

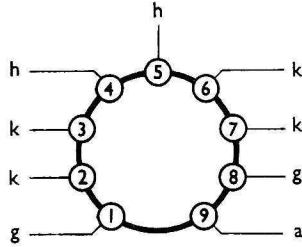
**S.E.C.**

VALVES

**LOW NOISE  
VHF TRIODE****A2599**

ISSUE 2

The A2599 is a low noise v.h.f. triode for grounded-cathode use. It is a commercial version of the CV5242.

**BASE CONNECTIONS AND VALVE DIMENSIONS**

Base: B9A  
 Bulb: Tubular.  
 Max. overall length: 56 mm.  
 Max. seated length: 49 mm.  
 Max. diameter: 22.2 mm.

Viewed from underside of base.

**HEATER**

|       |              |   |
|-------|--------------|---|
| $V_h$ | 6.3          | V |
| $I_h$ | 0.3 (approx) | A |

**MAXIMUM RATINGS (Absolute)**

|               |     |    |
|---------------|-----|----|
| $V_a$         | 250 | V  |
| $p_a$         | 2.5 | W  |
| $I_k$         | 20  | mA |
| $-V_g$        | 20  | V  |
| $v_{h-k(pk)}$ | 100 | V  |
| $T_{bulb}$    | 200 | °C |

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

$C_{g-all, less a}$ : 3.5pF;     $C_{a-all, less g}$ : 0.7pF;     $C_{g-a}$ : 1.1pF.

**CHARACTERISTICS**

|               |             |      |
|---------------|-------------|------|
| $V_a$         | 130         | V    |
| $I_a$         | 16          | mA   |
| $V_g$         | -1 (approx) | V    |
| $g_m$         | 15          | mA/V |
| $\mu$         | 60          | —    |
| * $C_{in(w)}$ | 6 (approx)  | pF   |
| * $r_{in(w)}$ | 30 (approx) | kΩ   |

\*Measured hot at 45Mc/s with anode decoupled to cathode.

**THE M-O VALVE CO. LTD. · BROOK GREEN · LONDON · W.6**

**AUGUST 1962**

# A2599

## TYPICAL OPERATION

### Class A. Low Noise Amplifier. Grounded Cathode Connection.

Used in the first stage of a cascode amplifier, followed by an A2521 triode, operated in grounded-grid connection, as shown in figs. 1, 2 and 3.

|                                       |      |      |           |
|---------------------------------------|------|------|-----------|
| $V_{a(b)}$                            | 180  | 250  | V         |
| $R_a$                                 | 3.3  | —    | $k\Omega$ |
| $R_k$                                 | 68   | 68   | $\Omega$  |
| $I_a$                                 | 15.5 | 14.5 | mA        |
| Frequency                             | 45   | 200  | Mc/s      |
| *Noise factor (average)               | 1.5  | 6.8  | dB        |
| †Noise factor (average)               | 1.3  | 4.7  | dB        |
| ‡Power gain (approx)                  | 30   | 20   | dB        |
| Optimum source resistance<br>(approx) | 1300 | 290  | $\Omega$  |

\*Input circuit tuned.

†Input circuit adjusted for lowest noise factor.

‡For the cascode amplifier.

## INSTALLATION

The valve may be mounted in any position. The use of a retaining device is recommended.

If a screening can is used it should be blackened inside and out.

Free air circulation around the bulb or the outside of the screening can should be provided.

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*Provision of circuit information in this publication does not imply a right to use any invention which may be involved and which is the subject of patents by whomsoever owned.*

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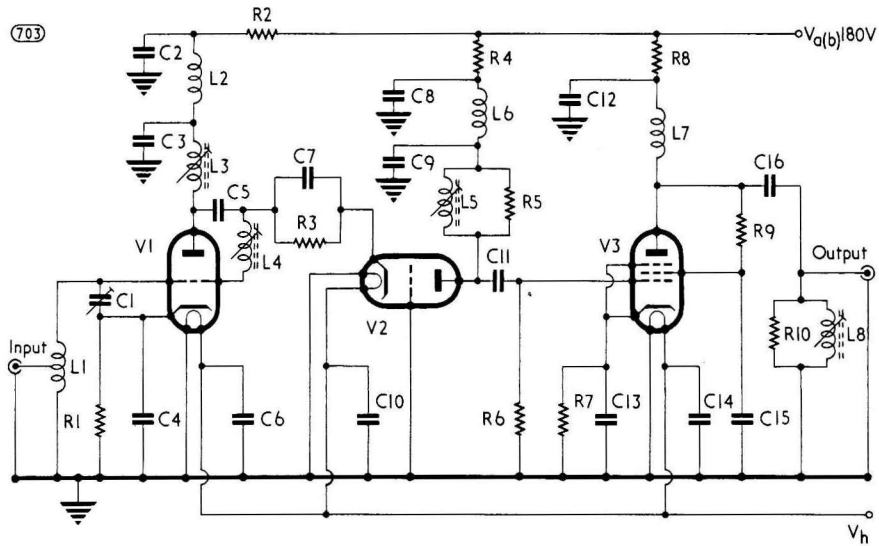


