

BRIMAR

RECEIVING VALVE

50C5

APPLICATION REPORT VAD/507.7

Standard Telephones and Cables Limited

FOOTSCRAY, KENT, ENGLAND

INTRODUCTION: The Brimar valve type 50C5 is a miniature indirectly heated beam tetrode. The heater is of the 150 milliamp type and is intended for operation in series with other valves having a similar heater current, such as in AC/DC equipment. The valve is suitable for use only on 110 volt mains or in equipment employing an HT line voltage not exceeding 140 volts.

DESCRIPTION: The valve consists of a beam tetrode unit capable of an output of the order of 2 watts. The unit is mounted in a standard T5½ bulb and is based with a B.V.A. Standard type B7G base.

This report contains characteristics of the valve and details of its use as a tetrode in push-pull or single ended amplifiers, and as a triode in push-pull or single ended amplifiers.

CHARACTERISTICS:

Cathode:	Indirectly heated	
	Voltage (nominal)	50 volts
	Current	0.15 ampere*
	Max. DC Heater Cathode potential	180 volts

* The heater current should not vary more than 5% from the rated value at any time, particularly is this important if the valve is used near its maximum ratings.

Dimensions:	Max. Overall Length	2-5/8 ins.
	Max. Diameter	3/4 in.
	Max. Seated Height	2-3/8 ins.

Base: Type B7G

Basing Connections:	Pin 1 Cathode and g_3
	Pin 2 Control Grid g_1
	Pin 3 Heater
	Pin 4 Heater
	Pin 5 Control Grid g_1
	Pin 6 Screen g_2
	Pin 7 Anode

Ratings:	Max. Anode Voltage	135 volts
	Max. Screen Voltage	117 volts
	Max. Anode Dissipation	5.5 watts
	Max. Screen Dissipation	1.25 watts

Capacities (approx.) †	$c_{g_1, a}$	0.64 pF
	c Input (c_{in})	13 pF
	c Output (c_{out})	6.1 pF
	$c_{h, k}$	17 pF

† Measured without shield.

CHARACTERISTIC CURVES: Curves are attached to this report which show:

Anode current plotted against anode volts for various values of grid voltage for the valve connected as a tetrode (I_a/V_a) (Curve No. 307.261).

Anode current plotted against anode volts for various values of grid voltage for the valve connected as a triode (I_a/V_a) (Curve No. 307.262).

TYPICAL OPERATION

Class A1 Amplifier (single ended):

Heater Current	0.15 ampere
Anode Voltage	110 volts
Screen Voltage	110 volts
Grid Voltage	-7.5 volts
Autobias Resistance	140 ohms
Anode Current	49 mA
Screen Current	4 mA approx.
Anode Impedance (r_a)	10,000 ohms
Mutual Conductance	7.5 mA/V
Inner Amplification Factor (μ)	5
Anode Load Resistance	2500 ohms
Peak AF Grid Voltage	7.5 volts
Total Harmonic Distortion	9%
Power Output	1.9 watts

A curve is attached to this report which shows the relation between power output, distortion and input signal voltage (Curve No. 307.263).

Class A1 Amplifier Push-Pull:

Heater Current	0.15 ampere
Anode Voltage	110 volts
Screen Voltage	110 volts
Grid Voltage	-7.5 volts
Autobias Resistance	70 ohms
Anode Current	98 mA
Screen Current	8 mA approx.
Output Load (anode-anode)	4000 ohms
Peak AF Grid Voltage (grid-grid)	15 volts
Total Harmonic Distortion	7%
Power Output	3.75 watts

Note.—Values given are for two valves.

A curve is attached to this report which shows the relation between power output, harmonic distortion, and input signal voltage (Curve No. 307.264).

Class A1 Amplifier (Triode connected) (single ended):

Heater Current	0.15 ampere
Max. Anode and Screen Dissipation (total)	6.75 watts
Max. Anode Voltage	110 volts
Grid Voltage	-7.5 volts
Autobias Resistance	140 ohms
Anode Current	53 mA
Anode Impedance (r_a)	850 ohms
Mutual Conductance	8.2 mA/V
Amplification Factor (μ)	7
Load Resistance	1000 ohms
Harmonic Distortion	4.8%
Max. Power Output	350 milliwatts

A curve is attached to this report showing the relation between power output, harmonic distortion, and signal input voltage (Curve No. 307.265).

