



TH 2321 and TH 233

AC/DC MAINS TRIODE HEPTODES

RATING (Both Types).

Heater Voltage	...	...	...	...	...	23.0
Heater Current (Amps.)	...	...	...	...	...	0.2

Heptode.

Maximum Anode Voltage	...	...	...	...	...	250
Maximum Screen Voltage	...	...	...	...	...	250
*Mutual Conductance (mA/V)	...	...	...	...	...	3.0

*Taken at $E_a=150$; $E_s=100$; $E_g=-2$; $E_g=0$.

Triode.

Maximum Anode Voltage	...	...	...	...	...	150
Maximum Peak Anode Current (mA)	...	...	...	...	...	15
*Amplification Factor	...	...	...	...	...	16
*Mutual Conductance (mA/V)	...	...	...	...	...	5.3

*Taken at $E_a=100$; $E_g=0$.

TYPICAL OPERATION.

Heptode.

Anode Voltage	...	...	...	...	...	175	175
Screen Voltage (Initial)	...	...	...	...	...	100	100
Grid Bias	...	...	...	...	...	3	2.5
Anode Current (mA)	...	...	...	...	...	2.6	3.1
Screen Current (mA)	...	...	...	...	...	5.6	6.9
Conversion Conductance ($\mu A/V$)	...	...	...	...	...	640	770
Anode A.C. Resistance (megohms)	...	...	...	...	...	1.3	1.0
Heterodyne Volts Peak	...	...	...	...	...	8.0	8.0

*Maximum input signal handling capacity ($E_g=34$; $E_s=175$)

*Conversion Conductance ($E_g=-34$; $E_s=175$ ($\mu A/V$) (approx.))

*For 5 per cent. Total Audio Harmonic Distortion at 60 per cent. Modulation.

Triode.

Anode Voltage	...	...	...	...	...	...	80
Anode Current (mA)	...	...	...	...	...	...	4 to 5

INTERNAL-ELECTRODE CAPACITIES.

Heptode.

	TH 2321	TH 233
*Anode to Earth	11.5	11.25 μF .
*Grid to Earth	9.5	9.25 μF .
Anode to Grid	0.0015	0.0005 μF .

Triode.

*Anode to Earth (less G0 to A0)	4.0	3.5 μF .
*Grid to Earth (less G0 to A0)	10.25	10.5 μF .
Anode to Grid	2.25	2.4 μF .

*"Earth" denotes the electrodes of any second valve section and the remaining earthy potential electrodes of the section under measurement, H and M joined to cathode.

DIMENSIONS.

Maximum Overall Length	...	...	...	127 mm.	108 mm.
Maximum Diameter	...	...	...	39 mm.	32 mm.

EDISWAN RADIO



GENERAL.

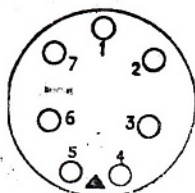
The TH.2321 and TH.233 are triode heptode frequency changers for use in A.C./D.C. mains receivers. They have been specially designed to meet the requirements of all wave receivers, and the inter-reaction between the input and oscillator circuits have been reduced to a minimum. A high conversion conductance is provided with a large initial grid bias, thus ensuring that no grid current is taken on the short wave bands. The characteristics, which are identical for both types, have been so designed as to provide large signal handling capacity with low cross modulation and low harmonic response. The TH.2321 is fitted with a standard 7-pin base, while the TH.233 is of small dimensions and fitted with the Mazda Octal base. The connexions are given below.

APPLICATION.

