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CONVAIR (ASTRONAUTICS) DIVISION
GENERAL DYNAMICS CORPORATION

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REPORT NO. 7A2236
DATE 8/23/61
NO. OF PAGES 132

CONVAIR | ASTRONAUTICS

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

CONVAIR-ASTRONAUTICS
AUG 3 1961
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FORM NO. A-700-1

SUMMARY

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 705L to J 705N. The test set was repaired and the specimen sent to the vendor for repair.

Before sending this specimen for repair, noneperating 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 5 (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 (HIPOT) 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 breaks 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 a

DISCUSSION OF THE DATA: (CONTINUED)

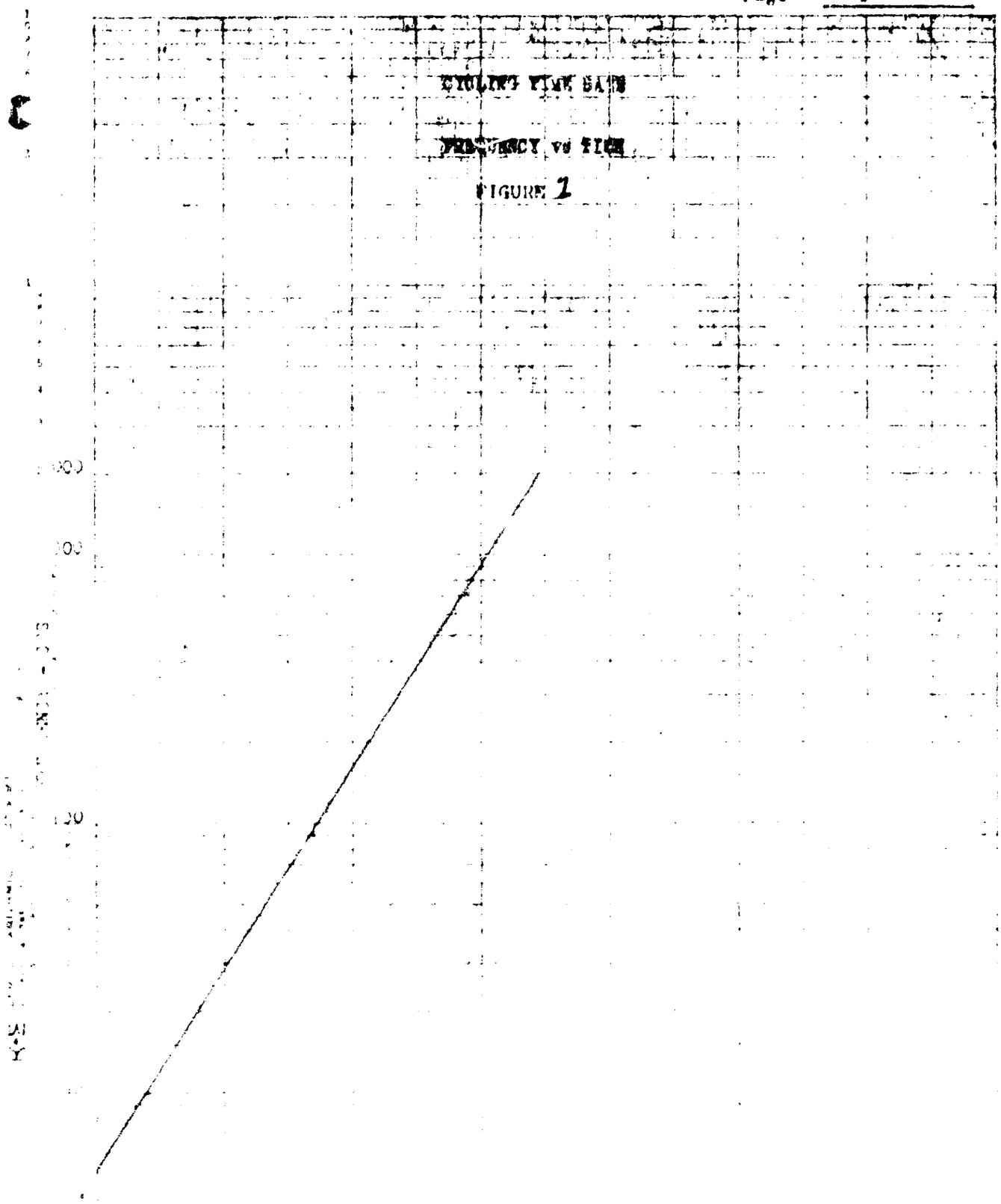
UNITED CONTROL SPECIMEN S/N 124: (CONTINUED)

D.C. switch assembly failed to transfer completely. When the specimen was opened, under circumstances stated in the preceeding 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.

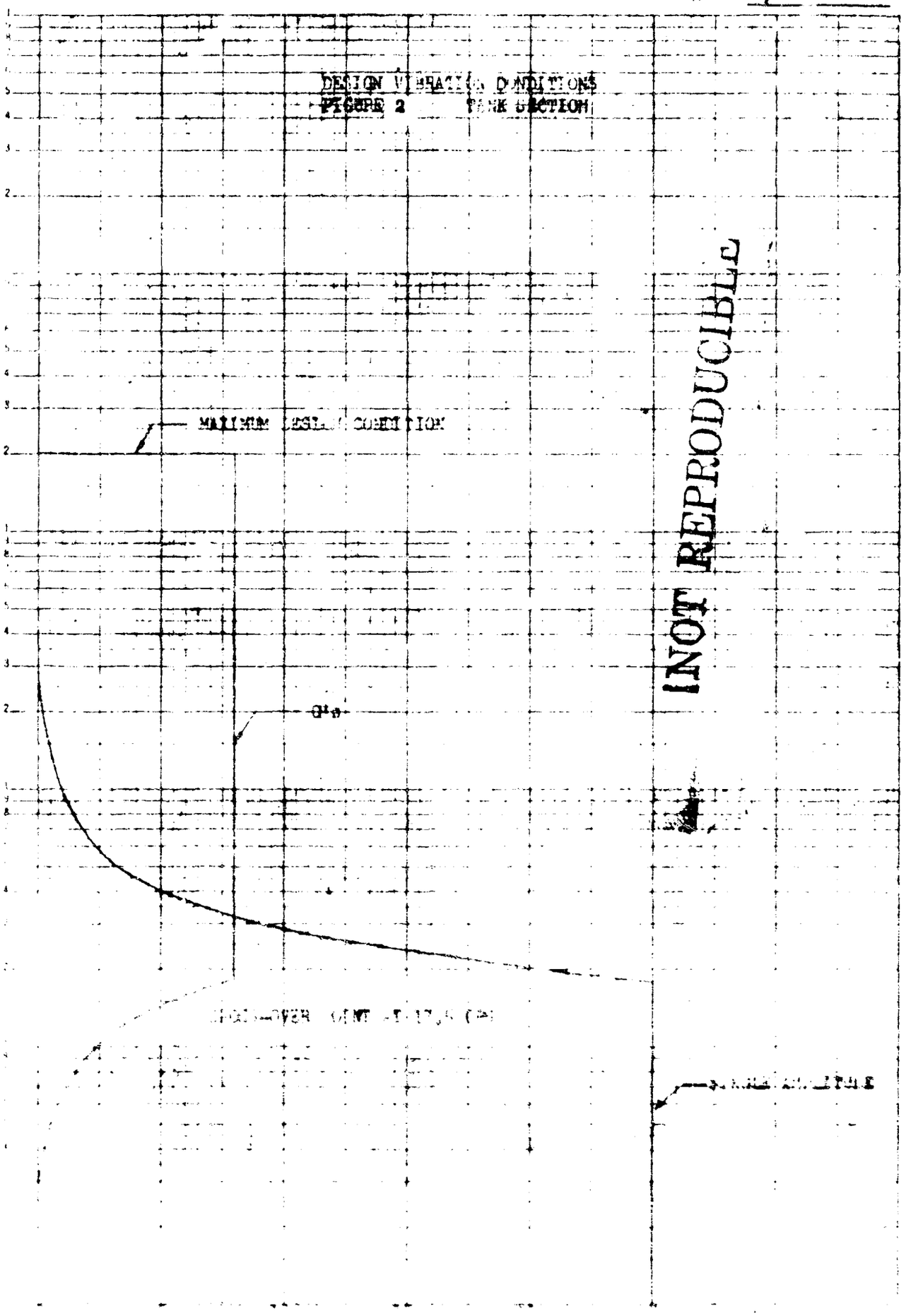
The specimen, and all production units that were determined to have the improper type of relays, were sent to the vendor for repair. Upon return of the reworked specimen, testing was resumed according to Figure 3 schedule. During the Operating Vibration Tests, in all three axes, several of the D.C. switch 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 concensus 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.


