6.C.31

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TRIODE HEPTODE FREQUENCY CHANGER

Indirectly heated – for parallel operation

RATING		Triode		Heptode
Heater Voltage (volts)	V_h		6.3	
Heater Current (amps)	I_h		0.83	
Maximum Anode Voltage (volts)	$V_{a(max)}$	150		250
Maximum Screen Voltage (volts)	V_{g2}			250
Mutual Conductance (mA/V)	g_m	• 5.3		: 3.1
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_{a_t} = 100v; V_{g_t} = 0v.

INTER-ELECTRODE CAPACITANCES

Heptode Section

Anode/Earth (μμF)	Ca(h),E	13.0
Anode/Grid (μμF)	Ca(h),g1(h)	0.0012
Grid 1/Earth (μμF)	Cg1(h),E	9.5
Heptode Grid/Triode Grid (μμF)	Cg1(h),g(t)	0.09

Triode Section

Anode/Earth (μμF)	Cout(t)	4.4
Anode/Grid (μμF)	Ca(t),g(t)	3.0
Grid/Earth (μμF)	Cin(t)	11.5

DIMENSIONS

Maximum Overall Length (mm)	103
Maximum Diameter (mm)	32
Maximum Seated Height (mm)	90
Approximate Nett Weight (ozs)	1¼
Approximate Packed Weight (ozs)	2¼

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)	gc	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) (μμF)	$C_{in(w)}$	12.5	13.0
Conversion Conductance at $V_g = -43v$; $V_{g2} = 250v$ (μA/V) (approx.)		3	
Input signal handling capacity (Peak carrier volts)			• 10

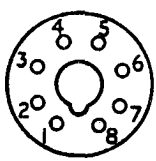
• For 5% Total Audio Harmonic Distortion at 60% Modulation.

Triode Section

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

BULB Metallised

BASE International octal (I08)



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,gt
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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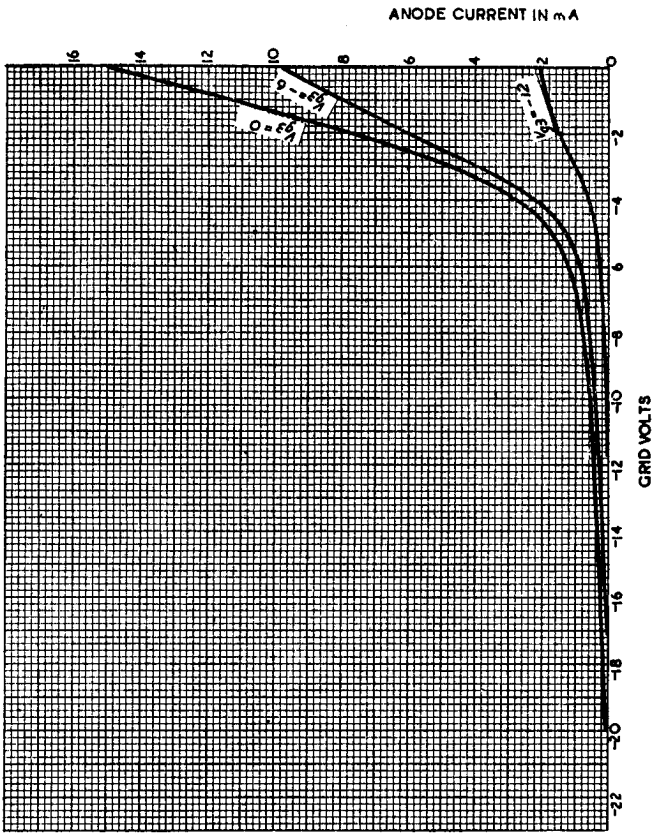
TRIODE HEPTODE FREQUENCY CHANGER
Indirectly heated – for parallel operation

