

for 100 Watt P.A. Amplifier

AWA Models PA1001AZ and PA1001BZ.

These models are high performance vacuum tube amplifiers delivering 100 watts.

Model PA1001AZ is designed for booster applications while Model PA1001BZ is designed for system applications.

A feature of these amplifiers is a driver/output stage of unique design developed by AWA which enables the output valves to be operated in Class AB1 without loss of performance since the coupling between all sections of the output transformer primary is maintained at 100% at all frequencies. Long valve life is thus ensured as the output stage only reaches full current on signal peaks. As a further aid to reliability, cathode resistors in all stages provide consistency of operation and overload protection.

OPERATIONAL LAYOUT.

The general disposition of controls is as follows:-

Operation controls are on the front panel, input terminals are on the left hand side and output terminals, pre-set controls and test points are at the rear.

All controls are clearly marked and their operation is quite conventional.

PRE-SET ADJUSTMENTS.

To provide reliability and protection to the amplifier the following adjustments are provided. These adjustments have been accurately made at the factory but may need to be repeated during the life of the equipment.

BIAS ADJUSTMENT of V4, V5, V6 and V7.

These adjustments are to be carried out whenever 7027A valves are replaced.

V4 and V5 Bias.

Adjust with no signal input into the amplifier.

Connect a d.c. voltmeter between the rear test points V4 and E. Adjust the V4, V5 BIAS control to give 8 volts. Move the meter to V5 test point and check it for 8 Volts, adjusting the control if necessary to compromise for V4 and V5 variations.

V6 and V7 Bias.

Connect the meter between test points V6 and E.

Adjust the V6, V7 BIAS control to give 8 volts. Move the meter to V7 test point and check it for 8 volts, adjusting the control if necessary to compromise for V6 and V7 variations.

N.B. Repeat the above adjustments for these two controls several times to obtain the closest balance possible. In some cases it may be necessary to swap valves around to have the closest

matching pairs in parallel.

A.C. BALANCE.

Several methods may be used depending on the test equipment available.

Method 1.

Connect a resistive load across the OUTPUT terminals with the shorting links correctly connected, e.g. joining 3-4, 6-7, 9-10 and use a 100 ohm load.

Connect a Distortion and Noise meter across part of the resistive load and apply an input signal of 1000 Hz to give almost full output from the amplifier, e.g. 90 volts across the 100 ohms load.

Adjust the A.C. BAL control for minimum total harmonic distortion.

Method 2.

Connect a resistive load on the amplifier as above.

Connect an oscilloscope across the 3.3 ohm resistor (R58) and apply a 1000 Hz input signal.

At an output of approximately 10% of full output, e.g. 10 volts across 100 ohm load, adjust the A.C. BAL. control for the minimum amplitude of the high frequency component of the c.r.o. signal.

Method 3.

A simplified version of method 2 above can be achieved by feeding the output of a radio into the amplifier and, with earphones connected across R58 (3.3 ohms), adjusting the A.C. BAL. control for minimum noise on the radio program.

OUTPUT LIMITER.

Turn the control fully anti-clockwise.

Connect a resistive load across the OUTPUT terminals with the shorting links correctly connected e.g. join 3-4, 6-7, 9-10 and use a 100 ohm load.

Apply a 1000 Hz signal to the amplifier and increase the signal level until the amplifier gives full output i.e. 100 volts across a 100 ohm load. Turn the OUTPUT LIMITER control until the limiter circuit just commences to work. This will be seen as a "blinking" on a voltmeter or an oscilloscope.

A similar adjustment may be used to set the limiter at levels below 100 watts. e.g. 75 watts-87 volts in 100 ohm load

50 watts-70 volts in 100 ohm load.

N.B. If no facilities are available for setting the limiter no damage will be done to the amplifier if the OUTPUT LIMITER control is left in its fully anti-clockwise position.

Model PA1001A.

Power Output: 100 watts (continuous sine wave at 1,000 Hz)

Distortion : less than 3% at 100 watts at 1,000 Hz

Sensitivity.

Input 1 : Pin 1 - E: 300mV

Input 2 : Pin 4 - E: 300mV

Hum/Noise : -65db.

Tone Control : Bass Cut Switch -5db at 200 Hz

Response : 3db points 50-12,000 Hz.

Regulation : better than 2db.

Model PA1001BZ.

Power Output: 100 watts (continuous sine wave at 1,000 Hz)

Distortion : less than 3% at 100 watts at 1,000 Hz

Sensitivity.