In each case the triode oscillator should be used with a parafeed tuned anode circuit and the component values required are given in the circuit shown. If any trouble is experienced with "squegging" at the highest frequency the grid leak resistance may be reduced to 25,000 ohms. On the short wave bands the mean anode current of the triode would be of the order of 4 to 4.5 mA, while on the medium and long waves the current taken by the triode will be of the order of 3 to 3.5 mA. An average heterodyne voltage of 8 to 10 volts peak is required at the grid of the triode. The value of the series grid resistance R.3 will depend very largely on the design of the coils and the effect of stray capacities across the grid of the triode. On the short wave band this resistance is usually of the order of 50 or 60 ohms. It may be necessary to insert a wave wound coil between the H.T. supply and the parafeed resistance R.2 in order to remove the damping effect of this resistance on the long and medium wave oscillator circuits. The peak anode current of the triode should never be allowed to exceed 15 mA. If parasitic oscillations are generated, these may be stopped by connecting a resistance (R.6) of 2.5 to 5 ohms close to the screen pin. The heater is designed to operate at 0.2 ampere and the resistance placed in series with the heaters should be such that the heater current has this value at average line voltage.

BASING.

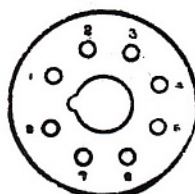
TH.2321.



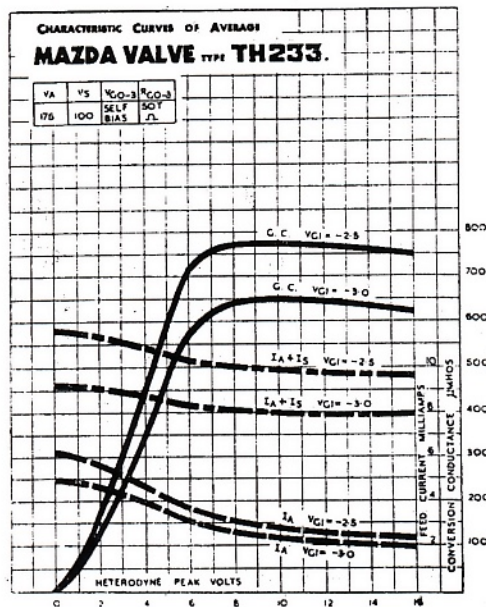
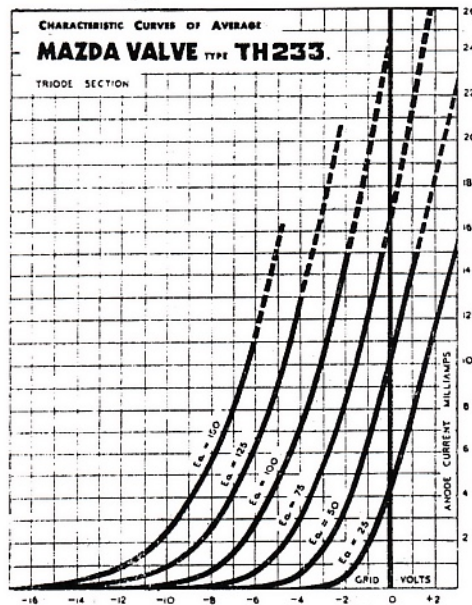
- | | |
|------------|--------------------------|
| Pin No. 1. | Oscillator Anode. |
| 2. | Oscillator Grid. |
| 3. | Heptode Screen. |
| 4. | Heater. |
| 5. | Heater. |
| 6. | Cathode and Metallising. |
| 7. | Heptode Anode. |
| Top Cap. | Heptode Control Grid. |

Viewed from the free end of the base.

TH.233.



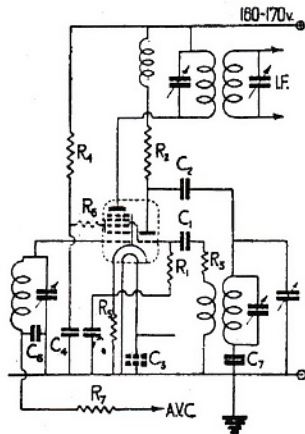
- | | |
|------------|-----------------------|
| Pin No. 1. | Heater. |
| 2. | Cathode. |
| 3. | Heptode Anode. |
| 4. | Oscillator Anode. |
| 5. | Oscillator Grid. |
| 6. | Metallising. |
| 7. | Heptode Screen. |
| 8. | Heater. |
| Top Cap. | Heptode Control Grid. |



