F183	-	10					
3 Resistors	RW-118F5RO	-	3					
3 Resistors	RW-118F5RO	-	3					
1 Electron Tube	CH1095	-	1					
6 Electron Tubes	6895	-	6					
1 Red Bulb	BI-106-3	-	1					
1 White Bulb	BI-106-3	-	1	43	33	21	18	136
1 Insulator	AX-221	-	1					
1 Connector	JJ-163	-	1					
1 Capacitor	CB-149	-	1					
1 Capacitor	CB-149	-	1					
1 Capacitor	CB-158	-	1					
3 Capacitors	CO-106-1000-30	-	3					
1 Capacitor	CX-103	-	1					
1 Capacitor	CO-107-30C	-	1					

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

TABLE 1–1–2–a. SHIPPING DATA (NON-SYNTHESIZED GPT–40K) (CASES 1 THROUGH 12)

CASE NO.	PART	DESIGNATION		DIMENSIONS*			VOLUME*	WEIGHT*
		COMMERCIAL	MILITARY	LENGTH	WIDTH	HEIGHT		
1	Main Frame Chassis	None	None	42-1/2	36-1/4	81-1/2	72.2	1083
2	Auxiliary Frame Chassis	None	None	43-1/2	25-3/4	81-1/2	53.1	580
3**	One Base Mount and Two RF Shields	MS-1458-1 MS-2175 (2)	None	57	7-7/8	40-1/8	10.4	175
4	Two Sides and Top of Main Frame	MS-2116-1, 2117-1, 1699-1	None	76-1/2	26-5/8	44	51.6	620
	Doors for Main Frame Chassis	MS-2037, 2120-1						
	Doors for Auxiliary Frame Chassis	MS-1648-1, 2119-1						
	20 Pieces of Trim Strip	MS-1663, 1634, 1635, 1636, 1637, 1669, 1670, 1671, 1672 (2), 1920 MS-2025 MS-2026 MS-2027 MS-2028 MS-2029 MS-2051 MS-2052 MS-2053 (2)						
5	Main Power Transformer	TF-203	None	28-7/8	19-1/2	23-1/2	7.5	531

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

**When the GPT-10K is to be shock mounted, the base mount in case 3 is replaced by nine shock mounts and three heavy support bars for mounting the shock mounts. (See figure 4-2-2.) In addition, case 12 contains two stabilizers which are sometimes called shock mounts.

TABLE 1–1–2–a. SHIPPING DATA (NON-SYNTHESIZED GPT–40K) (CASES 1 THROUGH 12) (Cont.)

CASE NO.	PART	DESIGNATION		DIMENSIONS*			VOLUME*	WEIGHT*
		COMMERCIAL	MILITARY	LENGTH	WIDTH	HEIGHT		
6	Transmitting Mode Selector RF Oscillator Variable Frequency Oscillator	SBE-3 or SBE-2 AO-101 or A-1516 VOX-5	AN/URA-28 AN/URA-23 0-672/URA-28 0-503A/URA-23 0-330(B)/FR	30-7/8	23	29-1/2	12.0	196
7	Frequency Shift Exciter Analyzer	XFK SA-2	C-2749/URT TS-1236/URM-116	30-7/8	23-1/2	29-1/2	12.0	171
8	Power Supply for: SBE-2 SBE-2 Isolation Keyer Two-Tone Generator	 A-1397 A-1397 AK-100 TTG	 PP-1769/URA-23 PP-1769/URA-23 — 0-579/URT	30-7/8	23	29-1/2	12.0	154
9	Power Supply for SA-2	PS-2	PP-2206/URM-116	20-3/4	26	16	5.0	80
10	RF Amplifier with Power Supply	RFC-1 AX-104	AM-2103A/URT	35-1/2	26	16	8.5	180
11	High-Voltage Rectifier with One Set (2 pieces) of Ground Straps	TI-104		35-1/2	26	16	8.5	165
12	Refer to Table 1-1-2-b for contents of Case No. 12.			30-7/8	23	29-1/2	12.0	110

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

TABLE 1-1-2-b. SHIPPING DATA

Tube Electron, 1 each, Ref/Sym V900, TMC P/N 4CX5000A, removed from Main Frame Power Amplifier Section.

Tube, Electron, 6 each, Ref/Sym V600 thru V605, TMC P/N 872-A, removed from High Voltage Rectifier Section.

Lamp Socket Assembly, High Voltage, 1 each, TMC P/N AX-124, removed from Auxiliary Frame Top. Complete with BI-106-1 lamp, Ref/Sym I3000.

Manuals, Technical, 1 set, supplied as a loose item.

Data, Test, 1 set, supplied as a loose item.

Strap, Grounding, 2 each, TMC P/N MS-1753-2-18, supplied as a loose item.

Strap, Grounding, 2 each, TMC P/N MS-1753-2-30, supplied as a loose item.

Resistor, Fixed, 8 each, Ref/Sym R-802 thru R-809, TMC P/N RW-118F-183, removed from Power Supply Assembly AX-138.

Resistor, Fixed, 3 each, Ref/Sym, R-816,819 and 820, TMC P/N RW-118F-502, removed from Power Supply Assembly AX-138.

Resistor, Fixed, 2 each, Ref/Sym R-812 and 813, TMC P/N RW-1196-181, removed from Power Supply Assembly AX-138.

Resistor, Fixed, 2 each, Ref/Sym R-814 and 815, TMC P/N RW-122.3-604, removed from Power Supply Assembly AX-138.

Resistor, Fixed, 2 each, Ref/Sym R-810 and 811, TMC P/N RW-122-1-405,removed from Power Supply Assembly AX-138.

Door Latch Plate, Bottom Front and Rear, 6 each, TMC P/N MS-2122 P/O Exterior Covers.

Door Latch Plate, Top Front and Rear, 6 each, TMC P/N MS-1660 P/O Exterior Covers.

Door Latch Bracket, Top, Front and Rear, 6 each, TMC P/N MS-1661 P/O Exterior Covers.

Door Latch Bracket, Bottom, Front and Rear, 6 each, TMC P/N MS-2123 P/O Exterior Covers.

Plug, Electrical, 2 each, TMC P/N PL-149, supplied as a loose item.

Assembly Kit, Frame to Frame, 1 each, consisting of:
- 30 each Screw, Hexagon,
- 30 each Washer, Flat,
- 30 each Washer, Lock,

Equipment, Mounting Hardware Kit, 1 each, consisting of:
- 44 each Screw, Binderhead,
- 44 each Washer, Fiber,

TABLE 1-1-2-b. SHIPPING DATA (Cont)

Assembly Kit, Top to Frame, 1 each, consisting of:
- 22 each Washer, flat,
- 22 each Washer, Lock,
- 22 each Screw, Hexagon,

Mounting Kit, Trim Strip, 1 each, consisting of:
- 32 each Nut, Speed,
- 99 each Screw, Binderhead,

Mounting Kit, Panel to Frame, 1 each, consisting of:
- 20 each Screw, Hexagon,
- 20 each Washer, Flat,
- 20 each Washer, Lock,

Mounting Kit, Door Latch Stops, 1 each, consisting of:
- 24 each Washer, Flat,
- 24 each Washer, Flat,
- 24 each Washer, Lock External,
- 24 each Washer, Lock Split,
- 24 each Nut, Hexagon,
- 24 each Screw, Binderhead,
- 24 each Screw, Flat

Mounting Kit, Hinges, Rear Door, 1 each, consisting of:
- 12 each Screw, Hexagon,
- 12 each Washer, Flat,
- 12 each Washer, Lock Split

Mounting Kit, Transformer to 40K Frame, 1 each, consisting of:
- 12 each Washer, Flat,
- 12 each Washer, Lock Split,
- 12 each Screw, Hexagonhead,

Mounting Kit, Transformer to 10K Frame, 1 each, consisting of:
- 4 each Screw, Hexagonhead,
- 4 each Washer, Lock Split,
- 4 each Washer, Flat,

Mounting Kit, Straps, Ground Copper, 1 each, consisting of:
- 1 each Screw, Hexagonhead,
- 3 each Nut, Hexagon,
- 4 each Washer, Lock Split,
- 9 each Washer, Flat,

Plug, Button 1/2", 8 each, TMC P/N HB-101-3, supplied as a loose item.

Plug, Button, 7/8" 48 each, TMC P/N HB-101-6, supplied as a loose item.

Hinges, Rear Door, 3 each, TMC P/N MS-2041.

Hinges, Rear, Door, 3 each, TMC P/N MS-2042.

Wrench, Allen, 1 each, TMC P/N WR-100-12.

TABLE 1-1-2-b. SHIPPING DATA (Cont)

Wrench, Allen, 1 each, TMC P/N WR-100-20

Cable, Emergency Output, TMC P/N CA-582-1

Machlett Tube (ML-6697) Warranty, 1 each

Penta Laboratory Warranty, 1 each, for TMC TV-100 Tube.

Eitel Mc Culloch Warranty, 1 each, for TMC 4CX5000A Tube.

Mounting Kit, Frame to 10K Base, 1 each, consisting of:

10 each Screw, Hexagonhead
10 each Washer, Flat
10 each Washer, Split

Mounting Kit, Frame to 40K Base, 1 each, consisting of:
13 each Screw, Hexagonhead
13 each Washer, Flat
13 each Washer, Split

Cables, CA-108, CA-109, and CA-502, 1 each, supplied with each TMC Model VOX when a component of the Transmitter.

Plug Electrical, 1 each, TMC P/N PL-132-3, supplied as a loose item.

Tube Electron, 1 each Ref/Symbol V203, TMC P/N TV-100, removed from RFC-1.

Capacitor, Variable, 1 each, Ref/Symbol C-928, TMC P/N AM-114 with PO-185-6 and MS-2368, removed from Main Frame.

Capacitor, Variable, 1 each, Ref/Sym C-927, TMC P/N AM-113, removed from Main Frame.

Capacitor, Variable, 1 each, Ref/Symbol C-916, TMC P/N AM-103 with PO-185-1 and MS-1696 removed from Main Frame.

Plug, Electrical, 2 each, TMC P/N PL-218, supplied as a loose item.

Plug, Electrical, 1 each, TMC P/N PL-157, supplied as a loose item.

Cable, Interconnect, 1 each, TMC P/N CA-615.

TABLE 1-1-2-c. SHIPPING DATA (SYNTHESIZED GPT-40K)

BOX NO.	CONTENTS	LENGTH	WIDTH	HEIGHT	GROSS WEIGHT
1	Assorted Items, see Table 1-1-2-b for detailed contents.	31 3/4	23 1/2	30 3/4	201
2	Assorted Items, see Table 1-1-2-e for detailed contents.	45 1/8	36	22 1/4	263
3	Mounting Base of the GPT-40KE complete with shield and access doors.	56 5/8	40 1/4	8 1/4	234
4	Mounting Base of the GPT-40KE complete with shield and access doors.	67 7/8	40 1/4	8 1/4	273
5	Auxiliary Frame of the Cabinet, complete with: Meter Panel Assembly Power Distribution Panel, TMC Model APP-3 Serial No. _____	79 1/4	48 1/8	31 1/2	768
6	Main Frame of the Cabinet, complete with: Power Amplifier Section Main Power Panel Relay Panel	80 3/4	42	49 3/4	1298
7	Power Amplifier Frame of the Cabinet complete with: Meter Panel Assembly Front Panel, Power Amplifier Control Power Amplifier Section Panel Main Control Relay Panel	80 3/4	42	49 3/4	1130
8	Power Supply Frame of the GPT-40KE Cabinet complete with: Power Supply Control Panel Spare Fuse Panel, TMC P/N MS-2095	80 3/4	42	49 3/4	1166
9	Main Power Transformer, TMC P/N TF-203, Ref/Sym T-800	28 7/8	19 7/8	24 7/8	539

TABLE 1-1-2-c. SHIPPING DATA (SYNTHESIZED GPT-40K) CON'T.

BOX NO.	CONTENTS	LENGTH	WIDTH	HEIGHT	GROSS WEIGHT
10	Power Transformer, TMC P/N TF-211, Ref/Sym T8101				654
11	Power Transformer, TMC P/N TF-211, Ref/Sym T8102	26 1/4	16 1/2	38	654
12	Power Transformer, TMC P/N TF-211, Ref/Sym T8103				654
13	Power Transformer, TMC P/N TF-215, Ref/Sym T8104	16 1/4	10 1/2	17	150
14	Power Transformer, TMC P/N TF-5016, Ref/Sym L8101	23 3/4	13 1/8	12 5/8	149
15	Capacitors, TMC P/N CP-107, Ref/Sym C8107 and C8108	24 3/4	15 3/8	21 1/8	210
16	Main Band Switch, removed from Power Amplifier ~~Supply~~ Frame, TMC P/N AS-120	40 7/8	26 1/2	29	201
17	Power Supply, TMC Model CPP-5, Serial No. _____ Frequency Divider, TMC Model CHL-1, Serial No. _____ R.F. Oscillator, TMC Model CSS-1B, Serial No. _____				212
18	A.F. Oscillator, TMC Model CLL-1, Serial No. _____ Telegraph Terminal, TMC Model TIS-3, Serial No. _____ R.F. Oscillator, TMC Model CBE-1, Serial No. _____	31 3/4	23 1/2	30 3/4	202
19	R.F. Oscillator, TMC Model CMO-1, Serial No. _____ R.F. Amplifier, TMC Model CHG-2A, Serial No. _____				214
20	Power Supply, TMC Model CPP-2, Serial No. _____	27	21 1/2	17 1/4	143

TABLE 1-1-2-c. SHIPPING DATA (SYNTHESIZED GPT-40K) CON'T.

BOX NO.	CONTENTS	LENGTH	WIDTH	HEIGHT	GROSS WEIGHT
21	R.F. Amplifier, TMC Model RFC-1, Serial No. _____	39 3/4	30 5/8	22 1/4	240
22	High-Voltage Rectifier Section, TMC P/N AX-103, Ref/Sym 600	"	"	"	233
23	Bias Supply Section, TMC P/N AP-104, Ref/Sym 7500	"	"	"	217
24	High-Voltage Rectifier Section, TMC P/N AP-105, Ref/Sym 8400	40 7/8	34 5/8	28	289
25	Crowbar Circuit Section, TMC P/N AX-212, Ref/Sym 8300	39 3/4	30 5/8	22 1/4	187
26	Antenna Tuner Section, TMC P/N AT-103, Ref/Sym 8200	40 7/8	34 5/8	28	250
27	Power Tube, Electron, TMC P/N ML-6697, Ref/Sym V7301	28 3/8	26 5/8	35	146
28	Exterior Covers and Trim Strips	76 5/8	27 1/2	44 3/4	643
29	Exterior Covers	76 5/8	22 1/8	44 3/4	490
30	Running Spares in a/w SigC Dwg. SC-D-93392 EXCEPT Item 78	29 7/8	24 1/4	20 5/8	95
31	Tube Electron, TMC P/N ML-6697 in a/w SigC Dwg. SC-D-93392	28 3/8	26 5/8	35	146

TABLE 1-1-2-e. SHIPPING DATA

Choke, 1 each, TMC P/N CL-271, Ref/Sym. L7312, removed from AX-275.

Resistor, 1 each, TMC P/N RW-119GIRO, Ref/Sym. R8101, removed from AP-103.

Resistor, 10 each, TMC P/N RW-118F183, Ref/Sym. R8102 thru R8111, removed from AP-103.

Resistor, 3 each, TMC P/N RW-118F5RO, Ref/Sym. R8112 thru R8114, removed from AP-103.

Resistor, 3 each, TMC P/N RW-118F5RO, Ref/Sym. R8301 thru R8303, removed from AX-212.

Tube, Electron, 1 each, TMC P/N 7568, Ref/Sym. V8301, removed from AX-212.

Tube, Electron, 6 each, TMC P/N 6895, Ref/Sym. 8401 thru 8406, removed from AP-105.

Insulator, 1 each, TMC P/N NS-128-1, Part of Ref/Sym. E8114, removed from AP-153.

Connector, 1 each, TMC P/N JJ-137, Ref/Sym. J-902, removed from AX-238.

Capacitor, 3 each, TMC P/N CB-160, Ref/Sym. 7330, 7331 and 7332, removed from AX-275.

Capacitor, 3 each, TMC P/N CO-106-1000-30C, Ref/Sym. C-7325, C-8207, and C-7328. C-7325 and C-7328 are removed from AX-275, C-8207 is removed from AT-103.

Capacitor, 1 each, TMC P/N CX-103, Ref/Sym. C-7316, removed from AX-275.

Capacitor, 1 each, TMC P/N CO-107-6-30C, Ref/Sym. C-7326, removed from AX-275.

Insulator, Feed-Thru, 1 each, TMC P/N AX-228, Ref/Sym. E-7305, removed from AX-275.

Contact Assembly, 2 each, TMC P/N AX-223, Ref/Sym. E-8115 and E-8116, removed from AP-103.

TABLE 1–1–3. TECHNICAL SPECIFICATIONS GPT–40K (NON-SYNTHESIZED OR SYNTHESIZED)

FUNCTION	REQUIREMENT
FREQUENCY RANGE:	2 to 28 megacycles, bandswitched.
OPERATING MODES:	SSB, ISB, CW, AM, FSK and FAX.
NOTE Five models (B, C, H, P, and T) are limited to SSB, ISB, AM, and CW; one model (G) is limited to CW and FSK; four models (A, L, W, AB) have the above capabilities.	
NOMINAL POWER OUTPUT:	40,000 watts two-tone PEP signal to distortion ratio at least 35 db. 20,000 watts two-tone PEP signal to distortion ratio at least 40 db. 25,000 watts average CW or FS.
EMERGENCY POWER OUTPUT: (Final amplifier not used)	10,000 watts PEP signal to distortion ratio at least 35 db; 5000 watts PEP, 40 db. 5,000 watts average CW or FS.
EMERGENCY POWER OUTPUT: (Inter RFC amplifier used only)	1,000 watts PEP.
OUTPUT IMPEDANCE:	50 or 70 ohms unbalanced. 3 1/8" EIA flange. 600 ohms balanced. Pi-L network will match a load with VSWR of 2:1 maximum.
STABILITY AND FREQUENCY CONTROL: (Synthesized Transmitter)	1. All radio frequency determining elements referenced to a built-in 1-mc standard. 2. Stability of 1 part in 10^8 per day for ambient temperature change of 15° C within the range of 0-50° C.
(Non-Synthesized transmitter)	1 part in 10^6 per 24 hour period from 10 oven controlled crystal position in the SBE.
TUNING:	All tuning and bandswitching controls are on the front panel (no plug-in components or mechanical adjustments). Self-cleaning contacts on RF bandswitches.
DISTORTION PRODUCTS:	See Power Output.
DISTORTION MEASURING:	Built-in spectrum analyzer (non-synthesized transmitter); external spectrum analyzer (part of PTE-3, synthesized transmitter).
UNWANTED SIDEBAND REJECTION:	500 cps single tone, 60 db down from full PEP output.
SPURIOUS SIGNALS:	At least 60 db below full PEP output.
CARRIER INSERTION:	-55 db to full PEP output.
HARMONIC SUPPRESSION:	Second harmonic at least 50 db down from full PEP output.

TABLE 1–1–3. TECHNICAL SPECIFICATIONS GPT–40K (NON-SYNTHESIZED OR SYNTHESIZED) (Cont.)

FUNCTION	REQUIREMENT
	Third harmonic at least 65 db down from full PEP output.
AUDIO RESPONSE: (Non-Synthesized Transmitter) (Synthesized Transmitter)	SBE-2 flat within ±1.5 db, 350-3300 cycles. SBE-3 Crystal lattice filters flat within ±1.5 db, 250-7500 cycles. SBE-4 Crystal lattice filters flat within ±1.5 db, 250-6000 cycles. CBE-1 Crystal lattice filters flat within ±1.5 db 250 to 7500 cps. CBE-2 Crystal lattice filters flat within ±1.5 db 250 to 3300 cps.
AUDIO INPUTS:	600 ohms balanced -20 to +10 dbm. Continuously adjustable for full RF output. An unbalanced input can also be applied.
HEAT DISSIPATION:	40 kw (approx.)
SPECIAL FEATURES:	ALDC (Automatic Load and Drive Control) is provided to improve linearity, limit distortion, and deliver a relatively constant RF output level during high modulation peaks or load changes. Front panel control allows adjustment of the level at which the ALDC takes effect or switching off the ALDC, if desired. Voice Operated Relay (non-synthesized transmitter only) - Voice control with anti-trip features. Adjustable gain and squelch.
METERING:	Large scale meters are mounted on tilted panels at the top of the units to accurately indicate operation of all critical circuits. These meters are externally illuminated for ease in reading.
ENVIRONMENTAL:	Designed to operate in any ambient temperature between the limits of 0 and 50° C for any value of humidity up to 90%.
COOLING:	Filtered forced air cooling, semi-pressurized cabinet. Adequate ventilation for the first and second frames of the transmitter requires 1600 cubic feet of air per minute (.075 density) at a static pressure of 2.25 inches of water. The third and fourth frames require 2500 cubic feet of air per minute (.075 density) at a static pressure equivalent to 8 inches of water.
SAFETY FEATURES:	Overload and bias protection with audible alarm. Safety interlocks at all high voltage points.
NOISE:	1. Power supply ripple -55 db from full PEP output. 2. Other, -70 db from full PEP output.

TABLE 1–1–3. TECHNICAL SPECIFICATIONS GPT–40K (NON-SYNTHESIZED OR SYNTHESIZED) (Cont.)

	FUNCTION	REQUIREMENT
NON-SYNTHESIZED TRANSMITTER	XFK FREQUENCY SHIFT:	Linear to 1000 cycles.
	XFK KEYING SOURCE:	1. Polar or neutral positive. 2. Linear input 30,000 ohms.
	XFK KEYING SPEED:	750 bauds (1,000 wpm) maximum.
	XFK KEYING IMPEDANCE:	Polar or neutral operation into 100,000 ohms. (May be bridged by external 1,800-ohm resistor for operation from a TTY loop.)
	XFK KEYING BIAS:	Not greater than 10% at 750 bauds.
	XFK STABILITY:	1. 10 cycles for ambient temperature change of 0.50° C. 2. 10 cps for line voltage change of 10%. 3. No drift for input signal variations of +25 to +150 volts (mark frequency)
	XFK CRYSTAL FREQUENCY:	$FC = \frac{Fo}{n}$ -200 kc Where Fo = transmitter output frequency n = transmitter multiplication factor.
SYNTHESIZED TRANSMITTER	TIS-3 KEYING INFORMATION:	FSK 75 bauds (100 wpm) maximum 50V, 100V, 20 ma, 60 ma, all neutral, floating, or either side grounded. 12-1000 cps shift. CW 140 bauds maximum. Same keying voltages as for FSK plus dry contact keying. FAX 400 bauds maximum. -5 to +5 DCV or 0 to +20 volts for linear shift of 1200 cycles.
PRIMARY POWER:		208/230 volts 50/60 cps, 3 phase.
REQUIREMENTS:		Maximum 80 KW. Primary of transformer may be connected for either DELTA or "Y" input.
INSTALLATION DATA:		Weight approximately 7,000 lbs. Size: 10 1/2' wide, 3' deep, 7' high
NUMBER OF CONTAINERS SHIPPED:		29
SIZE OF LARGEST CONTAINER:		36 1/4" X 43 1/4" X 81 1/2" (non-synthesized XMTR) 32" X 38 5/8" X 72 1/2" (synthesized XMTR)
SHIPPING WEIGHT & CUBE:		10,922 lbs. Cube 260.6 cu. ft.

TABLE 1–1–4–a. VACUUM TUBE COMPLEMENT, GPT–40K (NON-SYNTHESIZED)

1 PA (10K)	2 IPA (10K)	3 P. S. for Item 2	4 AX-103	5 SBE 3, 2	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, 2													6CL6	3, 3
	1			1, 1													6146	2, 2
	1																PL172	1
		1			1									2			5R4	4
		1					1	1	1					1			6X4	5
		2		2, 1	1	1			SLM-1=1					2			OA2	8, 7
									SLM-2=1								OB2	1
			6														872A	6
				4, 3													6AB4	4, 3
				2, 3						4							6U8	6, 7
				3, 4				2		1		1		2			12AT7	9, 10
				3, 3		3	3	4		4		1					12AU7	18, 18
				3, 2						1							6AH6	4, 3
				1. 1													6AL5	1, 1
						1											5V4G	1
						1											6BE6	1
						6											6AQ5	6
						1											6C4	1
						1											6AB4	1
							1										6J6	1
							2			1							6BE6	3
							1										2E26	1
							1										5U4G	1
							2										OB2	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						6AS7G	1
											1						12AX7	1
													1				6697	1
														1			6336A	1
															1		1095	1
																6	6895	6

Grand Total = 114, 113

TABLE 1–1–4–b. VACUUM TUBE COMPLEMENT, GPT–40K (SYNTHESIZED)

TUBE	1 PA (10K)	2 IPA (10K)	3 P. S. for ITEM 2	4 AX-103	5 CBE 1, 2	6 CHG-1	7 CHG-2	8 CPP-1	9 CPP-5	10 CMO 1, 2	11 CSS 1, 1A	12 CHL-1	13 CLL-1	14 CPP-2	15 TIS-3	16 PA (40K)	17 BIAS SUPPLY	18 CROW BAR	19 HV RECT	TOTAL
4CX5000A	1																			1
6CL6		1				1	1			1										4
6146		1				1	1													3
PL172		1																		1
5R4			1														2			3
6X4			1		1												1			3
OA2			2		1			1	1						2		2			9
OB2																				-
872				6																6
6C4					4															4
12AT7					2	1	1						1				2			7
12AU7					1					2					5					8
6AH6						13	8			4			1	1						27
6AU6						1	6			1			1				1			10
6U8						2	2					1	3							8
6AB4						1				1			1							3
6H4						1														1
6BA7						1	1			1			3							6
6C5G						1	1													2
6BE6						1	1			1										3
6AH7							1													1
6J4							2													2
6CS6										1										1
5814												3								3
5725												4								4
1EP1													1							1
6080														2						2
5U4														1						1
OC2														1						1
6J6															1					1
5963															1					1
6AG5															1					1
6697																1				1
6336A																	1			1
1095																		1		1
6895																			6	6
*2N1224 (TRANSISTORS)											3, 4*									

GRAND TOTAL 137

TABLE 1–1–5. 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.

* For station planning, greater capacity should be provided. TMC recommends a three-phase bank of 100-kw capacity. This oversize capacity is recommended to avoid low voltage on station facilities when GPT-40K transmitters are turned on.

BASIC TRANSMITTER COMPONENTS
GPT-10K

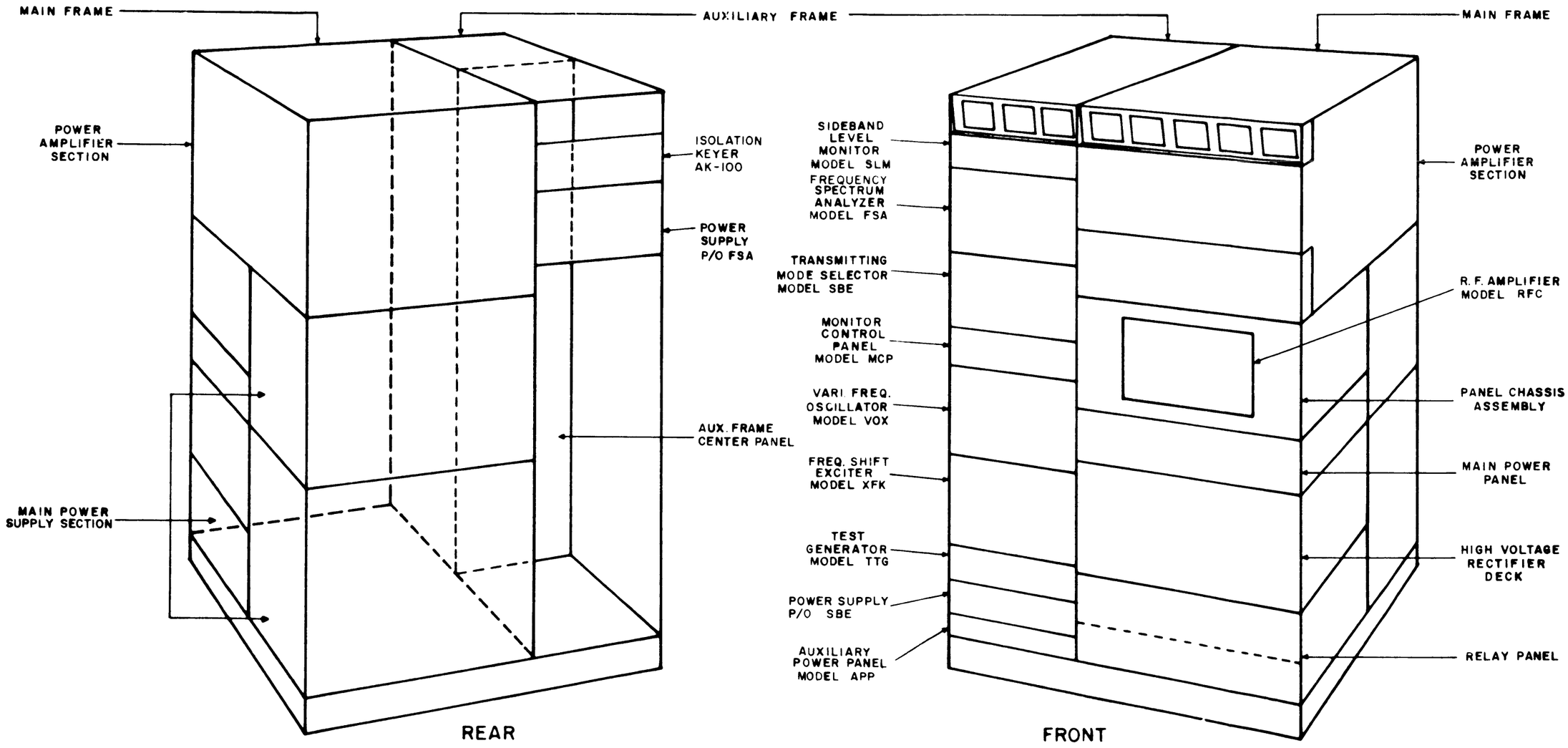
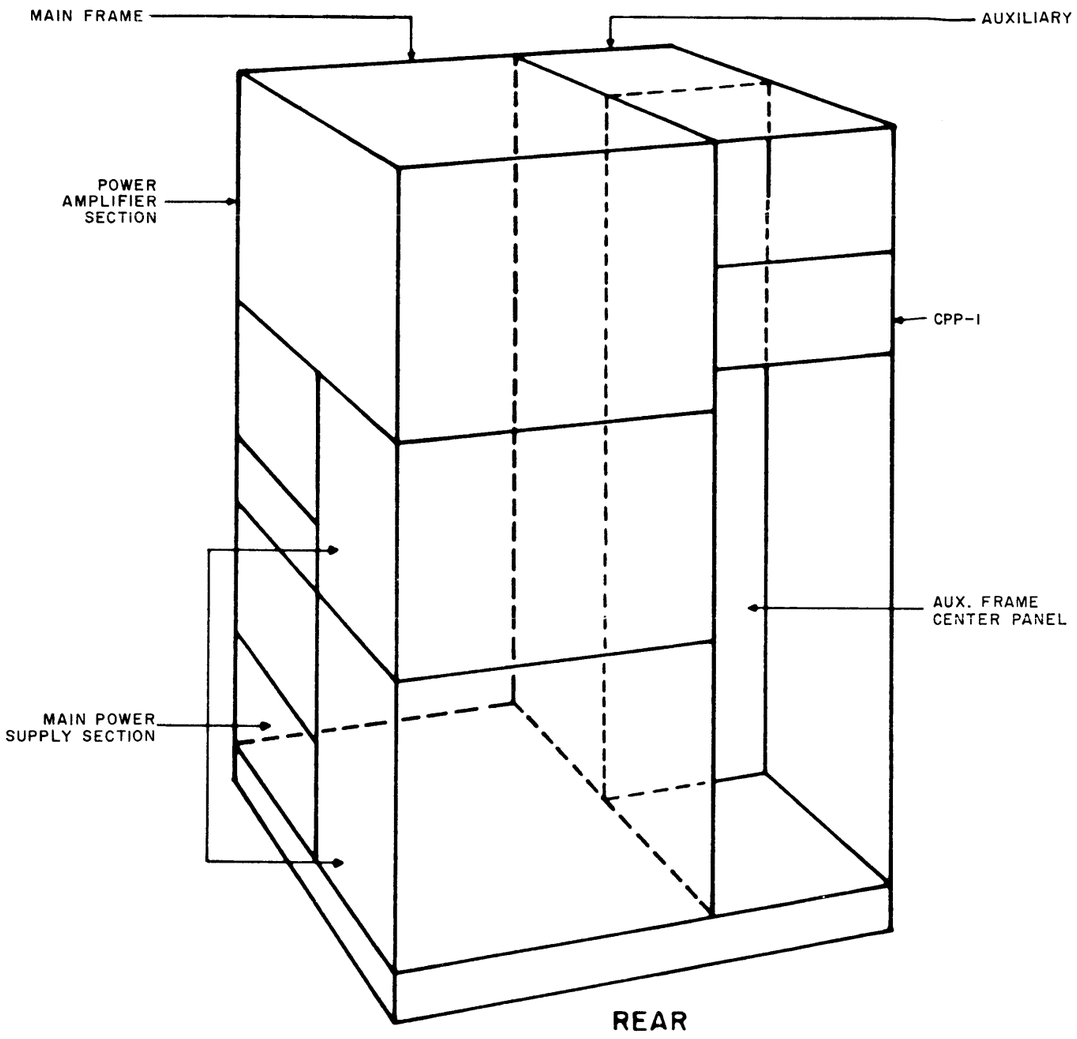


Figure 1-1-2-a. Isometric Diagram, GPT-10K (Non-Synthesized)

BASIC TRANSMITTER COMPONENTS
GPT-10K



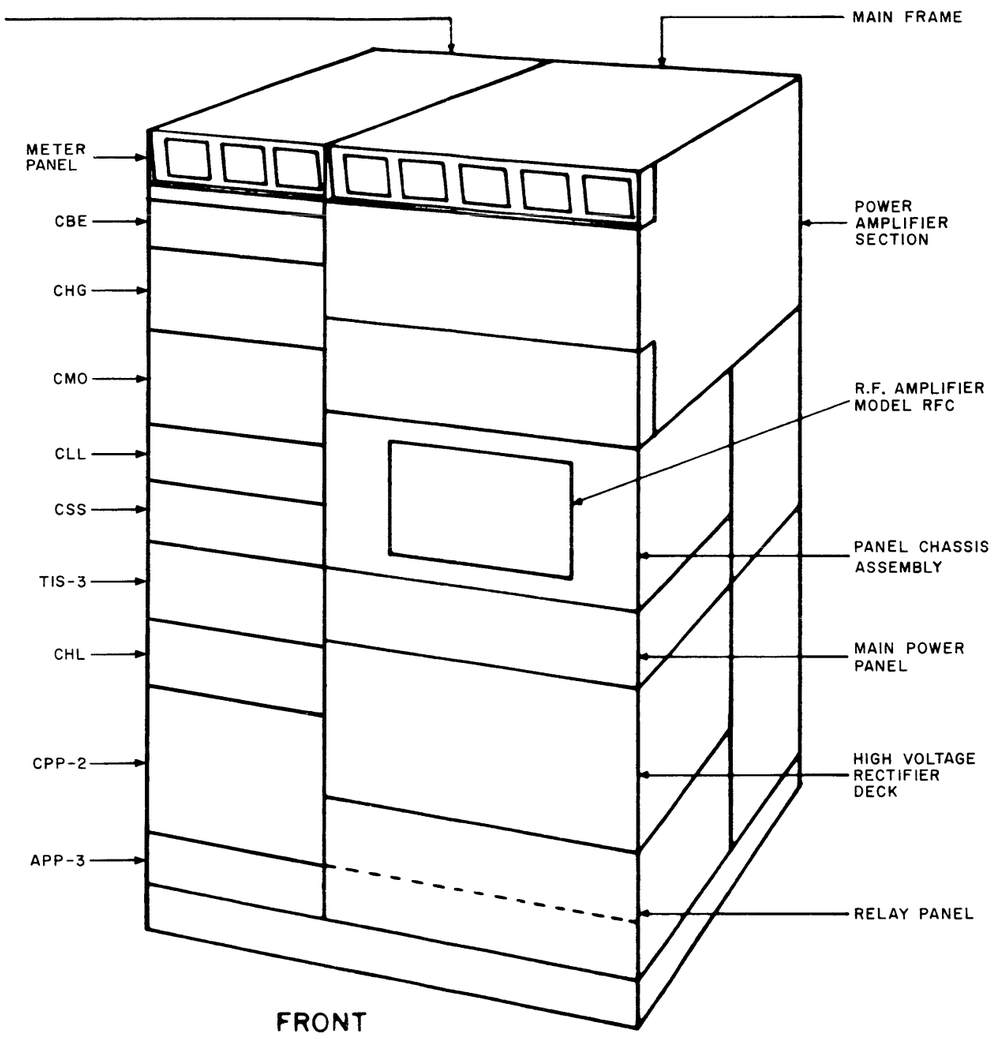
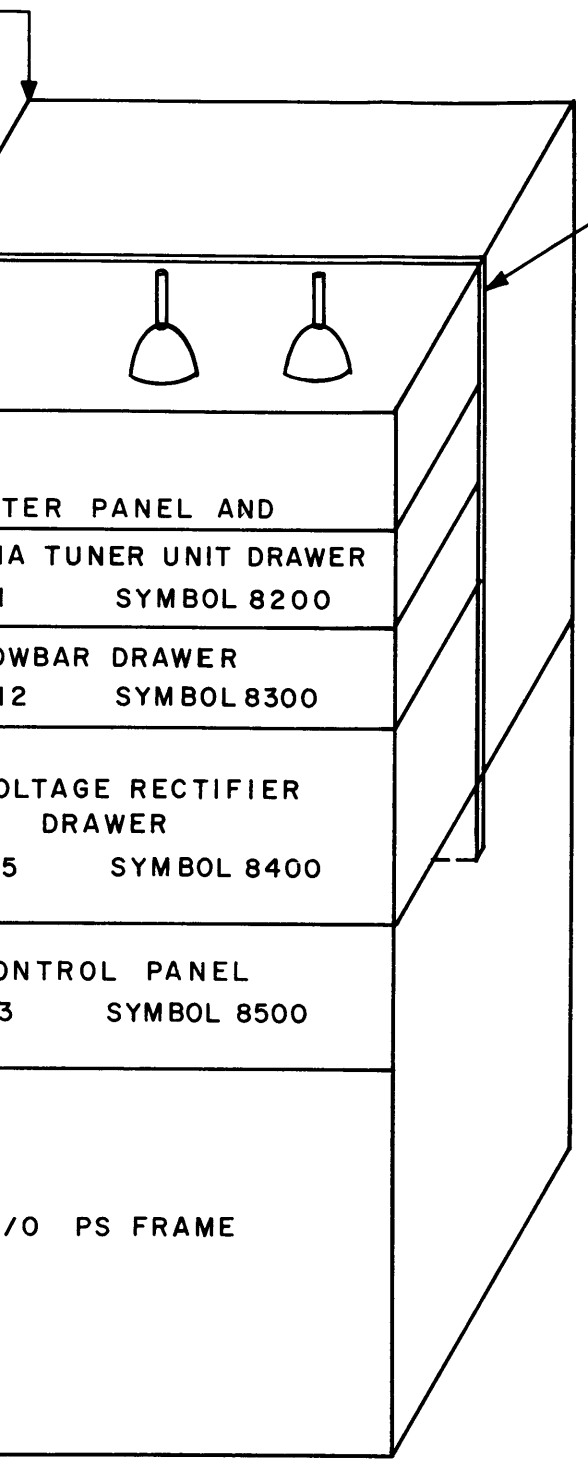
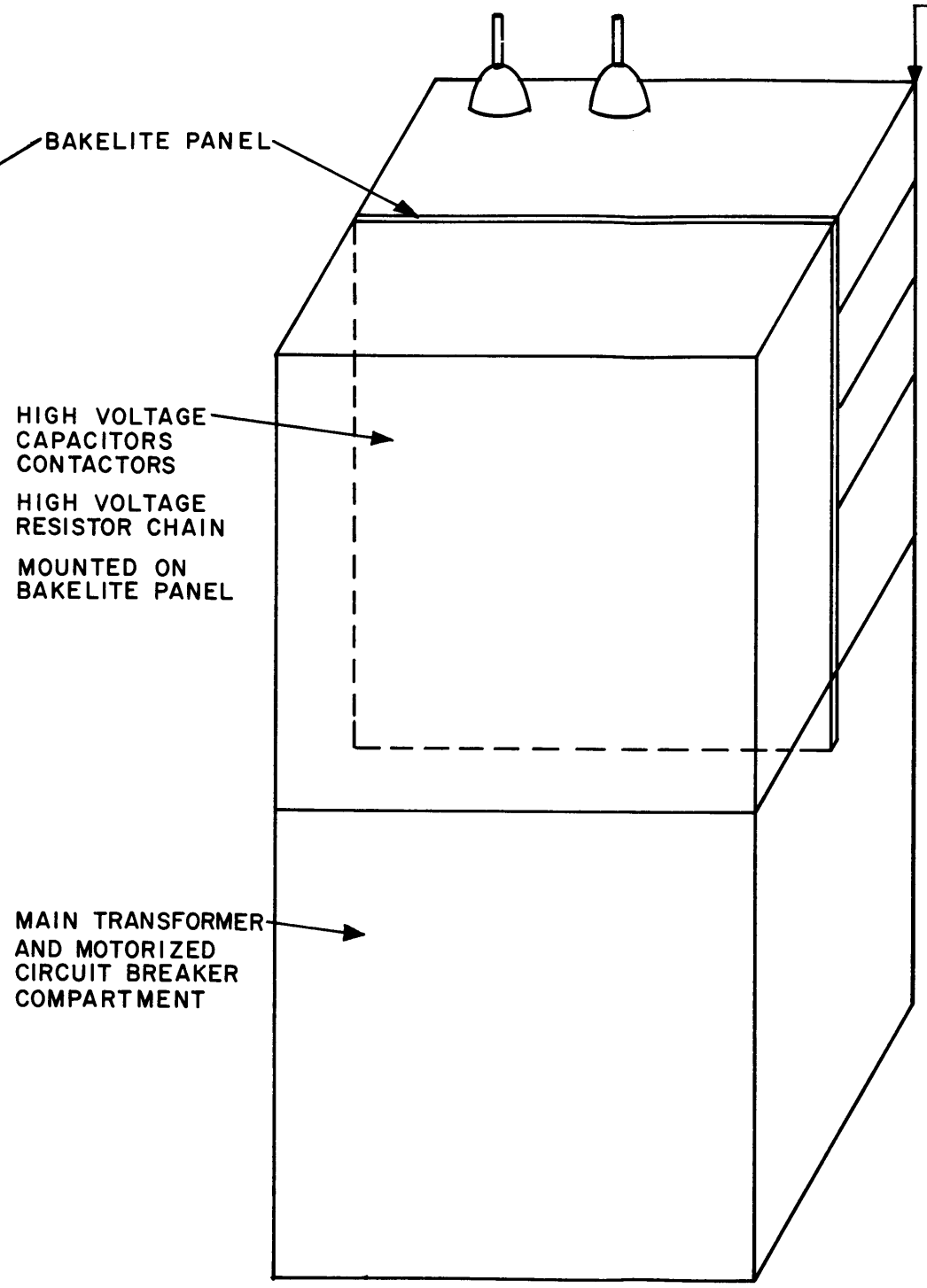


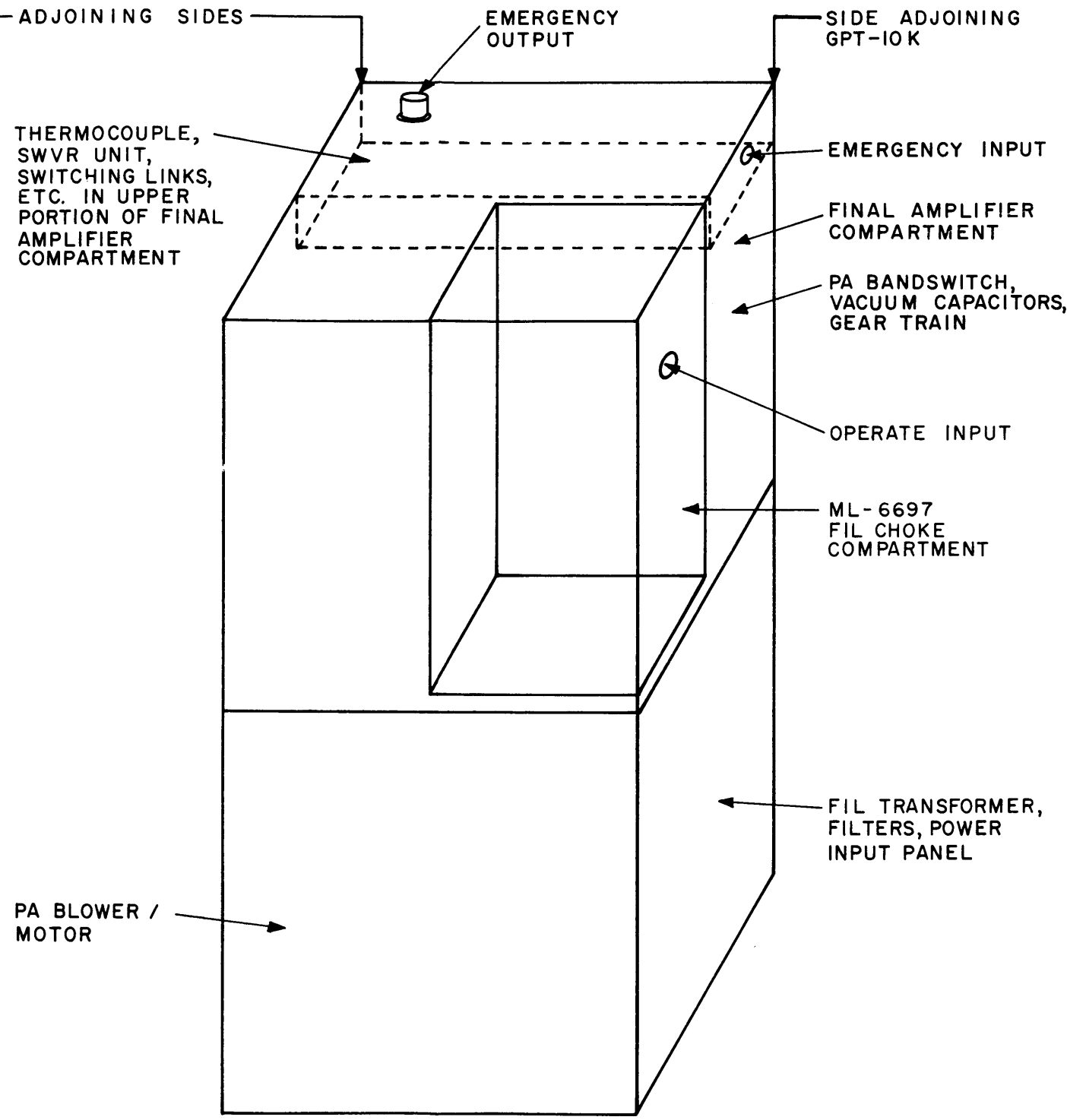
Figure 1-1-2-b. Isometric Diagram, GPT-10K (Synthesized)



PS FRAME
SYMBOL 8100
FRAME SUB-ASS'Y

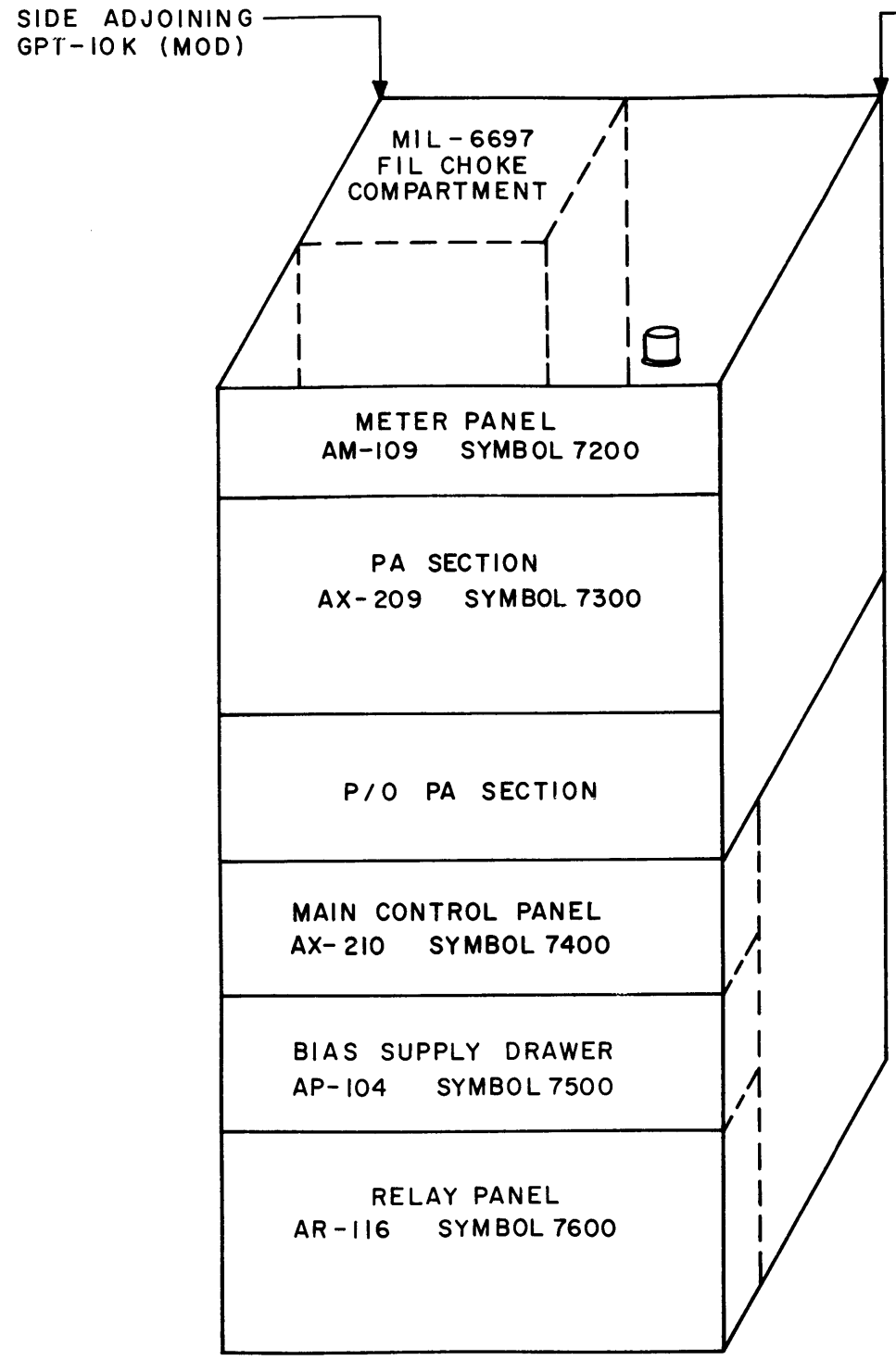


PS FRAME (REAR)

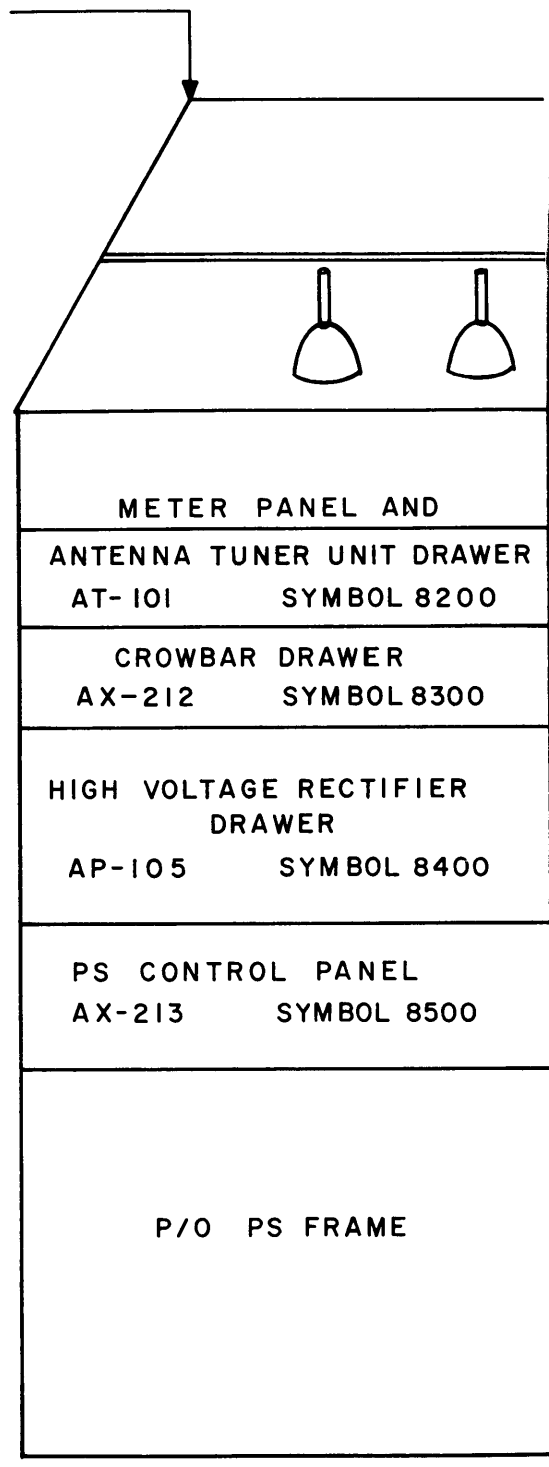


PA FRAME (REAR)

Figure 1-1-2-c. Isometric Diagram, GPT-40K (Third and Fourth Frames Only)



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



PS FRAME
AP-103 SYMBOL 8100
AX-211 FRAME SUB-A

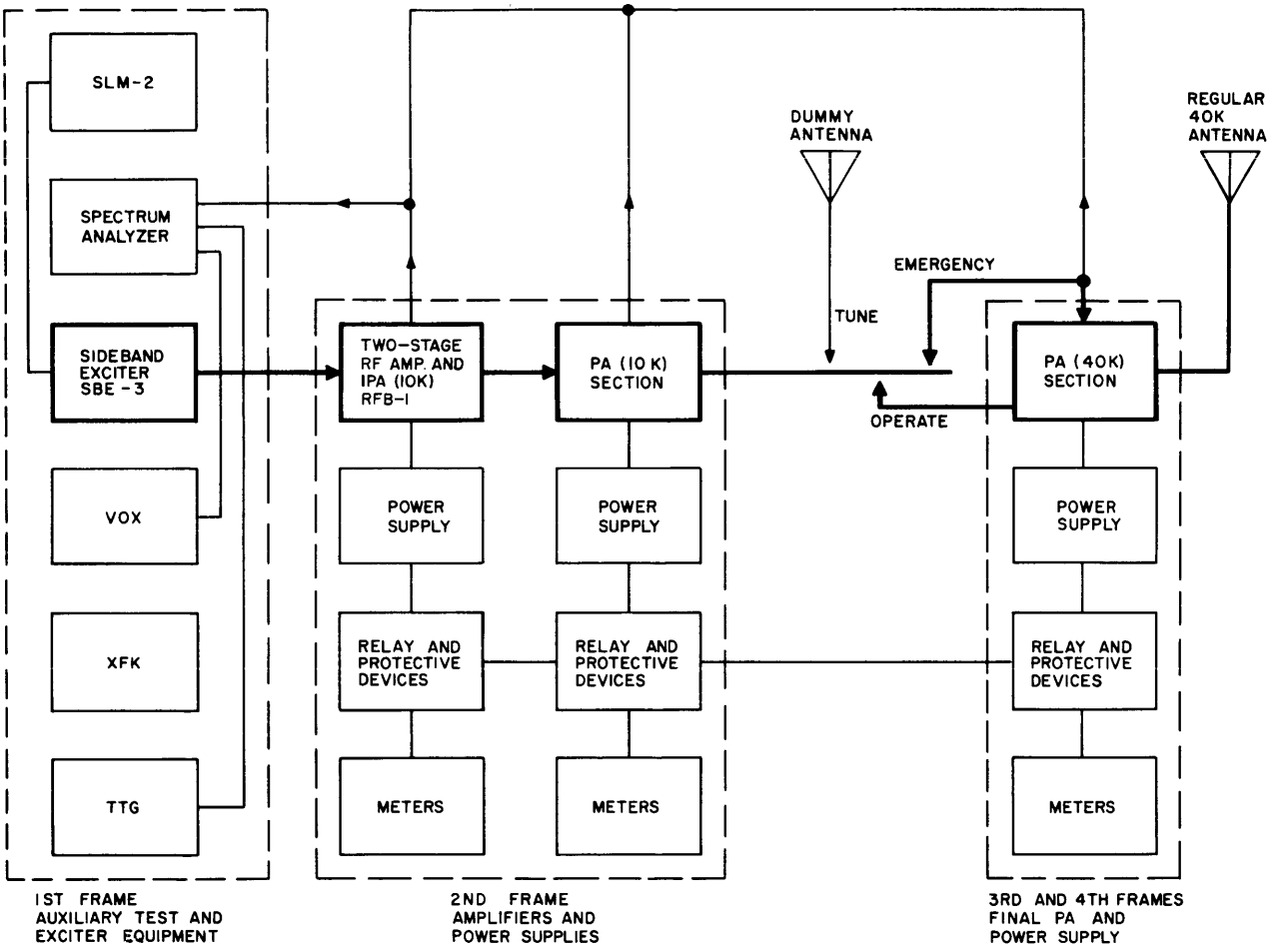


Figure 1-1-3-a. Block Diagram, GPT-40K (Non-Synthesized)

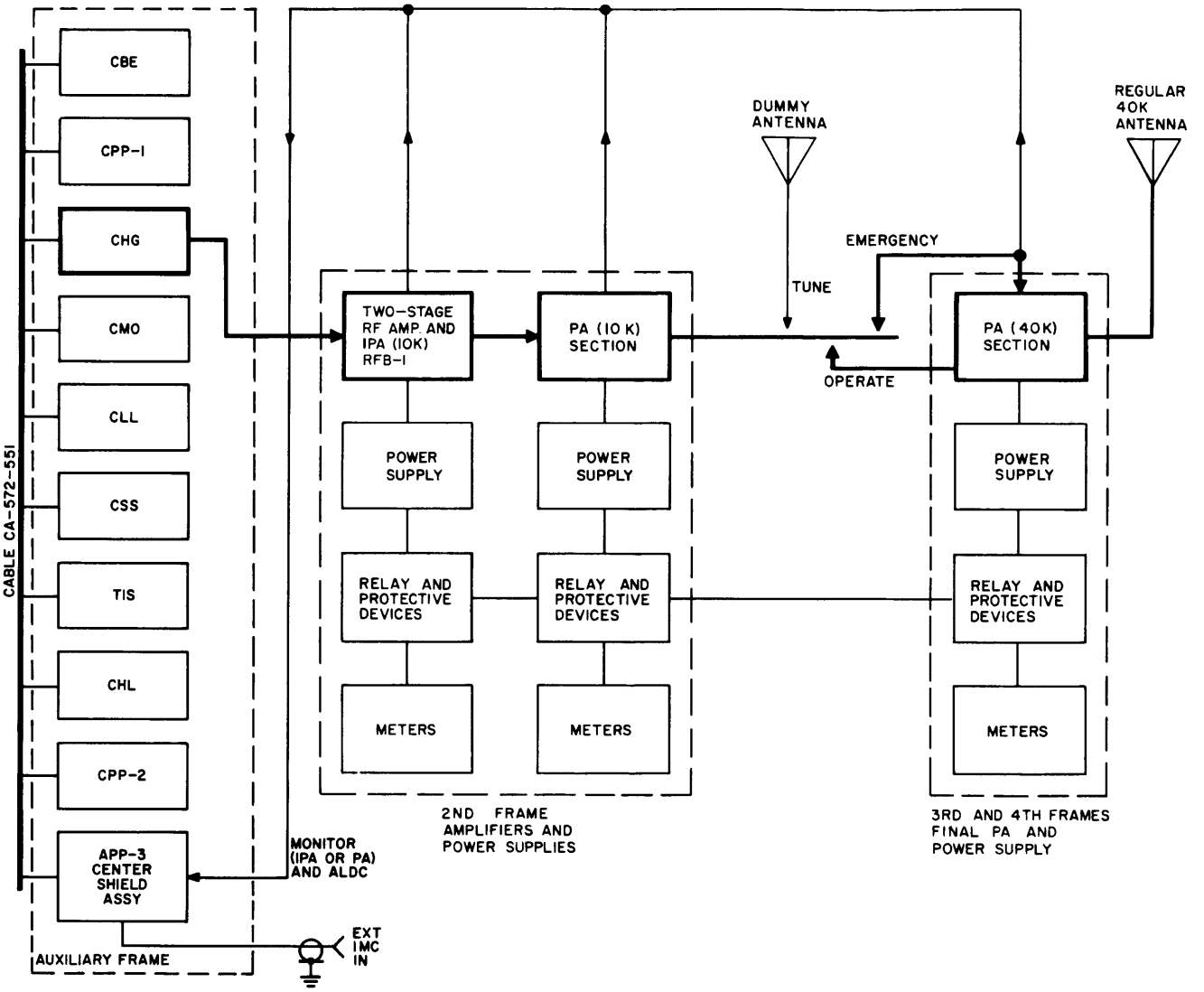


Figure 1-1-3-b. Block Diagram, GPT-40K (Synthesized)

PART II

TECHNICAL MANUAL FOR TRANSMITTING SET, RADIO, GPT-10K (SYNTHESIZED OR NON-SYNTHESIZED)

2–1–1. GENERAL.

Part II of the Technical Manual for Transmitting Set, Radio, GPT-40K (Synthesized or Non-Synthesized) utilizes the two-volume manual entitled Technical Manual for Transmitting Set, Radio GPT-10K to describe GPT-40K's equipment mounted on its first two frames. However, as explained in Part III which follows, the standard GPT-10K's equipment requires modification to enable it to become a GPT-40K driver.

PART III
STANDARD GPT-10K's MODIFICATIONS TO DRIVE GPT-40K

3–1–1. GENERAL.

The general description contained in Section 1 applies to both GPT-10K and GPT-40K transmitters.

The chassis (frame) of any GPT-10K and of the first (exciter) and second (IPA) frame of any GPT-40K are identical. This means that their installation procedures are identical. Within the chassis, GPT-10K's main frame components are somewhat different from GPT-40K's second frame components. The differences are readily apparent from the simplified block diagram sketch shown below.

1. GPT-10K's PA section contains an antenna tuning unit and antenna arrangements suitable for its requirements.

2. GPT-40K's IPA section replaces the antenna tuning unit with a 3-way selector switch for three RF output arrangements (dummy load used in tuning, emergency feed, and regular feed).

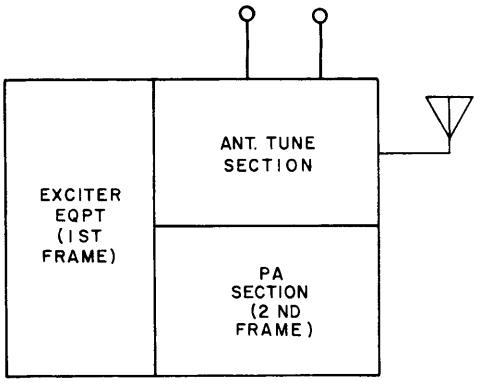
3. Because of the differences cited in 1 and 2, antenna installation details between the GPT-10K and the GPT-40K will differ. Access holes for antenna conductors are located in the main frame panels in the GPT-10K and in the third and fourth frame panels in the GPT-40K. The matter of these access holes and GPT-40K's power supply input circuits is amply covered in subsequent paragraphs.

The basic equipment supplied with the GPT-40K and its physical characteristics are given in Table 1-1-1. Tables 1-1-2-a through 1-1-2-e give shipping data for the GPT-40K. Power requirements of the GPT-40K are given in Table 1-1-5.

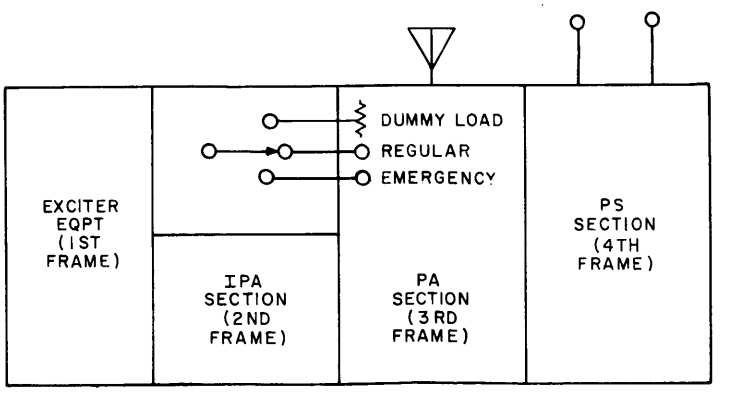
Modifications of the standard GPT-10K that permit it to become a driver of the GPT-40K are presented in this part (III) of the manual on the same section-by-section basis that Part II is written. See following paragraphs 3-1-2 through 3-1-9 for the specified arrangement applicable to Volume I. Paragraph 3-1-10 covers changes applicable to Volume II.

3–1–2. 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 1-1-5-a, 1-1-5-b, 1-1-7-a, 1-1-7-b, and 1-1-7-c in Volume I) are different from corresponding ones in the modified GPT-10K (figures 3-1-1-a, 3-1-1-b, 3-1-1-c, 3-1-1-d, and 3-1-2 in this section). Below are some of the 3 principal changes that enable the modified GPT-10K to mate with the PA-40K. These changes are described in detail in paragraph 3-1-5 below.



STANDARD GPT–10K



GPT–40K

Figure	Modified GPT-10K Replacing Standard GPT-10K Equipments
3-1-1-a, 3-1-1-b, 3-1-1-c, 3-1-1-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.
3-1-1-a, 3-1-1-b, 3-1-1-c, 3-1-1-d,	Coupling capacitor C911 is remounted.
3-1-1-a, 3-1-1-b, 3-1-1-c, 3-1-1-d,	FSA monitor wiring is arranged to monitor RF in two of three places in GPT-40K: IPA(10K), PA(10K), and PA(40K).
3-1-1-a, 3-1-1-b, 3-1-1-c, 3-1-1-d,	PA(10K)'s EMERGENCY and OPERATE output wiring assemblies differ from standard GPT-10K's unbalanced and balanced antenna wiring assemblies.
3-1-1-a, 3-1-1-b, 3-1-1-c, 3-1-1-d,	EXTERNAL RF probe in PA(10K)'s tank circuit.
3-1-2	PA(10K) to PA(40K) interconnecting signal cables.
	Shields, covers, and power input details are discussed in paragraph 3-1-3 below.

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

Figure I-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 feed-through 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 I-2-7 (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 3-1-3-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 or a standard GPT-10K has access holes X and Y covered by a plate, and the 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 3-1-3-b in this section shows the right side shield on the main frame. Figure 3-1-3-c in this section shows the left side shield of abutting GPT-40K's PA frame. Figures 3-1-3-a, 3-1-3-b, and 3-1-3-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 3-1-3-b in this section is an access hole for a cable interconnecting the PA(10K) and PA(40K) frames.

Figure I-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 I-2-6 in Volume I with figure 3-1-4 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 3-1-4 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 3-1-4 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 3-1-5-a 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 3-1-1-a, 3-1-1-b, 3-1-1-c, 3-1-1-d, 3-1-2, and 3-1-11 through 3-1-15 in this section. Figure 3-1-5-b 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 STANDARD GPT-10K's TO MATE WITH GPT-40K's FINAL AMPLIFIER SECTION:

Disassembly of GPT-10K's PA (See figure I-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 I-2-1 of Volume I).

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 3-1-1-a, 3-1-1-b, 3-1-1-c, 3-1-1-d, and 3-1-5-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 3-1-1-a, 3-1-1-b, 3-1-1-c, 3-1-1-d, and 3-1-5-b in this section.)

i. Remove antenna tuning unit and meter panel drawer. (See figures 3-1-1-a, 3-1-1-b, 3-1-1-c, 3-1-1-d, and 3-1-5-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 3-1-6 in this section) for attachment of emergency bracket.

b. Drill two holes in right front corner of PA deck (figure 3-1-6 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 3-1-5, sheet 2.)

3–1–4. 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 3-1-5 below.
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 (pick-up loop)	Contains an external monitor circuit (pick-up loop) to monitor RF in 4CX5000A's tank circuit. (See figure 3-1-1-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).

3–1–5. 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 3-1-7 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 3-1-7 in this section with "X" wiring is identical with figure I-4-11 of Volume I. 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 3-1-8 and 3-1-9 in this section.

STANDARD AMPLIFIER	MODIFIER AMPLIFIER
Unbalanced output J903 is provided. (See figure I-4-13 in Volume I.)	Emergency output J905 replaces unbalanced output J903. (See figure 3-1-7 in this section.)
Balanced output to rhombic is provided via E905 and E906. (See bowls in roof of PA compartment in figure I-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 3-1-8 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 3-1-8 in this section with "X" wiring is identical with figure I-4-13 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 3-1-8 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 3-1-9 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 3-1-9 in this section with "X" wiring is identical figure I-4-14 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 I733 (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 three-position interlock switch S904, mounted on the shaft of the three-position selector switch S903 does the following:

1. TUNE position completes the 10 kw interlocks and opens the 40 kw interlocks.
2. OPERATE position completes the 10 kw interlocks and the 40 kw interlocks.
3. EMERGENCY position completes the 10 kw interlocks and opens 40 kw interlocks.

The standard GPT-10K's main power circuit described in paragraph 4-6 in Volume I, is modified as shown in figure 3-1-10 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 3-1-10 in this section with "X" wiring is identical with figure I-4-18 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.

3–1–6. CHANGES TO PART II, VOLUME I, SECTION 5.

Comparison of figures I-5-7, I-5-9, I-5-10, and I-5-12 in Volume I with corresponding figures 3-1-11 through 3-1-14 in this section shows the changes to the PA compartment, standard versus modified GPT-10K, respectively. The callouts in figures 3-1-11 through 3-1-14 in this section are for the purpose of quickly pointing out the differences.

Comparison of figures I-5-12 and I-5-13 in Volume I with corresponding figures 3-1-14 and 3-1-15 in this section shows the changes to the coil blower compartment, standard versus modified GPT-10K, respectively. The callouts in figure 3-1-15 in this section are for the purpose of quickly pointing out the differences.

3–1–7. CHANGES TO PART II, VOLUME I, SECTION 6.

None.

3–1–8. CHANGES TO PART II, VOLUME I, SECTION 7.

Replace figure I-7-10 in Volume I with figure 3-1-16 in this section and figure I-7-12 in Volume I with figure 3-1-17 in this section.

3–1–9. CHANGES TO PART II, VOLUME I, SECTION 8.

