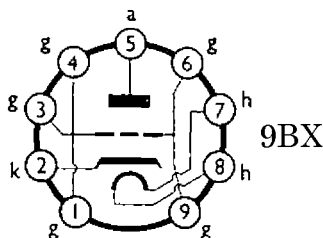


from JEDEC release #2395, March 2, 1959

**BASE CONNECTIONS AND VALVE DIMENSIONS**



View from underside  
of base.

Base : B39A  
Bulb : Tubular  
Max. overall length : 56  
Max. seated length : 49  
Max. diameter : 22.2

EG-1

T 62

mm 2.2  
mm 15.16  
mm 7/8

6-2

**HEATER**

|       |                |   |
|-------|----------------|---|
| $V_h$ | 6.3            | V |
| $I_h$ | 0.37 (approx.) | A |

**MAXIMUM RATINGS** (Absolute)

|               |     |    |
|---------------|-----|----|
| $V_a$         | 250 | V  |
| $P_a$         | 2.5 | W  |
| $I_g$         | 3   | mA |
| $I_k$         | 20  | mA |
| $-V_g$        | 20  | V  |
| $V_h - k(pk)$ | 100 | V  |

**CAPACITANCES** (Measured on a cold unscreened valve)

|                    |      |                    |        |                    |         |
|--------------------|------|--------------------|--------|--------------------|---------|
| $C_{k+h-g}$ less a | 4 pF | $C_{a-g}$ less h,k | 1.8 pF | $C_{k+h-a}$ less g | 0.07 pF |
|--------------------|------|--------------------|--------|--------------------|---------|

**CHARACTERISTICS**

|                |     |      |
|----------------|-----|------|
| $V_a$          | 130 | V    |
| $I_a$          | 16  | mA   |
| $V_g$ (approx) | -1  | V    |
| $g_{m\mu}$     | 15  | mA/V |
| $\mu$          | 60  | —    |

**TYPICAL OPERATION**

**Class A. Grounded Grid Amplifier at 900 Mc/s.** (Fig. 1)

|                                 |     |            |
|---------------------------------|-----|------------|
| $V_b$                           | 180 | V          |
| $R_a$                           | 3.3 | k $\Omega$ |
| $R_k$                           | 68  | $\Omega$   |
| $I_a$ (approx.)                 | 16  | mA         |
| * $\Delta f$ (to 3db) (approx.) | 50  | Mc/s       |
| *† Power gain (approx.)         | 10  | db         |
| Noise factor (approx)           | 11  | db         |

\* Bandwidth and power gain may be adjusted by altering the coupling between the anode circuit and the output line.

† A power gain of about 20db is near the limit of stability for this type of circuit.

**Variation of Noise Factor with Frequency**

When used under the above conditions, the noise factor variation is as follows :

|                |     |     |      |      |      |      |
|----------------|-----|-----|------|------|------|------|
| f :            | 500 | 600 | 700  | 800  | 900  | Mc/s |
| Noise factor : | 8.4 | 9.4 | 10.2 | 10.9 | 11.5 | db   |

**CIRCUIT DETAILS (Fig. 2)****900 Mc/s Amplifier**

The layout of the circuit is shown in fig. 2. The valve is mounted in a standard PTFE B9A socket. The transverse screen, which divides the chassis into compartments "A" and "B", is cut to fit closely over the base of the socket and soldered so that tags 4, 5 and 6 are in compartment "B." Tags 4 and 6 are soldered directly to the screen and tag 3 is soldered to its other side in compartment "A."

Tags 1 and 9 are soldered to the socket screening boss and the boss is soldered to the screen, as shown.

The heater and h.t. negative supplies are brought into the chassis via three feed-through capacitors and chokes, and a fourth feed-through capacitor makes the connection to the cathode bias resistor on the top of the chassis.

The anode-grid tuned circuit comprises a  $\lambda/2$  wavelength line and is made from a  $\frac{1}{8}$ " diameter copper rod 4 cm long soldered between tag 5 (anode) and the tuning capacitor C7, with a clearance of  $\frac{1}{8}$ " from the bottom of the chassis.

The r.f. input feeds through a coaxial socket and directly to the cathode tag 2 via C4. The r.f. output is tapped off anode line at 1 cm from the anode tag 5 and feeds through a coaxial socket via C6.