EDISWAN RADIO

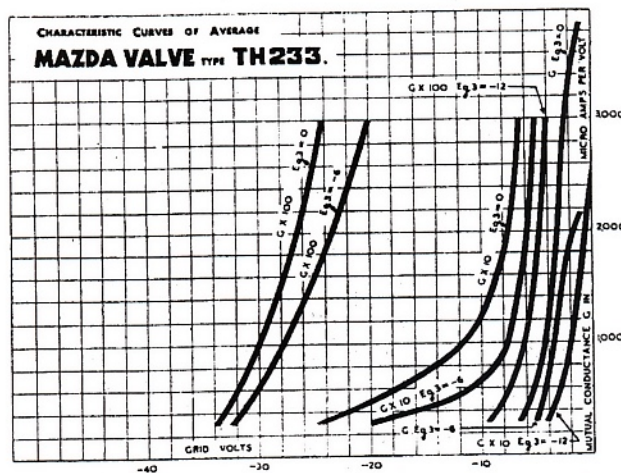


SUGGESTED CIRCUIT DIAGRAM USING TH 232I and TH 2 33



Values of the components in the circuit diagram :—

R1. 50,000 ohms.	C1. .0001mfd.
R2. 15,000 to 20,000 ohms.	C2. .0001mfd.
R3. See above.	C3. 0.01mfd.
R4. 11,500 to 9,500 ohms.	C4. 0.1—0.5mfd
R5. 250 to 180 ohms.	C5. 0.1—0.5mfd.
R6. 2.5 to 5 ohms (see above).	



Mazda Radio Valves are manufactured in Great Britain for the British Thomson-Houston Co., Ltd., London and Rugby, and distributed by:
THE EDISON SWAN ELECTRIC CO., LTD.,
155, CHANCERY CROSS ROAD, LONDON, W.C.2





VP.133

A.C./D.C. MAINS H.F. PENTODE

RATING.

Heater Voltage	...	...	...	...	...	13.0
Heater Current (amps)	...	...	...	...	...	0.2
Maximum Anode Voltage	...	...	...	...	...	200
Maximum Screen Voltage	...	...	...	...	...	200
*Mutual Conductance (mA/V)	...	...	...	...	...	3.1

*Taken at $E_a=200$; $E_s=150$; $E_g=0$.

TYPICAL OPERATION.

Anode Voltage	...	...	...	150	150	165	175
Screen Voltage (Initial)	...	...	...	100	150	165	175
Grid Bias	...	...	...	-0.7	-2.7	-3.6	-3.9
Mutual Conductance (mA/V)	...	...	...	2.35	2.1	2.0	2.0
Anode Current (mA)	...	...	...	7.2	8.0	8.0	8.5
Screen Current (mA)	...	...	...	2.0	2.2	2.2	2.3
Anode A.C. Resistance (megohms)	...	...	...	0.8	0.7	0.8	0.8
Grid Bias for Mutual Conductance of 10 μ A/V	...	...	...	—	—	—	43.5
†Maximum Peak Carrier Input Volts	...	...	...	—	—	—	9.5
Grid Bias for M.P.C.I.	...	...	...	—	—	—	38

†For 5 per cent. Total Distortion with a 60 per cent. Modulation.

Note.

For the case of initial screen voltages of 100, 150 or 165, the signal handling capacity (M.P.C.I.V.) grid bias and gain will be the same as in the last column if the screen voltage is allowed to rise to 175 volts.

INTER-ELECTRODE CAPACITIES.

*Anode to Earth	...	...	...	...	...	11.5 μ F
*Grid to Earth	...	...	...	...	...	7.0 μ F
Anode to Grid	...	...	...	...	...	0.0025 μ F

*"Earth" denotes the remaining earthy potential electrodes and metallising joined to cathode.

