

ASTOR

RADIO CORPORATION PTY. LTD.

DIVISION OF ELECTRONIC INDUSTRIES LTD.

126-130 GRANT STREET, SOUTH MELBOURNE, S.C.A.

TECHNICAL BULLETIN

File: Receivers
Portable

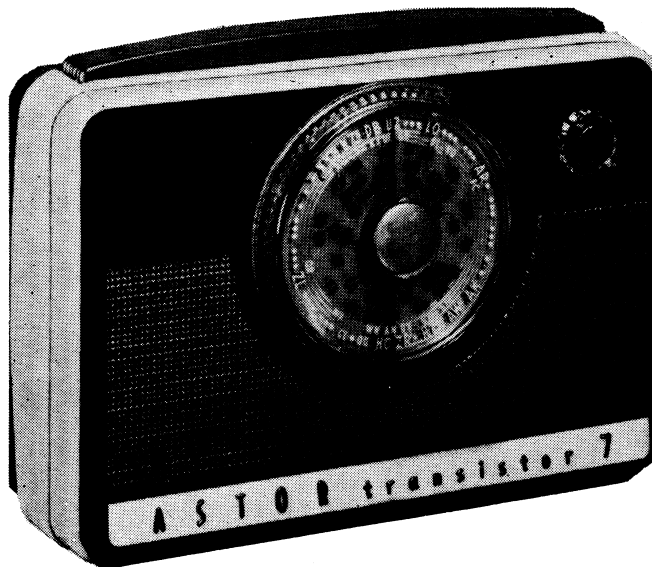
BULLETIN: GPN-1

Date: 7-10-59

Page: 1

ASTOR MODEL "GPN"

7 TRANSISTOR MIDGET PORTABLE RECEIVER



THIS BULLETIN CONTAINS:

1. Alignment Instructions.
2. Circuit Diagram.
3. Component Parts List.
4. IF. & RF. Trans. Connections.
5. Transistor Placement Diagram.
6. Battery Replacement Instructions and Diagram.
7. Instruction for Removing Chassis from Plastic Case.
8. Receiver Serial Number.
9. Receiver Servicing Precautions.
10. Instructions for Replacing Dial.

MODEL - GPN.

FOR OPERATION FROM:

9 Volt battery

CURRENT CONSUMPTION:

No signal - 10.5 mA.
250 mW Output - 63 mA.

POWER OUTPUT:

250 Milliwatts

TUNING RANGE:

535 to 1610 Kilocycles
560.7 to 186.3 Metres.

INTERMEDIATE FREQUENCY:

455 Kilocycles

SERVICE INSTRUCTIONS (ELECTRICAL)

ALIGNMENT INSTRUCTIONS

<u>EQUIPMENT</u>	<u>ALIGNMENT CONDITIONS</u>
Signal Generator :	modulated 400 CPS. Load Impedance: Sec. load imp. 4
Output Meter :	Ohms (output meter connected across speaker trans. sec.)
Mica Capacitor :	.01MF type PC145 for IFT. alignment
Straight Alignment Tool :	type PM581 for b/cast trim adjustment.
Flexible Alignment Tool :	type 48/712 for b/cast osc. coil core adj.
Hexagonal Alignment Tool :	type 418/81 for IFT. core adjustment.
	Output Level : 6 Milliwatts (voice coil open circuit)
	Output Level : 2 Milliwatts (voice coil in circuit)
	Volume control: Max. volume (fully clockwise)
	IF. Frequency : 455 Kc/s.
	Battery : 9 volts.

INTERMEDIATE FREQUENCY TRANSFORMER ALIGNMENT

Note 1. The receiver chassis does not have to be removed from the cabinet for alignment purposes.

It is only necessary to remove the rear section of the cabinet from the front section then move the battery out of the cabinet leaving the leads attached.

Remove screw from rear of cabinet, gently press the top of the rear section of the cabinet near the centre then prise the cabinet sections apart, commencing at the top.

Note 2. The iron core in the IF. transformers is the hexagonal bore type and may be adjusted with the hexagonal tip flexible alignment tool type 418/81, without removing the chassis from the cabinet.

