

MAZDA

6.C.31

TRIODE HEPTODE FREQUENCY CHANGER

Indirectly heated - for parallel operation

<u>RATING</u>	<u>Triode</u>	<u>Heptode</u>
Heater Voltage (volts)	V_h	6.3
Heater Current (amps)	I_h	0.83
Maximum Anode Voltage (volts)	$V_a(max)$	150
Maximum Screen Voltage (volts)	V_{g2}	250
Mutual Conductance (mA/V)	g_m	• 5.3
Amplification Factor	μ	• 16
Maximum Peak Anode Current (mA)	$I_a(pk)max$	15
Maximum Potential Heater/Cathode (volts DC)	$V_{h,k}$	150

: Taken at $V_a = 250v$; $V_{g2} = 100v$; $V_{g3} = 0$; $V_{g1} = -2v$.• Taken at $V_{at} = 100v$; $V_{gt} = 0v$.INTER-ELECTRODE CAPACITANCESHeptode Section

Anode/Earth (μF)	$C_{a(h),E}$	13.0
Anode/Grid (μF)	$C_{a(h),g1(h)}$	0.0012
Grid 1/Earth (μF)	$C_{g1(h),E}$	9.5
Heptode Grid/Triode Grid (μF)	$C_{g1(h),g(t)}$	0.09

Triode Section

Anode/Earth (μF)	$C_{out(t)}$	4.4
Anode/Grid (μF)	$C_{a(t),g(t)}$	3.0
Grid/Earth (μF)	$C_{in(t)}$	11.5

DIMENSIONS

Maximum Overall Length (mm)	103
Maximum Diameter (mm)	32
Maximum Seated Height (mm)	90
Approximate Nett Weight (ozs)	1 $\frac{1}{2}$
Approximate Packed Weight (ozs)	2 $\frac{1}{2}$

MOUNTING POSITION - Unrestricted.

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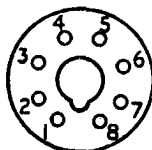
TYPICAL OPERATION**Heptode Section**

Anode Voltage (volts)	$V_a(h)$	250	250
Screen Voltage (volts)	$V_{g2}(h)$	100	100
Grid Bias (volts - ve)	$V_{g1}(h)$	-3.0	-2.5
Peak Heterodyne Voltage (volts)	$V_{(pk)het}$	9.0	9.0
Conversion Conductance (mA/volt)	g_c	750	870
Anode Current (mA)	$I_a(h)$	3.0	3.8
Screen Current (mA)	$I_{g2}(h)$	6.05	7.5
Anode Impedance (megohms)	$r_a(w)$	1.6	1.2
Input Capacitance Workings (Hot) (μF)	$C_{in}(w)$	12.5	13.0
Conversion Conductance at $V_g = -43v$; $V_{g2} = 250v(\mu A/V)$ (approx.)			3
Input signal handling capacity (Peak carrier volts)			• 10

- For 5% Total Audio Harmonic Distortion at 60% Modulation.

Triode Section

Anode Voltage (volts)	80
Anode Current (mA) (average)	5

BULB Metallised**BASE** International octal (IO8)

Viewed from free end of pins.

CONNEXIONS

Pin 1	Metallising	M
Pin 2	Heater	h
Pin 3	Heptode Anode	ah
Pin 4	Grid 2, Grid 4	$g2, g4$
Pin 5	Grid 3, Triode Grid	$g3, g_t$
Pin 6	Triode Anode	at
Pin 7	Heater	h
Pin 8	Cathode	k
Top Cap	Grid	gl

NOTE

The 6.C.31 is identical to the TH.41 with the exception of heater characteristics, basing and inter-electrode capacitance.