DIMENSIONS.

Maximum Overall Length	...	...	...	...	...	105 mm.
Maximum Diameter	...	...	...	...	...	32 mm.

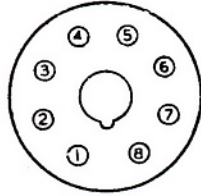
GENERAL.

The VP.133 is a variable-mu H.F. Pentode for use in A.C./D.C. receivers. The bulb is of small dimensions and metallised. The valve is fitted with a British Octal Base, the connections to which are given overleaf.

APPLICATION.

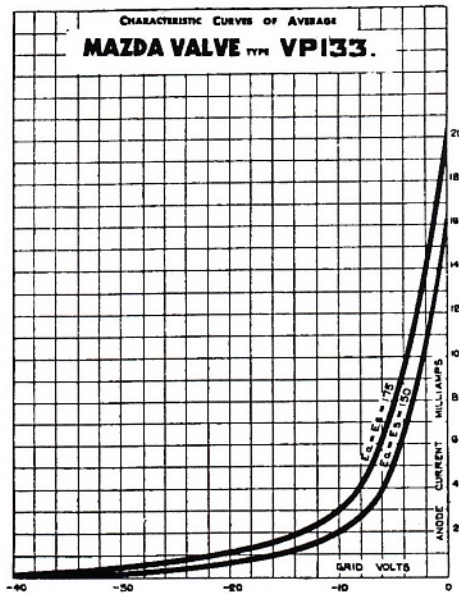
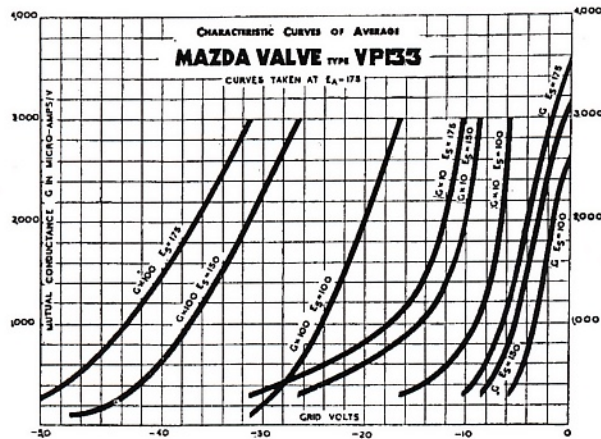
The valve has been specially designed for operation in A.C./D.C. receivers employing the loud speaker field winding for smoothing. Under these conditions, the screen voltage does not rise above 175 volts with an average mains tapping. It is recommended that this valve should be used in a super-heterodyne receiver with a Mazda TH.2321 converter. When so used, in a receiver provided with automatic volume control the bias applied to the valve should be one-half to two-thirds of the bias applied to the TH.2321.

BASING.



- Pin No. 1. Heater.
 2. Cathode.
 3. Anode.
 4. Screen.
 5. Suppressor Grid.
 6. Metallising.
 7. Omitted.
 8. Heater.
 Top Cap. Control Grid.

Viewed from the free end of the base.



Mazda Radio Valves are manufactured in Great Britain for
 the British Thomson-Houston Co., Ltd., London and Rugby.



HL.133 DD

A.C./D.C. MAINS DOUBLE DIODE TRIODE

RATING.

Heater Voltage	...	...	...	...	...	13.0
Heater Current (Amps)	...	...	...	...	...	0.2
Maximum Anode Voltage	...	...	...	...	...	250
*Mutual Conductance (mA/V)	...	...	...	...	...	2.5
*Amplification Factor	...	...	...	...	...	32
*Anode A.C. Resistance (Ohms)	...	...	...	...	...	12,800

* at $E_a = 100$; $E_g = 0$.

OPERATING CONDITIONS.

