PHILIPS

SERVICE DATA

and

OPERATING INSTRUCTIONS

for

BOOSTER 120 Watt A.C.

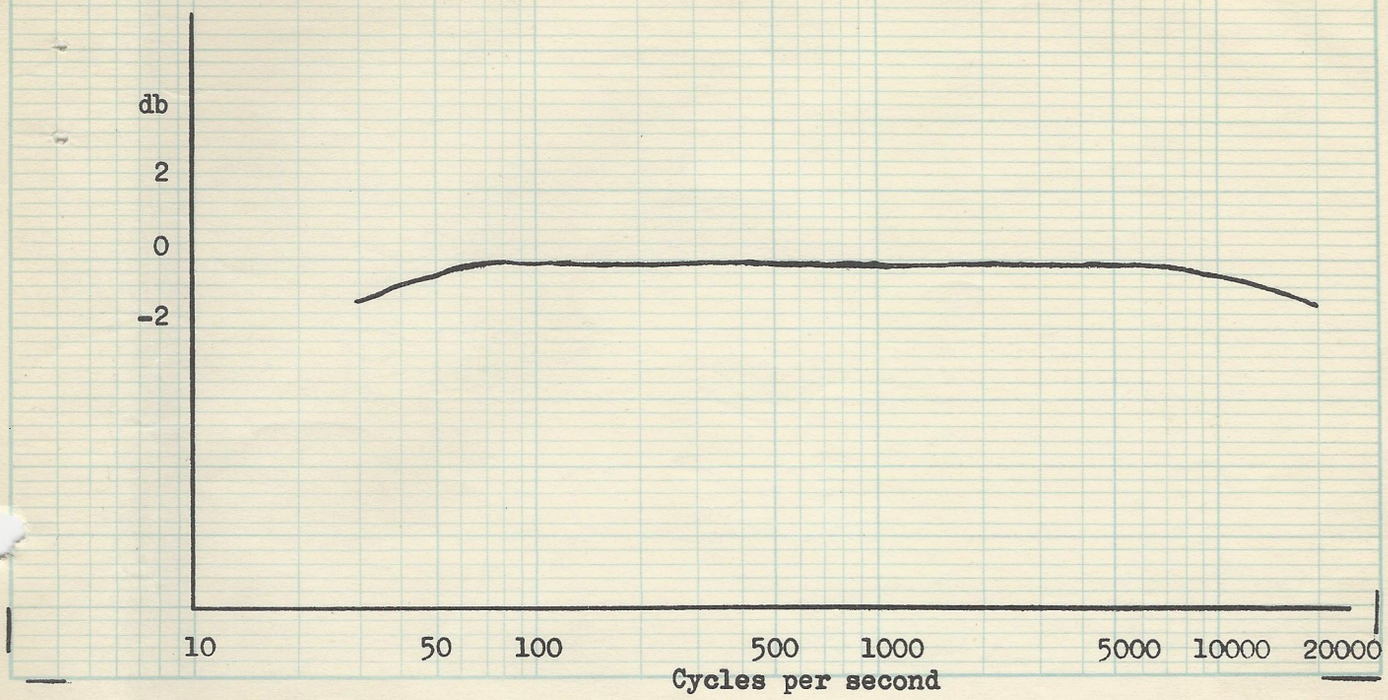
TYPE No. 962

electro-acoustic division

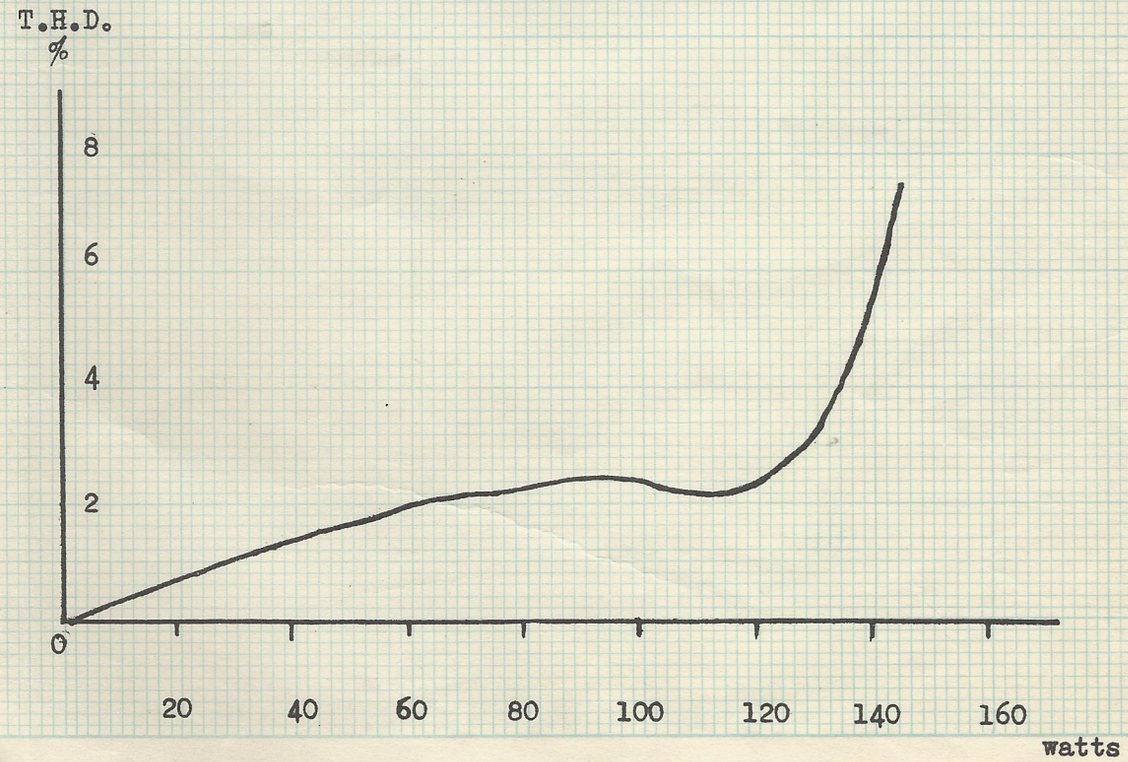
ela

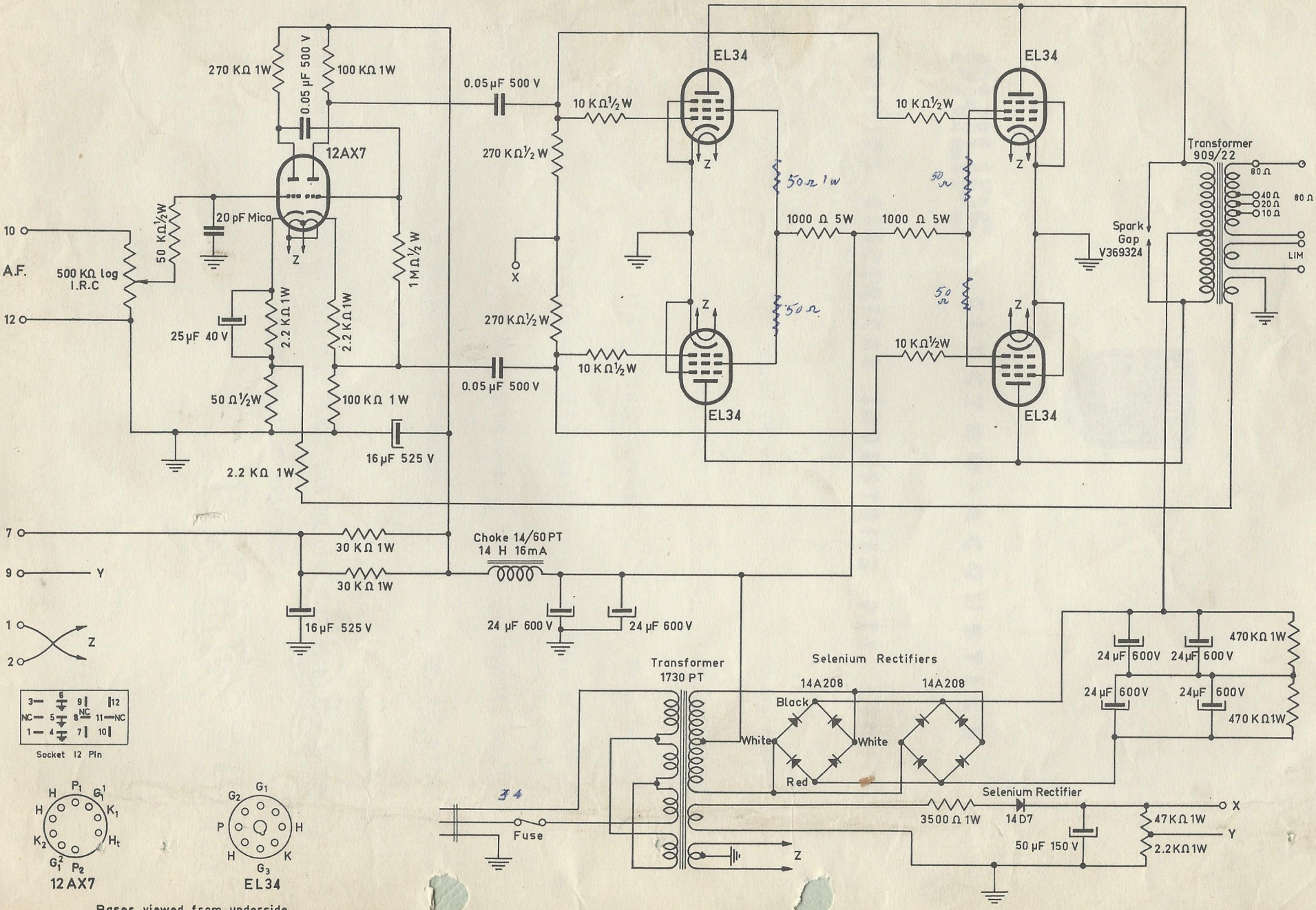
PHILIPS

FREQUENCY RESPONSE



POWER OUTPUT




270 KΩ 1W
0.05 μF 500 V
100 KΩ 1W
12AX7
20 pF Mica
50 KΩ½W
1 MΩ½ W
10
A.F.
500 KΩ log I.R.C
12
25 μF 40 V
2.2 KΩ 1W
2.2 KΩ 1W
50 Ω½W
100 KΩ 1W
16 μF 525 V
2.2 KΩ 1W
0.05 μF 500 V
10 KΩ½W
270 KΩ½ W
X
270 KΩ½W
10 KΩ½W
EL34
EL34
50Ω 1W
1000 Ω 5W
50Ω
EL34
EL34
10 KΩ½W
10 KΩ½W
1000 Ω 5W
50Ω
Transformer 909/22
80 Ω
40 Ω
20 Ω
10 Ω
80 Ω
Spark Gap V369324
LIM
7
9
Y
30 KΩ 1W
30 KΩ 1W
Choke 14/60 PT
14 H 16mA
16 μF 525 V
24 μF 600 V
24 μF 600 V
1
2
Z
Transformer 1730 PT
Selenium Rectifiers
14A208
14A208
Black
White
White
Red
24 μF 600V
24 μF 600 V
24 μF 600V
24 μF 600V
470 KΩ 1W
470 KΩ1W
Socket 12 Pin
Fuse
Z
Selenium Rectifier
3500 Ω 1W
14D7
50 μF 150 V
47 KΩ 1W
2.2 KΩ 1W
X
Y
12AX7
EL34
Bases viewed from underside

OPERATING INSTRUCTIONS FOR 120 WATT BOOSTER

GENERAL

Before connecting a new booster amplifier to the power supply ensure all valves are in their correct locations on the chassis and that the correct fuse is fitted.

