HANDBOOK

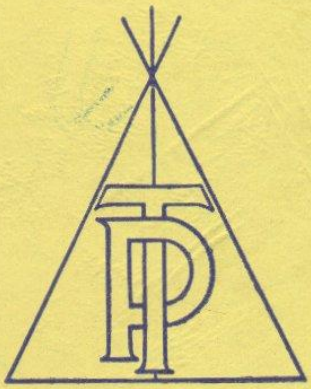
"A" SERIES PLUG-IN EQUIPMENT

SPECIFICATION, DESCRIPTION & CIRCUITS

SCHEDULE: C7008

CONTRACT: 20036

ITEM NOS. 13 15 15A 15B 16



Manufactured in Australia by

TRANSMISSION PRODUCTS PTY. LTD.

NORTH SYDNEY

HANDBOOK

"A" SERIES PLUG-IN EQUIPMENT

SPECIFICATION, DESCRIPTION & CIRCUITS.

SCHEDULE: C7008

CONTRACT: 20036

ITEM NOS. 13 15 15A 15B 16

E

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ITEM No.	
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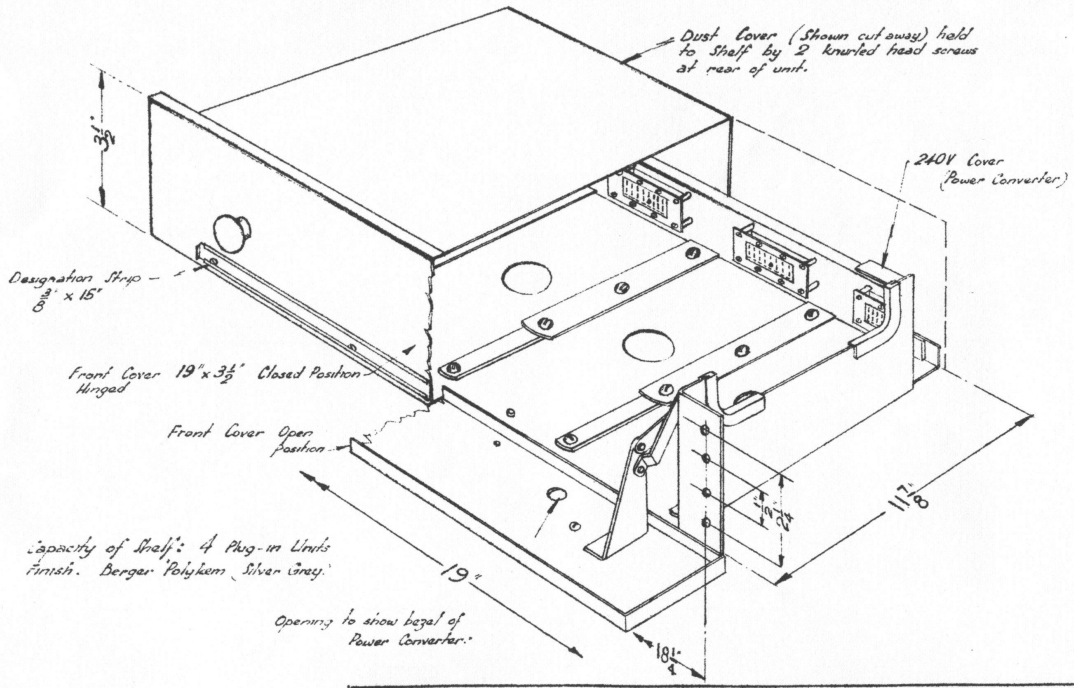
OPERATIONS



MATERIAL		DRAWN	
QUALITY		TRACED	
STOCK SIZE		CHECKED	MECH.
WEIGHT, 1,000			ELECT.
LENGTH, 1,000		PASSED	
SHEETS, 1,000		APPROVED	
ITEM FINISH		DATE	

TRANSMISSION PRODUCTS PTY. LTD.
COMMUNICATION ENGINEERS
DENISON STREET, NORTH SYDNEY, AUSTRALIA

SHELF 'A' SERIES EQUIP.

USED ON PROGRAMME INPUT EQUIP

THIRD ANGLE PROJECTION — DO NOT SCALE DRAWING — REPORT ERRORS

SCALE: - - -

UNLESS SPECIFIED TOLERANCE ON FRACTIONS IS - - -
" " DECIMALS IS: - - -

DRAWING NUMBER
M60-302-1

ISSUE	CHANGE
1	ORIGINAL

CHANGES

(2) TYPE 1 POWER CONVERTOR.

