

Ministry of Aviation D.L.R.D./R.A.E.

CV5847

SPECIFICATION M.O.A./CV.5847 ISSUE NO. 1 dated 2.7.62 To be read in conjunction with K1001, BS448 & BS1409	<u>SECURITY</u>	
	<u>SPECIFICATION</u>	<u>VALVE</u>
	Unclassified	Unclassified

TYPE OF VALVE: Double R.F. Beam Tetrode CATHODE: Indirectly - Heated ENVELOPE: Glass, unmetallised PROTOTYPE: QQV07-50	<u>MARKING</u> See K.1001/4
	<u>BASE</u> BS.448/B7A

<u>RATINGS</u>		<u>CONNECTIONS</u>	
(All limiting values are absolute)		<u>PIN</u>	<u>Electrode</u>
Heater Voltage	(V) 6.3	A	1 Heater h
Heater Current	(A) 1.8	A	2 Control Grid (1) g1'
Max. Anode Voltage (f= 250 Mc/s)	(V) 750		3 Screen Grid (Common) g2
Max. Anode Voltage (f= 500 Mc/s)	(V) 600		4 Cathode k
Max. Screen Grid Voltage	(V) 300		5 Heater (Centre tap)
Max. Negative Grid Voltage	(V) 175		6 Control Grid (2) g1''
Max. Anode Dissipation	(W) 25	B	7 Heater
Max. Screen Grid Dissipation	(W) 3.5	B	TC1 Anode 1 a'
Max. Control Grid Dissipation	(W) 1.0	B	TC2 Anode 2 a''
Max. Heater-Cathode Voltage	(V) 100		
Max. Peak Cathode Current	(mA) 875	B	
Max. Mean Cathode Current	(mA) 150	B	
Max. Grid-Cathode Resistance (fixed bias)	(k Ω) 50		
Max. Grid-Cathode Resistance (auto-bias)	(k Ω) 100		
Max. Temperature of Anode Pins	($^{\circ}$ C) 250	C	
Max. Temperature of Base Pins	($^{\circ}$ C) 180	C	

<u>CAPACITANCES (pF)</u>		<u>MOUNTING POSITION</u>	
C in (nom.)	10	B	Any
C out (nom.)	3.4	B	
C g'g'' (nom.)	1.2		
C a'a'' (nom.)	0.24		

NOTES

A. Centre tapped heater (series connected 12.6v 0.9A)

B. Each Section

C. Temperature measured at the junction of glass and pins. The valve may be operated at full ratings up to a frequency of 100 Mc/s with only normal radiation and convection cooling. Above this frequency or in poorly ventilated conditions, a minimum air flow of 5 c.ft./min. shall be directed onto the top of the envelope to ensure operation within the specified limits.

NOTES (cont'd.)

D. The Joint Service Catalogue Number is 5960-99-037-2925

TYPICAL CHARACTERISTICS AND OPERATING CONDITIONSCHARACTERISTICS (each section)

I_a = 30 mA
 g_m = 4.5 mA/V
 u_{g1-g2} = 8.0

PUSH PULL OPERATIONRATINGSCLASS 'C' TELEGRAPHY ORF.M. TELEPHONYTYPICAL CONDITIONS

Max. f	(Mc/s)	500	f	(Mc/s)	200	475
Max. V_a (f= 250 Mc/s)	(V)	750	V_a	(V)	600	500
Max. V_a (f= 500 Mc/s)	(V)	600	V_{g2}	(V)	250	250
Max. P_a	(W)	2 x 25	$-V_{g1}$	(V)	80	60
Max. V_{g2} (b)	(V)	600	I_a	(mA)	2 x 115	2 x 115
Max. V_{g2}	(V)	300	I_{g2}	(mA)	2 x 8.0	2 x 4.0
Max. P_{g2}	(W)	2 x 3.5	I_{g1}	(mA)	2 x 4.0	2 x 3.0
Max. P_{g1}	(W)	2 x 1.0	Pload (driver)	(W)	4.0	12.0
Max. I_{g1}	(mA)	2 x 5.0	P_a	(W)	2 x 17.5	2 x 23
Max. I_k	(mA)	2 x 150	Pout	(W)	103	69
Max. I_k pk	(mA)	2 x 875	η_a	(%)	75	60
Max. $-V_{g1}$	(V)	100	Pload	(W)	87	59
			$\eta_{transfer}$	(%)	85	85