Fig. 1. Circuit of 45Mc/s cascode amplifier.

## COMPONENT VALUES FOR FIG. 1.

| Valves          |        | Resistors  |             |
|-----------------|--------|------------|-------------|
| V1              | A2599  | R1, R3     | 68Ω 0.25W   |
| V2              | A2521  | R2, R4, R8 | 3.3kΩ 1W    |
| V3              | Z77    | R5         | 4.7kΩ 0.25W |
| Capacitors      |        | R6         | 1.0MΩ 0.25W |
| C1              | 2.8pF  | R7         | 150Ω 0.25W  |
| C2 to C14, C 16 | 1000pF | R9         | 22kΩ 0.25W  |
| C15             | 470pF  | R10        | 100Ω 0.25W  |

## Inductances

All coils of enamelled copper wire wound on  $\frac{1}{4}$  in. dia. former.

|            | Turns | s.w.g. |
|------------|-------|--------|
| L1         | 9     | 18     |
| L2, L6, L7 | 80    | 34     |
| *L3        | 12    | 20     |
| *L4        | 35    | 30     |
| *L5        | 10    | 20     |
| *L8        | 12    | 20     |

\*Core is of the type recommended for use up to 100 Mc/s.

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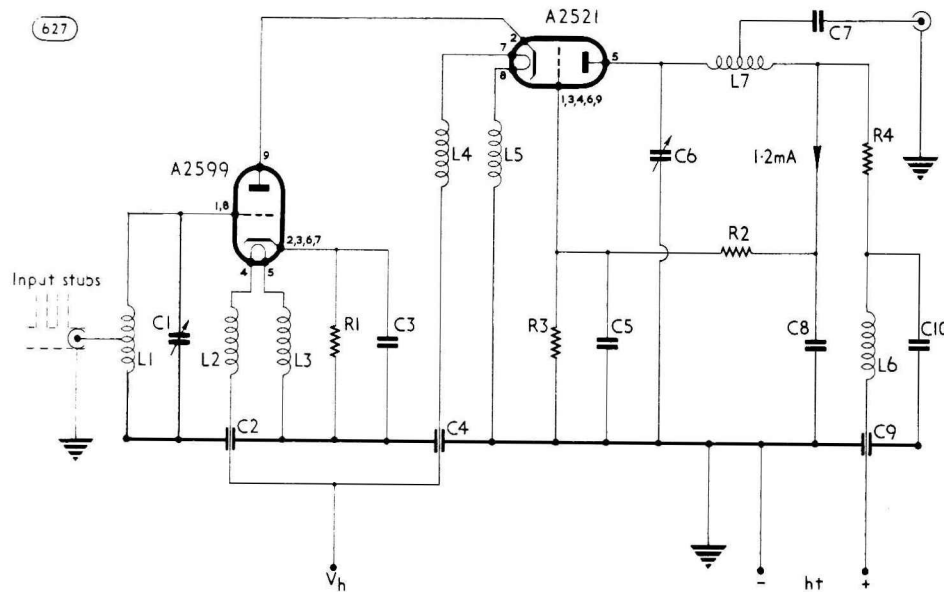


Fig. 2. Circuit of 200Mc/s cascode amplifier.