SYMBOL	STANDARD GPT-10K	MODIFIED GPT-10K
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

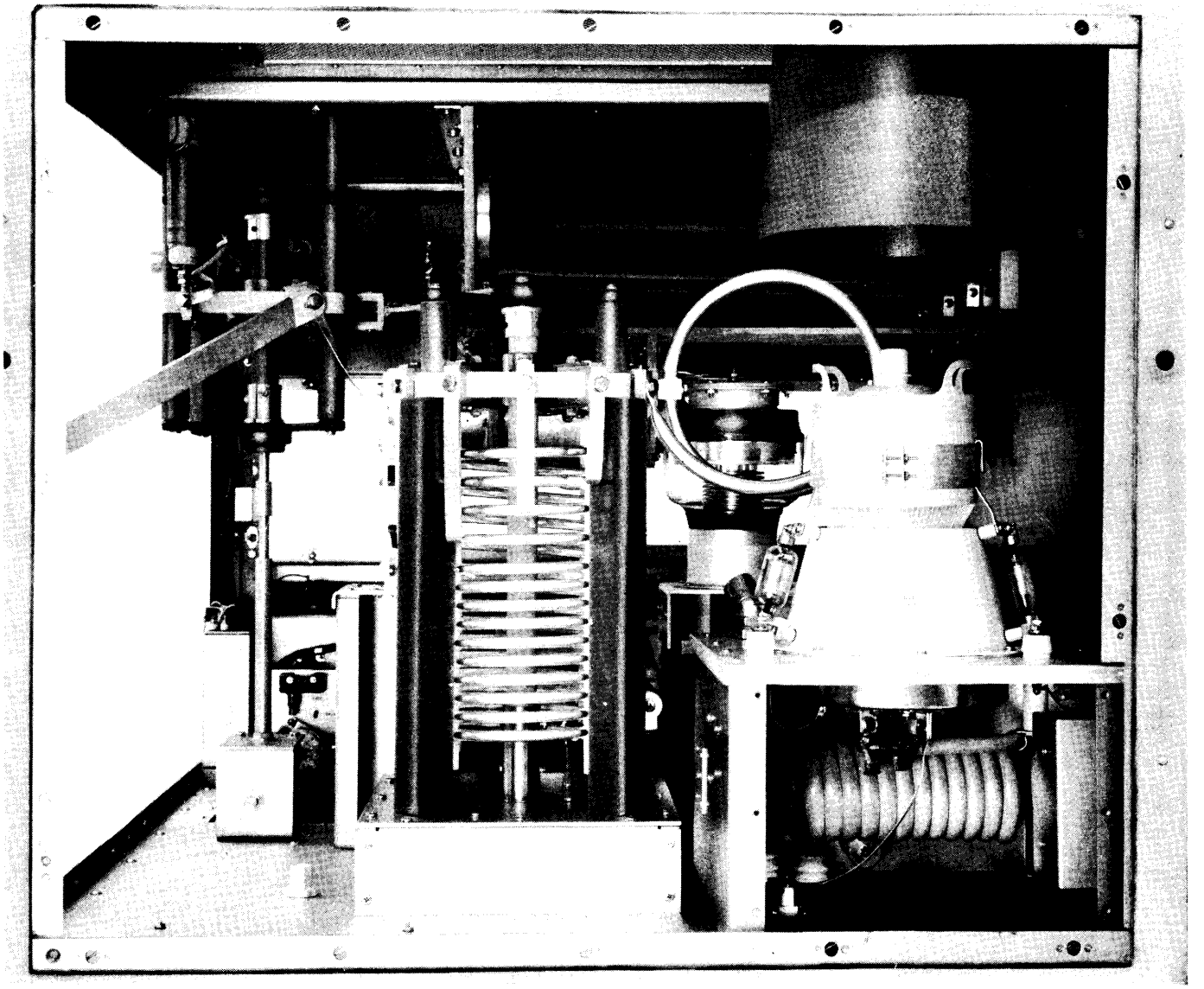


Figure 3-1-1-a. Modified GPT-10K's PA Compartment, Full Rear View

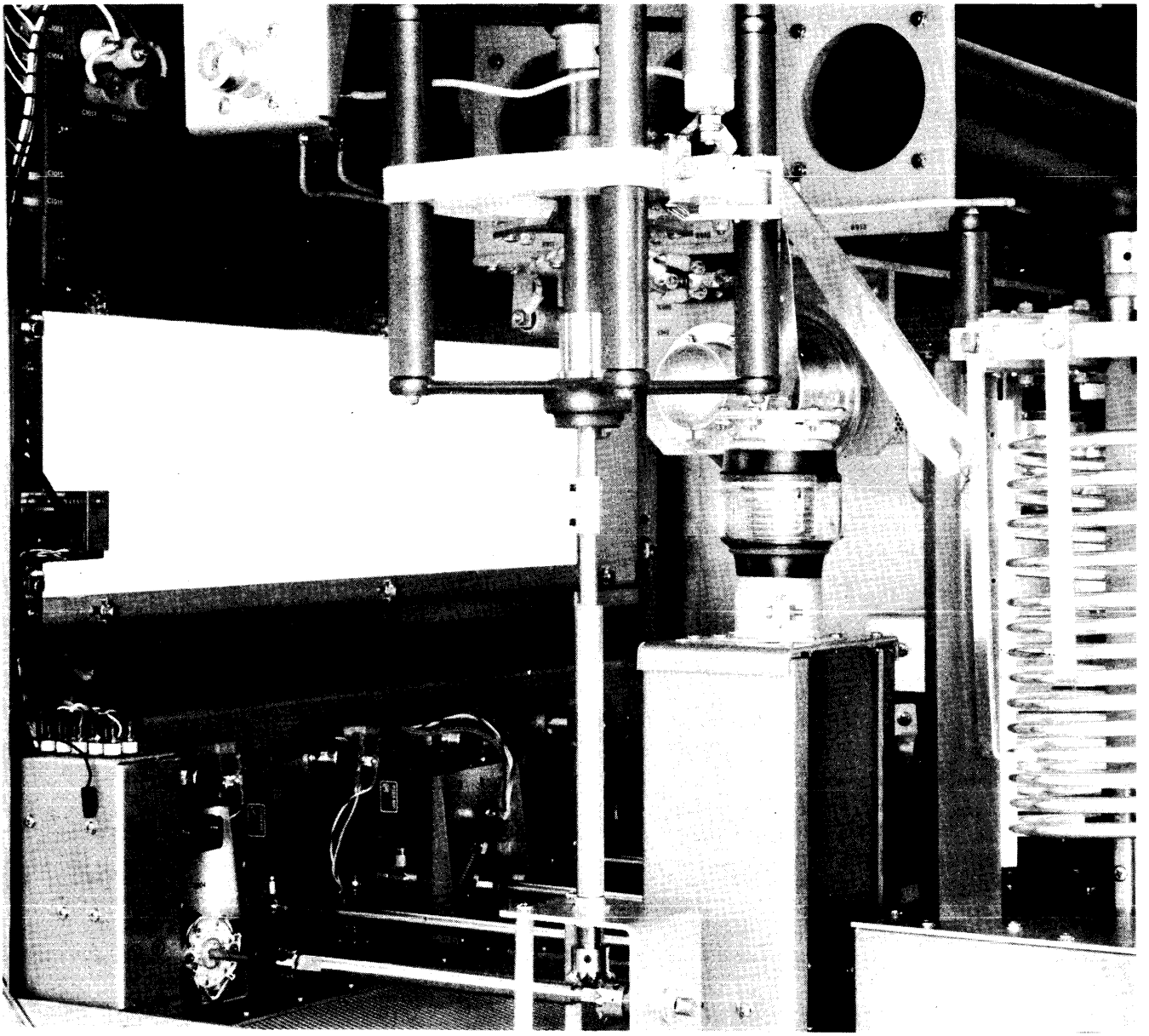


Figure 3-1-1-b. Modified GPT-10K's PA Compartment, 45-Degree Angle Side View

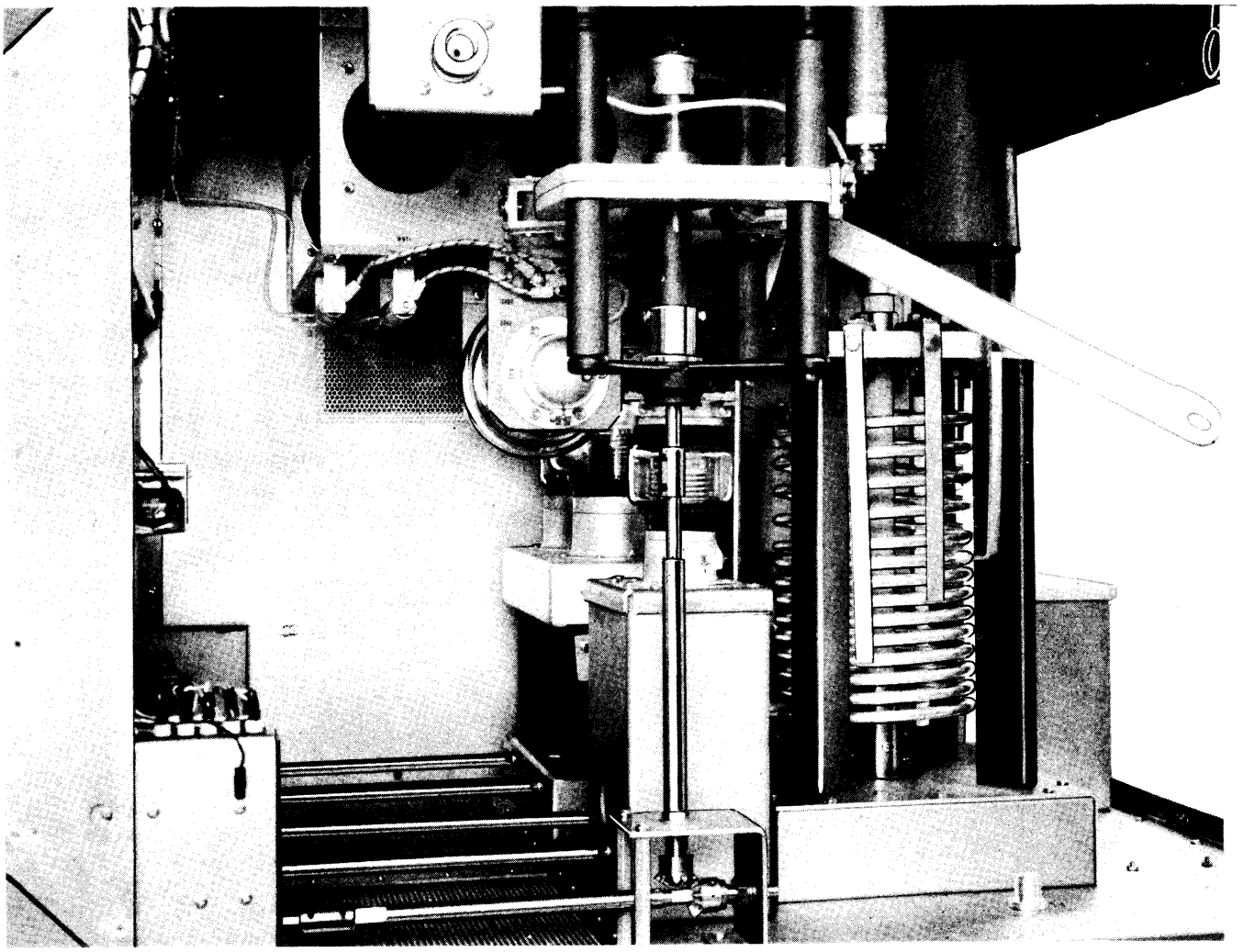


Figure 3-1-1-c. Modified GPT-10K's PA Compartment, 135-Degree Angle Side View

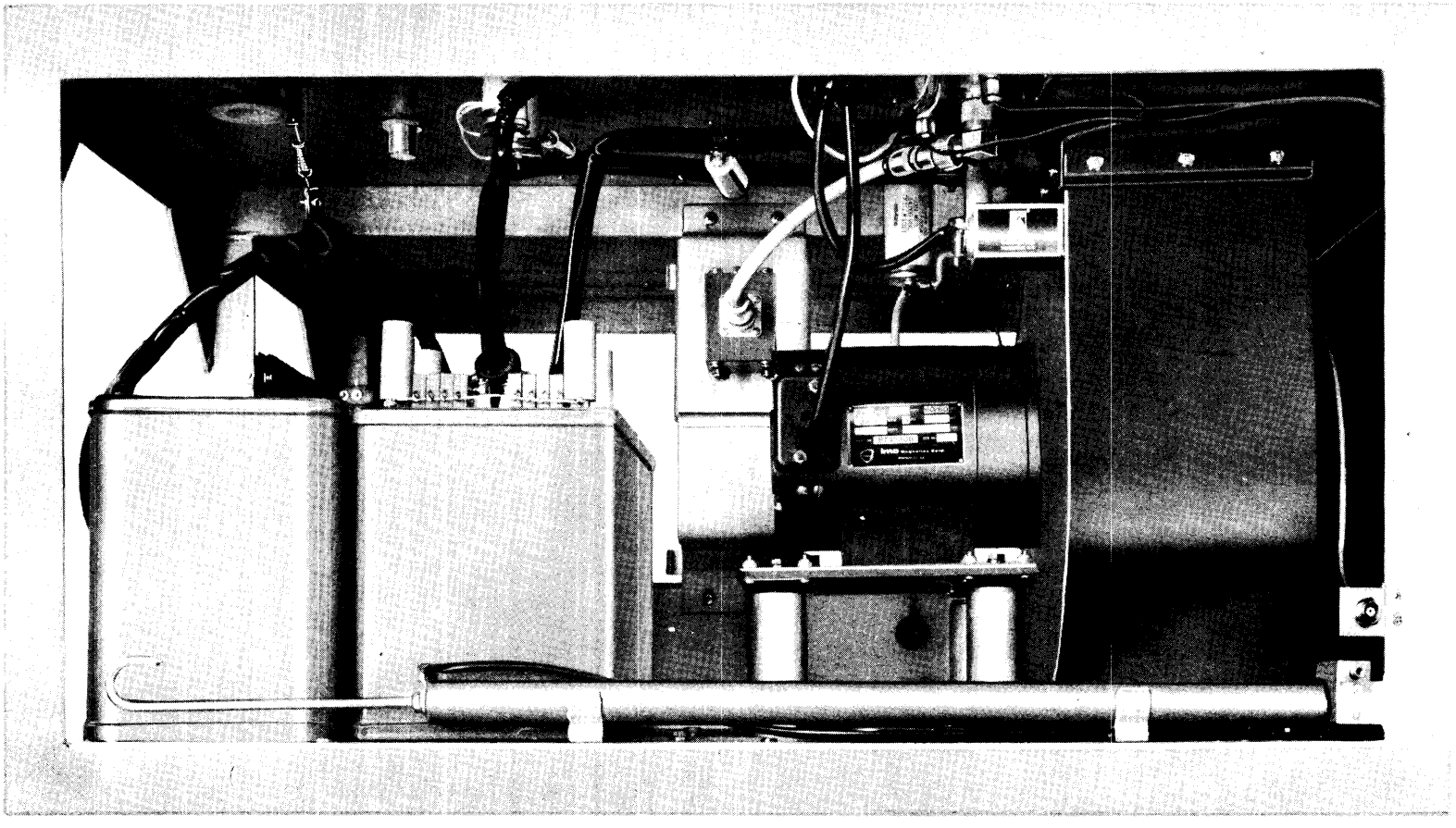


Figure 3-1-1-d. Modified GPT-10K's Blower Compartment Showing Coaxial Connectors Used for Regular 10 KW and Emergency 1 KW Supplies and Monitor to FSA

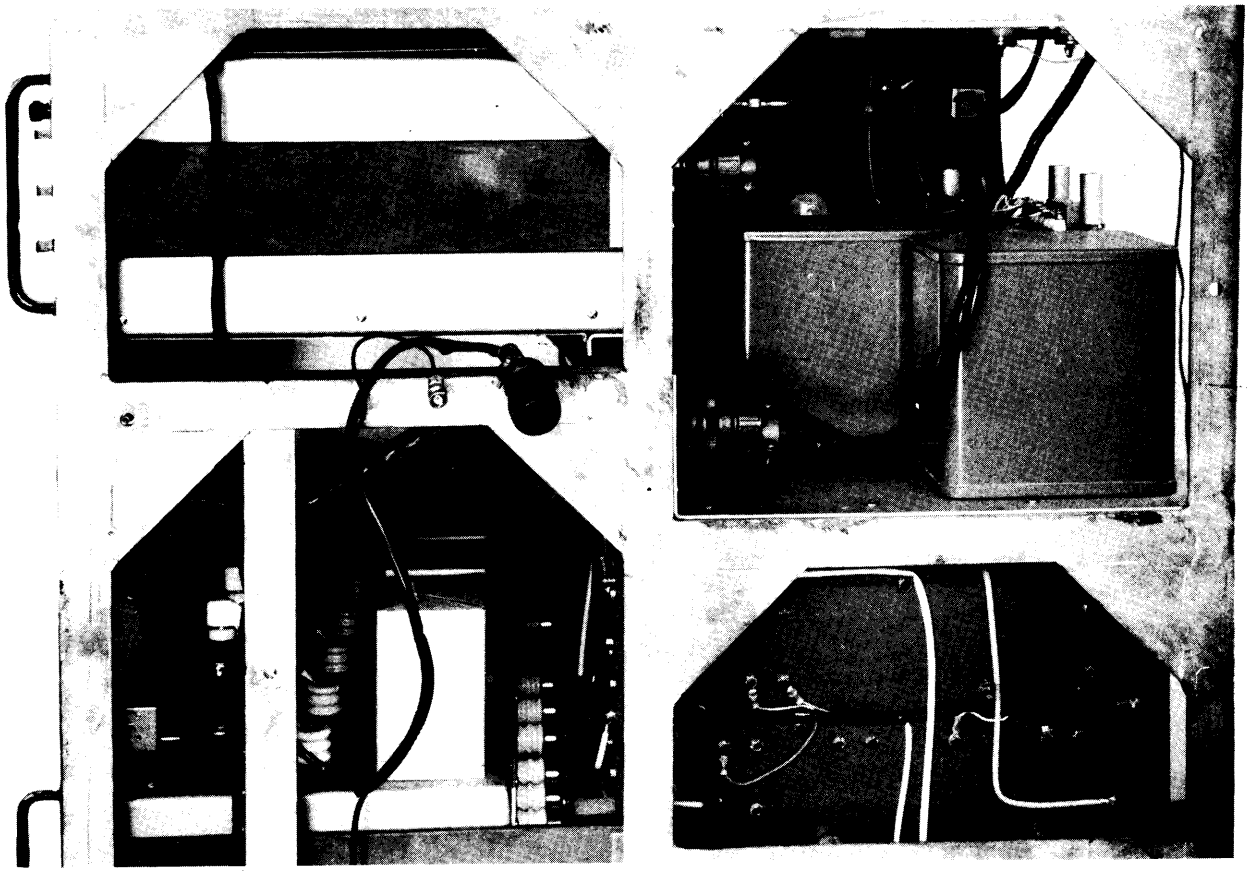
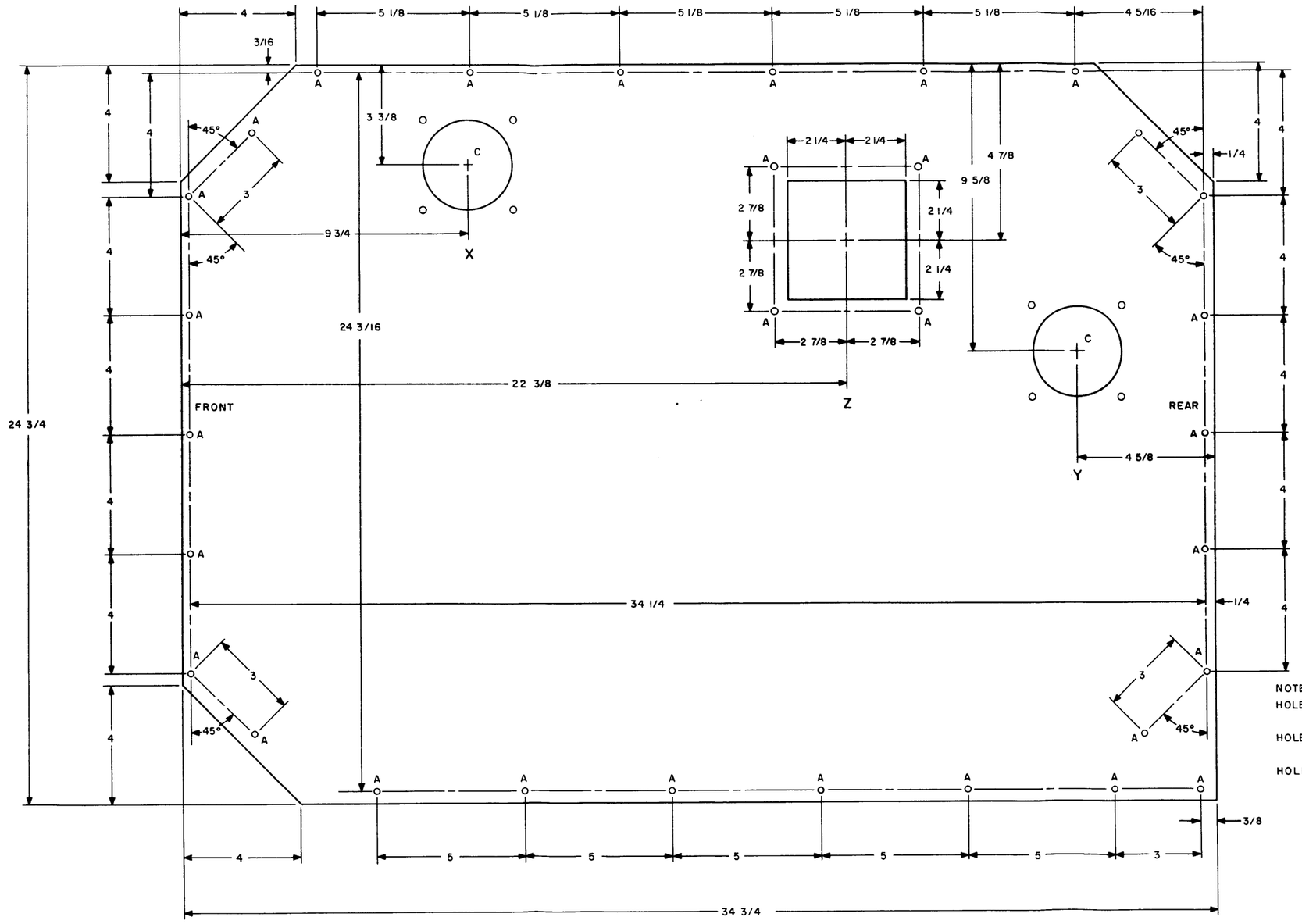


Figure 3-1-2. Modified GPT-10K's Signal Cables Interconnecting GPT-40K's Third and Fourth Frames



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 3-1-3-a. Modified GPT-10K's Right Side Top Inside Shield

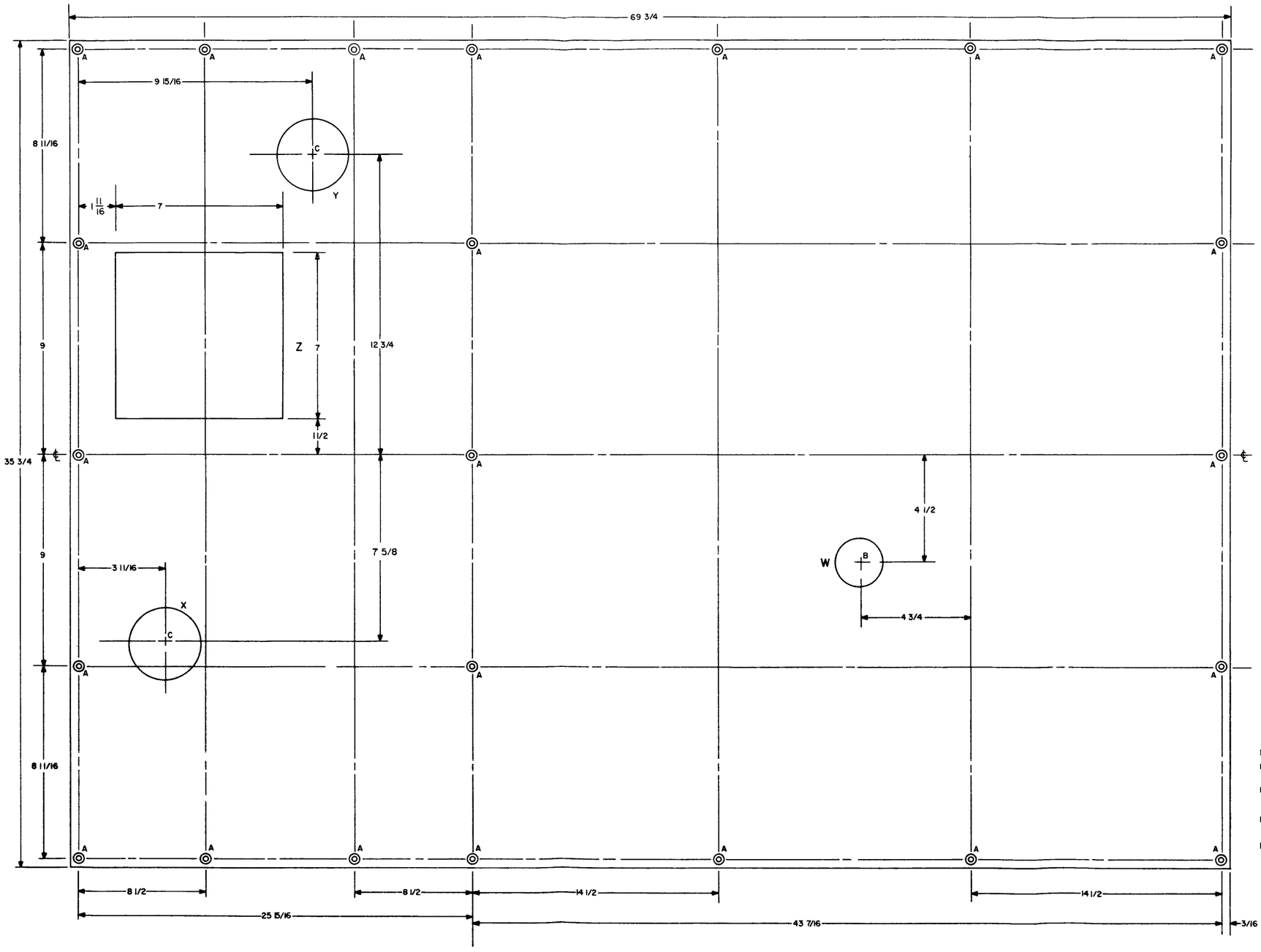
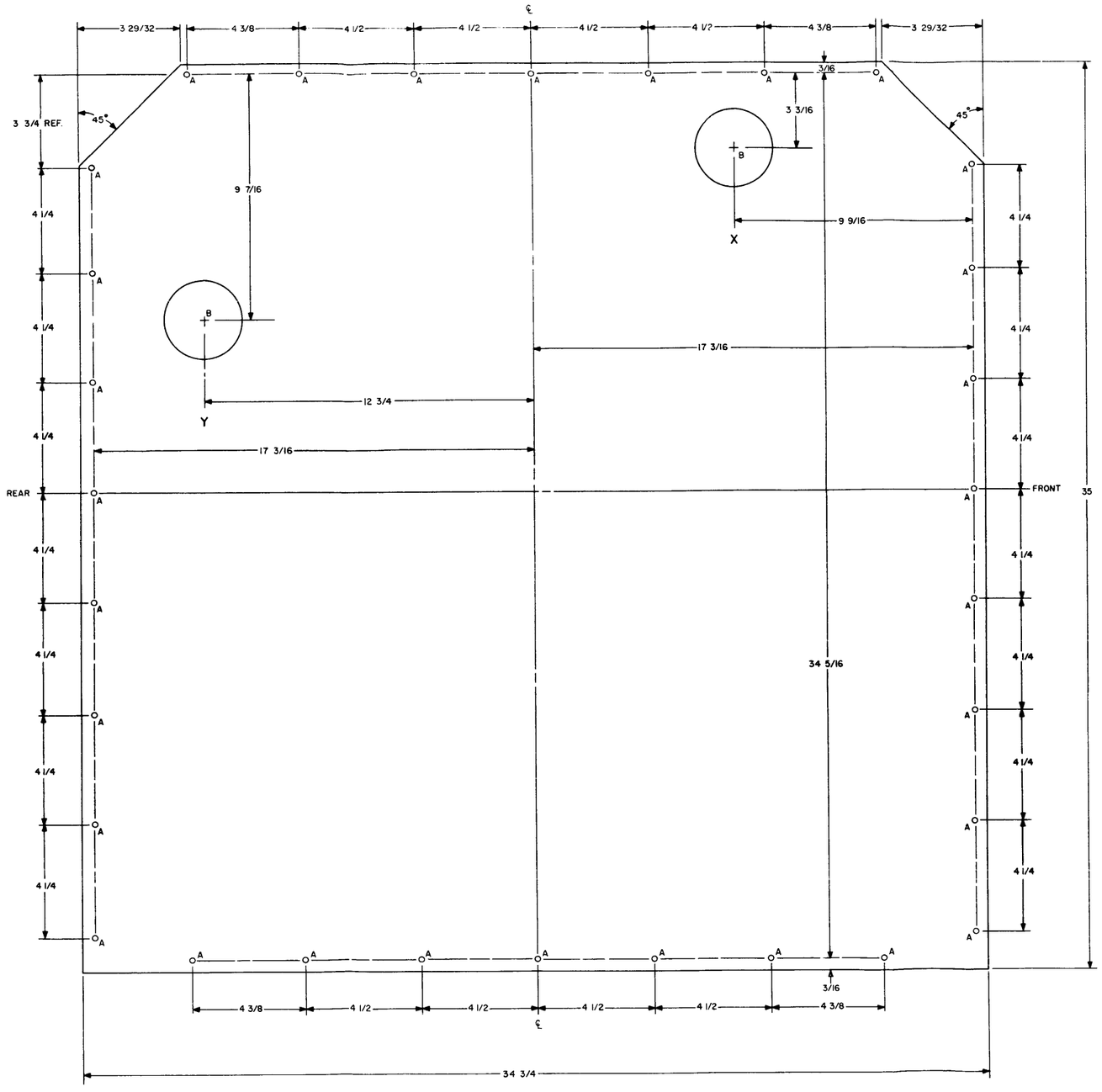


Figure 3-1-3-b. Modified GPT-10K's Right Side Shield



NOTES:
HOLE X= ACCESS HOLE FOR EMERGENCY ANTENNA (GPT-40K OPERATION).
HOLE Y= ACCESS HOLE FOR PA INPUT TO PA (40K) FINAL AMPLIFIER.

Figure 3-1-3-c. GPT-40K's Left Side PA Frame Shield

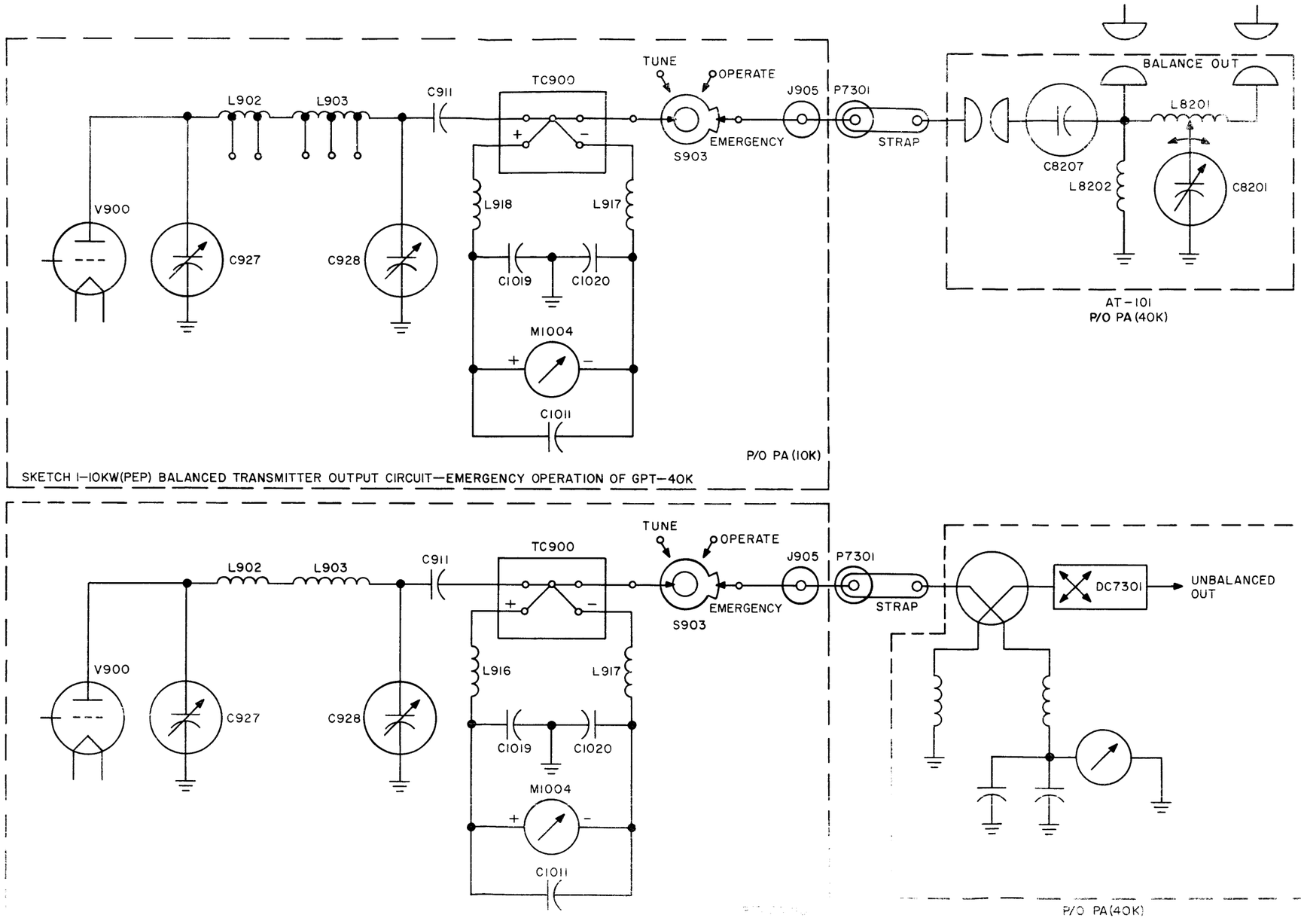


Figure 3-1-4. Modified GPT-10K's Output Circuit Operation with Balanced and Unbalanced Emergency Antennas

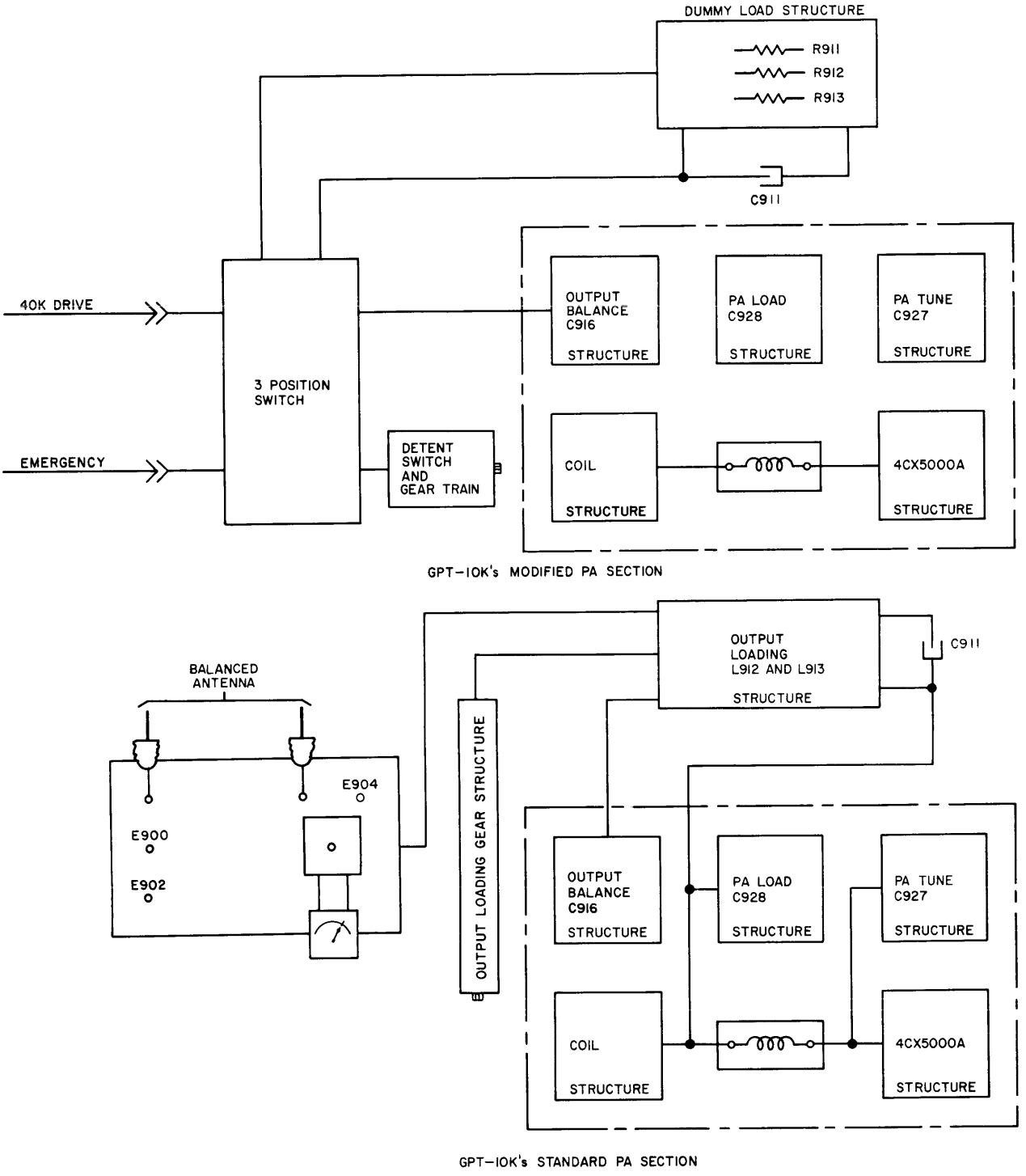


Figure 3-1-5-a. M ajor Assembly Differences Between GPT-10K's Standard and Modified PA Sections

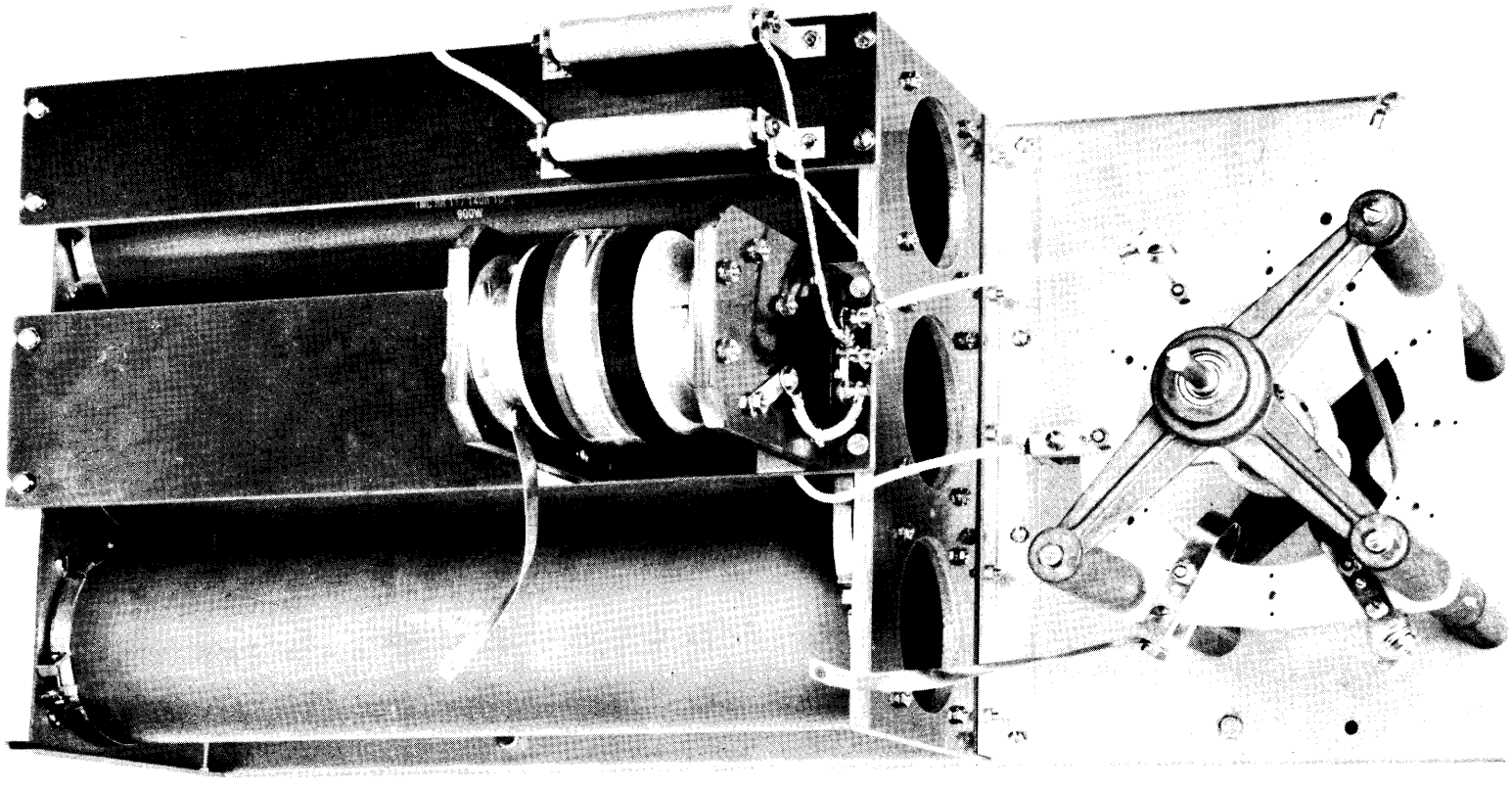


Figure 3-1-5-b. Switch and Load Assembly (A2064) Located in GPT-10K's Modified PA Section

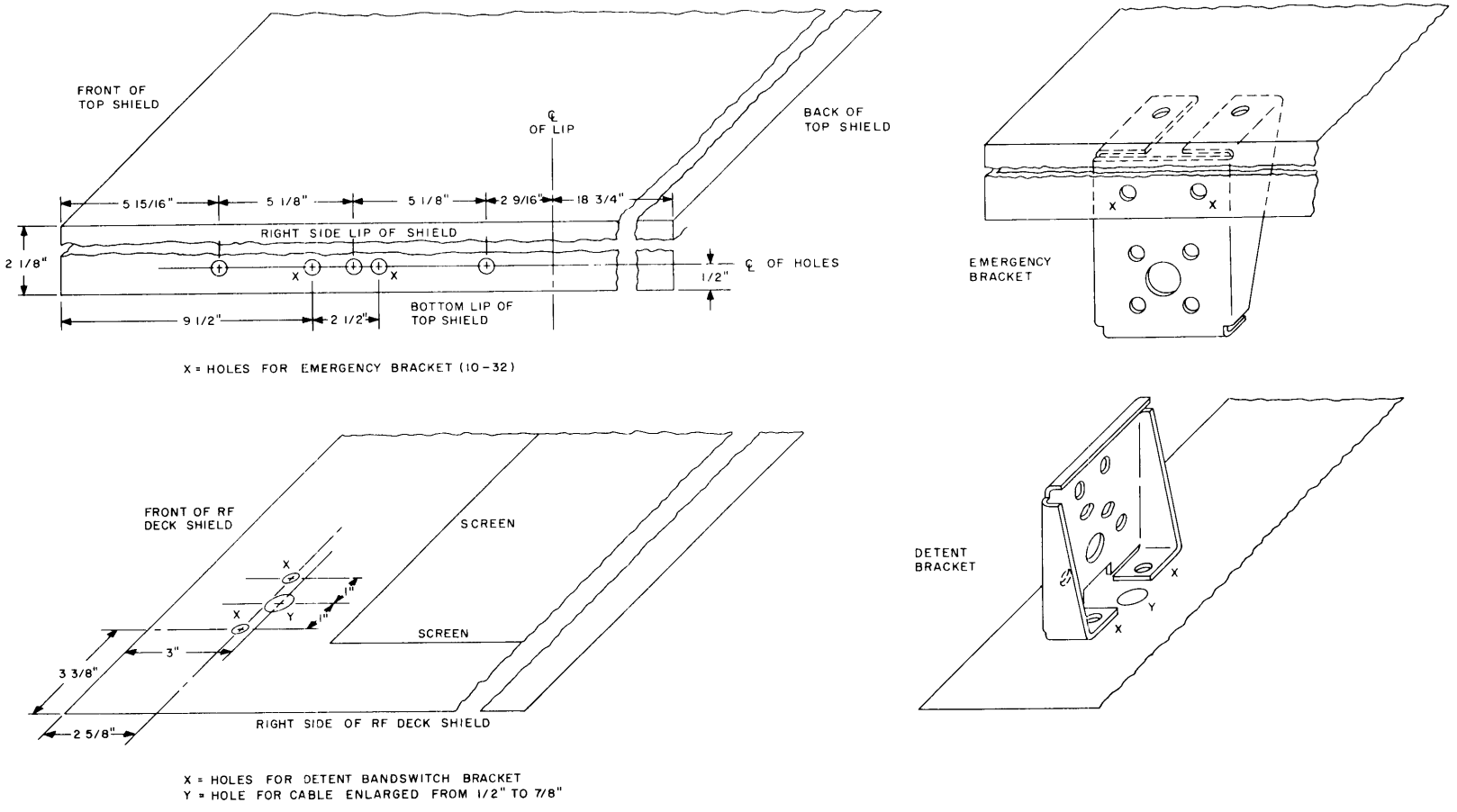
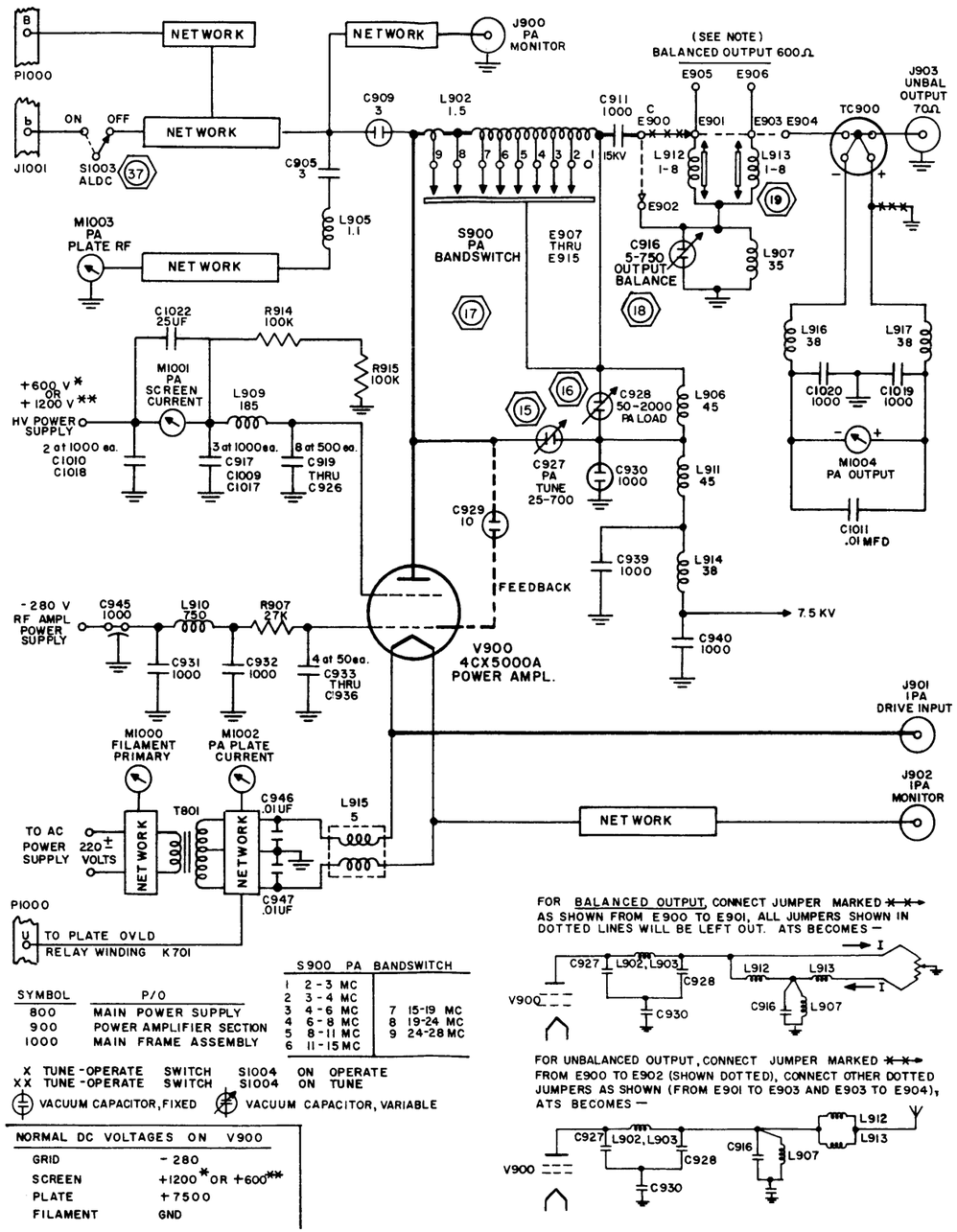


Figure 3-1-6. Additional Holes Required to Accommodate Attachment of GPT-10K's Emergency and Detent Brackets



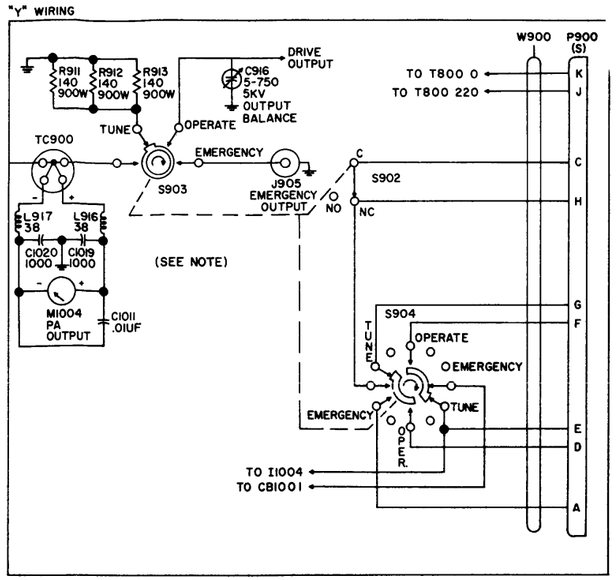
SYMBOL	P/O
800	MAIN POWER SUPPLY
900	POWER AMPLIFIER SECTION
1000	MAIN FRAME ASSEMBLY

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

X TUNE-OPERATE SWITCH S1004 ON OPERATE
XX TUNE-OPERATE SWITCH S1004 ON TUNE

VACUUM CAPACITOR, FIXED VACUUM CAPACITOR, VARIABLE

NORMAL DC VOLTAGES ON V900	
GRID	-280
SCREEN	+1200 * OR +600 **
PLATE	+7500
FILAMENT	GND



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

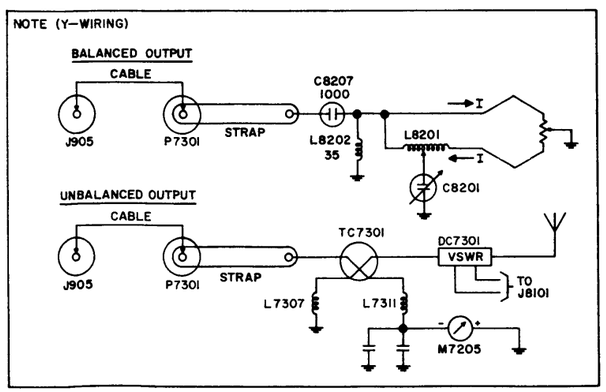
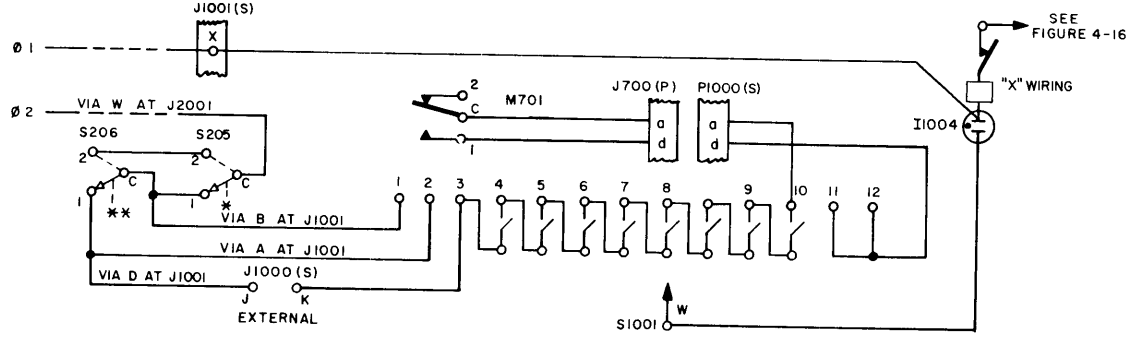
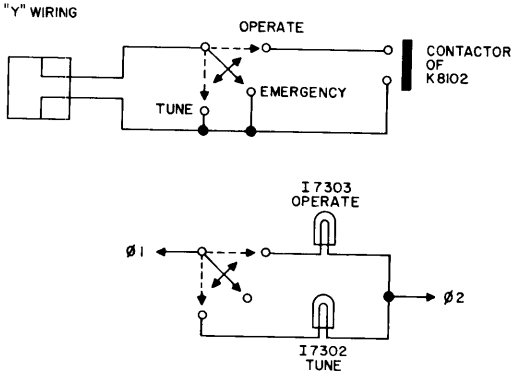


Figure 3-1-7. Simplified Schematic Diagram, Standard vs Modified GPT-10K's PA Circuit





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	

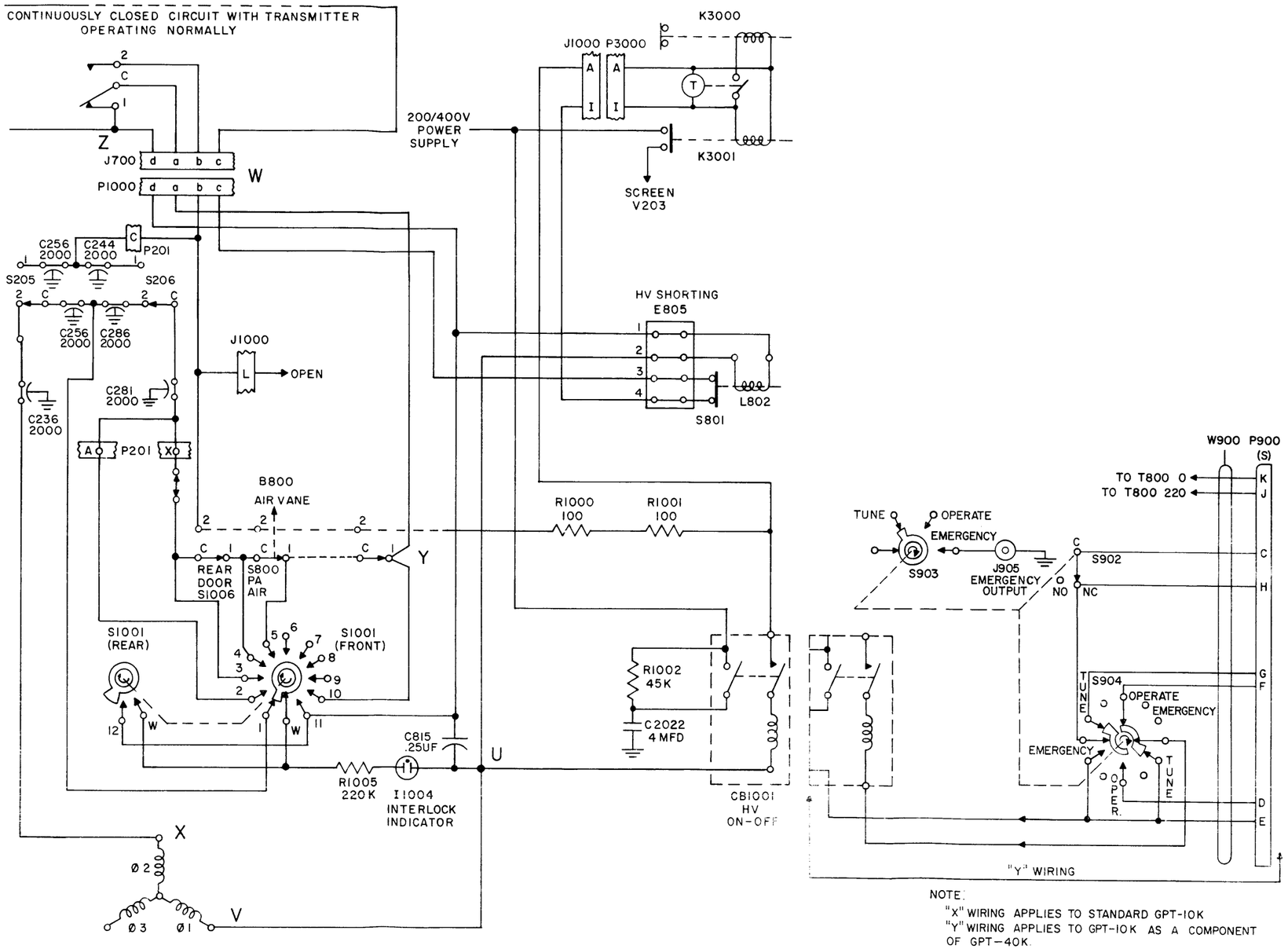
* S205 PLACEMENT CONTROLLED BY BANDSWITCH S202

** S206 PLACEMENT CONTROLLED BY AIR VANE SWITCH S206

NOTE:

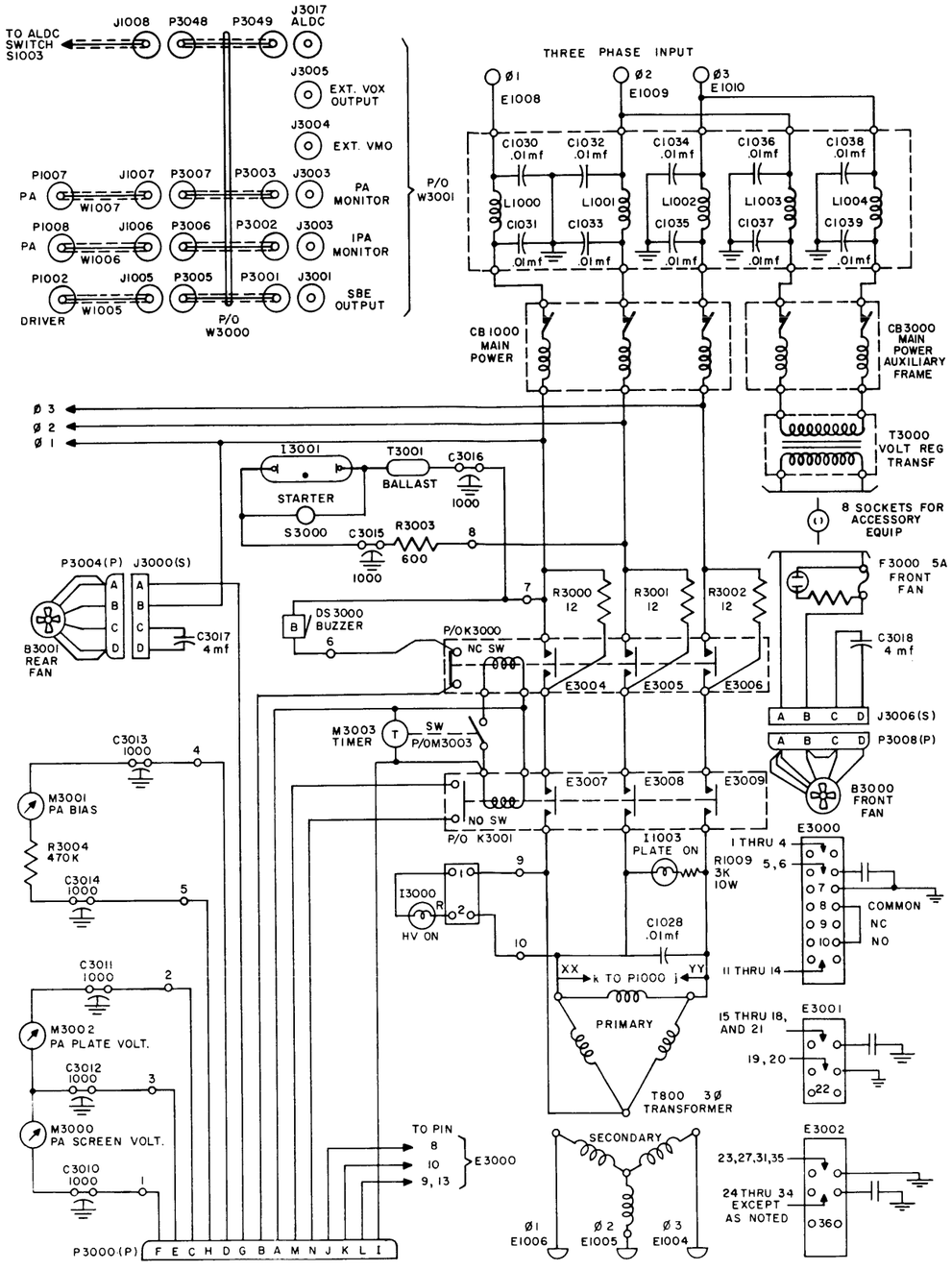
THREE POSITION SELECTION SWITCH S903 HAS TWO HALF ON SHAFT WITH HEAVY DUTY OUTPUT CIRCUIT TO DUMMY LOAD, EMERGENCY FEED FINAL GPT-40K PA DRIVE. FIRST HALF WAFER TIES GPT-40K'S CONTACTOR OF RELAY K8102 INTO MODIFIED GPT-10K'S INTERLOCK CIRCUIT; SECOND HALF WAFER TIES GPT-40K'S INDICATING LIGHTS I 7302 AND I 7303 INTO S903'S POSITION.

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



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

Figure 3-1-9. 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.

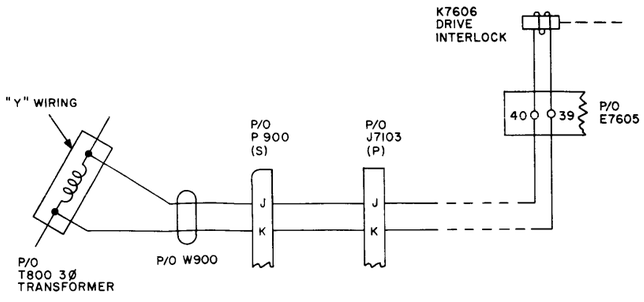


Figure 3-1-10. Simplified Schematic Diagram, Standard vs Modified GPT-10K's, Main Power Circuit

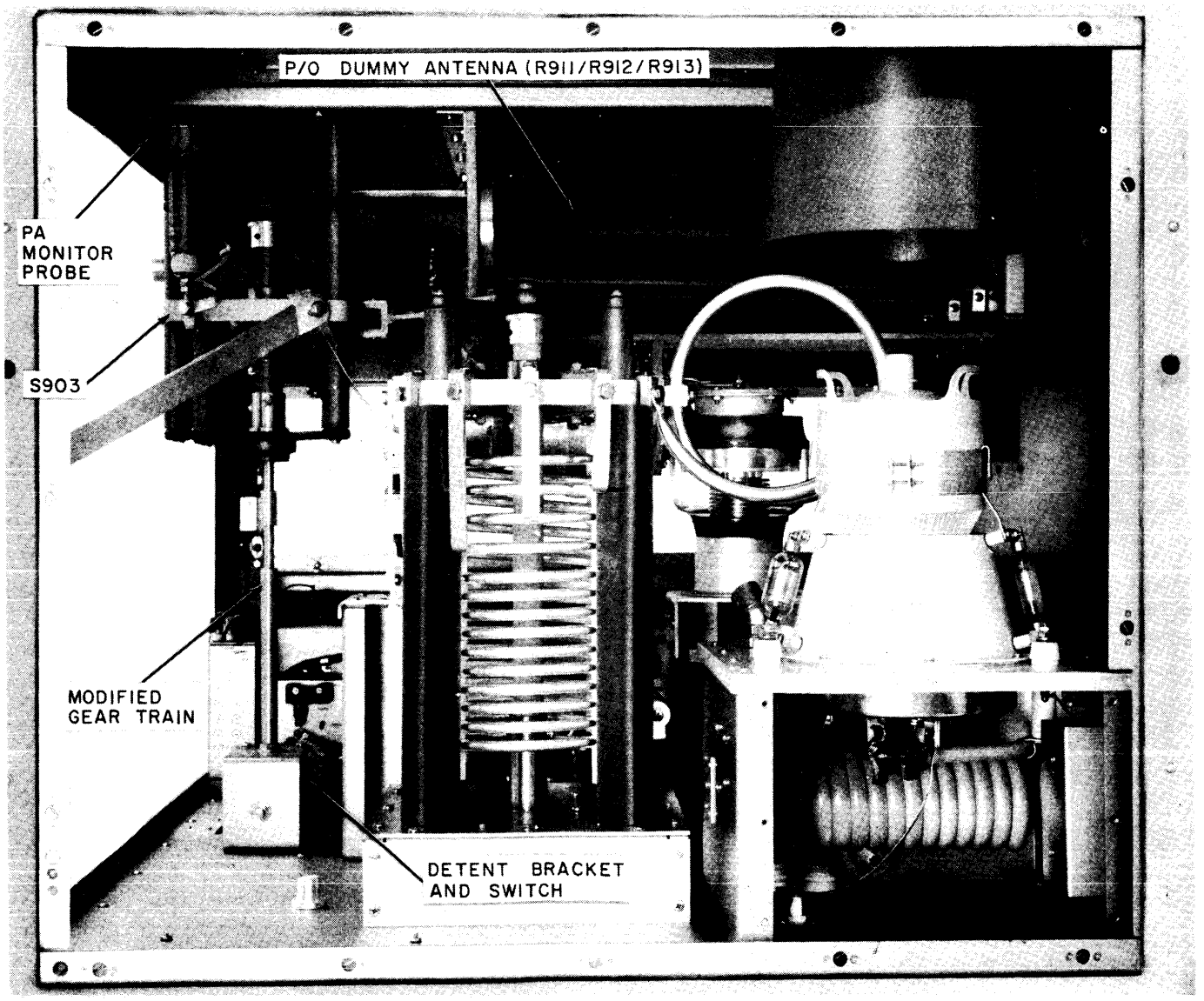


Figure 3-1-11. Modified GPT-10K's PA Compartment with Callouts on Changed Components, Full Rear View

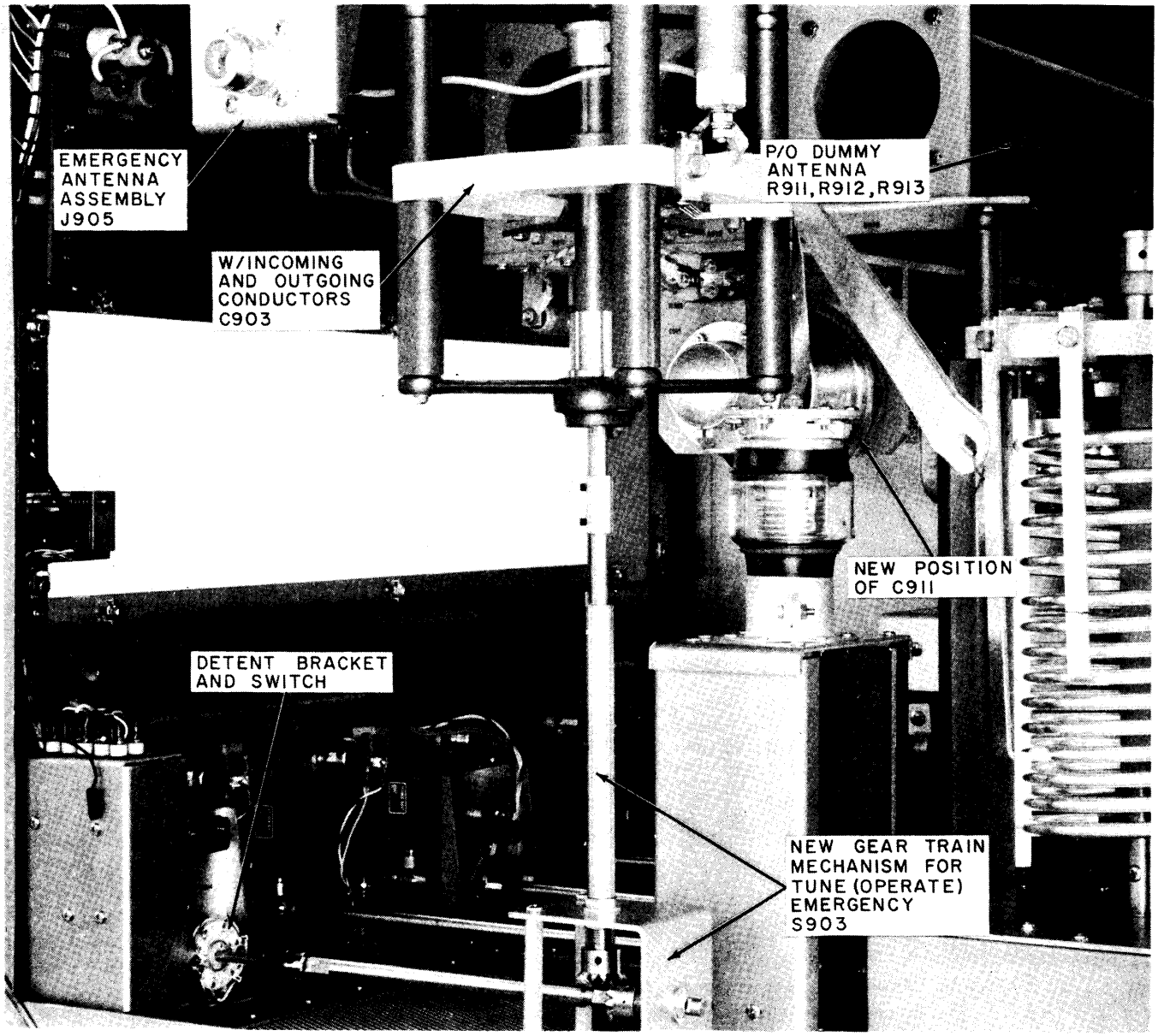


Figure 3-1-12. Modified GPT-10K's PA Compartment with Callouts on Changed Components, 45-Degree Angle Side View

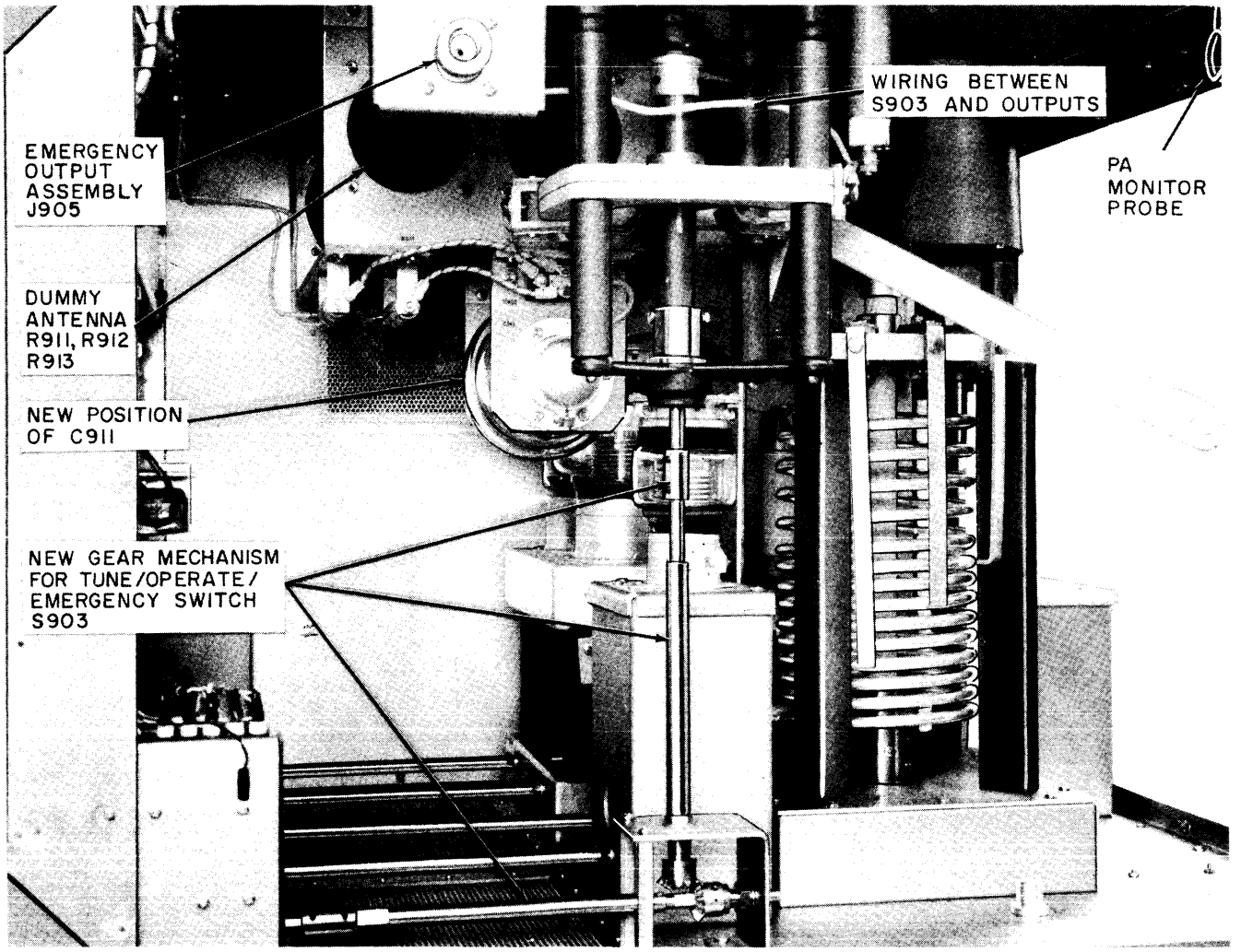


Figure 3-1-13. Modified GPT-10K's, PA Compartment with Callouts on Changed Components, 135-Degree Angle Side View

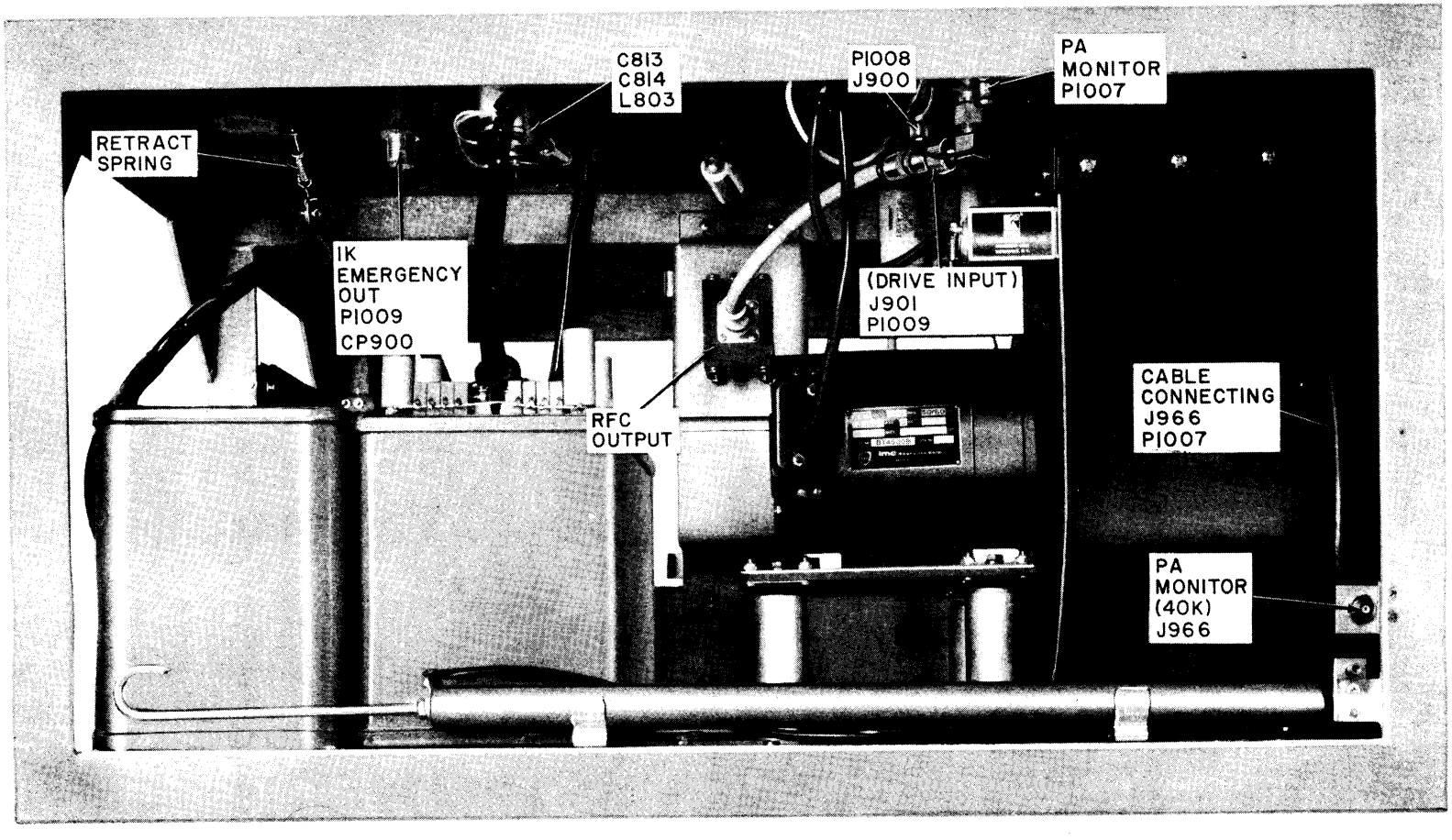


Figure 3-1-14. Modified GPT-10K's Blower Compartment Showing Coaxial Connectors Used for Regular 10 KW and Emergency 1 KW Supplies and Monitor to FSA With Callouts on Changed Compartments

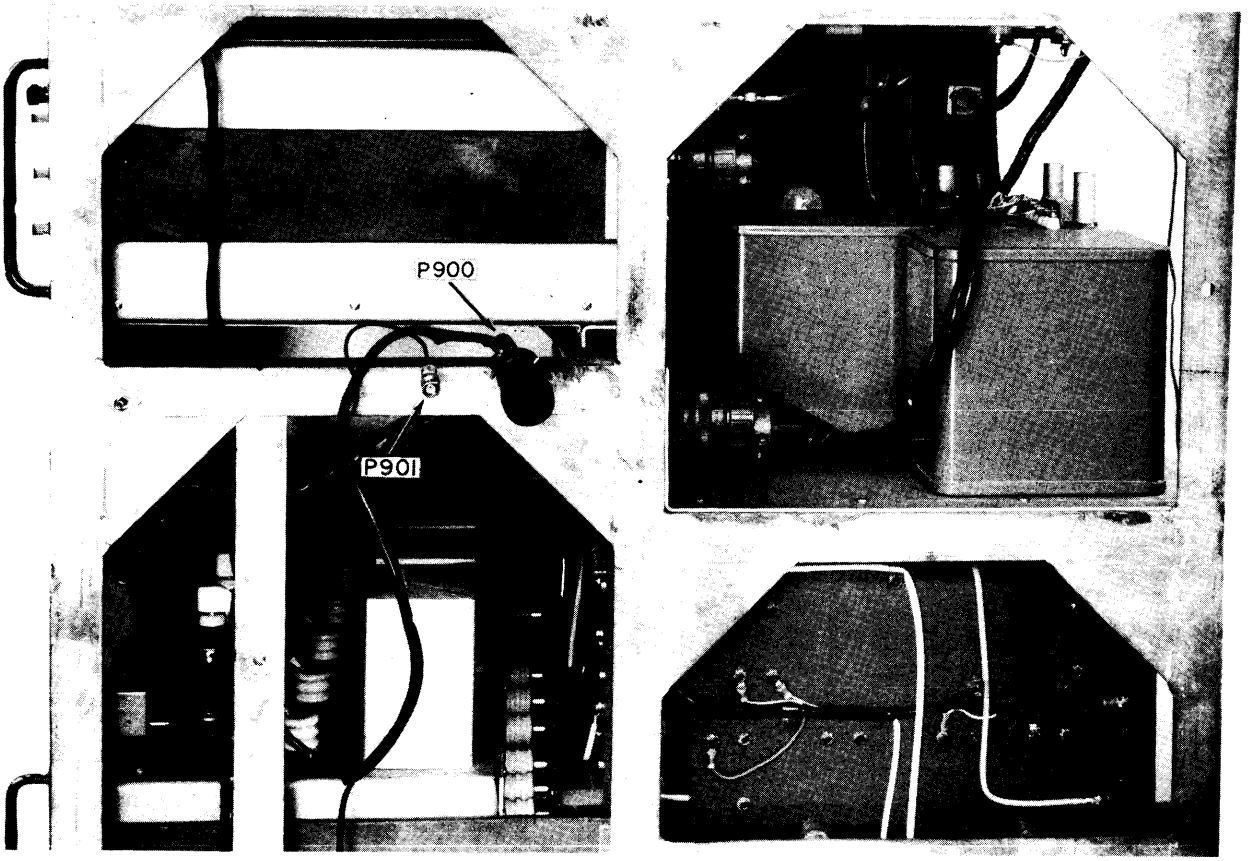
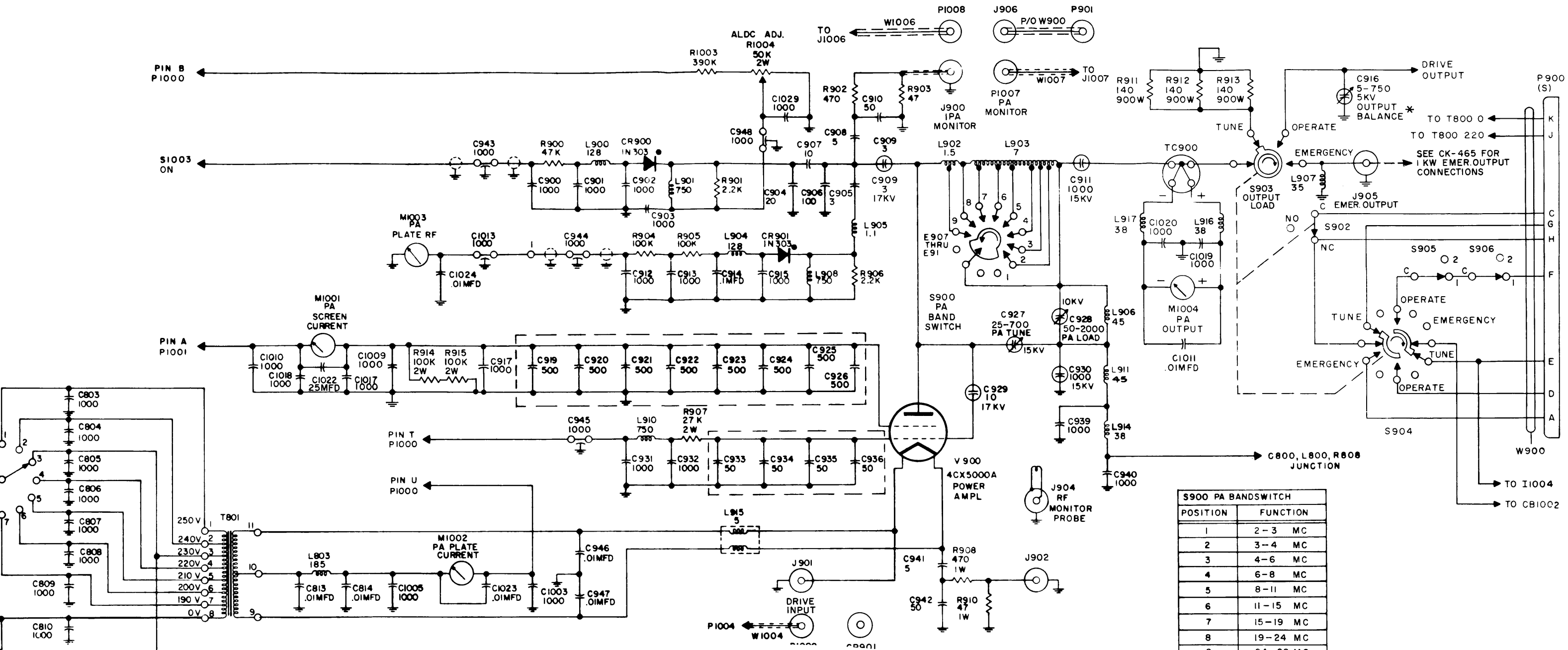


Figure 3-1-15. Modified GPT-10K's Signal Cables Interconnecting GPT-40K's Third and Fourth Frames with Callouts on Changed Components



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

NOTES–
UNLESS OTHERWISE SPECIFIED–
1. ALL CAPACITORS ARE IN μμFD.
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.