CYCLING TIME RATE
FREQUENCY vs TIME
FIGURE 1

DESIGN VIBRATION CONDITIONS
FIGURE 2 TANK SECTION

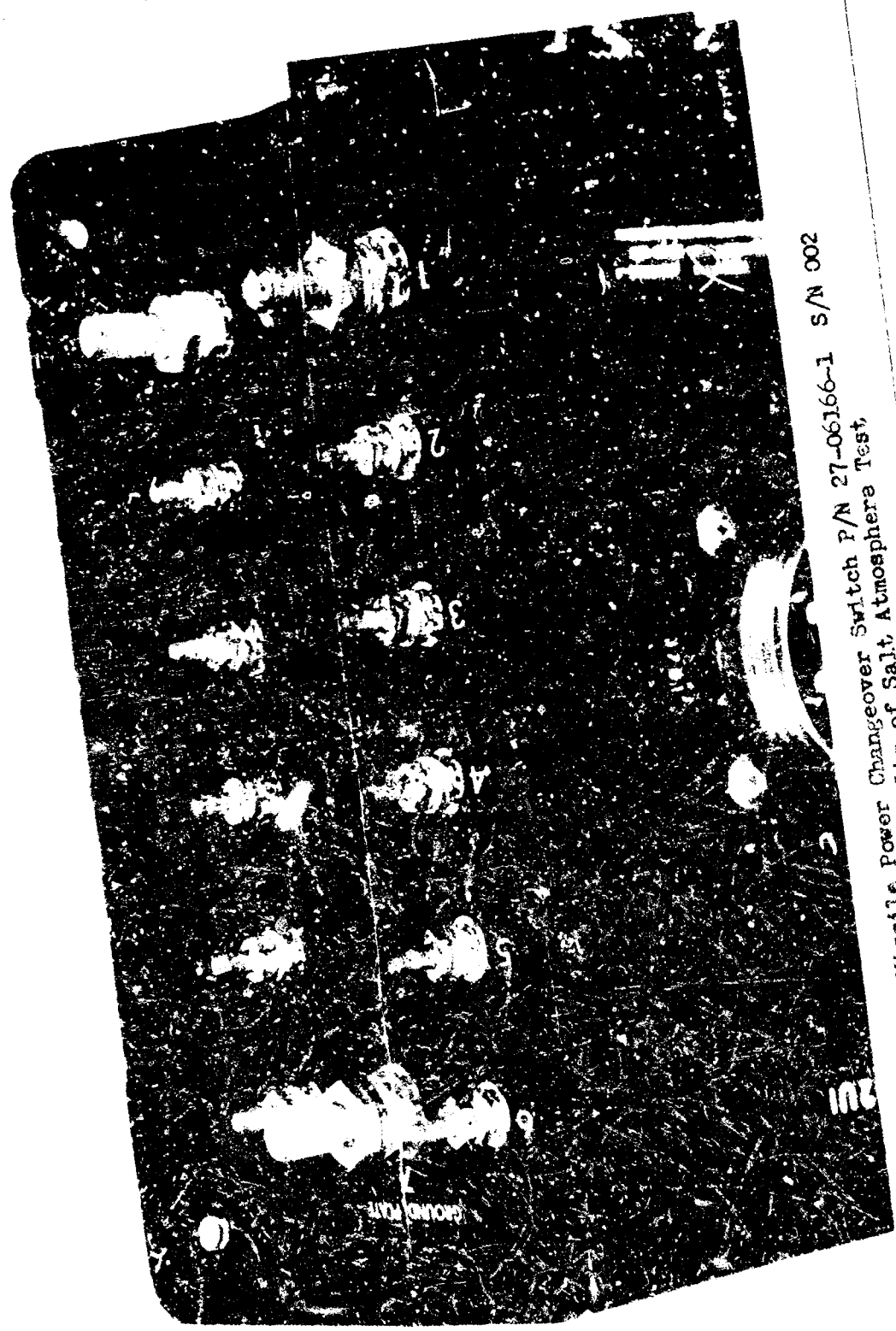


TEST SPECIMENS				
	KINETICS S/N 001	KINETICS S/N 002	UNITED CONTROL S/N 121	UNITED CONTROL S/N 124
TESTS PERFORMED	1. Nonoperating Vibration search for mechanical weaknesses 2. Initial Satisfactory Performance Test. 3. Operating Vibration all 3 axes. 4. Post Vibration (*) 5. -30°F @ ambient pressure.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

(*) Indicated Failure of this test.