Note 3. Two peaks may be obtained when adjusting the iron core in the IF transformers. The correct peak is the peak obtained when the core is screwed furthest toward transformer base.

Oper. No.	Generator Connection	Generator Frequency	Dummy Antenna	Instructions
1.	To converter transistor BASE lead: (junction of circuit No.28, 1 and 2.)	455 Kc/s.	0.01MF mica condenser in series with generator.	Turn the cond. gang to the high frequency end of travel position. From top of 3rd IFT. peak iron core for max. output refer note 2 and 3 above.
2.	As operation No. 1	455 Kc/s.	"	From top of 2nd IFT. peak iron core for max. output.
3.	As operation No. 1	455 Kc/s.	"	From top of 1st IFT. peak iron core for max. output.
4.	Repeat operations No. 1, 2 and 3.			

DIAL POINTER SETTING.

1. Remove the push-in type metal insert from the centre of the transparent tuning knob.
2. Loosen the three $\frac{1}{4}$ " x $\frac{3}{32}$ " whit. csk. hd. screws fastening the washer in the centre of the tuning knob.
3. Fully mesh condenser gang plates, then set centre of end of travel spot near 535 Kc/s. on dial reading to align with centre of indicator line on the dial background.
4. Securely tighten the three $\frac{3}{32}$ " screws in centre washer then refit push-in metal insert.

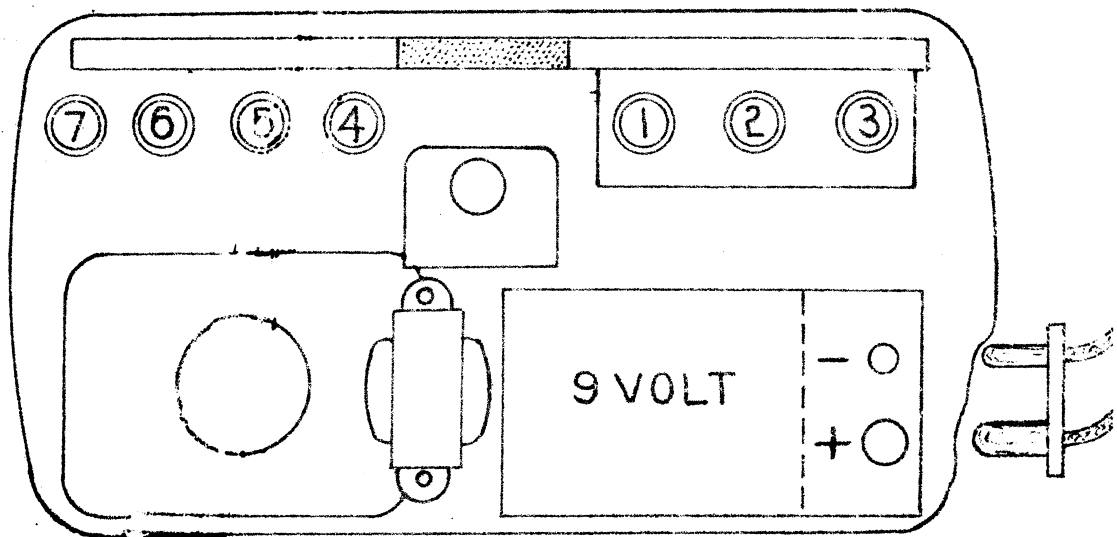
BROADCAST ALIGNMENT

- A. To inject a signal into the receiver rod aerial, connect to the active terminal of the signal generator approximately two feet of aerial wire, then fashion the wire into a vertical position.
- B. Place receiver chassis so that ferrite rod aerial is uppermost and horizontal and so that the movable winding end of the ferrite rod points to the 2 ft. of aerial wire. A distance of not less than 1 ft. is to be between the end of the ferrite rod and the 2 ft. of vertical aerial wire attached to the signal generator.