Amplifiers normally leave the factory with the mains transformer set for 240 V. A.C. operation. Where the mains voltage is not 240V, the baseplate of the booster may be removed to give access to the transformer tappings. ENSURE THE BOOSTER POWER LEAD IS NOT CONNECTED TO THE MAINS SUPPLY WHEN WORKING ON THE POWER TRANSFORMER.

To select new voltage tapping unsolder the power cable connected to the 240 volt lug and reconnect to appropriate terminal as per the following guide:

White, or yellow	260V
Red	240V
Green	220V

The power point used for boosters should be of the 3-pin earthed type. This enables the chassis to be earthed via the third conductor in the power lead, otherwise a separate earth lead must be used to provide an efficient earth connection for the chassis.

INPUT

Input to the booster is via pins 10 and 12 on a 12-pin socket. Pin 10 is the high inpedance connection and Pin 12 is the chassis return. The pin numbers are stamped on the inside bakelite moulding of the socket.

OUTPUT

The booster is designed for the constant voltage system method of load operation and allows great variation in the number of loudspeakers used without introducing mismatch distortion. The following table shows the minimum load impedance that should be used at various tappings of the output transformer. The table also indicates the permissible speaker load for the various output impedance values.

Nominal Output Impedance of Amplifier	Max Rated Speaker Power using 100 Volt Speakers	Minimum load Impedance permissible
80 ohm	150 watts	66 ohms
40 ohm	300 "	33 "
20 ohm	600 "	16 "
10 ohm	1200 "	8 "

VOLUME CONTROL:

A volume control is fitted on the input to the first valve. Rotation clockwise of this control increases the volume level.

WARNING:

Booster amplifiers operate at high voltages and it is strongly recommended not to carry out repairs on them unless technically qualified. Besides additional damage which may be caused to the circuit the possibility of lethal shock may exist even after the power supply has been interrupted because the high quality condensers used on these amplifiers take some time to discharge properly.

VENTILATION:

It is essential that the heat generated by the valves be allowed to escape to keep the temperature within safe limits. Sufficient space should therefore be provided on all sides of the amplifier for efficient ventilation.

SPARK GAP

This booster is fitted with a spark gap on the primary of the output transformer. With correct load and signal input not exceeding 1.2V peak the gap has no effect on the amplifier operation. A spark gap that functions during a signal may be an indication either than an excessively large signal is being applied or the output load is insufficient to absorb the full power output of the amplifier.

