HANDBOOK

FOR

BROADCAST STUDIO PLUG IN EQUIPMENT

TYPE 1	POWER CONVERTER	TRIMAX S75
TYPE 1	AMPLIFIER	TRIMAX A63
TYPE 2	AMPLIFIER	TRIMAX A65
TYPE 2	AMPLIFIER	TRIMAX A65A

TRIMAX TRANSFORMERS PTY. LTD.
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BROADCAST STUDIO PLUG IN EQUIPMENT

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SCHEDULE : C 7983
CONTRACT : 22818

GENERAL DESCRIPTION

May, 1960

The plug-in units described in this handbook are constructed on a plug-in chassis to departmental drawing CF551 and are suitable for use in a 4 unit or 8 unit shelf to P.M.G. drawings CF549, CF550 respectively.

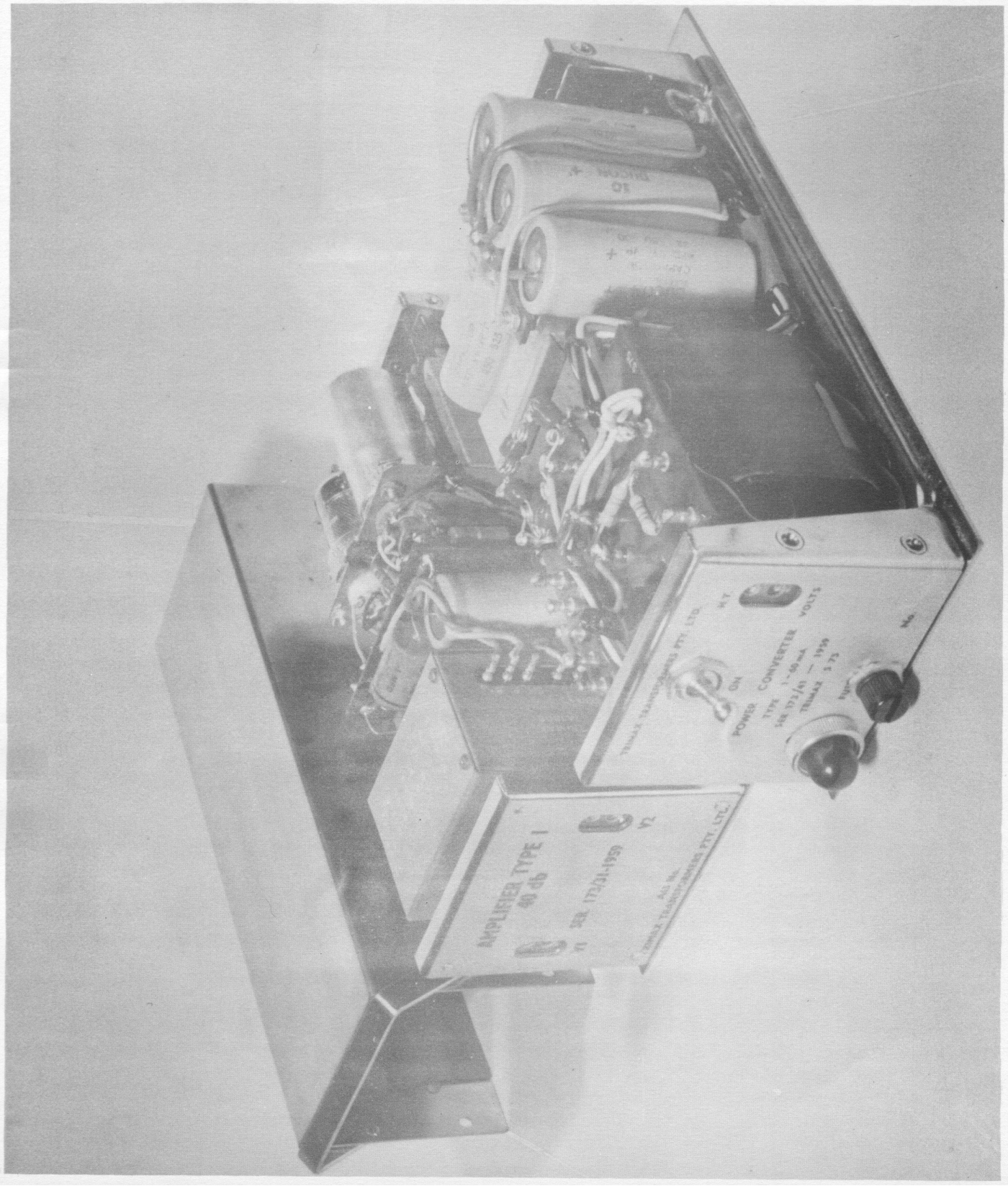
Four plug-in units, when mounted in a shelf to Drawing CF549, occupy $3\frac{1}{2}$" of standard 19" rack space to a depth of 11".