The Type 1 Power Convertor is designed to fit the "A" Series Plug-in Equipment Shelf and it has sufficient output to operate 3 plug-in Amplifiers simultaneously regardless of type.

Specification:

INPUT:	240 V.A.C. 50 cycles/sec.
OUTPUT:	Filament Supply, 2.5A at 6.3V ± 10%
HIGH TENSION SUPPLY:	50 mA at 240V (does not exceed 350V at 10 mA and is not less than 240V at 50 mA).

Hum content is less than 2.5 millivolts.

HEATING: The convertor does not over-heat when run continuously for 24 hours delivering 50 mA H.T. 2.5A at 6.3V simultaneously.

Viewed from the rear the pin allocation is as follows:

Pins 1 and 3	240V A.C.
Pins 6 and 9	6.3V (Filaments)
Pin 7	H.T. +
Pin 13	H.T. -
Pin 14	Earth

Component List:

C1, C3 and to C6	:	24 uF 525V Electrolytic Condensors
C2	:	1 uF Condensor 600 V
L1	:	Choke type FC1
V1	:	Valve 6V4
F1	:	Fuse 1 amp
PL	:	Pilot Lamp 6V
R1	:	Resistance .47 megohm 5% 1 W
T1	:	Transformer type PT12
S/w	:	Switch 240V 1A S.P.S.T.
H.T.	:	Polarized Cinch Jacks. Type No. 733.16.1

TYPICAL CURRENT REGULATION CURVE.

CURRENT	VOLTAGE	RIPPLE
5 mA	360V	0.6mV
10 mA	340V	0.8mV
20 mA	325V	1.0mV
30 mA	300V	1.2mV
40 mA	280V	1.6mV
50 mA	260V	1.8mV
60 mA	250V	2.2mV

The voltage measured at H.T. Volts cinch jack with a 1 m.A. meter built out to 1000 ohms will read midscale for 250 volts.

The circuit is wired in accordance with Drawing M09.146.1 which is included in the handbook.

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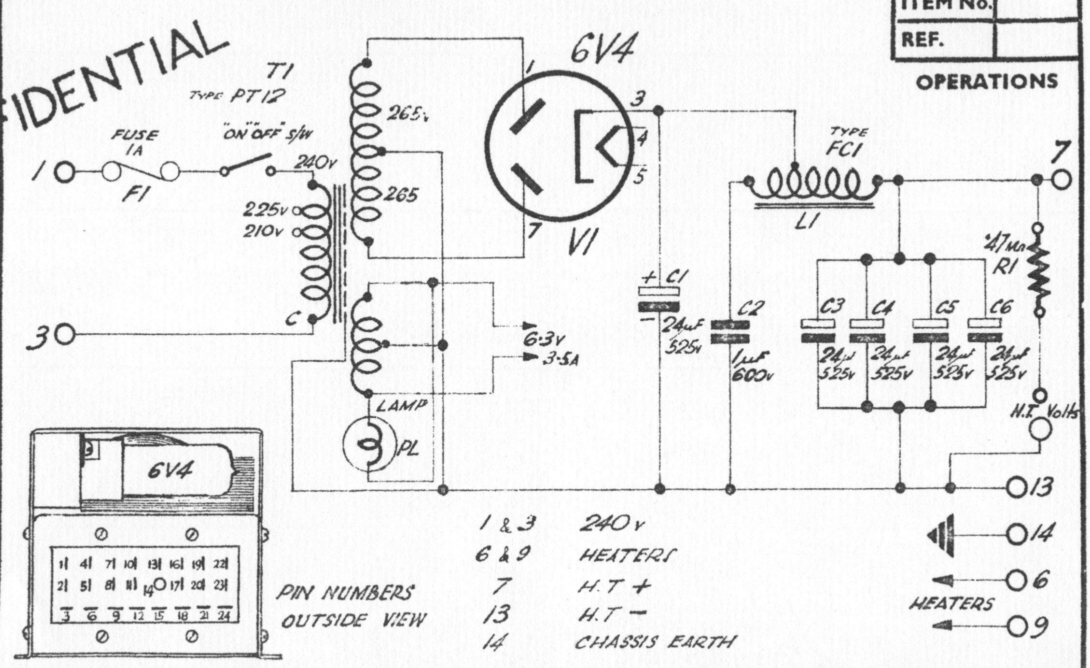

