CV 1042

ADMIRALTY SIGNAL ESTABLISHMENT
MINISTRY OF AIRCRAFT PRODUCTION (D.C.D.)
GENERAL POST OFFICE (ENGINEER-IN-CHIEF'S OFFICE)

Specification :-		SECURITY	
		Specn.	Valve.
AD/5405, D.C.D., W.T.1017, W2027D	Issue 4, Dated 7.12.44.	Open	Open
To be read in conjunction with K1001.			

Valve Electronic	
Navy	NT58/58A
Army	
R.A.F.	VT62
G.P.O.	POVT121A

TYPE OF VALVE :- Triode, R.F. Amplifier Oscillator.

CATHODE :- Directly Heated, Thoriated Tungsten.

ENVELOPE :- Glass - Unmetallised.

COMMERCIAL PROTOTYPE :- TY1-50, DET12.

MARKING.

NT58
A.P.4889
or
NT58A
A.P.W580

VT62
10E/11443

POVT121A

RATING		Note
Filament Volts	7.5	
Filament Current (A)	3.2	
Max. Anode Volts	1250	
Max. Anode Dissipation (W)	50	
Amplification Factor	10	A
Anode Impedance (ohms)	5000	A
Mutual Conductance (mA/V)	2.0	A
Max. Frequency for above ratings (Mc/s)	100	
CAPACITANCES (pF.)		
Caf (max.)	1.0	
Cgf (max.)	2.5	
Cag (max.)	3.5	

BASE
B4
See K1001/AIV/D5.1.

Pin	Electrode
1	No connection
2	No connection
3	Filament
4	Filament
TC1	Anode
TC2	Grid

TOP CAPS AND DIMENSIONS

See Drawing on page 3.

NOTES

A. Va = 1000 V, Ia = 50 mA.

B. Valves type VT62 are to be supplied in matched pairs which must agree in grid voltage to within 1.5 V. in test 'd'. In addition to the normal marking, cartons are to be marked with the words "one pair of matched valves."

NT58/58A
VT62
POVT121A

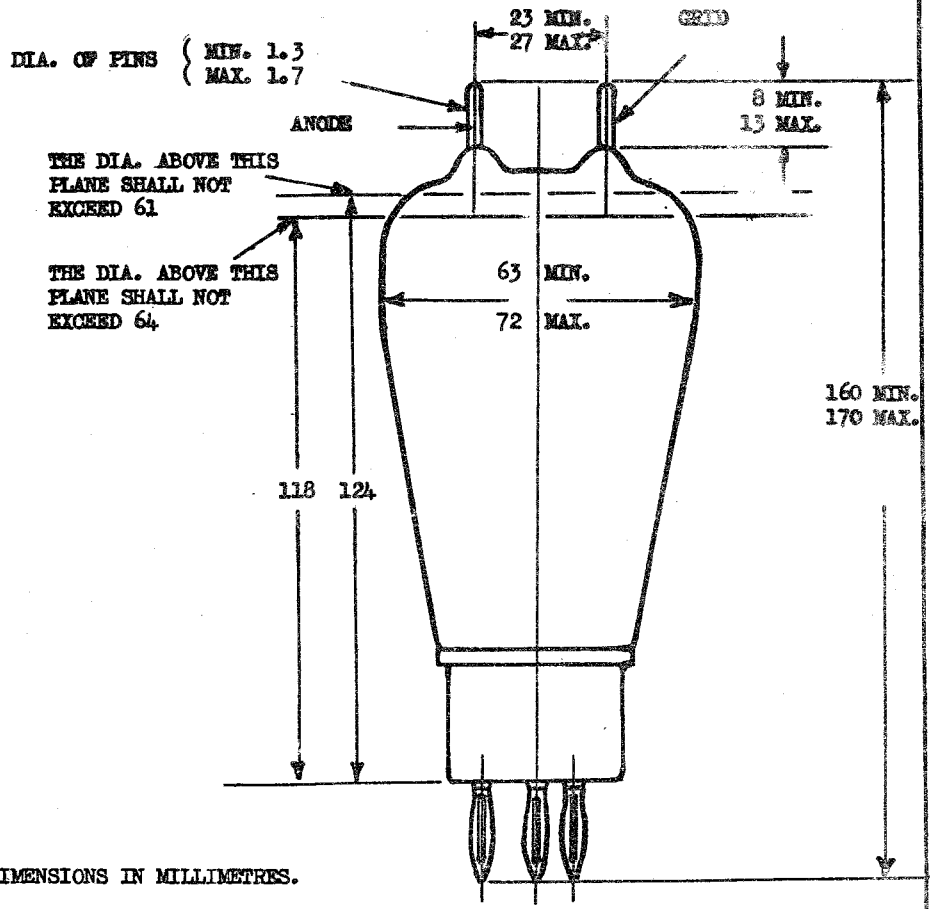
TESTS

To be performed in addition to those applicable in K1001.