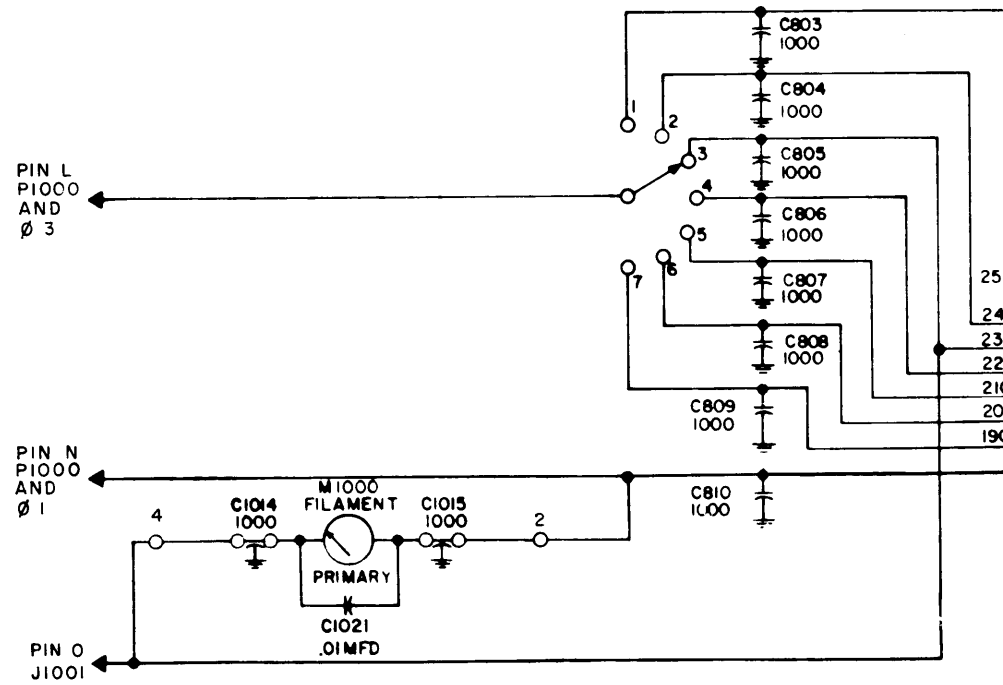
*VARIABLE ON 10KV OPERATION
FIXED ON 40KV OPERATION

Figure 3-1-16. Simplified Schematic Diagram, Modified GPT-10K's PA Section or GPT-40K's IPA Section

PIN B
P1000

S1003
ON

PIN A
P1001



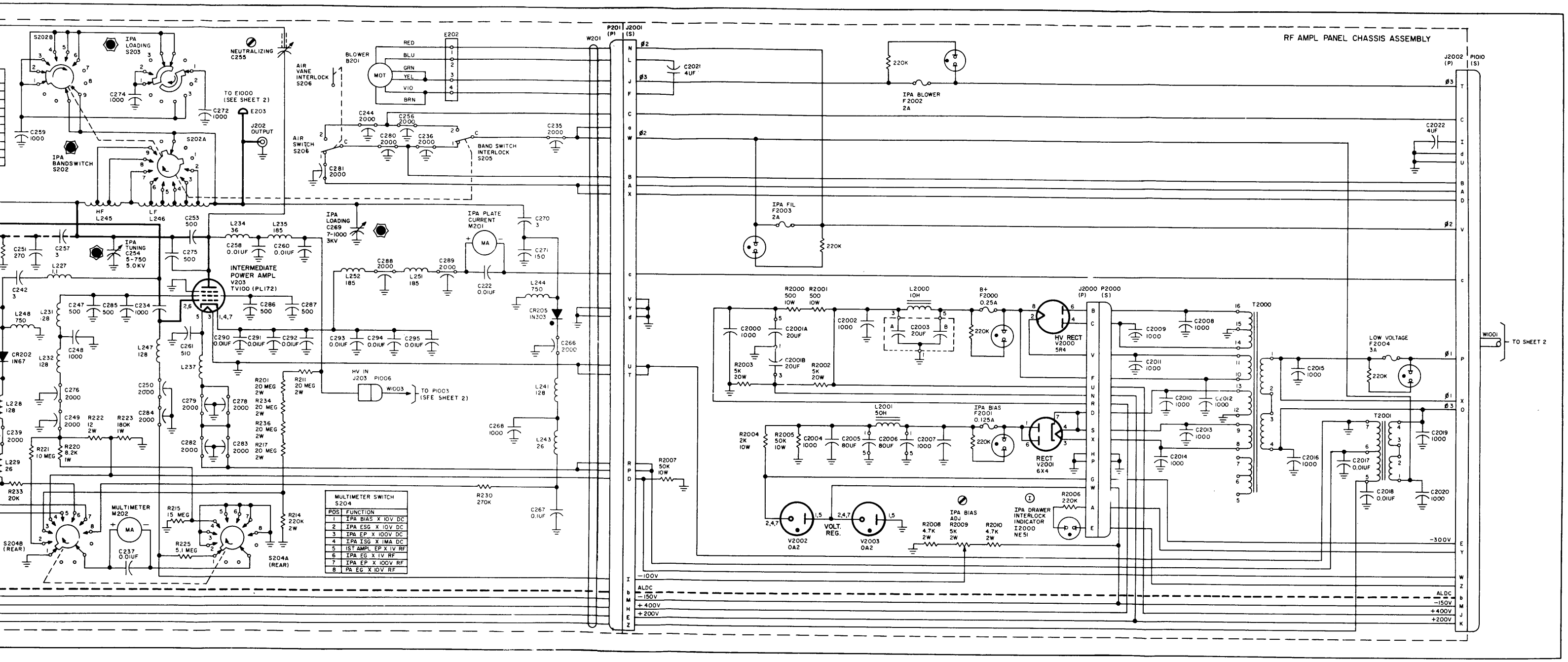


Figure 3-1-17. Schematic Diagram, Modified PA (10K) Frame Circuits or IPA (40K) Frame Circuits (Sheet 1 of 2)

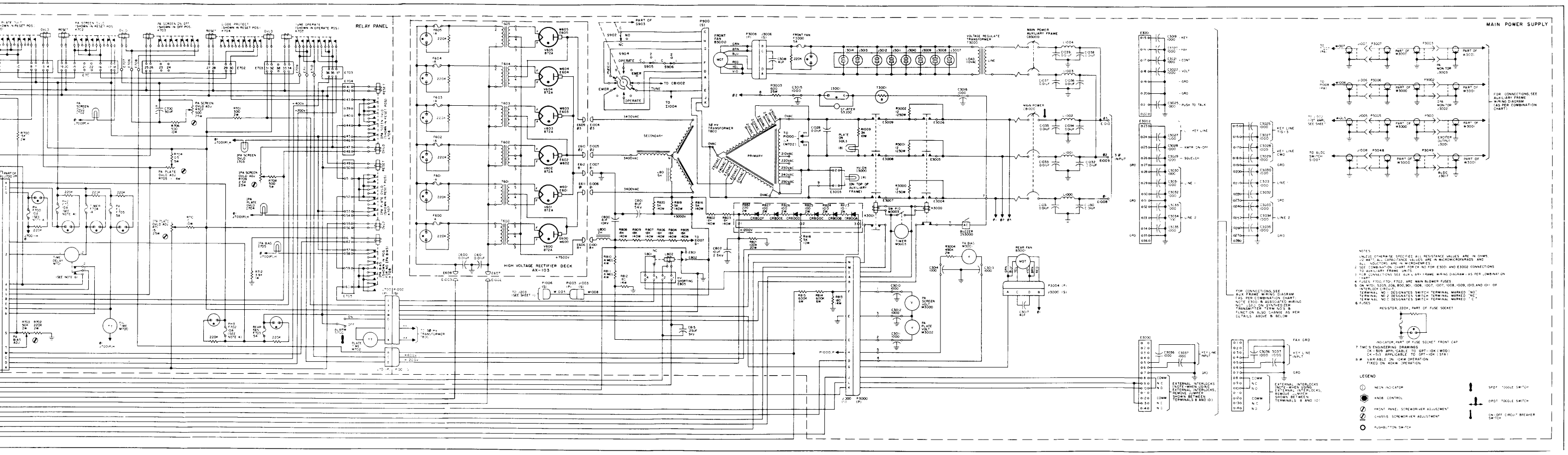
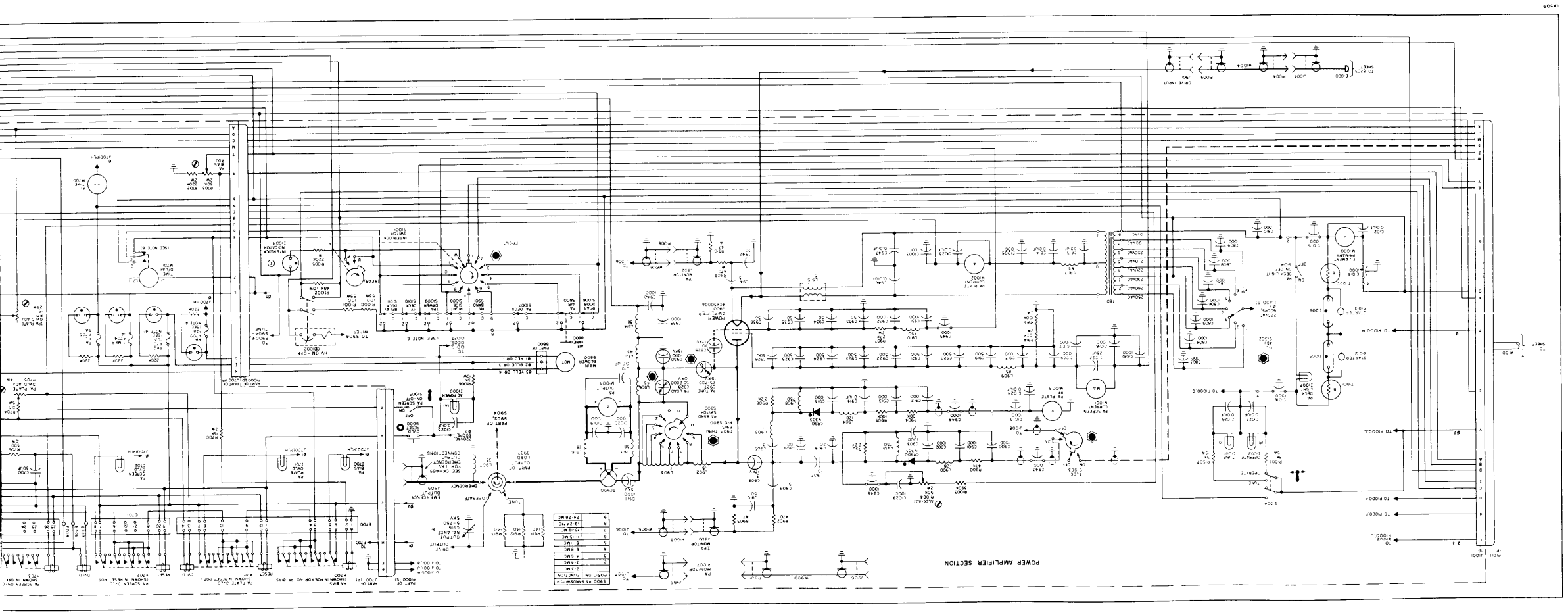


Figure 3-1-17. Schematic Diagram, Modified PA (10K) Frame Circuits or IPA (40K) Frames Circuits (Sheet 2 of 2)


POWER AMPLIFIER SECTION

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. Figures 4-1-1-a and 4-1-1-b in this section show 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 RF linear amplifiers and 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 5-hp motor and associated blower which supplies cooling air through PA(40K) tube V7301 (2800 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 four 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 MSC 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.

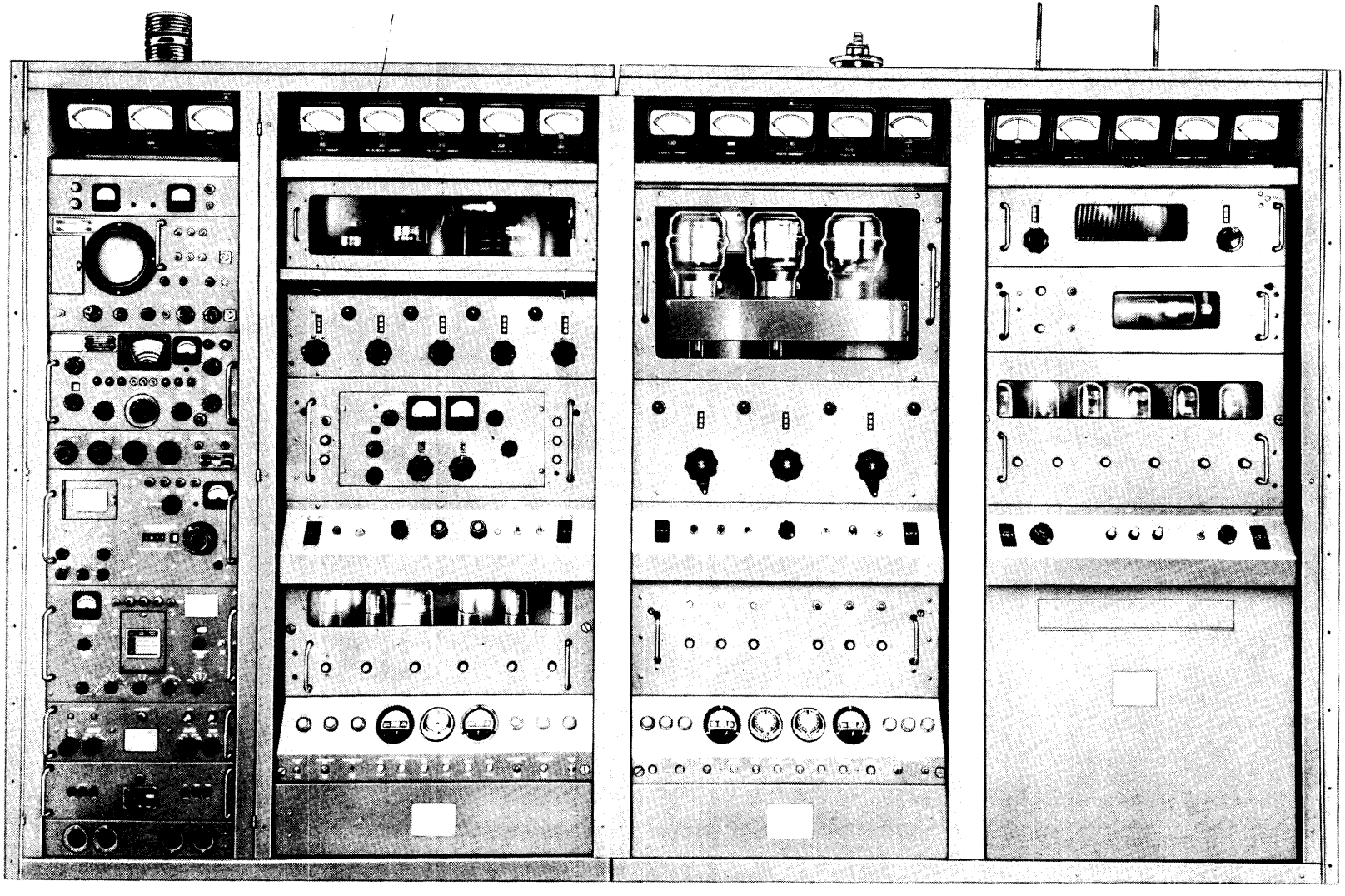


Figure 4-1-1-a. Front View, GPT-40K (Non-Synthesized)

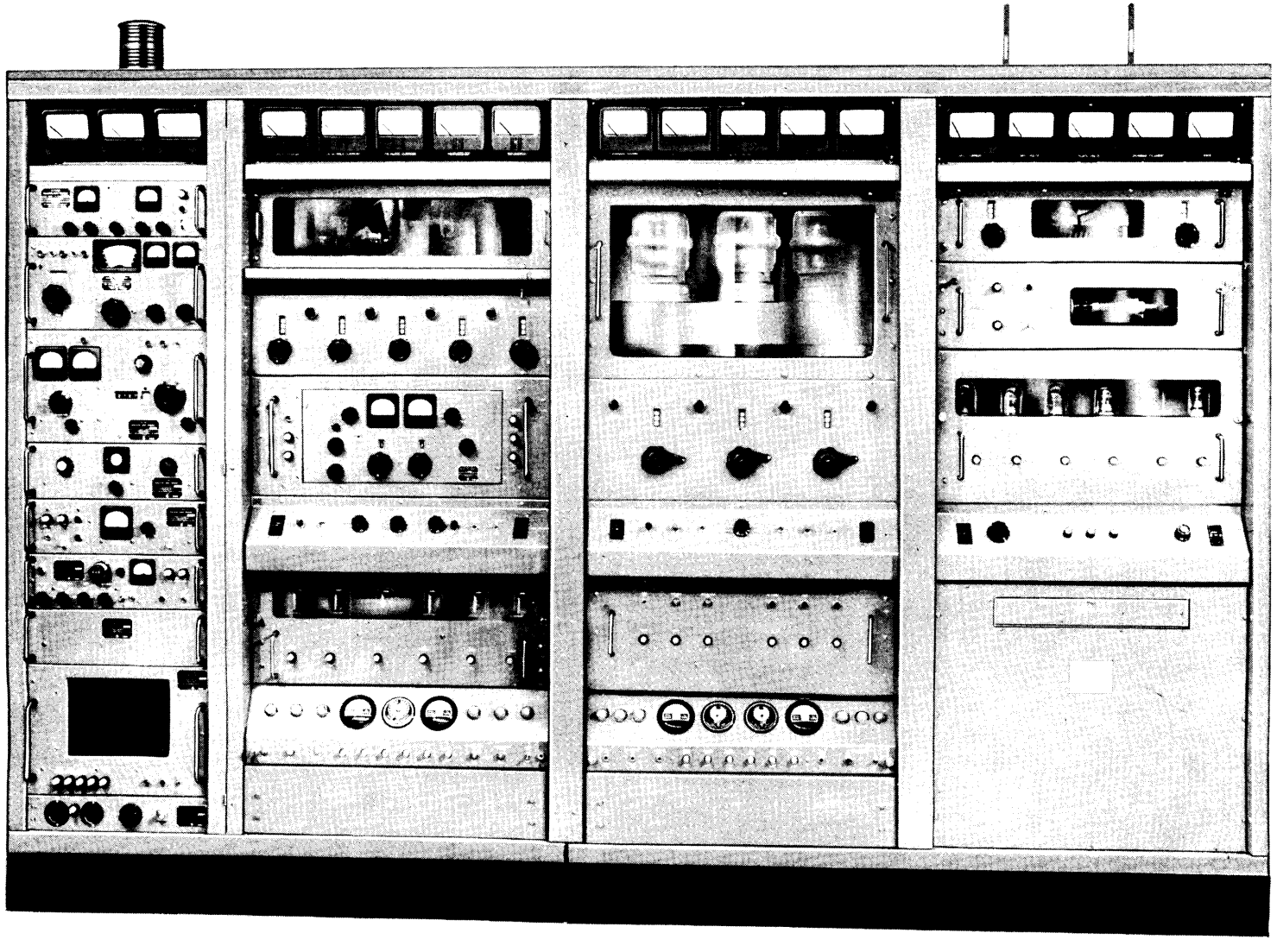
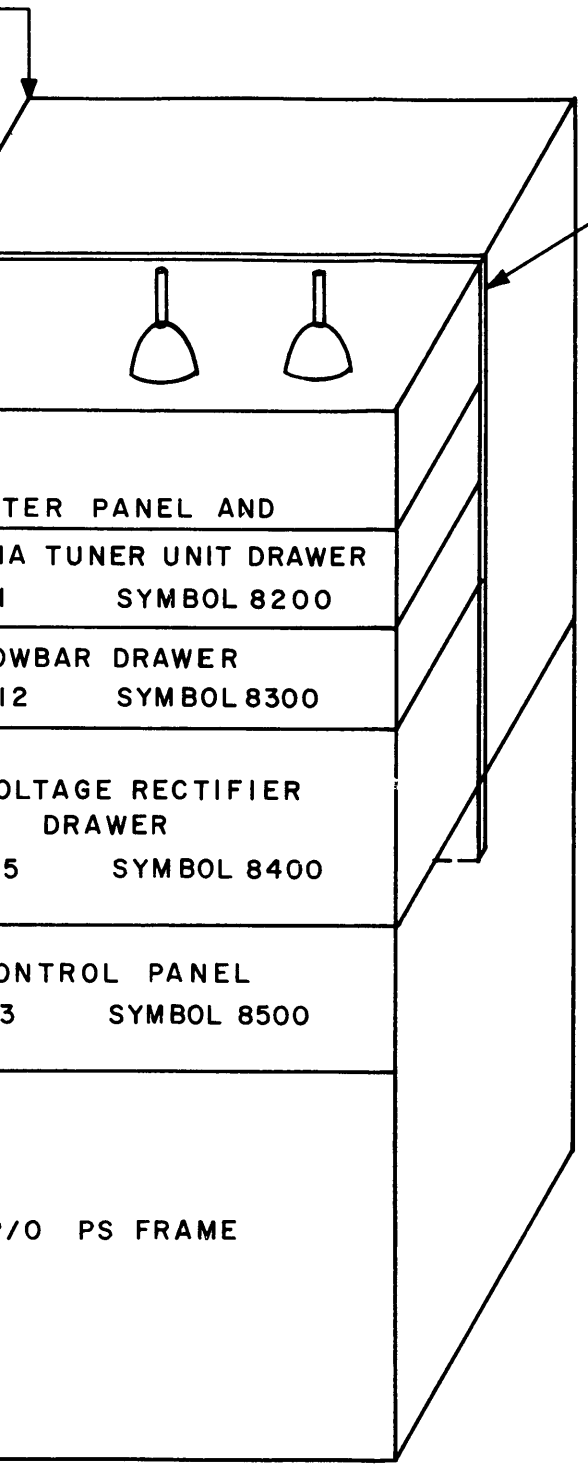
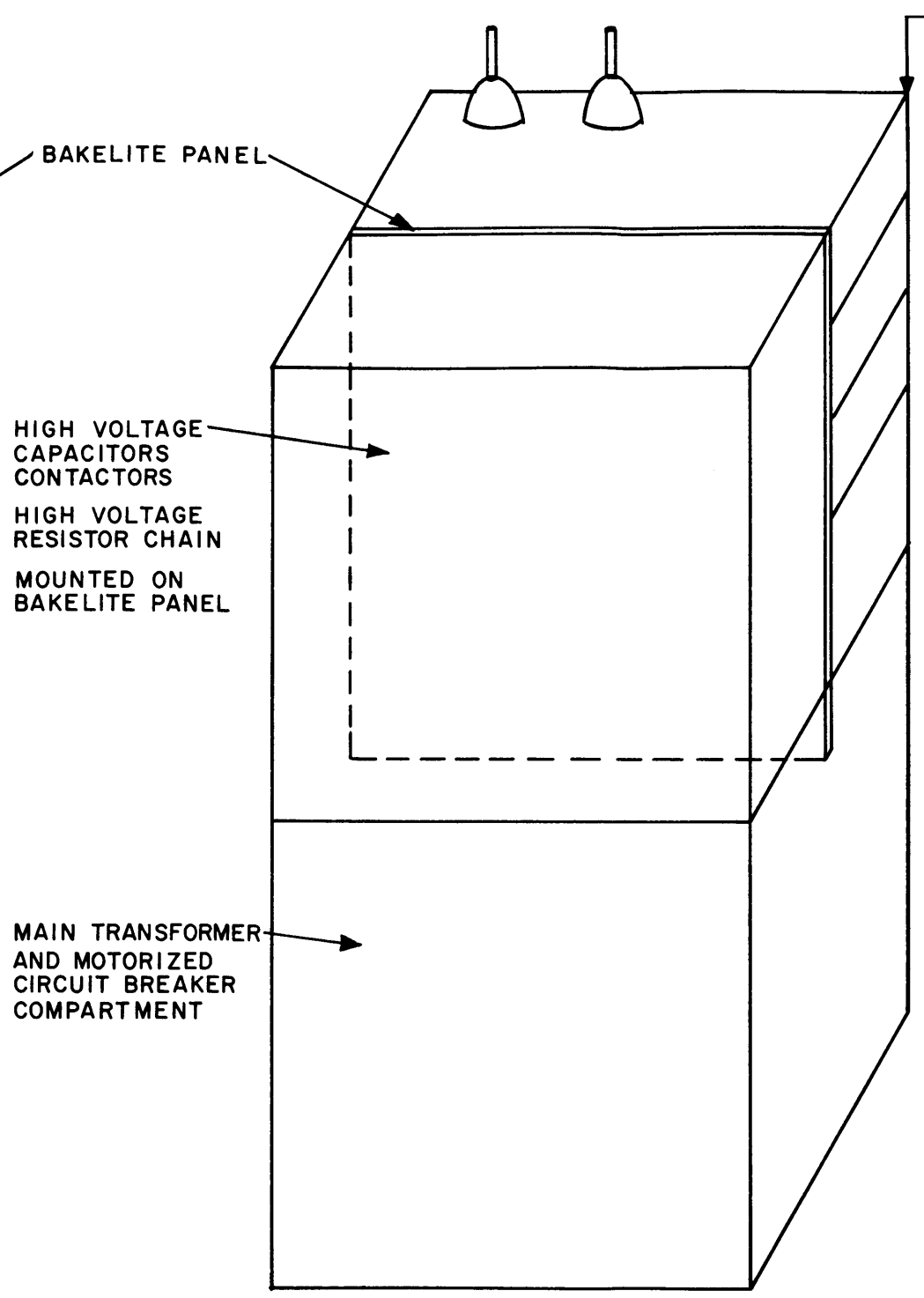


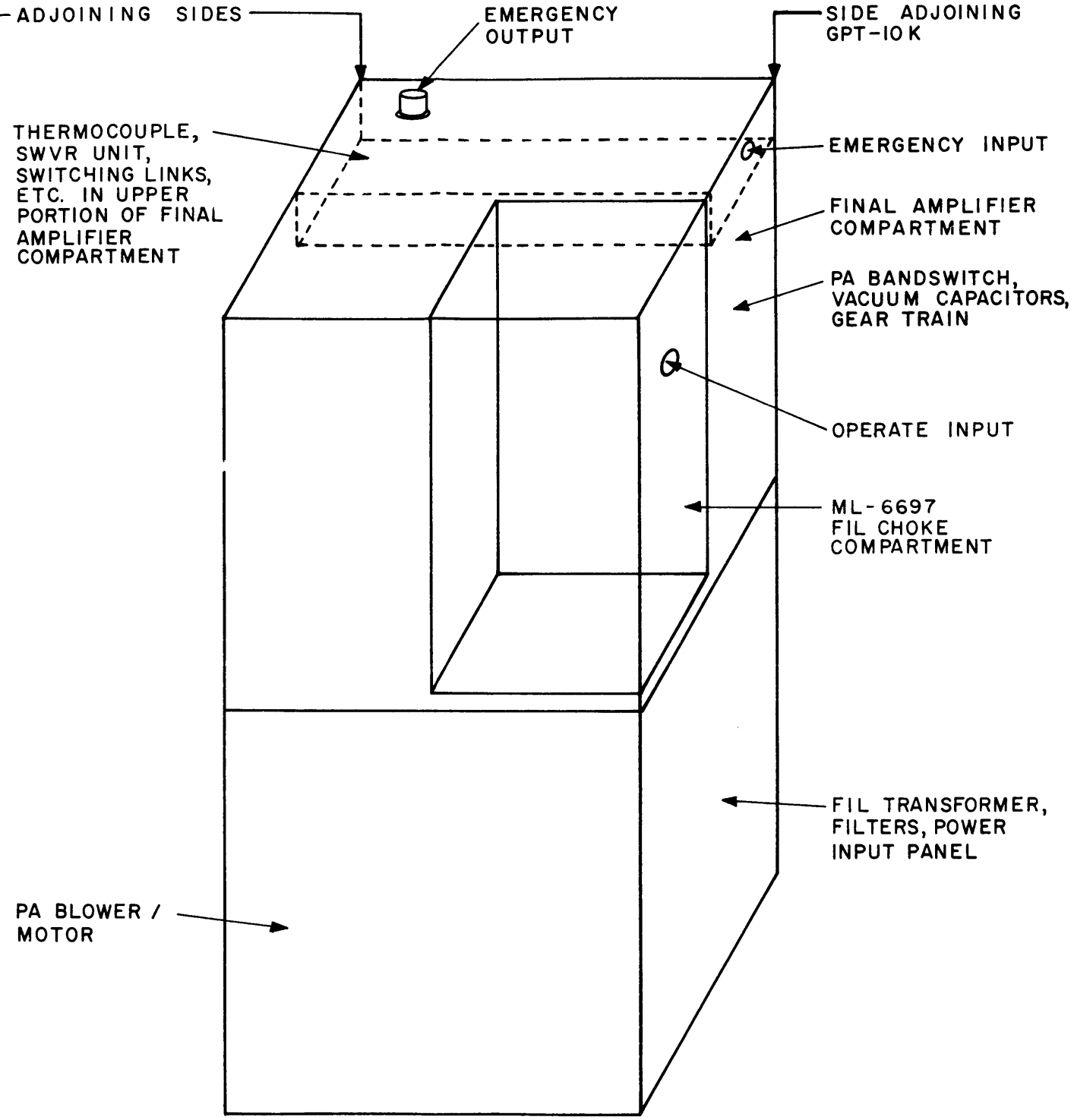
Figure 4-1-1-b. Front View, GPT-40K (Synthesized)



PS FRAME
SYMBOL 8100
FRAME SUB-ASS'Y

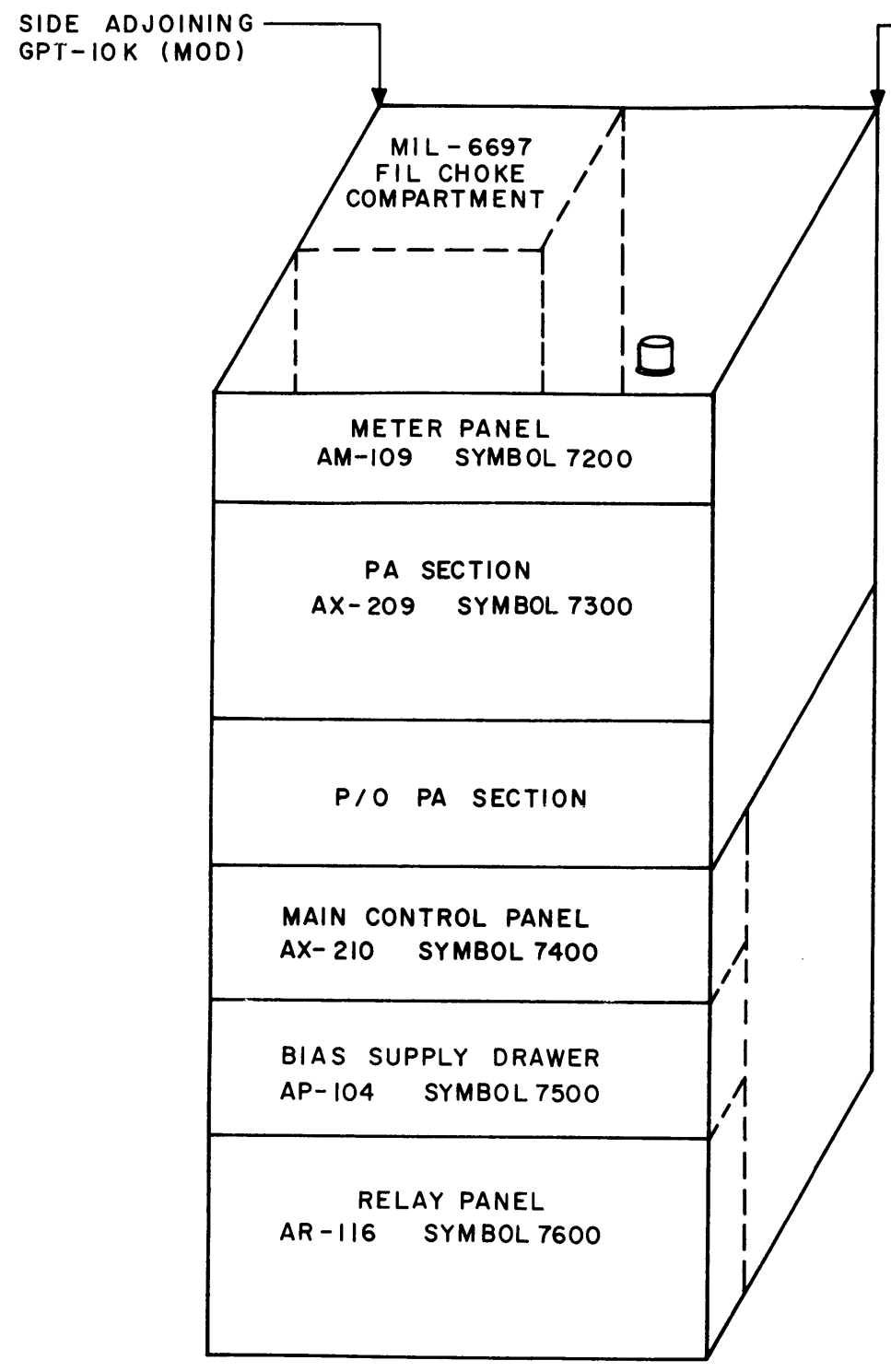


PS FRAME (REAR)

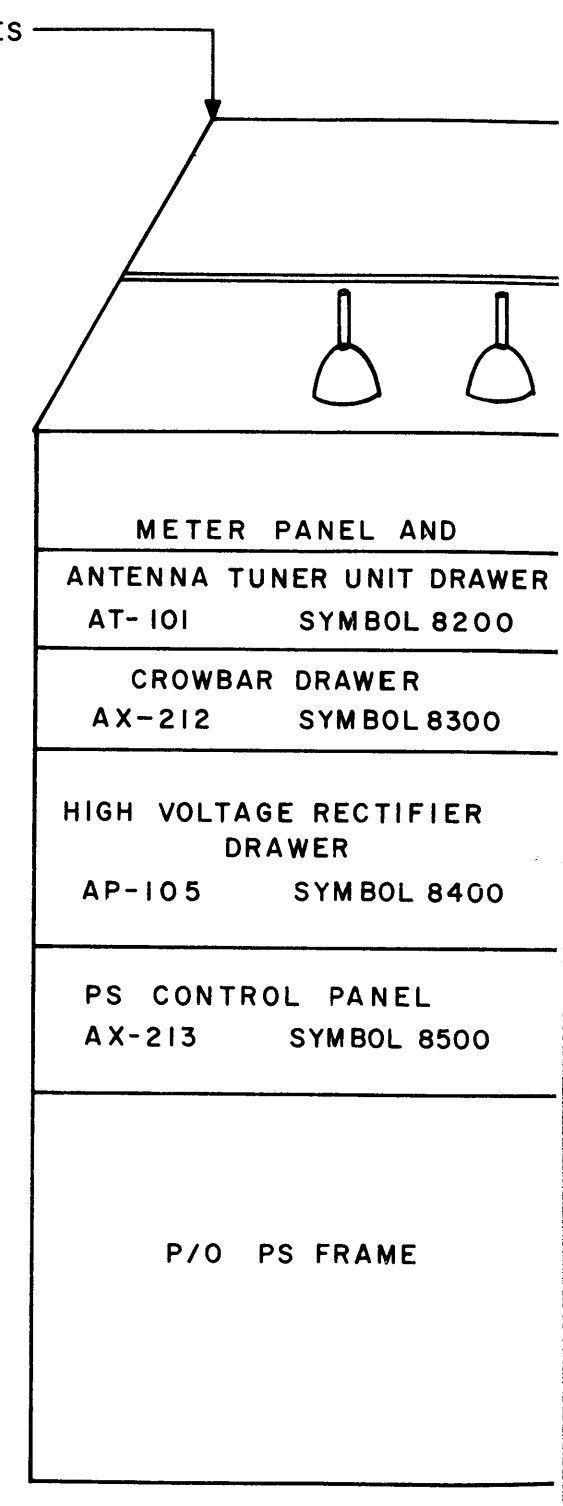


PA FRAME (REAR)

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



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



PS FRAME
AP-103 SYMBOL 8100
AX-211 FRAME SUB-A

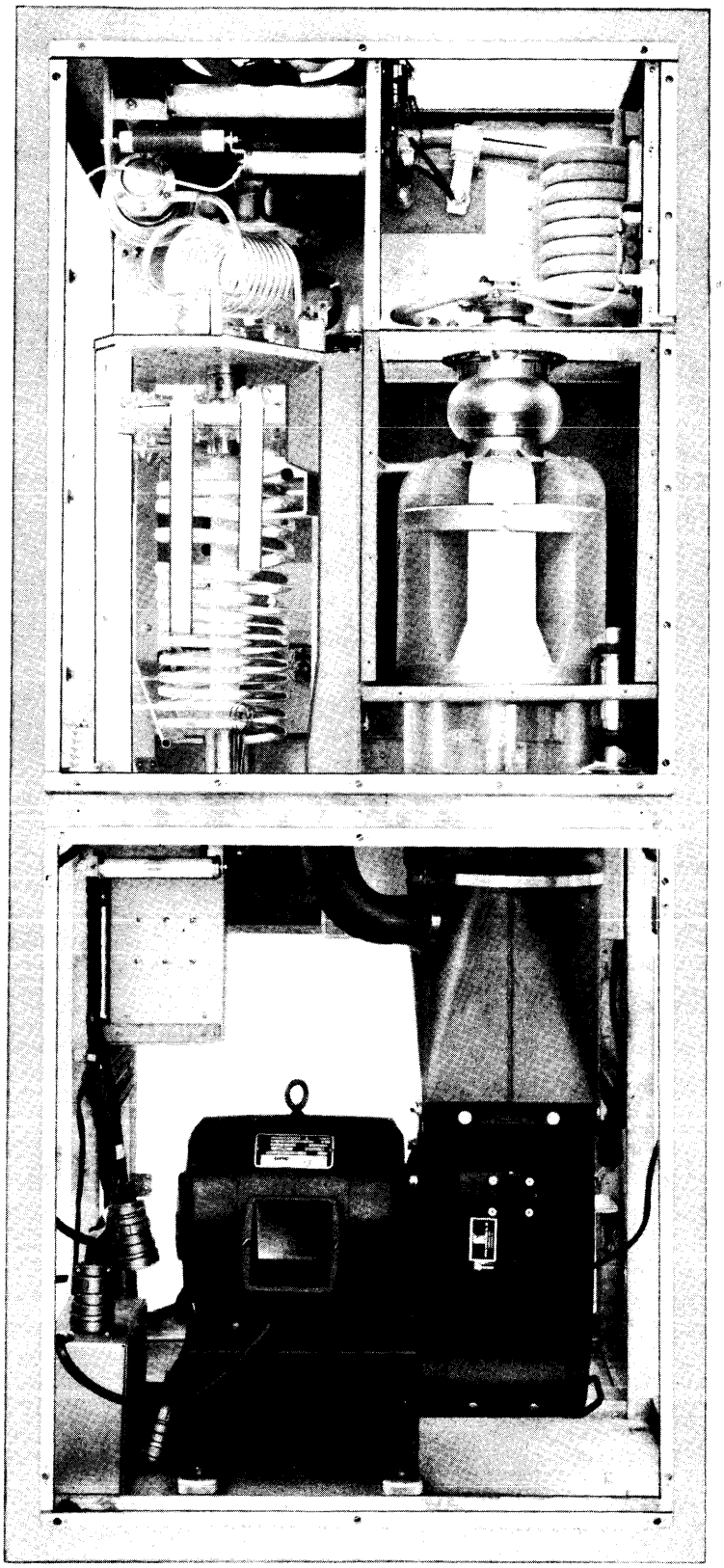


Figure 4-1-3. Overall Rear View, Third Frame, GPT-40K

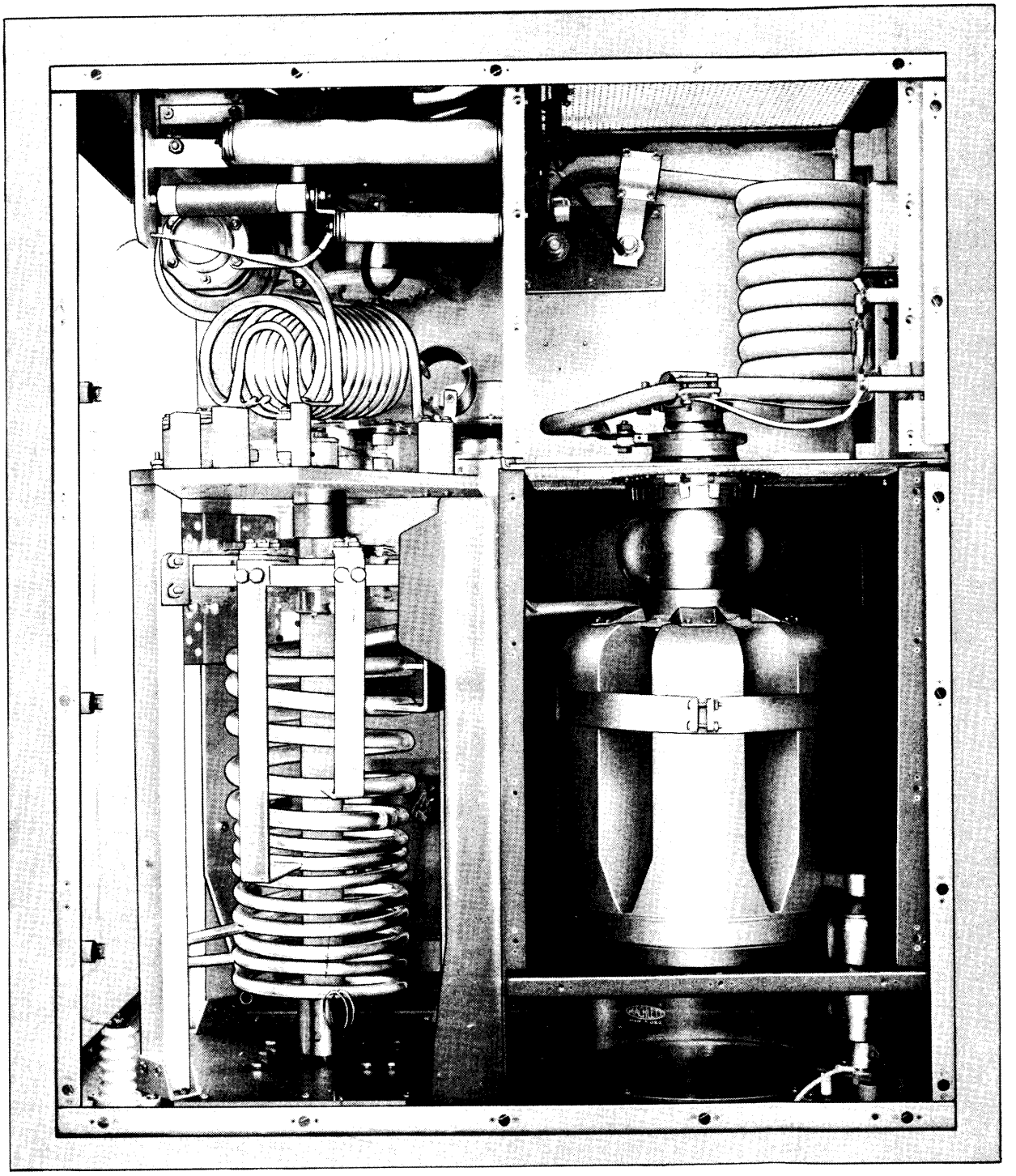


Figure 4-1-4-a. Full Rear View, PA Capacitor/Coil/Gear Train Compartment, GPT-40K

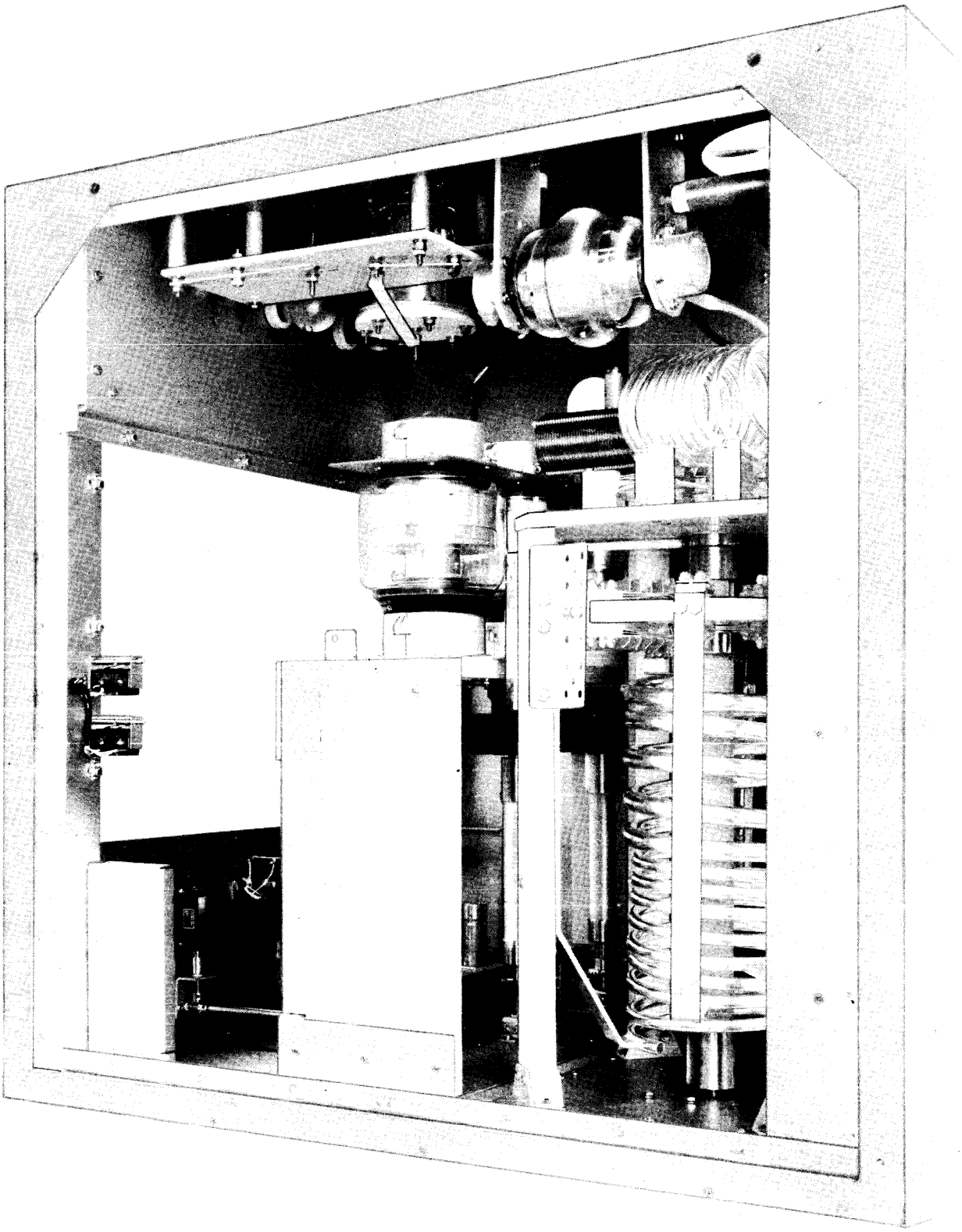


Figure 4-1-4-b. 45-Degree Angle Side View, PA Capacitor/Coil/Gear Train Compartment, GPT-40K

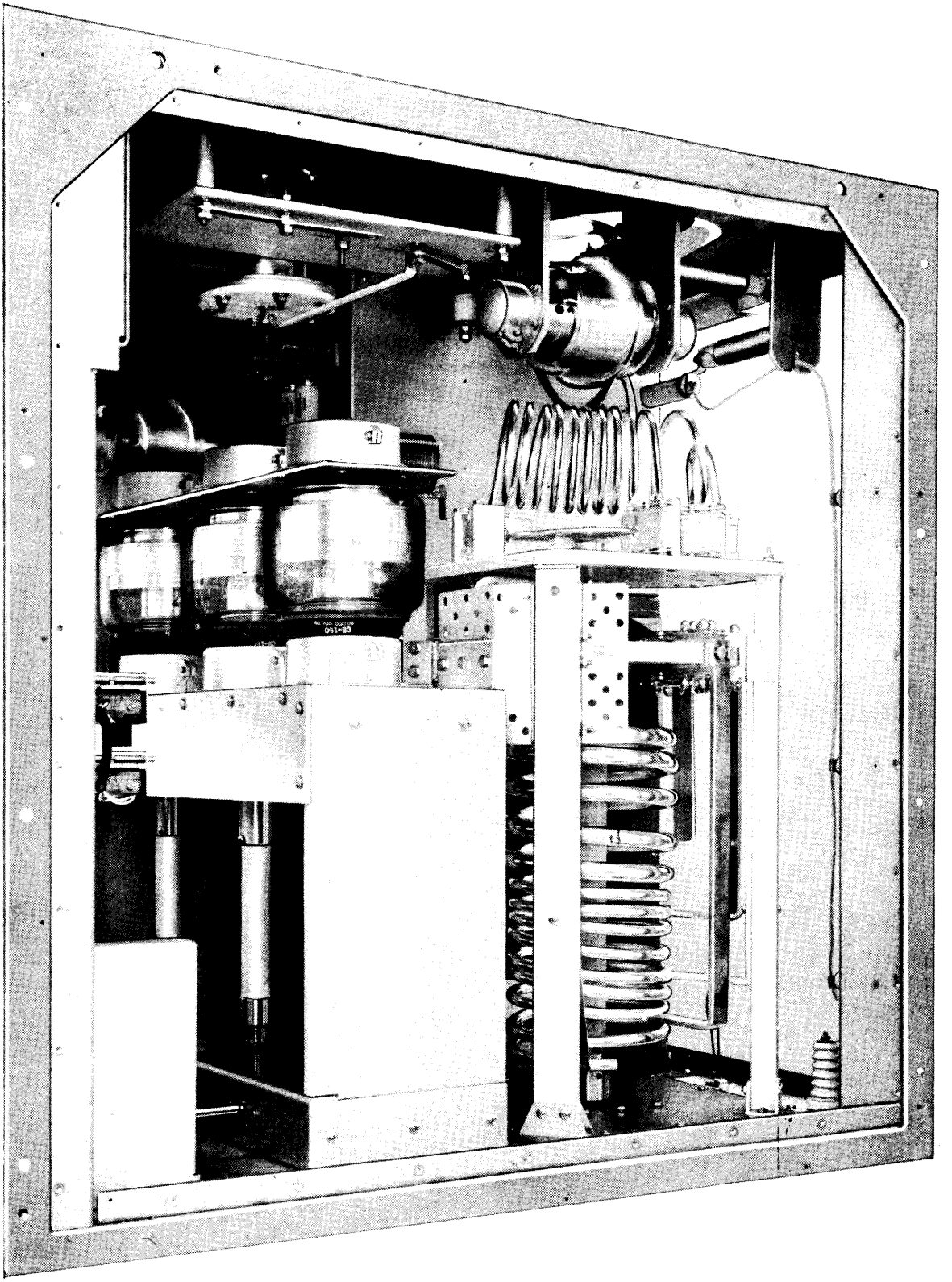


Figure 4-1-4-c. 135-Degree Angle Side View, PA Capacitor/Coil/Gear Train Compartment, GPT-40K

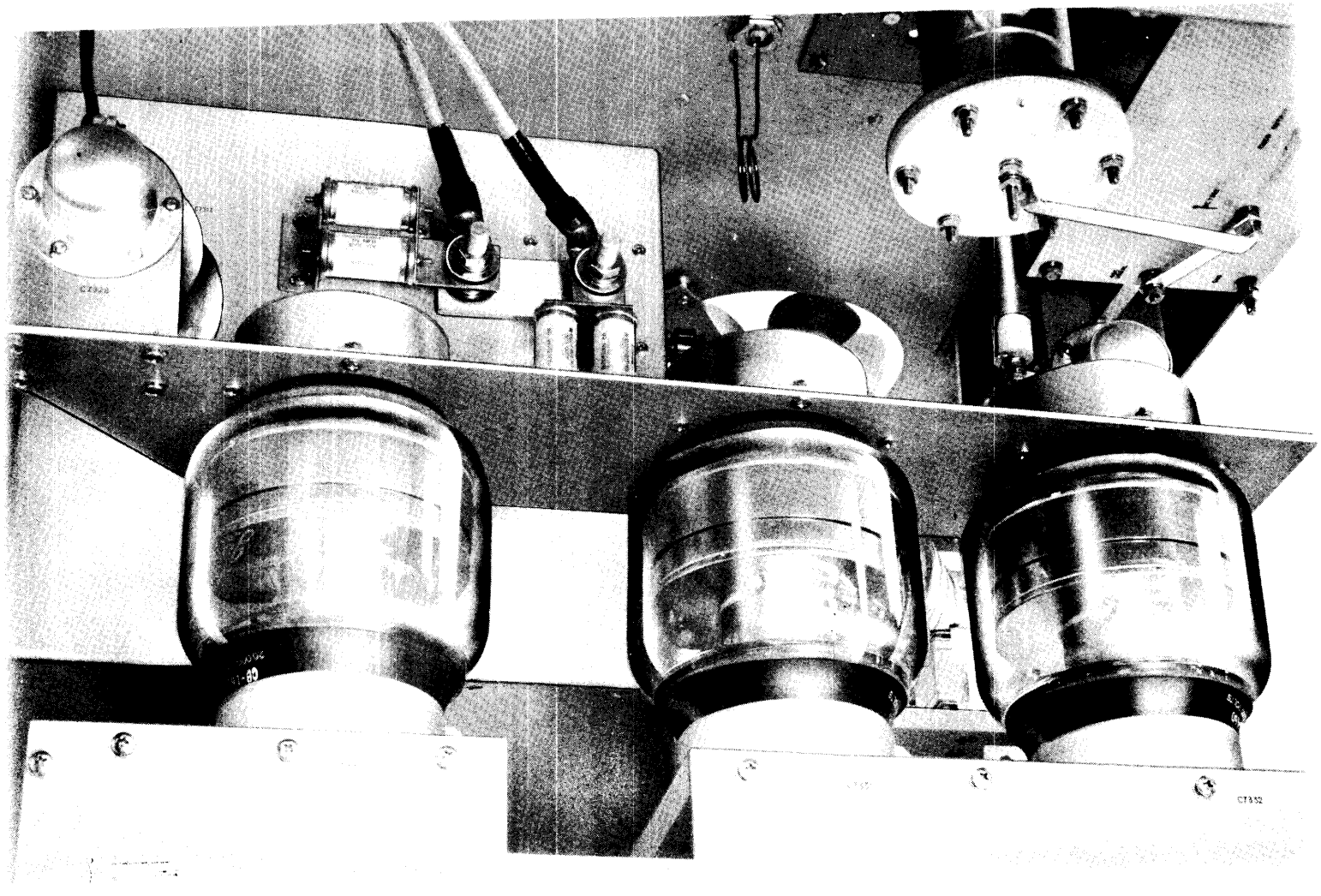


Figure 4-1-5-a. Front and Upward View, PA Capacitor/Coil/Gear Train Compartment, GPT-40K

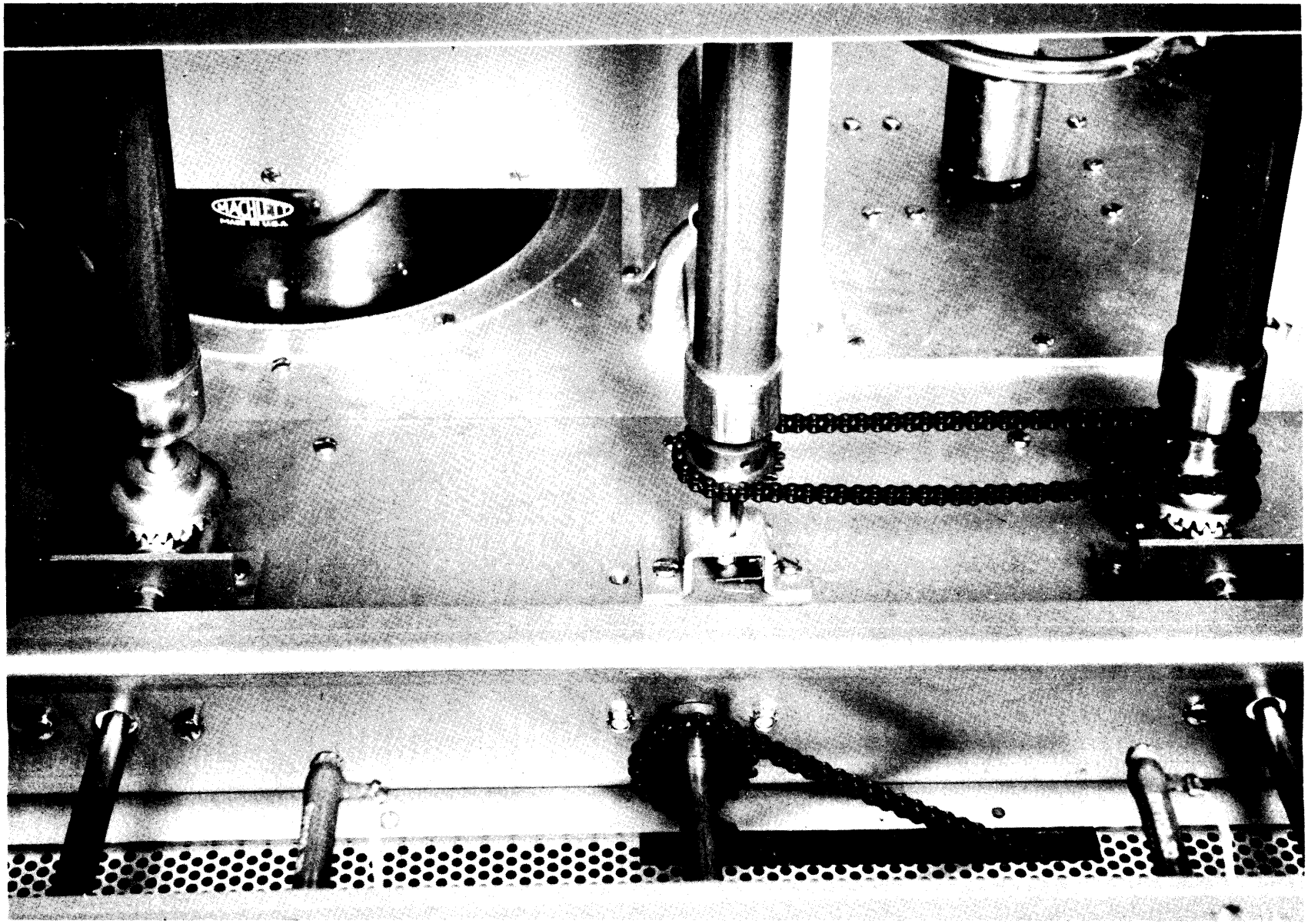


Figure 4-1-5-b. Front and Bottom View, PA Capacitor/Coil/Gear Train Compartment, GPT-40K

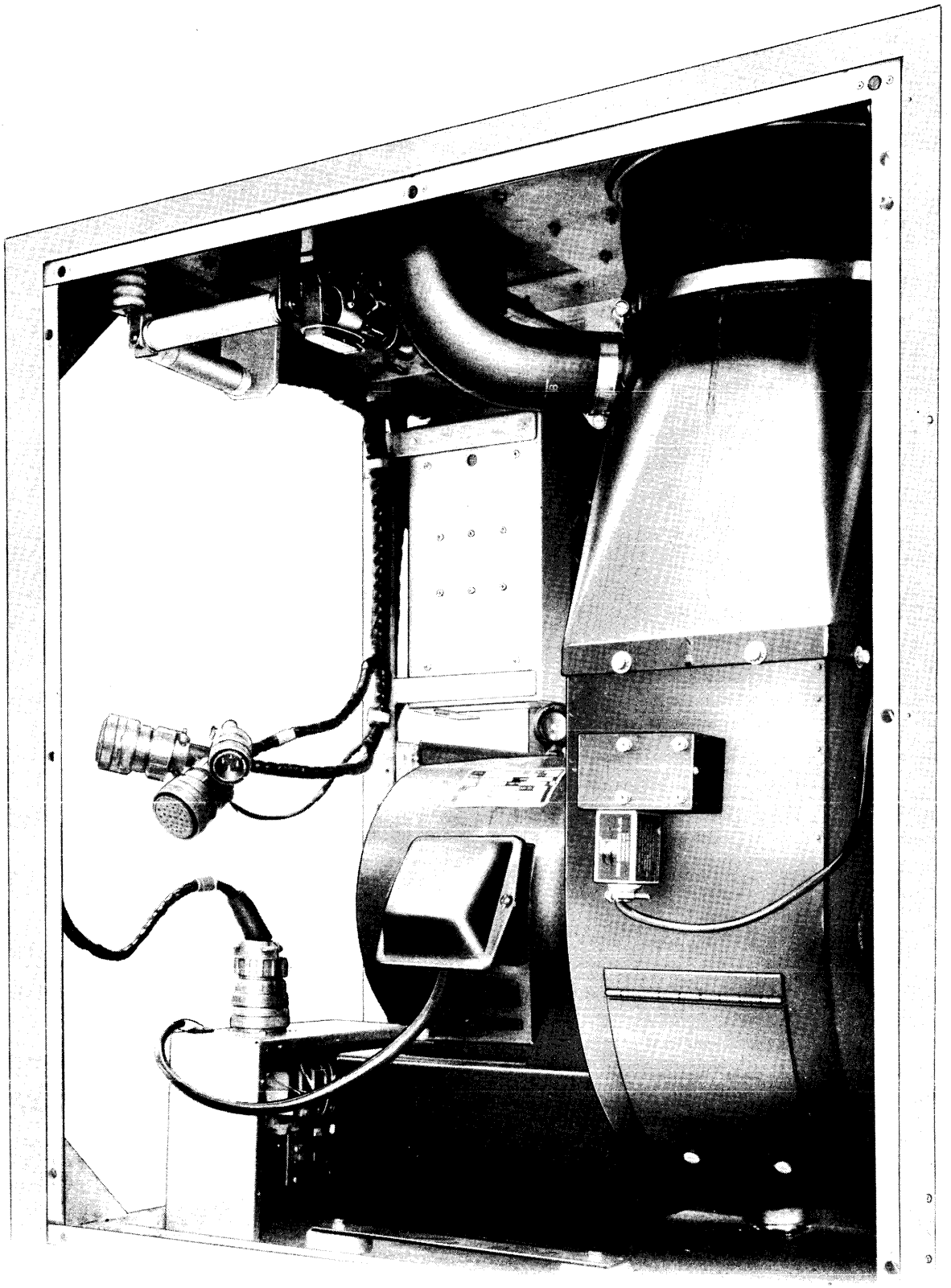


Figure 4-1-6-a. 45-Degree Angle Rear View, PA Blower Compartment, GPT-40K

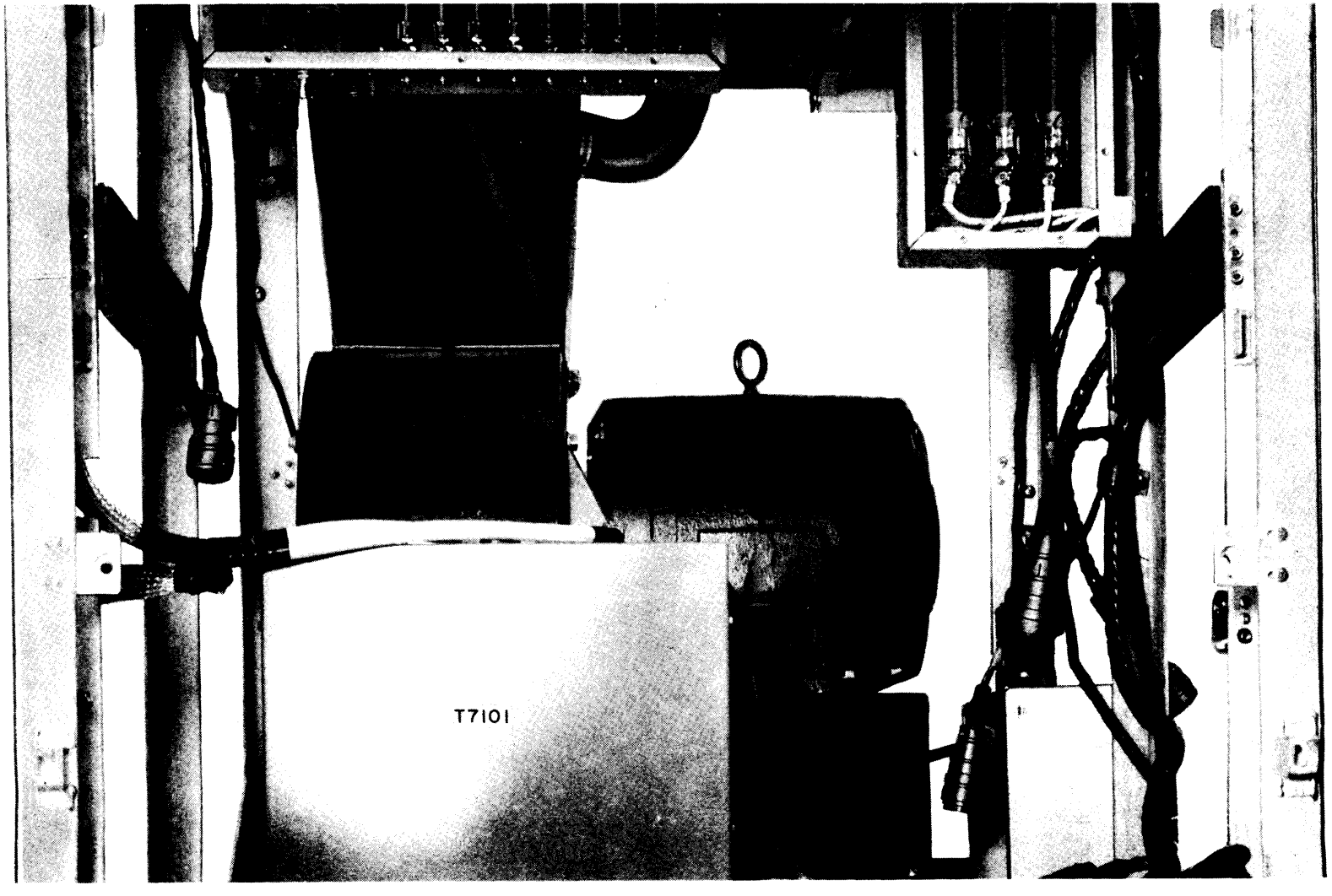


Figure 4-1-6-b. Full Front View, PA Blower Compartment, GPT-40K

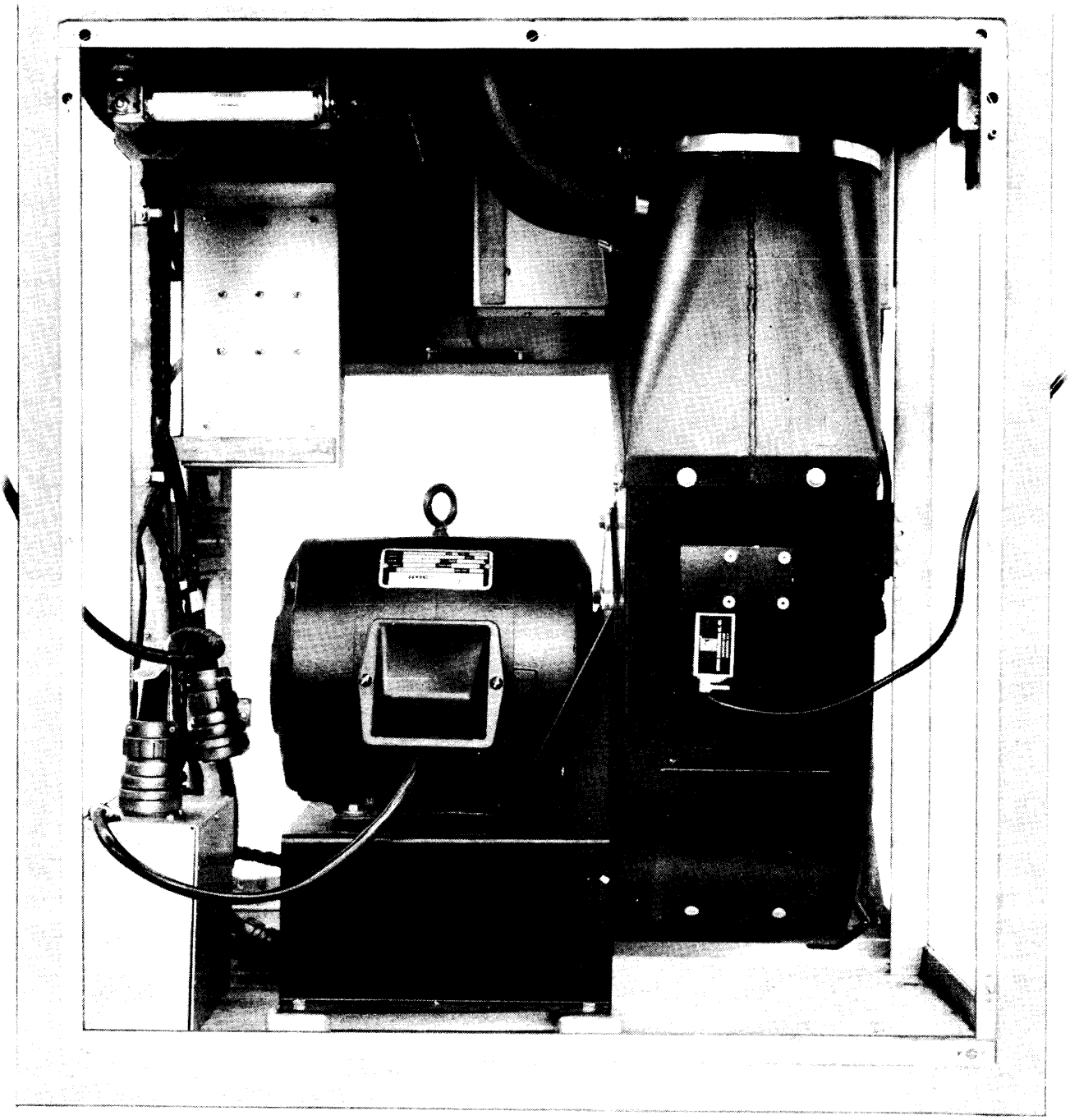


Figure 4-1-6-c. Full Rear View, PA Blower Compartment, GPT-40K

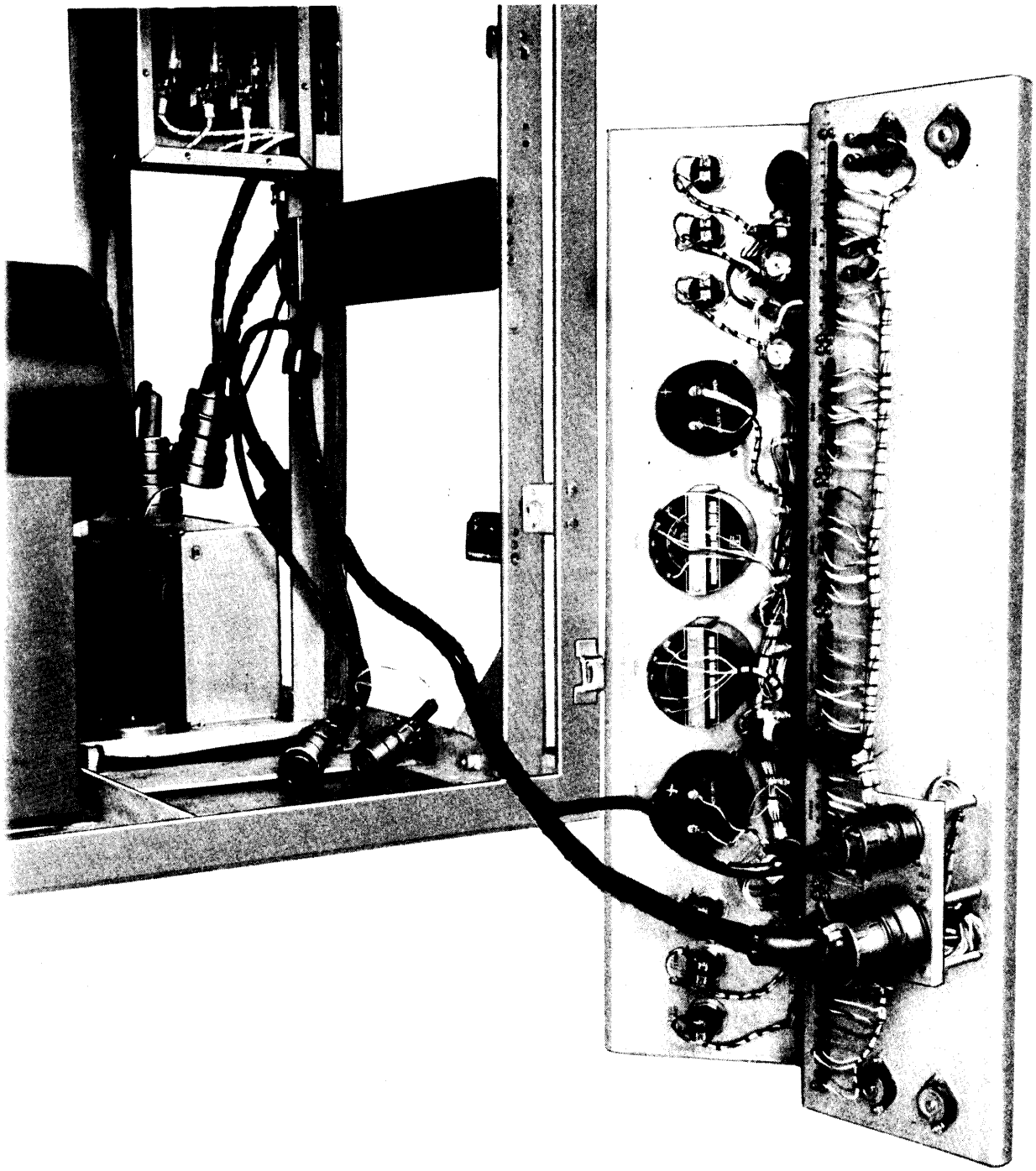


Figure 4-1-7. Rear View, Indicator Control Panel, GPT-40K

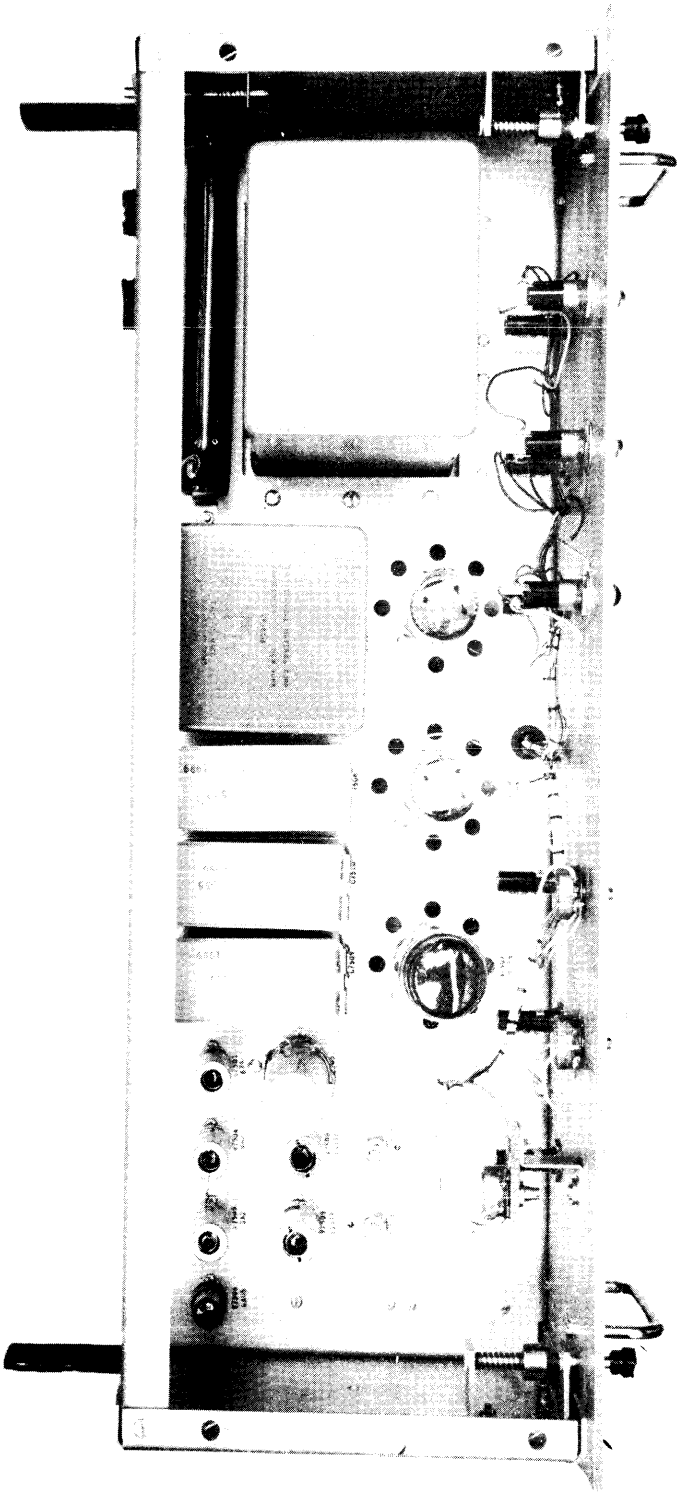
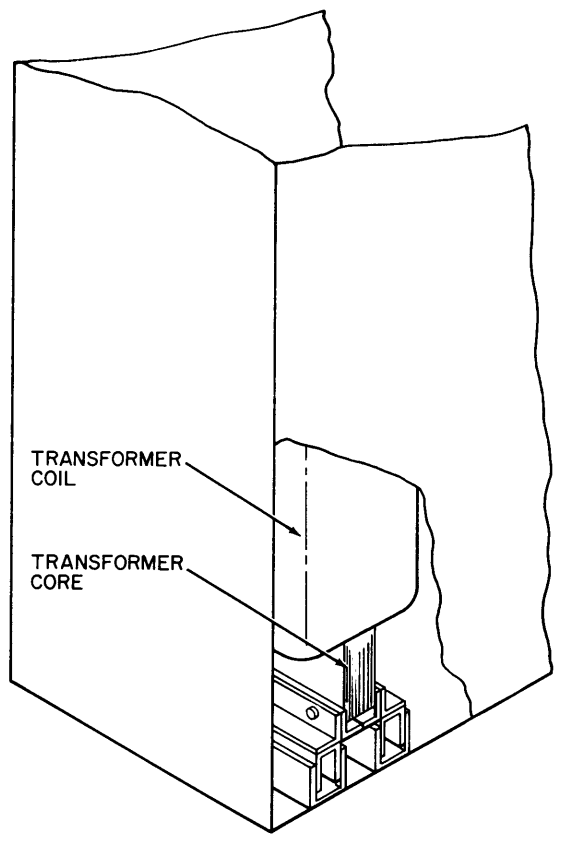
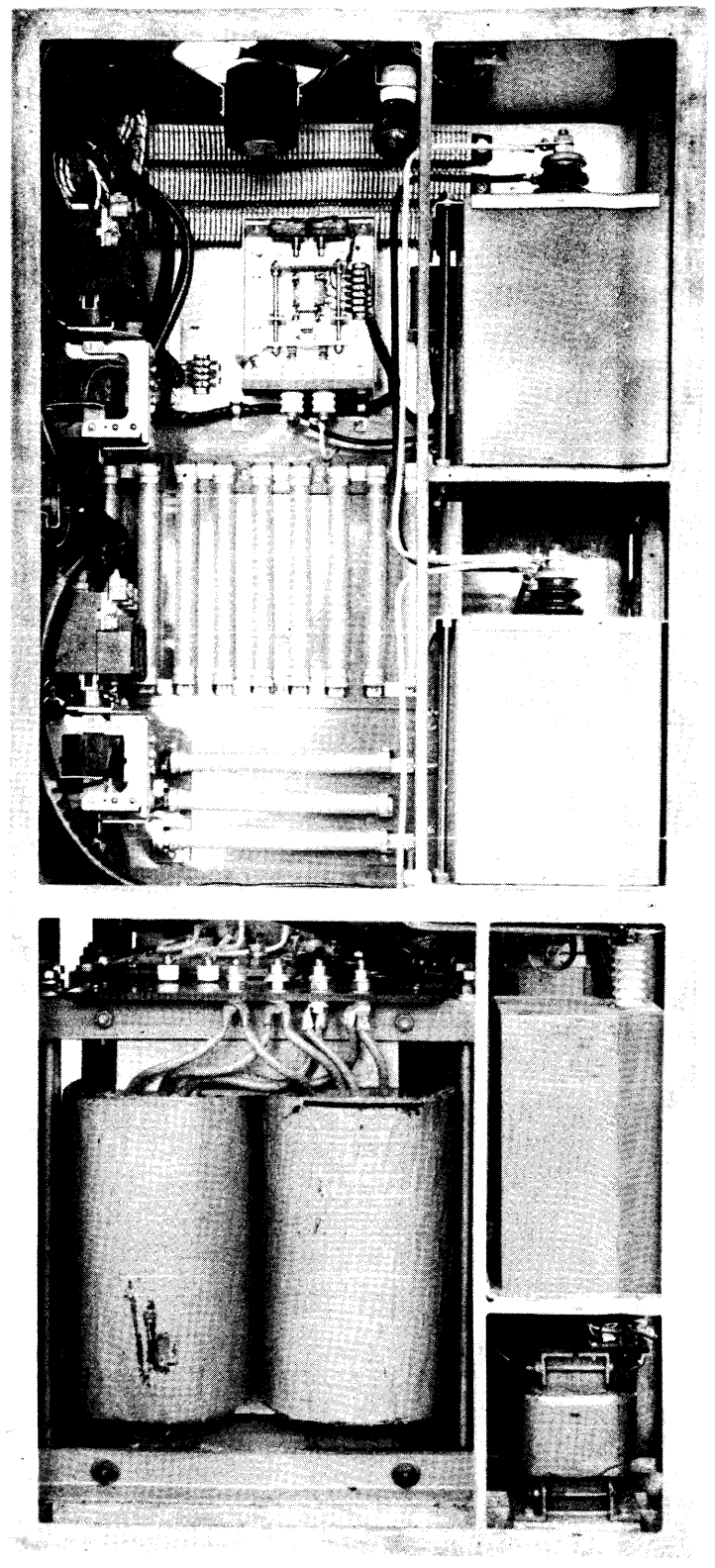