ISSUE	CHANGE
2	C5 & C6 added. C2 was 350v. Type of Power Trans was PT1. 6-3-57
1	ORIGINAL

CHANGES

MATERIAL		DRAWN	
QUALITY		TRACED	
STOCK SIZE		CHECKED	MECH. / ELECT. JWB
WEIGHT, 1,000			
LENGTH, 1,000		PASSED	
SHEETS, 1,000		APPROVED	
ITEM FINISH		DATE	

TRANSMISSION PRODUCTS PTY. LTD.
COMMUNICATION ENGINEERS
DENISON STREET, NORTH SYDNEY, AUSTRALIA

TYPE 1 POWER CONVERTER
PLUG-IN

USED ON PROGRAMME INPUT EQUIP

THIRD ANGLE PROJECTION — DO NOT SCALE DRAWING — REPORT ERRORS

DRAWING NUMBER: M09·146·1

SCALE: — UNLESS SPECIFIED

TOLERANCE ON FRACTIONS IS: —
DECIMALS IS:

TYPE 1 AMPLIFIER 40 db.

The Type 1 Amplifier is designed to plug into the "A" series Plug-in Equipment shelf and to operate from a Type 1 Power convertor.

Specification:

Impedance:	Input (a) 600 ohms ± 15% (b) 50 ohms Output 600 ohms ± 15%
Gain:	at +16 dbm 1000 cycles/sec 40db ± 1 db.
Frequency Response:	at +16 dbm from 30 cycles/sec to 15 kc/s ± 1 db referred to 1 kc/s
Harmonic Distortion:	Less than 1% over frequency range from 60 cycles/sec to 7.5 kc/s at +18 dbm and less than 2% from 30 cycles to 15 kc/s at + 21 dbm.
Equivalent Noise:	Not greater than -122 dbm
Cross Talk:	Disturbing level : +8 dbm Disturbed level : Not greater than -67 dbm
Stability:	Stable and free from oscillations when termination changed from 600 ohms non-reactive to 600 ohms in parallel with 0.1 MF Condenser.
Power Requirement:	To meet the above specification over the full range of regulation of Type 1 Power Supply.

Test Voltage and Currents (Nominal)

EF	86	Pin 6 :	96 Volts
EF	86	" 3 :	2.4 Volts
EF	86	Cathode Current :	1.25 mA
6AQ5		Pin 5 :	250 Volts
"		" 6 :	225 Volts
"		" 2 :	17.4 Volts
"		Cathode Current :	16. mA
TOTAL Current :			17.2 mA

(Test Voltmeter 1000 ohms per volt)

Plug Connections:

6 and 9 Filament : 6.3 V
7 H.T. +
10 and 12 600 ohm output
13 H.T.-
14 Earth
19 and 21 600 ohm Input
23 and 24 50 ohm Input

Circuit: The circuit is wired in accordance with Drawing M09.144.1 a copy of which is attached.

Components: The following is a list of components used on this amplifier.

C1 and C4	Condenser .1 uF 400V		
C2 and C6	Condenser Electrolytic	8 uF	525V
C3	" "	24 uF	525V
C5	" "	100 uF	12V
R1	Resistance DCC 62K ohms	1%	
R2	" DCF 1.8K "	1%	
R3	" DCF 480 "	1%	
R4	" DCF 100K "	1%	
R5	" DCF 47K "	1%	
R6	" DCF 220K "	1%	
R7	" DCC .47 megohms	1%	
R8	" DCF 33K ohms	1%	
R9	" DCF 1.1K "	1%	
R10	" W.W. 30 "	5%	3W
R11	" DCF 1.2K "	1%	
T1	Transformer Type T4/290 TN2		
T2	" " T5/700 TN2		
V1	Valve EF86		
V2	6AQ5		