Class A1 Amplifier (Triode connected) (Push-Pull):

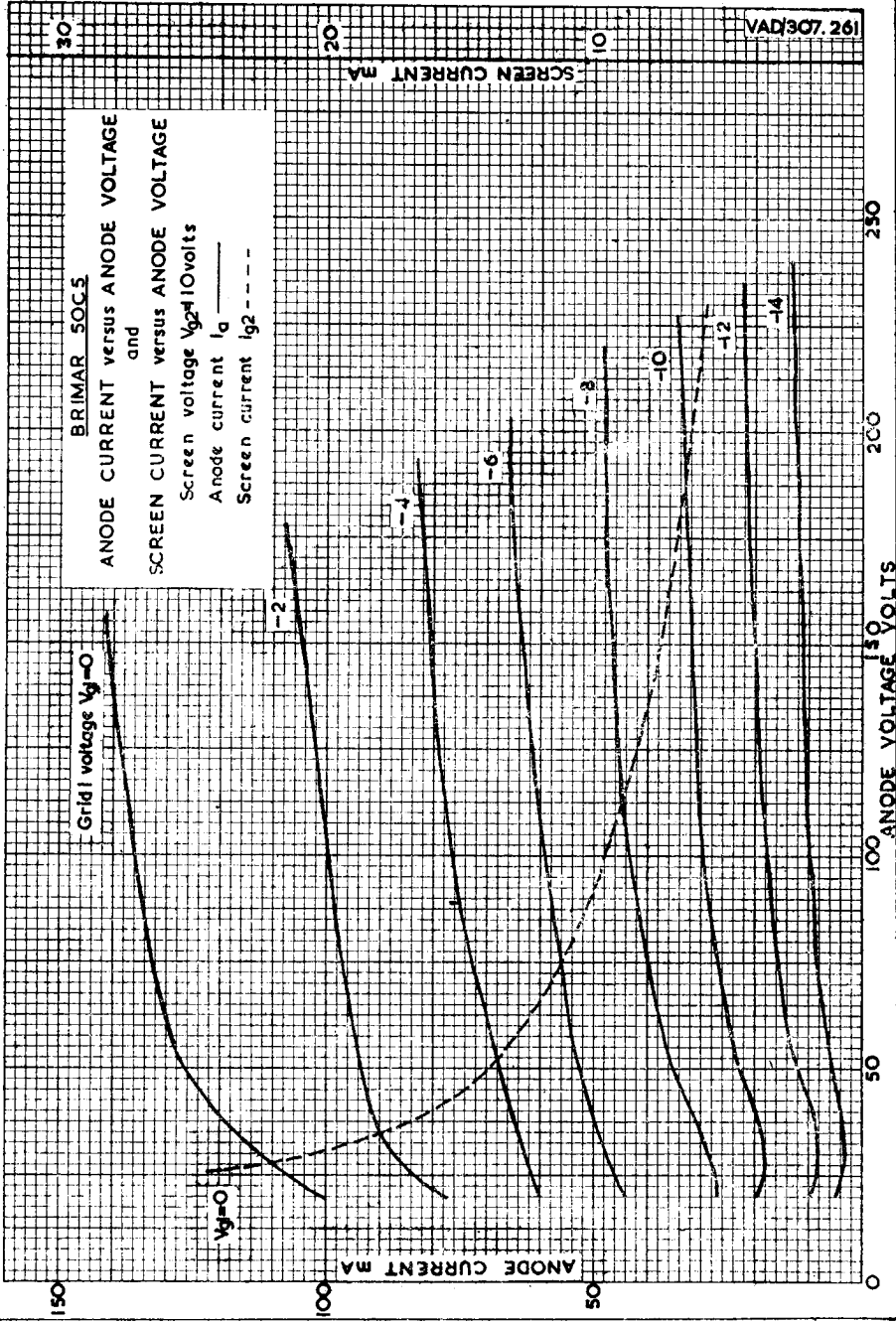
Heater Current	0.15 ampere
Anode Voltage	110 volts
Grid Voltage	—7.5 volts
Autobias Resistance	70 ohms
Anode Current	106 mA
Output Load (anode-anode)	2000 ohms
Peak AF Grid Voltage (grid-grid)	15 volts
Total Harmonic Distortion	2.1%
Power Output	0.75 watts

Note.—Values given are for two valves.