	Test Conditions				Test	Limits Min.	Limits Max.	% Tested
a	See K1001/AIII.				Capacitances (pF.)			
	Links to H.P.	Links to L.P.	Links to E.					
	TC1	3,4.	1,2,5,6,7,8, 9,10,TC2.		i. Caf	-	1.0	6 per week
	TC2	3,4.	1,2,5,6,7,8, 9,10,TC1.		ii. Cgf	-	2.5	
	TC1	TC2	1,2,3,4,5,6, 7,8,9,10.		iii. Cag	-	3.5	
	Vf (V)	Vg (V)	Va (V)	Ia (mA)				
b	7.5 AC or DC.	0	0	0	If (A)	2.8	3.6	100% or S
c	Adjusted AC or DC.	0	1000	10	Vf (V) (Emission Test)	-	4.0	100%
d	7.5 DC or 7.5 AC	Adjusted	800	60	Vg (V)	-30 -34	-50 -54	100%
e	7.5 AC or DC	Adjusted	800	50	Change in -Vg from value in test 'd' (V).	3	6	100%
f	7.5 AC or DC	Adjusted	1000	50	Change in -Vg from value in test 'e' (V).	18	24	100% or S
g	7.5 AC or DC	Adjusted	1000	50	Reverse Ig after 3 mins. (μA).	-	2.0	100%

DIMENSIONS AND CONNECTIONS

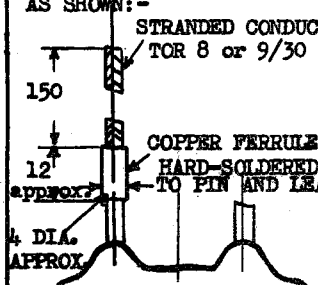
NT58, VT62
POVT121A



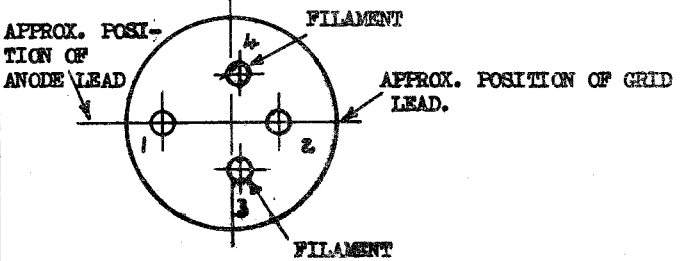
NOTE:-
ALL DIMENSIONS IN MILLIMETRES.

NT58A

AS NT58, BUT FITTED WITH BARE FLEXIBLE COPPER LEADS AS SHOWN:-



VIEW OF UNDERSIDE OF BASE

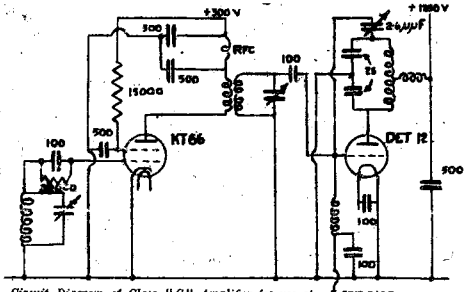


NOTE:- ANODE AND GRID LEADS TO LIE ON THE SAME SIDE OF THE CENTRE LINE OF THE VALVE AS PINS NOS. 1 & 2 OF BASE RESPECTIVELY, AND IN SAME PLANE.

TYPICAL OPERATING CONDITIONS.

In Radio Frequency Amplifier, Class "C" Telegraphy.

