

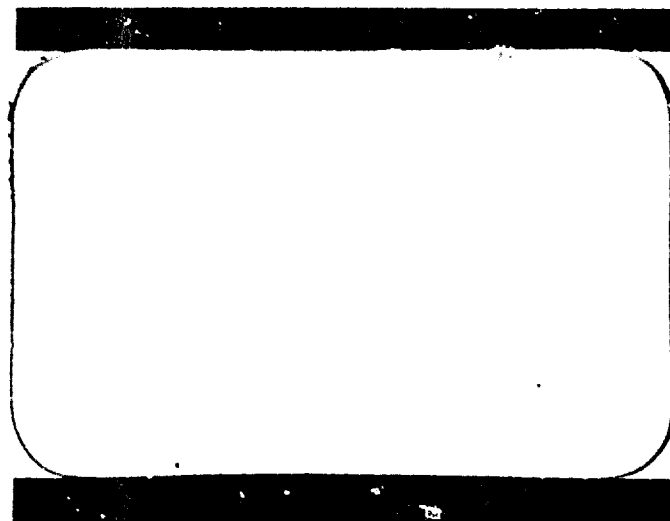
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CONVAIR (ASTRONAUTICS) DIVISION
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REPORT NO. 7A2236

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NO. OF PAGES 132

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CONVAIR DIVISION OF GENERAL DYNAMICS CORPORATION

REPORT NO. 7A2236

EVALUATION TEST REPORT

FOR

SWITCH ASSEMBLY AC-DC, MAIN POWER

CHANGEOVER, MISSILEBORNE

DWG. NO. 27A-06166
27A-06177

PREPARED BY

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CHECKED BY

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For Test Lab Group Engr.

APPROVED BY

H. S. Campbell
Chief of Test Labs

NOV 20 1961

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S U M M A R Y

The data presented in this report represents the results of Engineering Evaluation Tests performed on the Main Missile Power Changeover Switch, Part Number 27-00100, according to CVA test procedure 7-A-2236, and Test Laboratory Test Request, 7-A-2236.

Two specimens, serial numbers 001 and 002, manufactured by the Kinetics Corporation, Solana Beach, California; and two specimens, serial numbers 121 and 124 manufactured by United Control Corporation, Seattle, Washington, were tested concurrently. The individual tests performed on each specimen are listed on Figure 3 with asterisks indicating failures.

Figures 5 and 6 are schematic diagrams of the test setup.

This test was performed on a semi-formal basis, in that an approved procedure, and standard data sheets were used; however, the tests were not witnessed by inspection.

While this evaluation test was being conducted a noise problem developed in CV-A Receiving Inspection involving the production units being manufactured by United Control Corporation. CVA Components Test Laboratory was assigned the job of resolving the problems as an additional task to this test. The detailed testing data and results of the noise survey are included in this report as Addendum I.

Not including the noise problem, 18 failures and/or out-of-tolerance readings occurred during the test. Five of these failures and/or out-of-tolerance conditions occurred on the Kinetics Corporations specimens, and 13 failures and/or out-of-tolerance conditions occurred on the United Control Corporation specimens. A comprehensive discussion of these failures, and the test in general is included in a separate portion of the test report labeled "Discussion of the Data".

Original data, not included on the data sheets, is recorded in Engineering Work Book No. 7482 on permanent file in CVA Components Test Laboratory (Dept. 564-5).

DISCUSSION OF THE DATA:

The general test format and results, and more specifically, the failures, will be discussed by specimen, which is not necessarily the chronological sequence of the tests. Dates and more detailed information can be obtained by referring to the individual data sheets.

KINETICS S/N 001:

This specimen was received first and was used to setup and calibrate the test set and instrumentation used for the remainder of the test.

While calibrating the vibration setup, a discrepancy in the test set wiring caused a wire in the specimen to overheat and char excessively. The specimen wire was from J 703 L to J 703 N. The test set was repaired and the specimen sent to the vendor for repair.

Before sending this specimen for repair, noneoperating vibration per design criterion specifications, was conducted to search for mechanical weaknesses. The results were completely satisfactory.

After being repaired and returned to CVA, testing was resumed according to Figure 3 schedule. During the cold test at ambient pressure, one out-of-tolerance reading occurred. On an external to internal assembly cycle, AC switch circuit P40 required 16.5 milliseconds to make the transfer. The specification requires that the time be no greater than 15 milliseconds. This test was repeated several times the next day and all circuits were within tolerance then and on all subsequent tests.

During the remainder of the tests performed no failures and/or out-of-tolerance data occurred.

A Life Test was conducted on this specimen and on United Control S/N 121, but not on Kinetics S/N 002 or United Controls S/N 124. Voltage drop measurements were first made using the test setup and making measurements at sensing leads in the specimen mating electrical connectors according to Figure 3 (schematic of test setup). The specimens were then opened and voltage drop measurements were taken directly across the switching mechanisms according to the test procedure, Paragraph 4.5. The latter readings were subtracted from the former readings and are included as additional data sheets. These data should be subtracted from the voltage drop data taken during all other portions of the test, to obtain voltage drop across the switching mechanism.

DISCUSSION OF THE DATA: (CONTINUED)KINETICS S/N 002:

Before any testing was accomplished, this specimen was first used in a CVA demonstration in Washington, D.C. After being returned to San Diego it was lost. The test requestor's representative subsequently found it in the CVA salvage yard. From the quantity and severity of scratches and dents the specimen could very well have been subjected to severe mechanical shocks.

During the ambient conditions proof cycle the 200 ampere D.C. circuit indicated an out-of-tolerance dielectric resistance. The specification requires a minimum of 10 megohms dielectric resistance and this circuit measured .04 megohms to case, with 100 VDC applied. The specimen was sent to the vendor for repair. When it was returned to CVA the testing sequence was completely redone.

During the cold test (Paragraph 4.2.1.1(c)), the specimen failed to perform an assembly cycle from internal to external at 25 VDC. The specimen was again sent to the vendor for repair. When the specimen was returned to CVA testing was resumed from where the failure had occurred.

While sitting dormant in the CVA Components Test Laboratories (ambient San Diego climate conditions), corrosion was noted to be forming on the specimen hardware. The specimen was subsequently subjected to a Salt Atmosphere Test, according to CVA specification 7-00210. At the conclusion of the test a visual inspection showed considerable corrosion on the specimen ground plate studs and hardware. Figure 4 is a photograph of this condition, taken during the visual inspection. During the Post Salt Atmosphere Test proof cycle, a dielectric strength (HYPOT) failure occurred on J 701 A to J 701 D. The specification requires that this circuit withstand a minimum of 500 V RMS. The circuit broke down at 50 V RMS. The specimen was sent to the vendor for repair, and when returned to CVA, no further testing was accomplished.

DISCUSSION OF THE DATA: (CONTINUED)UNITED CONTROL SPECIMEN S/N 121:

During the Initial Satisfactory Performance Test, and on all subsequent tests where measured, dielectric strength failures occurred. CVA specification 27-06166, Paragraph 3.6.3.6, requires that the specimen, between adjacent power circuits and between each power circuit and case, be capable of withstanding 1500 V RMS. Only one circuit was out-of-tolerance on the Initial Satisfactory Performance Test. J 706 E to case broke down at 950 V RMS. The number of breakdown increased as testing progressed, until 6 breakdowns occurred during the Hot Test. A more detailed description of the dielectric strength failures is included on the individual data sheets.

During the Operating Vibration Tests, a considerable amount of "noise" and "chatter" was noted on the D.C. switch circuits. Due to the vagueness of CVA specification 27-06166 requirements and tolerances on "chatter" this was not resolved as a failure at this time. When United Control S/N 124 was tested the same condition occurred and is discussed in this section, "Discussion of the Data" under United Control S/N 124.

UNITED CONTROL SPECIMEN S/N 124:

During the Initial Satisfactory Performance Test, two complete failures occurred on this specimen. The first of these failures was below tolerance readings for dielectric strength on several switch circuits. After the proof cycle was completed the specimen was opened for failure analysis, with design group and vendor representatives present. It was determined that the wrong type of relay was used for the AC switch. The dielectric strength specification for the relays used in this specimen was 1000 V RMS, and the CVA component specification (27-06166) is 1500 V RMS. The vendor's representative stated that this type of relay had gotten in by mistake and were probably in several production items. A check of the production items on hand at CVA showed this to be the case.

The second failure during the Initial Satisfactory Performance Test, occurred during the third assembly cycle attempted. On performing an internal to external assembly cycle the specimen's

DISCUSSION OF THE DATA: (CONTINUED)UNITED CONTROL SPECIMEN S/N 124: (CONTINUED)

D.C. switch assembly failed to transfer completely. When the specimen was opened, under circumstances stated in the preceding paragraph, the following situation was found; In the D.C. switch motor circuit, the motor limiting microswitch was contaminated by a glyptal like substance and was hanging up in the open position. This appeared to be more of a workmanship problem than a design problem.

The specimen, and all production units that were determined to have the improper type of relays, were sent to the vendor for repair. Upon return of the reworked specimen, testing was resumed according to Figure 3 schedule. During the Operating Vibration Tests, in all three axes, several of the D.C. switch circuits exhibited a considerable amount of noise and chatter. At this point the CVA specification was very vague about contact "noise" or "chatter". It simply stated that it should not exist but did not define the term. A consensus of opinion between CVA Electrical Design Group and CVA Components Test Lab personnel was, that the "chatter" was unacceptable, and that the CVA specification 27-06166 requirements section include a description and tolerance for contact "chatter". The specimen was again sent to the vendor for rework.

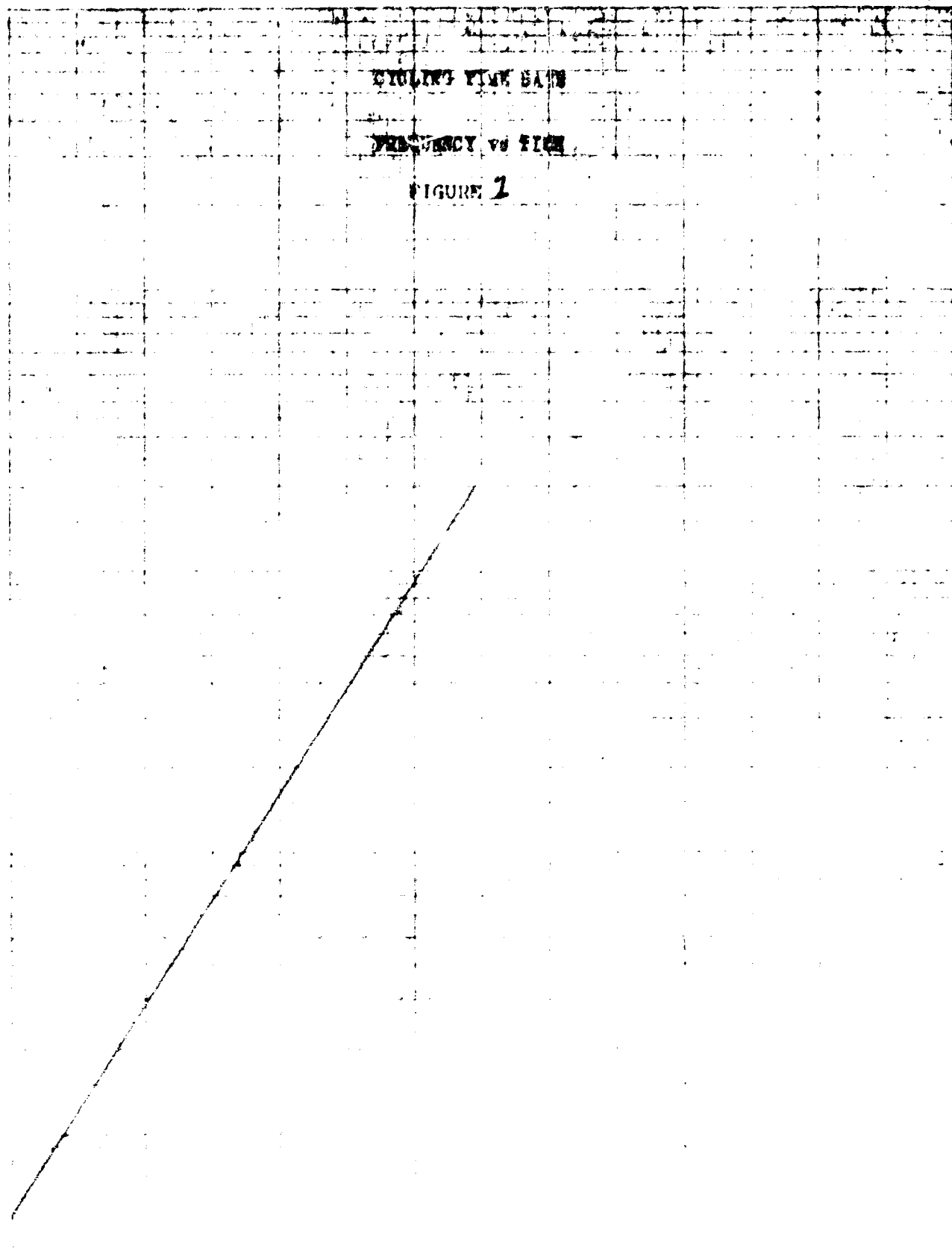
While this Evaluation Test was being conducted, the Receiving Inspection Dept. (280-2) was experiencing a "noise" problem on the AC switch circuits of the United Control production units. When United Control specimen S/N 124 was received back from rework, it was used solely for resolving this noise problem.

The report on testing done and results found in resolution of the "noise" problem are included in this report as Addendum I.

EXPLICIT TIME BASE

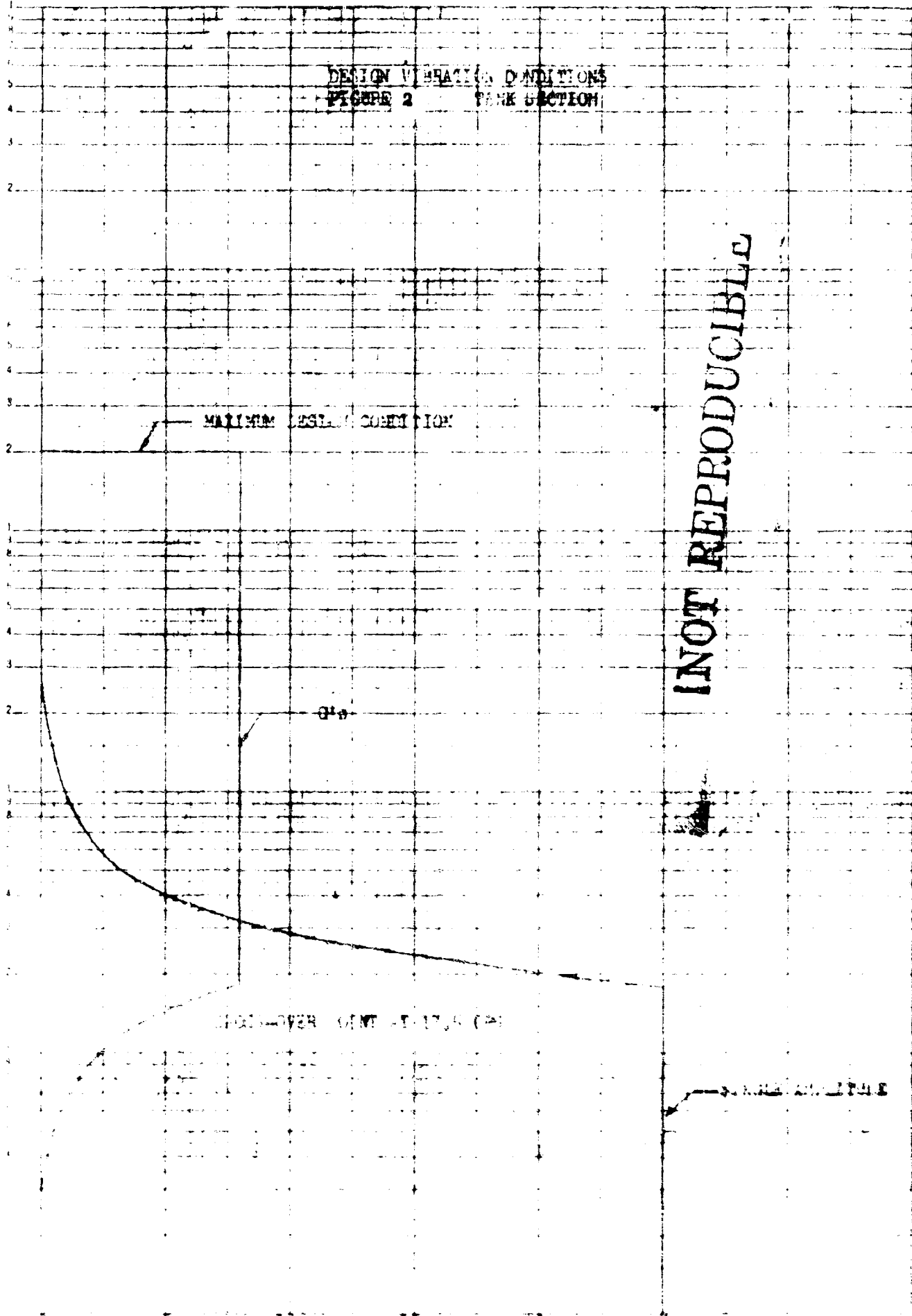
FREQUENCY VS TIME

FIGURE 1



7.8.2036-003
FREQUENCY VS TIME
EXPLICIT TIME BASE

DESIGN VIBRATION CONDITIONS
FIGURE 2 TANK SECTION

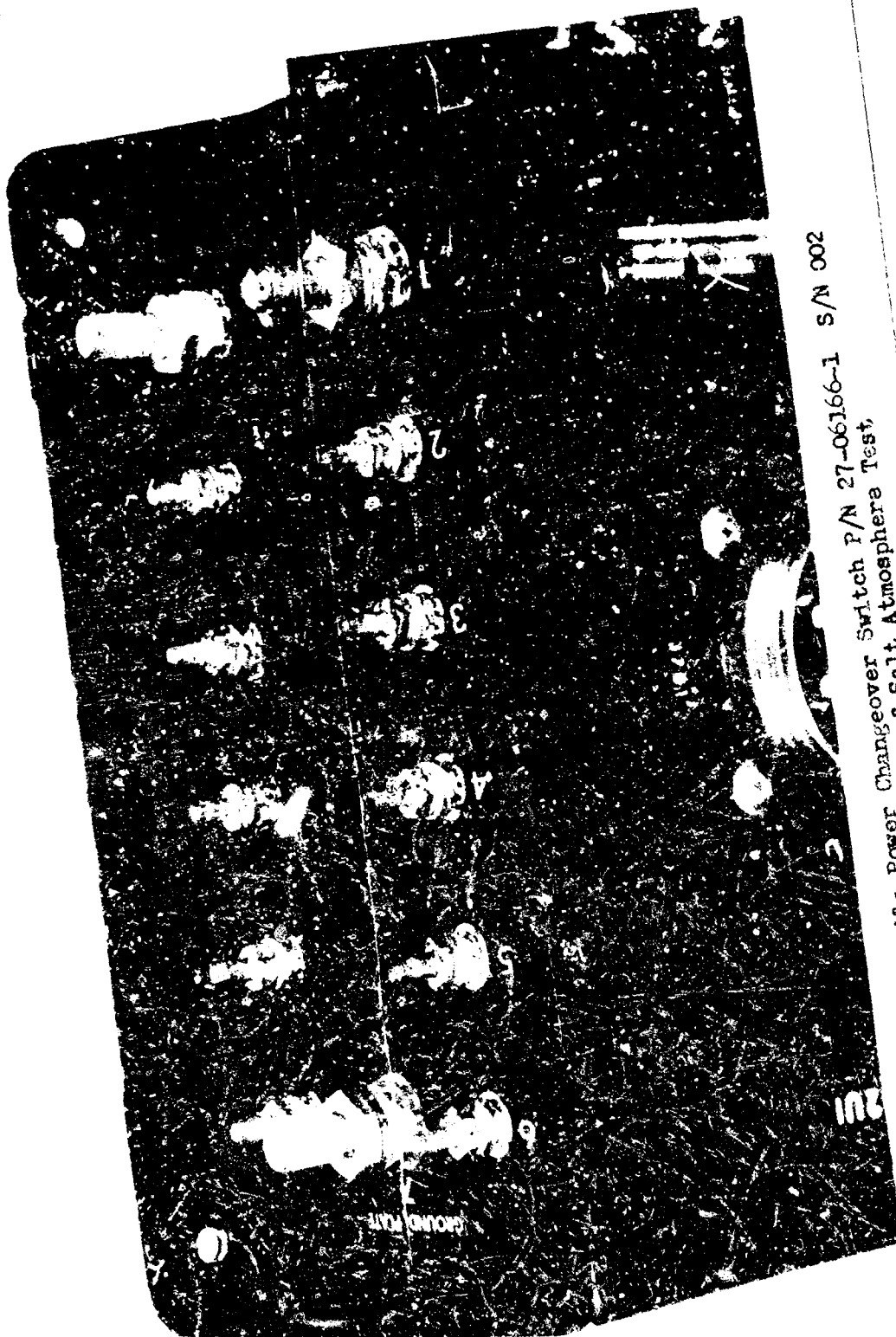


TEST SPECIMENS			
KINETICS S/N 001	KINETICS S/N 002	UNITED CONTROL S/N 121	UNITED CONTROL S/N 124
1. Nonoperating Vibration search for mechanical weaknesses	1. Initial satisfactory Performance Test	(*) 1. Initial satisfactory Performance Test.	(*) 1. Initial Satisfactory Performance Test
2. Initial Satisfactory Performance Test.	(*) 2. Ambient Conditions	(*) 2. Operating Vibration, all 3 axes.	2. Second Initial Satisfactory Performance Test.
3. Operating Vibration all 3 axes.	3. Second Initial Satisfactory Performance Test	(*) 3. Post Vibration	(*) 3. Operating Vibration, all 3 axes.
4. Post Vibration	4. Operating Vibration all 3 axes.	(*) 4. -30° at ambient pressure.	4. Post Vibration
(*) 5. -30°F @ ambient pressure.	5. Post Vibration	(*) 5. -30° @ 1 mm R.H.	This specimen used to resolve noise problem from this point on.
6. -65°F @ 1 mm R.H.	6. -30°F @ ambient pressure.	(*) 6. +180° @ 95% R.H.	
7. 160°F @ 95% R.H.	(*) 7. -30°F @ 1 mm R.H.	(*) 7. + 130° @ 1 mm Hg.	
8. 160°F @ 1 mm R.H.	(*) 8. Operating Acceleration.	(*) 8. +40° @ 95% R.H.	
9. 40°F @ 95% R.H.	9. Salt Atmosphere	(*) 9. Post Environmental.	
10. Re-run of Environmental Tests No. 7 and 9.		10. Operating Acceleration.	
11. Operating Acceleration		(*) 11. Re-run of all 3 axes of Operating Vibration.	
12. Life Test		12. Life Test	

TESTS PERFORMED

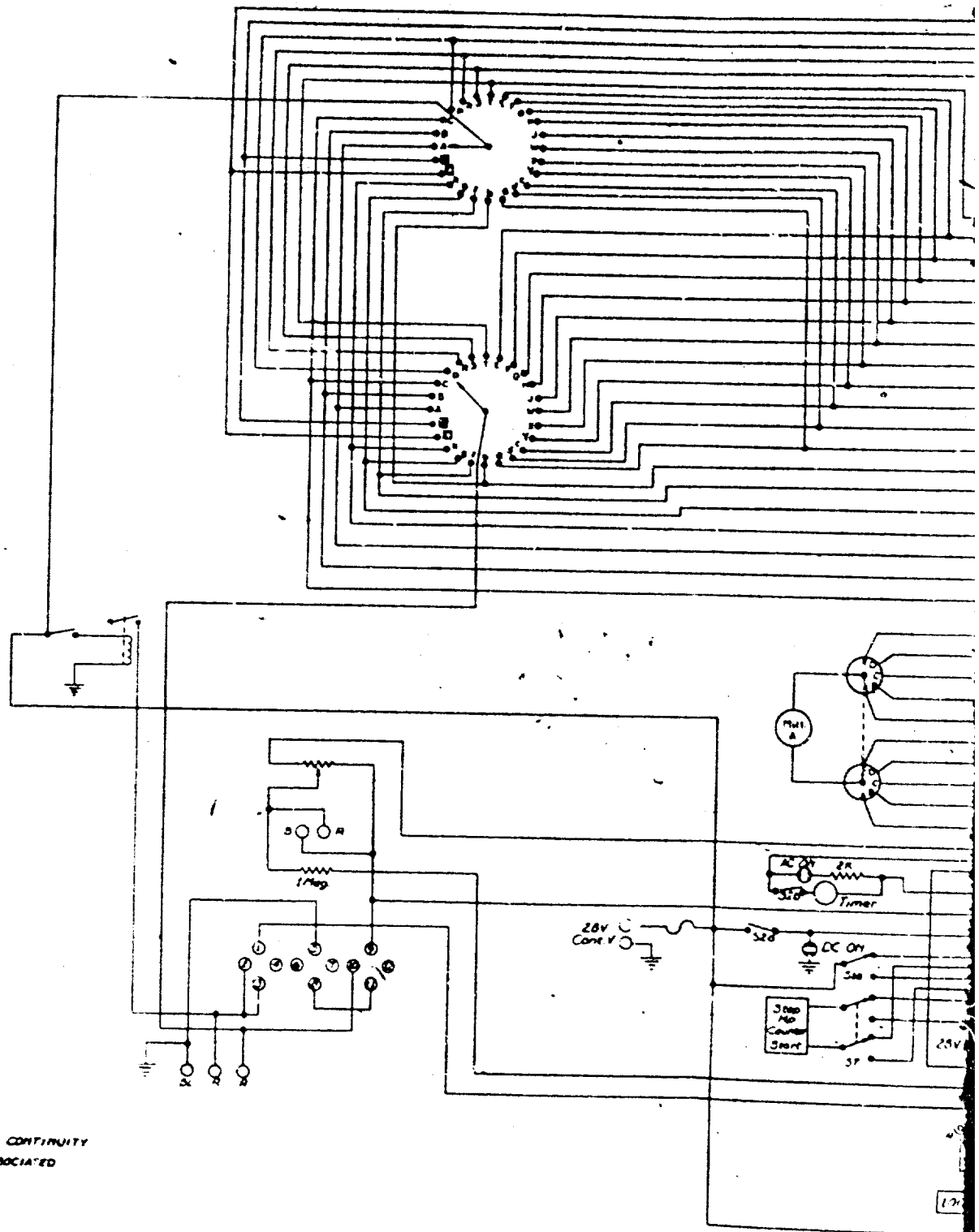
(*) Indicated Failure of this test.

FIGURE 3



Main Missile Power Changeover Switch P/N 27-06166-1 S/N 002
Results of Salt Atmosphere Test

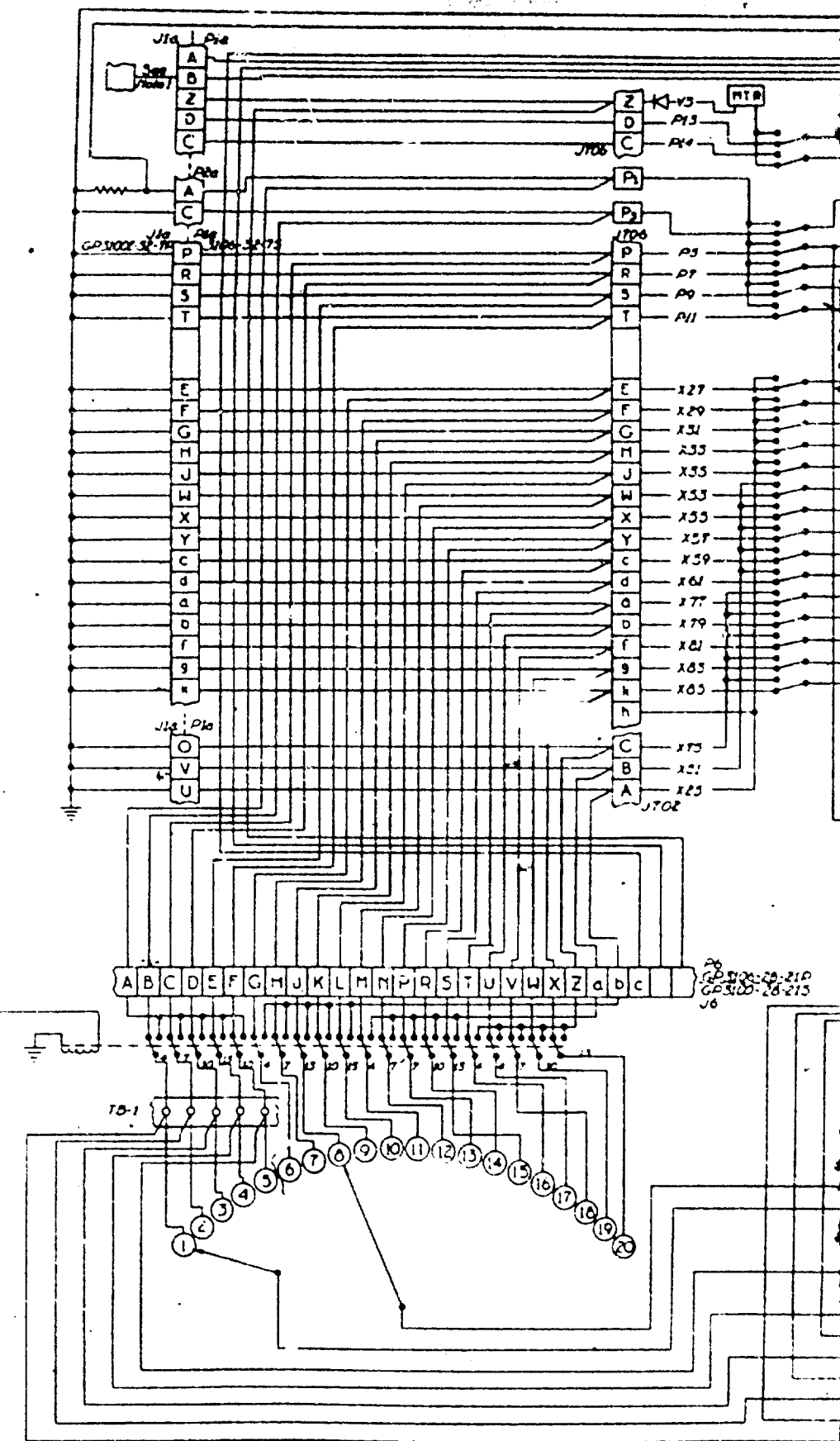
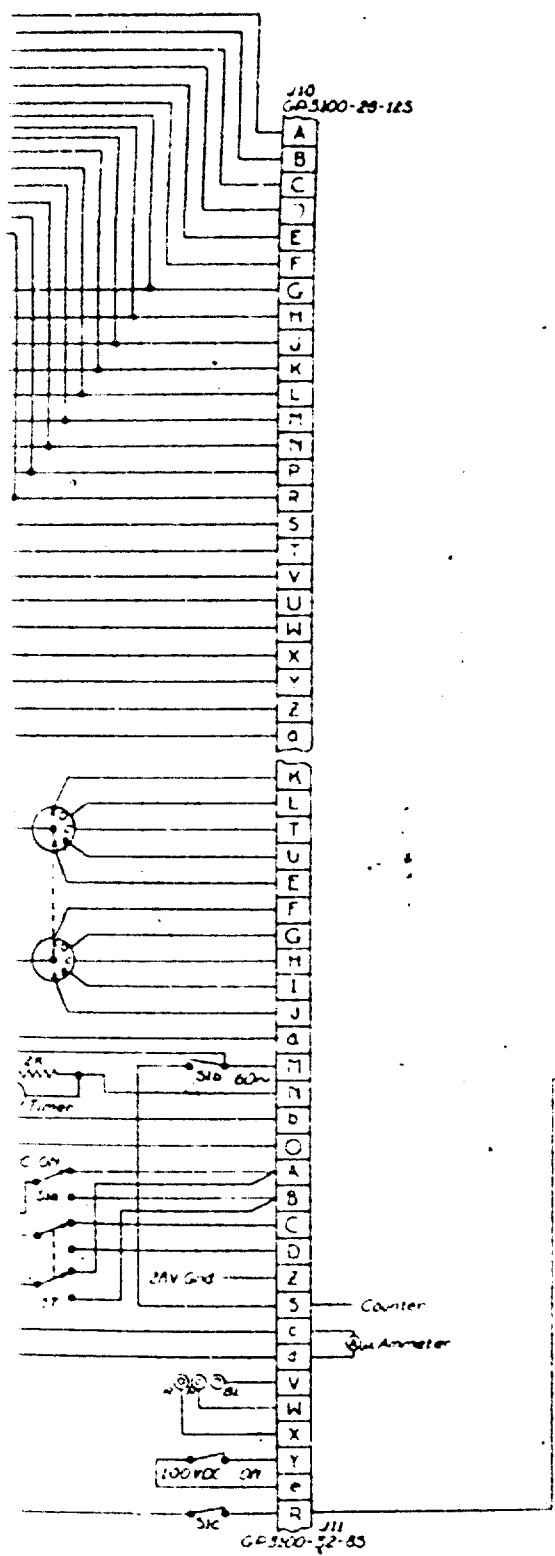
FIGURE 4



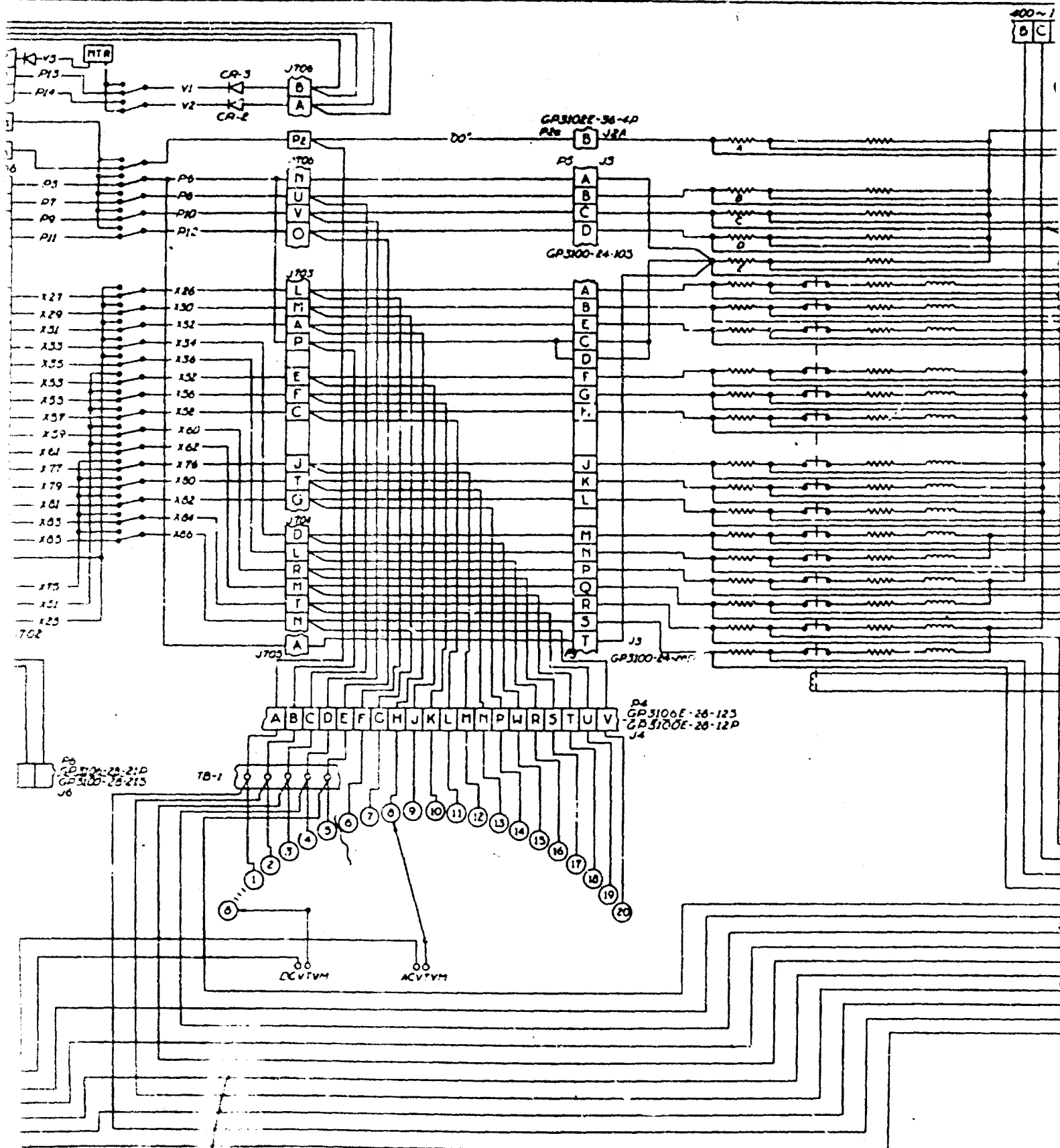
NOTES:

1. CABLE ON DWG #2.
2. THIS DWG DOES NOT INCLUDE CONTINUITY
LIGHT PANEL SCHEMATIC OR ASSOCIATED
WIRING AND CABLES.

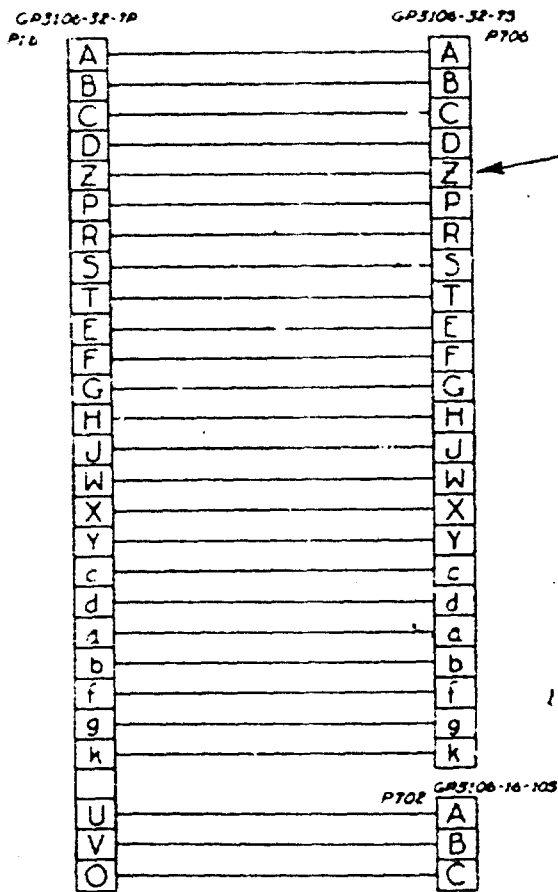
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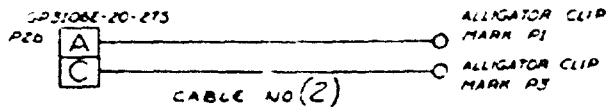
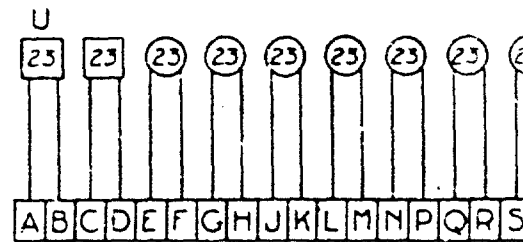
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CABLE NO. (1)



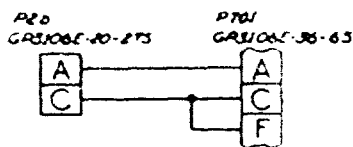
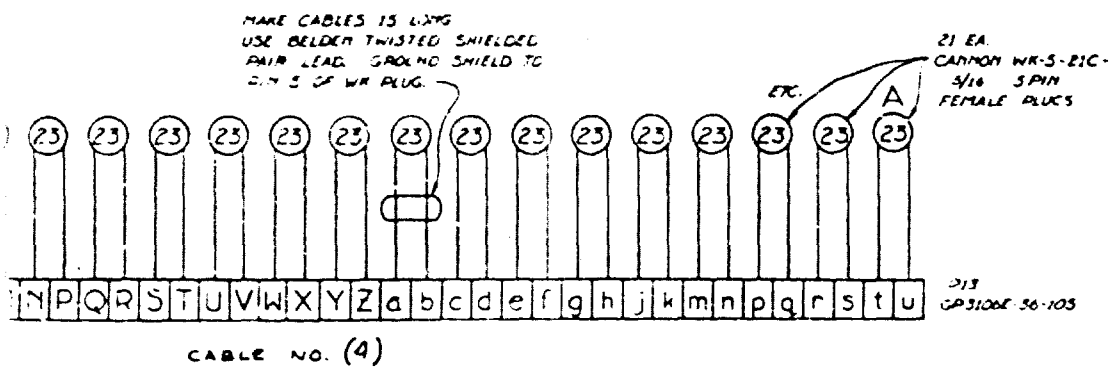
SEE NOTE 5 FOR "E" SERIES CHG.