Figure 4-1-8. Top View, Bias Supply Drawer, GPT-40K





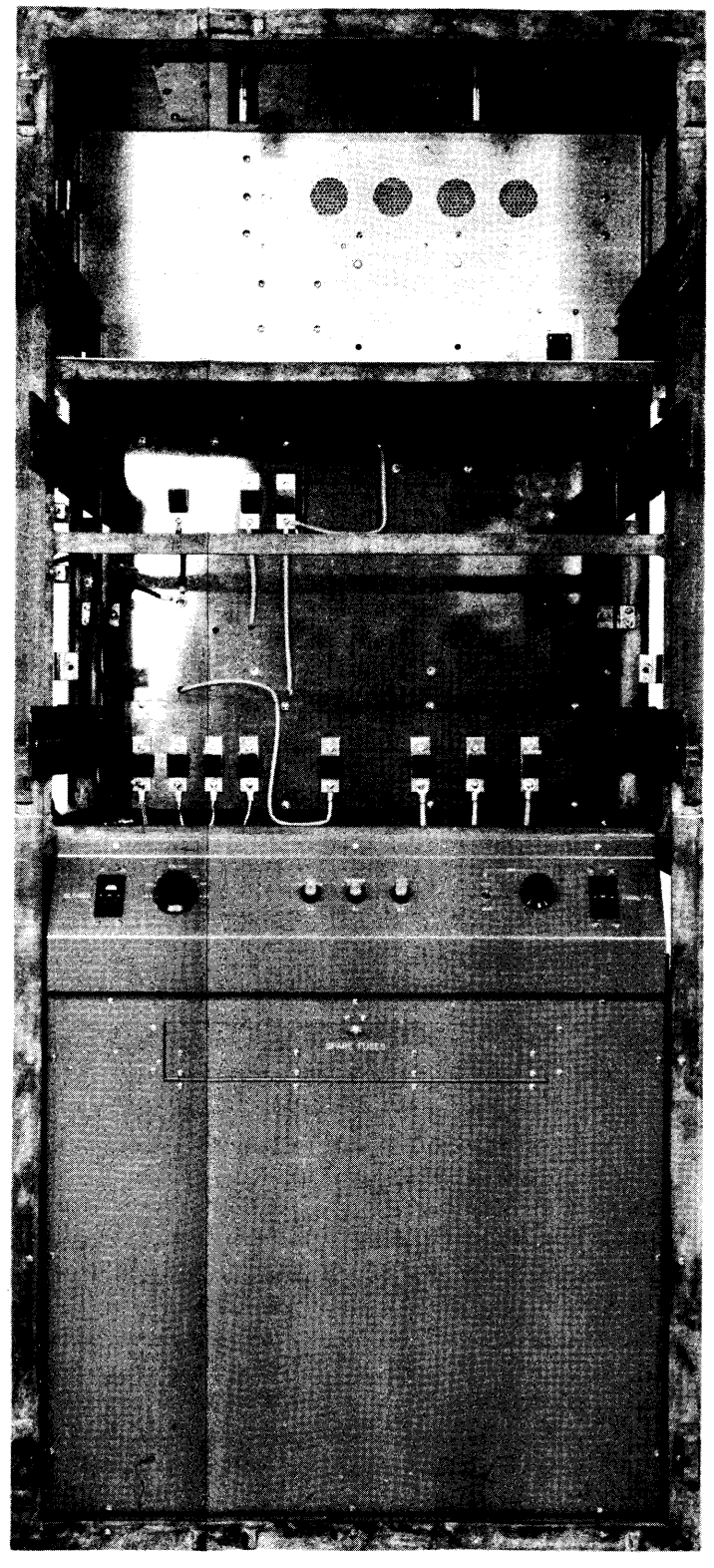
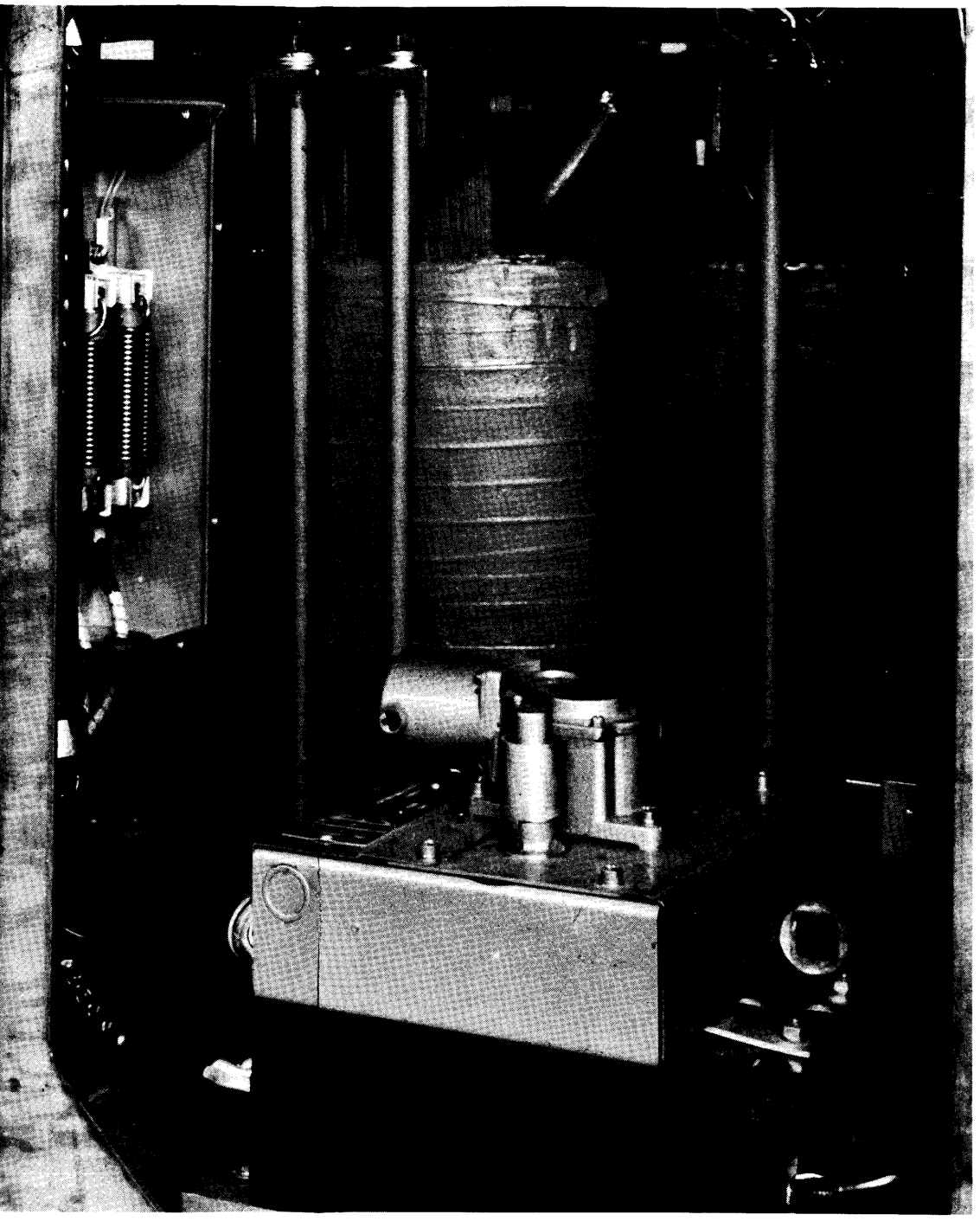


Figure 4-1-9. Overall Rear and Front (Removable Drawers Removed) Views, Fourth Frame, GPT-40K



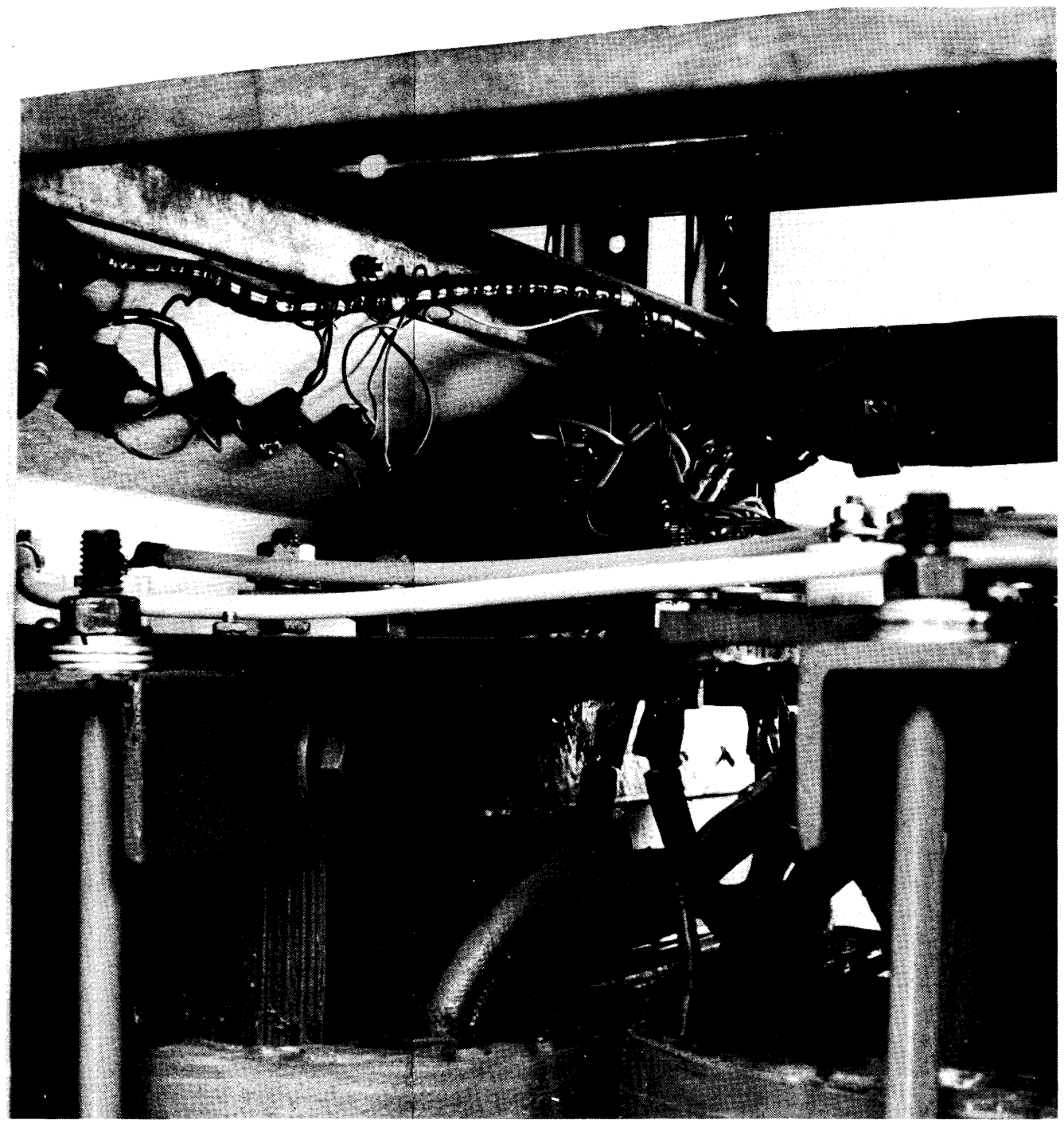
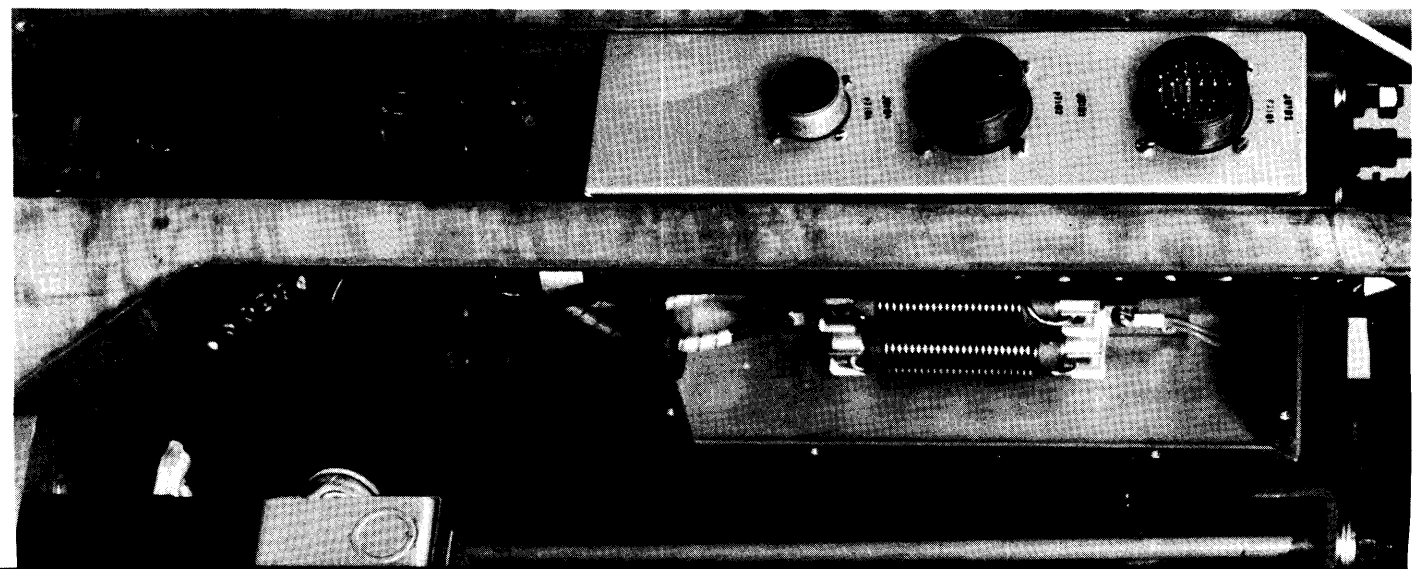


Figure 4-1-10. Right Side View of Main Transformers and Motorized Circuit Breaker Compartment, GPT-40K



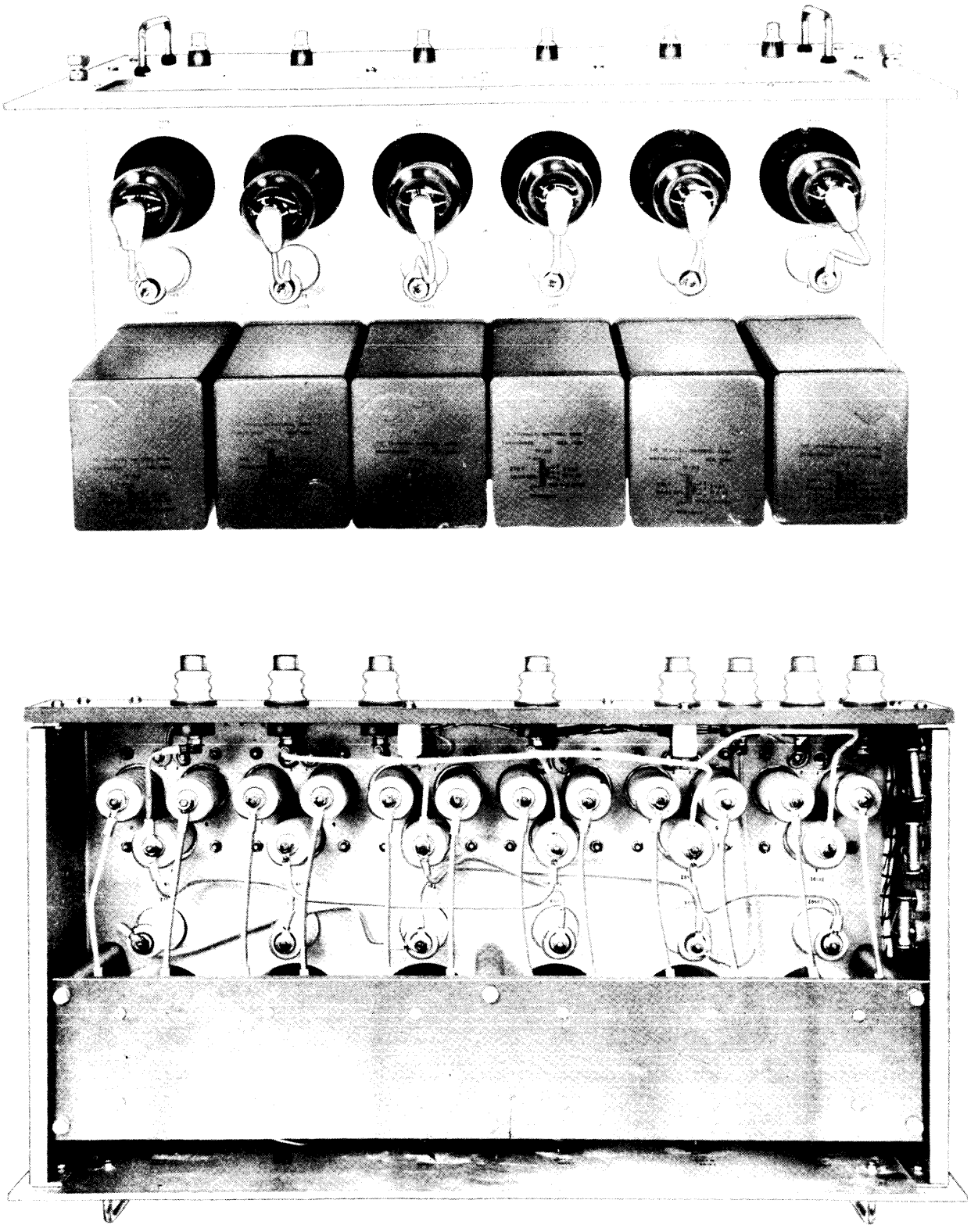


Figure 4-1-11. Top and Bottom View, High Voltage Rectifier Drawer, GPT-40K

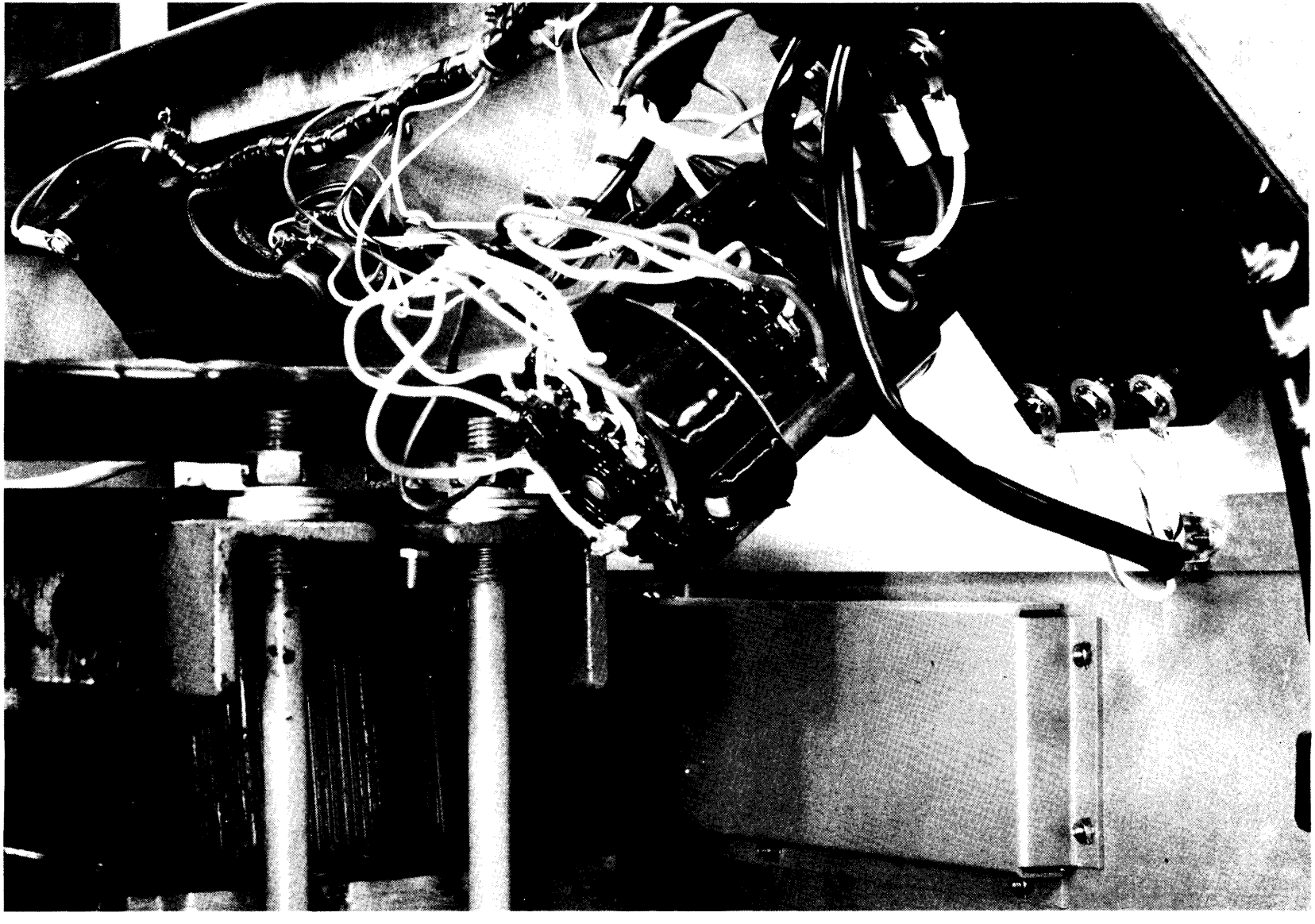


Figure 4-1-12. Rear View, Power Supply Control Panel, GPT-40K

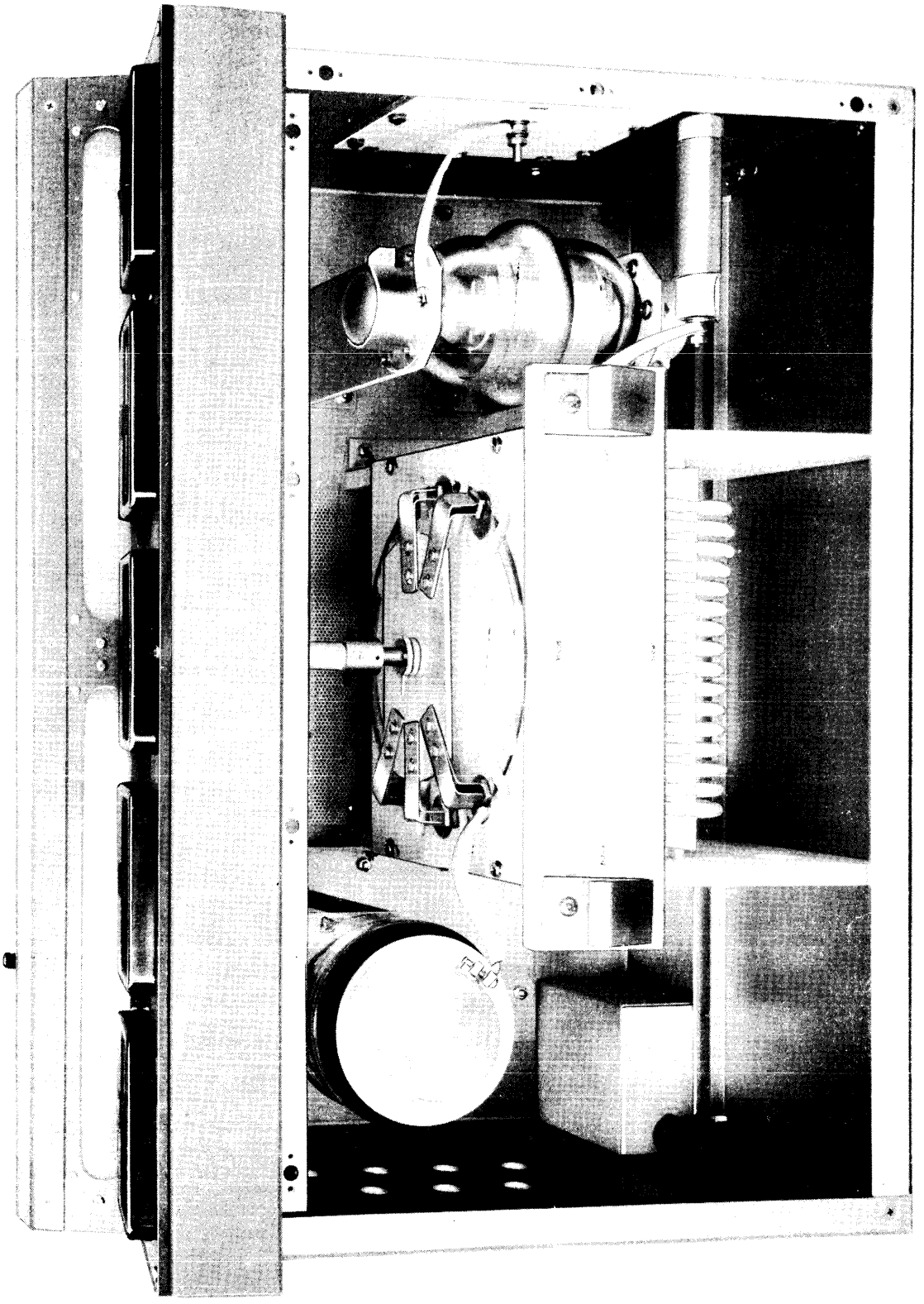


Figure 4-1-13-a. Rear Top View, Antenna Tuning Unit and Meter Panel Drawer, GPT-40K

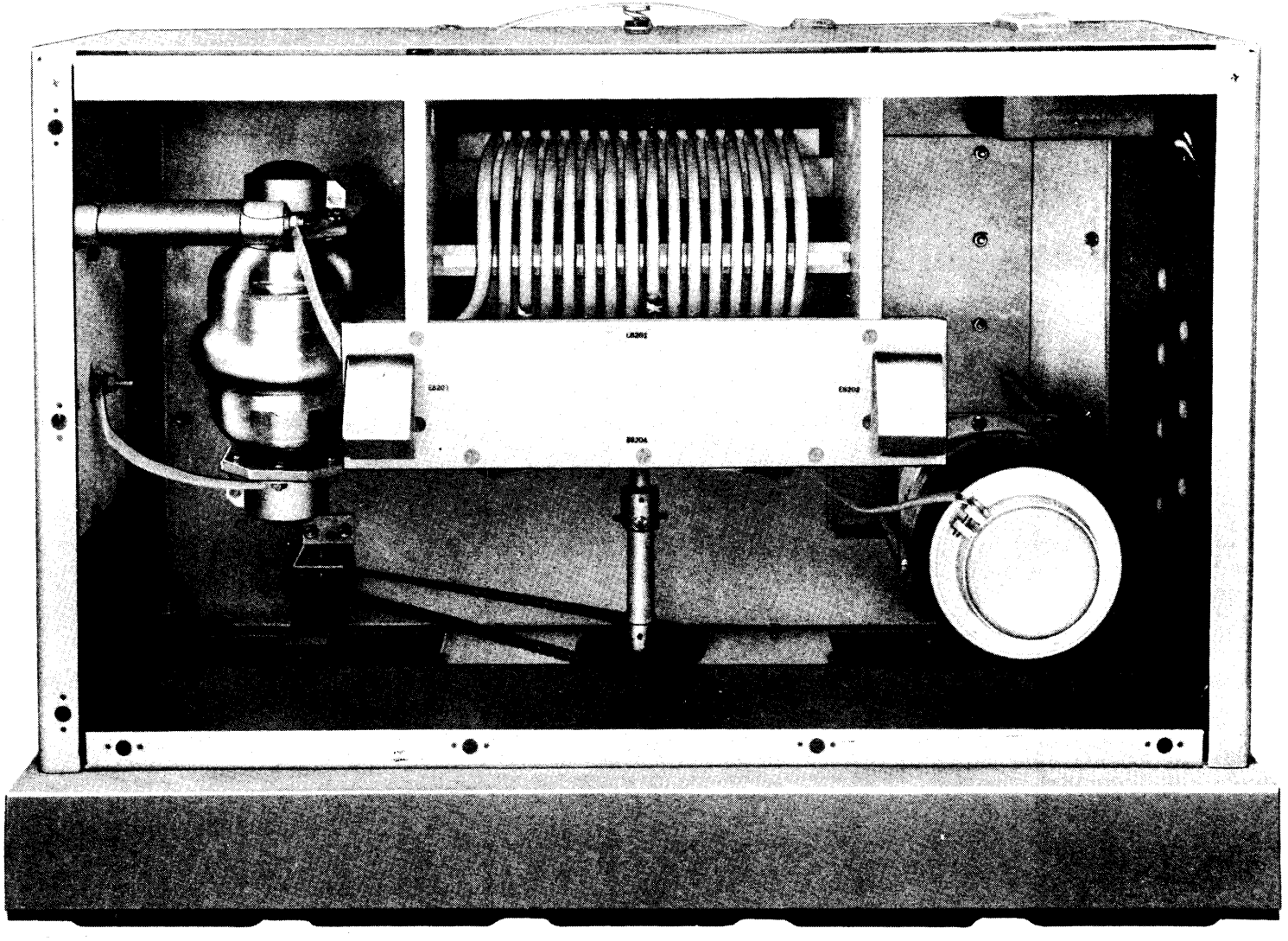


Figure 4-1-13-b. Front Top View, Antenna Tuning Unit and Meter Panel Drawer, GPT-40K

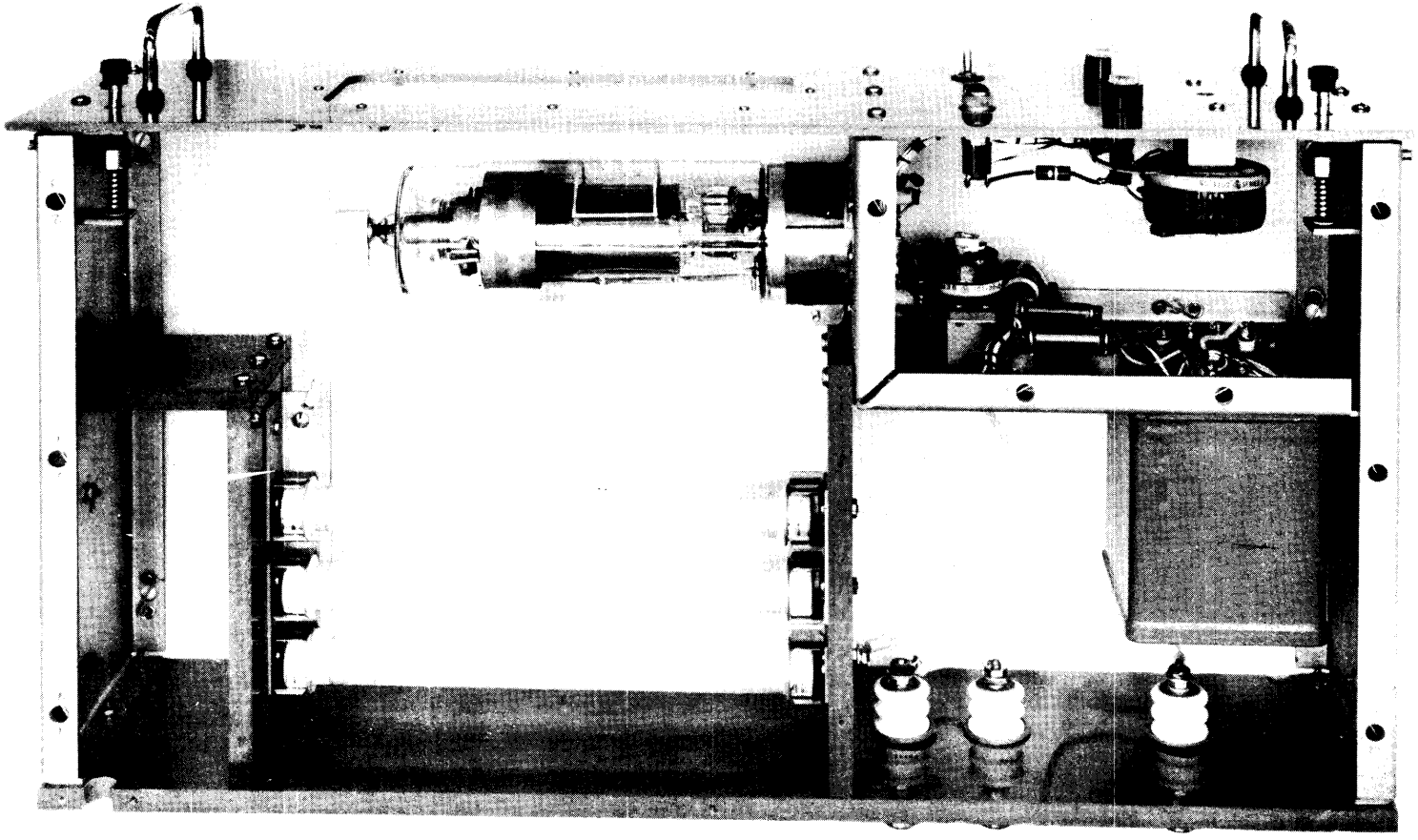


Figure 4-1-14. Top View, Crowbar Drawer, GPT-40K

SECTION 2
INSTALLATION

4–2–1. GENERAL.

As shown in table 1-1-2 in Part 1 of this manual, the GPT-40K is shipped in 29 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 12 and 28, each package being designated with the assembly name using its contents. Case 12 also contains two complete instruction manuals which should be read and understood for proper installation, operation, and maintenance.

The contents of the 29 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 a 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-40L 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 gurantees 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. LOCATION OF GPT–40K's FOUR FRAMES.

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 approximately 1 foot overhead. Figure 4-2-1 shows two antenna outlet arrangements, one when the customer orders a TMA-40K meter box assembly and one when no such box is ordered. In either case a two-foot clearance is recommended, if practicable, between the transmitters' top cover and the ceiling that houses the transmitter.

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. Figure 4-2-2 illustrates 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.

STEP	DESCRIPTION
1	Place base assembly of PS and PA frames shown in figure 4-2-2 in position, level and bolted to the floor.
2	Position base shield and secure to base assembly as shown in figures 4-2-2 and 4-2-3. Holes marked B secure shield to base.
	POWER SUPPLY (PS) FRAME
3	Position power supply frame properly on shield and bolt to base assembly. Tighten bolts and secure frame. Remove shield MS-2018 (figure 4-2-1)

STEP	DESCRIPTION
4	The next step is to mount the main transformer in the power supply frame (See figures 4-2-4 and 4-2-5). This operation is facilitated by removal of a few part already mounted on the frame. The transformer mounts from the left side of the power supply frame looking at it from the rear as shown in figure 4-2-4. The channels of the transformer fit into the larger channels in the base of the frame. The parts to be removed are the transformer bar, a switch on the power supply control panel and the bolts located in the power supply frame channels that are used to secure transformer. The transformer bar is an angle beam located on the side of the power supply frame and is shown designated as item 53 in figure 4-2-1. The switch to be removed is designated FINAL FIL. The panel directly below the power supply control panel may also be removed but this is optional. Place transformer in proper position, align holes, and replace bolts removed previously. Do not tighten these bolts until the transformer bar has been replaced and secured. Remount switch and panel if removed previously. Replace right side shield. Connect transformer as shown in figure 4-2-6.
5	Mount antenna insulating rods in the top, front of the power supply frame, shown in figure 4-2-1 and components mounted in compartments shown in rear view of power supply frame (right side). These components consist of oil filled capacitors C8107 and C8108 and choke coil L8101. Caution must be used when placing L8101 in the lower compartment or the interlock switch at the top of this compartment will be damaged.
	POWER AMPLIFIER (PA) FRAME
6	Mount PA frame on base assembly. Insert bolts into base assembly but do not tighten. Align holes between PS and PA frames; insert bolts and tighten from the top down. Tighten base assembly bolts.
	NOTE If a bolt starts to bind do not attempt to force its entry. This is an indication that further alignment is required. In this case remove all bolts. Align each hole visually and clamp with a "C" clamp, working from the top down. When satisfactory visual alignment is achieved proceed as indicated above.
7	Mount glass vacuum capacitors C7325, C7301, C7302, C7303 and C7328, shown in figure 4-3-7-a, -c. C7325 is mounted first. Remove bracket taped to sockets of C7301, C7302 and C7303 and mount capacitors as shown. These three capacitors are mounted on shafts which link them to front panel controls. This connection is shown in figure 4-2-7-b. When the three capacitors are secured, mount C7328 to the bracket holding C7301, C7329 and C7303.
8	Remove air duct and fiber board cover from power tube compartment. The compartment with cover and duct removed is shown in figure 4-2-7-c Also remove smallrubber hose to blower. This is to prevent hardward from falling into blower enclosure.
9	Install switch S7302 shown in figure 4-2-7-c. This is best accomplished by loosening the allen screws in the switch shaft socket and removing key taped to socket. Place switch assembly in position with shaft poised at entrance to socket. Insert key in socket and slide shaft in place. Secure switch to floor of compartment and connect leg of coil to C7325 as shown.
10	Remove screen above V7301, loosen socket and insert power tube. Before securing tube and socket, connect C7326 to V7301 as shown in lower right hand side of figure 4-2-7-c. Connect C7316 also as shown. Replace screen and ducting.
	SECOND GPT-40K (IPA) FRAME
11	Mount second frame on base and shield provided for GPT-10K main and auxiliary frame. Follow same procedure as previously outlined in section 2 for frame to base assembly. Secure second frame to PA frame, then to base.
12	Connect strap MS2535 from antenna switch to feed-thru terminal E8114 and attach proper cables. See following paragraph 4-2-5.
13	Insert pull out units in proper drawers and connect cables as directed in step 12.
14	For assembly procedure of remaining frames, see installation 10K section 2.

4–2–5. INTERCONNECTION OF CABLES.

Figure 4-2-8 presents a simplified block and interconnection diagram of the third and fourth GPT-40K's frames. The following tabulation summarizes the interconnections:

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

Connector	Connector	Where Connection is Made
J7103(S)	P7104(P)	PA Frame
P7105(S)	J501(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

In paragraph 2-5 of the Installation Instruction Manual for Radio Transmitter Models GPT-10K and GPT-40K there are simplified block and interconnection diagrams of the first and second GPT-40K's frames. Refer to figures 2-8-a, -b of that manual. However, as pointed out in paragraph 4-2-1, some RF output circuit changes will slightly modify the data given in paragraph 2-5 of the Installation manual. These changes affect only the RF output leg of GPT-40K's IPA and are covered in detail in subsequent section 4-6. With this exception, the GPT-40K's cables may be completely interconnected.

4–2–6. GPT–40K's ANTENNA CONNECTIONS.

As shown on figure 4-2-8 the GPT-40K is arranged to supply the following power to 600 and 50/70 antennas (balanced and unbalanced types respectively).

(1) 600 balanced (rhombic) antennas 40 KW, 10 KW, 1 KW (PEP).

(2) 50/70 unbalanced antennas 40 KW, 10 KW, 1 KW (PEP).

Basically, figure 4-2-8 schematically shown how the six arrangements are possible. From an installation standpoint physical arrangements to accomplish the electrical (schematic) araangements are needed. These resolve themselves intotwo general categories:

(1) Arrangements on frame 2 of the GPT-40K.

(2) Arrangements on frame 3 on the GPT-40K.

a. Frame 2 of GPT-40K.

(1) Power to Antenna (either 600- or 70/50) 40 KW (PEP).

Normal within-frame connections: TUNE/EMERGENCY/OPERATE switch in OPERATE.

(2) Power to Antenna (either 600- or 50/50) 10 KW (PEP).

Normal within-frame connections: TUNE/EMERGENCY/OPERATE switch in EMERGENCY.

(3) Power to Antenna (either 600- ro 70/50) 1 KW (PEP).

Special connections in frame 2 of GPT-10K;TUNE/EMERGENCY/OPERATE switch in EMERGENCY.

The special connections in frame 2 are shown in figures 2-14 and 2-15 of the Installation Manual. Step (1), make change per sketch 1c. Step (2), for 600 balanced antenna, make change per sketch 1a. Step (3), for 70/50 antenna, make change per sketch 1b.

b. Frame 3 of GPT-40K.

(1) 40 KW (PEP) Power to 600 (Rhombic) antenna.

See figure 4-2-9, sketch A.

(2) 40 KW (PEP) Power to 70/60 Antenna.

See figure 4-2-9, sketch D.

(3) 10 KW (PEP) Power to 600 (Rhombic) antenna.

See figure 4-2-9, sketch B.

(4) 10 KW (PEP) Power to 70/50 Antenna.

See figure 4-2-9, sketch E.

(5) 1 KW (PEP) Power to 600 (Rhombic) Antenna.

See figure 4-2-9, sketch C.

(6) 1 KW (PEP) Power to 70/50 Antenna.

See figure 4-2-9, sketch F.

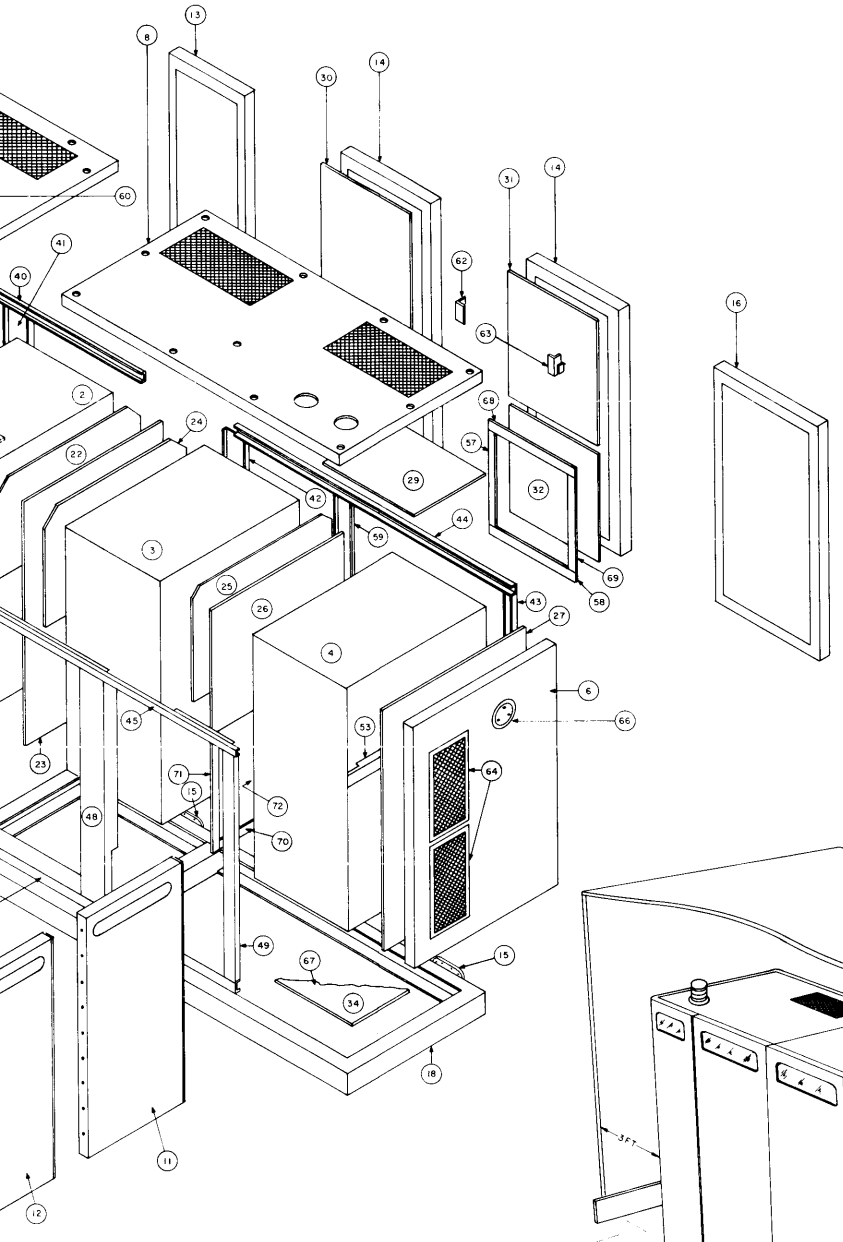
4–2–7. SUPPLEMENTARY INSTALLATION INSTRUCTIONS FOR 50-CYCLE POWER SUPPLY.

Refer to paragraph 2-7 of the 10K Installation Manual.

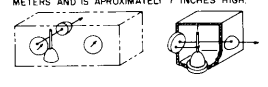
4–2–8. INITIAL ADJUSTMENTS AND CHECKOUT.

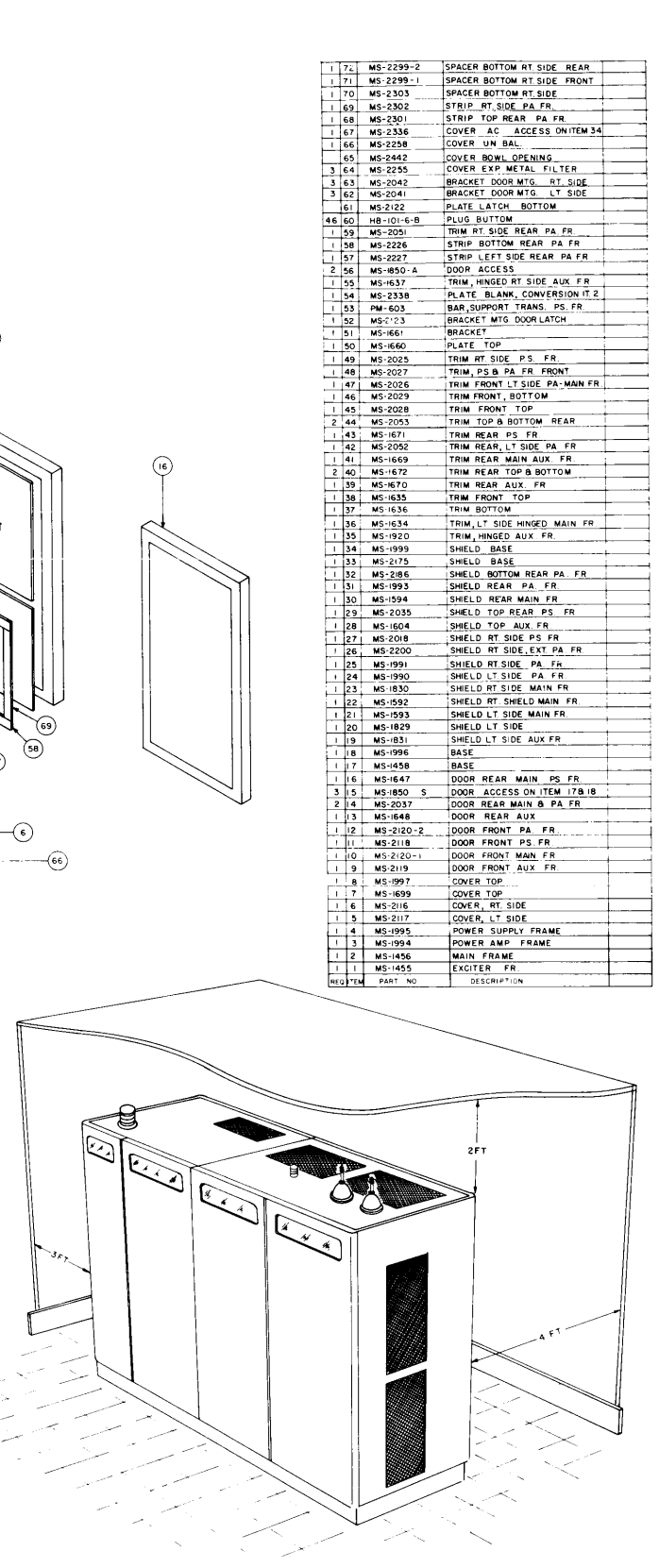
Refer to Tehcnical Manual for Transmitting Set, Radio, Model GPT-40K.

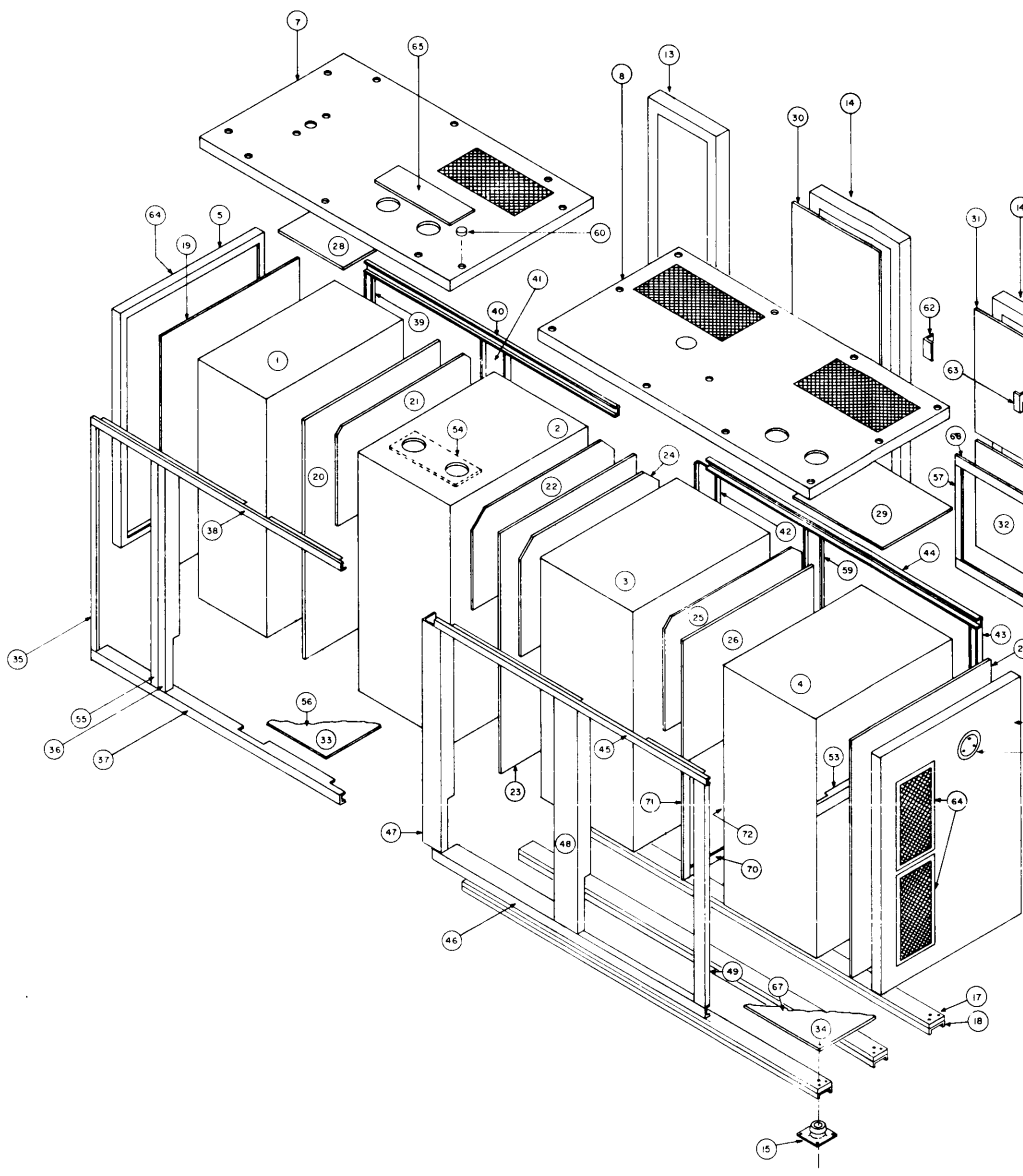
REQ'D	ITEM	PART NO	DESCRIPTION
1	71	MS-2299-2	SPACER BOTTOM RT SIDE REAR
1	71	MS-2299-1	SPACER BOTTOM RT SIDE FRONT
1	70	MS-2303	SPACER BOTTOM RT SIDE
1	69	MS-2302	STRIP RT SIDE PA FR
1	68	MS-2301	STRIP TOP REAR PA FR
1	67	MS-2336	COVER AC ACCESS ON ITEM 34
1	66	MS-2258	COVER UN BAL
	65	MS-2442	COVER 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 FR
1	54	MS-2338	PLATE BLANK, CONVERSION IT 2
1	53	PM-603	BAR, SUPPORT TRANS PS FR
1	52	MS-2123	BRACKET MTG DOOR LATCH
1	51	MS-1661	BRACKET
1	50	MS-1660	PLATE TOP
1	49	MS-2025	TRIM RT SIDE PS 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 PS 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



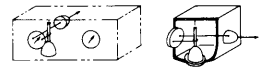
NOTE
TMA-40K METER BOX (SUPPLIED ON CUSTOMERS ORDER) CONTAINS, ANTENNA BOWLS, METERS AND IS APROXIMATELY 7 INCHES HIGH.







NOTE
TMA-40K METER BOX (SUPPLIED ON CUSTOMER'S ORDER) CONTAINS; ANTENNA BOWLS, METERS AND IS APPROXIMATELY 7 INCHES HIGH.



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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
3	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 FR
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3	50	MS-1660	PLATE TOP
1	49	MS-2025	TRIM RT SIDE PS 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-1035	SHIELD TOP REAR PS 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
3	18	MS-2692	SHOCK, TRACK (CHANNEL)
1	17	MS-2693	FILLER, SHIM
1	16	MS-1647	DOOR REAR MAIN PS FR
21	15	SH-100-21	SHOCK
2	14	MS-2037	DOOR REAR MAIN & PA FR
1	13	MS-1648	DOOR REAR AUX
	12		
	11		
	10		
	9		
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

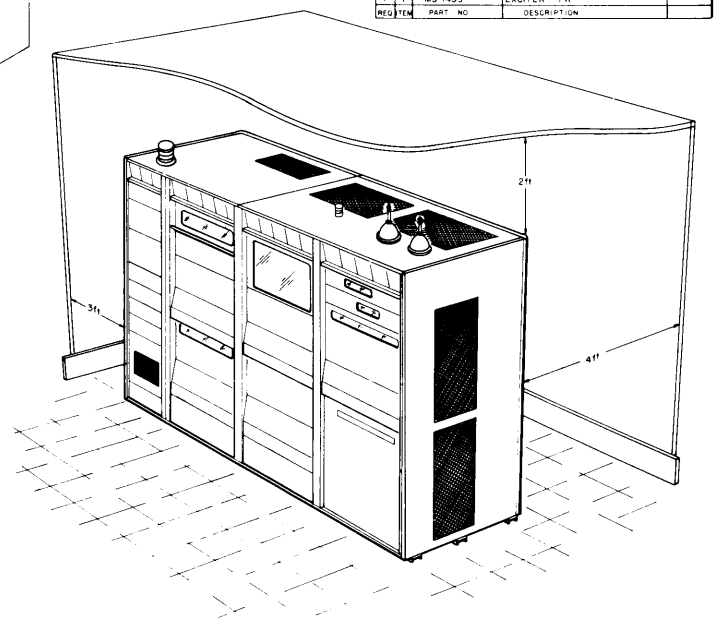
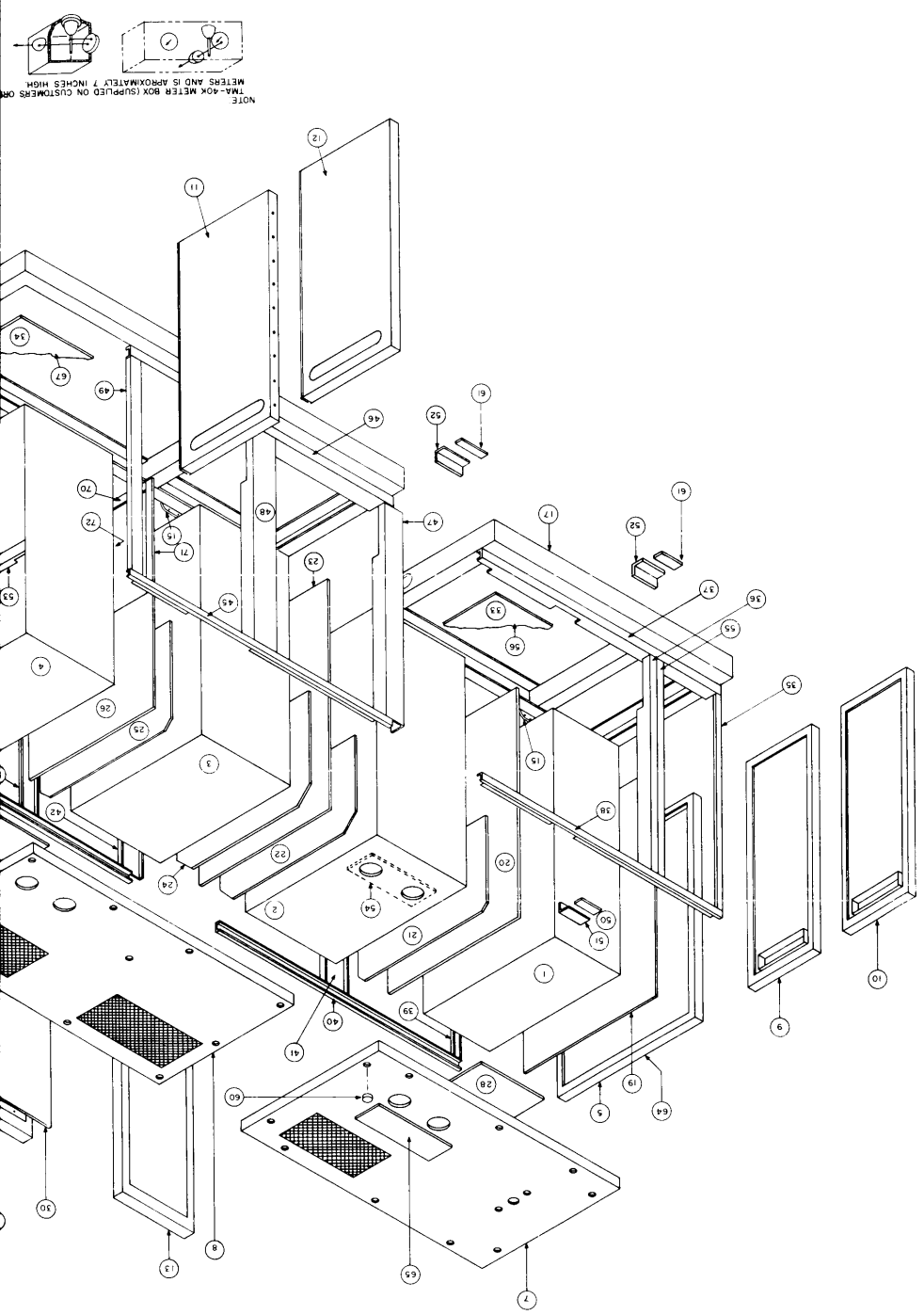
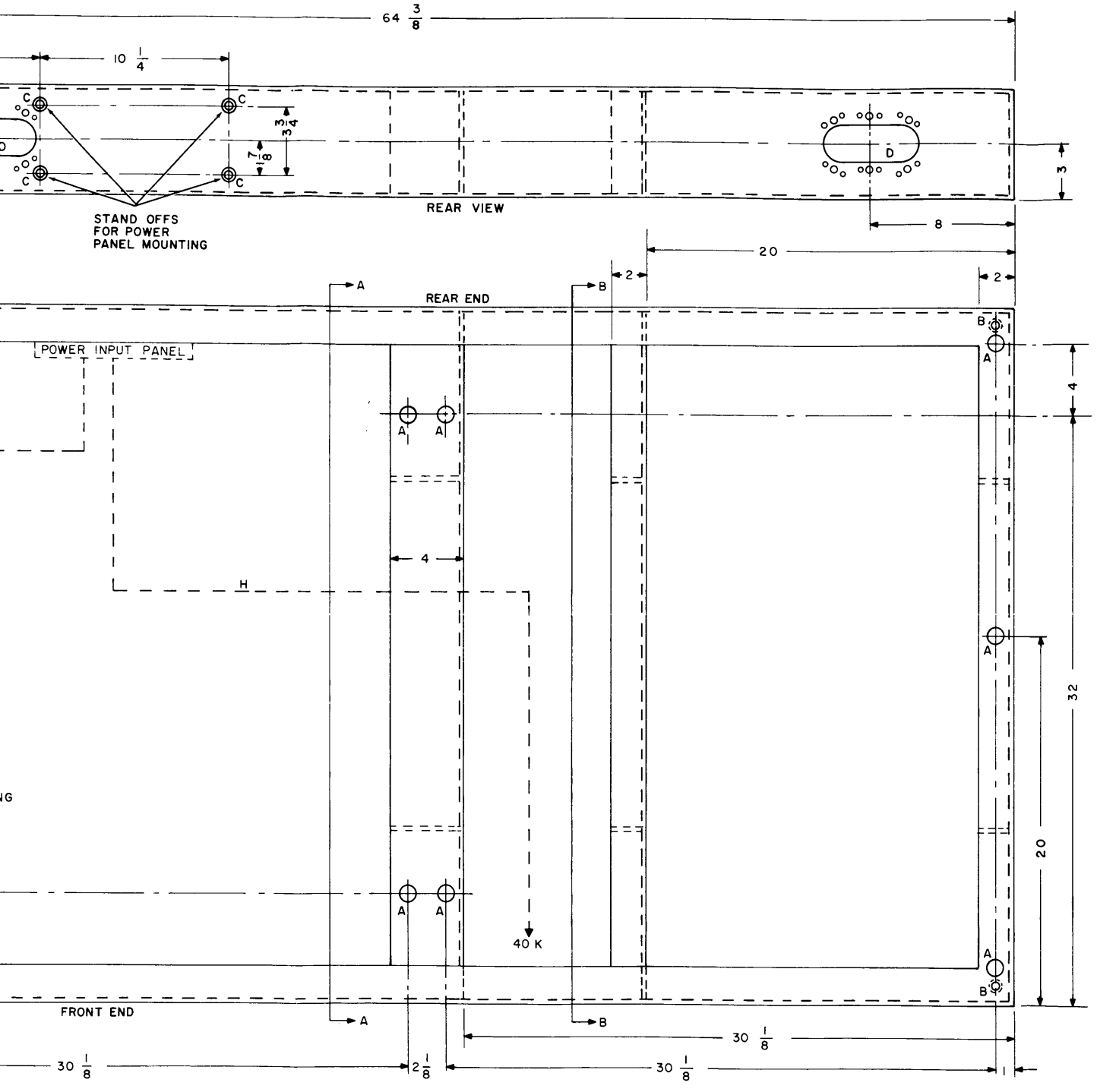


Figure 4-2-1. Assembly Drawing Exploded View, GPT-40K

NOTE
TMA-40K METER BOX (SUPPLIED ON CUSTOMERS OR
METERS AND IS APPROXIMATELY 7 INCHES HIGH



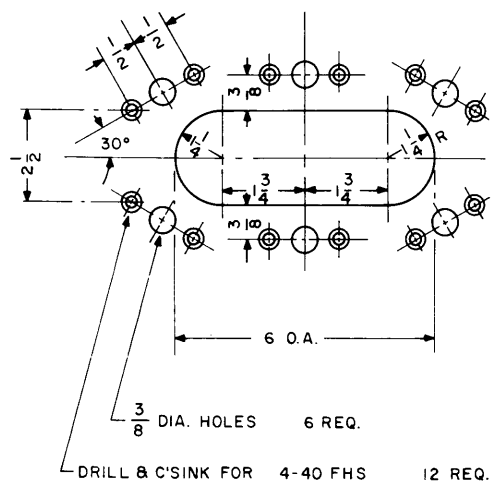


A - 7/16 DIA. HOLES (TOP ONLY) 10 REQ.

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

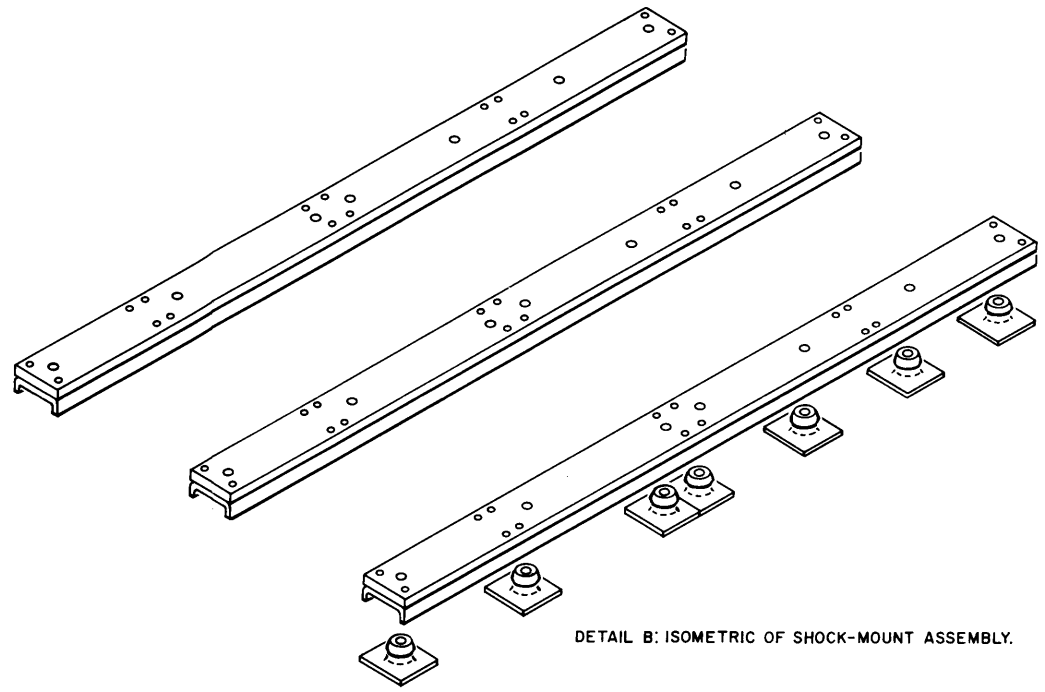
E - 2" DIA. HOLES 2 REQ

F - 3" DIA. HOLE 1 REQ

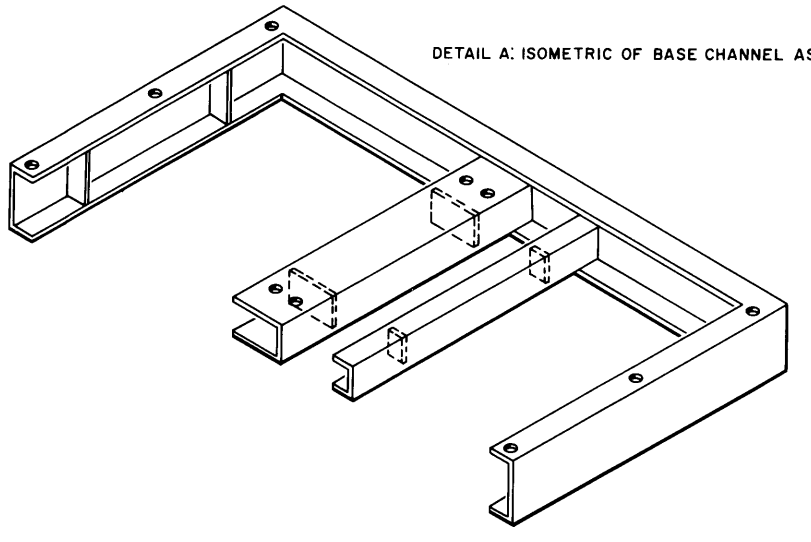
NOTE : 1
FOUR (4) "C" HOLES USED TO MOUNT POWER INPUT (3-PHASE, 230-VOLT) CONDUCTORS TO PA (10K)

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.

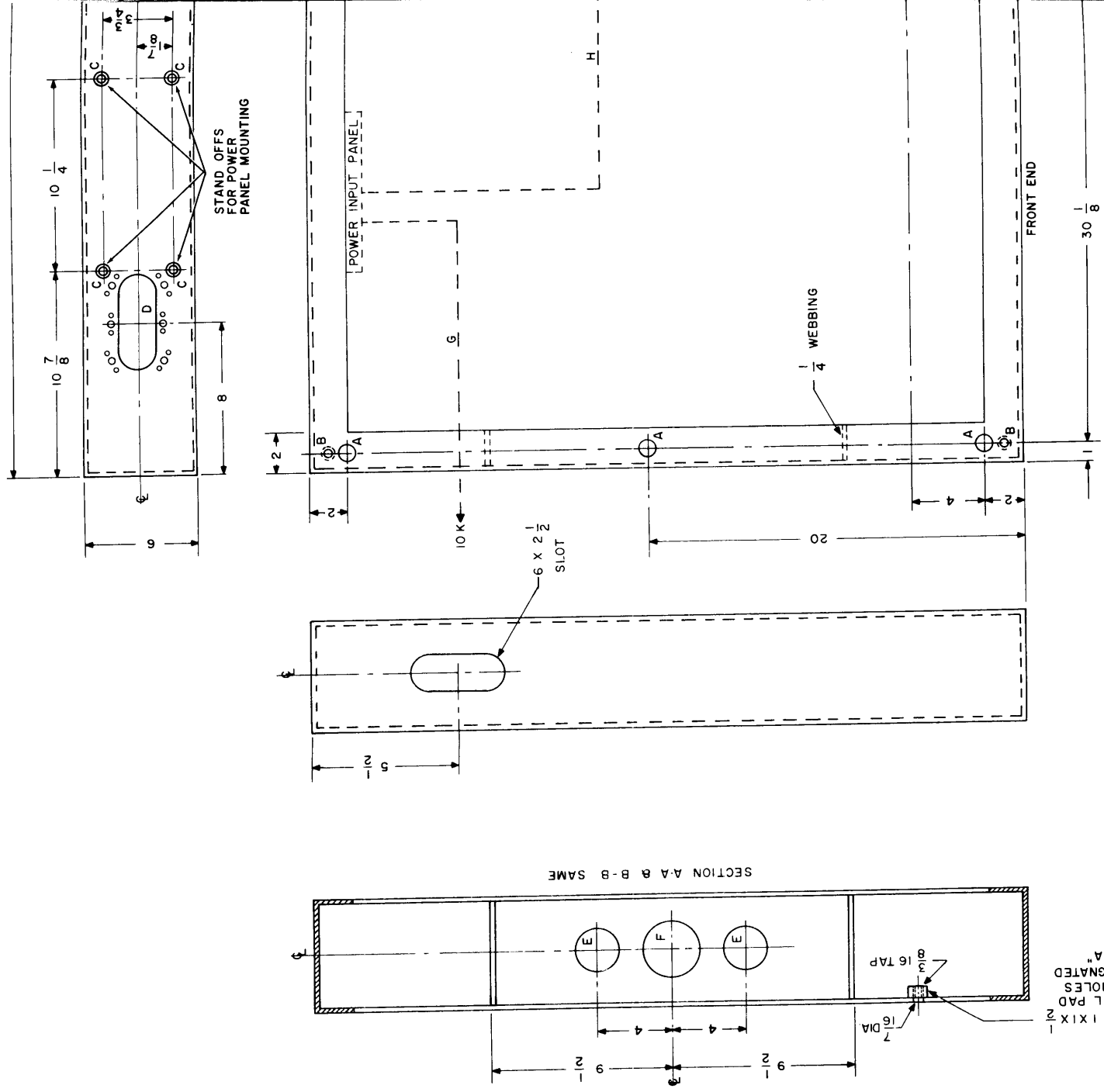


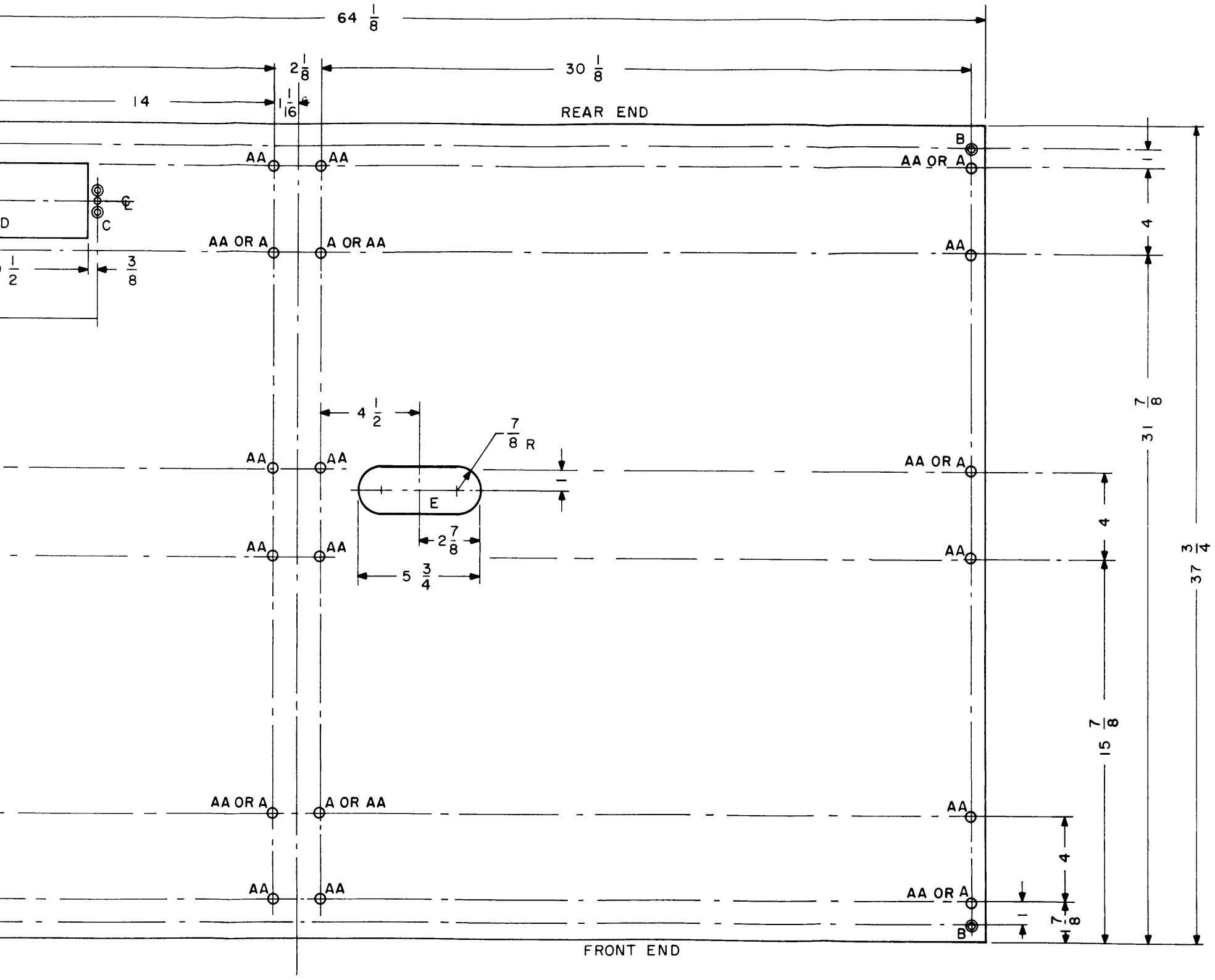
DETAIL B: ISOMETRIC OF SHOCK-MOUNT ASSEMBLY.



