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TECHNICAL DATA RECORD

NAA-SR-8145

TDR NO.

APPROVALS

PAGE 1 OF 30

DATE 1-23-63

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DEPT. & GROUP NO.

J. S. Holtwick, III

722-252

TITLE

Report of the Qualification Testing of SNAP 10A
Fixed Resistors

PROGRAM

SNAP 10A

SUBACCOUNT TITLE

Component Development & Test

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STATEMENT OF PROBLEM

The qualification testing of Ohmite 12K Ω , 2K Ω , 1K Ω 3 watt
and 500 Ω 1 watt fixed wirewound resistors for use in SNAP 10A.

ABSTRACT:

The qualification testing of the fixed resistors was done in
accordance with specification NE10FSM1-24-003, up to and includ-
ing the vibration and shock tests of that specification.Upon completion of the initial visual examination and dimensional
check, the resistors were weighed and the weights were recorded.The measurement of insulation resistance, performed with a mego-
hmmeter, indicated infinity for each resistor.The dielectric strength test was performed with a high potential
AC dielectric strength tester. The test voltage was applied with
no evidence of leakage or breakdown in any case.A wheatstone bridge was used to measure the DC resistance of each
resistor. All the resistors were well within their specified
tolerance.The resistance-temperature characteristic test was performed in
a temperature chamber at temperatures ranging from -67°F to
302°F. The resistors were placed in the chamber and the resis-
tance of each was measured with a wheatstone bridge at 9 tempera-
tures within the range mentioned. The resistors exhibited a
negative temperature coefficient, but remained within allowable
tolerances.The vibration and shock tests were performed on eight resistors.
During these tests, the resistors were monitored for electrical
discontinuity. Upon completion of vibration and shock, the DC
resistance, dielectric strength and insulation resistance of
each resistor was measured. There was no evidence of damage in
any case.

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Conclusion

The resistors remained well within specifications up to the point that the qualification tests were carried.

The tests on these resistors, as components, were discontinued due to a change in concept of how they were to be installed in the SNAP 10A system.

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SNAP-10A FIXED RESISTOR VISUAL EXAMINATION

WRITTEN BY:
Jack S. Holtwick

DATE PERFORMED:
5/1/62

TEST PERFORMED:

The 18 test resistors were visually inspected for any evidence of cracks, chips, burrs and any other visible damage.

The physical dimensions of each resistor were measured with vernier calipers to determine whether they were within manufacturers specifications as shown below:

OHMITE STYLE	RATED WATTAGE	LENGTH $\pm .020$	DIAMETER $\pm .020$
884-1A	1	0.417	0.106
884-3	3	0.542	0.230

Each resistor was weighed with a balance and the weights were recorded on the following sheet.

TEST RESULTS:

There was no visual evidence of damaged resistors.
All the physical measurements were within the manufacturers specifications.

TEST EQUIPMENT USED:

VERNIER CALIPERS NAA NO. 127

METTLER INST. CORP. BALANCE, AEC #159762

PROJECT NO:

7580

SNAP-10A FIXED RESISTOR WEIGHTS

CONTRACT NO:

3621-2147

DATE 5/1/62

RESISTOR VALUE	ID LETTER	WEIGHT IN GRAMS
12K-3W $\pm 1\%$	A	1.2460
12K-3W $\pm 1\%$	B	1.2492
12K-3W $\pm 1\%$	C	1.2591
12K-3W $\pm 1\%$	D	1.2592
12K-3W $\pm 1\%$	E	1.2519
12K-3W $\pm 1\%$	F	1.2512
2K-3W $\pm 5\%$	G	1.2697
2K-3W $\pm 5\%$	H	1.2605
2K-3W $\pm 5\%$	I	1.2545
2K-3W $\pm 5\%$	J	1.2725
1K-3W $\pm 5\%$	K	1.2591
1K-3W $\pm 5\%$	L	1.2573
1K-3W $\pm 5\%$	M	1.2677
1K-3W $\pm 5\%$	N	1.2645
500 Ω -1W $\pm 1\%$	O	.3251
500 Ω -1W $\pm 1\%$	P	.3223
500 Ω -1W $\pm 1\%$	Q	.3219
500 Ω -1W $\pm 1\%$	R	.3249