Notes:

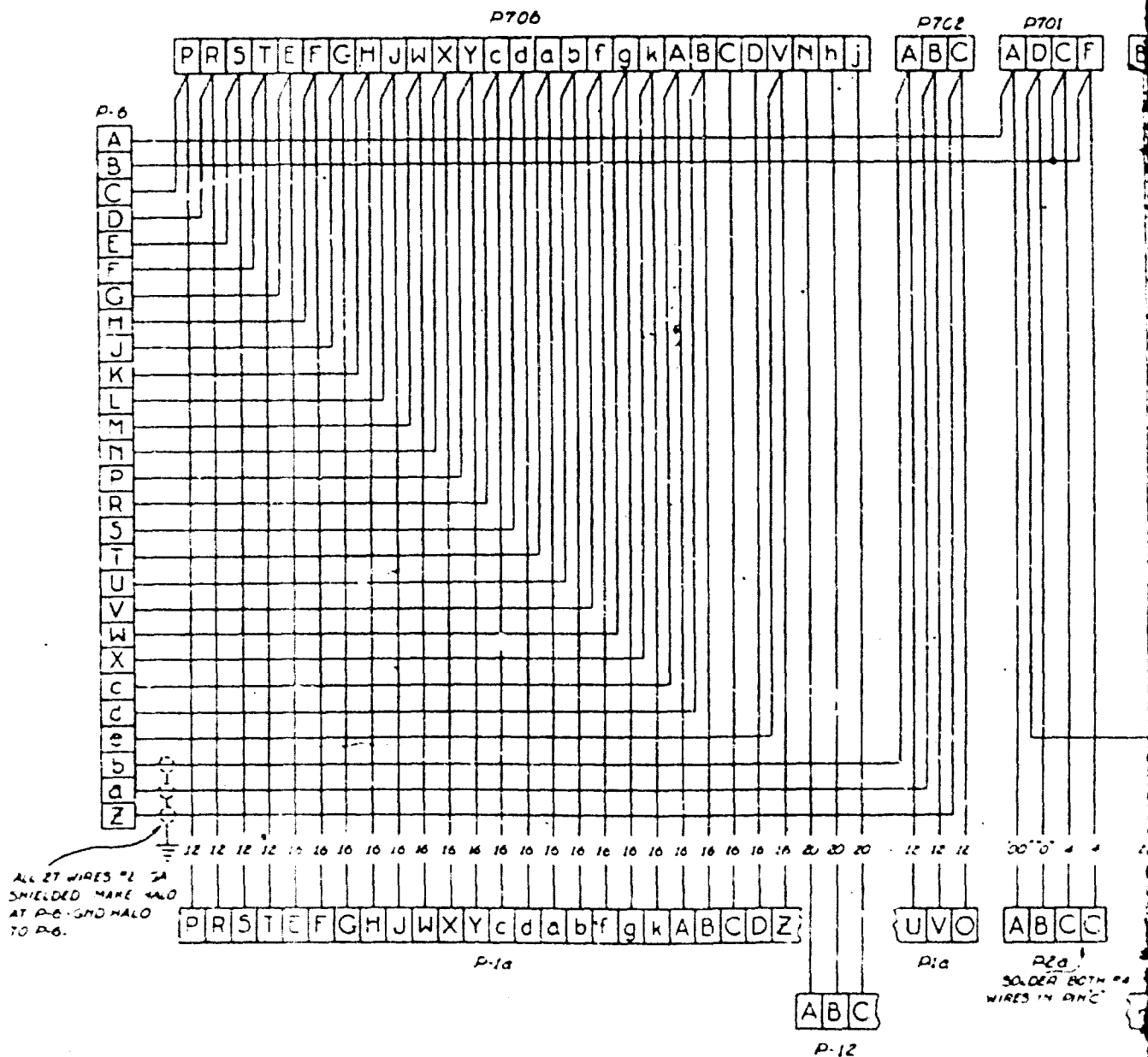
1. USE "18 GA WIRE WITH HEAVY INSULATION".
EA CFT. 1500 VRMS.
2. MAKE CABLES 15 FT. LONG. #1'
3. CABLE 1 & 2 COMPRISE "D" SERIES
HYPOT HARNESS.
4. CABLE 3 & 4 COMPRISE "E" SERIES
HYPOT HARNESS.
5. IN CABLE 1 WIRE ON PIN 2 OF J70B
HAS TO BE CHANGED TO PIN N J70B
FOR "E" SERIES.

A



MAIN PWR. C/O SW.
HYPOT HARNESS

B



P-1a GP3106E-32-73
P-2a GP3106E-36-43
P-3 GP3106E-24-235
P-4 GP3106E-28-125
P-5 GP3106E-24-10P
P-6 GP3106E-28-21P
P-7 GP3106E-28-215

P-701 GP3106E-32-45 or GP3106E-36-65
P-702 GP3106E-16-105
P-703 FT06E-20-16P
P-704 GP3106E-22-14P
P-705 GP3106E-28-11P
P-706 GP3106E-32-73
P-707 FT06E-10-6P

Notes:

1. MAKE HARNESS 13 FT. (+2" C) LONG.
2. USE STD. AWG WIRE (TYPE 30A 2-115).
3. DIRECT ANY QUESTIONS TO BCC-114-1.

C

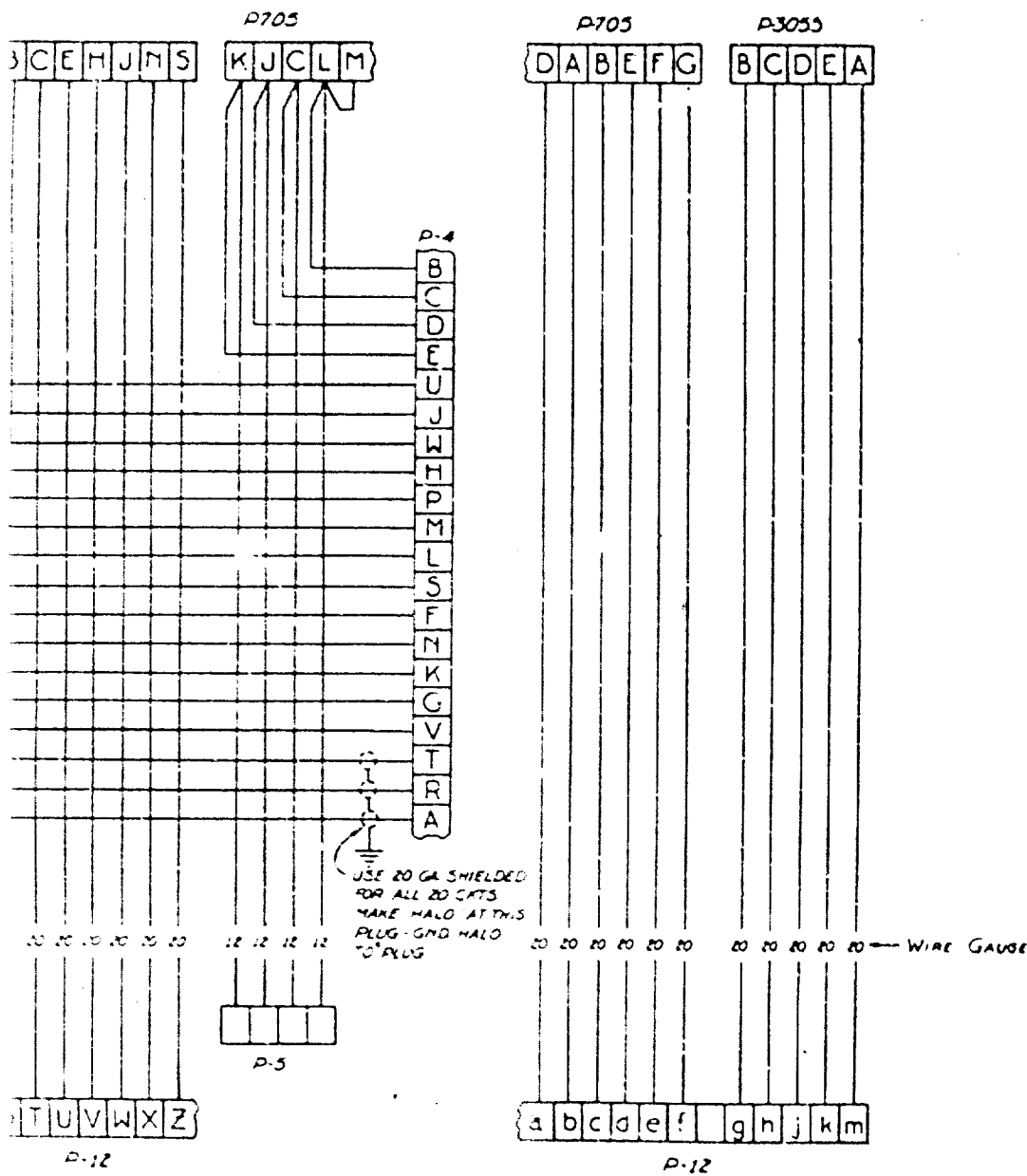


Figure 6
 MAIN PWR. C/O SW TEST SET NO. 2
 "E" SERIES HARNESS

H.T. MOBLEY 10-14-59

PAGE 11
 E

SHEET 2 OF 2

CONV. AIR. ASSEMBLY

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results: Satisfactory

Date: July 18, 58

Special Test Results: Positive Comp.
Specimen SN 001

Test Eng: P. F. Mobley

ENG Insp: NA

WAP Insp: NA

Parameter	Description Test Results	Remarks
4.1.8	Initial Satisfactory	
1.4	Operating Time: Start <u>107.5</u> hrs. Stop <u>107.8</u> hrs. Assembly Cycles <u>14</u> Start _____ hrs. Stop _____ hrs.	

Notes: 1. CEC recording Int. to Ext. to Int. record # 263

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Part: 4-1-3
 For para: 3-1-8 Operation 3/M DO1 Kinetic Corp. Date: July 14, 59
 Engineer: P. J. Mobley
 CVAC Insp: ---
 USAF Insp: ---

* Indicated out of tolerance

ASSEMBLY CYCLE OPERATION

Control voltage	Para 3-1-8 step	Time (seconds)	Tolerance (seconds)	Time of assembly cycle	
				Int. to Ex	Ext. to Int
10V	1	28.5	1 MAX		
10V	2	20.4	1 MAX		
10V	3	11.5	1 MAX		
10V	4	23.0	1 MAX		
10V	5	13.7	1 MAX		
10V	6	25.7	1 MAX		

DIAGNOSTIC APPROACH

All circuits satisfactory - - - - - YES ☒ NO ☐

ISOLATION RESISTANCE

All circuits measured greater than 10 megohms - - - YES ☒ NO ☐

SWITCH CONTINUITY AND NON-CONTINUITY

All switches satisfactory

Para 3-1-8 step	YES	NO	Switch position	
		see note	Internal	External
1				
2				
3				
4				
5				
6				

CYCLE RESPONSE TIME (20 milliseconds minimum)

External to Internal 55 milliseconds

Internal to External 62 milliseconds

POSITION TRANSFER TIME (15 milliseconds maximum)

Circuit	C.F.C. Chan. No.	Ex to Ex	Ex to Int	Circuit	C.F.C. Chan. No.	Ex to Ex	Ex to Int
P11	7	6.5	6.5	P12	8	5	5.1
P12	9	8	8	P13	9	8.5	10
P13	10	6	5.5	P14	10	8	8
P14	11	7	7	P15	11	8.5	8
P15	12	11	10	P16	12	6	6.5
P16	13	6.5	5	P17	13	11	10.5
P17	14	8	7	P18	14	4.5	6
P18	15	7.5	7				

VOLTAGE DROP:

Maximum Control Voltage (30 V.)

VOLTA

Switch In External Position			Switch In Internal Position				
SW. MK.	CIRCUIT	DATA	SW. MK.	CIRCUIT	DATA		Rel.
A	J701C - J701D	.070	A	J701A - J701D	.150		A
B	J706P - J705L	.117	B	J701A - J706L	.151		B
C	J706T - J705K	.121	C	J701A - J705K	.155		C
D	J706 - J705	.119	D	J701A - J705	.154		D
E	J706 - J705	.113	E	J701A - J705	.151		E
F	J706B - J706A	.084	F	J702A - J706A	.051		F
G	J706C - J706D	.110	G	J702B - J706D	.070		G
H	J706Y - J706F	.072	H	J702B - J706F	.033		H
I	J706A - J706C	.107	I	J702C - J706C	.076		I
J	J706T - J706K	.084	J	J702C - J706K	.032		J
K	J706G - J706L	.110	K	J702A - J706L	.062		K
L	J706B - J706K	.110	L	J702A - J706M	.064		L
M	J706W - J706P	.115	M	J702B - J706P	.064		M
N	J706K - J706B	.130	N	J702C - J706B	.093		N
O	J706C - J706A	.110	O	J702A - J706A	.079		O
P	J706J - J706C	.100	P	J702B - J706C	.054		P
Q	J706B - J706J	.074	Q	J702C - J706J	.059		Q
R	J706F - J706N	.110	R	J702A - J706N	.080		R
S	J706X - J706B	.110	S	J702B - J706B	.058		S
T	J706B - J706T	.090	T	J702C - J706T	.088		T

CONTINUITY CHECK:

All circuits indicated continuity Yes ☒ No ☐ See Notes

4.1.8 Initial Satisfactory

A

Date: July 14, 1959Page 14Test Engr: R.T. Mobley

Report 7A2236

CVAC Insp: NAISAF Insp: NA

VOLTAGE LOG:

Minimum Control Voltage (25 V.)

Switch in External Position			Switch in Internal Position		
Seq. No.	CIRCUIT	DATA	Seq. No.	CIRCUIT	DATA
A	J701C - J701D	.093	A	J701A - J701D	.125
B	J701F - J705L	.117	B	J701A - J705L	.152
C	J701F - J705K	.120	C	J701A - J705K	.154
D	J701C - J705J	.119	D	J701A - J705J	.153
E	J701F - J705C	.114	E	J701A - J705C	.150
F	J701F - J703A	.082	F	J702A - J703A	.072
G	J701C - J703D	.110	G	J702B - J703D	.062
H	J701F - J703F	.071	H	J702B - J703F	.033
I	J701C - J703C	.103	I	J702C - J703C	.074
J	J701F - J703K	.021	J	J703L - J703K	.031
K	J701C - J703L	.110	K	J702A - J703L	.060
L	J701F - J703M	.112	L	J702A - J703M	.062
M	J701F - J703P	.115	M	J702B - J703P	.072
N	J701F - J703B	.130	N	J702C - J703B	.071
O	J701C - J704A	.110	O	J702A - J704A	.076
P	J701F - J704C	.102	P	J702B - J704C	.073
Q	J701C - J704J	.092	Q	J702C - J704J	.077
R	J701F - J704N	.110	R	J702A - J704N	.077
S	J701F - J704P	.100	S	J702B - J704P	.056
T	J701F - J704T	.090	T	J702C - J704T	.041

B

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results: Satisfactory
 Specimen S/N 001 Kinetics Corp.
Specimen

Date: July 17, 1959
 Test Eng: R. T. Mobley
 CVAC Insp: NA
 USAF Insp: NA

Paragraph	Specification Requirement	Remarks
4.3	Operating Vib. "Y" Axis	
1.4	Operating Time: Start <u>1084</u> hrs. Stop <u>1092</u> hrs. Assembly Cycles <u>6</u> Start _____ hrs. Stop _____ hrs.	

- Notes: 1. Shaker overload kicked out at about 37 CPS but was reset immediately
 2. Shut down at 85 CPS to change recorder mag. 5-85 CPS Midwest Mag. SN 137
 3. Made switch transfer Int. Ext. Int @ 210 CPS
 4. 85-2000 CPS Mag. # 159 No sw. txfer on this roll, at end of run.
 5. made switch transfer Int. Ext. Int. on mag. sp 137
 6. Data reduced and run looked clean.

Para. 4.3 "Y" Axis
 For para. 4.3 Specimen S/N 001
Kinetics Corp. Spec.

Date: July 17, '59
 Engineer: P. T. Mobley
 CVAC Insp: NA
 USAF Insp: NA

* Indicator out of tolerance

ASSEMBLY CYCLE OPERATION:

Control voltage	Para 4.1.8 step	Time (seconds)	tolerance (seconds)	Type of assembly cycle	
				Int. to Ext.	Ext. to Int.
18V	a		3 MAX		
18V	d		3 MAX		
30V	f	NA	2 MAX	NA	NA
30V	i		2 MAX		
25V	j		2 MAX		
25V	k		2 MAX		

DIELECTRIC STRENGTH:

All circuits satisfactory ----- NA YES ☐ NO ☐

INSULATION RESISTANCE:

All circuits measured greater than 10 megohms NA YES ☐ NO ☐

SWITCH CONTINUITY AND NON-CONTINUITY:

All switches satisfactory

Para 4.1.8 step	YES	NO see note	Switch position	
			Internal	External
f			NA	
i				
j				
k				

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 50 milliseconds

Internal to External 52 milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.F.C. Chan. No.	In to Ex	Ex to In	Circuit	C.F.C. Chan. No.	In to Ex	Ex to In
P14	F	NA	8	P12	H	NA	5
P12	Q		8	P22	U		3
P30	H		6.5	P14	P		6.5
P36	T		6.5	P14	Q		9.5
P40	J		10	P16	R		2.5
P18	K		7	P28	S		12
P20	L		7	P38	T		3
P26	M	✓	12			✓	

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)Overall Test Results: Satisfactory Date: 7-23-59Specimen S/N 001 Kinetics
Corp. SpecimenTest Engr: R. T. Mobley
CVAC Insp: NA
USAF Insp: NA

Paragraph	Specification Requirement	Remarks
4.3	Operating Vib. "X" Axis	Accelerometer recorder #1 Drive #2 "X" Axis #3 "Y" Axis #5 "Z" Axis #6 Pippel Mag. # 26135
1.4	Operating Time: Start <u>111.4</u> hrs. Stop <u>111.9</u> hrs. Assembly Cycles 2 Start _____ hrs. Stop _____ hrs.	

Notes: 1.5-50 Mag. # 137

500-2000 Mag. # 159

Switch I-E-P @ 750 cps

Data reduced 7-24-59 - Entire run looks
clean.

Para. 4.3 "X" axisFor para. 4.3 Specimen S/N 001
Kinetics Corp.Date: 7-23-54
Engineer: P. T. Mabley
CVAC Insp: NA
USAF Insp: NA

• Indicates out of tolerance

ASSEMBLY CYCLE OPERATION:

Control voltage	Para 4.1.8 step	Time (seconds)	Tolerance (seconds)	Type of assembly cycle	
				Int. to Ex	Ext. to Int
15V	1		1 max		
15V	2		1 max		
30V	3	NA	2 max	NA	NA
30V	4		2 max		
25V	5		2 max		
25V	6		2 max		

DIELECTRIC STRENGTH:

All circuits satisfactory - - - - - NA YES ☐ NO ☐

INSULATION RESISTANCE:

All circuits measured greater than 10 megohms - NA YES ☐ NO ☐

SWITCH CONTINUITY AND NON-CONTINUITY:

All switches satisfactory

Para 4.1.8 step	YES	NO see note	Switch position	
			Internal	External
1		NA		
2		NA		
3		NA		
4		NA		

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 50 millisecondsInternal to External 46 milliseconds

Switch made during vib. @ 750cps

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.F.C. Chan. No.	In to Ex msec	Ex to In msec	Circuit	C.F.C. Chan. No.	In to Ex msec	Ex to In msec
P14	F	5	7	P12	H	4	6
P12	G	5	7	P22	O	8	7
P10	I	4	3	P14	P	7	8
P16	J	3	7	P11	Q	7	8
P10	K	9	10	P16	R	7	8
P18	L	7	8	P28	S	10	12
P20	M	7	8	P18	T	3	4
P26	N	4	5				

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results: Satisfactory
Specimen S/N 001 Kinetics Corp.
Specimen

Date: 7-23-59
Test Engr: R. T. Mobley
CVAC Insp: NA
USAF Insp: NA

Paragraph	Specification Requirement	Remarks
4.3	Operating Vib. "X" AXIS "Z"	
1.4	Operating Time: Start <u>111.9</u> hrs. Stop <u>112.4</u> hrs. Assembly Cycles <u>4</u> Start _____ hrs. Stop _____ hrs.	

Notes: 1. 5 - 225 MAG #154
SNITCH I-E-I (2) 185CPS
225 - 2000 MAG #137
Data reduced Run Looks Good on "Z" AXIS

Part. 4.3 "Z" axis
 For para. 4.3 Specimen S/N 001
Kinetics Corp.

Date: 7-23-59
 Engineer: RT Mobley
 CVAC Insp: NA
 USAF Insp: NA

* Indicates out of tolerance

ASSEMBLY CYCLE OPERATION:

Control voltage	Para 4.1.8 step	Time (seconds)	tolerance (seconds)	Type of assembly cycle	
				Int. to Ex	Ex. to Int
18V	A	NA	3 MAX	NA	NA
18V	A	NA	3 MAX		
30V	1		2 MAX		
30V	1		2 MAX		
25V	1		2 MAX		
25V	1		2 MAX		

DIELECTRIC STRENGTH:

All circuits satisfactory - - - - - YES ☒ NO ☐

INSULATION RESISTANCE:

All circuits measured greater than 10 megohms - - - YES ☒ NO ☐

SWITCH COMPONENTS AND NON-CONTINUITY

All switches satisfactory

Para 4.1.8 step	YES	NO see note	Switch position	
			Internal	External
1				
1				
1				
1				

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 50 milliseconds

Internal to External 45 milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.E.C. Chan. No.	Ex to Ex	Ex to In	Circuit	C.E.C. Chan. No.	In to Ex	Ex to In
P14	7	5.1	7.5	P12	8	3	4
P12	8	2	8	P22	9	8	8
P30	1	3.3	6	P14	7	7.5	5.5
P36	2	3	6	P16	9	8	8
P10	2	10	10	P18	8	5	6
P18	3	6	7.5	P28	8	9	9
P20	4	6	8	P38	7	3.3	5
P40	5	5	7.1				

CONVAIR ASTRONAUTICS

REPORT 7A2236

PAGE 21

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results: *Satisfactory*

Date: *7-24-58*

Specimen S/N *Coll Kinetics Corp.*
Specimen

Test Engr: *E. T. Mobley*
CVAC Insp: *NA*
USAF Insp: *NA*

Paragraph	Specification Requirement	Remarks
<i>4.3</i>	<i>Post Vibration Post Cycle</i>	
<i>1.4</i>	Operating Time: Start <i>112.4</i> hrs. Stop _____ hrs. Assembly Cycles <i>8</i> Start _____ hrs. Stop _____ hrs.	

Notes: *1. CEC Map. # 508, record #39 Int-Ext. Int.*

Para. 4.1.7 Post Vibration
 For para. 4.3 Specimen S/N 001
Kinetics Corp.

Date: 7-24-61
 Engineer: E. T. Mobley
 CVAC Insp: NH
 USAF Insp: NH

* Indicates out of tolerance

ASSEMBLY CYCLE OPERATION:

Control voltage	Para 4.1.8 step	Time (seconds)	tolerance (seconds)	Type of assembly cycle	
				Int. to Ext.	Ext. to Int.
18V	A	.215	3 max		
18V	A	.241	3 max		
30V	F	.118	2 max		
30V	I	.128	2 max		
25V	I	.144	2 max		
25V	I	.156	2 max		

DELIVERED STEADY STATE:

All circuits satisfactory - - - - - YES ☒ NO ☐

INSULATION RESISTANCE:

All circuits measured greater than 10 megohms - - - YES ☒ NO ☐

SWITCH CONTINUITY AND NON-CONTINUITY:

All switches satisfactory

Para 4.1.8 step	YES	NO see note	Switch position	
			Internal	External
1				
2				
3				
4				

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 47 milliseconds

Internal to External 47 milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.F.C. Chan. No.	In to Ex	Ex to In	Circuit	C.F.C. Chan. No.	In to Ex	Ex to In
P11	F	7	7	P12	H	2.75	3.5
P12	O	7	8	P22	O	7.5	7
P30	H	4.5	6	P14	F	7.5	7
P36	I	4.5	5	P11	O	7	8
P13	I	10	10.5	P16	H	7.5	6
P18	K	7	7.5	P28	S	10	10
P20	L	8	8	P18	I	3	4
P26	M	4	5				

VOLTAGE DROP:

Maximum Control Voltage (30 V.)

Switch in External Position			Switch in Internal Position		
SW. NO.	CIRCUIT	DATA	SW. NO.	CIRCUIT	DATA
A	J701G - J701D	.081	A	J701A - J701D	.112
B	J701P - J701L	.109	B	J701A - J701L	.139
C	J701T - J701F	.114	C	J701A - J701F	.141
D	J701G - J701T	.108	D	J701A - J701T	.139
E	J701G - J701C	.106	E	J701A - J701C	.136
F	J701B - J701A	.088	F	J701A - J701A	.052
G	J701B - J701D	.110	G	J701B - J701D	.068
H	J701B - J701F	.096	H	J701B - J701F	.034
I	J701B - J701G	.105	I	J701C - J701G	.069
J	J701T - J701B	.087	J	J701C - J701B	.032
K	J701G - J701L	.105	K	J701A - J701L	.059
L	J701B - J701M	.112	L	J701A - J701M	.065
M	J701W - J701P	.120	M	J701B - J701P	.070
N	J701G - J701H	.115	N	J701C - J701H	.075
O	J701T - J701A	.115	O	J701A - J701A	.036
P	J701G - J701C	.100	P	J701A - J701C	.049
Q	J701B - J701J	.084	Q	J701C - J701J	.055
R	J701F - J701N	.120	R	J701A - J701N	.033
S	J701X - J701R	.100	S	J701A - J701R	.049
T	J701B - J701T	.090	T	J701C - J701T	.037

CONTINUITY CHECK:

All circuits indicated continuity Yes ☒ No ☐ See Notes

4.3 Post Vib. Proof Cycle

A.

Date: 7-24-'59Page 23Test Engineer: E. T. MobleyReport: 7A2236Test Instrument: NACircuit Diagram: NA

VOLTAGE (V)

Minimum Control Voltage (25 V.)

Switch in External Position				Switch in Internal Position			
SW. NO.	SWITCH	DATA		SW. NO.	SWITCH	DATA	
A	ST012 - ST012	.083		A	ST01A - ST012	.114	
B	ST012 - ST012	.109		B	ST01A - ST012	.141	
C	ST012 - ST012	.115		C	ST01A - ST012	.144	
D	ST012 - ST012	.110		D	ST01A - ST012	.142	
E	ST012 - ST012	.108		E	ST01A - ST012	.137	
F	ST012 - ST012	.089		F	ST01A - ST012	.052	
G	ST012 - ST012	.110		G	ST01A - ST012	.067	
H	ST012 - ST012	.098		H	ST01A - ST012	.035	
I	ST012 - ST012	.104		I	ST01A - ST012	.067	
J	ST012 - ST012	.087		J	ST01A - ST012	.030	
K	ST012 - ST012	.105		K	ST01A - ST012	.060	
L	ST012 - ST012	.110		L	ST01A - ST012	.065	
M	ST012 - ST012	.120		M	ST01A - ST012	.070	
N	ST012 - ST012	.115		N	ST01A - ST012	.075	
O	ST012 - ST012	.115		O	ST01A - ST012	.086	
P	ST012 - ST012	.120		P	ST01A - ST012	.048	
Q	ST012 - ST012	.095		Q	ST01A - ST012	.056	
R	ST012 - ST012	.120		R	ST01A - ST012	.088	
S	ST012 - ST012	.100		S	ST01A - ST012	.049	
T	ST012 - ST012	.091		T	ST01A - ST012	.037	

B

CONVAIR
SAN DIEGO

VOLTAGE DROP:

Maximum Control Voltage (30 V.)

VOLT

Switch in External Position			Switch in Internal Position			VOLT
SW. NO.	CIRCUIT	DATA	SW. NO.	CIRCUIT	DATA	
A	J701G - J701D	0.110	A	J701A - J701D	0.114	A
B	J706P - J705L	0.114	B	J701A - J705L	0.127	B
C	J706T - J705K	0.111	C	J701A - J705K	0.133	C
D	J706T - J705I	0.112	D	J701A - J705I	0.132	D
E	J706T - J705C	0.119	E	J701A - J705C	0.129	E
F	J706B - J703A	0.115	F	J702A - J703A	0.042	F
G	J706C - J703D	0.100	G	J702B - J703D	0.062	G
H	J706Y - J703F	0.071	H	J702B - J703F	0.024	H
I	J706A - J703C	0.100	I	J702C - J703C	0.064	I
J	J706T - J703K	0.076	J	J702C - J703K	0.023	J
K	J706C - J703L	0.105	K	J702A - J703L	0.056	K
L	J706B - J703M	0.130	L	J702A - J703M	0.056	L
M	J706W - J703P	0.175	M	J702B - J703P	0.066	M
N	J706Z - J703R	0.100	N	J702C - J703R	0.068	N
O	J706T - J704A	0.100	O	J702A - J704A	0.074	O
P	J706B - J704C	0.090	P	J702B - J704C	0.043	P
Q	J706K - J704J	0.075	Q	J702C - J704J	0.042	Q
R	J706T - J704N	0.120	R	J702A - J704N	0.082	R
S	J706X - J704R	0.087	S	J702B - J704R	0.043	S
T	J706B - J704T	0.078	T	J702C - J704T	0.034	T

CONTINUITY CHECK:

All circuits indicated continuity Yes ☒ No ☐ See Notes

4.2.1.1c - 65°F. COLD TEST

0043 Midwest Record # (137 1st run)

CHARGE: INT. - EXT. - INT.

A

Date: 7-29-59Page 27Test Eng: Mobley/Hanson/Hawender

Report 7A2236

CVAC Insp: NHISAP Insp: NH

VOLTAGE LOG:

Minimum Control Voltage (25 V.)

Switch in External Position				Switch in Internal Position			
As. No.	CIRCUIT	DATA		As. No.	CIRCUIT	DATA	
A	J701C - J701D	0.130		A	J701A - J701B	0.126	
B	J701F - J701L	0.106		B	J701A - J701L	0.128	
C	J701T - J701K	0.106		C	J701A - J701X	0.134	
D	J701S - J701J	0.102		D	J701A - J701J	0.134	
E	J701F - J701C	0.114		E	J701A - J701C	0.128	
F	J701E - J701A	0.068		F	J702A - J702A	0.039	
G	J701C - J701D	0.078		G	J702B - J702D	0.060	
H	J701I - J701F	0.065		H	J702B - J702F	0.021	
I	J701A - J701C	0.040		I	J702C - J702C	0.063	
J	J701T - J701K	0.058		J	J702I - J702K	0.020	
K	J701C - J701L	0.098		K	J702A - J702L	0.052	
L	J701H - J701M	0.170		L	J702A - J702M	0.055	
M	J701K - J701P	0.140		M	J702B - J702P	0.065	
N	J701I - J701B	0.098		N	J702I - J702S	0.068	
O	J701C - J701A	0.098		O	J702A - J702A	0.078	
P	J701I - J701C	0.080		P	J702B - J702C	0.044	
Q	J701I - J701I	0.072		Q	J702C - J702C	0.042	
R	J701F - J701A	0.115		R	J702A - J702M	0.084	
S	J701J - J701B	0.080		S	J702B - J701I	0.042	
T	J701A - J701T	0.074		T	J702C - J701I	0.033	

B

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results: *Satisfactory*Date: *7-28-59*Specimen S/N *001. Kinetics*
*Corp. Specimen*Test Engr: *R. T. Mobley*CVAC Insp: *NA*USAF Insp: *NA*

Paragraph	Specification Requirement	Remarks
4.2.1.1	Radiant Heat	Max. non-operating temp. of specimen is 154°F
1.4	Operating Time: Start <i>NA</i> hrs. Stop _____ hrs. Assembly Cycles Start <i>NA</i> hrs. Stop _____ hrs.	

Notes: 1. This test was attempted 7-27-59 but Bemco box malfunctioned and temperature went to 250°F in about 15 minutes time before it was caught. The box was repaired and the test was run this date.

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results: *Unsatisfactory* Date: *7/29/59*Specimen S/N *001 Kinetics Corp.*Test Engr: *MOBLEY-HANSON-LAWENBERG*CVAC Insp: *N/A*USAF Insp: *N/A*

* Indicates out-of-tolerance data

Paragraph	Specification Requirement	Remarks
4.2.1.1 c	c - 65° F. 3.44 Hg 1 Hr. Proof @ AMBIENT PRESSURE - 30° F.	The environmental conditions were performed, w/ specimens in Bemco Box #2, per applicable spec. paragraph noted in 1st column.
1.4	Operating Time: 113.3 Start <u>113.3</u> hrs. Stop <u>113.4</u> hrs. Assembly Cycles <u>8</u> Start _____ hrs. Stop _____ hrs.	

* Notes: 1. AC switch circuit P40 required 16.5 millise. to transfer from Ext. to Int. This test was re-run several times the next day, at the same environment with this circuit in tolerance on all runs.