H.T. Supply	...	...	...	...	165	185
Decoupling Resistance (ohms.)	...	...	...	...	10,000	10,000
Anode Load (ohms)	...	...	...	...	50,000	50,000
Anode Current (mA)	...	...	...	...	1.25	1.45
Grid Bias Voltage	...	...	...	...	2.2	2.5
Self-Bias Resistance (ohms)	...	...	...	...	1,750	1,750
Voltage Amplification	...	...	...	...	20	21
Maximum Output Volts R.M.S. for $2\frac{1}{2}\%$ Harmonic Content	...	...	...	...	22½	27

INTER-ELECTRODE CAPACITIES.

Anode to Cathode	...	...	...	...	4.5	$\mu\mu\text{F}$
Grid to Cathode	...	...	...	...	3.5	$\mu\mu\text{F}$
Anode to Grid	...	...	...	...	3.5	$\mu\mu\text{F}$
*Diode 1 to Earth	...	...	...	...	3.25	$\mu\mu\text{F}$
*Diode 2 to Earth	...	...	...	...	3.25	$\mu\mu\text{F}$
Diode 1 to Diode 2	...	...	...	...	0.6	$\mu\mu\text{F}$

* "Earth" denotes the electrodes of any second valve section and the remaining earthy potential electrodes of the section under measurement, H. and M. joined to cathode.

DIMENSIONS.

Maximum overall length	...	...	...	...	105 mm.
Maximum diameter	...	...	...	...	32 mm

GENERAL.

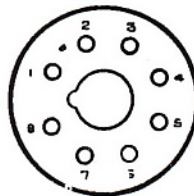
The HL.133DD is an indirectly heated double diode triode for use in D.C., A.C./D.C. mains, and car radio receivers. It consists of two separate diodes and a triode on a common cathode sleeve. The bulb is of small dimensions and metallised. The valve is fitted with a British Octal Base, the connections to which are given overleaf.

APPLICATION.

The HL.133DD is recommended for performing the simultaneous functions of A.V.C., detection and amplification. When the valve is used for detection, only D2 (pin No. 5) should be used for the purpose. If the other diode is not required, it should be connected to the cathode. The control grid should be biased by means of a self-bias resistance which should be by-passed with a condenser of 25-50 mFd.

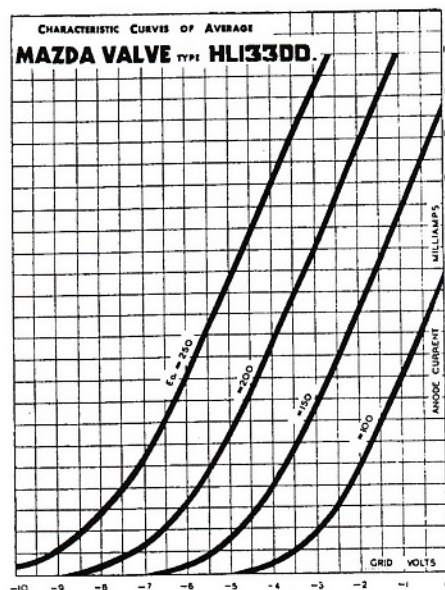


BASING.



- Pin No. 1. Heater.
 - 2. Cathode.
 - 3. Anode.
 - 4. —
 - 5. D2.
 - 6. Metallising.
 - 7. D1.
 - 8. Heater.
- Top Cap Control Grid.

Viewed from the free end of the base.



Mazda Radio Valves are manufactured in Great Britain for
the British Thomson-Houston Co., Ltd., London and Rugby.



PEN. 383

BEAM POWER AMPLIFIER FOR AC/DC MAINS

RATING.

Heater Voltage	...	...	...	...	...	38.0
Heater Current (Amps.)	...	...	...	...	...	0.2
Maximum Anode Voltage	...	...	...	...	...	200
Maximum Screen Voltage	...	...	...	...	...	200
Maximum Anode Dissipation (watts)	...	...	...	...	...	10
*Mutual Conductance (mA/V)	...	...	...	...	...	12

*Taken at $E_a = 100$; $E_s = 100$; $E_g = 0$.

