MINISTRY OF SUPPLY - DLRD(A)/TRE

VALVE ELECTRONIC

CV455

Specification MOS(A)/CV455
Issue 4 Dated 6.8.53
To be read in conjunction with K1001

SECURITY	
Specification	Valve
UNCLASSIFIED	UNCLASSIFIED

→ Indicates a change

TYPE OF VALVE = Double Triode

CATHODE = Indirectly-heated

ENVELOPE = Glass - Unmetallised

PROTOTYPE = 12AT7

RTMA DESIGNATION = 12AT7

MARKING

See K1001/4.
Additional Marking 12AT7.

BASE

B9A

RATING

			Note
Heater Voltage	(V)	12.6	A
Heater Current	(A)	0.15	A
Max. Anode Voltage	(V)	380	D
Max. No-load Anode Voltage	(V)	550	D
Max. Anode Dissipation	(W)	2.8	B,D
Max. Heater-Cathode Voltage	(V)	100	
Mutual Conductance	(mA/V)	5.5	C
Amplification Factor		60	C
Anode Impedance	(ohms)	10,000	C

CONNECTIONS

Pin	Electrode
1	A (b)
2	G1(b)
3	C (b)
4	H
5	H
6	A (a)
7	G1(a)
8	C (a)
9	HCT

CAPACITANCES (pF)

Cg-a	1.6	B
Cg-e	2.25	B
Ca-e	0.4	B
Ca-a (max.)	0.4	B

DIMENSIONS

See K1001/A1/D4

Dimension (mm)	Min.	Max.
A	-	55.6
B	-	22.4

NOTES

A. Centre-tapped heater.
B. Each section. Measured without metal screen.
C. Measured at: Va = 250V; Vg1 = 0; Rc = 200 ohms.
D. Absolute maximum value.

Z.5013.R.

CV455

TESTS

To be performed in addition to those applicable in K1001

	Test Conditions				Test	Limits Min.	Limits Max.	No. Tested	Note
a					CAPACITANCES (pF)				
					Ca(a) - g(a)	1.3	1.9	6	
					Ca(b) - g(b)	1.3	1.9		
					Cg(a) - e(a)	1.5	3.0	per	
					Cg(b) - e(b)	1.5	3.0		2
					Ca(a) - e(a)	0.1	0.7		
					Ca(b) - e(b)	0.1	0.7	week	
					Ca(a) - a(b)	-	0.4		
	Vh (V)	Va (V)	Vg_1 (V)	Rc (ohms)					
b	12.6	0	0	-	Ih (A)	.138	.162	100% or S	
c	12.6	250	0	200	Ia (mA)	7	14	100%	1
d	12.6	250	-20	200	Ia (μA)	-	100	100%	1
e	12.6	250	0	200	Reverse Ig (uA)	0	1.5	100%	1
f	12.6	250	0	200	gm (mA/V)	4.5	6.5	100%	1
g	12.6	250	0	200	u	50	70	20 per week	1
h	11.0	250	0	200	gm (mA/V)	4.0	-	100% or S	1
j	12.6	10	10	0 max.	Emission (mA)	50	-	100%	1,3

NOTE

1. Each section to be tested separately, with the opposite section earthed, or biased to cut off. Rc to be shunted with C = 1000uF
2. Measured without metal screen.
3. Test voltages to be applied only for sufficient time to obtain steady reading.

DATA SHEET

Valve Electronic Type CV 455

TYPICAL OPERATING CONDITIONS

As Class A1 Amplifier (per Section)

Anode Voltage	100	180	250	Volts
Anode Current	3.7	11.0	10	mA
Grid Voltage	-1	-1	-2	Volts
Anode Impedance	13,500	9,400	10,000	Ohms
Mutual Conductance	4.0	6.6	5.5	mA/V
Amplification Factor	54	62	55	-
Grid Voltage for Cut-off	-6	-8	-12	Volts

As Resistance Coupled Amplifier (per Section)

A curve is attached showing the relation of various parameters for certain given conditions.

As a Frequency Changer up to 450 mc/s.

Typical curves and circuit diagrams are attached.