Para. 4.1.9 See PARA. 4.2.1.1.4
 For para. 4.2.1.1.6 Specimen SN 001 KINETICS

Date: 7/29/59
 Engineer: MOBLEY-HAUBRON-LAWSON
 CVAC Insp: N/A
 'SAF' Insp: N/A

* Indicates out of tolerance

ASSEMBLY CYCLE OPERATION:

Control voltage	Para 4.1.8 step	Time (seconds)	Tolerance (seconds)	Type of assembly cycle	
				Int. to Ext.	Ext. to Int.
15V	8	.780	1 MAX		
15V	4	.270	1 MAX		
30V	5	.124	2 MAX		
30V	1	.134	2 MAX		
25V	2	.157	2 MAX		
25V	1	.151	2 MAX		

DIELECTRIC STRENGTH:

All circuits satisfactory - *Could not perform*

☐ YES ☐ NO

DISCHARGE RESISTANCE:

All circuits measured greater than 10 megohms - - - YES

☐ YES ☐ NO

SWITCH CONDUCTIVITY AND NON-CONDUCTIVITY:

All switches satisfactory

Para 4.1.8 step	YES	NO see note	Switch position	
			Internal	External
1				
2				
3				
4				

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal *66* milliseconds

Internal to External *58* milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.F.C. Chan. No.	In to Ex	Ex to In	Circuit	C.F.C. Chan. No.	In to Ex	Ex to In
P14	F	7	8	P12	M	4	3.5
P12	O	2	7.5	P22	O	7	9.5
P10	H	2	7	P34	P	4	7.5
P36	I	2	3	P11	Q	7	6.5
* P13	J	13	16.5	P16	R	7	25
P18	K	1	7.5	P28	S	11	11
P20	L	1	7.5	P38	T	5	3.5
P24	N	4	4.5				

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results: Satisfactory Date: 7-29-59Specimen S/N 001, KINETICTest Ingr: BRIDLEY-HANSON-LAVENDERCVAC Insp: N/AUSAF Insp: N/A

Paragraph	Specification Requirement	Remarks
4.2.1.1C	Operate specimen while Reducing pressure to 1mm Hg Temp. -65°F	"
1.4	Operating Time: Start <u>113.9</u> hrs. Stop <u>114.8</u> hrs. <u>.9</u> hrs. Assembly Cycles <u>8</u> Start _____ hrs. Stop _____ hrs.	

Notes:

1. During the first attempt to reach 1mm the pressure indicated 1.5mm Hg at the end of 10 minutes.
Continuity lights OK.
2. A second attempt was made to reach 1mm in 10 min. At the end of 10 min the best A.T. (low pres.) was 1.7mm. The proof cycle was run at 1.0mm. The specimen Temp increased to +17°F.
3. Ran out of time before getting Ext. to Int. 15V assembly cycle.
4. AC switch transfer time and cycle sequence were not accomplished on this proof cycle - see re-run of test 7-31-59

Para. 4.1.9

For para. 4.2.1.1.6 Specimen S/N 001 KINETICS

Date: 7/29/57

Engineer: BENJAMIN HAYES - LAUNDER

CVAC Insp: N/A

USAF Insp: N/A

* Indicates out of tolerance

ASSEMBLY CYCLE OPERATION

Control voltage	Para 4.1.1.6 step	Time (seconds)	Tolerance (seconds)	Type of assembly cycle	
				Int. to Ext.	Ext. to Int.
10V	1	.228	3 MAX		
10V	1	could not get	3 MAX see note		couldn't get
30V	2	.135	2 MAX		
30V	2	.113	2 MAX		
25V	3	.149	2 MAX		
25V	3	.140	2 MAX		

DIRECT CURRENT STRENGTH

All circuits satisfactory - - - YES ☒ NO ☐ *Could not accomplish*

INSULATION RESISTANCE

All circuits measured greater than 10 megohms - - - YES ☐ NO ☐ *Could not accomplish*

SWITCH CONTINUITY AND NON-CONTINUITY

All switches satisfactory

Para 4.1.1.6 step	YES	NO see note	Switch position	
			Internal	External
1				
2				
3				
4				

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal _____ milliseconds

Internal to External _____ milliseconds

See 7-1-57 of this test on 7-21-57

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.F.C. Chan. No.	In to Ex	Ex to In	Circuit	C.F.C. Chan. No.	In to Ex	Ex to In
P14	1			P12	1		
P12	1			P22	1		
P10	1			P14	1		
P16	1			P11	1		
P10	1			P16	1		
P18	1			P28	1		
P20	1			P18	1		
P26	1						

VOLTAGE DROP:

Maximum Control Voltage (30 V.)

VOLTS

Switch in External Position			Switch in Internal Position			Seq.
SW. NO.	CIRCUIT	DATA	SW. NO.	CIRCUIT	DATA	
A	J701G - J701D	0.100	A	J701A - J701D	0.119	A
B	J701F - J701L	0.103	B	J701A - J701L	0.134	B
C	J701T - J701K	0.106	C	J701A - J701K	0.138	C
D	J701V - J701J	0.102	D	J701A - J701J	0.136	D
E	J701W - J701C	0.103	E	J701A - J701C	0.134	E
F	J701B - J701A	0.060	F	J702A - J701A	0.041	F
G	J701C - J702D	0.100	G	J702B - J701D	0.062	G
H	J701E - J701F	0.071	H	J702B - J701F	0.025	H
I	J701G - J701G	0.070	I	J702C - J701G	0.066	I
J	J701H - J701H	0.052	J	J702C - J701H	0.014	J
K	J701G - J701H	0.088	K	J702A - J701H	0.054	K
L	J701B - J701H	0.120	L	J702A - J701H	0.051	L
M	J701G - J701P	0.105	M	J701B - J701P	0.066	M
N	J701G - J701P	0.095	N	J702C - J701B	0.010	N
O	J701G - J701A	0.100	O	J702A - J701A	0.000	O
P	J701G - J701C	0.079	P	J702B - J701C	0.044	P
Q	J701R - J701J	0.071	Q	J701C - J701J	0.044	Q
R	J701F - J701N	0.120	R	J702A - J701N	0.090	R
S	J701X - J701R	0.019	S	J702B - J701R	0.045	S
T	J701B - J701T	0.072	T	J701C - J701T	0.034	T

CONTINUITY CHECK:

All circuits indicated continuity Yes ☒ No ☐ See Notes

Midwest Record # ~~0044~~ 0044-1015 test @ 1MM Hz

Failed to RESET Counter on 180

CHARGE COIL, FROM EXT. TO INT.

So MADE KERN, but this test not
counter missing

A

Date: 7-29-'59

Page 30

Test Engr: Brierley/Hawender/Hanson

Report 7A2236

VAC Insp: NA

ISAP Insp: NA

VOLTAGE DROP:

Minimum Control Voltage (25 V.)

Switch in External Position				Switch in Internal Position			
SW. NO.	CIRCUIT	DATA		SW. NO.	CIRCUIT	DATA	
A	J701C - J701D	0.091		A	J701A - J701D	0.119	
H	J701F - J705L	0.106		B	J701A - J705L	0.135	
C	J705F - J701F	0.109		G	J701A - J705A	0.138	
L	J706C - J706J	0.104		2	J701A - J705J	0.107	
B	J706F - J705C	0.112		8	J701A - J705J	0.134	
F	J706E - J705A	0.077		I	J701A - J705A	0.042	
O	J706C - J701D	0.090		3	J701F - J701C	0.063	
H	J701I - J701F	0.070		B	J701B - J701F	0.026	
I	J706A - J701C	0.095		I	J701C - J701C	0.066	
J	J706F - J701K	0.058		J	J701C - J701L	0.018	
K	J706C - J701L	0.096		K	J701A - J701L	0.054	
L	J706H - J701M	0.108		L	J701A - J701M	0.058	
M	J706A - J701P	0.127		M	J701C - J701P	0.062	
N	J706C - J701R	0.105		N	J701C - J701R	0.075	
O	J706C - J701A	0.102		O	J701A - J701A	0.095	
P	J706C - J701C	0.080		P	J701B - J701C	0.044	
Q	J706C - J701L	0.074		Q	J701C - J701C	0.044	
R	J706F - J701A	0.118		R	J701A - J701L	0.085	
S	J706C - J701P	0.082		S	J701C - J701C	0.044	
T	J701I - J701C	0.075		T	J701C - J701C	0.044	

B

4.1 TEST CONDITIONS AND PROCEDURES (continued)

General Test Results: Satisfactory

Date: 7-30-51Specimen S/N 021 Kinetics exp.Test Eng: L. E. MobleyCVAC Insp: NAUSAF Insp: NA

Paragraph	Specification Requirement	Remarks
4.2.1.1d	+160° F w/ 45 lb L.H. Test - Proof cycle @ ambient pressure	
1.4	Operating Time: Start <u>11:45</u> hrs. Stop <u>11:54</u> hrs. Assembly Cycles <u>2</u> Start _____ hrs. Stop _____ hrs.	

Notes: 1. Dielectric strength and Insulation Resistance
cannot be tested at ^{+160° F} ~~ambient~~ Hy. Accessory
on this test, NA will be entered in the
data box when this information is
performed.

Para. 4.1.7
 For para. 2.1.1d Specimen S/N 001 Kinetics Date: 7-30-54
Corp. Spec. Engineer: P. T. Mokley
 CVAC Insp: NA
 USAF Insp: NA

* Indicates out of tolerance

ASSEMBLY CYCLE OPERATION

Control voltage	Para 4.1.8 step	Time (seconds)	tolerance (seconds)	Type of assembly cycle	
				Int. to Int.	Ext. to Int.
18V	a	.262	3 max		
18V	d	.248	3 max		
30V	f	.117	2 max		
30V	i	.133	2 max		
25V	j	.140	2 max		
25V	k	.163	2 max		

DIELECTRIC STRENGTH:

All circuits satisfactory - - - See Note 1 - YES ☐ NO ☐

INSULATION RESISTANCE:

All circuits measured greater than 10 megohms - - - See Note 1 - YES ☐ NO ☐

SWITCH COMPONENTS AND NON-CONTINUITY

All switches satisfactory

Para 4.1.8 step	YES	NO see note	Switch position	
			Internal	External
f				
i				
j				
k				

CYCLE SEQUENCE TIME: (90 milliseconds min' max)

External to Internal 5.0 milliseconds

Internal to External 4.7 milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.F.C. Chan. No.	In to Ex msec	Ex to In msec	Circuit	C.F.C. Chan. No.	In to Ex msec	Ex to In msec
P14	F	4.60	5.63	P121	H	2.06	5.1
P12	G	6.74	8.15	P22	O	7.22	9.0
P3C	H	5.81	9.1	P34	P	2.89	11.1
P36	I	2.22	3.0	P44	Q	7.30	9.4
P40	J	9.52	9.62	P16	R	4.45	5.1
P18	K	6.02	6.65	P28	S	9.37	11.0
P20	L	6.02	7.7	P28	T	2.62	3.2
P26	M	2.54	4.7				

VOLTAGE DROP:

Maximum Control Voltage (30 V.)

Switch in External Position			Switch in Internal Position		
SW. NO.	CIRCUIT	DATA	SW. NO.	CIRCUIT	DATA
A	J701C - J701D	0.112	A	J701A - J701D	0.158
B	J706P - J705L	0.129	B	J701A - J705L	0.165
C	J706T - J705K	0.133	C	J701A - J705K	0.170
D	J706 - J705I	0.129	D	J701A - J705I	0.167
E	J706H - J705C	0.128	E	J701A - J705C	0.161
F	J706B - J705A	0.100	F	J702A - J705A	.057
G	J706C - J705D	0.122	G	J702B - J705D	.074
H	J706Y - J705F	0.110	H	J702B - J705F	.036
I	J706a - J705G	0.120	I	J702C - J705G	.079
J	J706I - J705N	0.084	J	J702C - J705N	.028
K	J706G - J705J	0.122	K	J702A - J705J	.065
L	J706L - J705M	0.130	L	J702A - J705M	.069
M	J706V - J705P	0.138	M	J702B - J705P	.082
N	J706K - J705X	0.128	N	J702C - J705X	.085
O	J706J - J705A	0.118	O	J702A - J705A	.088
P	J706E - J705C	0.110	P	J702B - J705C	.054
Q	J706R - J705J	0.101	Q	J702C - J705J	.059
R	J706F - J705N	0.124	R	J702A - J705N	.091
S	J706Y - J705R	0.112	S	J702B - J705R	.056
T	J706E - J705T	0.100	T	J702C - J705T	.043

CONTINUITY CHECK:

All circuits indicated continuity Yes ☐ No ☐ See Notes

4.2.1.1d + 160°F w/ 95% RH
Proof Cycle @ ambient pressure

B

Date: 7-30-59Page 33Test Envr: R.T. Mobley

Report 7A2236

VAC Insp: NAVSAF Insp: NA

VOLTAGE (V):

Minimum Control Voltage (25 V.)

Switch in External Position			Switch in Internal Position		
Pos. No.	WIRING	DATA	Pos. No.	WIRING	DATA
A	J701C - J701D	.113	A	J701A - J701D	.159
B	J701F - J701L	.129	B	J701A - J701L	.166
C	J701E - J701K	.135	C	J701A - J701K	.174
D	J701G - J701J	.127	D	J701A - J701J	.172
E	J701F - J701C	.126	E	J701A - J701C	.163
F	J701E - J701A	.094	F	J701A - J701A	.056
G	J701G - J701B	.037 .124	G	J701F - J701D	.074
H	J701I - J701F	.095	H	J701E - J701F	.036
I	J701G - J701K	.120	I	J701E - J701K	.073
J	J701F - J701K	.083	J	J701E - J701K	.028
K	J701G - J701L	.120	K	J701A - J701L	.065
L	J701H - J701M	.145	L	J701A - J701M	.067
M	J701I - J701P	.140	M	J701E - J701P	.081
N	J701G - J701B	.130	N	J701E - J701B	.085
O	J701G - J701A	.122	O	J701A - J701A	.088
P	J701G - J701C	.110	P	J701E - J701C	.054
Q	J701H - J701E	.162	Q	J701E - J701E	.059
R	J701F - J701D	.124	R	J701A - J701D	.092
S	J701F - J701C	.112	S	J701B - J701C	.056
T	J701I - J701C	.108	T	J701C - J701I	.042

B

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results: *Undetermined - See* Date: *7/30/59*Specimen S/N *001 ICENETICS* Re-test Test Lng: *MORLEY-LAVENDER-HANSON*
CVAC Insp: *DA*
USAF Insp: *NA*

Paragraph	Specification Requirement	Remarks
4.2.1.1 d)	<i>+16.0°F Hot test Proof cycle @ 1 mm Hg.</i>	
2.4	Operating Time: Start <i>1154</i> hrs. Stop <i>1159</i> hrs. Assembly Cycles <i>10</i> Start _____ hrs. Stop _____ hrs.	

Notes:

- 1. (1.4 mm) Hg AT THE END OF (10 MIN.)*
- 2. AC switch transfer time and cycle sequence not recorded during this run because of test-set-up problems. See re-run of test made on 8-3-59.*

Para. 4.1.9
 For para. 4.2.11.6 Specimen S/N 001 KINETICS Date: 7-30-59
 Engineer: H. J. L. LAURENCE
 CVAC Insp: NA
 USAF Insp: NA

• Indicates out of tolerance

ASSEMBLY CYCLE OPERATION

Control voltage	Para 4.1.8 step	Time (seconds)	Tolerance (seconds)	Type of assembly cycle	
				Int. to Ext	Ext. to Int
16V	2	254	3 max		
16V	4	243	3 max		
30V	1	132	2 max		
30V	1	151	2 max		
25V	1	133	2 max		
25V	1	171	2 max		

DIELECTRIC STRENGTH

All circuits satisfactory - - - - - NA YES ☐ NO ☐

INSULATION RESISTANCE

All circuits measured greater than 10 megohms - - - YES ☐ NO ☐ NA

SWITCH CONTINUITY AND NON-CONTINUITY

All switches satisfactory

Para 4.1.8 step	YES	NO see note	Switch position	
			Internal	External
1				
2				
3				
4				

CYCLE STABILITY TIME (20 : seconds minimum)

External to Internal _____ milliseconds See TC-144 at

Internal to External _____ milliseconds this test 8-3-59

POSITION TRANSFER TIME (15 milliseconds maximum)

Circuit	C.F.C. Chan. No.	In to Ex	Ex to In	Circuit	C.F.C. Chan. No.	In to Ex	Ex to In
P11	F			P12	M		
P12	G			P22	C		
P13	H			P31	P		
P16	I			P17	S		
P19	J			P16	R		
P18	K			P28	S		
P20	L			P38	T		
P26	N						

4.2.1.1 d. +160° @ 1

VOLTAGE DROP:

Maximum Control Voltage (30 V.)

VOL

Switch in External Position			Switch in Internal Position		
SW. NO.	CIRCUIT	DATA	SW. NO.	CIRCUIT	DATA
A	J701G - J701D	0.115	A	J701A - J701D	0.159
B	J701P - J701L	0.132	B	J701A - J701L	0.169
C	J701T - J701K	0.134	C	J701A - J701K	0.170
D	J701G - J701F	0.124	D	J701A - J701F	0.175
E	J701G - J701C	0.128	E	J701A - J701C	0.166
F	J701G - J701A	0.044	F	J701A - J701A	0.056
G	J701G - J701L	0.135	G	J701B - J701D	0.074
H	J701G - J701F	0.130	H	J701B - J701F	0.036
I	J701G - J701C	0.122	I	J701C - J701K	0.080
J	J701G - J701K	0.085	J	J701C - J701A	0.028
K	J701G - J701L	0.122	K	J701A - J701L	0.069
L	J701G - J701D	0.130	L	J701A - J701K	0.070-0.069
M	J701G - J701P	0.125	M	J701B - J701F	0.082
N	J701G - J701F	0.134	N	J701C - J701K	0.081
O	J701G - J701A	0.120	O	J701A - J701A	0.088
P	J701G - J701C	0.113	P	J701B - J701K	0.054
Q	J701G - J701L	0.122	Q	J701C - J701A	0.060
R	J701G - J701D	0.126	R	J701A - J701K	0.092
S	J701G - J701P	0.112	S	J701B - J701K	0.056
T	J701G - J701F	0.102	T	J701C - J701K	0.044

CONTINUITY CHECK:

All circuits indicated continuity Yes ☐ No ☐ See Notes

180 CHANGE OVER WAS ATTEMPTED BUT
POWER SUPPLY OUTPUT WAS OFF.

115.6 SPECIMEN TEMP. +200°F

PRESSURE WAS 1.4 MM H₂ AND LOADS WERE
REMOVED TO ALLOW SPECIMEN TO COOL OFF.

COOLED FOR (10 MIN.) TEMP. CONT. TO CLIMB. TO 210°F
HEATING RODS IN TEMP. CHAMBER WERE LEFT
ON AND COULD HAVE POSSIBLY CAUSED RADIANT
HEAT ON THE SPECIMEN

A

Date: 7-30-59

Page 36

Test Unit: Mobley/Lewender/Hansen

Report 7A2236

VAC Insp: NA

GAAP Insp: NA

60° @ 1 min Hg.

VOLTAGE DROP:

Minimum Control Voltage (25 V.)

Switch in External Position				Switch in Internal Position			
Pos.	ME.	SWITCH	VOLTS	Pos.	ME.	SWITCH	VOLTS
A		J701C - J701D	0.112	A		J701A - J701B	0.153
B		J702F - J702L	0.131	B		J702A - J702L	0.171
C		J702F - J702E	0.137	C		J701A - J702A	0.114
D		J702C - J702D	0.130	D		J702A - J702C	0.170
E		J702F - J702C	0.130	E		J702A - J702C	0.166
F		J702E - J702A	0.045	F		J702C - J702A	0.038
G		J702C - J702D	0.123	G		J702C - J702D	0.076
H		J702F - J702C	0.103	H		J702C - J702F	0.038
I		J702A - J702C	0.123	I		J702C - J702A	0.082
J		J702C - J702F	0.123 0.039	J		J702C - J702F	0.027
K		J702C - J702L	0.126	K		J702C - J702L	0.067
L		J702F - J702M	0.132	L		J702C - J702M	0.072
M		J702C - J702P	0.147	M		J702C - J702P	0.083
N		J702C - J702B	0.136	N		J702C - J702B	0.089
O		J702C - J702A	0.123	O		J702C - J702A	0.030
P		J702C - J702C	0.112	P		J702C - J702C	0.036
Q		J702C - J702C	0.108	Q		J702C - J702C	0.063
R		J702C - J702A	0.121	R		J702C - J702A	0.034
S		J702C - J702B	0.116	S		J702C - J702B	0.038
T		J702C - J702C	0.103	T		J702C - J702C	0.045

MAX. SPECIMEN TEMP BEFORE RODS WERE SHUT OFF
226° F.

2° F.
T
DIAMNT

B

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results: *Satisfactory*Date: *7-31-59*Specimen S/N *001 Kinetics Corp. Specimen*Test Engr: *R. T. Mobley*CVAC Insp: *NA*USAF Insp: *NA*

Paragraph	Specification Requirement	Remarks
4.2.1.1e	+40° w/95%RH	Specimen temp. at beginning of proof cycle +45°F
1.4	Operating Time: Start <i>115.4</i> hrs. Stop <i>120.4</i> hrs. Assembly Cycles <i>8</i> Start _____ hrs. Stop _____ hrs.	

Notes:

Para. 4.1.9
 For para. 4.2.1.1(e) Specimen S/N 001

Date: 7-31-59
 Engineer: R. T. Mabley
 CVAC Insp: NA
 USAF Insp: NA

* Indicates out of tolerance

Kinetics Corp.

ASSEMBLY CYCLE OPERATION:

Control voltage	Para 4.1.8 step	Time (seconds)	tolerance (seconds)	Type of assembly cycle	
				Int. to Ext.	Ext. to Int.
18V	a	.225	1 max		
18V	d	.223	1 max		
30V	f	.113	2 max		
30V	i	.112	2 max		
25V	j	.155	2 max		
25V	j	.053	2 max		

DIELECTRIC STRENGTH:

All circuits satisfactory - - - *Could not accomplish* YES ☐ NO ☐

INSULATION RESISTANCE:

All circuits measured greater than 10 megohms - - - *Could not accomplish* YES ☐ NO ☐

SWITCH CONTINUITY AND NON-CONTINUITY

All switches satisfactory

Para 4.1.8 step	YES	NO see note	Switch position	
			Internal	External
1				
1				
1				
1				

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 78 milliseconds

Internal to External 40 milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.E.C. Chan. No.	In to Ex msec	Ex to In msec	Circuit	C.E.C. Chan. No.	In to Ex msec	Ex to In msec
P14	P	6	5.5	P42	N	2.5	6.5
P32	Q	6	6.5	P22	O	9	2.0
P30	H	3.5	8.5	P34	P	6	6.5
P36	I	3.5	8.0	P11	Q	7	2.5
P40	J	11.5	13.25	P16	R	5	5.5
P18	K	6	8.0	P28	S	9	11.0
P20	L	6	6.5	P38	T	2.5	2.0
P26	M	2.5	3.0				

VOLTAGE DROP:

Maximum Control Voltage (30 V.)

VOLT

Switch in External Position			Switch in Internal Position		
SW. NO.	CIRCUIT	DATA	SW. NO.	CIRCUIT	DATA
A	J701C - J701D	0.093	A	J701A - J701D	.149
B	J706P - J705L	0.119	B	J701A - J705L	.153
C	J706T - J705K	0.136	C	J701A - J705K	0.177
D	J706V - J705J	0.113	D	J701A - J705J	0.159
E	J706R - J705C	0.112	E	J701A - J705C	0.153
F	J706B - J702A	2.066	F	J702A - J703M	0.042
G	J706C - J703D	0.100	G	J702B - J703B	0.056
H	J706Y - J703F	0.073	H	J702B - J703F	0.026
I	J706a - J703G	0.100	I	J702C - J703G	0.070
J	J706F - J703K	0.060	J	J702C - J703K	0.021
K	J706G - J703L	0.100	K	J702A - J703L	0.057
L	J706H - J703M	0.110	L	J702A - J703M	0.052
M	J706W - J703P	0.110	M	J702B - J703P	0.021
N	J706E - J703F	0.108	N	J702C - J703B	0.076
O	J706J - J704A	0.108	O	J702A - J704A	0.078
P	J706d - J704C	0.090	P	J702B - J704C	0.045
Q	J706R - J704J	0.082	Q	J703C - J704J	0.049
R	J706F - J704N	0.155	R	J702A - J704N	0.281
S	J706X - J704R	0.097	S	J702B - J704R	0.046
T	J706b - J704T	0.031	T	J703C - J704T	0.036

CONTINUITY CHECK:

All circuits indicated continuity . . . Yes ☒ No ☐ See Notes

4.2.1.1e +40°F @ 95% R.H.

A

Date: 7-31-'59Page 39Test Engt: R.T. Mobley

Report 7A2236

HVAC Insp: NABAP Insp: NA

VOLTAGE DROP:

Minimum Control Voltage (25 V.)

Switch in External Position				Switch in Internal Position			
SW. NO.	CIRCUIT	DATA	SW. NO.	CIRCUIT	DATA		
A	J701C - J701D	0.091	A	J701A - J701D	0.143		
B	J702F - J705L	0.119	B	J701A - J705L	0.151		
C	J706T - J705K	0.140 now	C	J701A - J705K	0.174		
D	J706S - J705J	0.144 0.114	D	J701A - J705J	0.154		
E	J706R - J705C	0.141	E	J701A - J705C	0.150		
F	J706E - J703A	0.067	F	J702A - J703A	0.140 now	0.041	
G	J706C - J703D	0.105	G	J702B - J703D	0.065 now	0.064	
H	J702Y - J703F	0.076	H	J702B - J703F	0.065 now	0.025	
I	J706A - J703C	0.100	I	J702E - J703C	0.082 now	0.068	
J	J706I - J703K	0.061	J	J702E - J703K	0.082 now	0.020	
K	J706C - J703L	0.104	K	J702A - J703L	0.140 now	0.056	
L	J706H - J703M	0.110	L	J702A - J703M	0.140 now	0.059	
M	J706A - J703P	0.114	M	J702B - J703P	0.065 now	0.069	
N	J706C - J703R	0.110	N	J702C - J703R	0.082 now	0.073	
O	J706C - J704A	0.102	O	J702A - J704A	0.076		
P	J706I - J704C	0.091	P	J702B - J704C	0.044		
Q	J706C - J704E	0.085	Q	J702C - J704E	0.048		
R	J706T - J704B	0.113	R	J702A - J704B	0.080		
S	J706T - J704B	0.095	S	J702B - J704B	0.045		
T	J706A - J704T	0.084	T	J702C - J704T	0.035		

B

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results: Sat. Re-Test Date: 7-31-59Specimen S/N 001 KINETICSTest Engr: MURLEY-HANSON-LAQUEUR
CVAC Insp: NA
ISAP Insp: NA

Paragraph	Specification Requirement	Remarks
4.2.1.1c	- 30°F @ 1mm Hg. Re-run of 001.	
1.4	Operating Time: Start <u>116.4</u> hrs. Stop <u>116.8</u> hrs. Assembly Cycles 8 Start _____ hrs. Stop _____ hrs.	

Notes: 1. Reached 1.7mm Hg. in 10 min. Specimen at -29°F

2. SPECIMEN TEMP. AT END OF PROOT CYCLE +13°F

Para. 4.1.9 Re-Test
 For para. 4.2.1.1.6 Specimen S/N 001 Kinetic

Date: 2-51-59
 Engineer: R.T. Mobley
 CVAC Insp: NA
 USAF Insp: NA

* Indicates out of tolerance

ASSEMBLY CYCLE OPERATION:

Control voltage	Para 4.1.6 step	Time (seconds)	tolerance (seconds)	Type of assembly cycle	
				Int. to Ext.	Ext. to Int.
18V	a	.395	3 max		
18V	b	.204	3 max		
30V	c	.180	2 max		
30V	d	.149	2 max		
25V	e	.163	2 max		
25V	f	.164	2 max		

DIELECTRIC STRENGTH:

All circuits satisfactory - Could not do YES ☐ NO ☐

INSULATION RESISTANCE:

All circuits measured greater than 10 megohms - Could not do YES ☐ NO ☐

SWITCH CONTINUITY AND NON-CONTINUITY:

All switches satisfactory

Para 4.1.6 step	YES	NO see note	Switch position	
			Internal	External
a				
b				
c				
d				
e				
f				

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 50 milliseconds

Internal to External 50 milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.B.C. Chan. No.	In to Ex msec	Ex to In msec	Circuit	C.B.C. Chan. No.	In to Ex msec	Ex to In msec
P14	F	8	7	P12	H	3	3.5
P32	G	9	6.5	P22	O	10	8.0
P30	H	3	2.0	P34	P	2.5	6.5
P36	I	12	4.5	P14	Q	11	8.0
P40	J	12	10.5	P16	R	7	6.0
P18	K	8.5	9.5	P28	S	13	11.0
P20	L	11	7	P3	T	3	2.5
P26	M	5	3.5				

VOLTAGE DROP:

Maximum Control Voltage (30 V.)

VOL

Switch in External Position			Switch in Internal Position		
SW. NO.	CIRCUIT	DATA	SW. NO.	CIRCUIT	DATA
A	J701C - J701D	0.082	A	J701A - J701D	0.147 0.127
B	J701F - J701L	0.119	B	J701A - J701L	0.127 0.149
C	J701T - J701K	0.112	C	J701A - J701K	0.147
D	J701 - J701	0.109	D	J701A - J701	0.149
E	J701 - J701	0.104	E	J701A - J701	0.139
F	J701 - J701	0.058	F	J701 - J701	0.036
G	J701 - J701	0.098	G	J701 - J701	0.060
H	J701 - J701	0.064	H	J701 - J701	0.020
I	J701 - J701	0.044	I	J701 - J701	0.063
J	J701 - J701	0.053	J	J701 - J701	0.017
K	J701 - J701	0.045	K	J701 - J701	0.050
L	J701 - J701	0.100	L	J701 - J701	0.053
M	J701 - J701	0.100	M	J701 - J701	0.064
N	J701 - J701	0.100	N	J701 - J701	0.064
O	J701 - J701	0.495	O	J701 - J701	0.072
P	J701 - J701	0.090	P	J701 - J701	0.039
Q	J701 - J701	0.073	Q	J701 - J701	0.042
R	J701 - J701	0.045	R	J701 - J701	0.014
S	J701 - J701	0.086	S	J701 - J701	0.040
T	J701 - J701	0.074	T	J701 - J701	0.030

WILLIAM OWEN

All circuits indicated continuity Yes ☒ No ☐ See Notes

& 4.2.1.10 Re-Test -30°F @ 1mm Hg.

A

Date: 7-31-'59

Page 42

Test Engr: R.T. Mobley

Report 7A2236

CVAC Insp: NA

ESAY Insp: NA

VOLTAGE IRON

Minimum Control Voltage (25 V.)

Switch in External Position				Switch in Internal Position			
No. XX	START	DATA		No. XX	START	DATA	
A	J701C - J701B	0.085		A	J701A - J701B	0.129	
B	J701F - J701L	0.118		B	J701A - J701L	0.153	
C	J701E - J701K	0.113		C	J701A - J701K	0.154	
D	J701G - J701J	0.108		D	J701A - J701J	0.149	
E	J701F - J701G	0.106		E	J701A - J701G	0.143	
F	J701E - J701A	0.054		F	J702A - J702A	0.000	
G	J701G - J701D	0.048		G	J702B - J702D	0.063	
H	J701Y - J701X	0.066		H	J702B - J702E	0.020	
I	J701A - J701C	0.014		I	J702C - J701G	0.065	
J	J701F - J701K	0.054		J	J702E - J701L	0.017	
K	J701C - J701L	0.075		K	J702A - J701L	0.050	
L	J701F - J701M	0.000		L	J702A - J702M	0.055	
M	J701A - J701F	0.100		M	J702B - J701F	0.065	
N	J701F - J702B	0.077		N	J702B - J702E	0.070	
O	J701C - J701A	0.045		O	J702A - J701A	0.074	
P	J701G - J701C	0.040		P	J702B - J701C	0.040	
Q	J701G - J701E	0.014		Q	J702C - J701E	0.047	
R	J701F - J701A	0.049		R	J702A - J701E	0.077	
S	J701F - J701B	0.057		S	J702B - J701B	0.040	
T	J701A - J701E	0.070		T	J702C - J701E	0.030	

B

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

Re-Test
 General Test Results: Satisfactory Date: 8-3-'51
 Specimen S/N 001. Kinetics Corp. Test Engr: R. E. Mobley
Specimen CVAC Insp: NA
 USAP Insp: NA

Paragraph	Specification Requirement	Remarks
4.2.1.1 d	+160°F Hot test @ 1mm Hg. Re-run of this test on SN 001	
1.4	Operating Time: Start <u>116.8</u> hrs. Stop _____ hrs. Assembly Cycles <u>10</u> Start _____ hrs. Stop _____ hrs.	

- Notes:
1. Achieved 1mm Hg in 4 1/2 minutes
 2. CEC run I to E to I mag #. 157
 3. The specimen was inspected prior to performing this test. It was noted that the potting had expanded and was expanded out of the potting molds. A Hypot test was run at the end of the proof cycle to determine if any damage had been done to the dielectric strength when potting deformed.

Para. 4.19 Re-TestFor para. 2.3.1.1 Specimen S/N QOL Kinetics
Corp. SpecimenDate: 8-3-'59Engineer: R. T. MobleyCVAC Insp: NAUSAF Insp: NA

* Indicates out of tolerance

ASSEMBLY CYCLE OPERATION:

Control voltage	Para 4.1.8 step	Time (seconds)	Tolerance (seconds)	Type of assembly cycle	
				Int. to Ext	Ext. to Int
18V	1	.287	3 max		
18V	1	.247	3 max		
30V	1	.118	2 max		
30V	1	.141	2 max		
25V	1	.154	2 max		
25V	1	.152	2 max		

DIELECTRIC STRENGTH:

All circuits satisfactory

Performed at end of Proof Cycle

YES ☒ NO ☐

INSULATION RESISTANCE:

All circuits measured greater than 10 megohms - - - YES

see note

YES ☒ NO ☐

SWITCH CONTINUITY AND NON-CONTINUITY

All switches satisfactory

Para 4.1.8 step	YES	NO see note	Switch position	
			Internal	External
1				
2				
3				
4				

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 58.1 millisecondsInternal to External 66.6 milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.F.C. Chan. No.	In to Ex msec	Ex to In msec
P11	F	9.8	8.05
P12	G	12.15	8.82
P13	H	11.05	8.83
P14	I	6.30	3.18
P15	J	12.60	18.0
P16	K	8.60	10.15
P17	L	8.30	8.82
P18	M	5.10	4.56

Circuit	C.F.C. Chan. No.	In to Ex msec	Ex to In msec
P12	N	2.65	2.51
P22	O	11.85	12.45
P32	P	12.70	14.65
P42	Q	15.40	12.45
P16	R	7.58	6.48
P28	S	6.08	11.15
P38	T	2.40	2.11

Date: 8-3-'59Page 45Test Engr: R. T. Mobley

Report 7A2236

CVAC Insp: NAISAP Insp: NA

VOLTAGE DROP:

Minimum Control Voltage (25 V.)

Switch in External Position			Switch in Internal Position		
SW. NO.	CIRCUIT	DATA	SW. NO.	CIRCUIT	DATA
A	J701C - J701D	0.102	A	J701A - J701D	0.143
B	J701F - J701L	0.130	B	J701A - J701L	0.169
C	J701E - J701K	0.134	C	J701A - J701K	0.172
D	J701G - J701J	0.129	D	J701A - J701J	0.169
E	J701F - J701C	0.124	E	J701A - J701C	0.165
F	J701E - J701A	0.098	F	J702A - J702A	0.051
G	J701C - J701D	0.120	G	J702B - J702D	0.026
H	J701I - J701F	0.102	H	J702B - J702F	0.035
I	J701A - J701G	0.118	I	J702C - J701C	0.081
J	J701F - J701K	0.087	J	J702E - J701K	0.023
K	J701C - J701L	0.120	K	J702A - J701L	0.069
L	J701H - J701M	0.124	L	J702A - J702M	0.025
M	J701A - J701P	0.135	M	J702B - J702P	0.082
N	J701F - J701B	0.130	N	J702C - J702B	0.087
O	J701C - J701A	0.124	O	J702A - J702A	0.086
P	J701A - J701C	0.110	P	J702B - J702C	0.057
Q	J701E - J701J	0.101	Q	J702C - J702C	0.060
R	J701F - J701A	0.126	R	J702A - J702A	0.087
S	J701J - J701B	0.110	S	J702B - J702B	0.060
T	J701I - J701F	0.100	T	J702C - J702I	0.045

B

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results: *Satisfactory*Specimen S/N *001. Kinetics Inf.*
*Specimen*Date: *10-16-57*Test Engr: *R.T. Mobley*CVAC Insp: *NA*USAF Insp: *NA*

Paragraph	Specification Requirement	Remarks
4.4	Post Acceleration Proof Test	Midwest Recording, I-E-I May.# 137 record # 876
1.4	Operating Time: Start <i>10:01</i> hrs. Stop <i>10:25</i> hrs. Assembly Cycles <i>24</i> Start _____ hrs. Stop _____ hrs.	

Notes: 1. Results of Operating Acceleration
were completely satisfactory.

Para. 4.4For para. 4.4 Specimen S/N CalDate: 10-10-51Engineer: R. L. Mobley

CVAC Insp: _____

USAF Insp: _____

* Indicates out of tolerance

ASSEMBLY CYCLE OPERATION

Control voltage	Para 4.1.8 step	Time (seconds)	Tolerance (seconds)	Type of assembly cycle	
				Int. to Int	Ext. to Int
15V	1	130	1 max		
15V	1	139	1 max		
30V	1	107.2	2 max		
30V	1	104.5	2 max		
25V	1	104.5	2 max		
25V	1	109	2 max		

DIELECTRIC STRENGTH

All circuits satisfactory - - - - - YES ☒ NO ☐

INSULATION RESISTANCE

All circuits measured greater than 10 megohms - - - YES ☒ NO ☐

SWITCH CONTINUITY AND NON-CONTINUITY

All switches satisfactory

Para 4.1.8 step	YES	NO see note	Switch position	
			Internal	External
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

CYCLE SEQUENCE TIME (20 milliseconds minimum)

External to Internal 52 millisecondsInternal to External 50 milliseconds

POSITION TRANSFER TIME (15 milliseconds maximum)

Circuit	C.F.C. Chan. No.	In to Ex	Ex to In	Circuit	C.F.C. Chan. No.	In to Ex	Ex to In
PL1	1	6.4	6.2	PL2	2	6.5	6.5
PL2	2	6.4	6.2	PL3	3	6.8	7.5
PL3	3	6.4	6.2	PL4	4	6.3	7.8
PL4	4	6.4	6.2	PL5	5	6.7	8.3
PL5	5	7.5	7.4	PL6	6	7.2	7.2
PL6	6	6.4	6.4				
PL7	7	7.2	7.5				
PL8	8	7.5	7.5				

VOLTAGE DROP:

Maximum Control Voltage (30 V.)