Mic. (High Imp): 3mV

Phono : 200mV

Hum/Noise

Mic. : -45db

Phono : -55db.

Tone Control.

Phono/Radio Tone Control: - 5db at 2,000 Hz

Bass Cut Switch : - 5db at 200 Hz

Response : 3db points 50-12,000 Hz.

Regulation : better than 2db.

CIRCUIT REF.	DESCRIPTION	TOL.		WATT- AGE	CODE	QTY.	SUPPLIER.
		+	%				
R1	270K ohms cracked carbon (AZ)	5	$\frac{3}{8}$		616962.	B8 305	O5B/270K
	220K ohms cracked carbon (BZ)	5	$\frac{3}{8}$		616735.	B8 305	O5B/220K
R2	680K ohms " "	5	$\frac{3}{8}$		617673.	B8 305	O5B/680K
R3	270K ohms " "	5	$\frac{3}{8}$		616962.	B8 305	O5B/270K
R4	1 Megohm " "	5	$\frac{3}{8}$		618031.	B8 305	O5B/1M
R5	1K ohms " "	5	$\frac{3}{8}$		618043	B8 305	O5B/1K
R6	6.8Megohms " "	10	$\frac{3}{8}$		619156.	B8 305	O5A/6M8
R7	100K ohms " "	5	$\frac{3}{4}$		616029	B8 305	O6B/100K
R8	390K ohms " "	5	$\frac{3}{4}$		617210	B8 305	O6B/390K
R9	47K ohms carbon	10	1		614969.		
R10	220K ohms cracked carbon	5	$\frac{3}{4}$		616736	B8 305	O6B/220K
R11	120K ohms " "	5	$\frac{3}{8}$		616269	B8 305	O5B/120K
R12	1.2 Megohms " "	10	$\frac{3}{8}$		618149	B8 305	O5A/1M2
R13	100 ohms " "	5	$\frac{3}{8}$		604052	B8 305	O5B/100E
R14	3.3K ohms " "	5	$\frac{3}{8}$		610314	B8 305	O5B/3K3
R15	68K ohms " "	5	$\frac{3}{8}$		615510	B8 305	O5B/68K
R16	1.2 Megohms " "	10	$\frac{3}{8}$		618149	B8 305	O5A/1M2
R17	100K ohms " "	5	$\frac{3}{4}$		616029	B8 305	O6B/100K
R18	2.2K ohms " "	5	$\frac{3}{8}$		609457	B8 305	O5B/2K2
R19	220K ohms " "	5	$\frac{3}{4}$		616736	B8 305	O6B/220K
R20	56K ohms " "	5	$\frac{3}{4}$		615177	B8 305	O6B/56K
R21	1.2 Megohms " "	10	$\frac{3}{8}$		618149	B8 305	O5A/1M2
R22	2.7K ohms " "	5	$\frac{3}{4}$		609881	B8 305	O6B/2K7
R23	1.2 Megohms " "	10	$\frac{3}{8}$		618149	B8 305	O5A/1M2
R24	6.8K ohms carbon	10	1		611530		
R25	6.8K ohms carbon	10	1		611530		
R26	33K ohms wire wound	5	10		614481		
R27	33K ohms wire wound	5	10		614481		
R28	4.7K ohms cracked carbon	5	$\frac{3}{8}$		610972	B8 305	O5B/4K7
R29	4.7K ohms " "	5	$\frac{3}{8}$		610972	B8 305	O5B/4Ky
R30	4.7K ohms " "	5	$\frac{3}{8}$		610972	B8 305	O5B/4K7
R31	220K " "	5	$\frac{3}{8}$		616735	B8 305	O5B/220K
R32	33K " "	5	$\frac{3}{8}$		614478	B8 305	O5B/33K
R33	33K " "	5	$\frac{3}{8}$		614478	B8 305	O5B/33K
R34	220K ohms " "	5	$\frac{3}{8}$		616735	B8 305	O5B/220K
R35	4.7K ohms " "	5	$\frac{3}{8}$		610972	B8 305	O5B/4K7
R36	4.7K ohms " "	5	$\frac{3}{4}$		610940	B8 305	O6B/4K7
R37	100 ohms wire wound	5	7		604055		Ducon RVW4-J
R38	100 ohms wire wound	5	7		604055		Ducon RVW4-J
R39	4.7K ohms cracked carbon	5	$\frac{3}{4}$		610940	B8 305	O6B/4K7
R40	220K ohms carbon	10	1		616726		
R41	220K ohms " "	10	1		616726		
R42	220K ohms " "	10	1		616726		
R43	220K ohms " "	10	1		616726		