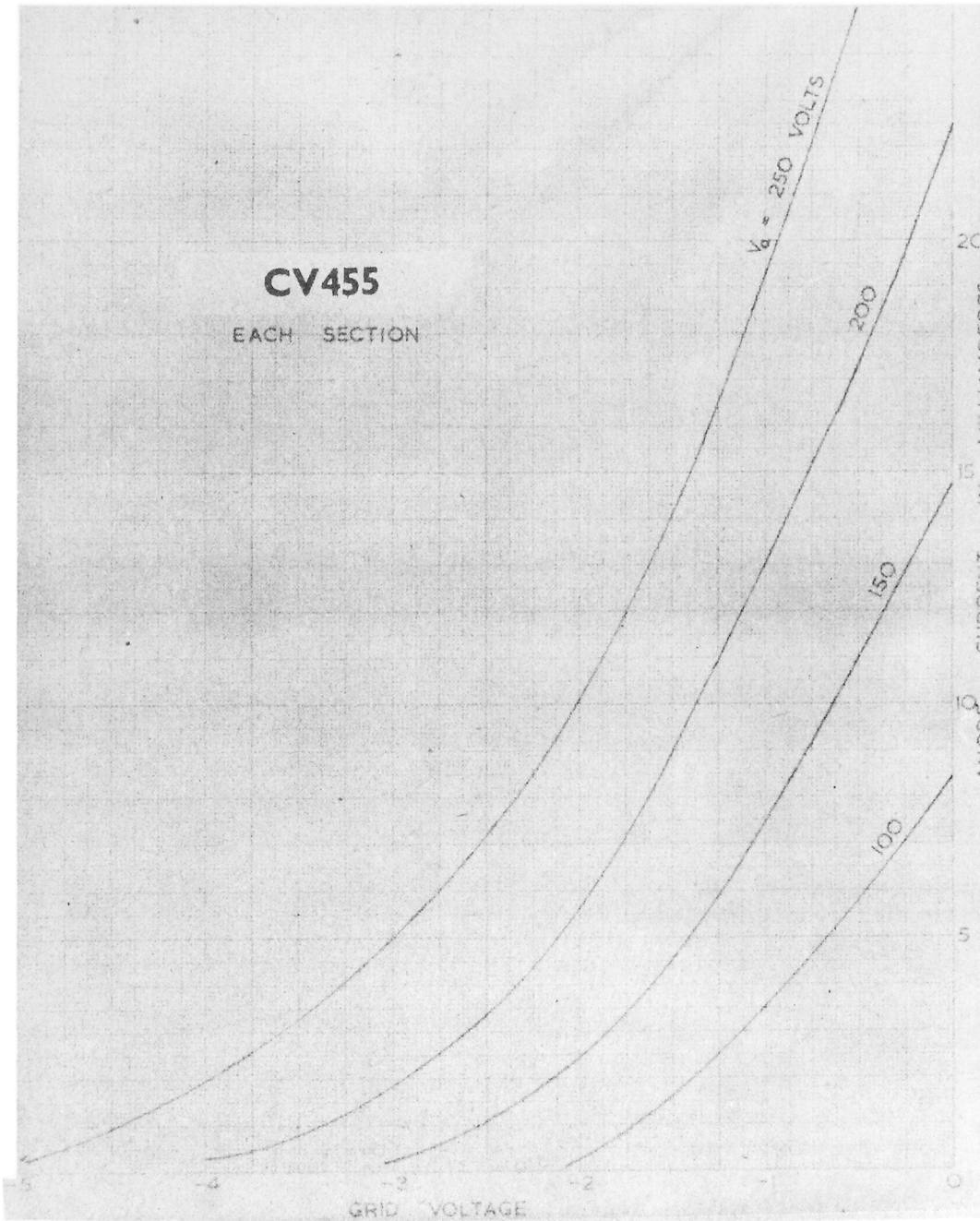
Oscillator Section - Typical Values.

