BRIMAR

Radio Valve Manual

1947-8

PRICE: TWO SHILLINGS AND SIXPENCE

Radio Valve Manual

1947-8

Standard Telephones and Cables Limited

(Radio Receiving Valve Division)

FOOTSCRAY, KENT

Telephone No.: FOOTSCRAY 3333

PRICE 2/6

P34/47 (Reprint)

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Introduction

The 1947-8 Brimar Valve Manual is intended for the use of Engineers in all branches of the Radio trade.

The equipment designer will find full technical data and curves on the newer types of receiving valve, whilst the information on a wide range of replacement types will prove of great assistance to the Service Engineer.

Diagrams of amplifiers using the more popular types of receiving valves are included for the benefit of the Radio Constructor.

Valves are listed in numerical order throughout and a functional classification chart is included to assist in the choice of suitable types.

Where Brimar Radio Valves are made . .
The Footscray Works of Standard Telephones and Cables Limited

VALVE RATINGS

The majority of the valve ratings given in this catalogue are based upon the " design centre " system as defined below, but some are " absolute " ratings, also defined below.

" ABSOLUTE RATINGS." For those types of valve where absolute ratings are applied the maximum ratings shown are limiting values and must not be exceeded under any conditions of use. If these ratings are exceeded the life and performance of the valve may be impaired. It is the duty of the equipment designer to make due allowances for supply voltage variations and for tolerances in the components used, such that the stated values are never exceeded. In cases where an " absolute " rating applies this is specifically mentioned.

" DESIGN CENTRE RATINGS." Most receiving valves are rated on a " design centre " rating. Such ratings make due allowance for variations in supply voltages normally encountered. The maximum ratings shown have been so chosen that the valves will give satisfactory life and performance in equipment operated from power supplies, of which the normal voltage including normal fluctuations falls within ± 10 per cent of the nominal value.

The allowance made does not include any variations due to tolerances in components used in equipment and it is the duty of a designer to make sure that the ratings are not exceeded with limit values of components with supply mains of the nominal value applied to the appropriate input connections.

In circumstances where it is known that abnormal supply mains variations are likely to be encountered appropriately lower maximum ratings should be employed.

The rating of valves in equipment operated from lead-acid accumulators assumes a nominal voltage of 2.0 volts per cell and a variation of ± 0.2 volts from this value. If due to the use of chargers a larger variation is encountered the maximum ratings should be reduced accordingly.

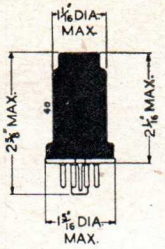
When the filaments of valves of the 1.4 volt type are operated other than from a single dry cell, they should be maintained within a range of 1.25 to 1.4 volts with a nominal value of 1.3 volts. If such valves are operated in series from batteries or supply mains it is usually necessary to employ shunting resistors across individual 1.4 volt sections of filament.

CLASSIFIED LIST OF VALVES

	Frequency Changers	R.F. Pentodes	Triode Amplifiers	Diode Types	Output Valves	Rectifiers
ENGLISH REPLACEMENT TYPE	15A2 15D1 15D2 20A1 20D2	8A1 8D2 9A1 9D2	4D1 HLA2	10D1 11A2 11D3 11D5	7A2 7A3 7D3 7D5 7D6 7D8 PA1 PEN A1	R1 R2 R3 R11† 1D5
U.X. REPLACEMENT TYPE	6A7 6F7	6C6 6D6 77 78	76 6A6	75 6B7	2A3 6B5 41 807†	1D6 5Z3 80 83 84/6Z4
OCTAL REPLACEMENT TYPE	1A7G/GT 6L7G	1N5G/GT 6SG7 6SH7 6SJ7 6SK7 12SJ7 12SK7 6U7G	6C5G 6N7G/GT	1H5G/GT 6R7G 6SQ7 12SQ7 12SR7	1A5G/GT 1C5G/GT 1Q5GT 6K6G 6N6G 25L6GT 50L6GT	0Z4 5Y3G
CURRENT OCTAL TYPE	6A8G/GT 6K8G/GT 12K8GT	6J7G/GT 6K7G/GT 12J7GT 12K7GT	6J5G/GT 6SL7GT 6SN7GT 25SN7GT	6B8G/GT 6H6G/GT 6Q7G/GT 12C8GT 12Q7GT	6AG6G 6F6G 6L6G 6V6G/GT 12A6 25A6G 35L6GT	5R4GY 5U4G 5V4G 5Z4G 6X5G/GT 25Z4G 35Z4GT
LOCTAL TYPE	7S7 1LA6E* 7A8* 7B8*	7H7 1LN5E* 7A7* 7B7* 7C7*	7F7 7N7	7K7 7R7 1LH4* 7B6* 7C6*	7C6 3D6 1LA4E* 7B5E*	7Y4 7Z4
MINIATURE TYPE	1R5	1T4 8D3 9D6		1S5 6AL5	3S4 1S4*	R10

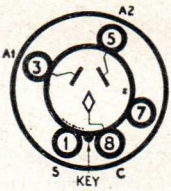
* Replacement Type

† Current Type



Replacement Type

TYPE 0Z4
(OCTAL BASE)
FULL WAVE RECTIFIER
For Car Radio



The BRIMAR type 0Z4 is a full wave gas filled rectifier with an ionic heated cathode, no external heater supply being required. The ionic bombardment of the cathode which occurs when first switching on soon raises the cathode to operating temperature and providing the rectified current is maintained at a minimum of 30 mA a long and useful life should be obtained. This feature renders the valve suitable for low-drain car receivers and other portable equipment where low battery consumption is important.

A minimum anode to cathode potential of 300 volts peak is necessary for consistent starting and this value increases somewhat during life.

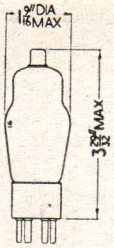
Type 0Z4 is fitted with a metal shell which must be efficiently earthed to prevent the radiation of R.F. interference to other parts of the receiver.

OPERATING CHARACTERISTICS

(Heater supply—not required)

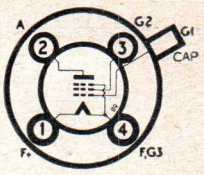
Starting Peak Voltage	300 volts min.
Peak Anode to Anode Voltage	1,000 volts max.
Peak Anode Current (each anode)	200 mA max.
D.C. Output Voltage	300 volts max.
D.C. Output Current	30 mA min. 75 mA max.
Voltage Drop...	24 volts

1A4E
1A5G/GT
1A6



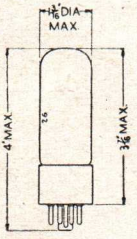
Obsolete Type

For Reference Only
TYPE **1A4E**
(U.X. BASE)
VARI-MU BATTERY
R.F. PENTODE



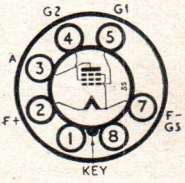
CHARACTERISTICS

Filament Voltage	2.0 volts	Screen (G2 Voltage	67.5 volts
Filament Current	0.06 amp.	Screen Current	0.9 mA
Anode Voltage	135 volts	Grid (G1) Voltage	−3.0 volts
Anode Current	2.2 mA	Mutual Conductance	0.65 mA/V
	Anode Impedance ... ... 1.0 meg.		



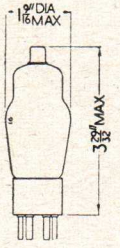
Replacement Type

TYPE **1A5G/GT**
(OCTAL BASE)
LOW-DRAIN BATTERY
POWER PENTODE



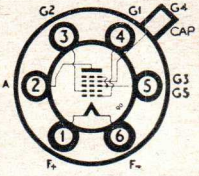
CHARACTERISTICS

Filament Voltage	1.4 volts	Grid (G1) Voltage	−4.5 volts
Filament Current	0.05 amp.	Anode Impedance	0.3 meg.
Anode Voltage	90 volts	Mutual Conductance	0.85 mA/V
Anode Current	4.0 mA	Amp. Factor	255
Screen (G2) Voltage	90 volts	Optimum Load	25,000 ohms
Screen Current	0.8 mA	Power Output	0.117 watts
	Harmonic Distortion ... 7 per cent.		



Obsolete Type

For Reference Only
TYPE **1A6**
(U.X. BASE)
BATTERY HEPTODE
FREQUENCY CHANGER



CHARACTERISTICS

Filament Voltage	2.0 volts	Oscillator Anode (G2) Supply	135 volts
Filament Current	0.06 amp.	Oscillator Anode Resistor	20,000 ohms
Anode Voltage	135 volts	Oscillator Anode Current	2.0 mA
Anode Current	1.8 mA	Oscillator Grid (G1) Resistor	50,000 ohms
Screen (G3, G5) Voltage	67.5 volts	Oscillator Grid Current	0.15 mA
Screen Current	2.1 mA	Anode Impedance	0.4 meg.
Control Grid (G4) Voltage	−3 volts	Conversion Conductance	0.275 mA/V

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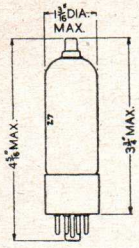
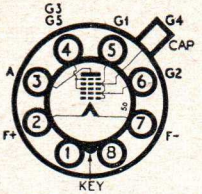
Replacement Types

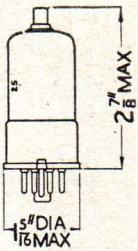
TYPES 1A7G, 1A7GT



1A7G



Note.—Type 1A7GT has Pin 1 connected to metal shell.



1A7GT

BATTERY HEPTODE FREQUENCY CHANGERS (OCTAL BASE)

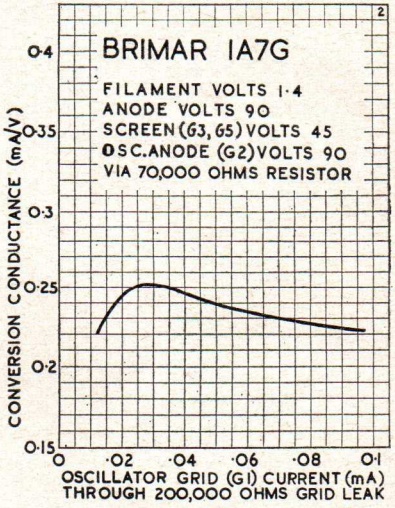
The BRIMAR types 1A7G and 1A7GT are self-oscillating frequency changers of the heptode (pentagrid) class. They are suitable for use in battery operated all-wave receivers and will operate satisfactorily at frequencies as high as 15 Mc/s. With the exception of their overall dimensions and inter-electrode capacitances the two valves have identical characteristics. When replacing one type by the other the receiver may require re-trimming to obtain the maximum gain.

RATINGS

Filament Voltage	1.4 volts
Filament Current	0.05 amp.
Anode Voltage	90 volts max.
Screen (G3, G5) Voltage ...	55 volts max.
Osc. Anode (G2) Voltage ...	90 volts max.
Total Cathode Current ...	3 mA max.

OPERATING CHARACTERISTICS

Anode Voltage	90 volts
Anode Current	0.55 mA
Screen Supply Voltage ...	90 volts
Screen Series Resistor ...	70,000 ohms
Screen Current	0.6 mA
Oscillator Anode Voltage ...	90 volts
Oscillator Anode Current ...	1.2 mA
Oscillator Grid (G1) Resistor	0.2 meg.
Oscillator Grid Current ...	0.035 mA
Control Grid (G4) Voltage ...	0 volts
Anode Impedance	0.6 meg.
Conversion Conductance ...	0.25 mA/V



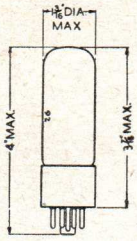
INTER ELECTRODE CAPACITANCES*

	Type 1A7G	Type 1A7GT
R.F. Input (Control Grid to all other electrodes)	6.5	7.5 pF
I.F. Output (Anode to all other electrodes)	11	10 pF
Oscillator Input (Oscillator Grid to all except oscillator Anode)... ...	4.0	3.2 pF
Oscillator Output (Oscillator Anode to all except oscillator Grid) ...	4.6	4.0 pF
Control Grid to Oscillator Grid	0.12	0.12 pF
Control Grid to Anode	0.3	0.4 pF
Control Grid to Oscillator Anode	0.26	0.25 pF
Oscillator Grid to Oscillator Anode	0.9	1.5 pF

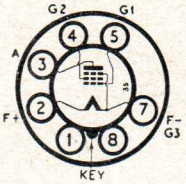
* *With close fitting shield connected to Pin 7.*

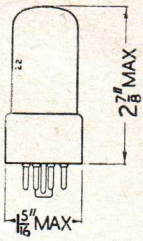
Replacement Types

TYPES 1C5G, 1C5GT
(OCTAL BASE)



1C5G





1C5GT

BATTERY POWER PENTODES

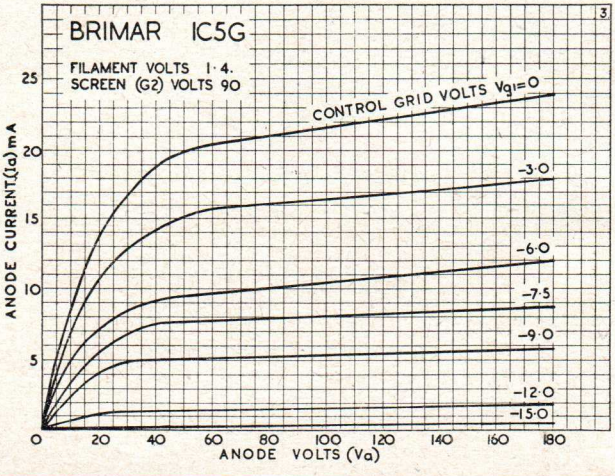
BRIMAR types 1C5G and 1C5GT are identical with the exception of their overall dimensions, which are shown in the drawings above.

RATINGS

Filament Voltage ... 1.4 volts
Filament Current ... 0.1 amp.
Anode Voltage ... 110 volts max.
Screen (G2) Voltage 110 volts max.
Cathode Current ... 12 mA max.

OPERATING CHARACTERISTICS

Anode Voltage	83	90	volts
Anode Current	7.0	7.5	mA
Screen (G2) Voltage	83	90	volts
Screen Current	1.6	1.6	mA
Control Grid (G1) Voltage	–7	–7.5	volts
Mutual Conductance	1.5	1.55	mA/V
Anode Impedance	0.11	0.115	meg.
Optimum Load	9,000	8,000	ohms
Power Output	0.20	0.24	watts
Harmonic Distortion	10	10	per cent.



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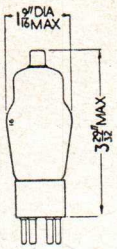
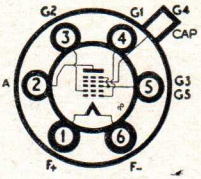


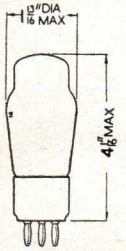
Obsolete Type

For Reference Only
TYPE 1C6
(U.X. BASE)
BATTERY HEPTODE
FREQUENCY CHANGER



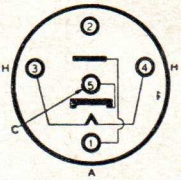
CHARACTERISTICS

Filament Voltage	2.0 volts	Oscillator Anode (G2) Supply	135 volts
Filament Current	0.12 amp.	Oscillator Anode Resistor ...	20,000 ohms
Anode Voltage	135 volts	Oscillator Anode Current ...	3.1 mA
Anode Current	1.3 mA	Oscillator Grid (G1) Resistor	50,000 ohms
Screen (G2, G4) Voltage ...	67.5 volts	Oscillator Grid Current ...	0.2 mA
Screen Current	2.5 mA	Anode Impedance	0.6 meg.
Control Grid (G4) Voltage ...	−3 volts	Conversion Conductance ...	0.3 mA/V



Replacement Type

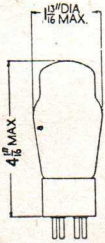
TYPE 1D5
(ENGLISH BASE)
HALF-WAVE A.C./D.C.
RECTIFIER



CHARACTERISTICS

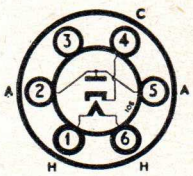
Heater Voltage	40 volts
Heater Current	0.2 amp.
Peak Inverse Voltage	700 volts max.
D.C. Heater-Cathode Potential	350 volts max.
R.M.S. Input	250 volts max.
Series Anode Limiting Resistor	50 ohms min.
Rectified Current	100 mA max.
Reservoir Condenser	16 μF max.

For characteristic curves refer to type 25Z4G.



Replacement Type

TYPE 1D6
(U.X. BASE)
HALF-WAVE A.C./D.C.
RECTIFIER



CHARACTERISTICS

BRIMAR type 1D6 is an indirectly heated rectifier for use in universal receivers. It is designed to replace types 25Z5, 25Y5 and 25RE where these valves are used in half-wave circuits. For voltage doubling applications two 1D6 valves are necessary.

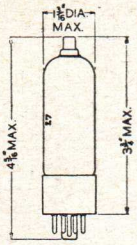
Heater Voltage	25 volts
Heater Current	0.3 amp.
R.M.S. Input Voltage	250 volts max.
Rectified Current	100 mA max.
Series Anode Limiting Resistor	50 ohms min*
Reservoir Condenser	16 μF max.

* *For Input Voltages exceeding 117 volts R.M.S.*

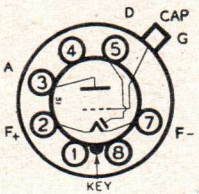
For further data concerning type 1D6 and characteristic curves refer to type 25Z4G.

Replacement Types

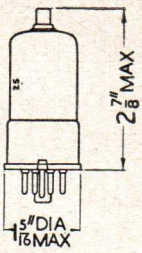
TYPES 1H5G, 1H5GT
(OCTAL BASE)



1H5G



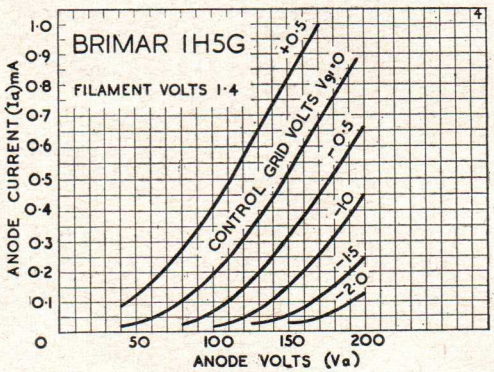
Note.—Type 1H5GT has Pin 1 connected to metal shell.



1H5GT

BATTERY SINGLE DIODE TRIODES

BRIMAR types 1H5G and 1H5GT are identical with the exception of their overall dimensions which are given in the drawings above.



RATINGS

Filament Voltage	1.4 volts
Filament Current	0.05 amp.
Anode Voltage	110 volts max.

CHARACTERISTICS

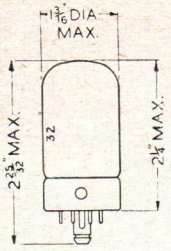
Anode Voltage	90 volts
Anode Current	0.15 mA
Control Grid Voltage	0 volts*
Mutual Conductance	0.275 mA/V
Anode Impedance	0.24 meg.
Amplification Factor	65

RESISTANCE COUPLED OPERATION

Anode Voltage	90 volts
Anode Resistor	0.25 meg.
Grid Resistor	1 meg.*
Peak Output	7 volts
Voltage Gain	20

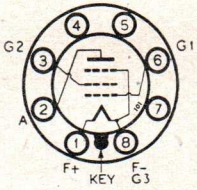
* *Grid returned to negative filament (Pin 7).*

BRIMAR



Replacement Type

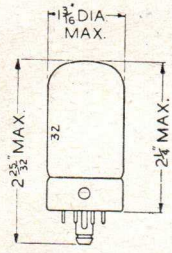
TYPE **1LA4E**
(LOCTAL BASE)
LOW-DRAIN BATTERY
POWER PENTODE



CHARACTERISTICS

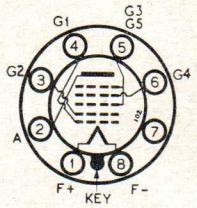
Filament Voltage	... ...	1.4 volts	Filament Current	... ...	0.05 amp.

For further information refer to type 1A5G.



Replacement Type

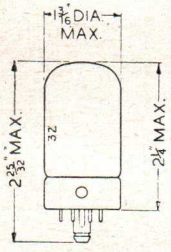
TYPE **1LA6E**
(LOCTAL BASE)
BATTERY HEPTODE
FREQUENCY CHANGER



CHARACTERISTICS

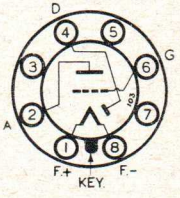
Filament Voltage	... ...	1.4 volts	Filament Current	... ...	0.05 amp.

For further information and characteristic curves refer to type 1A7G.



Replacement Type

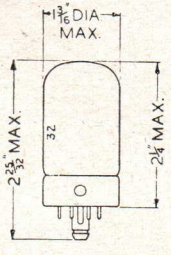
TYPE **1LH4**
(LOCTAL BASE)
BATTERY SINGLE
DIODE TRIODE



CHARACTERISTICS

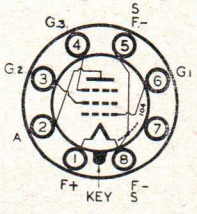
Filament Voltage	... ...	1.4 volts	Filament Current	... ...	0.05 amp.

For further information refer to type 1H5G.



Replacement Type

TYPE **1LN5E**
(LOCTAL BASE)
BATTERY
R.F. PENTODE



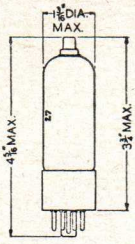
CHARACTERISTICS

Filament Voltage	... ...	1.4 volts	Screen Current	... ...	0.35 mA
Filament Current	... ...	0.05 amp.	Control Grid (G1) Voltage	...	0 volts
Anode Voltage	... ...	90 volts max.	Anode Impedance	... ...	1.1 meg.
Anode Current	... ...	1.6 mA	Mutual Conductance	... ...	0.8 mA/V
Screen (G2) Voltage	... ...	90 volts max.	Mutual Conductance	... ...	0.01 mA/V*

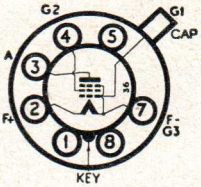
* *With Control Grid Voltage of −4.5 volts.*

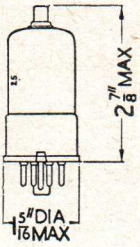
Replacement Types

TYPES 1N5G, 1N5GT (OCTAL BASE)



1N5G





1N5GT

Note.—Type 1N5GT has Pin 1 connected to metal shell.

BATTERY R.F. PENTODES

BRIMAR types 1N5G and 1N5GT are identical with the exception of their overall dimensions and inter-electrode capacitances. Provided a screening can is employed in the receiver one type will replace the other without appreciable change in performance.

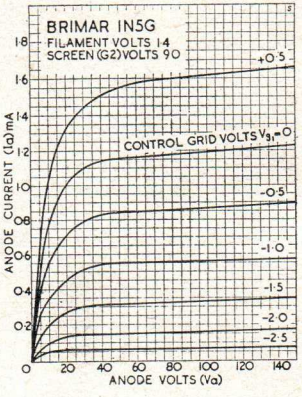
RATINGS

Filament Voltage	...	1.4 volts
Filament Current	...	0.05 amp.
Anode Voltage ...	...	110 volts max.
Screen (G2) Voltage	...	110 volts max.
Cathode Current	...	6.5 mA max.

CHARACTERISTICS

Anode Voltage ...	...	90 volts
Anode Current ...	...	1.2 mA
Screen Voltage	...	90 volts
Screen Current	...	0.3 mA
Control Grid (G1) Volt.		0 volts†
Anode Impedance	...	1.5 meg.
Mutual Conductance	...	0.75 mA/V
Mutual Conductance	...	0.005 mA/V††
Amplification Factor as a Triode (μ G1, G2)	...	27

†† *With a control Grid Voltage of −4 volts.*



RESISTANCE COUPLED OPERATION

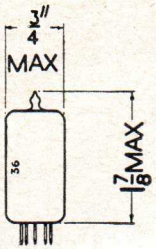
Anode and Screen Supply Voltage...	90 volts
Anode Load Resistor	0.5 meg.
Screen Series Resistor	2.2 meg.
Control Grid Resistor	1.0 meg. †
Peak Output	13 volts R.M.S.
Voltage Gain	28

† *Control grid Resistor returned to Negative Filament Pin 7.*

INTER-ELECTRODE CAPACITANCES*	1N5G	1N5GT
Input (Control grid to all except Anode) ...	3.2	3.2 pF
Output (Anode to all except Control Grid) ...	11	10 pF
Grid to Anode	.007	.007 pF max.

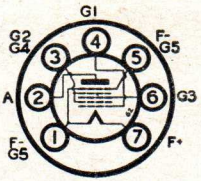
* *With external shield connected to Pin 7.*

BRIMAR



TYPE 1R5

(GLASS BUTTON BASE) MINIATURE BATTERY HEPTODE FREQUENCY CHANGER



BRIMAR type 1R5 is a miniature battery operated frequency changer of unconventional design and is particularly suitable for all-wave receivers. The control grid (G3) has vari-mu characteristics and A.V.C. may be applied. When used in the recommended circuits type 1R5 has a high effective oscillator slope and will operate satisfactorily at frequencies up to 30 Mc/s. Its small size and low filament drain features are particularly applicable to compact lightweight equipment.

RATINGS

Filament Voltage	1.4 volts
Filament Current	0.05 amp.
Anode Voltage	90 volts max.
Screen (G2, G4) Voltage	67.5 volts max.
Cathode Current	5.5 mA max.

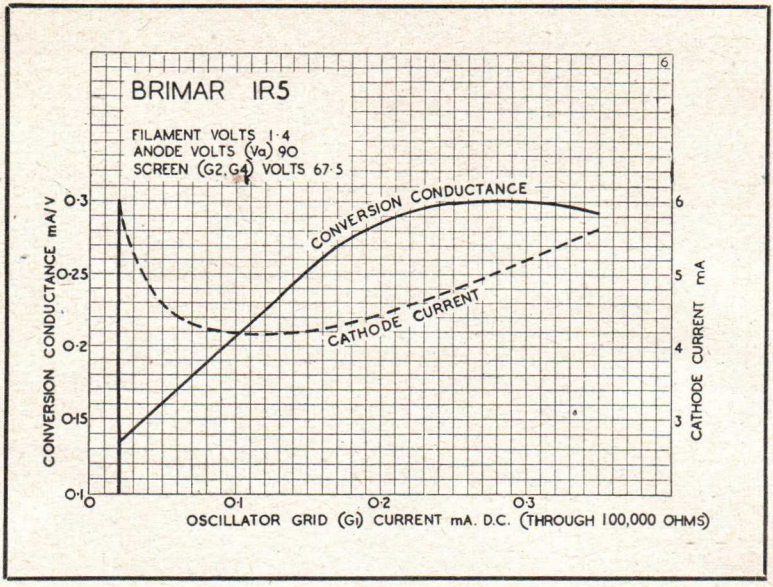
OPERATING CHARACTERISTICS

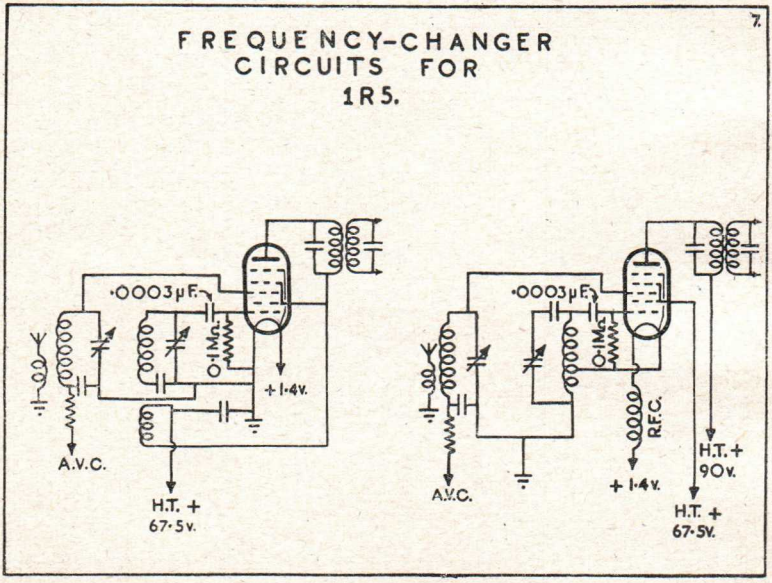
Anode Voltage	45	90	90	volts
Anode Current	0.7	0.8	1.6	mA
Screen Voltage	45	45	67.5	volts
Screen Current	1.9	1.9	3.2	mA
Oscillator Grid (G1) Resistor	0.1	0.1	0.1	meg.
Oscillator Grid Current	0.15	0.15	0.25	mA
Control Grid (G3) Voltage	0	0	0	volts
Anode Impedance	0.6	0.8	0.6	meg.
Conversion Conductance	0.24	0.25	0.3	mA/V
Control Grid Bias (For conversion conductance of 0.005 mA/V)	−9	−9	−14	volts

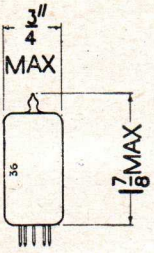
INTER-ELECTRODE CAPACITANCES*

R.F. Input (Control Grid to all other electrodes)	7.0 pF
I.F. Output (Anode to all other electrodes)	7.0 pF
Oscillator Input (Oscillator Grid to other electrodes)	3.8 pF
Control Grid to Oscillator Grid	0.2 pF max.
Oscillator Grid to Anode	0.1 pF max.
Control Grid to Anode	0.4 pF max.

* *With no external shield.*


6
BRIMAR IR5
FILAMENT VOLTS 1·4
ANODE VOLTS (Va) 90
SCREEN (G2,G4) VOLTS 67·5
CONVERSION CONDUCTANCE
CATHODE CURRENT
CONVERSION CONDUCTANCE mA/V
0·3
0·25
0·2
0·15
0·1
0
0·1
0·2
0·3
6
5
4
3
CATHODE CURRENT mA
OSCILLATOR GRID (G1) CURRENT mA. D.C. (THROUGH 100,000 OHMS)

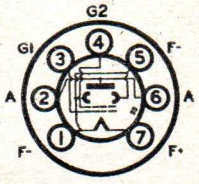

7.
FREQUENCY-CHANGER
CIRCUITS FOR
1R5.
·0003μF.
0·1Mg.
+1·4v.
A.V.C.
H.T. +
67·5v.
·0003μF.
0·1Mg.
R.F.C.
A.V.C.
+1·4v.
H.T. +
90v.
H.T. +
67·5v.



Replacement Type

TYPE 1S4

(GLASS BUTTON BASE) MINIATURE BATTERY OUTPUT BEAM TETRODE



BRIMAR type 1S4 is one of the new range of miniature battery valves introduced for replacement use in existing "personal" receivers. It has now been superceded by type 3S4.

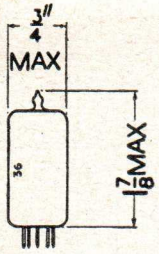
RATINGS

Filament Voltage	1.4 volts
Filament Current	0.1 amp.
Anode Voltage	90 volts max.
Screen (G2) Voltage...	67.5 volts max.
Cathode Current (no signal)	9.0 mA max.
Cathode Current (max. signal)	11.0 mA max.

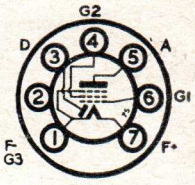
CHARACTERISTICS

Anode Voltage	45	67.5	90	volts
Anode Current	3.8	7.2	7.4	mA
Screen Voltage	45	67.5	67.5	volts
Screen Current	0.8	1.5	1.4	mA
Control Grid (G1) Voltage	–4.5	–7	–7	volts
Mutual Conductance	1.25	1.55	1.575	mA/V
Anode Impedance	0.1	0.1	0.1	meg.
Optimum Load	8,000	5,000	8,000	ohms
Power Output	0.075	0.18	0.27	watts
Harmonic Distortion	12	10	12	per cent.

For characteristic curves refer to type 3S4 (parallel filament connection).



TYPE 1S5
(GLASS BUTTON BASE) MINIATURE BATTERY DIODE—PENTODE



BRIMAR type 1S5 is one of the series of miniature battery valves recently introduced for portable radio equipment. It is designed for use as detector, A.V.C. and audio amplifier valve in superheterodyne receivers. Special care has been taken in the manufacture of type 1S5 to reduce noise and microphony to a low level.

RATINGS

Filament Voltage	1.4 volts
Filament Current	0.05 amp.
Anode Voltage	90 volts max.
Screen (G2) Voltage	90 volts max.
Cathode Current	4.5 mA max.

CHARACTERISTICS

Anode Voltage	67.5 volts
Anode Current	1.6 mA
Screen Voltage	67.5 volts
Screen Current	0.4 mA
Control Grid (G1) Voltage	0 volts*
Mutual Conductance	0.625 mA/V
Anode Impedance	0.4 meg.

RESISTANCE COUPLED OPERATION

Anode and Screen Supply Voltage	45	67.5	90	volts
Anode Load Resistor	1.0	1.0	1.0	meg.
Screen Series Resistor	3.0	3.0	3.0	meg.
Control Grid Resistor	10	10	10	meg.*
Peak Output	4.5	5.5	10	volts
Voltage gain	30	40	50	

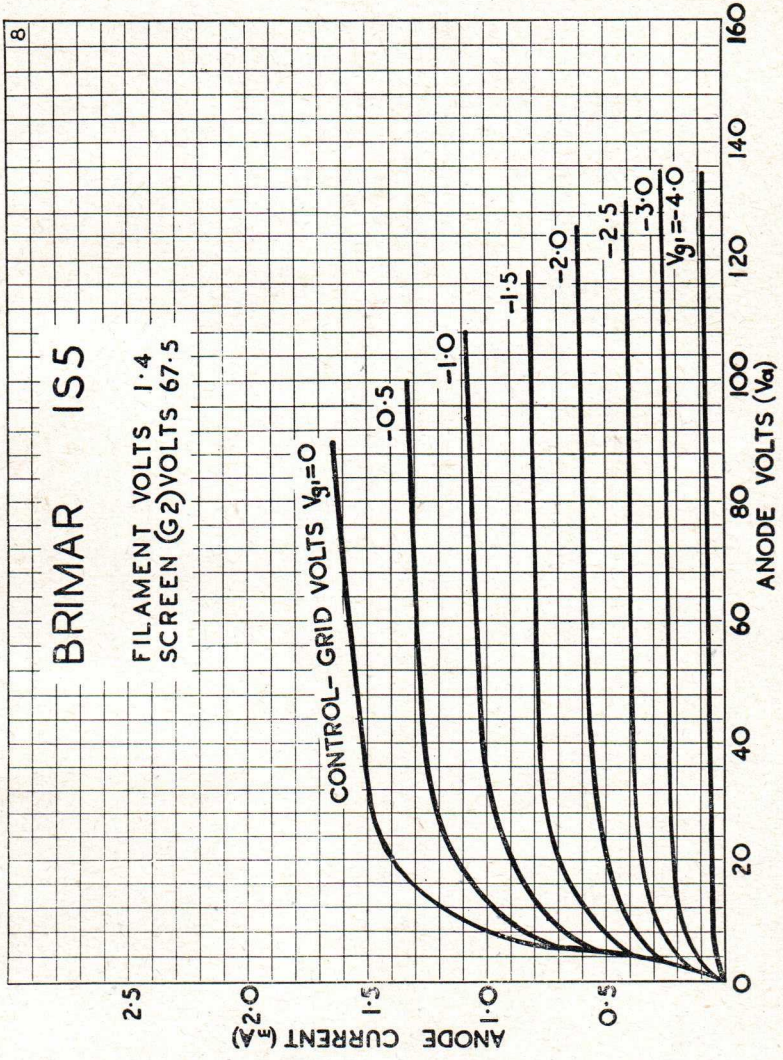
* *Control grid return taken to negative filament (Pin 1).*

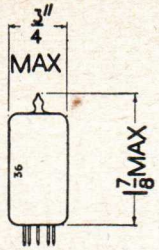
INTER-ELECTRODE CAPACITANCES †

Input (Control Grid to all except Anode)	2.2 pF
Output (Anode to all except Control Grid)	2.4 pF
Control Grid to Anode	0.2 pF
Diode to all other electrodes	3.0 pF

† *With no external shield.*

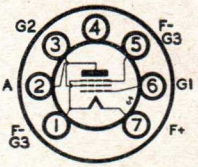
BRIMAR


BRIMAR 1S5
FILAMENT VOLTS 1·4
SCREEN (G2) VOLTS 67·5
CONTROL-GRID VOLTS Vg1=0
-0·5
-1·0
-1·5
-2·0
-2·5
-3·0
Vg1=-4·0
ANODE CURRENT (Ia) mA
2·5
2·0
1·5
1·0
0·5
0
20
40
60
80
100
120
140
160
ANODE VOLTS (Va)



TYPE 1T4

(GLASS BUTTON BASE) MINIATURE VARI-MU BATTERY R.F. PENTODE



BRIMAR type 1T4 is one of the series of miniature battery valves recently introduced for portable radio equipment. It is suitable for the R.F. or I.F. stages of receivers employing A.V.C. Type 1T4 is well screened internally and will function satisfactorily as a high gain amplifier in deaf aid or other audio apparatus.

RATINGS

Filament Voltage	1.4 volts
Filament Current	0.05 amp.
Anode Voltage	90 volts max.
Screen (G2) Voltage	67.5 volts max.
Cathode Current	5.5 mA max.

CHARACTERISTICS

Anode Voltage	45	90	90	volts
Anode Current	1.7	1.8	3.5	mA
Screen Voltage	45	45	67.5	volts
Screen Current	0.7	0.65	1.4	mA
Control Grid (G1) Voltage	0	0	0	volts*
Mutual Conductance	0.7	0.75	0.9	mA/V
Anode Impedance	0.35	0.8	0 5	meg.
Control Grid Bias	–10	–10	–16	volts
(for Mutual Conductance of 0.01 mA/V).				

RESISTANCE COUPLED OPERATION

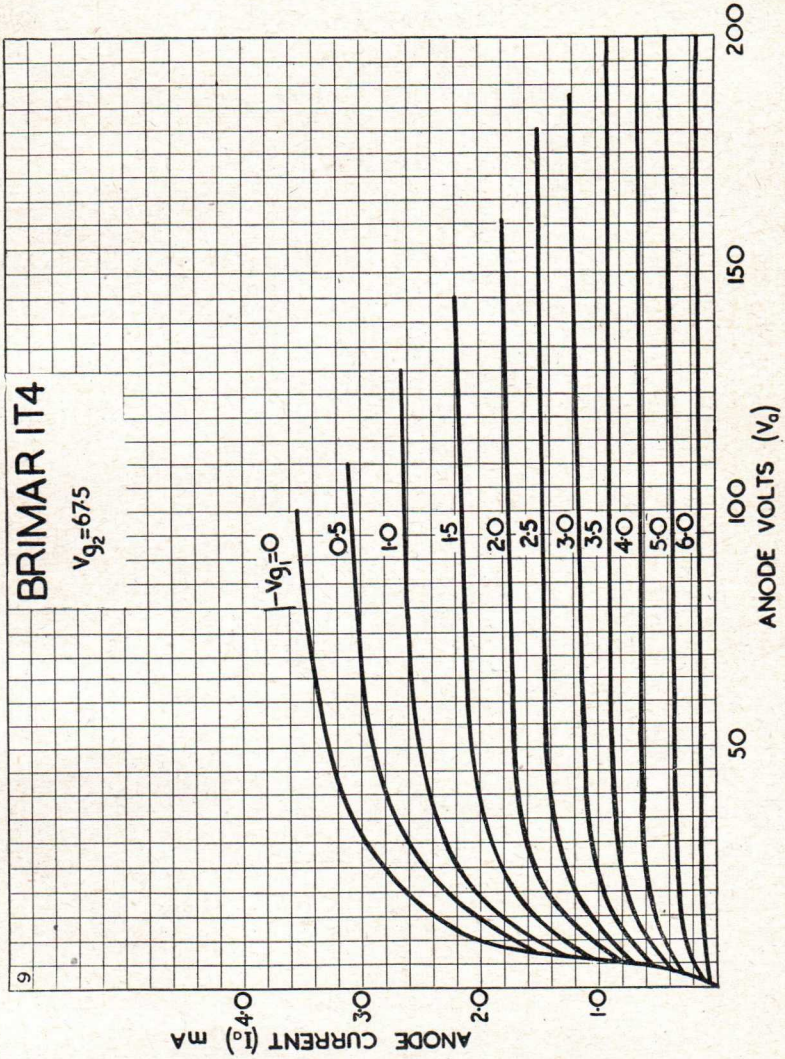
Anode and Screen Supply Voltages ...	45	67.5	90	volts
Anode Load Resistor	0.5	0.5	0.5	meg.
Screen Series Resistor	0.75	1.0	1.0	meg.
Control Grid Resistor	1.0	1.0	1.0	meg.*
Peak Output	7.5	15	20	volts
Voltage Gain	30	50	56	

* *Control grid return taken to negative filament (Pin* 1).