Oper. No.	Generator Connection	Generator Frequency	Instructions
1.	Refer para. A and B.	600 Kc/s.	Turn cond. gang and dial until centre of 600 Kc/s spot on dial reading aligns with the centre of the indicator line on the dial background. Leave cond. gang and dial set in this position then peak oscl. coil ind. trim (iron core) for max. output. Also peak the movable winding on the ferrite rod for max. output.
2.	Refer para. A and B.	1470 Kc/s.	Turn cond. gang and dial until centre of 1470 Kc/s spot on dial reading aligns with indicator line on dial background. Adjust oscl. trim. cond. for logging and peak ferrite rod aerial trimmer for max. output.
3.	Refer para. A and B.	600 Kc/s.	Turn cond. gang and dial until centre of 600 Kc/s spot on dial reading aligns with the centre of the indicator line on the dial background. Leave cond. gang and dial set in this position then peak oscl. coil ind. trim (iron core) and the movable winding on the ferrite rod aerial. Do not rock the cond. gang to and fro through the signal while adjusting the trimmers or move the 600 Kc/s spot on dial reading off the indicator line until after the trimmers have been adjusted for max. output.
4.	Refer para. A and B.	1470 Kc/s.	Turn cond. gang and dial until centre of 1470 Kc/s spot on dial reading aligns with indicator line on dial background. Readjust oscl. coil trim. cond. for logging and peak ferrite rod aerial trim. condenser for max. output.

Tuning range after alignment 535 to 1610 Kc/s.

SERVICE INSTRUCTIONS (MECHANICAL)

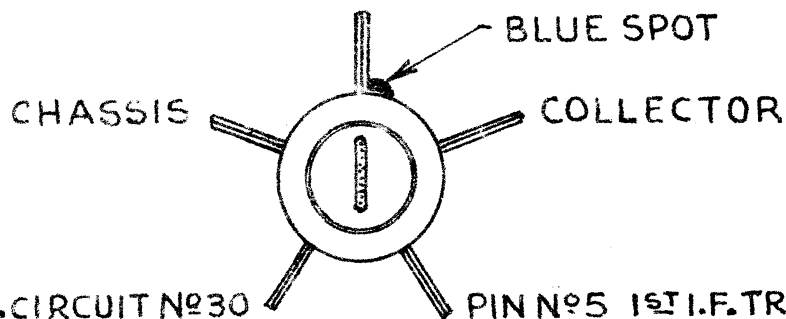


TRANSISTOR FUNCTIONS

NO.	FUNCTION	NO.	FUNCTION
1	CONVERTER	5	2 ND AUDIO DRIVER
2	1 ST I.F. AMPLIFIER	6	} PUSH-PULL OUTPUT
3	2 ND I.F. AMPLIFIER	7	
4	1 ST AUDIO DRIVER		

COIL AND TRANSFORMER CONNECTIONS

•01 MF. COND.
CIRCUIT N° 29



OSCILLATOR COIL VIEWED FROM LUG END

ROD AERIAL CONNECTIONS

- | | | |
|-----------------|--------------------------------|--|
| 56 | TURN FIXED PRIMARY WINDING:- | Lead from end turn furthest from movable $4\frac{1}{2}$ turn winding. Connect to the tuning condenser and the trimmer condenser. |
| 4 $\frac{1}{2}$ | TURN MOVABLE PRIMARY WINDING:- | Lead from end turn furthest from 56 turn winding. Connect to the chassis. |
| 4 | TURN FIXED SECONDARY WINDING:- | (Interwound at end of primary); lead from end nearest to $4\frac{1}{2}$ turn movable winding. Connect to the chassis. |
| 4 | TURN FIXED SECONDARY WINDING:- | (Interwound at end of primary); lead from end furthest from $4\frac{1}{2}$ turn movable winding. Connect to 0.01MF condenser circuit No. 28. |

INTERMEDIATE FREQUENCY TRANSFORMER CONNECTIONS

Connections for IF transformer base lugs are shown on the circuit diagram. The numbers correspond to the numbers on the transformer moulded base.

CHASSIS SERIAL NUMBER

The chassis serial number is stamped into the metal chassis near the IF. transformers and is visible when the rear section of the cabinet is removed from the front section.