TEST EQUIPMENT USED:

METTLER INST. CORP. BALANCE

AEC*159762

CALIBRATION DUE: JUNE 1962

ATMOSPHERIC CONDITIONS

TEMP. 80°F

REL. HUMIDITY 27%

BAR. PRESSURE 29.16 in/Hg

TEST OPERATOR:

Jack Holtwick

SNAP-10A FIXED RESISTOR INSULATION RESISTANCE TEST

WRITTEN BY:

Jack S. Holtwick

DATE PERFORMED:

9 MAY 1962

TEST PERFORMED:

The insulation resistance test was performed on the 18 test resistors. The resistors were mounted on one inch Stanoff Insulators and a Contour body Clamp was fitted to each one. (Fig. 1)

A DC. potential of 500 volts was applied between one leadwire and the Contour body Clamp of each resistor with an Associated Research Vibrotest model 201 serial # 5160 Inspected 28 Oct. 1961.

TEST RESULTS:

The Insulation resistance of each resistor tested measured infinity.

SNAP-10A FIXED RESISTOR INSULATION RESISTANCE TEST

PROJECT NO:
7580
CONTRACT NO:
3621-2147

DATE: 9 MAY 1962
MANUFACTURER:
OHMITE

TYPE	RES. IN OHMS	WATT. RATING	PERCENT TOLERANCE	LETTER DESIG.	INSULATION RES. IN MEGOHMS
884-3 ↑	12K	3	1	A	∞
	12K	3	1	B	∞
	12K	3	1	C	∞
	12K	3	1	D	∞
	12K	3	1	E	∞
	12K	3	1	F	∞
	2K	3	.5	G	∞
	2K	3	.5	H	∞
	2K	3	.5	I	∞
	2K	3	.5	J	∞
	1K	3	.5	K	∞
	1K	3	.5	L	∞
	1K	3	.5	M	∞
884-3 ↓	1K	3	.5	N	∞
884-1A ↑	500	1	.1	O	∞
	500	1	.1	P	∞
	500	1	.1	Q	∞
884-1A ↓	500	1	.1	R	∞

TEST EQUIPMENT USED:

ASSOC. RESEARCH VIBROTEST
MODEL: 201

SERIAL NO: 5160, AEC #164874

INSPECTED: 28 OCT. 1961

TEST CONDITIONS:

TEMPERATURE: 74°F

TEST OPERATOR:

Jack S. Holterich

SNAP-10A FIXED RESISTOR DIELECTRIC STRENGTH TEST

WRITTEN BY:

Jack S. Holtwick

DATE PERFORMED:

9 JUNE 1962

TEST PERFORMED:

The dielectric strength Test was Performed on 18 test resistors. The resistors were mounted on one inch standoff insulators and a Contour body Clamp was fitted to each one.

An AC. potential of 700volts was applied to the one watt size and 900volts to the three watt size, between the Contour body Clamp and the two resistor lead wires connected together. The test voltages were applied at the rate of 100volts per second and held for 5 seconds.

The equipment used to perform the test on each resistor was an Associated Research Hypot model 404, Serial No. 1282, calibrated June 6, 1962

TEST RESULTS:

None of the resistors tested exhibited any signs of Leakage or breakdown.

SNAP-10A FIXED RESISTOR DIELECTRIC STRENGTH TEST

PROJECT NO:

7580

CONTRACT NO:

3621-2147

DATE: 9 JUNE 1962

MANUFACTURER:

OHMITE

TYPE	RES. IN OHMS	WATT. RATING	PERCENT TOLERANCE	LETTER DESIG.	DIELECTRIC STRENGTH
884-3 ↑	12K	3	1	A	OK. TO 900VAC
	12K	3	1	B	O.K. "
	12K	3	1	C	O.K. "
	12K	3	1	D	O.K. "
	12K	3	1	E	O.K. "
	12K	3	1	F	O.K. "
	2K	3	.5	G	O.K. "
	2K	3	.5	H	O.K. "
	2K	3	.5	I	O.K. "
	2K	3	.5	J	O.K. "
	1K	3	.5	K	O.K. "
	1K	3	.5	L	O.K. "
	1K	3	.5	M	O.K. "
884-3 ↓	1K	3	.5	N	O.K. "
884-1A ↑	500	1	.1	O	O.K. TO 700VAC
	500	1	.1	P	O.K. "
	500	1	.1	Q	O.K. "
884-1A ↓	500	1	.1	R	O.K. "