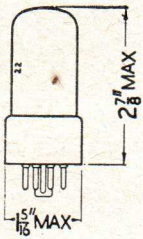
INTER-ELECTRODE CAPACITANCES †

Input (Control Grid to all except Anode)	3.6 pF
Output (Anode to all except Control Grid)	7.5 pF
Control Grid to Anode	0.01 pF max.

† *With external shield connected to Pin* 1.


BRIMAR 1T4
V_{g_2}=67.5
$-V_{g_1}$=0
0·5
1·0
1·5
2·0
2·5
3·0
3·5
4·0
5·0
6·0
ANODE CURRENT (I_a) mA
ANODE VOLTS (V_a)
50
100
150
200
1·0
2·0
3·0
4·0

1Q5GT
2A3
2A5



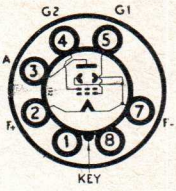
Replacement Type

TYPE **1Q5GT**

(OCTAL BASE)

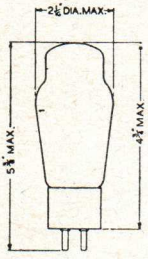
BATTERY OUTPUT

BEAM TETRODE



CHARACTERISTICS

Filament Voltage	1.4 volts	Control Grid (G1) Voltage ...	−4.5 volts
Filament Current	0.1 amp.	Mutual Conductance ...	2.2 mA/V
Anode Voltage	90 volts max.	Anode Impedance	75,000 ohms
Anode Current	9.5 mA	Optimum Load	8,000 ohms
Screen (G2) Voltage	90 volts max.	Power Output	0.27 watts
Screen Current	1.3 mA	Harmonic Distortion ...	6.0 per cent.

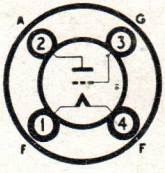


Replacement Type

TYPE **2A3**

(U.X. BASE)

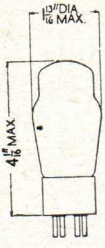
POWER TRIODE



CHARACTERISTICS (CLASS "A")

Filament Voltage	2.5 volts	Cathode Bias Resistor ...	750 ohms
Filament Current	2.5 amp.	Mutual Conductance ...	5.2 mA/V
Anode Voltage	250 volts	Anode Impedance	800 ohms
Anode Current	60 mA	Optimum Load	2,500 ohms
Control Grid Voltage ...	−45 volts	Power Output	3.5 watts

For Push-Pull operation refer to type 6A3.



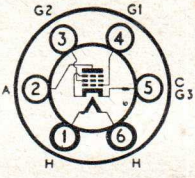
Obsolete Type

For Reference Only

TYPE **2A5**

(U.X. BASE)

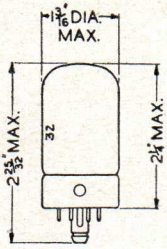
POWER PENTODE



CHARACTERISTICS

Heater Voltage	2.5 volts	Control Grid (G1) Voltage ...	−16.5 volts
Heater Current	1.75 amp.	Cathode Bias Resistor ...	400 ohms
Anode Voltage	250 volts	Mutual Conductance ...	2.5 mA/V
Anode Current	34 mA	Anode Impedance	80,000 ohms
Screen (G2) Voltage	250 volts	Optimum Load	7,000 ohms
Screen Current	6.5 mA	Power Output	3.2 watts

For further information and characteristic curves refer to type 6F6G.

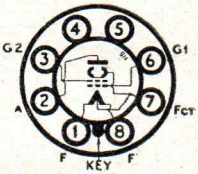


TYPE 3D6

(LOCTAL BASE)

BATTERY OUTPUT

BEAM TETRODE



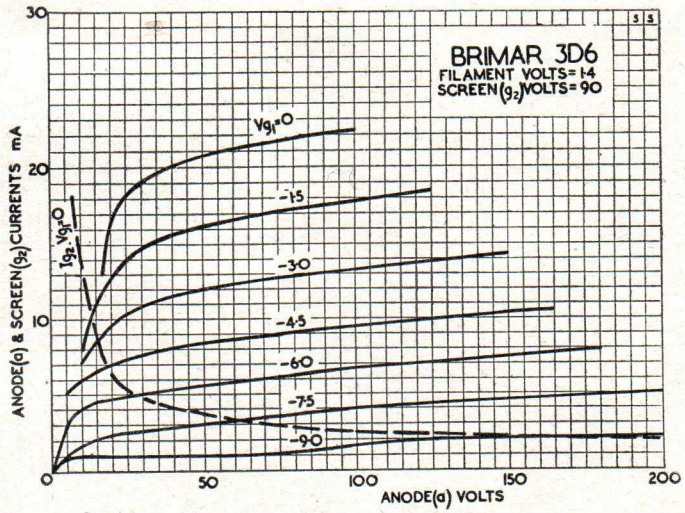
The BRIMAR type 3D6 is an output beam tetrode suitable for use in medium sized battery receivers where a large power output is required.

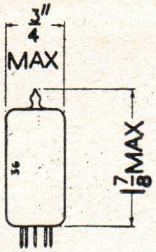
RATINGS

Filament Voltage	2.8	or 1.4	volts
Filament Current	0.11	or 0.22	amp.
Anode Voltage		180	volts max. (Absolute)
Screen (G2) Voltage		90	volts max.
Cathode Current		12	mA max.

OPERATING CHARACTERISTICS (Parallel Filaments)

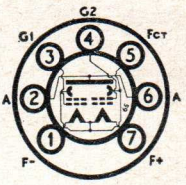
Anode Voltage	90	135	volts
Anode Current	9.5	9.8	mA
Screen Voltage	90	90	volts
Screen Current	1.6	1.2	mA
Control Grid (G1) Voltage	−4.5	−4.5	volts
Anode Impedance	0.10	0.15	meg.
Mutual Conductance	2.4	2.4	mA/V
Optimum Load	8,000	12,000	ohms
Power Output	0.27	0.5	watts





TYPE 3S4

(GLASS BUTTON BASE) MINIATURE BATTERY OUTPUT BEAM TETRODE



BRIMAR type 3S4 completes the range of miniature valves for use in battery receivers and compact portable equipment. The filament is in two sections which may be series or parallel connected. When series connected type 3S4 may be used in conjunction with other valves in the range and the filament operated from a high voltage source where the current is limited to 50 mA. When parallel connected this valve has indentical characteristics to BRIMAR type 1S4 which it supercedes.

RATINGS

	Parallel Filaments	Series Filaments†	
Filament Voltage	1.4	2.8	volts
Filament Current	0.1	0.05	amp.
Anode Voltage	90	90	volts max.
Screen (G2) Voltage	67.5	67.5	volts max.
Cathode Current (no signal) ...	9.0	4.5††	mA max.
Cathode Current (max. signal) ...	11.0	5.5††	mA max.

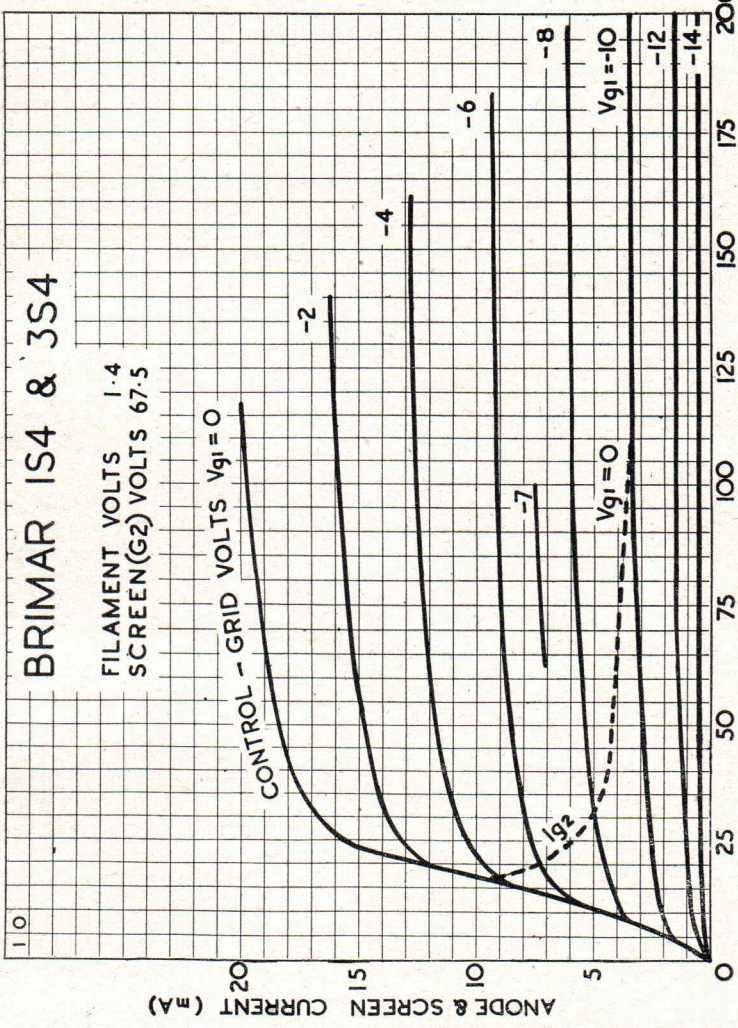
OPERATING CHARACTERISTICS

Anode Voltage	67.5	90	67.5	90	volts	
Anode Current	7.2	7.4	6.0	6.1	mA	
Screen Voltage	67.5	67.5	67.5	67.5	volts	
Screen Current	1.5	1.4	1.2	1.1	mA	
Control Grid (G1) Voltage ...	–7.0	–7.0	–7.0	–7.0	volts*	
Mutual Conductance	1.55	1.575	1.4	1.425	mA/V	
Anode Impedance	0.1	0.1	0.1	0.1	meg.	
Optimum Load	5,000	8,000	5,000	8,000	ohms	
Power Output	0.18	0.27	0.16	0.235	watts	
Harmonic Distortion	10	12	12	13	per cent.	

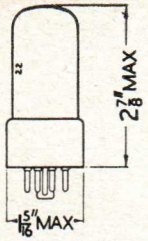
† *For series operation of the sections, a shunting resistor must be connected across the section between Pins No. 1 and No. 5 to by-pass any cathode current in excess of the rated maximum per section. When other tubes in series-filament arrangement contribute to the filament current of the 3S4, an additional shunting resistor may be required between Pins 1 and No. 7.*

†† *Values are for each 1.4 volt section.*

* *Control grid volts measured from negative filament (Pin 5 in parallel connection, Pin 1 in series connection).*


BRIMAR 1S4 & 3S4
FILAMENT VOLTS 1·4
SCREEN(G2) VOLTS 67·5
CONTROL - GRID VOLTS Vg1 = 0
-2
-4
-6
-7
-8
Vg1 = -10
-12
-14
Vg1 = 0
Vg2
ANODE & SCREEN CURRENT (mA)
ANODE VOLTS (Va)
0
5
10
15
20
25
50
75
100
125
150
175
200

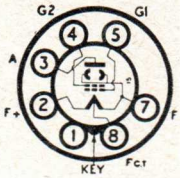
3Q5GT
4D1



Replacement Type

TYPE **3Q5GT**

BATTERY OUTPUT BEAM TETRODE

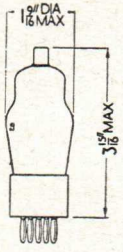


Type 3Q5GT has a double filament, the two halves of which may be connected in parallel or series as required.

CHARACTERISTICS

	Parallel Filament	Series Filament	
Filament Voltage	1.4	2.8	volts
Filament Current	0.1	0.05	amp.
Anode Voltage	90	90	volts max.
Anode Current	9.5	8.0	mA
Screen (G2) Voltage	90	90	volts max.
Screen Current	1.3	1.0	mA
Control Grid (G1) Voltage	–4.5	–4.5	volts*
Mutual Conductance	2.2	2.0	mA/V
Anode Impedance	90,000	80,000	ohms
Optimum Load	8,000	8,000	ohms
Power Output	0.27	0.23	watts
Harmonic Distortion	6.0	8.5	per cent.

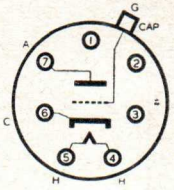
* *Control grid volts measured from negative filament (Pin 8 in parallel connection, Pin 7 in series connection)*



Replacement Type

TYPE **4D1**

(ENGLISH BASE) GENERAL PURPOSE TRIODE

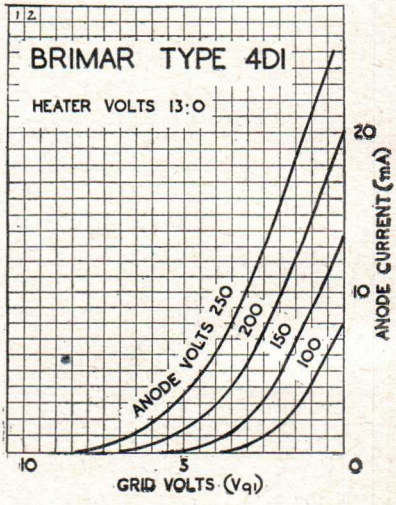


CHARACTERISTICS

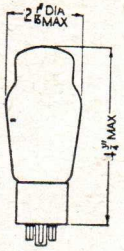
Heater Voltage	13 volts
Heater Current	0.2 amp.
Anode Voltage	250 volts max.
Anode Current	10 mA
Control Grid Voltage	–3 volts
Cathode Bias Resistor	300 ohms
Mutual Conductance	4.0 mA/V
Anode Impedance	10,000 ohms
Amplification Factor	40

OPERATION AS LEAKY GRID DETECTOR

Anode Supply Voltage	250 volts
Anode Load Resistor	25,000 ohms
Grid Condenser	200 pF
Grid Leak	1–2 meg.



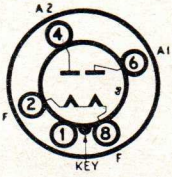
BRIMAR



TYPE **5R4GY**

(OCTAL BASE)

FULL WAVE RECTIFIER



The BRIMAR type 5R4GY is a directly heated full wave rectifier for use in A.C. mains equipment where a large output is required.

RATINGS

Filament Voltage	5.0 volts		
Filament Current	2.0 amp.		
Peak Current (each Anode)	650 mA max.		
Peak Inverse Voltage (no load)	2100	2400	2800 volts max.
Rectified Current (Condenser Input) ...	250	175	150 mA max.
Rectified Current (Choke Input)	250	250	175 mA max.

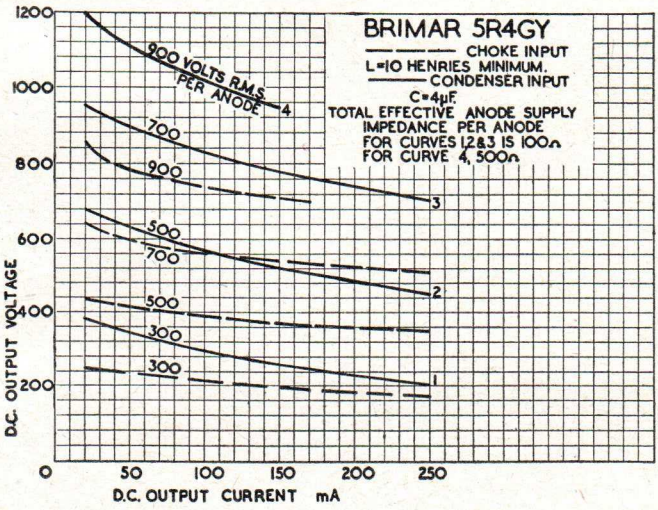
CHARACTERISTICS AS FULL WAVE RECTIFIER

	Condenser Input*			Choke Input
R.M.S. Input per Anode	750	1000	850	1000 volts max.
Supply Impedance per Anode	250	575	–	– ohms min.
Reservoir Condenser	4	4	–	– µF max.
Input Choke Inductance	–	–	5	10 Henries min.
Rectified Current...	250	150	250	175 mA max.

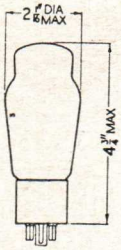
* *NOTE :—DELAYED SWITCHING of approximately 10 seconds MUST BE EMPLOYED when the following ratings are exceeded with a condenser input Filter.*

550 volts R.M.S. at 250 mA D.C.
600 volts R.M.S. at 200 mA D.C.
650 volts R.M.S. at 175 mA D.C.

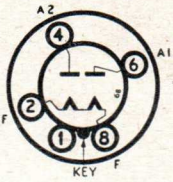
700 volts R.M.S. at 150 mA D.C.
800 volts R.M.S. at 125 mA D.C.
900 volts R.M.S. at 75 mA D.C.



CD36



TYPE **5U4G**
(OCTAL BASE)
FULL WAVE RECTIFIER



The BRIMAR type 5U4G is a full wave directly heated rectifier for use in A.C. equipments which require more power than type 5V4G will provide.

RATINGS

Filament Voltage	5.0 volts
Filament Current	3.0 amp.
Peak Inverse Voltage	1550 volts max.
Peak Current (each Anode)	675 mA max.

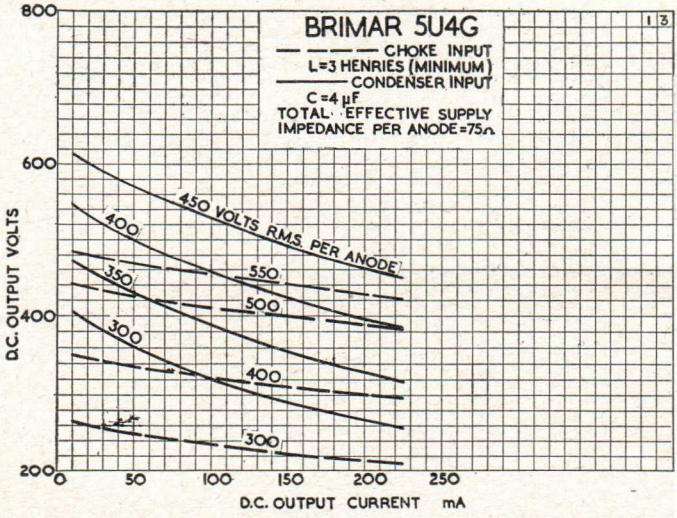
CHARACTERISTICS AS FULL WAVE RECTIFIER

CONDENSER INPUT

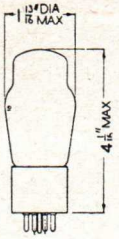
R.M.S. Input per Anode	450 volts max.
Supply Impedance per Anode...	75 ohms min.
Rectified Current	225 mA max.
Reservoir Condenser	32 μF max.

CHOKE INPUT

R.M.S. Input per Anode	550 volts max.
Input Choke Inductance	3 Henries min.
Rectified Current	225 mA max.



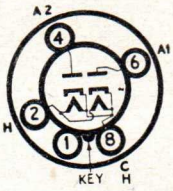
BRIMAR



TYPE 5V4G

(OCTAL BASE)

FULL WAVE RECTIFIER



The BRIMAR type 5V4G is an indirectly heated full wave rectifier for operation from A.C. mains. It will provide rather more output current than type 5Z4G and has a lower internal impedance.

RATINGS

Heater Voltage	5.0 volts
Heater Current...	2.0 amp.
Peak Inverse Voltage	1400 volts max.
Peak Current (each Anode)	525 *mA max.

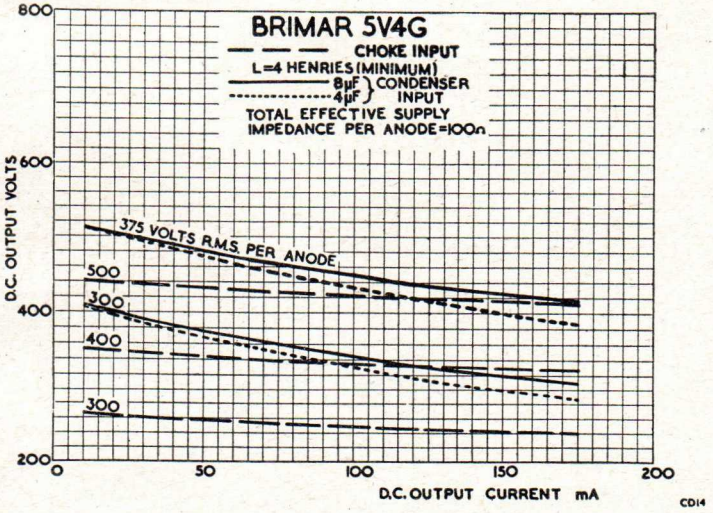
CHARACTERISTICS AS FULL WAVE RECTIFIER

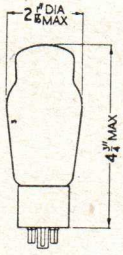
CONDENSER INPUT

R.M.S. Input per Anode	375 volts max.
Supply Impedance per Anode...	100 ohms min.
Rectified Current	175 mA max.
Reservoir Condenser	32 μF max.

CHOKE INPUT

R.M.S Input per Anode	500 volts max.
Input Choke Inductance	4 Henries min.
Rectified Current	175 mA max.





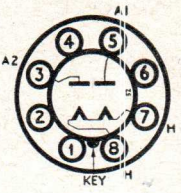
Obsolete Type

For Information Only

TYPE **5X4G**

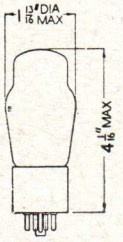
(OCTAL BASE)

FULL WAVE RECTIFIER



CHARACTERISTICS

Filament Voltage	5 volts
Filament Current	3.0 amp.
Peak Inverse Voltage	1,550 volts max.
Peak Current per Anode	675 mA max.
R.M.S. Input per Anode	450 volts max.
Supply Impedance per Anode	75 ohms min.
Rectified Current	225 mA max.
Reservoir Condenser	32 μF max

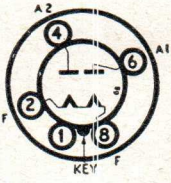


Replacement Type

TYPE **5Y3G**

(OCTAL BASE)

FULL WAVE RECTIFIER



The BRIMAR type 5Y3G is a directly heated full wave rectifier for A.C. mains equipment of moderate power requirements.

RATINGS

Filament Voltage	5.0 volts
Filament Current	2.0 amp.
Peak Inverse Voltage	1,400 volts max.
Peak Current (each Anode)	375 mA max.

OPERATION AS FULL WAVE RECTIFIER

CONDENSER INPUT

R.M.S. Input per Anode	350 volts max.
Supply Impedance per Anode	50 ohms. min.
Rectified Current	125 mA max.
Reservoir Condenser	32 μF max.

CHOKE INPUT

R.M.S. Input per Anode	500 volts max.
Input Choke Inductance	5 Henries min.
Rectified Current	125 mA max.

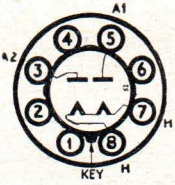
Obsolete Type

For Information Only

TYPE **5Y4G**

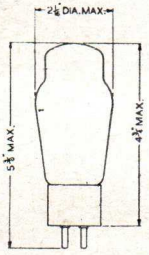
(OCTAL BASE)

FULL WAVE RECTIFIER



CHARACTERISTICS

Filament Voltage	5.0 volts
Filament Current	2.0 amp.
Peak Inverse Voltage	1,400 volts max.
Peak Current per Anode	375 mA max.
R.M.S. Input per Anode	350 volts max.
Supply Impedance per Anode...	50 ohms min.
Rectified Current	125 mA max.
Reservoir Condenser	32 μF max.

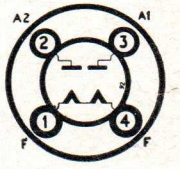


Replacement Type

TYPE **5Z3**

(U.X. BASE)

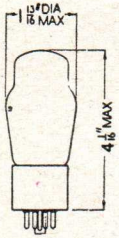
FULL WAVE RECTIFIER



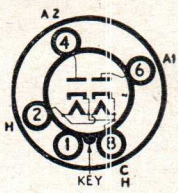
CHARACTERISTICS

Filament Voltage	5.0 volts
Filament Current	3.0 amp.
Peak Inverse Voltage	1,550 volts max.
Peak Current per Anode	675 mA max.
R.M.S. Input per Anode	450 volts max.
Supply Impedance per Anode...	75 ohms min.
Rectified Current	225 mA max.
Reservoir Condenser	32 μF max.

For characteristic curves refer to type 5U4G.



TYPE **5Z4G**
(OCTAL BASE)
FULL WAVE RECTIFIER



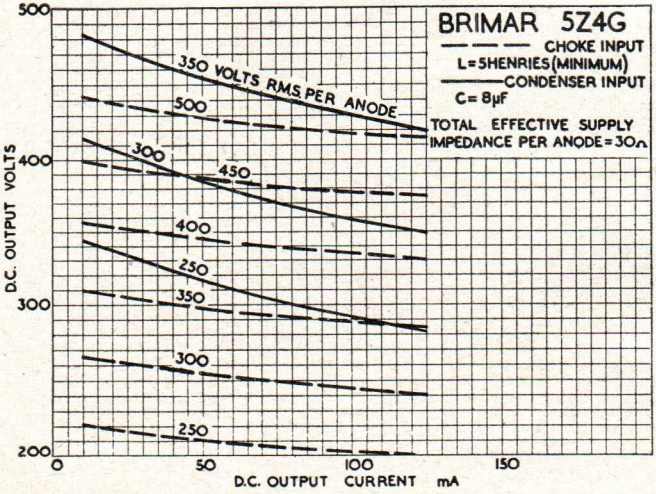
The BRIMAR type 5Z4G is an indirectly heated full wave rectifier for A.C. mains operation.

RATINGS

Heater Voltage	5.0 volts
Heater Current...	2.0 amp.
Peak Inverse Voltage	1,400 volts max.
Peak Current (each Anode)	375 mA max.

CHARACTERISTICS AS FULL WAVE RECTIFIER

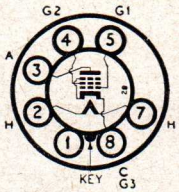
CONDENSER INPUT	
R.M.S. Input per Anode	350 volts max.
Supply Impedance per Anode...	30 ohms min.
Rectified Current	125 mA max.
Reservoir Condenser	32 μF max.
CHOKE INPUT	
R.M.S. Input per Anode	500 volts max.
Input Choke Inductance	5 Henries min.
Rectified Current	125 mA max.



CDIS

BRIMAR

TYPE **6AG6G**
(OCTAL BASE)
HIGH SLOPE
OUTPUT PENTODE



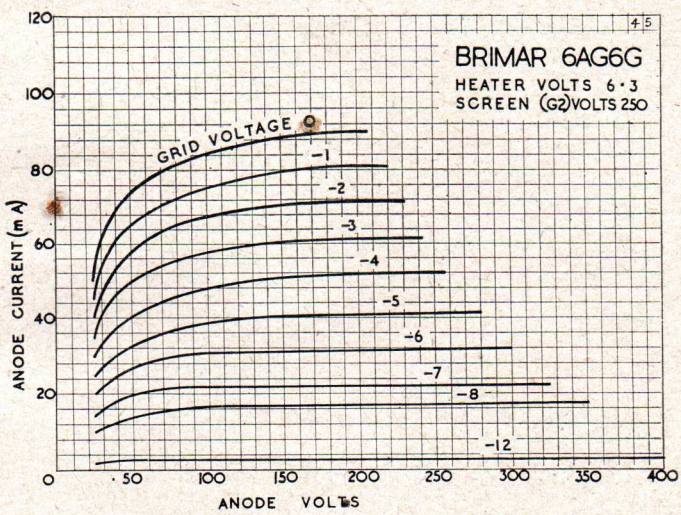
The BRIMAR type 6AG6G is an indirectly heated output pentode of high sensitivity for use in the output stage of radio receivers.

RATINGS

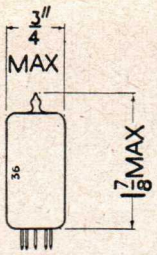
Heater Voltage	6.3 volts
Heater Current	1.2 amp.
Anode Voltage	250 volts max.
Anode Dissipation	10 watts max.
Screen (G2) Voltage	250 volts max.
Screen Dissipation	2.5 watts max.

OPERATING CHARACTERISTICS

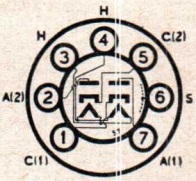
Anode Voltage	150	200	250	volts
Anode Current	30	31	32	mA
Screen Voltage	150	200	250	volts
Screen Current	5.5	6.0	6.0	mA
Control Grid (G1) Voltage	–2	–4	–6	volts
Cathode Bias Resistor	60	100	150	ohms
Anode Impedance	40,000	50,000	60,000	ohms
Mutual Conductance	9	10	10	mA/V
Optimum Load	8,500	8,700	9,000	ohms
Power Output	1.3	2.5	3.75	watts



C



TYPE **6AL5**
(GLASS BUTTON BASE)
MINIATURE DOUBLE DIODE



The BRIMAR type 6AL5 is an indirectly heated double diode with separate cathodes, fitted with a miniature button base. The low impedance of this valve renders it particularly suitable for use in wide band amplifiers and television receivers.

RATINGS

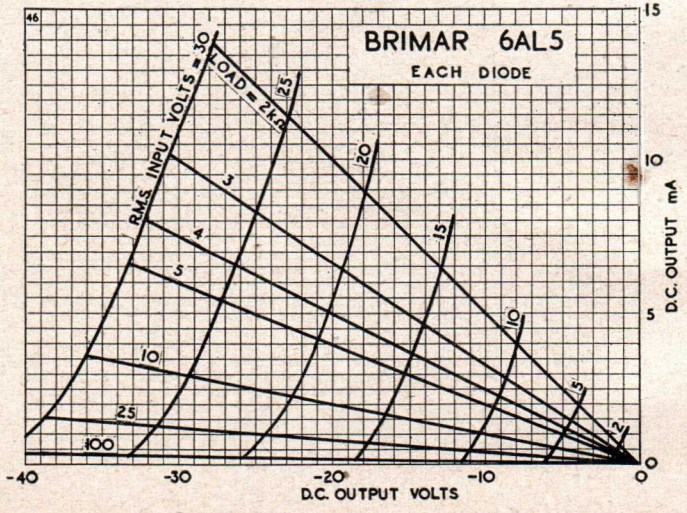
Heater Voltage	6.3 volts
Heater Current	0.3 amp.
Peak Inverse Voltage	420 volts max.
Peak Anode Current (each Anode)	54 mA. max.
Resonant Frequency (each Section)	700 Mc/s max.

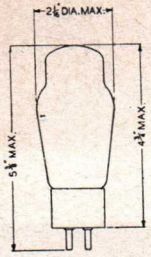
OPERATION AS HALF WAVE RECTIFIER

R.M.S. Input per Anode	150 volts max
Supply Impedance per Anode	300 ohms min.
Rectified Current per Anode	9 mA max.

INTER-ELECTRODE CAPACITANCES

Diode (1) to Cathode (1) and Heater	3.2 pF
Diode (2) to Cathode (2) and Heater	3.2 pF
Cathode (1) to Diode (1) and Heater	3.6 pF
Cathode (2) to Diode (2) and Heater	3.6 pF
Diode (1) to Diode (2)	0.026 pF max.



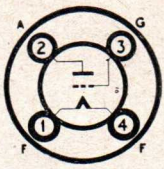


Replacement Type

TYPE **6A3**

(U.X. BASE)

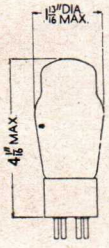
OUTPUT TRIODE



The BRIMAR type 6A3 is a directly heated output triode for A.C. mains equipment.

CHARACTERISTICS

	CLASS A.	CLASS AB1 (2 valves)	
Filament Voltage	6.3	–	volts
Filament Current	1.0	–	amp.
Anode Voltage	250 max.	325	volts
Anode Current	60	80	mA
Control Grid Voltage	–45	–68	volts
Auto Bias Resistor	750	850	ohms
Anode Impedance	800 ohms	–	
Mutual Conductance	5.25 mA/V	–	
Optimum Load	2,500	5,000	ohms
Power Output	3.5	10	watts

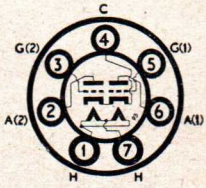


Replacement Type

TYPE **6A6**

(U.X. BASE)

DOUBLE TRIODE



CHARACTERISTICS

Heater Voltage ... ... 6.3 volts Heater Current ... ... 0.8 amp.

For further information refer to type 6N7G/GT.

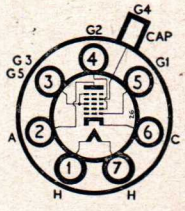
Replacement Types

TYPES **6A7, 6A7E**

(U.X. BASE)

HEPTODE

FREQUENCY CHANGERS



CHARACTERISTICS

Heater Voltage ... ... 6.3 volts Heater Current ... ... 0.3 amp.

INTER-ELECTRODE CAPACITANCES*

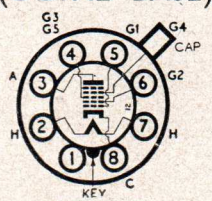
R.F. Input ...	8.5 pF	Control Grid (G4) to Oscillator Grid (G1) ...	0.15 pF
I.F. Output ...	9.0 pF	Control Grid to Anode	0.3 pF
Oscillator Input	7.0 pF	Control Grid to Oscillator Anode (G2)	0.15 pF
Oscillator Output...	5.5 pF	Oscillator Grid to Oscillator Anode	1.0 pF

* *With close fitting shield connected to cathode.*

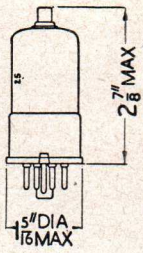
For further information refer to type 6A8G/GT.

TYPES 6A8G, 6A8GT
(OCTAL BASE)

6A8G



Note.—Type 6A8GT has Pin 1 connected to metal shell.



6A8GT

HEPTODE FREQUENCY CHANGERS

Types 6A8G, 6A8GT are self oscillating frequency changers of the heptode (pentagrid) class for use in A.C., A.C./D.C. and car radio receivers. In suitable circuits satisfactory operation may be secured at frequencies as high as 20 Mc/s. With the exception of their overall dimensions, types 6A8G and 6A8GT have identical characteristics.

RATINGS

Heater Voltage	6.3 volts
Heater Current...	0.3 amp.
Anode Voltage	300 volts max.
Anode Dissipation	1.0 watts max.
Screen (G3, G5) Voltage	100 volts max.
Screen Dissipation	0.3 watts max.
Oscillator Anode (G2) Voltage	200 volts max.
Oscillator Anode Dissipation	0.75 watts max.
Total Cathode Current	14 mA max.

OPERATING CHARACTERISTICS

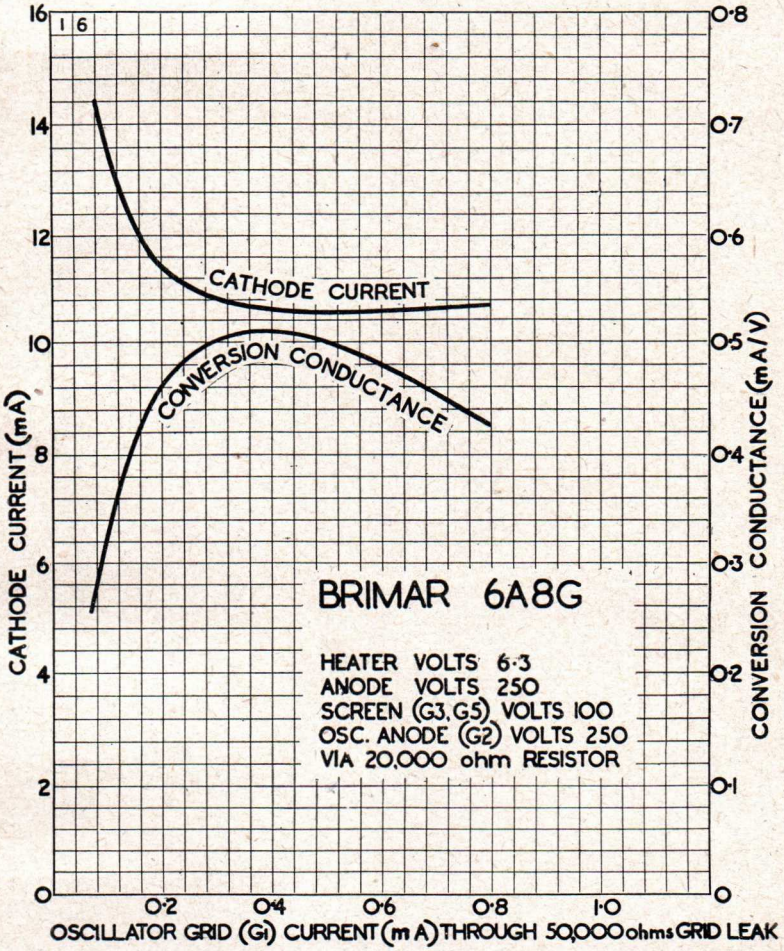
Anode Voltage	100	250 volts
Anode Current	1.1	3.5 mA
Screen Voltage	50	100 volts
Screen Current	1.3	2.7 mA
Oscillator Anode Supply Voltage	100	250 volts
Oscillator Anode Resistor	–	20,000 ohms
Oscillator Anode Current	2.0	4.0 mA
Control Grid (G4) Voltage	–1.5	–3 volts
Auto Bias Resistor	300	300 ohms
Oscillator Grid (G1) Resistor	50,000	50,000 ohms
Oscillator Grid Current	0.25	0.4 mA
Anode Impedance	0.6	0.36 meg.
Conversion Conductance	0.36	0.55 mA/V
Control Grid Voltage	–20	–35 volts

(For conversion of 0.005 mA/V).

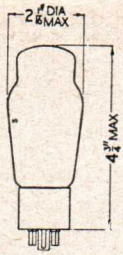
INTER-ELECTRODE CAPACITANCES*

R.F. Input (Control Grid to all other electrodes)	... 9.5 μF
I.F. Output (Anode to all other electrodes)	... 12.0 μF
Oscillator Input (Oscillator Grid to all except Oscillator Anode)	... 6.0 μF
Oscillator Output (Oscillator Anode to all except Oscillator Grid)	... 4.6 μF
Control Grid to Oscillator Grid	... 0.16 μF
Control Grid to Anode	... 0.26 μF
Control Grid to Oscillator Anode	... 0.19 μF
Oscillator Grid to Oscillator Anode	... 1.1 μF

* *With close fitting shield connected to Cathode.*


16
14
12
10
8
6
4
2
0
0·8
0·7
0·6
0·5
0·4
0·3
0·2
0·1
0
0·2
0·4
0·6
0·8
1·0
CATHODE CURRENT (mA)
CONVERSION CONDUCTANCE (mA/V)
OSCILLATOR GRID (Gi) CURRENT (mA) THROUGH 50,000 ohms GRID LEAK
CATHODE CURRENT
CONVERSION CONDUCTANCE
BRIMAR 6A8G
HEATER VOLTS 6·3
ANODE VOLTS 250
SCREEN (G3, G5) VOLTS 100
OSC. ANODE (G2) VOLTS 250
VIA 20,000 ohm RESISTOR

6B4G
6B5
6B6G
6B7/E

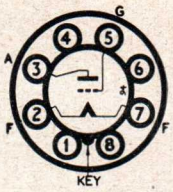


Obsolete Type
For reference only

TYPE **6B4G**

(OCTAL BASE)

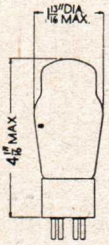
POWER TRIODE



CHARACTERISTICS

Filament Voltage ... ... 6.3 volts Filament Current ... ... 1.0 amp.

For further information refer to type 6A3.



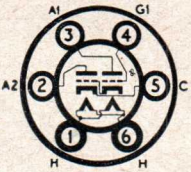
Replacement Type

TYPE **6B5**

(U.X. BASE)

DIRECT-COUPLED

POWER AMPLIFIER



CHARACTERISTICS

Heater Voltage ... ... 6.3 volts Heater Current ... ... 0.8 amp.