TYPICAL OPERATION.

Anode Voltage	...	...	...	138	150	160
Screen Voltage	...	...	...	150	150	175
Grid Bias	...	...	...	8.7	8.75	10.0
Anode Current (mA.)	...	...	...	50	50	64
Screen Current (mA.)	...	...	...	10	10	13
*Anode Load (ohms)	...	...	...	2,800	2,900	2,600
*Power Output (watts)	...	...	...	2.65	2.95	3.75
*Input Swing Volts (RMS)	...	...	...	4.7	4.8	5.5
Bias Resistance (ohms)	...	...	...	145	145	130

* For 5 per cent. Third Harmonic, and Second Harmonic not exceeding 5 per cent.

INTER-ELECTRODE CAPACITIES.

*Anode to Earth	...	...	...	...	13.5 $\mu\mu\text{F.}$
*Grid to Earth	...	...	...	...	21.5 $\mu\mu\text{F.}$
Anode to Grid	...	...	...	...	0.7 $\mu\mu\text{F.}$

* "Earth" denotes the remaining earthy potential electrodes and metallising joined to cathode.

DIMENSIONS.

Maximum Overall Length	...	...	...	...	120 mm.
Maximum Diameter	...	...	...	...	54 mm.

GENERAL.

The PEN. 383 is an indirectly-heated beam power amplifier for use in A.C. D.C. receivers. A band of metallising covers the lower portion of the bulb, and the valve is fitted with a Mazda octal base, the connexions to which are given overleaf.

APPLICATION.

When used with average A.C. mains with series speaker field circuit, in which the speaker field requires approximately 6 watts, a screen voltage of the order of 145 to 150 will be obtained. Approximately 2.7 watts will be delivered, without exceeding 5 per cent. of either second or third harmonic, with an output transformer resistance of 250 ohms.



In the case of parallel speaker fields, approximately 3.75 watts will be delivered using an output transformer with resistance of 250 ohms, and a 300 ohms smoothing choke smoothing a speaker field of 6 watts.

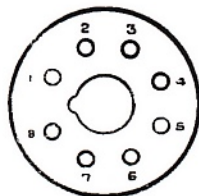
The valve should always be self-biased, and the value required is given on the preceding page. The grid to cathode circuit should be kept as low as possible and should not exceed 1 megohm for an anode dissipation limit of 10 watts. The grid circuit must be efficiently decoupled, and this may be achieved either by connecting an electrolytic condenser of 50 to 75 μ F. across the self-bias resistance, or decoupling the grid circuit in the usual manner. An anti-parastic resistance of the moulded type, and of a low self-capacity should be connected in the grid or anode circuit, and mounted close to the actual valve terminals. A value of 50 ohms is satisfactory in the case of an anode resistance.

The anode load should be accurately determined, and kept reasonably constant by the provision of a suitable condenser filter.

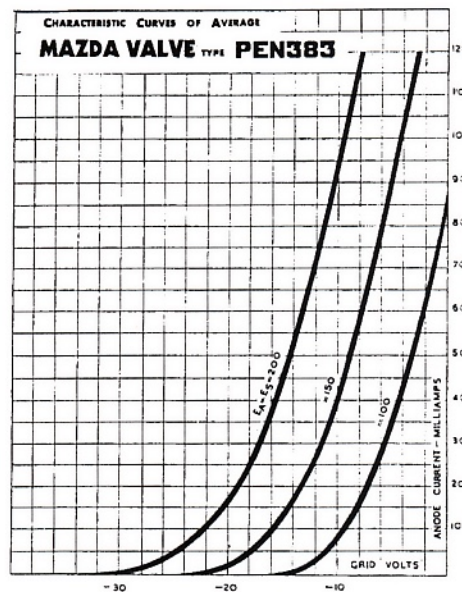
The heater is designed to operate at 0.2 amps. and the series heater resistance should be such that the heater current has this value at average line voltage.

