V.H.F. QUICK HEATING DOUBLE TETRODE

YL1030 QQZ06-40

PRELIMINARY DATA

QUICK REFERENCE DATA

Quick heating double tetrode for use as u.h.f. power amplifier or frequency multiplier in mobile transmitters.

70% of normal power output is obtained within 0.5 second.

		Class 'C' Telephony Anode and screen grid modulated	Class 'C' Telegraphy or F.M. Telephony	
f		180	180	Mc/s
P_{out}		64	85	W
f max.		500	500	Mc/s
V_a max.				
	(f = 200 Mc/s)	600	750	V
	(f = 500 Mc/s)	400	500	V
p_a max.		2 x 14	2 x 20	W

To be read in conjunction with GENERAL OPERATIONAL RECOMMENDATIONS - TRANSMITTING VALVES.

CLASS 'C' TELEGRAPHY OR F.M. TELEPHONY

Maximum operating conditions		Intermittent Mobile Service	
f	180	180	Mc/s
P_{out}	53	85	W
P_{load}	45	75	W
η_a	66	71	%
V_a	400	600	V
I_a	2 x 100	2 x 100	mA
V_{g2}	250	250	V
I_{g2}	2 x 8.0	2 x 9.0	mA
$-V_{g1}$	60	80	V
I_{g1}	2 x 3.0	2 x 3.5	mA
$P_{load\ (driver)}$	3.0	4.0	W
p_a	2 x 13.5	2 x 17.5	W
p_{g2}			W

CLASS 'C' TELEPHONY AND SCREEN-GRID MODULATION

Maximum operating conditions (Carrier conditions for 100% modulation)		Intermittent Mobile Service	
f	180	180	Mc/s
P_{out}	39	64	W
P_{load}	32	53	W
η_a	65	71	%
V_a	400	600	V
I_a	2 x 75	2 x 75	mA
V_{g2}	250	250	V
I_{g2}	2 x 9.0	2 x 9.0	mA
$-V_{g1}$	70	80	V
I_{g1}	2 x 2.0	2 x 2.0	mA
$P_{load\ (driver)}$	4.0	5.0	W
p_a	2 x 10.5	2 x 13	W
For 100% modulation			
P_{mod}	47	47	W
$v_{g2\ (pk)}$	185	185	V

FREQUENCY MULTIPLIER

Maximum operating conditions			Intermittent mobile service	
f_{out}/f_{in}	150/50	150/50	470/157	Mc/s
P_{out}	18	20	16	W
P_{load}	14.5	16	12	W
η_a	31	33	31	%
V_a	400	500	400	V
I_a	2 x 72	2 x 60	2 x 65	mA
V_{g2}	250	250	250	V
I_{g2}	2 x 8.0	2 x 5.0	2 x 6.0	mA
$-V_{g1}$	150	150	175	V
I_{g1}	2 x 2.5	2 x 3.0	2 x 2.9	mA
$V_{in(pk)}$	360	360	360	V
$P_{load\ (driver)}$	9.0	10	8.0	W
p_a	2 x 20	2 x 20	2 x 18	W

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ABSOLUTE MAXIMUM RATINGS

	Frequency Multiplier	Class 'C' Telephony	Class 'C' Telegraphy	
V_a max. (f = 200 Mc/s)	750	600	750	V
(f = 500Mc/s)	-	400	500	V
V_{g2} max.	300	300	300	V
$-V_{g1}$ max.	175	175	100	V
I_k max.	2 x 100	2 x 120	2 x 120	mA
p_a max.	2 x 20	2 x 14	2 x 20	W
p_{g2} max.	2 x 3.5	2 x 2.3	2 x 3.5	W
I_{g1} max.	-	2 x 5.0	2 x 5.0	mA
p_{g1} max.	2 x 1.0	2 x 1.0	2 x 1.0	W
R_{g1-k} max. per section. (fixed bias)	50	50	50	kΩ
R_{g1-k} max. per section. (automatic bias)	100	100	100	kΩ
$V_{g2\ (b)}$ max.	600	600	600	V

CATHODE

Quick heating directly heated filament.

70% P_{out} in less than 0.5 second.

* V_f	2.1	V
I_f	4.5	A

Frequency of filament supply

Sine wave	max. 200	c/s
Square wave	Any	

* The filament has been designed to accept temporary fluctuations of supply voltage of ± 15%.

CAPACITANCES

c_{out} (two sections in push-pull)	2.0	pF
c_{in} (two sections in push-pull)	6.0	pF

CHARACTERISTICS (each section) Measured at I_a = 30 mA

g_m	4.5	mA/V
μ_{g1-g2}	8.0	

MOUNTING POSITION Any

COOLING

Radiation and convection cooled

Maximum temperatures

Seals	250	°C
Pins	180	°C
Bulb	250	°C

Anode connectors providing a high degree of heat transfer by radiation or by conduction should be used.

