VALVE ELECTRONIC **CV124**

ADMIRALTY SIGNAL ESTABLISHMENT

Specification AD/CV124/Issue 7. Dated 7.3.47. To be read in conjunction with K1001.	SECURITY Specn. ~~Restricted~~ Unclass Valve Unclassified

TYPE OF VALVE:- Beam Tetrode.
CATHODE:- Indirectly heated.
ENVELOPE:- Glass, clear.
PROTOTYPE:- 807.

MARKING

See K1001/4.

RATING		Note
Heater voltage (V)	6.3	
Heater current (A)	0.9	
Max. anode voltage (V)	600	
Max. screen voltage (V)	300	
Max. anode dissipation (W)	25	
Max. screen dissipation (W)	3.5	
Mutual conductance (mA/V)	7.1	A
Max. signal DC anode current (mA)	120	

BASE
USM5
See K1001/AIV/D4.2.

Pin	Electrode
1	Heater
2	Screen Grid
3	Control Grid
4	Cathode and beam forming plates.
5	Heater
TC	Anode

CAPACITANCES (pF.)	
Cae	8.2
Cge	12.5
Cag (max.)	0.35

TOP CAP

See K1001/AI/D5.1

DIMENSIONS

See K1001/AI/D1.

Dimension	Min.	Max.
A mm	-	146
B mm	-	53

NOTE

A. At Va = 300 V, Vg2 = 250 V, Ia = 83 mA and Vg1 = -12.5 V approx.

PACKING

See ~~K1001/7.~~ K1005

TESTS

To be performed in addition to those applicable in K1001.

	Test Conditions				Test	Limits Min.	Limits Max.	No. Tested
a	See K1001/AIII				Capacitances			
	Links to H.P.	Links to L.P.	Links to E.		Cag (pF)	-	0.35	6 per week
	TC1	3	1,2,4,5, 6,7,8,9, 10 TC2.					
	3	1,2,4,5.	6,7,8,9 10, TC1 TC2.		Cge (pF)	-	14.0	
	TC1	1,2,4,5.	3,6,7,8, 9,10,TC2		Cae (pF)	-	11.0	
	Vh (V)	Va (V)	Vg2 (V)	Ia (mA)				
b	6.3	-	-	-	Ih (A)	0.8	1.0	100% or S
c	6.3	300	250	83	Vg (V)	-9.0	-16.0	100%
d	6.3	300	250	83	Ig2 (mA)	-	11	100% or S
e	6.3	300	250	83	gm (mA/V)	5.0	8.7	100%
f	6.3	300	250	83	Reverse Ig (μA)	-	3.0	100%
g	6.3	300	250		Ia tail (mA)	-	1.0	100% or S
	Vg = -55 V							
h	6.3 Screen and control-grid joined to anode and a voltage pulse of short duration and of peak value 400 V is applied to the anode (e.g. as described in K1001/AV Method III) the condenser C being 0.25 μF charged to 500 V and resistance R being adjusted so that a peak voltage of 100 V appears across it during the discharge				Peak Cathode Current (A)	4	-	100%

DATA SHEET. VALVE TYPE CV124

GENERAL.

The valve CV124 is a beam-tetrode based on the U.S. Type 807. It differs from the valves ATS25 and VT60A in that its acceptance tests contain no "special" requirements and therefore roughly correspond with commercial customers' limits.

TYPICAL OPERATING CONDITIONS.

Push-Pull Class AB2# Modulator and A.F.Amplifier.

(Values are for two valves).

D.C. Anode Voltage	400	500	600 V.
D.C. Screen Voltage	300	300	300 V.
D.C. Control Grid Voltage	-25	-25	-30 V.
Peak A.F. G-G Voltage	80	80	80 V.
Zero Sig. D.C. Anode Current	100	100	60 mA.
Max. Sig. D.C. Anode Current	230	230	200 mA.
Max. Sig. D.C. Screen Current	10	10	10 mA.
Local Resistance (per valve)	950	1165	1665 Ω
Effective Load Resistance (A-A)	3800	4660	6660 Ω
Peak Grid Input Power°	0.35	0.6	0.4 W.
Max. Signal Power Output≋	60	75	80 W.

R.F.Power Amplifier-Class B Telephony.

(Carrier conditions per valve for use with a maximum modulation factor of 1.0).

D.C. Anode Voltage	400	500	600 V.
D.C. Screen Voltage	250	250	250 V.
D.C. Control Grid Voltage	-25	-25	-25 V.
Peak R-F Grid Voltage	30	30	20 V.
D.C. Anode Current	75	75	62.5 mA.
D.C. Screen Current	4	4	3 mA.
D.C. Grid Current (approx.)	0	0	0 mA.
Driving Power (approx.)≋≋	0.25	0.25	0.2 W.
Power Output (approx.)	9	12.5	12.5 W.

