SPECIAL VALVES

Beam-Power Amplifiers

Codes: 5B/254G 5B/256M (CV499)
5B/254M (CV428) 5B/257M (CV2220)
5B/255M (CV391) 5B/258M (CV2347)

These valves are indirectly heated, beam-power tetrodes electrically similar to the 5B/250A (807) type, and of reliable construction. The 5B/254G is identical to the 5B/254M but has flexible leads for wiring directly into the circuit.

For applications where the valve is to be used at either high altitudes or under anode modulated conditions, the use of the double-ended versions (5B/254G, 5B/254M and 5B/258M) is to be preferred because of insulation considerations at the valve base.

MECHANICAL DATA

Mounting Position

There are no restrictions on the mounting position of these valves but, as they may reach high temperatures according to the power dissipated, the equipment should be designed so that adequate ventilation is afforded to ensure safe bulb temperature under all conditions of use. Under no circumstances should the temperature of the hottest point of the bulb be allowed to exceed 250°C.

Net weight	40	g
	1.4	oz

Standard Telephones and Cables Limited
Valve Division, Brixham Road, Paignton, Devon
Telephone: Paignton 58685 Telex: 4230
London Sales Office, Telephone: Footscray 3333 Telex: 21836
C O M P O N E N T S G R O U P

ELECTRICAL DATA

CATHODE

Indirectly-heated, oxide-coated

	5B/254M	5B/254G	5B/255M	
Heater voltage	6.3	6.3	6.3	V
Heater current (nominal)	0.9	0.9	0.9	A
	5B/256M	**5B/257M**	**5B/258M**	
Heater voltage	19	12	19	V
Heater current (nominal)	0.3	0.47	0.3	A

DIRECT INTERELECTRODE CAPACITANCES

	5B/254M	5B/254G	5B/255M	
Input	13	10	12	pF
Output	7	8	8.5	pF
Anode to Grid 1	0.1	0.12	0.13	pF
	5B/256M	**5B/257M**	**5B/258M**	
Input	12	12	13	pF
Output	8.5	8.5	7	pF
Anode to Grid 1	0.13	0.13	0.1	pF

CHARACTERISTICS

Mutual conductance	Measured at V_a=300V: V_{g_2}=250V, I_a = 72 mA	6	mA/V
Screen grid μ		9	

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

AUDIO FREQUENCY

Class AB_1. Power Amplifier or Modulator. Triode connected.
(For balanced two-valve operation.)

Maximum Ratings (per valve).

Direct anode voltage	400	V
Direct average anode current	125	mA
Direct anode plus screen dissipation	25	W
Peak heater to cathode voltage, positive or negative	135	V

Typical Operating Conditions (two valves).

Direct anode voltage	400	V
*Direct grid voltage	−45	V
Direct anode current, zero signal	64	mA
Direct anode current, max. signal	140	mA
Peak a.f. grid to grid voltage	90	V
Load resistor, anode to anode	3 000	Ω
Power output, two valves	15	W
Total harmonic distortion	3	%

Class AB_2. Power Amplifier or Modulator.
(For balanced two-valve operation.)

Maximum Ratings (per valve).

Direct anode voltage	600	V
Direct average anode current	120	mA
Direct anode dissipation	25	W
Direct screen voltage	300	V
Direct screen dissipation	4.5	W
Peak heater to cathode voltage, positive or negative	135	V

Typical Operating Conditions (two valves).

Direct anode voltage	500	600	V
Direct screen voltage	300	300	V
*Direct grid voltage	−30	−32	V
Direct anode current, zero signal	60	46	mA
Direct anode current, max. signal	240	200	mA
Direct screen current, zero signal	0.9	0.7	mA
Direct screen current, max. signal	16	12	mA
Peak a.f. grid to grid voltage	86	90	V
Load resistor, anode to anode	4 600	6 900	Ω
Power output, two valves	75	80	W

* The D.C. grid circuit resistance should not exceed 30 000 ohms when a fixed bias source is used. Cathode bias is not recommended.

RADIO FREQUENCY

Class B. Telephony. Modulated carrier applied to the grid.
(Carrier conditions per valve for use with 100% modulation.)

Maximum Ratings.

Direct anode voltage	600	V
Direct anode current	80	mA
Direct anode dissipation	25	W
Direct screen voltage	300	V
Direct screen dissipation	4.5	W
Peak heater to cathode voltage, positive or negative	135	V
Maximum frequency for above ratings	60	Mc/s
Maximum anode voltage for 125 Mc/s operation	450	V

Typical Operating Conditions.