Remove screw from rear of cabinet, gently press the top of the rear section of the cabinet near the centre then prise the cabinet sections apart, commencing at the top.

1. TO REMOVE CHASSIS ASSY. FROM CABINET.

- A. Remove the metal insert from the centre of the tuning knob.
- B. Remove the three $\frac{3}{32}$ " Whit. screws fastening the metal washer into the centre of the tuning knob.
- C. Remove the metal washer and the tuning knob from the condenser gang bush.
- D. Remove the push-on type knob from the volume control spindle.
- E. Remove the screw from the rear of the cabinet.
- F. Gently press the top of the rear section of the cabinet near the centre then prise the sections apart, commencing at the top.
- G. Prise plug out of socket in battery then remove the battery.

- H. At each end of the chassis remove the screw fastening the chassis to the cabinet.
- I. Remove the two screws fastening the bracket and transformer situated central in the cabinet. Remove the bracket.
- J. Slightly lift chassis and making sure not to damage the cabinet, unsolder the leads from the lugs on the speaker.
- K. Lift transformer and chassis out of the cabinet.
- L. Refitting of the chassis to the cabinet is the reverse procedure to removing it.

TO CHANGE DIAL READING

- A. Remove the tuning dial knob from the condenser gang bush as detailed in paragraphs 1A, B, and C.
- B. The dial reading is a press fit into the tuning knob and is located by four spigots.
- C. Carefully pull or prise the dial reading out of the knob.
- D. Locate the slots in the new dial reading with the spigots of the tuning knob then press the dial reading into the knob.
- E. Refit the tuning dial knob to the condenser gang bush then the centre washer and the three 3/32" Whit.screws. Do not tighten the screws.
- F. To set the tuning dial knob in the correct position refer to the Broadcast alignment procedure.

TO REMOVE THE BATTERY

- A. Switch the receiver OFF.
- B. Unscrew the screw from the rear of the cabinet.
- C. Gently press the top of the rear section of the cabinet near the centre then prise the sections apart, commencing at the top.
- D. Lift the battery upward and disconnect the two pin plug from the battery.
- E. Fitting of a new battery is the reverse procedure to removing it.

STORAGE WHEN OUT OF USE

It is not advisable to leave an exhausted battery in the receiver. If the receiver is stored away or not required for long periods, even partly-used batteries should be removed and stored in a dry cool place. This is a precautionary measure against the swelling and corroding action of worn-out batteries, which applies to all battery operated devices, such as torches, etc.

CLEANING AGENT FOR CABINET

Do not polish the moulded case or plastic sections with an abrasive material, motor car polish, boot polish, or similar household cleaning fluids as permanent damage may result to the finish of the case and plastic sections. To restore the lustre of the moulded case wipe with a soft cloth dampened with water and lightly polish with a neutral wax.

