



TH 232I 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 232I	TH 233
*Anode to Earth	11.5	11.25 $\mu\mu F$.
*Grid to Earth	9.5	9.25 $\mu\mu F$.
Anode to Grid	0.0015	0.0005 $\mu\mu F$.

Triode.

*Anode to Earth (less G0 to A0)	4.0	3.5 $\mu\mu F$.
*Grid to Earth (less G0 to A0)	10.25	10.5 $\mu\mu F$.
Anode to Grid	2.25	2.4 $\mu\mu F$.

** "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	127 mm.	108 mm.
Maximum Diameter	39 mm.	32 mm.



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.

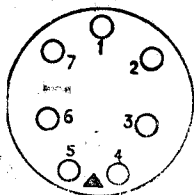
APPLICATION.

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.

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|------------|--------------------------|
| 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.

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|------------|-----------------------|
| 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. |

