10/22/98
R.B. Cramer
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NOV 2 4 1953
Case No. 574.00
Ref. Symbol: 1611
Project No. ET-1487
Completed 7/16/53

MR. G. H. MAULDIN - 1213

Re: Vibration Test of Two Potter & Brumfield Relays (SA-SS), Drawing Nos. DS (1213) 23291 and Sk (1213) 24042

Object of Test

This test was conducted to determine the pickup and drop-out voltages for each relay at room temperature, +165, and -90°F, and to monitor relay contacts for chatter during vibration. These relays are engineering models and results of this test is to be forwarded to the Potter and Brumfield Co to enable them to improve the relay if necessary.

Function of Object Tested

The relays are being considered for use in Fuze "A".

Authorization for Test

This test was requested by Division 1213 in a Work Order Authorization dated May 21, 1953. Mr. H. R. Sandiford was the consultant.

Procedure

Pickup and drop-out voltages were determined at room temperature and at +165°F. These voltages were not determined at -90°F prior to vibration, and failure during vibration precluded the possibility of determining them.

The relays were mounted to the jig by means of their normal mounting studs and vibrated according to Drawing No. Sk (1213) 24042, paragraph 3.4 as follows:

> From 10-30-10 cps in 5-minute cycles for 25 minutes at a constant double amplitude of 0.125 inch

SANDIA SYSTEMATIC DECLASSIFICATION REVIEW
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CLASSIFICATION CHANGED TO: U
AUTHORITY: R.B. Cramer
PERSON CHANGING MARKING & DATE: Carmela Dallego 10/22/98
RECORD ID: 99SN0234
PERSON VERIFYING MARKING & DATE: W Cope 10/30/98
DATED: 10/22/98
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DP 88
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From 30-60-30 cps in 5-minute cycles for 45 minutes at a constant double amplitude of 0.06 inch

From 60-500-60 cps in 15-minute cycles for 45 minutes at a constant acceleration of 10 g

Vibration was in each of three mutually perpendicular planes as shown in Fig. 1, with energized and de-energized time being equal for each plane.

Results

Table I shows pickup and drop-out voltages. No chatter occurred in the two lower frequency ranges, nor in Plane III of the 60-500 cps range (the first plane to be run in this range). In Plane II both relays chattered. At this point the jigs were changed to eliminate suspected amplification. A rerun at 10 g in this plane gave no indication of chatter. In an attempt to determine at what point chatter would occur, the relay was vibrated at 20 g and the internal wiring broke nearly 100 per cent. One relay was repaired by the consultant but failed again in this respect in Plane I after one cycle at 10 g.

W E Boshen
Test Conducted by W. E. BOSHEN - 1611

Original Signed By
R. L. WAGAR

Approved by R. L. WAGAR - 1611

WEB:1611:jf

Encl: Table I, Fig. 1

Copy to:
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J. P. Wanner, 1271
G. M. Byrne, 1925-3
J. M. Ralls, 1521-4 Attn: 1500 Drawing File

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TABLE I

Pickup and Drop-Out Voltages of Two Potter & Brumfield Relays During Vibration Test

Coil A		Coil B	
Pickup (volts)	Drop-Out (volts)	Pickup (volts)	Drop-Out (volts)
	Relay No. 1 (Room Temperature)		
11.4	1.6	11.8	1.8
11.4	1.6	11.8	1.8
11.3	1.6	11.8	1.8
11.3	1.6	11.8	1.8
11.4	1.6	11.9	1.8
	Relay No. 1 (+165°F)		
13.8	2.0	14.1	2.3
13.8	2.0	14.0	2.3
13.7	2.0	14.1	2.3
13.8	2.0	14.1	2.3
13.8	2.0	14.1	2.3
	Relay No. 2 (Room Temperature)		
12.4	2.4	12.0	1.9
12.6	2.2	12.0	1.9
12.5	2.3	12.1	1.9
12.4	2.2	11.9	1.9
12.5	2.2	12.0	1.9
	Relay No. 2 (+165°F)		
14.7	2.3	14.3	2.0
14.8	2.3	14.6	2.1
14.8	2.3	14.7	2.2
14.9	2.3	14.6	2.2
14.9	2.3	14.5	2.2