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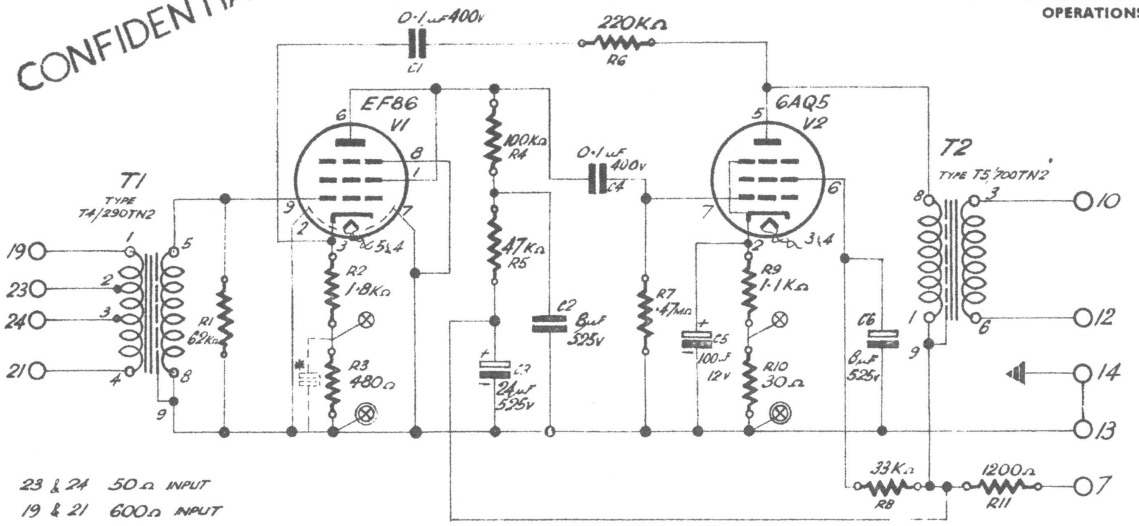
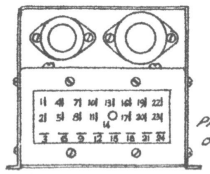


23 & 24	50Ω INPUT
19 & 21	600Ω INPUT
7	250V H.T.+
6 & 9	HEATERS
13	H.T.−
14	CHASSIS EARTH
10 & 12	600Ω OUT

⊗ Metering sockets 'V1' & 'V2'

* High frequency correction if necessary



PIN NUMBERS OUTSIDE VIEW.

ISSUE	CHANGE
2	Redesigned
1	ORIGINAL

CHANGES

MATERIAL		DRAWN	
QUALITY		TRACED	
STOCK SIZE		CHECKED	MECH.
WEIGHT, 1,000			ELECT.
LENGTH, 1,000		PASSED	
SHEETS, 1,000		APPROVED	
ITEM FINISH		DATE	

THIRD ANGLE PROJECTION — DO NOT SCALE DRAWING — REPORT ERRORS

SCALE: —

UNLESS SPECIFIED TOLERANCE ON FRACTIONS IS: — " DECIMALS IS: —

TRANSMISSION PRODUCTS PTY. LTD.
COMMUNICATION ENGINEERS
DENISON STREET, NORTH SYDNEY, AUSTRALIA

TYPE 1 AMPLIFIER 40db

USED ON PROG. INPUT EQUIP.

DRAWING NUMBER M09·144·1

TYPE 2 AMPLIFIER:

The Type 2 Amplifier is designed to plug into an "A" series Plug-in Equipment Shelf and to operate from a Type 1 Power Convertor.

Specification:

Impedance:	Input	Not less than 25,000 ohms
	Output	600 ohms ± 15%
Gain Control		The amplifier is fitted with a screwdriver operated 12 position gain control giving the following gain on successive steps 0, .5db, 1 db, 2db, 2.5db, 3db, 4db, 4.5db, 5db, 5.5db, 6db, and 6.5db in its most clockwise position.
Gain:		6.5db ±.25db.
Frequency Response		at 16 dbm from 30 cycles/sec to 15 kc/s ± 1 db referred to 1 kc/s.
Harmonic Distortion:		Less than 1% over the frequency range 60 cycles/sec to 7.5 kc/s and less than 2% from 30 cycles/sec to 15 kc/s at +27 dbm.
Equivalent Noise		Not greater than -75 dbm.
Cross Talk:		Disturbing Level +11 dbm Disturbed Level Not greater than -64 dbm.
Stability		Stable and free from oscillation ohm termination changed from 600 ohm non-reactive to 600 ohm in parallel with 0.1MF Condensor.
Power Requirements		To meet the above specification over the full range of regulation of the Type 1 Power Supply.