PHYSICAL DATA

	oz	g
Weight of valve	0.53	16
Weight of valve and carton	0.8	23

DIMENSIONS

	Inches	millimetres
B	1.811	46 max
C	0.079 ± 0.001	2.0 ± 0.01
D	0.650 ± 0.059	16.5 ± 1.5
E	2.874 ± 0.059	73 ± 1.5
F	3.524 ± 0.118	89.5 ± 3.0
G	0.098 ± 0.001	2.5 ± 0.03
H	0.551 ± 0.001	14 ± 0.03

Inch dimensions derived from original millimetre dimensions.

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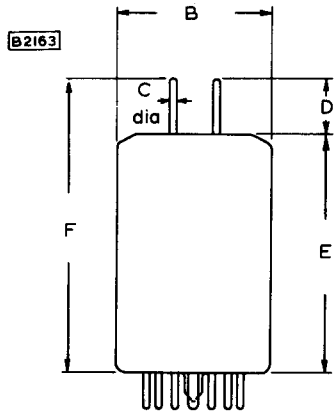

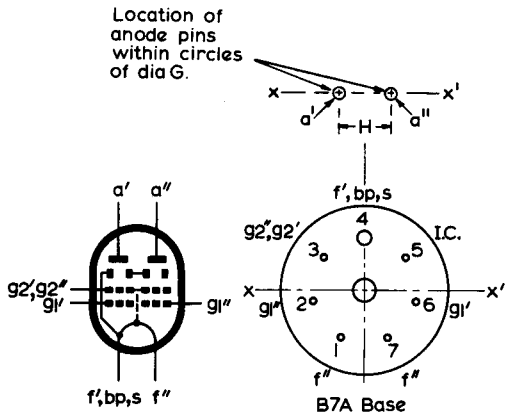

B7A Base

Contacts 1 and 7 should be strapped together externally to reduce the effective contact resistance.

