Steanes

SOUND SYSTEMS

SERVICE DATA

and

OPERATING INSTRUCTIONS

for

AMPLIFIER 20 Watt A.C.

TYPE No. S311

F. K. POPPLETON
213 HOPE ST., WEST BRUNSWICK
RADIO AND TELEVISION SALES AND SERVICE
FW 5000

20 WATT AMPLIFIER 240 V A.C.

OUTPUT POWER	20 watts at less than 5% total Harmonic distortion.
FREQUENCY RESPONSE	90 - 15000 cps plus 2 db with tone control set for flat response.
TONE CONTROL	Tapped potentiometer type - 11.5 db at 40 cps with control turned fully clockwise. - 21 db at 10,000 cps with control turned fully anticlockwise.
SIGNAL TO NOISE RATIO	(With volume controls at max.) Microphone : 62 db) weighted Pickup : 66 db)
POWER CONSUMPTION	123 VA at full signal
MAINS SUPPLY	220 - 240 - 260 V 90 - 60 cps
INPUTS	Microphone : 1 megohm Pickup : 500,000 ohms.
OUTPUT IMPEDANCES	500, 250, 125 ohms (100, 70, 50 volts)
DAMPING FACTOR	2.2
FUSE	2 amp - auto fuse.
VALVES	2 12 AX 7 V1 and V.3 2 EL34 V4 and V.5 1 GZ32 V2

VOLTAGE ANALYSIS

VALVE		ANODE	SCREEN	CATHODE	HEATER
V4 & V5	EL 34 (2)	320 V D.C.	310 V D.C.	20 V D.C.	6.1 V A.C.
V.2	GZ 32	280 V A.C.	-	325 V D.C.	5.2 V A.C.
V.1	12AX 7 (1)	140V D.C. 140V D.C.	- -	1.4 V D.C. 1.4 V D.C.	6.1 V A.C.
V.3	12AX 7 (2)	130V D.C. 210 V D.C.	- -	1.1 V D.C. 60 V D.C.	6.1 V A.C.

MEASUREMENTS TAKEN WITH 1000 OHMS PER VOLT METER TO CHASSIS

OPERATING INSTRUCTIONS FOR 20 WATT AMPLIFIER

GENERAL

Before using a new Amplifier, make sure that all valves are seated firmly in their sockets, and that fuses are fitting tightly in their holders.

All Amplifiers leave the factory with the power cable connected to the mains transformer for 240 volt A.C. operation. In cases where the mains voltage is not 240 volt, it is necessary to remove the baseplate of the Amplifier, BUT ENSURE THE AMPLIFIER IS NOT CONNECTED TO THE MAINS SUPPLY, unsolder the lead of the power cable connected to the 240 volt and re-solder to the lug required as per the following sequence:

Yellow or White	260 v.
Red	240 v
Green	220 v

The power point used for Amplifiers should be of the three pin earthed type, which will then earth the amplifier through the third conductor in the power lead. If an earthed power point is unavailable a separate earthing wire should be connected to the Amplifier chassis.

INPUT CONNECTORS

Before connecting any input source to this Amplifier, ensure the voltage to the plugs does not exceed the following -

Pickup	2 v
Microphone	.05 V

The input connectors are two-pin plugs (metal sheathed type) which are supplied with the Amplifier. The pin numbers are stamped on the inside bakelite moulding of the plug - No. 2 being Grid and No. 1. being Grid return.

When connecting the microphone or pickup cable to the plug pins, the two inner wires must be connected to Pins No. 1 and No. 2. whilst the braid shielding is soldered directly to the outer spring on the plug.

Where a single shielded conductor is encountered, the shielding should be connected to No. 1 pin and NOT to the spring, as this Amplifier features SINGLE POINT EARTHING. If this is NOT done correctly, EXCESSIVE HUM will develop.

OUTPUT CONNECTIONS

The constant voltage output system used, eliminates mismatch distortion. This permits any number of loudspeakers to be connected provided the total impedance is not lower than 0.8 times the selected impedance. In this regard there is provided at the rear of the Amplifier, a variable impedance selector switch.

Selection of wattage per speaker is calculated as under when connected to the 500 ohm tapping.