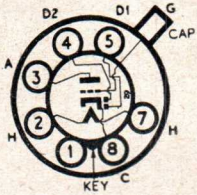
For further information refer to type 6N6G.

Obsolete Type
For reference only

TYPE **6B6G**

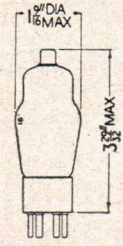
(OCTAL BASE)

DOUBLE DIODE TRIODE



CHARACTERISTICS

Heater Voltage	... ...	6.3 volts	Grid Voltage	... ...	−2 volts
Heater Current	... ...	0.3 amp.	Amplification Factor	...	100
Anode Voltage	... ...	250 volts	Mutual Conductance	...	1.1 mA/V
Anode Current	... ...	0.9 mA	Anode Impedance	...	91,000 ohms



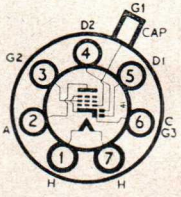
Replacement Types

TYPES **6B7, 6B7E**

(U.X. BASE)

DOUBLE

DIODE PENTODES



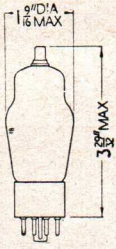
CHARACTERISTICS

Heater Voltage ... ... 6.3 volts Heater Current ... ... 0.3 amp.

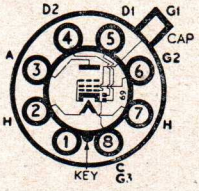
For further information refer to type 6B8G.

BRIMAR

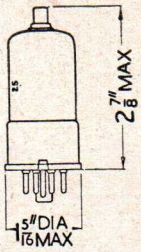
TYPES 6B8G, 6B8GT
(OCTAL BASE)



6B8G.



Note.—Type 6B8GT has Pin 1 connected to metal shell.



6B8GT.

DOUBLE DIODE PENTODES

The BRIMAR types 6B8G, 6B8GT are multiple valves designed for use simultaneously as detectors and I.F. or L.F. amplifiers. The pentode sections have semi-vari-mu characteristics and a certain amount of A.V.C. bias may be applied without appreciable distortion.

RATINGS

Heater Voltage	6.3 volts
Heater Current...	0.3 amp.
Anode Voltage	300 volts max.
Anode Dissipation	2.25 watts max.
Screen (G2) Voltage	125 volts max.
Screen Dissipation	0.3 watts max.
Control Grid Resistor	1.0 meg. max.

OPERATING CHARACTERISTICS. [Suppressor Grid (G3) connected to cathode].

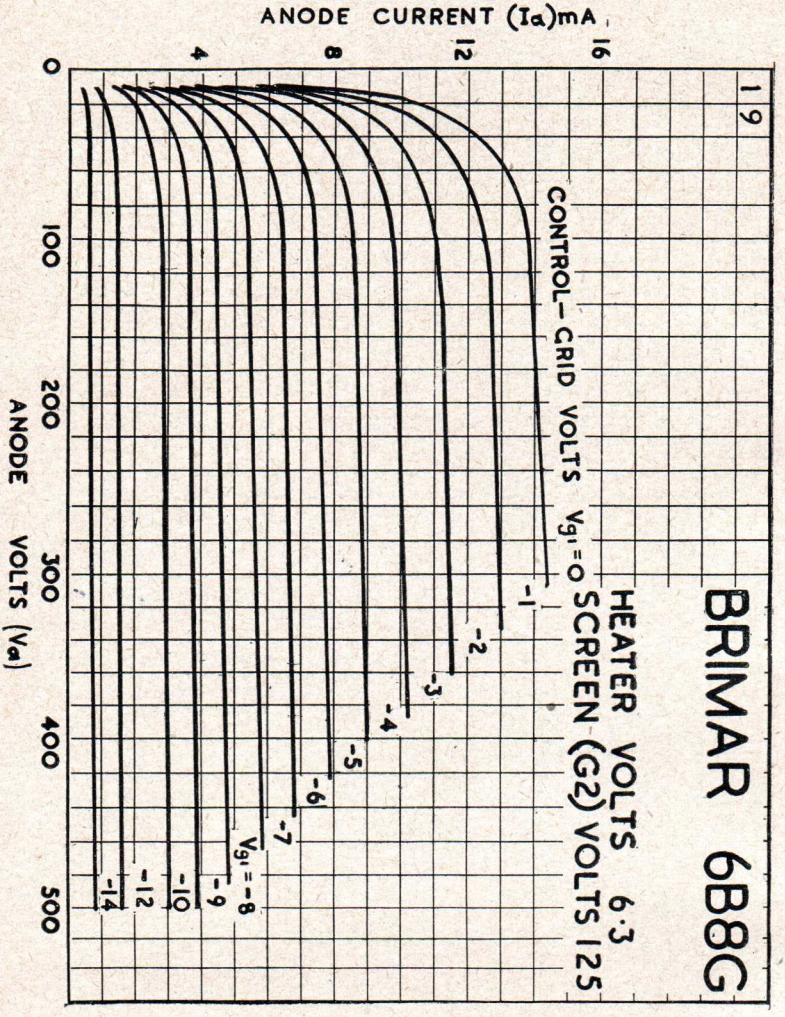
Anode Voltage	100	180	250	250	volts
Anode Current	5.8	3.4	6.0	9.0	mA
Screen Voltage	100	75	100	125	volts
Screen Current	1.7	0.9	1.5	2.3	mA
Control Grid (G1) Voltage ...	−3	−3	−3	−3	volts
Cathode Bias Resistor	400	700	400	250	ohms
Anode Impedance	0.3	1.0	0.8	0.6	meg.
Mutual Conductance	0.95	0.84	1.0	1.12	mA/V
Control Grid Cut-off Voltage...	−17	−13	−17	−21	volts

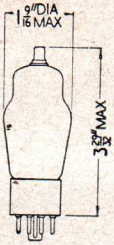
OPERATION AS RESISTANCE COUPLED AMPLIFIER. (G3 connected to cathode)

Anode and Screen Supply Voltage ...	90	180	300	volts
Anode Load Resistor	0.25	0.25	0.25	meg.
Screen Series Resistor	1.2	1.2	1.2	meg.
Cathode Bias Resistor	3,500	2,000	1,600	ohms
Peak Output	33	55	100	volts
Voltage gain	55	70	80	

INTER-ELECTRODE CAPACITANCES*	6B8G	6B8GT	
Input (Control Grid to all except Anode) ...	3.6	4.5	pF
Output (Anode to all except control Grid)	9.5	10.0	pF
Control Grid to Anode	0.01	0.005	pF max.

* *With close fitting shield connected to cathode.*

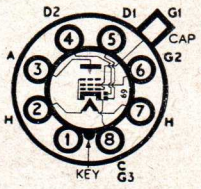

ANODE CURRENT (Ia)mA
0
4
8
12
16
ANODE VOLTS (Va)
0
100
200
300
400
500
BRIMAR 6B8G
HEATER VOLTS 6·3
SCREEN (G2) VOLTS 125
CONTROL-GRID VOLTS Vg1=0
-1
-2
-3
-4
-5
-6
-7
Vg1=-8
-9
-10
-12
-14



Obsolete Type

For Reference Only

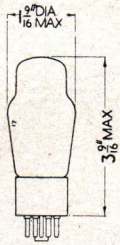
TYPE **6B8SG** (6G8G)
(OCTAL BASE)
DOUBLE DIODE
VARI-MU PENTODE



CHARACTERISTICS

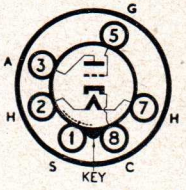
Heater Voltage	6.3 volts	Screen Current	1.4 mA
Heater Current	0.3 amp.	Control Grid Voltage	−3 volts
Anode Voltage	250 volts	Mutual Conductance	1.0 mA/V
Anode Current	6.5 mA	Anode Impedance	0.8 meg.
Screen (G2) Voltage	100 volts	Control Grid Voltage	−40 volts*

* *For Mutual Conductance of* 0.005 mA./V.



Replacement Type

TYPE **6C5G**
(OCTAL BASE)
GENERAL
PURPOSE TRIODE



The BRIMAR type 6C5G is a small triode suitable for use as detector, oscillator or L.F. amplifier valve.

RATINGS

Heater Voltage	6.3 volts
Heater Current	0.3 amp.
Anode Voltage	300 volts max.
Anode Dissipation	2.5 watts max.

OPERATING CHARACTERISTICS

Anode Voltage	250 volts
Anode Current	8.0 mA
Control Grid Voltage	−8 volts
Mutual Conductance	2.0 mA/V
Amplification Factor	20

OPERATION AS RESISTANCE COUPLED AMPLIFIER

Anode Supply Voltage	90	180	300	volts
Anode Load Resistor	0.1	0.1	0.1	meg.
Cathode Bias Resistor	8,000	6,500	6,000	ohms
Peak Output	22	54	84	volts
Voltage gain	11	12	13	

INTER-ELECTRODE CAPACITANCES*

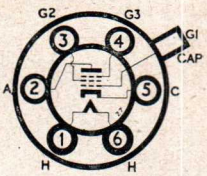
Input (Grid to all other electrodes)	4.4
Output (Anode to all other electrodes)	12.0 pF
Grid to Anode	2.2 pF

* *With Pin* 1 *(Internal Shield) connected to Cathode.*

C6
6D6
6F5

Replacement Type

TYPE **6C6**
(U.X. BASE)
R.F. PENTODE



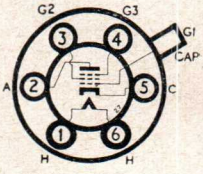
CHARACTERISTICS

Heater Voltage	... ...	6.3 volts	Screen Current	... ...	0.5 mA
Heater Current	... ...	0.3 amp.	Control Grid (G1) Voltage	...	−3 volts
Anode Voltage	... ...	250 volts	Anode Impedance	... ...	1.0 meg.
Anode Current	... ...	2.0 mA	Mutual Conductance	... ...	1.2 mA/V
Screen (G2) Voltage	... ...	100 volts	Cut-off Voltage	... ...	−7 volts

For further information on characteristics refer to type 6J7G.

Replacement Type

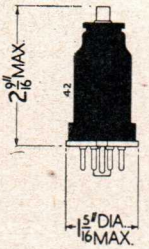
TYPE **6D6**
(U.X. BASE)
VARI-MU R.F. PENTODE



CHARACTERISTICS

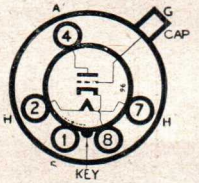
Heater Voltage	... ...	6.3 volts	Screen Current	... ...	2.0 mA
Heater Current	... ...	0.3 amp.	Control Grid (G1) Voltage	...	−3 volts
Anode Voltage	... ...	250 volts	Anode Impedance	... ...	0.8 meg.
Anode Current	... ...	8.2 mA	Mutual Conductance	... ...	1.6 mA/V
Screen (G2) Voltage	...	100 volts	Cut-off Voltage	... ...	−50 volts

For further information on characteristics refer to type 6U7G.



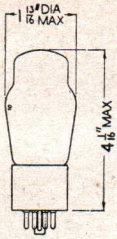
Obsolete Type

For Information Only
TYPE **6F5**
(OCTAL BASE)
HIGH MU TRIODE



CHARACTERISTICS

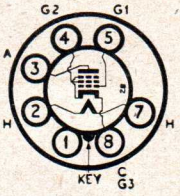
Heater Voltage	... ...	6.3 volts
Heater Current	... ...	0.3 amp.
Anode Voltage	... ...	250 volt
Anode Current	... ...	0.9 mA
Control Grid Voltage	... ...	−2 volts
Anode Impedance	... ...	66,000 ohms
Mutual Conductance	... ...	1.5 mA/V
Amplification Factor	... ...	100



TYPE **6F6G**

(OCTAL BASE)

POWER PENTODE



The BRIMAR type 6F6G is an indirectly heated output pentode suitable for use in A.C. and car radio equipment.

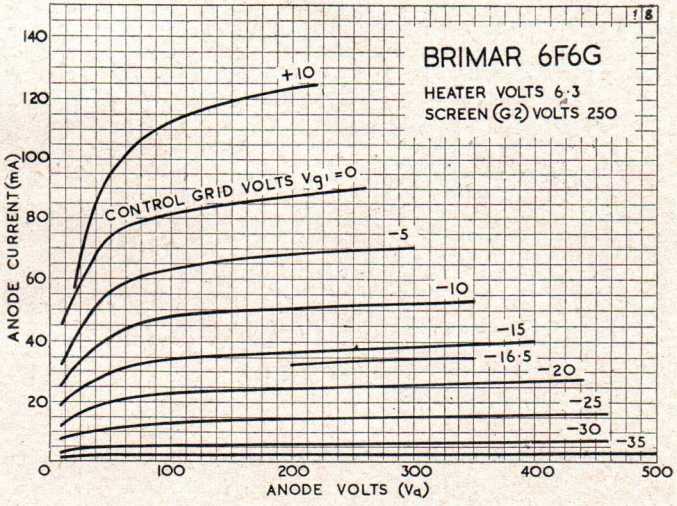
RATINGS

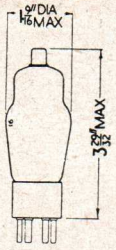
Heater Voltage	6.3 volts
Heater Current	0.7 amp.
Anode Voltage	375 volts max.
Anode Dissipation	11 watts max.
Screen (G2) Voltage	285 volts max.
Screen Dissipation	3.75 watts max.

OPERATING CHARACTERISTICS CLASS "A"

	SINGLE VALVE		PUSH PULL (2 VALVES)	
Anode Voltage	250	285	315	volts
Anode Current	34	38	62	mA
Screen Voltage	250	285	285	volts
Screen Current (Zero Signal)	6.5	7.0	12	mA
Screen Current (Max. Signal)	9.7	12.0	18	mA
Control Grid (G1) Voltage	−16.5	−20	−24	volts
Cathode Bias Resistor	410	440	320	ohms
Anode Impedance	80,000	78,000	–	ohms
Mutual Conductance	2.50	2.55	–	mA/V
Optimum Load	7,000	7,000	10,000 *	ohms
Power Output	3.2	4.8	10.5	watts
Harmonic Distortion	8.0	9.0	3	per cent.

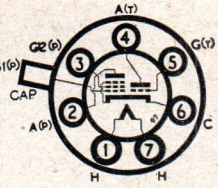
* *Anode to Anode Load.*





Replacement Types

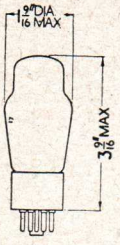
TYPES
6F7, 6F7E, 6F7B
(U.X. BASE)
TRIODE PENTODES



CHARACTERISTICS

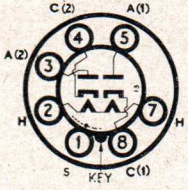
Heater Voltage ... ... 6.3 volts Heater Current ... ... 0.3 amp.

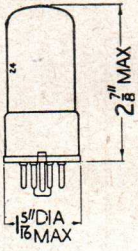
	TRIODE SECTION	PENTODE SECTION		
Anode Voltage	100	100	250	volts
Anode Current	3.5	6.3	6.5	mA
Screen (G2p) Voltage	–	100	100	volts
Screen Current	–	1.6	1.5	mA
Control Grid Voltage	–3	–3	–3	volts
Anode Impedance	0.02	0.30	0.85	meg.
Mutual Conductance	0.53	1.05	1.10	mA/V
Amplification Factor	8.5	300	900	



6H6G.

TYPES 6H6G, 6H6GT
(OCTAL BASE)





6H6GT.

DOUBLE DIODES

The BRIMAR types 6H6G, 6H6GT are indirectly heated double diode valves in which the two sections are entirely separate and screened from each other. With the exception of the heater, all connections are brought out to individual base pins.

RATINGS

Heater Voltage	6.3 volts
Heater Current	0.3 amp.
Peak Inverse Voltage	420 volts max.
Peak Anode Current (each Anode)	48 mA max.
D.C. Heater-Cathode Voltage	330 volts max.

OPERATION AS RECTIFIER

	HALF WAVE	FULL WAVE	
R.M.S. Input per Anode	117	117	volts max.
Supply Impedance per Anode	30	15	ohms min.
Rectified Current	8	8	mA max.

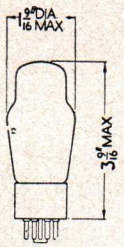
INTER-ELECTRODE CAPACITANCES*

	6H6G	6H6GT	
Anode (1) to Cathode (1)	3.0	3.1	pF
Anode (2) to Cathode (2)	3.4	4.0	pF
Anode (1) to Anode (2)	0.1	0.1	pF max.

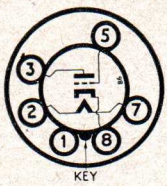
* *With close fitting shield connected to Cathode.*

For characteristic curves refer to type 6AL5.

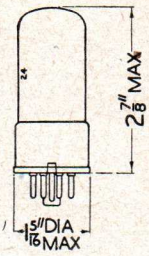
TYPES 6J5G, 6J5GT
(OCTAL BASE)



6J5G.



Note.—Type 6J5GT has Pin 1 connected to metal shell.



6J5GT.

GENERAL PURPOSE TRIODES

The BRIMAR types 6J5G, 6J5GT are indirectly heated triodes of medium amplification factor for use as oscillators or amplifiers in electronic equipment. With the exception of their inter-electrode capacitances and overall dimensions types 6J5G and 6J5GT are identical.

RATINGS

Heater Voltage ...	6.3 volts
Heater Current...	0.3 amp.
Anode Voltage	300 volts max.
Anode Dissipation	2.5 watts max.
Cathode Current	20 mA max.

OPERATING CHARACTERISTICS

Anode Voltage	100	250	volts
Anode Current	10.6	9.0	mA
Control Grid Voltage	0	−8	volts
Anode Impedance	8,000	7,700	ohms
Mutual Conductance	2.5	2.6	mA/V
Amplification Factor	20	20	

OPERATION AS RESISTANCE COUPLED AMPLIFIER

Anode Supply Voltage	100	200	300	volts
Anode Load Resistor	0.1	0.1	0.1	meg.
Cathode Bias Resistor	4,000	3,000	2,500	ohms
Peak Output	17	34	56	volts
Voltage Gain	13	14	14	

INTER-ELECTRODE CAPACITANCES*

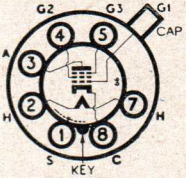
	6J5G	6J5GT	
Input (Control Grid to all except Anode)	3.8	4.2	pF
Output (Anode to all except Control Grid)	4.5	5.0	pF
Control Grid to Anode	4.0	5.0	pF

** With close fitting shield connected to Cathode.*

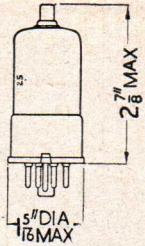
For characteristic curves refer to type 6SN7GT.

6J7G.

TYPES 6J7G, 6J7GT
(OCTAL BASE)



Note.—Type 6J7GT has Pin 1 connected to metal shell.



6J7GT.

R.F. PENTODES

The BRIMAR types 6J7G, 6J7GT are indirectly heated pentode amplifier valves suitable for use in A.C., A.C./D.C. or car radio equipment. With the exception of their overall dimensions the two types are identical.

RATINGS

Heater Voltage	6.3 volts
Heater Current	0.3 amp.
Anode Voltage	300 volts max.
Anode Dissipation	0.75 watts max.
Screen (G2) Voltage	125 volts max.
Screen Dissipation	0.1 watts max.

OPERATING CHARACTERISTICS [Suppressor Grid (G3) connected to Cathode].

Anode Voltage	100	250	volts
Anode Current	2.0	2.0	mA
Screen Voltage	100	100	volts
Screen Current	0.5	0.5	mA
Control Grid (G1) Voltage	–3	–3	volts
Anode Impedance	1.0	1.5	meg.
Mutual Conductance	1.1	1.25	mA/V
Control Grid Bias (For Anode current cut-off)	–7	–7	volts

OPERATION AS RESISTANCE COUPLED AMPLIFIER (G3 connected to Cathode)

Anode and Screen Supply Voltage	100	200	300	volts
Anode Load Resistor	0.25	0.25	0.25	meg.
Screen Series Resistor	1.0	1.0	1.2	meg.
Cathode Bias Resistor	2,500	1,500	1,200	ohms
Peak Output	35	70	100	volts
Voltage Gain	90	120	140	

OPERATION AS A TRIODE (G2, G3 connected to Anode).

For operating characteristics see type 6C5G.

OPERATION AS ANODE BEND DETECTOR (G3 connected to Cathode).

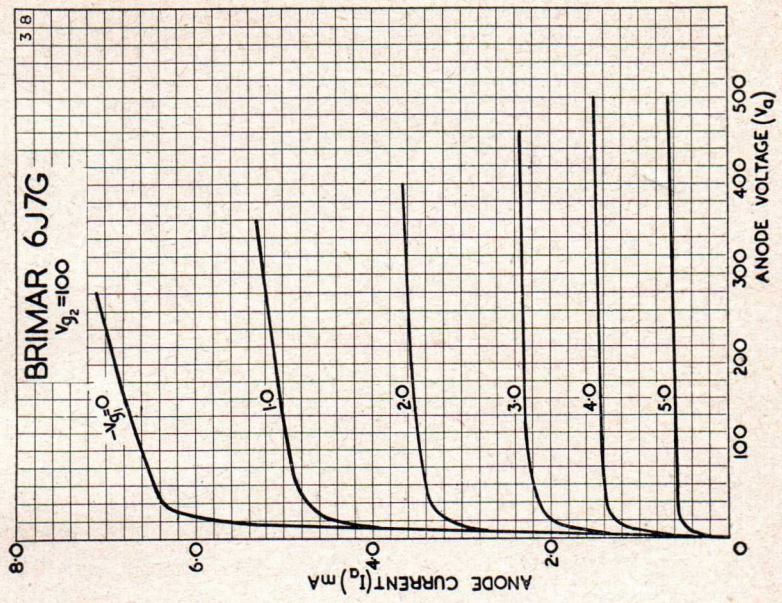
Anode Supply Voltage	100	250	volts
Anode Load Resistor	0.25	0.5	meg.
Screen Series Resistor	2.5	4.7	meg.
Cathode Bias Resistor	10,000	10,000	ohms
R.M.S. Input	1.6	1.4	volts*
Peak Output	17	17	volts*

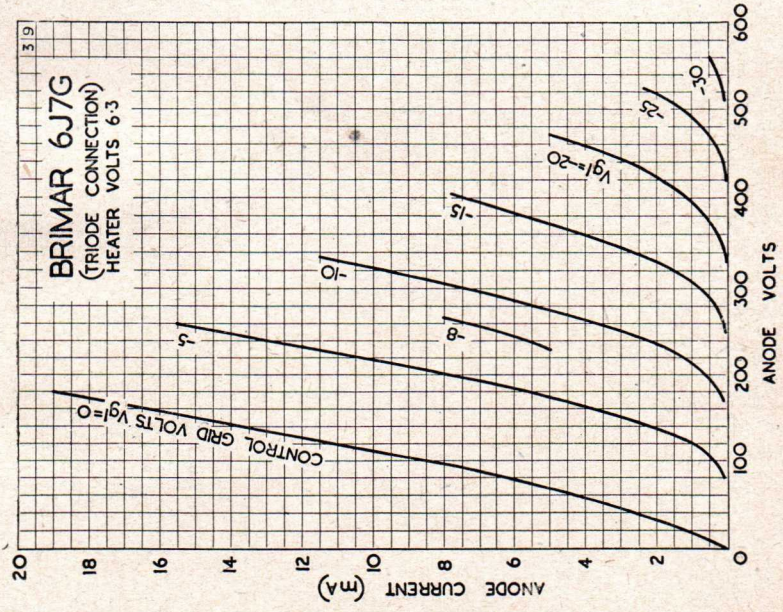
* *For R.M.S. Input modulated 20 per cent.*

INTER-ELECTRODE CAPACITANCES†

Input (Control Grid to all except Anode)	4.6 pF
Output (Anode to all except Control Grid)	12 pF
Control Grid to Anode	.007 pF max.

† *With close fitting shield connected to Cathode.*


3.8
BRIMAR 6J7G
V_{g_2}=100
$-V_{g_1}$=0
1.0
2.0
3.0
4.0
5.0
ANODE CURRENT (I_a) mA
ANODE VOLTAGE (V_a)


3.9
BRIMAR 6J7G
(TRIODE CONNECTION)
HEATER VOLTS 6.3
CONTROL GRID VOLTS V_{g1}=0
-5
-10
-15
-20
-25
-30
ANODE CURRENT (mA)
ANODE VOLTS

6K5G
6K6G

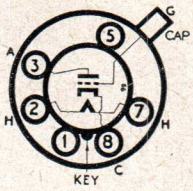
Obsolete Type

For Reference Only

TYPE **6K5G**

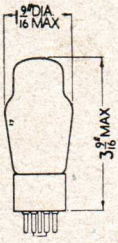
(OCTAL BASE)

HIGH MU TRIODE



CHARACTERISTICS

Heater Voltage		6.3 volts
Heater Current		0.3 amp.
Anode Voltage	100	250 volts
Anode Current	0.35	1.1 mA
Control Grid Voltage	–1.5	–3 volts
Anode Impedance	78,000	50,000 ohms
Mutual Conductance	0.9	1.4 mA/V
Amplification Factor	70	70

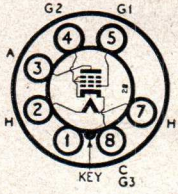


Replacement Type

TYPE **6K6G**

(OCTAL BASE)

POWER PENTODE



RATINGS

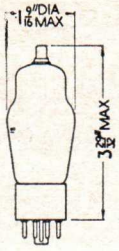
Heater Voltage	6.3 volts
Heater Current	0.4 amp.
Anode Voltage	315 volts max.
Anode Dissipation	8.5 watts max.
Screen (G2) Voltage	285 volts max.
Screen Dissipation	2.8 watts max.

OPERATING CHARACTERISTICS

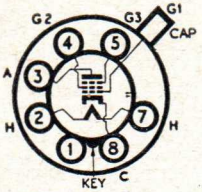
Anode Voltage	100	250	315	volts
Anode Current	9.0	32	25.5	mA
Screen Voltage	100	250	285	volts
Screen Current (Zero Signal)	1.6	5.5	4.0	mA
Screen Current (Max. Signal)	3.0	10	9.0	mA
Control Grid Voltage	–7	–18	–21	volts
Cathode Bias Resistor	600	500	700	ohms
Anode Impedance	100,000	68,000	75,000	ohms
Mutual Conductance	1.5	2.3	2.1	mA/V
Optimum Load	12,000	8,000	9,000	ohms
Power Output	0.35	3.4	4.5	watts
Harmonic Distortion	11	11	15	per cent.

BRIMAR

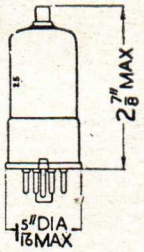
TYPES 6K7G, 6K7GT (OCTAL BASE)



6K7G.



Note.—Type 6K7GT has Pin 1 connected to metal shell.



6K7GT.

VARI-MU R.F. PENTODES

The BRIMAR types 6K7G, 6K7GT are indirectly heated pentodes of the vari-mu (remote cut-off) type for use in the R.F. or I.F. stages of radio equipment.

RATINGS

Heater Voltage	6.3 volts
Heater Current	0.3 amp.
Anode Voltage	300 volts max.
Anode Dissipation	2.75 watts max.
Screen (G2) Voltage	125 volts max.
Screen Dissipation	0.35 watts max.

OPERATING CHARACTERISTICS

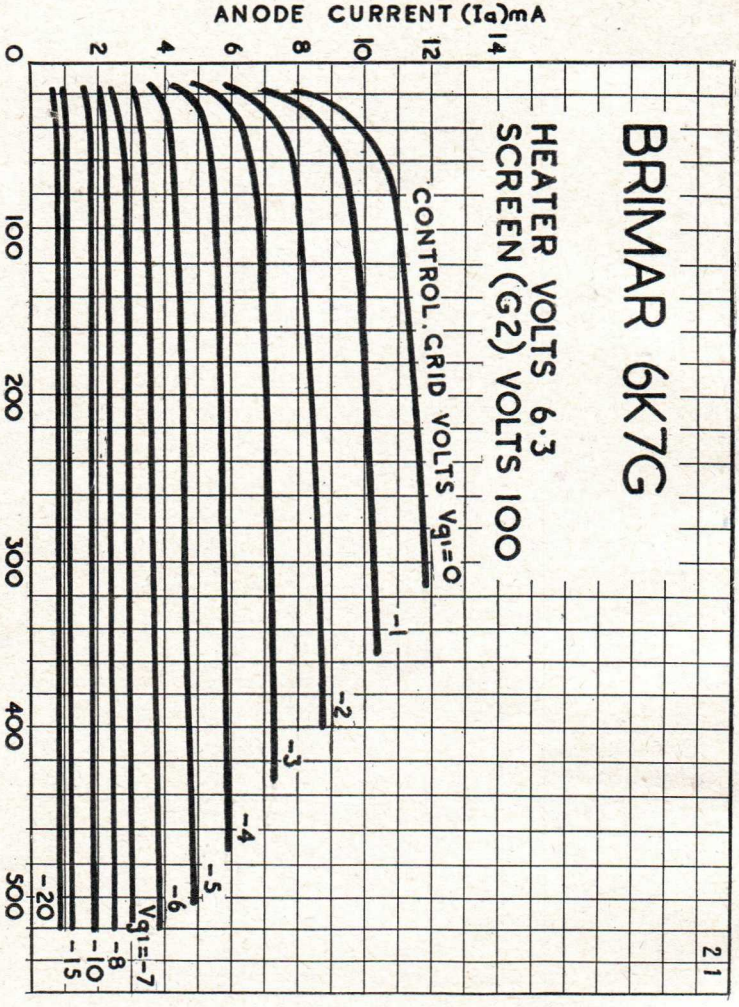
[Suppressor Grid (G3) connected to Cathode].

Anode Voltage	100	180	250	250	volts
Anode Current	9.5	4.0	7.0	10.5	mA
Screen Voltage	100	75	100	125	volts
Screen Current	2.7	1.0	1.7	2.6	mA
Control Grid (G1) Voltage	–1	–3	–3	–3	volts
Cathode Bias Resistor	–	600	330	220	ohms
Anode Impedance	0.15	1.0	0.8	0.6	meg.
Mutual Conductance	1.65	1.1	1.45	1.65	mA/V
Control Grid Voltage (For mutual conductance of .002 mA/V)	–38	–32	–42	–52	volts

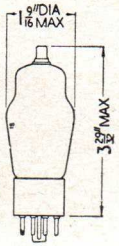
INTER-ELECTRODE CAPACITANCES*

	6K7G	6K7GT	
Input (Control Grid to all except Anode)	5	4.6	pF
Output (Anode to all except control Grid)	12	12	pF
Control Grid to Anode	0.007	0.005	pF max.

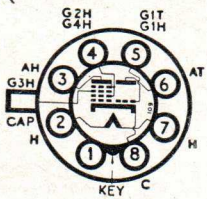
* *With close fitting shield connected to Cathode.*


BRIMAR 6K7G
HEATER VOLTS 6·3
SCREEN (G2) VOLTS 100
ANODE CURRENT (Ia) mA
ANODE VOLTS (Va)
CONTROL GRID VOLTS Vg1=0
-1
-2
-3
-4
-5
-6
Vg1=-7
-8
-10
-15
-20
0
2
4
6
8
10
12
14
100
200
300
400
500
21

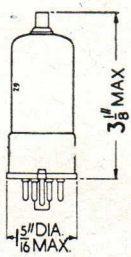
TYPES **6K8G, 6K8GT**
(OCTAL BASE)



6K8G.



Note.—Type 6K8GT has Pin 1 connected to metal shell.



6K8GT.

TRIODE-HEXODE FREQUENCY CHANGERS

The BRIMAR types 6K8G, 6K8GT are indirectly heated triode-hexode frequency changers of advanced design, for use in all-wave receivers. In suitable circuits satisfactory operation may be secured at frequencies higher than 60 Mc/s., whilst the high slope and low capacitances of the triode unit ensure adequate oscillation over a wide wave band. With the exceptions of overall dimensions types 6K8G and 6K8GT have identical characteristics.

RATINGS

Heater Voltage	6.3 volts	Hexode Screen (G2, G4) Volt.	150 volts max.
Heater Current	0.3 amp.	Hexode Screen Dissipation	0.7 watts max.
Hexode Anode (Ah) Voltage	300 volts max.	Triode Anode (At) Voltage	125 volts max.
Hexode Anode Dissipation	0.75 watts max.	Triode Anode Dissipation	0.75 watts max.

Total Cathode Current ... 16 mA max.

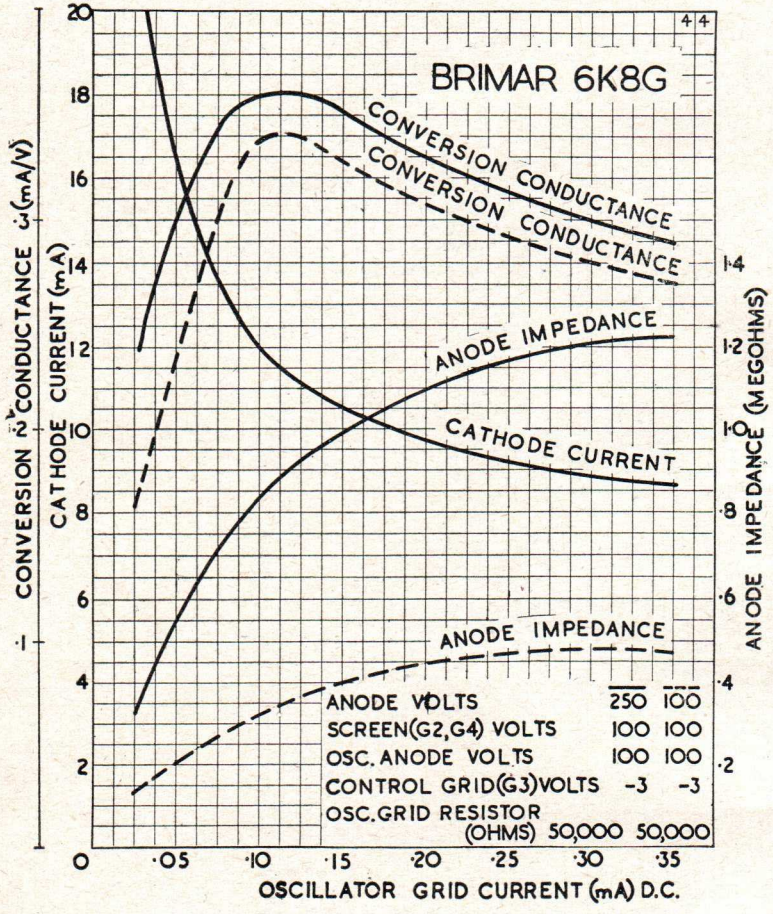
OPERATION AS FREQUENCY CHANGER

Hexode Anode Voltage	100	250	volts
Hexode Anode Current	2.3	2.5	mA
Hexode Screen Voltage	100	100	volts
Hexode Screen Current	6.2	6.0	mA
Hexode Control Grid (G3) Voltage	−3	−3	volts
Cathode Bias Resistor	220	300	ohms
Hexode Anode Impedance	0.4	0.6	meg.
Triode Anode Supply Voltage	100	250	volts
Triode Anode Voltage	100	100	volts
Triode Anode Resistor	—	40,000	ohms
Triode Anode Current	3.8	3.8	mA
Triode Grid (G1) Resistor	50,000	50,000	ohms
Triode Grid Current	0.15	0.15	mA
Conversion Conductance	0.33	0.36	mA/V
Hexode Control Grid Voltage ... ... (For conversion of 0.002 mA/V)	−30	−30	volts

INTER-ELECTRODE CAPACITANCES*

R.F. Input (G3 to all except Ah)	4.6	pF
I.F. Output (Ah to all except G3)	4.8	pF
Oscillator Input (G1 to all except At)	6.5	pF
Oscillator Output (At to all except G1)	3.4	pF
Control Grid (G3) to Oscillator Grid (G1)	0.2	pF max.
Control Grid (G3) to Oscillator Anode (At)	0.05	pF max.
Control Grid (G3) to Hexode Anode (Ah)	0.08	pF max.
Oscillator Grid (G1) to Oscillator Anode (At)	1.8	pF

** With close fitting shield connected to Cathode.*

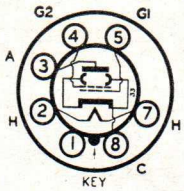

BRIMAR 6K8G
CONVERSION CONDUCTANCE
CONVERSION CONDUCTANCE
ANODE IMPEDANCE
CATHODE CURRENT
ANODE IMPEDANCE
CONVERSION CONDUCTANCE (mA/V)
CATHODE CURRENT (mA)
ANODE IMPEDANCE (MEGOHMS)
OSCILLATOR GRID CURRENT (mA) D.C.
ANODE VOLTS 250 100
SCREEN(G2,G4) VOLTS 100 100
OSC. ANODE VOLTS 100 100
CONTROL GRID(G3)VOLTS -3 -3
OSC.GRID RESISTOR (OHMS) 50,000 50,000

TYPE **6L6G**

(OCTAL BASE)

OUTPUT

BEAM TETRODE



The BRIMAR type 6L6G is an indirectly heated beam power tetrode for use in the output stages of large audio equipment. Owing to the special construction only a small proportion of odd harmonics are produced and in push-pull connection large outputs may be obtained without distortion.

RATINGS

Heater Voltage	6.3 volts
Heater Current	0.9 amp.
Anode Voltage	360 volts max.
Anode Dissipation	19 watts max.
Screen (G2) Voltage	270 volts max.
Screen Dissipation	2.5 watts max.

OPERATING CHARACTERISTICS

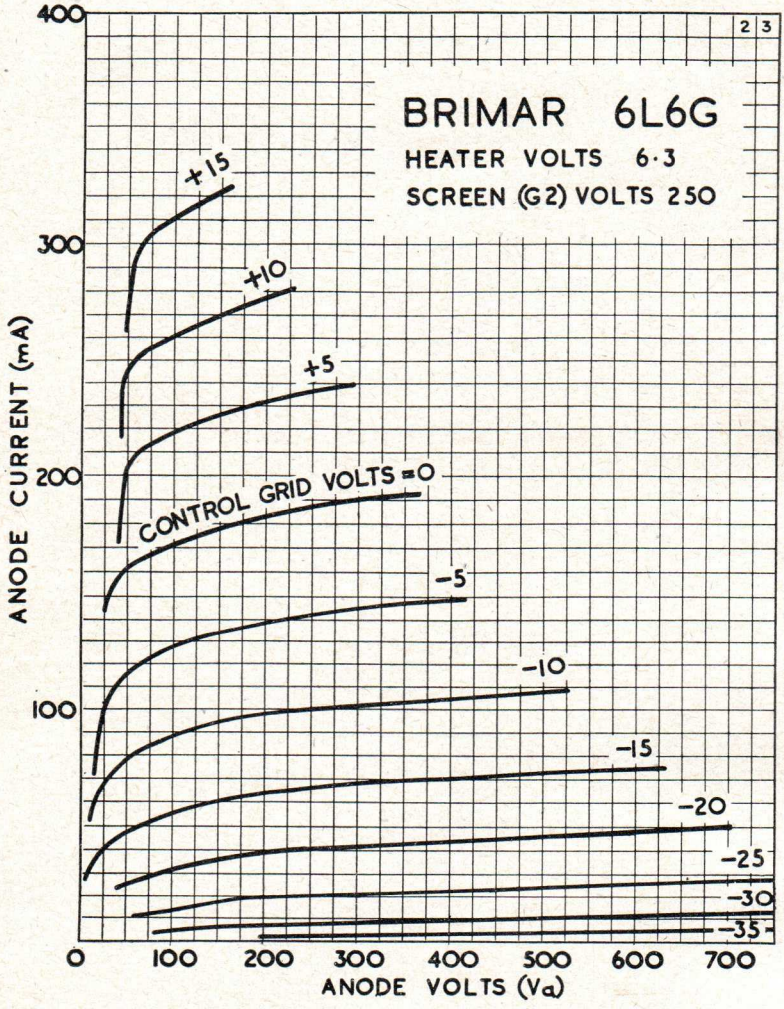
	CLASS A			CLASS AB1	
	Single Valve		Push Pull (2 valves)	Push Pull (2 valves)	
Anode Voltage	250	350	250	360	volts
Anode Current (Zero Signal)	72	54	120	88	mA
Anode Current (Max. Signal)	79	66	140	100	mA
Screen Voltage	250	250	250	270	volts
Screen Current (Zero Signal)	5.0	2.5	10	5	mA
Screen Current (Max. Signal)	7.3	7.0	16	17	mA
Control Grid (G1) Voltage	–14	–18	–16	–22.5	volts
Cathode Bias Resistor	170	300	125	250	ohms
Anode Impedance	22,500	33,000	25,000	–	ohms
Mutual Conductance	6.0	5.2	5.5	–	mA/V
Optimum Load	2,500	4,200	5,000	9,000	ohms
Power Output	6.5	11	14	24	watts
Harmonic Distortion	10	15	2	4	per cent.