Circuit No.	Description	Tol±	Rating	Part No.
1	18,000 Ohm carbon resistor	10%	$\frac{1}{2}$ W	R1832
2	3,900 Ohm carbon resistor	10%	$\frac{1}{2}$ W	R3922
3	3,900 Ohm carbon resistor	10%	$\frac{1}{2}$ W	R3922
4	2,200 Ohm carbon resistor	10%	$\frac{1}{2}$ W	R2222
5	330 Ohm carbon resistor	10%	$\frac{1}{2}$ W	R3312
6	4,700 Ohm carbon resistor	10%	$\frac{1}{2}$ W	R4722
7	4,700 Ohm carbon resistor	10%	$\frac{1}{2}$ W	R4722
8	39,000 Ohm carbon resistor	10%	$\frac{1}{2}$ W	R3932
9	560 Ohm carbon resistor	10%	$\frac{1}{2}$ W	R5612
10	1800 Ohm carbon resistor	10%	$\frac{1}{2}$ W	R1822
11	4,700 Ohm carbon resistor	10%	$\frac{1}{2}$ W	R4722
12	100,000 Ohm carbon resistor	10%	$\frac{1}{2}$ W	R1042
13	5,000 Ohm tapped at 600 Ohms SP.ST. switch attached			R213.
14	39,000 Ohm carbon resistor	10%	$\frac{1}{2}$ W	R3932
15	1,000 Ohm carbon resistor	10%	$\frac{1}{2}$ W	R1022
16	6,800 Ohm carbon resistor	10%	$\frac{1}{2}$ W	R6822
17	4,700 Ohm carbon resistor	10%	$\frac{1}{2}$ W	R4722
18	1,500 Ohm carbon resistor	10%	$\frac{1}{2}$ W	R1522
19	130 Ohm disc type negative temperature coefficient resistor	10%	1W	R167
20	2,200 Ohm carbon resistor	10%	$\frac{1}{2}$ W	R2222
21	82 Ohm wire wound resistor	10%	$\frac{1}{2}$ W	R157
22	10 Ohm wire wound resistor	10%	$\frac{1}{2}$ W	PR553
23	100 Ohm wire wound resistor	10%	$\frac{1}{2}$ W	PR262
24	6,800 Ohm carbon resistor	10%	$\frac{1}{2}$ W	R6822
25	22,000 Ohm carbon resistor	10%	$\frac{1}{2}$ W	R2232
26	Two gang variable condenser			C393
27	1.5 - 15 MMF trimmer condenser			PC928
28	.01 MF paper condenser	20%	200V DCW	E1033
29	.01 MF paper condenser	20%	200V DCW	E1033
30	310 MMF silvered mica condenser	2 $\frac{1}{2}$ %	500V DCW	C155
31	3-30 MMF wire wound trimmer condenser			PC663
32	.01 MF paper condenser	20%	200V DCW	E1033
33	15 MF Electrolytic condenser	+100%-10%	15V DCW	C282
34	.01 MF Paper condenser	20%	200V DCW	E1033
35	6 MMF Silvered mica condenser	1 MMF	500V DCW	C312
36	.01 MF Paper condenser	20%	200V DCW	E1033
37	.01 MF Paper condenser	20%	200V DCW	E1033
38	.01 MF Paper condenser	20%	200V DCW	E1033
39	.047 MF Paper condenser	20%	200V DCW	E4733
40	2 MF Electrolytic condenser	+100%-10%	150V DCW	C281
41	2 MF Electrolytic condenser	+100%-10%	150V DCW	C281
42	100 MF Electrolytic condenser	+100%-10%	150V DCW	C284
43	.27 MF Paper condenser	20%	200V DCW	E2743
44	.01 MF Paper condenser	20%	200V DCW	E1033
45	50 MF Electrolytic condenser	+250%-10%	3V DCW	C307
46	50 MF Electrolytic condenser	+250%-10%	3V DCW	C307
47	100 MF Electrolytic condenser	+100%-10%	12V DCW	C284
48	22 Ohm carbon resistor	10%	$\frac{1}{2}$ W	R2202
49	33,000 Ohm carbon resistor	10%	$\frac{1}{2}$ W	R3332