VOLT

Switch in External Position			Switch in Internal Position			
SW. NO.	CIRCUIT	DATA	SW. NO.	CIRCUIT	DATA	SW.
A	J701G - J701D	0.108	A	J701A - J701D	0.141	A
B	J706P - J705L	0.069.126	B	J701A - J705L	0.159	B
C	J706T - J705K	2.055.141	C	J701A - J705K	0.174	C
D	J706I - J705J	2.064.152	D	J701A - J705J	0.164	D
E	J706H - J705C	NA SEE NOTE	E	J701A - J705C	2-NA SEE NOTE	E
F	J706B - J702A	0.290	F	J702A - J702A	0.053	F
G	J706C - J702D	0.112	G	J702B - J702B	0.066	G
H	J706Y - J702F	0.140	H	J702A - J702F	0.037	H
I	J706A - J702C	0.103	I	J702C - J702C	0.012	I
J	J706F - J702K	0.036	J	J702C - J702K	0.028	J
K	J706G - J702L	0.112	K	J702A - J702L	0.063	K
L	J706H - J702M	0.111	L	J702A - J702M	0.066	L
M	J706W - J702P	0.104	M	J702B - J702P	0.062	M
N	J706X - J702F	0.110	N	J702C - J702F	0.275	N
O	J706C - J702A	0.115	O	J702A - J702A	0.079	O
P	J706B - J702C	0.047	P	J702B - J702C	0.052	P
Q	J706R - J702J	0.078	Q	J702C - J702J	0.051	Q
R	J706F - J702N	0.118	R	J702A - J702N	0.080	R
S	J706X - J702E	0.078	S	J702B - J702E	0.050	S
T	J706B - J702T	0.081	T	J702C - J702T	0.059	T

CONTINUITY CHECK:

All circuits indicated continuity Yes ☒ No ☐ See Notes

except 1 D.C. ckt. See Note

4.4 Post Acceleration Circuitry

11

Doc: 10-16-57Page 76Test Eng: R.T. Mobley

Report 7A2236

CVAC Insp: NAUSAF Insp: NA

VOLTAGE DROP:

Minimum Control Voltage (25 V.)

Switch in Internal Position			Switch in Internal Position		
Ref. No.	CIRCUIT	DATA	Ref. No.	CIRCUIT	DATA
A	J701C - J701D	0.111	A	J701A - J701D	0.146
B	J701P - J701L	0.129	B	J701A - J701L	0.164
C	J701R - J701K	0.142	C	J701A - J701K	0.179
D	J701S - J701J	0.133	D	J701A - J701J	0.167
E	J701R - J701C	NA	E	J701A - J701C	NA *
F	J701R - J701A	0.072	F	J702A - J703A	0.055
G	J701C - J701D	0.111	G	J702B - J703D	0.267
H	J701Y - J701F	0.102	H	J702B - J701F	0.040
I	J701A - J701G	0.108	I	J702C - J703C	0.073
J	J701S - J701K	0.093	J	J703E - J701K	0.028
K	J701C - J701L	0.110	K	J702A - J703L	0.004
L	J701R - J701M	0.111	L	J702A - J703M	0.003
M	J701R - J701P	0.105	M	J701B - J703P	0.002
N	J701Y - J701R	0.118	N	J701C - J701R	0.016
O	J701S - J701A	0.115	O	J702A - J701A	0.080
P	J701R - J701C	0.097	P	J702B - J701C	0.054
Q	J701R - J701L	0.100	Q	J701C - J701C	0.060
R	J701R - J701S	0.118	R	J702A - J701S	0.030
S	J701R - J701R	0.100	S	J701B - J701R	0.027
T	J701R - J701T	0.091	T	J701C - J701T	0.040

See note on 1st of
these 3 sheets

B

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results: *Satisfactory* Date: *10-19-58*
Specimen S/N *QAL Kinetics* Test Engr: *R.T. Meekley*
CVAC Insp: *N/A*
USAF Insp: *N/A*

Paragraph	Specification Requirement	Remarks
4.5	<i>Life Test</i>	
1.4	Operating Time: Start _____ hrs. Stop _____ hrs. Assembly Cycles Start _____ hrs. Stop _____ hrs.	

Notes: 1. The following two data sheets contain voltage drop data measured at 350 assembly cycles and at 500 assembly cycles.

VOLTAGE DROP:

Maximum Control Voltage (29.5V)

Switch In External Position			Switch In Internal Position		
SW. MK.	CIRCUIT	DATA	SW. MK.	CIRCUIT	DATA
A	J701C - J701E	0.123	A	J701A - J701D	.124
B	J706P - J705L	.120	B	J701A - J705L	.141
C	J706T - J705K	.139	C	J701A - J705K	.154
D	J706S - J705J	.127	D	J701A - J705J	.142
E	J706R - J705C	NA	E	J701A - J705C	NA
F	J706B - J703A	.088	F	J702A - J703A	.053
G	J706C - J703D	.108	G	J702B - J703D	.064
H	J706Y - J703F	.096	H	J702B - J703F	.040
I	J706G - J703G	.105	I	J702C - J703G	.071
J	J706E - J703K	.080	J	J702C - J703K	.022
K	J706G - J703L	.108	K	J702A - J703L	.064
L	J706H - J703M	.29	L	J702A - J703M	.062
M	J706W - J703P	.104	M	J702B - J703P	.261
N	J706K - J703R	.114	N	J702C - J703R	.073
O	J706T - J704A	.115	O	J702A - J704A	.082
P	J706J - J704C	.095	P	J702B - J704C	.052
Q	J706R - J704J	.092	Q	J702C - J704J	.058
R	J706P - J704M	.115	R	J702A - J704M	.081
S	J706A - J704R	.096	S	J702B - J704R	.055
T	J706B - J704T	.089	T	J702C - J704T	.040

CONTINUITY CHECK:

All circuits indicated continuity. N.A Yes ☐ No ☐ See notes

Life Test: Voltage drop: at 350 assembly cycles, control voltage at 29.5 volts first reading in the ext position, made one assembly cycle to int. position.

Cont. life cycling of specimen

2. Voltage drop measurements made the normal way, using test set.

A

Date: 19 Oct 1957Page 50Test Eng: R. T. Mackley

Report 7A2236

CVAC Insp: NAISAP Insp: NA

VOLTAGE DROP:

Minimum Control Voltage (25 V.)

Switch in Internal Position			Switch in Internal Position		
SW. NO.	CIRCUIT	DATA	SW. NO.	CIRCUIT	DATA
A	J701C - J701D	NA	A	J701A - J701D	NA
B	J701E - J701L		B	J701A - J701L	
C	J701T - J701X		C	J701A - J701X	
D	J701S - J701J		D	J701A - J701J	
E	J701F - J701G		E	J701A - J701G	
F	J701E - J703A		F	J702A - J703A	
G	J701E - J703D		G	J702B - J703D	
H	J701Y - J702F		H	J702E - J703F	
I	J701E - J703G		I	J702G - J703G	
J	J701F - J703K		J	J702H - J703K	
K	J701G - J703L		K	J702A - J703L	
L	J701H - J703M		L	J702A - J703M	
M	J701N - J703P		M	J702B - J703P	
N	J701G - J703R		N	J702C - J703R	
O	J701G - J704A		O	J702A - J704A	
P	J701G - J704G		P	J702B - J704G	
Q	J701G - J704J		Q	J702C - J704J	
R	J701Z - J704N		R	J702A - J704N	
S	J701X - J704R		S	J702B - J704R	
T	J701I - J704Z	V	T	J702C - J704I	V

Directly across contacts at 500 cycles

VOLTAGE DROP:

Maximum Control Voltage (30 V.)

VOLTA

Switch in External Position			Switch in Internal Position			
SW. NO.	CIRCUIT	DATA	SW. NO.	CIRCUIT	DATA	SW. NO.
A	J701G - J701D	.033	A	J701A - J701D	.053	A
B	J706P - J705L	.077	B	J701A - J705L	.055	B
C	J706T - J705K	.039	C	J701A - J705K	.055	C
D	J706S - J705J	.046	D	J701A - J705J	.056	D
E	J706R - J705C	<i>This circuit NG</i>	E	J701A - J705C	<i>This circuit NG</i>	E
F	J706B - J703A	.007	F	J702A - J703A	.011	F
G	J706A - J703D	.007	G	J702B - J703B	.009	G
H	J706Y - J703F	.007	H	J702B - J703F	.010	H
I	J706a - J703G	.007	I	J702C - J703G	.011	I
J	J706f - J703K	.013	J	J702C - J703K	.009	J
K	J706G - J703L	.007	K	J702A - J703L	.014	K
L	J706H - J703M	.007	L	J702A - J703M	.010	L
M	J706W - J703P	.025	M	J702B - J703P	.012	M
N	J706g - J703R	.006	N	J702C - J703R	.011	N
O	J706J - J704A	.007	O	J702A - J704A	.010	O
P	J706d - J704C	.010	P	J702B - J704C	.011	P
Q	J706R - J704J	.006	Q	J702C - J704J	.010	Q
R	J706F - J704M	.010	R	J702A - J704M	.011	R
S	J706X - J704R	.008	S	J702B - J704R	.012	S
T	J706b - J704T	.006	T	J702C - J704T	.010	T

CONTINUITY CHECK:

All circuits indicated continuity. *NA* Yes ☐ No ☐ See Notes

Voltage drop readings made at end of Life Test directly across contacts (1st & 2nd columns) using life test set 3rd & 4th columns.

A

Date: 11-6-59Page 51Test Engr: R.T. Mobley

Report 7A2236

CVAC Insp: NAUSAF Insp: NA

VOLTAGE DROP:

Minimum Control Voltage (25%) - Made using test set up at

550 cycles

Switch in External Position				Switch in Internal Position			
SW. MK.	CIRCUIT	DATA		SW. MK.	CIRCUIT	DATA	
A	J701C - J701D	0.105		A	J701A - J701D	0.121	
B	J706P - J705L	0.104 0.123		B	J701A - J705L	0.141	
C	J706T - J705K	0.443 0.136		C	J701A - J705K	0.141	
D	J706S - J705J	0.134		D	J701A - J705J	0.144	
VE	J706R - J705C	NA		E	J701A - J705Q	NA	
F	J706E - J703A	0.090		F	J702A - J703A	0.027	
G	J706C - J703D	0.098		G	J702B - J703D	0.027	
H	J706Y - J703F	0.100		H	J702B - J703F	0.021	
I	J706A - J703G	0.053		I	J702C - J703G	0.024	
J	J706F - J703K	0.010 110		J	J703I - J703K	0.020	
K	J706C - J703L	0.110		K	J702A - J703L	0.065	
L	J706H - J703M	0.110		L	J702A - J703M	0.060	
M	J706W - J703P	0.100		M	J702B - J703P	0.027	
N	J706G - J703R	0.110		N	J702C - J703R	0.061	
O	J706J - J704A	0.110		O	J702A - J704A	0.030	
P	J706I - J704C	0.100		P	J702B - J704C	0.023	
Q	J706R - J704J	0.014		Q	J702C - J704J	0.030	
R	J706X - J704N	0.125		R	J702A - J704N	0.034	
S	J706Y - J704R	0.120		S	J702B - J704R	0.025	
T	J706U - J704T	0.073		T	J702C - J704T	0.045	

B

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results: *Satisfactory*Date: *19 July 1954*Specimen S/N *Kinetics Corp. 002*Test Eng: *R. T. Mobley*CVAC Insp: *NA*USAF Insp: *NA*

Paragraph	Specification Requirement	Remarks
4.1.8	<i>Initial Satisfactory Performance Test</i>	
1.4	Operating Time: Start <i>101.8</i> hrs. Stop <i>108.3</i> hrs. Assembly Cycles <i>16</i> Start <i>NA</i> hrs. Stop <i>NA</i> hrs.	

Notes: 1. An Initial Satisfactory Performance Test and Ambient Conditions Prot Cycle were run on this specimen 4-14-54, and the specimen failed on the latter test. The specimen was fixed and sent to the shop for repair. Data was started in Engineering, Notebook 7482 and data sheets not used.

Para. 4.1.8For para. 4.1.8 Specimen S/N 002 Kinetic Engineering Corp. specimen Date: 14 July 1959
CVAC Insp: NA
USAF Insp: NA

* Indicates out of tolerance

ASSEMBLY CYCLE OPERATION:

Control voltage	Para 4.1.8 step	Time (seconds)	tolerance (seconds)	Type of assembly cycle	
				Int. to Ext	Ext. to Int
18V	a	.195	3 MAX		
18V	d	.102	3 MAX		
30V	f	.122	2 MAX		
30V	i	.144	2 MAX		
25V	j	.142	2 MAX		
25V	j	.201	2 MAX		

DIELECTRIC STRENGTH:

All circuits satisfactory - - - - - YES ☒ NO ☐

INSULATION RESISTANCE:

All circuits measured greater than 10 megohms - - - YES ☒ NO ☐

SWITCH CONTINUITY AND NON-CONTINUITY

All switches satisfactory

Para 4.1.8 step	YES	NO see note	Switch position	
			Internal	External
f				
i				
j				

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 0.1 milliseconds.Internal to External 0.1 milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.F.C. Chan. No.	In to Ex	Ex to In	Circuit	C.F.C. Chan. No.	In to Ex	Ex to In
		ms	ms			ms	ms
P12	F	all satisfactory		P12	N		
P12	G			P22	O		
P30	H			P34	P		
P36	I			P44	Q		
P40	J			P16	R		
P18	K			P28	S		
P20	L			P38	T		
P26	M						

VOLTAGE DROP:

Maximum Control Voltage (30 V.)

Switch in External Position			Switch in Internal Position		
SW. MK.	CIRCUIT	DATA	SW. MK.	CIRCUIT	DATA
A	J701G - J701D	.106	A	J701A - J701D	.204
B	J702P - J705L	.126	B	J701A - J705L	.172
C	J702T - J705K	.123	C	J701A - J705K	.161
D	J706 - J705	.140	D	J701A - J705	.163
E	J702 - J705C	.129	E	J701A - J705C	.152
F	J706R - J701L	.074	F	J702L - J701L	.043
G	J706C - J702B	.110	G	J702B - J702B	.067
H	J706Y - J702F	.094	H	J702B - J702F	.035
I	J706A - J702C	.115	I	J702C - J702C	.075
J	J706S - J702K	.102	J	J702C - J702K	.022
K	J706G - J702L	.101	K	J702A - J702L	.058
L	J706H - J702M	.108	L	J702A - J702M	.037
M	J706V - J702P	.115	M	J702B - J702P	.069
N	J706E - J702F	.118	N	J702C - J702F	.075
O	J706C - J702A	.110	O	J702A - J702A	.080
P	J706J - J702C	.108	P	J702B - J702C	.056
Q	J706R - J702J	.108	Q	J702C - J702J	.065
R	J706F - J702N	.118	R	J702A - J702N	.080
S	J706Y - J702R	.108	S	J702B - J702R	.067
T	J706B - J702T	.102	T	J702C - J702T	.044

CONTINUITY CHECK:

All circuits indicated continuity Yes ☒ No ☐ See Notes

4.1.8 Initial Satisfactory Kinetic Corp. Specimen S/N 002

A

Date: 14 July 1959

Page 54

Test Eng: J.H. West / R.T. Mobley

Report 7A2236

CVAC Insp: Na

ISAF Insp: Na

VOLTAGE INFO:

Minimum Control Voltage (25 V.)

Switch in External Position				Switch in Internal Position			
SW. NO.	CIRCUIT	DATA		SW. NO.	CIRCUIT	DATA	
A	J701C - J701D	.101		A	J701A - J701D	.156	
B	J706P - J705L	.130		B	J701A - J705L	.169	
C	J706T - J705K	.126		C	J701A - J705K	.162	
D	J706S - J705J	.144		D	J701A - J705J	.163	
E	J706P - J705C	.129		E	J701A - J705C	.156	
F	J706E - J703A	.075		F	J702A - J703A	.044	
G	J706C - J703D	.110		G	J702B - J703D	.068	
H	J706Y - J703F	.097		H	J702B - J703F	.036	
I	J706A - J703C	.113		I	J702C - J703C	.076	
J	J706F - J702K	.083		J	J702E - J702K	.023	
K	J706C - J703L	.102		K	J702A - J703L	.059	
L	J706H - J703M	.108		L	J702A - J703M	.067	
M	J706W - J703P	.115		M	J702B - J703P	.020	
N	J706E - J703R	.118		N	J702C - J703R	.072	
O	J706J - J704A	.112		O	J702A - J704A	.029	
P	J706E - J704C	.110		P	J702B - J704C	.056	
Q	J706E - J704J	.108		Q	J702C - J704J	.065	
R	J706F - J704N	.114		R	J702A - J704N	.050	
S	J706X - J704B	.105		S	J702B - J704B	.062	
T	J706L - J704T	.102		T	J702C - J704T	.045	

002

B

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results: *Satisfactory*Date: *July 17, 1959*Specimen S/N *002 Kinetics Corp.*
*Specimen*Test Engr: *R. T. Mobley*CVAC Insp: *NA*USAF Insp: *NA*

Paragraph	Specification Requirement	Remarks
4.3	Operating Vibration "Y" Axis	Accelerometers #1 Drive #2 X 3 Y 4 Z 5 pipper
1.4	Operating Time: Start <i>109.2</i> hrs. Stop <i>109.8</i> hrs. Assembly Cycles 6, Start _____ hrs. Stop _____ hrs.	

- Notes: 1. made switch transfer @ ^{Int. Ext. Int.} 215 CPS. on mag. sh 159
 2. made switch transfer Int. Ext. Int. @ end of run
 3. When the data reduced, the run looked good.

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results:

Date:

7-20-59

Specimen S/N 002 Kinetics Corp.
Specimen

Test Engr:

R. T. Mobley

CVAC Insp:

NA

USAF Insp:

NA

Paragraph	Specification Requirement	Remarks
4.3	Operating Vib. "Z" Axis	#1 - Drive 2 - "Y" Axis 3 - "X" Axis 4 - "Z" Axis 5 - Flipper
1.4	Operating Time: Start 110.0 hrs. Stop 110.5 hrs. Assembly Cycles Start 4 hrs. Stop 4 hrs.	

- Notes: 1. Made switch test @ 120 CFS Int. - Ext. - Int.
5 - 125 CFS Midwest mag. # 137
2. It was determined at about 200 CFS that
CEC-mtr. switch was in wrong position which
meant no record 5-200 CFS. This axis will be
re-run at end of env. testing.
3. No records obtained on this run -

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results: SatisfactoryDate: 7-20-59Specimen S/N 002 Kinetics Corp.Test Engr: R.T. Mobley/L. HarkinSPECIMENCVAC Insp: NAUSAF Insp: NA

Paragraph	Specification Requirement	Remarks
4.3	Operating Vibration "X" Axis	Accelerometers #1 - Drive #2 - "Y" Axis #3 - "X" Axis #4 - Z Axis
1.4	Operating Time: Start <u>110.5</u> hrs. Stop _____ hrs. Assembly Cycles <u>4</u> Start _____ hrs. Stop _____ hrs.	

- Notes:
1. Mode SWITCH TYPER @ 140 CPS INT-EXT-INT
5-250 CPS MIDWEST MAG 1.137
 2. 250-500 CPS. ERRATIC MOVEMENT OF
PAPER WAS NOTICED DURING THIS PERIOD.
AT 500 CPS PAPER MOVEMENT COMPLETELY
STOPPED AND TEST WAS STOPPED.

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results: Satisfactory

Date: 7-24-'59Specimen S/N 202 Kinetics
Corp. SwitchTest Ingt: R. T. MobleyCVAC Insp: NAUSAF Insp: NA

Paragraph	Specification Requirement	Remarks
4.3	Post Vibration Proof Cycle	
1.4	Operating Time: Start <u>113.0</u> hrs. Stop <u>113.3</u> hrs. Assembly Cycles <u>8</u> Start _____ hrs. Stop _____ hrs.	

Notes: 1. Recording is second record on May. # 208
Int. Ext. Int.

Para. 4.1.7
For para. 4.3 Specimen S/N 002
Lin tics Corp.

Date: 7-24-59
 Engineer: R. E. Mabley
 CVAC Insp: NA
 USAF Insp: NA

* Indicates out of tolerance

ASSEMBLY CYCLE OPERATION:

Control voltage	Para 4.1.8 step	Time (seconds)	tolerance (seconds)	Type of assembly cycle	
				Int. to Ext	Ext. to Int
15V	A	200	3 MAX		
15V	A	173	3 MAX		
30V	1	115	2 MAX		
30V	1	128	2 MAX		
25V	1	141	2 MAX		
25V	1	143	2 MAX		

DIELECTRIC STRENGTH:

All circuits satisfactory - - - - - YES

☒ NO ☐

INSULATION RESISTANCE

All circuits measured greater than 10 megohms - - - FLS

NO

ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED

All switches satisfactory

Para	1.1.6	YES	NO	Switch position
Risk			see note	Internal External
2				
3				
4				
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98				
99				
100				

~~CYCLE STARTING TIME~~ 20 p (seconds minimum)

External to Internal 11 milliseconds

Internal to External 4 milliseconds

POSITION TRANSFER TIME 15 minutes maximum

Circuit	C.N.O.	In to Ex	Ex to In
Circuit	C.N.O.	In to Ex	Ex to In
P10	1	All	History
P11	2		
P12	3		
P13	4		
P14	5		
P15	6		
P16	7		
P17	8		
P18	9		
P19	10		
P20	11		

VOLTAGE DROP:

Maximum Control Voltage (30 V.)

VOLT

Switch in External Position			Switch in Internal Position			
SW. MK.	CIRCUIT	DATA	SW. MK.	CIRCUIT	DATA	SW. MK.
A	J701G - J701D	.112	A	J701A - J701D	.183	A
B	J701P - J705L	.116	B	J701A - J705L	.169	B
C	J701T - J705K	.114	C	J701A - J705K	.146	C
D	J701 - J705J	.119	D	J701A - J705J	.148	D
E	J701 - J705C	.127	E	J701A - J705C	.145	E
F	J701B - J703A	.074	F	J701A - J703A	.044	F
G	J701C - J703D	.108	G	J701B - J703D	.065	G
H	J701E - J703F	.094	H	J701B - J703F	.034	H
I	J701 - J703G	.125	I	J701C - J703G	.073	I
J	J701 - J703K	.087	J	J701C - J703K	.022	J
K	J701G - J701L	.100	K	J701A - J701L	.055	K
L	J701H - J703M	.102	L	J701A - J703M	.097	L
M	J701W - J703P	.126	M	J701B - J703P	.066	M
N	J701G - J703F	.118	N	J701C - J703F	.069	N
O	J701C - J704A	.111	O	J701A - J704A	.088	O
P	J701B - J704C	.111	P	J701B - J704C	.051	P
Q	J701R - J704J	.106	Q	J701C - J704J	.059	Q
R	J701F - J704N	.155	R	J701A - J704N	.084	R
S	J701X - J704R	.100	S	J701B - J704R	.054	S
T	J701B - J704T	.100	T	J701C - J704T	.040	T

CONTINUITY CHECK:

All circuits indicated continuity Yes ☒ No ☐ See Notes

4.3 Post Vibration Proof Cycle
Kinetics SN 802

A

Date: 7-24-'59Page 60Test Engr: R. T. Mobley

Report 7A2236

CVAC Insp: NAEAP Insp: NA

VOLTAGE DROP:

Minimum Control Voltage (25 V.)

Switch in External Position			Switch in Internal Position		
SW. NO.	CIRCUIT	DATA	SW. NO.	CIRCUIT	DATA
A	J701C - J701B	.094	A	J701A - J701B	.156
B	J701P - J701L	.120	B	J701A - J701L	.155
C	J706E - J705K	.115	C	J701A - J705K	.149
D	J706S - J705J	.123	D	J701A - J705J	.149
E	J706P - J705C	.121	E	J701A - J705C	.144
F	J706E - J703A	.074	F	J702A - J703A	.046
G	J706C - J703D	.108	G	J702B - J703D	.066
H	J706Y - J703F	.096	H	J702B - J703F	.035
I	J706A - J703C	.110	I	J702C - J703C	.070
J	J706F - J702K	.079	J	J702C - J703K	.023
K	J706C - J703L	.100	K	J702A - J703L	.055
L	J706E - J703M	.104	L	J702A - J703M	.065
M	J706W - J703P	.112	M	J702B - J703P	.067
N	J706Y - J703B	.115	N	J702C - J703B	.070
O	J706C - J704A	.114	O	J702A - J704A	.088
P	J706A - J704C	.103	P	J702B - J704C	.052
Q	J706E - J704B	.100	Q	J702C - J704B	.060
R	J706F - J704A	.118	R	J702A - J704A	.090
S	J706Y - J704B	.100	S	J702B - J704B	.053
T	J706A - J704C	.100	T	J702C - J704C	.040

B

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test results: *See notes 1 & 2*Date: *7-28-'59*Specimen S/N *002 Kinetics Corp.*
*Specimen*Test Eng: *R. T. Mooly*
CVAC Insp: *NA*
USAF Insp: *NA*

Paragraph	Specification Requirement	Remarks
4.2.1.1	Radiant Heat	Max. illu-operating temp. was 152°F
1.4	Operating Time: <i>NA</i> Start _____ hrs. Stop _____ hrs. Assembly Cycles: <i>NA</i> Start _____ hrs. Stop _____ hrs.	

- Notes: 1. This test was attempted 7-27-59 in Benico Box #8. The unit was subjected to the test per 4.2.1.1 concurrent with specimen - in 21. The Benico Box malfunctioned and the temperature rose from 125°F to 250° in 20 minute time.
2. The Box was repaired and the test cont. on 7-28-59.

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results: Satisfactory

Date: 8/4/59

Specimen S/N 002 Kinetics Corp.
specimenTest Lead: R.T. Mobley
CVAC Insp:
USAF Insp: NA

Paragraph	Specification Requirement	Remarks
4.2.1.1(c)	-65°F Cold test 3.44" Hg. 1hr. Proof cycle @ 50" Hg. -30°F	
1.4	Operating Time: Start 117.1 hrs. Stop 117.6 hrs. Assembly Cycles 12 Start _____ hrs. Stop _____ hrs.	

Notes: 1. Specimen temp. at beginning of proof cycle
- 34°F

Part. 4.1.1 Date: 8-4-59
 For para. 4.1.1.1 Specimen S/N 001 Kinetic Engineer: R.T. Mobley
 Corp. SPECIMEN CVAC Insp: N/A
 USAF Insp: N/A

• Indicate out of tolerance

ASSEMBLY CYCLE OPERATION:

Control voltage	Para 4.1.1.8 step	Time (seconds)	tolerance (seconds)	Type of assembly cycle	
				Int. to Ex	Ext. to Int
15V	1	232	1 MAX		
15V	4	264	1 MAX		
30V	1	118	2 MAX		
30V	1	163	2 MAX		
25V	1	142	2 MAX		
25V	1	171	2 MAX		

DIELECTRIC STRENGTH:

All circuits satisfactory - - - - - YES ☒ NO ☐

INSULATION RESISTANCE:

All circuits measured greater than 10 megohms - - - YES ☒ NO ☐

SWITCH CONTINUITY AND NON-CONTINUITY

All switches satisfactory

Para 4.1.1.8 step	YES		NO see note	Switch position	
				Internal	External
1					
2					
3					
4					

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 01 milliseconds

Internal to External 01 milliseconds

POSITION TRANSFER TIME: (05 milliseconds maximum)

Circuit	Chan. No.	C.F.C.	In to Ex		Ex to In	
			secs	secs	secs	secs
P14	F		All satisfactory			
P32	G					
P30	H					
P34	I					
P40	J					
P18	K					
P20	L		V	V		
P26	M					
P22	N		All satisfactory			
P22	O					
P34	P					
P42	Q					
P16	R					
P28	S					
P38	T		V	V		

CONVAIR
SAN DIEGO

FORM 11

VOLTAGE DROP:

Maximum Control Voltage (30 V.)

VOL

Switch in External Position			Switch in Internal Position		
SW. NO.	CIRCUIT	DATA	SW. NO.	CIRCUIT	DATA
A	J701C - J701D	.108	A	J701A - J701D	.200
B	J706P - J705L	<i>P2M</i> .035.116	B	J701A - J705L	.199
C	J706T - J705K	<i>P2M</i> .043.107	C	J701A - J705K	.141
D	J706 - J705J	<i>P2M</i> .035.116	D	J701A - J705J	.148
E	J706H - J705C	<i>P2M</i> .014.136	E	J701A - J705C	.146
F	J706B - J701A	.070	F	J702A - J701A	.032
G	J706C - J701D	.076	G	J702B - J701D	.063
H	J706Y - J701F	.072	H	J702B - J701F	.022
I	J706A - J701G	.165	I	J702C - J701G	.078
J	J706I - J701K	.138	J	J702C - J701K	.016
K	J706G - J701J	.091	K	J702A - J701J	.055
L	J706H - J703B	.102	L	J702A - J703B	.170
M	J706W - J703P	.120	M	J702B - J703P	.064
N	J706K - J703Y	.140	N	J702C - J703B	.070
O	J706J - J701A	.100	O	J702A - J701A	.078
P	J706D - J701C	.091	P	J702B - J701C	.047
Q	J706R - J701J	.089	Q	J702C - J701J	.099
R	J706F - J701N	.171	R	J702A - J701N	.077
S	J706X - J704R	.093	S	J702B - J704R	.050
T	J706E - J701T	.112	T	J702C - J701T	.042

CONTINUITY CHECK:

All circuits indicated continuity Yes ☒ No ☐ See Notes

4.2.1.1(c). - 65°F Cold Test

Proof cycle @ -30°F 30" Hg.

A

Date: E-4-59Page 64Test Engr: R.T. MobleyReport 7A2236TVAC Insp: NAESAF Insp: NA

VOLTAGE DROP:

Minimum Control Voltage (25 V.)

Switched in External Position				Switched in Internal Position			
id. no.	CIRCUIT	DATA		id. no.	CIRCUIT	DATA	
A	J701C - J701D	0.121		A	J701A - J701D	.217	
B	J702P - J703L	0.114		B	J701A - J703L	.163	
C	J704E - J705K	0.104		C	J701A - J705K	.140	
D	J706C - J707J	0.115		D	J701A - J707J	.151	
E	J708R - J709C	0.118		E	J701A - J709C	.153	
F	J706E - J703A	0.059		F	J702A - J703A	.033	
G	J706C - J703D	0.095		G	J702B - J703D	.064	
H	J706Y - J707F	0.070		H	J702B - J703F	.024	
I	J706A - J703C	0.195		I	J702C - J703C	.072	
J	J706I - J703L	0.066		J	J703C - J703L	.017	
K	J706C - J703L	0.088		K	J702A - J703L	.055	
L	J706H - J703M	0.105		L	J702A - J703M	.133	
M	J706W - J703P	0.102		M	J701B - J703P	.066	
N	J706Y - J703B	0.100		N	J702C - J703B	.070	
O	J706J - J702A	0.100		O	J702A - J702A	.078	
P	J706I - J702C	0.090		P	J702B - J702C	.048	
Q	J706B - J702C	0.083		Q	J702C - J702C	.054	
R	J706F - J702A	0.112		R	J702A - J702A	.077	
S	J705X - J702P	0.090		S	J702B - J702P	.050	
T	J706L - J702C	0.087		T	J702C - J702C	.040	

B

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results: *Unsatisfactory*
 Specimen SN *Q21 Kinetics Corp.*
Specimen

Date: *8-4-'54*
 Test Ingr: *Edwards/Lawender/West*
 CVAC Insp: *NA*
 USAF Insp: *NA*

Paragraph	Specification Requirement	Remarks
4.2.1.(c)	-66°F Cold Test Proof Cycle at -30°F, 1mm Hg.	Specimen temp. -29°C beginning at 1mm Hg. Specimen temp. -5°F at failure. Perkins DC power supply current noted to be 10 amperes during attempted assembly cycle
1.4	Operating Time: Start <i>117.6</i> hrs. Stop <i>118.6</i> hrs. Assembly Cycles <i>6</i> Start _____ hrs. Stop _____ hrs.	

Note: 1. 1mm @ 6.0 mins

* 2. @ 26.5 V. when making transfer from INT. to EXT. switch
 didn't transfer. The command switch on the test
 setup was thrown to Ext. position but the
 Int. light just dimmed instead of going out.
 A buzzing noise was noted until the command
 switch was thrown back to Int.

Para, 4.1.9 Date: 8-4-54
 For para. 4.1.10 Specimen SN 601 Kinetic Engineer: _____
Corp. Specimen CVAC Insp: _____
 Indicates out of tolerance USAF Insp: _____

ASSEMBLY CYCLE OPERATION:

Control voltage	Para 4.1.9 step	Time (seconds)	Tolerance (seconds)	Type of assembly cycle	
				Int. to Ex.	Ext. to Int.
10V	1	.338	3 max		
10V	2		3 max		
30V	3	.037	2 max		
30V	4	.192	2 max		
25V	5	.171	2 max		
25V	6		2 max		

DIELECTRIC STRENGTH:

All circuits satisfactory - - - - - YES ☐ NO ☐

INSULATION RESISTANCE:

All circuits measured greater than 10 megohms - - - YES ☐ NO ☐

SWITCH CONTINUITY AND NON-CONTINUITY

All switches satisfactory

Para 4.1.9 step	YES	NO see note	Switch position	
			Internal	External
1				
2				
3				
4				
5				
6				

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal _____ milliseconds

Internal to External _____ milliseconds

These data not measured because of failure on previous step.

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit Chan. No.	C.F.C.	Ex to Ex	Ex to Int.	Circuit Chan. No.	C.F.C.	Ex to Ex	Ex to Int.
P12	F			P12	N		
P12	G			P22	C		
P30	H			P34	P		
P36	I			P11	Q		
P10	J			P15	R		
P18	K			P28	S		
P20	L			P38	T		
P26	M						

VOLTAGE DROP:

Maximum Control Voltage (30 V.)

VOLTS

Switch in External Position			Switch in Internal Position			
SW. MK.	CIRCUIT	DATA	SW. MK.	CIRCUIT	DATA	SW. MK.
A	J701C - J701D	.095	A	J701A - J701D	.183	A
B	J706P - J705L	.111	B	J701A - J705L	.145	B
C	J706T - J705K	.104	C	J701A - J705K	.137	C
D	J706J - J705J	.112	D	J701A - J705J	.139	D
E	J706I - J705C	.115	E	J701A - J705C	.133	E
F	J706B - J705A	.058	F	J702A - J705A	.029	F
G	J706C - J703D	.093	G	J702B - J703D	.060	G
H	J706Y - J703F	.070	H	J702B - J703F	.019	H
I	J706M - J703C	.132	I	J702C - J703C	.066	I
J	J706F - J702K	.098	J	J702C - J702K	.014	J
K	J706G - J702J	.082	K	J702A - J702J	.050	K
L	J706H - J702M	.095	L	J702A - J702M	.073	L
M	J706V - J702P	.102	M	J702B - J702P	.062	M
N	J706X - J702F	.103	N	J702C - J702H	.066	N
O	J706J - J702A	.120	O	J702A - J702A	.073	O
P	J706I - J702C	.088	P	J702B - J702C	.044	P
Q	J706B - J702J	.081	Q	J702C - J702J	.046	Q
R	J706F - J702M	.112	R	J702A - J702M	.073	R
S	J706X - J702H	.090	S	J702B - J702H	.046	S
T	J706B - J702T	.092	T	J702C - J702T	.035	T

CONTINUITY CHECK:

All circuits indicated continuity Yes ☐ No ☐ See Notes

4.2.1.12) Cold Test @ 1mm rty.

A

Date: 8-4-59Page 1a7Test Eng: Mabley / West

Report 7A2236

HVAC Insp: NASAP Insp: NA

VOLTAGE UNIT:

Minimum Control Voltage (25 V.)

Switch in External Position				Switch in Internal Position			
SW. NO.	CIRCUIT	DATA		SW. NO.	CIRCUIT	DATA	
A	J701C - J701D	Because of Failure could not get these data.		A	J701A - J701D	.174	
B	J701F - J701L			B	J701A - J701L	.149	
C	J701T - J701Y			C	J701A - J701Y	.140	
D	J701S - J701J			D	J701A - J701J	.142	
E	J701R - J701X			E	J701A - J701X	.137	
F	J701E - J701A			F	J702A - J702A	.030	
G	J701C - J701D			G	J701B - J701D	.061	
H	J701I - J701F			H	J702B - J701F	.021	
I	J701A - J701C			I	J701C - J701C	.062	
J	J701F - J701E			J	J701C - J701E	.015	
K	J701C - J701L	✓		K	J702A - J701L	.051	
L	J701H - J701M			L	J702A - J701M	.065	
M	J701N - J701P			M	J701B - J701P	.063	
N	J701G - J701R			N	J701C - J701R	.067	
O	J701C - J701A			O	J702A - J701A	.044	
P	J701C - J701C			P	J702B - J701C	.045	
Q	J701E - J701L			Q	J701C - J701L	.048	
R	J701F - J701A			R	J701A - J701M	.024	
S	J701F - J701R			S	J701B - J701R	.048	
T	J701I - J701T			T	J701C - J701I	.035	

B

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results: *Satisfactory* Date: *6-30-54*
 Specimen S/N *002 Kinetics Corp.* Test Engr: *R. J. Mackay*
 CVAC Insp: *NA*
 USAF Insp: *NA*

Paragraph	Specification Requirement	Remarks
4.4	Operating Hrs.	The specimen was mounted on CEVAF and ran for 30 sec. in each axis and once reversed in each axis
1.4	Operating Time: <i>1 hr.</i> Start _____ hrs. Stop _____ hrs. Assembly Cycles <i>14</i> Start _____ hrs. Stop _____ hrs.	