Each chassis contains a 24 pin connector and the pin allocations have been standardised to make units of different manufacture fully interchangeable. It also enables each unit to be placed in any desired position in the shelf, but normally the power converter is fitted in the extreme right hand position.

The pin allocation is as follows:

Pins 1 and 3	Mains (Pin 1 Active)
Pins 6 and 9	6.3V filament
Pin 7	H.T. Positive
Pins 10, 11 and 12	Output (11 C.T.)
Pin 13	H.T. Negative
Pin 14	Earth
Pins 19, 20 and 21	600 ohm or Bridging Input (20 C.T.)
Pins 23 and 24	50 ohm input (20 C.T.)

PHOTOGRAPH



TYPE 1 POWER CONVERTER SPECIFICATION

TRIMAX TYPE S. 75

May, 1960

The Type 1 Power Converter is designed to operate from normal mains supplies and provides filament and H.T. supplies for 3 Plug-in amplifiers simultaneously, regardless of type.

CIRCUITRY: The converter uses an astatically wound transformer to minimise hum pick-up in adjacent units. The rectifier circuit is of bridge form employing 4 silicon diodes. This results in high efficiency, low heating and high reliability. A two-stage filter is used to reduce the ripple content to a very small value. The output capacitor of the filter is made very large to improve the stability margin when two Type 1 Amplifiers are operated in cascade from the same Power Converter.

For circuit details and parts list refer drawing M637 (page 5).

SPECIFICATION:

Input : 200-250V AC 50 c/s. The appropriate primary tapping is selected on the transformer terminal panel inside the cover.
Approximate input current at full load - .15A

Low Tension Output : 6.3V ± 10% centre tapped. Max. current 2.5 Amp. A.C. Centre tap connected to H.T. negative.

High Tension Output : 250V DC at 60 mA DC
295V DC at 20 mA DC
315V DC at 5 mA DC

NOTE: The unit is capable of supplying an H.T. current of 80 mA continuously, without overheating.
The output voltage under that condition is 235V.

Filtering : At a load current of 60 mA the ripple content of the H.T. supply is less than 1 mV

Metering : A polarised metering socket is provided on the front panel. A 1 mA/1000 ohm meter (1V FSD) will read halfscale at 250V H.T.

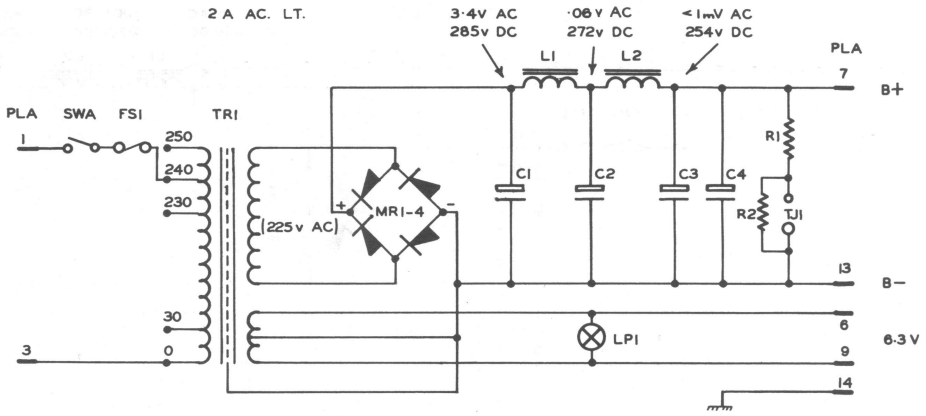
Fusing : A 0.5 amp miniature fuse (Australux M58) is provided and is accessible from the front panel.

Pilot Light Replacement : A telephone type globe is used in the pilot light. This can be replaced upon the removal of cover. Do not attempt to unscrew front bezel.