Direct anode voltage	500	600	V
Direct screen voltage	300	300	V
*Direct grid voltage	−40	−40	V
Direct anode current	70	62.5	mA
Direct screen current	4	4	mA
Peak r.f. grid voltage	40	36	V
Direct grid current	0	0	mA
†Grid driving power (approx.)	0.3	0.2	W
Power output	11	12.5	W

* The total effective grid circuit resistance should not exceed 30 000 ohms.

† At crest of a.f. cycle with 100% modulation.

Class C. Power Amplifier. Anode subject to modulation.

(Carrier conditions per valve for use with 100% modulation.)

Maximum Ratings.

Direct anode voltage	475	V
Direct anode current	83	mA
Direct anode dissipation	16.5	W
Direct screen voltage	300	V
Direct screen dissipation	3	W
Direct grid current	5	mA
Peak heater to cathode voltage, positive or negative	135	V
Maximum frequency for above ratings	60	Mc/s
Maximum direct anode voltage for 125 Mc/s operation	350	V

Typical Operating Conditions.

Direct anode voltage	400	475	V
†Direct screen voltage	250	250	V
†Screen series resistor	25	28	kΩ
*Direct grid voltage	−75	−85	V
Grid series resistor	21.4	21.2	kΩ
Direct anode current	80	83	mA
Direct screen current	6	8	mA
Peak r.f. grid voltage	95	108	V
§Direct grid current	3.5	4.0	mA
Grid drive power, approx.	0.3	0.4	W
Power output	22	28	W

Class C. Power Amplifier or Oscillator. Unmodulated.

Maximum Ratings.

Direct anode voltage	600	V
Direct anode current	100	mA
Direct anode dissipation	25	W
Direct screen voltage	300	V
Direct screen dissipation	4.5	W
Direct grid current	5.0	mA
Peak heater to cathode voltage, positive or negative	135	V
Maximum frequency for above ratings	60	Mc/s
Maximum direct anode voltage for 125 Mc/s operation	450	V

Typical Operating Conditions.

Direct anode voltage	500	600	V
⊙ Direct screen voltage	250	250	V
⊙ Screen series resistor	31	44	kΩ
*Direct grid voltage	−45	−45	V
Grid series resistor	11.2	11.2	kΩ
Direct anode current	100	100	mA
Direct screen current	8	8	mA
Peak r.f. grid voltage	65	65	V
§Direct grid current	4	4	mA
Grid drive power, approx.	0.3	0.3	W
Power output	32	40	W

* Obtained from the resistor of value shown, a cathode resistor, fixed supply or a combination of methods.

When the grid is driven positive and the valve operated at maximum ratings the total D.C. grid resistance should not exceed 30 000 ohms. For operation at less than maximum ratings the value may be increased to 100 000 ohms.

† Obtained from the modulated anode supply via a resistor of the value given, from a fixed supply via an a.f. choke, or, preferably, from a fixed supply via a separate winding on the modulation transformer.

§ Subject to wide variation dependent upon the impedance of the load circuit.

⊙ Obtained from a separate source, from the anode voltage supply via a potential divider or through a series resistor of the value shown. A series screen resistor should be used only in a circuit in which the valve is not keyed.

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5B/257M (CV2220)
5B/258M (CV2347)