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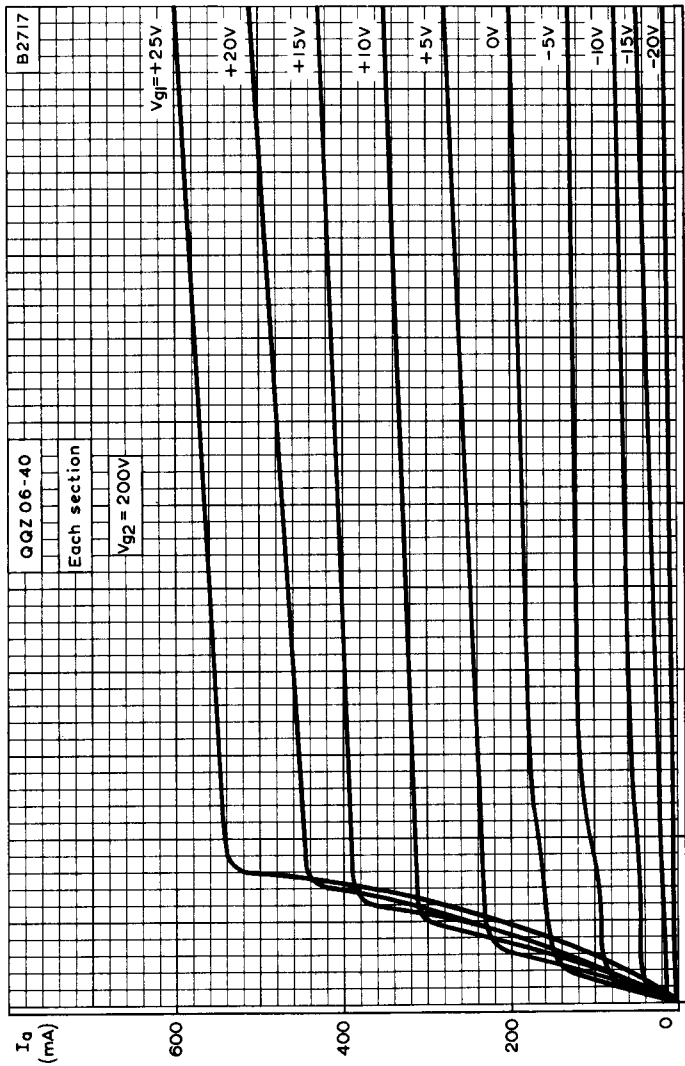
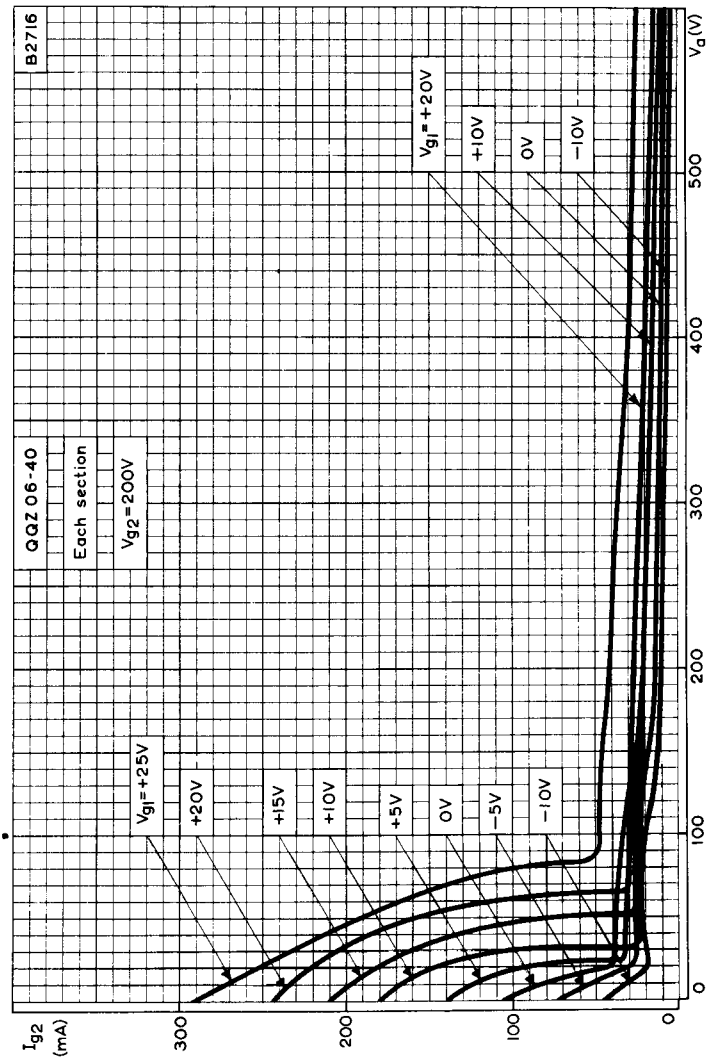
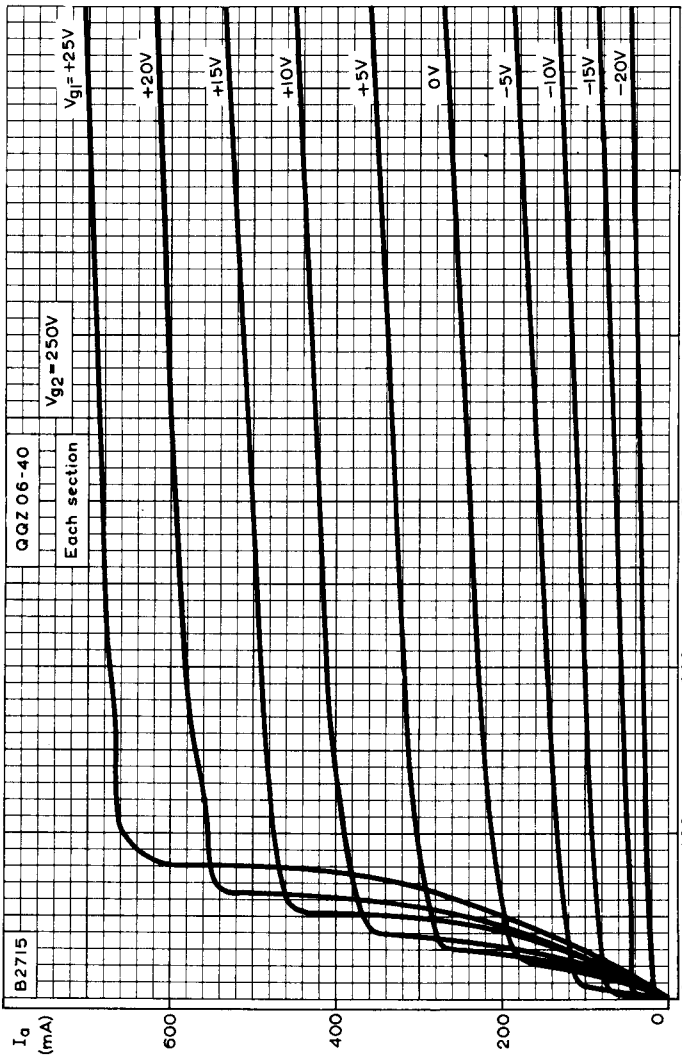