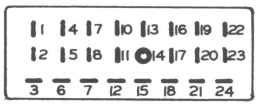
Maintenance: For maintenance purpose e.g., replacement of electrolytics, the whole filter assembly can be removed by two screws in the base of the unit.

TEST FIGURES

CONDITIONS : 60mA DC. HT.
2 A AC. LT.



PLA



VIEWED FROM MATING FACE

Item	Description	No. Req.
C1	Capacitor, 32uF, 350VW, Ducon Type ET6E	1
C2	Capacitor, 16uF, 450VW, Ducon Type ET5C	1
C3	Capacitor, 32uF, 350VW, Ducon Type ET6E	1
C4	Capacitor, 32uF, 350VW, Ducon Type ET6E	1
R1	Resistor, 270K ohm, ½W, 5%, Philips cracked carbon	1
R2	Resistor, 1.2K ohm, ½W, 5%, Philips cracked carbon	1
MR1-4	Silicon Rectifier, Type F6, Sarkes Tarzian	4
TR1	Transformer, TP3649	1
L1	Choke, TZ725	1
L2	Choke, TZ726	1
SWA	Switch, SPST, 1A, 250V, Alpha Type R	1
FS1	Fuse Holder, Miniature, Belling Lee Type L575	1
	Fuse, Miniature, Australux Type M58, 500mA	1
LP1	Lamp, Pilot, M633 Green; No. 2 Globe, 6V	1
PLA	Plug, 24 pin, Painton No. 311186 or Equivalent	1
TJ1	Socket, Cinch Type 733-16-1	1

TRIMAX TRANSFORMERS MELBOURNE	ISSUE	SCALE	DRAWN	CHECKED
	1 12/59	-	ICM	WHR
PMG·TYPE 1·POWER CONVERTER	2 5/60 PLUG VIEW	DRAWING No.		
TRIMAX S75		M637 SH.1 OF 5		

TYPE 1 AMPLIFIER SPECIFICATION

May, 1960

TRIMAX TYPE A. 63

This is a fixed gain amplifier suitable for microphone level work or as a following amplifier with an output power of approximately 120 mW. When two Type 1 Amplifiers are used in cascade from the same power converter, it is advisable to interpose a pad of at least 3 db loss between the two units to increase the stability margin.
Two alternative inputs are provided, one of 150 ohms suitable for operation from a 50 ohm microphone, the other of 600 ohms.

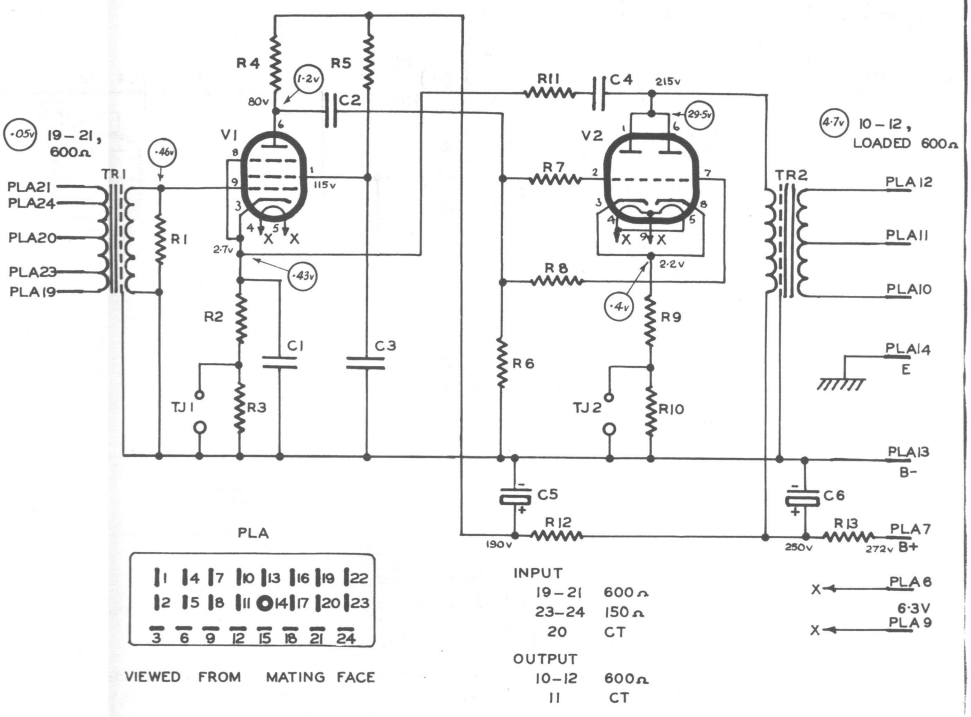
CIRCUITRY: A multishielded input transformer, tapped on the primary side, feeds a two-stage amplifier with heavy negative feedback, giving high gain stability, wide frequency range and low noise and distortion. The first stage employs a low noise pentode, the second stage a double triode used in parallel.