STC

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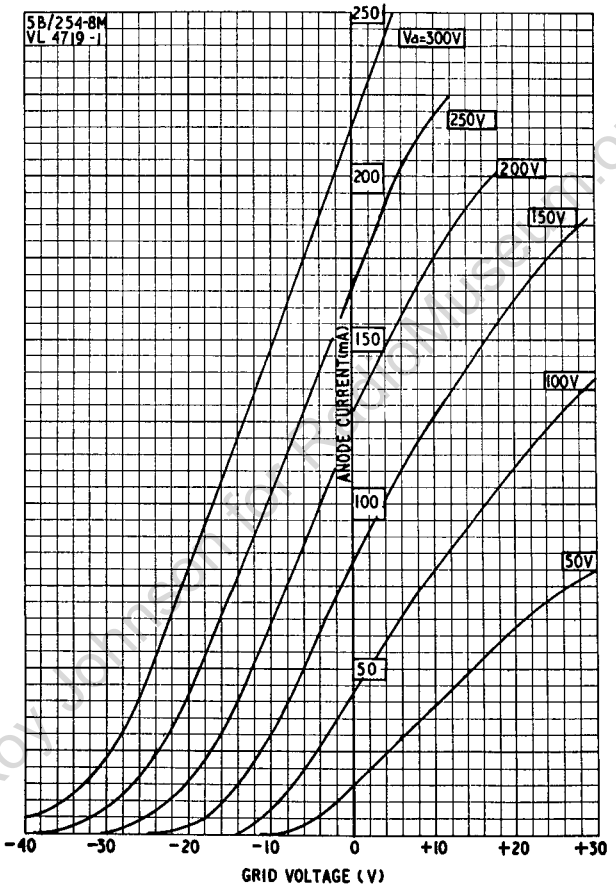
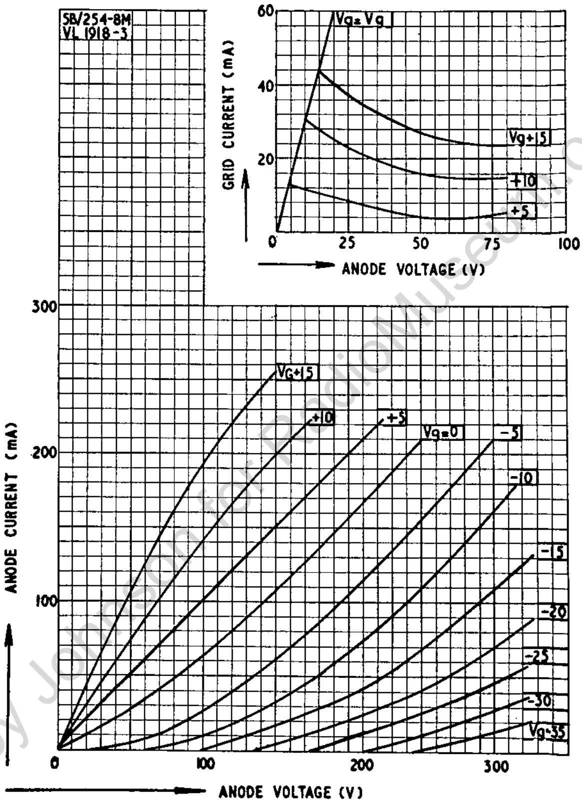
MUTUAL CHARACTERISTIC—TRIODE CONNECTED



CONSTANT VOLTAGE CHARACTERISTIC—TRIODE CONNECTED



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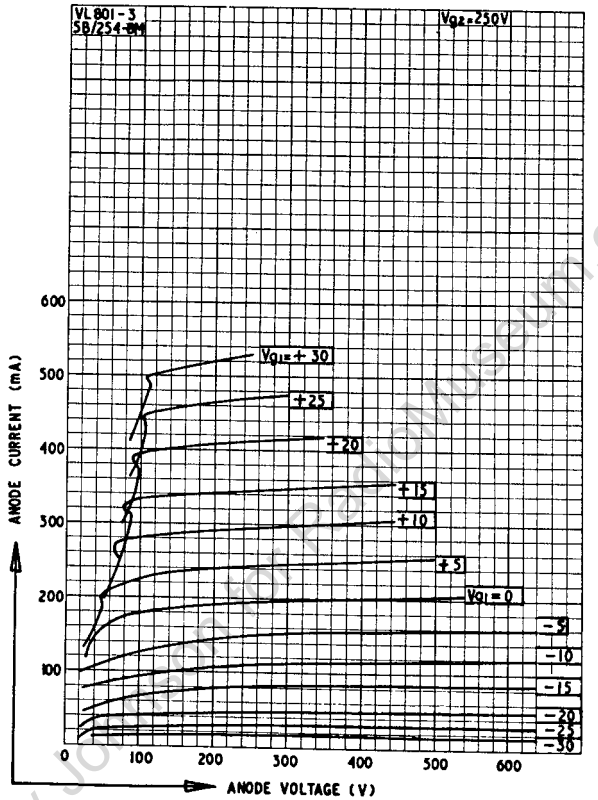