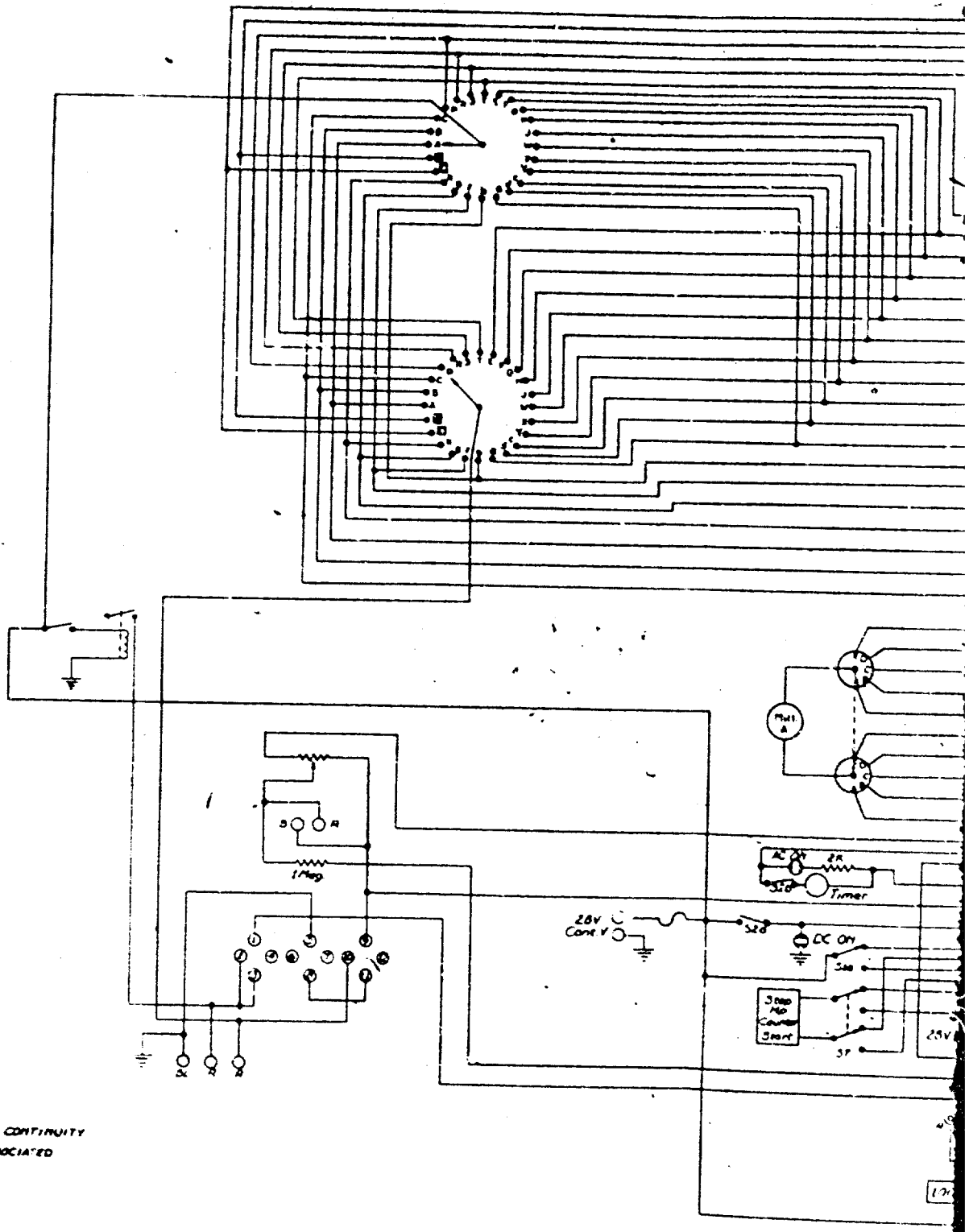
FIGURE 3

CONVAIR ASTRONAUTICS



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

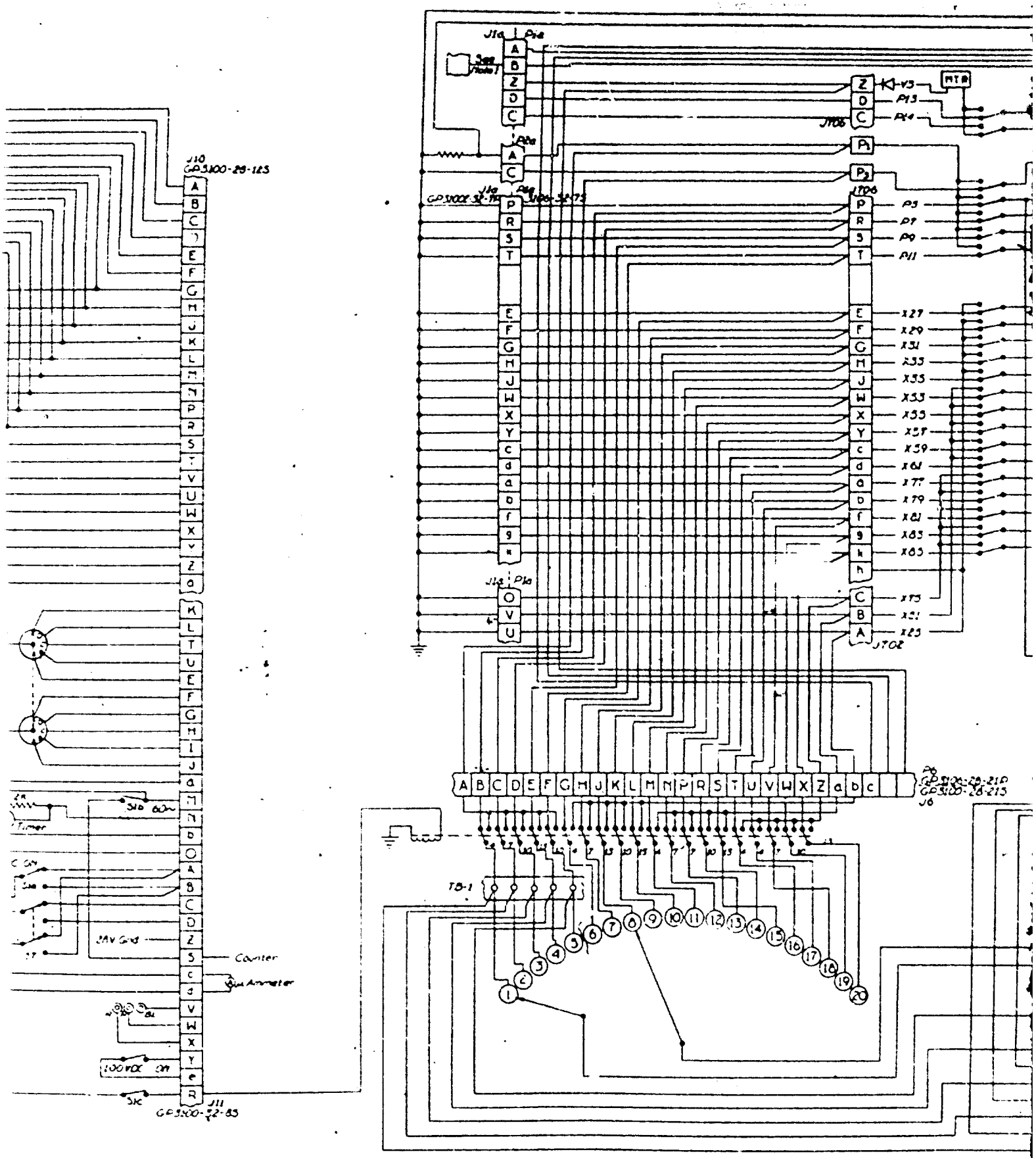
FIGURE 4



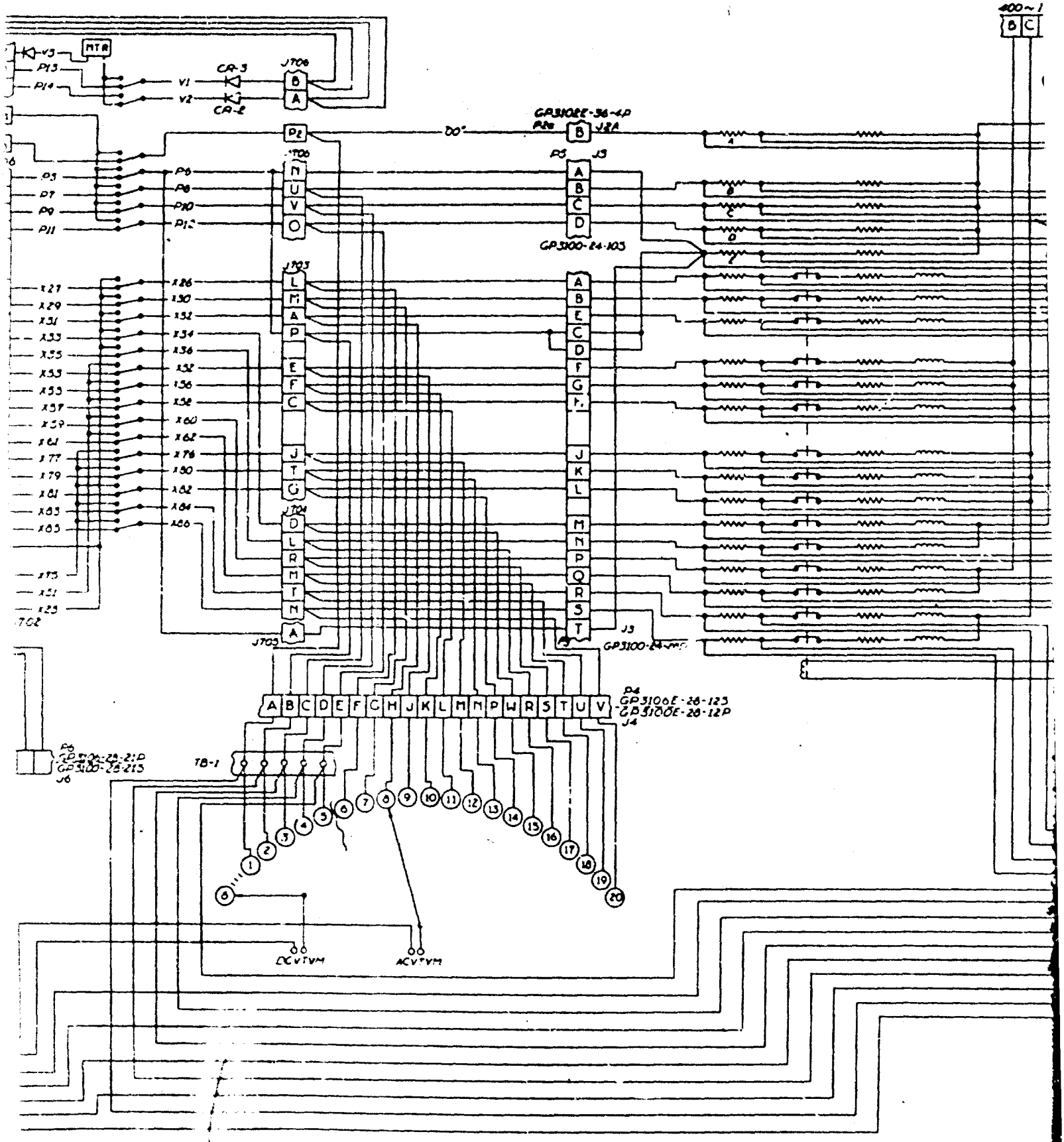
NOTES:

1. CABLE ON DWG #2.
2. THIS DWG DOES NOT INCLUDE CONTINUITY (RIGHT HAND) SCHEMATIC OR ASSOCIATED WIRING AND CABLES

A

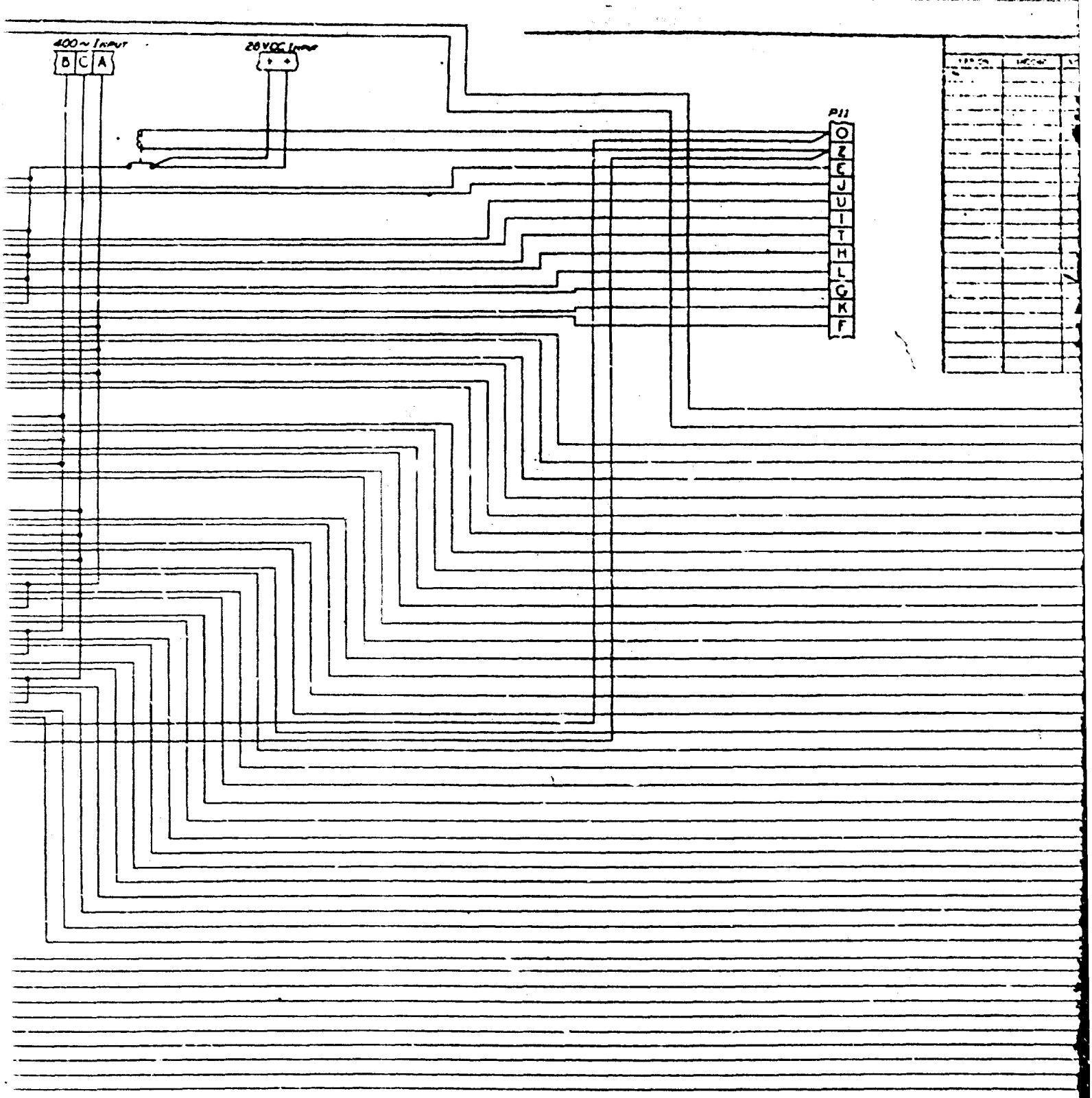

J10
GP3100-28-12S
J11
GP3100-32-8S
Counter
Ammeter
Timer
28V Gnd
100VDC ON
J1a
P1a
P2a
J1a
P1a
J1a
P1a
J7D6
J7D6
J7D2
MTR
V3
P13
P14
P1
P3
P5
P7
P9
P11
X27
X29
X31
X33
X35
X53
X55
X57
X59
X61
X77
X79
X81
X83
X85
X75
X51
X25
P6
GP3100-28-21P
GP3100-28-21S
J6
TB-1