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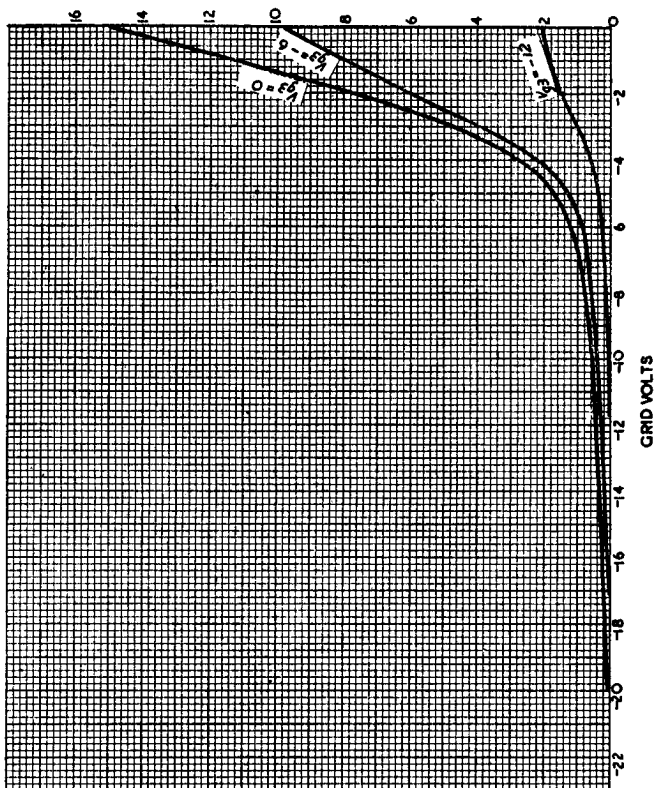
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AVERAGE CHARACTERISTIC CURVES

Curves of heptode section taken at $V_b = 250$, $V_{g2} = 100$

ANODE CURRENT IN mA



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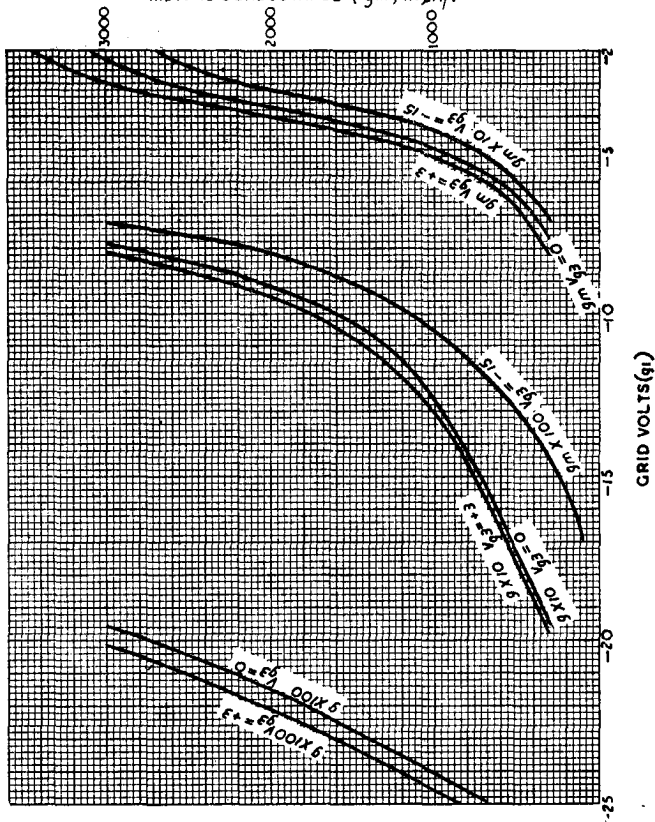
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AVERAGE CHARACTERISTIC CURVES