TEST EQUIPMENT USED:

ASSOC. RESEARCH HYPOT
MODEL: 404

SERIAL NO: 1282

LAST CALIBRATED: 6 JUNE 1962

TEST CONDITIONS:

TEMPERATURE 73°F

RELATIVE HUMIDITY 63%

TEST OPERATOR:

Jack S. Holterick

SNAP-10A FIXED RESISTOR DESIGN DC RESISTANCE MEASUREMENT

WRITTEN BY:

Jack S. Holterick

DATE PERFORMED:

11 JUNE 1962

TEST PERFORMED:

The 18 test resistors were mounted, Suspended by their leads, on one inch insulated standoffs.

The ESI impedance bridge, model 250DA Serial #12708 Calibrated 4/12/62, was used, as per equipment instructions, to measure the DC resistance of each resistor to see if their measured resistances would fall within the resistance values and tolerances shown below:

DESIGN
RESISTANCE
(IN OHMS)

500
1000
2000
12000

ACCEPTABLE
DEVIATION
(IN OHMS)

499.5 - 500.5
995 - 1005
1990 - 2010
11880 - 12120

TEST RESULTS:

All the resistors were found to fall within the acceptable deviation shown above. The measurements are recorded on the attached sheet.

SNAP-10A FIXED RESISTOR INITIAL DC. RESISTANCE MEASUREMENTS

PROJECT NO:
7580
CONTRACT NO:
3621-2147

DATE: 11 JUNE 1962
MANUFACTURER:
OHMITE

TYPE	RES. IN OHMS	WATT. RATING	PERCENT TOLERANCE	LETTER DESIG.	MEASURED D.C. RES. IN OHMS
884-3 ↑	12K	3	1	A	12030
	12K	3	1	B	12015
	12K	3	1	C	12025
	12K	3	1	D	12011
	12K	3	1	E	12010
	12K	3	1	F	11988
	2K	3	.5	G	1996.9
	2K	3	.5	H	1997.6
	2K	3	.5	I	1997.9
	2K	3	.5	J	1997.3
	1K	3	.5	K	999.2
	1K	3	.5	L	999.1
884-3 ↓	1K	3	.5	M	999.6
	1K	3	.5	N	999.5
884-1A ↑	500	1	.1	O	499.70
	500	1	.1	P	500.00
	500	1	.1	Q	499.84
884-1A ↓	500	1	.1	R	499.68

EQUIPMENT USED:

ESI IMPEDANCE BRIDGE
MODEL: 250 DA

SERIAL NO: 12708, A.E.C # 164869

LAST CALIBRATED: APRIL 12 1962

TEST CONDITIONS:

TEMPERATURE: 72°F

RELATIVE HUMIDITY 62%

TEST OPERATOR:

Jade S. Holtz

SNAP-IOA FIXED RESISTOR RESISTANCE-TEMPERATURE
CHARACTERISTIC TEST

WRITTEN BY:

Jack S. Holtwick

DATE STARTED: 6/22/62

DATE COMPLETED: 6/24/62

TEST PERFORMED:

The 18 test resistors were mounted on an aluminum Chassis suspended by their leadwires from one inch insulated standoffs. The resistor leadwires were wired to terminals and extension leads (5ft) were connected across these same terminals. The Chassis containing the resistors was then placed inside the Bemco 250/300 4.5 Temperature Chamber and extension leads brought to the outside of the Chamber, through the hole in Chamber, and connected to a terminal board. A Calibrated Iron-Constantan thermocouple was welded to a small strip of Stainless Steel which was wrapped around a resistor mounted near the center of the Chassis. The thermocouple lead was brought out and connected to a Leeds-Northrup Potentiometer. A thermometer was placed near the input terminals of the Land N Pot. and the instrument was adjusted to compensate for the temperature at the terminals.