50	Ferrite rod aerial	L330
51	Oscillator coil	L329
52	No. 1 IF. transformer - 455 Kc/s red spot on lug 4	L331
53	No. 2 IF. transformer - 455 Kc/s white spot on lug 4	L332
54	No. 3 IF. transformer - 455 Kc/s blue spot on lug 4	L333
55	Driver transformer - Pri. 4300 : Sec. CT 1250 Ohms impedance	L233
56	Speaker input transformer - Pri. CT270 : 3.5 Ohms impedance	T234
57	Battery - 9 volt, Eveready type 276-P	M470
58	Speaker - 3" permag. type 3C. Cone No. F94	K118
59	ON/OFF switch - SP.ST. part of vol. control circuit No. 13.	
60	Plug - 2 pin, battery leads	482/30C
	Terminal strip assy. - 7 lug type 2E3E	A596/30C
	Terminal strip assy. - 2 lug type E1	A599/30C
	Terminal strip assy. - 9 lug type 1E4E2	A620/30C
	Terminal strip assy. - 7 lug type 4E2	A631/30C
	Terminal strip assy. - 9 lug type E6E1	A640/30C
	Terminal strip assy. - 8 lug type 2E3E1	A593/30C
	Aerial rod mount pillar (2)	278/81
	Clip (2) aerial rod mt.	453/250
	Clip - oscl. coil mt.	6/622
	Clip (3) IF. transformer mt.	510/250
	Tuning knob - includes gold finish metal ring.	A114/849
	Insert - gold finish metal - centre of tuning knob.	50/8 9
	Dial reading - N.S.W.	676/81-2
	Dial reading - VIC/TAS.	676/81-3
	Dial reading - QLD	676/81-4
	Dial reading - SA./WA.	676/81-5
	Dial background	713/250
	Volume control knob - WHITE	302/81-2
	Volume control knob - CHARCOAL	302/81-4
	Volume control knob - CHERRY RED	302/81-6
	Volume control knob - OLD ROSE	302/81-12
	Volume control knob - GREY	302/81-18
	Volume control knob - LIME	302/81-20
	Circlip - volume knob	22/755
	Bush - cond. gang shaft.	52/849
	Nut - vol. control bush	41/161
	Washer - $\frac{3}{8}$ " int. shakeproof	1/562-15

CABINET CASE STYLING LIST

Complete cabinet supplied in a carton consisting of - front and rear sections of cabinet, moulded escutcheon, speaker grille, name panel, dial background and handle assembly, does not include Tuning or Volume control knob assemblies.

GREY/CHERRY RED	A119/849-21
OLD ROSE/CHARCOAL	A119/849-22
CHARCOAL/LIME	A119/849-23
WHITE/CHERRY RED	A119/849-24
CHERRY RED/GREY	A119/849-25
CHARCOAL/OLD ROSE	A119/849-26
LIME/CHARCOAL	A119/849-27
CHERRY RED/WHITE	A119/849-28

CABINET COMPONENTS SUPPLIED AS SEPARATE ITEMS

CABINET FRONT SECTION - includes escutcheon, grille, name panel, handle assy., dial background and cabinet front body section.

<u>CABINET FRONT</u>	<u>ESCUTCHEON</u>	
CHERRY RED	WHITE	A115/849-3
WHITE	CHERRY RED	A115/849-9
GREY	CHERRY RED	A115/849-13
OLD ROSE	CHARCOAL	A115/849-14
CHARCOAL	LIME	A115/849-15
CHERRY RED	GREY	A115/849-16
CHARCOAL	OLD ROSE	A115/849-17
LIME	CHARCOAL	A115/849-18

CABINET REAR SECTION

CHERRY RED	A118/849-3
CHARCOAL	A118/849-4
WHITE	A118/849-5
OLD ROSE	A118/849-6
GREY	A118/849-14
LIME	A118/849-15

HANDLE AND GRIP ASSEMBLY

GREY	A113/849-9
WHITE	A113/849-10
CHERRY RED	A113/849-13
CHARCOAL	A113/849-14
OLD ROSE	A113/849-16
LIME	A113/849-25

NEGATIVE TEMPERATURE COEFFICIENT RESISTOR

Due to a shortage of the 130 Ohm Negative Temperature Coefficient resistor, part No. R167 circuit No. 19, the components listed below will be used until the 130 Ohm Neg. Temp. Coefficient resistor is available.

Circuit No. 19 ----- 130 Ohm N.T.C. resistor changed to a 350 Ohm tubular type N.T.C. resistor part No. R259.

Circuit No. 20 ----- 2200 Ohm resistor changed to a 6800 Ohm 10% $\frac{1}{2}$ W carbon resistor part No. R6822.

Circuit No. 21 ----- 82 Ohm resistor changed to a 330 Ohm 10% $\frac{1}{2}$ W carbon resistor part No. R3312.

The above three circuit changes must all be used in conjunction with one another.

TRANSISTOR ELECTRICAL ALTERNATIVES

The Model "GPN" receiver is designed to use a Raytheon brand transistor complement as detailed below in group 1.

Other transistor complements which may be used are detailed in groups 2 to 10.