The position of the output tap determines the gain and bandwidth of the amplifier, the input circuit being of wide bandwidth.

For other centre frequencies, up to 1000 Mc/s, the circuit may be scaled.

**Local Oscillator**

The recommended circuit for a local oscillator is similar to that of the amplifier, with the following differences :

The transverse screen extends to only half the depth of the chassis from the valve socket. The resulting stray capacitance will then be sufficient to cause oscillation.

The input coaxial connector and C4 are omitted. The length of the anode line should be 4.5 cm, with the output tap positioned to give the required output.

A typical output of 50 mW over the range 720-870 Mc/s may be expected from this circuit.

For other centre frequencies, up to 1000 Mc/s, the circuit may be scaled.

**INSTALLATION**

The valve may be mounted in any position.

The use of a retaining device is recommended ; a screening can will be required for most applications.

Free air circulation round the valve is desirable ; the temperature of the hottest part of the bulb should not exceed 200°C.

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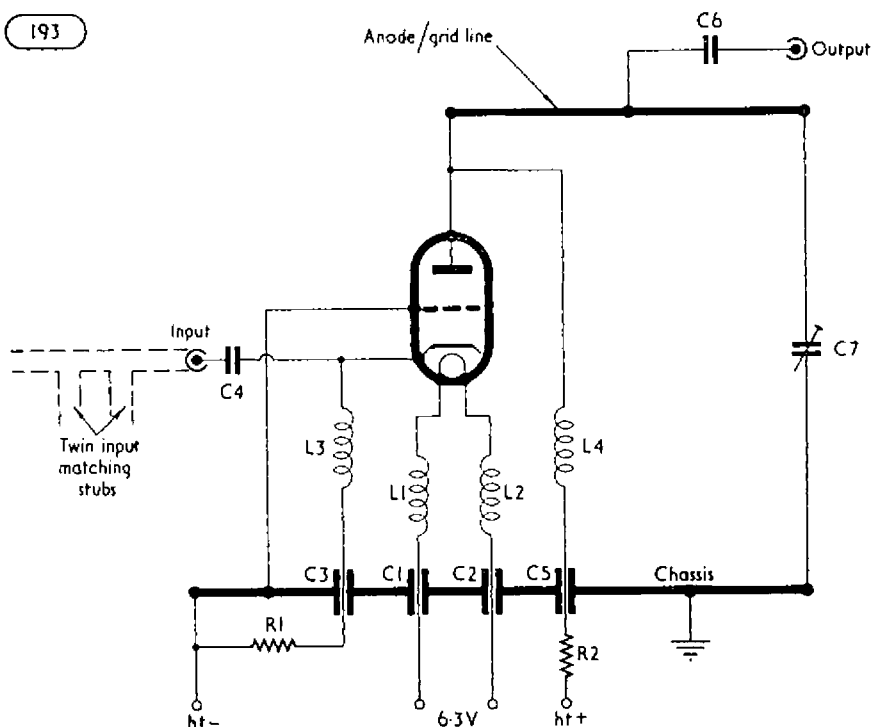


Fig. 1. Circuit of the 900 Mc/s Amplifier. Component values are as follows :

R1 68Ω ; R2 3.3 kΩ ; C1, 2, 3 and 5 1000 pF (feed-through) ; C4 680 pF (short tubular ceramic) ; C6 47 pF (short tubular ceramic) ; C7 3-9 pF ceramic trimmer (TCC Type CC159N) ; L1 to L4 15 turns 24 s.w.g. enamelled copper  $\frac{1}{8}$ " i.d. air-cored.