## COMPONENT VALUES FOR FIGS. 2 AND 3

### Resistors

|       |        |
|-------|--------|
| R1    | 68Ω.   |
| R2-R3 | 100kΩ. |
| R4    | 1kΩ.   |

### Capacitors

|             |                         |
|-------------|-------------------------|
| C1, C6      | 3-30pF ceramic trimmer. |
| C2, C4, C9  | 4700pF feedthrough.     |
| C3, C7, C10 | 1000pF.                 |
| C5, C8      | 2000pF.                 |

### Inductances

|          |   |
|----------|---|
| L1       | 1½ turns 14 s.w.g. copper wire ⅜in. i.d. tapped at 1 turn from earthy end.      |
| L2 to L6 | 20½in. of 26 s.w.g. enamelled copper wire close-wound ⅜in. i.d. air-cored coil. |
| L7       | 1½ turns 14 s.w.g. copper wire ½in. i.d. tapped at ½ turn from earthy end.      |

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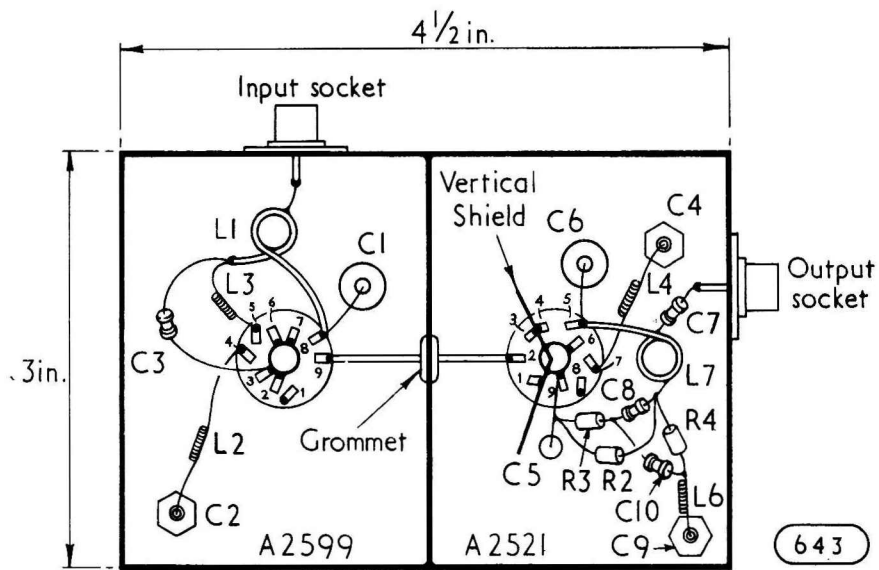


Fig. 3. Layout of 200Mc/s cascode amplifier.

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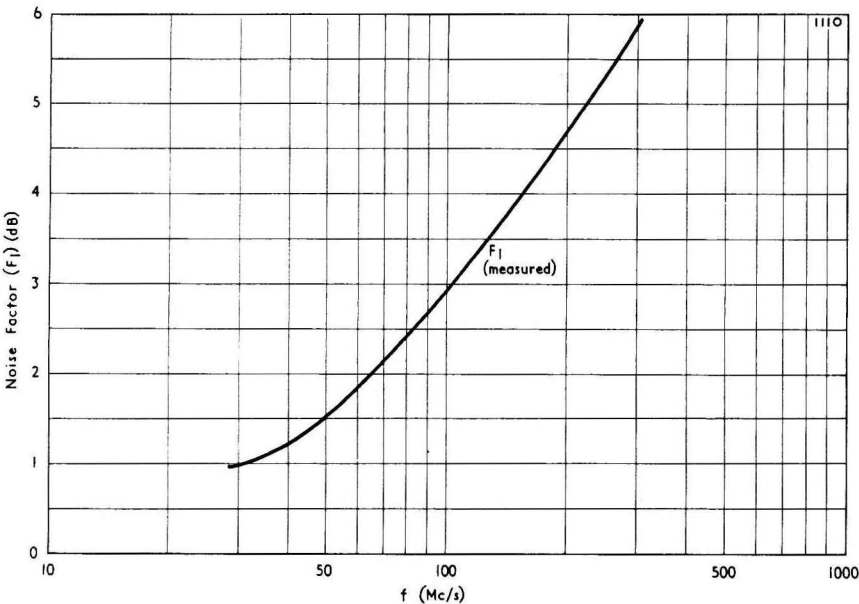


Fig. 4. Variation in average minimum noise factor against frequency for A2599-A2521 cascode amplifiers. ( $F_1$  measured using a noise diode).