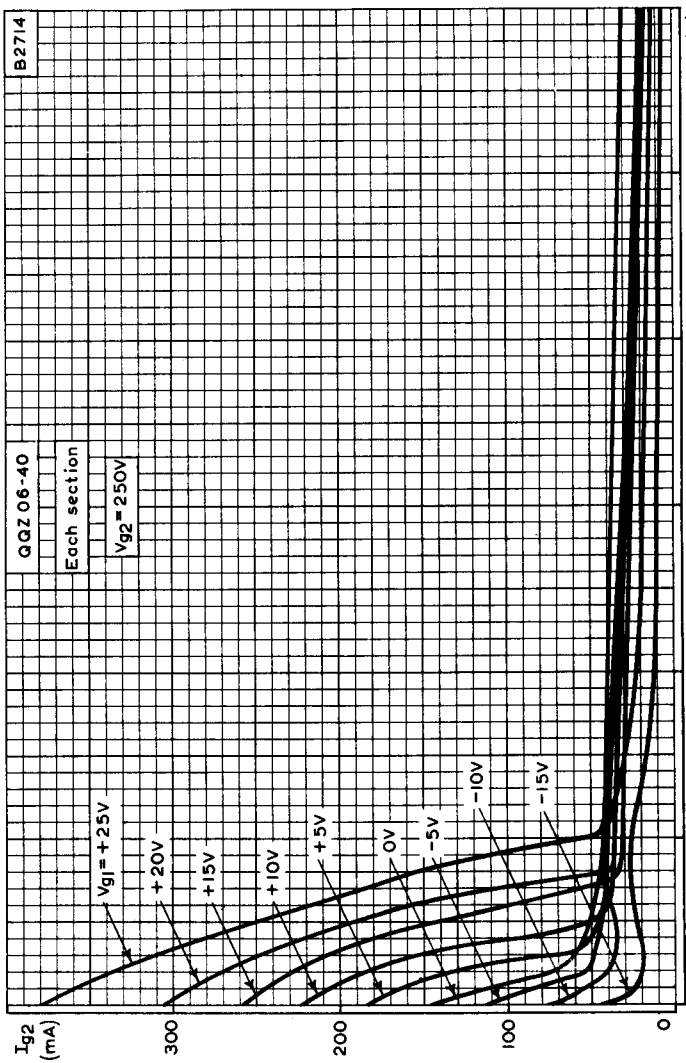
ANODE CURRENT FOR EACH SECTION PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER V_{g2} = 200V



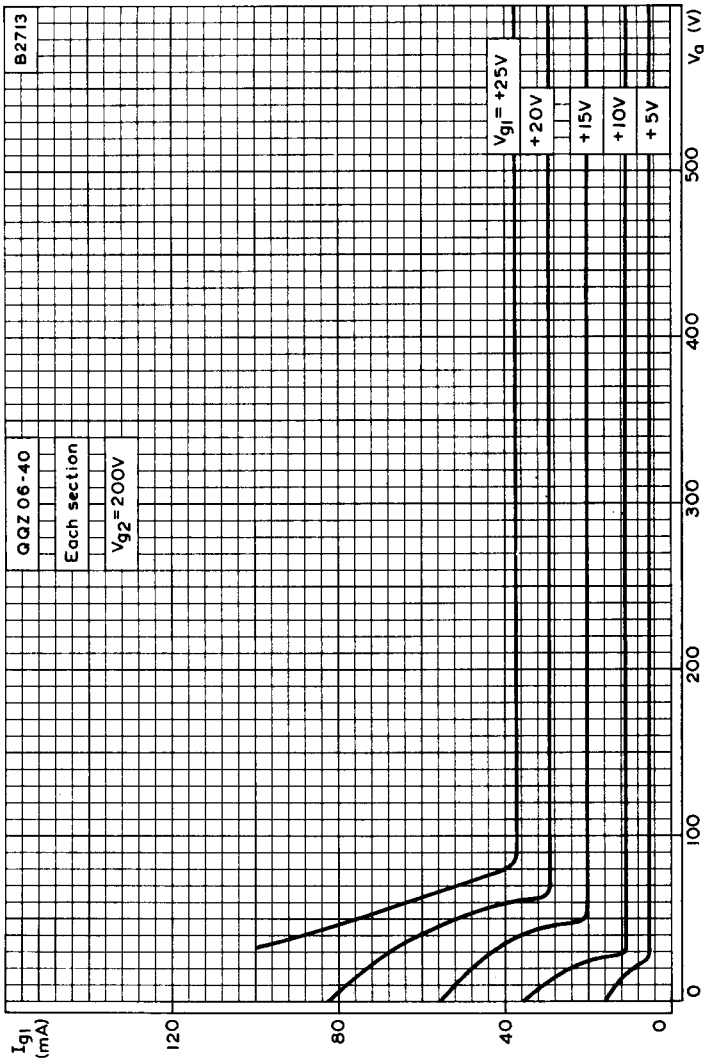
SCREEN-GRID CURRENT FOR EACH SECTION PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER V_{g2} = 200V