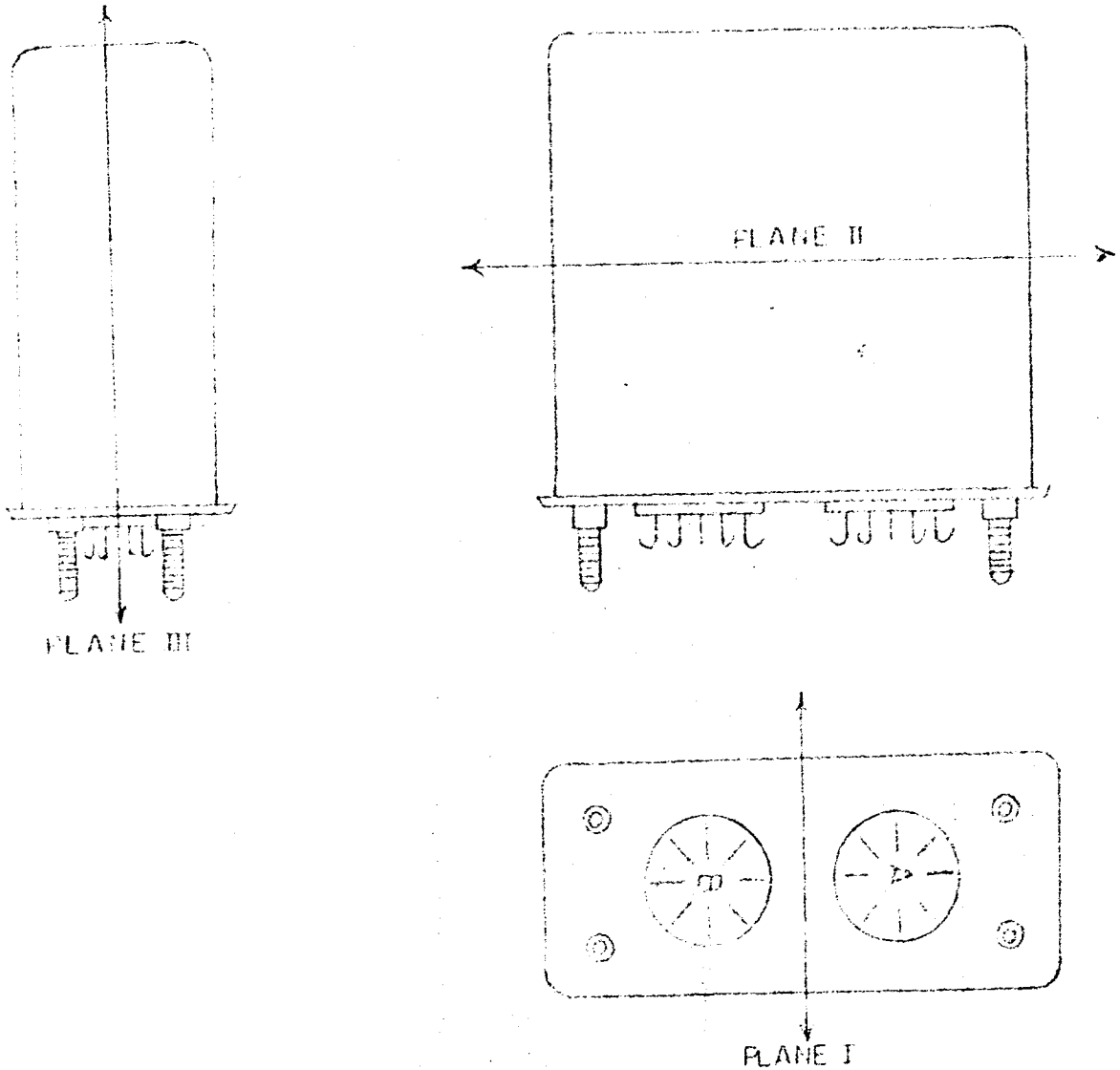

FIG. 1 PLANES OF VIBRATION OF THE POTTER & BRUMFIELD RELAYS