DETAIL A: ISOMETRIC OF BASE CHANNEL ASSEMBLY.

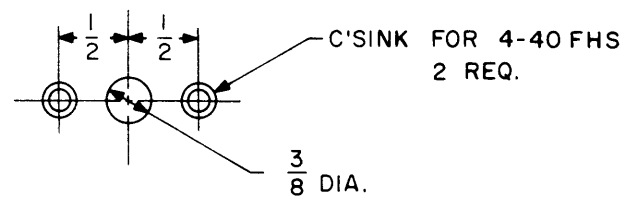
Figure 4-2-2. Installation Diagram Base Assembly, GPT-40K


STAND OFFS FOR POWER PANEL MOUNTING
POWER INPUT PANEL
FRONT END
1/4 WEBBING
6 X 2 1/2 SLOT
10 K
SECTION A-A & B-B SAME
STEEL PAD 1 X 1 X 1/2 DESIGNATED AT HOLES BY "A"
3/8 16 TAP
7/16 DIA



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

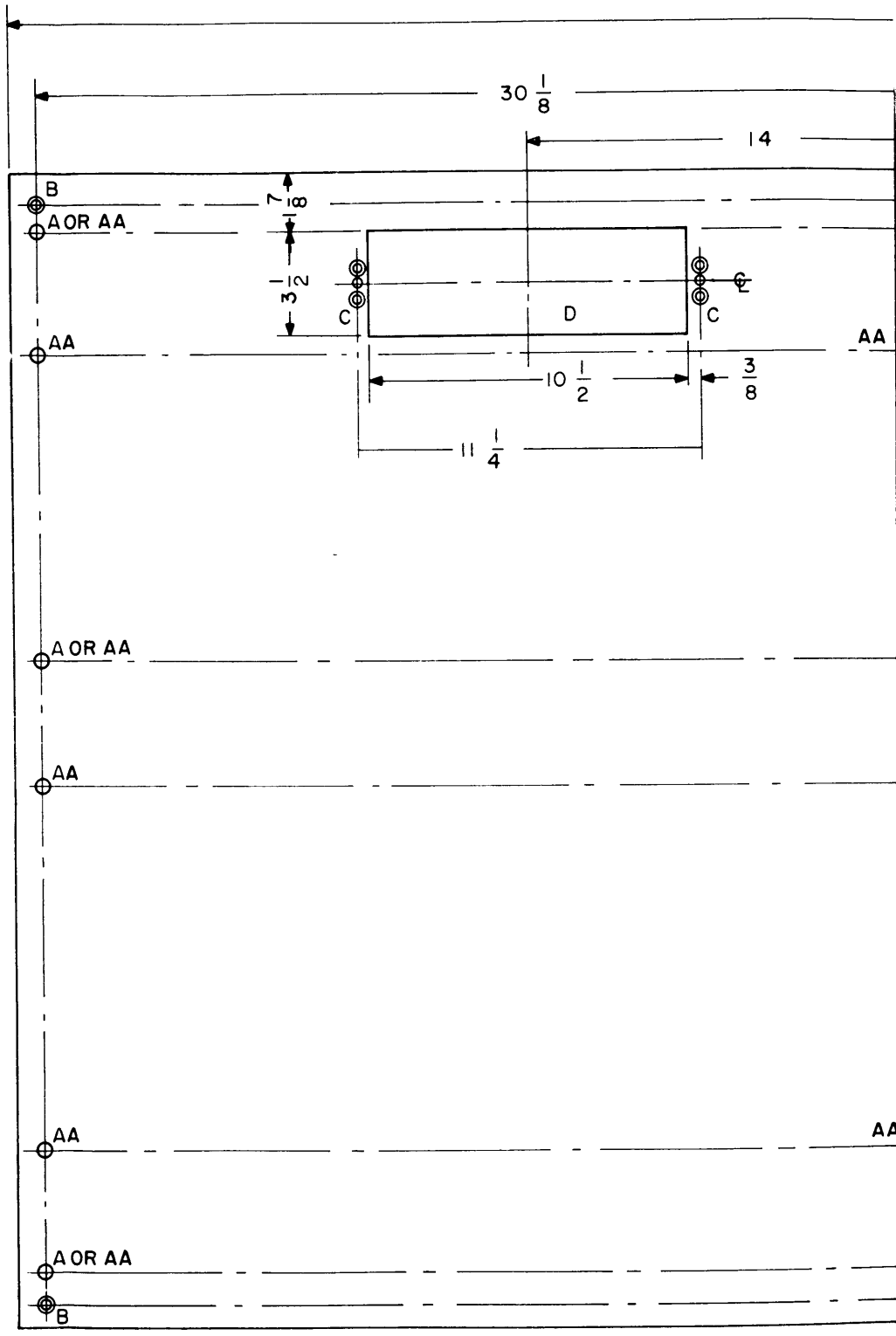
C - SEE DETAIL

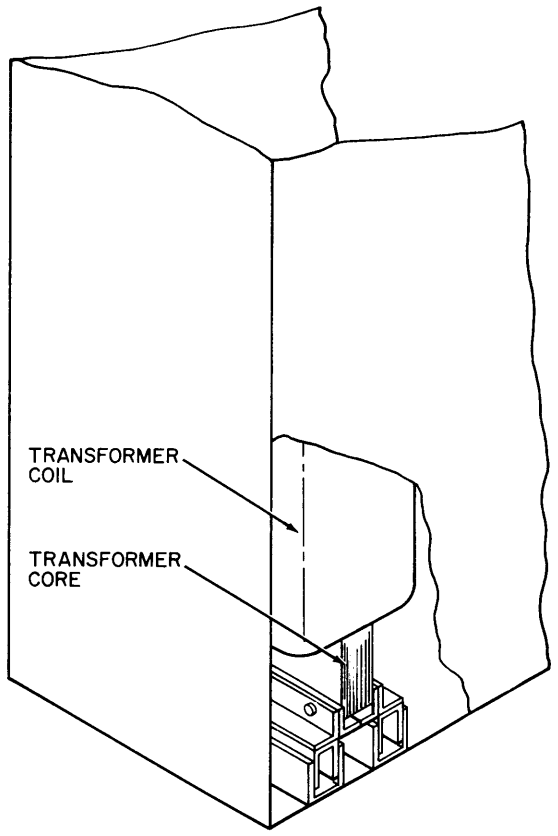


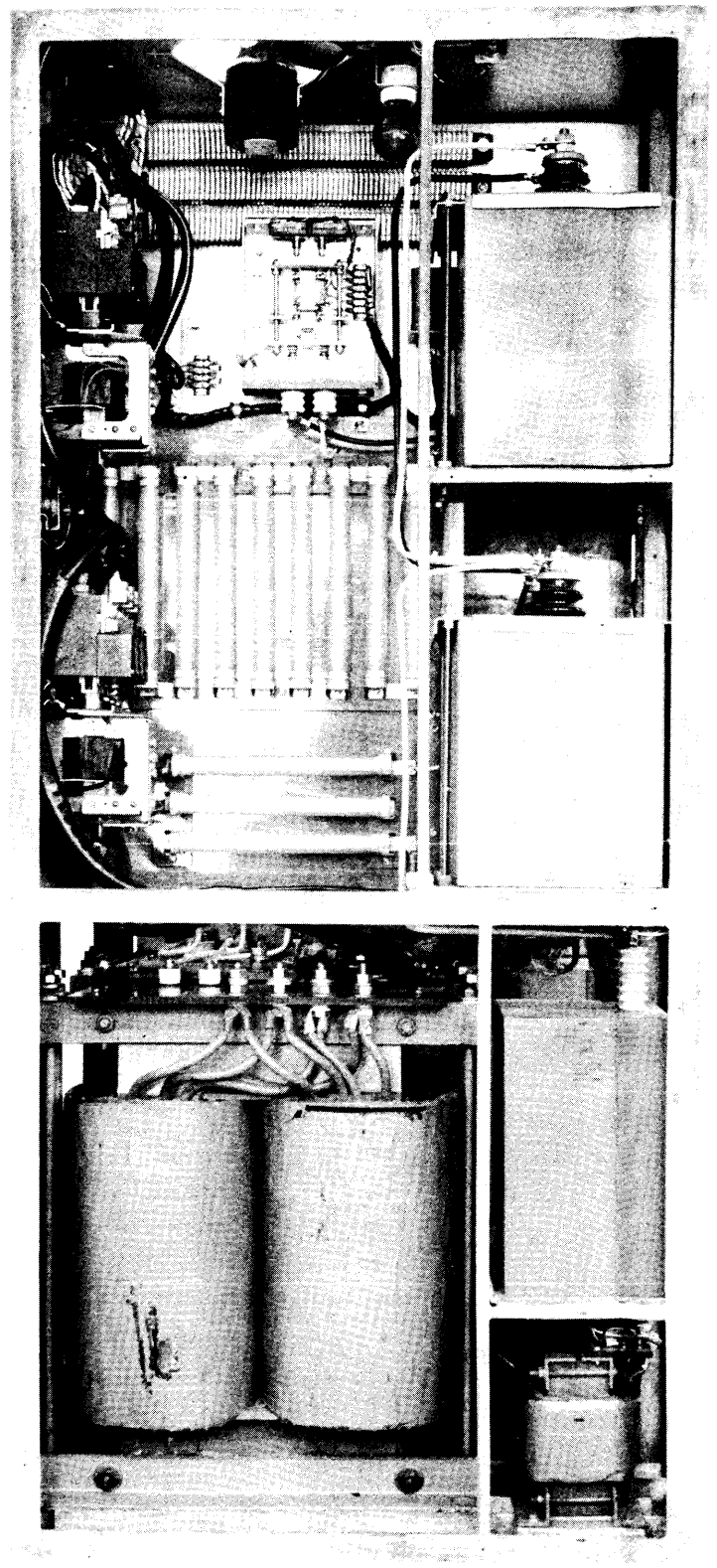
D - ACCESS HOLE FOR AC POWER TERMINAL PANEL.

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

Figure 4-2-3. Installation Diagram, Bottom Shield Details, GPT-40K


30 1/8
14
B
A OR AA
7/8
3 1/2
C
D
C
AA
AA
10 1/2
3/8
11 1/4
A OR AA
AA
AA
A OR AA
B





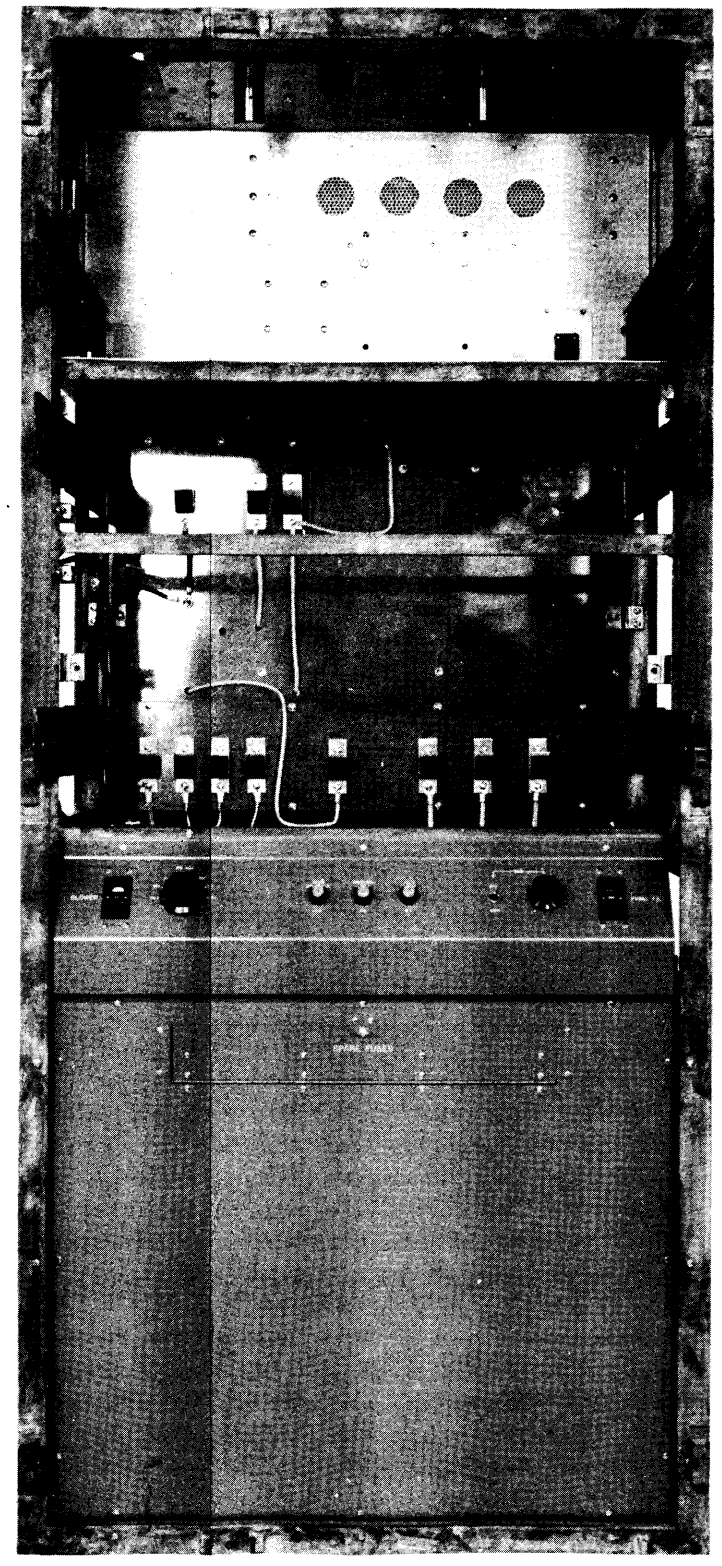
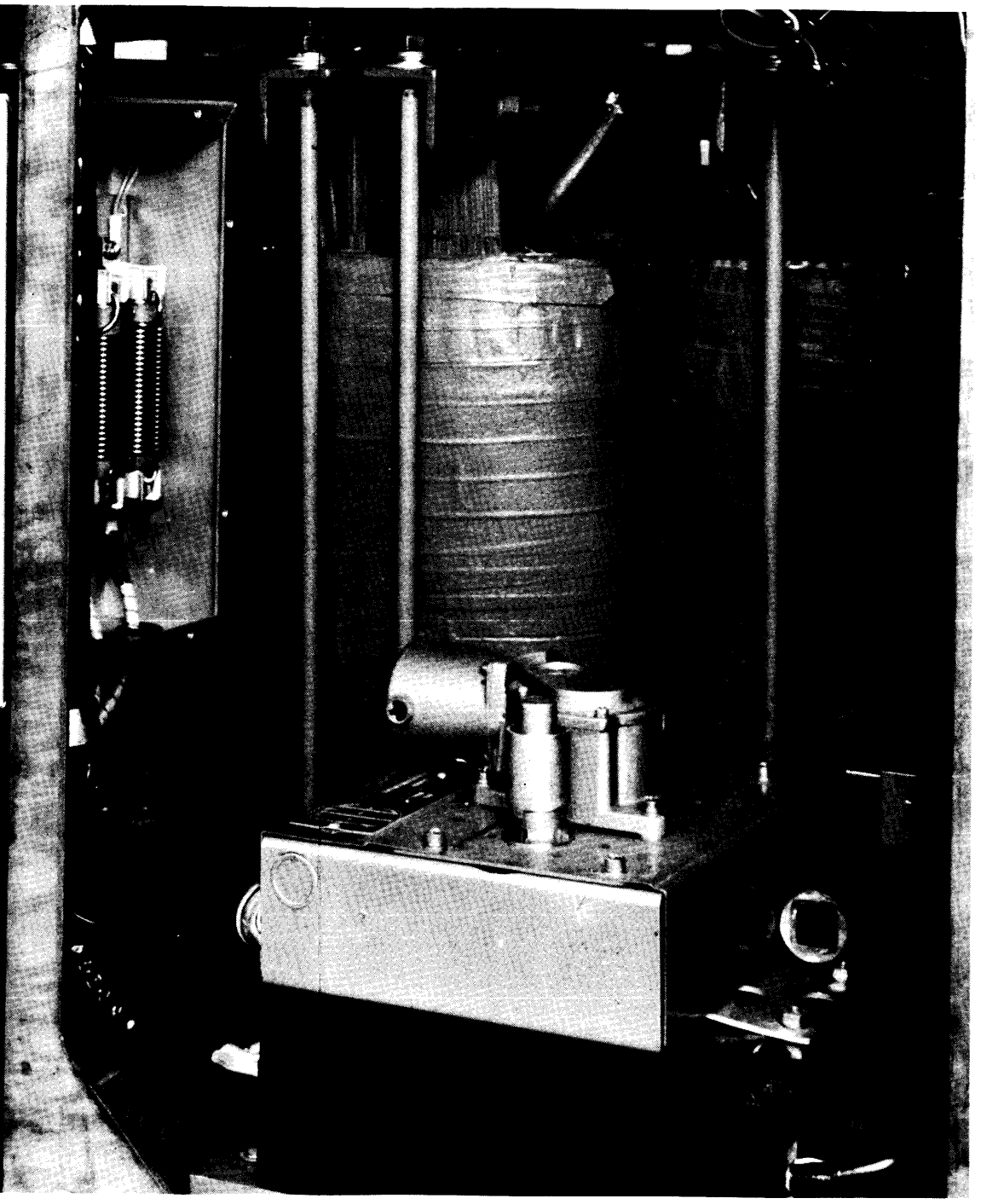


Figure 4-2-4. Overall Rear and Front (Removable Drawers Removed) Views, Fourth Frame GPT-40K



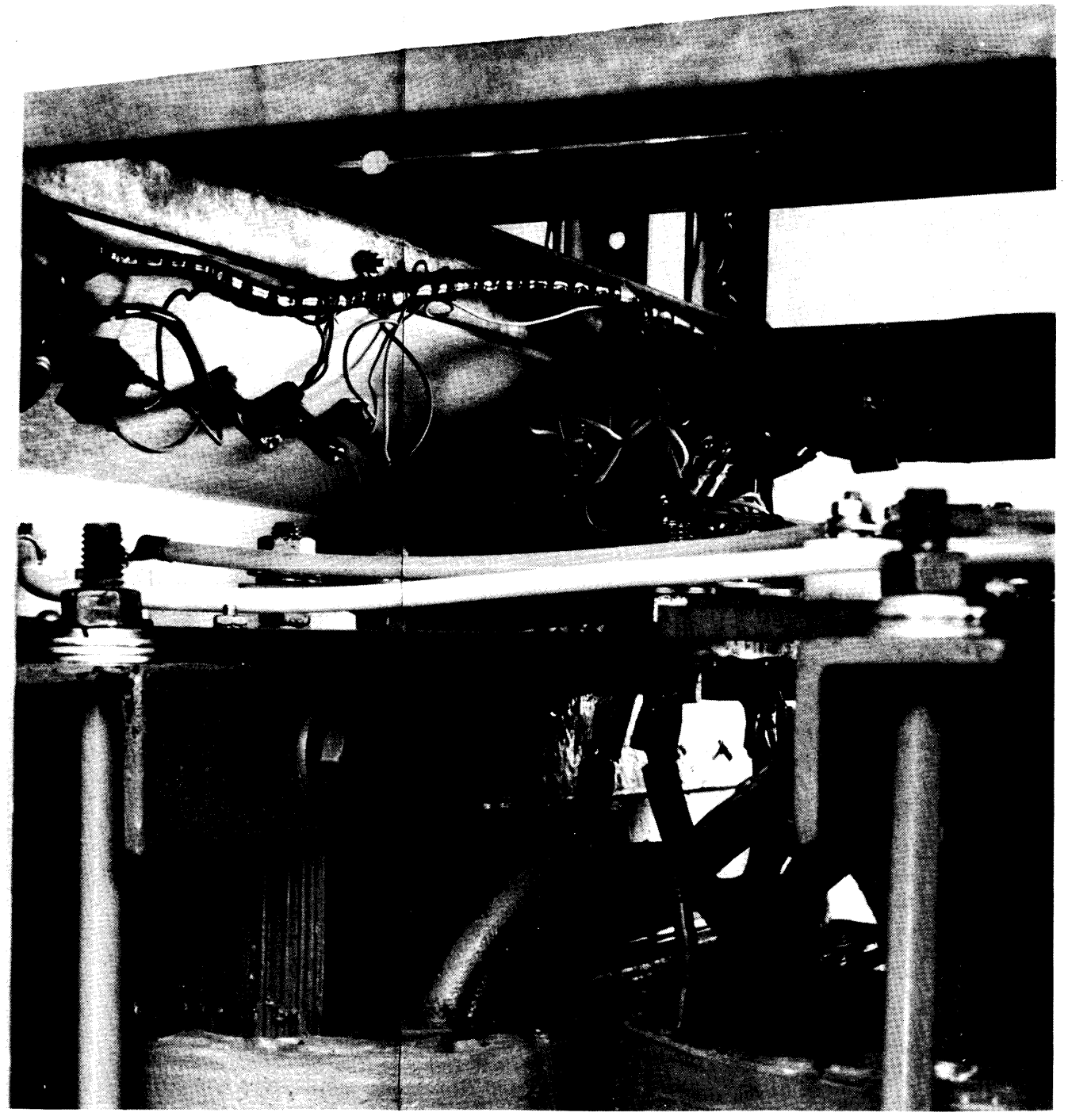
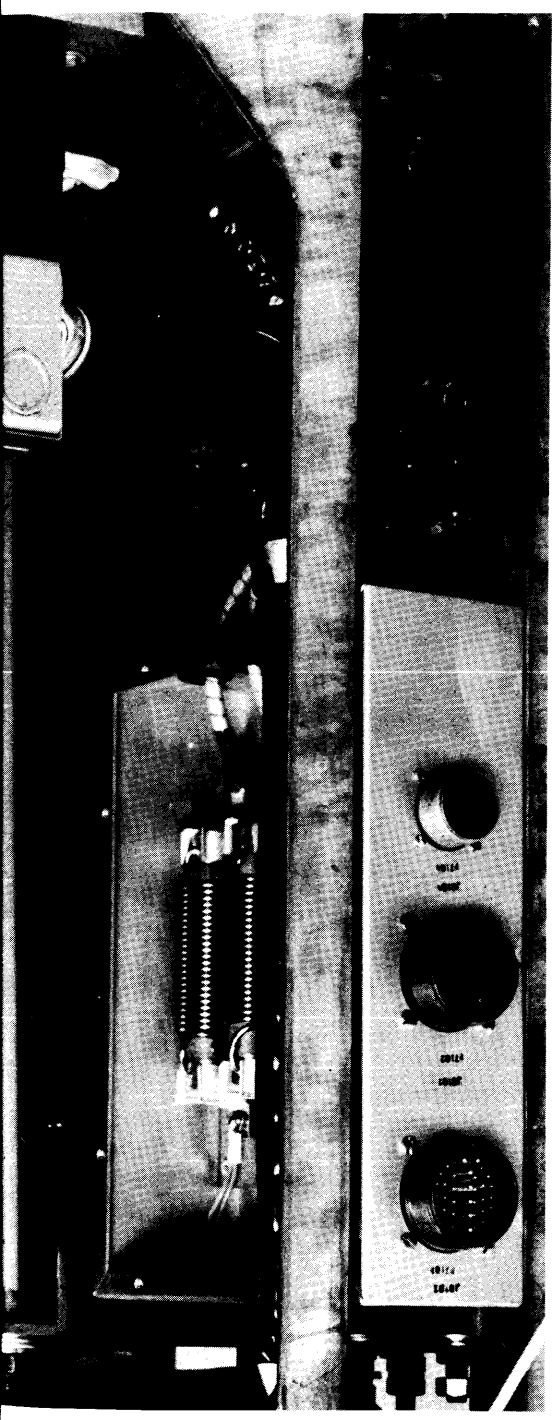


Figure 4-2-5. Right Side View of Main Transformers and Motorized Circuit Breaker Compartment, GPT-40K



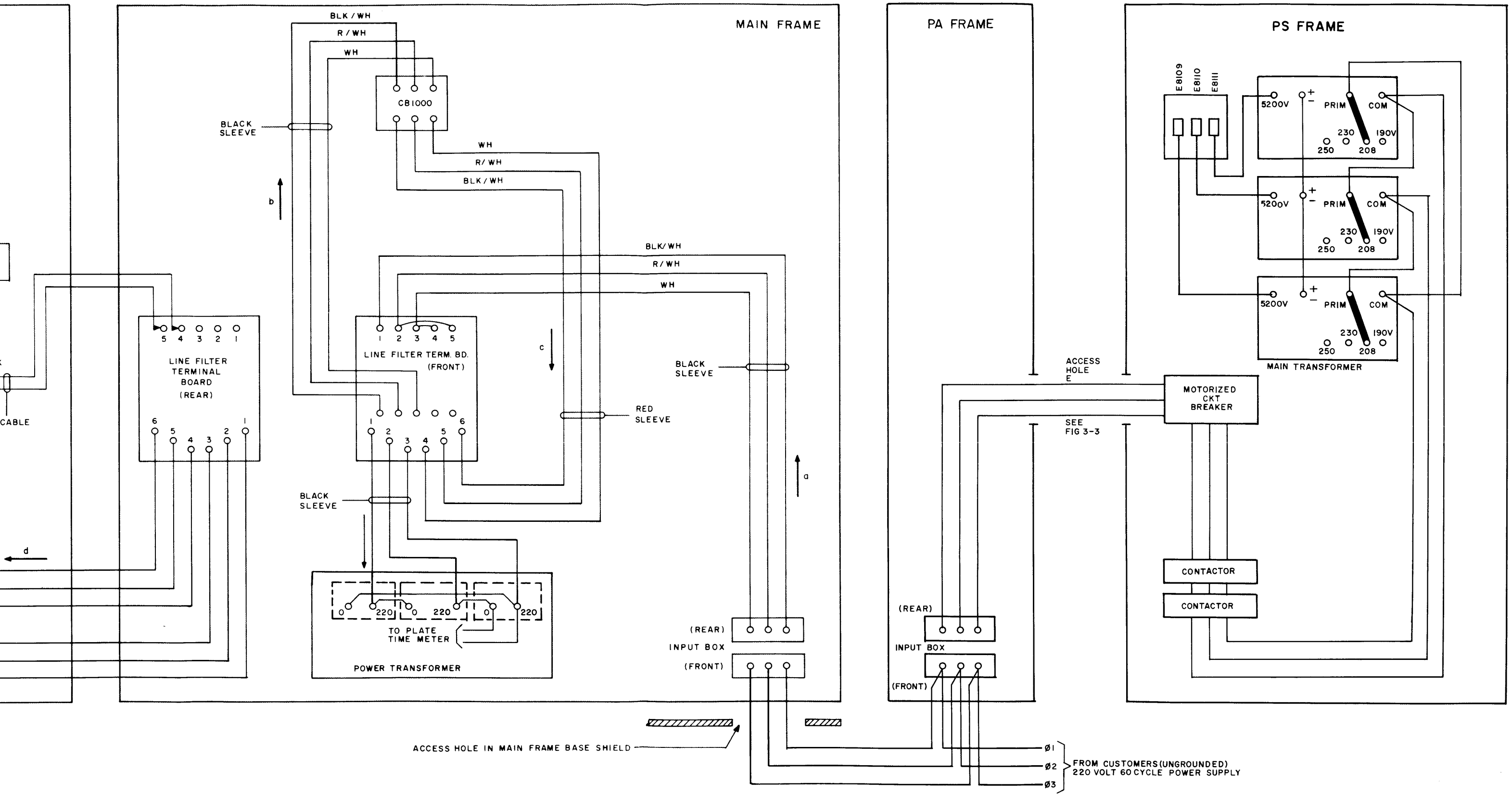
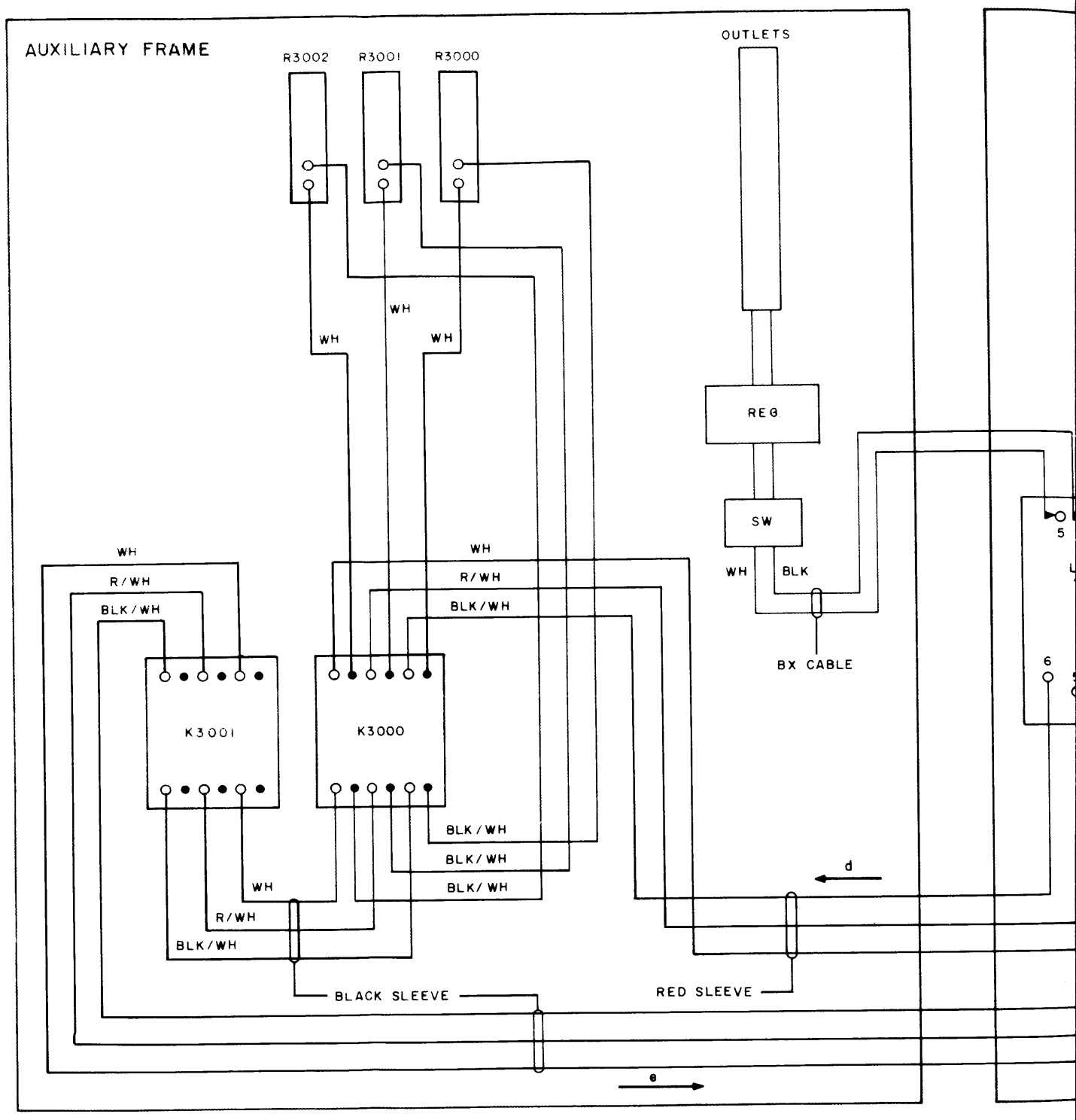


Figure 4-2-6. Wiring Diagram, GPT-40K's Power Circuit from Input Box to Power Supply



NOTE:

8 ARROW HEADS (AT REAR LINE FILTER TERMINAL BOARD) INDICATE ASSEMBLY CONNECTIONS BETWEEN AUXILIARY AND MAIN FRAMES.

POWER FLOW FOLLOWS ARROWS a,b,c,d,e AND f.

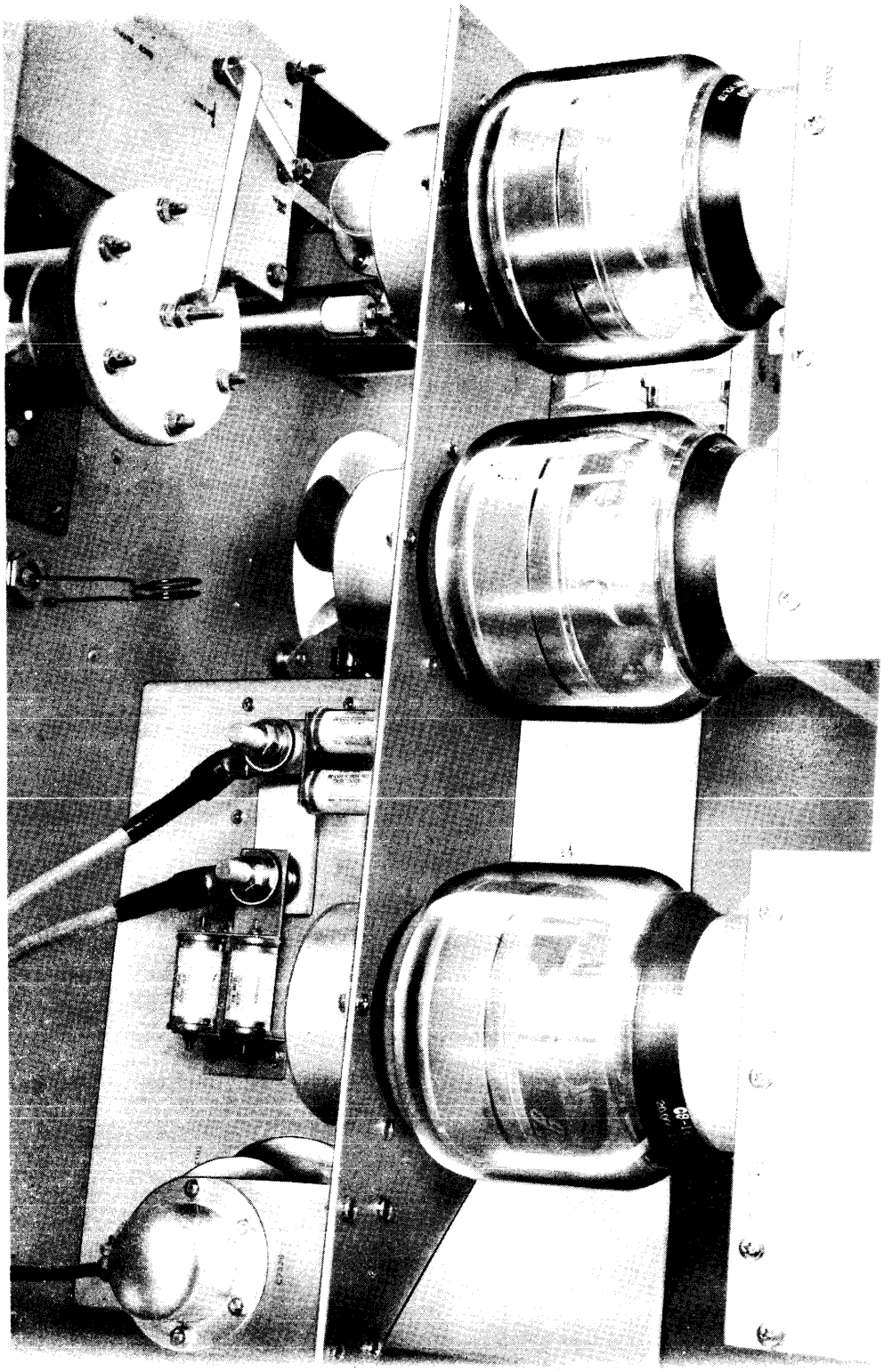


Figure 4-2-7-a. Full Upper Front View of PA Section, GPT-40K

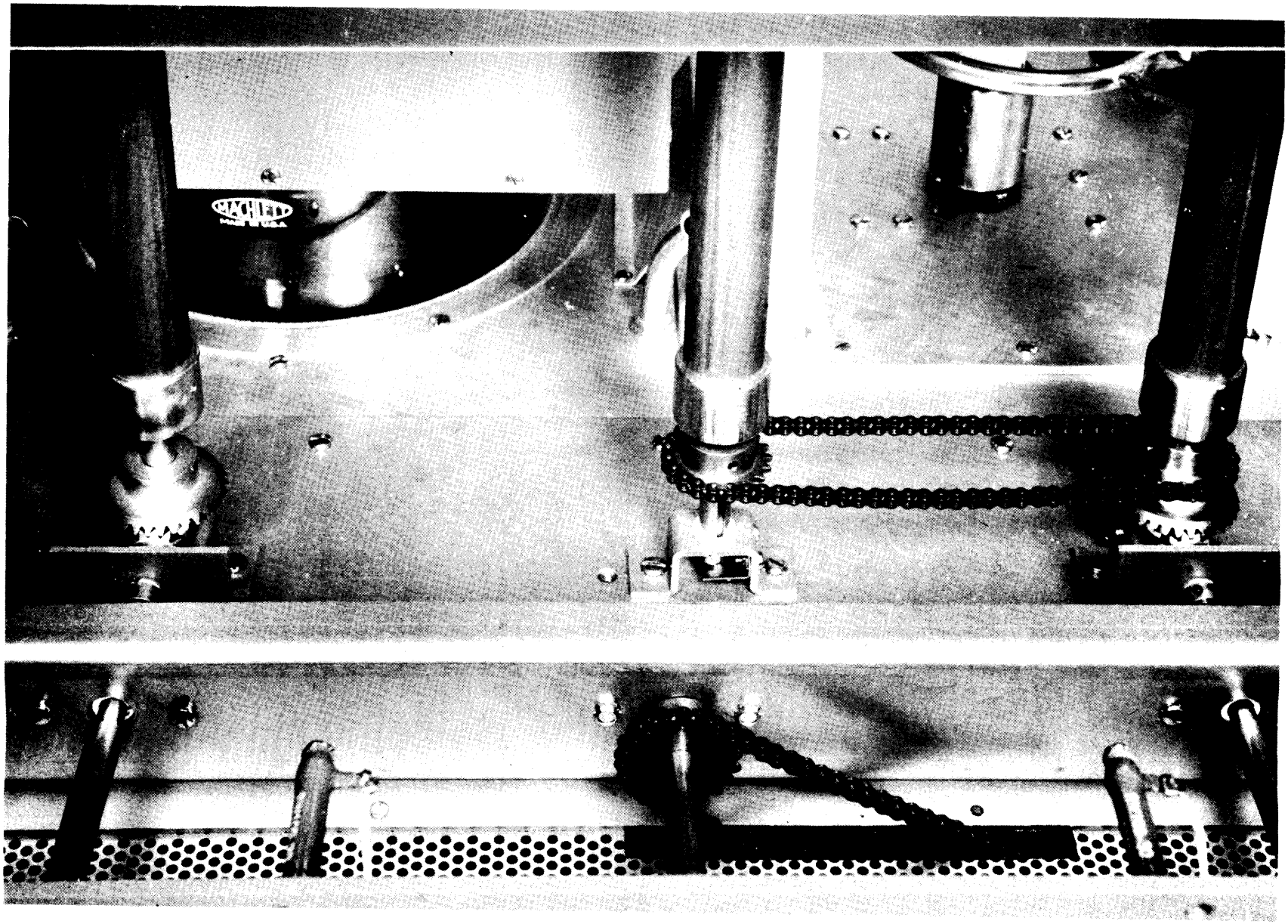


Figure 4-2-7-b. Full Lower Front View of PA Section, GPT-40K

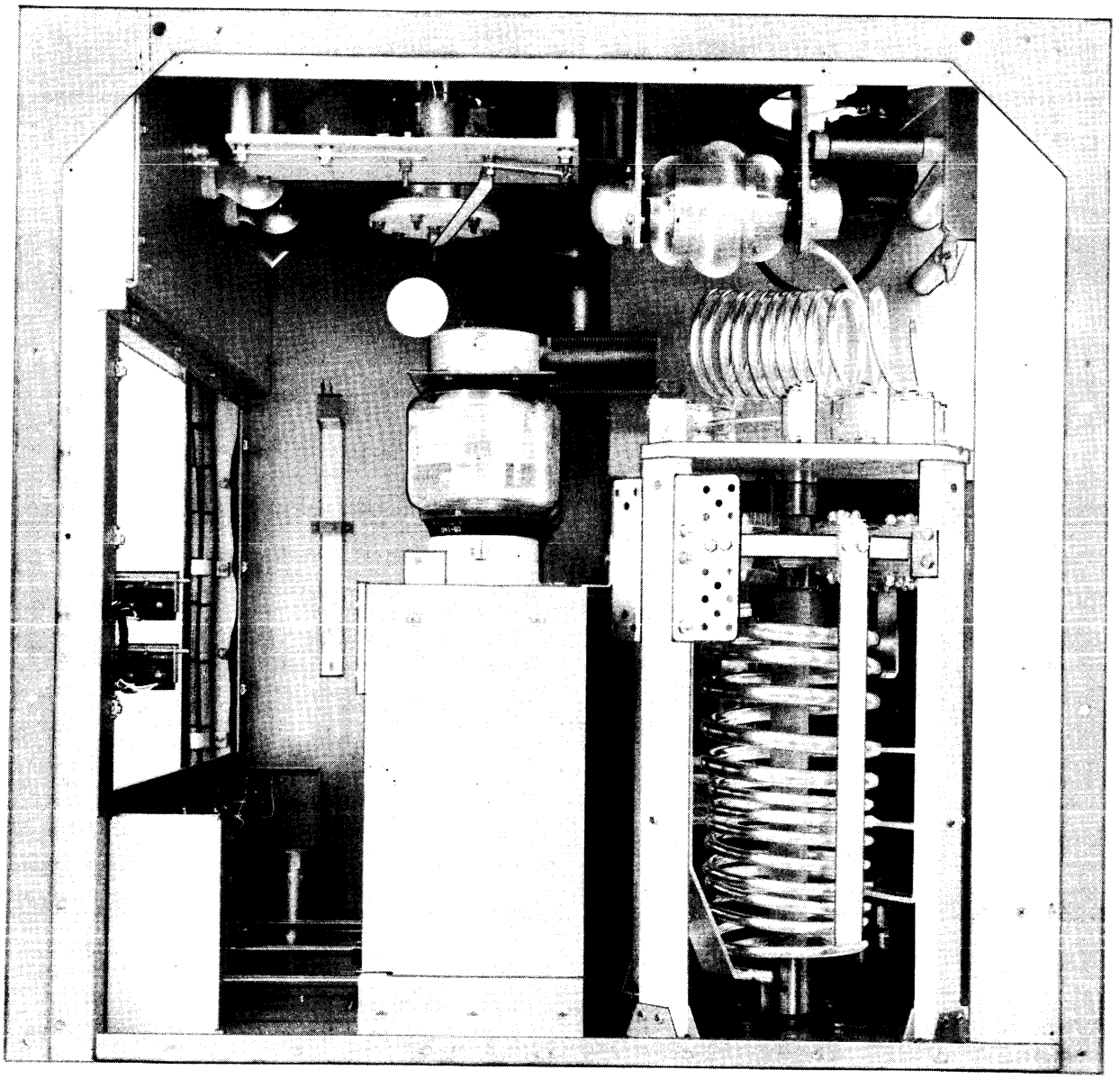
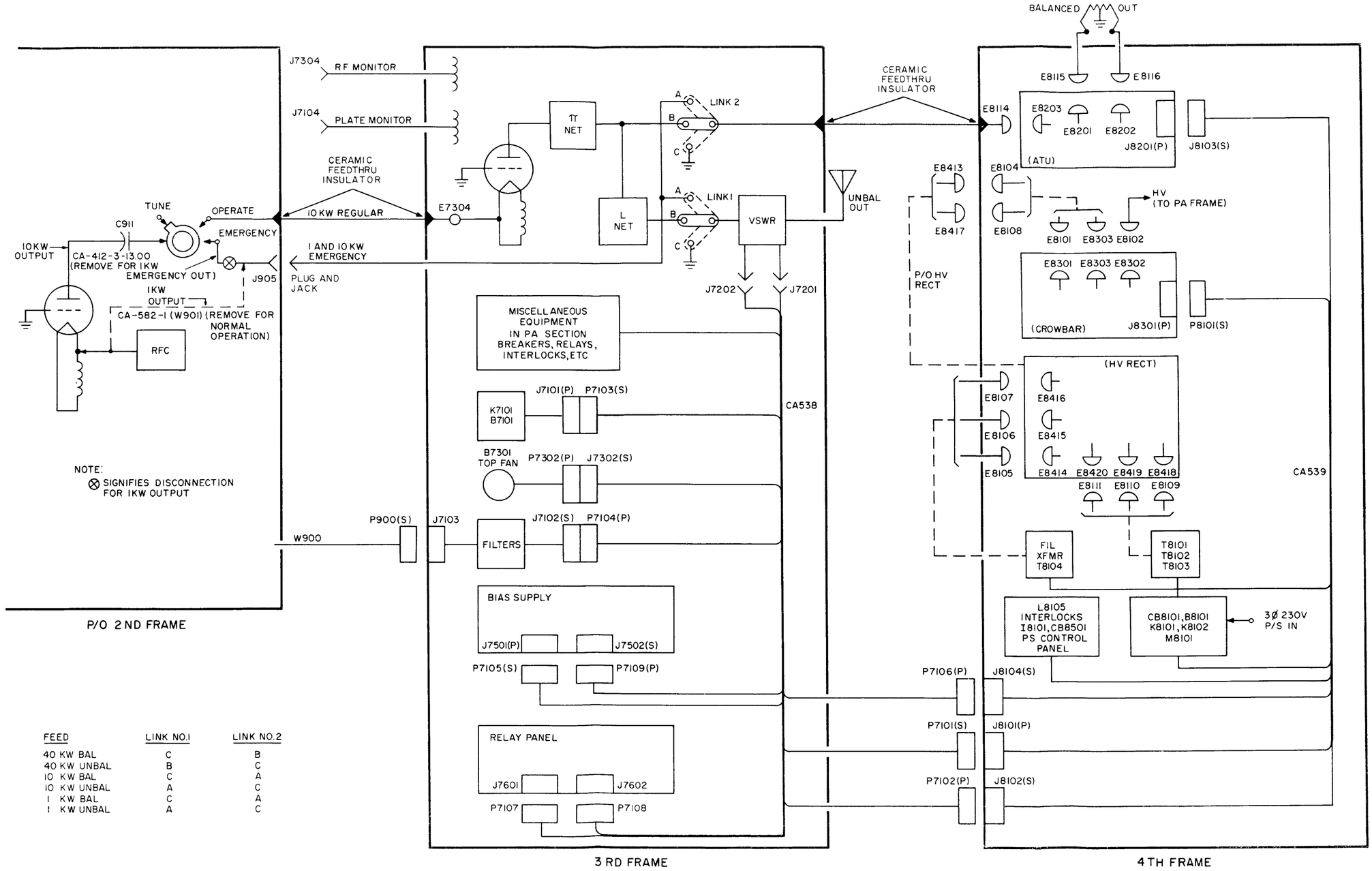
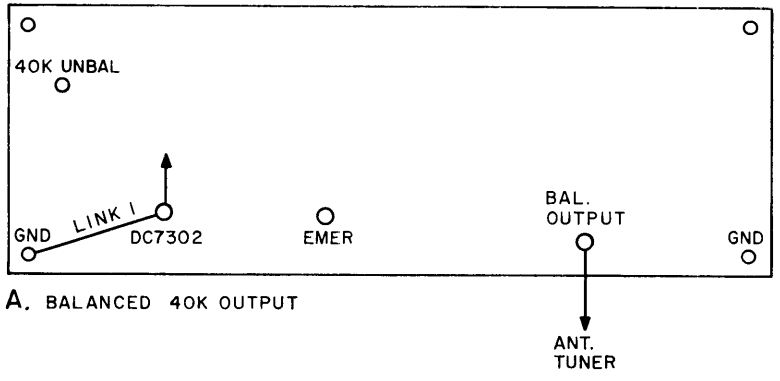


Figure 4-2-7-c. Side View of PA Section, GPT-40K

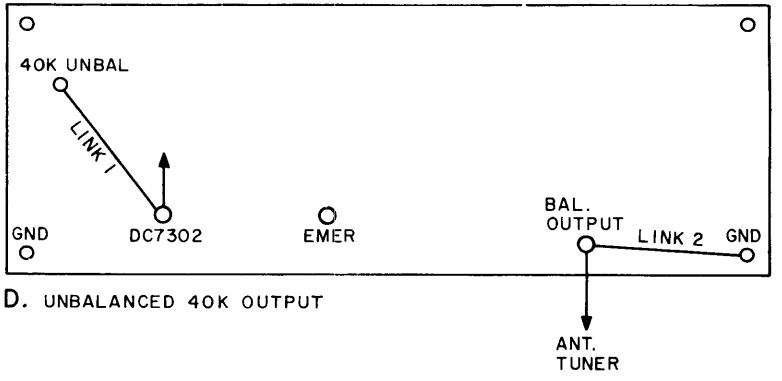


FEED	LINK NO.1	LINK NO.2
40 KW BAL	C	B
40 KW UNBAL	B	C
10 KW BAL	C	A
10 KW UNBAL	A	C
1 KW BAL	C	A
1 KW UNBAL	A	C

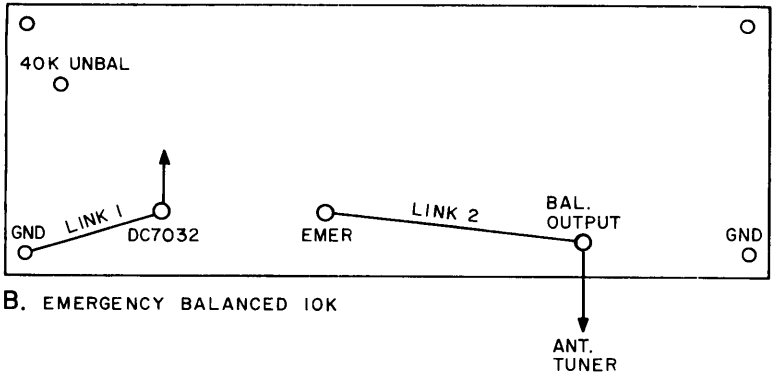
Figure 4-2-8. Cable Interconnections and Connections for Various Power and Type Outputs



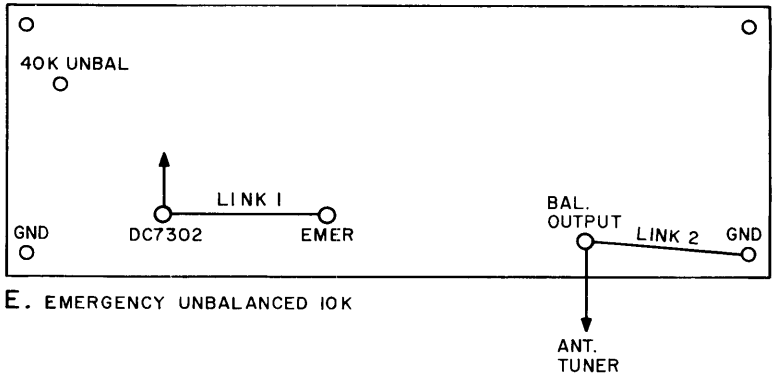
A. BALANCED 40K OUTPUT



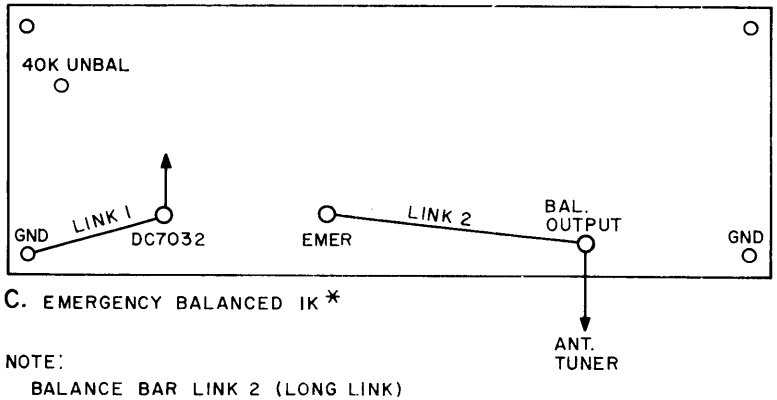
D. UNBALANCED 40K OUTPUT



B. EMERGENCY BALANCED 10K

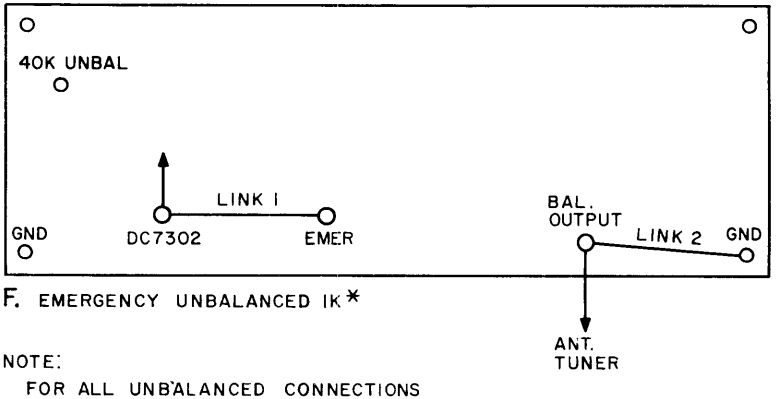


E. EMERGENCY UNBALANCED 10K



C. EMERGENCY BALANCED 1K *

NOTE:
BALANCE BAR LINK 2 (LONG LINK)
CONNECTED FOR ALL BALANCED CONNECTIONS.
* SEE FIG. 3-8



F. EMERGENCY UNBALANCED 1K *

NOTE:
FOR ALL UNBALANCED CONNECTIONS
LONG LINK 2 NOT CONNECTED.
* SEE FIG.3-8.

Figure 4-2-9. Physical Arrangements to Obtain Various Power and Type Outputs Shown on Figure 4-2-8

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 RETURN 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 GPT-40K's balanced 600-ohm antenna (rhombic).

b. Output of PA(10K) fed to GPT-40K's unbalanced 50-ohm antenna.

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

d. Output of PA(40K) fed to GPT-40K's 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 in the manuals referred to in Part II of this manual.

The following tabulation summarizes the principal steps in tuning/loading the RFC amplifier.

TUNE/OPERATE switch	TUNE
HIGH VOLTAGE	ON
MULTIMETER	1st AMPL Ep
1st AMPL TUNING	Increase SBE/CHG drive and adjust 1st AMPL TUNING for peak on multimeter. Keep drive adjusted for proper multimeter readings
MULTIMETER	IPA Ep
IPA GRID TUNING	Increase SBE/CHG drive and tune IPA GRID TUNING for peak on multimeter. Adjust SBE/CHG drive for reasonable meter reading.
MULTIMETER	IPA Isg
IPA PLATE	Increase SBE/CHG drive until IPA PLATE CURRENT meter indicates. Adjust IPA TUNING for dip in IPA PLATE CURRENT meter.
SBE/CHG	Drive momentarily zero.
PA SCREEN Switch	ON
IPA LOADING	Increase SBE/CHG drive until IPA plate current reads about 300 mils. Dip IPA plate current. Increase IPA LOADING and dip IPA plate current unitl IPA plate current is about 300 milli amperes. Momentarily reduce SBE/CHG drive to zero.

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(10K)'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 GPT-40K's 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 of this manual (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) using its 50-ohm dummy antenna.

The following tabulation applies only to GPT-10K's PA PLATE meter readings and supplements the general tuning/loading instructions contained in Part II of this manual (Volume I, Section 3).

TUNE/OPERATE switch	TUNE
GPT-10K's PA PLATE	Advance SBE/CHG's drive until PA plate current meter reads about one ampere. Tune PA TUNE control for dip in PA plate current. Increase SBE/CHG's drive until PA plate current meter again reads about one ampere. While bringing up SBE/CHG's drive watch PA PLATE RF to see that it does not rise above 2.5KV. Adjust PA LOAD and dip PA PLATE current until PA PLATE current reads one ampere and PA PLATE RF reads 2.5KV. These meter readings are approximate.
DUMMY ANTENNA'S CURRENT	8.4 amperes.

(3) Momentarily reduce SBE/CHG's drive 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 3-1a of Part II, Volume I).

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

(7) Advance SBE/CHG's drive 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 of this manual (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 in the 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.

The following tabulation applies to certain parameters of importance during tuning/loading operations of the GPT-10K under emergency 10KW output to GPT-40K's 600-ohm rhombic antenna. This tabulation supplements the general tuning/loading instructions contained in Part II of this manual (Volume I, Section 3).

PA TUNING	Increase SBE/CHG's drive until about one ampere is indicated on PA plate current. Tune PA TUNE control for dip in the PA plate current. If there is no dip in PA plate current, increase loading with LOAD control until PA plate current gives an indication. Redip PA plate current.
OUTPUT BALANCE	Turn OUTPUT BALANCE control for equal RF current in each leg of antenna feed line. Redip PA plate current.
FINAL TUNING	Working between SBE/CHG drive, PA TUNE, and PA LOAD, tune for one ampere PA plate current and 2.5 kilovolts PA plate RF. Check GPT-10K's plate current and IPA plate current for dip.
IDEAL METER READINGS	IPA ISg----20ma IPA plate current----300 ma or less GPT-10K plate current--1 ampere or less GPT-10K PA RF----2.5 kv or less
ANTENNA'S LOAD CURRENT	3 amperes

b. OUTPUT OF PA(10K) FED TO GPT-40K's 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 of this manual (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.

The following tabulation applies to certain parameters of importance during tuning/loading operations of the GPT-10K under emergency 10KW output to GPT-40K's 50-ohm unbalanced antenna. This tabulation supplements the general tuning/loading instructions contained in Part II of this manual (Volume I, Section 3).

PA TUNING	Increase SBE/CHG's drive until about one ampere is indicated on PA plate current. Tune PA TUNE control for dip in the PA plate current. If there is no dip in PA plate current, increase loading with LOAD control until PA plate current gives an indication. Re-dip PA plate current.
FINAL TUNING	Working between SBE/CHG drive, PA TUNE, and PA LOAD, tune for one ampere PA plate current and 2.5 kilovolts PA plate RF. Check GPT-10K's plate current and IPA plate current for dip.
IDEAL METER READINGS	IPA Isg----20ma IPA plate current ---- 300 ma or less GPT-10K plate current-- 1 ampere or less GPT-10K PA RF---- 2.5 kv or less
ANTENNA'S LOAD CURRENT	8.4 amperes.

c. OUTPUT OF PA(40K) FED TO GPT-40K's 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 SBE/CHG's drive 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 ks (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 and250). 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 VOLST 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
240	GRID OVLD. ADJ	Potentiometer R7602

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)
RELAY PANEL (Cont.)		
241	TUBE PROTECT	Potentiometer R7605
242	DRIVE INTERLOCKS IND	Indicator I7606
243	DRIVE 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

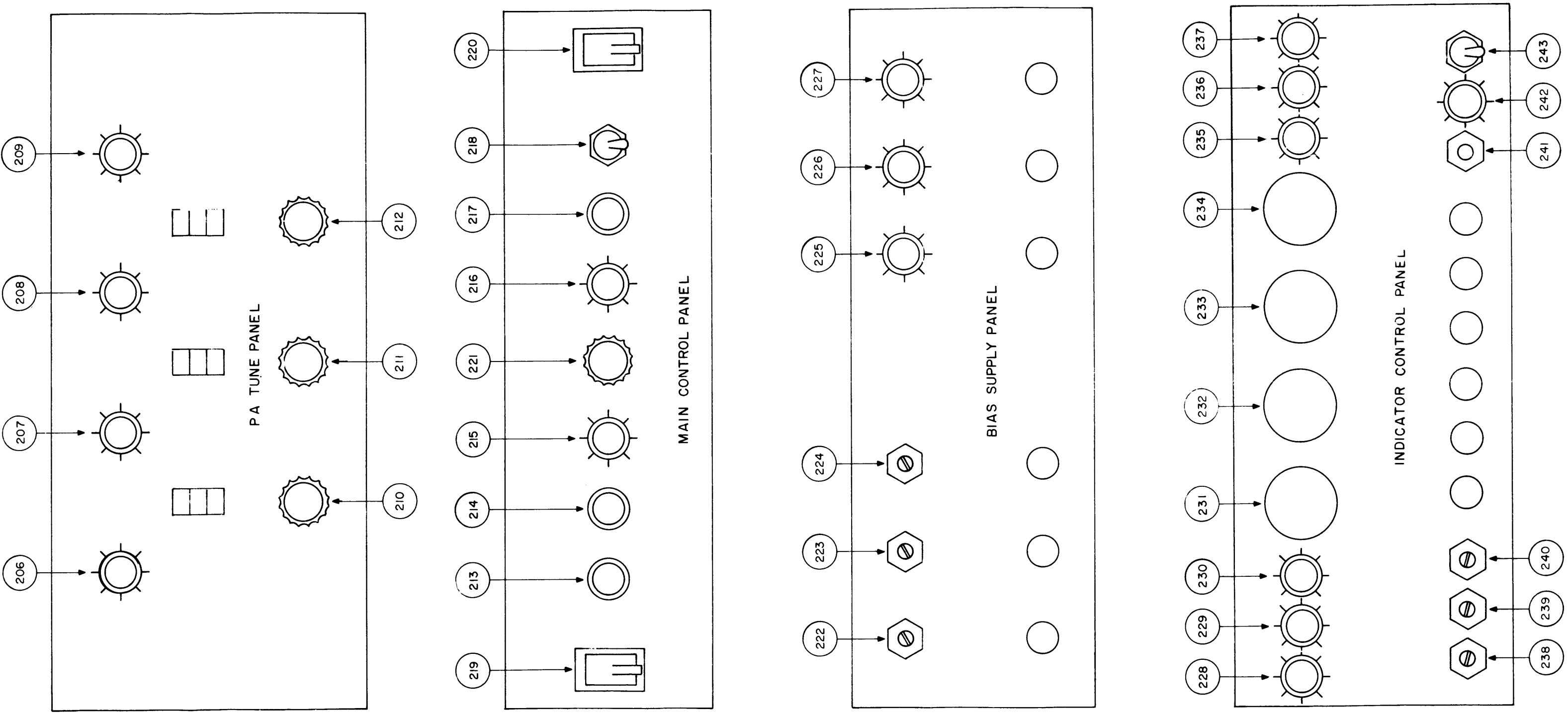


Figure 4-3-1. Tuning Controls, Third Frame, GPT-40K

201
202
203
204
205
METER PANEL

206
207
208
209

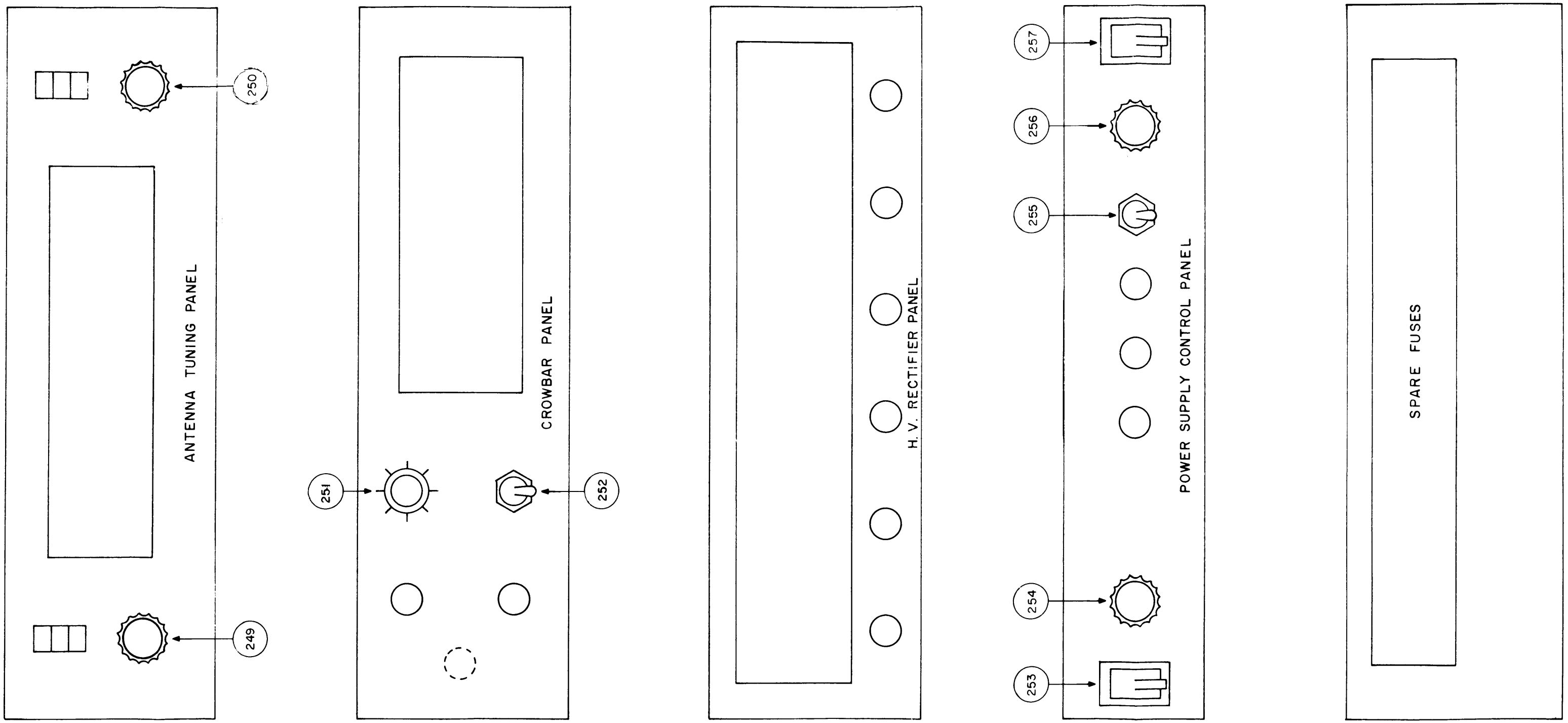
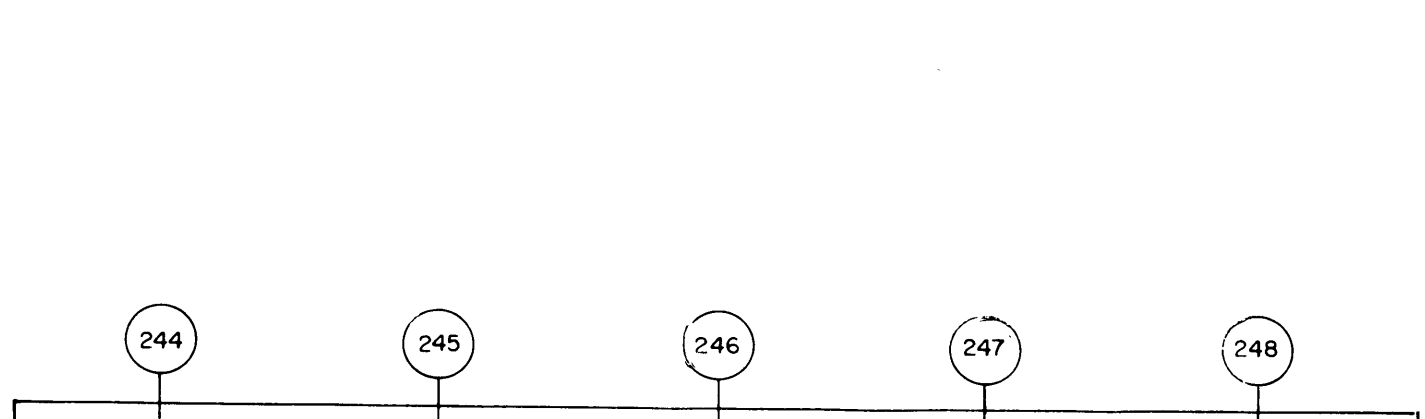


Figure 4-3-2. Tuning Controls, Fourth Frame, GPT-40K

244
245
246
247
248
METER PANEL



SBG-1			10K (IPA) STAGE (UNBAL ONLY)								40K (PA) STAGE												
FREQ. MC	SBG-1 BAND	CMO	BAND	PTE OSC SETTING	TUNE	LOAD	PLATE CURRENT	OUTPUT LOADING	10 KW LOAD CUR	10 KW S/D DB	FINAL BAND	TUNE	LOADING	DC PLATE CUR.	PLATE RF	DC GRID CURRENT	40 KW LOAD CUR.	40 KW S/D DB	20 KW LOAD CUR.	20 KW S/D DB	RF DRIVE VOLTS	% UN/BAL	ANT BAND
2	0	2000	2-4	2500	540	278	.90	000	11.0	N.R.	2-3	629	648	5.6	7	80	20	36	10	42	.60	—	—
3	0	3000	2-4	3500	275	184	.90	000	8.5	N.R.	2-3	454	647	5.6	7	90	20	37	10	42	.55	—	—
3	0	3000	2-4	3500	347	448	.90	000	9.0	N.R.	3-4	480	517	5.6	7	90	20	37	10	42	.55	—	—
4	2	2000	2-4	2250	355	313	1.05	000	9.0	N.R.	3-4	473	595	5.6	7.5	90	20	37	10	42	.55	—	—
4	2	2000	4-6	2250	350	344	1.2	000	8.0	N.R.	4-5	442	615	5.0	6.0	80	20	36	10	42	.50	—	—
5	2	3000	4-6	2750	263	443	.90	000	7.0	N.R.	4-5	409	508	4.4	6.5	75	20	37	10	44	.35	—	—
5	2	3000	4-6	2750	263	443	.90	000	7.0	N.R.	5-7	464	572	4.8	6.5	80	20	37	10	44	.55	—	—
6	4	2000	4-6	3250	224	334	.90	000	7.5	N.R.	5-7	435	468	5.0	6.0	80	20	36	10	44	.50	—	—
6	4	2000	6-8	3250	276	472	.90	000	7.5	N.R.	5-7	435	468	5.0	6.0	80	20	36	10	44	.50	—	—
7	4	3000	6-8	3750	235	390	.90	000	6.0	N.R.	5-7	406	423	5.0	6.5	80	20	37	10	44	.55	—	—
7	4	3000	6-8	3750	235	390	.90	000	6.0	N.R.	7-11	496	480	5.4	6.0	90	20	36	10	42	.55	—	—
8	6	2000	6-8	2125	212	255	.80	000	6.5	N.R.	7-11	465	440	5.4	5.5	90	20	37	10	44	.50	—	—
8	6	2000	8-11	2125	269	384	.90	000	6.5	N.R.	7-11	465	440	5.4	5.5	90	20	37	10	44	.50	—	—
11	8	3000	8-11	2875	204	194	.80	000	6.0	N.R.	7-11	419	378	5.2	5.5	80	20	36	10	42	.45	—	—
11	8	3000	11-15	2875	242	288	.90	000	6.0	N.R.	11-15	442	482	4.8	5.5	70	20	36	10	42	.45	—	—
15	12	3000	11-15	3875	161	154	.90	000	8.5	N.R.	11-15	401	397	4.8	4.5	70	20	37	10	44	.40	—	—
15	12	3000	15-19	3875	229	232	.90	000	9.0	N.R.	15-19	446	426	4.8	4.5	80	20	37	10	44	.40	—	—
19	16	3000	15-19	2437.5	178	126	.90	000	9.5	N.R.	15-19	403	396	4.0	4.0	90	20	36	10	42	.45	—	—
19	16	3000	19-24	2437.5	232	149	1.25	000	11.0	N.R.	19-24	441	406	5.0	3.0	70	20	37	10	42	.45	—	—
24	22	2000	19-24	3062.5	198	069	1.25	000	11.0	N.R.	19-24	411	376	4.6	4.0	90	20	37	10	42	.40	—	—
24	22	2000	24-28	3062.5	266	127	1.2	000	11.5	N.R.	24-28	428	387	4.8	4.5	90	20	37	10	42	.40	—	—
28	26	2000	24-28	3562.5	238	087	1.2	000	9.5	N.R.	24-28	412	369	4.2	3.5	80	20	36	10	40	.40	—	—
											211	210	212	203	204	244	205		205		202		249*
											NUMERICAL CONTROL DESIGNATION (SEE FIGURE 4-3-1)												

* NOT USED IN UNBALANCED ANTENNA OPERATION

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

SECTION 4
PRINCIPLES OF OPERATION

4–4–1. INTRODUCTION.

Figure 1-1-2-c 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 4CX5000A tube and a pi-L or pi antenna unit associated with a balanced 600-ohm or an unbalanced 50-ohm antenna, respectively. Figure 4-4-1 (sketches 5 and 6) shows that the 1-kw emergency feed bypasses both the 4CX5000A and ML-6697 PA stays.

Figure 4-4-2-a elaborates on figure 4-4-1 and shows connections for various power and type output; figure 4-4-2-b 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 ecounnters 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:

Operation	Antenna	Link Position Link No. 1	Link Position Line No. 2
40 kw	Balanced	C	B
40 kw	Unbalanced	B	C
1 or 10 kw	Balanced	C	A
1 or 10 kw	Unbalanced	A	C

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 (dead-man). (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; these 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 4 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, SWR: 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 T9101 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.

BLOWER 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 tube 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 (6 X 4), 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 operated 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 V7508 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 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 C8301 from 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.