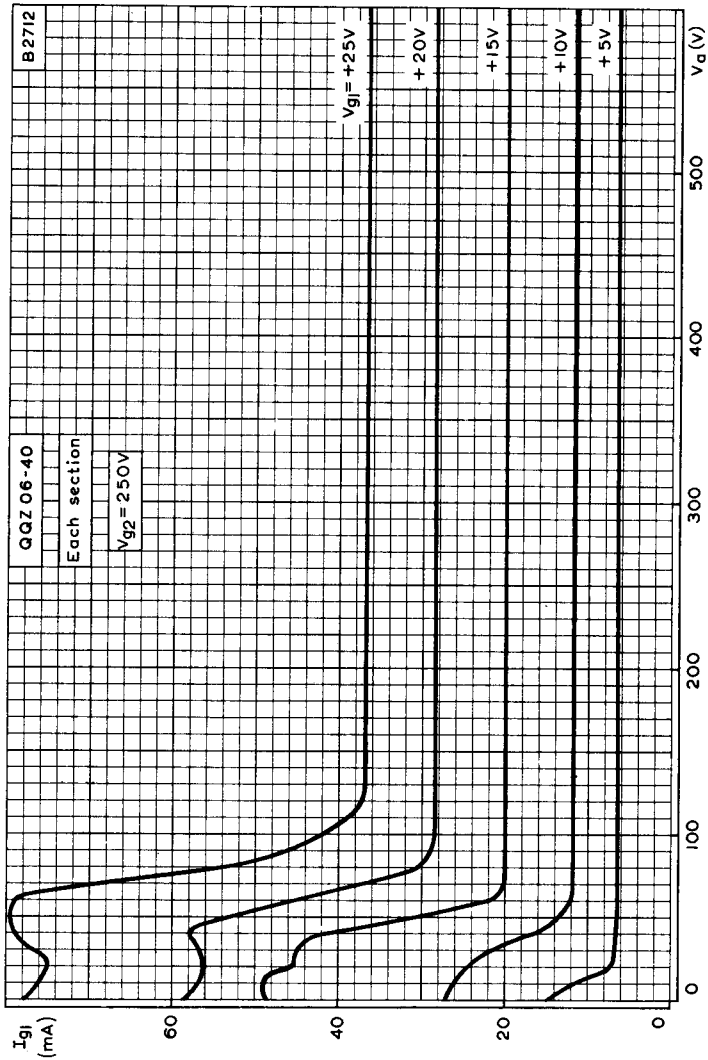
ANODE CURRENT FOR EACH SECTION PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER V_{g2} = 250V



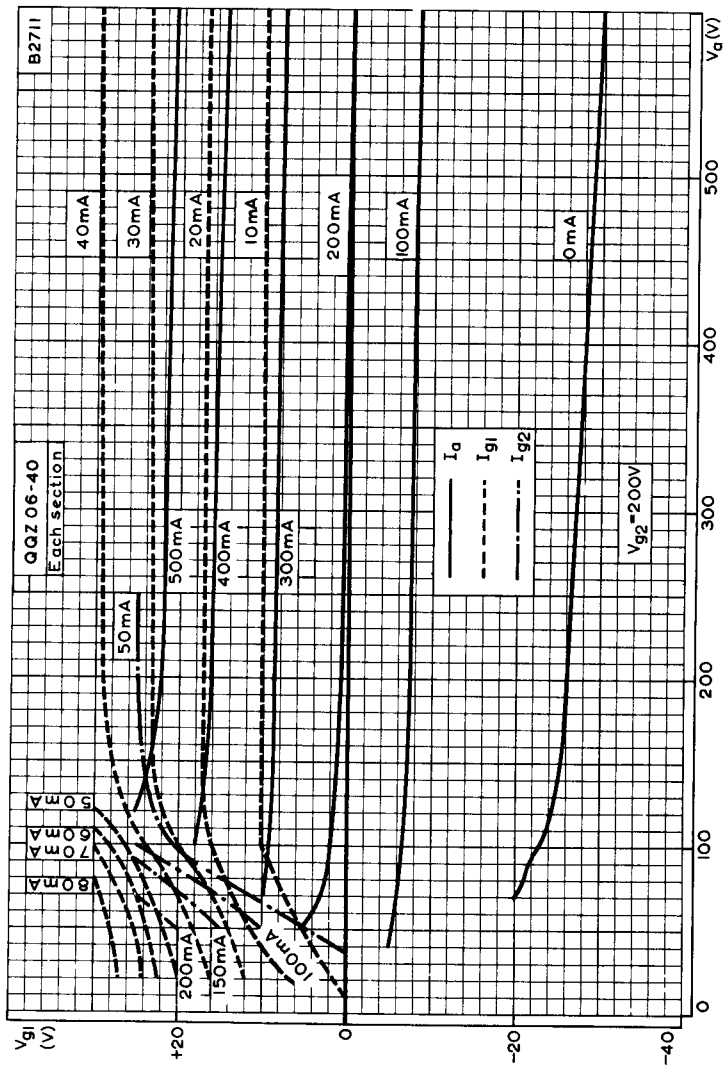
SCREEN-GRID CURRENT FOR EACH SECTION PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER V_{g2}=250V



