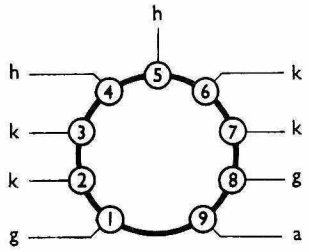
G.E.C.
VALVES

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



Viewed from underside of base.

Base: B9A
Bulb: Tubular.
Max. overall length: 56 mm.
Max. seated length: 49 mm.
Max. diameter: 22·2 mm.

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
$v_{h\text{-}k(pk)}$	100	V
T_{bulb}	200	°C

CAPACITANCES (Measured on a cold screened valve)

$c_{g\text{-all, less a}}$: 3·5pF; $c_{a\text{-all, less g}}$: 0·7pF; $c_{g\text{-a}}$: 1·1pF.

CHARACTERISTICS

V_a	130	V
I_a	16	mA
V_g	−1 (approx)	V
g_m	15	mA/V
μ	60	—
$*c_{in(w)}$	6 (approx)	pF
$*r_{in(w)}$	30 (approx)	kΩ

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

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	—	kΩ
R_k	68	68	Ω
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 (approx)	1300	290	Ω

*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.

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.

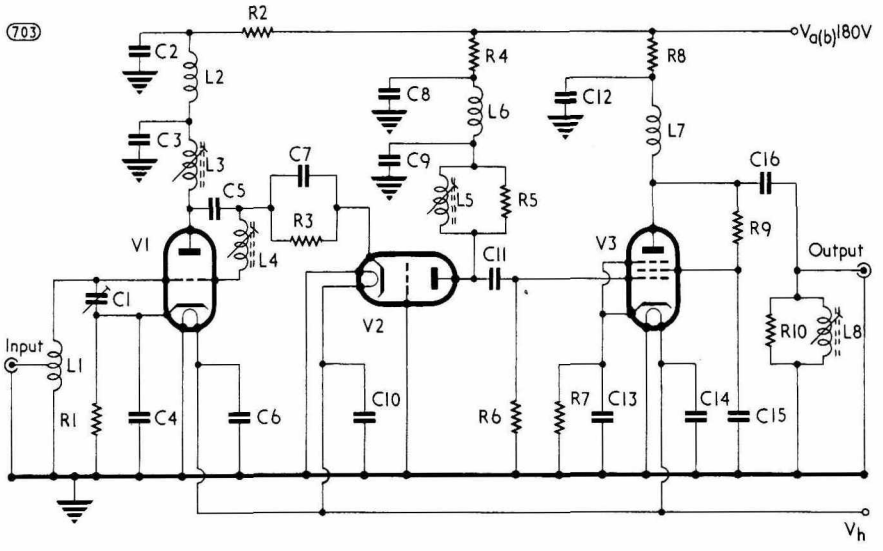


Fig. 1. Circuit of 45Mc/s cascode amplifier.

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 ¼ 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.

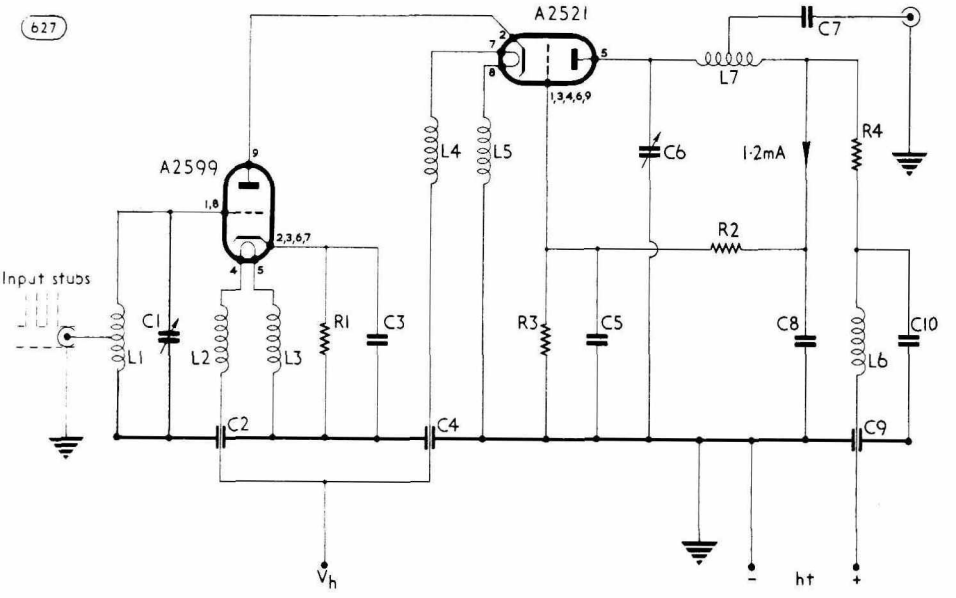


Fig. 2. Circuit of 200Mc/s cascode amplifier.