Curves of heptode section taken at $V_g = 250$, $V_{g2} = 100$

MUTUAL CONDUCTANCE (g_m) IN $\mu A/V$



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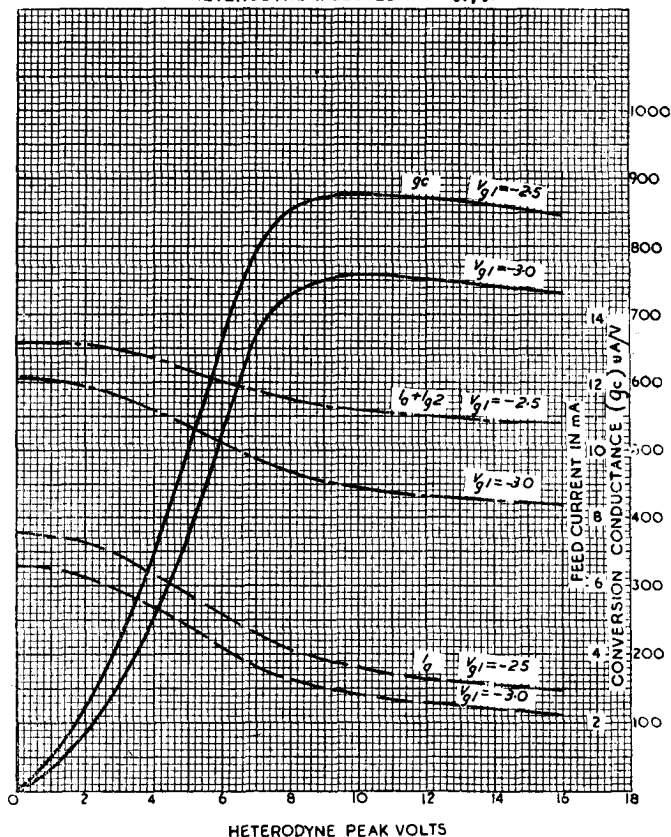
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AVERAGE CHARACTERISTIC CURVES

V_a	V_{g2}	V_{g3}	R_{g3}	V_{g1}	V_{sig}
250	100	Grid current bias	50,000 Ω	$\begin{cases} -2.5 \\ -3.0 \end{cases}$	$\begin{cases} 0.5V \\ Peak \end{cases}$

HETERODYNE INJECTED INTO g_1, g_3 

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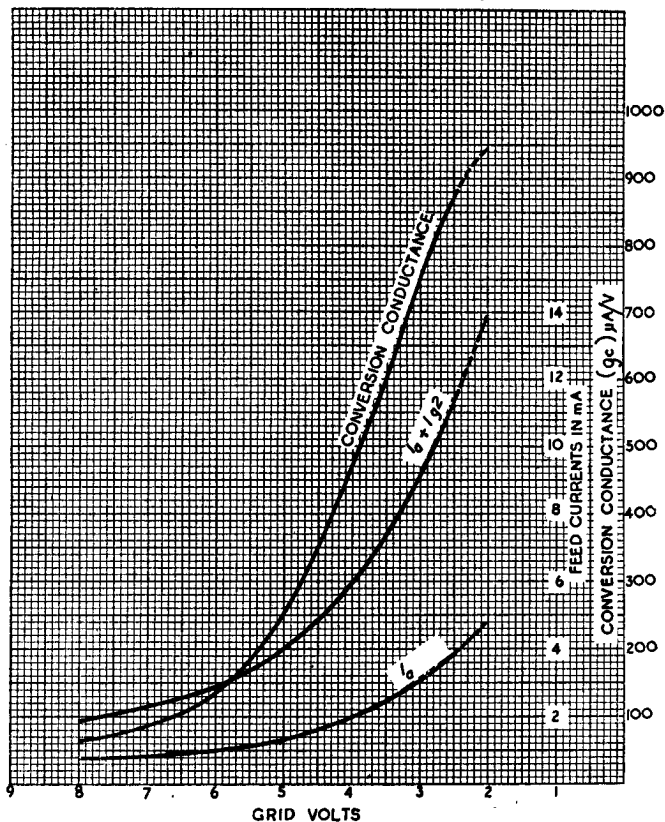
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AVERAGE CHARACTERISTIC CURVES

V_b	V_{g2}	V_{g3}	A_{g3}	V_{het}	V_{sig}
250	100	self bias	50,000 Ω	9.0 Peak	0.5v Peak

HETERODYNE INJECTED INTO g_1, g_3



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AVERAGE CHARACTERISTIC CURVES

V_b	V_{g2}	R_{g2}	V_{gt}	$R_{gt,k}$	V_{het}	Mod- ulation
250	100 @ $V_{g1} = 3$ Rising	24.8k Ω	self bias	50	9.0 Peak	60%

— 5% Total audio harmonic distortion
 — 10% Total audio harmonic distortion
 Heterodyne injected in 9t, 93