<u>GROUP 1.</u>	Converter	2N486	Raytheon	
	1st IF.	2N484	"	
	2nd IF.	2N484	"	
	1st Audio	2N362	"	
	Driver	2N363	"	
	Output	2N632	"	} Matched pair
	Output	2N632	"	

<u>GROUP 2.</u>	Converter	OC44	Philips	
	1st IF.	OC45	"	
	2nd IF.	OC45	"	
	1st Audio	OC75	"	
	Driver	OC71	"	
	Output	OC72	"	} Matched pair 2-OC72
	Output	OC72	"	

<u>GROUP 3.</u>	Converter	2N486	Raytheon	
	1st IF.	2N308	S.T.C.	
	2nd IF.	2N309	"	
	1st Audio	2N362	Raytheon	
	Driver	TS2	S.T.C.	
	Output	2N185	"	} Matched pair
	Output	2N185	"	

Circuit No. 35. 6 MMF neutralizing condenser is deleted when using the IF. amplifier transistors of this group.

<u>GROUP 4.</u>	Converter	2N486	Raytheon	
	1st IF.	2N484	"	
	2nd IF.	2N484	"	
	1st Audio	2N362	"	
	Driver	TS2	S.T.C.	
	Output	2N185	"	} Matched pair
	Output	2N185	"	

<u>GROUP 5.</u>	Converter	2N486	Raytheon	
	1st IF.	2N308	S.T.C.	
	2nd IF.	2N309	"	
	1st Audio	2N362	Raytheon	
	Driver	2N363	"	
	Output	2N185	S.T.C.	} Matched pair
	Output	2N185	"	

Circuit No. 35. 6 MMF neutralizing condenser is deleted when using the IF. amplifier transistors of this group.

<u>GROUP 6.</u>	Converter	2N486	Raytheon	
	1st IF.	2N484	"	
	2nd IF.	2N484	"	
	1st Audio	2N362	"	
	Driver	TS2	S.T.C.	
	Output	2N632	Raytheon	} Matched pair
	Output	2N632	"	

<u>GROUP 7.</u>	Converter	2N486	Raytheon	
	1st IF.	2N484	"	
	2nd IF.	2N484	"	
	1st Audio	2N362	"	
	Driver	TS3	S.T.C.	
	Output	2N632	Raytheon	} Matched pair
	Output	2N632	"	

<u>GROUP 8.</u>	Converter	2N486	Raytheon	
	1st IF.	2N484	"	
	2nd IF.	2N484	"	
	1st Audio	2N363	"	
	Driver	2N363	"	
	Output	2N185	S.T.C.	} Matched pair
	Output	2N185	"	

<u>GROUP 9.</u>	Converter	2N486	Raytheon	
	1st IF.	2N308	S.T.C.	
	2nd IF.	2N309	"	
	1st Audio	2N363	Raytheon	
	Driver	2N363	"	
	Output	2N185	S.T.C.	} Matched pair
	Output	2N185	"	

4 Circuit No. 35. 6 MMF neutralizing condenser is deleted when using the IF. amplifier transistors of this group.

<u>GROUP 10.</u>	Converter	OC44	Philips	
	1st IF.	OC45	"	
	2nd IF.	OC45	"	
	1st Audio	OC71	"	
	Driver	OC71	"	
	Output	OC72	"	} 2-OC72 matched pair
	Output	OC72	"	