B

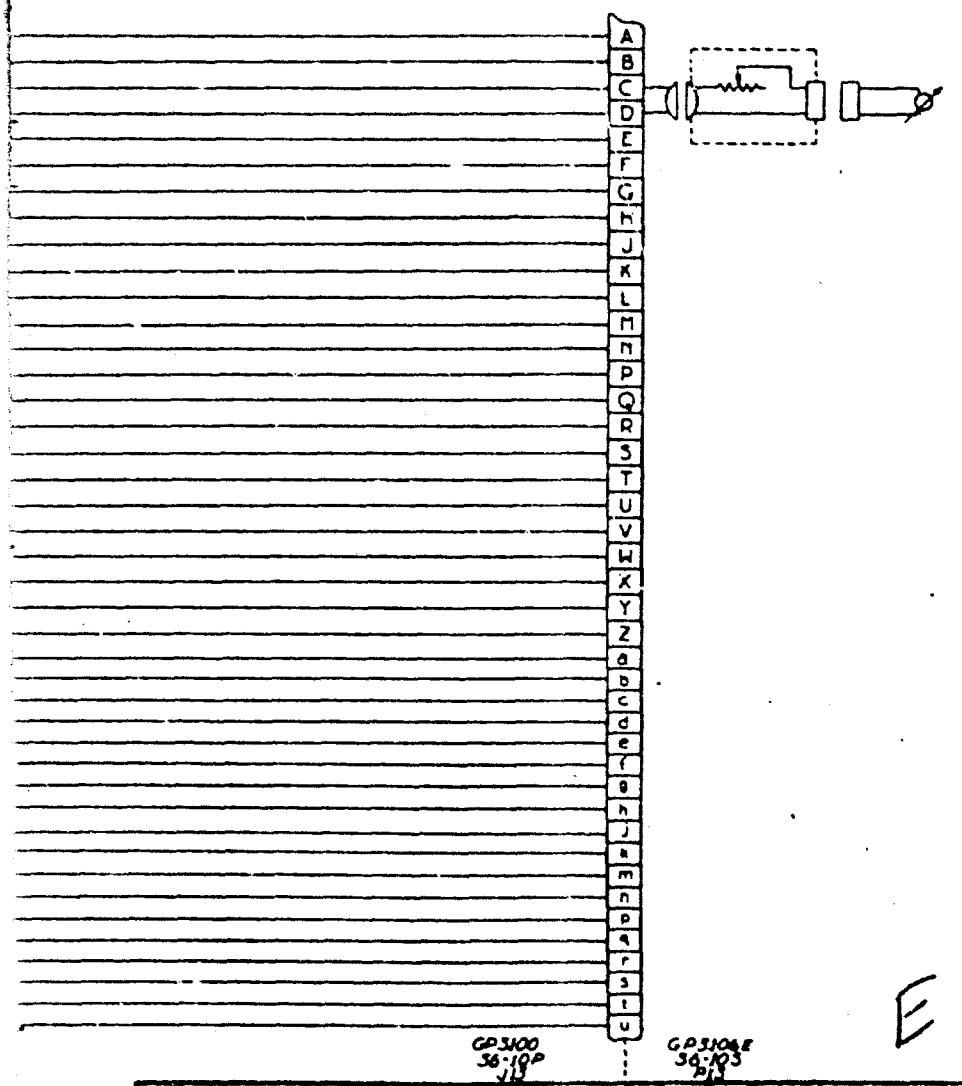


MTR
V3
P13
P14
V1
V2
CR-3
CR-2
J706
GP3102E-36-4P
P2a
J2A
P2
P5
J3
GP3100-24-105
J703
J704
J705
J3
P4
GP3106E-28-12S
GP3100E-28-12P
J4
TB-1
DCVTVM
ACVTVM

C



D



SCHEMATIC FOR 632-1
TEST PROGRAM ONLY.

E

SHEET 1 OF 2

AUTH

Figure 5
DIAGRAM-
MAIN POWER CHG-
OVER SWITCH
TEST SETUP NO. 2
SCHEMATIC.

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CONVAIR DIVISION OF
GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA

DWG 7A-2236-1

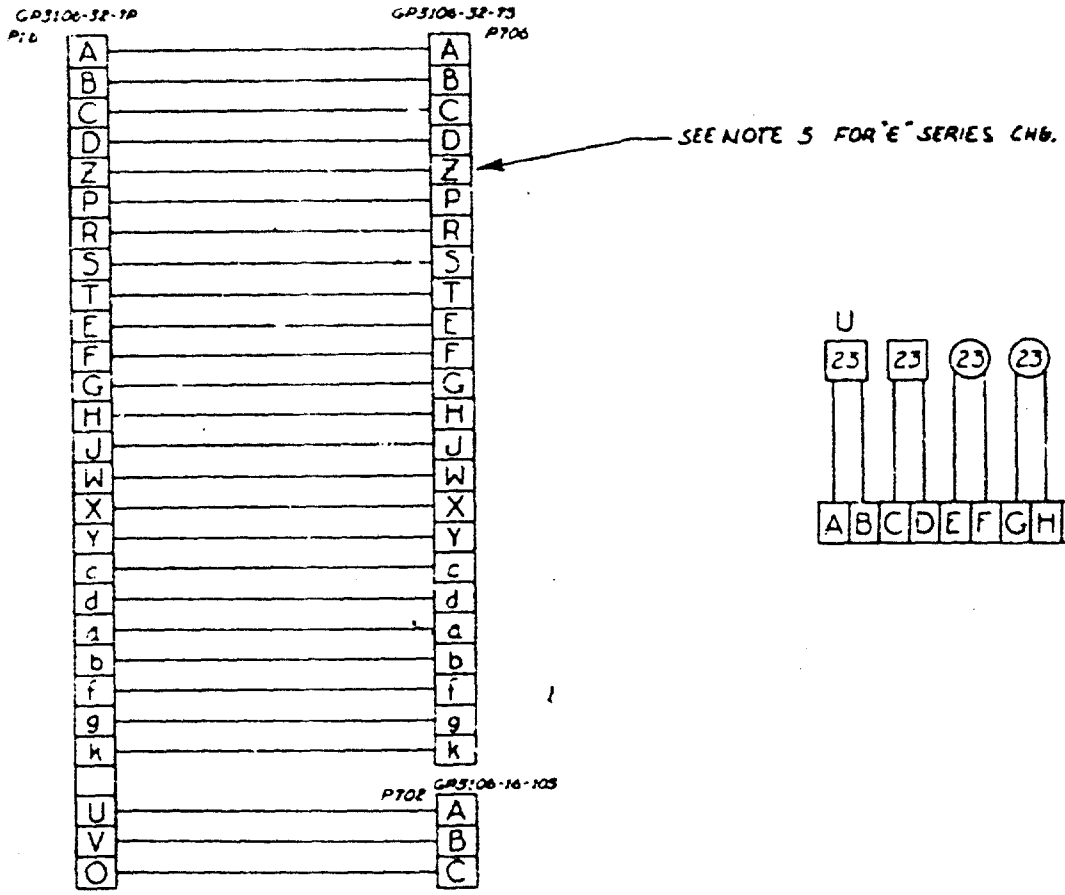
SIZE SHEET 1 OF 2

APPLICATION

GEN SPEC REL

PA 6510

CABLE NO. (1)

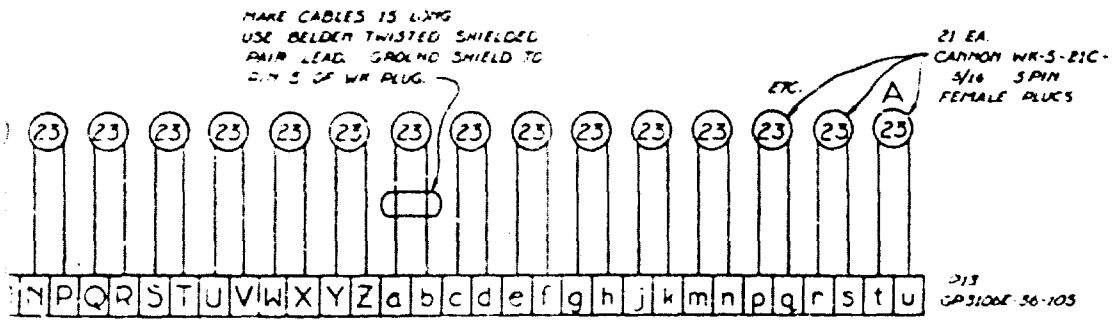


CABLE NO (2)

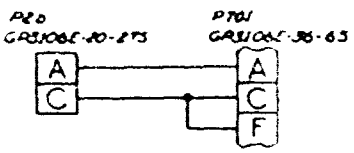
Notes:

1. USE #18 GA WIRE WITH HEAVY INSULATION. EA CKT. 1500 VRMS.
2. MAKE CABLES 15 FT. LONG ±1'
3. CABLE 1 & 2 COMPRISE "D" SERIES HYPOT HARNESS.
4. CABLE 3 & 1 COMPRISE "E" SERIES HYPOT HARNESS.
5. IN CABLE 1 WIRE ON PIN Z OF J706 HAS TO BE CHANGED TO PIN N J706 FOR "E" SERIES.