Anode Supply Voltage	250	Volts
Anode Decoupling Resistor	1,000	Ohms
Grid Resistor	10,000	Ohms

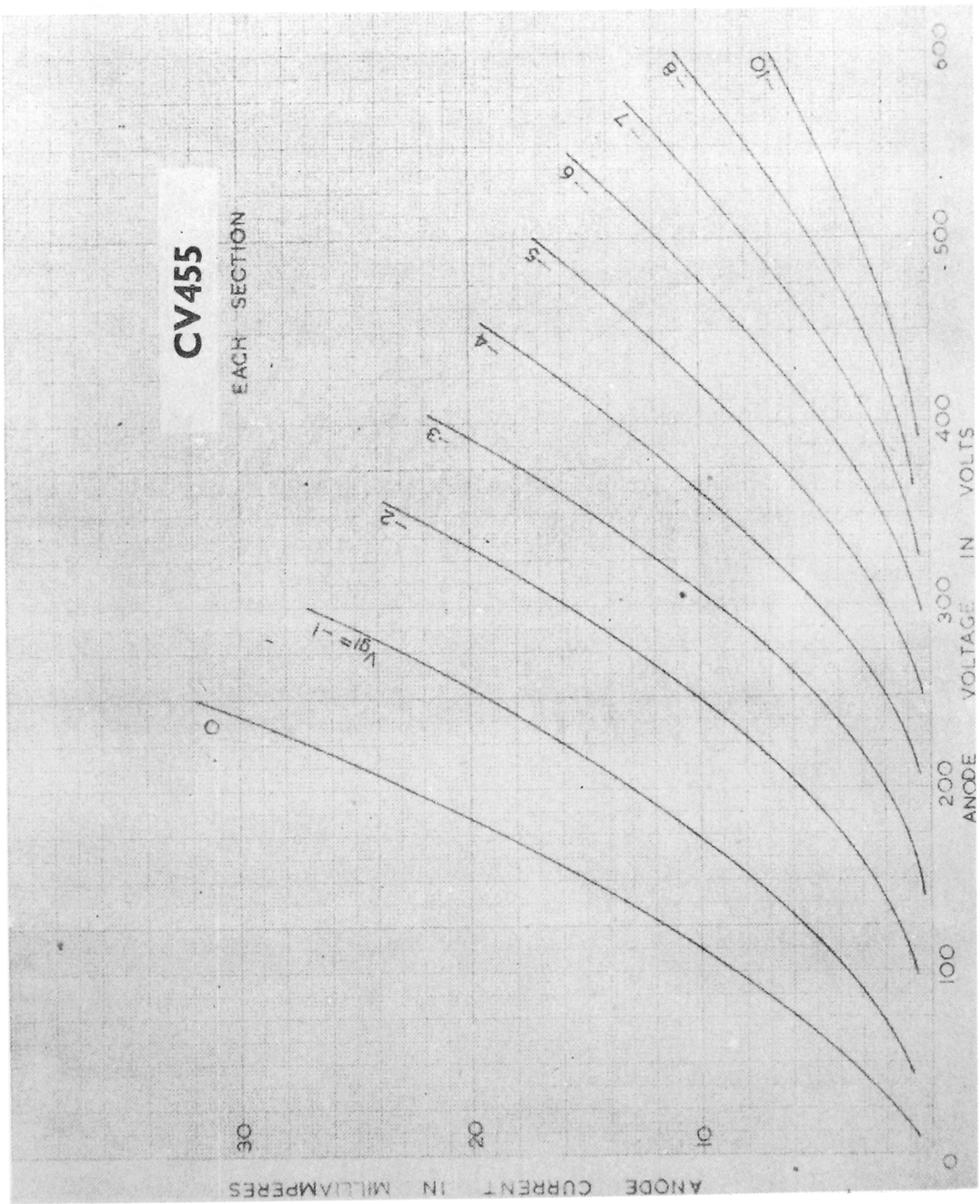
Mixer Section - Typical Values

Anode Supply Voltage	250	Volts
Anode Decoupling Resistor	1,000	Ohms
Cathode Bias Resistor	680	Ohms
Approx. Conversion Conductance	2.5	mA/V