R44	4.7K ohms cracked carbon	5	$\frac{3}{8}$	610972 B8 305 O5B/4K7
R45	220K ohms " "	5	$\frac{3}{8}$	616735 B8 305 O5B/220K
R46	33K ohms " "	5	$\frac{3}{8}$	614478 B8 305 O5B/33K
R47	33K ohms " "	5	$\frac{3}{8}$	614478 B8 305 O5B/33K
R48	220K ohms " "	5	$\frac{3}{8}$	616735 B8 305 O5B/220K
R49	4.7K ohms " "	5	$\frac{3}{8}$	610972 B8 305 O5B/4K7
R50	4.7K ohms " "	5	$\frac{3}{4}$	610940 B8 305 O6B/4K7
R51	100 ohms wire wound	5	7	604055 Ducon RVW4-J
R52	100 ohms wire wound	5	7	604055 Ducon RVW4-J
R53	4.7K ohms cracked carbon	5	$\frac{3}{4}$	610940 B8 305 O6B/4K7
R54	220K ohms carbon	10	1	616726
R55	220K ohms "	10	1	616726
R56	220K ohms "	10	1	616726
R57	220K ohms "	10	1	616726
R58	3.3 ohms wire wound	10	5	600488
R59	47 ohms carbon	10	1	603106
R60	47 ohms carbon	10	1	603106
R61	Not used.			
R62	6.8K ohms wire wound	10	7	611542 IRC PW7
R63	27K ohms wire wound	5	8	614154
RV1	50K ohms curve C carbon, Gain(AZ).			620341
	500K ohms curve C carbon, Volume (BZ)			620453
RV2	1 Megohm curve C carbon, Tone (BZ)			620789
RV3 ^X	Light Dependent Resistor			619566
RV4	500K ohms curve A carbon A.C. Balance			620569
RV5	5K ohms curve A carbon, Bias			620062
RV6	5K ohms curve A carbon, Bias			620062
RV7	250K ohms curve A carbon, Output Limiter			620519
RV8	100 ohms linear W.W. Monitor Level			621035

CAPACITORS

REF.	DESCRIPTION.	TOL.	VW	CODE or SUPPLIER.
C1	100pF polystyrene (AZ)	10	630	222233
	150pF polystyrene (BZ)	10	630	222698
C2	68pF N750 tubular ceramic (BZ)	10	500	221963
C3	0.0012uF polystyrene (BZ)	10	630	225303
C4	130pF polystyrene (BZ)	5	125	222583
C5	32uF Electro-Pigtail Mtg.	+100-20	4	229501 Miniwatt C426AR/ B32
C6	0.1uF polyester	10	400	227085
C7	8uF Electro. Pigtail Mtg.	+50-10	450	222529 Ducon ET2C
C8	0.01uF polystyrene	5	630	226335
C9	330pF polystyrene	10	630	223716
C10	500uF Electro. Pigtail Mtg.	+100-20	3	229854 Ducon EPB20
C11	0.01uF polystyrene	5	630	226335

REF.	DESCRIPTION	TOL.	VW	CODE	or	SUPPLIER.
C12	0.1 uF polyester	10	400	227085		
C13	82pF N150 disc ceramic	5	500	222135		
C14	0.1uF polyester	10	400	227085		
C15	0.1uF polyester	10	630	227093		
C16	8uF Electro Pigtail Mtg.	+50-10	450	222529		Ducon ET2C
C17	8uF Electro. Pigtail Mtg.	+50-10	450	222529		Ducon ET2C
C18	0.1uF polyester	10	630	227093		
C19	0.1uF polyester	10	630	227093		
C20	2uF metallised paper	20	200	227930		AEE W48
C21	2uF metallised paper	20	200	227930		AEE W48
C22	4uF Electro. Pigtail Mtg.	+50-10	450	228188		
C23	4uF Electro. Pigtail Mtg.	+50-10	450	228188		
C24	4uF Electro Pigtail Mtg.	+50-10	450	228188		
C25	4uF Electro. Pigtail Mtg.	+50-10	450	228188		
C26	0.1uF polyester	10	630	227093		
C27	2uF metallised paper	20	200	227930		AEE W48
C28	2uF metallised paper	20	200	227930		AEE W48
C29	0.1uF polyester	10	630	227093		
C30	4uF Electro. Pigtail Mtg.	+50-10	450	228188		Ducon ET7B
C31	4uF Electro. Pigtail Mtg.	+50-10	450	228188		Ducon ET7B
C32	4uF Electro. Pigtail Mtg.	+50-10	450	228188		Ducon ET7B
C33	4uF Electro. Pigtail Mtg.	+50-10	450	228188		Ducon ET7B
C34	0.01uF polyester	10	400	226365		
C35	8uF Electro. Pigtail Mtg.	+50-10	450	222529		Ducon ET2C
C36	100uF Electro. Chassis Mtg.	+50-10	450	229749		Ducon EMG1548FX
C37	100uF Electro. Chassis Mtg.	+50-10	450	229749		Ducon EMG1548FX

