

Western Electric

**124D
AMPLIFIER**



Instruction Bulletin No. 995P

124D AMPLIFIER

The 124D Amplifier is a three-stage high-gain amplifier intended for operation between a low level source and loud speakers.

Typical Electrical Characteristics

Gain—Approximately 107 db

Gain Control—35 db continuously variable

Frequency Characteristic—Uniform within ± 1 db over the range 35 to 10,000 cycles

Operates from 30 or 120 ohms nominal impedance

Operates into 600, 150, 30, 16, 7.5, or 1.75 ohms nominal impedance

Output Power—12 watts as shipped, 20 watts available

Output Noise—8 db below .001 watt, unweighted, under maximum gain conditions

Power Supply—105-125 volts, 50-60 cycles 1.25 amperes, 125 watts maximum

Apparatus Description

Dimensions— $19\frac{5}{8}$ inches wide, 7 inches deep and 7 inches high (Panel Space)

Weight—Approximately 20 pounds

Finish—Chassis—Alluminum lacquer

Mat—Black Japan, coded 124D-3

Aluminum Gray, coded 124D-15

ASSEMBLY

Load Impedance

The amplifier is shipped with the output transformer connected for a nominal load impedance of 600 ohms. If the load impedance is not within the range of 300 to 1200 ohms, the output transformer should be reconnected for the proper impedance as indicated in the table on the Schematic drawing, Figure 1.

Output Power

The amplifier is furnished connected for an output power of 12 watts. In the interests of minimum operating temperature and maximum vacuum tube life, it is recommended that the amplifier be operated as furnished unless more power is required. If an output power of 20 watts is desired, it is only necessary to replace the two orange colored wires connected to the rectifier tube socket

(marked 5U4G-274B) with the two unconnected red wires having taped ends. The orange wires removed should be similarly taped. Operation of non-Western Electric tubes under the 20 watt output condition may result in decreased vacuum tube life, and the use of Western Electric tubes, is therefore, recommended.

Mounting

The amplifier may be mounted vertically on a relay rack or in a cabinet equipped with vertical mounting brackets.

Ventilation

When mounted in a partially closed housing such as a perforated metal cabinet, adequate ventilation should be provided. 50 square inches of opening to free air near the bottom of the amplifier and a similar area provided above the amplifier is usually sufficient for a single 124D Amplifier; at least two inches of space should be provided between the top of the housing and the nearest part of the amplifier.

If additional 124D Amplifiers or other heat generating equipment is in the same housing, proportionately increased ventilation should be provided and the apparatus should be separated by at least four inches.

Safety Precautions

The local inspection authority should be consulted regarding installation and use. In general in order to meet these requirements no terminals or wiring involving the a-c supply or secondary power should be exposed to accidental contact. This condition is ordinarily met in the 124D Amplifier provided the mat is in place on the amplifier.

EXTERNAL CONNECTIONS

Input and Output

Input sources between 15 and 60 ohms should be connected to Terminals 1 and 2, and sources between 60 and 250 ohms to Terminals 1 and 3. If a grounded input circuit is used, the grounded side should be connected to amplifier Terminal 1. It is recommended that the input wires be a shielded twisted pair with insulation over the shield and the shield connected to the amplifier ground terminal.

A twisted pair should be used for output connections which should be made to Terminals 13 and 14.

Power

AC power should be connected to Terminals L1 and L2 if the line voltage averages between 105 and 115, and to Terminals L1 and L3 if between 115 and 125 volts. The ungrounded side of line should be connected to Terminal L1.

A 1.25 ampere Buss Fustat is provided on the amplifier chassis. This type

of fuse gives maximum protection to the amplifier and it is inadvisable to employ any other type. Consult the distributor or dealer from whom the amplifier was purchased for sources of supply.

Ground

The terminal marked "G" should be connected to a good building ground.

VACUUM TUBES

If non-Western Electric vacuum tubes are employed, glass type tubes are preferred. (The first stage vacuum tube is available only in the RCA 1612 metal type.)