The first test temperature was 302°F which was achieved at a temperature change rate of 5°F per minute, as were all the temperatures herein, by a cam fashioned, in the Qualification Lab, for the Wheelcc Controller. LN₂ was used as a coolant and to help stabilize the temperature of the Chamber.

Once the resistor on which the thermocouple was mounted reached 302°F , all the resistors were allowed to "soak" in this temperature for one hour and at the end of this period all the resistors were measured with the ESI bridge.

A five foot, two lead, cable with one end shorted together was placed in the chamber so that the shorted end was inside and the other end outside. The resistance of this cable was measured with the ESI bridge at each test temperature. The measured resistance of the cable was subtracted from the resistance reading of each resistor at each test temperature to compensate for extension lead lengths.

RES. TEMP.
CARAC. TEST
CONTINUED

The same procedure was repeated at 266°F, 230°F, 185°F, and 131°F.

The Chamber was returned to room ambient (77°F) and allowed to remain at room ambient over night. The next morning measurements were taken at 77°F, 32°F, -13°F, and -67°F. The same procedure stated previously was used to arrive at temperatures and make measurements.

The Chamber was once again returned to room ambient (77°F) and allowed to remain overnight. The next morning the repeatability of readings was checked at -13°F and -67°F. The Chamber was once again returned to room ambient.

NOTE:

The following are acceptable deviations in Ohms from the design resistance during the test:

DESIGN RESISTANCE IN OHMS	ACCEPTABLE DEVIATION IN OHMS DURING TEST
500	497.5 - 502.5
1000	992 - 1008
2000	1984 - 2016
12000	11808 - 12192

TEST RESULTS:

All the 18 test resistor values fell well within the allowable tolerances. The tabulated, Corrected and Graphic data is contained on the attached Sheets. The repeatability of the readings mentioned above was very good.

TEST EQUIPMENT USED:

Bemco Model 250/300 4.5 Temperature Chamber
Calibrated Iron-Constantan thermocouple

ESI Impedance Bridge, Model 250DA Serial #12708, Cal. 12 April 62
Leeds-Northrup Potentiometer, Model 8690 Serial 1576334 Cal. 3/62

PREPARED BY Jack S. Holtwick	ATOMICS INTERNATIONAL A Division of North American Aviation, Inc.	PAGE 11 OF 30
CHECKED BY		REPORT NO.
DATE		MODEL NO.

SNAP-10A FIXED RESISTOR TEST
 RESISTANCE TEMPERATURE CHARACTERISTIC
 MANUFACTURER: OHMITE
 SPECIFICATION NO. NEIOFSI-24-003 (PARA. 4.1.2.4.)
 DATE STARTED: 6/22/62 DATE COMPLETED: 6/23/62

RESISTOR IDENTITY LETTER	RESISTANCE MEASURED AT TEST TEMP. SEQUENCE								
	A	B	C	D	E	F	G	H	I
A	11996	12000	12009	12016	12022	12030	12032	12308	12041
B	11971	11987	11990	11999	12008	12012	12020	12021	12027
C	11980	11995	12000	12010	12016	12025	12029	12031	12038
D	11972	11979	11988	11991	12000	12011	12013	12018	12020
E	11970	11979	11988	11991	12000	12011	12013	12018	12021
F	11952	11956	11961	11970	11976	11988	11990	11990	11996
G	1993.1	1993.6	1994.4	1995.1	1995.7	1996.8	1997.5	1997.5	1998.1
H	1993.4	1994.6	1995.5	1996.1	1996.6	1997.6	1998.1	1998.4	1999.1
I	1994.0	1995.0	1995.0	1996.1	1996.6	1998.1	1998.3	1999.1	1999.1
J	1993.2	1994.3	1995.0	1995.9	1996.1	1997.2	1998.0	1998.1	1998.8
K	996.80	997.19	997.49	998.21	998.71	999.23	999.78	999.94	1000.52
L	996.63	996.88	997.31	997.98	998.66	999.09	999.51	999.86	1000.39
M	996.76	997.09	997.53	998.01	998.70	999.33	999.65	1000.03	1000.59
N	997.00	997.11	997.69	998.19	998.71	999.42	999.89	1000.35	1000.69
O	499.19	499.23	499.38	499.59	499.76	499.79	499.89	499.96	499.89
P	499.42	499.55	499.64	499.74	499.91	500.05	500.19	500.25	500.24
Q	499.35	499.44	499.59	499.63	499.79	499.95	500.03	500.16	500.20
R	499.20	499.31	499.44	499.51	499.80	499.81	499.88	499.99	500.01
LEAD R	0.4779	0.14541	0.14218	0.13629	0.13041	0.12332	0.12000	0.11850	0.11500