VALVES and DIODES

V1 EF86
V2 12AX7
V3 12AU7
V4 7027A
V5 7027A
V6 7027A
V7 7027A

V101 12AX7

MR1 AWV IN3195
MR2 AWV IN3195
MR3 AWV IN3195

MISCELLANEOUS.

TR1 Output Transformer 52468/001
TR2 Power Transformer 52466/003

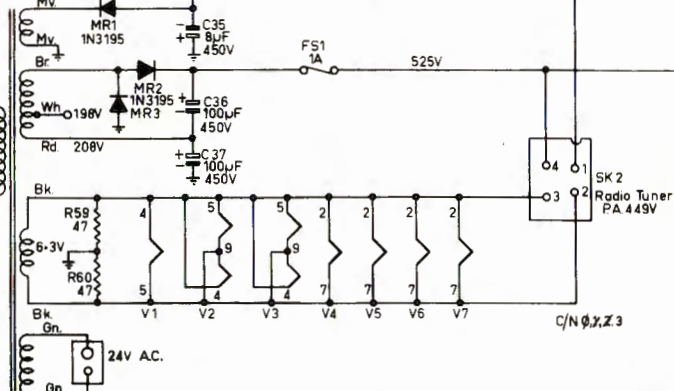
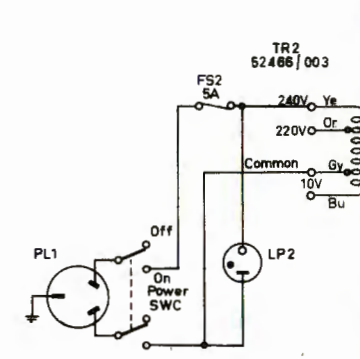
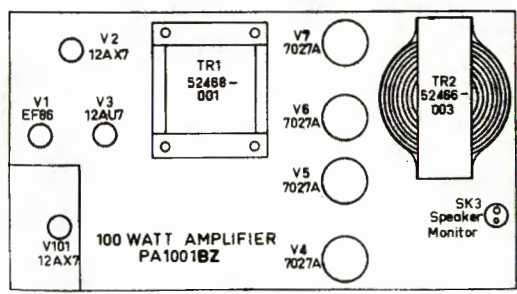
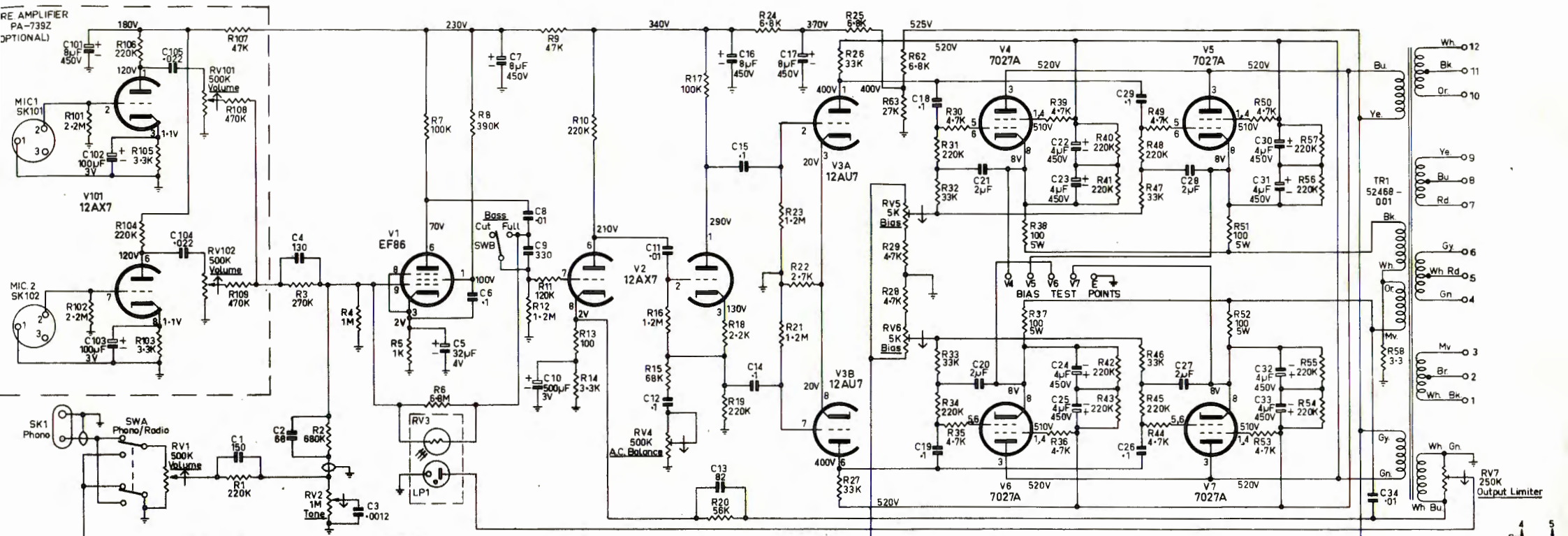
FS1	HT Fuse 1 Amp. Slow Blow	369954	
FS2	Mains Fuse 5 Amp.	370012	
LP1 [*]	Neon Lamp	428317	type NE-51
LP2	Neon Indicator	404006	Lumolite FP7/SL
PL1	3 Pin Plug, Mains		
PL2	2 Pin Wafer Plug, Monitor	34545	
SK1	4 Pin Socket, Input (AZ)	794571	
	2 Pin Wafer Socket, Phono (BZ)	794534	
SK2	4 Pin , Radio Tuner	793287	
SK3	2 Pin Wafer Socket, Monitor	793038	
SK101, 102.	3 Pin Mic-Input. Socket (BZ)	234026	ACME C112F
SWA	Switch, Toggle Phono/Radio (BZ)	857173	
SWB	Switch, Bass cut	61481	
SWC	Switch, Toggle Monitor	857173	