The amplifier should not be operated with a mixed complement of Western Electric and Non-Western Electric Amplifier Tubes. This restriction does not apply to rectifier tubes, nor to the 1612 type tube.

Connect the flexible grid leads to the tubes in the voltage stages, and if glass tubes are employed, the vacuum tube shields supplied with the amplifier should be placed over these tubes. Tube shields are not required with metal tubes.

MAINTENANCE

No routine maintenance is required other than the occasional checking and replacement of vacuum tubes. If the amplifier fails to operate properly, the trouble may be found through the use of the schematic, Figure 1 and wiring diagram, Figure 2.

ASSOCIATED PARTS

The following vacuum tubes required for operation must be ordered separately:

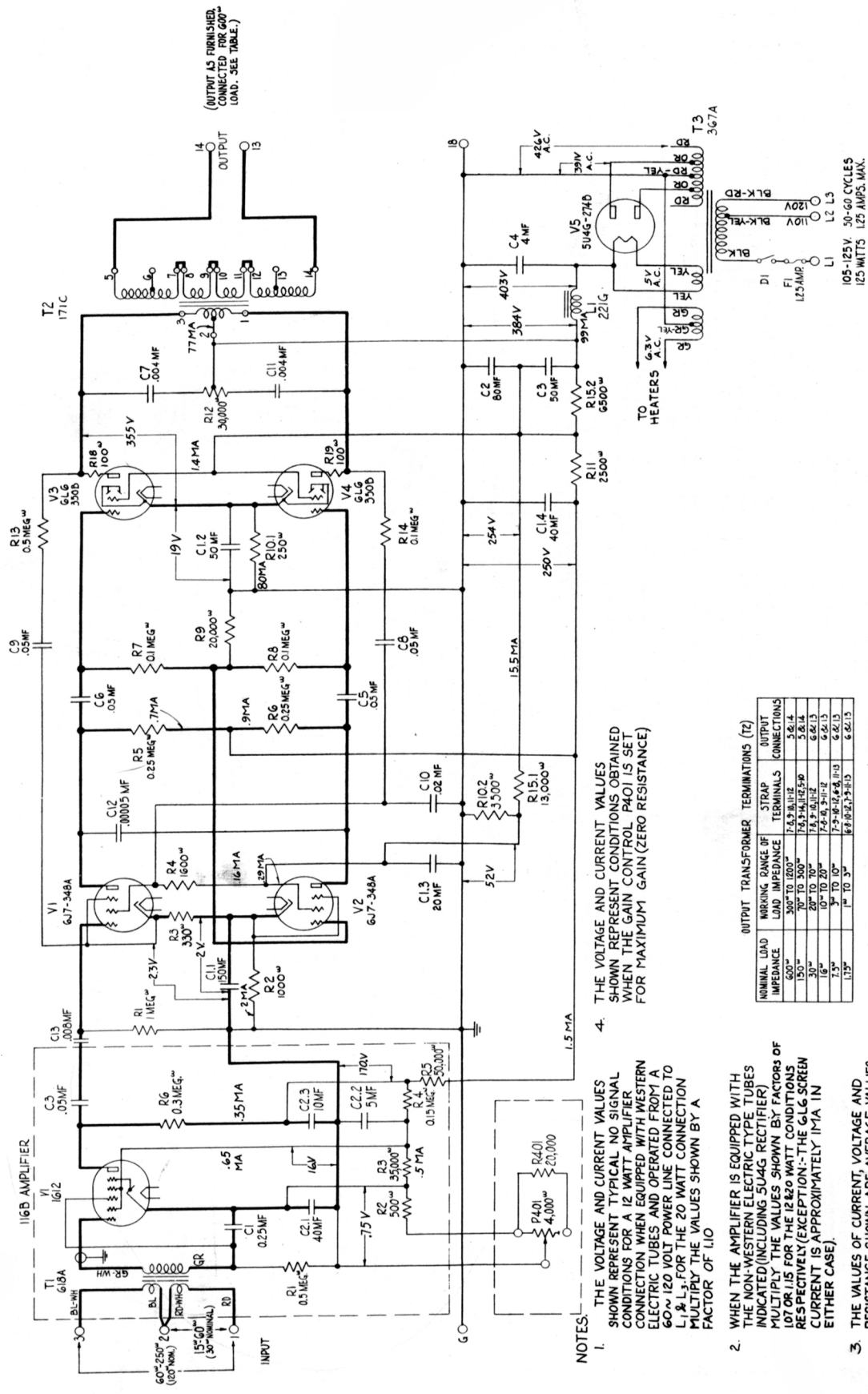
<i>Western Electric Tubes</i>		<i>Non-Western Electric Tubes</i>
2 — 348A	or	2 — 6J7 or 2 — 6J7G
2 — 350B	or	2 — 6L6 or 2 — 6L6G
1 — 274B	or	1 — 5T4 or 1 — 5U4G
	and	1 — RCA 1612