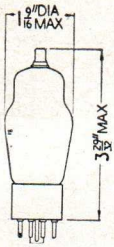
OPERATION AS TRIODE (G2 connected to Anode). CLASS A. PUSH PULL (2 valves).

Anode Voltage	325 volts
Anode Current	80 mA
Cathode Bias Resistor	375 ohms
Optimum Load	8,000 ohms
Power Output	6 watts
Harmonic Distortion	0.6 per cent.

INTER-ELECTRODE CAPACITANCES

Input (G1 to all except Anode)	11.5 pF
Output (Anode to all except G1)	8.5 pF
Control Grid to Anode	0.7 pF


2 3
BRIMAR 6L6G
HEATER VOLTS 6·3
SCREEN (G2) VOLTS 250
+15
+10
+5
CONTROL GRID VOLTS =0
-5
-10
-15
-20
-25
-30
-35
400
300
200
100
0
100
200
300
400
500
600
700
ANODE CURRENT (mA)
ANODE VOLTS (Va)



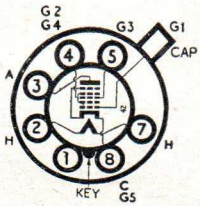
Replacement Type

TYPE **6L7G**

(OCTAL BASE)

PENTAGRID

MIXER AMPLIFIER



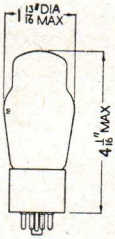
CHARACTERISTICS AS MIXER (WITH SEPARATE OSCILLATOR).

Heater Voltage		6.3 volts
Heater Current		0.3 amp.
Anode Voltage	250	250 volts
Anode Current	2.4	3.3 mA
Screen (G2,G4) Voltage	100	150 volts
Screen Current	7.1	9.2 mA
Control Grid (G1) Voltage	–3	–6 volts min.
Oscillator Grid (G3) Peak Voltage	12	18 volts min.
Anode Impedance	1.0	1.0 meg. min.
Conversion Conductance	0.37	0.35 mA/V
Control Grid (G1) Voltage (For Conversion of 0.005 mA/V)	–30	–45 volts

CHARACTERISTICS AS AMPLIFER

Anode Voltage	250 volts
Anode Current	5.3 mA
Screen (G2, G4) Voltage	100 volts
Screen Current	6.5 mA
Control Grid (G1) Voltage	–3 volts
Control Grid (G3) Voltage	–3 volts
Anode Impedance	0.6 meg.
Mutual Conductance (G1 to Anode)	1.1 mA/V
Mutual Conductance (G3 to Anode)	0.3 mA/V
Control Grid (G1) Voltage	–30 volts*
Control Grids (G1 and G3) Voltage	–15 volts*

* *For Anode Current cut-off.*



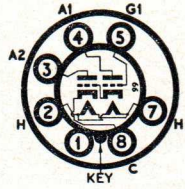
Replacement Type

TYPE **6N6G**

(OCTAL BASE)

DIRECT COUPLED

POWER AMPLIFIER



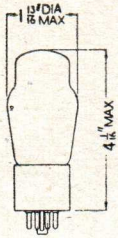
CHARACTERISTICS

Heater Voltage	6.3 volts	Grid (G1) Voltage	0 volts†
Heater Current	0.8 amp.	Peak Input Voltage	21 volts
Input Anode (A1) Voltage	300 volts	Anode Impedance	24,000 ohms
Input Anode Current	9.0 mA	Mutual Conductance	2.4 mA/V
Output Anode (A2) Voltage	300 volts	Optimum Load	7,000 ohms
Output Anode Current	42 mA	Power Output	4 watts

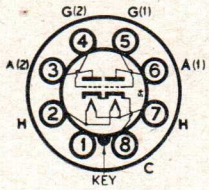
† *The bias for operation of the* 6N6G *is developed within the valve.*

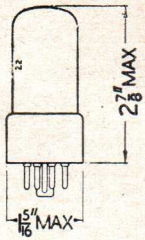
Replacement Types

TYPES 6N7G, 6N7GT



6N7G.





6N7GT.

DOUBLE TRIODES

RATINGS

Heater Voltage	6.3 volts
Heater Current	0.8 amp.
Anode Voltage	300 volts max.
Peak Anode Current (per Anode)	125 mA max.
Anode Dissipation (per Anode)	5.5 watts max.

OPERATING CHARACTERISTICS

	Each Section (Class A)	Both Sections (Class B)	
Anode Voltage	250	300	volts
Anode Current (Zero Signal)	3.0	35	mA
Anode Current (Max. Signal)	–	70	mA
Grid Voltage	–5	0	volts
Cathode Bias Resistor	1,000	–	ohms
Anode Impedance	23,000	–	ohms
Mutual Conductance	1.6	–	mA/V
Amplification Factor	35	–	–
Peak Input (Grid—Grid)	–	82	volts
Peak Grid Current (Each Section)	–	22	mA
Optimum Load	30,000	8,000	ohms*
Power Output	0.2	10	watts

* *Anode to Anode load.*

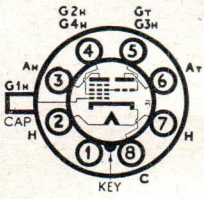
Obsolete Type

For Reference Only

TYPE 6P8G

(OCTAL BASE)

TRIODE-HEXODE FREQUENCY CHANGER

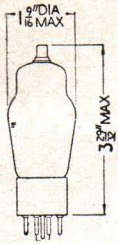


Heater Voltage	6.3 volts
Heater Current	0.8
Anode Voltage	250 volts
Anode Current	2.2 mA
Screen (G2, G4) Voltage	80 volts
Screen Current	3.0 mA
Control Grid (G1) Voltage	–3 volts
Cathode Bias Resistor	200 ohms

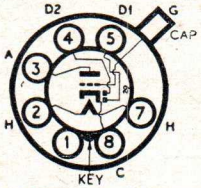
Triode Anode Voltage	100 volts
Triode Anode Resistor	70,000 ohms
Triode Anode Current	2.3 mA
Triode Grid (G1) Resistor	50,000 ohms
Triode Grid Current	0.25 mA
Anode Impedance	0.7 meg.
Conversion Conductance	0.65 mA/V

TYPES 6Q7G, 6Q7GT

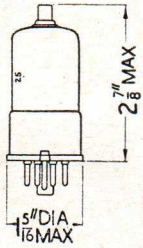
(OCTAL BASE)



6Q7G.



Note.—Type 6Q7GT has Pin 1 connected to metal shell.



6Q7GT.

DOUBLE DIODE TRIODES

The BRIMAR types 6Q7G, 6Q7GT are indirectly heated double diode triodes suitable for use as detector, A.V.C. and L.F. amplifiers in radio equipment. With the exception of their overall dimensions and inter-electrode capacitances, types 6Q7G and 6Q7GT have identical characteristics.

RATINGS

Heater Voltage	6.3 volts
Heater Current	0.3 amp.
Anode Voltage	300 volts max.
Grid Voltage	0 volts min.

OPERATING CHARACTERISTICS

Anode Voltage	100	250	volts
Anode Current	0.35	1.0	mA
Grid Voltage	–1.5	–3	volts
Anode Impedance	88,000	58,000	ohms
Mutual Conductance	0.8	1.2	mA/V
Amplification Factor	70	70	

OPERATION AS RESISTANCE COUPLED AMPLIFIER

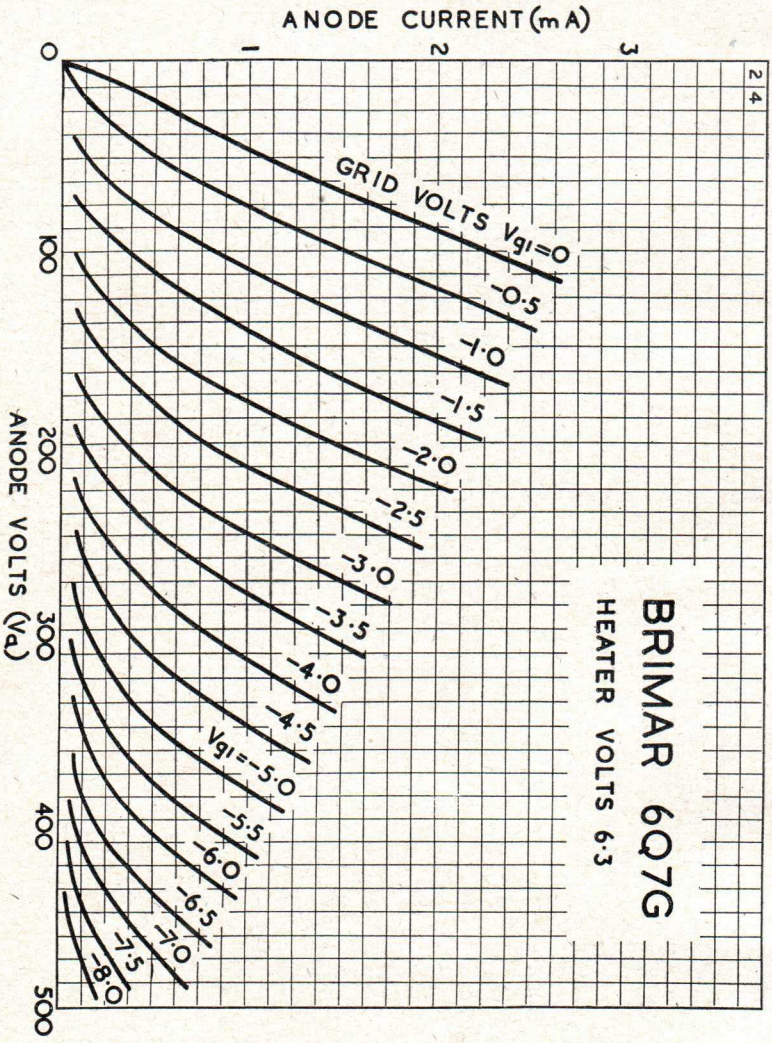
Anode Supply Voltage	100	250	250	volts
Anode Load Resistor	0.5	0.25	0.25	meg.
Grid Resistor	1.0	1.0	10	meg.
Cathode Bias Resistor	9,000	3,000	0	ohms
Peak Output	16	43	40	volts
Stage Gain*	33	42	42	
Harmonic Distortion*	2	1	5	per cent.

* *Figures are for 12 volt peak output.*

INTER-ELECTRODE CAPACITANCES†

	6Q7G	6Q7GT
Grid to Cathode	3.0	2.0 pF
Anode to Cathode	5.0	5.0 pF
Grid to Anode	1.5	1.6 pF
Diode (1 or 2) to Cathode	2.2	2.1 pF

† *With close fitting shield connected to Cathode.*

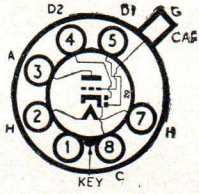

ANODE CURRENT (mA)
0
1
2
3
24
ANODE VOLTS (Va)
0
100
200
300
400
500
GRID VOLTS Vg1=0
-0·5
-1·0
-1·5
-2·0
-2·5
-3·0
-3·5
-4·0
-4·5
Vg1=-5·0
-5·5
-6·0
-6·5
-7·0
-7·5
-8·0
BRIMAR 6Q7G
HEATER VOLTS 6·3

Replacement Type

TYPE **6R7G**

(OCTAL BASE)

DOUBLE DIODE TRIODE



The BRIMAR type 6R7G is an indirectly heated double diode triode suitable for use as detector, A.V.C. and 1st A.F. valve in radio receivers. The triode section has a medium amplification factor together with a low anode impedance and may be used as an output valve for headphone operation.

RATINGS

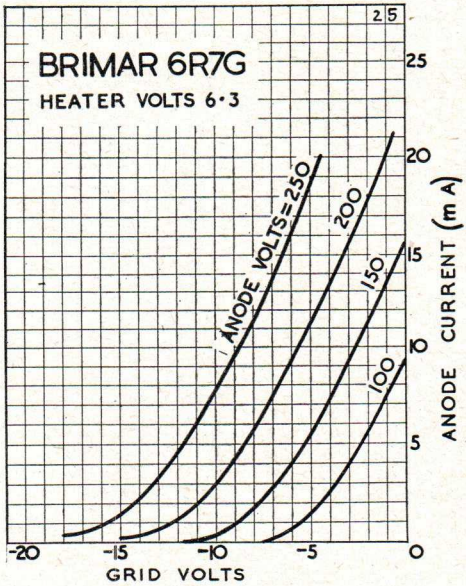
Heater Voltage	6.3 volts
Heater Current	0.3 amp.
Anode Voltage	250 volts max.
Anode Dissipation	2.5 watts max.

OPERATING CHARACTERISTICS

Anode Voltage ...	250 volts
Anode Current ...	9.5 mA
Control Grid Voltage	–9 volts
Anode Impedance ...	8,500 ohms
Mutual Conductance	1.9 mA/V
Amplification Factor	16

OPERATION AS RESISTANCE COUPLED AMPLIFIER

Anode Supply Voltage	250 volts
Anode Load Resistor	0.1 meg.
Cathode Bias Resistor	400 ohms
Peak Output... ...	60 volts
Voltage Gain ...	10

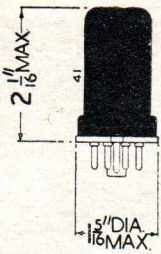


INTER-ELECTRODE CAPACITANCES*

Input (G to all except Anode)	2.6 pF
Output (Anode to all except G)	5.2 pF
Control Grid to Anode	2.4 pF

* *With close fitting shield connected to Cathode.*

6SG7
6SH7



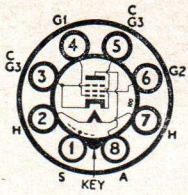
Replacement Type

TYPE **6SG7**

(OCTAL BASE)

SEMI-VARI-MU

R.F. PENTODE



RATINGS

Heater Voltage ...	6.3 volts
Heater Current ...	0.3 amp.
Anode Voltage ...	300 volts max.
Anode Dissipation	3 watts max.
Screen (G2) Voltage	200 volts max.
Screen Dissipation	0.6 watts max.

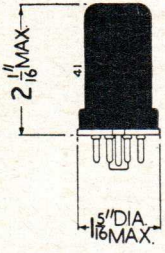
OPERATING CHARACTERISTICS

Anode Voltage ...	100	250	volts
Anode Current ...	8.2	9.2	mA
Screen Voltage	100	150	volts
Screen Current	3.2	3.4	mA
Control Grid (G1) Voltage	−1	−2.5	volts
Anode Impedance	0.25	1.0	meg.
Mutual Conductance	4.1	4.0	mA/V
Control Grid Voltage ...	−11.5	−17.5	volts

(For Mutual Conductance of 0.04 mA/V).

INTER-ELECTRODE CAPACITANCES

Input (G1 to all except Anode)	8.5 pF
Output (Anode to all except G1)	7.0 pF
Control Grid (G1) to Anode ...	0.003 pF max.

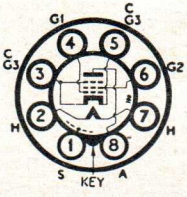


Replacement Type

TYPE **6SH7**

(OCTAL BASE)

R.F. PENTODE



RATINGS

Heater Voltage ...	6.3 volts
Heater Current ...	0.3 amp.
Anode Voltage ...	300 volts max.
Anode Dissipation	3 watts max.
Screen (G2) Voltage	150 volts max.
Screen Dissipation	0.7 watts max.

OPERATING CHARACTERISTICS

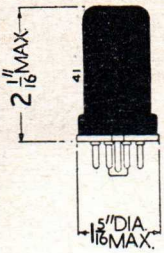
Anode Voltage ...	100	250	volts
Anode Current ...	5.3	10.8	mA
Screen Voltage	100	150	volts
Screen Current	2.1	4.1	mA
Control Grid (G1) Voltage	−1	−1	volts
Anode Impedance	0.35	0.9	meg.
Mutual Conductance	4.0	4.9	mA/V
Control Grid Voltage ...	−4	−5.5	volts

(For Anode current cut-off)

INTER-ELECTRODE CAPACITANCES

Input (G1 to all except Anode)	8.5 pF
Output (Anode to all except G1)	7.0 pF
Control Grid (G1) to Anode ...	0.003 pF max.

BRIMAR

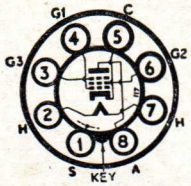


Replacement Type

TYPE **6SJ7**

(OCTAL BASE)

R.F. PENTODE



RATINGS

Heater Voltage	6.3 volts
Heater Current	0.3 amp.
Anode Voltage	300 volts max.
Anode Dissipation	2.5 watts max.
Screen (G2) Voltage	125 volts max.
Screen Dissipation	0.3 watts max.

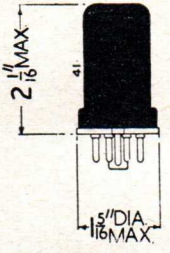
OPERATING CHARACTERISTICS

(G3 connected to Cathode)

Anode Voltage	100	250 volts
Anode Current	2.9	3.0 mA
Screen Voltage	100	100 volts
Screen Current	0.9	0.8 mA
Control Grid (G1) Voltage	−3	−3 volts
Anode Impedance	0.7	1.0 meg. min.
Mutual Conductance	1.6	1.6 mA/V
Control Grid Voltage ... ... (For anode current cut-off)	−8	−8 volts

INTER-ELECTRODE CAPACITANCES

Input (G1 to all except Anode)	6.0 pF
Output (Anode to all except G1)	7.0 pF
Control Grid (G1) to Anode	0.005 pF max.

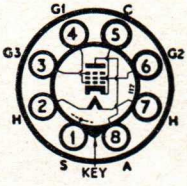


Replacement Type

TYPE **6SK7**

(OCTAL BASE)

VARI-MU R.F. PENTODE



RATINGS

Heater Voltage	6.3 volts
Heater Current	0.3 amp.
Anode Voltage	300 volts max.
Anode Dissipation	4.0 watts max.
Screen (G2) Voltage	125 volts max.
Screen Dissipation	0.4 watts max.

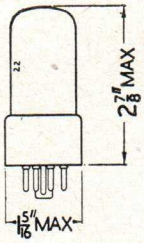
OPERATING CHARACTERISTICS

(G3 connected to Cathode)

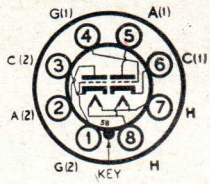
Anode Voltage	100	250 volts
Anode Current	13	9.2 mA
Screen Voltage	100	100 volts
Screen Current	4.0	2.6 mA
Control Grid (G1) Voltage	−1	−3 volts
Anode Impedance	0.1	0.8 meg.
Mutual Conductance	2.3	2.0 mA/V
Control Grid Voltage ... ... (For Mutual Conductance of 0.005 mA/V).	−35	−35 volts

INTER-ELECTRODE CAPACITANCES

Input (G1 to all except Anode)	6.0 pF
Output (Anode to all except G1)	7.0 pF
Control Grid (G1) to Anode	0.003 pF max.



TYPE **6SL7GT**
(OCTAL BASE)
HIGH-MU
DOUBLE TRIODE
(Separate Cathodes)



The BRIMAR type 6SL7GT is an indirectly heated valve comprising two high-mu triodes in one envelope. With the exception of the heaters, the connections to each assembly are brought out to separate base pins. Type 6SL7GT may be used as L.F. amplifier or phase inverter and in certain cases the two units may be connected in cascade to give a very high overall gain.

RATINGS

Heater Voltage	6.3 volts
Heater Current	0.3 amp.
Anode Voltage	250 volts max.
Anode Dissipation (each Anode)	1.0 watts max.

OPERATING CHARACTERISTICS (Each Section)

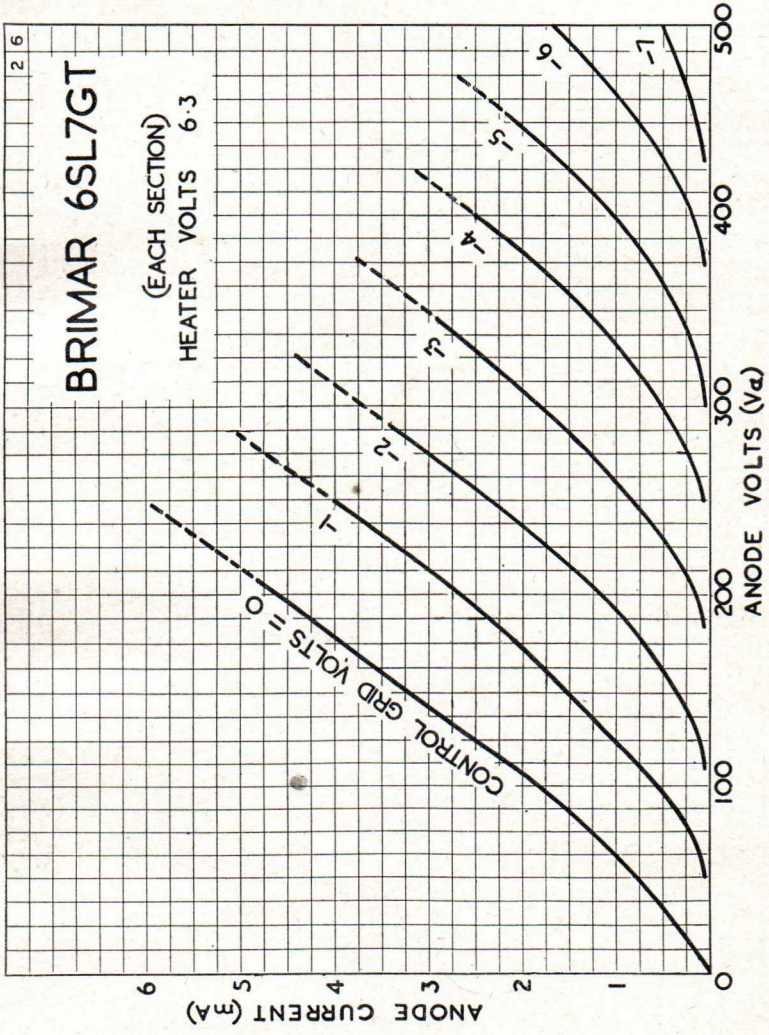
Anode Voltage	250 volts
Anode Current	2.3 mA
Control Grid Voltage	–2 volts
Anode Impedance	44,000 ohms
Mutual Conductance	1.6 mA/V
Amplification Factor	70

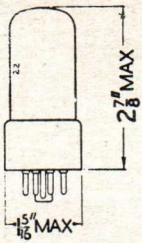
OPERATION AS RESISTANCE COUPLED AMPLIFIER (Each Section)

Anode Supply Voltage	100	250	volts
Anode Load Resistor	0.25	0.25	meg.
Cathode Bias Resistor	4,700	3,300	ohms
Peak Output	21	62	volts
Stage Gain	23	50	

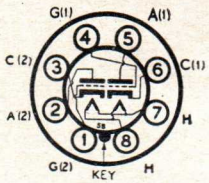
INTER-ELECTRODE CAPACITANCES

	Section (1)	Section (2)	
Input (Grid to all except Anode)	2.15	2.15	pF
Output (Anode to all except Grid)	0.9	0.9	pF
Grid to Anode	3.4	3.5	pF
Anode (1) to Anode (2)	1.4		pF
Grid (1) to Grid (2)	0.25		pF
Grid (1) to Anode (2)	0.45		pF
Grid (2) to Anode (1)	0.35		pF


BRIMAR 6SL7GT
(EACH SECTION)
HEATER VOLTS 6·3
2 6
ANODE CURRENT (mA)
ANODE VOLTS (Va)
CONTROL GRID VOLTS = 0
-1
-2
-3
-4
-5
-6
-7
0
100
200
300
400
500
1
2
3
4
5
6



TYPE 6SN7GT
(OCTAL BASE) LOW-MU DOUBLE TRIODE
(Separate Cathodes)



The BRIMAR type 6SN7GT is an indirectly heated valve comprising two general purpose triodes in one envelope. With the exception of the heaters, the connections to each assembly are brought out to separate base pins. Type 6SN7GT may be used as oscillator, L.F. amplifier, phase inverter, etc., or the two units may be connected in cascade to give a high overall gain. The operating characteristics of each section are identical to those of type 6J5GT.

RATINGS

Heater Voltage	6.3 volts
Heater Current	0.6 amp.
Anode Voltage	300 volts max.
Anode Dissipation (Each Anode)	2.5 watts max.
Average Grid Current	1.0 mA max.

OPERATING CHARACTERISTICS (Each Section)

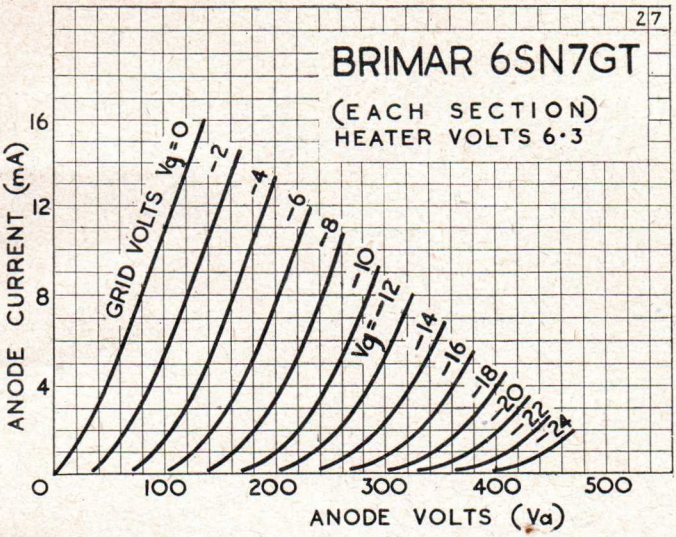
Anode Voltage	100	250 volts
Anode Current	10.6	9.0 mA
Control Grid Voltage	0	−8 volts
Cathode Bias Resistor	–	1,100 ohms
Anode Impedance	8,000	7,700 ohms
Mutual Conductance	2.5	2.6 mA/V
Amplification Factor	20	20

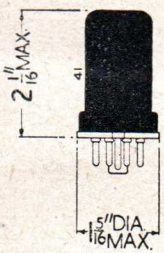
OPERATION AS RESISTANCE COUPLED AMPLIFIER (Each Section)

Anode Supply Voltage	100	200	300 volts
Anode Load Resistor	0.05	0.1	0.25 meg.
Cathode Bias Resistor	2,500	3,300	6,000 ohms
Peak Output	17	38	57 volts
Voltage Gain	13	14	14

INTER-ELECTRODE CAPACITANCES

	Section (1)	Section (2)
Input (Grid to all except Anode)	2.6	2.6 pF
Output (Anode to all except Grid)	0.8	0.8 pF
Grid to Anode	4.0	4.1 pF
Anode (1) to Anode (2)	0.5	pF
Grid (1) to Grid (2)	0.1	pF
Grid (1) to Anode (2)	0.2	pF
Grid (2) to Anode (1)	0.2	pF



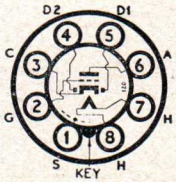


Replacement Type

TYPE **6SQ7**

(OCTAL BASE)

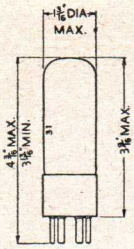
DOUBLE DIODE TRIODE



CHARACTERISTICS

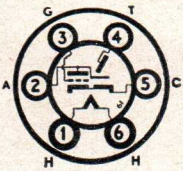
Heater Voltage	6.3 volts
Heater Current	0.3 amp.
Anode Voltage	250 volts
Anode Current	0.9 mA
Control Grid Voltage	−2 volts
Cathode Bias Resistor	2,500 ohms
Anode Impedance	91,000 ohms
Mutual Conductance	1.10 mA/V
Amplification Factor	100

6U5/6G5
6U7G



Replacement Type

TYPE **6U5/6G5**
(U.X. BASE)
" MAGIC EYE "
TUNING INDICATOR

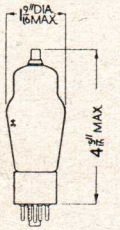


OPERATING CHARACTERISTICS

Heater Voltage	6.3 volts		
Heater Current	0.3 amp.		
Anode and Target (T) Supply Voltage ...	100	200	250 volts
Anode Load Resistor	0.5	1.0	1.0 meg.
Anode Current*	0.19	0.19	0.24 mA
Target Current*	1	3	4 mA approx.
Control Grid Voltage†	−8	−18.5	−22 volts

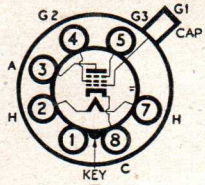
* *For shadow angle of approx. 90°, Control Grid Voltage zero.*

† *For shadow angle of 0°, Anode Current zero.*



Replacement Type

TYPE **6U7G**
(OCTAL BASE)
VARI-MU R.F. PENTODE



OPERATING CHARACTERISTICS

[Suppressor Grid (G3) connected to Cathode]

Heater Voltage		6.3 volts
Heater Current		0.3 amp.
Anode Voltage	100	250 volts
Anode Current	8.0	8.2 mA
Screen (G2) Voltage	100	100 volts
Screen Current	2.2	2.0 mA
Control Grid Voltage	−3	−3 volts
Cathode Bias Resistor	330	330 ohms
Anode Impedance	0.25	0.8 meg.
Mutual Conductance	1.5	1.6 mA/V
Control Grid Bias	−50	−50 volts
(For Mutual Conductance of 0.002 mA/V)		

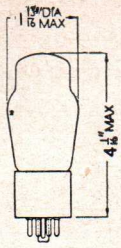
INTER-ELECTRODE CAPACITANCES§

Input (Control Grid to all except Anode)	5 pF
Output (Anode to all except Control Grid)	9 pF
Control Grid to Anode	0.007 pF max.

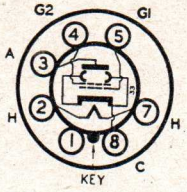
§ *With close fitting shield connected to Cathode.*

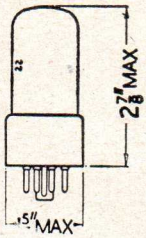
BRIMAR

TYPES **6V6G, 6V6GT**
(OCTAL BASE)



6V6G.





6V6GT.

OUTPUT BEAM TETRODES

The BRIMAR types 6V6G, 6V6GT are indirectly heated beam tetrodes for use in the output stages of radio receivers. The aligned grid construction together with the confining plates employed in these valves ensure high efficiency and very low screen current.

RATINGS

Heater Voltage	6.3 volts
Heater Current	0.45 amp.
Anode Voltage	315 volts max.
Anode Dissipation	12 watts max.
Screen (G2) Voltage	285 volts max.
Screen Dissipation	2.0 watts max.

OPERATING CHARACTERISTICS

	Single Valve Class A		Push Pull Class AB1 (2 valves)	
Anode Voltage	180	250	285	volts
Anode Current (Zero Signal)	29	45	70	mA
Anode Current (Max. Signal)	30	47	92	mA
Screen Voltage	180	250	285	volts
Screen Current (Zero Signal)	3.0	4.5	4.0	mA
Screen Current (Max. Signal)	4.0	7.0	13.5	mA
Control Grid (G1) Voltage	−8.5	−12.5	−19	volts
Cathode Bias Resistor	250	240	250	ohms
Anode Impedance	58,000	52,000	–	ohms
Mutual Conductance	3.7	4.1	–	mA/V
Optimum Load	5,500	5,000	8,000	ohms
Power Output	2.0	4.5	14	watts
Harmonic Distortion	8	8	3.5	per cent.

INTER-ELECTRODE CAPACITANCES

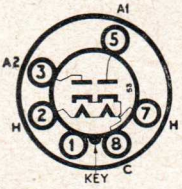
Input (Control Grid to all except Anode)	10.5 pF
Output (Anode to all except Control Grid)	9.2 pF
Control Grid to Anode	1.2 pF
Heater to Cathode	6.0 pF

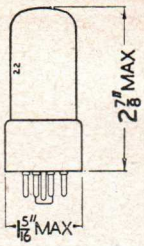
For characteristic curves refer to type 7C5.

TYPES **6X5G, 6X5GT**

(OCTAL BASE)

6X5G.





6X5GT.

FULL WAVE RECTIFIERS

The BRIMAR types 6X5G, 6X5GT are indirectly heated full wave rectifiers for use in equipment where the current drain does not exceed 70 mA.

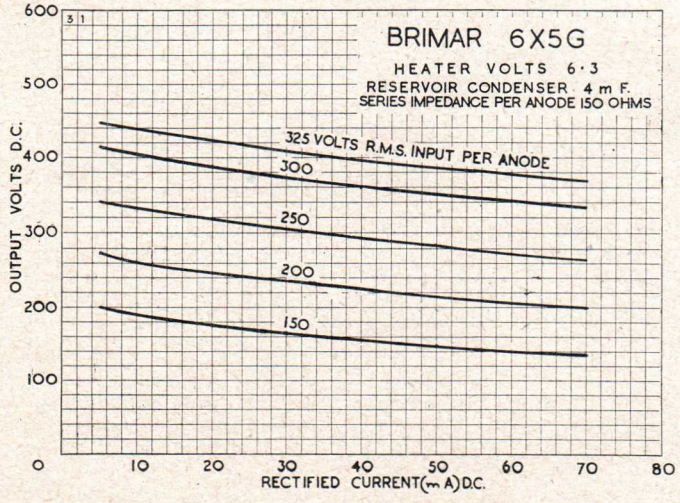
RATINGS

Heater Voltage	6.3 volts
Heater Current	0.6 amp.
Peak Inverse Voltage	1,250 volts max.
Peak Current (Each Anode)	210 mA max.
Heater Cathode Potential	450 volts max.

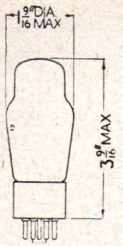
CHARACTERISTICS AS FULL WAVE RECTIFIER

CONDENSER INPUT

R.M.S. Input per Anode	325 volts max.
Supply Impedance per Anode	150 ohms min.
Rectified Current	70 mA max.
Reservoir Condenser	32 μF max.



BRIMAR



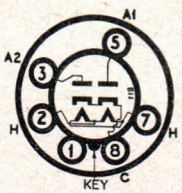
Obsolete Type

For Reference Only

TYPE **6ZY5G**

(OCTAL BASE)

FULL WAVE RECTIFIER



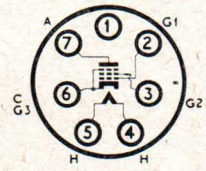
CHARACTERISTICS

Heater Voltage	6.3 volts
Heater Current	0.3 amp.
Peak Inverse Voltage	1,250 volts max.
Peak Current (per Anode)	120 mA max.
Heater Cathode Potential	450 volts max.
R.M.S. Input per Anode	325 volts max.
Rectified Current	40 mA max.

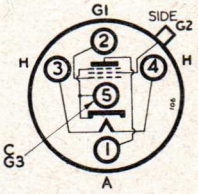
Replacement Type

TYPE **7A2**

(ENGLISH BASE)



7-pin



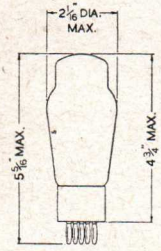
5-pin

OUTPUT PENTODE

CHARACTERISTICS

Heater Voltage	4.0 volts	Grid (G1) Voltage	−16.5 volts
Heater Current	1.2 amp.	Cathode Bias Resistor	410 ohms
Anode Voltage	250 volts	Anode Impedance	80,000 ohms
Anode Current	34 mA	Mutual Conductance	2.35 mA/V
Screen (G2) Voltage	250 volts	Optimum Load	7,000 ohms
Screen Current	6.5 mA	Power Output	3.5 watts

For characteristic curves refer to type 6F6G.



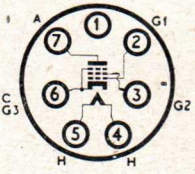
Replacement Type

TYPE **7A3**

(ENGLISH BASE)

HIGH SLOPE

POWER PENTODE

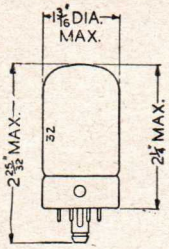


CHARACTERISTICS

Heater Voltage	4.0 volts	Grid (G1) Voltage	−6 volts
Heater Current	2.0 amp.	Cathode Bias Resistor	150 ohms
Anode Voltage	250 volts	Anode Impedance	60,000 ohms
Anode Current	32 mA	Mutual Conductance	10 mA/V
Screen (G2) Voltage	250 volts	Optimum Load	8,500 ohms
Screen Current	6.0 mA	Power Output	3.75 watts

The characteristics of the 7A3 *are similar to those of type* 6AG6G.

7A7
7A8
7B5E

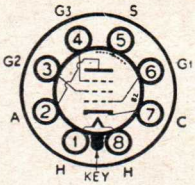


Replacement Type

TYPE **7A7**

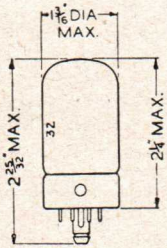
(LOCTAL BASE)

VARI-MU R.F. PENTODE



CHARACTERISTICS

Heater Voltage	... ...	6.3 volts	Grid (G1) Voltage	... ...	−3 volts
Heater Current	... ...	0.3 amp	Cathode Bias Resistor	...	300 ohms
Anode Voltage	... ...	250 volts	Anode Impedance	... ...	0.8 meg.
Anode Current	... ...	8.6 mA	Mutual Conductance	...	2.0 mA/V
Screen (G2) Voltage	... ...	100 volts	Grid (G1) Voltage	... ...	−35 volts
Screen Current	... ...	2.0 mA	(For Mutual Conductance of		0.005 mA/V)



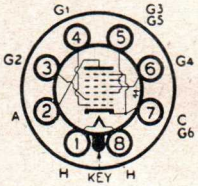
Replacement Type

TYPE **7A8**

(LOCTAL BASE)

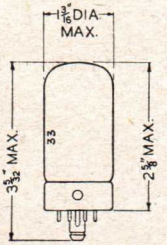
OCTODE

FREQUENCY CHANGER



CHARACTERISTICS

Heater Voltage	... ...	6.3 volts	Oscillator Anode Resistor	...	20,000 ohms
Heater Current	... ...	0.15 amp.	Control Grid (G4) Voltage		−3 volts
Anode Voltage	... ...	250 volts	Cathode Bias Resistor	...	300 ohms
Anode Current	... ...	3.0 mA	Oscillator Grid (G1) Resistor		50,000 ohms
Screen (G3, G5) Voltage	...	100 volts	Oscillator Grid Current	...	0.4 mA
Screen Current	... ...	2.8 mA	Anode Impedance	... ...	0.7 meg.
Osc. Anode (G2) Supply Volt.		250 volts	Conversion Conductance	...	0.6 mA/V

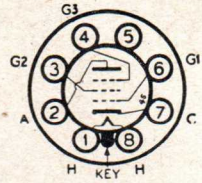


Replacement Type

TYPE **7B5E**

(LOCTAL BASE)

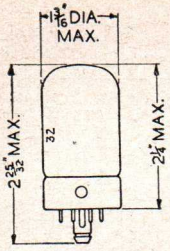
POWER PENTODE



CHARACTERISTICS

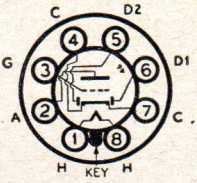
[Suppressor Grid (G3) connected to Cathode].