Notes: 1. GEC recordings made during 30 sec. runs in each axis, looks good for all 6 runs.
 2. HB switch transfer time and cycle sep. measured at the end of each 30-second run. Data for these on the next 3 pages.

+ "X" Axis * - "Z" Axis

Para. 4.1.5 k 41
 For para. 4.4 Specimen S/N 666
 R140115 1017

Date: _____
 Engineer: L. L. Maki
 CVAC Insp: _____
 USAF Insp: NH

* Indicates out of tolerance

ASSEMBLY CYCLE OPERATION

Control voltage	Para 4.1.5 step	Time (seconds)	tolerance (seconds)	Type of Assembly cycle	
				Int. to Ext	Ext. to Int
18V	2		1 max		
18V	4		1 max		
30V	2		2 max		
30V	1	NH	2 max		NH
25V	1		2 max		
25V	1		2 max		

DIAGNOSTIC STRENGTH:

All circuits satisfactory - - - - - YES ☒ NO ☐

INSULATION RESISTANCE:

All circuits measured greater than 10 megohms - - - YES ☒ NO ☐

SWITCH CONTINUITY AND NON-CONTINUITY

All switches satisfactory

Para 4.1.5 step	YES	NO see note	Switch position	
			Internal	External
1				
2				
3				
4				
5				
6				
7				
8				
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10				
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90				
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93				
94				
95				
96				
97				
98				
99				
100				

CYCLE SEQUENCE TIME: 20 milliseconds minimum

External to Internal: 74 milliseconds + - 2 Axis E 1 152

Internal to External: 54 milliseconds + - 2 Axis E 1 152

POSITION TRANSFER TIME: 15 milliseconds maximum

Circuit Chan. No.	Int to Ex	Ex to Int	Circuit Chan. No.	Int to Ex	Ex to Int
P12	8	9.8	P12	8.5	6.2
P13	7.6	7.5	P22	7	13
P14	8.4	8.5	P16	7.2	11.2
P15	8.5	8.3	P17	5.5	6.1
P16	8	6.8	P18	8.4	7.8
P17	10	7.5	P19	6.5	6.6
P18	7	6	P20	7	8.5
P19	10.5	7.5	P21	7.2	7.2
P20	10.5	7.5	P22	7.2	7.2
P21	10.5	7.5	P23	7.2	7.2
P22	10.5	7.5	P24	7.2	7.2
P23	10.5	7.5	P25	7.2	7.2
P24	10.5	7.5	P26	7.2	7.2
P25	10.5	7.5	P27	7.2	7.2
P26	10.5	7.5	P28	7.2	7.2
P27	10.5	7.5	P29	7.2	7.2
P28	10.5	7.5	P30	7.2	7.2
P29	10.5	7.5	P31	7.2	7.2
P30	10.5	7.5	P32	7.2	7.2
P31	10.5	7.5	P33	7.2	7.2
P32	10.5	7.5	P34	7.2	7.2
P33	10.5	7.5	P35	7.2	7.2
P34	10.5	7.5	P36	7.2	7.2
P35	10.5	7.5	P37	7.2	7.2
P36	10.5	7.5	P38	7.2	7.2
P37	10.5	7.5	P39	7.2	7.2
P38	10.5	7.5	P40	7.2	7.2
P39	10.5	7.5	P41	7.2	7.2
P40	10.5	7.5	P42	7.2	7.2
P41	10.5	7.5	P43	7.2	7.2
P42	10.5	7.5	P44	7.2	7.2
P43	10.5	7.5	P45	7.2	7.2
P44	10.5	7.5	P46	7.2	7.2
P45	10.5	7.5	P47	7.2	7.2
P46	10.5	7.5	P48	7.2	7.2
P47	10.5	7.5	P49	7.2	7.2
P48	10.5	7.5	P50	7.2	7.2
P49	10.5	7.5	P51	7.2	7.2
P50	10.5	7.5	P52	7.2	7.2
P51	10.5	7.5	P53	7.2	7.2
P52	10.5	7.5	P54	7.2	7.2
P53	10.5	7.5	P55	7.2	7.2
P54	10.5	7.5	P56	7.2	7.2
P55	10.5	7.5	P57	7.2	7.2
P56	10.5	7.5	P58	7.2	7.2
P57	10.5	7.5	P59	7.2	7.2
P58	10.5	7.5	P60	7.2	7.2
P59	10.5	7.5	P61	7.2	7.2
P60	10.5	7.5	P62	7.2	7.2
P61	10.5	7.5	P63	7.2	7.2
P62	10.5	7.5	P64	7.2	7.2
P63	10.5	7.5	P65	7.2	7.2
P64	10.5	7.5	P66	7.2	7.2
P65	10.5	7.5	P67	7.2	7.2
P66	10.5	7.5	P68	7.2	7.2
P67	10.5	7.5	P69	7.2	7.2
P68	10.5	7.5	P70	7.2	7.2
P69	10.5	7.5	P71	7.2	7.2
P70	10.5	7.5	P72	7.2	7.2
P71	10.5	7.5	P73	7.2	7.2
P72	10.5	7.5	P74	7.2	7.2
P73	10.5	7.5	P75	7.2	7.2
P74	10.5	7.5	P76	7.2	7.2
P75	10.5	7.5	P77	7.2	7.2
P76	10.5	7.5	P78	7.2	7.2
P77	10.5	7.5	P79	7.2	7.2
P78	10.5	7.5	P80	7.2	7.2
P79	10.5	7.5	P81	7.2	7.2
P80	10.5	7.5	P82	7.2	7.2
P81	10.5	7.5	P83	7.2	7.2
P82	10.5	7.5	P84	7.2	7.2
P83	10.5	7.5	P85	7.2	7.2
P84	10.5	7.5	P86	7.2	7.2
P85	10.5	7.5	P87	7.2	7.2
P86	10.5	7.5	P88	7.2	7.2
P87	10.5	7.5	P89	7.2	7.2
P88	10.5	7.5	P90	7.2	7.2
P89	10.5	7.5	P91	7.2	7.2
P90	10.5	7.5	P92	7.2	7.2
P91	10.5	7.5	P93	7.2	7.2
P92	10.5	7.5	P94	7.2	7.2
P93	10.5	7.5	P95	7.2	7.2
P94	10.5	7.5	P96	7.2	7.2
P95	10.5	7.5	P97	7.2	7.2
P96	10.5	7.5	P98	7.2	7.2
P97	10.5	7.5	P99	7.2	7.2
P98	10.5	7.5	P100	7.2	7.2

+ "X" "A" 12 + - X A 13

Para. 4.1.814MFor para. 4.4 Specimen S/N 002

Date:

Engineer: R. J. Noble

CVAC Insp: _____

USAF Insp: _____

* Indicates out of tolerance

ASSEMBLY CYCLE OPERATION:

Control voltage	Para 4.1.8 step	Time (seconds)	Tolerance (seconds)	Type of assembly cycle	
				Int. to Ext.	Ext. to Int.
18V	1		1 MAX		
18V	2		1 MAX		
30V	3	1.1	2 MAX		1.1
30V	4		2 MAX		
25V	5		1 MAX		
25V	6		2 MAX		

DIELECTRIC STRENGTH:

All circuits satisfactory - - - - - YES ☒ NO ☐

INSULATION RESISTANCE:

All circuits measured greater than 10 megohms - - - YES ☒ NO ☐

SWITCH CONTINUITY AND NON-CONTINUITY:

All switches satisfactory

Para 4.1.8 step	YES	NO see note	Switch position	
			Internal	External
1				
2				
3				
4				
5				
6				

CIRCUIT SEQUENCE TIME: 120 milliseconds minimum

External to Internal 78.4 milliseconds - - - X 4 1.1 1.1 1.1Internal to External 1.1 milliseconds - - - X 1.1 1.1 1.1

POSITION TRANSFER TIME: 15 milliseconds maximum

Circuit	C.F.C. Chap. No.	In to Ex	Ex to In	Circuit	C.F.C. Chap. No.	In to Ex	Ex to In
PL1	1	73.73	8.9	PL2	1	78.65	7.5
PL2	2	72.73	1.1	PL3	2	74.85	1.1
PL3	3	63.8	10.105	PL4	3	73.73	1.1
PL4	4	8.2	24.3.5	PL5	4	64.2	8.6.7
PL5	5	62.7	2.2.7	PL6	5	73.73	7.2
PL6	6	12.8	1.8.8	PL7	6	6.6	2.3.1.5
PL7	7	78.65	7.5.6.2	PL8	7	68.73	7.5.5
PL8	8	10.112	10.8.11	PL9	8	71.1	1.1.1.1

+ "x" Axis + "y" Axis

Para. 4.1.5
For para. 4.1 Specimen S/N 665Date: _____
Engineer: J. E. Mackay
CVAC Insp: _____
VSAP Insp: 144

* Indicates out of tolerance

ASSEMBLY CYCLE OPERATION:

Control voltage	Para 4.1.5 step	Time (seconds)	tolerance (seconds)	Type of assembly cycle	
				Int. to Ext	Ext. to Int
10V	A		3 max		
10V	B		3 max		
10V	C	14.4	2 max		
10V	D		2 max		
25V	E		2 max		
25V	F		2 max		

DIAGNOSTIC STRENGTH:

All circuits satisfactory - - - - - YES ☒ NO ☐

INSULATION RESISTANCE:

All circuits measured greater than 10 megohms - - - YES ☒ NO ☐

SWITCH CONTINUITY AND NON-CONTINUITY:

All switches satisfactory

Para 4.1.5 step	YES	NO see note	Switch position	
			Internal	External
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

CYCLE FREQUENCY TIME: (20 milliseconds minimum)

External to Internal 50 milliseconds + 4 "Axis E to I" + 4Internal to External 20 milliseconds + 4 "Axis I to E" + 0

PULSE TRANSFER TIME: (15 milliseconds maximum)

Circuit Chan. No.	C.F.C.	In to Ex		Ex to In	
		ms	ms	ms	ms
P10	A	0.5	0.8	0.8	0.5
P12	B	0.8	2.7	12.5	10.5
P14	C	0.5	0.8	11	11
P16	D	0.9	0.9	10.5	7.8
P18	E	0.5	0.6	7.5	7.2
P19	F	11	10.5	9	7
P20	G	2.5	7	3	7.2
P26	H	2.5	10	10.5	11

Circuit Chan. No.	C.F.C.	In to Ex		Ex to In	
		ms	ms	ms	ms
P10	M	5	2	0.8	0.8
P12	N	2.5	0.8	10	7
P14	P	0.8	7	11.5	10.5
P16	Q	5.8	5	0.8	0.8
P18	R	0.8	7	0.8	0.8
P19	S	7.5	6	0.8	0.8
P20	T	2.5	7	7.5	7
P26	U	7.5	7	7.5	7

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results: FailedDate: 10-2-57Specimen S/N McC Kinetics Corp.Test Eng: R.L. MarleyCVAC Insp: NAUSAF Insp: NA

Paragraph	Specification Requirement	Remarks
Extra test;	1 See Notes: Salt Atmosphere	
1.4	Operating Time: Start <u>NA</u> hrs. Stop <u>NA</u> hrs. Assembly Cycles Start <u>NA</u> hrs. Stop <u>NA</u> hrs.	

- Notes:
1. While sitting in storage in the Vib. Lab. the gen. stud hardware was noted to be rusting. A 100 hr. Salt Atmosphere test (per Spec. 27-06166 IP 4.4.8) was performed.
 2. After the test, considerable corrosion of the subject hardware was noted.
 3. After 4.4.8 test was performed a Hypot test was run. T701A to T711D broke from @ 50 VEMS.
 4. IC # 419473 was written and Specimen returned to vendor

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results: *Unsatisfactory*Date: *6-10-59*Specimen S/N *121 United Control*
*Specimen*Test Eng: *R. T. Mobley*
CVAC Insp: *NA*
USAF Insp: *NA*

Paragraph	Specification Requirement	Remarks
4.1.8	<i>Initial Satisfactory</i>	
1.4	Operating Time: <i>.6 hrs.</i> Start _____ hrs. Stop _____ hrs. Assembly Cycles <i>13</i> Start _____ hrs. Stop _____ hrs.	

Notes: 1. While performing Para. ^{4.1.8} 4.1.8 b) (Hypot test), J706 E to case indicated excessive leakage current and breakdown at 1500V. Breakdown occurred at approx. 950 VAC.

Para. 4.1.8
 For para. 4.1.8 Specimen 3/N 121
United Control

Date: 6-10-'54
 Engineer: R. L. Mobley
 CVAC Insp: _____
 USAF Insp: _____

* Indicates out of tolerance

ASSEMBLY CYCLE OPERATION:

Control voltage	Para 4.1.8 step	Time (seconds)	Tolerance (seconds)	Time of assembly cycle	
				Int. to Ext.	Ext. to Int.
18V	2	1.39	1 MAX		
18V	2	1.51	1 MAX		
10V	1	0.82	2 MAX		
30V	1	0.81	2 MAX		
25V	1	0.97	2 MAX		
25V	1	0.97	2 MAX		

DIELECTRIC STRENGTH:

All circuits satisfactory - - - - - YES ☐ NO ☒ *

INSULATION RESISTANCE:

All circuits measured greater than 20 megohms - - - YES ☒ NO ☐

SWITCH CONTINUITY AND NON-CONTINUITY

All switches satisfactory

Para 4.1.8 step	YES	NO see note	Switch position	
			Internal	External
1				
1				
1				
1				

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 220 milliseconds

Internal to External 200 milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit Chan. No.	C.F.C. No.	Int. to Ext.	Ext. to Int.	Circuit Chan. No.	C.F.C. No.	Int. to Ext.	Ext. to Int.
P14	F	5	6.3	P12	H	5	6.3
P32	O	1	1	P22	O	1	1
P30	H	1	1	P36	P	1	1
P34	1	1	1	P44	O	1	1
P40	1	1	1	P16	H	1	1
P18	1	1	1	P28	S	1	1
P20	1	1	1	P38	T	1	1
P26	H	5	6.3				

VOLTAGE DROP:

Maximum Control Voltage (30 V.)

VOLTA

Switch in External Position			Switch in Internal Position		
SW. NO.	CIRCUIT	DATA	SW. NO.	CIRCUIT	DATA
A	J701C - J701D	0.263	A	J701A - J701B	0.065
B	J706P - J705L	0.015	B	J701A - J705L	0.152
C	J706T - J705K	0.045	C	J701A - J705K	0.116
D	J706S - J705J	0.039	D	J701A - J705J	0.165
E	J706R - J705G	0.002	E	J702A - J705G	0.177
F	J706Q - J705A	0.092	F	J702B - J705A	0.064
G	J706A - J705D	0.130	G	J702B - J705D	0.125
H	J706Y - J705F	0.110	H	J702B - J705F	0.024
I	J706G - J705C	0.125	I	J702C - J705C	0.100
J	J706I - J705H	0.080	J	J702C - J705H	0.040
K	J706G - J705L	0.128	K	J702A - J705L	0.082
L	J706H - J705M	0.142	L	J702A - J705M	0.095
M	J706W - J705P	0.144	M	J702B - J705P	0.109
N	J706Z - J705R	0.131	N	J702C - J705R	0.112
O	J706J - J704A	0.138	O	J702A - J704A	0.110
P	J706d - J704C	0.094	P	J702B - J704C	0.059
Q	J706B - J704J	0.089	Q	J702E - J704J	0.070
R	J706F - J704N	0.142	R	J702A - J704N	0.110
S	J706X - J704R	0.115	S	J702B - J704R	0.067
T	J706b - J704T	0.097	T	J702C - J704T	0.036

CONTINUITY CHECK:

All circuits indicated continuity Yes ☒ No ☐ See Notes

Initial Satisfactory

A

Date: 6-10-59Page 75Test Engr: R. T. Moeley

Report 7A2236

CVAC Insp: NASAT Insp: NA

VOLTAGE DROP:

Minimum Control Voltage (25 V.)

Switch in External Position				Switch in Internal Position			
SW. MK.	CIRCUIT		DATA	SW. MK.	CIRCUIT		DATA
A	J701C	J701D	0.253	A	J701A	J701D	0.070
B	J706P	J705L	0.004	B	J701A	J705L	0.113
C	J706T	J705K	0.043	C	J701A	J705K	0.116
D	J706B	J705J	0.031	D	J701A	J705J	0.162
E	J706R	J705C	0.014	E	J701A	J705C	0.214
F	J706E	J703A	0.088	F	J702A	J703A	0.020
G	J706G	J703D	0.125	G	J702B	J703D	0.034
H	J706Y	J703N	0.101	H	J702B	J703N	0.023
I	J706G	J703C	0.120	I	J702C	J703C	0.083
J	J706C	J703K	0.077	J	J702C	J703K	0.042
K	J706G	J703L	0.115	K	J702A	J703L	0.070
L	J706H	J703M	0.138	L	J702A	J703M	0.079
M	J706W	J703P	0.142	M	J702B	J703P	0.087
N	J706G	J703R	0.130	N	J702C	J703R	0.086
O	J706J	J704A	0.134	O	J702A	J704A	0.082
P	J706A	J704C	0.142	P	J702B	J704C	0.058
Q	J706R	J704J	0.086	Q	J702C	J704J	0.061
R	J706Y	J704M	0.140	R	J702A	J704M	0.082
S	J706X	J704R	0.111	S	J702B	J704R	0.062
T	J706D	J704T	0.094	T	J702C	J704T	0.037

B

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results: Satisfactory

Date: 6-10-'58

Specimen S/N United Control Corp. 121

Test Engr: R. T. Mobley
CVAC Insp: NA
USAF Insp: NA

Paragraph	Specification Requirement	Remarks
4.3	Operating Vib. "Y" Axis	Only one resonance occurred - 306 @ 110 cps
1.4	Operating Time: 1.2 hrs. Start _____ hrs. Stop _____ hrs. Assembly Cycles 8 Start _____ hrs. Stop _____ hrs.	

- Notes:
1. First portion of sweep 5 - 125 - 5 cps -
Second portion of sweep 125 - 2000 cps
 2. Made Switch Int - Ext - Int at 300 cps
 3. Made Switch Int - Ext - Int at 1200 cps
 4. CEC Max # - 5-250 cps #137, - 250 - 2000 #506
 5. Accelerometer outputs recorded CEC max. #
26118 - 50g inch - #1 drive (max), #2 Z
#3 Y, #4 X (next to pipper, pipper)

4.1 TEST CONDITIONS AND PROCEDURES (Continued)General Test Results: *Marginal*Date: *6-11-'59*Specimen S/N *121.*Test Eng: *R. T. Mackey**United Control Corp. specimen*CVAC Insp: *NA*USAF Insp: *NA*

Paragraph	Specification Requirement	Remarks
4.3	Operating Vib. Z Axis	No resonance occurred
1.4	Operating Time: Start <i>90.5</i> hrs. Stop <i>91.5</i> hrs.. Assembly Cycles <i>8</i> Start _____ hrs. Stop _____ hrs.	

Notes: 1. Made switch Int. to Ext. to Int. at 260 cps.
2. 400w pwr. supply o.kt. bkr. popped out about 270 cps

3. A considerable amount of hash was noted between 6 - 20 cps. The hash and changes in voltage drop were great enough that a re-run on 5 - 125 was decided upon for all 3 Axes.

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results:

*Satisfactory*Date: *6-11-59*Specimen S/N *121.**United Cont. Corp. Specimen*Test Eng: *R.T. Mabley*CVAC Insp: *NA*USAF Insp: *NA*

Paragraph	Specification Requirement	Remarks
4.3	Operating Vib. "X" Axis	No RESONANCES occurred 5-250 Mag. #187
1.4	Operating Time: Start <i>91.2</i> hrs. Stop <i>91.9</i> hrs. Assembly Cycles <i>8</i> Start _____ hrs. Stop _____ hrs.	

Notes:

Made Switch from Int. to Ext. to Int. at 350 cps
 Made Switch at 1000 cps Int. to Ext. to Int.

Cycle Sequence was used within tolerance
 at 1000 CPS Switch and at end of run.
 40 Switch Transfer 3.4 ms at end of
 run Switch.

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results: *Unsatisfactory*Date: *6-15-59*Specimen S/N *121*Test Eng: *P. T. Mobley*CVAC Insp: *NA*USAF Insp: *NA**United Control Specimen*

Paragraph	Specification Requirement	Remarks
1.4	Post Vib. Proof Cycle & Ambient Conditions Proof Cycle Combined Operating Time: Start <i>91.9</i> hrs. Stop <i>92.6</i> hrs. Assembly Cycles <i>10</i> Start _____ hrs. Stop _____ hrs.	

Notes: * During Proof Cycle 4.1.9 (para. b), J702 A showed excessive current leakage and voltage breakdown.. Breakdown began at about 950 AC. J752 B was marginal at 1550V - Hypert. Pre. been light in color on intermittently.

Para. 4.1.9
 For pa. a. 4.3 Specimen S/N 121
United Cent.

Date: 6-15-54
 Engineer: R.T. Mobley
 CVAC Insp: NA
 USAF Insp: NA

* Indicates out of tolerance

ASSEMBLY CYCLE OPERATIONS

Control voltage	Para 4.1.9 stop	Time (seconds)	Tolerance (seconds)	Time of assembly cycle	
				Int. to Ext	Ext. to Int
11V	1	11.21ms	1 max		
10V	1	14.56ms	1 max		
30V	1	8.49ms	2 max		
10V	1	7.15ms	2 max		
25V	1	10.10ms	2 max		
25V	1	8.59ms	2 max		

DIELECTRIC STRENGTH

All circuits satisfactory - - - - - YES ☒ NO ☒ See Note: X

INSULATION RESISTANCE

All circuits measured greater than 10 megohms - - - YES ☒ NO ☒

SWITCH COMPONENTS AND NON-CONTINUITY

All switches satisfactory

Para 4.1.9 stop	YES	NO	Switch position	
		see note	Internal	External
1				
2				
3				
4				
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97				
98				
99				
100				

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 255 milliseconds

Internal to External 276 milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit Chan. No.	C.E.C.	Ex to Ex	Ex to Int	Circuit Chan. No.	C.E.C.	Ex to Ex	Ex to Int
P1A	2	3.2	3.1	P12	1	3.2	3.1
P12	0	3.2	3.1	P22	0	3.2	3.1
P30	1	3.2	3.1	P31	1	3.2	3.1
P36	1	3.2	3.1	P41	1	3.2	3.1
P40	1	3.2	3.1	P15	1	3.2	3.1
P18	1	3.2	3.1	P28	8	3.2	3.1
P20	1	3.2	3.1	P36	7	3.2	3.1
P36	1	3.2	3.1				

VOLTAGE DROP:

Maximum Control Voltage (30 V.)

VOLT

Switch in External Position			Switch in Internal Position		
SW. NO.	CIRCUIT	DATA	SW. NO.	CIRCUIT	DATA
A	J701Q - J701B	.231	A	J701A - J701D	.061
B	J706P - J705L	.133	B	J701A - J705L	.111
C	J706T - J705K	.124	C	J701A - J705K	.112
D	J706S - J705J	.101	D	J701A - J705J	.113 .144
E	J706R - J705H	.177	E	J702A - J705C	.215
F	J706Q - J705G	.091	F	J702B - J705B	.073
G	J706A - J705D	.13	G	J702B - J705B	.40
H	J706Y - J705F	.10	H	J702B - J705F	.030
I	J706Z - J705G	.12	I	J702C - J705G	.095
J	J706X - J705K	.070	J	J702C - J705K	.042
K	J706G - J703L	.115	K	J702A - J703L	.082
L	J706H - J703M	.14	L	J702A - J703M	.094
M	J706W - J703P	.14	M	J702B - J703P	.096
N	J706Z - J703R	.13	N	J702C - J703R	.105
O	J706J - J704A	.125	O	J702A - J704A	.11
P	J706I - J704C	.09	P	J702B - J704C	.057
Q	J706R - J704J	.09	Q	J702C - J704J	.068
R	J706P - J704M	.13	R	J702A - J704M	.11
S	J706X - J704R	.11	S	J702B - J704R	.064
T	J706B - J704T	.091	T	J702C - J704T	.034

CONTINUITY CHECK:

All circuits indicated continuity Yes ☒ No ☐ See Notes

Test Vibration Proof Cycle

Test Ambient Condition Proof Cycle Combined

A

Date: 6-15-59Page 81Test Engr: P. T. Mobley

Report 7A2236

CVAC Insp: NAUNAF Insp: NA

VOLTAGE DROP:

Minimum Control Voltage (25 V.)

Switch in External Position			Switch in Internal Position		
SM. NO.	CIRCUIT	DATA	SM. NO.	CIRCUIT	DATA
A	J701C - J701D	.025	A	J701A - J701D	.057
B	J706P - J705L	.164	B	J701A - J705L	.119
C	J706T - J705K	.139	C	J701A - J705K	.127
D	J706B - J705J	.145	D	J701A - J705J	.153
E	J706R - J705G	.181	E	J701A - J705G	.217
F	J706E - J703A	.087	F	J702A - J703A	.074
G	J706C - J703D	.13	G	J702B - J703D	.10
H	J706Y - J703F	.10	H	J702B - J703F	.029
I	J706A - J703G	.125	I	J702C - J703G	.096
J	J706I - J703K	.073	J	J702C - J703K	.045
K	J706Q - J703L	.11	K	J702A - J703L	.079
L	J706H - J703M	.14	L	J702A - J703M	.092
M	J706W - J703P	.14	M	J702B - J703P	.094
N	J706G - J703R	.13	N	J702C - J703R	.105
O	J706J - J704A	.128	O	J702A - J704A	.115
P	J706A - J704C	.091	P	J702B - J704C	.056
Q	J706R - J704J	.091	Q	J702C - J704J	.070
R	J706P - J704N	.185	R	J702A - J704N	.115
S	J706Y - J704R	.112	S	J702B - J704R	.063
T	J706B - J704T	.093	T	J702C - J704T	.033

B

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results: *Satisfactory*Date: *6-16-59*
Test Engr: *R. T. Mobley*
CVAC Insp: *NA*
USAF Insp: *NA*Specimen S/N *621**United Control*

Paragraph	Specification Requirement	Remarks
4.2.1.1 b)	Radiant Heat	Time Spec. Temp 1830 78°F 1915 124°F Radiant Heat Off 2020 125 2100 144 2130 144 2155 144 2210 144 2315 144
1.4	Operating Time: Start <i>NA</i> hrs. Stop <i>NA</i> hrs. Assembly Cycles Start <i>NA</i> hrs. Stop <i>NA</i> hrs.	

Notes:

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results: *Unsatisfactory*Date: *6-17-'59*Specimen S/N *121*Test Eng: *R. T. Mobley*CVAC Insp: *NA*USAF Insp: *NA**United Control Spec.*

Paragraph	Specification Requirement	Remarks
4.2.1.1 1)	<i>-65° F (1.11 test. @ 30" Hg.</i>	
1.4	Operating Time: <i>92.6</i> Start <i>6:24</i> hrs. Stop <i>93.3</i> hrs. Assembly Cycles <i>12</i> Start _____ hrs. Stop _____ hrs.	

- Notes: 1. Dielectric strength test made at the end of -65°F @ 1mm Hg. test, after box pressure brought back to atmospheric.
2. The time failure occurred after during Hypot as shown on test. See next test for Hypot & failure details

Para. 4.1.9
 For para. 4.2.1.1 Specimen S/N 121
United Control

Date: 6-17-59
 Engineer: R. L. Mobley
 CVAC Insp: ALM
 URAF Insp: NH

* Indicates out of tolerance

ASSEMBLY CYCLE OPERATION:

Control voltage	Para 4.1.8 step	Time (seconds)	Tolerance (seconds)	Type of assembly cycle	
				Int. to Ext.	Ext. to Int.
1W	1	1.63	3 MAX		
1W	2	1.23	3 MAX		
2W	1	1.03	2 MAX		
2W	2	.99	2 MAX		
2W	3	1.24	2 MAX		
2W	4	1.21	2 MAX		

DIELECTRIC STRENGTH:

All circuits satisfactory - - - - - YES ☐ NO ☒ *

INSULATION RESISTANCE:

All circuits measured greater than 10 megohms - - - YES ☒ NO ☐

SWITCH CONTINUITY AND NON-CONTINUITY

All switches satisfactory

Para 4.1.8 step	YES		NO see note	Switch position	
				Internal	External
1					
2					
3					
4					

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 3.5 milliseconds

Internal to External 3.36 milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.E.C. Chan. No.	In to Ext	Ext to In	Circuit	C.E.C. Chan. No.	In to Ext	Ext to In
P11	1	2	3	P12	1	2	3
P12	2	1	1	P22	2	1	1
P30	1			P31	1		
P31	2			P41	1		
P40	1			P16	1		
P18	1			P28	1		
P20	1			P38	1		
P31	1	3	9				

VOLTAGE DROP:

Maximum Control Voltage (30 V.)

VOLTA

Switch in External Position				Switch in Internal Position			
WM. NO.	CIRCUIT	DATA	DATA	WM. NO.	CIRCUIT	DATA	WM.
A	J701B - J701D	0.100		A	J701B - J701D	0.060	A
B	J706P - J705L	0.156		B	J701A - J705L	0.125	B
C	J706T - J705K	0.120		C	J701A - J705K	0.172	C
D	J706S - J705J	0.129		D	J701A - J705J	0.162	D
E	J706R - J705H	0.155		E	J702A - J705H	0.341	E
F	J706Q - J705G	0.059		F	J702B - J705G	0.042	F
G	J706N - J705F	0.105		G	J702B - J705F	0.090	G
H	J706Y - J705E	0.088		H	J702B - J705E	0.021	H
I	J706M - J705C	0.097		I	J702C - J705C	0.088	I
J	J706X - J705B	0.060 <i>new</i>		J	J702C - J705B	0.030	J
K	J706Q - J703L	0.740 0.071		K	J702A - J703L	0.068	K
L	J706H - J703M	0.110		L	J702A - J703M	0.052	L
M	J706W - J703P	0.115		M	J702B - J703P	0.089	M
N	J706K - J703R	0.110		N	J702C - J703R	0.093	N
O	J706J - J704A	0.108		O	J702A - J704A	0.079	O
P	J706I - J704C	0.074		P	J702B - J704C	0.055	P
Q	J706E - J704J	0.069		Q	J702C - J704J	0.052	Q
R	J706F - J704N	0.110		R	J702A - J704N	0.082	R
S	J706X - J704B	0.088		S	J702B - J704B	0.071	S
T	J706B - J704T	0.075		T	J702C - J704T	0.034	T

CONTINUITY CHECK

All circuits indicated continuity Yes ☒ No ☐ See Notes

Cold Test @ 30" rly.

A

Date: 6-11-59Page 85Test Engr: E. T. Mobley

Report 7A2236

CVAC Insp: NAURAF Insp: NA

VOLTAGE DROP:

Minimum Control Voltage (25 V.)

Switch in External Position			Switch in External Position		
SW. NO.	CIRCUIT	DATA	SW. NO.	CIRCUIT	DATA
A	J701C - J701D	0.293	J701A - J701B		0.059
B	J706P - J706L	0.148	J701A - J705L		0.115
C	J706T - J705K	0.117	J701A - J705K		0.133
D	J706S - J705J	0.128	J701A - J705J		0.156
E	J706R - J705G	0.157	J701A - J705G		0.305
F	J706R - J703A	0.056	J702A - J703A		0.044
G	J706Q - J703D	0.105	J702B - J703D		0.092
H	J706X - J703W	0.088	J702B - J703W		0.022
I	J706A - J703G	0.098	J702C - J703G		0.088
J	J706C - J703K	0.061	J702C - J703K		0.030
K	J706Q - J703L	0.068	J702A - J703L		0.071
L	J706R - J703M	0.110	J702A - J703M		0.079
M	J706W - J703P	0.1615 ^{PM}	J702B - J703P		0.090
N	J706S - J703R	0.120	J702C - J703R		0.094
O	J706J - J704A	0.110	J702A - J704A		0.080
P	J706A - J704C	0.076	J702B - J704C		0.056
Q	J706R - J704J	0.070	J702D - J704J		0.052
R	J706T - J704M	0.110	J702A - J704M		0.083
S	J706X - J704N	0.090	J702B - J704N		0.062
T	J706b - J704T	0.077	J702B - J704T		0.035

B

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results:

Date: 6-17-59Specimen S/N 121Test Engr: E. J. MobleyCVAC Insp: NAUSAF Insp: NA

United Control Corp.

Paragraph	Specification Requirement	Remarks
4.2.1.1 C)	Cold test @ 1MM Hg. test	CEC Recording 1st run @ 19.5V E to I. 2nd " @ 29.5V I to E. 3rd " @ 29.5V E to I.
1.4	Operating Time: Start <u>93.3</u> hrs. Stop <u>93.8</u> hrs. Assembly Cycles Start <u>12</u> hrs. Stop _____ hrs.	

Notes:

1. Reached 1.3MM Hg. in 10 min. — 1MM Hg. 13 min.
2. During Hypot test J706 E showed break-down from 1250 VAC and up. Switch was in External position.
3. Hypot test was performed @ -30°F and appx. 30" Hg.

Para. 4.1.9 IMM 121
 For para. 4.2.1 Specimen S/N 121
Unit 1 Cont.

Date: 10-17-57
 Engineer: P. T. Mobley
 CVAC Insp: NA
 USAP Insp: NA

* Indicates out of tolerance

ASSEMBLY CYCLE OPERATION

Control voltage	Para 4.1.8 stop	Time (seconds)	Tolerances (seconds)	Time of assembly cycle	
				Int. to Ext.	Ext. to Int.
15V	A	1.87	1 MAX		
15V	A	1.84	1 MAX		
15V	A	1.23	2 MAX		
15V	A	1.82	2 MAX		
15V	A	1.25	2 MAX		
25V	A	1.20	2 MAX		

DIELECTRIC STRENGTH

All circuits satisfactory YES ☐ NO ☒ *See Note X*

INSULATION RESISTANCE

All circuits measured greater than 10 megohms . . . YES ☒ NO ☐

SWITCH CONTINUITY AND NON-CONTINUITY

All switches satisfactory

Para 4.1.8 stop	YES	NO	Switch position	
		see note	Internal	External

CYCLE SEQUENCE TIME (70 milliseconds minimum)

External to Internal 270 milliseconds

Internal to External 302 milliseconds

POSITION TRANSFER TIME (15 milliseconds maximum)

Circuit	C.F.C. Chan. No.	In to Ex	Ex to In	Circuit	C.F.C. Chan. No.	In to Ex	Ex to In
P14	1	2.8	2.7	P12	2	2.8	2.7
P12	2			P22	3		
P10	3			P14	4		
P16	4			P16	5		
P10	5			P20	6		
P16	6			P18	7		
P20	7						
P18	8						

WALSH 1001

Maximum Control Voltage (30 V.)

WALSH

Setback to Reference Position				Setback to Internal Position			
NO. XL	CHARTER	DATA	NO. XL	CHARTER	DATA	NO. XL	CHARTER
A	J701G - J701D	C. 129	A	J701A - J701D	C. 676	A	J701A - J701D
B	J706P - J706L	C. 146	B	J701A - J706L	C. 111	B	J701A - J706L
C	J706T - J706K	C. 122	C	J701A - J706K	C. 134	C	J701A - J706K
D	J706S - J706H	C. 119	D	J701A - J706H	C. 156	D	J701A - J706H
E	J706R - J706B	C. 155	E	J706A - J706C	C. 314	E	J706A - J706C
F	J706B - J706A	C. 156	F	J706A - J706A	C. 146	F	J706A - J706A
G	J706A - J706B	C. 160	G	J706B - J706B	C. 290	G	J706B - J706B
H	J706Y - J706F	C. 129	H	J706B - J706F	C. 622	H	J706B - J706F
I	J706a - J706X	C. 125	I	J706C - J706C	C. 090	I	J706C - J706C
J	J706T - J706H	C. 163	J	J706C - J706H	C. 030	J	J706C - J706H
K	J706Q - J706L	C. 676	K	J706A - J706L	C. 073	K	J706A - J706L
L	J706E - J706M	C. 110	L	J706A - J706M	C. 083	L	J706A - J706M
M	J706N - J706P	C. 125	M	J706A - J706P	C. 692	M	J706A - J706P
N	J706S - J706R	C. 185	N	J706C - J706R	C. 695	N	J706C - J706R
O	J706J - J706A	C. 110	O	J706A - J706A	C. 082	O	J706A - J706A
P	J706A - J706C	C. 670	P	J706C - J706C	C. 555	P	J706C - J706C
Q	J706R - J706J	C. 129	Q	J706C - J706J	C. 654	Q	J706C - J706J
R	J706P - J706M	C. 113	R	J706A - J706M	C. 660	R	J706A - J706M
S	J706X - J706S	C. 690	S	J706B - J706S	C. 667	S	J706B - J706S
T	J706B - J706T	C. 639	T	J706S - J706T	C. 638	T	J706S - J706T

CONTINUITY

All circuits indicated continuity . . . Yes ☒ No ☐ See Notes

A.2.1.1 d) Setback Test 1/1/22

A

Date: 6-17-59

Page 88

Test Eng: R. T. Mobley

Report 7-2236

CVAC Insp: NH

JHAF Insp: NH

VOLTAGE DROP:

Maximum Control Voltage (25 V.)