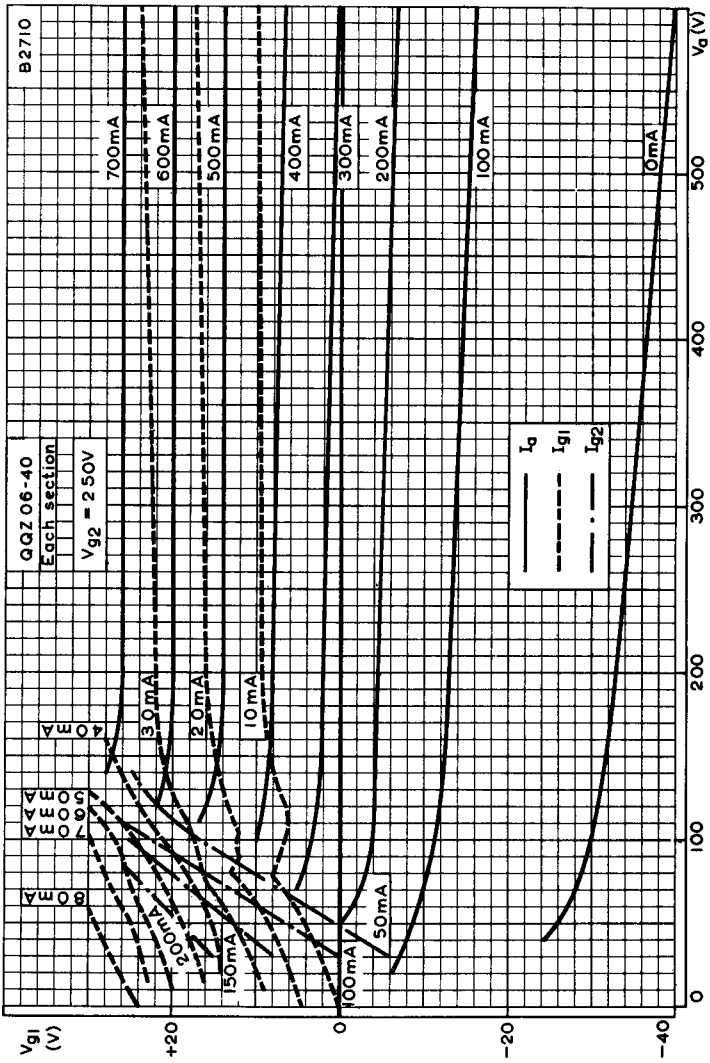
CONTROL-GRID CURRENT FOR EACH SECTION PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER V_{g2}=200V



CONTROL-GRID CURRENT FOR EACH SECTION PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER V_{g2} = 250V