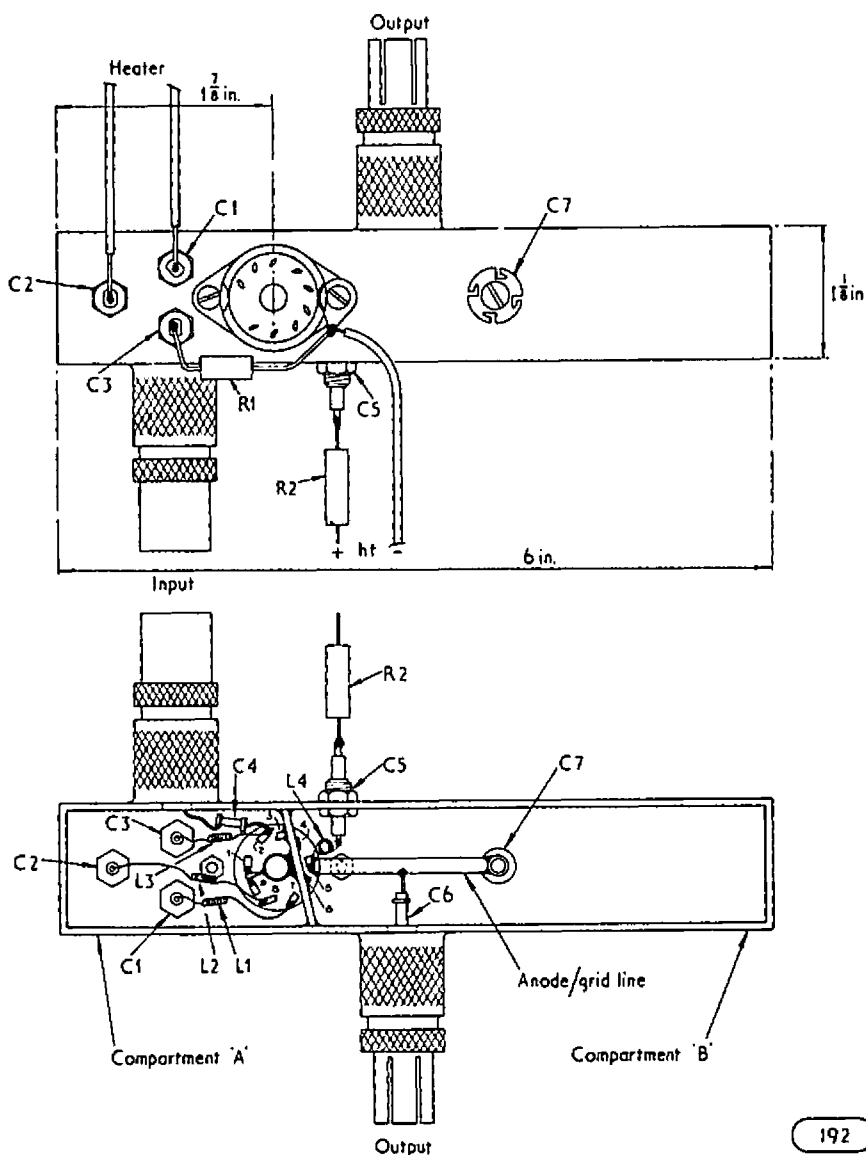


Fig. 2. Layout of the amplifier of fig. 1.