Switched in Retarded Position			Switched in Internal Position		
PM. NO.	CIRCUIT	DATA	PM. NO.	CIRCUIT	DATA
A	J701C - J701D	0.100	A	J701A - J701D	0.072
B	J706F - J705L	0.144	B	J701A - J705L	0.110
C	J706F - J705K	0.128	C	J701L - J705K	0.145
D	J706B - J705J	0.122	D	J701A - J705J	0.163
E	J706B - J705G	0.159	E	J701A - J705G	0.310
F	J706R - J703A	0.025	F	J702A - J703A	0.051
G	J706C - J703D	0.110	G	J702B - J703D	0.090
H	J706Y - J703F	0.093	H	J702B - J703F	0.024
I	J706A - J703E	0.102	I	J702C - J703G	0.090
J	J706E - J703K	0.046	J	J702C - J703K	0.032
K	J706Z - J703L	0.046	K	J702A - J703L	0.033
L	J706M - J703M	0.115	L	J702A - J703M	0.080
M	J706U - J702F	0.120	M	J702B - J702F	0.070
N	J706C - J703R	0.120	N	J702C - J703R	0.094
O	J706J - J704A	0.112	O	J702A - J704A	0.032
P	J706A - J704C	0.078	P	J702B - J704C	0.054
Q	J706R - J704I	0.074	Q	J702C - J704I	0.056
R	J706F - J704M	0.115	R	J702A - J704M	0.086
S	J706X - J704R	0.972	S	J702B - J704R	0.040
T	J706B - J704T	0.030	T	J702C - J704T	0.036

B

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results:

Date:

6-18-59

Specimen S/N

121. United Control
Corp. Specimen

Test Tag:

R. T. Mobley

CVAC Insp:

NA

USAF Insp:

NA

Paragraph	Specification Requirement	Remarks
4.2.1.1 d)	Hot test 3165° and 31° H ₂	CEC Recording Ext. to Int. Int. to Ext. Int. to Ext.
1.4	Operating Time: Start <u>73.8</u> hrs. Stop <u>94.5</u> hrs. Assembly Cycles <u>8</u> Start _____ hrs. Stop _____ hrs.	

Notes:

Para. 4.1.9
 For para. 4.2.1.1 Specimen A/N 121
United Control

Date: 6-18-59
 Engineer: R. T. Mobley
 CVAC Insp: NA
 USAF Insp: NA

* Indicates out of tolerance

ASSEMBLY CYCLE OPERATION:

Control voltage	Para 4.1.8 step	Time (seconds)	Tolerance (seconds)	Type of assembly cycle	
				Int. to Ext.	Ext. to Int.
10V	1	1.36	3 MAX		
10V	2	1.16	3 MAX		
20V	3	.67	2 MAX		
20V	4	.72	2 MAX		
20V	5	.93	2 MAX		
20V	6	.82	2 MAX		

DIELECTRIC STRENGTH:

All circuits satisfactory - - - - - YES ☐ NO ☐

INSULATION RESISTANCE:

All circuits measured greater than 10 megohms - - - YES ☐ NO ☐

SWITCH CONTINUITY AND NON-CONTINUITY

All switches satisfactory

Para 4.1.5 step	YES		NO See note	Switch position	
				Internal	External
1					
2					
3					
4					

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 230 milliseconds

Internal to External 256 milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.E.C. Chan. No.	In to Ext	Ext to In	Circuit	C.E.C. Chan. No.	In to Ext	Ext to In
P14	F	3.9	2.1	P42	H	3.9	2.1
P32	G			P22	O		
P30	R			P34	P		
P36	I			P44	Q		
P40	J			P16	M		
P18	K			P28	N		
P20	L			P38	T	3.9	2.1
P26	N	3.9	2.1				

WIKIAT J702:

Maximum Contact Voltage (30 V.)

Switch in External Position			Switch in Internal Position		
SM. NO.	CIRCUIT	DATA	SM. NO.	CIRCUIT	DATA
A	J701C - J701D	0.240	A	J701A - J701D	0.059
B	J706P - J705L	0.179	B	J701A - J705L	0.130
C	J706T - J705K	0.142	C	J701A - J705K	0.150
D	J706S - J705N	0.155	D	J701A - J705N	0.190
E	J706R - J705M	0.198	E	J702A - J705M	0.229
F	J706Q - J705J	0.115	F	J702A - J705J	0.075
G	J706A - J705B	0.130	G	J702B - J705B	0.108
H	J706Y - J705F	0.123	H	J702B - J705F	0.027
I	J706A - J705G	0.125	I	J702C - J705G	0.167
J	J706T - J705K	0.090	J	J702C - J705K	0.140
K	J706G - J703L	0.135	K	J702A - J703L	0.080
L	J706H - J703M	0.145	L	J702A - J703M	0.100
M	J706H - J703P	0.145	M	J702B - J703P	0.116
N	J706E - J703R	0.150	N	J702C - J703R	0.114
O	J706J - J704A	0.137	O	J702A - J704A	0.107
P	J706d - J704C	0.098	P	J702B - J704C	0.062
Q	J706R - J704J	0.094	Q	J702C - J704J	0.079
R	J706Y - J704M	0.140	R	J702A - J704M	0.109
S	J706X - J704R	0.120	S	J702B - J704R	0.072
T	J706b - J704T	0.130	T	J702C - J704T	0.037

CONTINUITY CHECK:

All circuits indicated continuity Yes ☒ No ☐ See Notes

4.2.1.1 Hot Test - 160°F @
30" Hg.

A

Date: 6-18-59Page 91Test Eng: R. T. Mobley

Report 7A2236

CVAC Insp: NAURAP Insp: NA

VOLTAGE DROP:

Minimum Control Voltage (25 V.)

Switch in External Position			Switch in Internal Position		
SM. NO.	CIRCUIT	DATA	SM. NO.	CIRCUIT	DATA
A	J701C - J701D	0.029	J701A - J701D		0.061
B	J706P - J705L	0.183	J701A - J705L		0.129
C	J706T - J705K	0.145	J701A - J705K		0.148
D	J706S - J705J	0.152	J701A - J705J		0.212
E	J706R - J705C	0.203	J701A - J705C		0.226
F	J706R - J703A	0.180	J702A - J703A		0.074
G	J706Q - J703D	0.135	J702B - J703D		0.140
H	J706X - J703F	0.125	J702B - J703F		0.026
I	J706Q - J703G	0.130	J702C - J703G		0.108
J	J706T - J703K	0.091	J702C - J703K		0.043
K	J706Q - J703L	0.155	J702A - J703L		0.082
L	J706H - J703M	0.147	J702A - J703M		0.100
M	J706W - J703P	0.150	J702B - J703P		0.110
N	J706g - J703R	0.131	J702C - J703R		0.116
O	J706J - J704A	0.135	J702A - J704A		0.103
P	J706A - J704C	0.108	J702B - J704C		0.066
Q	J706B - J704J	0.096	J702C - J704J		0.080
R	J706T - J704M	0.145	J702A - J704M		0.105
S	J706X - J704R	0.122	J702B - J704R		0.276
T	J706b - J704T	0.102	J702B - J704T		0.239

B

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results:

Date: 6-18-59Specimen S/N 121Test Ingr: R. T. MobleyCVAC Insp: NA

United Control Corp. Spec.

USAF Insp: NA

Paragraph	Specification Requirement	Remarks
4.2.1.1 d)	Hot Test 160°F @ 1.7 mm Hg.	CEC Recordings Run #1 Ext. to Int. Int. to Ext.
1.4	Operating Time: Start <u>94.5</u> hrs. Stop <u>94.9</u> hrs. Assembly Cycles <u>10</u> Start _____ hrs. Stop _____ hrs.	

Notes: 1. Following discrepancies occurred on Hypet test
 * a. J706 E, switch Ext. - breakdown @ 175 VEMS
 * b. J702 A, switch Int. - breakdown @ 175 VEMS
 * c. J702 B, switch Int. - breakdown @ 1375 VEMS
 Some intermittent breakdown @ 1375 VEMS
 * d. J702 A, to case on dielectric strength test
 measured - & 6 u.u.

Note: e. J701 A to case 4.5 u.u.

Note: f. J701 B to case 2.5 u.u.

Part. 4-1.9
 For para. 2.2.1.1 Specimen 2/N 121

United Control

Date: 6-18-59
 Engineer: E. J. Mabley
 CVAC Insp: NA
 USAF Insp: NA

* Indicates out of tolerance

ASSEMBLY CYCLE OPERATION:

Control voltage	Para 4.1.8 step	Time (seconds)	Tolerance (seconds)	Time of assembly cycle	
				Int. to Ext.	Ext. to Int.
10V	1	1.26	1 MAX		
10V	2	1.24	1 MAX		
30V	3	0.79	2 MAX		
20V	4	0.69	2 MAX		
20V	5	0.92	2 MAX		
20V	6	0.91	2 MAX		

* DIELECTRIC STRENGTH:

All circuits satisfactory YES ☐ NO ☒

* INSULATION RESISTANCE:

All circuits measured greater than 10 megohms . . . YES ☐ NO ☒

* SWITCH CONTINUITY AND NON-CONTINUITY

All switches satisfactory

Para 4.1.8 step	YES	NO see note	Switch position	
			Internal	External
1				
2				
3				
4				
5				
6				

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 208 milliseconds

Internal to External 237 milliseconds

POSITION TRANSFER TIME: (15 milliseconds minimum)

Circuit	C.E.C. Chan. No.	In to Ex	Ex to In	Circuit	C.E.C. Chan. No.	In to Ex	Ex to In
P14	F	4.8	3.2	P12	H	4.8	3.2
P32	G	↑	↑	P22	O	↑	↑
P30	H	↑	↑	P34	P	↑	↑
P36	I	↑	↑	P44	Q	↑	↑
P40	J	↑	↑	P16	R	↑	↑
P18	K	↑	↑	P28	S	↑	↑
P20	L	↑	↑	P38	T	4.8	3.2
P26	M	4.8	3.2				

VOLTAGE DROP:

Maximum Control Voltage (30 V.)

VOL.

Switch in External Position			Switch in Internal Position		
SM. NO.	CIRCUIT	DATA	SM. NO.	CIRCUIT	DATA
A	J701C - J701D	0.069	A	J701A - J701D	0.061
B	J706P - J705L	0.176	B	J701A - J705L	0.133
C	J706T - J705K	0.141	C	J701A - J705K	0.145
D	J706B - J705H	0.146	D	J701A - J705H	0.265
E	J706M - J705B	0.497	E	J702A - J705B	0.235
F	J706N - J703L	0.118	F	J702B - J703L	0.071
G	J706A - J703D	0.132	G	J702B - J703D	0.102
H	J706Y - J703F	0.118	H	J702B - J703F	0.035
I	J706a - J703G	0.130	I	J702C - J703G	0.112
J	J706F - J703K	0.083	J	J702D - J703K	0.042
K	J706Q - J703L	0.126	K	J702A - J703L	0.081
L	J706H - J703M	0.147	L	J702A - J703M	0.103
M	J706N - J703P	0.150	M	J702B - J703P	0.113
N	J706K - J703R	0.135	N	J702C - J703R	0.120
O	J706J - J704A	0.133	O	J702A - J704A	0.103
P	J706A - J704C	0.100	P	J702B - J704C	0.065
Q	J706R - J704J	0.094	Q	J702C - J704J	0.081
R	J706F - J704M	0.142	R	J702A - J704M	0.106
S	J706X - J704R	0.122	S	J702B - J704R	0.075
T	J706b - J704T	0.102	T	J702C - J704T	0.041

CONTINUITY CHECK:

All circuits indicated continuity Yes ☒ No ☐ See Notes

4.2.1.1 Hot test 160°F
@ 1.7 mm Hg.

Date: 6-18-59Page 94Test Engr: R. T. MobleyReport # A2236CVAC Insp: NHUSAF Insp: N/A

VOLTAGE DROP:

Minimum Control Voltage (25 V.)

Switch in External Position			Switch in Internal Position		
SW. NO.	CIRCUIT	DATA	SW. NO.	CIRCUIT	DATA
A	J701C - J701D	0.099	A	J701A - J701D	0.062
B	J706P - J706L	0.179	B	J701A - J705L	0.132
C	J706T - J705K	0.149	C	J701A - J705K	0.139
D	J706B - J705J	0.180	D	J701A - J705J	0.214
E	J706R - J705C	0.202	E	J701A - J705H	0.236
F	J706R - J703A	0.120	F	J702A - J703A	0.074
G	J706C - J703D	0.136	G	J702B - J703D	0.114
H	J706X - J703W	0.120	H	J702B - J703W	0.025
I	J706A - J703G	0.132	I	J702C - J703G	0.114
J	J706E - J703K	0.085	J	J702C - J703K	0.044
K	J706Q - J703L	0.129	K	J702A - J703L	0.031
L	J706H - J703M	0.150	L	J702A - J703M	0.102
M	J706W - J703P	0.151	M	J702B - J703P	0.115
N	J706S - J703R	0.138	N	J702C - J703R	0.122
O	J706J - J704A	0.135	O	J702A - J704A	0.105
P	J706A - J704C	0.100	P	J702E - J704C	0.066
Q	J706B - J704J	0.026	Q	J702C - J704J	0.082
R	J706T - J704M	0.145	R	J702A - J704M	0.107
S	J706Y - J704R	0.124	S	J702B - J704R	0.078
T	J706D - J704T	0.102	T	J702B - J704T	0.041

B

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results:

Date:

6-19-'59

Specimen S/N 121

Test Engr:

E. T. Mabley

CVAC Insp:

NA

USAF Insp:

NA

United Control Corp. Spec.

Paragraph	Specification Requirement	Remarks
4.2.1.1 c)	+40°F @ 75% RH test	SEC Recording Run #1 Int. to Ext. #2 Ext. to Int. Mag. #
1.4	Operating Time: .6 hr. Start 94.9 hrs. Stop 95.5 hrs. Assembly Cycles 10 Start _____ hrs. Stop _____ hrs.	

Notes: Hypot Test

J702 A (switch Int.) broke down appx. 200VAC
 J702 A to case → 60 μ a
 J706 Y to case 13 μ a
 J706 f to case 12 μ a
 J702 A to J706 Y 15 μ a
 J706 Y to J706 f 11 μ a

Para. 4.1.7Per para. 4.2.1.10 Specimen S/N 121Date: 6-19-59Engineer: E. L. MableyCVAC Insp: NAUSAP Insp: NA

* Indicates out of tolerance

ASSEMBLY CYCLE OPERATION

Control voltage	Para 4.1.8 step	Time (seconds)	Tolerance (seconds)	Type of assembly cycle	
				In. to Ext.	Ext. to In.
15V	1	1.57	1 max		
15V	2	1.44	1 max		
10V	3	.86	2 max		
10V	4	.58	2 max		
25V	5	.90	2 max		
25V	6	1.24	2 max		

DIELECTRIC STRENGTH

All circuits satisfactory - - - - - YES ☐ NO ☒

See Note X

INSULATION RESISTANCE

All circuits measured greater than 10 megohms - - - YES ☐ NO ☒

SWITCH CONTINUITY AND NON-CONTINUITY

All switches satisfactory

Para 4.1.8 step	YES	NO see note	Switch position	
			Internal	External
1				
2				
3				
4				
5				
6				

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 267 millisecondsInternal to External 270 milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.F.C. Chan. No.	In to Ext. msec	Ext to In msec	Circuit	C.F.C. Chan. No.	In to Ext. msec	Ext to In msec
P14	1	9.2	3.3	P12	1	3.2	3.3
P12	2			P22	2		
P30	3			P14	3		
P16	4			P16	4		
P40	5			P28	5		
P18	6			P18	6		
P20	7			P38	7	3.2	3.3
P26	8	9.2	3.3				

VOLTAGE DROP

Maximum Control Voltage (30 V.)

External

VOL

Switch in External Position			Switch in Internal Position		
SW. NO.	CIRCUIT	DATA	SW. NO.	CIRCUIT	DATA
A	J7010 - J7010	0.066	A	J701A - J701B	0.200
B	J706P - J705L	0.156	B	J701A - J705L	0.161
C	J706T - J705K	0.135	C	J701A - J705K	0.130
D	J706H - J705J	0.202	D	J701A - J705J	0.152
E	J706R - J705M	0.322	E	J702A - J705C	0.180
F	J706B - J701A	0.066	F	J702B - J702B	0.072
G	J706A - J703D	0.091	G	J702B - J702B	0.110
H	J706Y - J703F	0.025	H	J702B - J702F	0.110
I	J706A - J703G	0.091	I	J702C - J703G	0.111
J	J706P - J703K	0.039	J	J702C - J703K	0.075
K	J706Q - J703L	0.063	K	J702A - J703L	0.075
L	J706H - J703M	0.081	L	J702A - J703M	0.124
M	J706W - J703P	0.091	M	J702B - J703P	0.124
N	J706R - J703R	0.097	N	J702C - J703R	0.118
O	J706J - J704A	0.093	O	J702A - J704A	0.118
P	J706U - J704Q	0.050	P	J702B - J704C	0.083
Q	J706A - J704J	0.065	Q	J702C - J704J	0.080
R	J706P - J704M	0.092	R	J702A - J704M	0.123
S	J706X - J704R	0.071	S	J702B - J704R	0.116
T	J706B - J704T	0.035	T	J702C - J704T	0.098

CONTINUITY CHECKS

All circuits indicated continuity Yes ☒ No ☐ See Notes

4.2.1.1e) + 40°F @ 95% R.H.

A

Date: 6-19-59Page 97Test Engr: R. T. Mobley

Report 7A2236

CVAC Insp: NAWAP Insp: NA

VOLTAGE DROP:

Minimum Control Voltage (25 V.)

Switch in External Position				Switch in Internal Position			
SW. NO.	CIRCUIT	DATA	SW. NO.	CIRCUIT	DATA	SW. NO.	CIRCUIT
A	J701C - J701D	0.029	1	J701A - J701D	0.066		
B	J706P - J706L	0.162	2	J701A - J706L	0.142		
C	J706T - J706K	0.137	3	J701A - J706K	0.136		
D	J706G - J706J	0.146	4	J701A - J706J	0.217		
E	J706R - J706C	0.180	5	J701A - J706C	0.307		
F	J706E - J703A	0.072	6	J702A - J703A	0.069		
G	J706G - J703D	0.111	7	J702B - J703D	0.092		
H	J706I - J703F	0.111	8	J702B - J703F	0.026		
I	J706A - J703H	0.110	9	J702C - J703H	0.292		
J	J706C - J703K	0.072	10	J702C - J703K	0.040		
K	J706G - J703L	0.074	11	J702A - J703L	0.065		
L	J706H - J703M	0.122	12	J702A - J703M	0.082		
M	J706M - J703P	0.124	13	J702B - J703P	0.092		
N	J706G - J703R	0.120	14	J702C - J703R	0.100		
O	J706J - J704A	0.120	15	J702A - J704A	0.092		
P	J706A - J704C	0.083	16	J702B - J704C	0.052		
Q	J706R - J704J	0.078	17	J702C - J704J	0.066		
R	J706T - J704M	0.122	18	J702A - J704M	0.094		
S	J706I - J704R	0.113	19	J702B - J704R	0.070		
T	J706G - J704T	0.088	20	J702C - J704T	0.036		

B

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results: UnsatisfactoryDate: 6-19-57Specimen S/N 121. United Control Corp. specimenTest Engr: R. T. MobleyCVAC Insp: NAUSAF Insp: NA

Paragraph	Specification Requirement	Remarks
4.2.1.1 +)	Post Env. & Ambient Cond. Proct Cycle	
1.4	Operating Time: <u>.4 hr.</u> Start <u>95.5</u> hrs. Stop <u>95.7</u> hrs. Assembly Cycles <u>10</u> Start _____ hrs. Stop _____ hrs.	

Note: 1. During Hypot test (Switch Ext.) had
breakdown & 200V ON IN TYPE E

X 2. Dielectric strength test (Ext.) - TYPE E
→ ok.

3. SEC word #1. Int. to Ext.; #2. Ext. to Int

Para. 4.1.4For para. Exhibit Specimen S/N 121Date: 6-19-59Engineer: R. J. MoleyCVAC Insp: NHUSAF Insp: NH

* Indicates out of tolerance

United Control Corp.
SPECIMEN

ASSEMBLY CYCLE OPERATION:

Control voltage	Para 4.1.8 step	Time (seconds)	tolerance (seconds)	Type of assembly cycle	
				Int. to Ext.	Ext. to Int.
18V	a	1.46	1 MAX		
18V	d	1.44	1 MAX		
30V	f	0.73	2 MAX		
30V	i	0.83	2 MAX		
25V	j	2.49	2 MAX		
25V	k	2.76	2 MAX		

DIELECTRIC STRENGTH:

All circuits satisfactory - - - - - YES ☒ NO ☐

INSULATION RESISTANCE:

All circuits measured greater than 10 megohms - - - YES ☒ NO ☐

SWITCH CONTINUITY AND NON-CONTINUITY

All switches satisfactory

Para 4.1.8 step	YES	NO see note	Switch position	
			Internal	External
1				
2				
3				
4				

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 240 millisecondsInternal to External 228 milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.F.C. Chan. No.	In to Ex	Ex to In	Circuit	C.F.C. Chan. No.	In to Ex	Ex to In
P14	K	3.5	3.2	P12	M	3.5	3.2
P12	Q	1	1	P22	O	1	1
P30	H			P34	P	1	1
P36	I			P44	Q	1	1
P40	J			P16	R		
P18	K			P28	S	1	1
P20	L	1	1	P38	T	3.5	3.2
P26	M	3.5	3.2				

VOLTAGE DROP: Maximum Control Voltage (30 V.)

Switch in External Position			Switch in Internal Position		
SW. NO.	CIRCUIT	DATA	SW. NO.	CIRCUIT	DATA
A	J701B - J701D	0.099	A	J701A - J701D	0.059
B	J706F - J705L	0.159	B	J701A - J705L	0.133
C	J706T - J705E	0.136	C	J701A - J705K	0.138
D	J706S - J705J	0.146	D	J701A - J705I	0.226
E	J706R - J705H	0.125	E	J702A - J705C	0.263
F	J706Q - J703A	0.082	F	J702B - J703B	0.080
G	J706N - J703D	0.120	G	J702B - J703B	0.095
H	J706Y - J703F	0.115	H	J702B - J703F	0.110
I	J706M - J703G	0.120	I	J702C - J703G	0.096
J	J706I - J703K	0.025	J	J702C - J703K	0.044
K	J706O - J703L	0.094	K	J702A - J703L	0.076
L	J706H - J703M	0.130	L	J702A - J703M	0.090
M	J706W - J703P	0.140	M	J702B - J703P	0.095
N	J706X - J703R	0.120	N	J702C - J703R	0.105
O	J706J - J704A	0.125	O	J702A - J704A	0.110
P	J706D - J704C	0.083	P	J702B - J704C	0.056
Q	J706R - J704J	0.084	Q	J702C - J704J	0.070
R	J706F - J704M	0.135	R	J702A - J704M	0.115
S	J706X - J704R	0.110	S	J702B - J704R	0.063
T	J706B - J704T	0.092	T	J702C - J704T	0.034

CONTINUITY CHECK:

All circuits indicated continuity Yes ☒ No ☐ See Notes

4.2.1.1 f. Post Environmental Ambient
Env. Proof Cycle

A

Date: 6-19-59Page 100Test Engr: R. T. Mabley

Report 7A2236

CVAC Insp: NHUBAP Insp: NH

VOLTAGE DROP:

Minimum Control Voltage (25 V.)

Switch in External Position			Switch in Internal Position		
SW. MK.	CIRCUIT	DATA	SW. MK.	CIRCUIT	DATA
A	J701C - J701D	0.105	A	J701A - J701D	0.069
B	J706P - J705L	0.142	B	J701A - J705L	0.131
C	J706T - J705K	0.136	C	J701A - J705K	0.147
D	J706S - J705J	0.153	D	J701A - J705J	0.228
E	J706R - J705G	0.180	E	J701A - J705G	0.259
F	J706R - J703A	0.094	F	J702A - J703A	0.084
G	J706Q - J703D	0.125	G	J702B - J703D	0.092
H	J706T - J703F	0.120	H	J702B - J703F	0.032
I	J706Q - J703H	0.120	I	J702C - J703H	0.098
J	J706T - J703K	0.028	J	J702C - J703K	0.045
K	J706Q - J703L	0.110	K	J702A - J703L	0.029
L	J706R - J703M	0.140	L	J702A - J703M	0.092
M	J706W - J703P	0.140	M	J702B - J703P	0.097
N	J706G - J703R	0.130	N	J702C - J703R	0.110
O	J706J - J704A	0.130	O	J702A - J704A	0.115
P	J706A - J704C	0.092	P	J702B - J704C	0.056
Q	J706R - J704J	0.088	Q	J702C - J704J	0.072
R	J706T - J704N	0.140	R	J702A - J704N	0.120
S	J706X - J704R	0.115	S	J702B - J704R	0.065
T	J706B - J704T	0.094	T	J702C - J704T	0.034

B

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results: *Satisfactory*Date: *6-30-'59*Specimen S/N *121*Test Engr: *R. T. Mobley**United Control Corp.*

CVAC Insp: _____

USAF Insp: _____

Paragraph	Specification Requirement	Remarks
4.4	Operating Acc. Post Acc. proof cycle	CEC Recording Speed # 4 timing A Int. to Ext. to Int. Speed # 2, timing B Loads off Loads ON Int. to Ext. to Int. Loads off
2.4	Operating Time: Start <i>96.1</i> hrs. Stop <i>97.0</i> hrs. Assembly Cycles <i>14</i> Start _____ hrs. Stop _____ hrs.	Recorder Mag. #

- * Notes: 1. During operating Acceleration At switch are no greater than 7.5 milliseconds for IN, & HANDEL
- * 2. cycle sequence is no less than .219 seconds.
- * 3. exist fig. in engineering Notebook

Para. 4.1.7
 For para. 4.4 Specimen S/N 121
United Control Corp. Spec.
 * Indicates out of tolerance

Date: 6-30-59
 Engineer: R. J. Mobley
 CVAC Insp: NA
 USAF Insp: NA

ASSEMBLY CYCLE OPERATION:

Control voltage	Para 4.1.8 step	Time (seconds)	tolerance (seconds)	Type of Assembly cycle	
				Int. to Ext.	Ext. to Int.
18V	a	1.48	1 MAX	☒	☒
18V	d	1.37	1 MAX	☒	☒
30V	f	0.84	2 MAX	☒	☒
30V	i	0.70	2 MAX	☒	☒
25V	j	0.78	2 MAX	☒	☒
25V	j	0.95	2 MAX	☒	☒

DIELECTRIC STRENGTH:

All circuits satisfactory - - - - - YES ☒ NO ☐

INSULATION RESISTANCE:

All circuits measured greater than 10 megohms - - - YES ☒ NO ☐

SWITCH CONTINUITY AND NON-CONTINUITY

All switches satisfactory

Para 4.1.8 step	YES	NO see note	Switch position	
			Internal	External
f	☒		☒	☒
i	☒		☒	☒
j	☒		☒	☒
j	☒		☒	☒

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal see note 1 previous page milliseconds

Internal to External _____ milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.F.C. Chan. No.	In to Ex	Ex to In	Circuit	C.F.C. Chan. No.	In to Ex	Ex to In
PL	F			P42	F		
P12	F			P22	F		
P31	F			P34	F		
P35	F			P44	F		
P43	F			P16	F		
P13	F			P28	F		
P20	F			P38	F		
P26	F						

VOLTAGE DROP:

Maximum Control Voltage (30 V.)

VOL

Switch in External Position			Switch in Internal Position		
SM. NO.	CIRCUIT	DATA	SM. NO.	CIRCUIT	DATA
A	J701G - J701D	.458	A	J701A - J701D	.074
B	J706P - J705L	.190	B	J701A - J705L	.129
C	J706T - J705K	.163	C	J701A - J705K	.133
D	J706S - J705J	.190	D	J701A - J705J	.126
E	J706R - J705H	.216	E	J702A - J705C	.154
F	J706Q - J703A	.090	F	J702A - J703A	.159
G	J706N - J703D	.137	G	J702B - J703B	.160
H	J706Y - J703F	.110	H	J702B - J703F	.030
I	J706M - J703G	.130	I	J702C - J703G	.170
J	J706I - J703K	.074	J	J702C - J703K	.082
K	J706G - J703L	.109	K	J702A - J703L	.150
L	J706H - J703M	.142	L	J702A - J703M	.168
M	J706W - J703P	.145	M	J702B - J703P	.160
N	J706Z - J703R	.132	N	J702C - J703R	.170
O	J706J - J704A	.122	O	J702A - J704A	.193
P	J706Q - J704C	.098	P	J702B - J704C	.081
Q	J706R - J704J	.092	Q	J702C - J704J	.139
R	J706T - J704M	.186	R	J702A - J704M	.190
S	J706X - J704B	.117	S	J702B - J704B	.092
T	J706b - J704T	.094	T	J702C - J704T	.066

CONTINUITY CHECK:

All circuits indicated continuity Yes ☒ No ☐ See Notes

4.4 Post Acceleration
Proof Cycle

A

Date: 6-30-59Page 103Test Engr: R.T. Mobley

Report 7A2236

CVAC Insp: NADBAF Insp: NA

VOLTAGE DROP:

Minimum Control Voltage (25 V.)

Switch in External Position			Switch in Internal Position		
SW. NO.	CIRCUIT	DATA	SW. NO.	CIRCUIT	DATA
A	J701C - J701D	.499	A	J701A - J701D	.051
B	J706P - J705L	.163	B	J701A - J705L	.129
C	J706T - J705K	.149	C	J701A - J705K	.180
D	J706B - J705J	.154	D	J701A - J705J	.119
E	J706R - J705G	.190	E	J701A - J705G	.159
F	J706A - J703A	.084	F	J702A - J703A	.160
G	J706C - J703D	.132	G	J702B - J703D	.162
H	J706T - J703E	.110	H	J702B - J703E	.030
I	J706A - J703G	.130	I	J702C - J703G	.172
J	J706T - J703K	.079	J	J702C - J703K	.082
K	J706D - J703L	.105	K	J702A - J703L	.156
L	J706B - J703M	.147	L	J702A - J703M	.172
M	J706W - J703P	.145	M	J702B - J703P	.160
N	J706S - J703R	.133	N	J702C - J703R	.180
O	J706J - J704A	.124	O	J702A - J704A	.195
P	J706A - J704C	.094	P	J702B - J704C	.082
Q	J706B - J704J	.095	Q	J702C - J704J	.140
R	J706T - J704M	.132	R	J702A - J704M	.193
S	J706J - J704R	.127	S	J702B - J704R	.092
T	J706D - J704T	.100	T	J702B - J704T	.067

B

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results: Marginal (Re-test) Date: 6-30-59Specimen S/N 121. UNITED CONTROL
CORR SPECIMENTest Engr: R. J. MOONEY / J. COCHRAN
CVAC Insp: N/A
USAF Insp: U/A

Paragraph	Specification Requirement	Remarks
4.3	OPERATING VIBRATION 5 to 125 CPS. "X" AXIS	RECORDER MAG. No. 159 SPEED #2, (16"/SEC) RECORD No. 1253 TIMING - "B" 18 CHANNEL C.E.C. RECORDING RESONANCES: #1 - DRIVE 2 - "X" AXIS MAG. NO. 199 CK 21 3 - "Y" AXIS 4 - "Z" AXIS RECORD No. 08233 5 - APPER A/R EVERY CYCLE FROM 5-20, " 5 CYCLES " 30-100, 110, 120, & 125. DOUBLE PIPS AT 5, 20, 125.
1.4	Operating Time: Start <u>27.5</u> hrs. Stop <u>27.66</u> hrs. Assembly Cycles 2 Start _____ hrs. Stop _____ hrs.	

Notes:

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results: Marginal (Retest) Date: 6-30-'57Specimen S/N 121

United Control Corp.

Test Engr: R. T. MobleyCVAC Insp: NAUGAF Insp: NA

Paragraph	Specification Requirement	Remarks
4.3	OPERATING VIBRATION 5-125 cps "Y" Axis (re-run)	Reorder Mag. # 137 Speed #2 (16"/sec) Timing B 18 channel CEC recording resonances #1 Drive #2 "X" Axis #3 Y Axis #4 Z Axis #5 Pippin Pips every cycle 5-20 every 5 20-100 110, 120, 125 double pips @ 20, 125, 5
1.4	Operating Time: Start <u>97.0</u> hrs. Stop <u>97.2</u> hrs. Assembly Cycles <u>4</u> Start _____ hrs. Stop _____ hrs.	Mag. # 26073

Notes: 1. Made a switch txfer I to E to I @ 90 cfs

2. There were no large resonances during this
sweep - the only one of note was in "Y" Axis
@ 120 CPS

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results: *Marginal (Retest)* Date: *6-30-59*Specimen 3/W *121 United Control Corp. Specimen*Test Engr: *R.T. MOOREY / J. G. WETZEL*
CVAC Insp: *N/A*
USAF Insp: *N/A*

Paragraph	Specification Requirement	Remarks
4.3	Operating Vib. 5 - 12.5 CPS "Z" AXIS (REUN)	RECORDER MAG. NO. 159 SPEED #2 (16"/SEC.) TIMING "B" 18 CHANNEL C.E.C. RECORDING RESONANCES: #1 - DRIVE 2 - "X" AXIS MAG. NO. 3 - "Y" AXIS 26073 4 - "Z" AXIS 5 - PIPPER PIPS EVERY CYCLE FROM 5-20 " 5 CYCLES FROM 20-100 10, 120, 125 DOUBLE PIPS AT 5, 20, 125 See NOTE 1 BELOW.
1.4	Operating Time: Start <i>97.2</i> hrs. Stop <i>97.5</i> hrs. Assembly Cycles <i>2</i> Start _____ hrs. Stop _____ hrs.	

- Notes: 1. IT APPEARS THAT THE 18 CHANNEL C.E.C. RECORDER ON THE ACCELEROMETER OUTPUTS WAS FUNCTIONING ABNORMALLY DURING THIS VIBRATION SWEEP. IN ORDER TO PREVENT OVERTESTING IN THIS AXIS IT WAS DECIDED TO EVAL THE "X" AXIS RESONANT SEARCH BEFORE RERUNNING THE "Z" AXIS.
2. The accelerometer output recording was N.G. so it was destroyed.

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results: Marginal (2nd Re-test)

Date: 6-30-59

Specimen S/N 121. UNITED CONTROL
CORP. SPECIMEN.Test Engr: E. T. MURLEY / J. COURTNEY
CVAC Insp: N/A
USAF Insp: N/A

Paragraph	Specification Requirement	Remarks
4.3	OPERATING VIBRATION 5-125 C.P.S. DERUN OF Z AXIS (SEE NOTE 1 BELOW)	REORDER MAG. NO. 333 SPEED #2 (16" SEC) RECORD NO. 0256 18 CHANNEL CEC RECORDING RESONANCES: #1- DRIVE 2- "X" AXIS MAG. NO. 199CK.21 3- "Y" AXIS RECORD NO. 08234 4- "Z" AXIS 5- PAPER
1.4	Operating Time: Start 97.64 hrs. Stop 97.85 hrs. Assembly Cycles 2 Start _____ hrs. Stop _____ hrs.	PIPS EVERY CYCLE FROM 5 TO 20, " 5 CYCLES " 20 TO 100, 110, 120, & 125. DOUBLE PIPS AT 5, 20, 125

Notes: 1. THIS VIBRATION SWEEP IS A REPEAT OF THE ONE
CONDUCTED FROM 97.2 TO 97.5 HOURS OPERATING TIME
EARLIER THIS EVENING.

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results:

Specimen S/N 121. United Control
Corp. SpecimenDate: July 7, 1959
Test Engr: R. T. Mobley
CVAC Insp: NA
USAF Insp: NA

Paragraph	Specification Requirement	Remarks
4.5	Life Test	
1.4	Operating Time: Start <u>97.9</u> hrs. Stop _____ hrs. Assembly Cycles Start _____ hrs. Stop _____ hrs.	

Notes: 1. A total of 132 cycles (switching) had been put on specimen in testing prior to beginning of Life Test.

2. 214 cycles required to obtain 301 cycles

VOLTAGE DROP:

Maximum Control Voltage (30 V.)