½ watt	20,000 ohms.
1 watt	10,000 ohms.
2 watt	5,000 ohms.
4 watt	2,500 ohms.
8 watt	1,250 ohms.

Where the impedance selector switch is set to a lower impedance value, the power fed to each loudspeaker is proportionately reduced.

VOLUME CONTROL

Separate controls are provided for each input channel and this allows

individual adjustment and mixing. To increase volume turn the knob clockwise.

TONE CONTROL

Separate bass and treble controls having wide attenuation range. Refer Frequency Response Graph.

PRECAUTIONS

It is strongly recommended not to carry out repairs on Amplifiers unless technically capable. Besides additional damage which may result from trying to tamper with an Amplifier, it should always be borne in mind that if the top or bottom covers are removed, terminals carrying dangerous high voltages are exposed, sometimes even after the Amplifier is disconnected from the mains supply.

It is essential that sufficient space be allowed on all sides of the Amplifier to provide efficient ventilation. Under no circumstances should anything be placed on top of the perforated cover, as this will result in overheating and subsequent damage.

NOTE:

Plug numbers quoted for connections for microphone and pickup apply to the plugs supplied with the Amplifier (Acme).

TEST SHEET

for

AMPLIFIER 20 WATT.

1. Plug all valves except rectifier and switch on.

2. Connect 500 ohm load to 500 ohm tap.

3. Plug in rectifier and watch for H. T. shorts.

4. With tone control set for flat response and pickup volume at minimum, connect a signal of 2 mV at 1000 cps to microphone input socket.

5. Turn up microphone volume control and check output for 100 V at less than 5% distortion.

6. Turn down microphone until output is 50 V.

7. Change generator frequency to 60 cps, output should now be 40V.

8. Turn tone control to "Speech" position, Output should now be 10 V.

9. Return tone control to flat position and change generator frequency to 10,000 cps. Output should be 40 V.

10. Turn tone control to "Music" position. Output should now be 1.5 V.

11. With microphone volume at minimum and tone control at the "flat" position connect 1000 cps signal to the P.U. input socket. With an input of 120 mV ensure that 100 V can be obtained at the terminals.

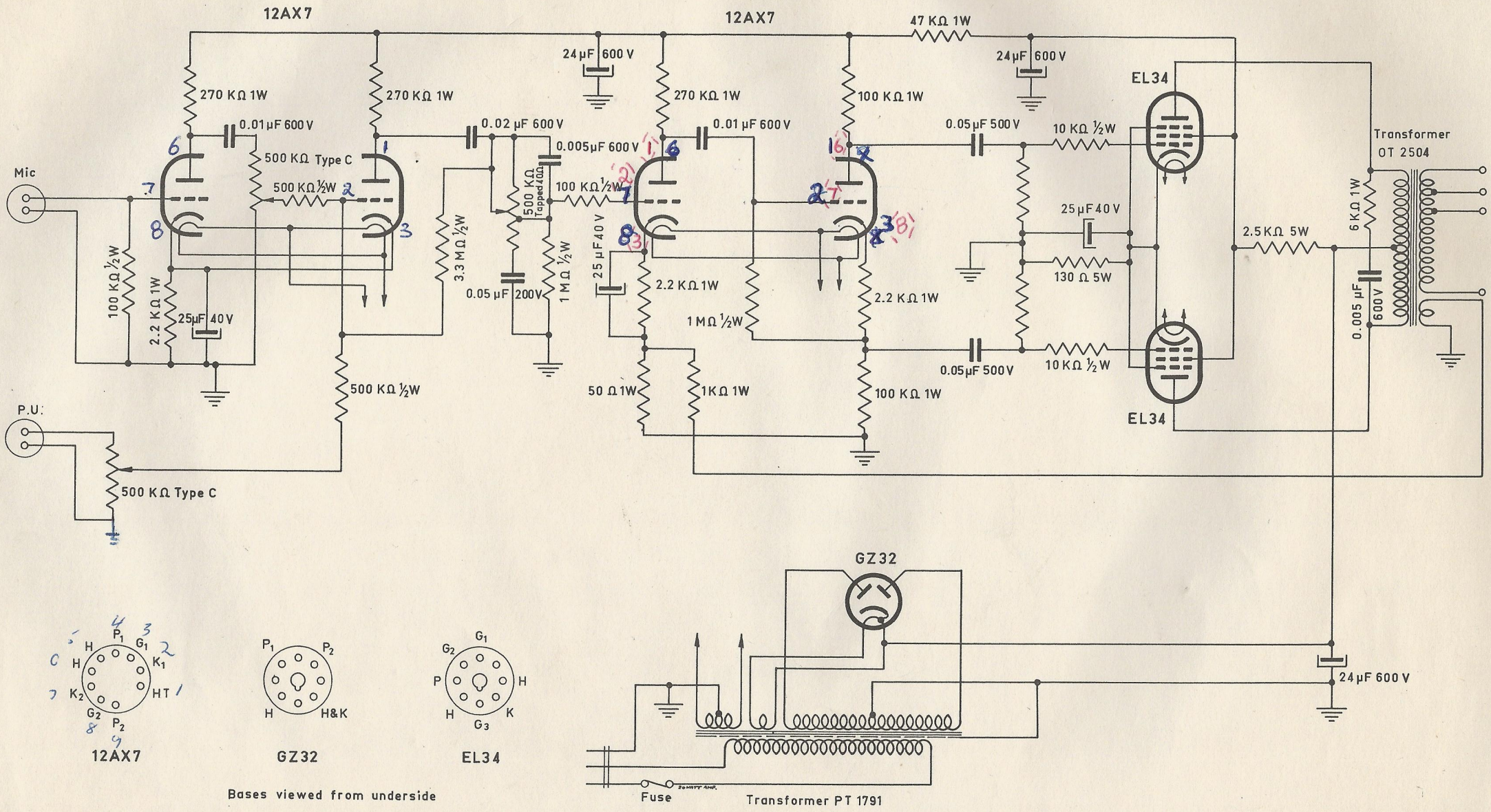
12. Disconnect generator and turn volume controls to minimum. Output should now be .25 V.