LEAD R = RESISTANCE MEASURED IN
 REFERENCE LEAD USED TO
 COMPENSATE FOR EXTENSION
 LEAD LENGTHS AT TEST
 SEQUENCE TEMP.

EQUIPMENT USED: (1) ESI IMPEDENCE BRIDGE. (2) L&N POTENTIOMETER
 EQUIPMENT CALIBRATED: (1) SN 12708, 4/12/62. (2) SN 1576334, 3/62
 ENVIRONMENTAL EQUIPMENT: BEMCO -250/300 -4.5

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
			SEQUENCE A		SEQUENCE B		SEQUENCE C		SEQUENCE D		SEQUENCE E		SEQUENCE F		SEQUENCE G		SEQUENCE H		SEQUENCE I		
	I.D.	R _{in OHMS}	Y	%Δ	Y	%Δ	Y	%Δ	Y	%Δ	Y	%Δ	Y	%Δ	Y	%Δ	Y	%Δ	Y	%Δ	
1	A	12030	11996	0.283	12000	0.251	12009	0.175	12016	0.118	12022	0.068	12030	0.001	12032	0.016	12038	0.065	12041	0.090	
2	B	12015	11971	0.284	11987	0.234	11990	0.209	11999	0.134	12008	0.059	12012	0.025	12020	0.041	12021	0.049	12027	0.099	
3	C	12025	11980	0.375	11995	0.250	12000	0.209	12010	0.126	12016	0.076	12025	0.001	12029	0.032	12031	0.049	12038	0.107	
4	D	12011	11972	0.326	11979	0.268	11988	0.193	11991	0.168	12000	0.093	12011	0.001	12013	0.016	12018	0.057	12020	0.074	
5	E	12010	11970	0.334	11979	0.259	11988	0.184	11991	0.160	12000	0.084	12011	0.007	12013	0.024	12018	0.066	12021	0.090	
6	F	11988	11952	0.302	11956	0.268	11961	0.226	11970	0.151	11976	0.101	11988	0.001	11990	0.157	11990	0.016	11996	0.066	
7	G	1996.9	1993.0	0.198	1993.5	0.173	1994.3	0.132	1995.0	0.097	1995.6	0.067	1996.7	0.011	1997.4	0.024	1997.4	0.025	1998.0	0.054	
8	H	1997.6	1993.3	0.218	1994.5	0.158	1995.4	0.112	1996.0	0.082	1996.5	0.057	1997.5	0.006	1998.0	0.019	1998.3	0.034	1999.0	0.069	
9	I	1997.9	1993.9	0.202	1994.9	0.153	1994.9	0.152	1996.0	0.097	1996.5	0.072	1997.8	0.004	1998.2	0.014	1999.0	0.054	1999.0	0.054	
10	J	1997.3	1993.1	0.212	1994.2	0.158	1994.9	0.122	1995.8	0.077	1996.0	0.067	1997.1	0.011	1997.9	0.029	1998.0	0.034	1998.7	0.069	
11	K	999.2	996.70	0.255	997.05	0.216	997.35	0.186	998.10	0.113	998.58	0.063	999.11	0.009	999.66	0.046	999.82	0.062	1000.41	0.012	
12	L	999.1	996.50	0.262	996.74	0.237	997.17	0.193	997.84	0.126	998.53	0.057	998.97	0.013	999.39	0.029	999.74	0.064	1000.28	0.012	
13	M	999.6	996.61	0.300	996.95	0.266	997.39	0.221	997.87	0.173	998.57	0.103	999.21	0.040	999.60	0.007	999.91	0.031	1000.48	0.088	
14	N	999.5	996.85	0.266	996.97	0.254	997.55	0.195	998.05	0.145	998.58	0.092	999.30	0.021	999.77	0.027	1000.23	0.072	1000.58	0.108	
15	O	499.70	499.04	0.132	499.09	0.123	499.24	0.093	499.45	0.049	499.63	0.001	499.67	0.007	499.77	0.014	499.84	0.028	499.78	0.015	
16	P	500.00	499.27	0.146	499.41	0.119	499.50	0.101	499.60	0.079	499.78	0.044	499.93	0.015	500.07	0.014	500.13	0.026	500.13	0.025	
17	Q	499.84	499.20	0.128	499.30	0.109	499.45	0.079	499.49	0.070	499.66	0.036	499.83	0.003	499.91	0.014	500.04	0.040	500.09	0.049	
18	R	499.68	499.05	0.106	499.17	0.103	499.30	0.077	499.37	0.062	499.67	0.002	499.69	0.001	499.76	0.016	499.87	0.038	499.90	0.043	
19	CORRECTION																				
20	IN OHMS		0.14779		0.14541		0.14218		0.13629		0.13041		0.12332		0.12000		0.11850		0.11500		
21																					
22																					
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I.D. = IDENTIFICATION LETTER ASSIGNED