CONVERTING TO 70 WATT OUTPUT:

When the full power of 120 watts is not required this booster may be converted to give about 70 watt output into a 140 ohm load. The conversion should be carried out as follows:-

1. Remove one pair of EL.34 Valves from the push-pull parallel combination thus leaving only one pair in push-pull.

2. Disconnect the leads from one of the bridge-connected selenium rectifiers in the H.T. section and remove these rectifiers from the chassis.

3. Connect the remaining high tension rectifier to the lower voltage taps on the power transformer secondary.

OTHER MODIFICATIONS:

Whenever power outputs not exceeding 105 watts or 60 watts are required it is advisable to operate the amplifier on the 260 volt tap on the primary of the power transformer, with mains input of 240 volts. This ensures longer life from the output valves but it is also necessary to restore the bias voltage to its correct value. This entails changing the 3,500 ohm 1 watt resistor on the bias supply rectifier to 2.2. K 1 watt to compensate for the lower voltage supplied by the transformer when operated on the 260 V tap with 240 V input.

AMPLIFIER 120 WATT BOOSTER

POWER OUTPUT:	120 watts at less than 3% total harmonic distortion.
FREQUENCY RESPONSE:	20 to 20,000 cps (plus, minus 2 db).
INPUT IMPEDANCE:	500 K, with one side earthed.
INPUT SENSITIVITY:	1.2 volt.
OUTPUT IMPEDANCE:	80 ohms. Taps at 40, 20 and 10 ohms.
OUTPUT VOLTAGE VARIATION:	Between no load and full load = 2.8 db.
SIGNAL TO NOISE RATIO:	70 db.
MAINS VOLTAGE:	110, 220, 240 and 260 volts, A.C. 40 - 60 cycles.
POWER CONSUMPTION:	No signal : 135 V.A. full signal : 280 V.A.
FUSE:	3 amp auto type.
VALVES:	4 - EL34; 1 - 12 AX7 Pilot Lamps : 6.3V 0.15 amps
RECTIFIERS:	Selenium : 3 X 14A208 : 1 X 14D7
OVERALL DIMENSIONS:	$16\frac{1}{4}$" lg x $11\frac{1}{4}$" wide x $10\frac{1}{4}$" high.
WEIGHT:	44 lbs.

TEST SHEET

for

120 WATT BOOSTER

1. Check that valves are in correct socket locations and look for faulty wiring etc..

2. Ensure that power transformer tapping agrees with mains voltage on which amplifier is to be used.

3. Disconnect the H.T. leads from the power transformer and switch on amplifier.

4. Using a 1000 ohm/volt meter on the 1000 volt range, measure the voltage at the junction of the two EL.34 grid resistors (point X on diagram). Reading should be 36 volts NEGATIVE with respect to chassis.

5. Switch off power and check spark gap on output transformer. Gap should be 0.010 of an inch.

6. Connect the H.T. leads back on power transformer and switch on.

7. Measure the following voltages with respect to chassis:

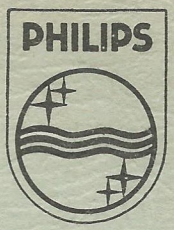
VALVE	PLATE	SCREEN	CATHODE	HEATER
Each EL34	840V. D.C.	420 V D.C.	0	6.2 V
12AX7	(1)170V. D.C.	-	1.4 V D.C.	6.2 V
	(2)280V. D.C.	-	70 V D.C.	

8. Connect an 80 ohm load of correct power dissipation to the output of amplifier and apply a 1000 c/s signal to the input at a level of 1.2. volts peak. Output voltage across load should be 100 volts, without excessive distortion.

9. Reduce signal input until output voltage drops to 70 V then change input signal to 40 c/s. Output at this frequency should be 69 volts.

10. Change the generator frequency to 10,000 c/s, maintaining same input level. Output meter should now read 73 volts.

11. Reduce input to zero and set booster volume control to minimum. Output should be less than 35 mV.



THIS EQUIPMENT HAS BEEN DESIGNED AND

MANUFACTURED IN AUSTRALIA

By the

electro acoustic division

of

PHILIPS ELECTRICAL INDUSTRIES PTY. LIMITED

MELBOURNE	590 Bourke Street	Phone MU6091
SYDNEY	367 Kent Street	Phone BX6486
ADELAIDE	119 Grenfell Street	Phone W 2241
BRISBANE	148 Edward Street	Phone B 2666 -7
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 PHILIPS BRANCHES

AMENDMENTS TO SERVICE DATA AND OPERATING INSTRUCTIONS.

120 Watt BOOSTER

Circuit Diagram

a) Insert the fuse rating "3 amp" on the primary side of the mains transformer.

b) Insert a resistor of 50 ohm 1 watt in series with the screen grid of each EL.34 Valve.

6/12 STATION MASTER

Delete the type number shown for the power transformer and insert "CZ.344.095".