Heater Voltage	... ...	6.3 volts	Grid (G1) Voltage	... ...	−18 volts
Heater Current	... ...	0.4 amp.	Cathode Bias Resistor	...	500 ohms
Anode Voltage	... ...	250 volts	Anode Impedance	... ...	68,000 ohms
Anode Current	... ...	32 mA	Mutual Conductance	...	2.2 mA/V
Screen (G2) Voltage	... ...	250 volts	Optimum Load	... ...	7,600 ohms
Screen Current	... ...	5.5. mA	Power Output	... ...	3.4 watts



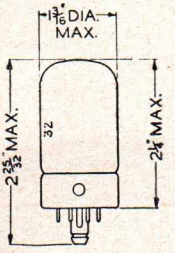
Replacement Type

TYPE **7B6**
(LOCTAL BASE)
DOUBLE DIODE TRIODE



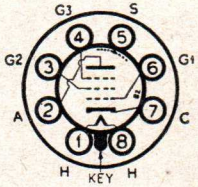
CHARACTERISTICS

Heater Voltage	...	6.3 volts	Grid Voltage ...	...	–2 volts
Heater Current	...	0.3 amp.	Cathode Bias Resistor	...	2,000 ohms
Anode Voltage	...	250 volts	Mutual Conductance	...	1.1 mA/V
Anode Current	...	1.0 mA	Amplification Factor ...	...	100



Replacement Type

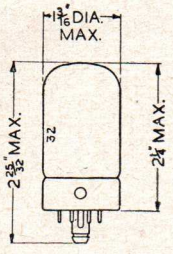
TYPE **7B7**
(LOCTAL BASE)
VARI-MU R.F. PENTODE



CHARACTERISTICS

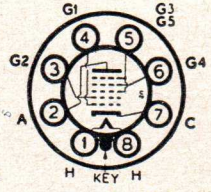
[Suppressor (G3) connected to Cathode]

Heater Voltage	...	6.3 volts	Control Grid (G1) Voltage ...		–3 volts
Heater Current	...	0.15 amp.	Cathode Bias Resistor	...	300 ohms
Anode Voltage	...	250 volts	Anode Impedance ...	...	0.7 meg.
Anode Current	...	8.5 mA	Mutual Conductance	...	1.7 mA/V
Screen (G2) Voltage ...		100 volts	Control Grid Voltage	...	–40 volts
Screen Current	...	2.0 mA	(For Mutual Conductance of 0.005 mA/V)		



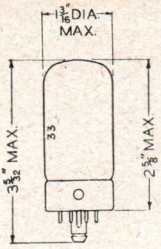
Replacement Type

TYPE **7B8**
(LOCTAL BASE)
HEPTODE
FREQUENCY CHANGER



CHARACTERISTICS

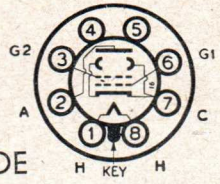
Heater Voltage	...	6.3 volts	Oscillator Anode Current	...	4.0 mA
Heater Current	...	0.3 amp.	Control Grid (G4) Voltage ...		–3 volts
Anode Voltage	...	250 volts	Cathode Bias Resistor	...	300 ohms
Anode Current	...	3.5 mA	Oscillator Grid (G1) Resistor		50,000 ohms
Screen (G3, G5) Voltage	...	100 volts	Oscillator Grid Current	...	0.4 mA
Screen Current	...	2.7 mA	Anode Impedance ...	...	0.36 meg.
Osc. Anode (G2) Voltage	...	150 volts	Conversion Conductance	...	0.55 mA/V



TYPE **7C5**

(LOCTAL BASE)

OUTPUT BEAM TETRODE



The BRIMAR type 7C5 is an indirectly heated beam tetrode of the "all glass" construction, suitable for use in the output stages of radio receivers. The operating characteristics are identical to those of type 6V6G.

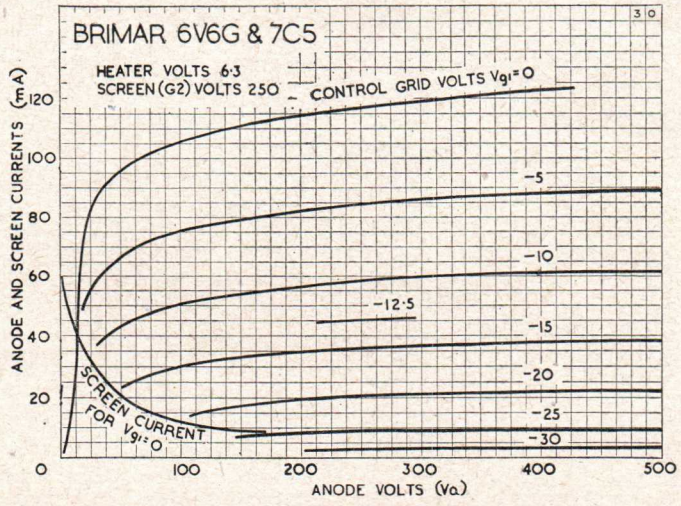
RATINGS

Heater Voltage	6.3 volts
Heater Current	0.45 amp.
Anode Voltage	315 volts max.
Anode Dissipation	12 watts max.
Screen (G2) Voltage	285 volts max.
Screen Dissipation	2.0 watts max.

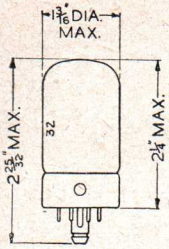
INTER-ELECTRODE CAPACITANCES (Approx.)

Input (G1 to all except Anode)	7.5 pF
Output (Anode to all except G1)	5.25 pF
Control Grid to Anode	0.45 pF
Heater to Cathode	4.8 pF

For operating characteristics refer to type 6V6G.

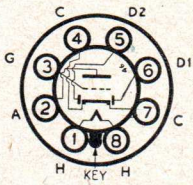


BRIMAR



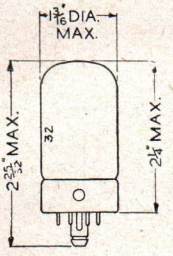
Replacement Type

TYPE **7C6**
(LOCTAL BASE)
DOUBLE DIODE TRIODE



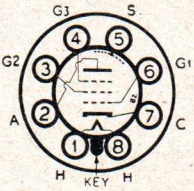
CHARACTERISTICS

Heater Voltage	... ...	6.3 volts	Control Grid Voltage	...	−1 volt
Heater Current	... ...	0.15 amp.	Cathode Bias Resistor	...	1,000 ohms
Anode Voltage	... ...	250 volts	Mutual Conductance	...	1.0 mA/V
Anode Current	... ...	1.3 mA	Amplification Factor	...	100



Replacement Type

TYPE **7C7**
(LOCTAL BASE)
R.F. PENTODE



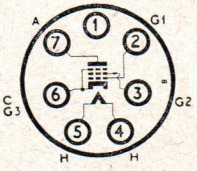
CHARACTERISTICS

[Suppressor grid (G3) connected to Cathode]

Heater Voltage	... ...	6.3 volts	Control Grid (G1) Voltage		−3 volts
Heater Current	... ...	0.15 amp.	Cathode Bias Resistor	...	1,200 ohms
Anode Voltage	... ...	250 volts	Anode Impedance	...	2.0 meg.
Anode Current	... ...	2.0 mA	Mutual Conductance	...	1.3 mA/V
Screen (G2) Voltage	... ...	100 volts	Control Grid Voltage	...	−7 volts
Screen Current	... ...	0.5 mA	(For Anode Current cut-off).		

Replacement Type

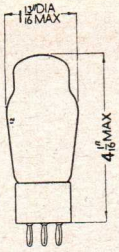
TYPE **7D3**
(ENGLISH BASE)
POWER PENTODE



CHARACTERISTICS

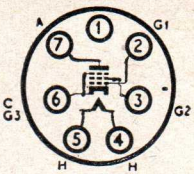
Heater Voltage		40 volts
Heater Current		0.20 amp.
Anode Voltage	135	160 volts max.
Anode Current	37	33 mA
Screen (G2) Voltage	135	120 volts
Screen Current	8.0	6.5 mA
Control Grid (G1) Voltage	−20	−18 volts
Cathode Bias Resistor	440	440 ohms
Anode Impedance	35,000	42,000 ohms
Mutual Conductance	2.45	2.4 mA/V
Optimum Load	4,000	5,000 ohms
Power Output	2.0	2.2 watts
Harmonic Distortion	9	10 per cent.

For further information refer to type 25A6G.



Replacement Type

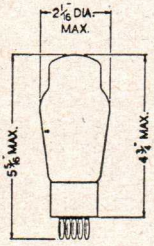
TYPE **7D5**
(ENGLISH BASE)
POWER PENTODE



CHARACTERISTICS

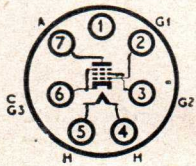
Heater Voltage	... ...	13.0 volts	Control Grid (G1) Voltage		−16.5 volts
Heater Current	... ...	0.315 amp.	Cathode Bias Resistor	...	410 ohms
Anode Voltage	... ...	250 volts	Anode Impedance	... ...	80,000 ohms
Anode Current	... ...	34 mA	Mutual Conductance	...	2.35 mA/V
Screen (G2) Voltage	... ...	250 volts	Optimum Load	... ...	7,000 ohms
Screen Current	... ...	6.5 mA	Power Output	... ...	3.5 watts

For characteristic curves refer to type 6F6G.



Replacement Type

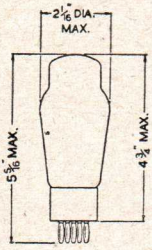
TYPE **7D6**
(ENGLISH BASE)
HIGH SLOPE
POWER PENTODE



CHARACTERISTICS

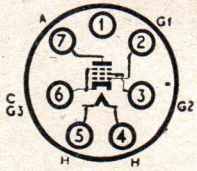
Heater Voltage	... ...	40 volts	Control Grid (G1) Voltage		−6 volts
Heater Current	... ...	0.20 amp.	Cathode Bias Resistor	...	150 ohms
Anode Voltage	... ...	250 volts	Anode Impedance	... ...	60,000 ohms
Anode Current	... ...	32 mA	Mutual Conductance	...	10 mA/V
Screen (G2) Voltage	... ...	250 volts	Optimum Load	... ...	8,500 ohms
Screen Current	... ...	6.0 mA	Power Output	... ...	3.75 watts

For characteristic curves refer to type 6AG6G.



Replacement Type

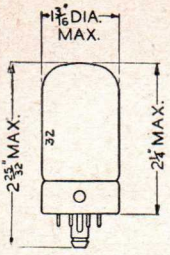
TYPE **7D8**
(ENGLISH BASE)
HIGH SLOPE
POWER PENTODE



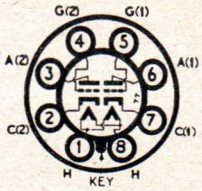
CHARACTERISTICS

Heater Voltage	... ...	13.0 volts	Control Grid (G1) Voltage		−6 volts
Heater Current	... ...	0.65 amp.	Cathode Bias Resistor	...	150 ohms
Anode Voltage	... ...	250 volts	Anode Impedance	... ...	60,000 ohms
Anode Current	... ...	32 mA	Mutual Conductance	...	10 mA/V
Screen (G2) Voltage	... ...	250 volts	Optimum Load	... ...	8,500 ohms
Screen Current	... ...	6.0 mA	Power Output	... ...	3.75 watts

For characteristic curves refer to type 6AG6G



TYPE **7F7**
(LOCTAL BASE)
HIGH-MU
DOUBLE TRIODE
(Separate Cathodes)



The BRIMAR type 7F7 is an indirectly heated double triode valve of the "all glass" construction, fitted with a lock-in type base. Except for inter-electrode capacitances, type 7F7 has identical characteristics to type 6SL7GT.

RATINGS

Heater Voltage	6.3 volts
Heater Current	0.3 amp.
Anode Voltage	250 volts max.
Anode Dissipation (Each Anode)	1.0 watt max.

OPERATING CHARACTERISTICS (Each Section)

Anode Voltage	250 volts
Anode Current	2.3 mA
Control Grid Voltage	–2 volts
Anode Impedance	44,000 ohms
Mutual Conductance	1.6 mA/V
Amplification Factor	70

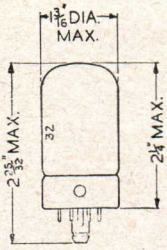
OPERATION AS RESISTANCE COUPLED AMPLIFIER (Each Section)

Anode Supply Voltage	100	250 volts
Anode Load Resistor	0.25	0.25 meg.
Cathode Bias Resistor	4,700	3,300 ohms
Peak Output	21	62 volts
Voltage Gain	23	50

INTER-ELECTRODE CAPACITANCES

	Section (1)	Section (2)	
Input (Grid to all except Anode)	2.15	2.15	pF
Output (Anode to all except Grid)	0.9	0.9	pF
Grid to Anode	3.4	3.5	pF

For characteristic curves refer to type 6SL7GT.

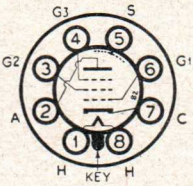


TYPE **7H7**

(LOCTAL BASE)

HIGH SLOPE

VARI-MU R.F. PENTODE



The BRIMAR type 7H7 is an indirectly heated vari-mu R.F. pentode of the "all glass" construction and is fitted with a lock-in type base. Type 7H7 features high slope together with good internal screening and is suitable for the R.F. and I.F. amplifier stages of all wave receivers.

RATINGS

Heater Voltage	6.3 volts
Heater Current	0.3 amp.
Anode Voltage	300 volts max.
Anode Dissipation	2.5 watts
Screen (G2) Voltage	150 volts max.
Screen Dissipation	0.5 watts

OPERATING CHARACTERISTICS

[Suppressor Grid (G3) connected to Cathode]

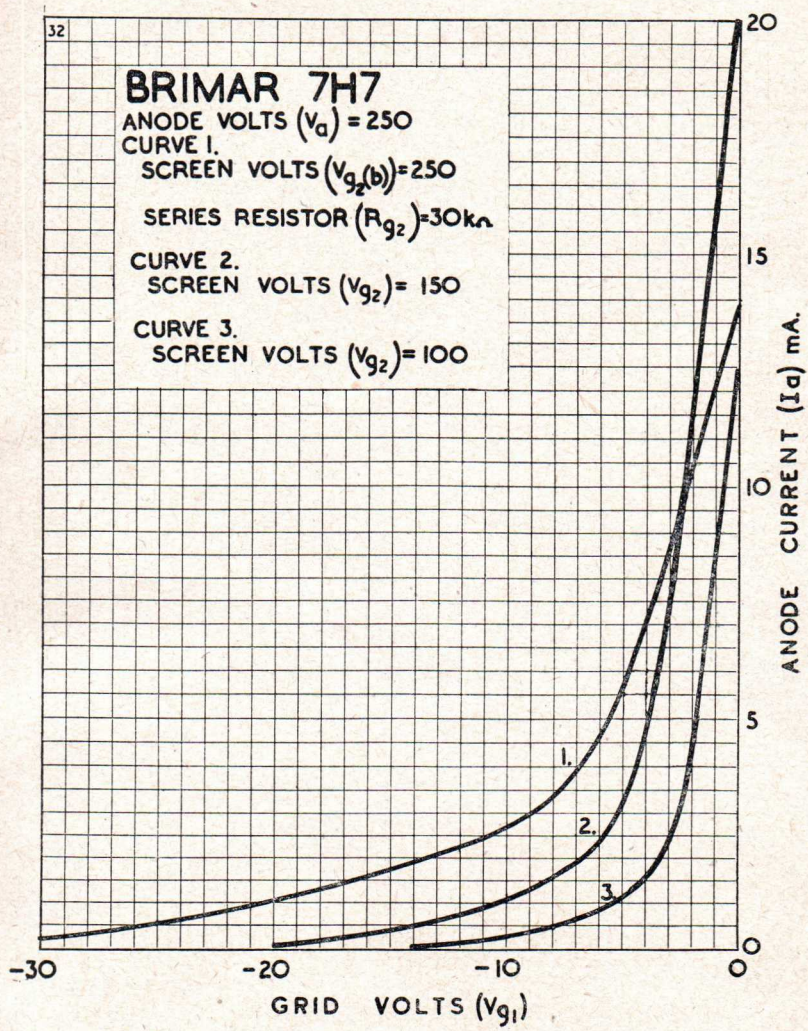
Anode Voltage	100	250	250	volts
Anode Current	8.2	9.5	9.5	mA
Screen Voltage	100	150	250*	volts
Screen Current	3.3	3.5	3.5	mA
Control Grid (G1) Voltage	−1	−2.5	−2.5	volts
Cathode Bias Resistor	100	200	200	ohms
Anode Impedance	0.25	0.8	0.8	meg.
Mutual Conductance	3.8	3.8	3.8	mA/V
Control Grid Voltage	−12	−19	−30	volts

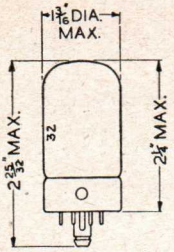
(For Mutual Conductance of 0.005 mA/V)

* *Via series screen resistor of* 30,000 *ohms.*

INTER-ELECTRODE CAPACITANCES

Input (Control Grid to all except Anode)	8.0 pF
Output (Anode to all except Control Grid)	7.0 pF
Control Grid to Anode	0.007 max.

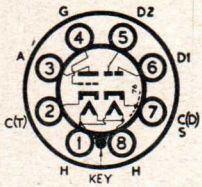

32
BRIMAR 7H7
ANODE VOLTS (V_a) = 250
CURVE 1.
SCREEN VOLTS ($V_{g_2(b)}$)=250
SERIES RESISTOR (R_{g_2})=30kΩ
CURVE 2.
SCREEN VOLTS (V_{g_2})= 150
CURVE 3.
SCREEN VOLTS (V_{g_2})= 100
1.
2.
3.
20
15
10
5
0
ANODE CURRENT (Ia) mA.
-30
-20
-10
0
GRID VOLTS (V_{g_1})



TYPE **7K7**

(LOCTAL BASE)

DOUBLE DIODE TRIODE



The BRIMAR type 7K7 is an indirectly heated double diode triode valve of the "all glass" construction, fitted with a lock-in type base. A separate cathode connection is provided for the triode section, permitting unconventional circuit arrangements if desired.

RATINGS

Heater Voltage	6.3 volts
Heater Current	0.3 amp.
Anode Voltage	250 volts
Anode Dissipation	1.0 watt

OPERATING CHARACTERISTICS

Anode Voltage	250 volts
Anode Current	2.3 mA
Control Grid Voltage	–2 volts
Cathode Bias Resistor	1,000 ohms
Anode Impedance	44,000 ohms
Mutual Conductance	1.6 mA/V
Amplification Factor	70

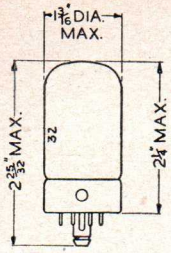
RESISTANCE COUPLED OPERATION

Anode Supply Voltage	100	250 volts
Anode Load Resistor	0.25	0.25 meg.
Cathode Bias Resistor	4,700	3,300 ohms
Peak Output	21	62 volts
Voltage Gain	23	50

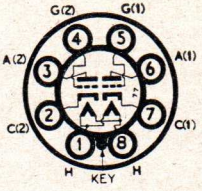
INTER-ELECTRODE CAPACITANCES

Input (Grid to all except Anode)	1.7 pF
Output (Anode to all except Grid)	1.6 pF
Grid to Anode	1.65 pF
Diode 1 to Cathode (Cd)	1.2 pF
Diode 2 to Cathode (Cd)	1.3 pF
Diode 1 to Diode 2	0.12 pF
Diode Cathode (Cd) to Heater	4.7 pF
Triode Cathode (Ct) to Heater	4.2 pF

For characteristic curves refer to type 6SL7GT.



TYPE **7N7**
(LOCTAL BASE)
LOW-MU
DOUBLE TRIODE
(Separate Cathodes)



The BRIMAR type 7N7 is an indirectly heated double triode valve featuring the "all glass" construction, fitted with a lock-in type base. Except for the inter-electrode capacitances, the characteristics are identical to those of type 6SN7GT.

RATINGS

Heater Voltage	6.3 volts
Heater Current	0.6 amp.
Anode Voltage	300 volts max.
Anode Dissipation	2.5 watts max
Average Grid Current	1.0 mA max.

OPERATING CHARACTERISTICS

Anode Voltage	250 volts
Anode Current	9.0 mA
Control Grid Voltage	−8 volts
Cathode Bias Resistor	1,100 ohms
Anode Impedance	7,700 ohms
Mutual Conductance	2.6 mA/V
Amplification Factor	20

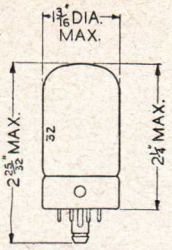
OPERATION AS RESISTANCE COUPLED AMPLIFIER

Refer to type 6SN7GT.

INTER-ELECTRODE CAPACITANCES

	Section (1)	Section (2)
Input (Grid to all except Anode)	2.9	3.4 pF
Output (Anode to all except Grid)	2.4	2.0 pF
Grid to Anode	3.0	3.0 pF

For characteristic curves refer to type 6SN7GT.

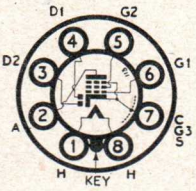


TYPE **7R7**

(LOCTAL BASE)

DOUBLE DIODE

R.F. PENTODE



The BRIMAR type 7R7 is a multiple valve of "all glass" construction designed for simultaneous operation as detector and I.F. or L.F. amplifier in radio receivers. The pentode section has semi-vari-mu characteristics and A.V.C. may be applied.

RATINGS

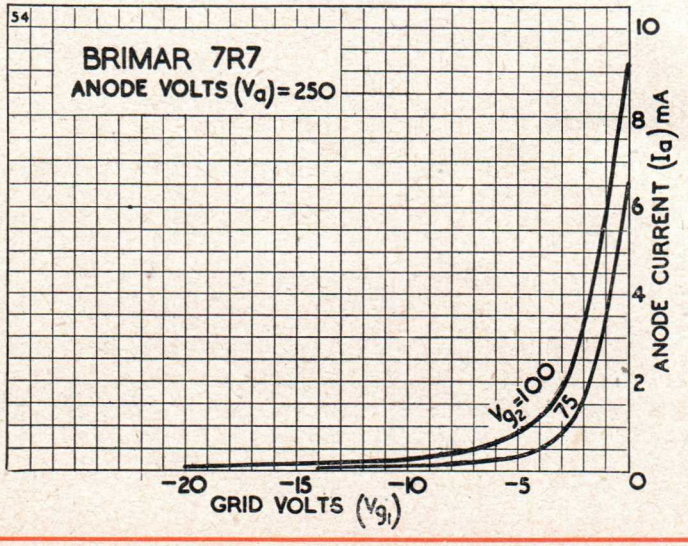
Heater Voltage	6.3 volts
Heater Current	0.3 amp.
Anode Voltage	250 volts max.
Anode Dissipation	2.0 watts max.
Screen (G2) Voltage	100 volts max.
Screen Dissipation	0.25 watt max.

OPERATING CHARACTERISTICS

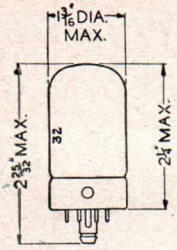
Anode Voltage	100	250	volts
Anode Current	5.5	5.7	mA
Screen Voltage	100	100	volts
Screen Current	2.0	1.7	mA
Control Grid (G1) Voltage	−1.0	−1.0	volt
Cathode Bias Resistor	150	150	ohms
Anode Impedance	0.35	1.0	meg.
Mutual Conductance	3.0	3.2	mA/V
Control Grid Voltage (For Anode current cut-off)	−16	−20	volts

INTER-ELECTRODE CAPACITANCES

Input (Control Grid to all except Anode)	5.6 pF
Output (Anode to all except Control Grid)	5.3 pF
Control Grid to Anode	0.004 pF max.



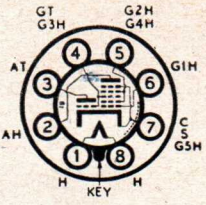
BRIMAR



TYPE 7S7

(LOCTAL BASE)

TRIODE-HEPTODE FREQUENCY CHANGER



The BRIMAR type 7S7 is an indirectly heated triode-heptode of the "all glass" construction, fitted with a lock-in type base. Type 7S7 features high conversion, together with high anode impedance and will operate efficiently at frequencies up to 100 Mc/s.

RATINGS

Heater Voltage	6.3 volts
Heater Current	0.3 amp.
Heptode Anode Voltage	250 volts max.
Heptode Screen (G2, G4) Voltage	100 volts max.
Triode Anode Supply Voltage	250 volts max.
Total Cathode Current	13 mA max.

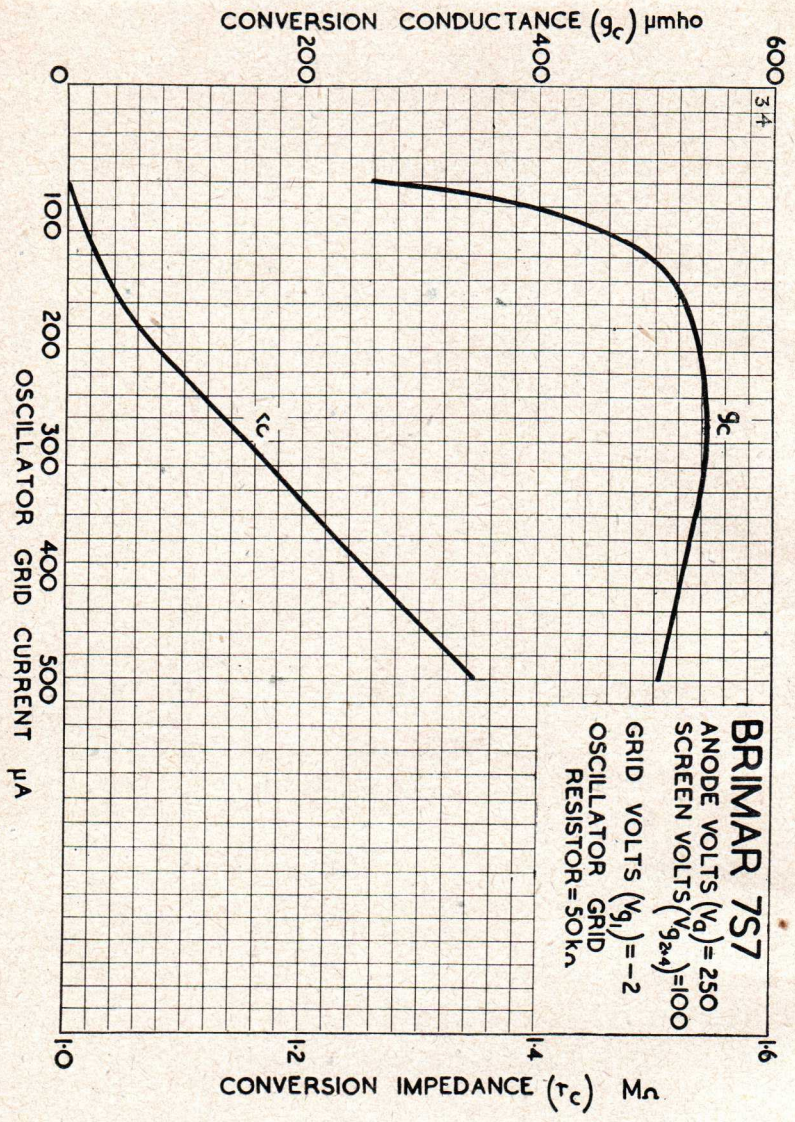
OPERATING CHARACTERISTICS

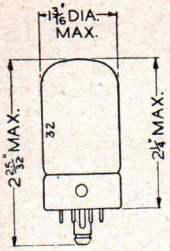
Heptode Anode Voltage	100	250	volts
Heptode Anode Current	1.9	1.9	mA
Heptode Screen Voltage	100	100	volts
Heptode Screen Current	3.0	3.0	mA
Heptode Control Grid (G1) Voltage	−2	−2	volts
Cathode Bias Resistor	250	200	ohms
Heptode Anode Impedance	0.5	1.25	meg.
Triode Anode Supply Voltage	100	250	volts
Triode Anode Resistor	—	20,000	ohms
Triode Anode Voltage	100	150	volts
Triode Anode Current	3.0	5.0	mA
Triode Grid Current	0.3	0.4	mA
Triode Grid Resistor	50,000	50,000	ohms
Conversion Conductance	0.5	0.53	mA/V
Heptode Control Grid Voltage (For Conversion Conductance of 0.005 mA/V)	−21	−21	volts

INTER-ELECTRODE CAPACITANCES*

R.F. Input (G1 to all except Ah)	8.0 pF
I.F. Output (Ah to all except G1)	5.0 pF
Oscillator Input (Gt to all except At)	6.2 pF
Oscillator Output (At to all except Gt)	2.2 pF
Control Grid (G1) to Heptode Anode (Ah)	0.03 pF max.
Oscillator Grid (Gt) to Oscillator Anode (At)	1.0 pF

* *With close fitting shield connected to Cathode.*

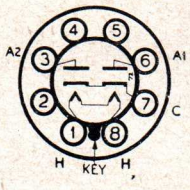

CONVERSION CONDUCTANCE (g_c) µmho
0
200
400
600
34
g_c
r_c
BRIMAR 7S7
ANODE VOLTS (V_a) = 250
SCREEN VOLTS (V_{g2+4}) = 100
GRID VOLTS (V_{g1}) = −2
OSCILLATOR GRID RESISTOR = 50kΩ
OSCILLATOR GRID CURRENT µA
0
100
200
300
400
500
CONVERSION IMPEDANCE (r_c) MΩ
1·0
1·2
1·4
1·6



TYPE 7Y4

(LOCTAL BASE)

FULL WAVE RECTIFIER



The BRIMAR type 7Y4 is an indirectly heated full wave rectifier for use in equipment where the current drain does not exceed 60 mA.

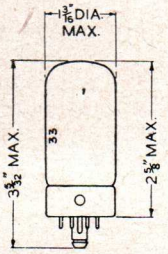
RATINGS

Heater Voltage	6.3 volts
Heater Current	0.5 amp.
Peak Inverse Voltage	1,250 volts max.
Peak Current (Each Anode)	180 mA max.
Heater Cathode Potential	450 volts max.

CHARACTERISTICS AS FULL WAVE RECTIFIER

CONDENSER INPUT

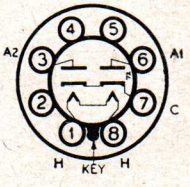
R.M.S. Input per Anode	325 volts max.
Supply Impedance per Anode	150 ohms min.
Rectified Current	60 mA max.
Reservoir Condenser	32 μF max.



TYPE 7Z4

(LOCTAL BASE)

FULL WAVE RECTIFIER



The BRIMAR type 7Z4 is an indirectly heated full wave rectifier for use in A.C. and car radio equipment.

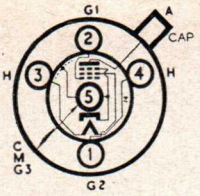
RATINGS

Heater Voltage	6.3 volts
Heater Current	0.9 amp.
Peak Inverse Voltage	1,250 volts max.
Peak Current (Each Anode)	300 mA max.
Heater-Cathode Potential	450 volts max.

OPERATION AS FULL WAVE RECTIFIER

CONDENSER INPUT

R.M.S. Input per Anode	325 volts max.
Supply Impedance per Anode...	50 ohms min.
Rectified Current...	100 mA max.
Reservoir Condenser	32 μF max.



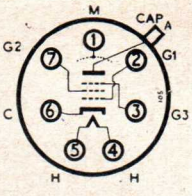
5-pin

Replacement Type

TYPE **8A1**

(ENGLISH BASE)

R.F. PENTODE



7-Pin

CHARACTERISTICS

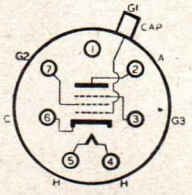
Heater Voltage	4.0 volts
Heater Current	1.0 amp.
Anode Voltage	200 volts
Anode Current	3.5 mA
Screen (G2) Voltage	80 volts
Screen Current	0.7 mA
Control Grid (G1) Voltage	–1.5 volts
Cathode Bias Resistor	200 ohms
Anode Impedance	0.6 meg.
Mutual Conductance	4.0 mA/V
Overall Length (Including Pins)	$5\frac{5}{16}$ inches max.
Max. Diameter of Bulb	$1\frac{3}{4}$ inches max.

Replacement Type

TYPE **8D2**

(ENGLISH BASE)

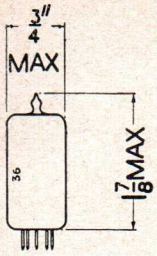
R.F. PENTODE



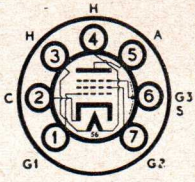
CHARACTERISTICS

Heater Voltage	13.0 volts
Heater Current	0.2 amp.
Anode Voltage	250 volts
Anode Current	2.0 mA
Screen (G2) Voltage	100 volts
Screen Current	0.5 mA
Control Grid (G1) Voltage	–3 volts
Cathode Bias Resistor	1,000 ohms
Anode Impedance	1.1 meg.
Mutual Conductance	1.25 mA/V

For further information refer to type 6J7G.



TYPE **8D3**
(GLASS BUTTON BASE)
HIGH SLOPE
R.F. PENTODE



The BRIMAR type 8D3 is an indirectly heated high slope pentode of the "all glass" construction, fitted with a miniature type base. It is particularly suitable for use in wide band amplifiers and television receivers, where it may be employed in the R.F., I.F. or V.F. stages. In conjunction with a suitable oscillator the 8D3 will function satisfactorily as a frequency changer at frequencies up to 100 M/cs.

RATINGS

Heater Voltage	6.3 volts
Heater Current	0.3 amp.
Anode Voltage	250 volts max.
Anode Dissipation	2.5 watts max.
Screen (G2) Voltage	250 volts max.
Screen Dissipation	0.8 watts max.

OPERATING CHARACTERISTICS

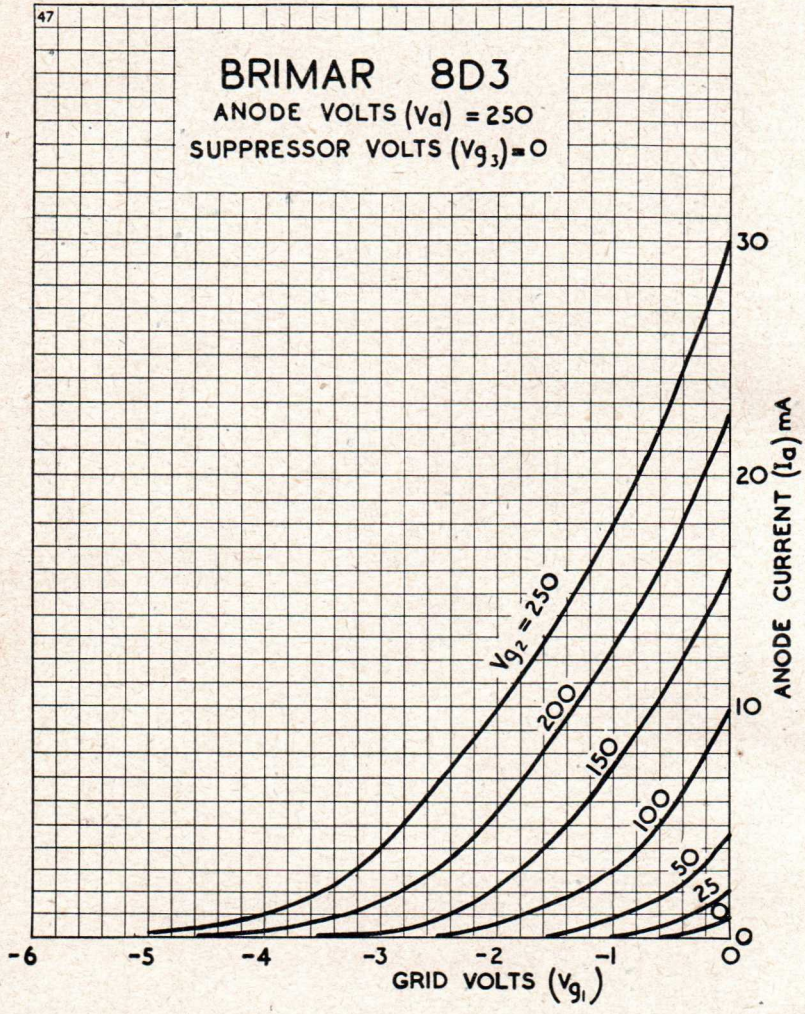
[Suppressor Grid (G3) connected to Cathode]

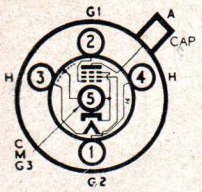
Anode Voltage	200	250	volts
Anode Current	9.0	10.0	mA
Screen Voltage	200	250	volts
Screen Current	2.25	2.6	mA
Control Grid (G1) Voltage	–1.5	–2.0	volts
Cathode Bias Resistor	135	160	ohms
Anode Impedance (Approx.)	0.8	1.0	meg.
Mutual Conductance	7.5	7.5	mA/V
Input Resistance at 45 Mc/s.	7,000	8,200	ohms
Control Grid Voltage	–4.5	–5.5	volts
(For Cathode Current cut-off)			
Working Input Capacity	10.4	10.1	pF
Change in Input Capacity	2.3	2.0	pF
(G1 biassed to cut-off)			
Inner Amplification Factor (μG1/G2)	70	70	

INTER-ELECTRODE CAPACITANCES*

Input (Control Grid to all except Anode)	7.5 pF
Output (Anode to all except Control Grid)	3.2 pF
Control Grid to Anode	0.005 pF

* *With close fitting shield connected to Cathode.*

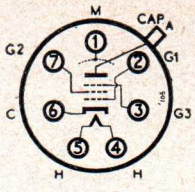

47
BRIMAR 8D3
ANODE VOLTS (Va) = 250
SUPPRESSOR VOLTS (Vg3) = 0
30
20
10
0
ANODE CURRENT (Ia) mA
Vg2 = 250
200
150
100
50
25
0
-6
-5
-4
-3
-2
-1
0
GRID VOLTS (Vg1)



5-pin

Replacement Type

TYPE **9A1**
(ENGLISH BASE)
VARI-MU
R.F. PENTODE



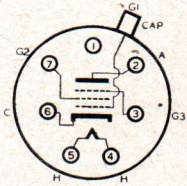
7-pin

CHARACTERISTICS

Heater Voltage	4.0 volts
Heater Current	1.0 amp.
Anode Voltage	200 volts
Anode Current	5.0 mA
Screen (G2) Voltage	80 volts
Screen Current	1.0 mA
Control Grid (G1) Voltage	–1.5 volts
Cathode Bias Resistor	220 ohms
Anode Impedance	0.6 meg.
Mutual Conductance	4.25 mA/V
Control Grid Voltage	–30 volts
(For Mutual Conductance of 0.010 mA/V)	
Overall Length (Including Pins)	$5\frac{5}{16}$ inches max.
Max. Diameter of Bulb	$1\frac{3}{4}$ inches.

Replacement Type

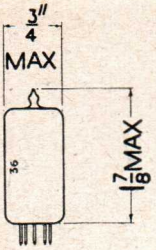
TYPE **9D2**
(ENGLISH BASE)
VARI-MU
R.F. PENTODE



CHARACTERISTICS

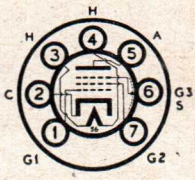
Heater Voltage	13.0 volts
Heater Current	0.2 amp.
Anode Voltage	250 volts
Anode Current	10.5 mA
Screen (G2) Voltage	125 volts
Screen Current	2.6 mA
Control Grid (G1) Voltage	–3 volts
Cathode Bias Resistor	220 ohms
Anode Impedance	0.6 meg.
Mutual Conductance	1.65 mA/V
Control Grid Voltage	–52 volts
(For Mutual Conductance of 0.002 mA/V).	

For further information refer to type 6K7G.



TYPE **9D6**

(GLASS BUTTON BASE) VARI-MU R.F. PENTODE



The BRIMAR type 9D6 is an indirectly heated vari-mu R.F. pentode of the "all glass" construction, fitted with a miniature type base. Owing to its relatively high slope and small physical size, type 9D6 is particularly suitable for use in the R.F. and I.F. stages of compact radio equipment.

RATINGS

Heater Voltage	6.3 volts
Heater Current	0.2 amp.
Anode Voltage	250 volts max.
Anode Dissipation	2.5 watts max.
Screen (G2) Voltage	250 volts max.
Screen Dissipation	0.6 watts max.