VOLTA

Switch in External Position			Switch in Internal Position		
SM. NO.	CIRCUIT	DATA	SM. NO.	CIRCUIT	DATA
A	J701G - J701D	0.0134.030	A	J701A - J701D	0.024
B	J706P - J705L	0.005	B	J701A - J705L	0.012
C	J706T - J705K	0.013	C	J701A - J705K	0.028
H	J706S - J705J	0.009	H	J701A - J705J	0.024
E	J706R - J705H	0.006	E	J702A - J705C	0.007
F	J706Q - J705G	0.032	F	J702B - J705B	0.025
G	J706M - J705F	0.032	G	J702B - J705B	0.115
H	J706Y - J703F	0.031	H	J702B - J703F	0.115 0.013
I	J706A - J703G	0.028	I	J702C - J703G	0.137
J	J706F - J703K	0.030	J	J702C - J703K	0.105
K	J706G - J703L	0.025	K	J702A - J703L	0.038
L	J706H - J703M	0.030	L	J702A - J703M	0.025
M	J706W - J703P	0.032	M	J702B - J703P	0.115
N	J706E - J703R	0.030	N	J702C - J703R	0.028
O	J706J - J704A	0.029	O	J702A - J704A	0.025
P	J706C - J704C	0.027	P	J702B - J704C	0.084
Q	J706R - J704J	0.031	Q	J702C - J704J	0.027
R	J706F - J704M	0.025	R	J702A - J704M	0.027
S	J706Y - J704S	0.027	S	J702B - J704R	0.082
T	J706B - J704T	0.028	T	J702C - J704T	0.090

CONTINUITY CHECK:

All circuits indicated continuity Yes ☐ No ☐ See Notes

4.5 Life Test United Control
Corp. Specimen SN-121
Made at 354 cycles

Switch in INTER

Made at 500

A

Date: _____

Page 107

Test Engr: _____

Report 712236

CVAC Insp: _____

USAF Insp: _____

VOLTAGE DROP:

Minimum Control Voltage (25 V.)

Switch in External Position			Switch in Internal Position		
SW. NO.	CIRCUIT	DATA	SW. NO.	CIRCUIT	DATA
A	J7013 - J701D		-	J701A - J701D	
B	J706P - J705L			J701A - J705L	
C	J706T - J705K			J701A - J705K	
D	J706S - J705J			J701A - J705J	
E	J706R - J705C			J701A - J705C	
F	J706Z - J703A		F	J702A - J703A	
G	J706C - J703D		G	J702B - J703D	0.030
3 H	J706Y - J703F		H	J702B - J703F	0.029
I	J706A - J703G		I	J702C - J703G	0.028
J	J706T - J703K		J	J702C - J703K	0.026
K	J706Q - J703L		K	J702A - J703L	0.028
L	J706H - J703M		L	J702A - J703M	
M	J706W - J703P		M	J702B - J703P	0.028
N	J706X - J703R		N	J702C - J703R	
O	J706J - J704A		O	J702A - J704A	
P	J706Q - J704C		P	J702B - J704C	0.028
Q	J706R - J704J		Q	J702C - J704J	
R	J706T - J704M		R	J702A - J704M	
S	J706X - J704R		S	J702B - J704R	0.025
T	J706b - J704T		T	J702C - J704T	0.027

in Internal Position

at 500 cycles

B

CONVAIR ASTRONAUTICS

REPORT 7A2236

PAGE 110

Para. No. 4.1.9
 For Para. 4.5
 Specimen United Control Corp.
SN 121

Date: July 10, 1959
 Test Eng: R. T. Mobley
 CVAC Insp: NA
 USAF Insp: NA

VOLTAGE DROP ACROSS (DISTRIBUTION) SWITCH CONTACTS Using Test Set.
4P @ end of Life Test

SWITCH	CNT.	DATA Internal	SWITCH	CNT.	External DATA
A	P2-P1	0.059	A	P2-P3	0.096
B	P6-P1	0.109	B	P6-P5	0.162
C	P12-P1	0.104	C	P12-P11	0.160
D	P10-P1	0.105	D	P10-P9	0.142
E	P8-P1	0.122	E	P8-P7	0.178
F	P14-P13	0.031	F	P14-P15	0.114
G	P32-P25	0.096	G	P32-P33	0.120
H	P30-P25	0.031	H	P30-P31	0.114
I	P36-P37	0.105	I	P36-P39	0.120
J	P40-P37	0.040	J	P40-P43	0.077
K	P18-P13	0.080	K	P18-P19	0.128
L	P20-P13	0.090	L	P20-P21	0.136
M	P26-P25	0.100	M	P26-P27	0.136
N	P42-P37	0.110	N	P42-P45	0.129
O	P22-P13	0.112	O	P22-P23	0.129
P	P34-P25	0.054	P	P34-P35	0.139
Q	P44-P37	0.074	Q	P44-P47	0.096
R	P16-P13	0.110	R	P16-P17	0.137
S	P28-P25	0.063	S	P28-P29	0.112
T	P38-P37	0.052	T	P38-P41	0.042

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results: *Failed*Date: *July 14, 1957*Specimen S/N *124 United Control Corp. Specimen*Test Engr: *E. T. Mobley*CVAC Insp: *NA*USAF Insp: *NA*

Paragraph	Specification Requirement	Remarks
4.1.8	<i>Initial Satisfactory</i>	<i>- see note 1 below - The Hypot breakdown was determined to be caused by the vendor using the improper relays for the AC switch</i>
1.4	Operating Time: Start <i>10.3</i> hrs. Stop <i>102.8</i> hrs. Assembly Cycles <i>0</i> Start _____ hrs. Stop _____ hrs.	

* 1. During Hypot test with 1500 VDCS applied, leakage & breakdown occurred between J706F-J706G; J706H, J706S; intermittent between e & d and between a & b and between f & i and j & k

* 2. D.C. switch failed to transfer on third cycle when it should have opened. After limiting micro-switch was found to be contaminated and hanging-up in the open position. Exercising the plunger a few times freed the switch and allowed the DC switch to trip. The switch was repaired and sent to the vendor.

CONVAIR ASTRONAUTICS

REPORT 7A2236

DATE 1/2

Para. 4.1.8
For para. 4.1.8 Specimen S/N 124
United Control Corp.

Date: July 14, '59
Engineer: R. J. Mahley
CVAC Insp: NA
USAF Insp: NA

* Indicates out of tolerance

ASSEMBLY CYCLE OPERATION:

Control voltage	Para 4.1.8 step	Time (seconds)	Tolerance (seconds)	Type of assembly cycle	
				Int. to Ext.	Ext. to Int.
10V	a	1.933	± MAX		
15V	a	1.514	± MAX		
* 30V	f		± MAX		
30V	i		± MAX		
25V	j		± MAX		
25V	k		± MAX		

DIELECTRIC STRENGTH:

* All circuits satisfactory YES * ☒ NO ☐

INSULATION RESISTANCE:

All circuits measured greater than 10 megohms YES ☒ NO ☐

SWITCH CONTINUITY AND NON-CONTINUITY

All switches satisfactory

Failed before these steps run

Para 4.1.8 step	YES	NO see note	Switch position	
			Internal	External
1				
2				
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99				
100				

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal _____ milliseconds

Internal to External _____ milliseconds

POSITION TRANSFER TIME: (15 milliseconds minimum)

Circuit	C.F.C. Char. No.	Ex to Ex	Ex to In	Circuit	C.F.C. Char. No.	Ex to Ex	Ex to In
P14	F			P42	N		
P12	G			P22	C		
P30	H			P31	F		
P46	I			P44	G		
P40	J			P16	N		
P18	F			P24	S		
P20	H			P18	T		
P26	N						

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results: Satisfactory

Date: Oct. 5

Specimen S/N 124. United Control

Test Eng: H. Edwards

CVAC Insp: NA

USAF Insp: NA

Paragraph	Specification Requirement	Remarks
4.1.8	Initial Satisfactory	Initial sat. com
1.4	Operating Time: Start 158.6 hrs. Stop 159.4 hrs. Assembly cycles 8 Start _____ hrs. Stop _____ hrs.	

Notes: The voltage drop across J701A - J701D was considerably too high. It was determined that the sensing lead on J701A was loose. This was repaired but the voltage drop was then meas. as 1.3400. It was noted that pin A in J701 was badly pitted and that the plug heated up. (One on test set pitted). This plug will be changed after Vib. and a new set of E drop meas. made.

Para. 4.1.8 United Control
 For para. 4.1.8 Specimen S/N 124
 Initial Sat.

Date: Oct. 5
 Engineer: H. Edwards
 CVAC Insp: ---
 USAF Insp: N/A

* Indicates out of tolerance

ASSEMBLY CYCLE OPERATION:

Control voltage	Para 4.1.8 step	Time (seconds)	Tolerance (seconds)	Type of assembly cycle	
				Int. to Ext.	Ext. to Int.
15V	A	1.449	3 max		
15V	d	1.325	3 max		
15V	f	0.673	2 max		
30V	1	0.661	2 max		
25V	1	0.781	2 max		
25V	1	0.914	2 max		

DISSIPATIVE STRENGTH:

All circuits satisfactory - - - - - YES ☒ NO ☐

INSULATIVE RESISTANCE:

All circuits measured greater than 10 megohms - - - YES ☒ NO ☐

SWITCH CONTINUITY AND MAKE-CONTINUITY:

All switches satisfactory

Rec. No. 0849

Para 4.1.8 step	YES	NO see note	Switch position	
			Internal	External
1				
2				
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96				
97				
98				
99				
100				

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 122 milliseconds

Internal to External 130 milliseconds

POSITION TRANSFER TIME: (15 milliseconds minimum)

Circuit	C.F.C. No.	In to Ex	Ex to In	Circuit	C.F.C. No.	In to Ex	Ex to In
P11	F	12	12	P12	F	12	12
P12	O	12	12	P13	F	12	12
P13	H	12	12	P14	F	12	12
P14	I	12	12	P15	F	12	12
P15	J	12	12	P16	F	12	12
P16	K	12	12	P17	F	12	12
P17	L	12	12	P18	F	12	12
P18	M	12	12	P19	F	12	12
P19	N	12	12	P20	F	12	12
P20	O	12	12	P21	F	12	12
P21	P	12	12	P22	F	12	12
P22	Q	12	12	P23	F	12	12
P23	R	12	12	P24	F	12	12
P24	S	12	12	P25	F	12	12
P25	T	12	12	P26	F	12	12
P26	U	12	12	P27	F	12	12
P27	V	12	12	P28	F	12	12
P28	W	12	12	P29	F	12	12
P29	X	12	12	P30	F	12	12
P30	Y	12	12	P31	F	12	12
P31	Z	12	12	P32	F	12	12
P32	AA	12	12	P33	F	12	12
P33	AB	12	12	P34	F	12	12
P34	AC	12	12	P35	F	12	12
P35	AD	12	12	P36	F	12	12
P36	AE	12	12	P37	F	12	12
P37	AF	12	12	P38	F	12	12
P38	AG	12	12	P39	F	12	12
P39	AH	12	12	P40	F	12	12
P40	AI	12	12	P41	F	12	12
P41	AJ	12	12	P42	F	12	12
P42	AK	12	12	P43	F	12	12
P43	AL	12	12	P44	F	12	12
P44	AM	12	12	P45	F	12	12
P45	AN	12	12	P46	F	12	12
P46	AO	12	12	P47	F	12	12
P47	AP	12	12	P48	F	12	12
P48	AQ	12	12	P49	F	12	12
P49	AR	12	12	P50	F	12	12
P50	AS	12	12	P51	F	12	12
P51	AT	12	12	P52	F	12	12
P52	AU	12	12	P53	F	12	12
P53	AV	12	12	P54	F	12	12
P54	AW	12	12	P55	F	12	12
P55	AX	12	12	P56	F	12	12
P56	AY	12	12	P57	F	12	12
P57	AZ	12	12	P58	F	12	12
P58	BA	12	12	P59	F	12	12
P59	BB	12	12	P60	F	12	12
P60	BC	12	12	P61	F	12	12
P61	BD	12	12	P62	F	12	12
P62	BE	12	12	P63	F	12	12
P63	BF	12	12	P64	F	12	12
P64	BG	12	12	P65	F	12	12
P65	BH	12	12	P66	F	12	12
P66	BI	12	12	P67	F	12	12
P67	BJ	12	12	P68	F	12	12
P68	BK	12	12	P69	F	12	12
P69	BL	12	12	P70	F	12	12
P70	BM	12	12	P71	F	12	12
P71	BN	12	12	P72	F	12	12
P72	BO	12	12	P73	F	12	12
P73	BP	12	12	P74	F	12	12
P74	BQ	12	12	P75	F	12	12
P75	BR	12	12	P76	F	12	12
P76	BS	12	12	P77	F	12	12
P77	BT	12	12	P78	F	12	12
P78	BU	12	12	P79	F	12	12
P79	BV	12	12	P80	F	12	12
P80	BW	12	12	P81	F	12	12
P81	BX	12	12	P82	F	12	12
P82	BY	12	12	P83	F	12	12
P83	BZ	12	12	P84	F	12	12
P84	CA	12	12	P85	F	12	12
P85	CB	12	12	P86	F	12	12
P86	CC	12	12	P87	F	12	12
P87	CD	12	12	P88	F	12	12
P88	CE	12	12	P89	F	12	12
P89	CF	12	12	P90	F	12	12
P90	CG	12	12	P91	F	12	12
P91	CH	12	12	P92	F	12	12
P92	CI	12	12	P93	F	12	12
P93	CJ	12	12	P94	F	12	12
P94	CK	12	12	P95	F	12	12
P95	CL	12	12	P96	F	12	12
P96	CM	12	12	P97	F	12	12
P97	CN	12	12	P98	F	12	12
P98	CO	12	12	P99	F	12	12
P99	CP	12	12	P100	F	12	12

TIME DROP:

Maximum Control Voltage (30 V.)

VOL

Switch in External Position			Switch in Internal Position		
ML	CIRCUIT	DATA	ML	CIRCUIT	DATA
A	J701C - J701D	.048	A	J701A - J701D	.194
B	J706P - J705L	.142	B	J701A - J705L	.124
C	J706T - J705K	.162	C	J701A - J705K	.107
D	J706 - J705	.194	D	J701A - J705	.189
E	J706 - J705C	.199	E	J701A - J705C	.204
F	J706B - J705A	.110	F	J702A - J702	.102
G	J706L - J705B	.105	G	J702B - J702B	.089
H	J706Y - J703W	.094	H	J702B - J703W	.031 .490
I	J706A - J703C	.105	I	J702C - J703C	.102
J	J706C - J703K	.082	J	J702C - J703K	.052
K	J706C - J703L	.140	K	J702A - J703L	.106
L	J706H - J703M	.135	L	J702A - J703M	.099
M	J706M - J703P	.102	M	J702A - J703P	.080
N	J706E - J703E	.112	N	J702C - J703E	.095
O	J706C - J703A	.146	O	J702A - J703A	.149
P	J706L - J704C	.099	P	J702B - J704C	.078
Q	J706R - J704J	.093	Q	J702C - J704J	.078
R	J706T - J704N	.138	R	J702A - J704N	.131
S	J706Y - J704R	.148	S	J702B - J704R	.077
T	J706 - J704T	.93	T	J702C - J704T	.042

CONTINUITY CHECK

All circuits indicated continuity . . . Yes ☒ No ☐ See Notes

4.1.8. Initial Satisfactory Performance Test

Date:

Oct. 5

Page

115

Test Engr:

H. Edwards

Report 7A2236

OVAC Insp:

NA

IGAP Insp:

NA

VOLTAGE DROP:

Minimum Control Voltage (25 V.)

Switched in External Position				Switched in Internal Position			
Ref. No.	CIRCUIT	DATA		Ref. No.	CIRCUIT	DATA	
A	J701C - J701B	.064		A	J701A - J701B	.824 *	
B	J701F - J701L	.132		B	J701A - J701L	.128	
C	J701E - J701K	.148		C	J701A - J701K	.111	
D	J701G - J701J	.177		D	J701A - J701J	.112	
E	J701H - J701C	.193		E	J701A - J701C	.185	
F	J701E - J701A	.111		F	J702A - J702A	.099	
G	J701C - J701D	.102		G	J702B - J702D	.087	
H	J701F - J701F	.095		H	J702B - J701F	.030	
I	J701E - J701C	.108		I	J702C - J701C	.100	
J	J701F - J701L	.079		J	J702C - J701L	.050	
K	J701C - J701L	.124		K	J702A - J701L	.096	
L	J701H - J701F	.122		L	J702A - J701H	.096	.030
M	J701H - J701F	.098		M	J702B - J701F	.078	
N	J701F - J701K	.111		N	J702C - J701K	.078	.092
O	J701J - J701A	.143		O	J702A - J701A	.141	
P	J701E - J701C	.098		P	J702B - J701C	.076	
Q	J701E - J701L	.090		Q	J702C - J701L	.077	
R	J701F - J701L	.134		R	J702A - J701L	.125	
S	J701F - J701K	.105		S	J702B - J701K	.076	
T	J701L - J701C	.092		T	J702C - J701C	.091	

* NOTE: READING FLUCTUATED BETWEEN

0.324 AND 0.824 VDC.

It was determined that this discrepancy was in the test set.

B

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results:

Specimen: *129 United*
Control Specimen

Date: *10-6-58*
 Test Eng: *R.T. Mobley*
 CVAC Insp: *NA*
 USAP Insp: *NA*

Paragraph	Specification Requirement	Remarks
4.3	Operating Vib. Y Axis	#1 Z axis 2 accel. record #2 Y Axis 3 #3 X Axis 4 #1 drive 1 25G/11 2,3 & 4 50G/inch Mag # 200021 Record # 17994 5-80 cps 17995 80-200 cps
1.4	Operating Time: Start <i>159.4</i> hrs. Stop <i>160.0</i> hrs. Assembly cycles <i>6</i> Start _____ hrs. Stop _____ hrs.	

1. Channel "A" (200A ext.) was noted to have quite a bit of noise - an assembly cycle was made I to E @ speed #1 @ 48 cps to see what ext. looked like. Back to I at 30 cps.

2. Made assembly cycle I to E to I @ speed 4 timing "A" at 200 cps

3. Assembly cycle at end of run made at speed 3

Para. 4.3 *Opn. Vib. "V" Axis*
 For para. 4.3 Specimen S/N 124
United Control

Date: 10-6-54
 Engineer: R. T. Mahley
 CVAC Insp: NA
 USAF Insp: NA

* Indicates out of tolerance

ASSEMBLY CYCLE OPERATION:

Control voltage	Para 4.1.8 step	Time (seconds)	tolerance (seconds)	Type of assembly cycle	
				Int. to Ext	Ext. to Int
15V	2	NA	1 max		
15V	4	NA	1 max		
30V	7	NA	2 max		
30V	1		2 max		
25V	1		2 max		
25V	1		2 max		

DIELECTRIC STRENGTH:

All circuits satisfactory - - - - - YES ☒ NO ☐

INSULATION RESISTANCE:

All circuits measured greater than 10 megohms - - - YES ☒ NO ☐

SWITCH CONTINUITY AND NON-CONTINUITY

All switches satisfactory

Para 4.1.8 step	YES	NO see note	Switch position	
			Internal	External
1		NA		
2				
3				
4				

CYCLE STOPPING TIME: (20 milliseconds minimum)

External to Internal 266 milliseconds

Internal to External 255 milliseconds

POSITION TRANSFER TIME: (0.5 milliseconds maximum)

Circuit	C.F.C. Chan. No.	In to Ex msec	Ex to In msec	Circuit	C.F.C. Chan. No.	In to Ex msec	Ex to In msec
P11	1	1.5	1.5	P12	2	1.5	1.5
P12	2	1.5	1.5	P13	3	1.5	1.5
P13	3	2.0	2.0	P14	4	1.5	1.5
P14	4	1.5	1.5	P15	5	1.5	1.5
P15	5	1.5	1.5	P16	6	1.5	1.5
P16	6	1.5	1.5	P17	7	1.5	1.5
P17	7	1.5	1.5	P18	8	1.5	1.5
P18	8	1.5	1.5	P19	9	1.5	1.5
P19	9	1.5	1.5	P20	10	1.5	1.5
P20	10	1.5	1.5	P21	11	1.5	1.5
P21	11	1.5	1.5	P22	12	1.5	1.5

End of run (happy)

4.1 TEST CONDITIONS AND TEST (Continued)

General Test Results:

Specimen S/n 124 United Cont.

date: 10-6-'59
 Test Eng: R.J. Mobley
 CVAC In: NA
 ADAT In: NA

Paragraph	Specification Requirement	Remarks
4.3	Operating Vib. "Z" axis	Calib. on front of "Z" axis sweep - Textronix calib. input 12" run at 100 mv. in 12" run at 600 mv. in
1.4	Operating Time: Start <u>160.0 hrs.</u> Stop <u>160.5 hrs.</u> Assembly Cycles <u>6</u> Start <u> </u> hrs. Stop <u> </u> hrs.	record mag. # 159 accel. record mag. # 200021 record # 18000 Calib. and pos. same as "Y" Axis

1. Made assembly cycle I to E at 45 cps - back to I at 65 cps - switch made considerable rattling noise during both "Y" & "Z" sweeps
2. Made assembly cycle I-E-I @ speed A, timing A, @ 140 cps

Para. 4.3 *Opn. Vib. "Z" Axis*
 For para. 4.3 Specimen S/N 124
United Control
 * Indicates out of tolerance

Date: 10-6-59
 Engineer: R. T. Mobley
 CVAC Insp: NA
 USAF Insp: NA

ASSEMBLY CYCLE OPERATION:

Control voltage	Para 4.1.8 step	Time (seconds)	tolerance (seconds)	Type of assembly cycle	
				Int. to Ext.	Ext. to Int.
18V	A		3 MAX		
18V	A		3 MAX		
30V	?	NA	2 MAX	NA	NA
30V	1		2 MAX		
25V	1		2 MAX		
25V	1		2 MAX		

DIELECTRIC STRENGTH:

All circuits satisfactory - - - - - YES ☒ NO ☐

INSULATION RESISTANCE:

All circuits measured greater than 10 megohms - - - YES ☒ NO ☐

SWITCH CONTINUITY AND NON-CONTINUITY

All switches satisfactory

Para 4.1.8 step	YES	NO see note	Switch position	
			Internal	External
?		NA		

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 530 milliseconds

Internal to External 225 milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit Chan. No.	C.F.C.	Ex to Ex msec	Ex to In msec	Circuit Chan. No.	C.F.C.	In to Ex msec	Ex to In msec
P14	F	1.5	1.5	P12	N	1.5	1.5
P12	Q	1.0	1.5	P22	Q	2.0	1.5
P30	R	2.0	2.5	P36	P	1.5 1.0	1.0
P36	I	1.5	1.0	P44	J	2.5 1.5	1.5
P40	J	1.5	1.0	P16	R	2.5 2.5	1.5
P18	K	1.5	1.5	P48	S	2.3	2.0
P20	L	1.5	1.5	P38	T	1.0	1.5
P26	M	2.0	2.0				

end of run

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results:

Date:

10-6-'59

Specimen S/N

LTA United
Control Corp.

Test Engr:

R. L. Mobley

CVAC Insp:

USAF Insp:

NA

Paragraph	Specification Requirement	Remarks
4.3	Operating Vib. "X" axis	
1.4	Operating Time: Start 160.5 hrs. Stop _____ hrs. Assembly Cycles Start _____ hrs. Stop _____ hrs.	

Notes: 1. Made assembly cycle at 140 CPS @ Speed #4
2. 5-200 mag. # 137 2m - 2000 SN
3. Assembly cycle - Ram Performed at
672 cps.

Para. 1.3 Opn. Vib. "X" Axis
 For para. 1.2 Specimen S/N 124
United Control

Date: 10-6-54
 Engineer: Mabley-R.T.
 CVAC Insp: NA
 USAF Insp: NA

* Indicates out of tolerance

ASSEMBLY CYCLE OPERATION

Control voltage	Para 1.1.8 step	Time (seconds)	tolerance (seconds)	Type of assembly cycle	
				Int. to Ext	Ext. to Int
18V	a		3 max		
18V	d		3 max		
30V	f	NA	2 max	NA	
30V	1		2 max		
25V	1		2 max		
25V	1		2 max		

DIELECTRIC STRENGTH:

All circuits satisfactory - - - - - NA ☐ YES ☐ NO

INSULATION RESISTANCE:

All circuits measured greater than 10 megohms - - - - - NA ☐ YES ☐ NO

SWITCH CONTINUITY AND NON-CONTINUITY

All switches satisfactory

Para 1.1.8 step	YES	NO see note	Switch position	
			Internal	External
1		NA		
2				
3				
4				

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal _____ milliseconds

Internal to External _____ milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.E.C. Chan. No.	In to Ex msec	Ex to In msec	Circuit	C.E.C. Chan. No.	In to Ex msec	Ex to In msec
P14	F			P22	M		
P12	G			P24	N		
P30	H			P26	O		
P36	I			P28	P		
P40	J			P30	Q		
P18	K			P32	R		
P20	L			P34	S		
P26	M			P36	T		

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results: See Note 2

Date: 10-9-'59

Specimen S/N 124 United Cont.

Test Eng: R. T. Mabley

CVAC Insp: NA

USAF Insp: NA

Paragraph	Specification Requirement	Remarks
	Post Vibration proof cycle	
1.4	Operating Time: Start 161.7 hrs. Stop _____ hrs. Assembly Cycles Start _____ hrs. Stop _____ hrs.	

Notes: 1. CEC Mag. # I-E-I @ 1294/sec.
 2. Reducing Midtest data indicated that
 JTCIAT JTCID was still intermittent - specimen
 was IR'd (IR # 414475) 10-12-'59 and
 sent back to Vendor for repair & per
 verbal agreement with Mr. S.F. King, Elt. T. Dir.

Post Vibration
proof cyclePara. 4-3For para. 3.1 Specimen S/N 124 U.C.Date: 10-9-59Engineer: R.T. MobleyCVAC Insp: NAUSAF Insp: NA

* Indicates out of tolerance

ASSEMBLY CYCLE OPERATION:

Control voltage	Para 4.1.8 step	Time (seconds)	tolerance (seconds)	Type of assembly cycle	
				Int. to Ex	Ext. to Int
18V	a	1.93	1 max		
18V	d	1.59	1 max		
30V	f	.871	2 max		
30V	i	.726	2 max		
25V	j	1.04	2 max		
25V	k	1.00	2 max		

DIAGNOSTIC AIRCRAFT:

All circuits satisfactory - - - YES ☐ NO ☐

INSULATION RESISTANCE:

All circuits measured greater than 10 megohms - - - YES ☐ NO ☐

SWITCH CONTINUITY AND NON-CONTINUITY:

All switches satisfactory

Para 4.1.8 step	YES	NO see note	Switch position	
			Internal	External
f				
i				
j				
k				

CYCLE SEQUENCE TIME (20 milliseconds minimum)

External to Internal 28 millisecondsInternal to External 38 milliseconds

POSITION TRANSFER TIME (15 milliseconds maximum)

Circuit	C.E.C. Chan. No.	In to Ex	Ex to In	Circuit	C.E.C. Chan. No.	In to Ex	Ex to In
P12	7	1	2	P12	7	1	2
P12	8	2	3	P12	8	2	3
P12	9	3	4	P12	9	3	4
P12	10	4	5	P12	10	4	5
P12	11	5	6	P12	11	5	6
P12	12	6	7	P12	12	6	7
P12	13	7	8	P12	13	7	8
P12	14	8	9	P12	14	8	9
P12	15	9	10	P12	15	9	10
P12	16	10	11	P12	16	10	11
P12	17	11	12	P12	17	11	12
P12	18	12	13	P12	18	12	13
P12	19	13	14	P12	19	13	14
P12	20	14	15	P12	20	14	15
P12	21	15	16	P12	21	15	16
P12	22	16	17	P12	22	16	17
P12	23	17	18	P12	23	17	18
P12	24	18	19	P12	24	18	19
P12	25	19	20	P12	25	19	20
P12	26	20	21	P12	26	20	21
P12	27	21	22	P12	27	21	22
P12	28	22	23	P12	28	22	23
P12	29	23	24	P12	29	23	24
P12	30	24	25	P12	30	24	25
P12	31	25	26	P12	31	25	26
P12	32	26	27	P12	32	26	27
P12	33	27	28	P12	33	27	28
P12	34	28	29	P12	34	28	29
P12	35	29	30	P12	35	29	30
P12	36	30	31	P12	36	30	31
P12	37	31	32	P12	37	31	32
P12	38	32	33	P12	38	32	33
P12	39	33	34	P12	39	33	34
P12	40	34	35	P12	40	34	35
P12	41	35	36	P12	41	35	36
P12	42	36	37	P12	42	36	37
P12	43	37	38	P12	43	37	38
P12	44	38	39	P12	44	38	39
P12	45	39	40	P12	45	39	40
P12	46	40	41	P12	46	40	41
P12	47	41	42	P12	47	41	42
P12	48	42	43	P12	48	42	43
P12	49	43	44	P12	49	43	44
P12	50	44	45	P12	50	44	45
P12	51	45	46	P12	51	45	46
P12	52	46	47	P12	52	46	47
P12	53	47	48	P12	53	47	48
P12	54	48	49	P12	54	48	49
P12	55	49	50	P12	55	49	50
P12	56	50	51	P12	56	50	51
P12	57	51	52	P12	57	51	52
P12	58	52	53	P12	58	52	53
P12	59	53	54	P12	59	53	54
P12	60	54	55	P12	60	54	55
P12	61	55	56	P12	61	55	56
P12	62	56	57	P12	62	56	57
P12	63	57	58	P12	63	57	58
P12	64	58	59	P12	64	58	59
P12	65	59	60	P12	65	59	60
P12	66	60	61	P12	66	60	61
P12	67	61	62	P12	67	61	62
P12	68	62	63	P12	68	62	63
P12	69	63	64	P12	69	63	64
P12	70	64	65	P12	70	64	65
P12	71	65	66	P12	71	65	66
P12	72	66	67	P12	72	66	67
P12	73	67	68	P12	73	67	68
P12	74	68	69	P12	74	68	69
P12	75	69	70	P12	75	69	70
P12	76	70	71	P12	76	70	71
P12	77	71	72	P12	77	71	72
P12	78	72	73	P12	78	72	73
P12	79	73	74	P12	79	73	74
P12	80	74	75	P12	80	74	75
P12	81	75	76	P12	81	75	76
P12	82	76	77	P12	82	76	77
P12	83	77	78	P12	83	77	78
P12	84	78	79	P12	84	78	79
P12	85	79	80	P12	85	79	80
P12	86	80	81	P12	86	80	81
P12	87	81	82	P12	87	81	82
P12	88	82	83	P12	88	82	83
P12	89	83	84	P12	89	83	84
P12	90	84	85	P12	90	84	85
P12	91	85	86	P12	91	85	86
P12	92	86	87	P12	92	86	87
P12	93	87	88	P12	93	87	88
P12	94	88	89	P12	94	88	89
P12	95	89	90	P12	95	89	90
P12	96	90	91	P12	96	90	91
P12	97	91	92	P12	97	91	92
P12	98	92	93	P12	98	92	93
P12	99	93	94	P12	99	93	94
P12	100	94	95	P12	100	94	95

CONVAIN
SAN DIEGO

VOLTAGE DROP:

Maximum Control Voltage (30 V.)

Switch in External Position			Switch in Internal Position		
SW. NO.	CIRCUIT	DATA	SW. NO.	CIRCUIT	DATA
A	J701E - J701D	.090	A	J701A - J701B	.356
B	J706P - J705L	.138	B	J701A - J705L	.130
C	J706T - J705K	.174	C	J701A - J705K	.180
D	J706S - J705J	.167	D	J701A - J705J	.099
E	J706R - J705C	.203	E	J701A - J705C	.191
F	J706B - J702A	.105	F	J702A - J701B	.089
G	J706C - J702D	.108	G	J702B - J702B	.034
H	J706X - J701F	.087	H	J702B - J702F	.083
I	J706e - J702G	.108	I	J702C - J702K	.104
J	J706I - J703K	.071	J	J702C - J703K	.046
K	J706G - J703L	.118	K	J702A - J703L	.088
L	J706H - J703M	.122	L	J702A - J703M	.091
M	J701M - J701P	.100	M	J702B - J703P	.085
N	J706K - J703F	.111	N	J702C - J703F	.094
O	J706J - J704A	.141	O	J702A - J704A	.138
P	J706d - J704C	.096		J702B - J704C	.075
Q	J706R - J704J	.089		J702C - J704J	.074
R	J706F - J704N	.135	R	J702A - J704N	.131
S	J706X - J704P	.102	S	J702B - J704P	.074
T	J706B - J704T	.091	T	J702C - J704T	.044

CONTINUITY CHECK:

All circuits indicated continuity Yes ☒ No ☐ See Notes

Post Vib. Proof Cycle

A

Date: 10-9-'59Page 124Test Engr: R.T. MobleyReport 742236CVAC Insp: NAUSAF Insp: NA

VOLTAGE DATA

Minimum Control Voltage (25 V.)

Switch in External Position				Switch in Internal Position			
SW. NO.	CIRCUIT	DATA		SW. NO.	CIRCUIT	DATA	
A	J701C - J701D	.122		A	J701A - J701D	.440	
B	J701A - J701L	.152		B	J701A - J701L	.127	
C	J701E - J701K	.146		C	J701A - J701K	.104	
D	J701G - J701J	.176		D	J701A - J701J	.107	
E	J701F - J701C	.214		E	J701A - J701C	.214	
F	J701E - J701A	.105		F	J701A - J701A	.092	
G	J701C - J701D	.108		G	J701B - J701D	.095	
H	J701I - J701F	.088		H	J701B - J701F	.023	
I	J701G - J701C	.108		I	J701C - J701C	.102	
J	J701E - J701K	.072		J	J701C - J701K	.046	
K	J701G - J701L	.113		K	J701A - J701L	.089	
L	J701H - J701M	.124		L	J701A - J701M	.092	
M	J701N - J701P	.100		M	J701C - J701P	.086	
N	J701G - J701B	.111		N	J701C - J701K	.095	
O	J701C - J701L	.142		O	J701A - J701A	.044	
P	J701E - J701C	.097		P	J701B - J701C	.076	
Q	J701E - J701C	.090		Q	J701C - J701C	.075	
R	J701E - J701A	.136		R	J701A - J701A	.122	
S	J701G - J701P	.102		S	J701C - J701C	.074	
T	J701A - J701C	.092		T	J701C - J701C	.044	

B

ADDENDUM I

SUBJECT: Evaluation of the noise problem on the United Control Corp. 27-06166 and 27-06177 Main Power Changeover switches, which includes testing of the Reach Relays, P/N 9225.

A SUMMARY OF THE PROBLEM:

The United Control Corp. Main Missile Power Changeover switches, CV-A parts No. 27-06166-1 and 27-06177-1 started failing in CV-A Receiving Inspection about 10 December 1959. The Engineering Operating Procedure (EOP) used by Receiving Inspection, required that contact "noise" be less than 10 millivolts, when vibrated on the TET-810 Vibration machine. All of the United Control switches being received by CV-A at this time were failing to meet this requirement, with some units exhibiting as much as 300 millivolts of noise.

CV-A Components Test Laboratory (Dept. 364-5) was performing the Engineering Evaluation Test on the 27-06166-1 switch at this time. The job of investigating the "noise" phenomena, and determining what was generating it was assigned as an additional task to this test.

On reviewing the failures that had occurred, it was determined that all of the out-of-tolerance readings were occurring on the AC switch contacts. United Control Corp. was using Leach, Magnetic latch, 10 amp., 4 PDT relays (Leach P/N 9225), for the AC switch, in all of the units giving trouble at this time.

ADDENDUM I (CONTINUED)

TESTING PERFORMED ON THE 27-06166 SWITCH:

The first general approach, in pursuing this problem, was to determine how much effect the different variables had on the noise generated. This was done by holding all variables except one, constant, and changing it in a logical sequence of steps.

A test setup was built according to Figure 3 to duplicate Receiving Inspection's test set voltage and current characteristics. United Control switch, S/N 124 was connected to this test set and all AC circuits measured for noise. With R-1 load set at 10K (approximately 3 ma current), 4 circuits exhibited more than 100 MV of noise when the switch case was taped gently with a light metallic object. This specimen was next connected to the Evaluation Test setup and all AC circuits, except 2 (2 of the 4 circuits that exhibited more than 100 MV noise on the prior test) were energized with full rated loads, 5A, 400 cps. When the specimen was taped gently with a light metallic object, the result of noise measured was the same as the results of the former test. Three assembly cycles were performed at rated loads, with the noise on some circuits increasing, some circuits decreasing and some staying the same.

These results were next rechecked by using a different switch. A production unit, S/N 125, had 8 circuits exhibit more than 20 millivolts of noise when checked by Receiving Inspection on the TET-810 Production Vibration machine. All 15 AC circuits were first energized with rated loads (5 amp. 400 cycles) and the contacts monitored for noise. Next, twenty-five assembly cycles were accomplished at rated loads. The overall result was the same as with S/N 124. The switch (S/N 125) was next rechecked with the Receiving Inspection test setup on the TET-810. Only one circuit exhibited more than 20 millivolts of noise. The unit was re-run on the Receiving Inspection setup the next day with the noise condition getting steadily worse.

United Control switch S/N 124 was next subjected to random vibration on the CV-A Components Test Laboratory facilities. The one circuit that had exhibited the most noise in prior tests was selected and monitored. Random vibration stimulus was a 2G RMS, 1 minute burst of energy (bandwidth as noted below). The following results were recorded on a Hughes Memoscope, Model No. 104.