R.F.Power Amplifier and Oscillator-Class C Telegraphy.

(Key-down conditions per valve without modulation##).

D.C. Anode Voltage	400	500	600 V.
D.C. Screen Voltage from a fixed supply of	250	250	250 V.
D.C. Screen Voltage from a series resistor of	17,000	28,000	39,000 Ω
D.C. Grid Voltage † from a fixed supply of	-50	-50	-50 V.
D.C. Grid Voltage † from a cathode resistor of	470	470	450 Ω
D.C. Grid Voltage † from a grid resistor of	20,000	25,000	16,700 Ω
Peak R-F Grid Voltage	80	80	80 V.
D.C. Anode Current	95	95	100 mA.
D.C. Screen Current	9	9	9 mA.
D.C. Grid Current (approx.)	2.5	2	3 mA.
Driving Power (approx.)	0.18	0.14	0.22 W.
Power Output (approx.)	25	30	37.5 W.

Anode-Modulated R.F.Power Amplifier-Class C Telephony.

(Carrier conditions per valve for use with a maximum modulation factor of 1.0).

D.C. Anode Voltage	325	400	475 V.
D.C. Screen Voltage	225	225	225 V.
D.C. Screen Voltage from series resistor of°°	10,000	16,000	25,000 Ω
D.C. Grid Voltage † from combination of	-45	-50	-50 V.
grid resistor	5,000	10,000	10,000 Ω
cathode resistor	300	300	300 Ω
Peak R-F Grid Voltage	70	70	70 V.
D.C. Anode Current	80	80	83 mA.
D.C. Screen Current	9	9	9 mA.
D.C. Grid Current (approx.)	3	3	2 mA.
Driving Power (approx.)	0.2	0.2	0.1 W.
Power Output (approx.)	15	19	24 W.

Subscript (2) indicates that grid current flows during part of input cycle.

≋ Averaged of any audio-frequency cycle of sine-wave form.

° Driver stage should be capable of supplying the grids of the class AB2 stage with the specified peak values at low distortion. The effective resistance per grid circuit of the class AB2 stage should be kept below 500 ohms and the effective impedance at the highest desired response frequency should not exceed 700 ohms.

† The total effective grid circuit resistance should not exceed 25,000 ohms.

≋ With zero impedance driver and perfect regulation, plate circuit distortion does not exceed 2%. In practice, anode voltage regulation, screen voltage regulation, and grid bias regulation, should not be greater than 5%, 5% and 3% respectively.

≋≋ At crest of A.F. cycle with modulation factor of 1.0.

°° Connected to modulated plate voltage supply.

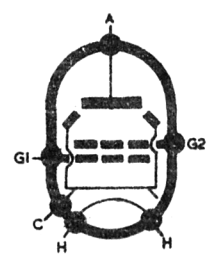
Modulation essentially negative may be used if the positive peak of the audio-frequency envelope does not exceed 115% of the carrier conditions.

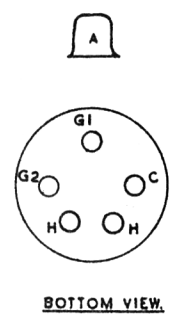
The cathode circuit of the valve should be connected to the electrical mid-point of the heater circuit when the heater is operated from an A.C. supply. When the heater is operated from a D.C.source, the cathode circuit should be connected to the negative heater supply lead. In circuits where the cathode is not directly connected to the heater, the potential difference between them exceed 100 volts. If the use of a large resistance is necessary between heater and cathode in some circuit designs, it should be by-passed by a suitable filter network to avoid the possibility of hum.

Shielding and isolation of the input and output circuits are necessary for stable operation. In some cases where the valve is used as an R-F amplifier, neutralisation may be necessary to prevent feedback. The R-F impedance between the screen and cathode must be kept low, usually by means of a suitable by-pass condenser. The capacitance of this condenser may be in the order of 0.01 to 0.1 μF. In telephone service when the screen is modulated, a smaller capacitance may be required in order to avoid excessive A-F by-passing. However, if the capacitance is too small, R-F feed-back may occur between anode and control grid, depending on the circuit layout, operating frequency and power gain of the stage. A-F by-passing difficulties can usually be eliminated if the screen by-pass condenser is replaced by a series tuned circuit to resonate at the operating frequency. The series-tuned circuit presents a high-impedance to audio-frequencies, but a very low impedance to its resonant frequency.

The valve may be operated at maximum ratings in all classes of service at frequencies up to 60 Mc/s. The tabulation below shows the highest percentage of maximum anode voltage and power input that can be used up to 125 Mc/s. for any class of service.

FREQUENCY		60	80	125	Mc/s
MAX.	Permissible % of max. rated anode voltage and anode input :				
	Class B telephony	100	90	75	%
	Class C { telephony, anode-mod. / telegraphy. }	100	80	55	%





BOTTOM VIEW.