OPERATING CHARACTERISTICS

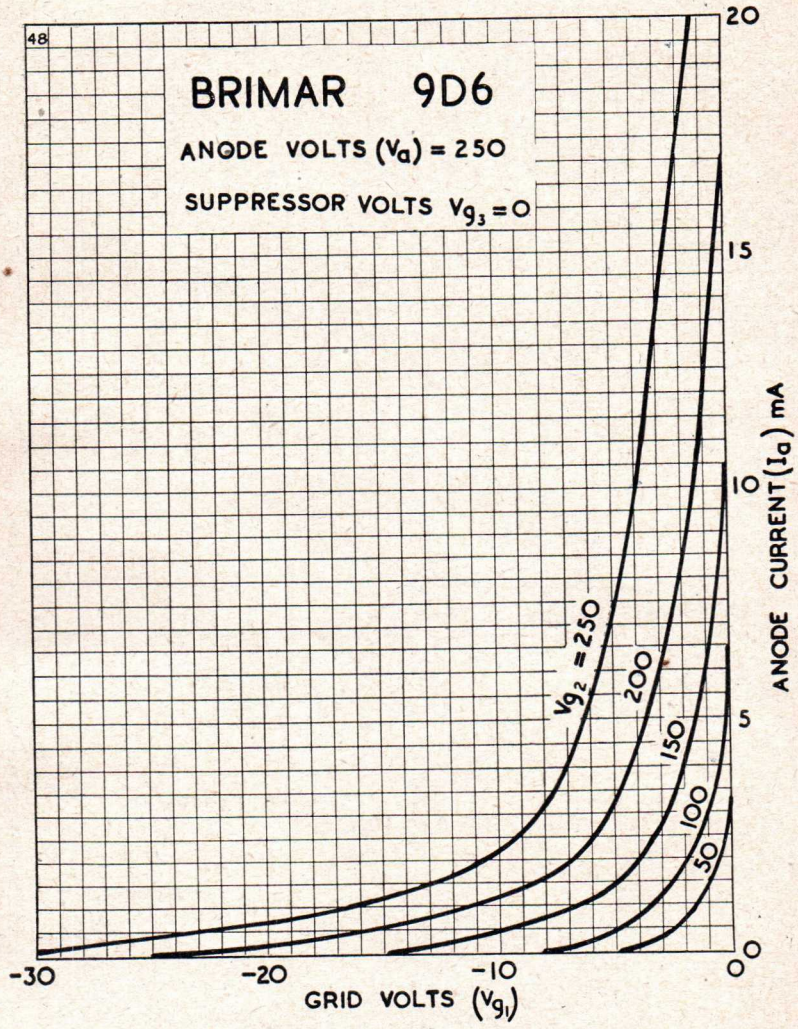
[Suppressor Grid (G3) connected to Cathode]

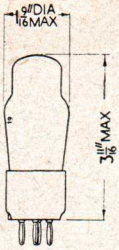
Anode Voltage	250	250	volts
Anode Current	8.0	8.0	mA
Screen Voltage	150	200	volts
Screen Current	2.0	2.1	mA
Control Grid (G1) Voltage	−0.65	−2.5	volts
Cathode Bias Resistor	65	250	ohms
Anode Impedance	1.0	1.0	meg.
Mutual Conductance	2.5	2.5	mA/V
Inner Amplification Factor (μG1/G2)	–	30	
Control Grid Voltage	−15	−28	volts
(For Mutual Conductance of 0.005 mA/V)			

INTER-ELECTRODE CAPACITANCES*

Input (Control Grid to all except Anode)	4.5 pF
Output (Anode to all except Control Grid)	7.0 pF
Control Grid to Anode	0.004 pF

* *With close fitting shield connected to Cathode.*


48
BRIMAR 9D6
ANODE VOLTS (V_a) = 250
SUPPRESSOR VOLTS V_{g_3} = 0
V_{g_2} = 250
200
150
100
50
20
15
10
5
0
ANODE CURRENT (I_a) mA
-30
-20
-10
0
GRID VOLTS (V_{g_1})

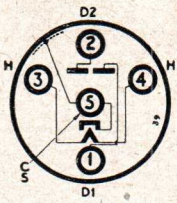


Replacement Type

TYPE **10D1**

(ENGLISH BASE)

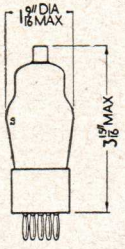
DOUBLE DIODE



CHARACTERISTICS

Heater Voltage	13.0 volts
Heater Current	0.2 amp.
R.M.S. Input	50 volts max.
Rectified Current	1.0 mA max.

For Diode characteristic curves refer to type 6AL5.



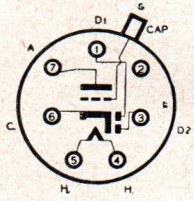
Replacement Type

TYPE **11A2**

(ENGLISH BASE)

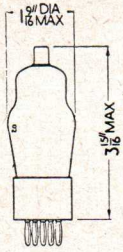
DOUBLE DIODE

TRIODE



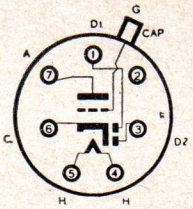
CHARACTERISTICS

Heater Voltage	4.0 volts
Heater Current	1.0 amp.
Anode Voltage	200 volts
Anode Current	3.0 mA
Grid Voltage	−2 volts
Cathode Bias Resistor	600 ohms
Anode Impedance	18,000 ohms
Mutual Conductance	2.8 mA/V
Amplification Factor	50



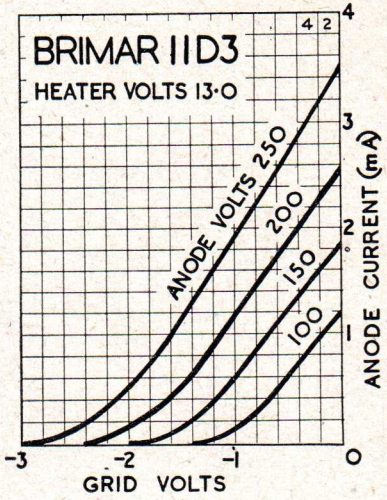
Replacement Type

TYPE **11D3**
(ENGLISH BASE)
DOUBLE DIODE TRIODE



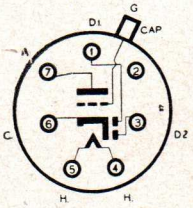
CHARACTERISTICS

Heater Voltage	...	13.0 volts
Heater Current	...	0.2 amp.
Anode Voltage	...	250 volts
Anode Current	...	0.4 mA
Grid Voltage	...	–2 volts
Cathode Bias Resistor		5,000 ohms
Anode Impedance		90,000 ohms
Mutual Conductance		1.10 mA/V
Amplification Factor		100



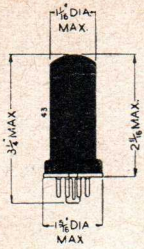
Replacement Type

TYPE **11D5**
(ENGLISH BASE)
DOUBLE DIODE TRIODE

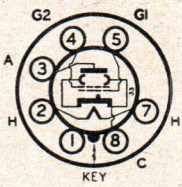


CHARACTERISTICS

Heater Voltage	...	13.0 volts
Heater Current	...	0.15 amp.
Anode Voltage	...	250 volts
Anode Current	...	3.8 mA
Grid Voltage	...	–3 volts
Cathode Bias Resistor	...	750 ohms
Anode Impedance	...	26,700 ohms
Mutual Conductance	...	1.5 mA/V
Amplification Factor	...	40



TYPE **12A6**
(OCTAL BASE)
OUTPUT BEAM
TETRODE



The BRIMAR type 12A6 is an indirectly heated output beam tetrode of high efficiency for use in car radio or A.C./D.C. receivers, where the supply exceeds 110 volts.

RATINGS

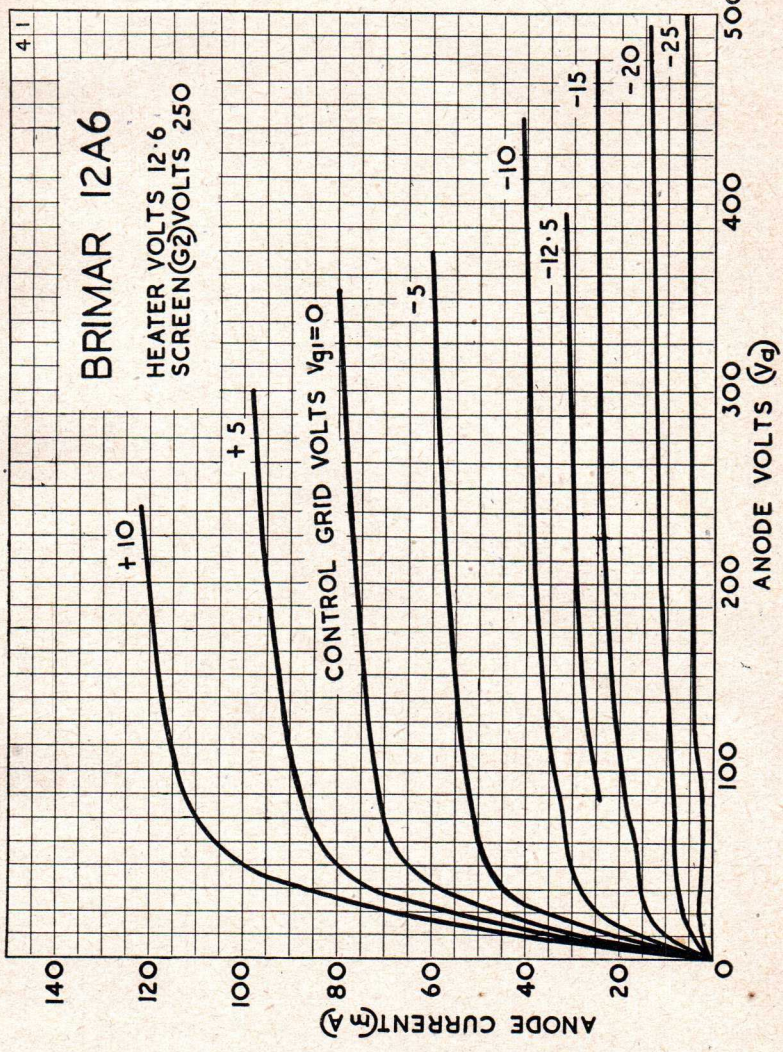
Heater Voltage	12.6 volts
Heater Current	0.15 amp.
Anode Voltage	250 volts max.
Anode Dissipation	7.5 watts max.
Screen (G2) Voltage	250 volts max.
Screen Dissipation	1.5 watts max.

OPERATING CHARACTERISTICS (CLASS "A")

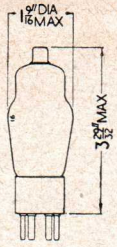
Anode Voltage	180	250	volts
Anode Current	21	30	mA
Screen Voltage	180	250	volts
Screen Current	2.6	3.5	mA
Control Grid (G1) Voltage	–8.5	–12.5	volts
Cathode Bias Resistor	350	350	ohms
Anode Impedance	92,000	70,000	ohms
Mutual Conductance	2.7	3.0	mA/V
Optimum Load	8,000	7,500	ohms
Power Output	1.6	2.8	watts
Harmonic Distortion	7	7	per cent.

INTER-ELECTRODE CAPACITANCES

Input (Contro Grid to all except Anode)	9.0 pF
Output (Anode to all except Control Grid)	9.0 pF
Control Grid to Anode	0.3 pF


BRIMAR 12A6
HEATER VOLTS 12·6
SCREEN(G2)VOLTS 250
CONTROL GRID VOLTS Vg1=0
+10
+5
-5
-10
-12·5
-15
-20
-25
ANODE CURRENT(mA)
ANODE VOLTS (Va)
0
20
40
60
80
100
120
140
100
200
300
400
500

12A7
12C8GT
12J7GT



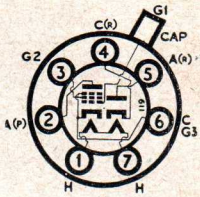
Obsolete Type

For Reference Only

TYPE **12A7**

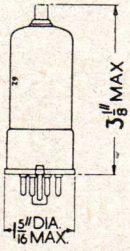
(U.X. BASE)

PENTODE — RECTIFIER



CHARACTERISTICS

Heater Voltage	...	12.6 volts	Anode Current	...	9.0 mA
Heater Current	...	0.3 amp.	Screen Voltage	...	135 volts max.
RECTIFIER SECTION			Screen Current	...	2.5 mA
R.M.S. Input	...	125 volts max.	Control Grid Voltage	...	−13.5 volts
Rectified Current	...	30 mA max.	Mutual Conductance	...	1.0 mA/V
PENTODE SECTION			Optimum Load	...	13,500 ohms.
Anode Voltage	...	135 volts max.	Power Output	...	0.55 watt

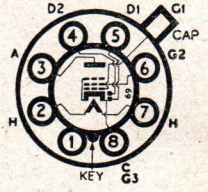


TYPE **12C8GT**

(OCTAL BASE)

DOUBLE DIODE

AMPLIFIER PENTODE

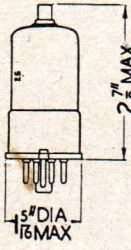


Note.—Pin 1 connected to metal shell.

CHARACTERISTICS

Heater Voltage	...	12.6 volts	Screen Current	...	2.3 mA
Heater Current	...	0.15 amp.	Control Grid (G1) Voltage	...	−3 volts
Anode Voltage	...	250 volts	Cathode Bias Resistor	...	250 ohms
Anode Current	...	9.0 mA	Anode Impedance	...	0.6 meg.
Screen (G2) Voltage	...	125 volts	Mutual Conductance	...	1.12 mA/V

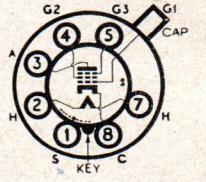
For further information and characteristic curves refer to type 6B8GT.



TYPE **12J7GT**

(OCTAL BASE)

R.F. PENTODE



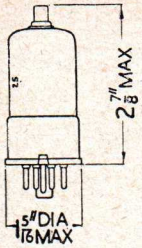
Note.—Pin 1 connected to metal shell.

CHARACTERISTICS

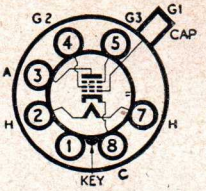
Heater Voltage	...	12.6 volts	Screen Current	...	0.5 mA
Heater Current	...	0.15 amp.	Control Grid (G1) Voltage		−3 volts
Anode Voltage	...	250 volts	Cathode Bias Resistor	...	1,000 ohms
Anode Current	...	2.0 mA	Anode Impedance	...	1.5 meg.
Screen (G2) Voltage	...	100 volts	Mutual Conductance	...	1.25 mA/V

For further information and characteristic curves refer to type 6J7GT.

BRIMAR



TYPE **12K7GT**
(OCTAL BASE)
VARI-MU
R.F. PENTODE

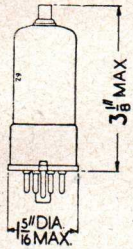


Note.—Pin 1 connected to metal shell.

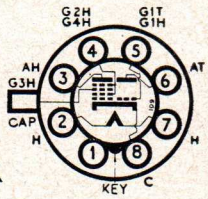
CHARACTERISTICS

Heater Voltage	12.6 volts	Control Grid (G1) Voltage ...	−3 volts
Heater Current	0.15 amp.	Cathode Bias Resistor ...	220 ohms
Anode Voltage	250 volts	Anode Impedance	0.6 meg.
Anode Current	10.5 mA	Mutual Conductance ...	1.65 mA/V
Screen (G2) Voltage	125 volts	Control Grid Voltage ...	−52 volts
Screen Current	2.6 mA	(For Mutual Conductance of 0.002 mA/V)	

For further information and characteristic curves refer to type 6K7GT.



TYPE **12K8GT**
(OCTAL BASE)
TRIODE-HEXODE
FREQUENCY CHANGER

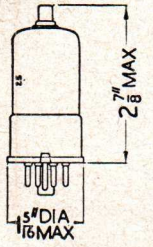


Note.—Pin 1 connected to metal shell.

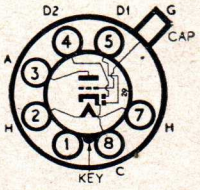
CHARACTERISTICS

Heater Voltage	12.6 volts	Triode Anode Supply Voltage	250 volts
Heater Current	0.15 amp.	Triode Anode Voltage ...	100 volts
Anode Voltage	250 volts	Triode Anode Resistor ...	40,000 ohms
Anode Current	2.5 mA	Triode Anode Current ...	3.8 mA
Screen (G2, G4) Voltage ...	100 volts	Triode Grid (G1) Resistor ...	50,000 ohms
Screen Current	6.0 mA	Triode Grid Current ...	0.15 mA
Control Grid (G3) Voltage	−3 volts	Conversion Conductance ...	0.36 mA/V
Cathode Bias Resistor ...	300 ohms	Control Grid Voltage ...	−30 volts
Anode Impedance	0.6 meg.	(For Conversion Conductance of 0.002 mA/V)	

For further information and characteristic curves refer to type 6K8GT.



TYPE **12Q7GT**
(OCTAL BASE)
DOUBLE DIODE TRIODE

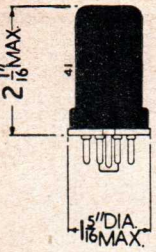


Note.—Pin 1 connected to metal shell.

CHARACTERISTICS

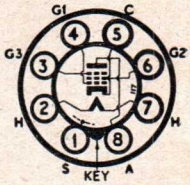
Heater Voltage	12.6 volts	Grid Voltage	−3 volts
Heater Current	0.15 amp.	Anode Impedance	58,000 ohms
Anode Voltage	250 volts	Mutual Conductance ...	1.2 mA/V
Anode Current	1.1 mA	Amplification Factor	70

For further information and characteristic curves refer to type 6Q7GT.



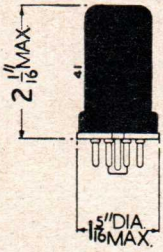
Replacement Type

TYPE **12SJ7**
(OCTAL BASE)
R.F. PENTODE



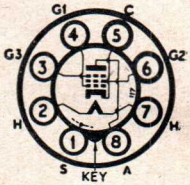
CHARACTERISTICS

Heater Voltage	... ...	12.6 volts	Control Grid (G1) Voltage		–3 volts
Heater Current	... ...	0.15 amp.	Cathode Bias Resistor	...	1,000 ohms
Anode Voltage	... ...	250 volts	Anode Impedance	... ...	1.5 meg.
Anode Current	... ...	3.0 mA	Mutual Conductance	...	1.65 mA/V
Screen (G2) Voltage	... ...	100 volts	Control Grid Voltage	...	–9 volts
Screen Current	... ...	0.8 mA	(For Anode Current cut-off).		



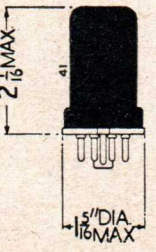
Replacement Type

TYPE **12SK7**
(OCTAL BASE)
VARI-MU
R.F. PENTODE



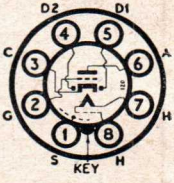
CHARACTERISTICS

Heater Voltage	... ...	12.6 volts	Control Grid (G1) Voltage	...	–3 volts
Heater Current	... ...	0.15 amp.	Cathode Bias Resistor	...	220 ohms
Anode Voltage	... ...	250 volts	Anode Impedance	... ...	0.8 meg.
Anode Current	... ...	9.2 mA	Mutual Conductance	...	2.0 mA/V
Screen (G2) Voltage	... ...	100 volts	Control Grid Voltage	...	–35 volts
Screen Current	... ...	2.4 mA	(For Mutual Conductance of 0.01 mA/V)		



Replacement Type

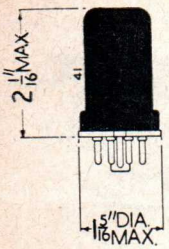
TYPE **12SQ7**
(OCTAL BASE)
DOUBLE DIODE TRIODE



CHARACTERISTICS

Heater Voltage	... ...	12.6 volts	Grid Voltage	... ...	–2 volts
Heater Current	... ...	0.15 amp.	Anode Impedance	... ...	91,000 ohms
Anode Voltage	... ...	250 volts	Mutual Conductance	...	1.1 mA/V
Anode Current	... ...	0.9 mA	Amplification Factor	... ...	100

For characteristic curves refer to type 11D3.

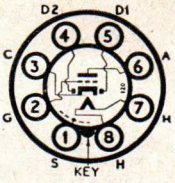


Replacement Type

TYPE **12SR7**

(OCTAL BASE)

DOUBLE DIODE TRIODE



CHARACTERISTICS

Heater Voltage	... ...	12.6 volts	Anode Impedance	... ...	8,500 ohms
Heater Current	... ...	0.15 amp.	Mutual Conductance	...	1.9 mA/V
Anode Voltage	... ...	250 volts	Amplification Factor	...	16
Anode Current	... ...	6.5 mA	Optimum Load	... ...	10,000 ohms
Grid Voltage	... ...	−9 volts	Power Output	... ...	0.30 watts

For further information and characteristic curves refer to type 6R7G.

Obsolete Type

For Reference Only

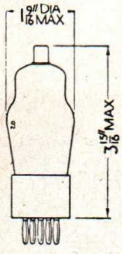
TYPE **12Z3**

(U.X. BASE)

HALF WAVE RECTIFIER

CHARACTERISTICS

Heater Voltage	... ...	12.6 volts	Max. R.M.S. Input	... ...	235 volts
Heater Current	... ...	0.3 amp.	Max. Rectified Current	...	55 mA
Min. Supply Impedance	...	75 ohms	Max. Heater-Cathode Voltage		350 volts

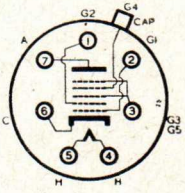


Replacement Types

TYPES **15A2, 15D1, 15D2**

(ENGLISH BASE)

HEPTODE FREQUENCY CHANGERS



CHARACTERISTICS

	15A2	15D1	15D2	
Heater Voltage	4.0	13.0	13.0	volts
Heater Current	0.65	0.2	0.15	amp.
Anode Voltage		250		volts
Anode Current		3.5		mA
Screen (G3, G5) Voltage		100		volts
Screen Current		2.7		mA
Oscillator Anode (G2) Voltage		200		volts
Oscillator Anode Current		4.0		mA
Control Grid (G4) Voltage		−3		volts
Oscillator Grid (G1) Resistor		50,000		ohms
Oscillator Grid Current		0.4		mA
Anode Impedance		0.36		meg.
Conversion Conductance		0.55		mA/V

For further information and characteristic curves refer to type 6A8G.

15
18
19

Obsolete Type

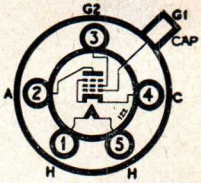
For Information Only

TYPE 15

(U.X. BASE)

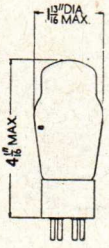
INDIRECTLY HEATED

BATTERY R.F. PENTODE



CHARACTERISTICS

Heater Voltage	... ...	2.0 volts	Screen Current	... ...	0.3 mA
Heater Current	... ...	0.22 amp.	Control Grid (G1) Voltage	...	−1.5 volts
Anode Voltage	... ...	135 volts	Anode Impedance	... ...	0.8 meg.
Anode Current	... ...	1.85 mA	Mutual Conductance	...	0.7 mA/V
Screen (G2) Voltage	... ...	67.5 volts	Max. Heater Cathode Voltage		22 volts

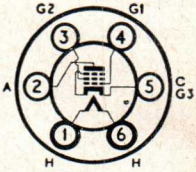


Replacement Type

TYPE 18

(U.X. BASE)

POWER PENTODE



CHARACTERISTICS

Heater Voltage	... ...	14.0 volts	Control Grid (G1) Voltage	...	−16.5 volts
Heater Current	... ...	0.3 amp.	Cathode Bias Resistor	...	410 ohms
Anode Voltage	... ...	250 volts	Anode Impedance	... ...	80,000 ohms
Anode Current	... ...	34 mA	Mutual Conductance	...	2.5 mA/V
Screen (G2) Voltage	... ...	250 volts	Optimum Load	... ...	7,000 ohms
Screen Current	... ...	6.5 mA	Power Output	... ...	3.2 watts

For further information and characteristic curves refer to type 6F6G.

Obsolete Type

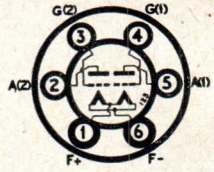
For Information Only

TYPE 19

(U.X. BASE)

CLASS " B " TWIN

BATTERY TRIODE

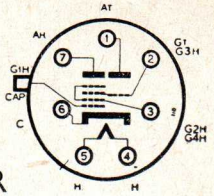


CHARACTERISTICS

Filament Voltage	... ...	2.0 volts	
Filament Current	... ...	0.26 amp.	
Anode Voltage	... ...	135	135 volts
Anode Current (Zero Signal)	... ...	3.4	10.0 mA
Anode Current (Max. Signal)	... ...	25.0	27 0 mA
Control Grid Voltage	... ...	−3	0 volts
Input Power	... ...	0.13	0.17 watts
Optimum Load (Anode to Anode)	... ...	10,000	10,000 ohms
Power Output	... ...	1.9	2.1 watts

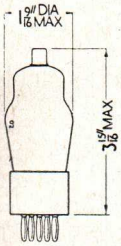
Replacement Type

TYPE **20A1**
(ENGLISH BASE)
TRIODE—HEXODE
FREQUENCY CHANGER



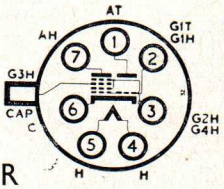
CHARACTERISTICS

Heater Voltage	...	4.0 volts	Oscillator Anode Current	...	2.3 mA
Heater Current	...	1.2 amp.	Control Grid (G1) Voltage		−1.5 volts
Anode Voltage	...	250 volts	Oscillator Grid Resistor	...	50,000 ohms
Anode Current	...	2.2 mA	Oscillator Grid Current	...	0.25 mA
Screen (G2, G4) Voltage	...	80 volts	Anode Impedance	...	0.7 meg.
Screen Current	...	3.0 mA	Conversion Conductance	...	0.65 mA/V
Oscillator Anode Voltage	...	100 volts			



Replacement Type

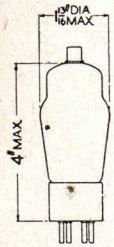
TYPE **20D2**
(ENGLISH BASE)
TRIODE—HEXODE
FREQUENCY CHANGER



CHARACTERISTICS

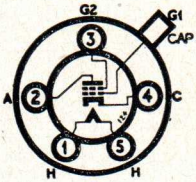
Heater Voltage	...	13.0 volts	Oscillator Anode Current	...	3.8 mA
Heater Current	...	0.15 amp.	Oscillator Grid (G1) Resistor		50,000 ohms
Anode Voltage	...	250 volts	Oscillator Grid Current	...	0.15 mA
Anode Current	...	2.5 mA	Control Grid (G3) Voltage	...	−3 volts
Screen (G2, G4) Voltage	...	100 volts	Cathode Bias Resistor	...	300 ohms
Screen Current	...	6.0 mA	Anode Impedance	...	0.6 meg.
Oscillator Anode Voltage	...	100 volts	Conversion Conductance	...	0.36 mA/V

For characteristic curves refer to type 6K8G



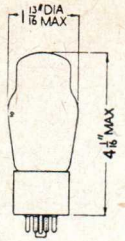
Obsolete Types

For Reference Only
TYPES **24A, 24E**
(U.X. BASE)
R.F. TETRODES



CHARACTERISTICS

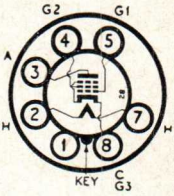
Heater Voltage	...	2.5 volts	Screen Current	...	1.7 mA
Heater Current	...	1.75 amp.	Grid Control (G1) Voltage	...	−3 volts
Anode Voltage	...	250 volts	Cathode Bias Resistor	...	500 ohms
Anode Current	...	4.0 mA	Anode Impedance	...	0.6 meg.
Screen (G2) Voltage	...	90 volts	Mutual Conductance	...	1.0 mA/V



TYPE **25A6G**

(OCTAL BASE)

POWER PENTODE



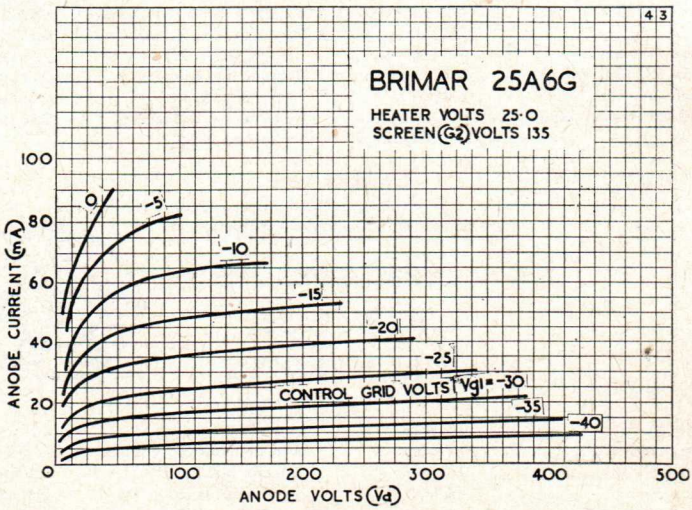
The BRIMAR type 25A6G is an indirectly heated power pentode for use in A.C./D.C. equipment where the operating voltages are low.

RATINGS

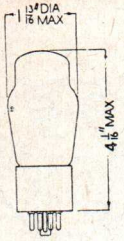
Heater Voltage ...	25.0 volts
Heater Current ...	0.3 amp.
Anode Voltage ...	160 volts max.
Anode Dissipation	5.3 watts max.
Screen (G2) Voltage	135 volts max.
Screen Dissipation	1.9 watts max.

OPERATING CHARACTERISTICS CLASS "A"

Anode Voltage ...	95	135	160	volts
Anode Current ...	20	37	33	mA
Screen Voltage	95	135	120	volts
Screen Current (Zero Signal)	4.0	8.0	6.5	mA
Screen Current (Max. Signal) ...	8	14	12	mA
Control Grid (G1) Voltage	−15	−20	−18	volts
Cathode Bias Resistor	625	440	440	ohms
Anode Impedance	45,000	35,000	42,000	ohms
Mutual Conductance	2.0	2.45	2.4	mA/V
Optimum Load ...	4,500	4,000	5,000	ohms
Power Output ...	0.9	2.0	2.2	watts
Harmonic Distortion	11	9	10	per cent.

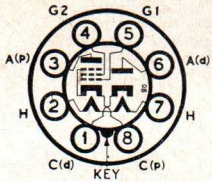


BRIMAR



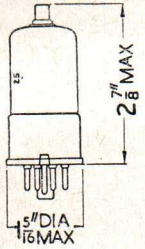
Obsolete Type

For Reference Only
TYPE **25A7G**
(OCTAL BASE)
PENTODE — RECTIFIER



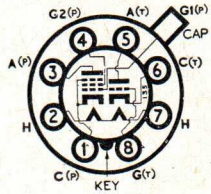
CHARACTERISTICS

Heater Voltage	...	25 volts	Screen (G2) Voltage	...	100 volts max.
Heater Current	...	0.3 amp.	Screen Current	...	4 mA
RECTIFIER SECTION			Control Grid (G1) Voltage		−15 volts
R.M.S. Input	...	125 volts max.	Cathode Bias Resistor	...	550 ohms
Rectified Current	...	75 mA max.	Anode Impedance	...	50,000 ohms
PENTODE SECTION			Mutual Conductance	...	1.8 mA/V
Anode Voltage	...	100 volts max.	Optimum Load	...	4,500 ohms
Anode Current	...	20.5 mA	Power Output	...	0.77 watt



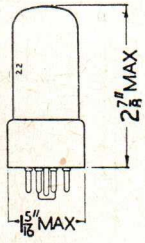
Obsolete Type

For Reference Only
TYPE **25B8GT**
(OCTAL BASE)
TRIODE—R.F. PENTODE



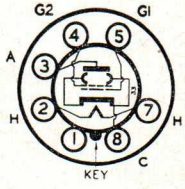
CHARACTERISTICS

Heater Voltage	...	25 volts	PENTODE SECTION		
Heater Current	...	0.15 amp.	Anode (Ap) Voltage	...	100 volts
TRIODE SECTION			Anode Current	...	7.6 mA
Anode (At) Voltage	...	100 volts	Screen (G2p) Voltage	...	100 volts
Anode Current	...	0.6 mA	Screen Current	...	2.0 mA
Grid (Gt) Voltage	...	−1 volt	Control Grid (G1p) Voltage		−3 volts
Mutual Conductance	...	1.5 mA/V	Anode Impedance	...	0.2 meg.
Amplification Factor	...	112	Mutual Conductance	...	2.0 mA/V



Replacement Type

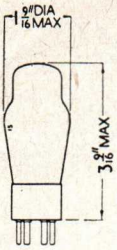
TYPE **25L6GT**
(OCTAL BASE)
OUTPUT BEAM
TETRODE



CHARACTERISTICS

Heater Voltage	25		volts
Heater Current	0.3		amp.
Anode Voltage	110	200	volts
Anode Current	49	50	mA
Screen Voltage	110	110	volts
Screen Current (Zero Signal)	4.0	2.0	mA
Screen Current (Max. Signal)	9	7	mA
Control Grid (G1) Voltage	−7.5	−8	volts
Cathode Bias Resistor	150	160	ohms
Anode Impedance	10,000	30,000	ohms
Mutual Conductance	9.0	9.5	mA/V
Optimum Load	1,500	3,000	ohms
Power Output	2.1	4.3	watts
Harmonic Distortion	11	10	percent.

25RE
25Y5
25SN7GT



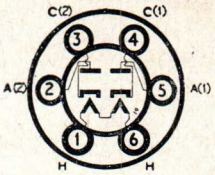
Obsolete Types

For Reference Only

TYPES **25RE, 25Y5**

(U.X. BASE)

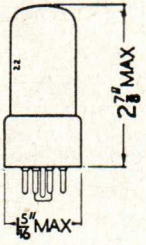
A.C./D.C. RECTIFIERS



CHARACTERISTICS

Heater Voltage	25 volts
Heater Current	0.3 amp.
Heater-Cathode Potential	350 volts max.
R.M.S. Input per Anode	250 volts max.
Rectified Current	85 mA max.

Types 25RE, 25Y5 when used in half wave circuits (both Anodes and both Cathodes connected together) may be replaced directly by BRIMAR type 1D6.

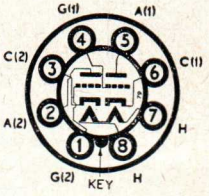


TYPE **25SN7GT**

(OCTAL BASE)

DOUBLE TRIODE

(SEPARATE CATHODES)

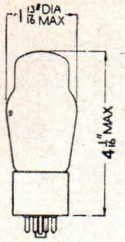


The BRIMAR type 25SN7GT is an indirectly heated double triode introduced especially for use in aircraft or A.C./D.C. equipment. Except for the heater ratings, the characteristics are identical to those of type 6SN7GT.

CHARACTERISTICS

Heater Voltage	25	volts	
Heater Current	0.15	amp.	
Anode Voltage	100	250	volts
Anode Current	10.6	9.0	mA
Grid Voltage	0	−8	volts
Cathode Bias Resistor	−	1,100	ohms
Anode Impedance	8,000	7,700	ohms
Mutual Conductance	2.5	2.6	mA/V
Amplification Factor	20	20	

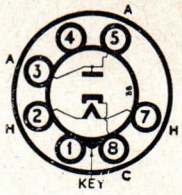
For further information and characteristic curves refer to type 6SN7GT.



TYPE 25Z4G

(OCTAL BASE)

HALF-WAVE RECTIFIER



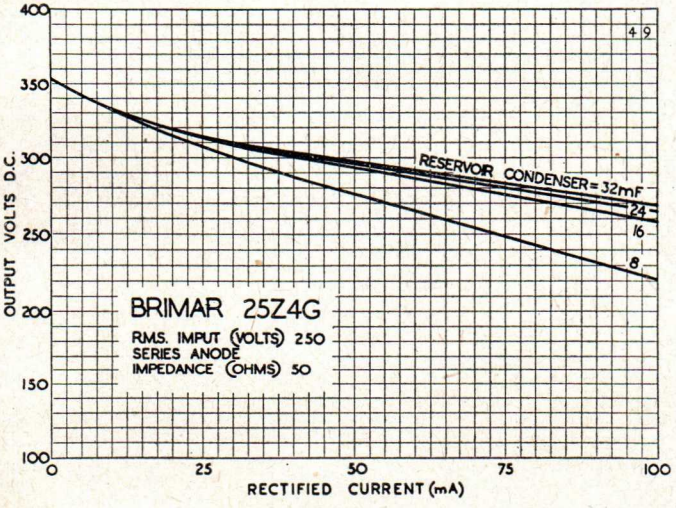
The BRIMAR type 25Z4G is an indirectly heated half wave rectifier for use in A.C./D.C. equipment. It is designed to replace type 25Z6G where this valve is used in half-wave application.

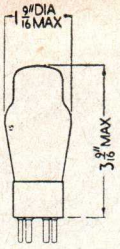
RATINGS

Heater Voltage	25 volts
Heater Current	0.30 amp.
Peak Inverse Voltage	700 volts max.
Peak Anode Current	450 mA max
Heater Cathode Potential	350 volts max.

CHARACTERISTICS AS HALF-WAVE RECTIFIER

R.M.S. Input	117	250 volts max.
Supply Impedance	0	100 ohms min.
Rectified Current	100	100 mA max.

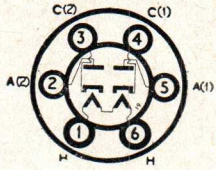




Obsolete Type

For Reference Only

TYPE 25Z5
(U.X. BASE)
A.C./D.C. RECTIFIER



CHARACTERISTICS

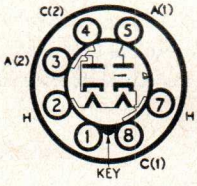
Heater Voltage		25 volts
Heater Current		0.3 amp.
	VOLTAGE DOUBLER	HALF-WAVE
R.M.S. Input per Anode	117	235 volts max.
Rectified Current	75	150 mA max.
Supply Impedance per Anode	0	100 ohms min

Type 25Z5 when used in half-wave circuits may be replaced by type 1D6.

Obsolete Type

For Reference Only

TYPE 25Z6G
(OCTAL BASE)
A.C./D.C. RECTIFIER



CHARACTERISTICS

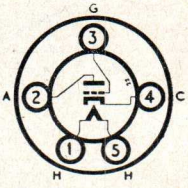
Heater Voltage		25 volts
Heater Current		0.3 amp.
	VOLTAGE DOUBLER	HALF-WAVE
R.M.S. Input per Anode	117	235 volts max.
Rectified Current	75	150 mA max.
Supply Impedance per Anode	0	100 ohms min.