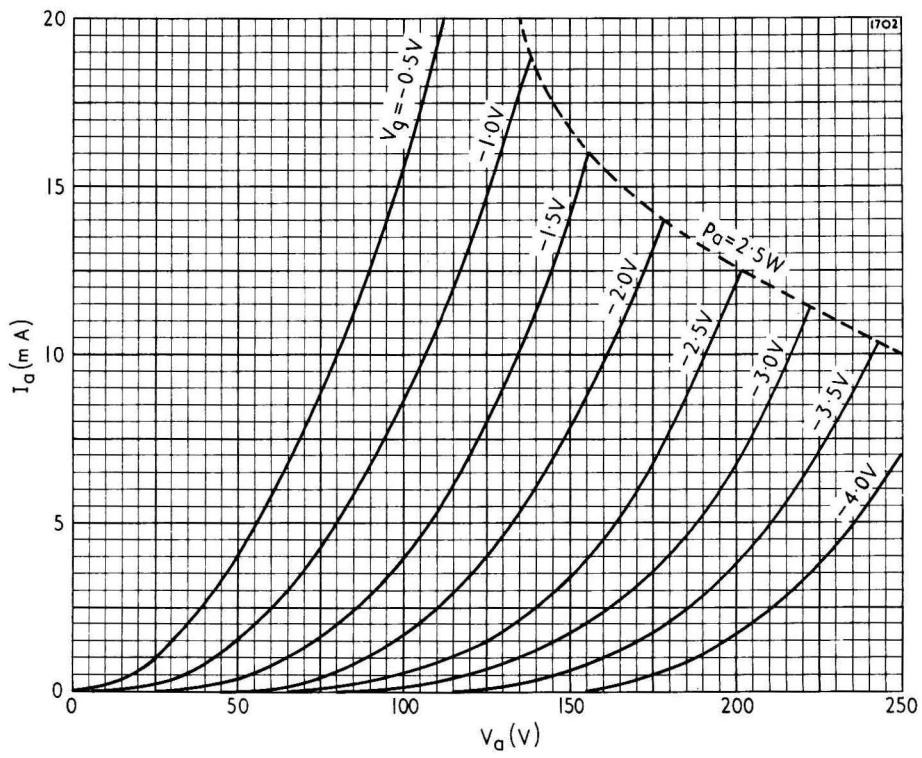


Fig 5.

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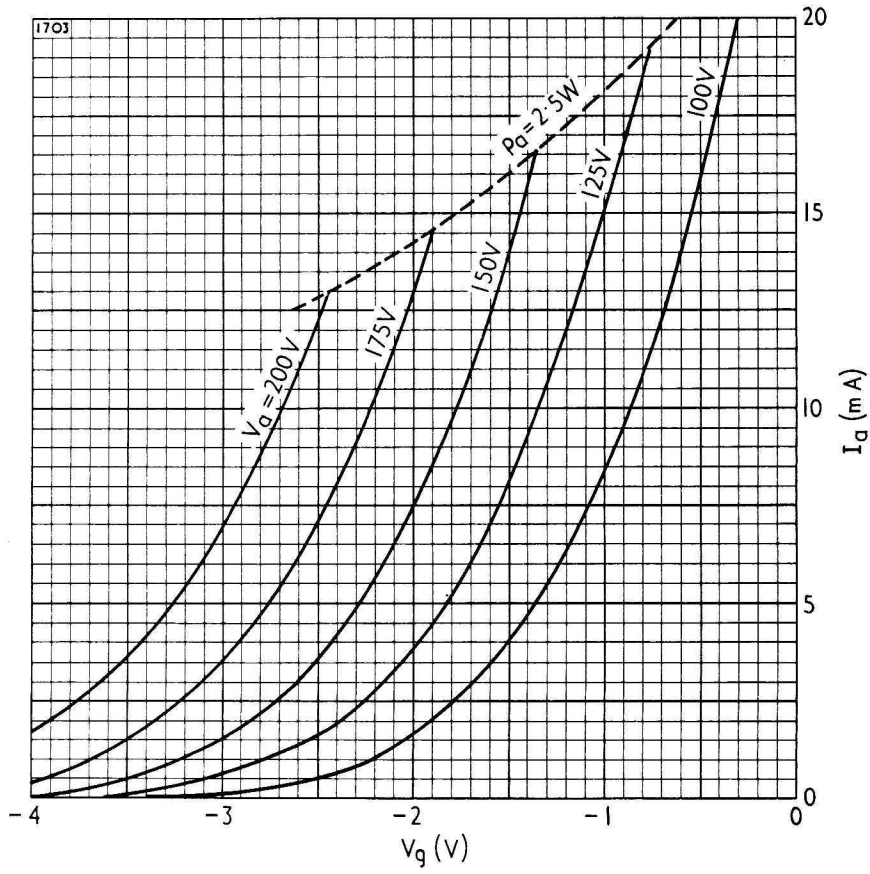


Fig. 6.