TESTS

CV5847

TEST CONDITIONS:- Unless otherwise stated.									
		V _h (V) 6.3	V _a (V) 600	V _{g2} (V) 250	Note 1, 11				
K.1001 Ref.	Test	Test Conditions		AQL %	Insp. Level	Symbol	LIMITS		Units
							Min.	Max.	
AV	<u>GROUP A</u>								
	Reverse Grid Current	Adjust V _{g1} for I _a =4.0mA Note 2		-	100%	-I _{g1}	-	6.0	μA
	Anode Current (1)	V _{g1} = -24V		-	100%	I _a (1)	18	52	mA
	Screen Current	Adjust V _{g1} for I _a =4.0mA		-	100%	I _{g2}	-	6.0	mA
	Anode Current (2)	V _{g1} = -40V		-	100%	I _a (2)	-	5.0	mA
	Heater Current			-	100%	I _h	1.6	2.0	A
	Emission	a + g ₂ + g ₁ (strapped) = 225v. Note 3		-	100%	I _s	1.8	-	A
	<u>GROUP B</u>								
	Heater-Cathode Leakage Current	V _{hk} = + 100 V.		0.65	II	I _{hk}	-	40	μA
	Change in Grid Voltage	Set V _{g2} =250V. Adjust V _{g1} for I _a =4.0mA, reduce V _{g2} to 200V and readjust V _{g1} for I _a =4.0mA.		0.65	II	ΔV _{g1}	5.2	7.5	V
	Mutual Conductance	V _{g1} = -24V ΔV _{g1} = 0.5 V Max.		0.65	II	g _m	3.5	6.5	mA/V
	<u>GROUP C</u>								
	Power Output (200 Mc/s)	V _a = 700V V _{g1} = -90V I _a = 225mA I _{g1} = 4-10mA I _{g2} = 20mA max. Note 4		6.5	IC	P _{out} (load)	95	-	W
	Vibration Noise	V _a = 250V Adjust V _{g1} for I _a = 10mA RL = 2k Vibration Amplitude = +0.01" Note 5		6.5	IC	V _a (pk/pk)	-	800	mV
	Change in Mutual Conductance	V _h = 5.7V Notes 6 and 7		6.5	IC	Δg _m	-	15	%

K.1001 Ref.	Test	Test Conditions	AQL %	Insp. Level	Symbol	LIMITS		Units.
						Min.	Max.	
AIII	<u>GROUP D</u>							
	Capacitances	The valves shall be measured on a 1 Mc/s R.F. bridge in a fully shielded socket, Top cap connectors to be screened. Note 10	6.5	L5	Ca'gl ⁿ -	-	0.015	pF
			6.5	L5	Ca ⁿ gl'	-	0.015	pF
			6.5	L5	Ca'gl ⁿ -	9.0	11.5	pF
			6.5	L5	C'in	9.0	11.5	pF
			6.5	L5	C'out	2.8	3.8	pF
			6.5	L5	C'out	2.8	3.8	pF
6.5			L5	Ca'-out	-	0.5	pF	
11.3	<u>GROUP E</u> Fatigue	No voltages applied. The valves shall be vibrated sinusoidally on the axis perpendicular to the planes of the anodes at a frequency = 50 c/s. amplitude = +0.02" Duration = 15 mins.	-	IC	-	-	-	
11.4	Shock	Hammer angle = 30° The Valve shall be struck at an angle of 45° to the press seal. Three blows.	-	IC	-	-	-	
	<u>Post Fatigue & Shock Tests</u>	Combined A.Q.L.	6.5					
	Inoperatives		2.5	-	-	-	-	
	Reverse Grid Current	As in Group A	2.5	-	-Igl	-	7.5 μA	
	Vibration Noise	As in Group C	2.5	-	Va (pk/pk)	-	1.0 V	
	Power Output (200 Mc/s)	As in Group C	2.5	-	Pout	90	- W	
AVI/S	<u>GROUP F</u> Life Test	Note 8, 9		IC				
AVI/S.6	<u>Life Test (End Point 500 hrs.)</u>							
	Inoperatives		2.5	-	-	-	-	
	Reverse Grid Current	As in Group A	2.5	-	-Igl	-	7.5 μA	
	Power Output	As in Group C	2.5	-	Pout (load)	90	- W	