For circuit details and parts list refer Drawing M638 (Page 7).

SPECIFICATION:

Input Z	:	Condition A : 600 ohm ± 15% Source Z 600 ohm Condition B : 150 ohm ± 15% Source Z 50 ohm 30 c/s - 15K c/s
Output Z	:	600 ohm ± 15% 30 c/s - 10 Kc/s.
Load Z	:	600 ohm.
Gain	:	Condition A : 40 db ± 1 db measured at + 8 dbm as ratio of output to input power. Condition B : 46 db ± 1 db measured as voltage ratio.
Frequency Response	:	± 1 db 30 c/s - 15 Kc/s relative to 1 Kc/s at + 8 dbm.
Power Output	:	The distortion does not exceed 0.5% at + 21 dbm from 60 c/s - 7.5 Kc/s. The distortion does not exceed 1% at + 21 dbm from 30 c/s - 15 Kc/s.
Noise:	:	The noise at the output does not exceed - 82 dbm with the input terminated in its appropriate source impedance.
Crosstalk	:	The amplifier output does not exceed - 67 dbm with the disturbing amplifier delivering + 8dbm at the output.
Stability	:	The amplifier remains stable when the termination is changed from 600 ohms to 600 ohms in parallel with 0.1uF.
Power Requirement	:	6.3V 0.5 Amp. A.C. 240-300 V DC 16 mA. 3 amplifiers are normally supplied by one Type 1 Power Converter.
Metering	:	Two polarised metering sockets are provided on the front panel, for measurement of the cathode current of V1 & V2 respectively. These will give a half scale reading on a 1 mA/1000 ohm (1V FSD) meter. Valves should be replaced if current drops below 40% FSD.

Item	Description	No. Req.
R1	68K 5% Hi Stab. DCF IRC	1
R2	1.6K 5% " " " "	1
R3	510Ω 5% " " DCC "	1
R4	100K 5% " " DCF "	1
R5	330K 5% " " " "	1
R6	1 Meg 10% Carbon BTA "	1
R7, R8	27K 10% " BTS "	2
R9	120Ω 5% Hi Stab. DCF "	1
R10	39Ω 5% ½W Crack. Carb. Philips	1
R11	150K 5% Hi Stab. DCF IRC	1
R12	47K 10% Carbon BTA "	1
R13	1.5K 10% " " "	1
C1	.0033uF 5% Mica SM Ducon	1
C2	0.22uF Paper 400V "	1
C3, C4	0.1uF Paper 400V TPB464 "	2
C5	8uF / 300VW ET2D "	1
C6	24uF / 300VW ET5C "	1
V1	EF86	1
V2	12AT7	1
T1	MS1807 / M654	1
T2	TA1808 / M655	1
PLA	Connector, 24 pin Painton 311186 or equivalent	1
TJ1 TJ2	Socket, Cinch Type 733-16-1	2



TYPICAL TEST FIGURES

·46v AC – 1000Ω GAIN 40 DB
AC-VTVM, 1MΩ

80v DC – 20,000Ω/VOLT

TRIMAX TRANSFORMERS MELBOURNE	ISSUE	SCALE	DRAWN	CHECKED
PMG TYPE 1 AMPLIFIER	1 5/60	—	MDK	CB
TRIMAX A63		DRAWING No.	M638 SH 1 OF 3	

TYPE 2 AMPLIFIER SPECIFICATION

June, 1961

TRIMAX TYPE A. 65.

The type A.65 is a low gain amplifier used mainly as an isolating amplifier and for compensation of switching losses. The nominal power output of 500mW is sufficient for all line work and the gain is variable in 0.5 db steps.