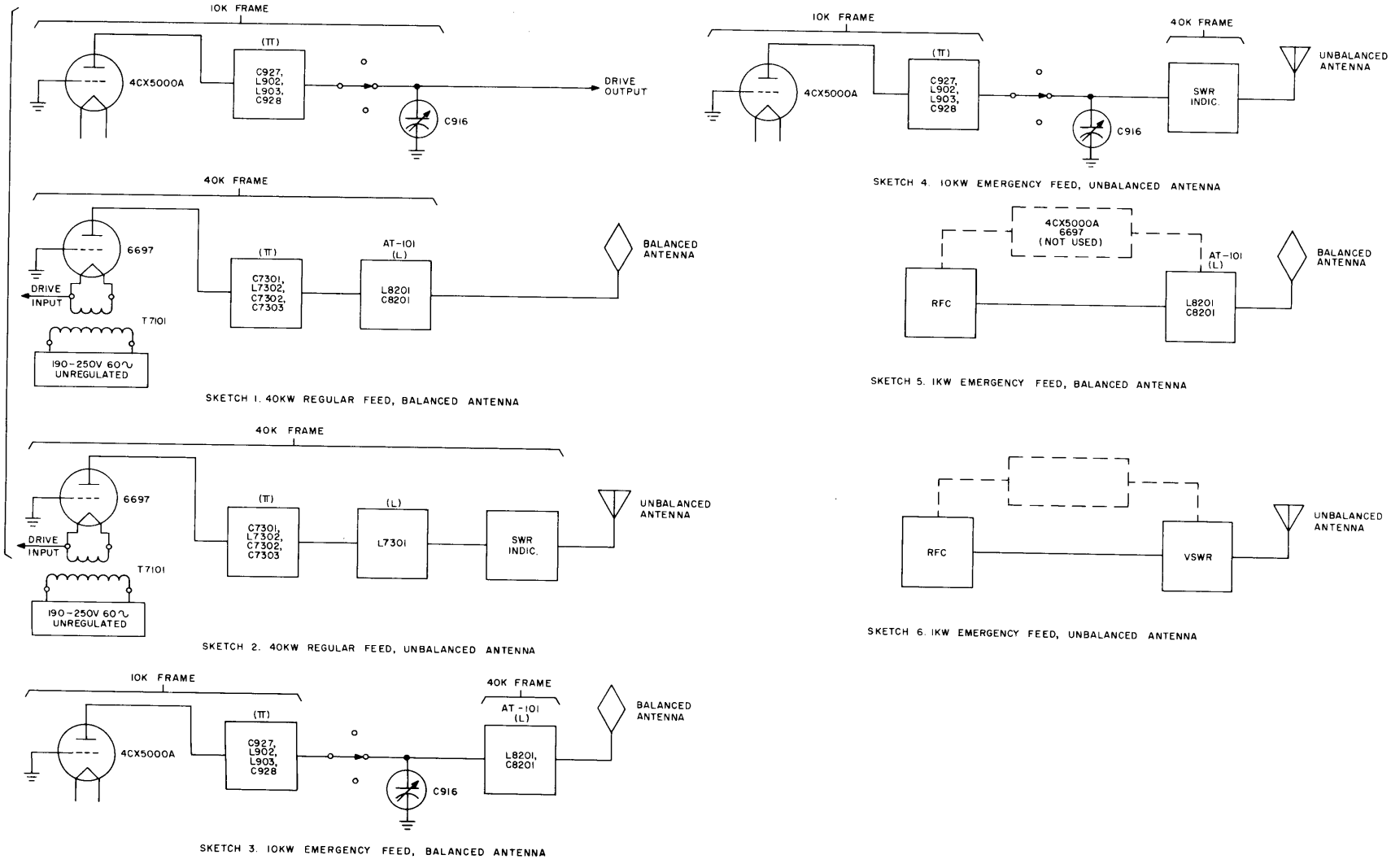


Figure 4-4-1. Block Diagram, Antenna Circuits For 1kw, 10kw, and 40kw Outputs, GPT-40K

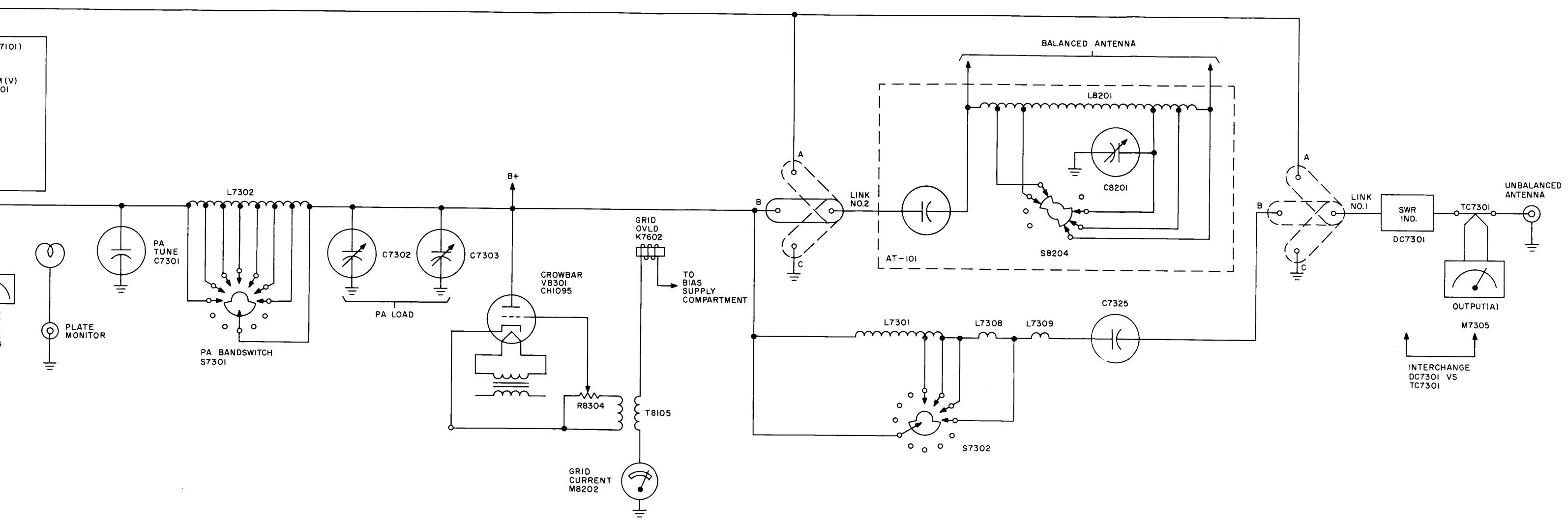
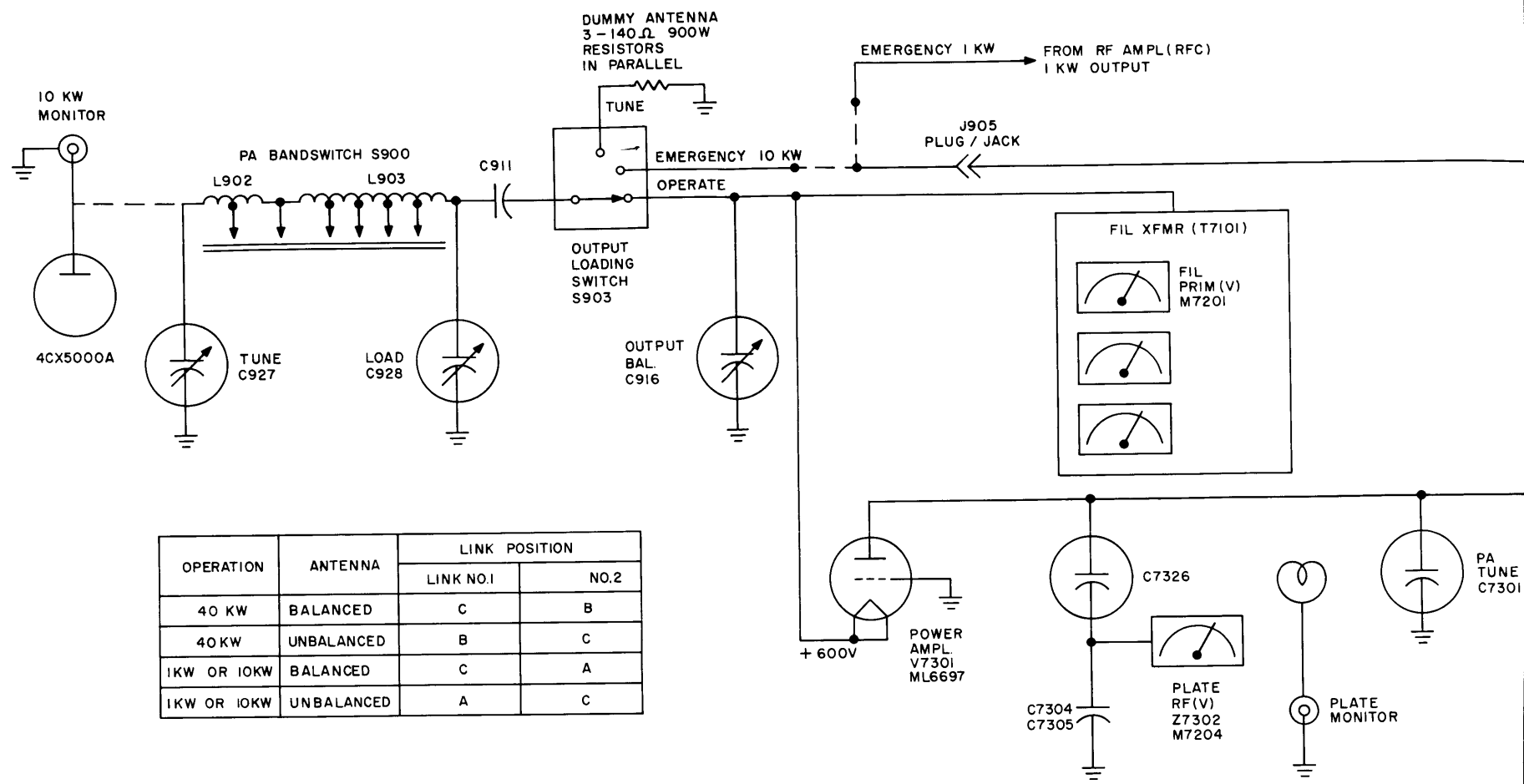
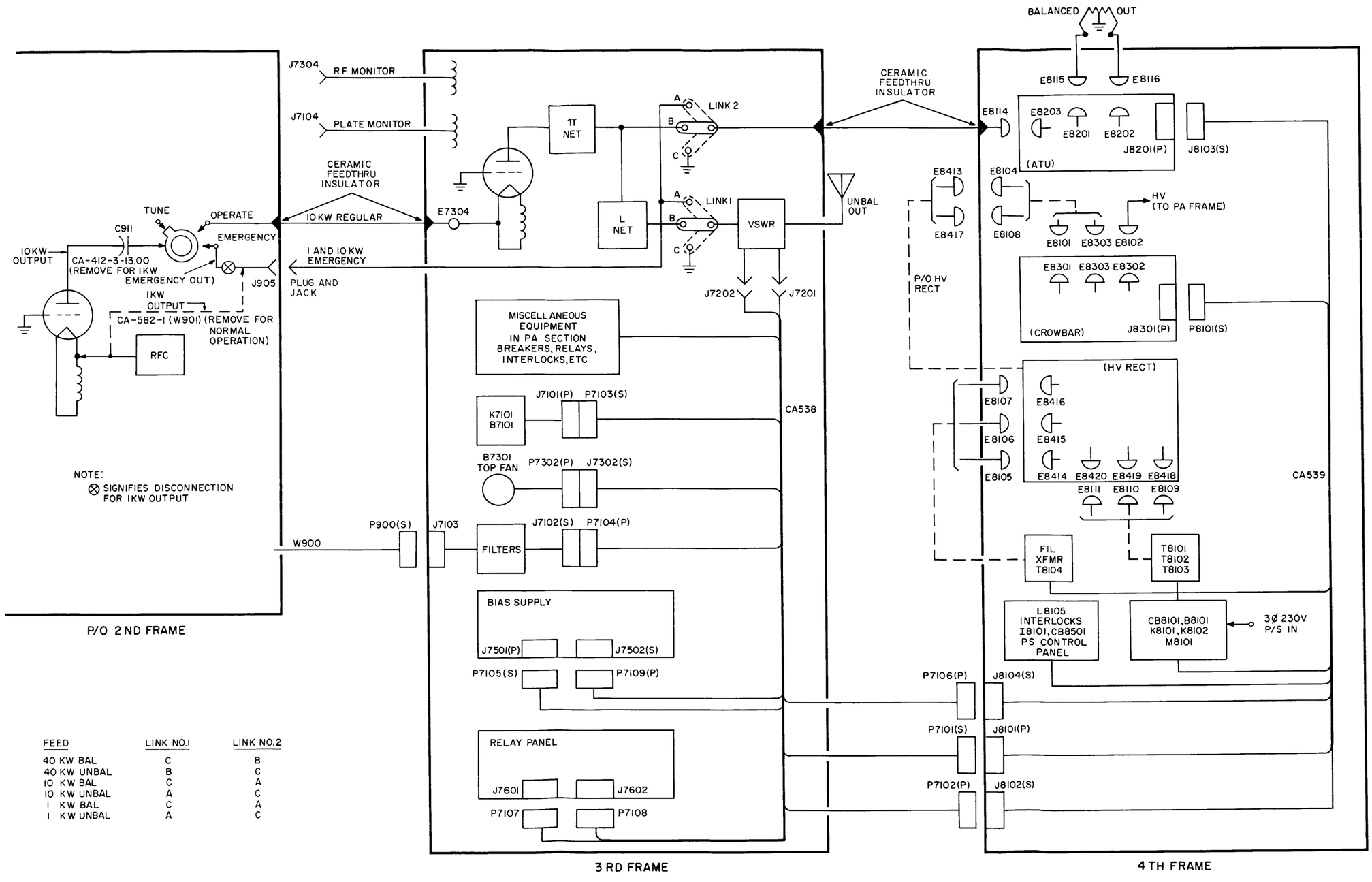


Figure 4-4-2-a. Simplified Schematic Diagram, Antenna Circuits for 1kw, 10kw, and 40kw Outputs, GPT-40K



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



FEED	LINK NO.1	LINK NO.2
40 KW BAL	C	B
40 KW UNBAL	B	C
10 KW BAL	C	A
10 KW UNBAL	A	C
1 KW BAL	C	A
1 KW UNBAL	A	C

Figure 4-4-2-b. Cable Interconnections and Connections For Various Power and Type Outputs, GPT-40K

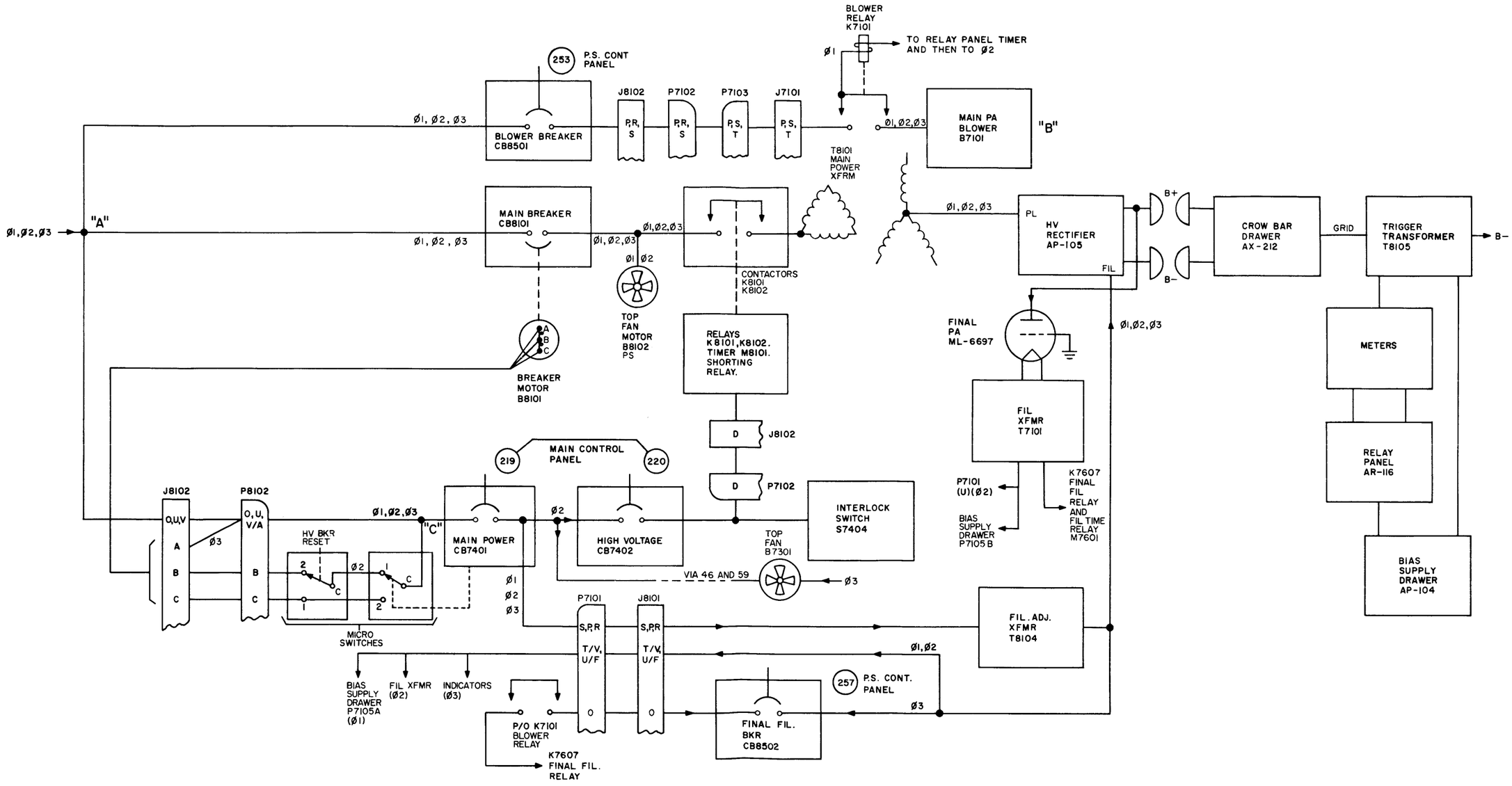


Figure 4-4-3. Functional Block Diagram, Power Supply Circuits, GPT-40K

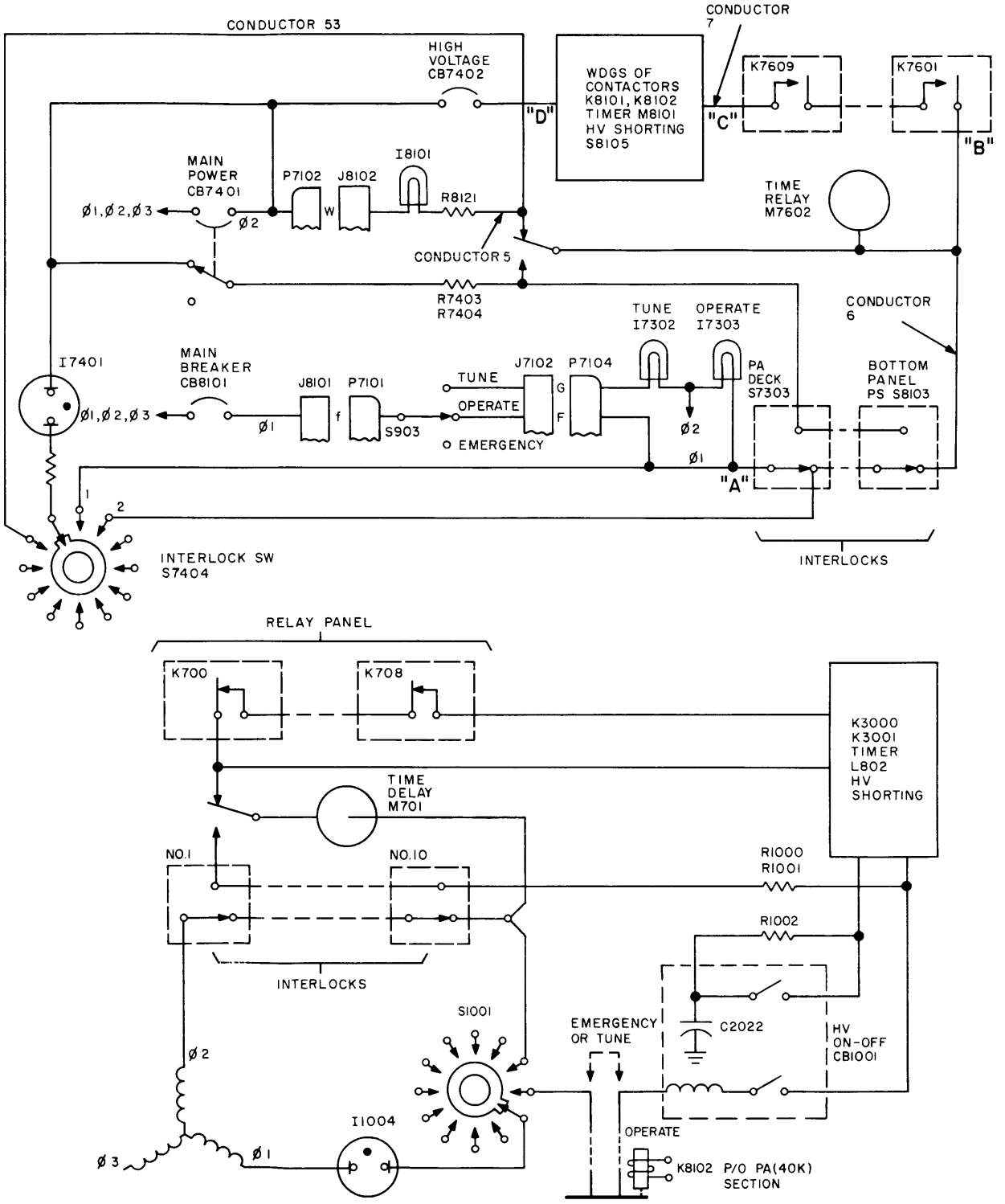


Figure 4-4-4. Functional Block Diagram, Interlock-Protective Circuits for Modified GPT-10K, GPT-40K

RETUNE K7603

SWR K7604

BIAS K7605

DRIVE INTERLOCK K7606

FINAL FILAMENT K7607

TUBE PROTECT K7608

CROWBAR K7609

RESET

(SHOWN IN RESET POSITION)

OVLD

(SHOWN IN POSITION FOR NO BIAS)

(SPRING)

(CONTACTS CAN BE SHORTED OUT BY S7601 FOR NO INTERLOCK)

(SHOWN IN POSITION FOR NO FIL VOLT)

(PLATE CURRENT IN ML-6697 LESS THEN 3 AMPS DC)

(NO CROWBAR FILAMENT VOLTAGE)

E7602 — 15 16 17 18 20 19 21 22

E7603 — 24 23 25 26 28 27 30 29

E7604 — 32 31 34 33 36 35 37 38

E7605 — 39 40 41 42 44 43

E7606 — 46 45 47 48 55 56 49 50

E7606 — 53 54

E7606 — 57 58 61 62 59 60

R7608 0.166

Ø1 VIA OVLD RESET SWITCH S7401

Ø1

Ø2

RETUNE I7603

SWR I7604

BIAS RELAY ADJ R7604 15K 3W

BIAS I7605

R7605 33K 10W

DRIVE INTERLOCK S7601

DRIVE INTERLOCK I7606

R7607 220K 1/2W

FINAL FILAMENT I7607

TUBE PROTECT ADJ R7606 05 25W

TOP FAN F7601 5A

ELAPSE METERS F7603 2 AMPS

TIME DELAY F7604 2 AMPS

FIL TIME M7601

TIME DELAY M7602

BLOWER DELAY M7603

BLOWER DELAY F7602 2 AMPS

PLATE TIME M7604

SHORTING RELAY F7605 2 AMPS

BLOWER CONTACTOR F7606 2 AMPS

RELAY PANEL AR-116

F d k J I R f S N E M b X T W c a Z e K L O P G U V Y J7601

P7107

43 60 138 59 45 52 6 53 5 42 49 56 54 55 46 58 57 61 47 48 50 51 44 19 37 7

Ø2 Ø1 Ø2

NOTE:
TERMINALS ON TERMINAL STRIPS E7601 THOUGH E7606 IN NON SEQUENCE TO SIMPLIFY DRAWING.

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

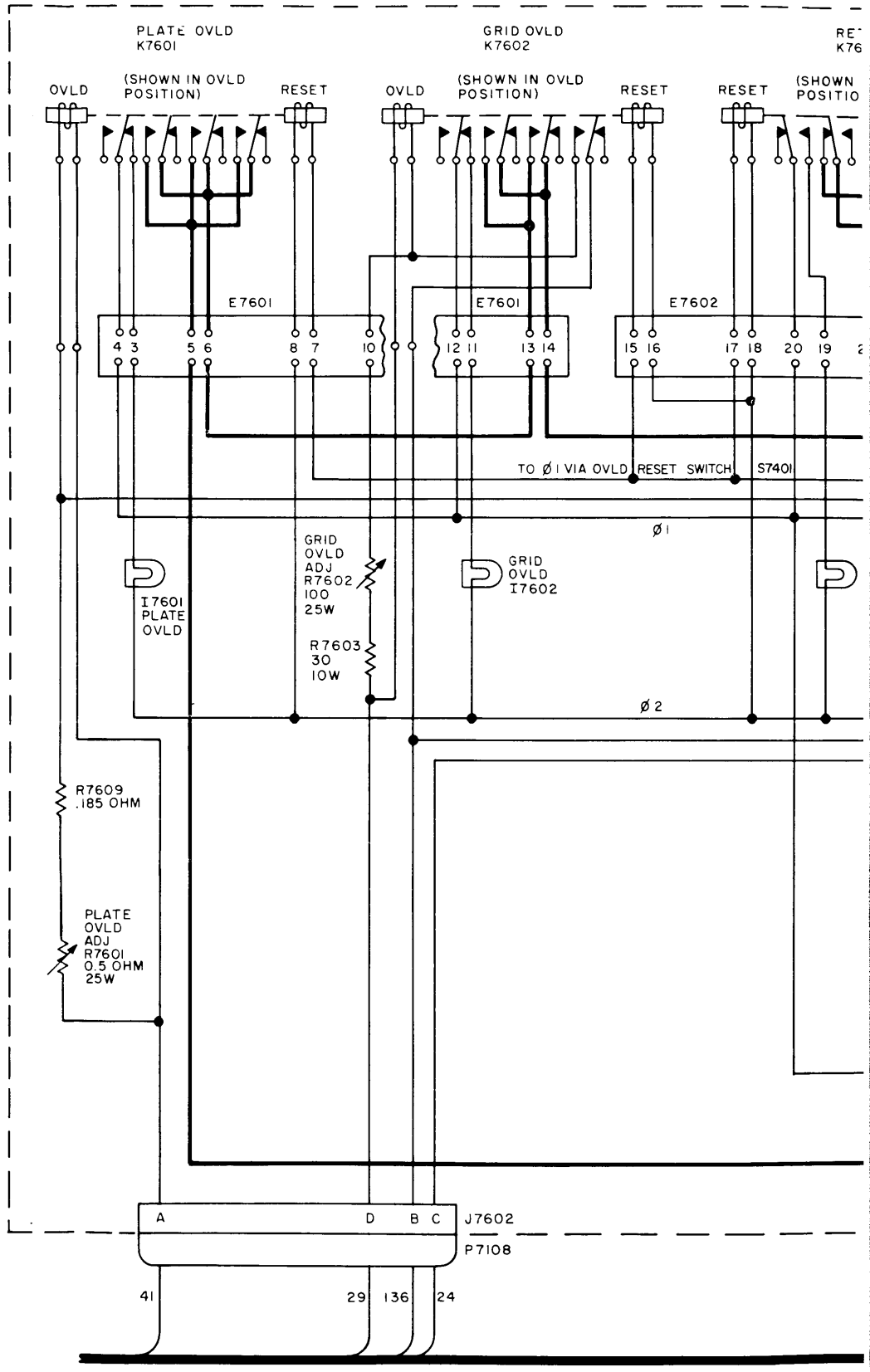


PLATE OVLD
K7601
GRID OVLD
K7602
OVLD
(SHOWN IN OVLD POSITION)
RESET
E7601
E7602
4 3 5 6 8 7 10
12 11 13 14
15 16 17 18 20 19
TO Ø1 VIA OVLD RESET SWITCH S7401
Ø1
Ø2
I7601
PLATE
OVLD
GRID
OVLD
ADJ
R7602
100
25W
R7603
30
10W
GRID
OVLD
I7602
R7609
.185 OHM
PLATE
OVLD
ADJ
R7601
0.5 OHM
25W
A
D
B
C
J7602
P7108
41
29
136
24

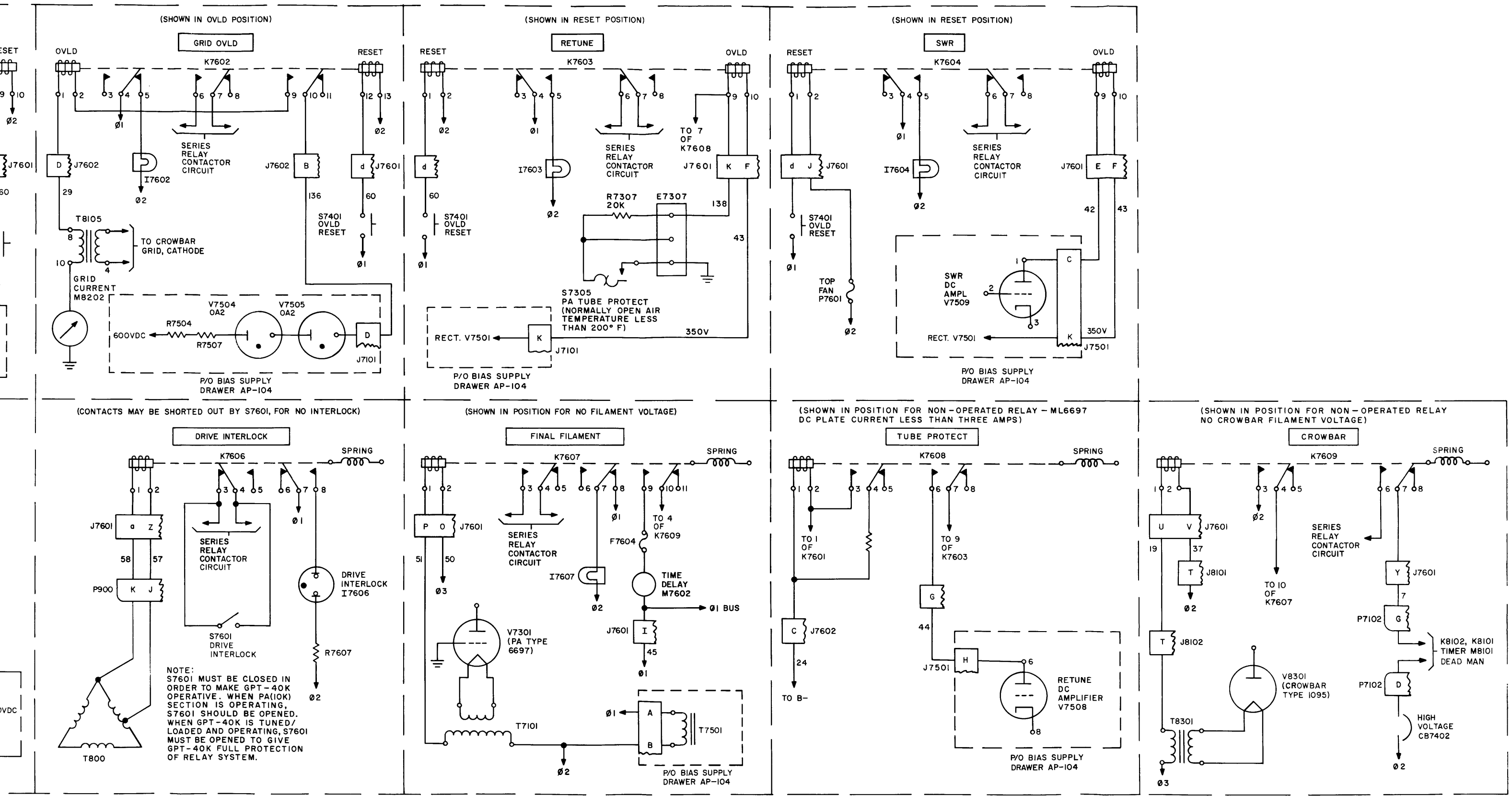
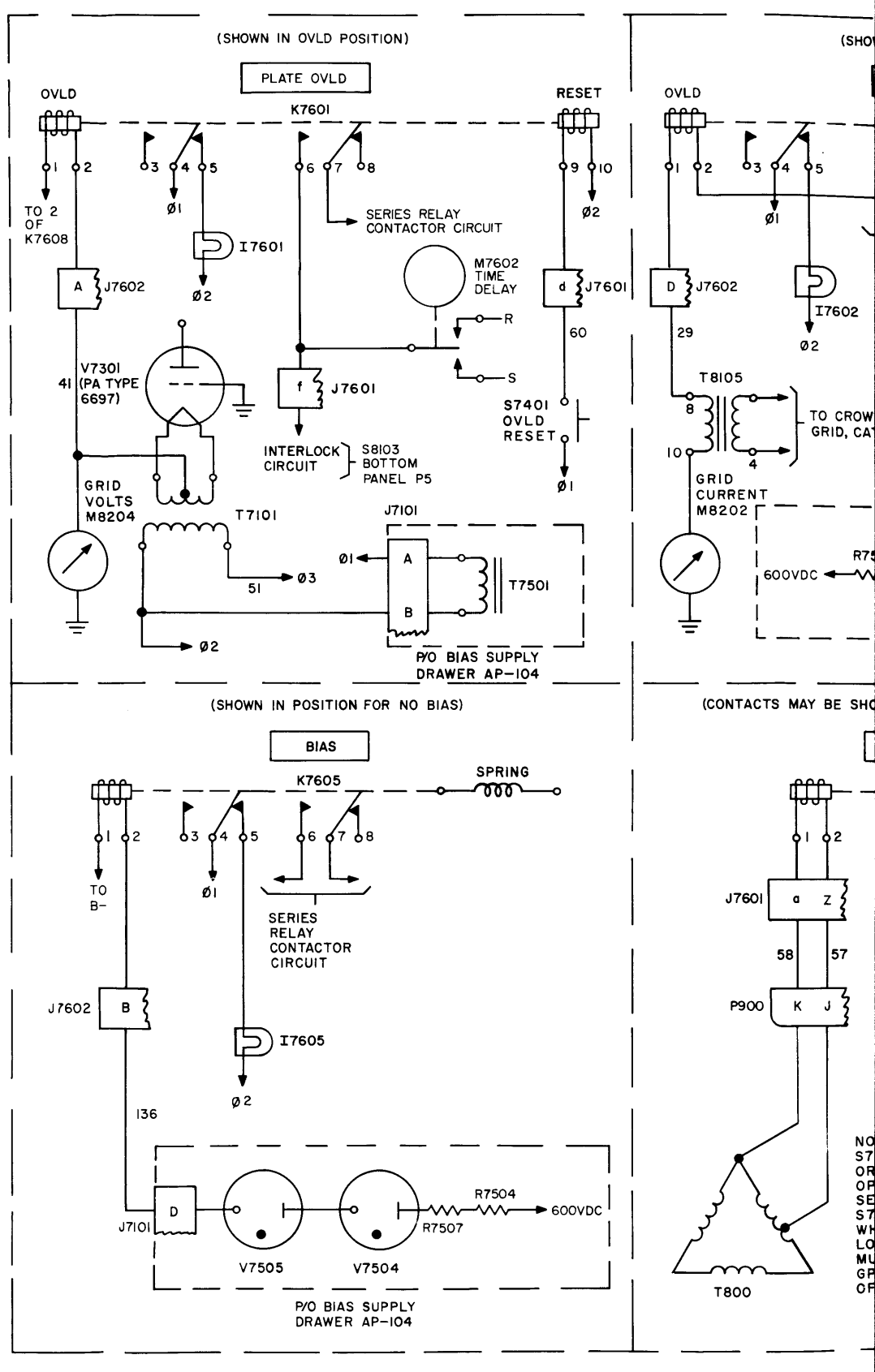


Figure 4-4-6. Simplified Schematic Diagram, Relay Panel, GPT-40K


(SHOWN IN OVLD POSITION)
PLATE OVLD
OVLD
K7601
RESET
TO 2 OF K7608
Ø1
I7601
Ø2
SERIES RELAY CONTACTOR CIRCUIT
M7602 TIME DELAY
J7602
J7601
R
S
60
V7301 (PA TYPE 6697)
41
J7601
S7401 OVLD RESET
INTERLOCK CIRCUIT
S8103 BOTTOM PANEL P5
GRID VOLTS M8204
T7101
J7101
51
Ø3
T7501
P/O BIAS SUPPLY DRAWER AP-104
(SHOWN IN POSITION FOR NO BIAS)
BIAS
OVLD
Ø1
J7602
29
I7602
Ø2
T8105
8
10
4
GRID CURRENT M8202
600VDC
(CONTACTS MAY BE SHO
K7605
SPRING
TO B-
SERIES RELAY CONTACTOR CIRCUIT
J7602
I7605
136
J7101
R7504
R7507
600VDC
V7505
V7504
P/O BIAS SUPPLY DRAWER AP-104
J7601
58
57
P900
T800

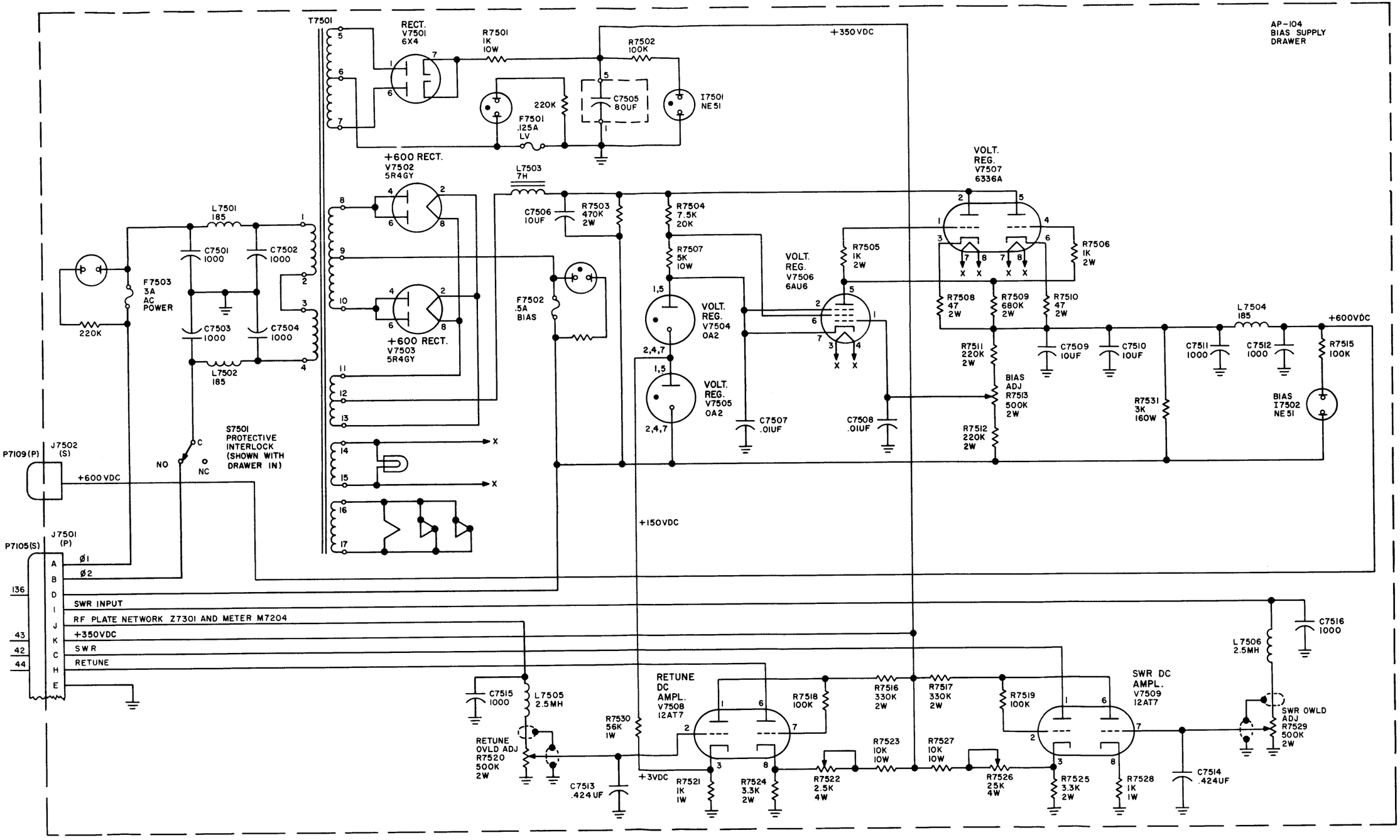


Figure 4-4-7. Simplified Schematic Diagram, Bias Supply, GPT-40K

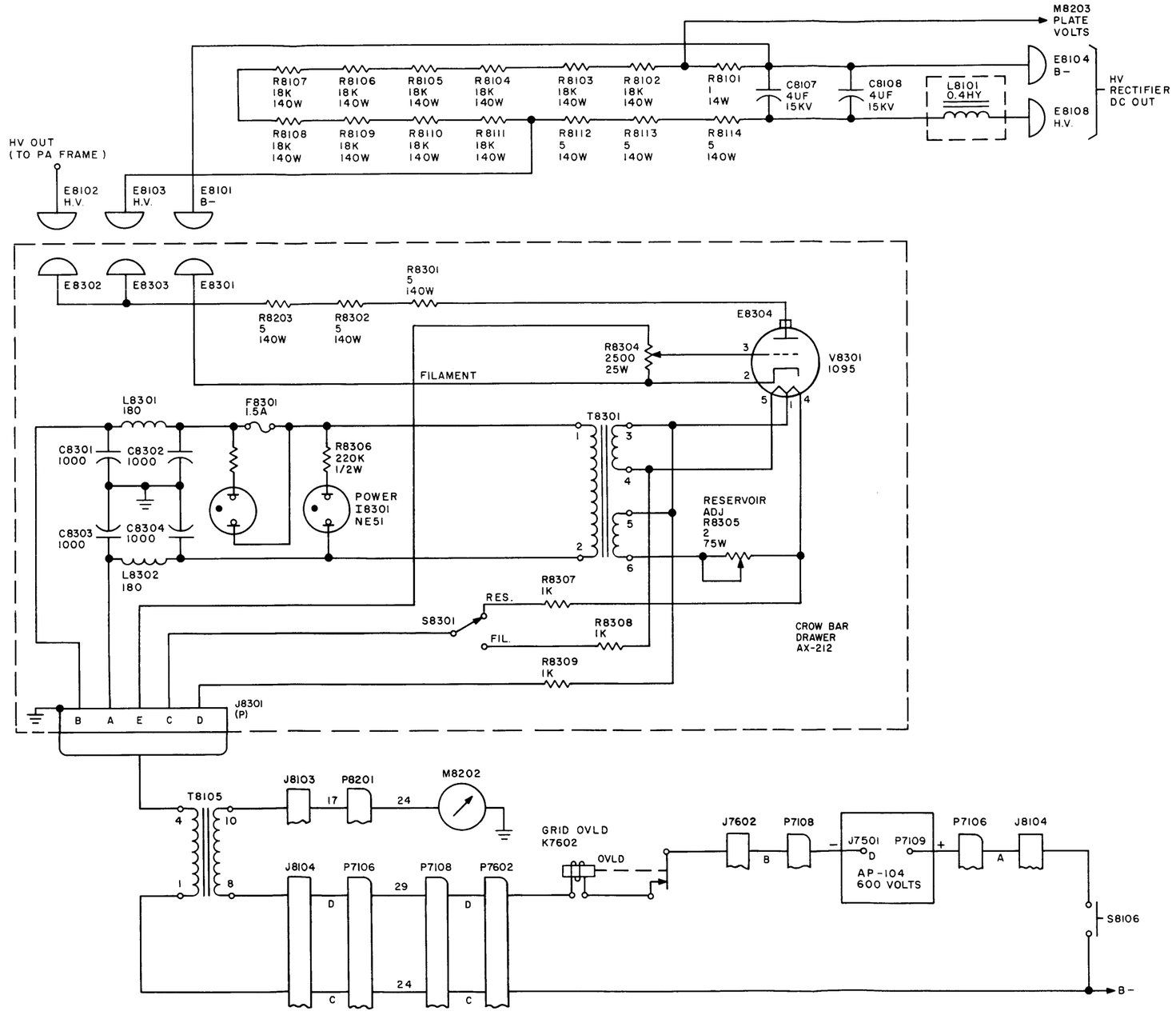


Figure 4-4-8. Simplified Schematic Diagram, Crowbar Drawer Circuit, GPT-40K

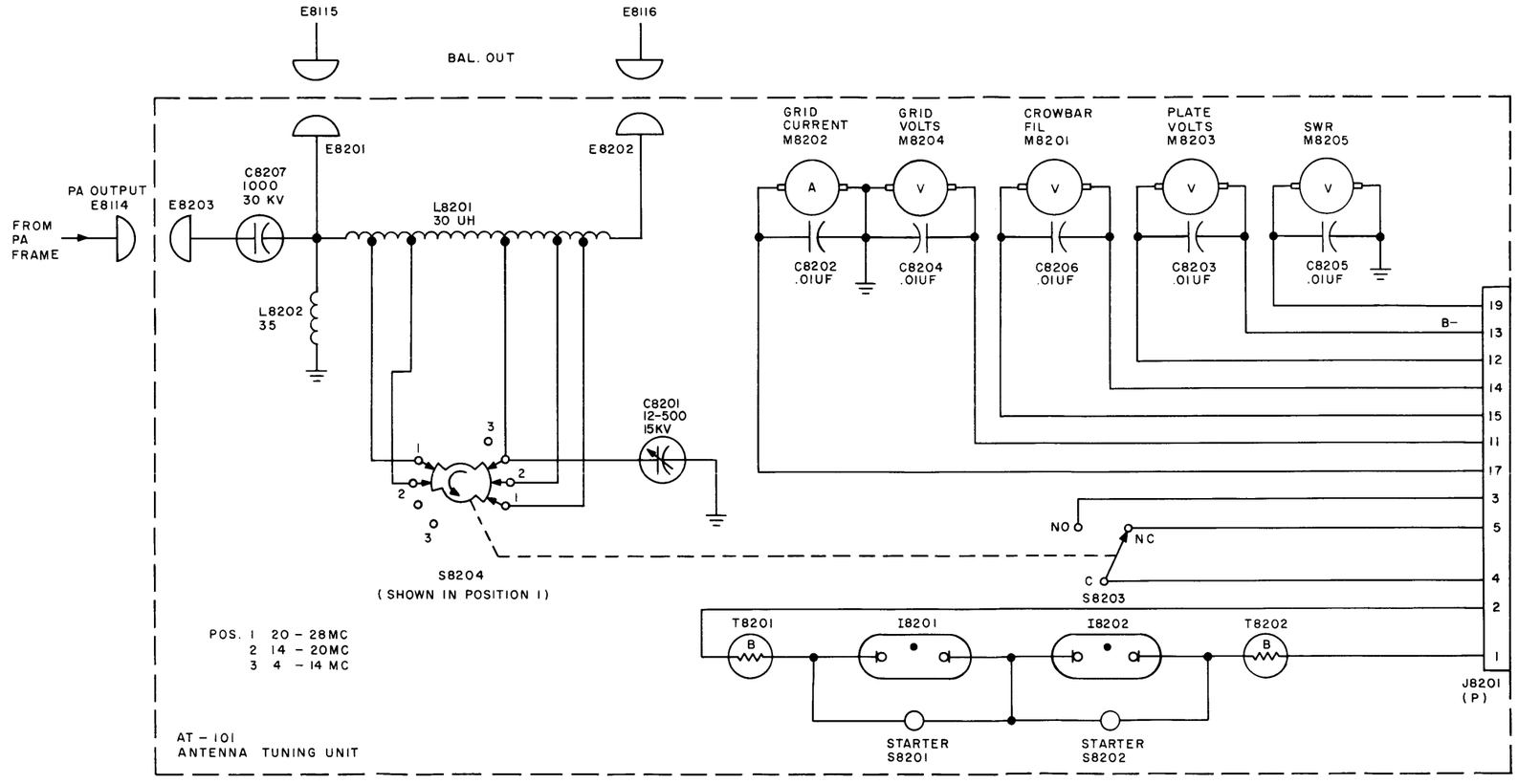


Figure 4-4-9. Simplified Schematic Diagram, Antenna Tuning Unit and Meter Panel Drawer Circuit, GPT-40K

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.

The information presented in paragraphs 4-5-3 through 4-5-9 provide localizing trouble when trouble indications occur; for example, when circuit breakers continually trip, motors fail to operate, lamps fail to light, meter indications are abnormal, fuses blow, etc. In this event conventional trouble-shooting procedures of checking tabular values against detailed shcematic drawings should then be carefully followed.

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. - Table 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 phased on complete disconnection of all connections in the PA section.

b. LOCATION DATA. - Figures 4-5-4 through 4-5-7 shows 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 CONNECTORS 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. (MANI CONTROL PANEL) HV BREAKER INDICATOR goes on. (MANI CONTROL PANEL)	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 (Cont.)

STEP	CONTROLS OPERATED	NORMAL INDICATIONS	REMEDY
		A. C. POWER indicator goes on. } BIAS SUPPLY BIAS indicator goes on. } BIAS SUPPLY L. V. indicator goes on. } DRAWER POWER indicator goes on (Crowbar Drawer)	
	(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 of the air due to operation of an overlaod 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	PIN4	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 = 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, I, 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

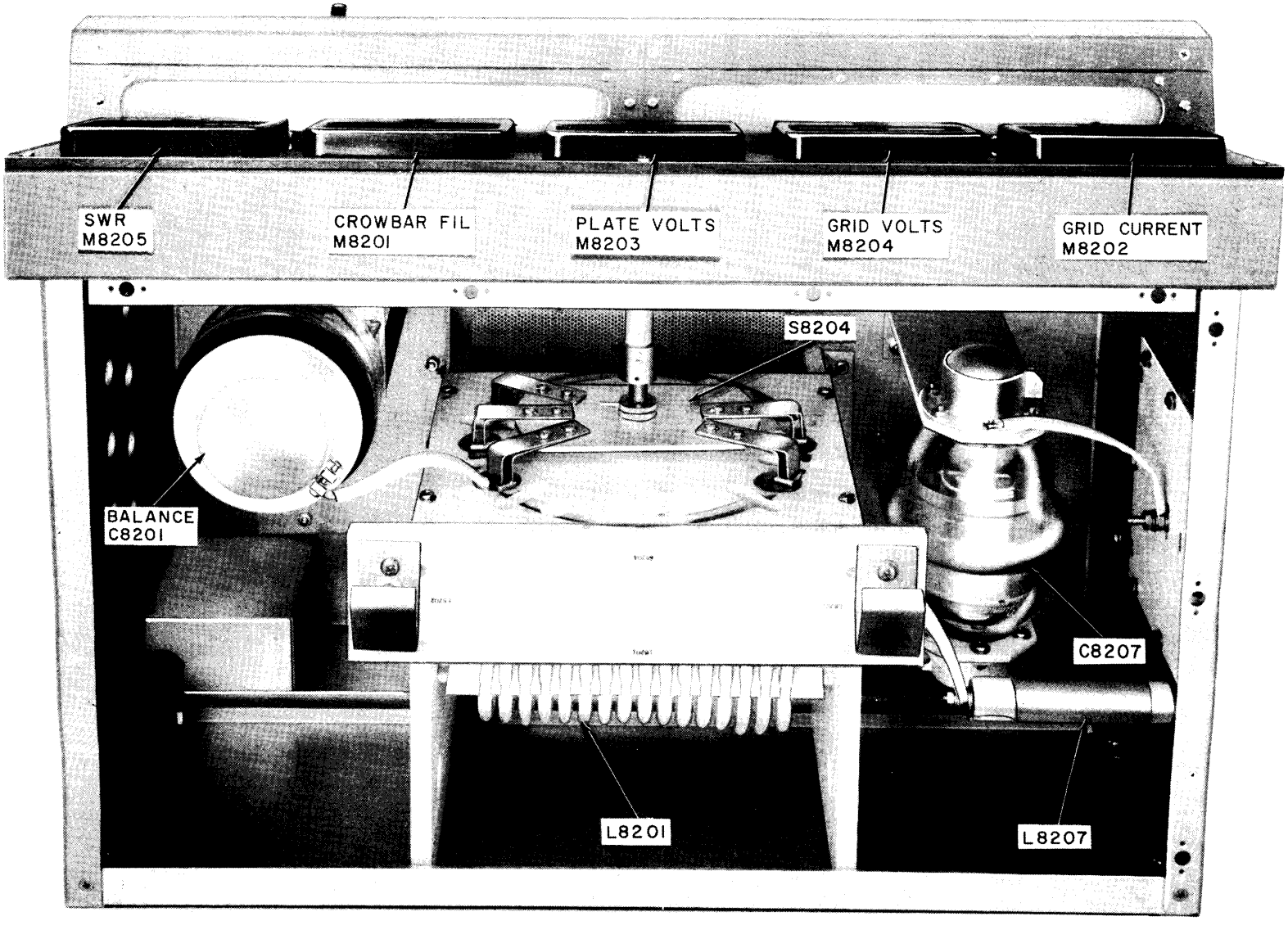


Figure 4-5-1. Top View with Callouts, Antenna Tuning Unit and Meter Panel Drawer, GPT-40K

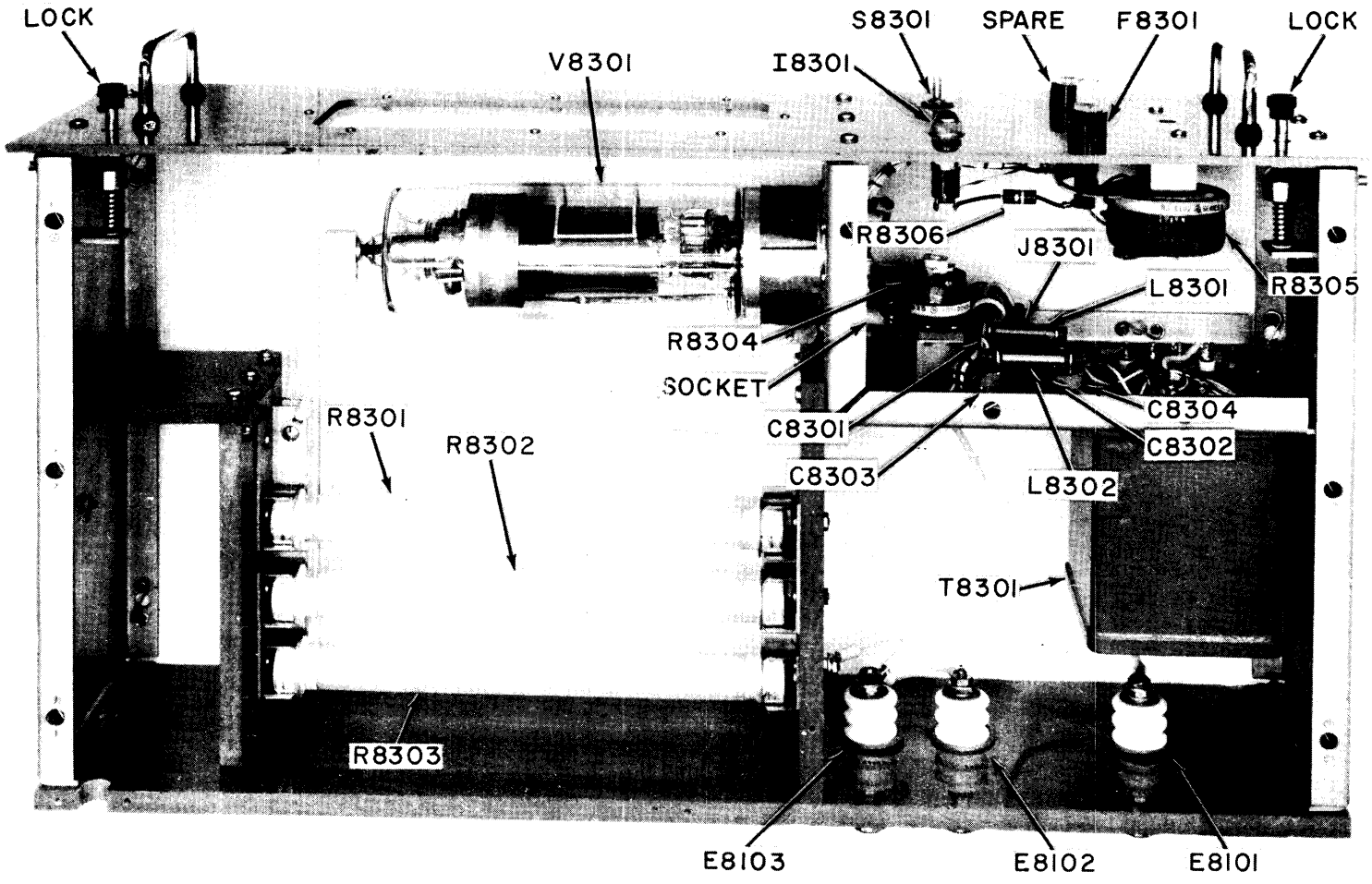


Figure 4-5-2. Top View with Callouts, Crowbar Drawer, GPT-40K

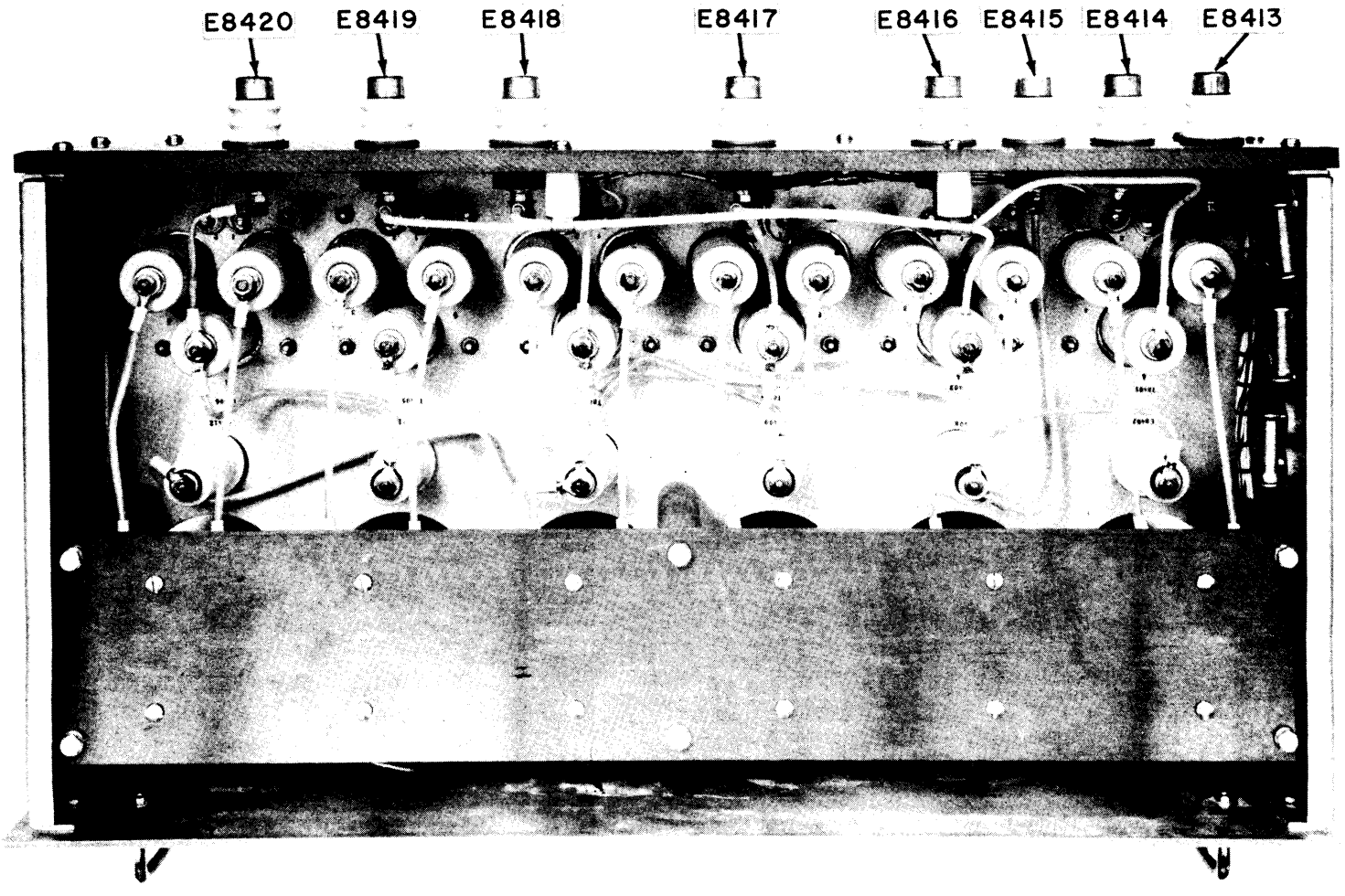


Figure 4-5-3. Bottom View with Callouts, High Voltage Rectifier Drawer, GPT-40K

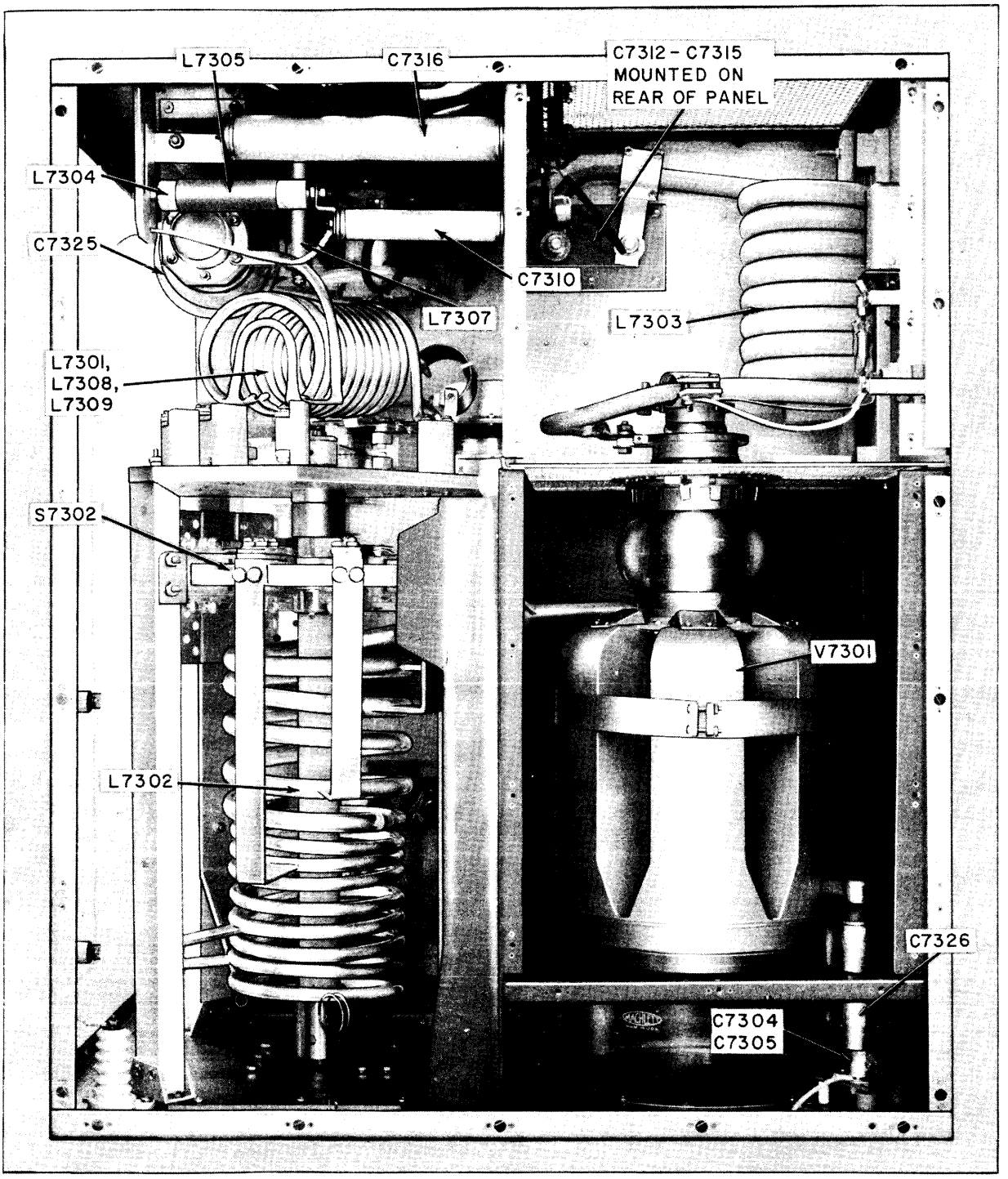


Figure 4-5-4. Rear View with Callouts, PA Capacitor/Coil/Gear Train Compartment, GPT-40K

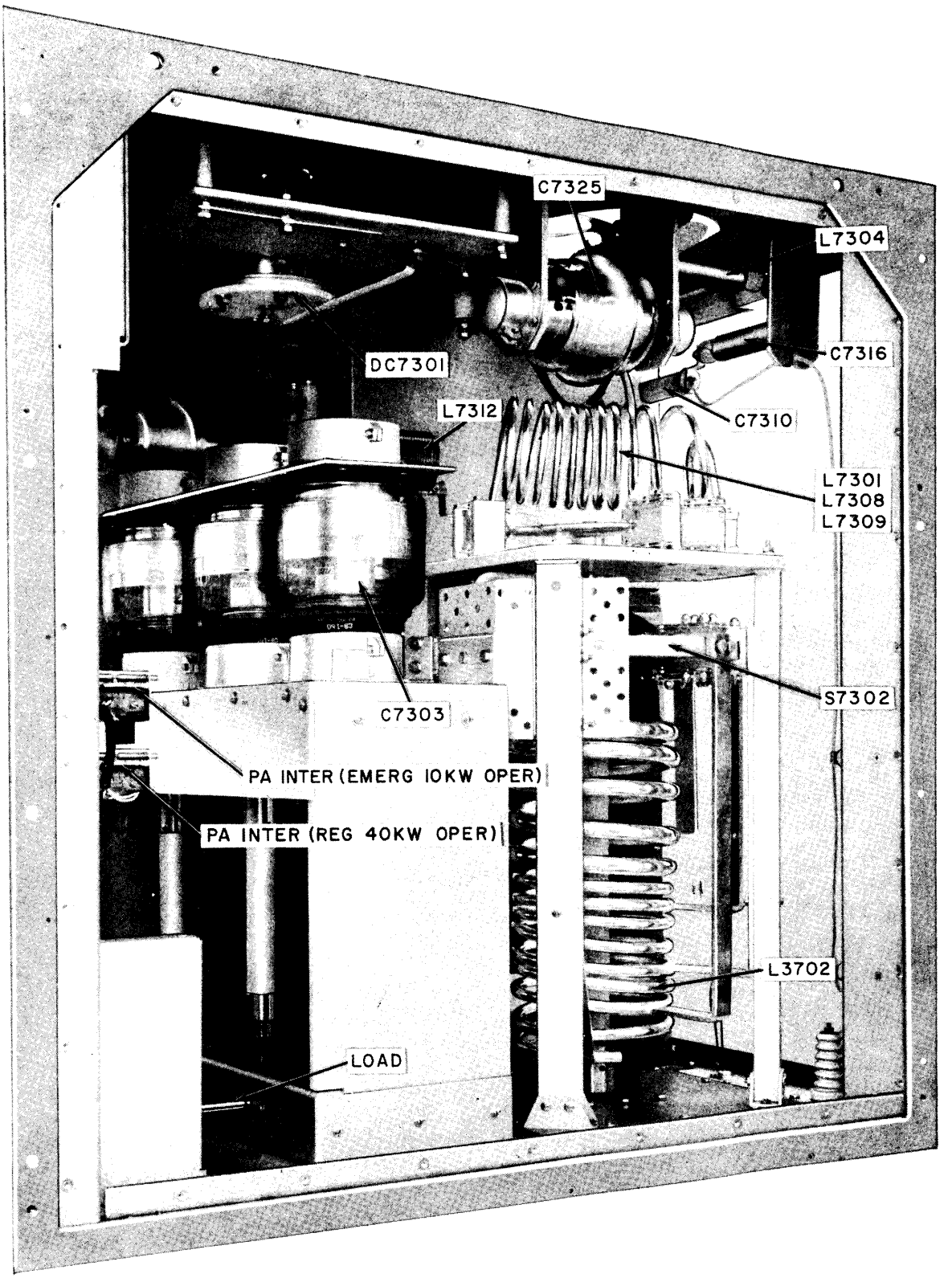


Figure 4-5-5. 135-Degree Angle Side View with Callouts, PA Capacitor/Coil/Gear Train Compartment, GPT-40K

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

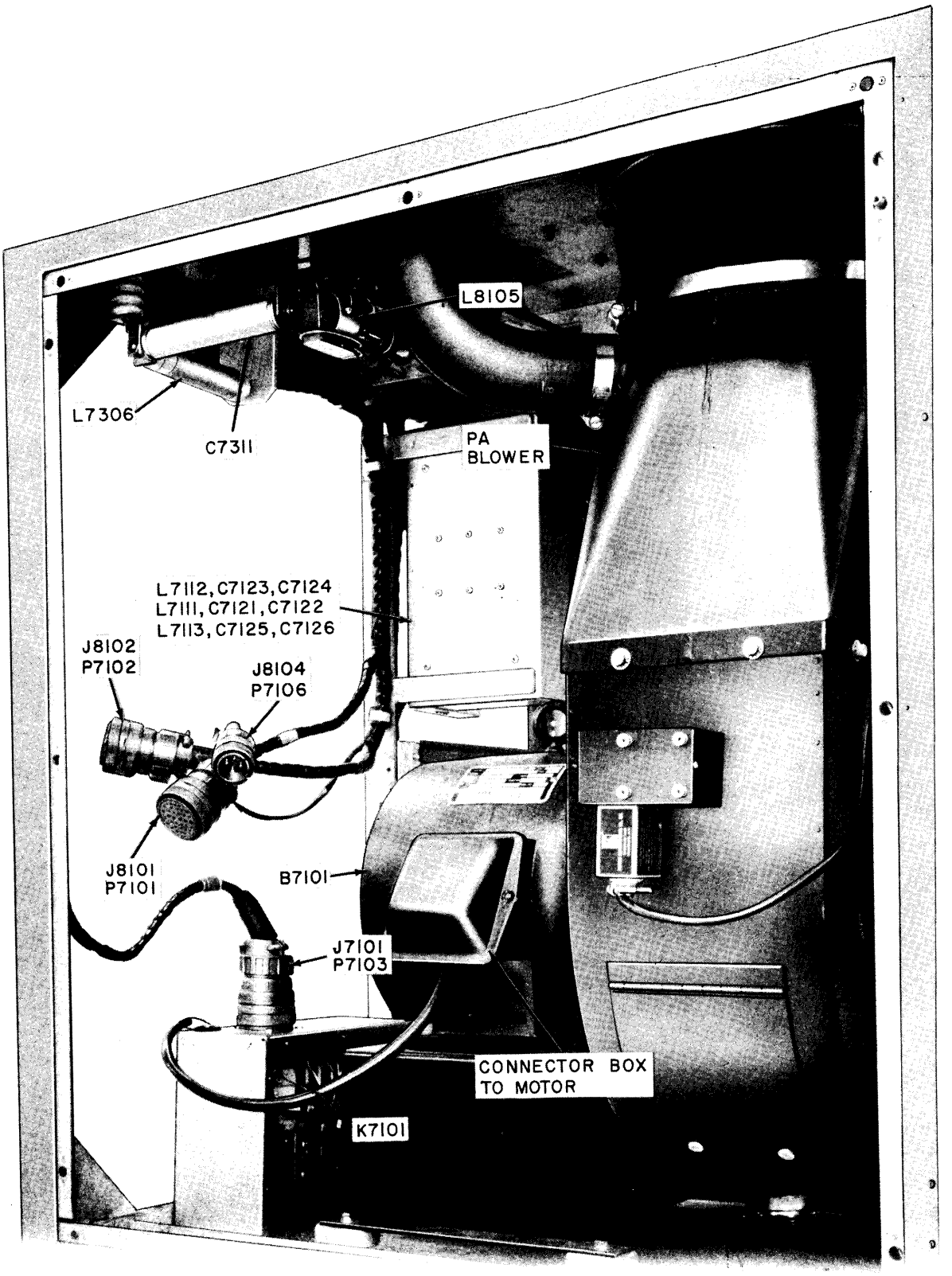


Figure 4-5-7. Rear View with Callouts, PA Blower Compartment, GPT-40K

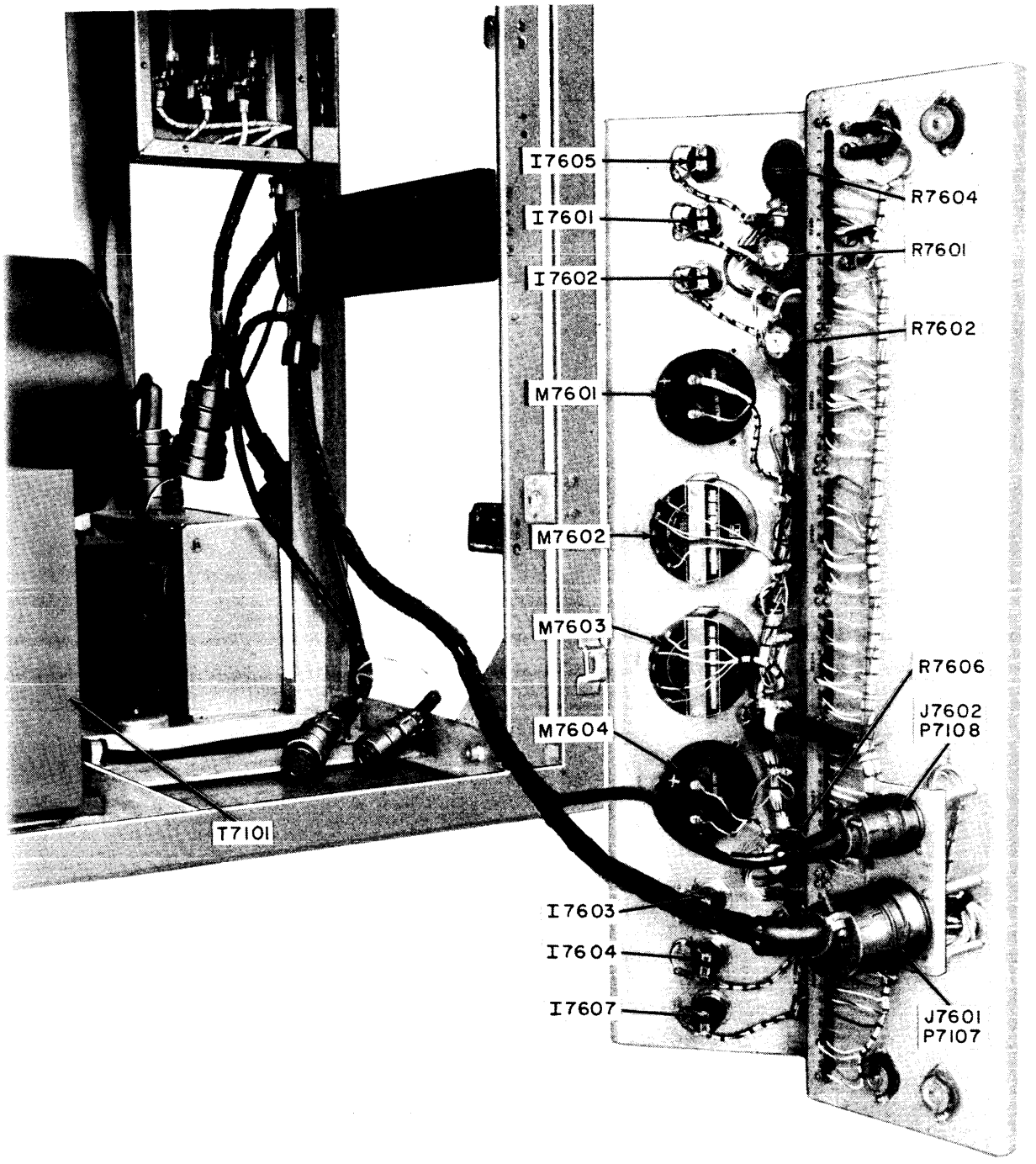
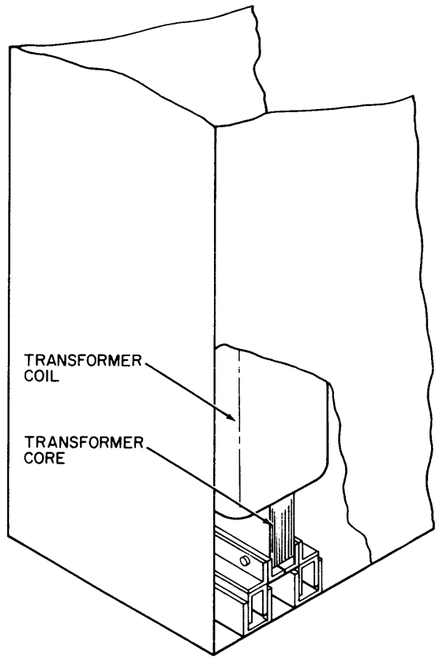
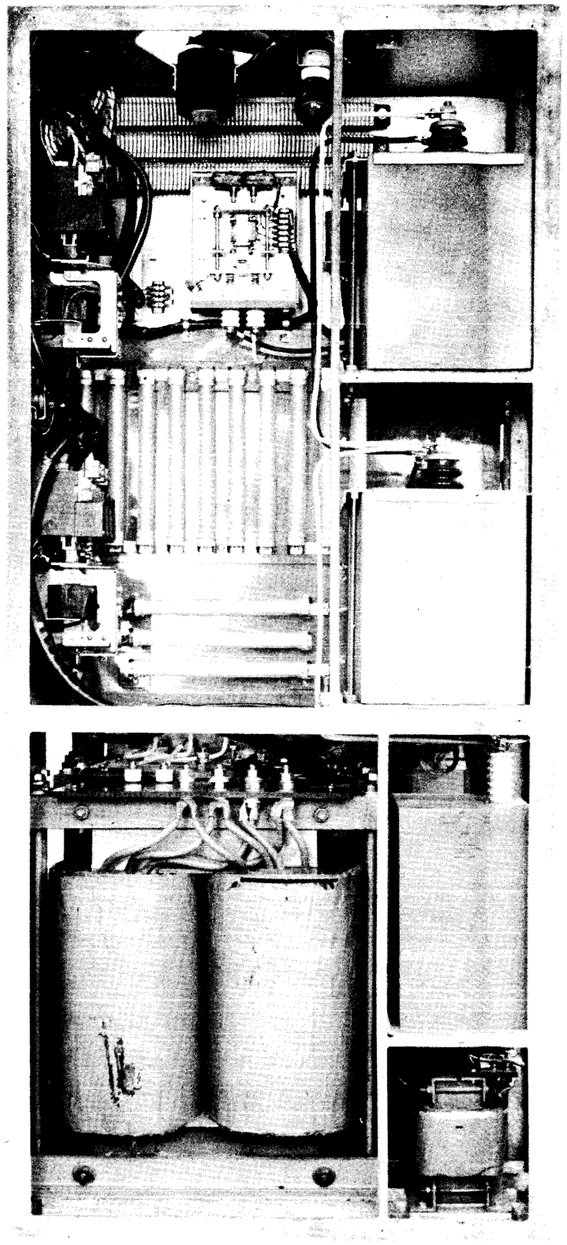


Figure 4-5-8. Rear View with Callouts, Indicator Control Panel, GPT-40K





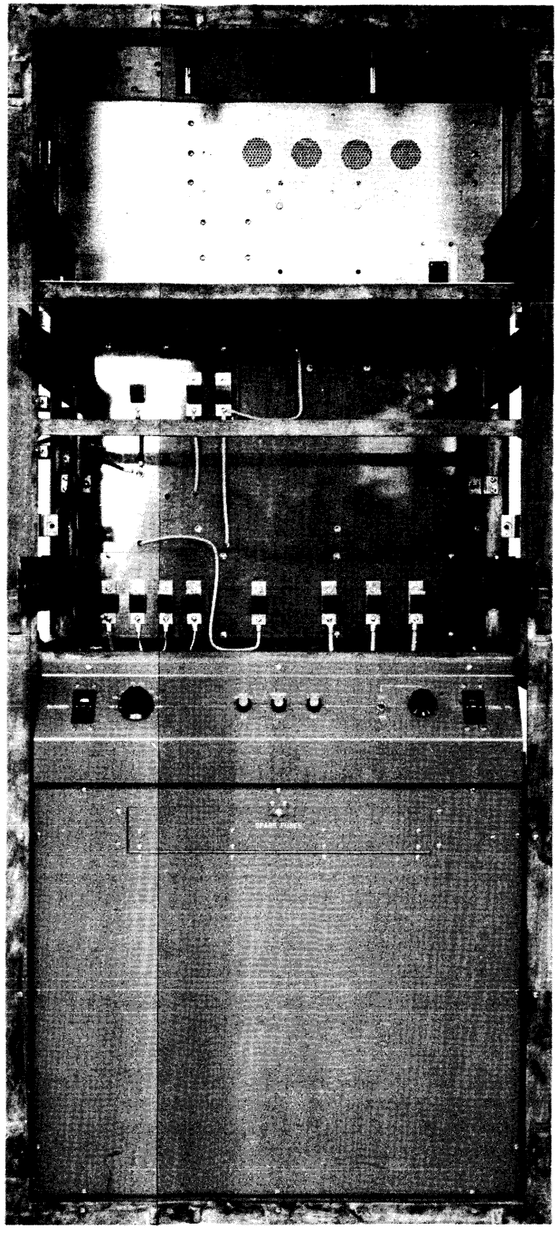
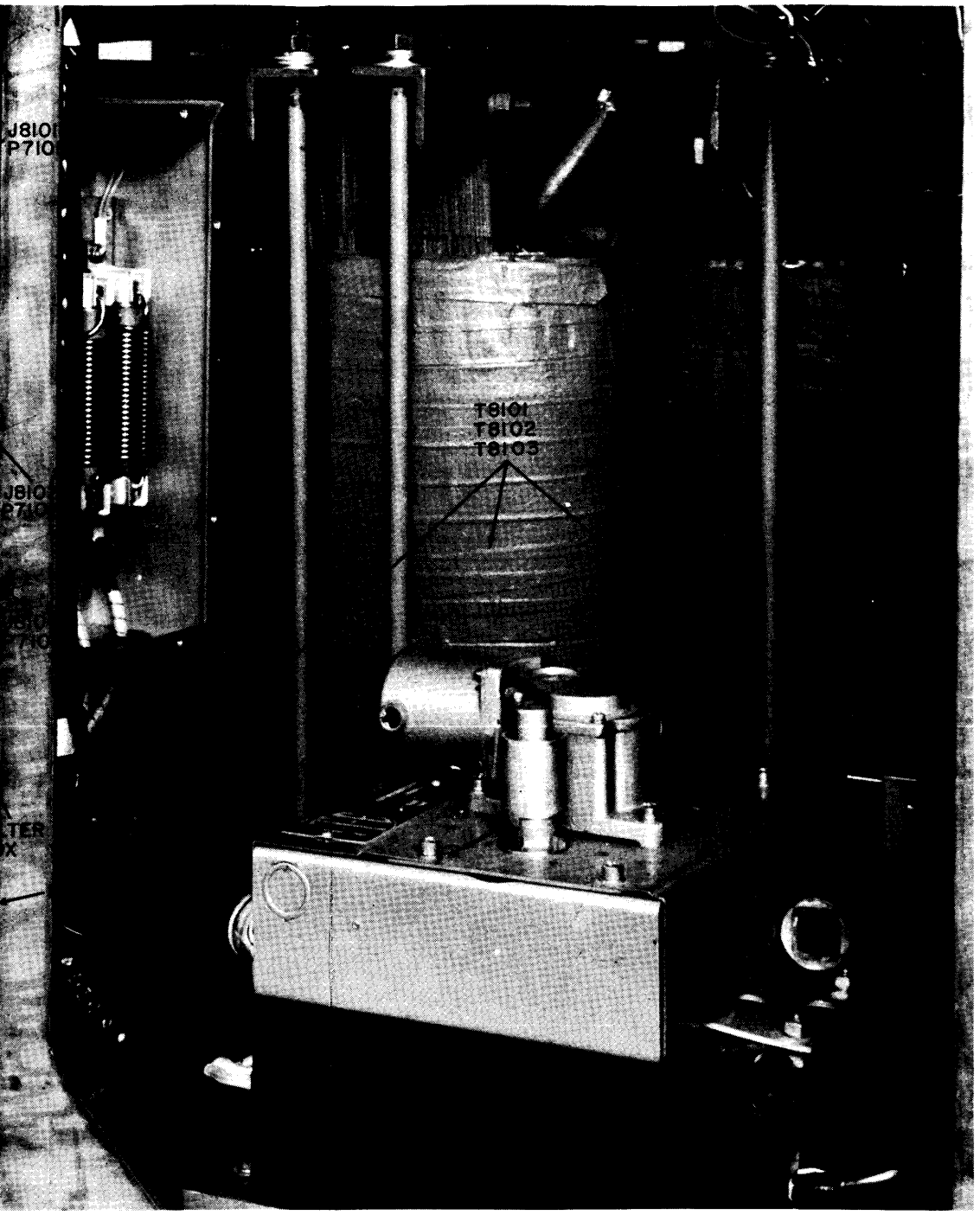


Figure 4-5-9. Rear View with Callouts, Fourth Frame, GPT-40K



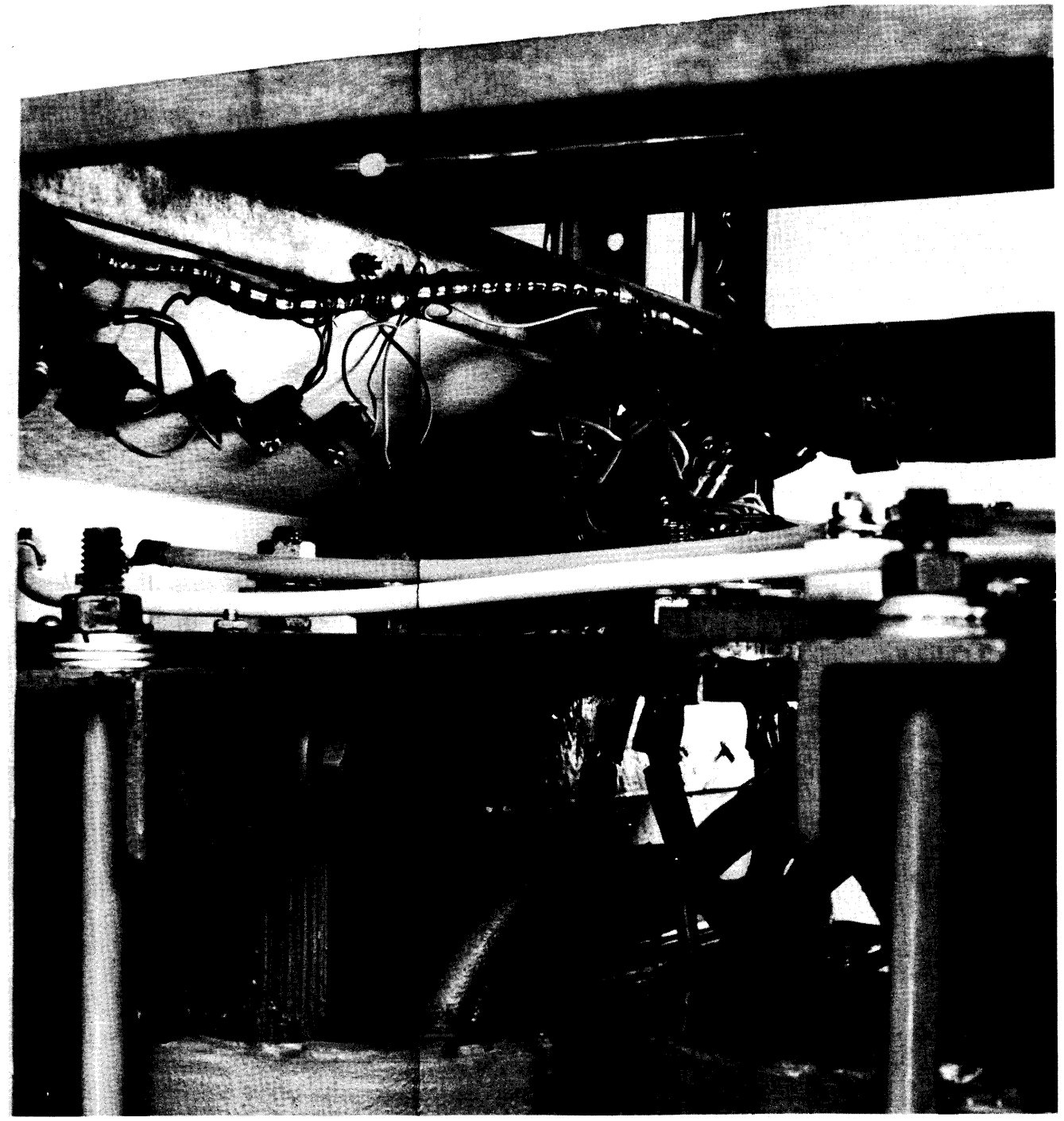
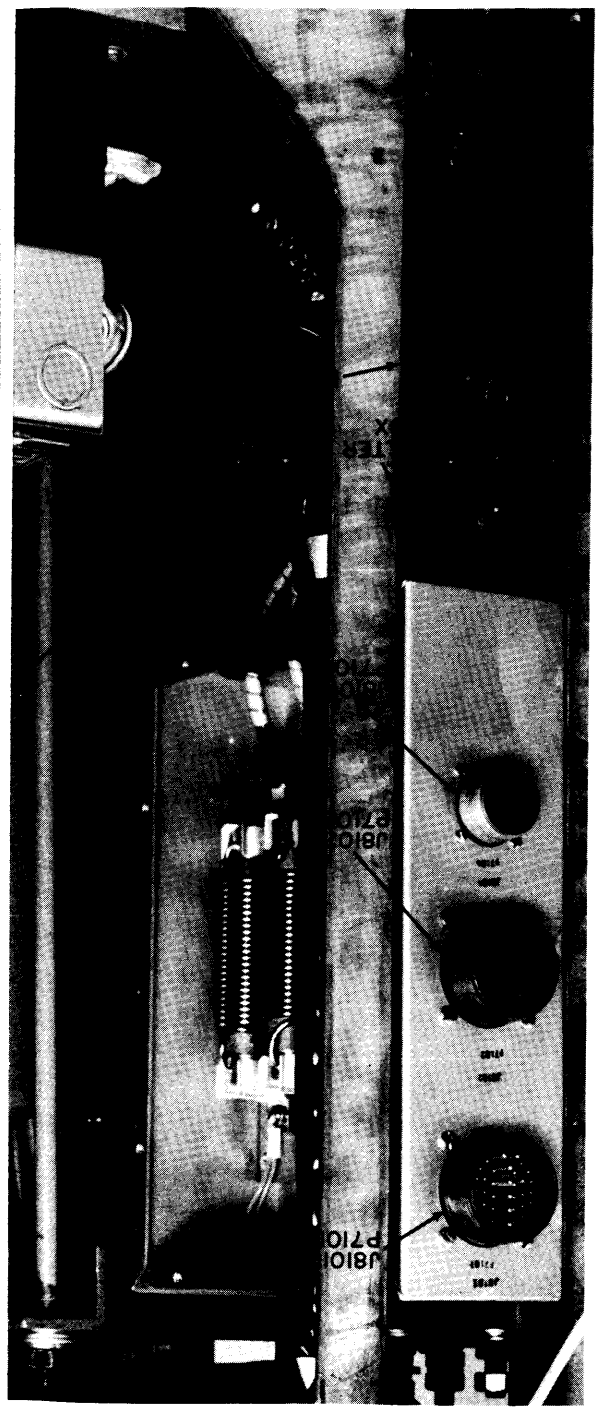


Figure 4-5-10. Right Side View with Callouts, Main Transformer and Motorized Circuit, GPT-40K



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 noncomplex 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 cyclss 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	—
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

Relay	Nomenclature	Terminal	Resistance (in ohms)	Pileup	Contacts	60 cps or DC Adjustment	
						Operate	Nonoperate
K7606	DRIVER INTER-LOCK	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 FILA-MENT	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	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 - PRELIMINARY CONSIDERATIONS.