A



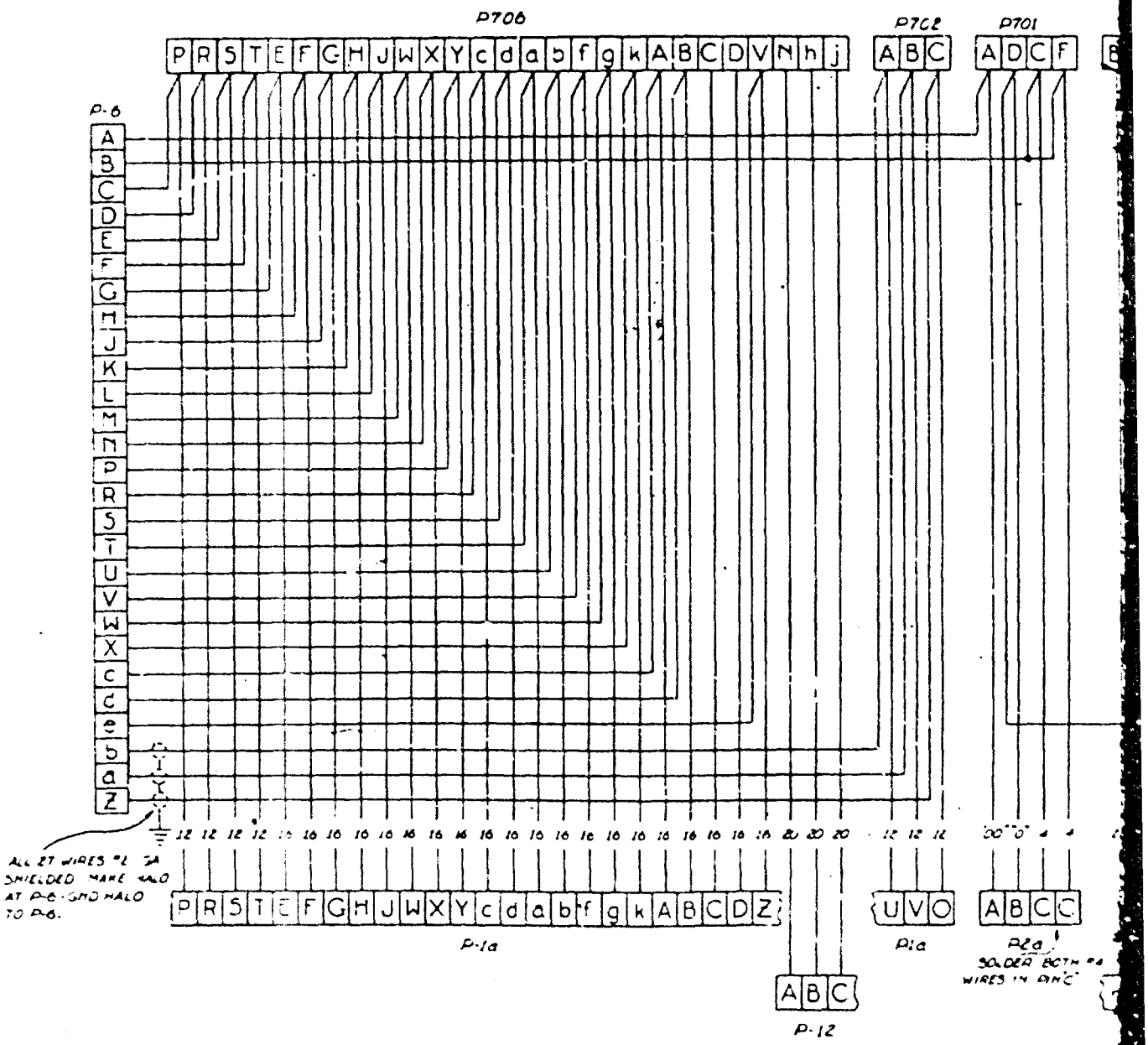
CABLE NO. (4)



CABLE NO. (3)

MAIN PWR. C/O SW.
HYPOT HARNESS

B

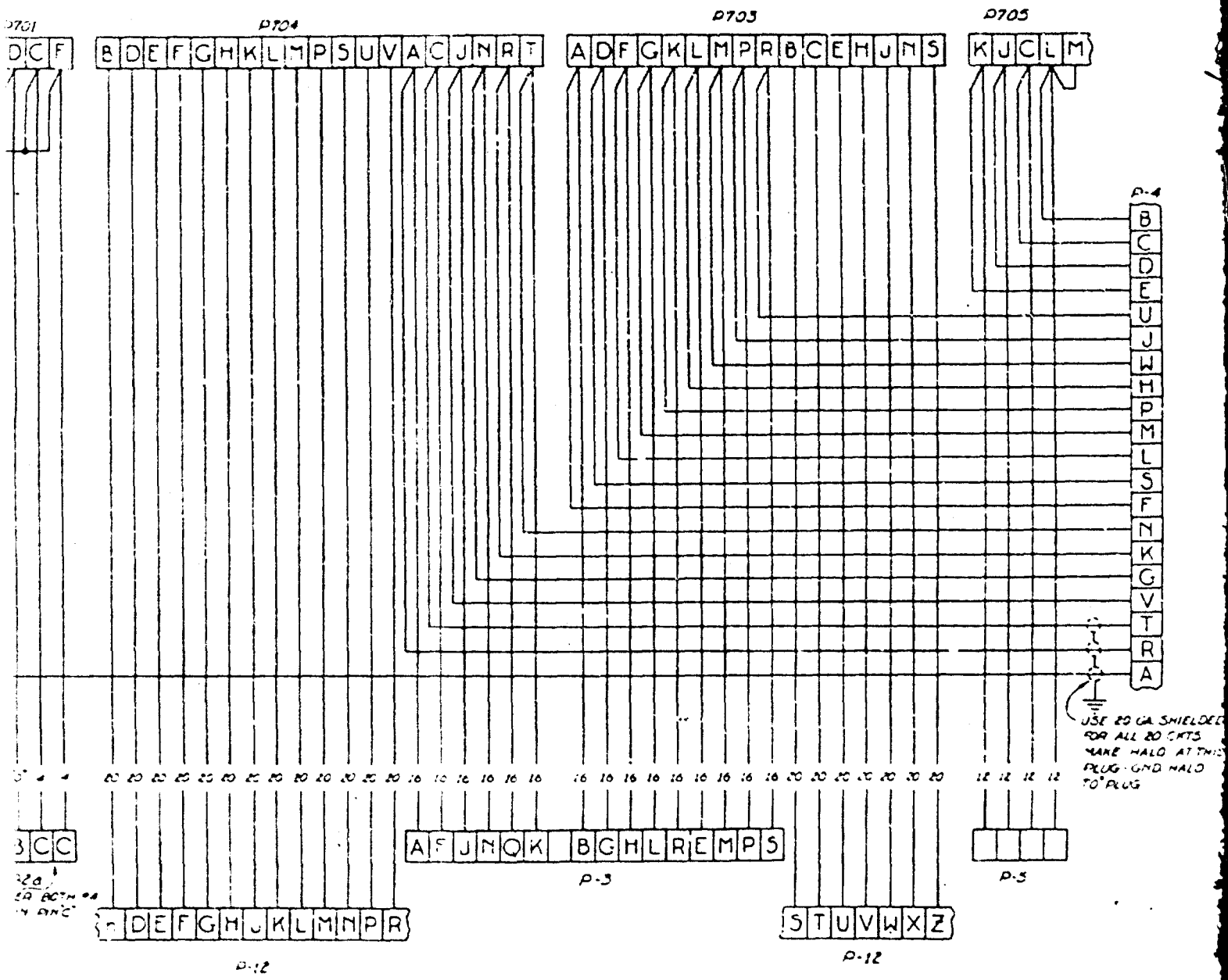


P1a	GP3106E-32-7S	P701	GP3106E-36-6S or GP3106E-36-6S
P2a	GP3106E-36-4S	P702	GP3106E-16-10S
P3	GP3106E-24-23S	P703	PT06E-20-16P
P4	GP3106E-28-12S	P704	GP3106E-22-14P
P5	GP3106E-24-10P	P705	GP3106E-28-11P
P6	GP3106E-28-21P	P706	GP3106E-32-7S
P12	GP3106E-38-21S	P3055	PT06E-10-6P

Notes:

1. MAKE HARNESS 13 FT. (+2-0) LONG
2. USE STD MIL WIRE (TYPE 3 OR 2 [illegible]
3. DIRECT ANY QUESTIONS TO BGE [illegible]

C


P701
D C F
P704
B D E F G H K L M P S U V A C J N R T
P703
A D F G K L M P R B C E H J N S
P705
K J C L M
P-4
B C D E U J W H P M L S F N K G V T R A
USE 20 GA SHIELDED
FOR ALL 20 CKTS
MAKE HALO AT THIS
PLUG-GND HALO
TO PLUG
A F J N Q K B G H L R E M P S
P-3
P-5
D E F G H J K L M N P R
P-12
S T U V W X Z
P-12