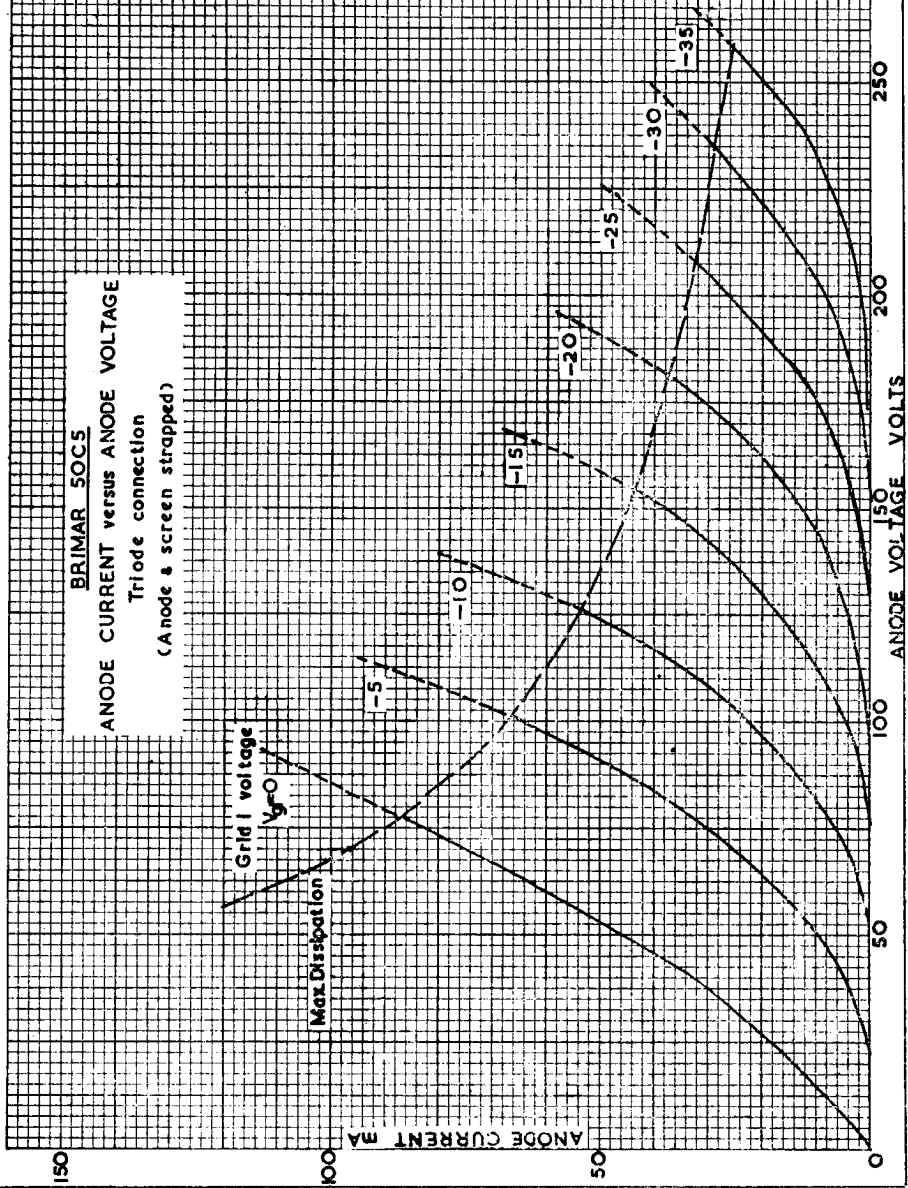
Curves are attached to this report which show the relation between power output, harmonic distortion, and input signal voltage (Curve No. 307-266).