MECHANICAL REPLACEMENTS

Badge, AWA	63831	
Holder, Fuse	400027	
Knob Assembly, Control	63908	
Panel, Output Termination	551514	
Panel, Bias Testing Termination	551517	
Plug, Microphone (BZ)	234045	ACME C110M
Plug, 2 Pin Wafer, Phono (BZ)	581234	
Plug, Button		
3/4" (Tuning Spindle)	64759	
5/8" (Tuning Indicator)	61050/001	
29/64" (Extra Controls) (AZ)	64777	
Nut, Locking, Gain Control (AZ)	484092	
Nut, Cap, Gain Control (AZ)	188920	
Trim Edging, Top Cover	61018	

OPTIONAL EXTRAS.

Monitor Speaker Kit PA780	64780
Monitor Speaker & Cable Ass'y (LS1)	50230
Radio Tuner Kit PA449Y.	



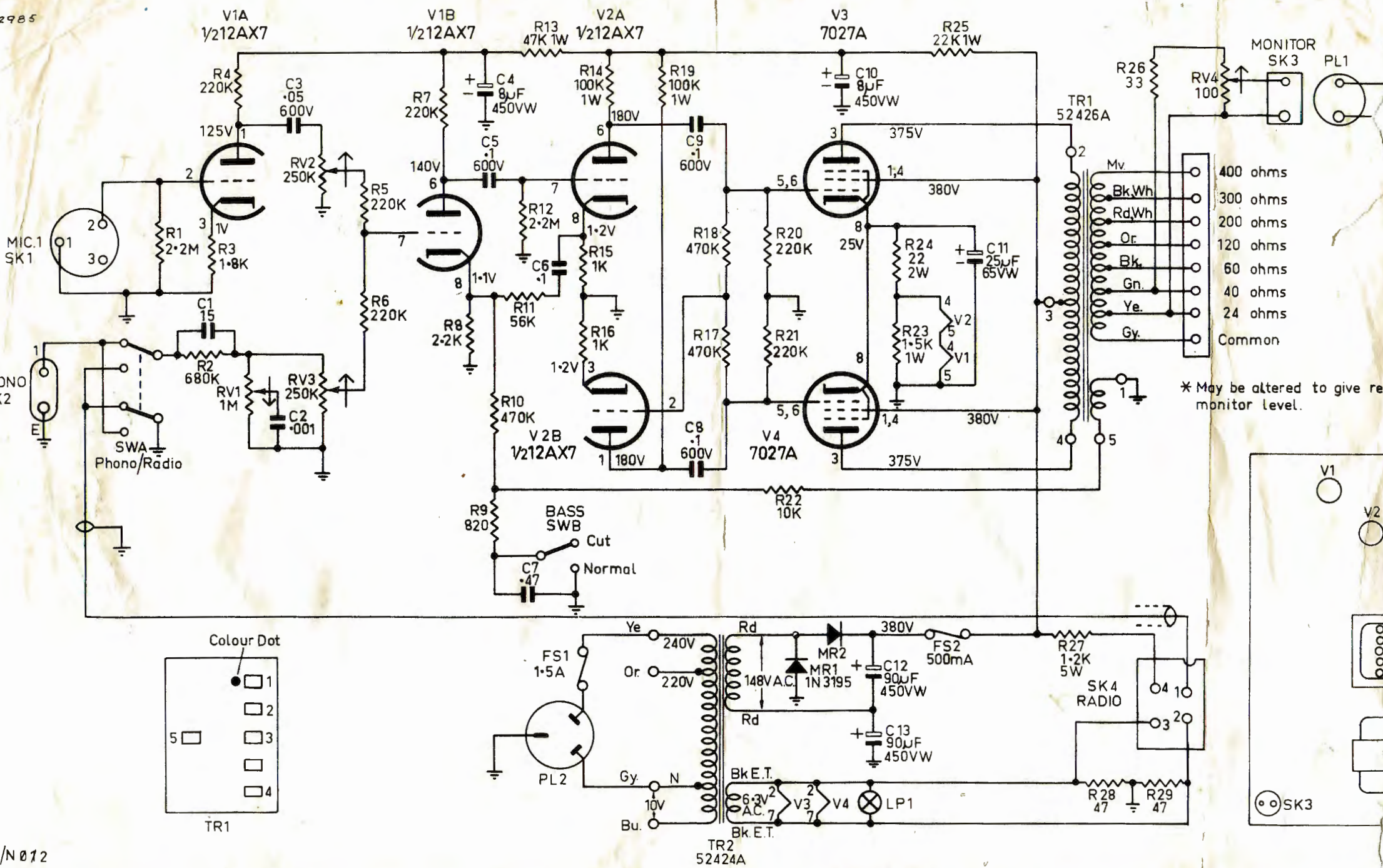
OUTPUT CONNECTIONS		
No OF 600Ω SPEAKERS	OUTPUT TERMINATION	JOIN FOLLOWING