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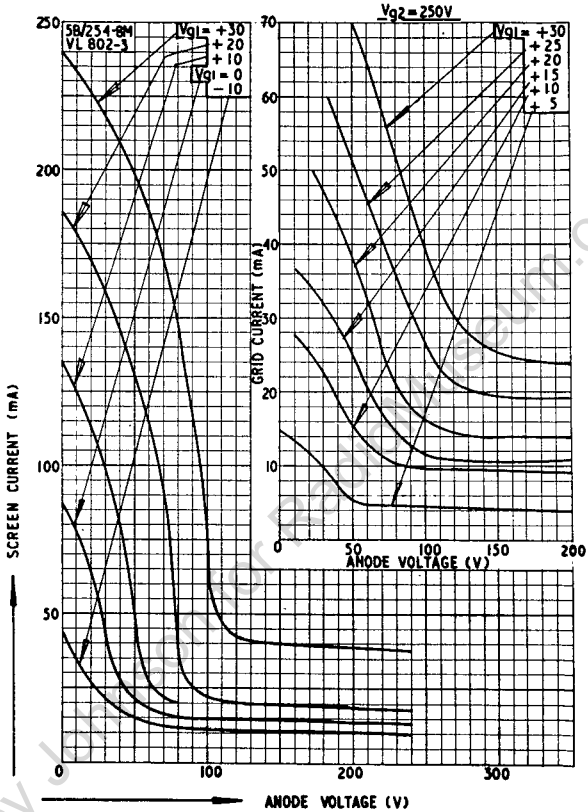

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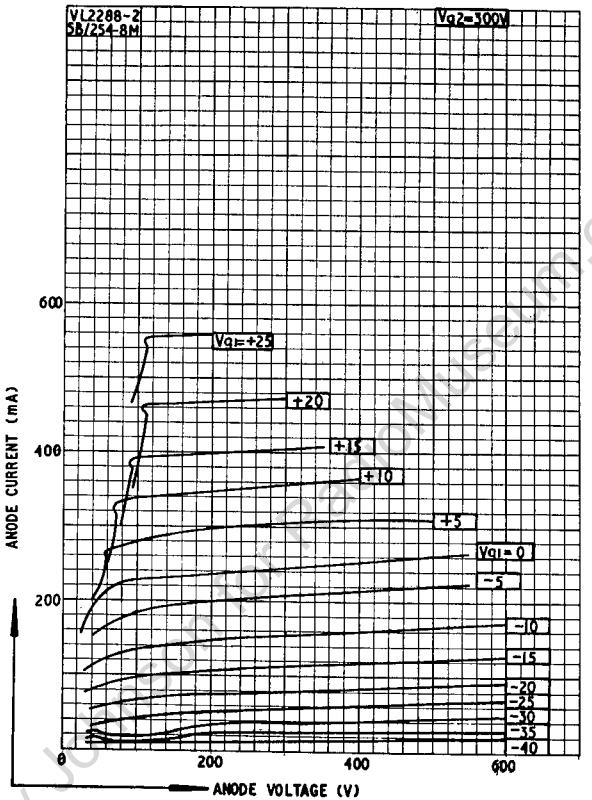