CONSTANT CURRENT CHARACTERISTICS FOR EACH SECTION V_{g2} = 200V



CONSTANT CURRENT CHARACTERISTICS FOR EACH SECTION V_{g2} = 250V

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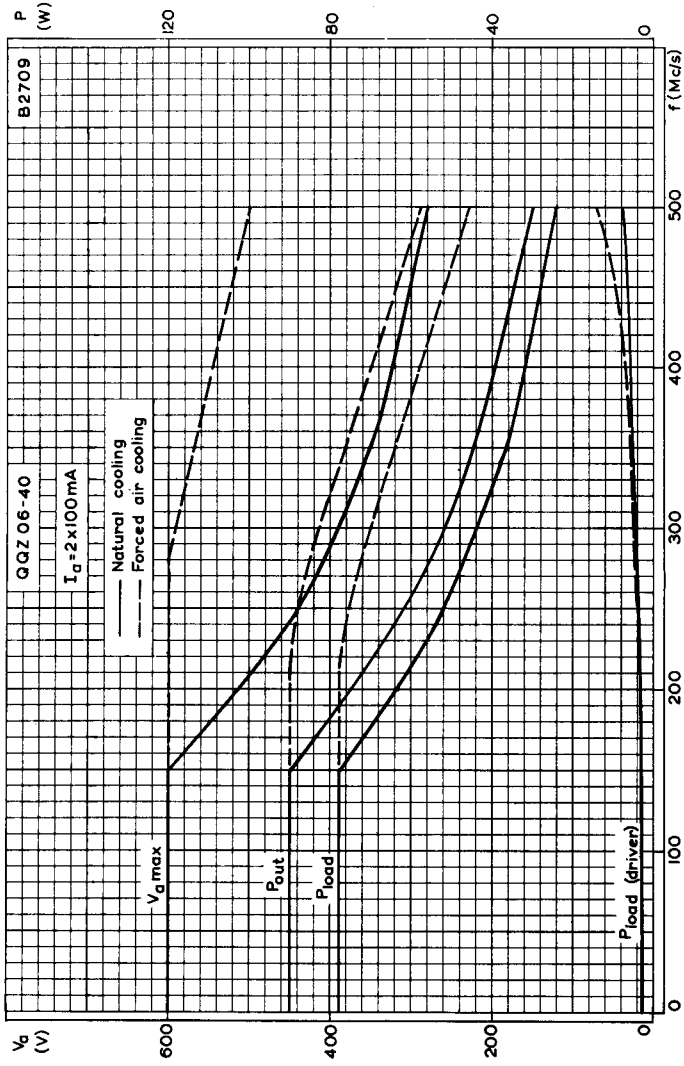
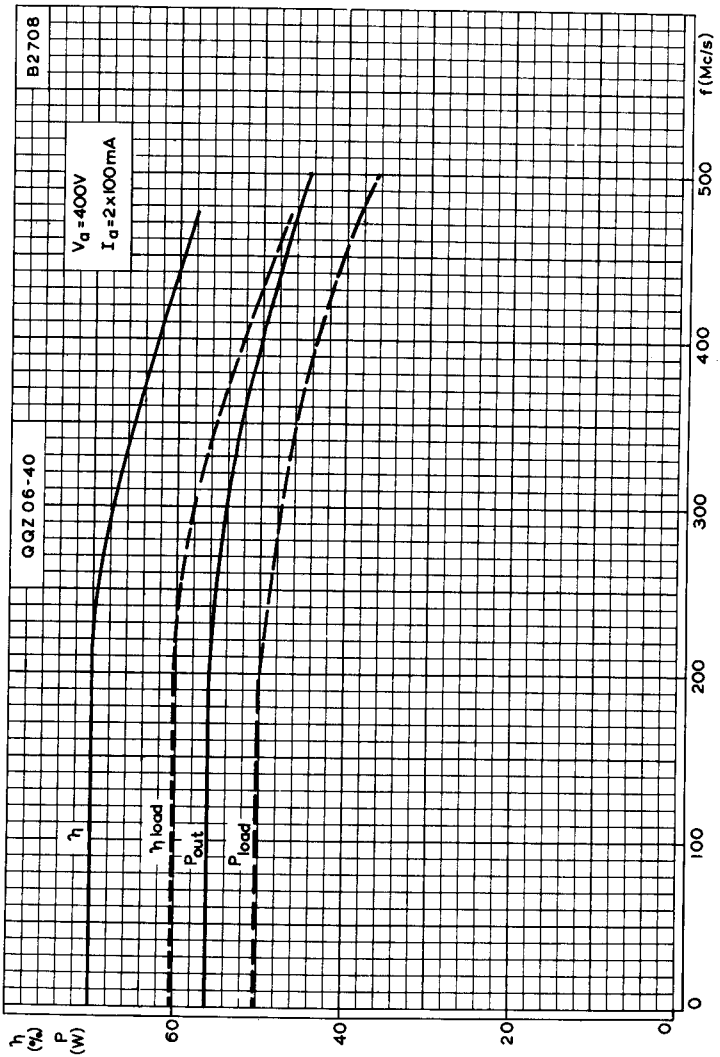


MAXIMUM OPERATING CONDITIONS FOR A PUSH-PULL R.F. POWER AMPLIFIER (CLASS 'C' TELEGRAPHY OR F.M. TELEPHONY



FREQUENCY CHARACTERISTICS FOR OPERATING CONDITIONS AS A PUSH-PULL R.F. POWER AMPLIFIER (CLASS 'C' TELEGRAPHY OR F.M. TELEGRAPHY)

