

ADMIRALTY SIGNAL ESTABLISHMENT

Specification AD/CV22/Issue 4. Dated 25.2.46. To be read in conjunction with K1001 ignoring clauses:- 5.2, 5.3, 5.8.	<table border="1"> <tr> <th colspan="2">SECURITY</th></tr> <tr> <th>Specification</th><th>Valve</th></tr> <tr> <td>Restricted Unclassified</td><td>Restricted Unclassified</td></tr> </table>	SECURITY		Specification	Valve	Restricted Unclassified	Restricted Unclassified
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<u>TYPE OF VALVE</u> :- Hot cathode, mercury vapour grid-controlled triode rated for operation only in circuits where it is required to deliver current impulses of short duration.			<u>MARKING</u> See K1001/4 <u>Additional Marking</u> :- Serial No.																																												
<u>CATHODE</u> :- Directly heated. <u>ENVELOPE</u> :- Glass. <u>PROTOTYPE</u> :- BT45.			<u>DIMENSIONS AND CONNECTIONS</u> See Fig. 2.																																												
<table><thead><tr><th colspan="3"><u>RATING</u></th><th rowspan="2">Note</th></tr><tr><th></th><th></th><th></th></tr></thead><tbody><tr><td>Vf</td><td>(V)</td><td>2.5</td><td></td></tr><tr><td>Approx. If</td><td>(A)</td><td>22</td><td></td></tr><tr><td>Max. peak Va</td><td>(kV)</td><td>20</td><td>A</td></tr><tr><td>Max. peak Ia</td><td></td><td>65</td><td>A</td></tr><tr><td>Max. rate Ia rise</td><td>(A/μS)</td><td>500</td><td>A</td></tr><tr><td>Max. neg. standing Vg</td><td>(V)</td><td>-250</td><td></td></tr><tr><td>Condensed mercury temp. in $^{\circ}$C for above ratings:-</td><td></td><td></td><td></td></tr><tr><td>Min:</td><td></td><td>45$^{\circ}$</td><td></td></tr><tr><td>Max:</td><td></td><td>60$^{\circ}$</td><td></td></tr></tbody></table>			<u>RATING</u>			Note				Vf	(V)	2.5		Approx. If	(A)	22		Max. peak Va	(kV)	20	A	Max. peak Ia		65	A	Max. rate Ia rise	(A/ μ S)	500	A	Max. neg. standing Vg	(V)	-250		Condensed mercury temp. in $^{\circ}$ C for above ratings:-				Min:		45 $^{\circ}$		Max:		60 $^{\circ}$		<u>PACKING</u> See K1001/7.3.	
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<u>NOTES</u>																																															
A. These ratings are given for $T_p = 1$ to 3μ S, and PRF = 500 per S.																																															
B. <u>Limiting temperatures.</u>																																															
(i) <u>Mercury condensation temperature.</u> This may be taken as the glass bulb temperature measured by a thermocouple at the coldest spot on the valve, observable as the point at which mercury condensation takes place.																																															
(ii) <u>Ambient temperature.</u> This is defined as the temperature measured at a point 2" from the glass bulb and on a level which is $1\frac{1}{2}$ " above the lower end of the valve.																																															
During the tests, the ambient temperature must be from 25 $^{\circ}$ - 40 $^{\circ}$ C.																																															
C. <u>Mounting.</u> For tests other than the operation test the valve is to be mounted vertically, with anode uppermost, in an enclosure screened from draught and at a distance of not less than 12 ins. from surrounding apparatus, and at least 4 ins. from the base of the enclosure.																																															
D. <u>Pre-heating.</u> Before testing, the valve is to be pre-heated for not less than 10 mins. with Vf = 2.5 V.																																															
E. <u>Mercury distribution.</u> During test 'o' there should be no liquid mercury at the anode end of the valve, and pre-heating should be allowed to ensure this. (Such pre-heating is facilitated by placing a cowl over the anode end of the valve. A suitable cowl can be made from 2-mil asbestos paper, shaped into a cone of height 6" and base diameter 4". The cowl must be removed before test).																																															

To be performed in addition to those applicable in K1001.

See Notes B, C, D and E.

	Test Conditions	Test	Limits		No. Tested
			Min.	Max.	
a	$V_f = 2.5 \text{ V.}$ (AC or DC)	If (A)	20	23.5	100%
b	$V_f = 2.5 \text{ V.}$ (AC or DC), $V_g = 0 \text{ V.}$ Anode Resistance set to give $I_a = 2.5 \text{ A.}$	Voltage drop V_a (V)	-	17	100%
c	$V_f = 2.5 \text{ V.}$ (AC or DC). Grid resistance = 0.01 megohm, $V_a = 20 \text{ kV.}$ (AC peak: 50 c/s) applied through a resistance of 0.2 to 0.4 megohm. $V_g = -250 \text{ V approx.,}$ gradually reduced until an arc strikes between cathode and anode.	Striking voltage $-V_g$ (V)	-	-50	100%
d	Valves to be operated in pairs in equipment substantially similar to the G.L. Mark III modulator as regards circuit (Fig.1) and housing of test valves; peak anode voltage being at least 20 kV and peak anode current at least 55 A. Other details of operation to be agreed between approving authority and manufacturer. Minimum duration of test : 5 minutes.	<u>Operation.</u> Normal and satisfactory working of set must be obtained without deterioration of the valve. In particular simultaneous firing of the two valves under test must be attainable by adjustment of the phasing control potentiometer. A record shall be kept of the proportion and nature of failures under this test.			100%