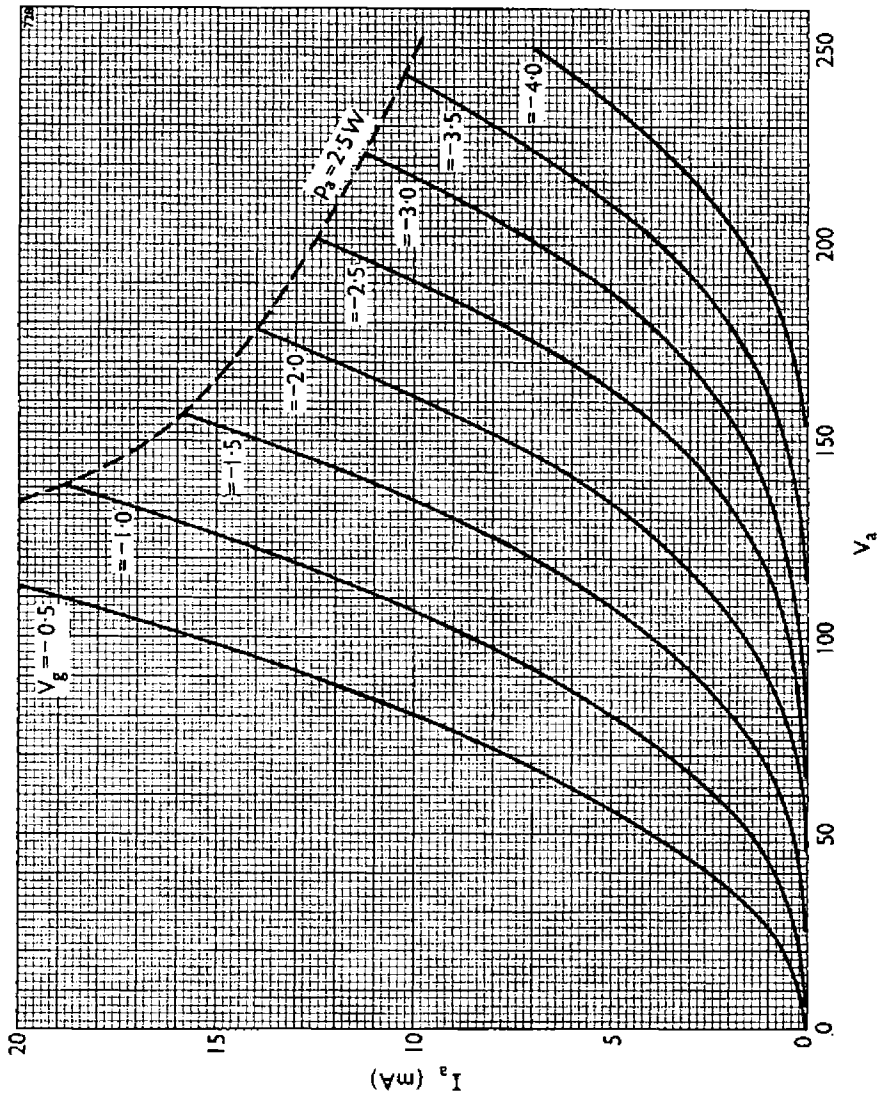


Fig. 3.

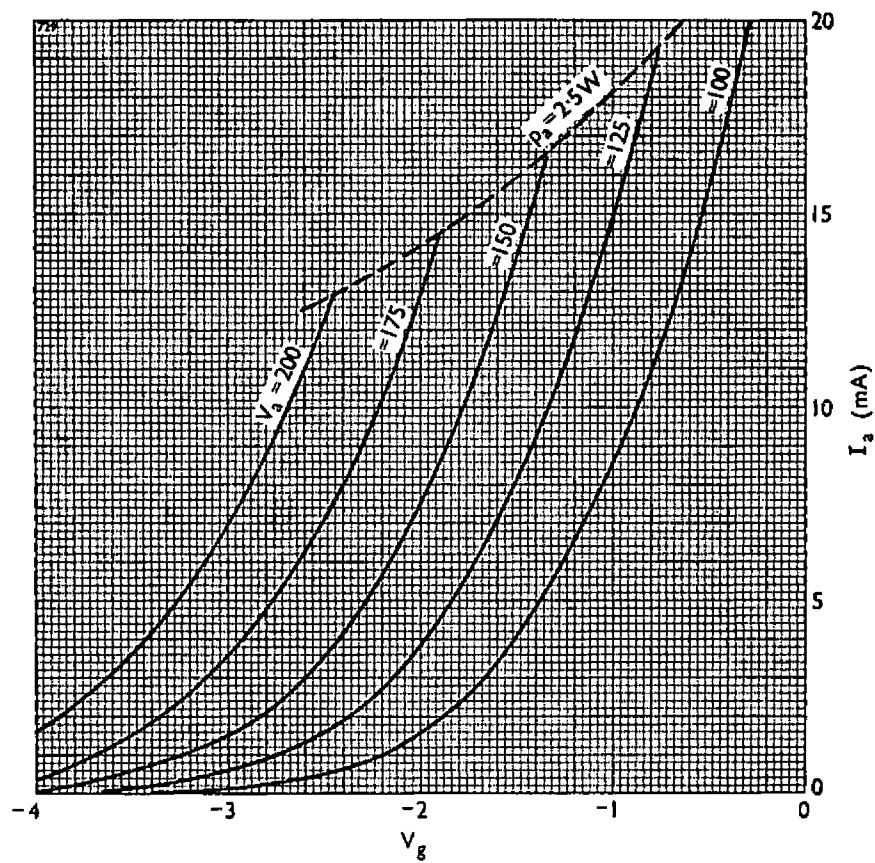


Fig. 4.