For operation at frequencies above 120 megacycles wound coils become too small to be practicable, and the tuning systems may consist of resonant lines, frequency variation being obtained by adjustment of the effective length of the lines. Half-wave lines should also be connected in the filament leads in order to earth effectively the active part of the filament. The driver stage consists of a pair of [illegible] valves in a push-pull self-oscillator. The amplifier gives a power gain of two at 1.5 metres, and ceases to amplify at about 1.2 metres.



Circuit Diagram of Class "C" Amplifier for use at frequencies up to 120 mc.s and Driver stage.

Below 120 megacycles a typical circuit is given in Fig. 1 above.

Control grid bias may be obtained from a battery, as shown, or from a grid leak of 10,000 ohms.

A suitable driver stage for wavelengths down to 4 metres uses a KT66 Tetrode in a self-oscillator circuit. The amplifier gives a power gain of about ten times at 7 metres, six times at 4 metres.

Self-Oscillator, with resonant line frequency control.

Fig. 2 shows the circuit of a push-pull oscillator using a resonant line in the grid circuit only; it should be slightly less than a quarter wavelength long. The operating conditions at a wavelength of 2.5 metres are set out in the table below.

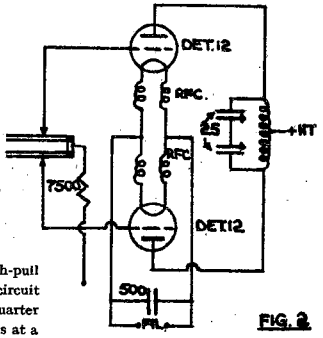


FIG. 2

Circuit diagram of push-pull self-oscillator with resonant grid lines.

Anode Voltage.	Anode current, 2 valves.	Grid current, 2 valves.	Watts output.	Anode efficiency.	Anode dissipation per valve.
					Watts.
1,100	140 mA.	15 mA.	65	42%	44.5
800	115 mA.	18 mA.	38	41%	27
500	110 mA.	28 mA.	23	42%	11

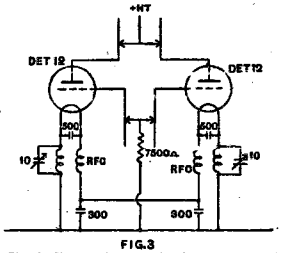


FIG.3

Circuit diagram for operation between 1.25 and 2 metres, using resonant lines in both anode and grid circuits.

Fig. 3 shows a circuit using resonant lines in both anode and grid circuits, suitable for operation between 1.25 and 2 metres. The table set out below gives operating conditions.

Wavelength metres.	Anode voltage.	Anode current, 2 valves.	Watts output, 2 valves.	Anode efficiency.	Anode dissipation per valve.	Remarks.
					Watts.	
3.0	1,100	90 mA.	45	45%	25.5	Untuned filament chokes
2.1	1,000	110 mA.	35	32%	37.5	
1.6	850	115 mA.	18	18.5%	40	
2.5	1,000	100 mA.	50	50%	25	Tuned filament chokes
2.1	1,000	110 mA.	48	44%	31	
1.4	820	100 mA.	27	33%	27.5	

Self-Oscillator, Single Valve.

A typical circuit is shown in Fig. 4.

Below 2.5 metres the main oscillatory circuit consists of a copper strip L_1 tuned by the grid anode capacitance of the valve in series with the grid blocking condenser. The wavelength of operation is controlled by the length of the strip.

For above 2.5 metres, a tuned filament system is not essential, quarter wave chokes being satisfactory.

Below 1.5 metres oscillation can only be obtained with a tuned filament system, as shown.

A table of operating conditions is given below.

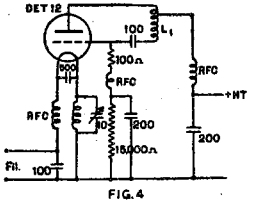


FIG. 4

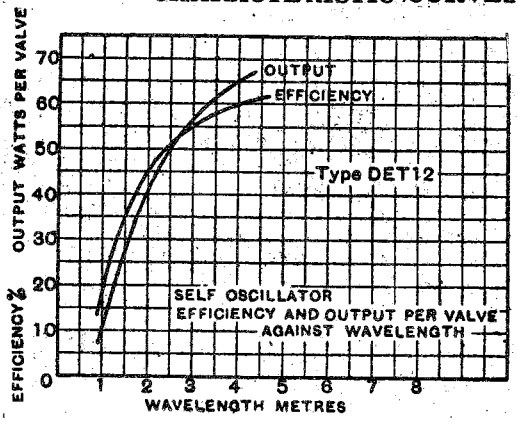
Circuit for single valve as self oscillator.