R = RESISTANCE AT REFERENCE TEMP. 77°F

Y = RESISTANCE AT TEST TEMP. (SPEC. 4.1.2.4) (CORRECTED)

%Δ = PERCENT RESISTANCE CHANGE = $\frac{(Y-R)}{R} \times 100$

CORRECTION IN OHMS = THE RESISTANCE OF A FIVE FOOT LEAD PLACED IN THE CHAMBER AND MEASURED AT EACH TEST TEMPERATURE. THIS RESISTANCE SHALL BE SUBTRACTED FROM EACH MEASURED RESISTANCE OF EACH RESISTOR AT EACH TEST TEMP. THIS APPROXIMATELY COMPENSATES FOR THE RESISTANCE OF THE EXTENSION LEADS.

TEST OPERATOR:

Jack S. Holtwick

SNAP-10A FIXED RESISTOR TEST

RESISTANCE TEMPERATURE CHARACTERISTIC

MANUFACTURER: OHMITE

DATE STARTED: 6/22/62

DATE COMPLETED: 6/23/62

SPECIFICATION NO. NE10F91-24-003

ORIGINATED BY

CALCULATED BY

CHECKED BY

DATE

PROJECT

ATOMICS INTERNATIONAL

A Division of North American Aviation, Inc.

SHEET 12 OF 30

MOUNTING OF FIXED RESISTORS

(FIGURE 1)

SNAP-IOA FIXED RESISTOR VIBRATION AND SHOCK TESTS

WRITTEN BY:

Jack S. Holtzwick

DATE PERFORMED:

2 NOVEMBER 1962

TEST PERFORMED:

8 resistors from the group of 18 were selected for vibration and shock tests. The 8 included (2) $12K \pm 1\%$ 3watt, (2) $2K \pm .5\%$ 3watt, (2) $1K \pm .5\%$ 3watt, and (2) $500\Omega \pm .1\%$ 1watt resistors which were mounted on two terminal boards and wired to the terminals, with the bodies of the resistors held down with clamps. (Fig. 2) The 4 resistors on each board were electrically wired in series and were connected to a test fixture which applied 6 volts d.c., from a power supply, across the series strings. Two totalizing counters model 302A, one for each board, were used to count possible electrical discontinuities. (Fig. 3)

The terminal boards were bolted firmly to the vibration and shock fixtures for the tests.

The vibration test consisted of a sinusoidal sweep going from low to high to low frequencies in 50 minutes at a constant octave sweep rate in each of three mutually perpendicular axes. The order in which the axes were vibrated was lateral, longitudinal, and normal as defined by figure 2. The vibration levels used were as follows:

5-25 CPS $\frac{1}{4}$ inch Double-Amplitude
25-400 CPS 8g
400-3000 CPS 10g

The shock test consisted of 2 shocks in each direction along each of three mutually perpendicular axes in the following order: lateral, longitudinal, and normal, as defined by figure 2. The shocks were 20g magnitude and 6 milliseconds in duration.