ADDENDUM I (CONTINUED)

TESTING PERFORMED ON THE 27-06166 SWITCH: (CONTINUED)

<u>Bandwidth of Stimulus:</u>	<u>Avg. Noise Level:</u>	<u>Spike Noise Level:</u>
18 cps - 1 Kc	60 millivolts	170 MV
18 cps - 500 cps	60 MV	160 MV
18 cps - 100 cps	10 MV	16 MV
100 cps - 500 cps	60 MV	170 MV
100 cps - 300 cps	70 MV	180 MV
300 cps - 500 cps	40 - 60 MV	160 MV
300 cps - 1 Kc	40 - 80 MV	140 MV
1 Kc - 1.5 Kc	150 MV	300 MV
1 Kc - 1.2 Kc	125 MV	225 MV
The amplitude was changed to 1G RMS:		
1 Kc - 1.2 Kc	6 MV	28 MV
The amplitude was changed to 3G RMS:		
1 Kc - 1.2 Kc	175 MV	280 MV

Accelerometers were attached (using dental cement) to the relay enclosures of the 4, 5 amp. circuit relays in S/N 121. The switch was subjected to an 8G, slow sine sweep and resonances were recorded as follows:

<u>Vibration Frequency(cps):</u>	<u>Amplification Factor:</u>	<u>g. Level:</u>
220	4.5	36
280	5	40
460	6	44(*)
590	4	32
1100	5	40
2200	8.5	68

(*) Perpendicular to the axis of vibration

The final check on the switch, as an integral component, was to subject it to a 5 minute random vibration test with characteristics according to Figure 1. All AC circuits of the specimen were energized with rated current, 5 amperes, and noise was determined as the voltage drop difference between static and vibration conditions. Results were as follows: All circuits exhibited some noise, 5 circuits more than 10 millivolts, with the worst condition being 74 millivolts.

In reviewing the test results and data taken thus far, the logical conclusion was that the Leach Relays, P/N 9225, being used as the AC switch, were the source of noise.

ADDENDUM I (CONTINUED)

TESTING OF LEACH RELAYS, P/N 9225:

Relay K-2 was removed from United Control specimen S/N 121. This relay contained circuit P-26 which exhibited the most noise during prior tests. The relay cover was very carefully removed and the internal mechanism given a thorough visual inspection. The circuit shown in Figure 3 was connected to a set of contacts and several forms of stimuli were applied in an attempt to reproduce noise. Negative results were encountered in all except the following situation. A normally closed set of contacts were gently pried open with a Nylon probe. Just as the contacts started to separate, it was noted visually that arcing was occurring between the normally closed and common contacts. This circuit was being monitored on a Hughes Memoscope, Model 104, and the pattern on the scope caused by this condition was essentially the same as the pattern that Receiving Inspection had been getting when a switch failed on the TET-810.

In view of the results to date, it was decided that the open relay should be vibrated and its physical and electrical action during vibration recorded and analyzed. A vibration jig was designed and built that would give a minimum of resonances. Figure 2 is a photograph of the jig with a relay mounted. An electrical test circuit was built to allow a stimulus signal to be applied to the relay contacts selectively and the contact, so energized, to be monitored on an oscilloscope or other instrumentation. Figure 4 is a schematic of the test set. Relay K-2 which had been removed from switch S/N 121 was subjected to a slow 10G sine sweep, and the amount of displacement of the contacts during resonances was noted. Many resonances occurred from 118 cps to 1670 cps with the average displacement during a resonance being about 0.03 inches and the maximum displacement (at 360 cps) being 0.08 inches. Electrical noise was not monitored during this run.

Relay K-2, which had been removed from S/124 was subjected to a slow, 8G sine sweep with essentially the same results as were obtained from the previous test. The maximum contact displacement on this relay was 0.02 inch at 1077 cps. Noise was monitored and occurred as follows: From 280 MV to 100 VM between 1050 and 1100 cps, peaking at 1055 cps.

ADDENDUM I (CONTINUED)

TESTING OF LEACH RELAYS, P/N 9225: (CONTINUED)

Two Leach relays P/N 9225, directly off the Leach production line, were hand carried to CV-A by a Leach representative. One of these relays was vibrated under the same conditions as the test just completed on K-2 from S/N 124. The results were practically the same as those on the previous two tests, with the noise occurring, if anything, more often (more resonances of relay contacts) than on the previous test. Figures 5 and 6 are photographs of one of these P/N 9225 relays with the cover removed. Figure 5 shows the contacts open and Figure 8 shows the contacts closed.

Fastax movies (16mm) were made of two different opened relays being subjected to an 8G sine sweep vibration. The results of these movies confirm the data measured in other ways on the previous tests and give a graphic record of the vibration characteristics of the Leach 9225 relay.

Two Leach relays were hand carried from United Control Corp. by an engineering representative. These relays were from a lot that was currently being used in the production of the Main Power Changeover switch P/N 27-06166. The relays were not opened but were checked for noise. When subjected to an 8G sine sweep on the fixture shown in Figure 2 and monitored with the test circuit shown in Figure 4, 6 of the 8 contacts monitored, exhibited more than 10 millivolts of noise.

ADDENDUM I (CONTINUED)

CRITIQUE ON CONFERENCE HELD TO DISCUSS AND RESOLVE THIS PROBLEM:

At this time a conference was called by CV-A, with United Control representatives, Leach Corp. representatives and cognizant CV-A department representatives attending. The purpose of the meeting was to discuss the switch failures and the results of the tests performed to date, and to try to adopt a program for resolving the overall problem.

The results of the testing that has been described thus far, were presented by CV-A Engineering, with the following conclusions:

- 1) The United Control switches, P/N 27-06177 and 27-06166, because of the noise, do not do the job that CV-A engineering requires.
- 2) The source of the noise is in the Leach 9225 relay.
- 3) Under a broad interpretation of CV-A specification 27-06166, revision "C", the United Control Switch does meet CV-A requirements; however the specification is grossly inadequate.
- 4) The characteristics of the TET-810 were not known well enough to continue using it, in any capacity, as a test instrument for power changeover switches.

United Control Corporation stated that they would effect the redesign necessary to make the AC switch of the Main Power Changeover switch, satisfy the CV-A requirements. Leach stated that they would modify the design of the 9225 relay to make it meet CV-A noise requirements. CV-A stated that specification 27-06166 would be revised to adequately reflect the CV-A requirements.

ADDENDUM I (CONTINUED)

TEST RESULTS OF MODIFIED SPECIMENS:

The Leach Corporation effected two modification programs for the 9225 relays to be purchased by United Control Corporation for the Main Missile Power Changeover switches. The first modification consisted of adding stiffeners to, and increasing the mass of the relay contact arms. The second modification consisted of changing the relay contact material to a high gold content alloy. Two of each type relay just described were hand carried to CV-A test laboratories. The two relays with gold contacts were redesignated as Leach P/N 9225-5811 and the two with stiffened contact arms as Leach P/N 9225-5373.

Both of the 9225-5811 relays were subjected to 3 axes of 3G sine sweep vibration and monitored for contact noise using the test circuit shown in Figure 4. (8.5 MA contact current) No noise was measured on the 8 contacts in either, "External Closed" or "Internal Closed" positions for the 6 sweeps. Figures 7, and 8 are photographs of one of the two 9225-5811 relays with the cover removed. It can be seen by comparing photographs of the 9225 and 9225-5811 relays that the contact shape and contact area were also changed in addition to changing contact material.

The two 5373 relays were next subjected to the same type test as just described. One relay exhibited no noise under all the conditions tested. The second of the two 5373 relays exhibited more than 300 millivolts of noise at 1625 cps (vibration frequency) on one of the 4 contacts. The specimen was allowed to dwell in the critical vibration frequency area. Other contacts developed noise greater than 10 MV, and the situation grew progressively worse. The test requestor's representative decided that this modification was unsatisfactory, so testing on the 5373 relays was discontinued.

As pointed out in a previous paragraph, amplification factors of up to 8.5 were encountered from the input to the switch mountings, to the input to the relay mountings. In view of this, United Control Corp. redesigned the relay mounting arrangement. A rework kit was shipped to CV-A and installed in switch S/N 121. Figure 9 is a photograph of S/N 121 with the rework accomplished and two of the relays instrumented for vibration. The reworked switch was vibrated, at 8G, 5-2000 cps and the accelerometers were monitored for resonances. The maximum resonances encountered were 12G, or an amplification factor of 15.

ADDENDUM I (CONTINUED)

TEST RESULTS OF MODIFIED SPECIMENS:

An investigation into the TET-810 problem, revealed that the vibration fixtures used for mounting the 27-06166 and 27-06177 switches were amplifying the "G" level considerably. At some frequencies the amplification factor was as great as 5. Up to this time there was no record of a validation having been run on the fixtures. Another group at CV-A was given the task of re-designing, fabricating and validating new fixtures with a low amplification factor. To the writers knowledge this task was attempted but never completed. The final test on S/N 121, with the new 5811 relays and the rework kit installed, was to have been vibrated on the TET-810 using the new vibration fixture. Since this new fixture never materialized this test was never performed.

Both the Leach relay P/N 9225 and P/N 9225-5811 were subjected to contact chemical analysis (spectrography technique) with the following results:

9225-5811 Relay:

Au	Pt	Zn	Cu	B	P	N ₁	Cd	Ag
10%	5%	10%	2%	0.5%	0.01%	5%	0.1%	Remainder

9225 Relay:

Au	Pt	Zn	Cu	B	P	N ₁	Cd	Al	Ag
-	-	1%	1%	1%	0.2%	-	15%	2%	Remainder

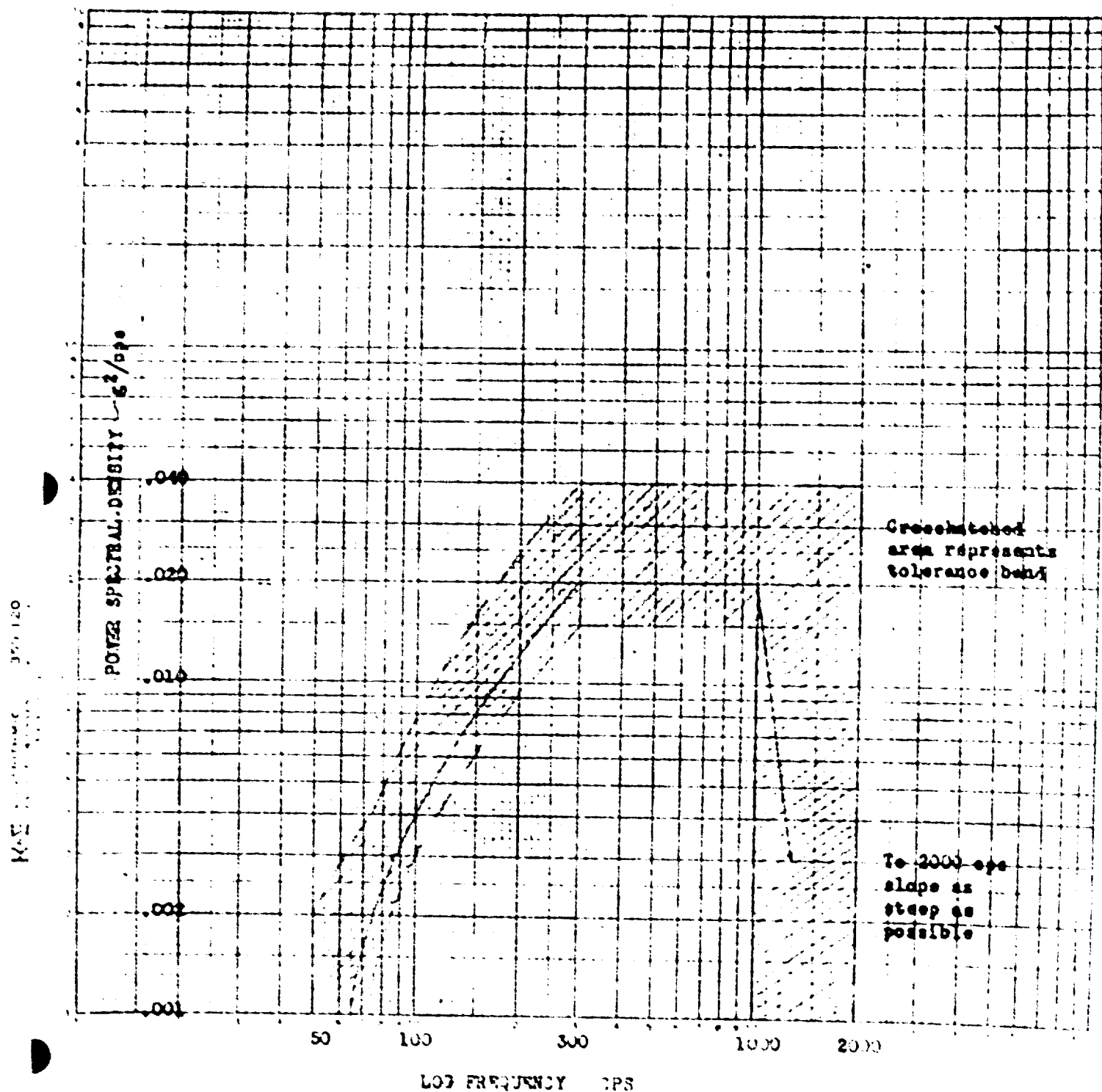
United Control Corporation has redesigned the 27-06166 and 27-06177 switches to use a rotary switching mechanism in lieu of relays for the AC circuits, however some components had been manufactured using relays, and are currently being used by CV-A

ADDENDUM I (CONTINUED)

TEST RESULTS OF MODIFIED SPECIMENS: (CONTINUED)

In summarizing the results of this test the writer concludes that the Leach relay, P/N 9225, is not suitable for use in the Missile Power Changeover switches and recommends that they be removed from all subject components. The Leach relay, P/N 9225-5811 is suitable for use and it should be substituted for the 9225 relay.

FIGURE 1 RANDOM VIBRATION SPECTRUM
NOSE AND TANK SECTIONS





TYPICAL ELECTRICAL RECEPT.
ON SPECIMEN ~ PINS FOR REF. ONLY

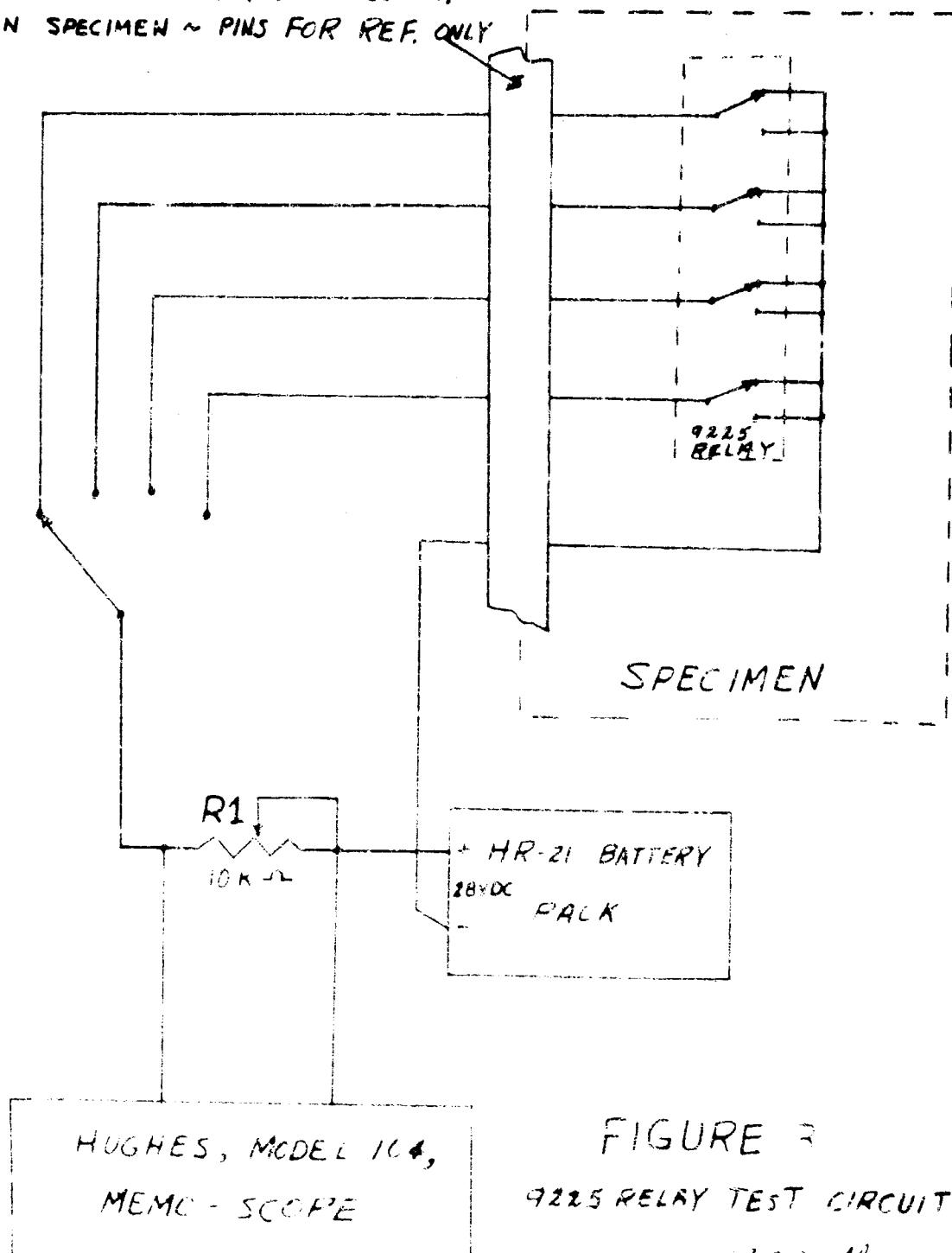


FIGURE 3
9225 RELAY TEST CIRCUIT
R.D. Miley

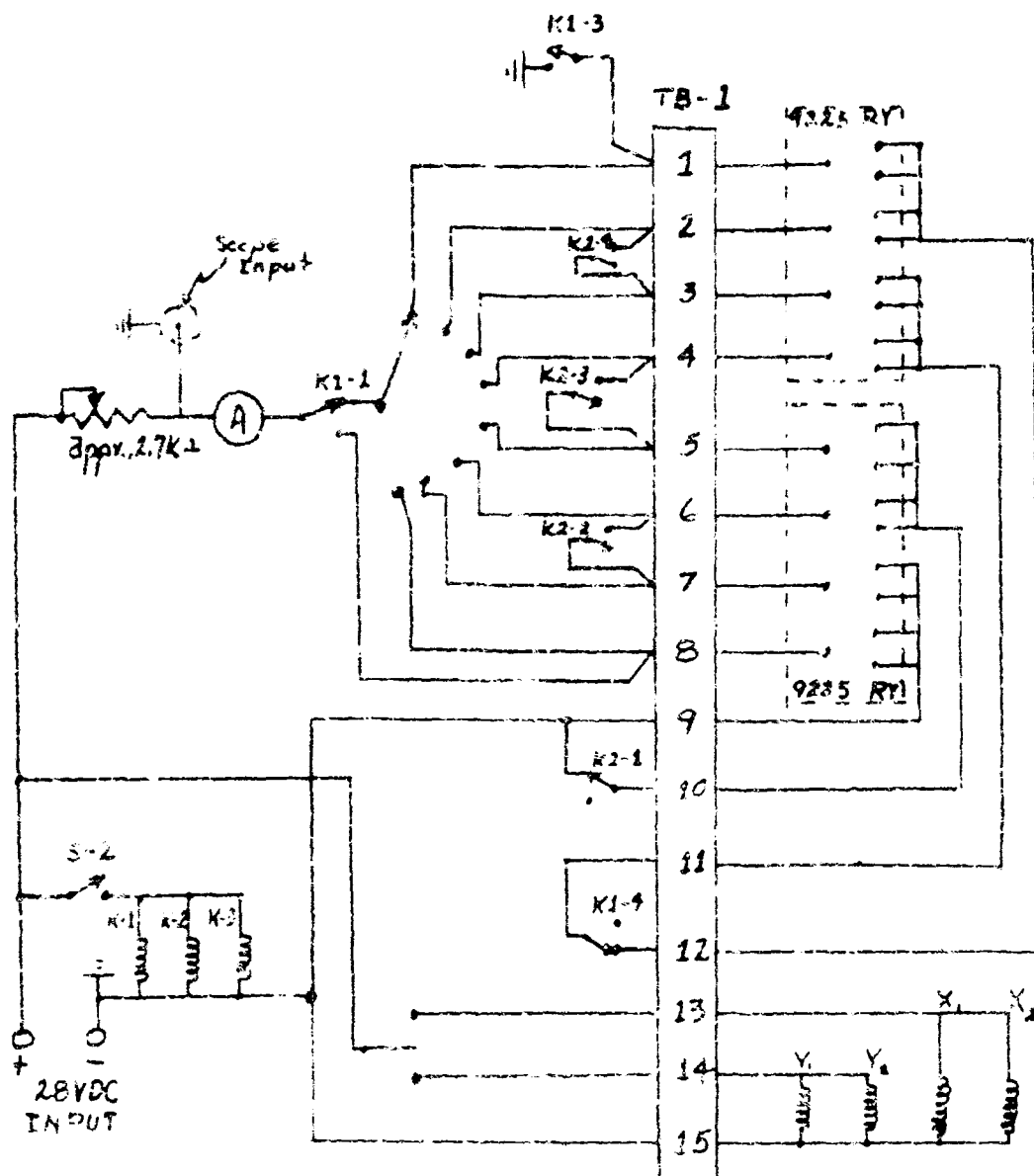
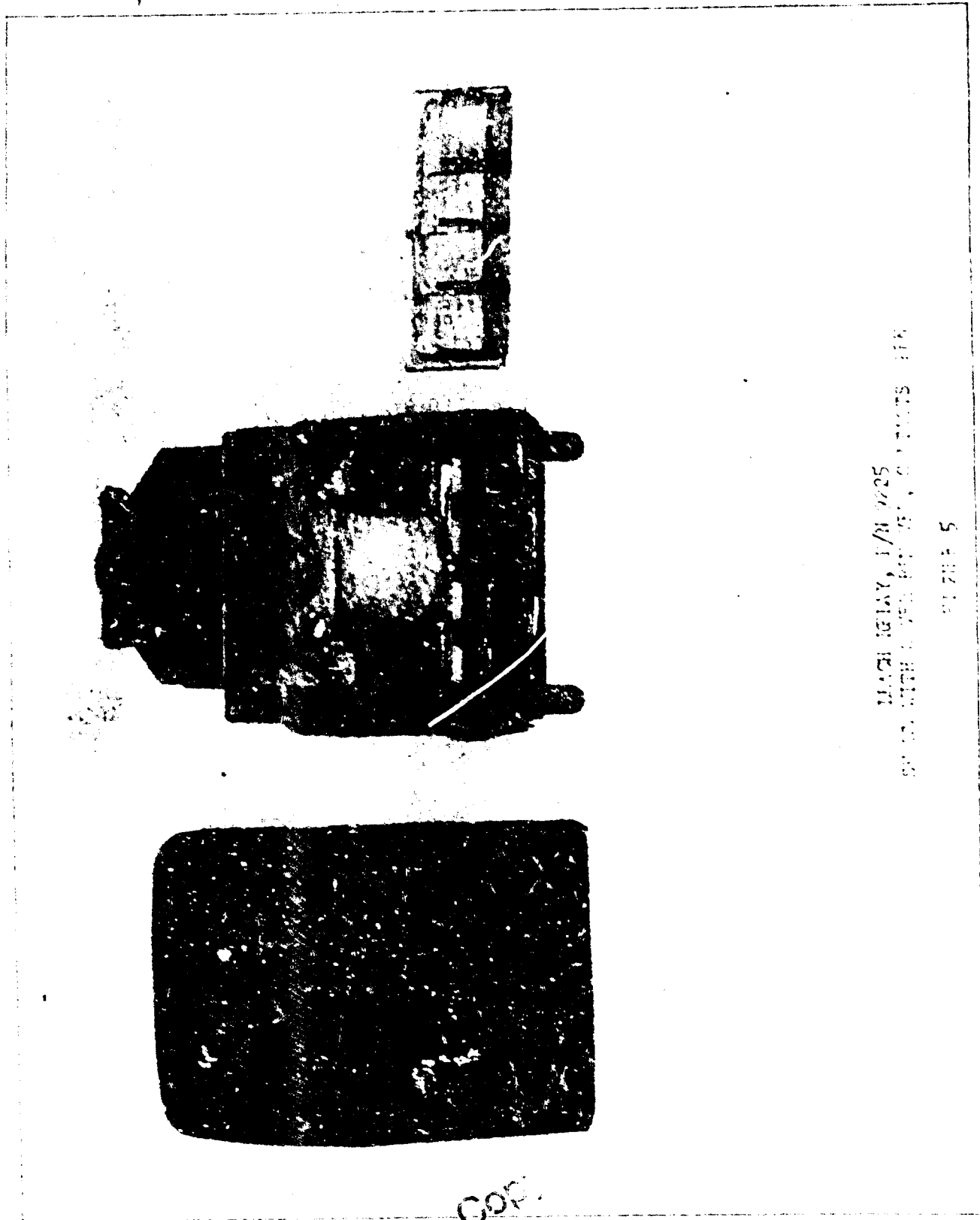


FIGURE 4

MAIN POWER CHANGEOVER SWITCH TEST SET
TO TEST 9225 RELAY NOISE

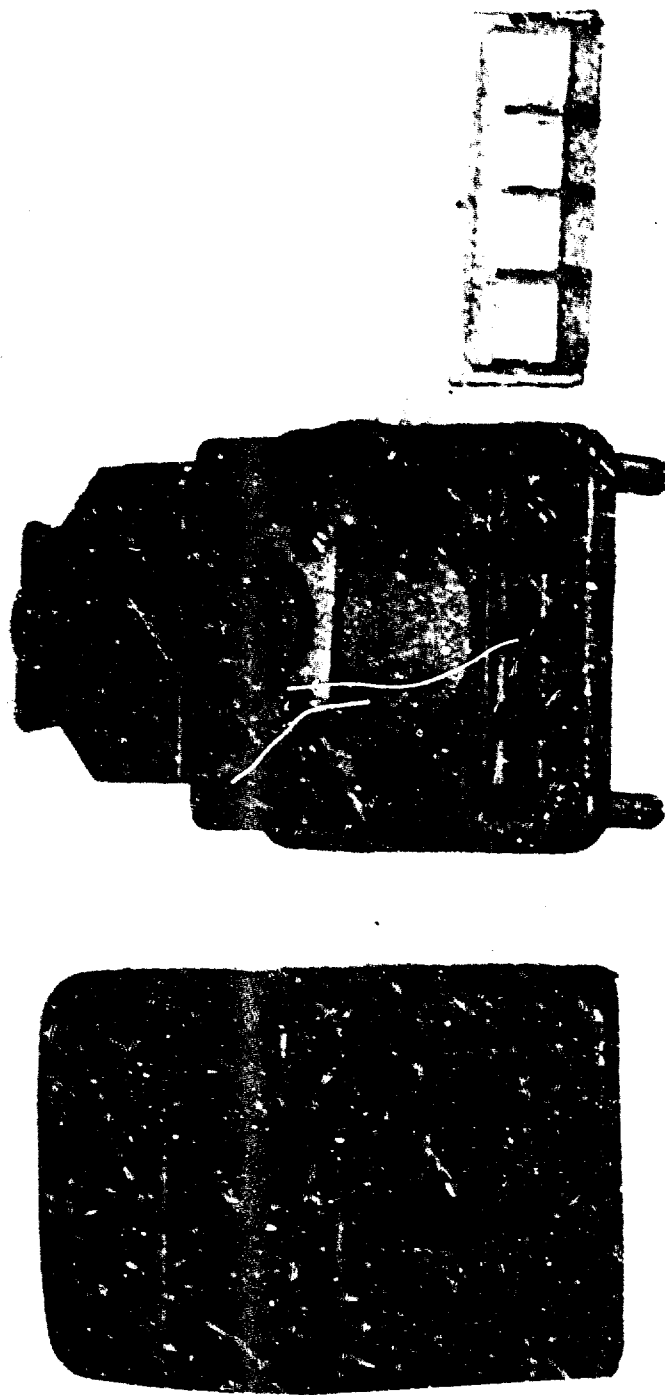
R. D. M. Kelly



RECEIVED, 1/11/25
526 R/1 AM/11/25

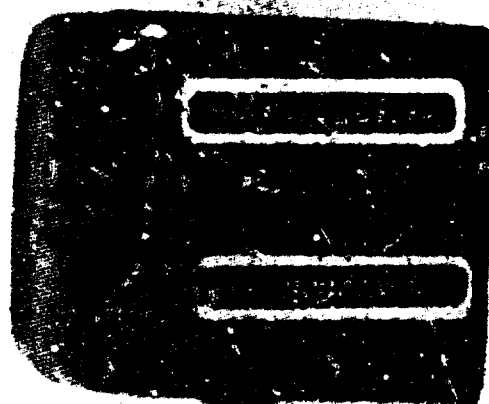
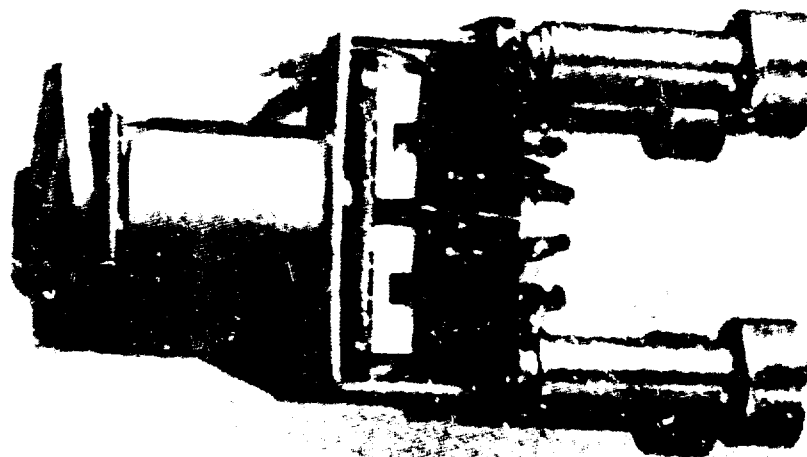
5

Best Available Copy



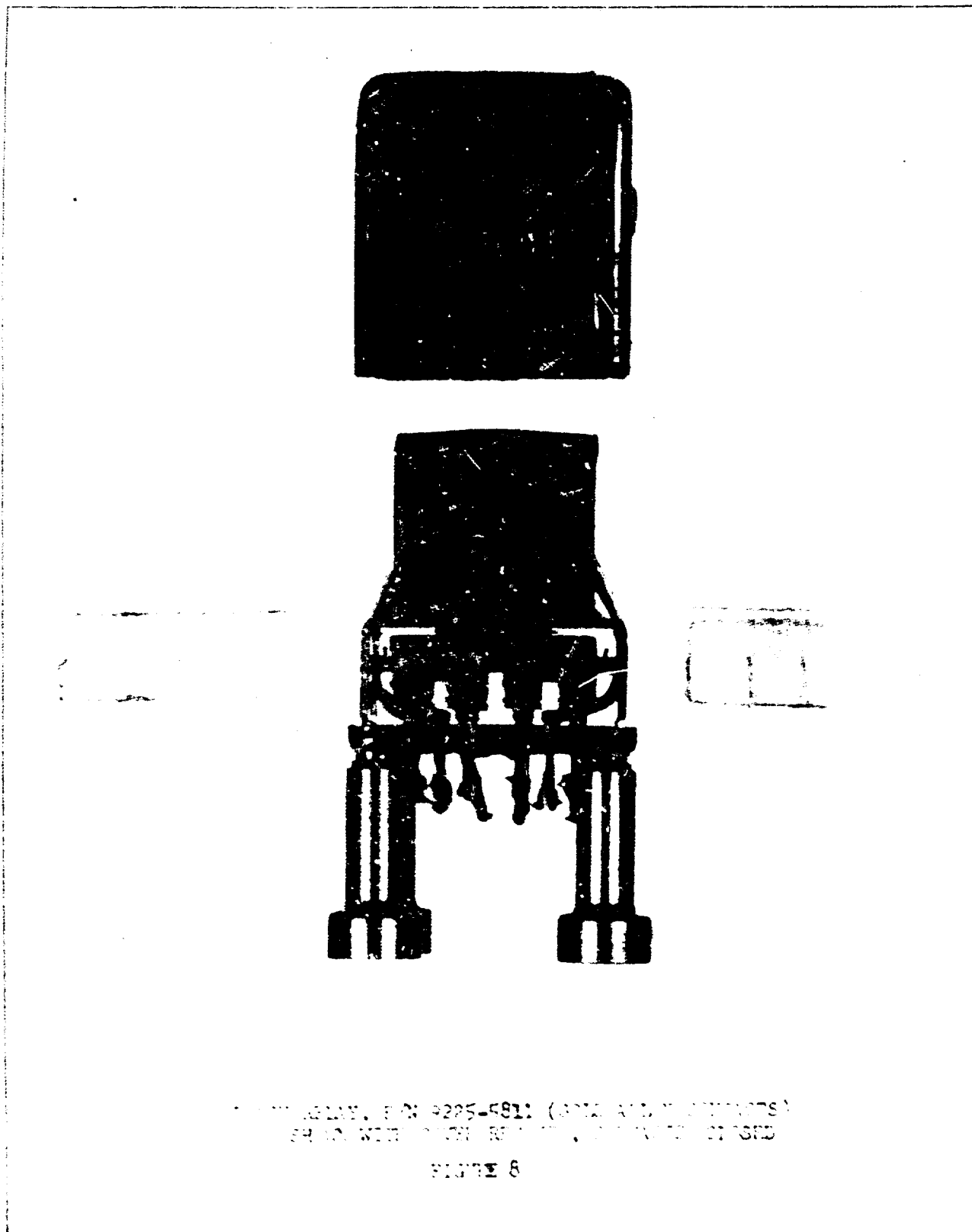
REAR VIEW, 1/11 9225
 SHOWN WITH CONVAIR 12000, CONVAIR 12000

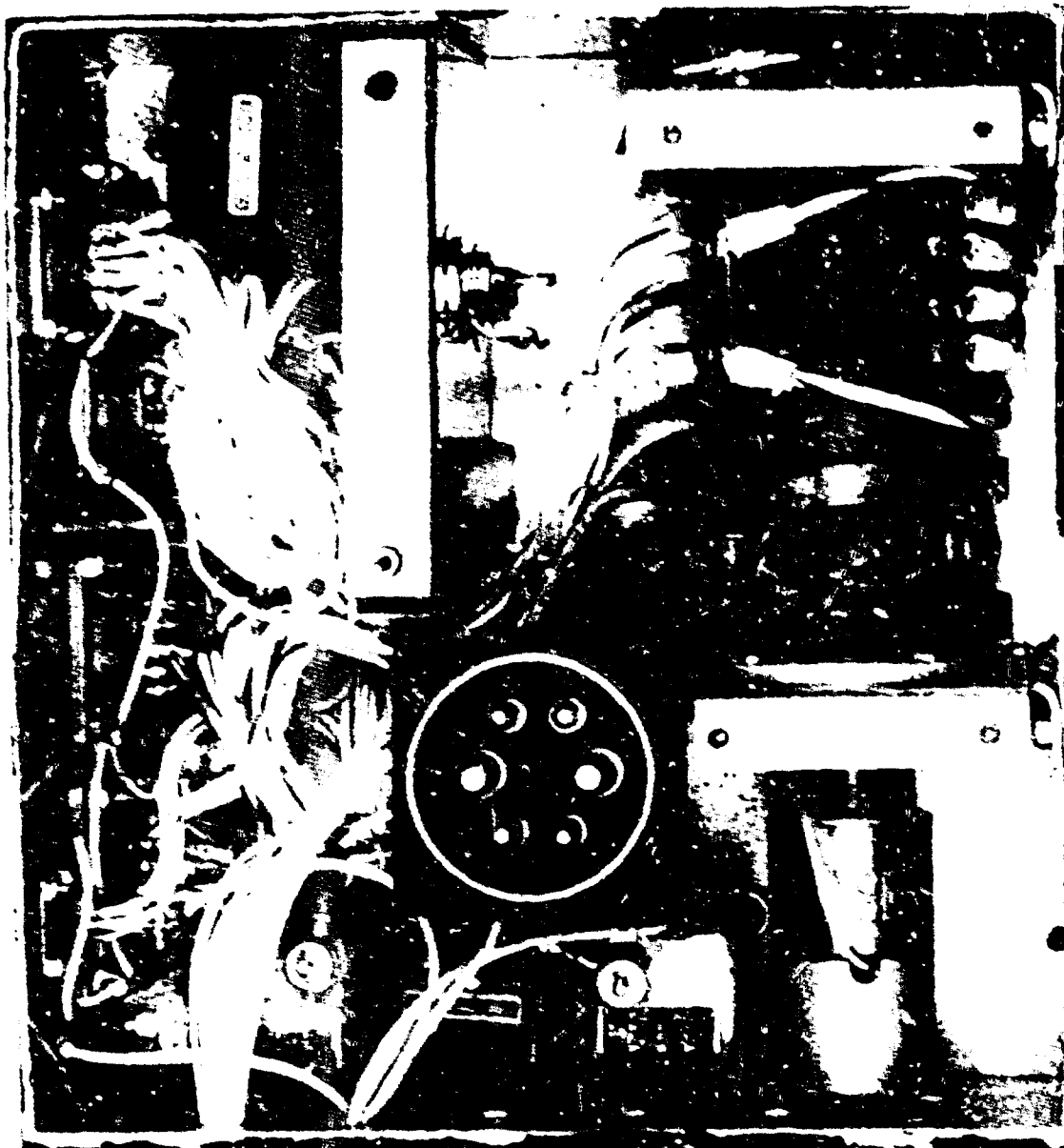
1/11 9225



CONVAIR, P/N 9305-4811 (G-LE KILBY PATENTS)
SPECIALTY CONVAIR ENGINE, 2-10-50-1111

FIGURE 7





MAIN POWER CHARGE VOLT SWITCH, P/N 27-00166-1
WITH INSTALLATION KIT (INSTALLATION INSTRUCTIONS INCLUDED)

FIGURE 9