Type 25Z6G when used in half-wave circuits may be replaced by type 25Z4G

Obsolete Type

For Reference Only

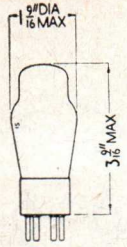
TYPE 27
(U.X. BASE)
GENERAL PURPOSE
TRIODE



CHARACTERISTICS

Heater Voltage		2.5	volts
Heater Current		1.75	amp.
Anode Voltage	90	250	volts
Anode Current	2.7	5.2	mA
Grid Voltage	−6	−21	volts
Cathode Bias Resistor	2,200	4,000	ohms
Anode Impedance	11,000	9,000	ohms
Mutual Conductance	0.8	1.0	mA/V
Amplification Factor	9	9	

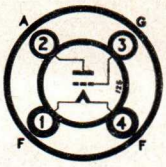
BRIMAR



Obsolete Type

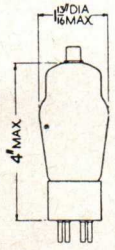
For Reference Only

TYPE 30
(U.X. BASE)
BATTERY GENERAL PURPOSE TRIODE



CHARACTERISTICS

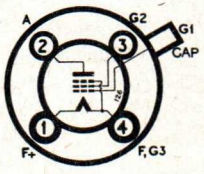
Filament Voltage	2.0		volts
Filament Current	0.06		amp.
Anode Voltage	90	135	volts
Anode Current	2.5	3.0	mA
Grid Voltage	−4.5	−9	volts
Mutual Conductance	0.85	0.9	mA/V
Amplification Factor	9.3	9.3	
Grid to Anode Capacitance		6	pF
Grid to Filament Capacitance		3	pF
Anode to Filament Capacitance		2	pF



Obsolete Type

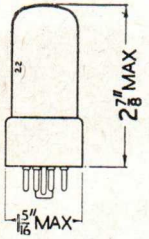
For Reference Only

TYPE 32E
(U.X. BASE)
BATTERY R.F. PENTODE



CHARACTERISTICS

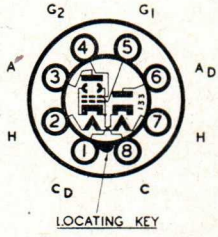
Filament Voltage	2.0 volts	Screen Current	0.4 mA
Filament Current	0.06 amp.	Control Grid (G1) Voltage	−3 volts
Anode Voltage	135 volts	Anode Impedance	1.0 meg.
Anode Current	1.7 mA	Mutual Conductance	0.6 mA/V
Screen (G2) Voltage	67.5 volts		



Obsolete Type

For Reference Only

TYPE 32L7GT
(OCTAL BASE)
TETRODE-RECTIFIER



CHARACTERISTICS

Heater Voltage	32.5 volts	Screen (G2) Voltage	90 volts
Heater Current	0.3 amp.	Screen Current	2.0 mA
RECTIFIER SECTION		Control Grid (G1) Voltage	-7 volts
R.M.S. Input	125 volts max.	Cathode Bias Resistor	220 ohms
Rectified Current	60 mA max.	Anode Impedance	17,000 ohms
TETRODE SECTION		Mutual Conductance	4.8 mA/V
Anode Voltage	90 volts	Optimum Load	2,600 ohms
Anode Current	27 mA	Power Output	1.0 watt

34E
35RE

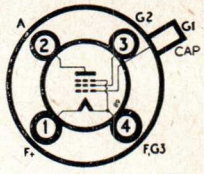
Obsolete Type

For Reference Only

TYPE **34E**

(U.X. BASE)

BATTERY VARI-MU R.F. PENTODE

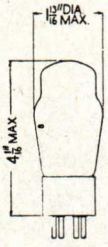


CHARACTERISTICS

Filament Voltage	2.0	volts	
Filament Current	0.06	amp.	
Anode Voltage	67.5	135	volts
Anode Current	2.7	2.8	mA
Screen (G2) Voltage	67.5	67.5	volts
Screen Current	1.1	1.0	mA
Control Grid (G1) Voltage	–3	–3	volts
Anode Impedance	0.4	0.6	meg.
Mutual Conductance	0.56	0.6	mA/V
Control Grid Voltage	–22.5	–22.5	volts

(For Mutual Conductance of 0.015 mA/V)

Obsolete Type

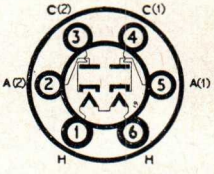


For Reference Only

TYPE **35RE**

(U.X. BASE)

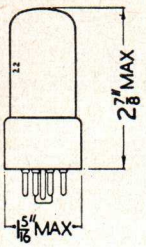
A.C./D.C. RECTIFIER



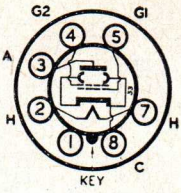
CHARACTERISTICS

Heater Voltage	35 volts
Heater Current	0.3 amp.
Heater Cathode Potential	350 volts max.
R.M.S. Input per Anode	250 volts max.
Rectified Current	100 mA max.

In half-wave applications type 35RE may often be replaced by type 1D6 with a slight alteration to the value of mains resistor employed.



TYPE **35L6GT**
(OCTAL BASE)
OUTPUT BEAM
TETRODE



RATINGS

The BRIMAR type 35L6GT is an indirectly heated beam tetrode for use in the output stages of A.C./D.C. equipments where the operating voltages are low.

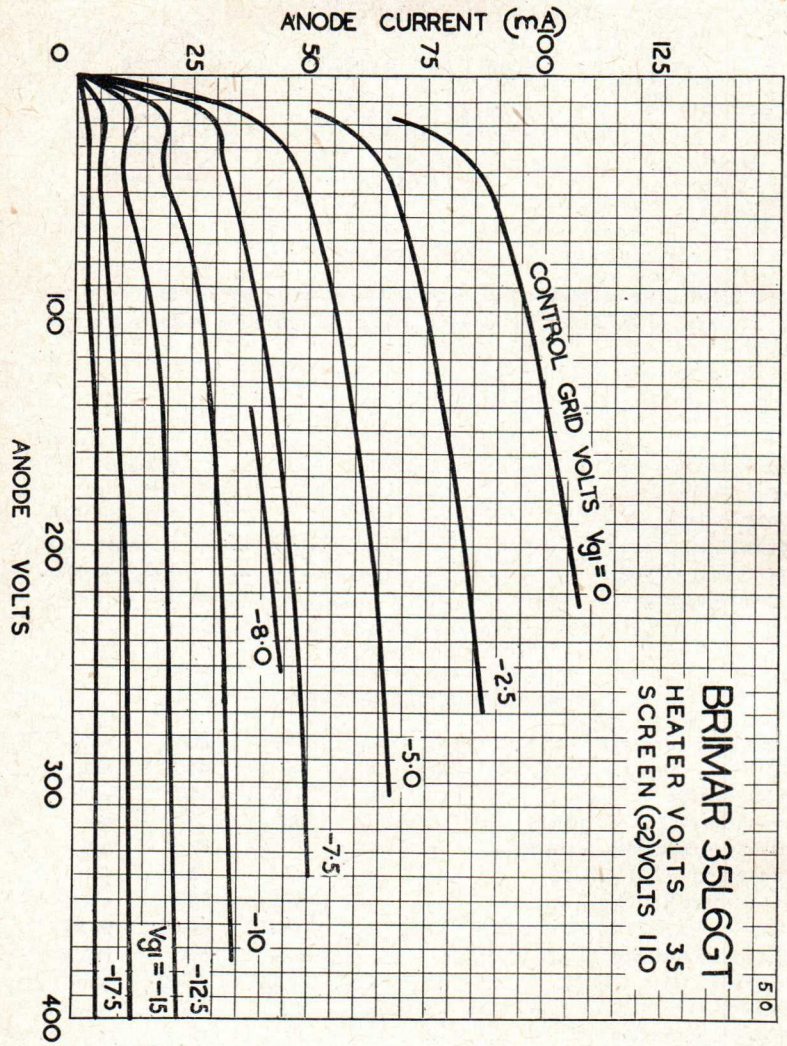
Heater Voltage	35 volts
Heater Current	0.15 amp.
Anode Voltage	200 volts max.
Anode Dissipation	8.5 watts max.
Screen (G2) Voltage	110 volts max.
Screen Dissipation	1.0 watt max.

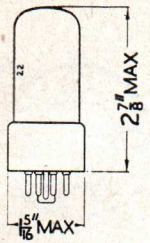
OPERATING CHARACTERISTICS

Anode Voltage	110	200	volts
Anode Current	40	41	mA
Screen Voltage	110	110	volts
Screen Current (Zero Signal)	3.0	2.0	mA
Screen Current (Max. Signal)	7	7	mA
Control Grid (G1) Voltage	−7.5	−8	volts
Cathode Bias Resistor	170	185	ohms
Anode Impedance	14,000	40,000	ohms
Mutual Conductance	5.8	5.9	mA/V
Optimum Load	2,500	4,500	ohms
Power Output	1.5	3.3	watts
Harmonic Distortion	10	10	per cent.

INTER-ELECTRODE CAPACITANCES (Approx.)

Input (Control Grid to all except Anode)	14 pF
Output (Anode to all except Control Grid)	8.5 pF
Control Grid to Anode	1.0 pF

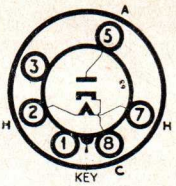

ANODE CURRENT (mA)
0
25
50
75
100
125
ANODE VOLTS
0
100
200
300
400
BRIMAR 35L6GT
HEATER VOLTS 35
SCREEN (G2) VOLTS 110
CONTROL GRID VOLTS Vg1 = 0
-2·5
-5·0
-7·5
-8·0
-10
-12·5
Vg1 = -15
-17·5



TYPE **35Z4GT**

(OCTAL BASE)

HALF-WAVE RECTIFIER



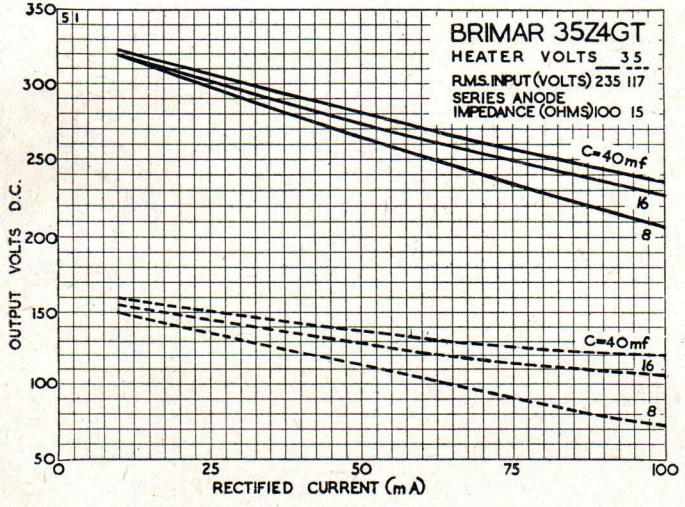
The BRIMAR type 35Z4GT is an indirectly heated half-wave rectifier for use in A.C./D.C. equipment where low heater current drain is of importance.

RATINGS

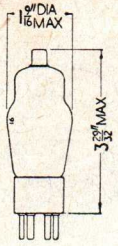
Heater Voltage	35 volts
Heater Current	0.15 amp.
Peak Inverse Voltage	700 volts max.
Peak Anode Current	600 mA max.
Heater Cathode Potential	350 volts max.

CHARACTERISTICS AS HALF-WAVE RECTIFIER

R.M.S. Input	117	250 volts max.
Supply Impedance	15	100 ohms min.
Rectified Current	100	100 mA max.
Reservoir Condenser	40	40 μF max.



36
37
39/44



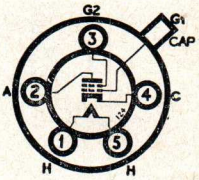
Obsolete Type

For Reference Only

TYPE 36

(U.X. BASE)

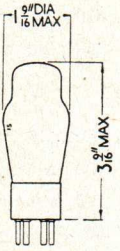
R.F. TETRODE



CHARACTERISTICS

Heater Voltage	6.3 volts		
Heater Current	0.3 amp.		
Anode Voltage	100	250	volts
Anode Current	1.8	3.2	mA
Screen (G2) Voltage	55	90	volts
Screen Current	0.9	1.7	mA
Control Grid (G1) Voltage	−1.5	−3	volts
Anode Impedance	0.55	0.55	meg.
Mutual Conductance	0.85	1.1	mA/V

Type 6J7G will often make a successful substitute for type 36. The valve socket must first be replaced by an International Octal type.



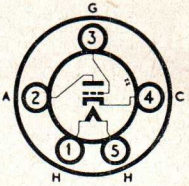
Obsolete Type

For Reference Only

TYPE 37

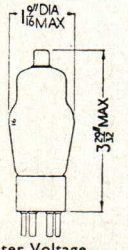
(U.X. BASE)

GENERAL PURPOSE TRIODE



CHARACTERISTICS

Heater Voltage	6.3 volts		
Heater Current	0.3 amp.		
Anode Voltage	90	250	volts
Anode Current	2.5	7.5	mA
Grid Voltage	−6	−18	volts
Anode Impedance	11,500	8,400	ohms
Mutual Conductance	0.8	1.1	mA/V
Amplification Factor	9.2	9.2	



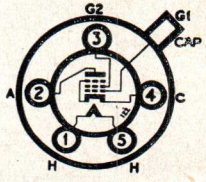
Obsolete Type

For Reference Only

TYPE 39/44

(U.X. BASE)

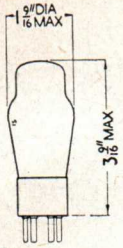
VARI-MU R.F. PENTODE



CHARACTERISTICS

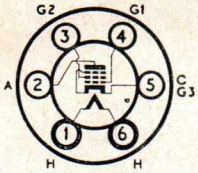
Heater Voltage	6.3 volts		
Heater Current	0.3 amp.		
Anode Voltage	90	250	volts
Anode Current	5.6	5.8	mA
Screen (G2) Voltage	90	90	volts
Screen Current	1.6	1.4	mA
Control Grid (G1) Voltage	−3	−3	volts
Anode Impedance	0.4	1.0	meg.
Mutual Conductance	1.0	1.1	mA/V

Type 6K7G will often make a successful substitution for type 39/44. The valve socket must first be replaced by an International Octal type.



Replacement Types

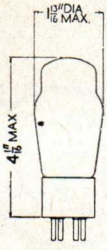
TYPES 41, 41E
(U.X. BASE)
POWER PENTODES



CHARACTERISTICS

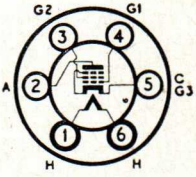
Heater Voltage	6.3 volts		
Heater Current	0.4 amp.		
Anode Voltage	180	250	volts
Anode Current	18.5	32	mA
Screen (G2) Voltage	180	250	volts
Screen Current	3.0	5.5	mA
Control Grid (G1) Voltage	–13.5	–18	volts
Cathode Bias Resistor	600	500	ohms
Anode Impedance	81,000	68,000	ohms
Mutual Conductance	1.85	2.3	mA/V
Optimum Load	9,000	8,000	ohms
Power Output	1.5	3.4	watts
Harmonic Distortion	10	11	per cent.

The characteristics of type 41 are identical to those of type 6K6G.



Replacement Types

TYPES 42, 42E
(U.X. BASE)
POWER PENTODES



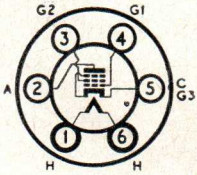
CHARACTERISTICS

Heater Voltage	6.3 volts
Heater Current	0.7 amp.
Anode Voltage	250 volts
Anode Current	34 mA
Screen (G2) Voltage	250 volts
Screen Current	6.5 mA
Control Grid (G1) Voltage	–16.5 volts
Cathode Bias Resistor	410 ohms
Anode Impedance	80,000 ohms
Mutual Conductance	2.5 mA/V
Optimum Load	7,000 ohms
Power Output	3.2 watts
Harmonic Distortion	8 per cent.

For further information and characteristic curves refer to type 6F6G.

Replacement Types

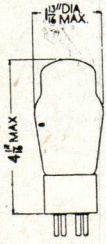
TYPES **43, 43E**
(U.X. BASE)
POWER PENTODES



CHARACTERISTICS

Heater Voltage		25	volts
Heater Current		0.3	amp.
Anode Voltage	135	160	volts
Anode Current	37	33	mA
Screen (G2) Voltage	135	120	volts
Screen Current	8.0	6.5	mA
Control Grid (G1) Voltage	−20	−18	volts
Cathode Bias Resistor	440	440	ohms
Anode Impedance	35,000	42,000	ohms
Mutual Conductance	2.45	2.40	mA/V
Optimum Load	4,000	5,000	ohms
Power Output	2.0	2.2	watts
Harmonic Distortion	9	10	per cent.

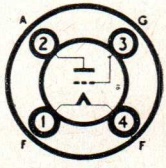
For further information and characteristic curves refer to type 25A6G.



Obsolete Type

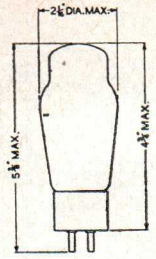
For Reference Only

TYPE **45**
(U.X. BASE)
POWER TRIODE



CHARACTERISTICS

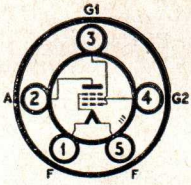
Filament Voltage	2.5 volts
Filament Current	1.5 amp.
Anode Voltage	250 volts
Anode Current	36 mA
Grid Voltage	−50 volts
Cathode Bias Resistor	1,500 ohms
Anode Impedance	1,600 ohms
Mutual Conductance	2.2 mA/V
Amplification Factor	3.5
Optimum Load	3,900 ohms
Power Output	1.6 watts



Obsolete Types

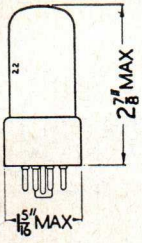
For Reference Only

TYPES 47, 47E
(U.X. BASE)
POWER PENTODES



CHARACTERISTICS

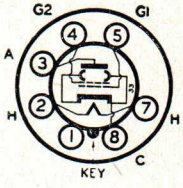
Filament Voltage	...	2.5 volts	Control Grid (G1) Voltage	...	−16.5 volts
Filament Current	...	1.75 amp.	Cathode Bias Resistor	...	450 ohms
Anode Voltage	...	250 volts	Anode Impedance	...	60,000 ohms
Anode Current	...	31 mA	Mutual Conductance	...	2.5 mA/V
Screen (G2) Voltage	...	250 volts	Optimum Load	...	7,000 ohms
Screen Current	...	6 mA	Power Output	...	2.7 watts



Replacement Type

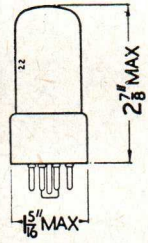
TYPE 50L6GT
(OCTAL BASE)

OUTPUT BEAM TETRODE



CHARACTERISTICS

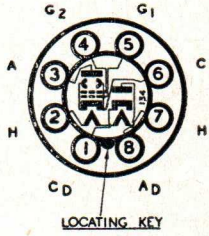
Heater Voltage	...	50 volts	Control Grid (G1) Voltage	...	−7.5 volts
Heater Current	...	0.15 amp.	Cathode Bias Resistor	...	150 ohms
Anode Voltage	...	110 volts	Anode Impedance	...	10,000 ohms
Anode Current	...	49 mA	Mutual Conductance	...	9.0 mA/V
Screen (G2) Voltage	...	110 volts	Optimum Load	...	1,500 ohms
Screen Current	...	4.0 mA	Power Output	...	2.1 watts



Obsolete Type

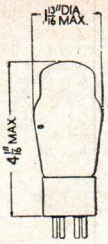
For Reference Only

TYPE 70L7GT
(OCTAL BASE)
TETRODE-RECTIFIER



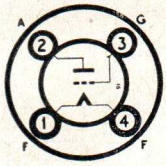
CHARACTERISTICS

Heater Voltage	...	70 volts	Screen (G2) Voltage	...	110 volts
Heater Current	...	0.15 amp.	Screen Current	...	3.0 mA
RECTIFIER SECTION			Control Grid (G1) Voltage	...	−7.5 volts
R.M.S. Input	...	125 volts max.	Cathode Bias Resistor	...	175 ohms
Rectified Current	...	70 mA max.	Anode Impedance	...	15,000 ohms
PENTODE SECTION			Mutual Conductance	...	7.5 mA/V
Anode Voltage	...	110 volts	Optimum Load	...	2,000 ohms
Anode Current	...	40 mA	Power Output	...	1.8 watts



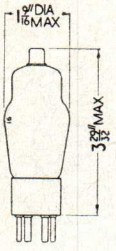
Obsolete Type

For Reference Only
TYPE 71A
(U.X. BASE)
POWER TRIODE



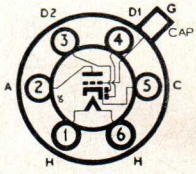
CHARACTERISTICS

Filament Voltage	... ...	5.0 volts	Anode Impedance	... ...	1,750 ohms
Filament Current	... ...	0.25 amp.	Mutual Conductance	...	1.7 mA/V
Anode Voltage	... ...	180 volts	Amplification Factor	...	3
Anode Current	... ...	20 mA	Optimum Load	... ...	4,800 ohms
Grid Voltage	... ...	−40.5 volts	Power Output	... ...	0.8 watt



Replacement Type

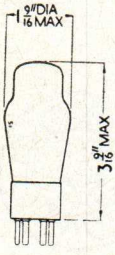
TYPE 75
(U.X. BASE)
DOUBLE DIODE TRIODE



CHARACTERISTICS

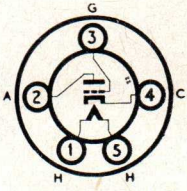
Heater Voltage	... ...	6.3 volts	Grid Voltage	... ...	−2 volts
Heater Current	... ...	0.3 amp.	Anode Impedance	... ...	91,000 ohms
Anode Volts	... ...	250 volts	Mutual Conductance	...	1.1 mA/V
Anode Current	.. ...	0.9 mA	Amplification Factor	... ...	100

For characteristic curves refer to type 11D3.



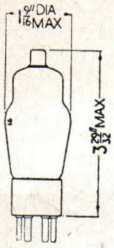
Replacement Type

TYPE 76
(U.X. BASE)
GENERAL PURPOSE
TRIODE



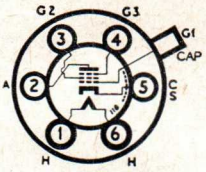
CHARACTERISTICS

Heater Voltage	... ...		6.3 volts	
Heater Current	... ...		0.3 amp.	
Anode Voltage	... ...	100	250	volts
Anode Current	... ...	2.5	5.0	mA
Grid Voltage	... ...	−5	−13.5	volts
Anode Impedance	... ...	12,000	9,500	ohms
Mutual Conductance	... ...	1.15	1.45	mA/V
Amplification Factor	... ...	14	14	
Grid to Anode Capacitance	... ...		2.2	pF
Grid to Cathode Capacitance	... ...		3.4	pF
Anode to Cathode Capacitance	... ...		5.5	pF



Replacement Types

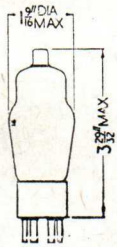
TYPES **77, 77E**
(U.X. BASE)
R.F. PENTODES



CHARACTERISTICS

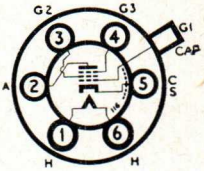
Heater Voltage	... ...	6.3 volts	Control Grid (G1) Voltage	...	−3 volts
Heater Current	... ...	0.3 amp.	Suppressor (G3) Voltage	...	0 volts
Anode Voltage	... ...	250 volts	Anode Impedance	... ...	1.5 meg.
Anode Current	... ...	2.3 mA	Mutual Conductance	...	1.2 mA/
Screen (G2) Voltage	... ...	100 volts	Control Grid Voltage	...	−7.5 volts
Screen Current	... ...	0.5 mA	(For Anode Current cut-off)		

For further information refer to type 6J7G.



Replacement Types

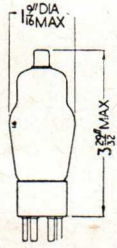
TYPES **78, 78E**
(U.X. BASE)
VARI-MU
R.F. PENTODES



CHARACTERISTICS

Heater Voltage	... ...	6.3 volts	Control Grid (G1) Voltage		−3 volts
Heater Current	... ...	0.3 amp.	Cathode Bias Resistor	...	330 ohms
Anode Voltage	... ...	250 volts	Anode Impedance	... ...	0.8 meg.
Anode Current	... ...	7.0 mA	Mutual Conductance	...	1.45 mA/V
Screen (G2) Voltage	... ...	100 volts	Control Grid Voltage	...	−42 volts
Screen Current	... ...	1.7 mA	(For Mutual Conductance of 0.002 mA/V)		

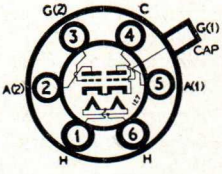
For further information and characteristic curves refer to type 6K7G.



Obsolete Type

For Reference Only

TYPE **79**
(U.X. BASE)
CLASS "B"
DOUBLE TRIODE

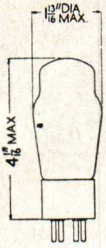


CHARACTERISTIC AS CLASS "B" AMPLIFIER

Heater Voltage	6.3	volts	
Heater Current	0.6	amp.	
Anode Voltage	180	250	volts
Anode Current (Zero Signal)	7.6	10.6	mA
Input Driving Power	350	380	mW
Optimum Load*	7,000	14,000	ohms
Power Output	5.5	8.0	watts

* *Anode to Anode load.*

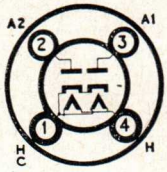
Replacement Type



TYPE 80

(U.X. BASE)

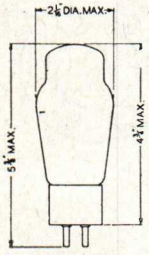
FULL-WAVE RECTIFIER



CHARACTERISTICS

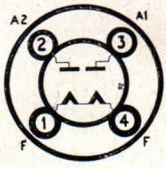
Heater Voltage	5.0 volts
Heater Current	2.0 amp.
R.M.S. Input per Anode	350 volts max.
Rectified Current	125 mA max.

For further information and characteristic curves refer to type 5Z4G.



TYPE 83

(U.X. BASE)
FULL-WAVE RECTIFIER
(MERCURY VAPOUR)



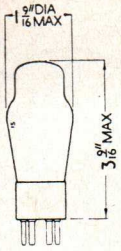
The BRIMAR type 83 is a directly heated full-wave rectifier of the Mercury Vapour type suitable for use in large audio equipment. Owing to its very low internal voltage drop, type 83 will give excellent regulation, limited only by the characteristics of the supply impedance. The full load must not be applied until the filament has reached operating temperature (10-15 seconds).

RATINGS

Filament Voltage	5.0 volts
Filament Current	3.0 amp.
Peak Inverse Voltage	1,550 volts max.
Peak Current per Anode	1.0 amp. max.
Average Current per Anode	225 mA max.
Condensed Mercury Temperature	20-60°C.

OPERATION AS FULL-WAVE RECTIFIER

CONDENSER INPUT	
R.M.S. Input per Anode	450 volts max.
Supply Impedance per Anode	50 ohms min.
Rectified Current	225 mA max.
CHOKE INPUT	
R.M.S. Input per Anode	550 volts max.
Input Choke Inductance	3 Henries min.
Rectified Current	225 mA max.

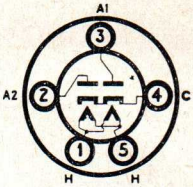


Replacement Type

TYPE 84/6Z4

(U.X. BASE)

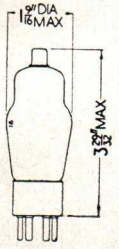
FULL WAVE RECTIFIER



CHARACTERISTICS

Heater Voltage	6.3 volts
Heater Current	0.5 amp.
R.M.S. Input per Anode ...	325 volts max.
Rectified Current	60 mA max.

For further information refer to type 7Y4.



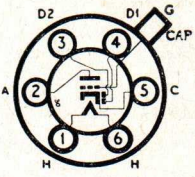
Obsolete Type

For Reference Only

TYPE 85

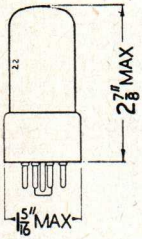
(U.X. BASE)

DOUBLE DIODE TRIODE



CHARACTERISTICS

Heater Voltage		6.3	volts
Heater Current		0.3	amp.
Anode Voltage	135	250	volts
Anode Current	3.7	8.0	mA
Grid Voltage	−10.5	−20	volts
Anode Impedance	11,000	7,500	ohms
Mutual Conductance	0.75	1.1	mA/V
Amplification Factor	8.3	8.3	



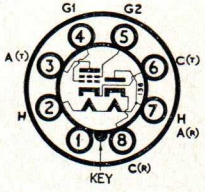
Obsolete Type

For Reference Only

TYPE 117P7GT

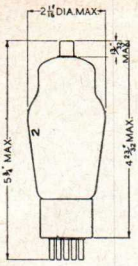
(OCTAL BASE)

TETRODE-RECTIFIER

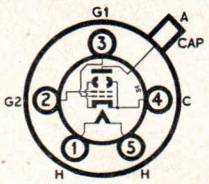


CHARACTERISTICS

Heater Voltage	117 volts	Screen (G2) Voltage ...	105 volts
Heater Current	0.09 amp.	Screen Current	4 mA
RECTIFIER SECTION		Control Grid (G1) Voltage	−5.2 volts
R.M.S. Input	117 volts max.	Cathode Bias Resistor ...	125 ohms
Rectified Current	75 mA max.	Anode Impedance ...	17,000 ohms
TETRODE SECTION		Mutual Conductance ...	5.3 mA/V
Anode Voltage	105 volts	Optimum Load	4,000 ohms
Anode Current	43 mA	Power Output	0.85 watts



TYPE 807
(U.X. BASE)
OUTPUT BEAM TETRODE



The BRIMAR type 807 is an indirectly heated beam tetrode for use in the output stages of large audio equipment. The valve is fitted with a low-loss base and may be used as R.F. amplifier or frequency multiplier in transmitters. Above 60 Mc/s the ratings must be reduced and at 120 Mc/s the ratings must not exceed 50 per cent of the maximum.

RATINGS

Heater Voltage	6.3 volts	
Heater Current	0.9 amp.	
Anode Voltage	600 volts	Absolute Maximum
Anode Dissipation	25 watts	
Screen (G2) Voltage	300 volts	
Screen Dissipation	3.5 watts	

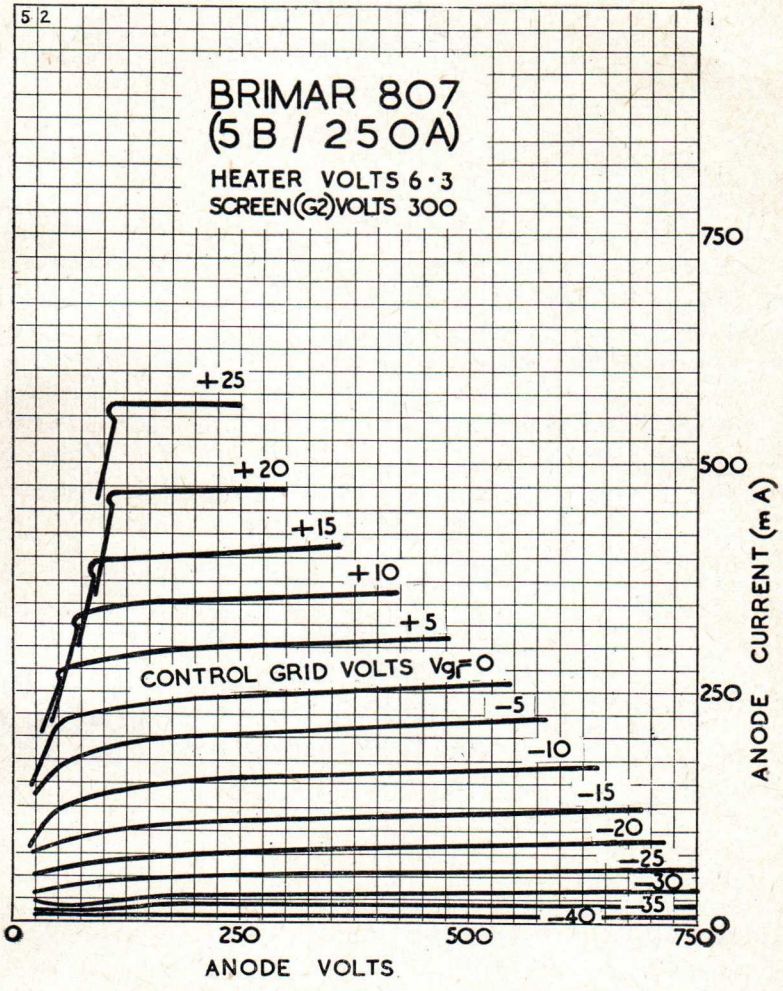
OPERATING CHARACTERISTICS (CLASS "A")

Anode Voltage	300	500	volts
Anode Current	83	50	mA
Screen Voltage	250	200	volts
Screen Current	8.0	1.6	mA
Control Grid (G1) Voltage	−12.5	−14.5	volts
Cathode Bias Resistor	140	280	ohms
Anode Impedance	24,000	39,000	ohms
Mutual Conductance	6.5	5.7	mA/V
Optimum Load	3,000	6,000	ohms
Power Output	6.4	11.5	watts
Harmonic Distortion	6	12	per cent.

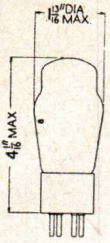
OPERATION AS PUSH-PULL AMPLIFIER (2 VALVES)

	Class AB1		Class AB2*	
Anode Voltage	300	600	600	volts
Anode Current (Zero Signal)	100	80	60	mA
Anode Current (Max. Signal)	119	150	200	mA
Screen Voltage	300	300	300	volts
Screen Current (Zero Signal)	2.5	1.5	5	mA
Screen Current (Max. Signal)	16.5	17.5	21	mA
Control Grid Voltage	—	−27.5	−30	volts
Cathode Bias Resistor	270	—	—	ohms
Peak Input (Grid to Grid)	72	59	78	volts
Optimum Load (Anode to Anode)	9,000	10,000	6,400	ohms
Power Output	32.5	47.5	80	watts
Harmonic Distortion	2.7	2.2	3.5	per cent.

** To obtain the maximum output at low distortion, the Anode and Screen supply voltages must not vary more than 5 per cent nor the grid bias 3 per cent between no signal and full signal conditions*


5 2
BRIMAR 807
(5B / 250A)
HEATER VOLTS 6·3
SCREEN(G2)VOLTS 300
+25
+20
+15
+10
+5
CONTROL GRID VOLTS Vg=0
-5
-10
-15
-20
-25
-30
-35
-40
0
250
500
750
ANODE VOLTS
750
500
250
0
ANODE CURRENT (mA)

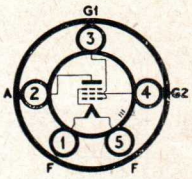
2101
2102



Obsolete Type

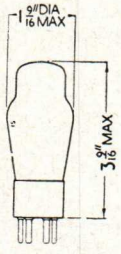
For Reference Only

TYPE **2101**
(U.X. BASE)
BATTERY POWER PENTODE



CHARACTERISTICS

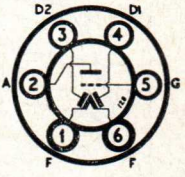
Filament Voltage	2.0 volts
Filament Current	0.12 amp.
Anode Voltage	135 volts
Anode Current	8.0 mA
Screen (G2) Voltage	135 volts
Screen Current	2.6 mA
Control Grid (G1) Voltage	–4.5 volts
Anode Impedance	200,000 ohms
Mutual Conductance	1.7 mA/V
Optimum Load	16,000 ohms
Power Output	0.45 watts



Obsolete Type

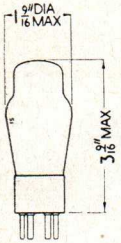
For Reference Only

TYPE **2102**
(U.X. BASE)
BATTERY DOUBLE DIODE TRIODE



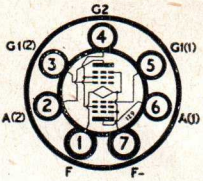
CHARACTERISTICS

Filament Voltage	2.0 volts
Filament Current	0.12 amp.
Anode Voltage	135 volts
Anode Current	2.1 mA
Grid Voltage	–1.5 volts
Anode Impedance	23,000 ohms
Mutual Conductance	1.3 mA/V
Amplification Factor	30



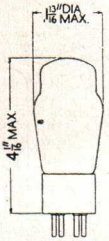
Obsolete Type

For Reference Only
TYPE **2103**
(U.X. BASE)
BATTERY DOUBLE PENTODE



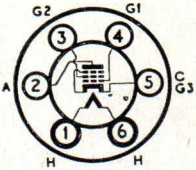
CHARACTERISTICS

Filament Volts	2.0 volts
Filament Current	0.26 amp.
Anode Voltage	135 volts
Anode Current	4.0 mA
Screen (G2) Voltage	135 volts
Screen Current	1.2 mA
Control Grid (G1) Voltage	–7.5 volts
Mutual Conductance	1.6 mA/V
Optimum Load (Anode to Anode)	24,000 ohms
Power Output	0.6 watts



Obsolete Type

For Reference Only
TYPE **2151**
(U.X. BASE)
POWER PENTODE



CHARACTERISTICS

	Single Valve	Push-Pull (2 valves).	
Heater Voltage	14	volts	
Heater Current	0.3	amp.	
Anode Voltage	250	250	volts
Anode Current	47	94	mA
Screen (G2) Voltage	250	250	volts
Screen Current	11.6	23	mA
Control Grid (G1) Voltage	–31	–31	volts
Cathode Bias Resistor	500	250	ohms
Anode Impedance	50,000	–	ohms
Mutual Conductance	2.4	–	mA/V
Optimum Load	5,000	7,000*	ohms
Power Output	5.0	12	watts

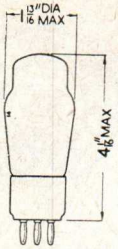
* *Anode to Anode load.*

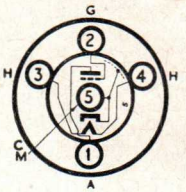
HLA2
PA1
PENA1

Replacement Type

TYPE **HLA2**

(ENGLISH BASE) GENERAL PURPOSE TRIODE





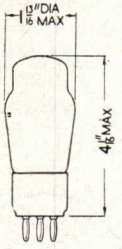
CHARACTERISTICS

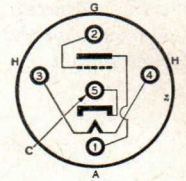
Heater Voltage	...	4.0 volts	Cathode Bias Resistor	...	400 ohms
Heater Current	...	1.0 amp.	Anode Impedance	...	9,000 ohms
Anode Voltage	...	200 volts	Mutual Conductance	...	5.5 mA/V
Anode Current	...	6.0 mA	Amplification Factor	...	50
Grid Voltage	...	–2.5 volts			

Replacement Type

TYPE **PA1**

(ENGLISH BASE) POWER TRIODE





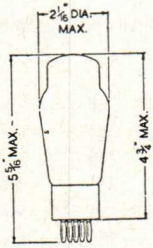
CHARACTERISTICS

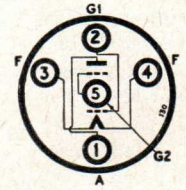
Heater Voltage	...	4.0 volts	Cathode Bias Resistor	...	260 ohms
Heater Current	...	1.0 amp.	Anode Impedance	...	1,050 ohms
Anode Voltage	...	200 volts	Mutual Conductance	...	12 mA/V
Anode Current	...	40 mA	Optimum Load	...	4,000 ohms
Grid Voltage	...	–9 volts	Power Output	...	1.8 watts

Replacement Type

TYPE **PENA1**

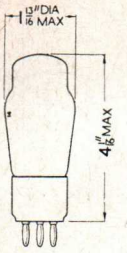
(ENGLISH BASE) POWER PENTODE





CHARACTERISTICS

Filament Voltage	...	4.0 volts	Control Grid (G1) Voltage		–16.5 volts
Filament Current	...	1.0 amp.	Cathode Bias Resistor	...	450 ohms
Anode Voltage	...	250 volts	Mutual Conductance	...	3.0 mA/V
Anode Current	...	32 mA	Optimum Load	...	8,000 ohms
Screen (G2) Voltage	...	250 volts	Power Output	...	2.7 watts
Screen Current	...	6.5 mA			

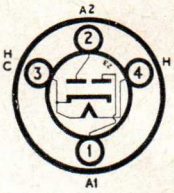


Replacement Types

TYPES **R1, R2**

(ENGLISH BASE)

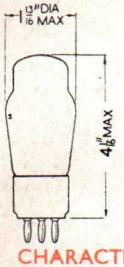
FULL-WAVE RECTIFIERS



CHARACTERISTICS

	R.1	R.2	
Heater Voltage	4.0	4.0	volts
Heater Current	1.0	2.5	amp.
R.M.S. Input per Anode	250	350	volts max.
Rectified Current	60	120	mA

For characteristic curves of type R2, *refer to type* R3.

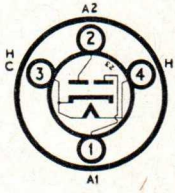


Replacement Type

TYPE **R3**

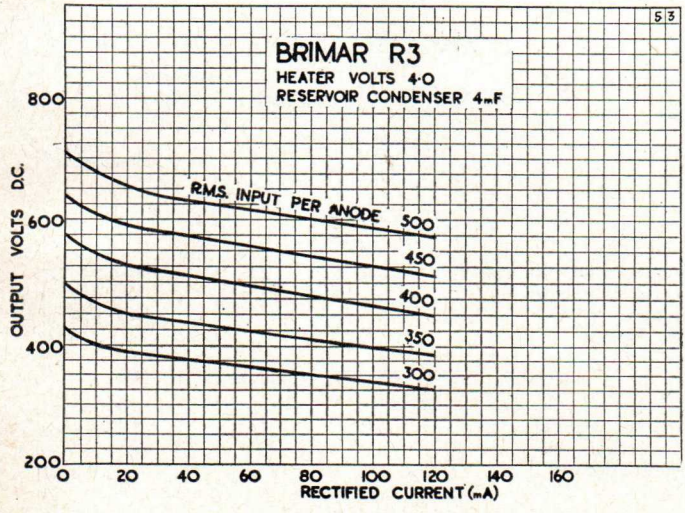
(ENGLISH BASE)

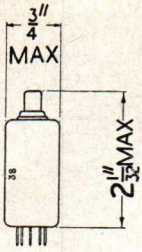
FULL-WAVE RECTIFIER



CHARACTERISTICS AS FULL WAVE RECTIFIER (CONDENSER INPUT)

Heater Voltage	4.0 volts	R.M.S. Input per Anode ...	500 volts max.
Heater Current	2.5 amp.	Rectified Current	120 mA max.
Peak Inverse Voltage ...	1,500 volts max.	Supply Impedance per Anode	150 ohms min.
Peak Current (Each Anode)	400 mA max.		