BASING.

- Pin No. 1. Heater.
 2. Cathode.
 3. Anode.
 4. Screen.
 5. Control Grid.
 6. Metal-lising.
 7. Omitted.
 8. Heater.



Viewed from the free end of the base.



Mazda Radio Valves are manufactured in Great Britain for the British Thomson-Houston Co., Ltd., London and Rugby, and distributed by

THE EDISON SWAN ELECTRIC CO., LTD.
 155, CHARING CROSS ROAD, LONDON, W.C.2.





U.403

AC/DC MAINS HALF WAVE RECTIFIER

RATING.

Heater Voltage	...	...	...	...	...	...	40.0
Heater Current (Amps.)	...	...	...	...	...	...	0.2
Maximum Anode Voltage (R.M.S.)	...	...	...	...	...	...	250
Maximum Output Current (mA.)	...	...	...	...	...	...	120

TYPICAL OPERATION.

Input Volts (R.M.S.)	...	...	...	200	230	200	230
D.C. Load Current (mA.)	...	...	...	90	90	120	120
Reservoir Capacity (μ F.)	...	...	...	16	16	16	16
D.C. Rectified Output	...	...	...	193*	237*	175*	218*
D.C. Volts Drop across Rectifier	...	...	...	8.5	8.5	11	11

* Voltage Output with 50 ohms limiting resistance in series with rectifier.

DIMENSIONS.

Maximum Overall Length	...	...	...	...	...	...	100 mm.
Maximum Diameter	...	...	...	...	...	...	38 mm.

GENERAL.

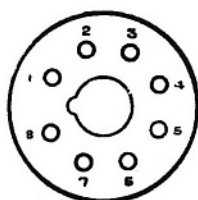
The U.403 is an indirectly heated half wave rectifier suitable for use in A.C./D.C. receivers. The bulb is metallised, and the valve is fitted with a Mazda octal base, the connexions to which are given overleaf.

APPLICATION.

To safeguard the valve from the large current surges present on switching, it is imperative to use a 50-ohm resistance in series with the anode. In A.C./D.C. receivers it is usually desirable to connect this resistance in series with the reservoir condenser in order not to reduce the voltage output on D.C. mains. The reservoir capacity should not exceed 16 μ F. unless an appreciably higher limiting resistance is employed. In use, the metal coating should be connected to the chassis.

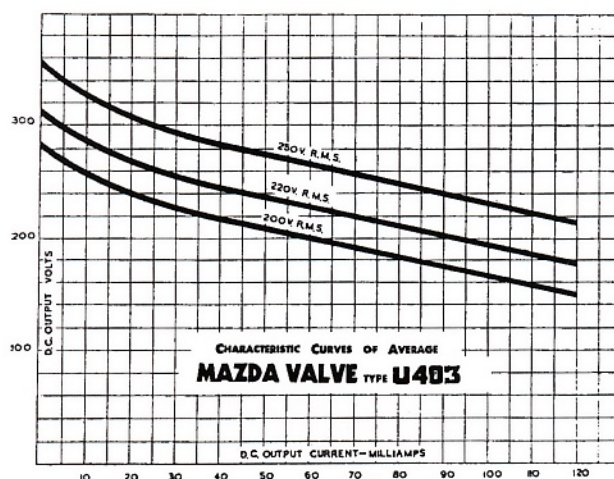


BASING.



Viewed from the free end of the base.

- Pin No. 1. Heater.
 2. Omitted.
 3. Cathode.
 4. Omitted.
 5. Anode.
 6. Metallising.
 7. Omitted.
 8. Heater.



Mazda Radio Valves are manufactured in Great Britain for the British Thomson-Houston Co., Ltd., London and Rugby, and distributed by
THE EDISON SWAN ELECTRIC CO., LTD.
 155, CHARING CROSS ROAD, LONDON, W.C.2.