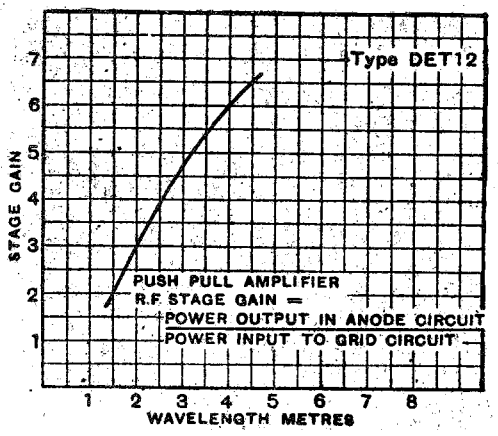
Wavelength metres.	Anode voltage.	Anode current.	Grid leak, ohms.	Grid current.	Watts output.	Anode efficiency.	Anode dissipation.
							Watts.
4.4	1,250	90 mA.	15,000	24 mA.	67	60%	46
2.5	1,000	100 mA.	7,500	22 mA.	50	50%	50
2.0	950	100 mA.	7,500	18 mA.	43	45%	52
1.5	800	100 mA.	7,500	12 mA.	28	35%	52
1.1	650	100 mA.	2,500	11 mA.	13	20%	52
0.9	500	100 mA.	2,500	7 mA.	7	14%	43

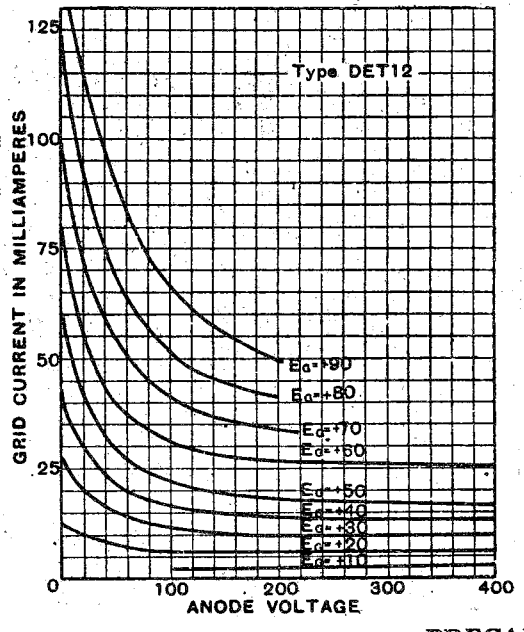
Source of information: Osram Catalogue.

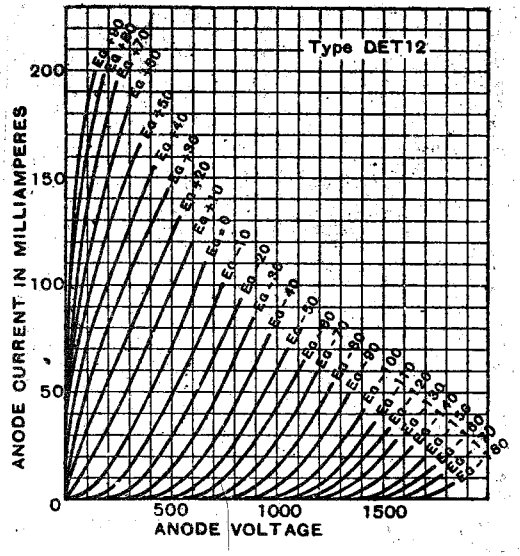
NT58
&VT62.

CHARACTERISTIC CURVES OF AVERAGE VALVE.









PRECAUTIONS.

1. Before operating, anode and grid radiators must be attached in order to provide adequate heat radiation, and to provide good electrical contact.

2. Condensers for the higher frequencies should be built up by using the metal base plate as one condenser plate and a small metal flag as the other plate, with a thin sheet of mica as dielectric.

3. Condensers tuning the anode circuits should preferably be of the split stator type in order that the rotor bearings do not carry the large circulating current.

4. For efficient operation as an oscillator below 2.5 metres, and for any oscillation below 1.5 metres, tuned filament chokes are essential.

NT58/a/ii. Source of curves : Osram Catalogue