TEST RESULTS:

The resistors showed no evidence of damage or electrical discontinuity during either vibration or shock tests.

VIBRATION AND SHOCK
TEST CONTINUED

TEST EQUIPMENT USED:

HEWLETT PACKARD MODEL 721 POWER SUPPLY
SERIAL: AEC*163541 CAL. DATE: APRIL 1962

CMC MODEL 302A TOTALIZING COUNTER
SERIAL: AEC*164898 CAL. DATE: JUNE 1962
SERIAL: AEC*164899 CAL. DATE: JUNE 1962

LING MODEL 246 VIBRATION EQUIPMENT
SERIAL: 35 CAL. DATE 2 NOVEMBER 1962

BARRY VARI PULSE MODEL 15575 SHOCK EQUIPMENT
SERIAL: 63

VIBRATION AND SHOCK AXES

(FIGURE 2)

DISCONTINUITY CHECK HOOKUP

(FIGURE 3)

POST ENVIRONMENTAL TESTS ON SNAP-10A FIXED RESISTORS

WRITTEN BY:

Jack S. Holtwick

DATE PERFORMED:

9 NOVEMBER 1962

TEST PERFORMED:

UPON Completion of the Vibration and Shock Tests the 8 fixed resistors were removed from their terminal boards and were measured as to DC resistance, insulation resistance, and dielectric strength. The same methods were used to perform these measurements as previously stated in this report. The data for these measurements is on the following Sheet.

TEST RESULTS:

All measurements showed that the 8 Test resistors were well within tolerance and indicated no evidence of damage from the Vibration and Shock tests.

POST ENVIRONMENTAL TEST MEASUREMENTS

PROJECT NO:
7561

DATE: 9 NOVEMBER 1962

CONTRACT NO:
3621-2223MANUFACTURER:
OHMITE

	TYPE	RES. IN OHMS	WATT. RATING	PERCENT TOLERANCE	LETTER DESIG.	MEASURED RES. IN OHMS	DIELECTRIC STRENGTH
	884-3	12K	3	1	A	12029	OK. TO 900V
		12K	3	1	B	12011	
		2K	3	.5	G	1996.4	
		2K	3	.5	H	1997.1	
		1K	3	.5	K	998.91	
	884-3	1K	3	.5	L	998.79	OK. TO 900V
	884-1A	500	1	.1	O	499.55	OK. TO 700V
	884-1A	500	1	.1	P	499.82	OK. TO 700V

The insulation resistance of each resistor was measured and was found to be infinity.

TEST EQUIPMENT USED:

ESI IMPEDANCE BRIDGE MODEL 250 DA
SERIAL: AEC*164869 CAL: APRIL 12 1962

ASSOCIATED RESEARCH HYPOT MODEL 404
SERIAL: AEC*167950 CAL: NOV. 9 1962

INDUSTRIAL INSTRUMENTS MEGOHMMETER MODEL L-7
SERIAL: AEC*168357 CAL: NOV. 7 1962

TEST CONDITIONS:

TEMPERATURE: 80°F
RELATIVE HUMIDITY: 40%

TEST OPERATOR:
Jack S. Holtwick

SNAP 10A FIXED RESISTOR

RESISTANCE-TEMPERATURE CHARACTERISTIC

EQUIPMENT USED: (1) ESI IMPEDANCE BRIDGE (2) L & N POTENTIOMETER
EQUIPMENT CALIBRATED: (1) SN 12708 4/12/62 (2) SN 1576334 3/62
ENVIRONMENTAL EQUIPMENT: BEMCO -250/300 -4.5

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DATE 6/29/62

PROJECT NO. 7580

TEST OPERATOR

Jack S. Holtz

SPECIFICATION NO.