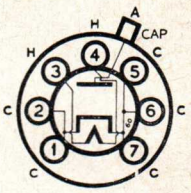




TYPE **R10**

(GLASS BUTTON BASE)

MINIATURE HIGH VOLTAGE RECTIFIER



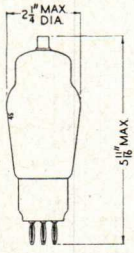
The BRIMAR type R10 is an indirectly heated half-wave rectifier of the " all glass " construction, fitted with a miniature type base. It is particularly suitable for use in portable oscilloscopes and may be used in television power supplies of the " line fly-back " type.

RATINGS

Heater Voltage	4.0 volts
Heater Current	0.5 amp.
Peak Inverse Voltage (No Load)	15.5 KV. max.
Peak Inverse Voltage (Full Load)	12.5 KV. max.
Peak Anode Current	40 mA max.
Supply Frequency	100 Kc/s max.

CHARACTERISTICS AS HALF-WAVE RECTIFIER

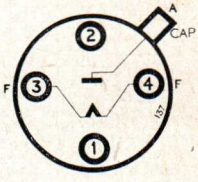
R.M.S. Input (DELAYED SWITCHING)	5.5. KV. max.
R.M.S. Input (SIMULTANEOUS SWITCHING)	3.5 KV. max.
Series Anode Impedance	62,000 ohms min.
Rectified Current	5.0 mA max.



TYPE **R11**

(ENGLISH BASE)

HIGH VOLTAGE RECTIFIER



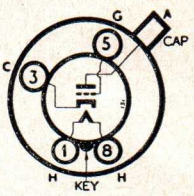
RATINGS

Heater Voltage	4.0 volts
Heater Current	1.1 amp.
Peak Inverse Voltage (No Load)	14 KV. max.
Peak Inverse Voltage (Full Load)	12.5 KV. max.
Peak Anode Current	350 mA max.
Supply Frequency	60 cps. max.

CHARACTERISTICS AS HALF-WAVE RECTIFIER

R.M.S. Input	5.0 KV. max.
Series Anode Impedance	4,000 ohms min.
Rectified Current	50 mA max.
Reservoir Condenser	1.0 μF max.

TYPE **C9A**
(ENGLISH OCTAL BASE) CATHODE RAY TUBE MAGNETIC TYPE



The BRIMAR type C9A is an ndirectly heated high voltage cathode ray tube for use in domestic television receivers. Magnetic deflection and focusing are employed and details of the necessary coils are given below.

RATINGS

Heater Voltage ...	2.0 volts
Heater Current...	1.4 amp.
Anode Voltage	6,000 volts max.
Beam Current ...	0.15 mA max.

OPERATING CHARACTERISTICS

Anode Voltage	5,000 volts
Grid Voltage ...	−30 volts
(For Beam Current cut-off) ...	
Average Peak to Peak Modulation for Maximum Beam Current	23 volts
Mean Length of Scanning Coils	1.75 ins.
Scanning Coil Sensitivity (Approx.) ...	9 amp. turns per in.
Focusing Coil Requirements (Using $\frac{1}{4}$ in. gap)	700 amp. turns

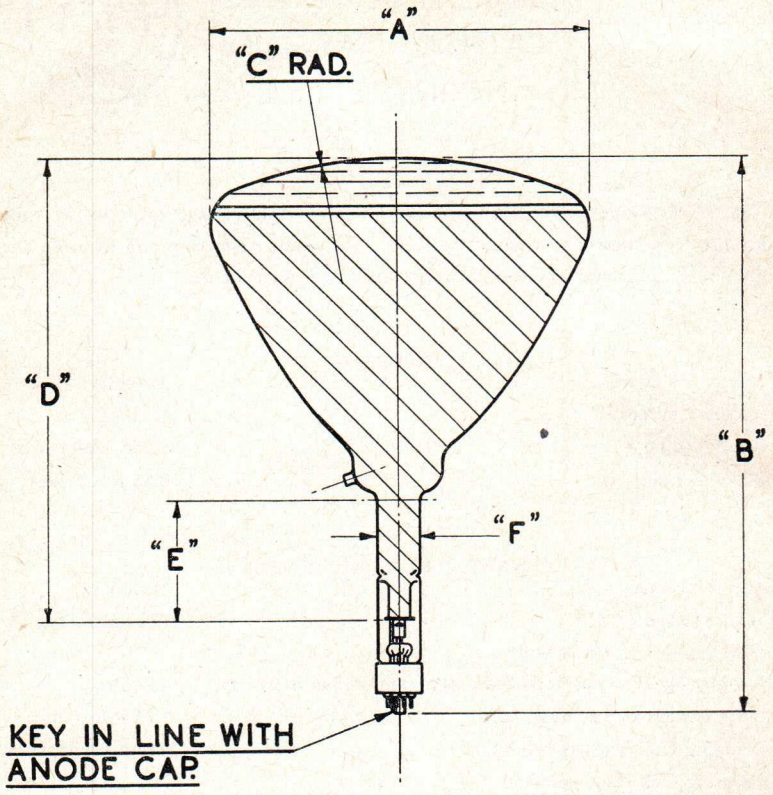
SUGGESTED DESIGN DATA FOR FOCUSING COIL

Length of Coil	$1\frac{1}{2}$ in.
Total Turns ...	27,000
Wire Gauge ...	44 s.w.g.
Focusing Current	25 mA

INTER-ELECTRODE CAPACITANCES (APPROX.)

Grid to all other Electrodes ...	5 pF
Cathode to all other Electrodes	5 pF

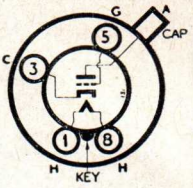
CATHODE RAY TUBES TYPES C9A & C12A.



DIMENSIONS IN MILLIMETRES

DIMENSION	C9A	C12A
A	228	312
B	369±5	460±5
C	380	385
D	308.7±2	397±2
E	103.3±1	113±1
F	34.5±.5	34.5±.5

TYPE **C12A**
(ENGLISH OCTAL BASE)
CATHODE RAY TUBE
MAGNETIC TYPE



The BRIMAR type C12A is an indirectly heated high voltage cathode ray tube for use in domestic television receivers. Magnetic Deflection and focusing are employed and details of the necessary coils are given below.

RATINGS

Heater Voltage	2.0 volts
Heater Current...	1.4 amp.
Anode Voltage	6,000 volts max.
Beam Current	0.150 mA max.

OPERATING CHARACTERISTICS

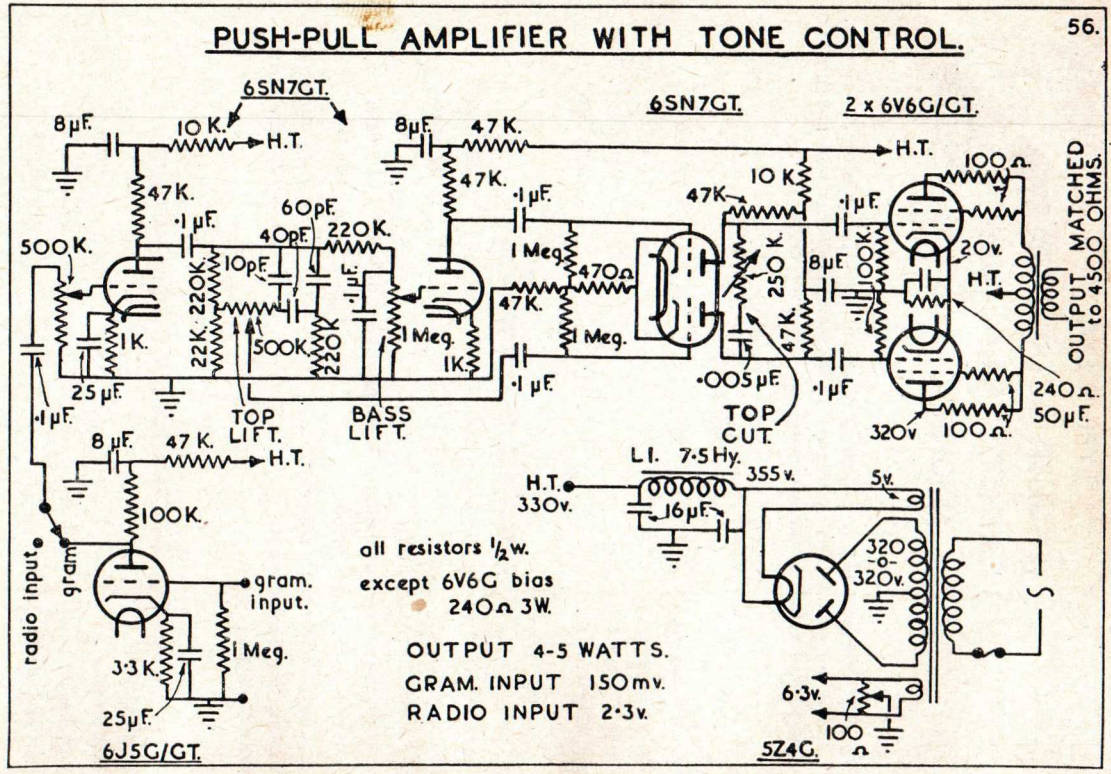
Anode Voltage	5,500 volts
Grid Voltage	–35 volts
(For Beam Current cut-off)	
Average Peak to Peak Modulation for Maximum Beam Current	24.5 volts
Mean Length of Scanning Coils	1.75 ins.
Scanning Coil Sensitivity (Approx.)	10 amp. turns per in.
Focusing Coil Requirements	700 amp. turns
(With $\frac{1}{4}$ in. gap.)	

DESIGN DATA FOR FOCUSING COIL (APPROX.)

Length of Coil	$1\frac{1}{2}$ in.
Total turns	27,000
Wire Gauge	44 s.w.g.
Focusing Current	30 mA

INTER-ELECTRODE CAPACITANCES

Grid to all other Electrodes	5 pF
Cathode to all other Electrodes	5 pF

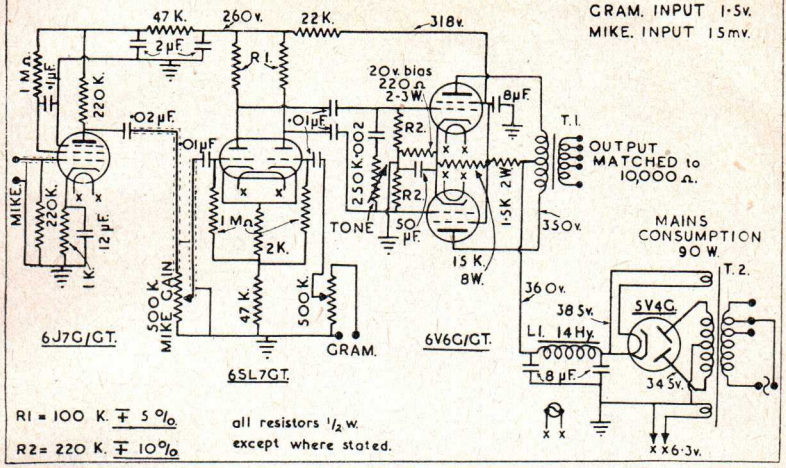

PUSH-PULL AMPLIFIER WITH TONE CONTROL.
56.
6SN7GT.
6SN7GT.
2 x 6V6G/GT.
8µF.
10 K.
H.T.
47K.
·1µF.
60pF.
40pF.
220K.
500K.
10pF.
22K.
220K.
500K
220K
·1µF.
1K.
25µF.
·1µF.
TOP LIFT.
BASS LIFT.
1 Meg.
1K.
8µF.
47 K.
H.T.
100K.
radio input.
gram.
gram. input.
1 Meg.
3·3K.
25µF.
6J5G/GT.
8µF.
47K.
H.T.
47K.
·1µF.
1 Meg.
470Ω
1 Meg.
·1µF.
47K
10 K
·1µF.
250 K.
47K.
·005µF.
TOP CUT.
8µF.
100K.
·1µF
100Ω.
20v.
H.T.
320v
100Ω.
240Ω.
50µF.
OUTPUT MATCHED to 4500 OHMS.
L1. 7·5Hy.
H.T. 330v.
16µF.
355 v.
5v.
320 - 0 - 320v.
6·3v.
100Ω
5Z4G.
all resistors ½w.
except 6V6G bias
240Ω 3W.
OUTPUT 4-5 WATTS.
GRAM. INPUT 150mv.
RADIO INPUT 2·3v.

BRIMAR

57.

PUSH-PULL 6V6G/GT AMPLIFIER.

12 – 15 WATTS OUTPUT.
GRAM. INPUT 1·5v.
MIKE. INPUT 15mv.



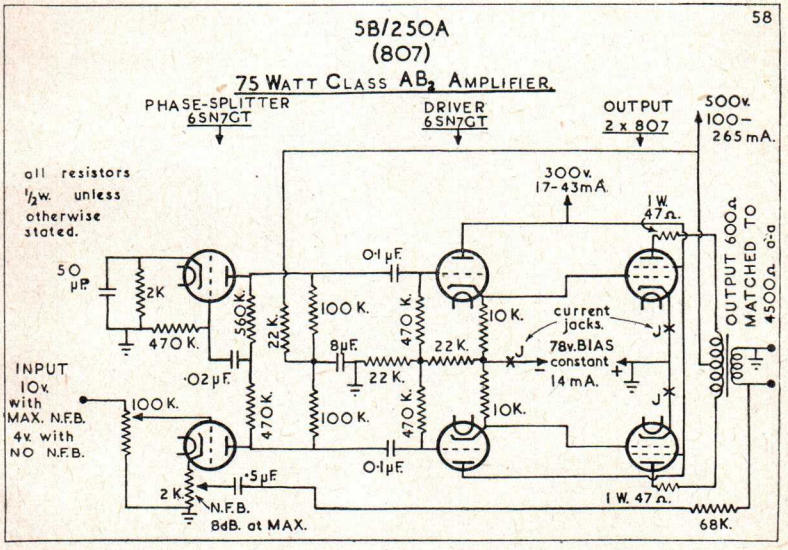
R1 = 100 K. ∓ 5%
R2 = 220 K. ∓ 10%

all resistors ½ w. except where stated.

58

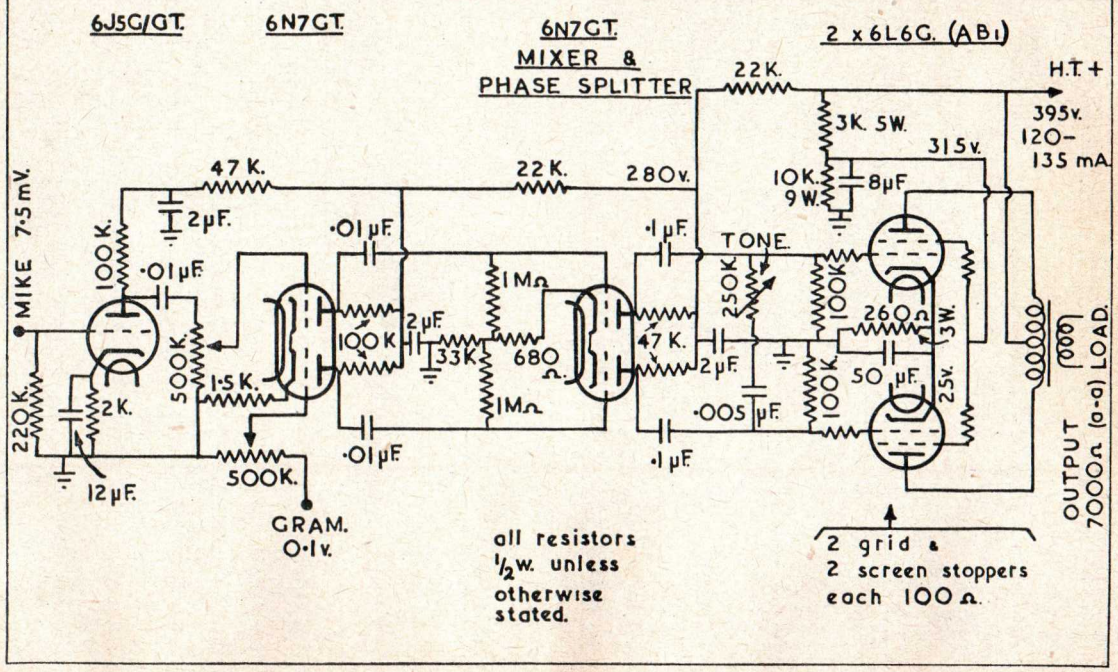
5B/250A (807)

75 WATT CLASS AB₂ AMPLIFIER.



20-25 WATT AMPLIFIER.

59.



FORMULAE IN RADIO ENGINEERING

1. OHMS LAW.

If V equals the voltage existing across a resistance of R ohms when a current of I amperes is flowing, then :—

$$V = I \times R,\ I = \frac{V}{R},\ \text{or}\ R = \frac{V}{I}$$

N.B.—1 Ampere = 1,000 milliamperes.

Example :—

Q. The screen current of a valve is 2 milliamperes when the screen voltage is 100 volts. What resistance will be required to drop the HT voltage from 250 volts to 100 volts to supply the screen of the valve?

A. Voltage across the resistor = 250-100 = 150 volts. Current = 2/1,000 Amperes ; then $R = \frac{V}{I}$

$$= \frac{150}{2/1{,}000} = \frac{150{,}000}{2} = 75{,}000 \text{ ohms.}$$

2. POWER.

Power is expressed in watts, and is equal to :—$V \times I$, or V^2/R or $I^2 \times R$, where V, I and R have the same meanings as in (1). Hence the power rating of the resistor in the above problem is found as follows :—

$$W = V \times I = 150 \times 2/1{,}000 = \frac{300}{1{,}000} = 0.3 \text{ watts.}$$

A 0.5 Watt or larger resistor would therefore be used.

3. RESISTORS IN SERIES AND PARALLEL.

The total resistance of a number of resistors connected in series is the sum of the separate resistances.

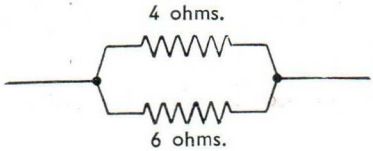
50 ohms. 20 ohms. 75 ohms.

Thus the total resistance of the three resistors shown above = 145 ohms.

The total resistance of a number of resistors connected in parallel is smaller than the resistance of any one taken alone, and is equal to :—

$$\frac{1}{\frac{1}{R} + \frac{1}{R2} + \frac{1}{R3}}$$

where R1, R2 and R3 are the separate resistors. For two resistors this works out to :—$\frac{R1 \times R2}{R1 + R2}$

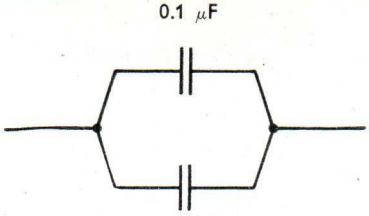


The resistance of the two resistors shown above

$$= \frac{4 \times 6}{4 + 6} = \frac{24}{10} = 2.4 \text{ ohms.}$$

4. CONDENSERS IN SERIES AND PARALLEL.

The Capacitance of two or more condensers connected in parallel is equal to the sum of their capacitances.



Thus the capacitance of the above combination will be 0.2 μF

The capacitance of a number of condensers connected in series is smaller than that of one taken alone and equals :—

$$\frac{1}{\frac{1}{C1} + \frac{1}{C2} + \frac{1}{C3}}$$

For two condensers this works out to :—

$$\frac{C1 \times C2}{C1 + C2}$$

and thus the capacity of the above combination will be

$$\frac{0.01}{0.2} = 0.05\ \mu F$$

5. BIAS RESISTANCES.

These may be worked out as in (1), but the total cathode current (sum of anode, screen and oscillator anode currents) must be employed in the formula.

Example.

Q. What bias resistor is required to provide 12 volts bias for a pentode whose anode current is 45 mA and screen current 5 mA ?

A. Total current through resistor = 45 + 5 = 50 mA = 50/1,000 ampere.

$$R = V/I = \frac{12}{50/1,000} = \frac{12,000}{50} = 240 \text{ ohms.}$$

In battery sets with automatic grid bias, the total H.T. current as measured at the H.T. negative battery terminal is employed in the formula.

6. THE REACTANCE OF CONDENSERS AND COILS.

The reactance of a condenser or a coil (i.e., its resistance to alternating current) is given by the formulae below :—

$$X_C = \frac{1}{2\pi fC} \qquad X_L = 2\pi fL$$

Where Xc = reactance of condenser, X_L = reactance of coil (both measured in ohms).

$2\pi = 6.28.$

= Frequency of alternating current in cycles per sec.

C = Capacitance of condenser in Farads.

L = Inductance of coil in Henries.

7. VALVE CHARACTERISTICS.

Gm = Mutual conductance of Valve (normally in mA/volt.)

μ = Amplification factor of valve.

R = Anode load in ohms.

Ra = Anode impedance in ohms.

Amplification factor (μ) = Anode Impedance (Ra) × Mutual Conductance (Gm).

Ra is measured in ohms.

Gm is measured in amps. per volt.

or alternatively

Ra is measured in thousands of ohms.

Gm is measured in milliamps per volt.

STAGE GAIN.

$$A = \frac{\mu R}{R + Ra}$$ where A is stage gain.

Where R (the anode load) is small compared with Ra (the anode impedance)

$$A = Gm \times R$$

NEGATIVE FEEDBACK.

$$A^1 = \frac{AB}{1 + B}$$

where :—

A = Amplification before feedback is applied.

A^1 = Amplification after feedback is applied.

B = Fraction of voltage fed back.

8. GENERAL.

1 Ampere (A) = 1,000 milliamperes (mA) = 1,000,000 microamperes (μA)

1 Farad (F) = 1,000,000 microfarads (μF)

1 Microfarad (μF) = 1,000,000 micro-microfarads. ($\mu\mu$F or pF)

1 Henry (H) = 1,000,000 microhenries (μH)

1 Volt (V) = 1,000 millivolts (mV.) = 1,000,000 microvolts (μV.)

1 Watt (W) = 1,000 milliwatts (mW.), 1 Kilowatt (KW.) = 1,000 watts.

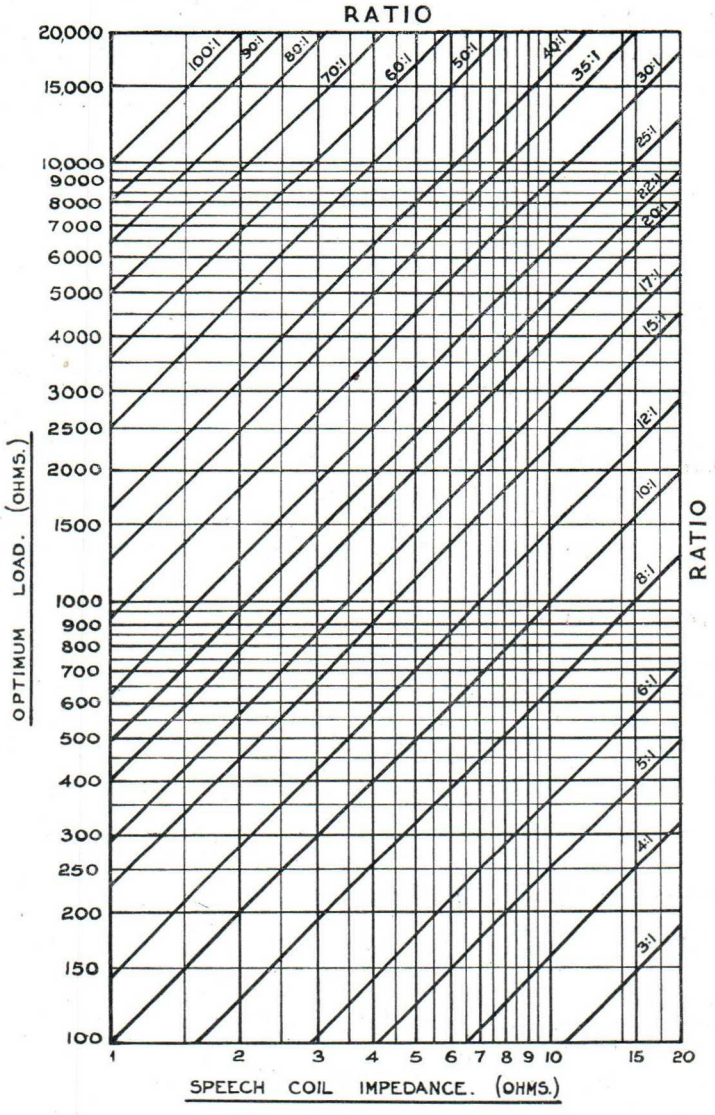
1 Kilocycle per sec. (Kc/s) = 1,000 cycles per sec. (c/s).

1 Megacycle per sec. (Mc/s) = 1,000 Kilocycles per sec. (Kc/s) = 1,000,000 cycles per sec. (c/s).

OUTPUT TRANSFORMER RATIOS

Derived from the formula :—

$$\frac{\text{Optimum Load}}{\text{Speech Coil Impedance}} = (\text{Transformer Ratio})^2$$

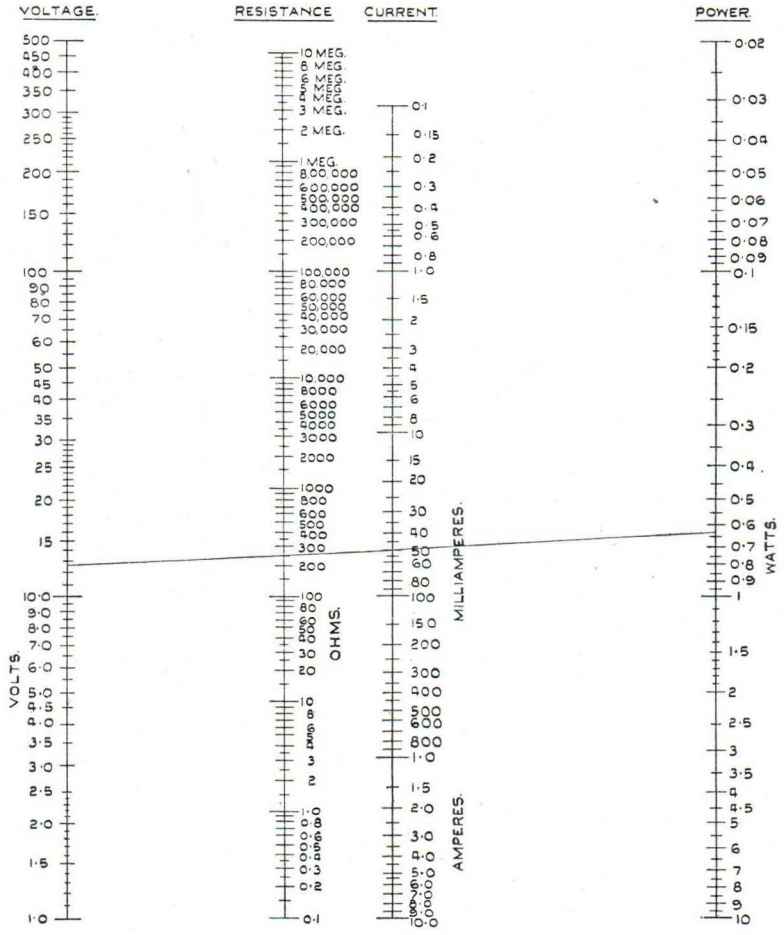


BRIMAR

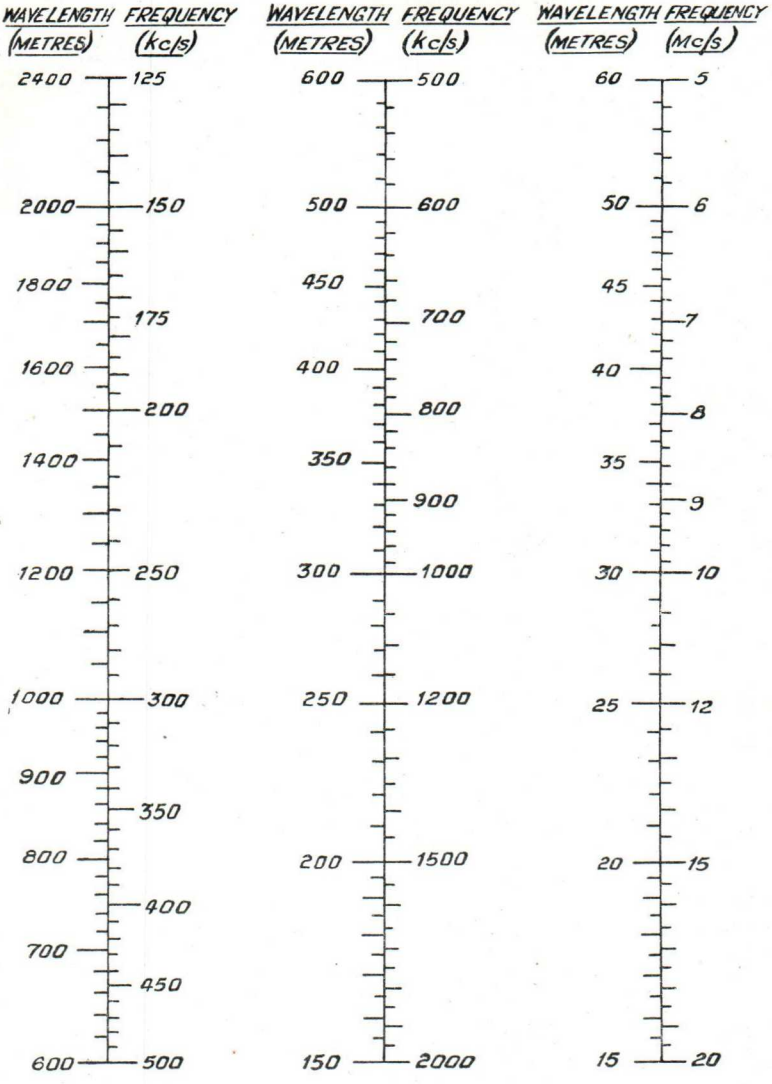
POWER AND RESISTANCE ABAC

To use the abac select known points on any two of the vertical scales and lay a ruler across these points so as to cut the other two scales. The points where the ruler cuts these latter scales will give the values required, e.g., to obtain the correct bias resistor for a 6V6G proceed as follows :—

The Anode and Screen Currents total 50mA and the recommended Grid Bias is 12.5 volts. A line drawn through these points cuts the power and resistance scales at 0.625 watt and 250 ohms respectively. A 1 watt, 250 ohm resistor would therefore be satisfactory.



CONVERSION TABLE
FREQUENCY AND WAVELENGTH



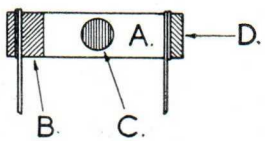
BRIMAR

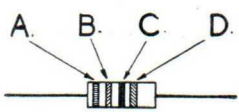
RESISTOR AND CONDENSER COLOUR CODES

1. Resistors.

The colour coding may take one of two forms as shown in the diagrams below. In each case the letters have the following meanings :—A gives the first significant figure, B the second, whilst C gives the number of noughts following the figures. D gives the tolerances of the resistor ; if D is not present, the tolerances are ±20 per cent of the nominal value

Colour	Figure	Tolerance
Black	0	
Brown	1	
Red	2	
Orange	3	
Yellow	4	
Green	5	
Blue	6	
Purple	7	
Grey	8	
White	9	
Gold	—	±5%
Silver	—	±10%





2. Condensers

The colour coding takes the form of three dots, the colours of which have the same numerical values as in the table above. The colours are read from left to right, the first two giving the significant figures and the third the number of noughts following the figures.

All values are given in picofarads (pF). (1,000,000 pF=1μF). The rating of condensers so marked is assumed to be 500 volts working, and the tolerances ±20%.

EQUIVALENTS

ENGLISH TYPES

BRIMAR	Cossor	Marconi Osram	Mazda	Mullard	Ferranti	Ever Ready
20A1	41STH	X41	AC/TH1	TH4A	—	—
20D2	—	—	—	—	—	—
15D1	13PGA	—	—	FC13C	VHTA	C80B
15D2	—	—	—	—	—	—
9D2	13VPA	—	VP1322	VP13C	—	C50N
8D2	13SPA	—	—	SP13C	—	C50B
11D3	13DHA	—	HL/DD1320	TDD13C	HAD	—
11D5	—	—	—	—	—	—
10D1	—	—	—	2D13C	ZD	C20C
4D1	—	—	HL1320	HL13C	DA	C30B
7D3	40PPA	—	—	—	—	—
7D5	—	—	—	—	—	—
7D6	—	—	PEN3520	PEN36C	—	C70D
7D8	—	—	PEN1340	PEN13C	PTA	—
HLA2	41MH	MH41	AC/2HL	904V	D4	A30D
PA1	41MXP	—	AC/P1	O54V	—	—
15A2	41MPG	MX40 X42	—	FC4	VHT4	A80A
9A1*	MVS/PEN	VMP4	AC/VP1	VP4	VPT4	A50M
8A1*	MS/PEN	MSP4	AC/S2PEN	SP4	SPT4	A50A
11A2	DDT	MHD4	AC/HLDD	TDD4	H4D	A23A
7A2†	MP/PEN	MPT4 MKT4 N40 KT42	AG/PEN	PEN4VA	—	A70B
7A3	42MP/PEN	N41 KT41	AC2/PEN	PENA 4 PEN4VB	PT4	A70C
1D5	40SUA	—	U4020	UR1C	RZ	C10B
R1	408BU 506BU	U10	UU2 UU60/250	IW2 DW2	—	S11A
R2	442BU 431U	U12 MU12	UU3 UU4 UU120/350	IW3 IW4/350 DW3 DW4/350	R4	S11D A11B A11D
R3	460BU 441U	U14 MU14	UU5 UU120/500	IW4 DW4	R4A	A11C

*Available with 5 and 7 pin bases.

†Available with 5 pin base and side terminal.

NOTE.—Except in the case of voltage doubling circuits, the Brimar half-wave rectifier 25Z4G may be used in place of the 25Z6G and similarly the 1D6 may be used in place of types 25RE, 25Y5 and 25Z5.

1.4 VOLT BATTERY OCTALS

BRIMAR	1A7G	1N5G	1H5G	1C5G	3Q5GT
Marconi Osram	X14	Z14	HD14	N14	N15
Mullard	DK32	DF33	DAC32	DL35	DL33

OCTAL TYPES

Brimar	5U4G	5Y3G 5Z4G	6AG6G	6A8G	6F6G	6H6G	6J5G	6J7G	6U7G 6K7G	6K8G
Marconi Osram	U52	U50	KT61	X63	KT63	D63	L63	KTZ63	KTW63	X65
Brimar	**6L6G**	**6L7G**	**6Q7G**	**6R7G**	**25L6G**	**25Z4G**	**12K8GT**	**12K7GT**	**12Q7GT**	**35Z4GT**
Marconi Osram	KT66	X64	DH63	DL63	KT32	U31	X76M	W76	DH76	U76

MINIATURE TYPES

Brimar	1R5	1S5	1T4	3S4	6AL5	8D3	9D6
Mullard	DK91	DAF91	DF91	DL92	EB91	EF91	EF92
Marconi Osram	X17	ZD17	W17	N17			

LOCTAL TYPES

Brimar	7A7/7H7	7S7	7C5	7Z4
Marconi Osram	W81	X81	KT81	U82

PRICE LIST

Type	Price	P.Tax	Type	Price	P.Tax	Type	Price	P. Tax
0Z4	12/6	4/1	6K7G, GT	10/6	3/5	10D1	7/6	2/6
1A5G	9/–	3/–	6K8G, GT	11/6	3/9	11A2	16/6	5/5
1A7G, GT	10/6	3/5	6L6G	15/–	4/11	11D3	12/–	3/11
1C5G, GT	9/–	3/–	6L7G	10/6	3/5	11D5	12/–	3/11
1D5	9/–	3/–	6N6G	15/–	4/11	12A6	10/6	3/5
1D6	9/–	3/–	6N7G, GT	15/–	4/11	12C8GT	12/6	4/1
1H5G, GT	7/6	2/6	6Q7G, GT	9/6	3/1	12J7GT	10/6	3/5
1LA4E	9/–	3/–	6R7G	9/6	3/1	12K7GT	10/6	3/5
1LA6E	10/6	3/5	6SG7	10/6	3/5	12Q7GT	9/6	3/1
1LH4	7/6	2/6	6SH7	10/6	3/5	12SJ7	10/6	3/5
1LN5E	9/–	3/–	6SJ7	10/6	3/5	12SK7	10/6	3/5
1N5G, GT	9/–	3/–	6SK7	10/6	3/5	12SQ7	9/6	3/1
1R5	13/–	4/3	6SL7GT	15/–	4/11	12SR7	9/6	3/1
1S4	11/6	3/9	6SN7GT	15/–	4/11	15A2	18/–	5/11
1S5	13/–	4/3	6SQ7	9/6	3/1	15D1	18/–	5/11
1T4	11/6	3/9	6U5/6G5	8/6	2/10	15D2	18/–	5/11
1Q5GT	9/–	3/–	6U7G	10/6	3/5	18	13/–	4/3
2A3	13/6	4/5	6V6G, GT	10/6	3/5	20A1	18/–	5/11
3D6	9/–	3/–	6X5G, GT	9/–	3/–	20D2	18/–	5/11
3S4	11/6	3/9	7A2	13/–	4/3	25A6G	10/6	3/5
3Q5GT	9/–	3/–	7A3	13/–	4/3	25L6GT	10/6	3/5
4D1	10/–	3/3	7A7	10/6	3/5	25SN7GT	15/–	4/11
5R4GY	15/–	4/11	7A8	11/6	3/9	25Z4G	9/–	3/–
5U4G	15/–	4/11	7B5E	10/6	3/5	35L6GT	10/6	3/5
5V4G	9/–	3/–	7B6	9/6	3/1	35Z4GT	9/–	3/–
5Y3G	9/–	3/–	7B7	10/6	3/5	41, E	13/–	4/3
5Z3	15/–	4/11	7B8	11/6	3/9	42, E	13/–	4/3
5Z4G	9/–	3/–	7C5	10/6	3/5	43, E	13/–	4/3
6AG6G	10/6	3/5	7C6	9/6	3/1	50L6GT	10/6	3/5
6AL5	7/6	2/6	7C7	10/6	3/5	75	12/–	3/11
6A3	13/6	4/5	7D3	13/–	4/3	76	10/–	3/3
6A6	15/–	4/11	7D5	13/–	4/3	77, E	15/6	5/1
6A7, E	18/–	5/11	7D6	16/–	5/3	78, E	15/6	5/1
6A8G, GT	11/6	3/9	7D8	16/–	5/3	80	9/–	3/–
6B4G	9/6	3/1	7F7	*		83	15/–	4/11
6B5	15/–	4/11	7H7	*		84/6Z4	9/–	3/–
6B6G	9/6	3/1	7K7	*		807	25/–	
6B7, E	17/–	5/7	7N7	*		HLA2	12/6	4/1
6B8G, GT	12/6	4/1	7R7	*		PA1	13/6	4/5
6C5G	7/6	2/6	7S7	*		PENA1	13/–	4/3
6C6	15/6	5/1	7Y4	9/–	3/–	R1, R2	9/–	3/–
6D6	15/6	5/1	7Z4	*		R3	9/–	3/–
6F6G	10/6	3/5	8A1	15/6	5/1	R10	15/–	4/11
6F7, B, E	11/6	3/9	8D2	15/6	5/1	R11	15/–	4/11
6H6G, GT	7/6	2/6	8D3	17/6	5/9	C9A	9 0 0	3 10 3
6J5G, GT	7/6	2/6	9A1	15/6	5/1	C12A	12 0 0	4 13 8
6J7G, GT	10/6	3/5	9D2	15/6	5/1			
6K6G	10/6	3/5	9D6	12/–	3/11			

** Prices to be announced later*

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