2N486

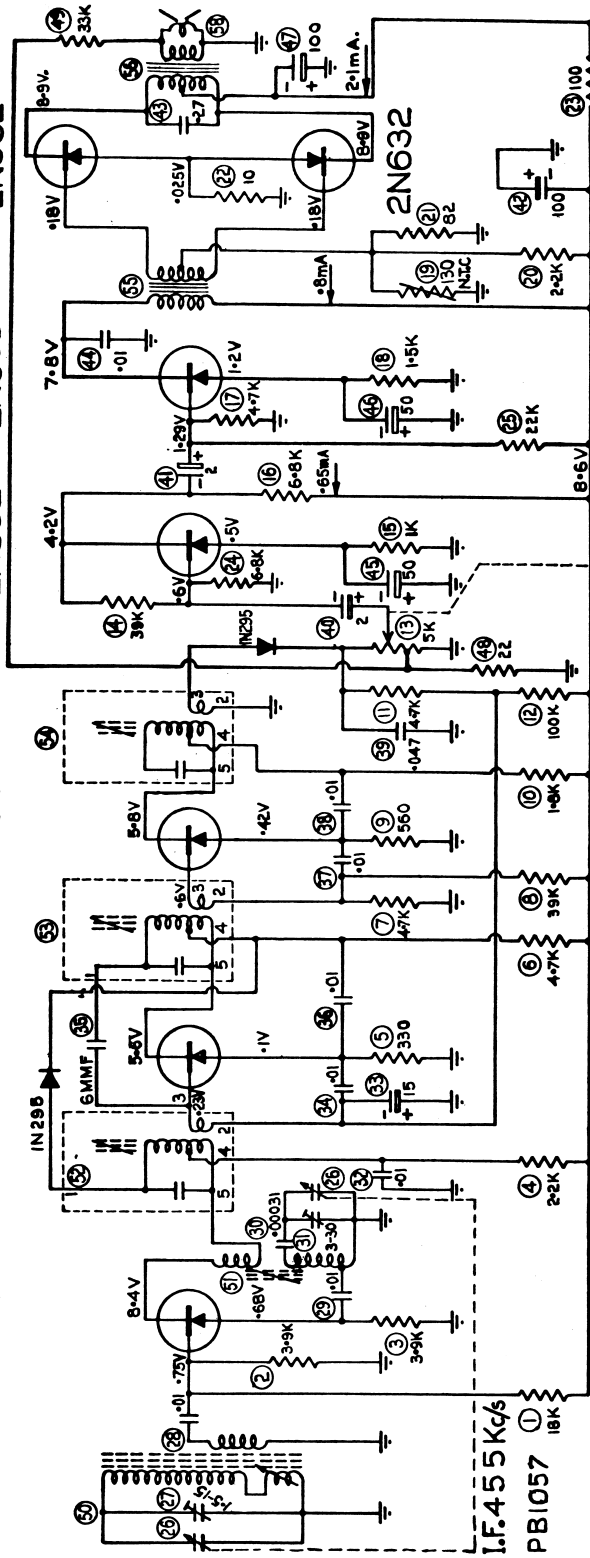
2N484

2N484

2N362

2N363

2N632



I.F. 455 Kcs

PB1057

FUNCTION RAYTHEON

CONVERTER 2N486

1st LEAMP. 2N4842nd LEAMP. 2N4841st AUDIO DVR 2N3622nd AUDIO DVR 2N363

PUSH-PULL (2N632)

OUTPUT (2N632)

MATCHED PAIR

[RAYTHEON]

[PHILIPS]

[S.T.C.]

MODEL GPN

COLLECTOR

COLLECTOR

COLLECTOR

COLLECTOR

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OUTPUT (2N632)

MATCHED PAIR

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OUTPUT (2N632)

MATCHED PAIR

[RAYTHEON]

[PHILIPS]

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[RAYTHEON]

[PHILIPS]

[S.T.C.]

MODEL GPN

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PUSH-PULL (2N632)

OUTPUT (2N632)

MATCHED PAIR

[RAYTHEON]

[PHILIPS]

[S.T.C.]

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FUNCTION RAYTHEON

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OUTPUT (2N632)

MATCHED PAIR

[RAYTHEON]

[PHILIPS]

[S.T.C.]

MODEL GPN

COLLECTOR

COLLECTOR

COLLECTOR

COLLECTOR

FUNCTION RAYTHEON

CONVERTER 2N486

1st LEAMP. 2N4842nd LEAMP. 2N4841st AUDIO DVR 2N3622nd AUDIO DVR 2N363

PUSH-PULL (2N632)

OUTPUT (2N632)

MATCHED PAIR

[RAYTHEON]

[PHILIPS]

[S.T.C.]

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