AVERAGE CHARACTERISTIC CURVES

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



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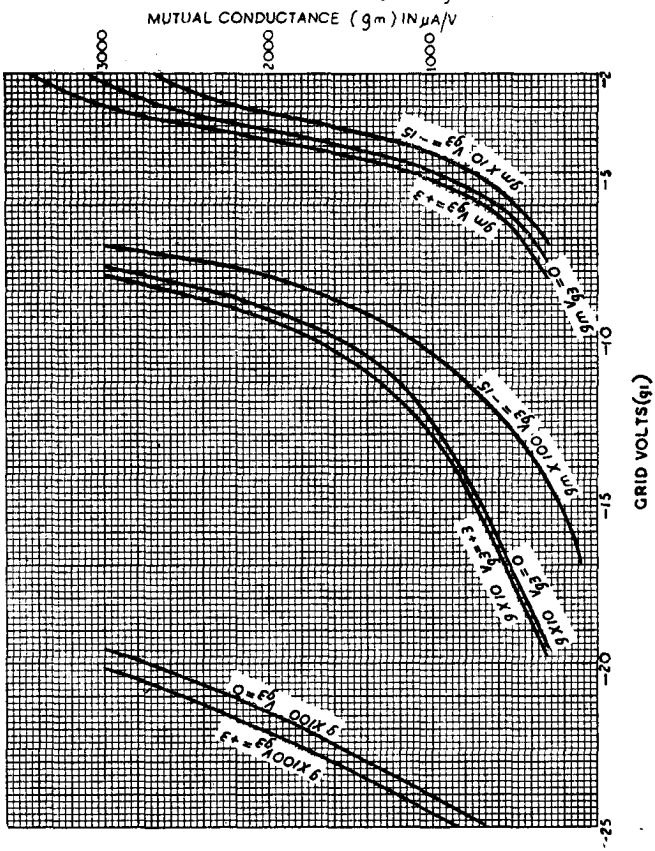
TRIODE HEPTODE FREQUENCY CHANGER

Indirectly heated – for parallel operation

AVERAGE CHARACTERISTIC CURVES

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



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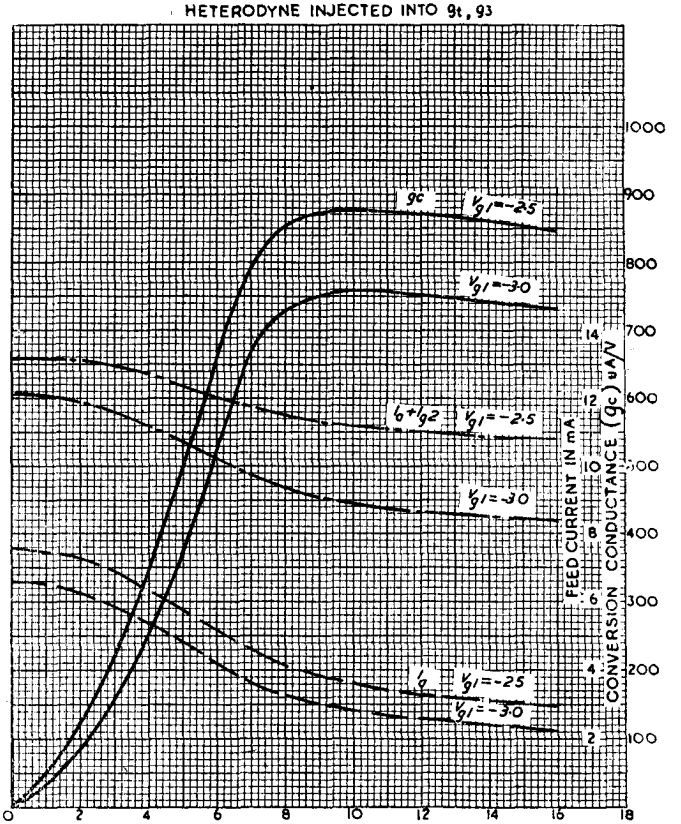
TRIODE HEPTODE FREQUENCY CHANGER

Indirectly heated – for parallel operation

AVERAGE CHARACTERISTIC CURVES

V_a	V_{g2}	V_{g3}	R_{g3}	V_{g1}	V_{sig}
250	100	Grid current bias	50,000 Ω	−2·5 −3·0	0·5 v Peak