COMPONENT VALUES FOR FIGS. 2 AND 3

Resistors		Capacitors	
R1	68 Ω.	C1, C6	3-30pF ceramic trimmer.
R2–R3	100k Ω.	C2, C4, C9	4700pF feedthrough.
R4	1k Ω.	C3, C7, C10	1000pF.
		C5, C8	2000pF.

Inductances

L1	$1\frac{3}{4}$ turns 14 s.w.g. copper wire $\frac{3}{8}$in. i.d. tapped at 1 turn from earthy end.
L2 to L6	$20\frac{1}{2}$in. of 26 s.w.g. enamelled copper wire close-wound $\frac{3}{16}$in. i.d. air-cored coil.
L7	$1\frac{1}{2}$ turns 14 s.w.g. copper wire $\frac{1}{2}$in. i.d. tapped at $\frac{1}{2}$ turn from earthy end.

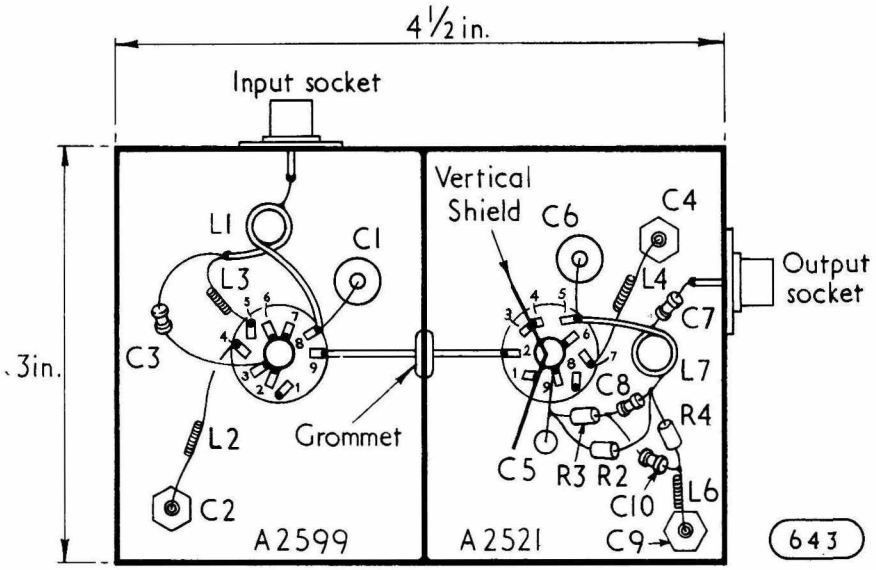


Fig. 3. Layout of 200Mc/s cascode amplifier.

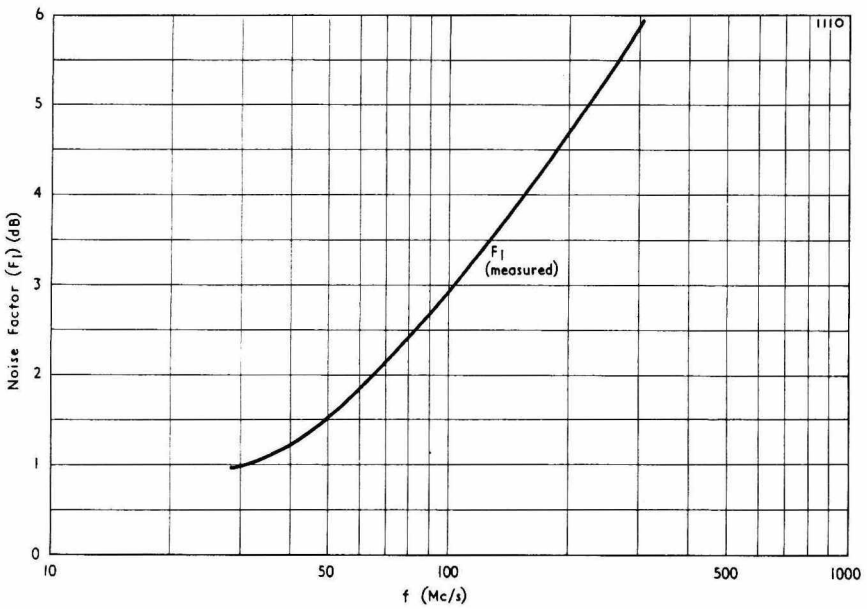


Fig. 4. Variation in average minimum noise factor against frequency for A2599-A2521 cascode amplifiers. (F_1 measured using a noise diode).