The input impedance is suitable for bridging a terminated 600 ohm line and the output is designed to feed a 600 ohm lead.

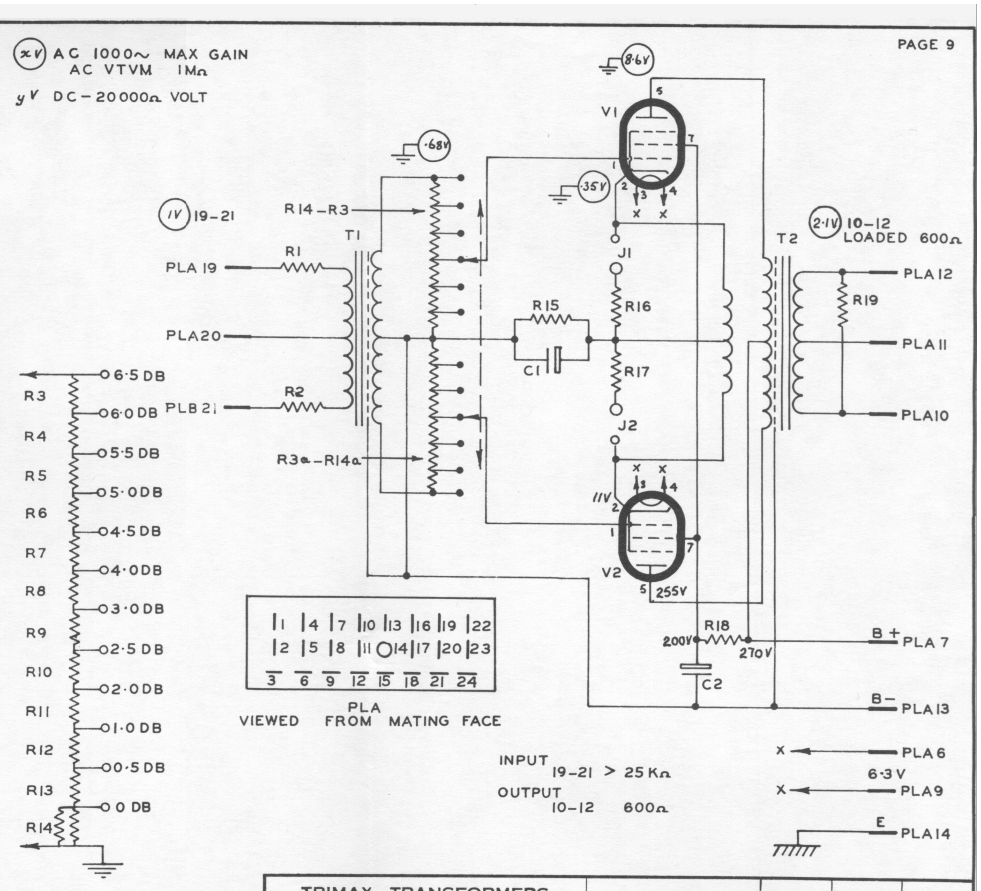
CIRCUITRY : A multishielded input transformer with a balanced stepped gain control on its secondary side feeds two low power output pentodes in push-pull. Negative feedback is applied from a tertiary winding on the output transformer.

For circuit details and parts list refer Dwg. M.724 P.9.

SPECIFICATION :

Input Z	:	Greater than 25,000 ohm 30 c/s - 15 Kc
Output Z	:	600 ohm ± 15% 30 c/s - 15 Kc
Load Z	:	600 ohm
Gain	:	0 db - 6.5 db ± 0.25 db variable in 0.5 db steps
Frequency Response	:	± 1 db 30 c/s - 15 Kc relative to 1 Kc
Power Output	:	+ 27 dbm (500 mW) for less than 0.5% distortion 60 c/s - 10 Kc. The amplifier will deliver + 30 dbm (1 Watt) before serious distortion occurs.
Noise	:	The equivalent noise input is less than -75 dbm
Crosstalk	:	The amplifier output does not exceed - 65 dbm with adjacent amplifier delivering + 11 dbm at output.
Stability	:	The amplifier remains stable when the termination is changed from 600 ohm to 600 ohm in parallel with 0.1uF.
Power Requirement	:	6.3V 0.4 Amp A.C. 240 - 300V D.C. 20mA 3 amplifiers are normally supplied by one Type 1 Converter.
Metering	:	Two polarised metering sockets are provided on the front panel, for measurement of the cathode current of V1 & V2 respectively. These will give a half scale reading on a 1 mA/1000 ohm (1V FSD) meter. Valves should be replaced if current drops below 40% FSD. For best distortion figures at low frequencies the valve currents should be within 10% of each other.