BRIMAR 50C5
ANODE CURRENT versus ANODE VOLTAGE
and
SCREEN CURRENT versus ANODE VOLTAGE
Screen voltage V_{g2} 110volts
Anode current I_a _____
Screen current I_{g2} - - - -

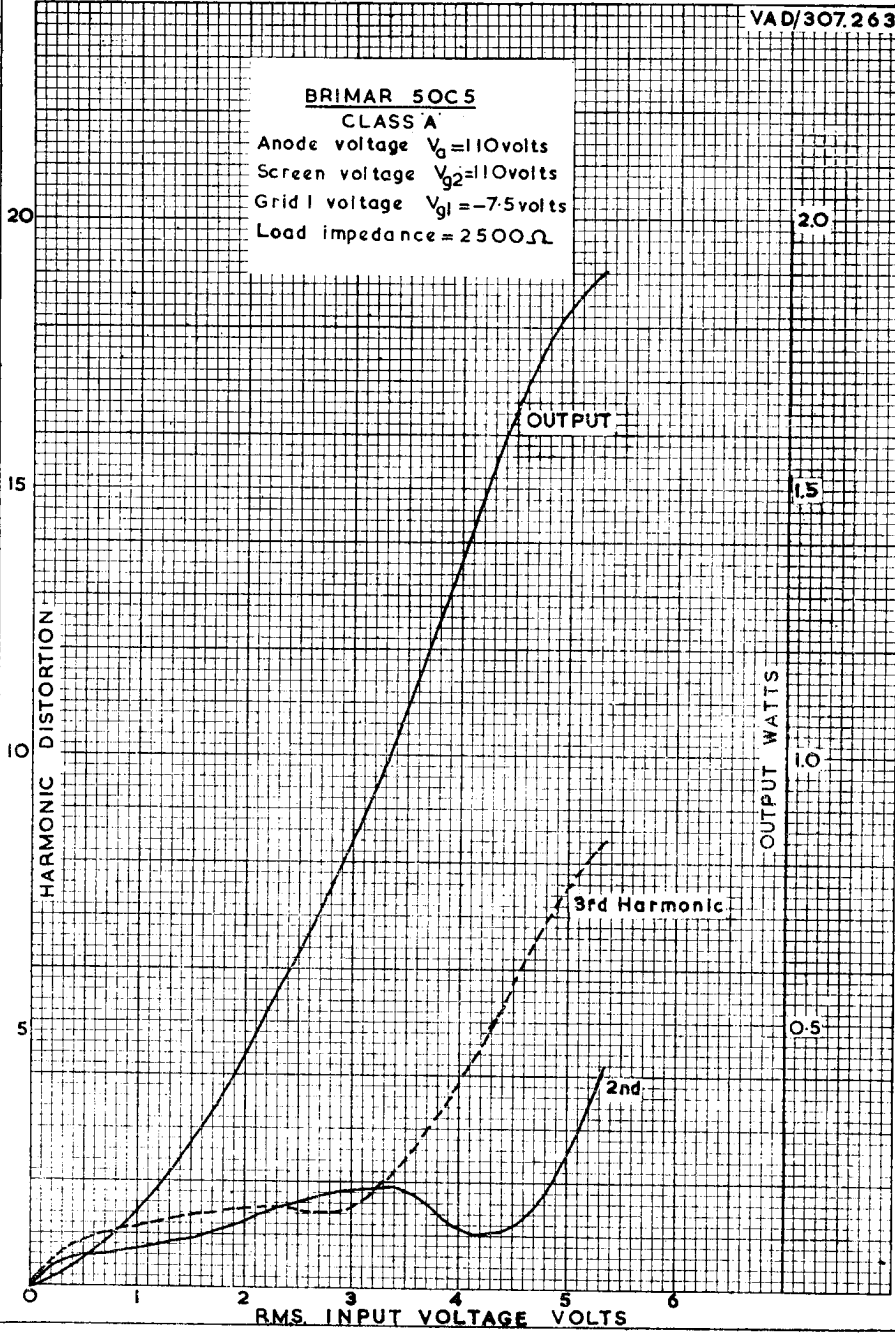
Grid 1 voltage V_{g1} 0



BRIMAR 50C5
ANODE CURRENT versus ANODE VOLTAGE
Triode connection
(Anode & screen strapped)