HETERODYNE INJECTED INTO g_1, g_3



HETERODYNE PEAK VOLTS

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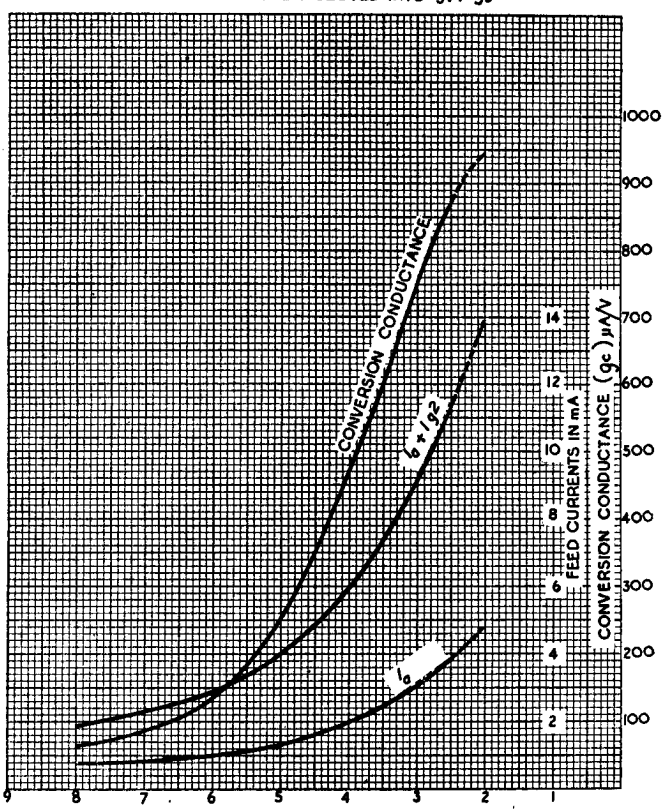
AVERAGE CHARACTERISTIC CURVES

V_b	V_{g2}	V_{g3}	R_{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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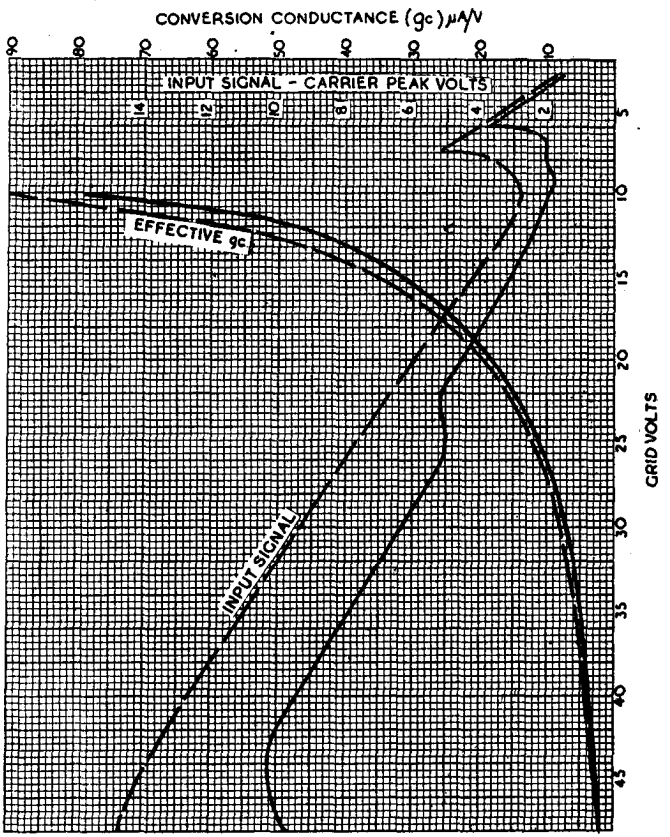
AVERAGE CHARACTERISTIC CURVES

V_a	V_{g2}	R_{g2}	V_{gt}	$R_{gt,k}$	V_{het}	Modulation
250	100 @ $V_{g1}=-3$ Rising	24·8kΩ	self bias	50	9·0 Peak	60%

——— 5% Total audio harmonic distortion
— — 10% Total audio harmonic distortion
Heterodyne injected in $g_{t,g3}$



THE EDISON SWAN ELECTRIC COMPANY LTD.