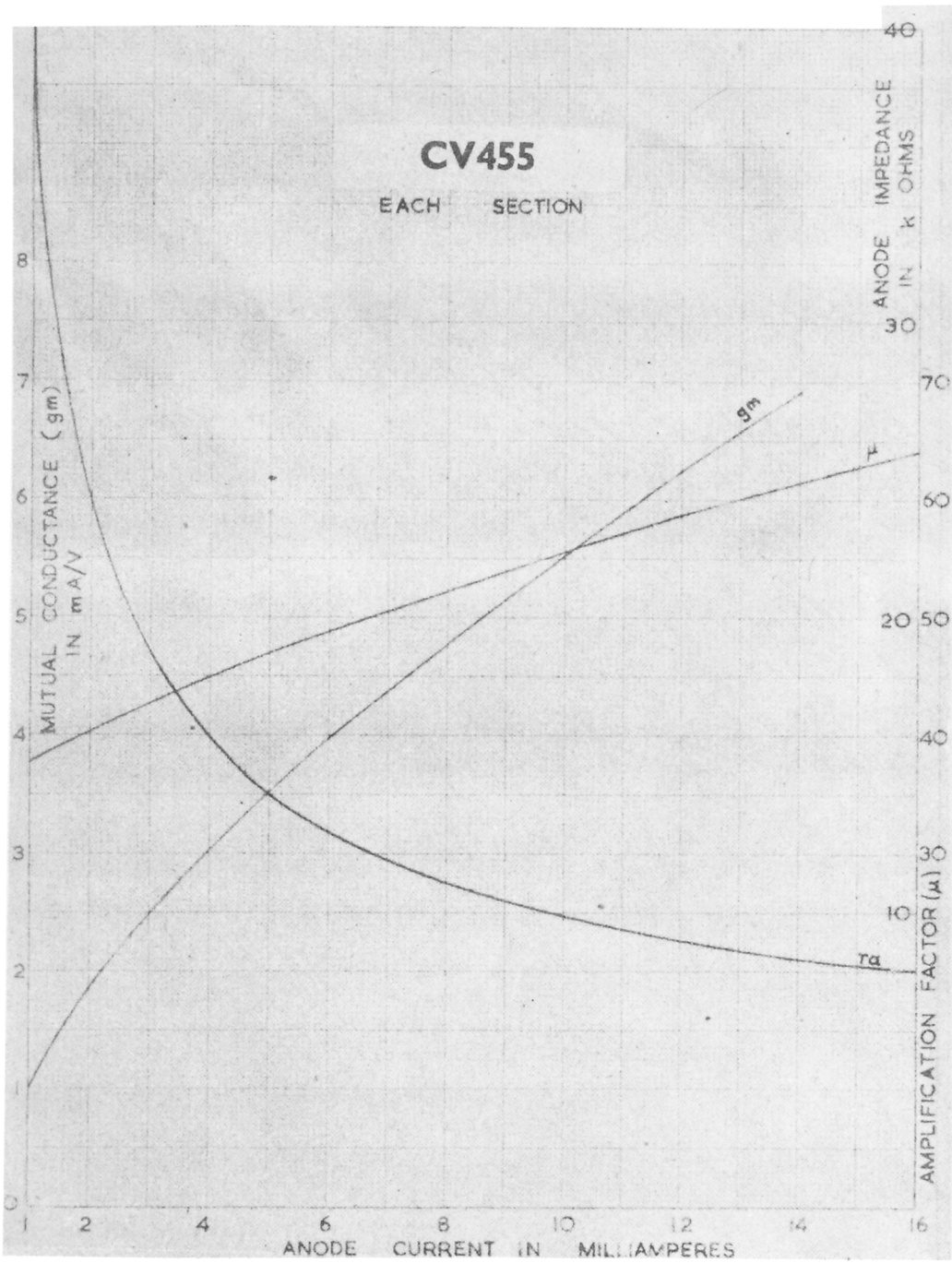
Mounting Position - Any


CV455
EACH SECTION
V_a = 250 VOLTS
200
150
100
ANODE CURRENT IN MILLIAMPERES
20
15
10
5
0
-5
-4
-3
-2
-1
GRID VOLTAGE