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-40K 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(40)'s interlock system.

d. GPT-40K TYPE TESTS

It is convenient to divide GPT-40K's tests into three categories, namely tests on exciter (auxiliary) frame, tests on 10 KW driver frame when supplied with excitation from exciter frame, and tests on 40 KW amplifier/power supply frames when supplied with excitation from 10 KW driver frame.

e. PART I - TESTS OF GPT-40K's AUXILIARY (NON-SYNTHESIZED) AND EXCITER (SYNTHESIZED) FRAME

(1) PRELIMINARY CHECKS AND CONSIDERATIONS

All units in the auxiliary rack must be tested and approved separately before installation as a sysstem. After installation, all units must be checked for proper interconnection and proper terminations of inputs and outputs.

See following items (2) through (11) and their subdivisions for recommended tests on GPT-40K's auxiliary (non-synthesized) and exciter (synthesized) frame.

(2) MECHANICAL AND ELECTRICAL INSPECTION.

WARNING

NO POWER ON GPT-40K EXCEPT WHEN SPECIFIED.

Give the rack a good visual inspection Check routing of cable to see that no strain exists when units are pulled out and tilted. Check slides for ease of operation.

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.

Make the following electrical inspection:

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

(b) Check 115-volt single phase circuits in auxiliary frame for possible shorts to ground.

(c) Check high voltage feed to plate and screen of power amplifier socket for possible shorts to ground.

NOTE

Check that the high voltage shorting switch S801 is open for this check and that SCREEN resisters approximately 35,000 ohms, and PLATE, approxi- 100,000 ohms.

Make the following auxiliary frame checkout on an non-synthesized GPT-40K transmitter.

(a) Place auxiliary circuit breaker in ON position, turn power on all equipment in auxiliary frame and allow a 10-minute warm-up.

(b) 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.

Make the following exciter frame checkout on a synthesized GPT-40K transmitter.

(a) Place POWER/STANDBY (CPP-2) in ON; POWER indicator lights.

(b) Place B+ (TIS-3) in ON; B+ indicator lights.

(c) Place EXCITER (TIS-3) in LINE.

(d) Place ON/STANDBY (CSS-1A) in ON; POWER indicator lights.

(e) Place SYNC (CLL-1) in OFF.

(f) Place OPERATE/CAL (CMO-1) in CAL.

(g) Place POWER (CHG-1) in ON) Dial lamps and Oven.

(h) Place B+ (CHG-1) in ON) indicator light.

(i) Place ON/OFF (CBE-1) in ON; POWER indicator lights.

Steps (a) through (i) indicate a recommended turn-on porcedure. From a cold start the rack should have a warm-up time results under STANDBY operation during idle periods. Observe that the exciter frame fan is operating and that removing fuse F3000 at the rear of the frame should make the fan inoperative.

(3) SETTINGS OF EQUIPMENT UNITS ON AUXILIARY FRAME OF NON-SYNTHESIZED GPT-40K TRANSMITTER AND MEASUREMENT OF FSA INHERENT DISTORTION

(a) FSA Controls:
IF ANTENN - 20 DB
SWEEP WIDTH SELECTOR - 7.5 KC
AMPLITUDE SCALE - LOG
GAIN - maximum
CAL OSC LEVEL - OFF
AFC -OFF

(b) MCP Controls:
ANALYZER MONITOR - TEST
VOX RF OUTPUT - FSA

(c) TTG Controls:
RF TONE SELECTOR - TWO TONE

(d) VOX Controls:
BAND - MCS - 2-4 mc
TUNING - 2.5 mc
Counter - 2.5 mc
METER - HFO
HFO - ON
ZERO BEAT - OFF
Output approximately 0.1 volt.

After a 1/2 hour warm-up period, check VOX's 2 and 4 mcs ends for calibration. If necessary adjust the high and low end trimmers to bring the ends on frequency. Check the HFO output on each band from 2-64 mc. Check the zero beat indicator for proper operation both visual and audible.

(e) 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 ANTENNUATOR switches as needed to fill the FSA graph. Turn IF ATTEN switch to 0 DB. FSA inherent distortion should be better than 60 db in order to serve as a satisfactory indicator of GPT-40K's distortion.

(4) SETTINGS OF EQUIPMENT UNITS ON AUXILIARY FRAME OF NON-SYNTHESIZED GPT-40K TRANSMITTER AND MEASUREMENT OF SBE INHERENT DISTORTION.

(a) SBE CALIBRATION

(1) Place the following cyrstals in the MF crystal oven:

MF xtal Pos. 1, 2250 KC
MF xtal Pos. 2, 3250 KC
MF xtal Pos. 3, 4250 KC

(2) Switch the METER SW to the calibrate position and zero the meter.

(3) Place MF XTAL SW in position 3 and turn carrier insertion to approximately 5.

(4) Turn EXCITER switch ON and set METER SW to MF position.

(5) Tune the MF TUNING for a peak on the meter. The MF dial reading must correspond to the xtal frequency.

(6) Repeat this procedure for 2250 MC and 3250 MC to check each extal and dial calibration.

(7) Switch METER SW to RF.

(8) Rotate the output control to full clockwise. Check following frequencies using the tune-up procedure for the SBE:

A) 4 MC
B) 8 MC
C) 16 MC
D) 28 MC

(b) SBE SWITCH SETTINGS FOR DISTORTION MEASUREMENT

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

(c) MCP Controls for Distortion Measurement
VOX RF OUTPUT - FSA
ANALYZER MONITOR - SBE
CHANNEL 1 - TONE INPUT
CHANNEL 2 - LINE 2 INPUT
MODE - SSB
SBE VMO INPUT - OFF

(d) VOX Controls for Distortion Measurement
BAND - MCS - 4-8 Mc
TUNING - 2.250 mc
Counter - 2.250 mc
Output approximately .1 volt

(e) TTG Controls for Distortion Measurement
AUDIO TONE SELECTOR - TWO TONE
AUDIO OUTPUT - half turn clockwise
RF TONE SELECTOR - OFF

(f) SBE DISTORTION TEST
USB GAIN - 3db (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 item (3) (4) above
Two-trace 2 kc apart (approximately) should appear on oscilloscope (on FSA)
Antennuate 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.

(5) SLM CALIBRATION - NON-SYNTHESIZED GPT-40K TRANSMITTER.

(a) Adjust SBE audio level to -3 db.

(b) Calibrate USB on SLM for -3 db.

(c) Repeat above procedure for LSB.

(6) SBE SIDEBAND REVERSAL CHECK - NON-SYNTHESIZED GPT-40K TRANSMITTER

(a) Set the LSB SW to channel 1; set the LSB Audio Gain Control to the midway position.

(b) Set the METER SW to the LSB position. Observe reference meter reading.

(c) Check for sideband reversal by switching OUTPUT TUNING (RF band) from the 2-4 to the 4-8 bands. The USB and LSB Audio levels on the SLM must reverse.

NOTE

When item (c) is performed to the meter reads 0 with meter switch in the LSB position but reference reading (item b) with meter switch in the USB position.

(7) SBE TONES CHECK (AUDIO AND RF) - NON-SYNTHESIZED GPT-40K TRANSMITTER

(a) With TTG's controls set for two-tone output and MCP's controls for tone in on channel 2, turn the LSB switch to OFF; set the USB switch to channel 2; turn the USB Audio Gain Control to the midway position; turn the METER SW to USB.

(b) Set the USB audio level to 0 DB and turn the SBE output control midway. Tune the SBE for output of 2.0 MC. Tune the VOX to 2.5 MC. Adjust the VOX's output for approximately .1 volt.

(c) Adjust the frequency of the VOX to place the two tones in the center of the FSA scope; set IF Attenuator switch to 20 DB. Adjust the level with the input Attenuator to 0 DB. Equalize the tone levels with the TTG audio level controls. (VOX's frequency must be 500 KC greater than SBE's frequency.)

(8) SBE CW KEYING - NON-SYNTHESIZED GPT -40K TRANSMITTER

(a) Tune SBE to any output frequency.

(b) Connect output of a square wave generator to terminals 5 and 6 of terminal board E3000 on the rear center shield panel.

(c) Set the AK-100 located on the top rear of the auxiliary frame in 50-v keying position.

(d) Set mode switch on the MCP to SBE CW.

(e) Increase the output of the square wave generator to 50 V.

(f) The RF output level of the SBE should vary with a variation of frequency of the square wave generator.

(9) EXTERNAL CONNECTION ON REAR PANEL - NON-SYNTHESIZED GPT-40K TRANSMITTER

(a) Connect an audio generator set having 2000 cycles output to terminals 28 and 30 on terminal board E3000. By placing channel 1 on the MCP to line 1 check for an audio indication on SBE channel 1, USB and LSB.

(b) Connect audio generator output to terminal 32 and 34 on terminal board E3000. Check for an audio indication on SBE channel 2, LSB and USB.

(c) Push to talk terminal 21 on terminal board E3000 should read approximately 820 ohms to ground.

(d) Squelch terminal 26 on terminal board E3000 should read 5000 ohms to ground.

(e) Xmtr ON-OFF terminal 25 on terminal board E3000 should be grounded with operation of the Xmtr ON-OFF switch on the SBE.

(10) FUSE PROTECTION - NON-SYNTHESIZED GPT-40K TRANSMITTER

In every fused unit in auxiliary rack pull out fuses one at a time. Check to see each unit is de-activated and that fuses are of proper rating.

(11) SETTINGS OF EQUIPMENT UNITS ON EXCITER FRAME OF SYNTHESIZED GPT-40K TRANSMITTER AND RECOMMENDED OBSERVATIONS

In the synthesized GPT-40K transmitter, an external portable test unit, knows as RF Spectrum Analyzer Model PTE-3, is used to evaluate the GPT-40K's exciter frame's performance. Technical Manual for RF Spectrum Analyzer Model PTE-3 presents complete operating, calibrating, and other data pertaining to PTE-3's overall system and individual unit usages

Section 3 of Part I of Volume II of Technical Manual for Sideband Generator Models SBG-1, -2 presents a complete turn-on procedure for the GPT-40K's exciter frame.

FSA's inherent distortion is determined in the same manner as ascertained for the auxiliary frame of the non-synthesized GPT-40K transmitter. In the synthesized GPT-40K transmitter case, the procedure concerns the FSA, VOX, and TTG component units of the PTE-3.

In the non-synthesized GPT-40K transmitter case, inherent distortion at output to SBE unit is measured by supplying the SBE with TTG's two tones and observing FSA's presentation due to SBE's output voltage. The procedure for doing this is presented in preceding paragraph (4). In the synthesized GPT-40K transmitter case, inherent distortion at the output of CHG unit is measured by supplying CBE with TTG's two tones and observing FSA's presentation due to CHG's output voltage. The procedure for doing this is analogous to that for the non-synthesized transmitter case.

f. PART II - TESTS ON GPT-40K's 10 KW DRIVER FRAME

The following tests and/or checks should be made with GPT-40K's 10 KW driver frame in the following REFERENCE condition unless otherwise stated:

Place the GPT-40K's OUTPUT LOADING selector switch S903 in the EMERGENCY position and connect GPT-40K's 10 KW output to an external 50-ohm unbalanced load via GPT-40K's unbalanced antenna outlet. Tuning and loading tests should be made as follows:

Selector Switch S903	Test Frequencies
Emergency Position	All
Tune Position *	4, 8, 15, and 28 mc

* Do not drive output over 5 amperes RF to prevent overheating of the internal dummy load resistors.

(1) MECHNICAL INSPECTION.

(a) Check all switches on the PA frame for proper operation.

(b) Check PA tune, PA load, output load and output balance controls for a counter reading of 000 corresponding to minimum capacitance.

(c) Check to see that band switch counter reading corresponds to proper bandswitch position.

(d) Carefully inspect the IPA and PA bandswitches for good mechanical fit.

(e) Check for loose fuse holders.

(f) In the IPA and PA sections, check for obvious miswiring and loose connections.

(g) Check the power supply for loose connections and correct value of parts.

(2) PREMINARY ELECTRICAL INSPECTION.

(a) Check for short circuits to ground:
- (i) 3 input phases should read open circuit to ground.
- (ii) B+ to ground should be approximately 100, 000 ohms.

(b) The following units must be checked for proper termination:
- (i) Relay panel
- (ii) Bias drawer
- (iii) IPA drawer

(c) Check complete unit for proper fusing.

(d) Check that the PA output circuit is strapped for unbalanced output.

(e) TURN ON main power: The main power indicator light must go on.
- (i) Check for proper rotation of the main blower (arrow on blower housing points clockwise; if blower turns counterclockwise reverse two phases on 10 KW input leads) and the rear fan.
- (ii) Remove the rear fan fuse, the fan must go off.
- (iii) Remove any two main blower fuses simultaneously, the main blower must go off.
- (iv) Removal of the PA filament fuse must remove the PA filament voltage.
- (v) Removal of the timer fuse must deactivate the timer.
- (vi) Removal of the six (6) high voltage rectifier filament fuses must remove filament voltage.
- (vii) Removal of the IPA blower fuse must stop the blower.
- (viii) Removal of the IPA filament fuse must remove filament voltage from the TV-100 (PA-172 socket).
- (ix) Removal of the IPA L. V. fuse must remove AC power from the low voltage power supply.
- (x) Removal of the IPA bias fuse must remove the bias voltage and de-activate the IPA bias relay.
- (xi) Removal of the B+ fuse must remove the IPA high voltage.
- (xii) The filament primary meter must read the AC filament primary voltage and the filament adj. control must vary this reading.
- (xiii) The PA bias meter must read between -200 to -300 volts DC and be adjustable by use of the PA bias adjust control on the relay panel.
- (xiv) Unlatch the following relays: 1) PA Plate, 2) PA Screen, 3) IPA Plate, 4) IPA Screen. The corresponding indicator lights must light. By pushing the reset button on main control panel the lights must go out and the relays must reset.
- (xv) The tune-operate light must correspond to the position of the tune-operate switch on the main control panel; also the tune-operate relay on the relay panel must energize and de-energize.
- (xvi) Activating the PA screen switch must turn on and off the PA screen relay.
- (xvii) The filament elapsed time meter must indicate when filaments are on.
- (xviii) Check the time delay for proper operation and interval.
- (xix) The plate elapsed time meter must work only when the high voltage is on.
- (xx) With the alarm switch on the alarm must sound except when the high voltage is on.

(3) INTERLOCK SYSTEM.

Preliminary operations are as follows:

(l) Place the alarm switch on the relay panel to the ON position.

(m) Mechanically de-activate the following relays:
- (i) PA Plate overload
- (ii) PA Screen overload
- (iii) Zener Protect overload
- (iv) IPA Plate overload
- (v) IPA Screen overload
- (vi) Bias relays (by removal of respective bias fuses). In de-activation of each of the above relays the high voltage must go off and the alarm must sound.

(n) The plate elapsed time meter must be indicating.

(o) Turn the high voltage switch to the OFF position.

(5) PARASITIC CHECK

(a) Set the IPA and PA band switches to the 24-28 mc band.

(b) Set the PA loading capacitor to 000.

(c) With no drive, turn on GPT-10K's high voltage and main power circuit breakers.

(d) Rotate the PA tune capacitor from 000 to maximum capacitance, there must be no indication on the PA plate RF meter.

(e) Turn off GPT-10K's high voltage and main power circuit breakers.

(6) OVERLOADS

(a) PA PLATE OVLD ADJ
- (i) Tune the transmitter to full output on 2.0 MC as per tuning chart.
- (ii) Overload the transmitter output by increasing the output loading.
- (iii) Retune the PA and increase the SBE/CHG output.
- (iv) Adjust the PA PLATE OVLD ADJ to trip at 2 amperes. Record this reading.

(b) PA SCREEN OVLD ADJ
- (i) Tune the transmitter to full output.
- (ii) Under-load transmitter by decreasing the PA output loading.
- (iii) Increase the output of the SBE/CHG to increase the screen current.
- (iv) Adjust the IPA SCREEN OVLD ADJ to trip at 80 ma.

(c) IPA PLATE OVLD ADJ
- (i) Adjust to trip at 600 ma by using the same procedure as for the PA PLATE OVLD ADJ.

(d) IPA SCREEN OVLD ADJ
- (i) Adjust to trip at 30 ma by using the same procedure as for the PA SCREEN OVLD ADJ.

(e) With the transmitter fully loaded turn on the ALDC. The transmitter output must decrease with an increase in ALDC control voltage without degradation of the distortion specifications over the full range of the ALDC control.

(7) DISTORTION SPECIFICATIONS AND CHECKS

Balanced output two tone test:

(a) Full power distortion 35 db (2.9 amps. into 600 ohm load).

(b) Half power distortion 40 db (2.1 amps. into 600 ohm load).

Unbalanced output two tone test:

(a) Full power distortion 35 db (8 amps. into 70 ohm load).

(b) Half power distortion 40 db (6 amps. into 70 ohm load).

These checks must be made at each frequency indicated on the tuning chart for balanced and unbalanced operation.

(a) Switch the analyzer to the IPA position and check the distortion.

NOTE

By slight reloading and retuning of the IPA and PA distortion can be improved.

(b) Switch the analyzer to the PA position and check the distortion.

(8) GENERAL TUNING/LOADING PRECAUTIONS

(a) Check that transmitter's output is connected to a 50-ohm unbalanced or a 600-ohm balanced load. The loads should be connected to GPT-40K's third frame (50-ohm) or fourth frame (600-ohm) antenna ouptuts.

(b) Tune the exciter in the auxiliary and test equipment to test frequencies and safe levels.

(c) Set the transmitter tuning and loading controls as per the tuning chart.

NOTE

Figures may vary from transmitter to transmitter due to lead length, minimum capacitance setting and various other settings. The chart serves as only a tuning aid for the tester and/or operator.

(d) Reduce the auxiliary frame's output to minimum to prevent the screen overload from activating.

(e) The PA tube must never be driven beyond .75 amperes plate current unless plate circuit is tuned with an indication of PA plate RF.

(f) The IPA plate current must never be driven beyond 300 ma unless the IPA plate circuit is tuned.

(9) INTERMEDIATE POWER AMPLIFIER TUNING

(a) Switch the high voltage off.

(b) Set the multimeter switch to the 1st amplifier position.

(c) Advance the SBE/CHG output control approximately one-quarter turn.

(d) Vary the 1st amplifier tuning for a peak on the multimeter.

(e) Set the multimeter to the IPA Eg position.

(f) Vary the IPA. Grid tuning for a peak on the multimeter.

(g) Reduce the SBE/CHG output to minimum.

(10) OUTPUT TUNING

NOTE

Numerical values given below apply specifically when transmitter's output is connected to a 70-ohm unbalanced load.

(a) Turn the high voltage on.

(b) Advance the SBE/CHG output to a point where the IPA plate current is approximately 300 ma when TUNE-OPERATE switch is in OPERATE position.

(c) Vary the IPA tune control for a dip in the IPA plate current.

(d) The above step must increase the PA plate current.

(e) Vary the PA tune control for a dip in PA plate current.

(f) Advance the SBE/CHG output to a PA plate current of 1.4 amperes. Reload and retune the IPA for a plate current of 300 ma.

(g) Retune and reload the PA for a reading of 8 amperes on the RF output meter.

(h) The PA screen current is a good tuning indicator:

(i) Transmitter under-loaded. Screen current is over 10 ma.
(ii) Transmitter over-loaded. Screen current will show little or no indication.
(iii) Proper tuning and loading is indicated when screen current is approximately 10 ma for full output.

(i) The normal indications of a properly loaded transmitter at full output are:
(i) PA plate RF 3.0 to 5.5 KV.
(ii) PA plate current 1.2 to 1.5 amperes.
(iii) PA screen current 10 ma.
(iv) RF output 8 amperes.
(v) PA plate voltage 6.5 to 7.5 KV.
(vi) PA screen voltage 1200 VDC.
(vii) IPA plate current 250-350 ma.

(j) Check all test frequencies on the tuning chart and record all information.

(k) Turn the high voltage off.

(11) BALANCED ANTENNA OPERATION

(a) Strap the PA output circuit for 600 ohm balanced output.

(b) Connect the transmitter to a 600 ohm balanced load.

(c) Tuning procedure is the same as for a 70 ohm unbalanced load except for the balanced and the control which equalizes the line currents and the output load control which are necessary for impedance matching. Load current should be 3 rather than 8 amperes.

(d) Record all information on the tuning chart.

g. PART III - TESTS ON GPT-40K's 40 KW PA/PS FRAME

(1) NO POWER ON PA(40K).

Before the 10 KW driver and 40 KW amplifier are combined and power lines are connected, the following checks must be made:

(a) Measure 3-phase inputs to ground for shorts.

(b) Place an insulated spacer under the shorting relay to open and check the insulation of the 12 KV DC bus (plate of ML-6697) to ground. It should be approximately 180,000 ohms. Check the shorting relay, making sure that connections short both sides of the high voltage capacitors to ground.

(c) Check the insulation of the B- bus to ground; it should be approximately 3000 ohms. Remove high voltage connections on the bias supply; the insulation of the C-bus to ground should be infinite.

(d) Check proper action of GPT-10K's BAND-SWITCH S900. Turn the switch step-by-step throughout its entire range. At each step check that GPT-10K's pi network coils L901 and L902 contain the proper windings. Also the switch contacts are good, electrically and mechanically.

(e) Interconnect 10K and 40K units.

(f) Connect 3-phase inputs to the 40 KW amplifier (200 ampere lines).

(g) Strap the 40 KW PA output for unbalanced output and connect 40 KW unbalanced load to the output of the PA amplifier.

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

(i) Check that PA BAND SW counter corresponds to the PA proper bandswitch position.

(j) Check that the counter for the BALANCE capacitor reads 000 when the capacitor is at minimum capacitance.

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

(2) CONTROL CIRCUIT SETTINGS AND CHECKS

(a) Set PA (40K)'s FINAL FILAMENT circuit breaker CB8502 to ON.

(b) Set PA(40K)'s BLOWER circuit breaker CB8501 to ON.

(c) Set PA(10K)'s MAIN POWER circuit breaker CB1000 to ON.

(d) Turn PA(10K)'s OUTPUT LOADING selector switch S903 to OPERATE.

NOTE

Ensure that the PA(10K)'s AC POWER light goes on and that PA(10K)'s meters go on in PA and power supply frame.

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

(f) Set PA(40K)'s RESERVOIR FILAMENT switch S8301 to FILAMENT; note that the CROWBAR FILAMENT meter reads 6.3 volts.

(g) Set the PA(40K)'s RESERVOIR FILAMENT switch to RESERVOIR and adjust voltage to the right voltage (see stamped voltage on bottom of thryatron).

Check the following:

(i) The PA's light should go on and off by switching PA light ON/OFF switch S7403 on the 40 KW control panel.

(ii) The main HV breaker CB7402 should go on and off with main power breaker CB7401.

(iii) Push the HV breaker reset; the HV breaker should reset.

(iv) The bandswitch release should energize the bandswitch solenoid releasing the bandswitch stop (see preceding item d).

(v) Unlatch the plate, grid overload, retune, and SWR relays. Pushing the overload reset should reset the relays.

(vi) Set the blower delay timer to approximately 1/2 minute. Turn on the blower breaker CB8501. Check the blower for proper rotation (CW from the blade end). Also check the PA and power supply fans for proper rotation. Turn the main power breaker CB7401 off. The main blower B7101 should stay on and blower delay time should start operating; when it gets to zero the blower should stop and the timer should de-activate. Set the blower delay timer at 3 minutes for normal operation.

(vii) Turn the FINAL FIL breaker CB8502 off. The FINAL FILAMENT light I7607 on the relay panel should go on and the timer should reset.

(h) 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.

(i) 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).

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

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

(l) Adjust BIAS ADJ potentiometer supply so that the GRID VOLTS meter indicates 600 volts.

(m) 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.

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

(3) FUSE CHECKS

(a) Check all fuses for proper ratings.

(b) Remove the crowbar filament fuse F8301. The crowbar filament meter M8201 should stop indicating. The timer should also de-energize.

(c) Remove the HV rectifier fuses F8401 through F8406 one at a time. The filaments should go out.

(d) Remove the meter light fuse F8503 (P/S control panel). The meter lighting should go out.

(e) Removal of the breaker motor fuse F8502 (P/S control panel) should render the breaker motor inoperative.

(f) Removal of the interlock fuse F8501 (P/S control panel) removes the voltage from the interlock and the interlock system. (Make sure the 10 KW switch mode is in the operate position.)

(g) Remove the bias supply fuses F7501 through F7503 one at a time. The associated voltages should be disabled.

(h) Remove the following fuses in the relay panel:
- (i) The Blower contactor fuse F7606 should de-activate the blower.
- (ii) The blower delay F7602 should de-activate the blower delay timer.
- (iii) The time delay fuse F7604 should de-activate time the delay.
- (iv) The removal of the top fan fuse F7601 should stop the top fan.
- (v) The removal of the shorting relay fuse F7605 should make the solenoid inoperative.
- (vi) The removal of the elapsed time meter fuse F7603 should de-activate the meter.

(4) DEADMAN CHECKS

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

TIMER - remove TIME DELAY fuse
Open read 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 tuning the GPT-10K OUTPUT LOADING switch to TUNE or EMERGENCY; this should make the GPT-40K interlock system inoperative.

(5) INTERLOCK SWITCH CHECKS

(a) Turn the 10 KW mode switch to the TUNE position. On the PA front panel the tune indicator I7401 should light. The 40 KW external interlock position indicator I7404 on the main control panel should be out.

(b) Place the 10 KW mode switch to the OPERATE position. The 40 KW external interlock indicator I7404 on the main control panel should light.

(c) Turn the mode switch to operate and check the following interlocks. If all the following switches are closed, the interlock indicator I7401 lights as the interlock switch is turned to its 11 positions successively.
- (i) PA Compartment Cover
- (ii) PA Bandswitch
- (iii) Bias Drawer
- (iv) Relay Panel
- (v) Crowbar Drawer
- (vi) High Voltage Rectifier Drawer
- (vii) High Voltage Compartment Rear Door
- (viii) PA Compartment Rear Door
- (ix) Time Delay
- (x) Air Switch
- (xi) External

(d) De-energize each interlock one at a time. Interlock indicator should go out in each respective position. With the high voltage on each interlock should trip the high voltage breaker and de-energize the shorting relay. Check the air switch position by turning the main blower off.

(e) Successively trip the following relays.

PLATE OVLD
GRID OVLD
RETUNE
SWR
BIAS
DRIVER INTERLOCK
FINAL FILAMENT
CROWBAR

This should operate (deenergized) the high voltage contactors.

(f) Turn the interlock indicator switch to the exterme counterclockwise (external) position and check the following:
- (i) Switch the 10 KW mode switch from TUNE to OPERATE. The interlock indicator I7404 on the main control panel should light.

(ii) Indicator should remain on in all positions of interlock indicator switch S7404.

(iii) The high voltage shorting relay should be energized and the bias voltmeter should read approximately 550 volts. The red light on the rear of the power supply compartment should light.

CAUTION

NEVER TOUCH ANY EXPOSED PARTS OF THE TRANSMITTER UNDER ABOVE CONDITIONS. WHEN THE SHORTING RELAY IS ENERGIZED, +600 VOLTS D.C. FROM THE BIAS SUPPLY IS ON THE B- LINE. BE EXTREMELY CAREFUL WHEN WORKING ON THE BIAS SUPPLY WHEN THE POWER IS ON.

(6) FILAMENT ADJUST CHECK

(a) The filament adjust switch S8501 on the P/S control panel controls the AC inputs to the HV rectifiers, the crowbar filament, the PA filament and the bias supply. The "Filament Primary" meter M7201 on the meter panel monitors this voltage. The "Filament Primary" meter must be set up to read 230 volts by use of the filament adjust switch. The tap on the filament adjust switch used to attain this voltage will indicate the actual line voltage.

(b) Turn the filament adjust switch midway between two position to ensure that the crowbar, HV rectifier, bias supply and PA filament AC power goes off due to opening up the secondard of T8104. When this happens crowbar filament, PA filament, and PA bias meters should read zero. Furthermore the HV solenoids should be de-activated and the interlock circuit should open.

(7) RETUNE CHECK

(a) The purpose of the retune circuit is to protest the final tube from over-dissipation. The retune relay will trip with a plate current of 3 amps if there is no PA Plate RF.

(b) There is a fixed bias of +3 Volts DC on the retune DC amplifier, which will cause the relay tube to draw approximately 12 MA, which is enough current to make the retune relay trip. The retune relay is connected to the tube protect relay. This relay is set up for 3 amperes DC final current. When it trips it connects the retune relay into the circuit energizing the return relay. The PA plate RF is rectified in the meter circuit and this small DC voltage cancels out the fixed bias of 3 volts and the retune relay tube is held at cut off.

(c) Remove terminal 32 on terminal strip E7604 on the relay panel and place a milliameter in series with terminal 32. Energize (close) the tube protect relay by hand. Current should be approximately 10-15. MA. Remove the bias fuse F7502 from the bias supply. (This removes 3 volts bias from the retune tube). Now adjust R7522 (in the bias supply) for 1.5 MA. Replace the bias fuse and the current should go to 12 MA approximately. When tube protect relay is de-energized there should be no current.

(8) SWR CHECK

(a) The SWR overload is set by opening terminal 31 on terminal strip E7604 on the relay panel and inserting a milliameter Adjust R7526 (Bias Supply Drawer) for 1.6 MA. Set SWR OVLD adjust on front panel of bias supply to maximum.

(b) Before turning on the HV, check the timer (HV shorting), antenna tuner switch interlock, and the HV transformer for proper taps (208V).

(c) With all interlocks energized, the red bulb on the rear of the power supply should light. Place driver interlock switch on relay panel to ON position.

(d) Turn the HV on and after an 8 second delay the plate voltmeter should be approximately 12 KV.

(9) FINAL INTERLOCK CHECK

(a) Turn the 10 KW mode switch first to TUNE then to EMERGENCY. This should turn off the 40 KW high voltage. (See PLATE VOLTS meter).

(b) Turn the driver interlock switch S7601 on the relay panel to the ON position.

(c) Turn the 40 KW high voltage on. The driver indicator I7606 on the relay panel should go out. Switch the driver interlock switch to OFF. The 10 KW and 40 KW should stay on. Trip the 10 KW overload; all HV should go off. Keep in mind that before unit can be turned on again the driver interlock switch must be turned on first. Check all 40 KW overload relays to make sure they turn high voltage off. Check all interlocks to make sure they turn high voltage off. (See preceding paragraph (5)).

(10) TUBE PROTECT CHECK

The tube protect relay (K7608) must rtip at 3 amperes and must unlatch at 2.1 amperes. In order to accomplish this, a shunt R7608 is connected across the tube protect overload coil (K7608). Adjust the PA bias R7513 (bias drawer) for 3 amperes of DC plate current. Adjust the tube protect R7606 (relay panel)

to make the transmitter trip (mechanically overpower retune relay) at 3 amperes. To check unlatch current (2. 1 amperes) hold overload reset button; set bias for 3 amperes of DC plate current where relay trips. Reduce the bias and note the current reading at which the relay opens. If the current is less than 2. 1 amperes, turns must be removed from the shunt until it opens at 2. 1 amperes, this is to adjust for differences in relay characteristics.

(11) THERMOSTAT

Place a shunt across the terminals of the thermostat. The retune overload should go. (This is done with HV off and interlock open).

(12) RF TEST

Check the arrows on the directional coupler for proper direction. Before applying power set the residual plate current to 1. 75 amperes. Make sure all shields are on. Set retune overload adjust R7520 in bias supply drawer to maximum clockwise. Tune the transmitter to 4 mc using tuning chart. Before driving the final over 3 amperes, check the 10 KW and 40 KW tuning for proper dip. Power into the unbalanced load output is read directly in kilowatts (average power). Two-tone test full-power output should be 20 KW. Switch the SWR switch to calibrate. The RF output meter reading should go to zero and the SWR meter should indicate. Release the switch and read the SWR directly. Set overloads as follows:

(a) Plate Overload R7601 (PLATE OVLD ADJ) - 5-5-1/2 amps.

(b) Grid Overload R7602 (GRID OVLD ADJ) - 200 amps.

(c) Bias Relay R7604 - Set Bias relay adjust to a point where bias relay energizes.

The retune overload is set as follows: Drive the transmitter to a level of 2. 0 to 2. 5 KV RF.

Turn retune overload adjust R7520 (on the bias supply) until the transmitter retune circuit trips. Set the control slightly below this point. Check the retune circuit by detuning the PA plate until PA plate current is 3. 0 amperes with less than 2 KV (RF). The retune circuit should trip.

Transmitter is properly tuned when following readings are obtained.

(a) Plate Current - 4 to 4. 2 amperes.

(b) Grid Current - 10 to 70 MA

(c) Plate RF - 5 to 6 KV (RF)

Complete unbalanced and balanced test runs using test sheets supplied.

Always set up controls with tuning chart for approximate settings.

(13) CROWBAR OVERLOAD TEST

CAUTION

The following steps must be done with the high voltage off and the high voltage capacitors discharged.

(a) Set R8304 in the crowbar drawer to mid-position.

(b) Connect a 1000 ohm 1/2 watt resistor between the HV capacitors C8301 through C8304 and ground.

(c) Turn the high voltage on.
  (i) The crowbar should flash.
  (ii) The 1000 ohm resistor should shatter.
  (iii) The main breaker should open.
  (iv) The grid overload should open.

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

FREQ MC	10K (IPA) STAGE (UNBALANCE ONLY)				40 PA STAGE BALANCE OR UNBALANCE			40 PA STAGE (BALANCE ONLY)			40 PA STAGE (UNBALANCE ONLY)	REMARKS
	BAND	TUNE	LOAD	OUTPUT LOADING	FINAL BAND	TUNE	LOAD	ANT TUNE	ANTENNA TUNING BAND	$I_1 = I_2$*	LOAD CURRENT**	
2	2-4	540	280	000	2-3	630	650	458	2-12	5.8	20 KW	*Anneters in legs of Rhombic Antenna **Output Wattmeter
3	2-4	275	185	000	2-3	455	645	269	2-12	5.8	20 KW	
3	2-4	345	450	000	3-4	480	515	269	2-12	5.8	20 KW	
4	2-4	355	315	000	3-4	475	595	133	2-12	5.8	20 KW	
4	4-6	350	345	000	4-5	440	615	133	2-12	5.8	20 KW	
5	4-6	265	445	000	4-5	410	510	031	2-12	5.8	20 KW	
5	4-6	265	445	000	5-7	465	570	081	2-12	5.8	20 KW	
6	4-6	225	335	000	5-7	435	470	055	2-12	5.8	20 KW	
6	6-8	275	470	000	5-7	435	470	055	2-12	5.8	20 KW	
7	6-8	235	390	000	5-7	405	425	038	2-12	5.8	20 KW	
7	6-8	235	390	000	7-11	405	480	038	2-12	5.8	20 KW	
8	6-8	210	255	000	7-11	405	440	022	2-12	5.8	20 KW	
8	8-11	270	385	000	7-11	465	440	022	2-12	5.8	20 KW	
11	8-11	205	195	000	7-11	420	380	009	2-12	5.8	20 KW	
11	11-15	240	290	000	11-15	420	480	009	12-20	5.8	20 KW	
15	11-15	160	155	000	11-15	400	395	006	12-20	5.8	20 KW	
15	15-19	230	230	000	15-19	445	425	003	12-20	5.8	20 KW	
19	15-19	180	125	000	15-19	405	395	118	12-20	5.8	20 KW	
18	19-24	232	150	000	19-25	440	405	118	20-24	5.8	20 KW	
24	19-24	200	069	000	19-24	410	375	109	20-24	5.8	20 KW	
24	24-28	265	125	000	24-28	430	385	109	24-28	5.8	20 KW	
28	24-28	240	087	000	24-28	410	370	004	24-28	5.8	20 KW	

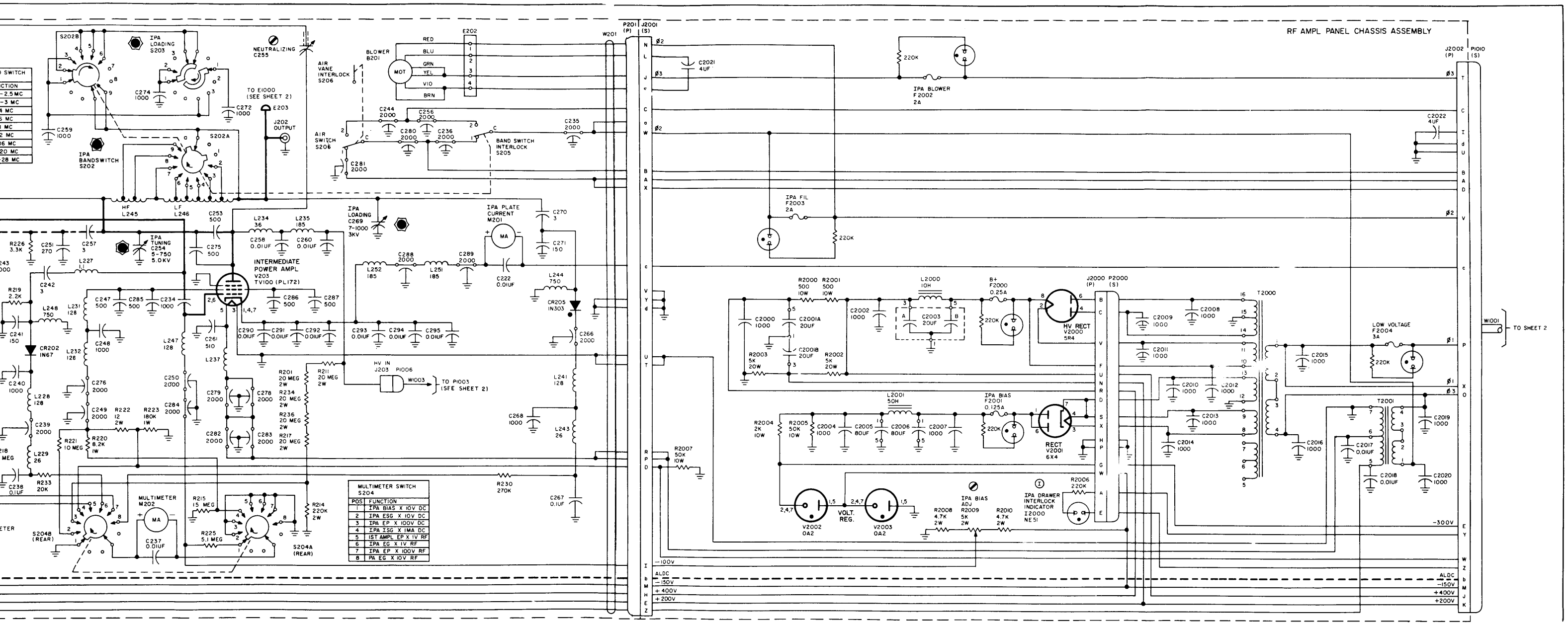
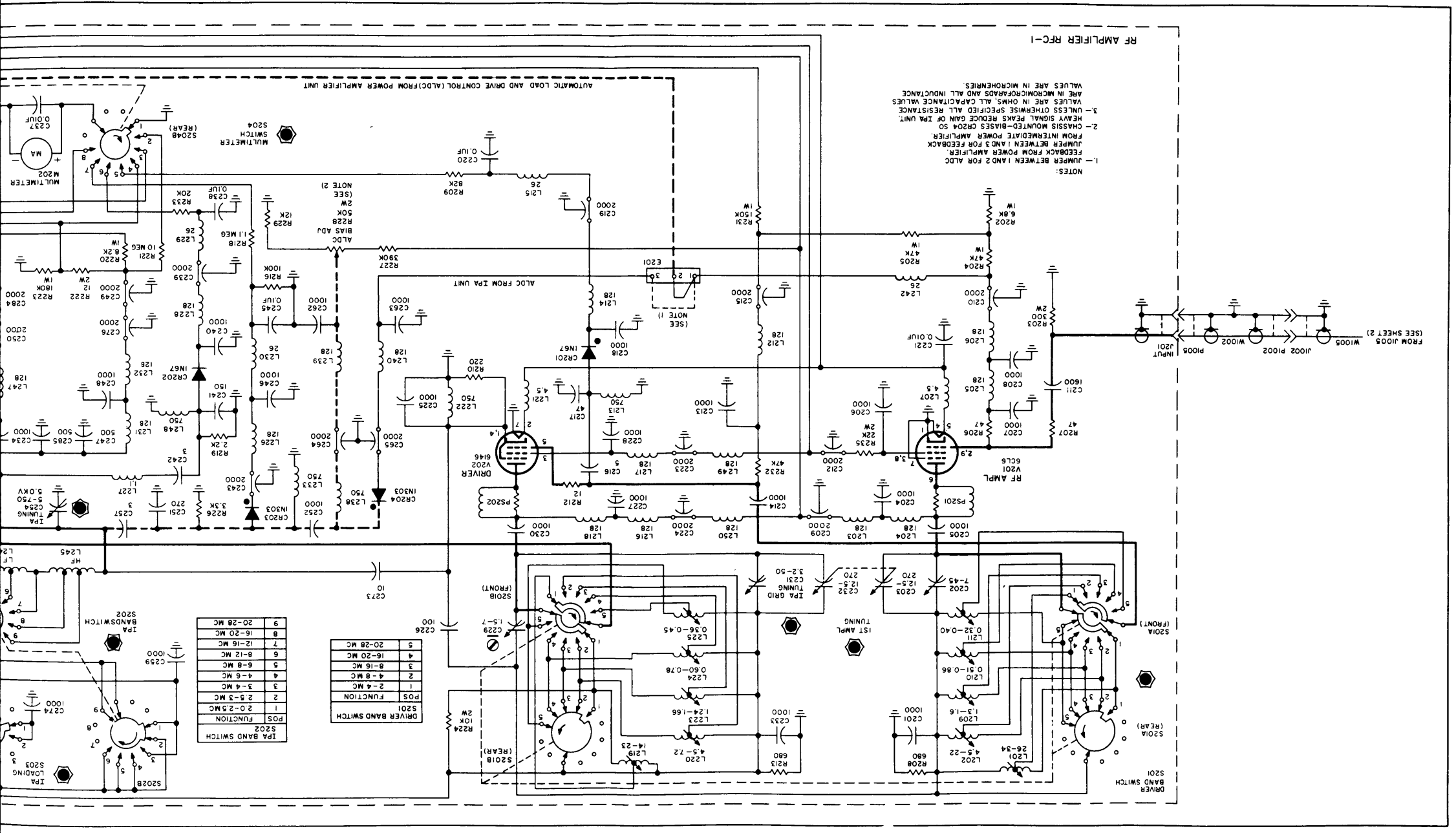


Figure 4-7-1. Schematic Diagram, GPT-40K (Sheet 1 of 5)

CK509


RF AMPLIFIER RFC-1
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 VALUES ARE IN OHMS, ALL CAPACITANCE VALUES ARE IN MICROMICROFARADS AND ALL INDUCTANCE VALUES ARE IN MICROHENRIES
3- UNLESS OTHERWISE SPECIFIED ALL RESISTANCE VALUES ARE IN OHMS, ALL CAPACITANCE VALUES ARE IN MICROMICROFARADS AND ALL INDUCTANCE VALUES ARE IN MICROHENRIES
AUTOMATIC LOAD AND DRIVE CONTROL (ALDC)FROM POWER AMPLIFIER UNIT
ALDC FROM IPA UNIT
FROM J1005 (SEE SHEET 2)
J1002 P1002
W1005
P1005
INPUT J201
DRIVER BAND SWITCH S201
DRIVER
RF AMPL 6CL6 V201
DRIVER 6146 V202
MULTIMETER SWITCH S204
MULTIMETER M202
IPA BAND SWITCH S202
DRIVER BAND SWITCH S201
POS | FUNCTION
1 | 20-2.5 MC
2 | 2.5-3 MC
3 | 3-4 MC
4 | 4-6 MC
5 | 6-8 MC
6 | 8-12 MC
7 | 12-16 MC
8 | 16-20 MC
9 | 20-28 MC
POS | FUNCTION
1 | 2-4 MC
2 | 4-8 MC
3 | 8-16 MC
4 | 16-20 MC
5 | 20-28 MC
IPA BANDSWITCH S202
IPA LOADING S203
IPA TUNING S204 5-750 3.0KV
IST AMPL TUNING
IPA GRID TUNING C231 32-50
(FRONT)
(REAR)

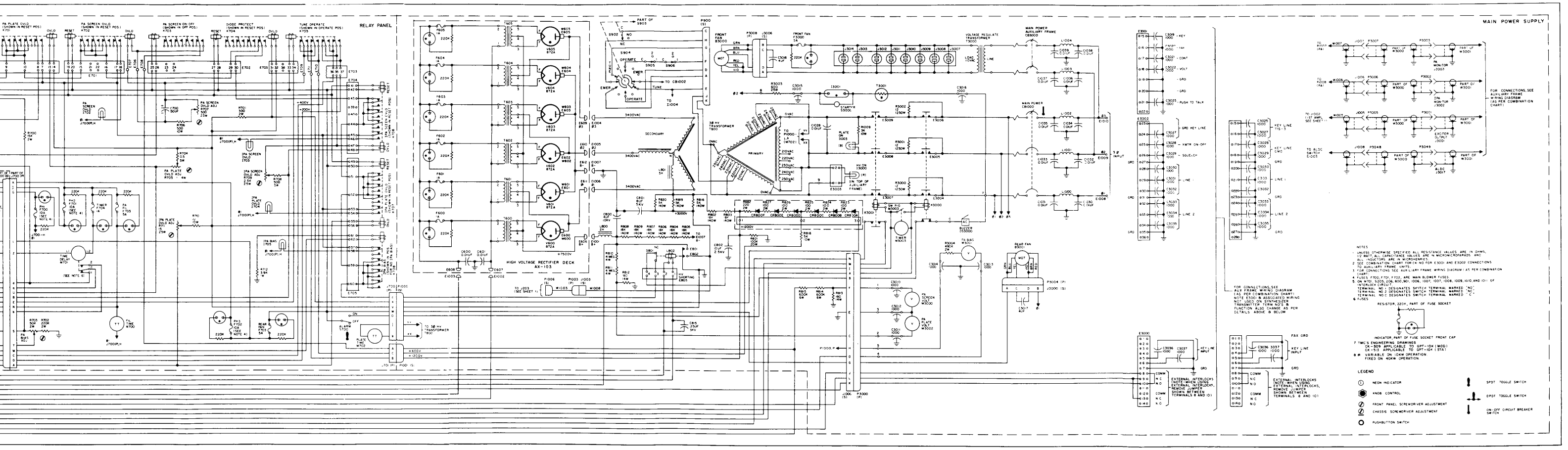
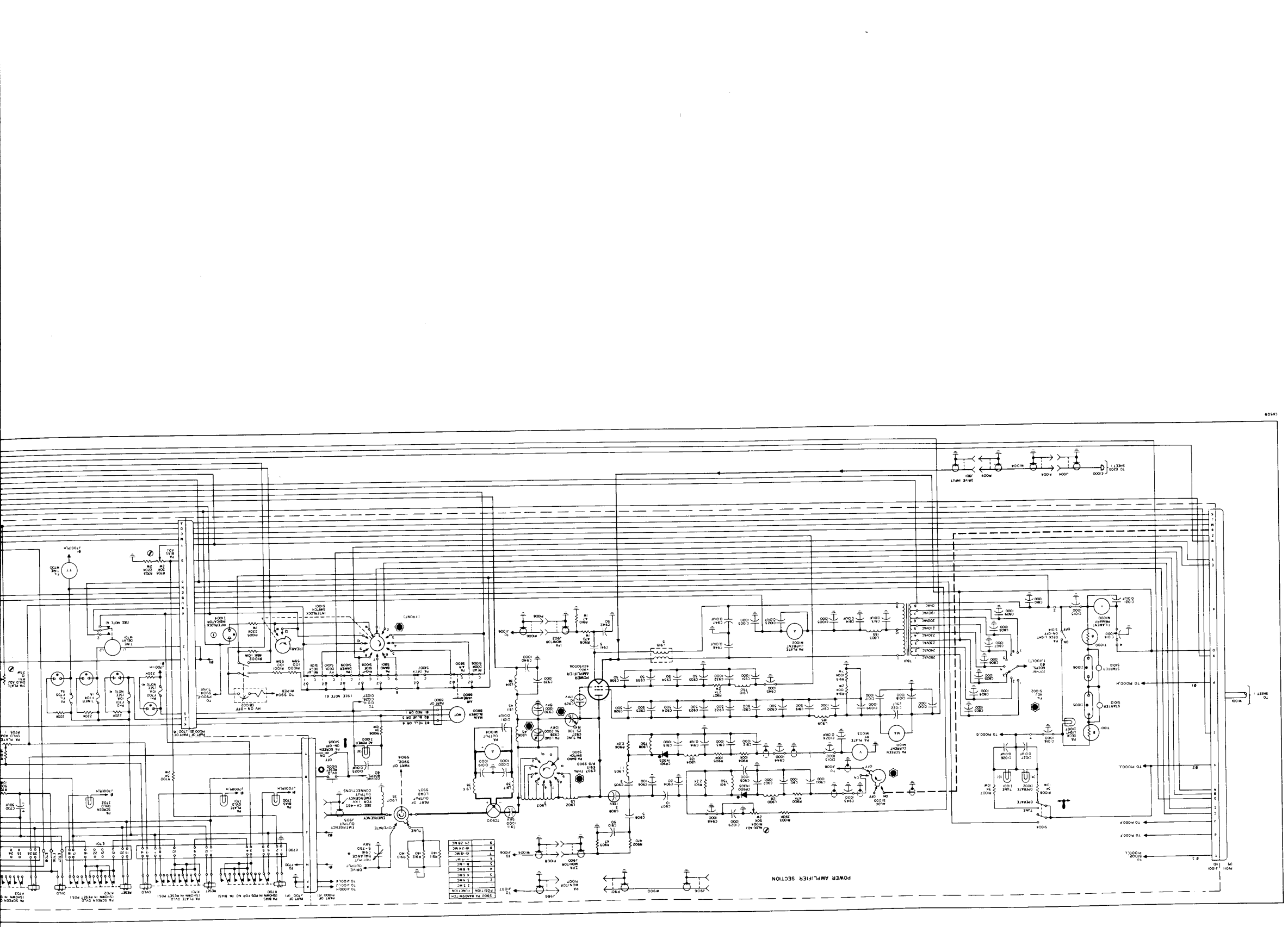


Figure 4-7-1. Schematic Diagram, GPT-40K (Sheet 2 of 5)


POWER AMPLIFIER SECTION

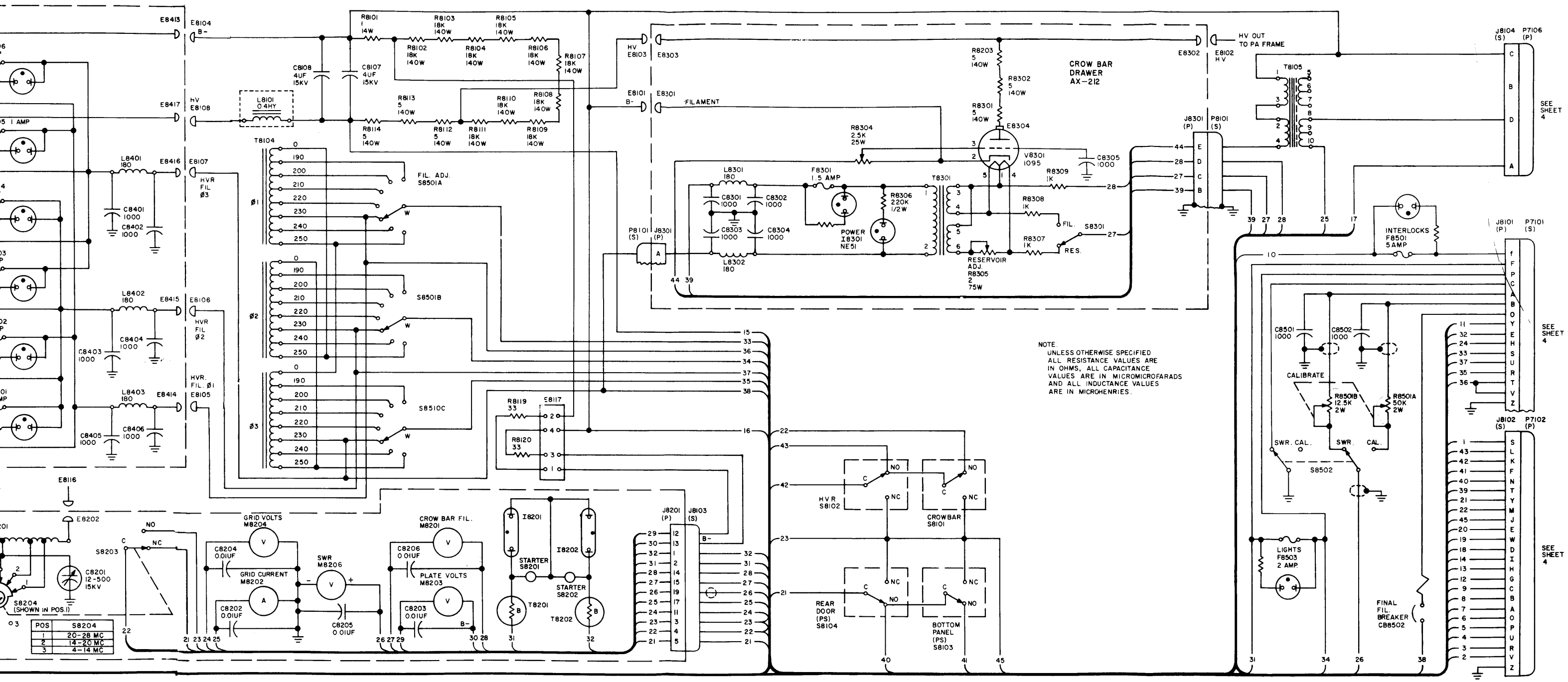
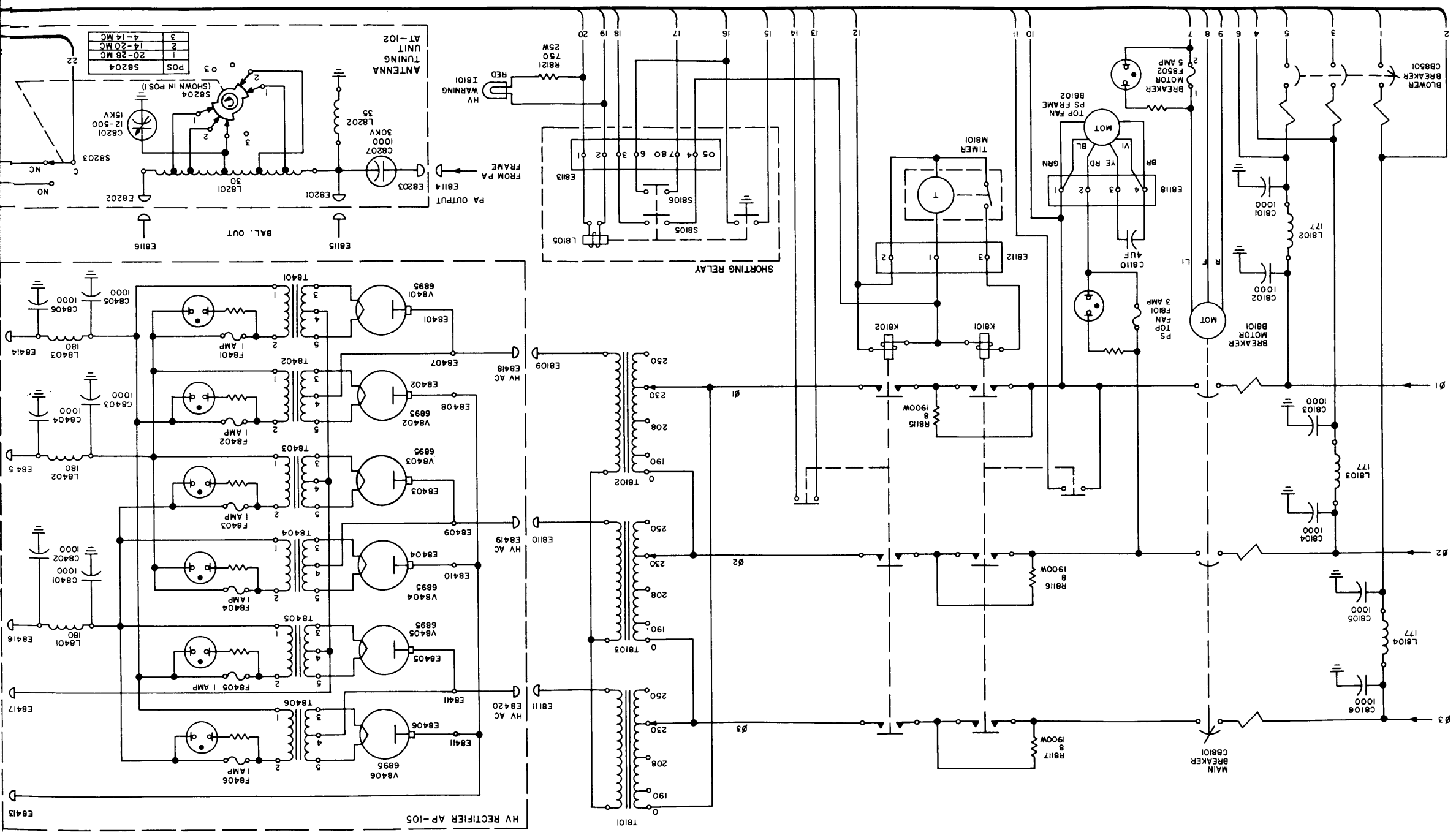


Figure 4-7-1. Schematic Diagram, GPT-40K (Sheet 3 of 5)


ANTENNA TUNING UNIT AT-102
POS S8204
1 20-28 MC
2 14-20 MC
3 4-14 MC
S8204 (SHOWN IN POS 1)
C8201 12-500 15KV
L8202 35
C8207 1000 30KV
L8201 30
E8202
E8201
E8203
E8114
FROM PA FRAME
PA OUTPUT
E8116
BAL. OUT
E8115
S8203
NC
NO
C
HV RECTIFIER AP-105
T8401
T8402
T8403
T8404
T8405
T8406
V8401 6895
V8402 6895
V8403 6895
V8404 6895
V8405 6895
V8406 6895
F8401 1 AMP
F8402 1 AMP
F8403 1 AMP
F8404 1 AMP
F8405 1 AMP
F8406 1 AMP
E8407
E8408
E8409
E8410
E8411
E8418
E8419
E8420
HV AC
E8109
E8110
E8111
E8413
E8414
E8415
E8416
E8417
L8403 180
L8402 180
L8401 180
C8406 1000
C8405 1000
C8404 1000
C8403 1000
C8402 1000
C8401 1000
SHORTING RELAY
S8106
S8105
L8105
E8113
R8121 750 25W
HV WARNING I8101
RED
T8101
T8102
T8103
250
230
208
190
0
ØI
Ø2
Ø3
K8101
K8102
E8112
TIMER M8101
T
C8110 4UF
E8118
BR
GRN
YE
RD
VI
BL
MOT
TOP FAN PS FRAME B8102
BREAKER F8502 5 AMP
P5 TOP FAN F8101 3 AMP
BREAKER MOTOR B8101
R8115 8 1900W
R8116 8 1900W
R8117 8 1900W
MAIN BREAKER C8801
BLOWER BREAKER C8850I
C8102 1000
C8101 1000
L8102 177
C8103 1000
C8104 1000
L8103 177
C8105 1000
C8106 1000
L8104 177
R
F
L1
ØI
Ø2
Ø3

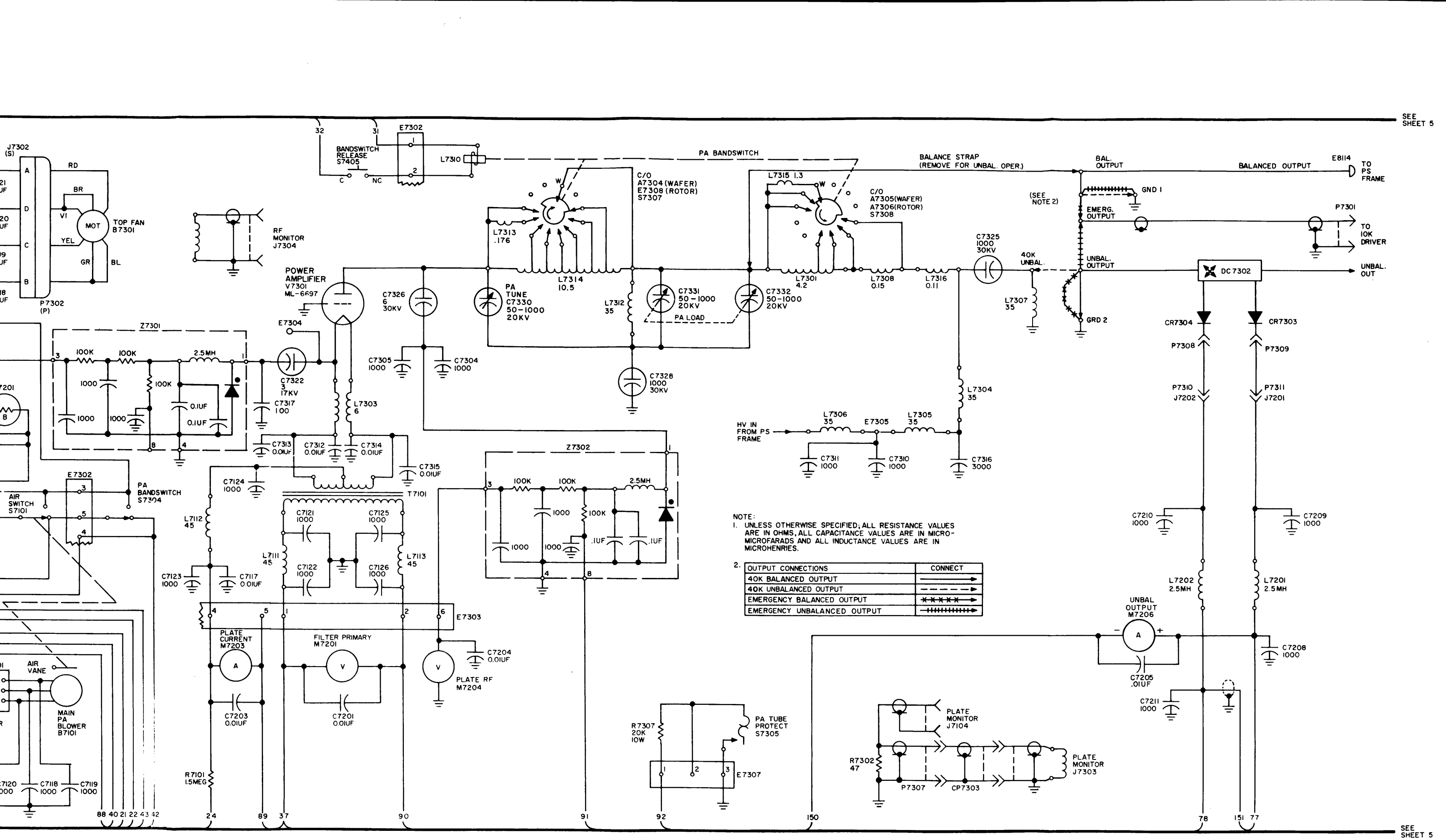
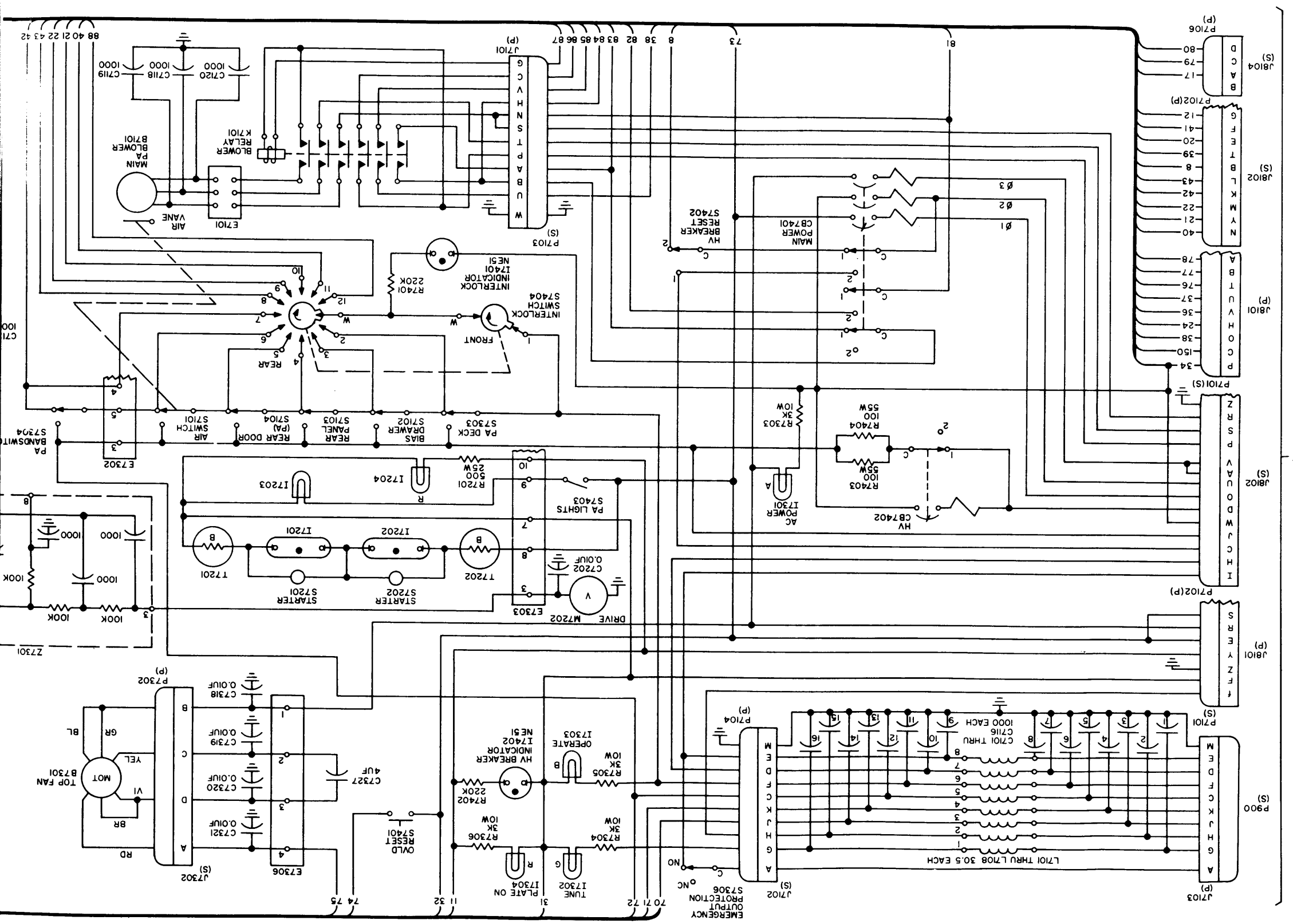


Figure 4-7-1. Schematic Diagram, GPT-40K (Sheet 4 of 5)


SEE SHEET 3
P7106 (P)
J8104 (S)
P7102(P)
J8102 (S)
J8101 (P)
P7101(S)
J8102 (S)
P7102(P)
J8101 (P)
P7101 (S)
P900 (S)
J7103 (P)
P7103 (S)
J7102 (S)
P7104 (P)
J7302 (S)
P7302 (P)
E7306
E7302
E7101
E7303
Z7301
MAIN PA BLOWER B7101
AIR VANE
BLOWER RELAY K7101
C7120 1000
C7118 1000
C7119 1000
MAIN POWER CB7401
HV BREAKER RESET S7402
HV CB7402
R7403 100 55W
R7404 100 55W
R7303 3K 10W
AC POWER I7301
INTERLOCK SWITCH S7404
INTERLOCK INDICATOR I7401 NE51
R7401 220K
FRONT
REAR
PA DECK S7303
BIAS DRAWER S7102
REAR PANEL S7103
REAR DOOR (PA) S7104
AIR SWITCH S7101
PA BANDSWITCH S7304
PA LIGHTS S7403
R7201 500 25W
I7203
I7204
I7201
I7202
T7201
T7202
STARTER S7201
STARTER S7202
C7202 0.01UF
DRIVE M7202
C7101 THRU C7116 1000 EACH
L7101 THRU L7108 30.5 EACH
HV BREAKER INDICATOR I7402 NE51
OPERATE I7303
R7305 3K 10W
R7402 220K
R7304 3K 10W
R7306 3K 10W
TUNE I7302
PLATE ON I7304
OVLD RESET S7401
C7327 4UF
C7318 0.01UF
C7319 0.01UF
C7320 0.01UF
C7321 0.01UF
TOP FAN B7301
MOT
EMERGENCY OUTPUT PROTECTION S7306
100K
1000
Ø1
Ø2
Ø3