Item	Description	
R1 R2	4.7 K ½W 5% Crack. Carb. Philips	2
R3 R5	2.7 K " " " "	
R3a R5a	2.7 K " " " " "	6
R6 R7	2.2 K " " " "	
R6a R7a	2.2 K " " " " "	4
R8 R8a	3.9 K " " " " "	2
R9 R10	1.8 K " " " "	
R9a R10a	1.8 K " " " " "	4
R11 R11a	3.3 K " " " " "	2
R12 R13	1.5 K " " " "	
R12a R13a	1.5 K " " " " "	4
R14 R14a	27 K " " " " "	2
R14 R14a	180 K " " " " "	2
R16 R17	270 ohm" " " " "	2
R19	47 K " " " " "	1
R18	27 K 1W 10% Compostn. Ducon	1
R15	500 Ohm 3W 5% Wire Wound Victn. Restr.	1
C1	100 uF/12 V ET1B Ducon	1
C2	8 uF/500V ET4C Ducon	1
V1 V2	EL91/6AM5	2
PLA	24 Pin Male Connector 311186 Painton	1
J1 J2	2 Pin Sockets 733-16-1 Cinch	2
SW1	2 Pole 12 Position Oak	1
T1	MS 1866/M733 Trimax	1
T2	TA 1865/M734 Trimax	1



TRIMAX TRANSFORMERS MELBOURNE	ISSUE	SCALE	DRAWN	CHECKED
PMG TYPE 2 AMPLIFIER	1 4 61	—	MDK	C.B.
TRIMAX A65		DRAWING No.	M 724 SH 1	

TYPE 2 AMPLIFIER SPECIFICATION

June, 1962.

TRIMAX TYPE A. 65A.

The type A.65A is a low gain amplifier used mainly as an isolating amplifier and for compensation of switching losses. The nominal power output of 500mW is sufficient for all line work and the gain is variable in 0.5 db steps.

The input impedance is suitable for bridging a terminated 600 ohm line and the output is designed to feed a 600 ohm lead.

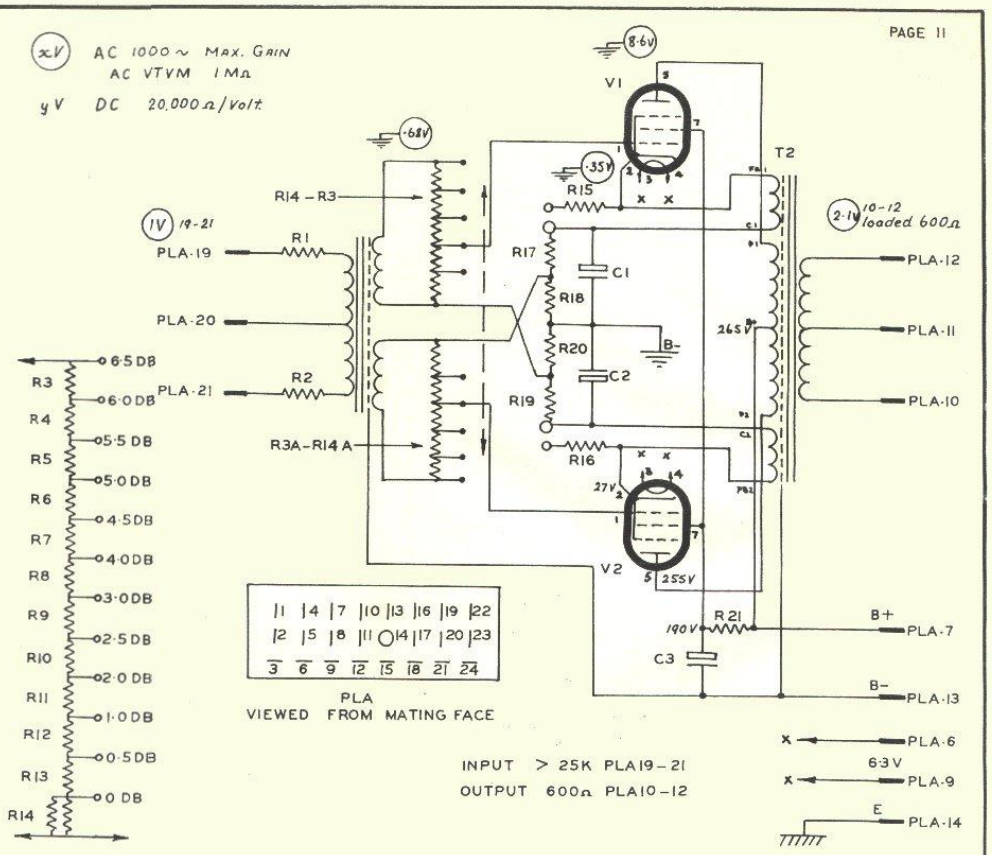
CIRCUITRY : A multishielded input transformer with a balanced stepped gain control on its secondary side feeds two low power output pentodes in push-pull. Negative feedback is applied from a tertiary winding on the output transformer.