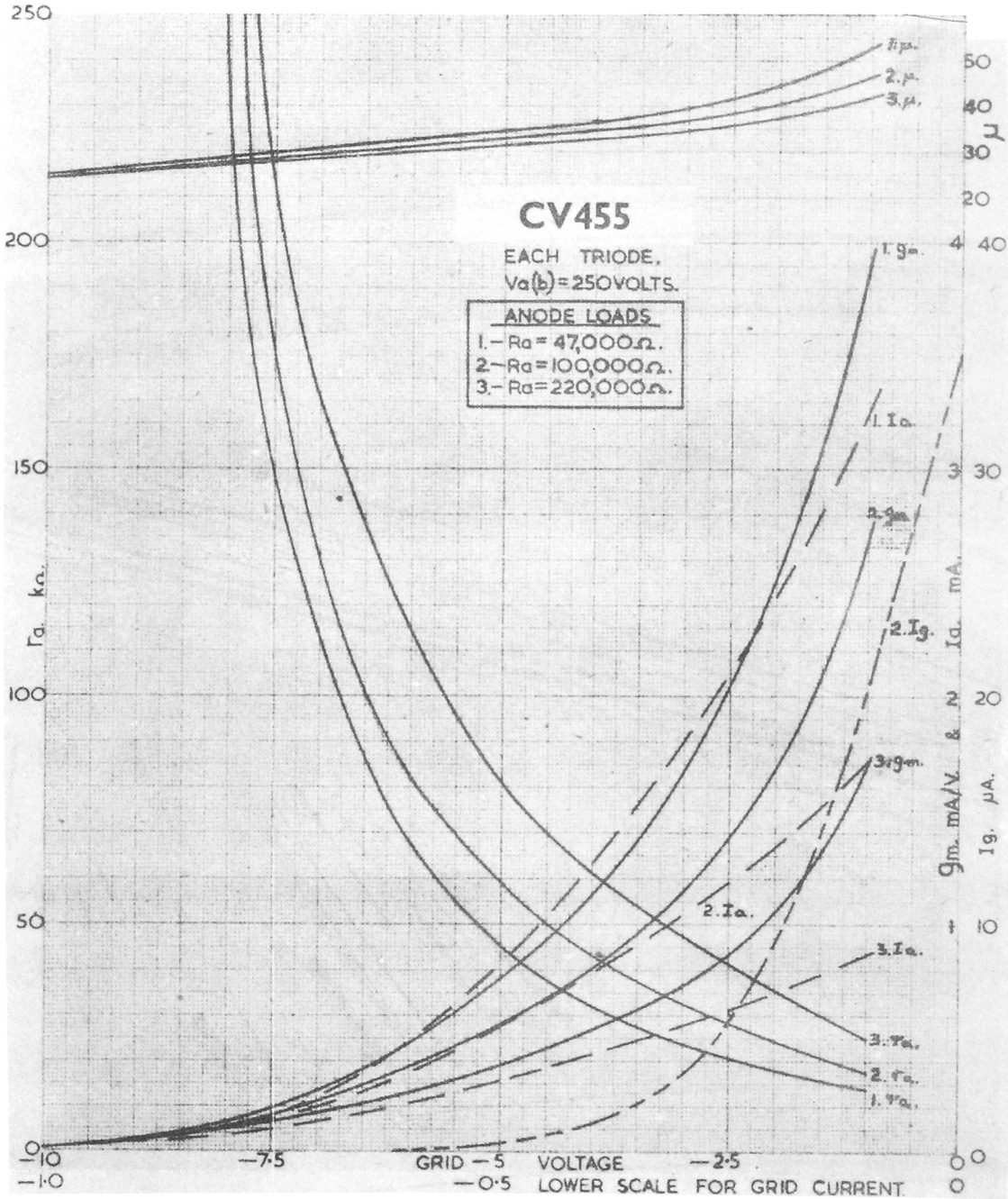
DATA SHEET


CV455
EACH SECTION
ANODE CURRENT IN MILLIAMPERES
ANODE VOLTAGE IN VOLTS
0
10
20
30
100
200
300
400
500
600
Vg = -1
-2
-3
-4
-5
-6
-7
-8
-10
0