Components:	R1 and R14:	25K ohms	½w ± 5%
	R2 and R15:	4.2K "	" "
	R3 and R16:	4K "	" "
	R4 and R17:	3.7K "	" "
R5,R6,R18 and R19:		3.5K "	" "
	R7 and R20:	6K "	" "
R8,R9,R21 and R22:		2.7K "	" "
	R10 and R23:	4.5K "	" "
	R11 and R24:	2.4K "	" "
	R12 and R25:	2.1K "	" "
	R13 and R26:	35.5K"	" "
	R27 and R30:	1K "	1W "
	R28 and R29:	66 "	3W AA "
	C1 and C2 :	25 MF Condensor Electolytic 40V	
	V1 :	Valve 12AU7	
	T1 :	Transformer Type T4/281 TN2	
	T2 :	Transformer Type T5/692 N2	

Test Voltages and Currents: Nominal

12 AU7 Pins 1 and 6	290V
12 AU7 Pins 3 and 8	11V
12 AU7 Cathode Current	9 mA
Total Current	18 mA

Plug Connections:

Pin No.	6 and 9	Filament 6.3V A.C.
" "	7	H.T. +
	13	H.T. -
	14	Earth
	10, 11, 12	600 ohm Output (11 CT)
	19, 20, 21	25K ohms input (20 CT)

Circuit: The circuit is wired in accordance with Drawing M09.145.1 a copy of which is attached.

MONITORING METER:

The Monitoring Meter is a 1 m.A. Meter built out to 1,000 ohms. It is linearly calibrated from 0 to 10 in 0.2 intervals, each complete integer is indicated and the half scale deflection is indicated by the figure "5" in red and a red line $\frac{3}{4}$" long.

The meter is mounted in a case of suitable dimensions, such that it can be comfortably held in one hand and easily read.

It is fitted with a 2'9" cord with a polarized Cinch plug complementary to Cinch jack 733.16.1 and connected so that the small pin is positive. It is designed to be used for testing various plug in amplifiers, and plug in power supply voltages which under normal working conditions should show a midscale reading ± 25%.

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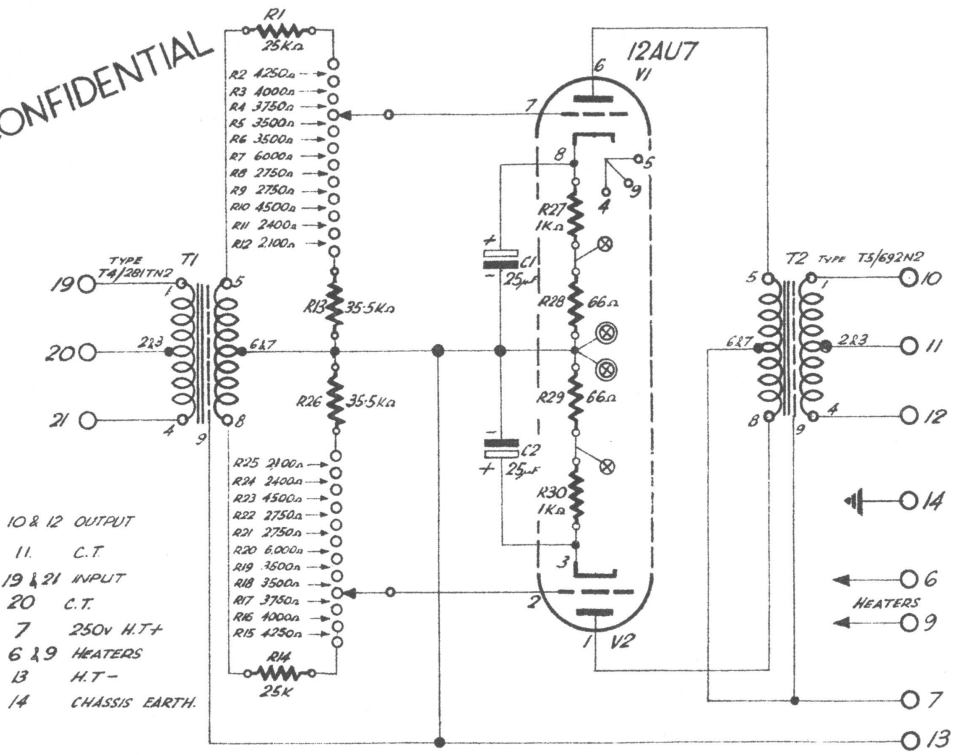
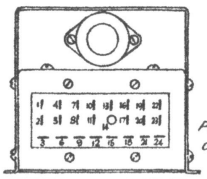


10 & 12 OUTPUT
11. C.T
19 & 21 INPUT
20 C.T.
7 250v H.T+
6 & 9 HEATERS
13 H.T−
14 CHASSIS EARTH.