K.1001 Ref.	Test	Test Conditions	AQL %	Insp. Level	Symbol	LIMITS		Units
						Min.	Max.	
	<u>GROUP G</u>							
AIX/2.4	Electrical Retest after 28 days Holding Period			100%				
AVI/5.6	Inoperatives		0.5	-	-	-	-	-
	Reverse Grid Current	As in Group A	0.5	-	-Igl	-	7.5	uA

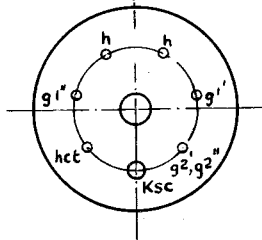
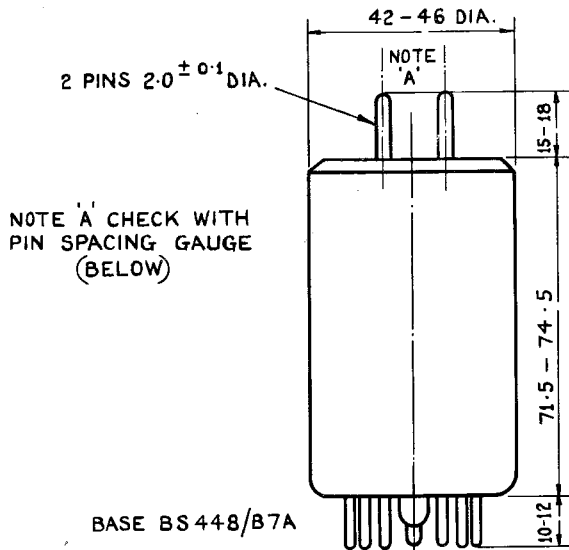
NOTES

- Test each section separately with gl of the non-active section biased to -100v. Heaters parallel connected.
- Read after a minimum period of three minutes operation when the measurement shall neither be rising nor out of limit.
- The two sections connected in parallel.
- At a circuit efficiency of 80%.
- The valve shall be vibrated sinusoidally at f = 50 cps. in each of the following planes:-
 - Major axis
 - Transversely in the planes of the anodes.
 - Transversely, perpendicular to the planes of the anodes.
- The change in mutual conductance is expressed as:

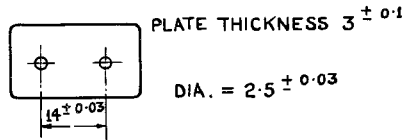
$$\frac{gm \text{ at } 6.3v - gm \text{ at } 5.7v}{gm \text{ at } 6.3v} \times 100\%$$
- Preheat the valves for five minutes under the test conditions before making the test.
- The life test is to be performed in an approved dynamic circuit.
- The Inspection Level of IC is applicable to production quantities in excess of 1000 valves. Where orders are for less than this quantity, the life test specified in K1001 Section 13 shall apply.
- The connections for the capacitance test shall be as follows:-

TEST	H.P	LP	E
Ca'gl"	TC1	6	1, 2, 3, 4, 5, 6, 7
Ca"gl'	TC2	13457C	TC1, TC2
Ca"gl"	TC2	13457C 2	TC1, TC2 2, 3, 4, 5, 6, 7
Ca'gl'	TC1	6	123457C TC1
C'in	2	13457C	TC1, TC2 6
C'in	6	13457C	TC1, TC2 2
C'out	TC1	13457C	2, 6, TC2
C'out	TC2	13457C	2, 6, TC1
Ca'a"	TC1	TC2	1234567C

- Readings to be made after a minimum of 3 mins. operation.



VIEW LOOKING ON TO PINS.
BASE - B7A (ACC. TO BS448)



PIN SPACING GAUGE

NOTE :- ALL DIMENSIONS IN MILLIMETRES.