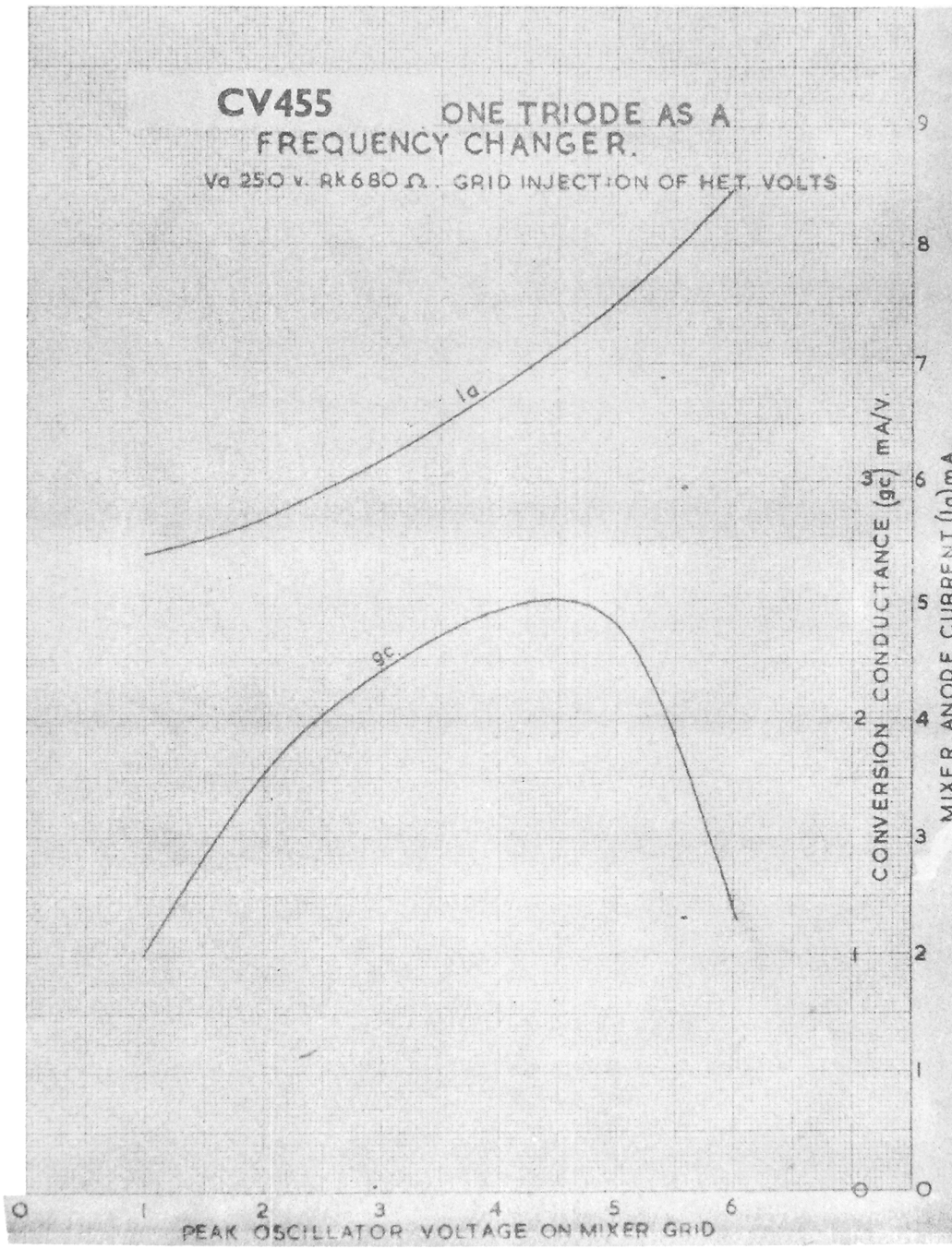
DATA SHEET


CV455
EACH SECTION
MUTUAL CONDUCTANCE (gm) IN mA/V
ANODE IMPEDANCE IN K OHMS
AMPLIFICATION FACTOR (μ)
ANODE CURRENT IN MILLIAMPERES
gm
μ
ra
0
1
2
3
4
5
6
7
8
10
20
30
40
50
60
70
1
2
4
6
8
10
12
14
16