D

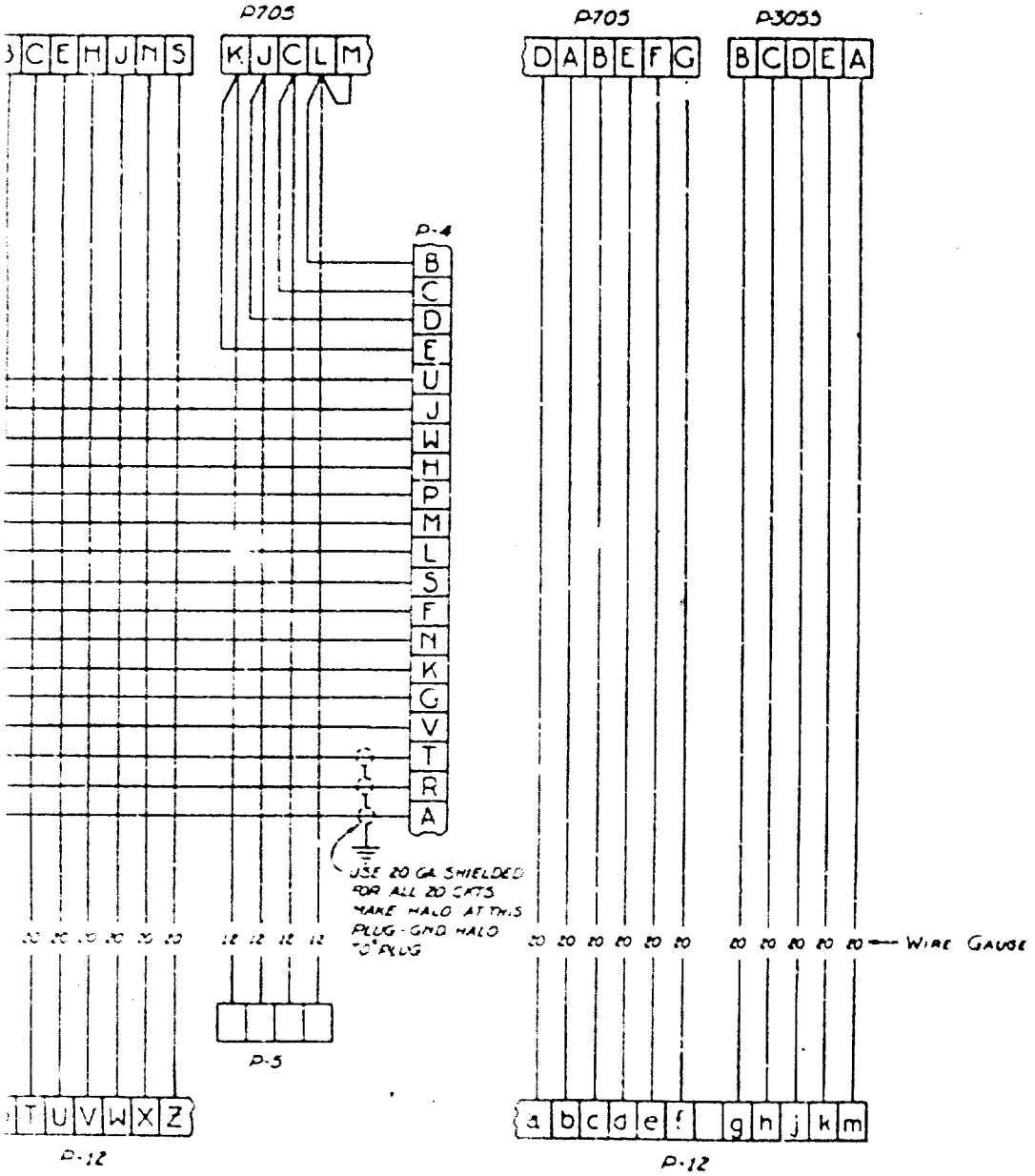


Figure 6

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

R.T. MOBLEY 10-14-59

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SHEET 2 OF 2

E

CONVAIR ASTRONAUTICS

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results: Satisfactory

Date: July 14, 59

Test Engr: R. T. Mobley

Specimen 2/2: Electrus Corp. Specimen SN 001

CVAC Insp: NA

USAF Insp: NA

Paragraph	Specification Requirements	Remarks
4.1.8	Initial Satisfactory	
1.4	Operating Time: Start 107.5 hrs. Stop 107.5 hrs. Assembly Cycles 14 Start _____ hrs. Stop _____ hrs.	

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

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Para. 4.1.8
For para. 4.1.8 Specimen S/N 001 Kinetics Corp.

Date: July 14, 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
15V	a	.285	3 max	X	
15V	d	.204	3 max		X
30V	f	.115	2 max		X
30V	i	.030	2 max	X	
25V	j	.137	2 max		X
25V	j	.057	2 max	X	

DIELECTRIC STRENGTH:
All circuits satisfactory - - - - - - - - - - - - - YES. [X] NO [ ]

INSULATION RESISTANCE:
All circuits measured greater than 10 megohms - - - YES [X] NO [ ]

SWITCH CONTINUITY AND NON-CONTINUITY
All switches satisfactory

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

CYCLE SEQUENCE TIME. (20 milliseconds minimum)

External to Internal 55 milliseconds

Internal to External 60 milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.E.C. Chan. No.	In to Ex msec	Ex to In msec
P14	F	6.5	6.5
P32	G	8	8
P30	H	6	5.5
P36	I	4	4
P40	J	11	10
P18	K	6.5	8
P20	L	8	7
P26	M	7.5	7

Circuit	C.E.C. Chan. No.	In to Ex msec	Ex to In msec
P42	N	5	5
P22	O	8.5	10
P34	P	9	9
P44	Q	8.5	8
P16	R	6	6.5
P28	S	11	10.5
P38	T	4.5	6

CONVAIR
SAN DIEGO

VOLTAGE DROP: Maximum Control Voltage (30 V.)

Switch in External Position				Switch in Internal Position			
SW. MK.	CIRCUIT		DATA	SW. MK.	CIRCUIT		DATA
A	J701C	- J701D	.070	A	J701A	- J701D	.150
B	J706P	- J705L	.117	B	J701A	- J705L	.151
C	J706T	- J705K	.121	C	J701A	- J705K	.155
D	J706	- J705	.119	D	J701A	- J705	.154
E	J706	- J705	.113	E	J701A	- J705	.151
F	J706R	- J703A	.084	F	J702A	- J703A	.051
G	J706c	- J703D	.110	G	J702B	- J703D	.070
H	J706X	- J703F	.072	H	J702B	- J703F	.033
I	J706m	- J703G	.107	I	J702C	- J703G	.076
J	J706r	- J703K	.084	J	J702C	- J703K	.032
K	J706G	- J703L	.110	K	J702A	- J703L	.062
L	J706H	- J703M	.112	L	J702A	- J703M	.064
M	J706W	- J703P	.115	M	J702B	- J703P	.064
N	J706X	- J703R	.130	N	J702C	- J703R	.093
O	J706[illegible]	- J704A	.110	O	J702A	- J704A	.079
P	J706[illegible]	- J704C	.100	P	J702B	- J704C	.054
Q	J706R	- J704J	.074	Q	J702C	- J704J	.059
R	J706F	- J704N	.110	R	J702A	- J704N	.080
S	J706X	- J704R	.110	S	J702B	- J704R	.058
T	J706b	- J704T	.090	T	J702C	- J704T	.088

CONTINUITY CHECK:

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

4.1.8 Initial Satisfactory

A

Date: July 14, 1959 Page 14

Test Engr: R. T. Mobley Report 7A2236

CVAC Insp: NA USAF 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	.093	A	J701A - J701D	.125
B	J706P -	J705L	.117	B	J701A - J705L	.152
C	J706T -	J705K	.120	C	J701A - J705K	.154
D	J706S -	J705J	.119	D	J701A - J705J	.153
E	J706P -	J705C	.114	E	J701A - J705C	.150
F	J706E -	J703A	.082	F	J702A - J703A	.048
G	J706C -	J703D	.110	G	J702B - J703D	.063
H	J706Y -	J703F	.071	H	J702B - J703F	.033
I	J706a -	J703C	.108	I	J702C - J703C	.074
J	J706f -	J703K	.080	J	J702C - J703K	.031
K	J706C -	J703L	.110	K	J702A - J703L	.060
L	J706H -	J703M	.116	L	J702A - J703M	.062
M	J706W -	J703P	.115	M	J702B - J703P	.072
N	J706[illegible] -	J703R	.130	N	J702C - J703R	.071
O	J706[illegible] -	J704A	.110	O	J702A - J704A	.076
P	J706[illegible] -	J704C	.100	P	J702B - J704C	[illegible]
Q	J706[illegible] -	J704J	.093	Q	J702C - J704J	.027
R	J706F -	J704N	.110	R	J702A - J704N	.077
S	J706[illegible] -	J704P	.100	S	J702B - J704P	.056
T	J706[illegible] -	J704T	.090	T	J702C - J704T	.041

B

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results: Satisfactory

Date: July 17, 1959

Specimen S/N 001 Kinetics Corp. Specimen

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

Paragraph	Specification Requirement	Remarks
4.3	Operating Vib. "Y" Axis	
1.4	Operating Time: Start 1084 hrs. Stop 1092 hrs. Assembly Cycles 6 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 mtgs. 5-85 CPS Midwest Mag. SN 137
3. Made switch transfer Int. Ext. Int @ 210 CPS
4. 85-2000 CPS Mag. # 159 No sw. tx'fer on this roll, at end of run.
5. made switch transfer Int. Ext. Int for mag. SN 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: R.T. Mobley
CVAC Insp: ----------
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		3 max		
18V	d	NA	3 max	NA	
30V	f		2 max		
30V	i		2 max		
25V	j		2 max		
25V	j		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				
f			NA	
j				
j				

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 50 milliseconds

Internal to External 52 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	NA	8		P42	M	NA	5
P32	G		8		P22	O		7
P30	H		6.5		P34	P		8.5
P36	I		6.5		P44	Q		9.5
P40	J		10		P16	R		7.5
P18	K		7		P28	S		12
P20	L		7		P38	T		3
P26	M		12					

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results: Satisfactory Date: 7-23-59

Specimen S/N 001 Kinetics Corp. Specimen

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

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

Notes: 1.5-50 Mag. # 137
500-2000 Mag. # 159
switch I-E-F @ 750 CPS
Data reduced 7-24-59 - Entire run looks clean.