GAIN CONTROL

0
0·5 db
1·0 db
2·0 db
2·5 db
3·0 db
4·0 db
4·5 db
5·0 db
5·5 db
6·0 db
6·5 db.



PIN NUMBERS OUTSIDE VIEW

ISSUE	CHANGE
1	ORIGINAL

CHANGES

MATERIAL		DRAWN	
QUALITY		TRACED	
STOCK SIZE		CHECKED	MECH.
WEIGHT, 1,000			ELECT.
LENGTH, 1,000		PASSED	
SHEETS, 1,000		APPROVED	
ITEM FINISH		DATE	

TRANSMISSION PRODUCTS PTY. LTD.
COMMUNICATION ENGINEERS
DENISON STREET, NORTH SYDNEY, AUSTRALIA

TYPE 2 AMPLIFIER
PLUG IN

USED ON PROG. INPUT EQUIP.

THIRD ANGLE PROJECTION — DO NOT SCALE DRAWING — REPORT ERRORS

SCALE: —

UNLESS SPECIFIED TOLERANCE ON FRACTIONS IS: —
" DECIMALS IS:

DRAWING NUMBER
M09·145·1

PROGRAMME FAIL ALARM

SCHEDULE - C.7008

CONTRACT - 20036

ITEM 29

Specification: -

Normal Operating Level: -	-10 dbm to + 5 dbm
Alarm Operate: -	-30 dbm
Alarm Restore: -	-10 dbm
Time Constant Control:-	6 adjustable steps from 20 seconds to 2 minutes - Screw driver setting.
Input Control: -	Continuously variable, visible indication screwdriver setting.
Input Impedance: -	Not less than 20,000 ohms.
Power Supply: -	Type 1 Power Converter
Special Condition: -	The alarm shall fail safe (i.e., the failure of any of the operating voltages or tubes, shall cause the alarm to operate.)

Description

General: - This unit is designed to provide an indication when the incoming program or the demodulated output of the transmitter falls below a specified level. In order to prevent the alarm operating during muted pauses in the program, a controlled time delay has been provided, whereby the delay may be selected in intervals between 20 seconds and 2 minutes at the following points: - 20 seconds, 30 seconds, 40 seconds, one minute, 90 seconds and two minutes.

The unit is designed for normal operation of a program level between -10 dbm and +5 dbm. The alarm indication is given when the program level falls below -30 dbm and resets when the level rises to 10 dbm. The indication is also given should any of the supply voltages or electron tubes in the unit fail. This latter is to ensure that the program is not left without failure monitoring, unless an indication is given.

The unit is fitted with a gain control which is screwdriver operated with a visible gain setting indication.

The input impedance is not less than 20,000 ohms over the frequency range between 30 cycles and 15 kilocycles. It is designed to operate from the voltages and current supplied by a Type 1, Power Converter, and its physical dimensions are such that it will plug into a plug-in shelf fitted with a 24 point socket, in a similar manner to the power converter which operates it. The terminal connections of the 24 point plug conform to the standard connections for plug-in equipment for input, HT + & -, filament and earth. The external relay connections are to pins, 15 & 16.

Circuit Description:-

The unit is wired in accordance with circuit M09.153.1 which is included in this handbook. The incoming signal is impressed on the grid of valve V1A via the gain control P1. The amplified signal is rectified by V2 and the resulting positive voltage is impressed upon the grid of V1B controls the operation of Relay A. Relay A puts B- to the grid of V3A which in turn drives V3B, and allows operating current to flow through the external relay PFA., the bias to Valve V3A & B is controlled by voltage divider R14 & R15. The unit is now in the non-indicating condition. Should the signal be taken off the input or reduced to - 30 dbm or less, relay A releases and removes the B - from the grid of V3A., but the potential remains during the discharge time of C3, which is controlled by resistors R8-R13.

(Cont'd.)

Should any of the voltages or valves fail, it can be seen that V3B will not draw current, therefore external relay PFA will release and indicate failure.