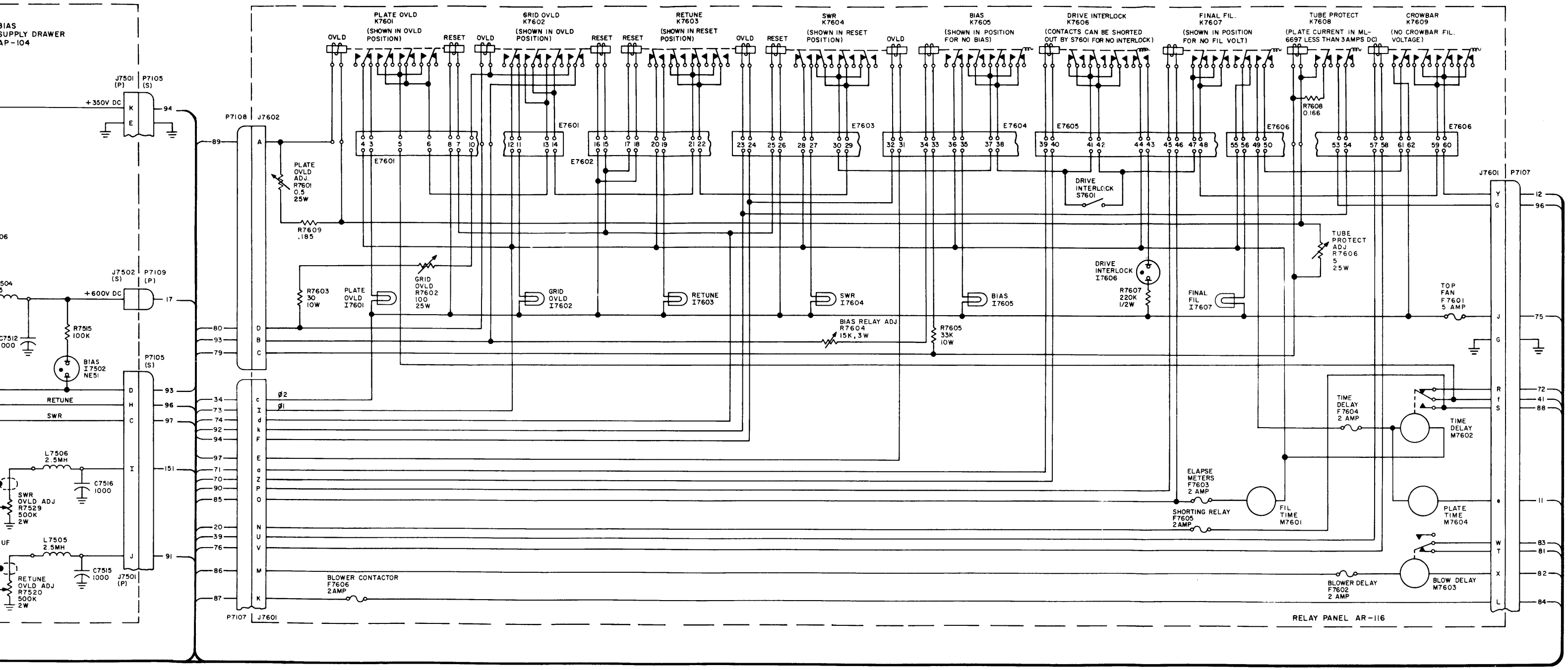


Figure 4-7-1. Schematic Diagram, GPT-40K (Sheet 5 of 5)

SEE SHEET 4

BIAS SUPPLY DRAWER AP-104

T7501

RECTIFIER V7501 6X4

R7501 1K 10W

220K

LV F7501 0.125AMP

C7505 80UF

+350V

R7502 100K

LV I7501 NE51

+350V DC

J7501 (P) P7105 (S)

K 94

E

+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

R7508 47 2W

R7509 680K 2W

R7510 47 2W

R7511 220K 2W

C7508 0.01UF

C7509 10UF

C7510 10UF

C7511 1000

L7504 185

C7512 1000

R7515 100K

BIAS I7502 NE51

BIAS ADJ. R7513 500K 2W

R7512 220K 2W

R7531 3K 160W

J7502 (S) P7109 (P)

+600V DC 17

P7105 (S)

D 93

H RETUNE 96

C SWR 97

I 151

J 91

J7501 (P)

P7105 (S) 36 A

37 B

220K

AC POWER F7503 3 AMP

L7501 185

C7501 1000

C7502 1000

C7503 1000

C7504 1000

L7502 185

NO C NC

J7501 (P)

PROTECTIVE INTERLOCK (SHOWN WITH DRAWER IN) S7501

BIAS F7502 0.5 AMP

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

R7527 10K 10W

R7522 25K 4W

R7526 25K 4W

R7517 330K 2W

R7519 100K

SWR DC AMPLIFIER V7509 12AT7

R7525 3.3K 2W

R7528 1K 1W

L7506 2.5MH

C7516 1000

SWR OVLD ADJ R7529 500K 2W

C7514 0.424UF

L7505 2.5MH

C7515 1000

RETUNE OVLD ADJ R7520 500K 2W

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

SEE SHEET 4

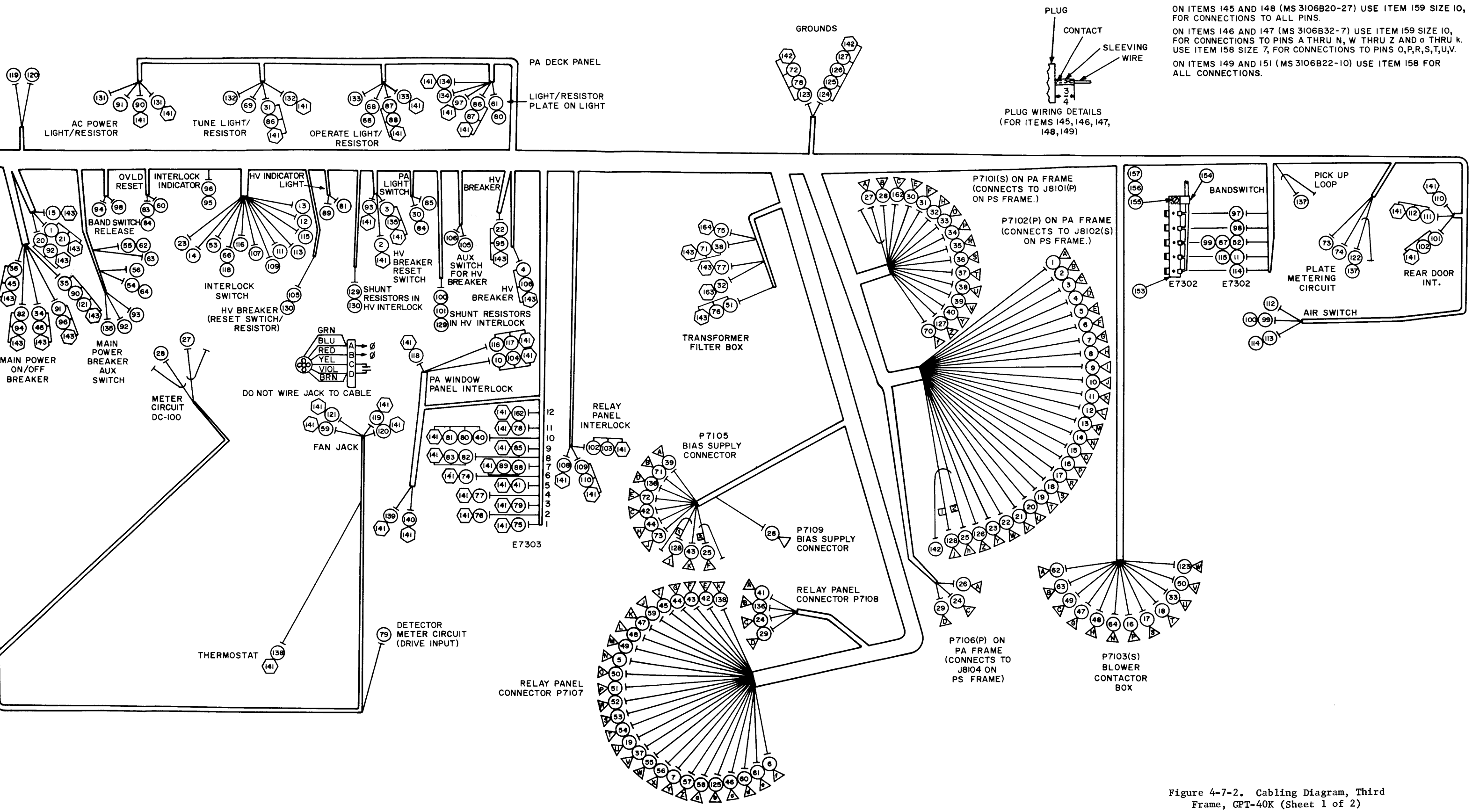
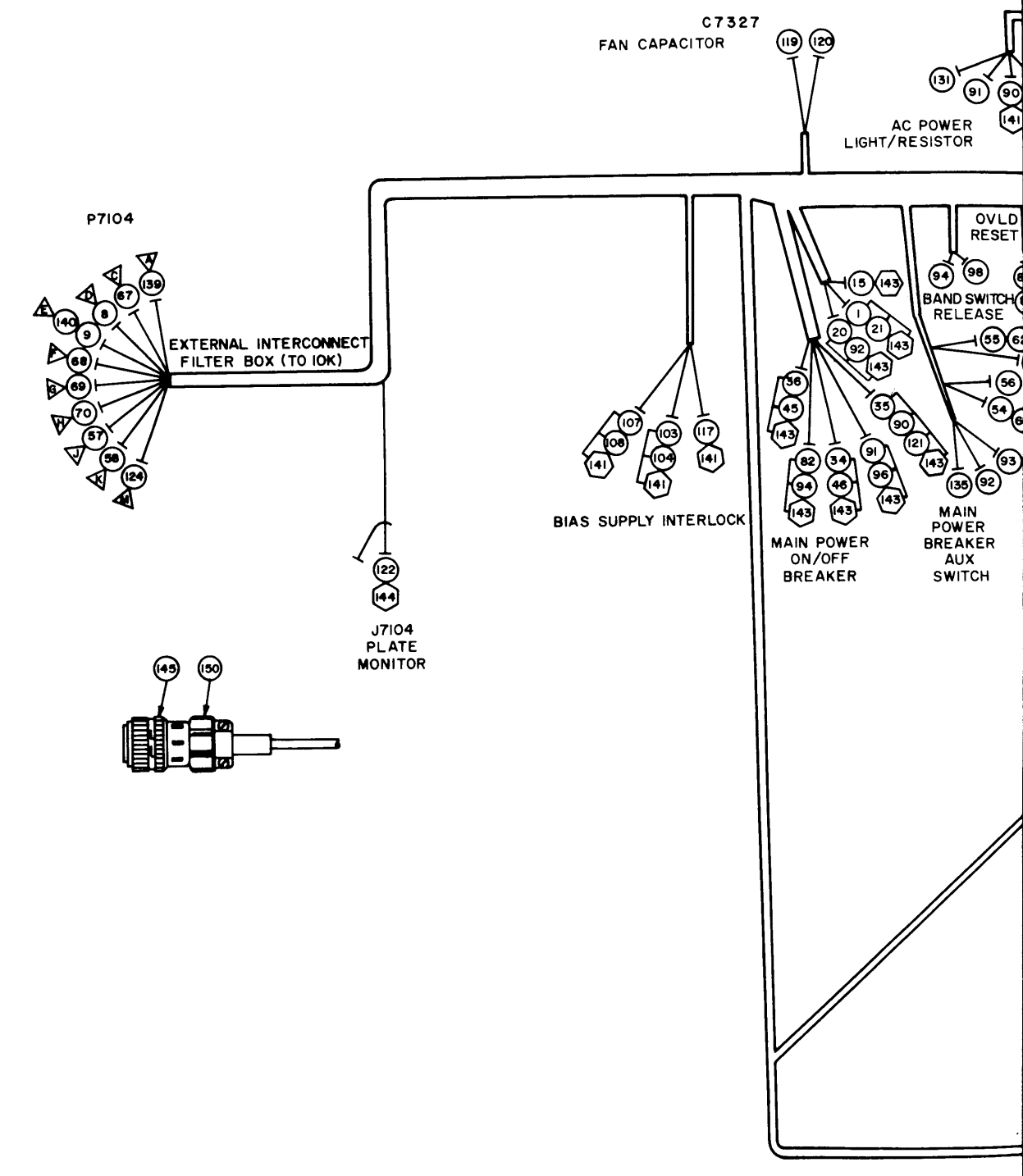


Figure 4-7-2. Cabling Diagram, Third Frame, GPT-40K (Sheet 1 of 2)


C7327
FAN CAPACITOR
AC POWER
LIGHT/RESISTOR
OVLD
RESET
BAND SWITCH
RELEASE
P7104
EXTERNAL INTERCONNECT
FILTER BOX (TO 10K)
BIAS SUPPLY INTERLOCK
MAIN POWER
ON/OFF
BREAKER
MAIN
POWER
BREAKER
AUX
SWITCH
J7104
PLATE
MONITOR

CA-843B

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

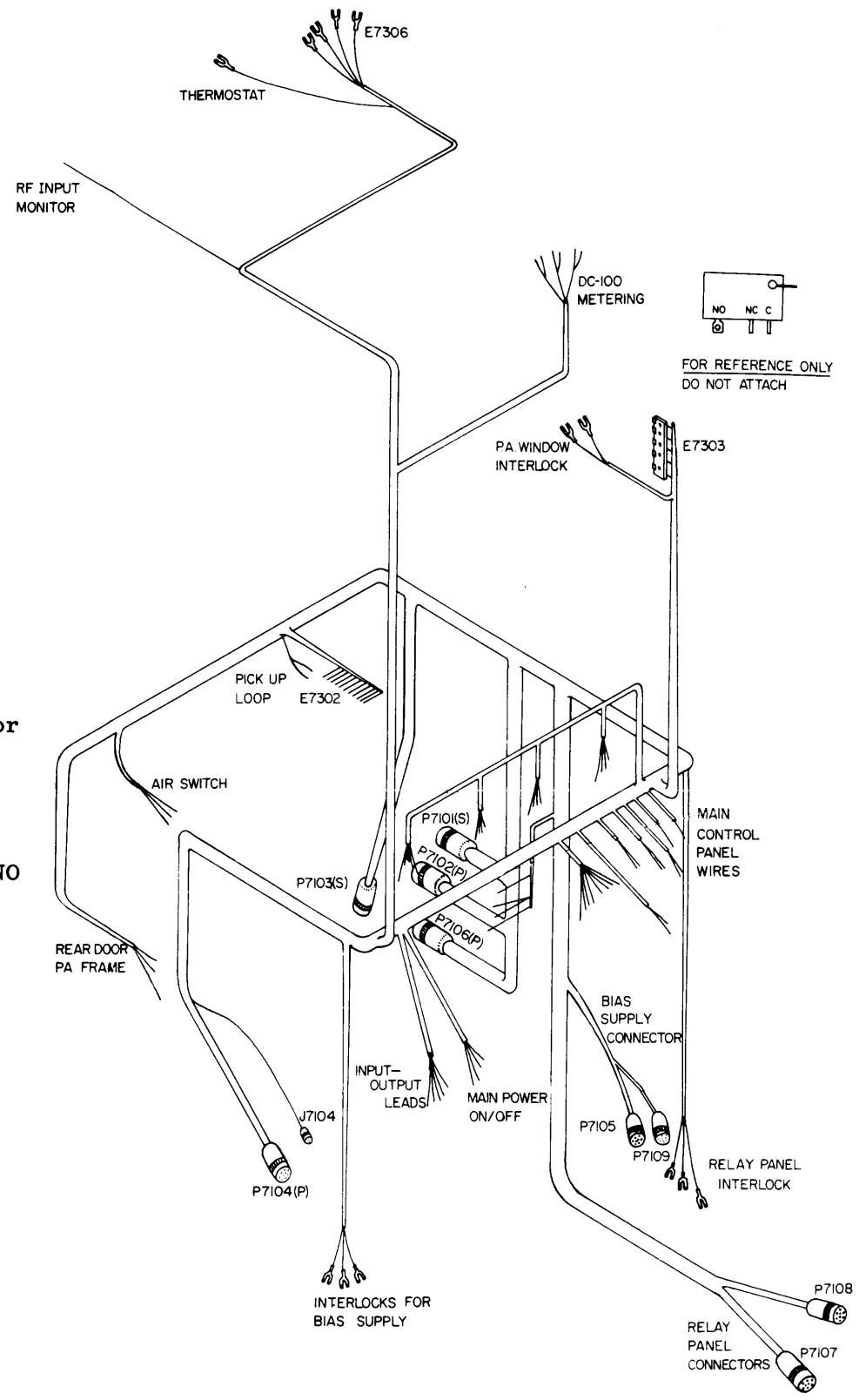


Figure 4-7-2. Cabling Diagram, Third Frame, GPT-40K (Sheet 2 of 2)

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 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.
53	Green	P7107, Pin S to Interlock Switch, Ti
54	Wh/Yellow	P7107, Pin T to Main Power Breaker;
55	Wh/Orange	P7107, Pin W to Main Power Breaker;
56	Wh/Red	P7107, Pin X to Main Power Breaker/
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;
63	Wh/Green	P7103, Pin B to Main Power Breaker/
64	Wh/Yellow	P7103, Pin N to Main Power Breaker;
65		NOT USED
66	Wh/Green	Oper. Light To Interlock Switch
67	Wh/Brown	P7104, Pin C to Bandswitch Interlock
68	Wh/Green Tag	P7104, Pin F to Operate Light Resist
69	Green	P7104, Pin G to Tune Light Res.
70	White	P7104, Pin H to Pin f, P7101.
71	Wh/Violet	P7105, Pin H to xfmr Filter box.
72	Black	P7105, Pin E to Ground.
73	Green	P7105, Pin J to Plate Meter Circuit,
74	Blue	Plate Meter Circuit Pin 3 to Meter
75	Wh/Violet	Meter Box Strip Term 1(Fil Prl)to xf
76	Violet	Meter Box Strip Term. 2(Fil Prl) to
78	Black	Meter Box Strip Term. 11(6nd) to Gro
79	Yellow	Meter Box Strip Term. 3 (Drive Meter
80	Yellow	Plate On Light Resistor To Meter Box Lite Res.)
81	Yellow	Meter Box Strip Term. 10(Red Lite Re Light Res.
82	White	Main Power Bkr. Ø 1C to Meter Box St AC).
83	White	Meter Box Strip Term 8 to Ovld. Rese
84	White	Ovld. Reset Switch to PA light Switc
85	Wh/Black	Meter Box Strip Term 9(Wh. Lite) To
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 Ter
89	Wh/Violet	Meter Box Strip Term. 7 To HV Brk.
90	Grey	AC Power Light To Main Power Breaker
91	Violet	Main Power Breaker Ø 2C to AC Power
92	Violet	Main Power Breaker Ø 2H to Main Powe Comm.
93	Red	Main Power Breaker Aux. SW. L NO to
94	White	Main Power Breaker Ø 1C to Bandswitc
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
98	Red	Bandswitch Release Solenoid To Bands
99	Wh/Brown	Bandswitch Interlock NC To Air Switc
101	Wh/Brown	Resistor to Rear Door Int. NC
102	Wh/Brown	Rear Door Inter. NC To Relay Panel
103	Wh/Brown	Relay Panel Inter. NC to Bias Drawer
104	Wh/Brown	Bias Drawer Inter. NC to PA Deck Int

ANTENNA TUNER

J8103

CONNECTOR

CONTACTS

WIRE

SLEEVING - USE ITEM 109 (SIZE 8) FOR CONNECTIONS TO PINS 1,3,4 5,6,7,8,9 &10.
USE ITEM 110 (SIZE 4) FOR CONNECTIONS TO PINS 11, 12, 14.

ITEM 97 (JJ-181) WIRING

DEADMAN ASSEMBLY E8113

E8117

R8119 / R8120

B- TO XFMR T8105

TERMINAL 10

GRID CURRENT METER VIA TERMINAL 8

TERMINAL 4

PULSE XMT T8105

TERMINAL 1

RESISTOR R8101 (1ohm)

HV CONTACTOR COIL

HV CONTACTOR AUX SWITCH

E8112

RESISTOR SHORTING CONTACTOR

AUX SWITCH OF RESISTOR SHORTING CONTACTOR

AUX SWITCH OF RESISTOR SHORTING CONTACTOR

GROUNDS

PS FAN

PS FAN STRIP TERMINAL 3 & 4 (CAPACITOR STARTING)

PS FAN FUSE

HV LIGHT RESISTOR

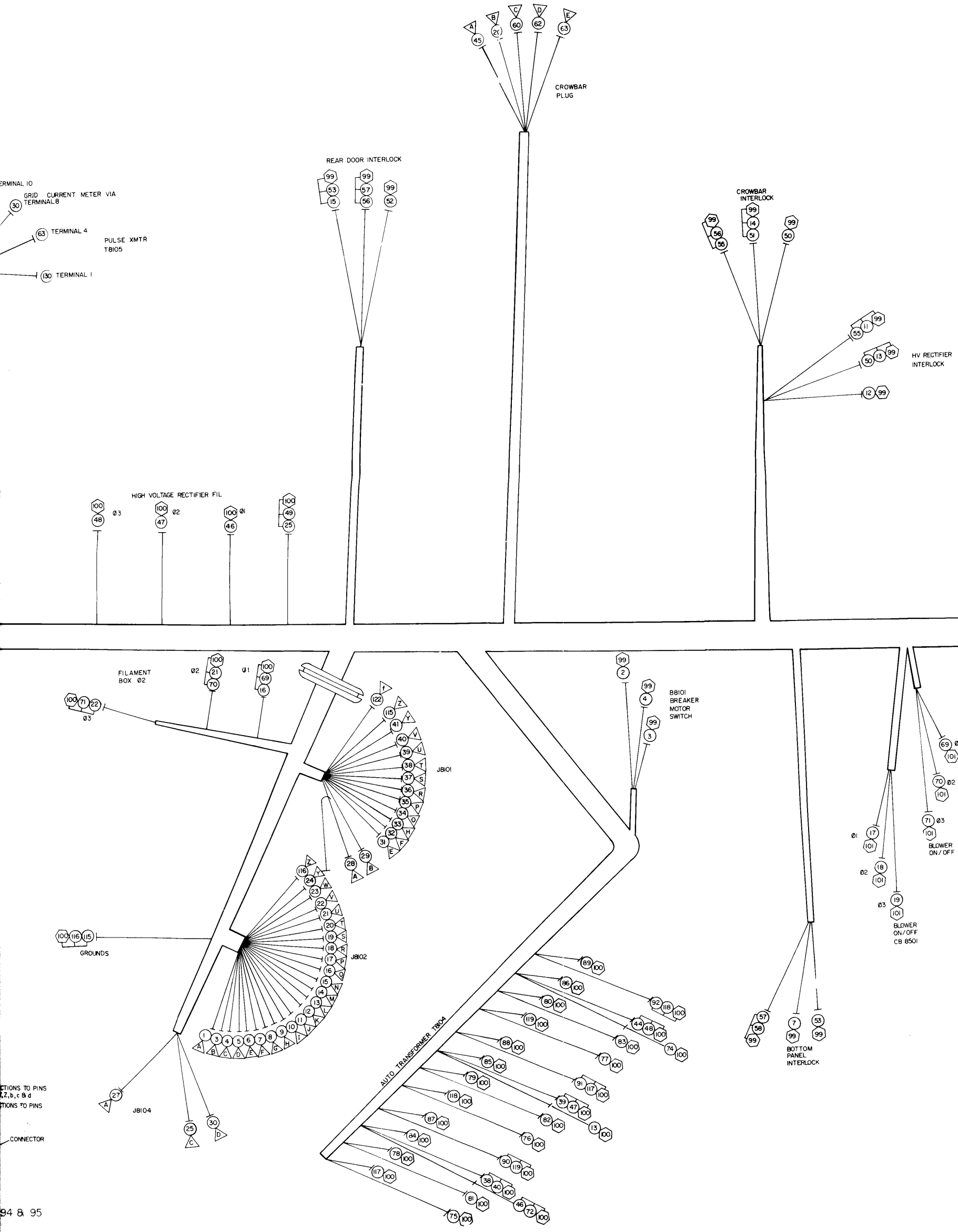
SLEEVING - USE ITEM 107 (SIZE 10) FOR CONNECTIONS TO PINS A, B, C, D, E, F, G, H, I, J, K, L, M, N, W, X, Y, Z, b, c & d
USE ITEM 108 (SIZE 7) FOR CONNECTIONS TO PINS O, P, R, S, T, U & V.

WIRE

CONTACT

CONNECTOR

WIRING DETAIL FOR ITEMS 94 & 95


CROWBAR PLUG
REAR DOOR INTERLOCK
CROWBAR INTERLOCK
HV RECTIFIER INTERLOCK
HIGH VOLTAGE RECTIFIER FIL
Ø3
Ø2
Ø1
FILAMENT BOX Ø2
J8101
J8102
J8104
GRID CURRENT METER VIA TERMINAL 8
PULSE XMTR T8105
TERMINAL 4
TERMINAL 1
TERMINAL 10
GROUNDS
B8101 BREAKER MOTOR SWITCH
AUTO TRANSFORMER T8104
BOTTOM PANEL INTERLOCK
BLOWER ON/OFF
BLOWER ON/OFF CB 8501
220V TAP Ø1
210 TAP SW Ø1
200V TAP Ø1
190V TAP Ø1
TAP 210 Ø2
TAP 200 Ø2
TAP 190 Ø2
210 Ø3
200 Ø3
190 Ø3
230V TAP Ø1
240V TAP Ø1
250 TAP Ø1
INTERLOCK FUSE
WIPER 230V
WIPER 230 Ø2
WIPER 230 Ø3
240 Ø2
240 Ø3
250 Ø2
250 Ø3
TIONS TO PINS
Z,b,c & d
TIONS TO PINS
CONNECTOR
94 & 95

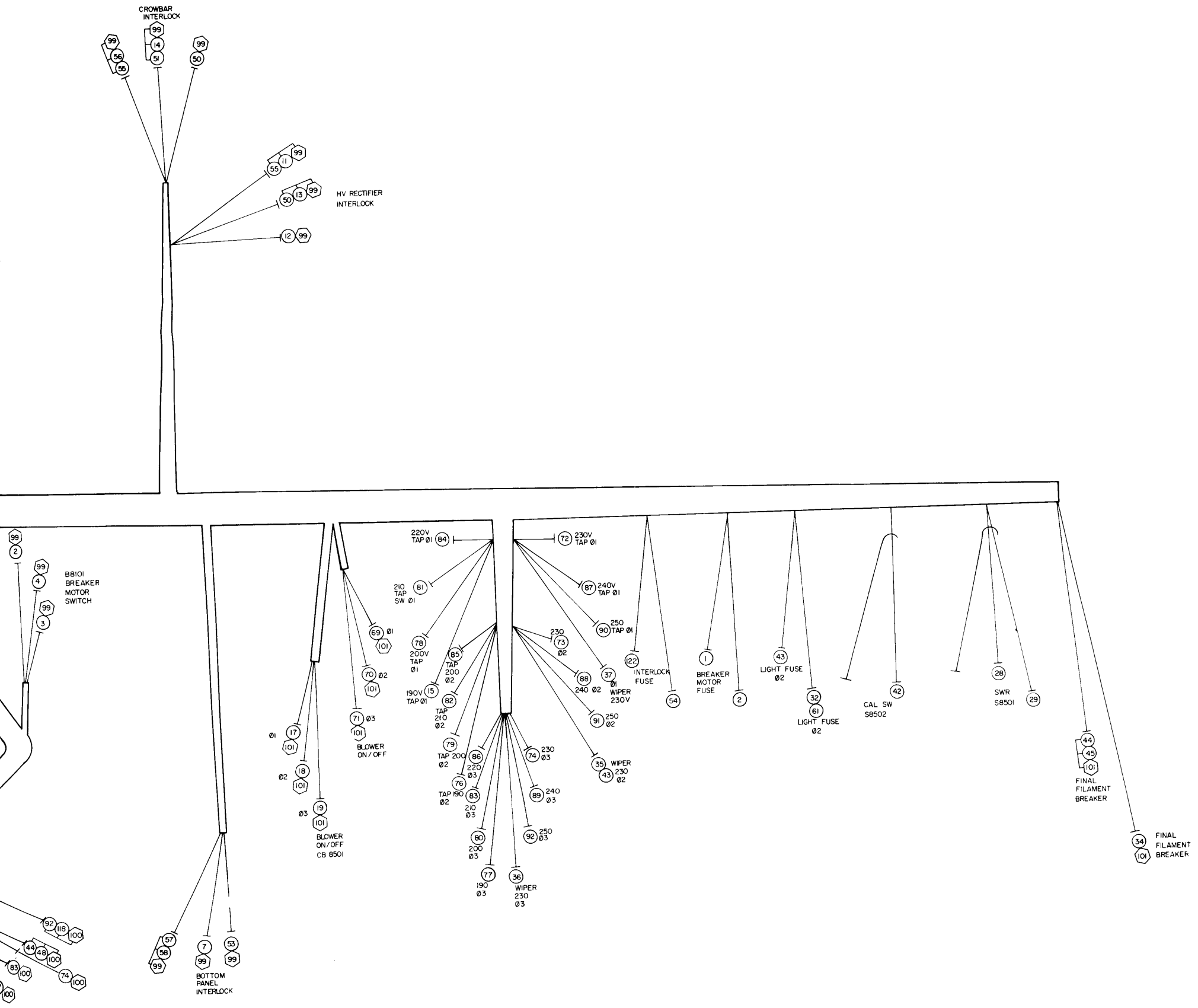


Figure 4-7-3. Cabling Diagram, Fourth Frame, GPT-40K (Sheet 1 of 2)

TERMINATIONS		COND.	COLOR	TERMINATIONS	
	To			From	To
NO	Crowbar Inter., C	133	Orange	Sh. Relay, Term 2	HV Lite
ter., NO	Ant. Tuner, Pin 4, C	134	White	Ø 1 Contactor	Fan Strip, Term. 1
, Pin 5 NO	Rear Door Inter., C	135	Violet	Ø 2 Contactor	Fan Fuse
Inter., NO	Bottom Panel Inter., C	136	Wh/Violet	Fan Strip, Term 2	Fuse
Sw. Ø 1 Wiper	Interlock Fuse	137	White	Fan Strip, Term 3	Cap.
, NC	Crowbar Inter., NC	138	White	Fan Strip, Term 4	Cap.
ter., NC	Rear Door Inter., NC	139	Orange	Cal./SWR Switch	Pin "C" on J8101
Inter., NC	Bottom Panel Inter., NC	140	Wh/Green	J8102, Pin j	Pin 16, J8103 Tuner Unit
el Inter., NC	Ant. Tuner, Pin 3 NC	141	Wh/Red	J8102, Pin L	Pin 20, J8103 Tuner Unit
Resistor, Res. Board	Ant. Tuner, Strip,Plate Volt Meter	142	Violet	XF8102	Common, T8103
, Pin 15 AV Volts	Crowbar, Pin C Filament	143	Grey	XF8103	230 Term. of T8103
	Ant. Tuner, Pin 2	144	Green	E8119, Term. 6	K8102
in D Filament	Ant. Tuner, Pin 14 AC Volts				
in E to	XFMR. Term. 4	ITEM		DESCRIPTION	REMARKS
m. No. 5	Timer Switch				
Cont. Coil	Timer Switch	93		Cord, Lacing	
Cont. Coil	HV Cont. Coil	94		Connector, Receptacle, Female	J8102
Cont. Coil	Short Relay Micro Sw.	95		Connector, Receptacle, Male	J8101
Cont. Aux Switch	Res. Short Cont. Ø 1 Line Term.	96		Connector, Plug, Female	P8101
Off Ø 1	Filter Box, Ø 1	97		Connector, Receptacle, Female	J8103
Off Ø 2	Filter Box, Ø 2	98		Strip, Fanning, 8 Lug	
Off Ø 3	Filter Box, Ø 3	99		Lug, Spade (#6)	
1, 230 V	Auto XFMR, Ø 1, 230 V	100		Terminal, #10	
2, 230 V	Auto XFMR, Ø 2, 230 V	101		Terminal, #1/4	
3, 230 V	Auto XFMR, Ø 3, 230 V	102		Clamp, "G" Type, 3/16 D	
1, 190 V	Auto XFMR, Ø 1, 190 V	103		Screw, Machine, 6-32 x ½ " Long	
2, 190 V	Auto XFMR, Ø 2, 190 V	104		Lockwasher, Ext.	
3, 190 V	Auto XFMR, Ø 3, 190 V	105		Nut, Hex	
1, 200 V	Auto XFMR, Ø 1, 200 V	106		Grommet, Elastic, 1-½ ID	
2, 200 V	Auto XFMR, Ø 2, 200 V	107		Sleeving, Size 10 (.106 ID)	Black
3, 200 V	Auto XFMR, Ø 3, 200 V	108		Sleeving, Size 7 (.148 ID)	Black
1, 210 V	Auto XFMR, Ø 1, 210 V	109		Sleeving, Size 8 (.133 ID)	Black
2, 210 V	Auto XFMR, Ø 2, 210 V	110		Sleeving, Size 4 (.208 ID)	Black
3, 210 V	Auto XFMR, Ø 3, 210 V	111		Deleted	
1, 220 V	Auto XFMR, Ø 1, 220 V	112		Deleted	
2, 220 V	Auto XFMR, Ø 2, 220 V	113		Deleted	
3, 220 V	Auto XFMR, Ø 3, 220 V	114		Deleted	
1, 240 V	Auto XFMR, Ø 1, 240 V	121		Fanning Strip	
2, 240 V	Auto XFMR, Ø 2, 240 V	123		Connector, Receptacle, Female	J8104
3, 240 V	Auto XFMR, Ø 3, 240 V	124		NOT USED	
1, 250 V	Auto XFMR, Ø 1, 250 V	125		Clamp, Cable	for P8101
2, 250 V	Auto XFMR, Ø 2, 250 V	126		NOT USED	
3, 250 V	Auto XFMR, Ø 3, 250 V	145		Terminal Lug	
n Z	Ground				
n Z	Ground				
	Ø 2 250 (Auto XFMR)				
	Ø 3 250 (Auto XFMR)				
	Ø 1 250 (Auto XFMR)				
	Cont. Coil				
	Pin F of J8101				
Relay Pin 6	B-				
r, Pin 12	Term. Strip 1				
r, Pin 13	Term. Strip 3				
Relay B-	XFMR Term. 1				
n.10	Tuner Unit Pin 17				
Term 1	HV Lite Resistor				

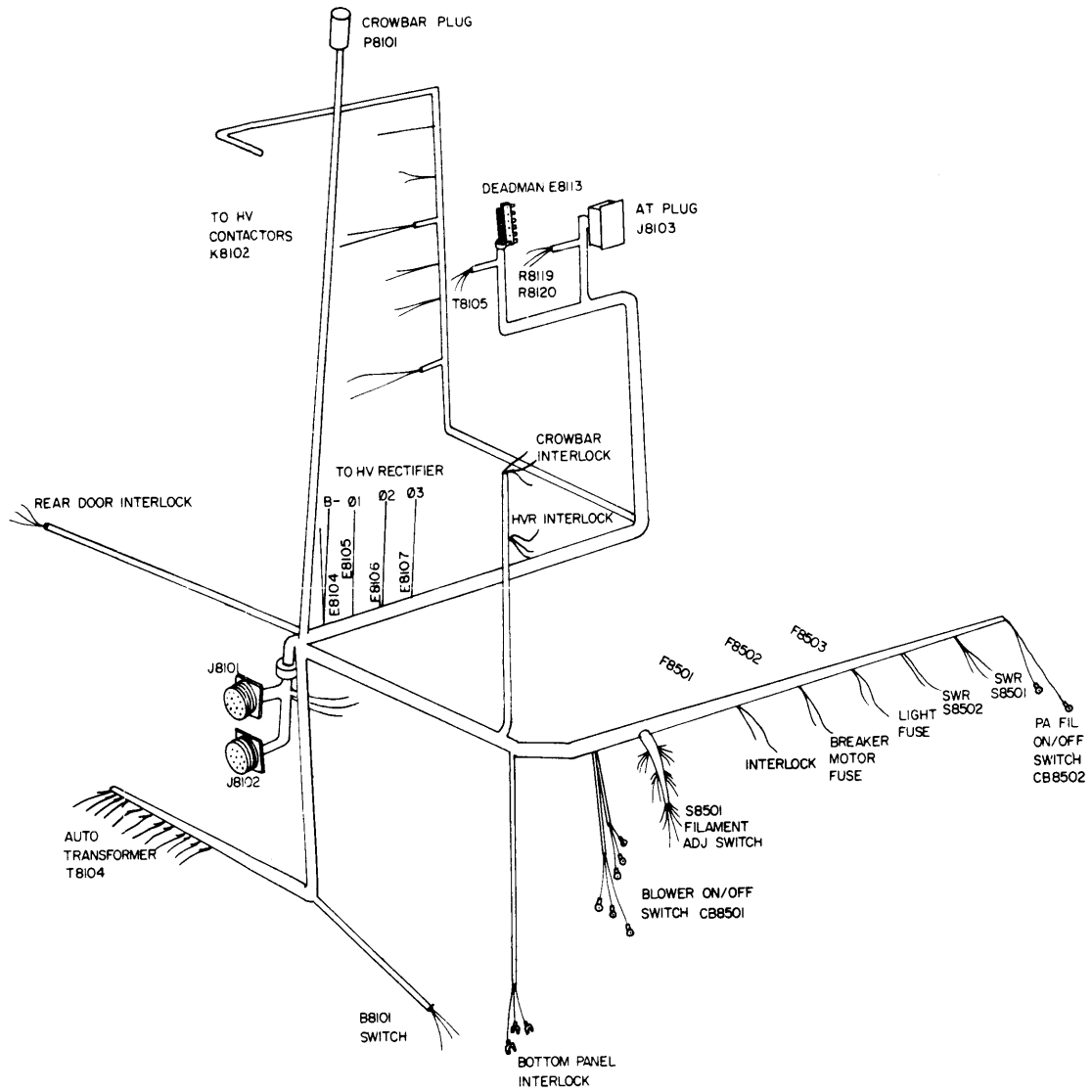


Figure 4-7-3. Cabling Diagram, Fourth Frame, GPT-40K (Sheet 2 of 2)

RUNNING SHEET FOR PS FRAME CABLE

COND.	COLOR	TERMINATIONS From	To
1	Grey	Pin A	Breaker Motor Fuse
2	Grey	Breaker Motor Fuse	Ll 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	E8119, Term. No. 5
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. b-Return
26		NOT USED	
27	Wh/Red	J8104, Pin A	Short Relay Micro Sw. + 600 V
28	Wh/Shld.	J8101, Pin A	SWR Pot
29	Red/ Shld.	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 230V
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., NO	
52	Red	Ant. Tuner, Pin 5 NO	
53	Wh/Blue	Rear Door Inter., NO	
54	White	Fil. Adj. Sw. Ø 1 Wiper	
55	Wh/Brown	HVR Inter., NC	
56	Wh/Brown	Crowbar Inter., NC	
57	Wh/Brown	Rear Door Inter., NC	
58	Wh/Brown	Bottom Panel Inter., NC	
59	Wh/Red	1 Ohm 14W Resistor, Res. Board	
60	Blue	Ant. Tuner, Pin 15 AV Volts	
61	Wh/Violet	Light Fuse	
62	Pink	Crowbar, Pin D Filament	
63	Wh/Brown	Crowbar, Pin E to	
64	Green	E8119, Term. No. 5	
65	Orange	Res. Short Cont. Coil	
66	Blue	Res. Short Cont. Coil	
67	Blue	Res. Short Cont. Coil	
68	White	Res. Short Cont. Aux Switch	
69	White	Blower On-Off Ø 1	
70	Violet	Blower On-Off Ø 2	
71	Grey	Blower On-Off Ø 3	
72	White	Tap Sw. Ø 1, 230 V	
73	Violet	Tap Sw. Ø 2, 230 V	
74	Grey	Tap Sw. Ø 3, 230 V	
75	Red	Tap Sw. Ø 1, 190 V	
76	Red	Tap Sw. Ø 2, 190 V	
77	Red	Tap Sw. Ø 3, 190 V	
78	Blue	Tap Sw. Ø 1, 200 V	
79	Blue	Tap Sw. Ø 2, 200 V	
80	Blue	Tap Sw. Ø 3, 200 V	
81	Yellow	Tap Sw. Ø 1, 210 V	
82	Yellow	Tap Sw. Ø 2, 210 V	
83	Yellow	Tap Sw. Ø 3, 210 V	
84	Orange	Tap Sw. Ø 1, 220 V	
85	Orange	Tap Sw. Ø 2, 220 V	
86	Orange	Tap Sw. Ø 3, 220 V	
87	Green	Tap Sw. Ø 1, 240 V	
88	Green	Tap Sw. Ø 2, 240 V	
89	Green	Tap Sw. Ø 3, 240 V	
90	Brown	Tap Sw. Ø 1, 250 V	
91	Brown	Tap Sw. Ø 2, 250 V	
92	Brown	Tap Sw. Ø 3, 250 V	
115	Black	J8101, Pin Z	
116	Black	J8102, Pin Z	
117	Brown	Ø 1 0	
118	Brown	Ø 2 0	
119	Brown	Ø 3 0	
120	Blue	Timer	
122	Wh/Black	Int. Fuse	
127	Tan	Shorting Relay Pin 6	
128		Ant. Tuner, Pin 12	
129		Ant. Tuner, Pin 13	
130	Tan	Shorting Relay B-	
131	Wh/Green	XFMR. Term.10	
132	Wh/Blue	Sh. Relay, Term 1	

PART V
PARTS LIST

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 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	CO-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	CO-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	
C936	Same as C933, part of XV900.	Grid Bypass	
C937	NOT USED.		

PA(10K) SECTION (SYMBOL SERIES 900)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
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.	Drive Input	UG-560/U
J902	Same as J900.	Monitor	
J903	NOT USED.		
J904	CONNECTOR, probe assembly.	RF Monitor	AJ-100

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
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	
L917	Same as L914.	Thermocouple Isolation	
MP900	COUNTER, rotating: 3 wheel, 0 to 9 each wheel.	Tune Indicator	CY-105

PA(10K) SECTION (SYMBOL SERIES 900)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
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.	ADLC 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	

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
S901	SWITCH, micro, push; 10 amps at 125/250 VAC; 1/2 amp at 125 VDC.	PA Bandswitch Interlock	SW-189
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	NOT USED.		
B7102	BLOWER, centrifugal: CCW rotation up blast; 5.0 hp, 220 VAC, 50/60 cycles, 3 phase; 2930 rpm at 50 cycles, 3520 rpm at 60 cycles.	Main PA Blower	BL-110
C7101	CAPACITOR, fixed: ceramic; 1000 uuf, ±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	
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: trylar; .01 uf, ±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	

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
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 socket 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 uh; Q = 35, resistance . 025 ohms; frequency 2. 5 mc.	External Filter Coil	CL-222
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 uh, 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; AN socket type, 35 contacts.	PA to PS Interconnect	MS3106B-32-7S
P7102	CONNECTOR, plug: male; AN pin type, 35 contacts.	PA to PS Interconnect	MS3106B-32-7P

PA(40K) FRAME (SYMBOL SERIES 7100)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
P7103	Same as P7101.	Blower Contactor Plug	
P7104	CONNECTOR, plug: male; AN pin type, 14 contacts.	Ext. Filter Plug	MS3106B-20-27P
P7105	CONNECTOR, plug: female; AN socket type, 14 contacts.	Bias Supply Plug	MS3106B-20-27S
P7106	CONNECTOR, plug: male; AN pin type, 4 contacts.	PA to PS Interconnect	MS3106B-22-10P
P7107	Same as P7101.	Relay Panel Plug	
P7108	CONNECTOR, plug: female; AN socket type, 4 contacts.	Relay Panel Plug	MS3106B-22-10S
P7109	CONNECTOR, plug: male; AN pin type, 1 contact.	Bias Supply B-Plug	MS3106B-18-16P
R7101	RESISTOR, fixed: composition; 1 megohm, ±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
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

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
A7301	NOT USED.		
A7302	NOT USED.		
A7303	NOT USED.		
A7304	BANDSWITCH AND COIL ASSEMBLY: consists of: A. Symbol A7305, SWITCH SECTION & COIL ASSEMBLY, "L" SECTION, TMC No. AX-294 B. Symbol A7306, GEAR BOX ASSEMBLY, TMC No. A-2024 C. Symbol E7308, INSULATOR, STANDOFF, TMC No. A-1992-2 D. Symbol E7309, 7310, INSULATOR, STANDOFF, TMC No. A-1992-1 E. Symbol L7313, COIL, RF, 19 to 24 MC, TMC No. CL-276 F. Symbol L7314, COIL, RF, 2 to 19 MC, TMC No. CL-277 G. Symbol MP7301, SHAFT, MAIN, TMC No. PX-538 H. Symbol S7307, SWITCH SECTION, ROTARY, "Pi" SECTION, TMC No. AX-266 J. Various plates, brackets, baffles, and hardware.	Main Bandswitch	AS-120
A7305	SWITCH SECTION AND COIL ASSEMBLY; "L" SECTION: consists of: A. Symbol L7308, COIL, RF, 19 to 24 MC, TMC No. CL-223 B. Symbol L7315, COIL, RF, 2 to 19 MC, TMC No. CL-279 C. Symbol L7316, COIL, RF, 24 to 28 MC, TMC No. CL-278 D. Symbol S7308, SWITCH SECTION, ROTARY, TMC No. AX-353 E. Various hardware This Assembly also supplied with TMC Part No. AS-120, symbol A7304.	Switch & Coil, "L" Section	AX-294
A7306	GEAR BOX ASSEMBLY, BANDSWITCH: consists of: A. Symbol E7302, TERMINAL BOARD, TMC No. TM-102-5 B. Symbol L7310, SOLENOID, TMC No. SZ-100 C. Symbol MP7302, GEAR, WORM, TMC No. GR-151-3 D. Symbol MP7303, GEAR, WORM WHEEL, TMC No. GR-151-1 E. Symbol S7304, SWITCH, TMC No. SW-189 F. Various bearings, plates, hubs, shafts, leads and hardware. This Assembly also supplied with TMC Part No. AS-120, symbol A7304.	Drive and Detent, Bandswitch	A-2024

PA(40K) SECTION (SYMBOL SERIES 7300)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
B7301	FAN, axial: 3400 rpm, CW; 115-230 VAC.	Top Fan	BI-108
C7301	NOT USED.		
C7302	NOT USED.		
C7303	NOT USED.		
C7304	CAPACITOR, FIXED, CERAMIC: 1000 uuf; ±20%; 5000 vdcw.	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 uuf, ±10%; 18,000 vdcw.	Bypass, PA Plate	CX102K102S
C7311	Same as C7310.	Bypass, PA Plate	
C7312	CAPACITOR, FIXED, TRYLAR: .01 uf; ±5%; 4000 vdcw.	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 uuf; 25000 vdcw.	Bypass, PA Plate	CX-103
C7317	CAPACITOR, FIXED, MICA: 100 uuf; ±10%; char. B, 500 vdcw.	Bypass, Drive Meter Circuit	CM20B101K
C7318	CAPACITOR, FIXED, MICA: .01 uf; ±10%; char. B, 300 vdcw.	Top Fan Bypass	CM35B103K
C7319	Same as C7318.	Top Fan Bypass	
C7320	Same as C7318.	Top Fan Bypass	
C7321	NOT USED.		
C7322	CAPACITOR, FIXED, VACUUM: 3 uuf; 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 uuf; ±10%; char. B, 500 vdcw.	Plate Monitor	CM15B500K

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
C7325	CAPACITOR, FIXED, VACUUM: 1000 uuf; 30 kv; 125 amps rms.	DC Blocking	CO-106-1000-30C
C7326	CAPACITOR, FIXED, VACUUM: 6 uuf; 30 kv; 60 amps rms.	Coupling, Plate Meter Circuit	CO-107-6-30C
C7327	CAPACITOR, FIXED, PAPER: 4 uf; ±10%; char. F; 600 vdcw; oil filled and impregnated, hermetically sealed cylindrical metal case.	Top Fan Capacitor	CP41B1FF405K
C7328	Same as C7325.	Bypass	
C7329	NOT USED.		
C7330	CAPACITOR, VARIABLE, VACUUM: 50 - 1000 uuf, 125 amp RMS, 20 kv, glass case.	PA Tune	CB-160
C7331	Same as C7330.	PA Load	
C7332	Same as C7330.	PA Load	
CP7301	NOT USED.		
CP7302	NOT USED.		
CP7303	ADAPTER, connector.	J7303 to P7307 Adapter	UG-273/U
CR7301	NOT USED.		
CR7302	NOT USED.		
CR7303	DETECTING ELEMENT, DIRECTIONAL COUPLER: frequency range 2 - 30 mc. Also supplied with DC-101, Symbol No. DC7302.	SWR Forward	DD-103
CR7304	Same as CR7303.	SWR Reverse	
DC7301	NOT USED.		
DC7302	COUPLER, DIRECTIONAL: 60000 watt; 2-30 mc; supplied with 2 diodes Symbol No. CR7303, CR7304.	SWR System	DC-101
E7301	NOT USED.		
E7302	TERMINAL STRIP, BARRIER TYPE: 5 terminal. Also supplied with TMC Part No. A-2024, Symbol No. A7306.	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
E7308	INSULATOR, STANDOFF: rectangular; material, supra-mica 500; over-all dim., 1 in. by 1-1/2 in. x 21 in. lg excluding 1/4-20 thd by 1-3/8 lg rod protruding from end, five mounting holes. Also supplied with TMC No. AS-120, Symbol A7304.	Support, Bandswitch	A-1992-2
E7309	INSULATOR, STANDOFF: rectangular; material, supra-mica 500; over-all dim., 1 in. by 1-1/2 in. x 21 in. lg excluding 1/4-20 thd by 1-3/8 lg rod protruding from end, six mounting holes. Also supplied with TMC No. AS-120, Symbol A7304.	Support, Bandswitch	A-1992-1
E7310	Same as E7309. Also supplied with TMC No. AS-120, Symbol A7304.	Support, Bandswitch	
E7311	CONTACT, ELECTRICAL: wiper; brass and copper components, silver plated; over-all dim., 1-3/8 in. by 4-1/8 in. by 8-1/8 in.; hardware, brass, nickel plated. This Assembly also supplied with TMC No. AX-266, Symbol S7307.	"Pi" Section Wiper Contact	AX-268
E7312	CONTACT, ELECTRICAL: button type; brass and copper components, silver plated; over-all dim., 1 in. by 2-1/2 in. by 2-7/8 in.; hardware, brass, nickel plated. This Assembly also supplied with TMC No. AX-266, Symbol S7307.	"Pi" Section Contact	AX-267
E7313	Same as E7312. Also supplied with TMC No. AX-266, Symbol S7307.	"Pi" Section Contact	
E7314	Same as E7312. Also supplied with TMC No. AX-266, Symbol S7307.	"Pi" Section Contact	
E7315	Same as E7312. Also supplied with TMC No. AX-266, Symbol S7307.	"Pi" Section Contact	
E7316	Same as E7312. Also supplied with TMC No. AX-266, Symbol S7307.	"Pi" Section Contact	
E7317	Same as E7312. Also supplied with TMC No. AX-266, Symbol S7307.	"Pi" Section Contact	
E7318	Same as E7312. Also supplied with TMC No. AX-266, Symbol S7307.	"Pi" Section Contact	

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
E7319	Same as E7312. Also supplied with TMC No. AX-266, Symbol S7307.	"Pi" Section Contact	
E7320	ROTOR, ELECTRICAL SWITCH: "Pi" Section; brass, rhodium plate; over-all dim., 1-1/2 in. by 6 in. by 7 in. approx.; 112 deg. span. Also supplied with TMC No. AX-266, Symbol S7307.	Pi Section Rotor	RO-102
E7321	INSULATOR, DISC TYPE: "Pi" Section; material, supra-mica 500; over-all dim., 3/4 in. by 12 in. od by 8-3/4 id with 11 groupings of four 1/8 in. dia mounting holes. Also supplied with TMC No. AX-266, Symbol S7307.	Pi Section Wafer	WS-107
E7322	CONTACT, ELECTRICAL: button type; brass, copper, and aluminum components, silver plated; over-all dim., 1 in. by 2-1/4 in. by 2-9/16 in.; hardware, brass, nickel plated. This Assembly also supplied with TMC No. AX-353, Symbol S7308.	L Section Contact	AX-339
E7323	Same as E7322. Also supplied with TMC No. AX-353, Symbol S7308.	L Section Contact	
E7324	Same as E7322. Also supplied with TMC No. AX-353, Symbol S7308.	L Section Contact	
E7325	Same as E7322. Also supplied with TMC No. AX-353, Symbol S7308.	L Section Contact	
E7326	Same as E7322. Also supplied with TMC No. AX-353, Symbol S7308.	L Section Contact	
E7327	ROTOR, ELECTRICAL SWITCH: "L" Section; brass, silver plated; over-all dim., 7/8 in. by 4-5/8 in. by 6 in. approx.; 102 deg. span. Also supplied with TMC No. AX-353, Symbol S7308.	L Section Rotor	RO-103
E7328	INSULATOR, PLATE TYPE: "L" Section; material, Supra-mica 500; over-all dim., 1/2 in. by 12 in. by 12 in. with 6 in. by 6 in. by 6 in. corner notch and various size holes. Also supplied with TMC No. AX-353, Symbol S7308.	L Section Wafer	WS-125
E7329	CONTACT, ELECTRICAL: aluminum, silver plated; 1/2 in. by 1-1/2 in. by 2-1/4 in.; two 10-32 thd by 7/8 in. dp holes spaced 7/8 in. c to c on each end. Also supplied with TMC No. AX-353, Symbol S7308.	L Section Common	PM-734
E7330	CORE: fixed type; ferramic, type Q2; 5/8 in. dia by 7 in. lg.	Filament Coil Core	CI-112-Q2-7L

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SYM	DESCRIPTION	FUNCTION	TMC PART NO.
E7331	Same as E7330.	Filament Coil Core	
E7332	Same as E7330.	Filament Coil Core	
E7333	Same as E7322. Also supplied with TMC No. AX-353, Symbol S7308.	L Section Contact	
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	MS3102A-14S-2S
J7303	CONNECTOR: probe, R. F.	Plate Monitor	AJ-101
J7304	CONNECTOR: probe, R. F.	R. F. Monitor	AJ-100
L7301	NOT USED.		
L7302	NOT USED.		
L7303	COIL, R. F. : fixed; 6 uhy; 225 amps max; teflon insulated.	PA Filament	CL-220
L7304	COIL, R. F. : fixed; 35 uhy, Q = 180 at 2. 5 mc.	Decoupling	CL-166
L7305	Same as L7304.	Decoupling	
L7306	Same as L7304.	Decoupling	
L7307	Same as L7304.	Thermocouple	
L7308	COIL, R. F. : fixed; 15 uhy; copper, silver plated. Also supplied with TMC No. AX-294, Symbol A7305.	"L" Section Tank Coil, 19-24 Mc	CL-223
L7309	NOT USED.		
L7310	SOLENOID, RELAY: with plunger; 230 v, 60 cps, 0. 2 amps; continuous duty cycle. Also supplied with TMC No. A-2024, Symbol A7306.	Bandswitch Release System	SZ-100
L7311	NOT USED.		
L7312	COIL, R. F. : fixed; 35 uh nom inductance; air wound.	Decoupling	CL-271

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
L7313	COIL, R. F. : fixed; . 175 uh, copper, silver plated. Also supplied with TMC No. AS-120, Symbol A7304.	19-24 Mc Tank Coil	CL-276
L7314	COIL, R. F. : fixed; 10. 5 uhy, current rating, 300 amps; tapped; copper, silver plated; dim. , including taps, 13-1/4 in. dia by 16-3/4 in. lg. Also supplied with TMC No. AS-120, Symbol A7304.	Pi Section Main Tank Coil, 2-19 Mc	CL-277
L7315	COIL, R. F. : fixed; 5. 5 uhy; 11 turns, tapped; copper, silver plated; dim. , excluding taps, 4-1/4 in. dia by 10 in. lg. Also supplied with TMC No. AX-294, Symbol A7305.	L Section Tank Coil, 2-19 Mc	CL-279
L7316	COIL, R. F. : fixed; . 11 uhy; copper, silver plated; over-all dim. , 1 in. by 5 in. by 6-1/4 in. Also supplied with TMC No. AX-294, Symbol A7305.	L Section Tank Coil, 24-28 Mc	CL-278
MP7301	SHAFT, STRAIGHT: insulated; material, G-7 Silicone Glass; 1-1/2 in. mon od by 19-7/8 in. lg; keywayed at both ends. Also supplied with TMC No. AS-120, Symbol A7304.	Main Shaft, Bandswitch	PX-538
MP7302	GEAR, WORM: pitch dia, . 625 in. ; pitch, 16; threads, double, right hand; pressure angle, 14-1/2 deg. ; face, 1 in. ; . 3125 in. by . 3125 in. square center hole; material oil hardened steel. Also supplied with TMC No. A-2024, Symbol A7306.	Drive Gear, Bandswitch	GR-151-3
MP7303	GEAR, WORM WHEEL: pitch dia, 3. 750 in. ; pitch, 16; threads, double, right hand; pressure angle, 14-1/2 deg. ; face, 5/16 in. ; no. of teeth, 60; hub, 1-1/2 in. dia by 7/16 in. ; . 753 in. dia keywayed center hole; material, oil hardened steel. Also supplied with TMC No. A-2024, Symbol A7306.	Drive Gear, Bandswitch	GR-151-1
MP7304	COUNTER, ROTATING, FIXED MOUNTING: 3 wheel, non-reset; first position, 2 to 3 mc; second position, 3 to 4 mc; third position, 4 to 5 mc; fourth position, 5 to 7 mc; fifth position, 7 to 11 mc; sixth position, 11 to 15 mc; seventh position, 15 to 19 mc; eight position, 19 to 24 mc; ninth position, 24 to 28 mc. Black figures on white background.	Bandswitch Frequency Counter	AC-138
MP7305	COUNTER, ROTATING, FIXED MOUNTING: 3 wheel, non-reset; 0 to 9 each wheel.	PA Tune Capacitor Counter	CY-105
MP7306	Same as MP7305.	PA Load Capacitor Counter	

PA(40K) SECTION (SYMBOL SERIES 7300)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
P7301	CONNECTOR, PLUG: QDL; male; single connector; for RG-18/U, RG-35/U or RG-164/U cable. Also supplied with TMC No. CA-561, Symbol W7301.	Emergency Output Connector	PL-136
P7302	CONNECTOR, PLUG: male; 4 contacts.	Top Fan Plug	MS3106B-14S-2P
P7303	NOT USED.		
P7304	NOT USED.		
P7305	NOT USED.		
P7306	NOT USED.		
P7307	CONNECTOR, PLUG: RF, coaxial.	Plate Monitor	PL-169
P7308	CONNECTOR, PLUG: angle type. Also supplied with TMC No. CA-577-2, Symbol W7303.	SWR Reflected Power	PL-192
P7309	Same as P7308. Also supplied with TMC No. CA-577-1, Symbol W7302.	SWR Forward Power	
P7310	CONNECTOR, PLUG: coaxial, male. Also supplied with TMC No. CA-577-2, Symbol W7303.	SWR Reflected Power	UG-88/U
P7311	Same as P7310. Also supplied with TMC No. CA-577-1, Symbol W7302.	SWR Forward Power	
R7301	RESISTOR, FIXED, COMPOSITION: 470 ohms; ±5%; 1/2 watt.	Volt Divider Plate Monitor	RC20GF471J
R7302	RESISTOR, FIXED, COMPOSITION: 47 ohms; ±5%; 1/2 watt.	Volt Divider Plate Monitor	RC20GF470J
R7303	RESISTOR, FIXED, WIRE WOUND: 3000 ohms; ±5%; 10 watts.	AC Power Light Dropping Res.	RW-109-30
R7304	Same as R7303.	Tube Light Dropping Res.	
R7305	Same as R7303.	Operate Light Dropping Res.	
R7306	Same as R7303.	Plate On Light Dropping Res.	
R7307	RESISTOR, FIXED, WIRE WOUND: 20,000 ohms; ±5%; 10 watts.	Thermostat Dropping	RW-109-37
S7301	NOT USED.		
S7302	NOT USED.		
S7303	SWITCH, INTERLOCK: push to operate; total travel approx. 0.312 in.; 15 amp, 120, 250 vac; 2 amps resistive at 250 vdc.	PA Deck Interlock	SW-230

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
S7304	SWITCH, MICRO: push; 10 amps at 125/250 vac; 1/2 amp at 125 vdc. Also supplied with TMC No. A-2024, Symbol A7306.	PA Bandswitch	SW-189
S7305	SWITCH, THERMOSTATIC: SPST; closes at 200° ±6°F; opens at 185° ±6°F.	PA Tube Protect	SS-104
S7306	Same as S7303.	Emergency Output Protection	
S7307	SWITCH SECTION, ROTARY: "Pi" Section; one moving contact, nine fixed contacts; consists of: A. Symbol B7311, Contact, Electrical, TMC No. AX-268. B. Symbols E7312, 7313, 7314, 7315, 7316, 7317, 7318, 7319, Contact, Electrical, TMC No. AX-267. C. Symbol E7320, Rotor, TMC No. RO-102. D. Symbol E7321, Insulator, Disc, TMC No. WS-107. E. Various hardware.	Pi Section Bandswitch	AX-266
S7308	SWITCH SECTION, ROTARY: "L" Section; one moving contact, seven fixed contacts; consists of: A. Symbol E7322, 7323, 7324, 7325, 7326, 7333, Contact, Electrical, TMC No. AX-339. B. Symbol E7327, Rotor, TMC No. RO-103. C. Symbol E7328, Insulator, Disc, TMC No. WS-125. D. Symbol E7329, Contact, Electrical, TMC No. PM-734. E. Various hubs, plates and hardware.	L Section Bandswitch	AX-353
V7301	TUBE, ELECTRON: triode.	Power Amplifier	ML-6697
W7301	CABLE ASSEMBLY, R. F.: consists of MIL type RG-17/U coaxial cable, one each connector, TMC No. PL-136, Symbol P7301; 29-7/8 in. lg over-all including connector.	10 KW Emergency Output	CA-561
W7302	CABLE ASSEMBLY, R. F.: consists of MIL type RG-58/U coaxial cable, one connector, TMC No. PL-192, Symbol P7309, one connector, TMC No. UG-88/U, Symbol P7311; 8-1/2 in. lg over-all.	Forward Power Interconnect	CA-577-1
W7303	CABLE ASSEMBLY, R. F.: consists of MIL type RG-58/U coaxial cable, one connector, TMC No. PL-192, Symbol P7308, one connector, TMC No. UG-88/U, Symbol P7310; 13-1/2 in. lg over-all.	Reflected Power Interconnect	CA-577-2
XI7301	SOCKET, LAMP: with frosted amber lens; screw type socket	AC Power	TS-136-3FS

PA(40K) SECTION (SYMBOL SERIES 7300)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
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	TS101P01
XZ7302	Same as XZ7301.	Plate Monitor Network Socket	
Z7301	NETWORK, DETECTOR: R. F.; range 2 to 28 mc; meters to 30 kv RF; converting RF to DC for metering circuit. (Non-repairable item.)	Drive Metering Network	AX-219
Z7302	Same as Z7301.	Plate Monitor Network	

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
CB7401	CIRCUIT BREAKER, triple pole, single throw; 230 VAC, 50 amps; series trip, 3 auxiliary switches mounted on rear.	Main Power ON-OFF	SW-266
CB7402	CIRCUIT BREAKER, single pole, single throw; 230 VAC, 2 amps; series trip, auxiliary SPDT switch mounted on rear.	High Voltage ON-OFF	SW-268
I7401	LAMP, neon, miniature; 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 Bkr. Indic. Dropping Res.	
R7403	RESISTOR, fixed: wire wound; 100 ohms, 55 watts.	HV Protect	RW-115-101-55
R7404	Same as R7403.	HV Protect	
S7401	SWITCH, push button: momentary contact; SPST; 1 amp at 250 V, 3 amps at 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 Indic. 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%; 500 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%, 1000 volts, char. F.	Filter Cap., 600 V.	CP70B1FG106K
C7507	DELETED.		
C7508	CAPACITOR, fixed: mica; .01 uf, ±10%, char. B; 300 wvdc.	RF Bypass, V7506	CM35B103K
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	CN108C423K
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
J7502	CONNECTOR, receptacle: female, 1 contact.	B-Connector	MS3102A-18-16S

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
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.	Volt. Dropping V7501	RW-109-24
R7502	RESISTOR, fixed: composition; 100,000 ohms, ±10%, 1/2 w.	I7501 Volt. Dropping	RC20GF104K
R7503	RESISTOR, fixed: composition; 470,000 ohms, ±10%, 2 watts.	Volt. Dropping	RC420GF474K
R7504	RESISTOR, fixed: wire wound; 7500 ohms, ±10%, 20 watts.	Volt. Dropping	RW-110-32
R7505	RESISTOR, fixed: composition; 1000 ohms, ±10%, 2 watts.	V7506 Plate Dropping	RC42GF102K
R7506	Same as R7505.	Plate Dropping	
R7507	RESISTOR, fixed: wire wound; 5000 ohms, 10 watts, 1-3/4 length.	Volt. Divider	RW-109-32
R7508	RESISTOR, fixed: composition; 47 ohms, ±10%, 2 watts.	Volt. Divider	RC42GF470K
R7509	RESISTOR, fixed: composition; 680,000 ohms, ±10%, 2 watts.	Volt. Divider	RC42GF684K
R7510	Same as R7508.	Volt. Divider	
R7511	RESISTOR, fixed: composition; 220,000 ohms, ±10%, 2 watts.	Volt. Divider	RC42GF224K
R7512	Same as R7511.	Volt. Divider	
R7513	RESISTOR, variable: composition; 500,000 ohms, ±20%, 2 watts, with locking bushing.	Bias Adj.	RV4ATXA504B
R7514	NOT USED.		
R7515	Same as R7502.	Bias Indic. Volt. Dropping	
R7516	RESISTOR, fixed: composition; 330,000 ohms, ±10%, 2 watts.	V7508 Plate Dropping	RC42GF334K

BIAS SUPPLY DRAWER (SYMBOL SERIES 7500)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
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	RA106ASXA253A
R7523	RESISTOR, fixed: wire wound; 10,000 ohms, ±5%, 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
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.	Volt. Reg.	OA2

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
V7505	Same as V7504.	Volt. Reg.	
V7506	TUBE, electron: sharp cutoff RF pentode; 7 pin miniature.	Volt. Reg, +600V	6AU6
V7507	TUBE, electron: twin power triode.	Volt. Reg, +600V	6336A
V7508	TUBE, electron: duo triode; 9 pin miniature.	Retune DC Ampl.	12AT7
V7509	Same as V7509.	SWR DC Ampl.	
XC7501 thru XC7504	NOT USED.		
XC7505	SOCKET, electron: octal, high crown.	Capacitor Socket C7505	TS101P01A
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 minuature.	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 candlebra; 110 volts, 1/4 watt; T-4-1/2 clear bulb; bayonet base.	Plate Overload	BI-103-2
I7602	Same as I7601.	Grid Overload	
I7603	Same as I7601.	Retune	
I7604	Same as I7601.	SWR	
I7605	Same as I7601.	Bias	
I7606	LAMP, neon: miniature; 110 volts, 1/25 watt; T-3-1/4 clear bulb; bayonet base.	Drive Interlock	BI-100-51
I7607	Same as I7601.	Final Filament	
J7601	CONNECTOR, receptacle: male; 35 contacts.	Power In & Out	MS3102A-32-7P
J7602	CONNECTOR, receptacle: male; 4 contacts.	Power In & Out	MS3102A-22-10P
K7601	RELAY ASSEMBLY, consists of armature relay with cabling. Contacts - silver cadmium rated at 25 amps, 125 VAC resistive: latch relay - 1100 ohms, ±10%; unlatch relay 0-93 ohms, ±10%: latch operate 220 V, 60 cps AC or less.	Plate Overload	AR-117

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
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
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 - 5 seconds.	Time Delay	TI-101-4
M7603	Same as M7602.	Blower Delay	

RELAY PANEL (SYMBOL SERIES 7600)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
M7604	Same as M7601.	Plate Time	
R7601	RESISTOR, variable: wire wound; .5 ohms, ±10%, 25 watts.	Plate Ovld. Adj.	RA75ASAOR5AK25
R7602	RESISTOR, variable: wire wound; 100 ohms, ±10%; 25 watts.	Grid Ovld. Adj.	RA75ASA101AK25
R7603	RESISTOR, fixed: wire wound, 30 ohms, ±5%, 10 watts.	Grid Ovld. Volt. Dropping	RW-109-46
R7604	RESISTOR, adjustable: wire wound; 15,000 ohms; ±10%; 3 watts.	Bias Relay Adj.	RA100ASSA153A
R7605	RESISTOR, fixed: wire wound; 35,000 ohms, ±5%, 10 watts.	Bias Relay Volt. Dropping	RW-109-40
R7606	Same as R7601.	Tube Protect Adj.	
R7607	RESISTOR, fixed: composition; 220,000 ohms, ±10%; 1/2 watt.	Drive Interlock Indic. Volt. Dropping	RC20GF224K
R7608	RESISTOR, fixed: wire wound; .166 ohms, ±5%. (R7608 is p/o K7608.)	Tube Protect Relay Coil Shunt	AR-128
R7609	RESISTOR, fixed: wire wound; .185 ohms, ±5%.	K7601 Current Limiting	AR-130
S7601	SWITCH, toggle: SPST; 6 amps; 125 VAC; 28° angle of throw; solder lug terminals.	Driver Interlock	ST-12A
XI7601	HOLDER, lamp: bayonet base; 105/125 volts, with white frosted lens.	Plate Overload	TS-137-7FB4
XI7602	Same as XI7601.	Grid Overload.	
XI7603	Same as XI7601.	Retune	
XI7604	Same as XI7601.	SWR	
XI7605	Same as XI7601.	Bias	
XI7606	LIGHT, indicator: w/clear white lens; for miniature base T-3-1/4 bulb.	Driver Interlock	TS-106-2
XI7607	Same as XI7601.	Final Filament	

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
B8101	GEARCASE-MOTOR: 240 VAC at 5 amps. For use with, but not part of SW-271, Symbol CB8101.	Main Power Breaker Motor	MO-110
B8102	FAN, axial: 3400 rpm, CW; 115/230 vac.	Top Fan, PS Frame	BL-108
C8101	CAPACITOR, fixed: ceramic; 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, 15000 wvdc.	AC Filter	CP-107
C8108	Same as C8107.	AC Filter	
C8109	DELETED.		
C8110	CAPACITOR, fixed: paper dielectric; 4 uf, ±10%; 600 wvdc hermetically sealed cylindrical metal case.	Fan Capacitor	CP41B1FF405K
CB8101	CIRCUIT BREAKER: magnetic trip; 3 pole; 600 VAC, 225 amp; Used with, but not part of MO-110, Symbol B8101.	Main Power Breaker	SW-271
E8101	CONTACT, spring loaded, nickel plated beryllium copper; 2-1/4" x 1-1/4" x 1" o/a.	B-, Crowbar	AX-153
E8102	Same as E8101.	HV, Crowbar	
E8103	Same as E8101.	HV, Crowbar	
E8104	Same as E8101.	B-, HVR	
E8105	Same as E8101.	HVR Filament	
E8106	Same as E8101.	HVR Filament	
E8107	Same as E8101.	HVR Filament	
E8108	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	

POWER SUPPLY FRAME (SYMBOL SERIES 8100)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
E8112	TERMINAL STRIP, barrier type, 3 terminals.	Timer Term. Strip	TM-102-3
E8113	TERMINAL STRIP, barrier type, 8 terminals.	Shorting Relay Terminal Strip	TM-102-8
E8114	CONTACT, ELECTRICAL: spring wiper type; beryllium copper, nickel plated.	PA Output Contact	AX-221
E8115	CONTACT ASSY., balanced output, brass 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
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 PA 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; 230 V, 60 cps, 0.2 amps; continuous duty cycle.	Shorting Relay Actuator	SZ-100
M8101	TIME DELAY: 20 seconds; quick make, quick break, 250 V, 5 amp switches.	Contactor Delay	TI-100

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
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	
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; 750 ohms, 25 watts.	HV Warning Lamp Volt. Dropping	RW-111-18
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	

POWER SUPPLY FRAME (SYMBOL SERIES 8100)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
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	
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
XI1801	SOCKET, bulkhead mounting; ceramic; for standard base incandescent lamp; rated for 660 watts, 250 volts.	I8101 Socket	TS-143

ANTENNA TUNING UNIT METER PANEL DRAWER (SYMBOL SERIES 8200)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
A8201	ROTOR, ELECTRICAL SWITCH: consists of one basic rotor, brass, silver plated and 5 contacts, TMC part no. AX-234, symbol no. E8204, 5, 6, 7, 8.	S8201 Rotor	AR-127
A8202	COIL, CONTACT, and INSULATOR ASSEMBLY: consists of one coil, TMC p/n CL-221, symbol no. L8201; one contact assembly, TMC p/n AX-258; symbol no. A8203; two sideplates, silicone glass; two spring contacts, TMC p/n AX-221, symbol no's. E8201, E8202; various mounting and retaining hardware, brass, nickel plated.	Bandswitch Coil	AC-112
A8203	CONTACT ASSEMBLY: bandswitch; consists of one mounting plate, supra-mica; 4 button contacts, TMC part no. AX-233, symbol no's. E8209, 10, 11 & 12; one button contact with strap, TMC part no. AX-257, symbol no. E8213. This Assembly also supplied with Assembly, TMC part no. AC-112, symbol no. A8202.	Bandswitch Wafer	AX-258
C8201	NOT USED.		
C8202	CAPACITOR, fixed: mica; .01 uf, ±10%, 300 wvdc, char. B.	Grid Current Meter Bypass	CM35B103K
C8203	Same as C8202.	Plate Volt Meter Bypass	
C8204	Same as C8202.	Grid Volt Meter Bypass	
C8205	Same as C8202.	SWR Meter Bypass	
C8206	Same as C8202.	Crowbar Fil. Meter Bypass	
C8207	CAPACITOR, fixed: vacuum; 1000 uuf, 30 kv, 125 amps RMS.	Coupling Cap.	CO-106-1000-30C
C8208	CAPACITOR, variable: vacuum; 50 to 2000 uuf, 10,000 volts peak, 45 amps RMS; with extension shaft, pinned and keywayed.	Balance Adj.	AM-116
E8201	CONTACT, ELECTRICAL: spring wiper type; beryllium copper, nickel plated. Also supplied with Assembly, TMC p/n AC-112, Symbol no. A8202.	Balanced Output Contact	AX-221
E8202	Same as E8201.	Balanced Output Contact	
E8203	CONTACT, ELECTRICAL: button type; brass, rhodium plated; hardware, brass, nickel plated.	PA Output Contact	AX-222

ANTENNA TUNING UNIT METER PANEL DRAWER (SYMBOL SERIES 8200)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
E8204	CONTACT, ELECTRICAL: leaf and shoe type; beryllium copper and brass, rhodium plated. Also supplied with Rotor, TMC p/n AR-127, symbol no. A8201.	Rotor Contact	AX-234
E8205	Same as E8204.	Rotor Contact	
E8205	Same as E8204.	Rotor Contact	
E8207	Same as E8204.	Rotor Contact	
E8208	Same as E8204.	Rotor Contact	
E8209	CONTACT, ELECTRICAL: button type; brass, rhodium plated; hardware, brass, nickel plated. Also supplied with Contact Assembly, TMC p/n AX-258, symbol A8203.	Switch Contact	AX-233
E8210	Same as E8209.	Switch Contact	
E8211	Same as E8209.	Switch Contact	
E8212	Same as E8209.	Switch Contact	
E8213	CONTACT, ELECTRICAL: button type, with strap; brass, rhodium plated; hardware, brass, nickel plated. Also supplied with Contact Assembly, TMC p/n AX-258, symbol A8203.	Switch Contact	AX-257
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, R. F. : fixed; 30 uhy total, tapped. Also supplied with Assembly, TMC p/n AC-112, symbol no. A8202.	Coil Section of A8202	CL-221
L8202	COIL, 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, miliamps: 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

ANTENNA TUNING UNIT METER PANEL DRAWER (SYMBOL SERIES 8200)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
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	NOT USED.		
M8206	METER, SWR: movement 0-100 microamps; approx. resistance 2000 ohms, pointer spade type, rectangular case.	SWR Meter	MR-146
MP8201	COUNTER, ROTATING, FIXED MOUNTING: 3 wheel; non-reset type; 0 to 9 each wheel.	Bal. Capacitor Counter	
MP8202	NOT USED.		
MP8203	COUNTER, ROTATING, FIXED MOUNTING: 3 wheel; non-reset type; first position, blank; third position, 12-20 mc; fourth position, 20-28 mc.	Bandswitch Counter	AC-139
R8201	NOT USED.		
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: push; 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 - Symbol # A8203	Bandswitch	c/o A8201 and A8203
T8201	BALLAST, fluorescent lamp: 8 watts; 118 volts, 0.17 amps, 60 cps.	Lamp Ballast	PO-169
T8202	Same as T8201.	Lamp Ballast	
XI8201 A, B	SOCKET, fluorescent lamp: 75 watts; 250 volts.	Lamp Socket	TS-141
XI8202 A, B	Same as XI8201.	Lamp Socket	
KS8201	SOCKET, starter: fluorescent; 60 watts, 250 volts.	Starter Socket	TS-140
KS8202	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
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	RA75AXA252AK25
R8305	RHEOSTAT, sliding contact type: 2 ohms, 75 watts, 6.120 maximum amps; 28 steps; slotted shaft	Reservoir Adj.	RP-101-3-S
R8306	RESISTOR, fixed: composition; 220,000 ohms, ±10%, 1/2 w.	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.	

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
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: crowbar; 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 gaint.	Socket, V8301	TS-125-2

HIGH VOLTAGE RECTIFIER DRAWER (SYMBOL SERIES 8400)

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 2.5 V; terminals 3-5 5 V at 10 amps AC plus 2 amps DC. In accordance with MIL-T-27A, Type TF1RX01YY.	Filament Transformer, V8401	TF-213
T8402	Same as T8401.	Filament Transformer, V8402	
T8403	Same as T8401.	Filament Transformer, V8403	
T8404	Same as T8401.	Filament Transformer, V8404	
T8405	Same as T8401.	Filament Transformer, V8405	
T8406	Same as T8401.	Filament Transformer, V8406	
V8401	TUBE, electron: rectifier; half wave, mercury vapor.	HV Rectifier	6895
V8402	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	
XF8406	Same as XF8401.	F8406 Socket	

HIGH VOLTAGE RECTIFIER DRAWER (SYMBOL SERIES 8400)

SYM	DESCRIPTION	FUNCTION	TMC PART NO.
XV8401	SOCKET, tube: 4 pin base; twist lock.	V8401 Socket	TS-123-206-200
XV8402	Same as XV8401.	V8402 Socket	
XV8403	Same as XV8401.	V8403 Socket	
XV8404	Same as XV8401.	V8404 Socket	
XV8405	Same as XV8401.	V8405 Socket	
XV8406	Same as XV8401.	V8406 Socket	

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