DATA SHEET

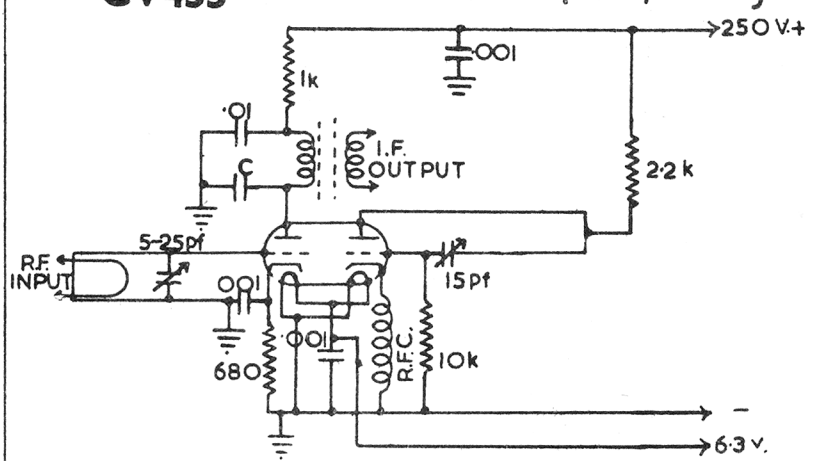

CV455
EACH TRIODE.
Va(b) = 250 VOLTS.
ANODE LOADS
1.– Ra = 47,000Ω.
2.– Ra = 100,000Ω.
3.– Ra = 220,000Ω.
1.μ.
2.μ.
3.μ.
μ
1.gm.
1.Ia.
2.gm.
2.Ig.
3.gm.
2.Ia.
3.Ia.
3.Va.
2.Va.
1.Va.
Ra. kΩ.
gm. mA/V. & Ia. mA.
Ig. μA.
250
200
150
100
50
0
50
40
30
20
4
3
2
1
0
40
30
20
10
0
−10
−7·5
−5
−2·5
0
GRID VOLTAGE
−1·0
−0·5
LOWER SCALE FOR GRID CURRENT

DATA SHEET


CV455 ONE TRIODE AS A FREQUENCY CHANGER.
Va 250 v. Rk 680 Ω. GRID INJECTION OF HET. VOLTS
Ia
gc
CONVERSION CONDUCTANCE (gc) mA/V.
MIXER ANODE CURRENT (Ia) mA.
PEAK OSCILLATOR VOLTAGE ON MIXER GRID
0
1
2
3
4
5
6
7
8
9

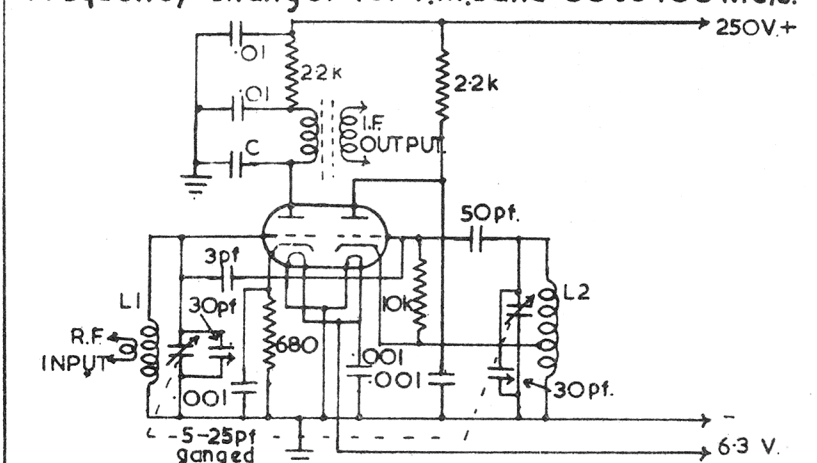
DATA SHEET

CV455 420Mc/s Frequency changer.



TUNED CIRCUITS PARALLEL LINES 14 S.W.G. COPPER WIRE, APPROX. 2 to 2 1/2 INCHES LONG, SPACED 1/2 INCH.

Frequency changer for F.M. band 88 to 108 Mc/s.



L1. 2 1/4 TURNS 22 S.W.G. I.D. 3/8 in. 1/2 in. LONG. WIRE LENGTH INCLUDING LEADS, 4 3/8 in.
L2. 1 3/4 TURNS 22 S.W.G. I.D. 1/4 in. 3/16 in. LONG. WIRE LENGTH, INCLUDING LEADS, 3 3/4 in. TAP 1 TURN FROM EARTHY END.