For circuit details and parts list refer Dwg. M.724 P.11

SPECIFICATION :

Input Z	:	Greater than 25,000 ohm 30 c/s - 15 Kc
Output Z	:	600 ohm ± 15% 30 c/s - 15 Kc
Load Z	:	600 ohm
Gain	:	0 db - 6.5 db ± 0.25 db variable in 0.5 db steps
Frequency Response	:	± 0.5 db 60 c/s - 15 Kc relative to 1 Kc ± 1 db 30 c/s - 60 c/s - 60 c/s relative to 1 Kc.
Power Output	:	+ 24 dbm for less than 0.5% distortion 60 c/s - 7.5 Kc and less than 1% 30 c/s - 15 Kc/s. The amplifier will deliver + 30 dbm (1 Watt) before serious distortion occurs.
Noise	:	The equivalent noise input is less than - 80 dbm Crosstalk due to an adjacent amplifier delivering an output of + 11 dbm does not cause appreciable alteration of this figure.
Stability	:	The amplifier remains stable when the termination is changed from 600 ohm to 600 ohm in parallel with 0.1uF.
Power Requirement	:	6.3V 0.4 Amp A.C. 240 - 300V D.C. 20mA 3 amplifiers are normally supplied by one Type 1 Converter.
Metering	:	Two polarised metering sockets are provided on the front panel, for measurement of the cathode current of V1 & V2 respectively. These will give a half scale reading on a 1 mA/1000 ohm (1V FSD) meter. Valves should be replaced if current drops below 40% FSD. For best distortion figures at low frequencies the valve currents should be within 10% of each other.

Part No.	Description	Qty.
R1, R2	4.3K ½ Watt 5% D.C.C. Hi-Stab.	2
R3, R4, R5) R3a, R4a,) R5a)	2.7K ½ " " Cracked Carbon	6
R6, R7) R6a, R7a)	2.2K ½ " " " "	4
R8, R8a	3.9K ½ " " " "	2
R9, R10) R9a, R10a)	1.8K ½ " " " "	4
R11, R11a	3.3K ½ " " " "	2
R12, R13) R12a, R13a)	1.5K ½ " " " "	4
R14, R14a	27K ½ " " " "	2
R14, R14a	180K ½ " " " "	2
R15, R16	180 Ohm ½ Watt 5% Cracked Carbon	2
R17, R19	1K ½ " " " "	2
R18, R20	1.8K ½ " " " "	2
R21	39K 1 " 10% Comp. RMC	1
C1, C2	50 uF 25VW ET2B (Ducon)	2
C3,	8 uF 450VW ET2D "	1
V1, V2	EL91/6AM5	2
J1, J2 S	Sockets, 2 pin Cinch Type 733-16-1	2
SW1	Switch, OAK type, 1 pole, 12 position 2 section	1
PLA	Connector, 24 pin male Painton 311186	1
T1	Transformer, Input MS2009/M733/1	1
T2	Transformer, Output TA2010/M734/1	1



L M ERICSSON – TRIMAX MELBOURNE	ISSUE	SCALE	DRAWN / CHECKED
PMG TYPE 2 AMPLIFIER	1 4 61 A65	—	M.D.K. / W.H.R.
TRIMAX A65A	2 3 62 A65A	DRAWING No.	M 724 SH 1