Para. 4.3 "X" axis
Per para. 4.3 Specimen S/N 001
Kinetics Corp.

Date: 7-23-57
Engineer: R. T. Mabley
CVAC Insp: ----------
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
15V	2		1 max		
15V	4	NA	1 max	NA	NA
30V	5		2 max		
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 4.1.6 step	YES	NO see note	Switch position Internal	External
5		NA	NA	
1				
1				
1				

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 50 milliseconds

Internal to External 46 milliseconds

Switch made during vib. @ 750CPS

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	5	7		P42	N	4	6
P32	G	5	7		P22	O	8	7
P30	H	4	3		P34	P	7	8
P36	J	3	4		P44	Q	7	8
P40	K	9	10		P16	R	7	8
P18	L	7	8		P28	S	10	12
P20	M	7	8		P38	T	3	4
P26	N	4	5					

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results: Satisfactory

Date: 7-23-59

Specimen S/N 001 Kinetics Corp. Specimen

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

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

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

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

Date: 7-23-'59
Engineer: R.T. Mohler
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
15V	a	NA	3 max	NA	
15V	d		3 max		
30V	f		2 max		
30V	i		2 max		
25V	j		2 max		
25V	j		2 max		

DIELECTRIC STRENGTH:
All circuits satisfactory - - - - - - - - - - - - - YES [NA] NO [ ]

INSULATION RESISTANCE:
All circuits measured greater than 10 megohms - - - YES [NA] NO [ ]

SWITCH CONTINUITY AND NON-CONTINUITY
All switches satisfactory NA

Para 4.1.6 step	YES	NO see note	Switch position Internal	External
g				
i				
j				
j				

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.	In to Ex mono	Ex to In mono
P14	F	5.1	7.5
P32	G	2	8
P30	H	3.5	6
P36	I	3	6
P40	J	10	10
P18	K	6	7.5
P20	L	6	8
P26	M	5	7.5

Circuit	C.E.C. Chan. No.	In to Ex mono	Ex to In mono
P42	N	3	4
P22	O	8	8
P34	P	7.5	8.5
P44	Q	8	8
P16	R	5	6
P28	S	9	9
P38	T	3.5	5

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results: Satisfactory Date: 7-24-59

Specimen S/N CCL Kinetics Corp. Specimen Test Engr: R. T. Mobley
CVAC Insp: NA
USAF Insp: NA

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

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

Para. 4.1.9 Post Vibration
For para. 4.3 Specimen S/N 001
Kinetics Corp.

Date: 7-24-61
Engineer: E. T. Mobley
CVAC Insp: ----
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	.215	3 max		X
18V	d	.241	3 max	X	
30V	f	.118	2 max		X
30V	i	.128	2 max	X	
25V	j	.144	2 max		X
25V	j	.156	2 max	X	

DIELECTRIC STRENGTH:
All circuits satisfactory - - - - - - - - - - - - - YES [X] NO [ ]

INSULATION RESISTANCE:
All circuits measured greater than 10 megohms - - - YES [X] NO [ ]

SWITCH CONTINUITY AND NON-CONTINUITY
All switches satisfactory

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

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 47 milliseconds

Internal to External 47 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	7	7	P42	N	2.75	3.5
P32	G	7	8	P22	O	7.5	9
P30	H	4.5	6	P34	P	7.5	9
P36	I	4.5	5	P44	Q	7	8
P40	J	10	10.5	P16	R	7.5	6
P18	K	7	7.5	P28	S	10	10
P20	L	8	8	P38	T	3	4
P26	M	4	5				

CONVAIR
SAN DIEGO

FORM 1

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	.081	A	J701A - J701D	.112
B	J701P - J705L	.109	B	J701A - J705L	.139
C	J701T - J705K	.114	C	J701A - J705K	.141
D	J706 - J705	.108	D	J701A - J705	.139
E	J706 - J705C	.106	E	J701A - J705	.136
F	J702B - J702A	.088	F	J702A - J702	.052
G	J702 - J702D	.110	G	J702B - J702D	.068
H	J702A - J702F	.096	H	J702B - J702F	.054
I	J702A - J702G	.105	I	J702C - J702G	.069
J	J702 - J702K	.087	J	J702C - J702K	.032
K	J702G - J702L	.105	K	J702A - J702L	.059
L	J702H - J702M	.110	L	J702A - J702M	.065
M	J702W - J702P	.120	M	J702B - J702P	.070
N	J702X - J702R	.115	N	J702C - J702R	.075
O	J704 - J704A	.115	O	J702A - J704A	.086
P	J704 - J704C	.100	P	J704 - J704C	.049
[illegible]	J704 - J704J	.084	[illegible]	J702C - J704J	.055
R	J704F - J704N	.120	R	J702A - J704N	.083
S	J704X - J704R	.100	S	J702B - J704R	.049
T	J704B - J704T	.090	T	J702C - J704T	.037

CONTINUITY CHECK:

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

4.3 Post Vib. Proof Cycle

A

Date: 7-24-'59 Page 23

Test Engr: E. T. Mabley Report 7A2236

[illegible] Insp: NA [illegible] 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	.083	A	J701A -	J701D	.114
B	J70[illegible] -	J703L	.109	B	J701A -	J70[illegible]	.141
C	J70[illegible] -	J70[illegible]	.115	C	J701A -	J70[illegible]	.144
D	J70[illegible] -	J70[illegible]	.110	D	J701A -	J70[illegible]	.142
E	J70[illegible] -	J705C	.108	E	J701A -	J70[illegible]	.137
F	J70[illegible] -	J703A	.089	F	J70[illegible] -	J70[illegible]	.052
G	J70[illegible] -	J70[illegible]	.110	G	J70[illegible] -	J70[illegible]	.067
H	J70[illegible] -	J70[illegible]	.098	H	J70[illegible] -	J70[illegible]	.035
I	J70[illegible] -	J703C	.104	I	J70[illegible] -	J70[illegible]	.069
J	J70[illegible] -	J70[illegible]	.087	J	J70[illegible] -	J70[illegible]	.030
K	J70[illegible] -	J70[illegible]	.105	K	J702A -	J70[illegible]	.060
L	J70[illegible] -	J703M	.110	L	J702A -	J703M	.065
M	J70[illegible] -	J70[illegible]	.120	M	J70[illegible] -	J70[illegible]	.070
N	J70[illegible] -	J703R	.115	N	J70[illegible] -	J70[illegible]	.075
O	J70[illegible] -	J704A	.115	O	J70[illegible] -	J70[illegible]	.086
P	J70[illegible] -	J704C	.100	P	J70[illegible] -	J70[illegible]	.048
Q	J70[illegible] -	J70[illegible]	.095	Q	J70[illegible] -	J70[illegible]	.056
R	J70[illegible] -	J70[illegible]	.120	R	J70[illegible] -	J70[illegible]	.088
S	J70[illegible] -	J70[illegible]	.100	S	J70[illegible] -	J70[illegible]	.049
T	J70[illegible] -	J70[illegible]	.091	T	J70[illegible] -	J70[illegible]	.037

B

CONVAIR
SAN DIEGO

VOLTAGE DROP: Maximum Control Voltage (30 V.)

Switch in External Position				Switch in Internal Position			
SW. MK.	CIRCUIT		DATA	SW. MK.	CIRCUIT		DATA
A	J701C -	J701D	0.110	A	J701A -	J701D	0.114
B	J706P -	J705L	0.114	B	J701A -	J705L	0.127
C	J706T -	J705K	0.111	C	J701A -	J705K	0.133
D	J706[illegible] -	J705[illegible]	0.112	D	J701A -	J705[illegible]	0.132
E	J706[illegible] -	J705C	0.119	E	J701A -	J705C	0.129
F	J706B -	J703A	0.115	F	J702A -	J703A	0.042
G	J706c -	J703D	0.100	G	J702B -	J703D	0.062
H	J706Y -	J703F	0.071	H	J702B -	J703F	0.024
I	J706a -	J703G	0.100	I	J702C -	J703G	0.064
J	J706f -	J703K	0.076	J	J702C -	J703K	0.023
K	J706G -	J703L	0.105	K	J702A -	J703L	0.056
L	J706H -	J703M	0.130	L	J702A -	J703M	0.056
M	J706W -	J703P	0.175	M	J702B -	J703P	0.066
N	J706X -	J703R	0.100	N	J702C -	J703R	0.068
O	J706[illegible] -	J704A	0.100	O	J702A -	J704A	0.074
P	J706d -	J704C	0.090	P	J702B -	J704C	0.043
Q	J706R -	J704J	0.075	Q	J702C -	J704J	0.042
R	J706T -	J704N	0.120	R	J702A -	J704N	0.082
S	J706X -	J704R	0.087	S	J702B -	J704R	0.043
T	J706b -	J704T	0.078	T	J702C -	J704T	0.034

CONTINUITY CHECK:

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

4.2.1.1c -65°F COLD TEST

0043 MIDWEST RECORD # (137 1st run)

CHANGE: INT. — EXT. — INT.