It is recommended that spare 1.25A Buss Fustat fuses be kept on hand in case of accidental blow-out.

Use of the 102A Cover is recommended for mechanical protection to the apparatus side of the amplifier.

These parts or replacements may be obtained through the nearest distributor.

Additional information regarding system applications of this amplifier, its use in special services or in connection with other equipment may be obtained from the distributor.



(OUTPUT AS FURNISHED,
CONNECTED FOR 600 Ω
LOAD. SEE TABLE.)

4. THE VOLTAGE AND CURRENT VALUES SHOWN REPRESENT CONDITIONS OBTAINED WHEN THE GAIN CONTROL PHO1 IS SET FOR MAXIMUM GAIN (ZERO RESISTANCE)

MINIMAL LOAD IMPEDANCE	WIRING RANGE OF LOAD IMPEDANCE	STRAP TERMINALS	OUTPUT CONNECTIONS
600 Ω	30 Ω TO 300 Ω	7-8, 9, 11, 12	5, 6, 14
150 Ω	70 Ω TO 500 Ω	7-8, 9, 11, 12, 13	5, 6, 14
30 Ω	20 Ω TO 10 Ω	7-8, 9, 11, 12	6, 8, 13
1.5 Ω	3 Ω TO 10 Ω	7-8, 9, 11, 12	6, 8, 13
1.12 Ω	1 Ω TO 3 Ω	6-8, 9, 11, 12, 13	6, 8, 13

- THE VOLTAGE AND CURRENT VALUES SHOWN REPRESENT TYPICAL NO SIGNAL CONDITIONS FOR A 12 WATT AMPLIFIER CONNECTION WHEN EQUIPPED WITH WESTERN ELECTRIC TUBES AND OPERATED FROM A 60 \sim 120 VOLT POWER LINE CONNECTED TO L₁ & L₃. FOR THE 20 WATT CONNECTION MULTIPLY THE VALUES SHOWN BY A FACTOR OF 1.10
- WHEN THE AMPLIFIER IS EQUIPPED WITH THE NON-WESTERN ELECTRIC TYPE TUBES INDICATED (INCLUDING 504G RECTIFIER) MULTIPLY THE VALUES SHOWN BY FACTORS OF 1.07 OR 1.15 FOR THE 12 & 20 WATT CONNECTIONS RESPECTIVELY (EXCEPTION - THE 6L6 SCREEN CURRENT IS APPROXIMATELY 1 MA IN EITHER CASE).
- THE VALUES OF CURRENT, VOLTAGE AND RESISTANCE SHOWN ARE AVERAGE VALUES. IN SPECIFIC INSTANCES THEY MAY BE AT VARIANCE WITH VACUUM TUBE HAND BOOK DATA AND ARE INTENDED ONLY AS AN AID IN SERVICING THE AMPLIFIER. READINGS SHOULD BE TAKEN WITH THE EQUIVALENT OF A VOLT-OHM-METER WHOSE RESISTANCE IS AT LEAST 1000 OHMS PER VOLT.

FIGURE 1—Schematic

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