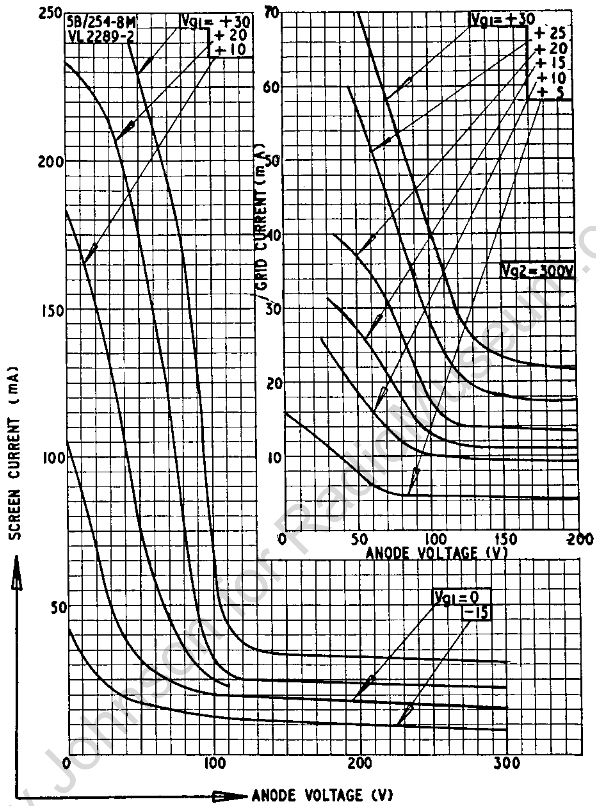

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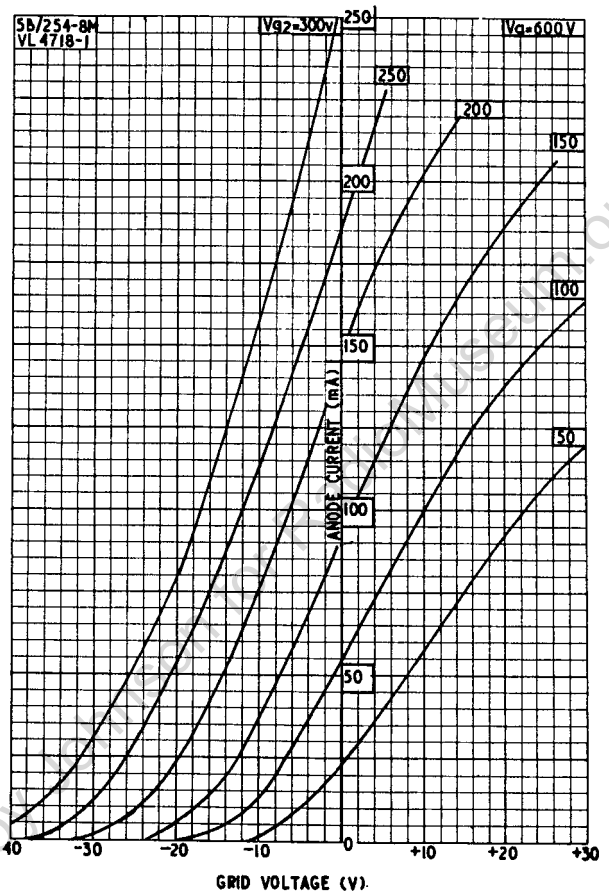

Code: 5B/254G

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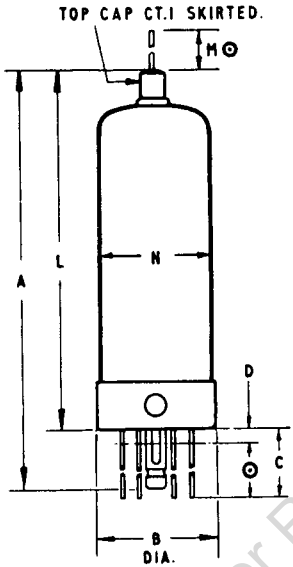

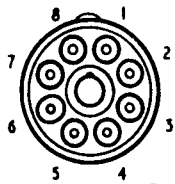

BASING

1. HEATER.
2. CATHODE & BEAM PLATES.
3. GRID No. 2.
4. CATHODE & BEAM PLATES.
5. GRID No. 1.
6. CATHODE & BEAM PLATES.
7. CATHODE & BEAM PLATES.
8. HEATER.

T.C. ANODE.

DIM.	MILLIMETRES.	INCHES.
A	105,6 MAX.	4 5/32 MAX.
B	30,2 MAX.	1 3/16 MAX.
C	50,8 MIN.	2 MIN.
D	3,2 NOM.	1/8 NOM.
L	92,1 MAX.	3 5/8 MAX.
M	25,4 MIN.	1 MIN.
N	27,8 MIN.	1·095 MIN.
	29,2 MAX.	1·150 MAX.

⊙ DENOTES: LEADS TINNED OVER THIS PORTION

NOTE:—BASIC FIGURES ARE INCHES.

STC

Codes: 5B/254M (CV428)
5B/258M (CV2347)

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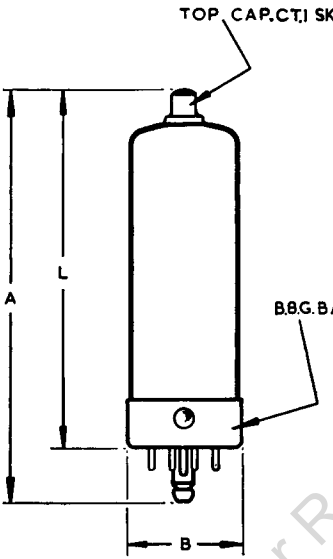

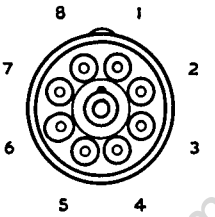

BASING

1. HEATER
2. CATHODE AND BEAM PLATES
3. GRID No. 2
4. CATHODE AND BEAM PLATES
5. GRID No. 1
6. GRID No. 1
7. CATHODE AND BEAM PLATES
8. HEATER

T.C. ANODE

DIM.	MILLIMETRES	INCHES
A	105,6 MAX.	$4\frac{5}{32}$ MAX.
B	30,15 MAX.	$1\frac{3}{16}$ MAX.
L	92,1 MAX.	$3\frac{5}{8}$ MAX.

NOTE.—BASIC DIMENSIONS ARE INCHES