BRIMAR 50C5
CLASS A
Anode voltage $V_a = 110$ volts
Screen voltage $V_{g2} = 110$ volts
Grid 1 voltage $V_{g1} = -7.5$ volts
Load impedance = 2500Ω



BRIMAR 50C5

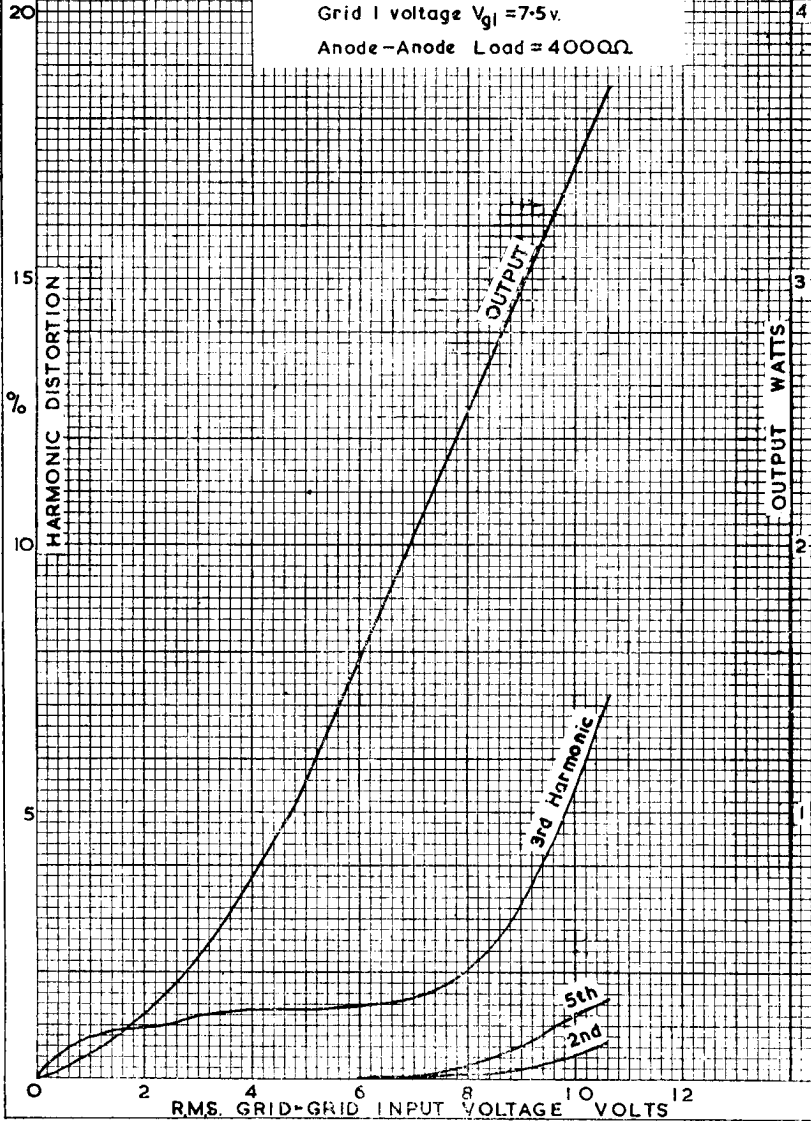
CLASS A PUSH-PULL

Anode voltage $V_a = 110\text{v}$.

Screen voltage $V_{g2} = 110\text{v}$.

Grid 1 voltage $V_{g1} = 7.5\text{v}$.

Anode-Anode Load = 4000Ω .



BRIMAR 50C5
CLASS A TRIODE CONNECTION
Anode voltage $V_a = 110$ Volts
Grid 1 voltage $V_{g1} = -7.5$ Volts
Load Impedance = 1000Ω



BRIMAR 50C5
CLASS A PUSH-PULL
TRIODE CONNECTION
 Anode voltage = 110 volts
 Grid 1 voltage = -7.5 volts
 Anode-Anode Load = 2000 Ω