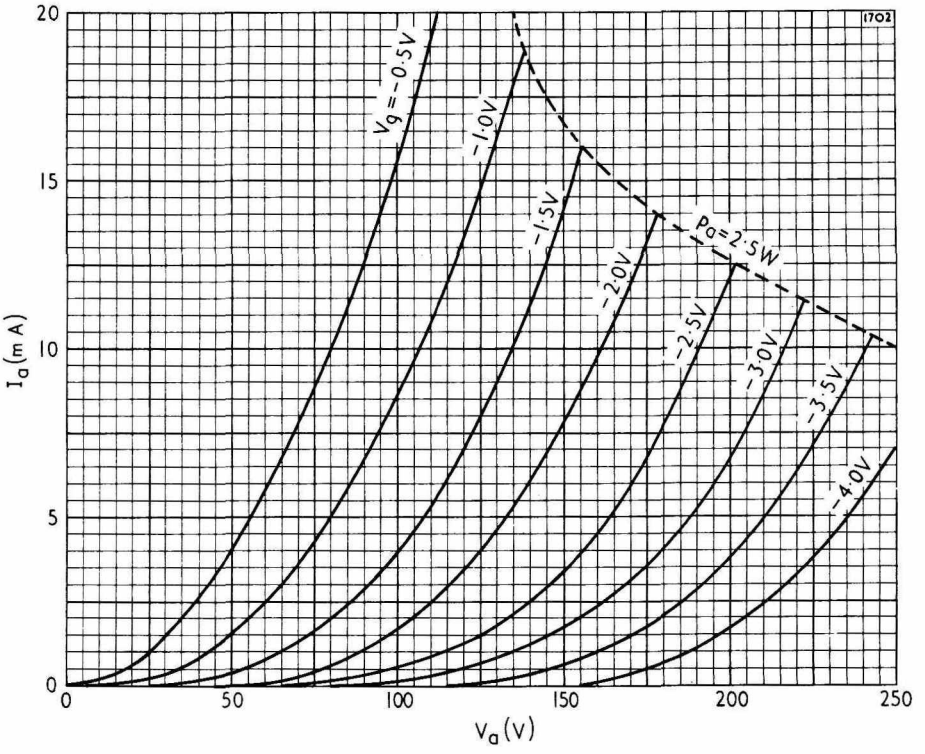

1702
$V_g = -0{\cdot}5V$
$-1{\cdot}0V$
$-1{\cdot}5V$
$-2{\cdot}0V$
$-2{\cdot}5V$
$-3{\cdot}0V$
$-3{\cdot}5V$
$-4{\cdot}0V$
$P_a = 2{\cdot}5W$
I_a (mA)
V_a (V)
0
5
10
15
20
0
50
100
150
200
250

Fig 5.

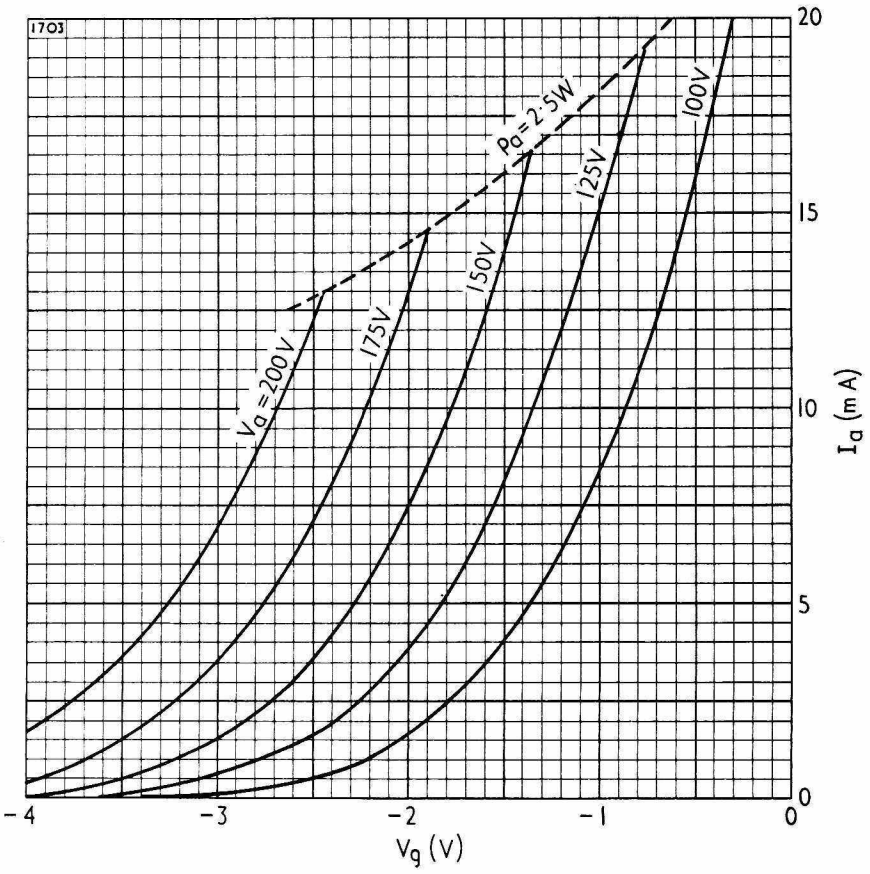


Fig. 6.

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