13. Short circuit the microphone socket and turn the microphone volume to minimum. Output should now be .5V.

14. Tap valves for excessive microphony and internal short circuits.

15. With an AVOMETER check for the following voltages.

		ANODE	SCREEN	CATHODE	HEATER
V4 & V5	E134(2)	320 V D.C.	310 V D.C.	20 V D.C.	6.1v A.C.
V2	GZ32	280 V A.C.	-	325V D.C.	5.2v A.C.
	12AX7(1)	140 V D.C.	-	1.4 D.C.	6.1v A.C.
V1		140 V D.C.	-	1.4 D.C.	
V.3	12AX7 (2)	130 V D.C.	-	1.1v D.C.	6.1v A.C.
		210 V D.C.	-	60 V D.C.	


12AX7
12AX7
47 KΩ 1W
24 µF 600 V
24 µF 600 V
270 KΩ 1W
270 KΩ 1W
270 KΩ 1W
100 KΩ 1W
EL34
0.01 µF 600 V
0.02 µF 600 V
0.005µF 600 V
0.01 µF 600 V
0.05µF 500 V
10 KΩ ½W
Transformer
OT 2504
Mic
500 KΩ Type C
500 KΩ ½W
100 KΩ ½W
25 µF 40 V
2.5 KΩ 5W
6 KΩ 1W
100 KΩ ½W
2.2 KΩ 1W
25µF 40 V
3.3 MΩ ½W
500 KΩ Tapped 400Ω
0.05 µF 200V
1 MΩ ½W
25 µF 40 V
2.2 KΩ 1W
1 MΩ ½W
2.2 KΩ 1W
130 Ω 5W
0.005 µF 600V
P.U.
500 KΩ ½W
50 Ω 1W
1KΩ 1W
100 KΩ 1W
0.05µF 500V
10 KΩ ½W
EL34
500 KΩ Type C
GZ32
24µF 600 V
12AX7
GZ32
EL34
Bases viewed from underside
Fuse
Transformer PT 1791

Steanes SOUND SYSTEMS PTY. LTD.

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PERTH	381 Murray Street	Phone BA3131, BA4696
HOBART	235 Collins Street	Phone B7230, B2120

FURTHER INFORMATION ON THIS EQUIPMENT CAN BE OBTAINED FROM ANY OF THE ABOVE STEANES BRANCHES