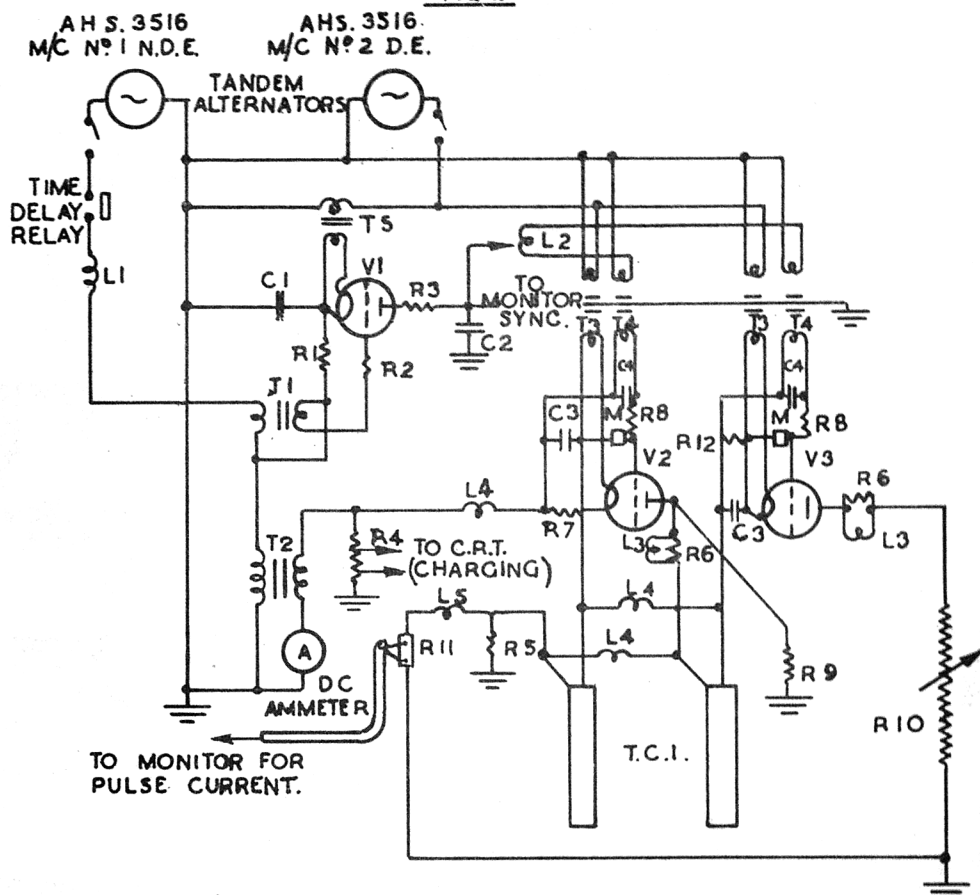
DATA

Given for information of equipment designers, and not subject to acceptance testing.

ADDITIONAL RATINGS.

- (i) Max. negative hold-off grid voltage at $V_a = 10 \text{ kV} = -15 \text{ V.}$
- (ii) Average ditto = -5 V.
- (iii) Minimum grid resistance is determined primarily by the capacity of the grid control circuit. It may be as low as required, but it is recommended that it should not be so low that the grid current flowing exceeds about 0.5 A with the grid positive.

FIG 1.



KEY

L1 8.5 mH 6A
 L2 250 μ H (Pot.).
 L3 12 μ H
 L4 20 mH 80 ohms
 L5 2 μ H
 R1 400 ohms, 5W.
 R2 10,000 ohms, 0.5W.
 R3 10 ohms, 5W.
 R4 Pot. for C.R.T.
 R5 100 ohms, 1W.

R6 330 ohms, 15W.
 R7 2500 ohms, 8W.
 R8 5000 ohms, 2W.
 R9 10,000 ohms, 20W.
 R10 350 ohms approx.
 R11 5 ohms, 8W.
 R12 5000 ohms, 6W.
 C1 0.1 μ F 400V.
 C2 100 μ F, 1KV.
 C3 2 μ F, 400V.
 C4 0.002 μ F, 3KV.
 SURGE.

M METROSIL
 (B.T.H. Ref. 5K.1511374-1)
 T1 PEAKING TRANSFORMER
 T2 MAINS H.T. TRANSFORMER.
 T3 FILT. TRANSFORMER
 T4 GRID TRANSFORMER
 T5 FILT. TRANSFORMER
 V1 THYRATRON BT35 (NGT7)
 V2 CV22 (under test.)
 V3 CV22 " "

T.C.I. TWIN CABLE $Z=175 \text{ ohms}$ PER
 $L=0.5 \mu\text{s}$ CABLE
 CREST WORKING VOLTAGE 20 KV.

NOTE:—TRANSFORMERS T1, T2, T3, T4, T5 ARE AS DESIGNED FOR G.L. MK III
 AND ARE DESCRIBED IN THIS APPROPRIATE SPECIFICATIONS.
 † NON INDUCTIVE RESISTANCE (e.g. CRESSL MAT) ADJUSTABLE
 TO GIVE CORRECT MATCHING.