NE 10 FSI-24-003

SNAP 10A FIXED RESISTOR RESISTANCE-TEMPERATURE CHARACTERISTIC

EQUIPMENT USED: (1) ESI IMPEDANCE BRIDGE (2) L+N POTENTIOMETER
EQUIPMENT CALIBRATED: (1) SN 12708, 4/2/62. (2) SN 1576334, 3/62
ENVIRONMENTAL EQUIPMENT: BEMCO -250/300-4.5

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DATE 6/29/62
PROJECT NO. 7580
TEST OPERATOR
Jack S. Holtzsch
SPECIFICATION NO
NE10FS1-24-003

SNAP-10A FIXED RESISTOR

RESISTANCE-TEMPERATURE CHARACTERISTIC

EQUIPMENT USED: (1) TEST IMPEDANCE BRIDGE (2) L+N POTENTIOMETER
EQUIPMENT CALIBRATED: (1) SN 12708, 4/12/62. (2) SN 1576334, 3/62
ENVIRONMENTAL EQUIPMENT: BEMCO *250/300-4.5

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PROJECT NO. 7580
TEST OPERATOR
Jack S. Holtzsch
SPECIFICATION NO.
NEIOFSI-24-0013

SNAP-10A FIXED RESISTOR

RESISTANCE - TEMPERATURE CHARACTERISTIC

EQUIPMENT USED: (1) EST IMPEDANCE BRIDGE, (2) L+N POTENTIOMETER

EQUIPMENT CALIBRATED: (1) SN 12708, 4/12/62, (2) SN 157633A, 3/62

ENVIRONMENTAL EQUIPMENT: BEMCO -250/300 -A.5

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DATE 6/29/62

PROJECT NO. 7580

TEST OPERATOR

Jack S. Hultsch

SPECIFICATION NO.

SNAP 10A FIXED RESISTOR

RESISTANCE-TEMPERATURE CHARACTERISTIC

EQUIPMENT USED: (1) ESI IMPEDANCE BRIDGE (2) L+N POTENTIOMETER
EQUIPMENT CALIBRATED: (1) SN 12708, 4/12/62. (2) SN 1576334, 3/62
ENVIRONMENTAL EQUIPMENT: GEMCO -250/300-4.5

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TEST OPERATOR
Jack S. Holtz
SPECIFICATION NO.
NEIOSI-2A-003

SNAP 10A FIXED RESISTOR RESISTANCE - TEMPERATURE CHARACTERISTIC

EQUIPMENT USED: (1) EST IMPEDANCE BRIDGE, (2) L+N POTENTIOMETER
EQUIPMENT CALIBRATED: (1) SN 12708, 4/12/62, (2) SN 1676334, 3/62
ENVIRONMENTAL EQUIPMENT: BSM CO - 250/300-4.5

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PROJECT NO. 1580
TEST OPERATOR
Jack S. Holtz
SPECIFICATION NO.
NE OF SI-24-003

SNAP 10A FIXED RESISTOR

RESISTANCE-TEMPERATURE CHARACTERISTIC

EQUIPMENT USED: (1) EST IMPEDANCE BRIDGE. (2) L+N POTENTIOMETER

EQUIPMENT CALIBRATED: (1) SN 12708, 4/12/62. (2) SN 1576334, 3/62

ENVIRONMENTAL EQUIPMENT: REMCO-250/300-A.5

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TEST OPERATOR
Jack S. Holtz
SPECIFICATION NO.
NE.OFSI-24-003

SNAP 10A FIXED RESISTOR

RESISTANCE - TEMPERATURE CHARACTERISTIC

EQUIPMENT USED: (1) ESI IMPEDANCE BRIDGE, (2) LYN POTENTIOMETER

EQUIPMENT CALIBRATED: (1) SN 12708, 4/12/62, (2) SN 1576334, 3/62

ENVIRONMENTAL EQUIPMENT: BEMCO-256/300-A.5

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DATE 6/29/62

PROJECT NO. 7580

TEST OPERATOR

Jack S. Holtz

SPECIFICATION NO.

NEIOFSI-24-003

SNAP-10A FIXED RESISTOR RESISTANCE-TEMPERATURE CHARACTERISTIC

EQUIPMENT USED: (1) TEST IMPEDANCE BRIDGE, (2) L&N POTENTIOMETER
EQUIPMENT CALIBRATED: (1) SN 12708, 4/12/62, (2) SN 1576334, 3/62
ENVIRONMENTAL EQUIPMENT: BEMCO -250/300-4.5

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PROJECT NO. 7580
TEST OPERATOR
Jack S. Hallmark
SPECIFICATION NO.
NEIOFSI-24-003