Parts List: -

R1	47 K ohms		BTS	10%
R2	4.7 K "		BTA	5%
R3	.47 M "		BTS	10%
R4	1 M "		BTS	10%
R5	10 M "		BTS	10%
R6	160 "		BTA	5%
R7	5 K "		BTS	10%
R8	2.2 M "		BTS	5%
R9	1.5 M "		BTS	5%
R10	1 M "		BTS	5%
R11	2.2 M "		BTS	5%
R12	3.3 M "		BTS	5%
R13	4.7 M "		BTS	5%
R14	2 K "		DJA	5%
R15	8 K "		DJ	5%
R16	75 "		AA	5%
R17	1.5 M "		BTS	10%
R18	.22 M "		BTS	10%
C1	.1 MF "		Hermaseal	400V
C2	.01 "		"	200V
C3	4 "		1 BS4 OP	200V
T1	Transformer Type T4/281TN2			
P1	Potentiometer 100K ohms.			
V1	Valve 12A x 7			
V2	" 6AL5			
V3	" 12AU7			

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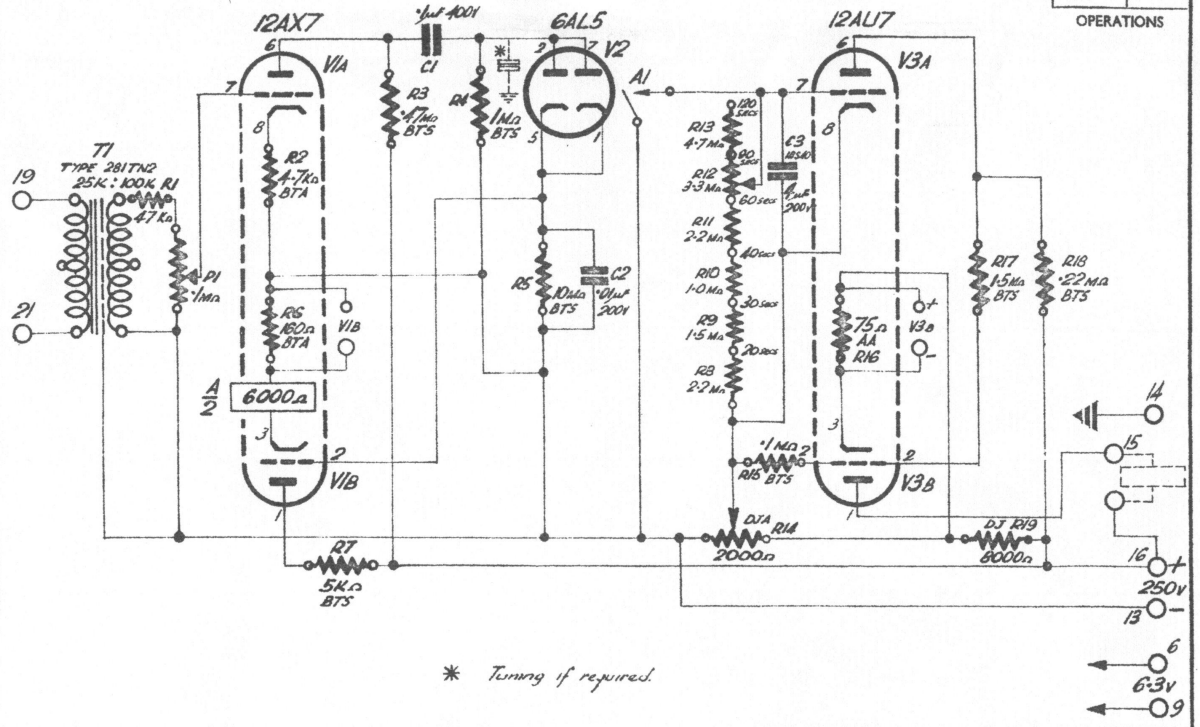

* Tuning if required.

MATERIAL		DRAWN		TRANSMISSION PRODUCTS PTY. LTD.
QUALITY		TRACED		COMMUNICATION ENGINEERS
STOCK SIZE		CHECKED	MECH.	DENISON STREET, NORTH SYDNEY, AUSTRALIA
WEIGHT, 1,000			ELECT.	SCHEMATIC PROGRAMME FAILURE ALARM
LENGTH, 1,000		PASSED		
SHEETS, 1,000		APPROVED		USED ON PROG. INPUT EQUIP.
ITEM FINISH		DATE		

THIRD ANGLE PROJECTION — DO NOT SCALE DRAWING — REPORT ERRORS

SCALE: UNLESS SPECIFIED TOLERANCE ON FRACTIONS IS: " DECIMALS IS:

DRAWING NUMBER M09·153·1

ISSUE	CHANGE
1	ORIGINAL

CHANGES