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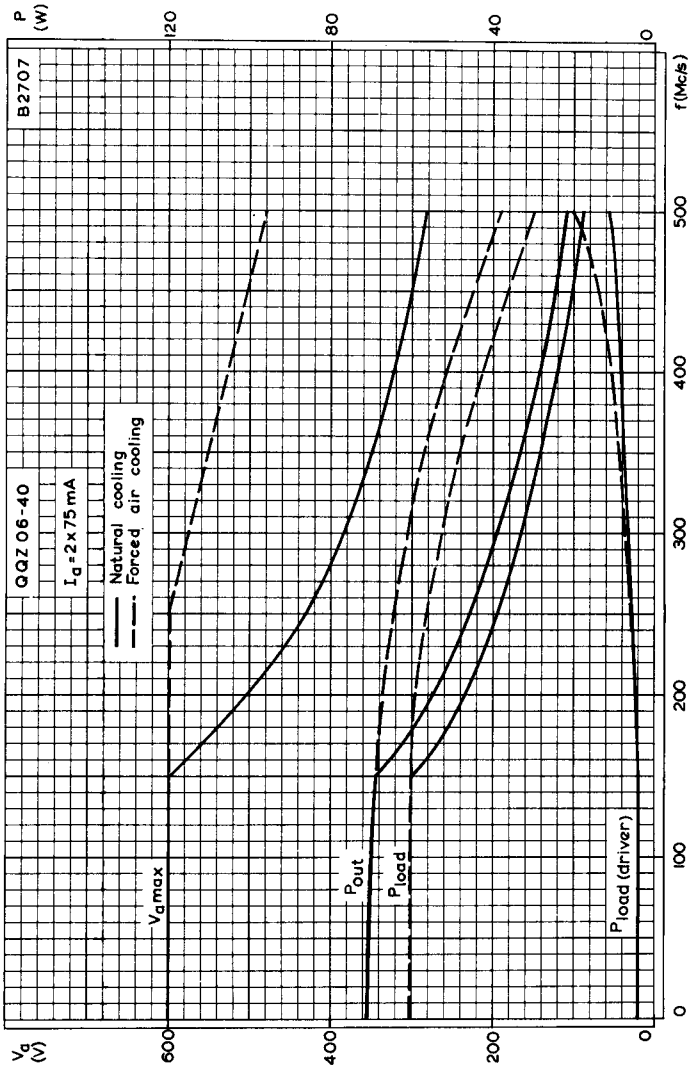
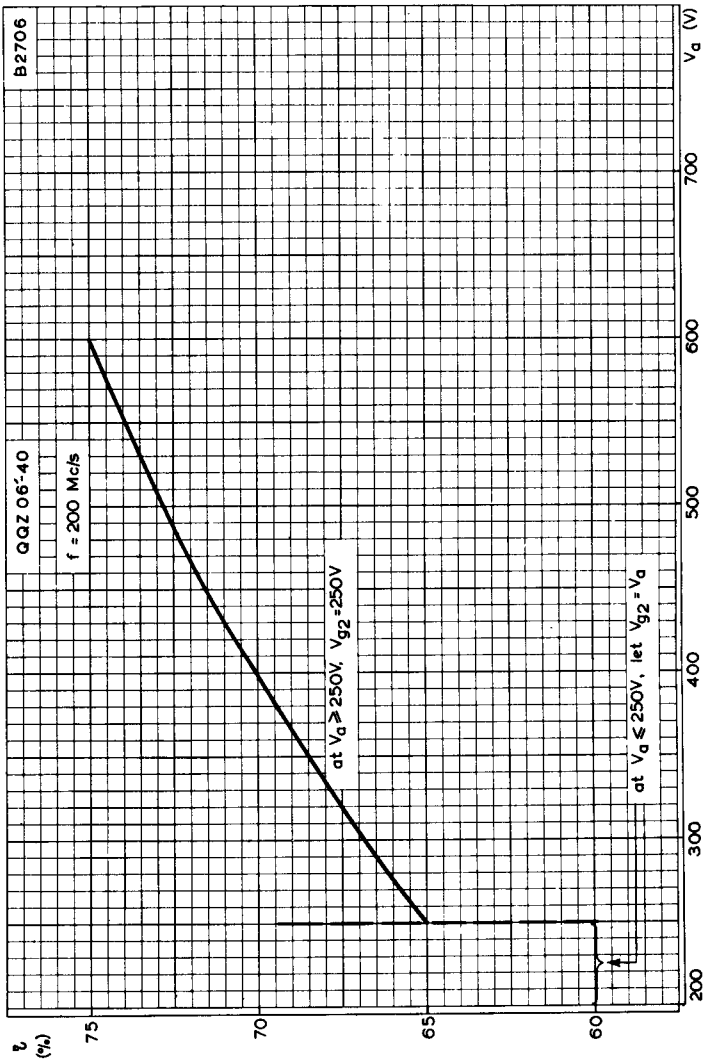


MAXIMUM OPERATING CONDITIONS FOR AN ANODE AND SCREEN-GRID MODULATED R.F. POWER AMPLIFIER (CLASS 'C' TELEPHONY)



ANODE EFFICIENCY PLOTTED AGAINST ANODE VOLTAGE FOR CLASS 'C' PUSH-PULL TELEGRAPHY