4-6	100Ω / 100V	3-4, 6-7, 9-10
7-9	82Ω	3-5, 6-7, 8-10
10-13	49Ω / 70V	3-5-7, 6-8-10
14-18	32Ω	3-4, 5-8, 9-10
19-29	2.5Ω	1-4, 3-10, 9-12, 6-7
30-49	1.4Ω	1-4, 2-7, 9-12, 6-11
50-100	8Ω	1-4, 3-8, 9-12, 5-10
DVER 100	6Ω	1-4-7-10, 3-6-9-12

AMALGAMATED WIRELESS (AUSTRALASIA) LTD. SYDNEY	DRN. <i>[Signature]</i>	CKD. <i>[Signature]</i>	APP. <i>[Signature]</i>	RLD. <i>[Signature]</i>	TYPE- PA.1001BZ
CIRCUIT DIAGRAM 100 WATT PA. AMPLIFIER					DRG. CD1514

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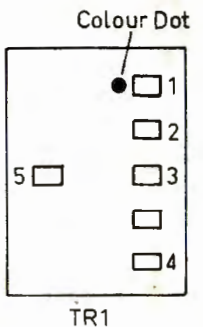
62985

HONO SK2



- 400 ohms
- 300 ohms
- 200 ohms
- 120 ohms
- 60 ohms
- 40 ohms
- 24 ohms
- Common

* May be altered to give reqd monitor level.



TR1