A

Date: 7-29-59 Page 27

Test Engr: Mobley/Hanson/Lavender Report 7A2236

CVAC Insp: NA USAF 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	0.130	A	J701A -	J701D	0.126
B	J706F -	J705L	0.106	B	J701A -	J705L	0.128
C	J706T -	J705K	0.106	C	J701A -	J705K	0.134
D	J706S -	J705J	0.102	D	J701A -	J705J	0.134
E	J706P -	J705C	0.114	E	J701A -	J705C	0.128
F	J706E -	J703A	0.068	F	J702A -	J703A	0.039
G	J706C -	J703D	0.078	G	J702B -	J703D	0.060
H	J706X -	J703F	0.065	H	J702B -	J703F	0.021
I	J706a -	J703C	0.090	I	J702C -	J703C	0.063
J	J706f -	J703K	0.058	J	J702C -	J703K	0.020
K	J706C -	J703L	0.098	K	J702A -	J703L	0.056
L	J706H -	J703M	0.170	L	J702A -	J703M	0.055
M	J706W -	J703P	0.140	M	J702B -	J703P	0.065
N	J706g -	J703R	0.098	N	J702C -	J703R	0.068
O	J706J -	J704A	0.098	O	J702A -	J704A	0.078
P	J706B -	J704C	0.080	P	J702B -	J704C	0.044
Q	J706L -	J704J	0.072	Q	J702C -	J704J	0.042
R	J706F -	J704N	0.115	R	J702A -	J704N	0.082
S	J706X -	J704R	0.080	S	J702B -	J704R	0.042
T	J706A -	J704T	0.074	T	J702C -	J704T	0.033

B

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results: Satisfactory

Date: 7-28-59

Test Engr: R. T. Mobley

Specimen S/N 001. Kinetics Corp. Specimen

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 NA hrs. Stop _____ hrs. Assembly Cycles Start NA hrs. Stop _____ hrs.	

Notes: 1. This test was attempted 7-27-59 but Benco 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-LAVENDER
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/specimen in Bemco Box #2, per applicable spec. paragraph noted in 1st Column.
1.4	Operating Time: 113.3 Start 113.3 hrs. Stop 113.4 hrs. Assembly Cycles 8 Start _____ hrs. Stop _____ hrs.	

* Notes: 1. AC switch circuit P40 required 16.5 millisec. 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 for PARA. 4.2.1.1c
For para. 4.2.1.1c Specimen S/N 001 KINETICS

Date: 7/29/59
Engineer: HOBLEY-HAUSON-LANGLOIS
CVAC Insp: N/A
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	.780	1 max		
15V	d	.270	1 max		
30V	f	.124	2 max		
30V	i	.134	2 max		
25V	j	.157	2 max		
25V	j	.151	2 max		

DIELECTRIC STRENGTH:
All circuits satisfactory - Could not perform YES ☐ NO ☐

INSULATION RESISTANCE: Could not perform
All circuits measured greater than 10 megohms - - - YES ☐ NO ☐

SWITCH CONDUCTIVITY AND NON-CONDUCTIVITY
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 62 milliseconds

Internal to External 58 milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.E.C. Chan. No.	In to Ex msec	Ex to In msec
P14	F	7	8
P32	G	3	2.5
P30	H	2	2
P36	I	2	3
P40	J	13	16.5
P18	K	7	7.5
P20	L	11	7.5
P24	M	4	4.5

Circuit	C.F.C. Chan. No.	In to Ex msec	Ex to In msec
P42	N	4	3.5
P22	O	7	9.5
P34	P	4	6.5
P44	Q	7	8
P16	R	7	25
P28	S	11	11
P38	T	5	3.5

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results: Satisfactory Date: 7-29-59

Specimen S/N 001. KINETIC

Test Engr: BRIERLEY-HANSON-LAVENDER
CVAC Insp: N/A
USAF Insp: N/A

Paragraph	Specification Requirement	Remarks
4.2.1.1C	Operate specimen while reducing pressure to 1mmHg Temp. -65°F	
1.4	Operating Time: Start 113.9 hrs. Stop 114.8 hrs. .9 hrs. Assembly Cycles 8 Start _____ hrs. Stop _____ hrs.	

Notes:

1. During the first attempt to reach 1mm the pressure indicated 1.8mm 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 ... (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. 18V 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. 4.2.1.1c Specimen S/N 001 KINETICS

Date: 7/29/57
Engineer: BRIERLEY-HARSON-LAUNDER
CVAC Insp: N/A
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	.228	3 max	X	
15V	d	could not get	3 max see note		Couldn't get
30V	f	.130	2 max	X	
30V	i	.113	2 max		X
25V	j	.149	2 max	X	
25V	j	.140	2 max		X

DIELECTRIC STRENGTH:
All circuits satisfactory - - Could not accomplish YES [ ] NO [ ]

INSULATION RESISTANCE:
All circuits measured greater than 10 megohms - - - YES [ ] NO [ ] Could not accomplish

SWITCH CONTINUITY AND NON-CONTINUITY
All switches satisfactory

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

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal _____ milliseconds See re-run of this test on 7-31-57

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			P42	M		
P32	[illegible]	See note 4		P22	O	See note 4	
P30	[illegible]			P34	P		
P34	[illegible]			P44	Q		
P40	[illegible]			P16	R		
P18	K			P28	S		
P20	[illegible]			P38	T		
P26	M						

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FORM 11

VOLTAGE DROP: Maximum Control Voltage (30 V.)

	Switch in External Position			Switch in Internal Position		
SW. MK.	CIRCUIT	DATA	SW. MK.	CIRCUIT	DATA	
A	J701C - J701D	0.100	A	J701A - J701D	0.114	A
B	J706P - J705L	0.103	B	J701A - J705L	0.134	B
C	J706T - J705K	0.106	C	J701A - J705K	0.138	C
D	J706[illegible] - J705[illegible]	0.104	D	J701A - J705[illegible]	0.136	D
E	J706[illegible] - J705C	0.103	E	J701A - J705[illegible]	0.134	E
F	J706[illegible] - J703A	0.060	F	J702A - J703A	0.041	F
G	J706[illegible] - J703D	0.100	G	J702B - J703D	0.062	G
H	J706Y - J703F	0.071	H	J702B - J703F	0.045	H
I	J706e - J703G	0.070	I	J702C - J703G	0.066	I
J	J706[illegible] - J703K	0.052	J	J702C - J703K	0.014	J
K	J706G - J703[illegible]	0.088	K	J702A - J703[illegible]	0.054	K
L	J706[illegible] - J70[illegible]	0.152	L	J702A - J703[illegible]	0.061	L
M	J706[illegible] - J703P	0.105	M	J702B - J703P	0.066	M
N	J706[illegible] - J703P	0.092	N	J702C - J703[illegible]	0.070	N
O	J706[illegible] - J704A	0.100	O	J702A - J704A	[illegible]	O
P	J706d - J704C	0.079	P	J702B - J704C	0.041	P
Q	J706R - J704J	0.071	Q	J702C - J704J	0.044	Q
R	J706F - J704N	0.124	R	J702A - J704[illegible]	0.092	R
S	J706X - J704R	0.079	S	J702B - J704[illegible]	0.045	S
T	J706b - J704T	0.074	T	J702C - J704T	0.054	T

CONTINUITY CHECK:

All circuits indicated continuity . . . . Yes [X] No [ ] See Notes

Midwest Record # 0044 [illegible] @ 1MM Hg

Failed to Reset Counter on 180

Changed Cover, Found Ext. to Int.

So Made Rerun, but this not yet

Count Adjing

A

Date: 7-29-'59 Page 30

Test Engr: Brierley/Lavender/Hanson Report 7A2236

VAC Insp: NA USAF Insp: NA

VOLTAGE DROP: Minimum Control Voltage (25 V.)

	Switch in External Position				Switch in Internal Position			
Dc. MK.	CIRCUIT		DATA		Dc. MK.	CIRCUIT		DATA
A	J701C -	J701D	0.091		A	J701A -	J701D	0.119
B	J706F -	J705L	0.106		B	J701A -	J705L	0.135
C	J706T -	J701F	0.109		C	J701A -	J705K	0.138
D	J706S -	J705J	0.104		D	J701A -	J705J	0.1[illegible]7
E	J706P -	J705C	0.112		E	J701A -	J705C	0.134
F	J706R -	J703A	0.077		F	J702A -	J703A	0.042
G	J706[illegible] -	J703D	0.096		G	J702F -	J703D	0.063
H	J706Y -	J703F	0.070		H	J702B -	J703F	0.026
I	J706a -	J703C	0.095		I	J702C -	J703C	0.066
J	J706[illegible] -	J703K	0.058		J	J702D -	J703K	0.019
K	J706[illegible] -	J703L	0.096		K	J702A -	J703L	0.054
L	J706H -	J703M	0.108		L	J702A -	J703M	0.058
M	J706W -	J703P	0.127		M	J702[illegible] -	J703P	0.068
N	J706[illegible] -	J703R	0.102		N	J702[illegible] -	J703R	0.07[illegible]
O	J706[illegible] -	J704A	0.102		O	J702A -	J704A	0.095
P	J706[illegible] -	J704C	0.080		P	J702B -	J704C	0.044
Q	J706[illegible] -	J704[illegible]	0.072		Q	J702C -	J704[illegible]	0.044
R	J706F -	J704N	0.118		R	J702A -	J704N	0.08[illegible]
S	J706X -	J704R	0.082		S	J702[illegible] -	J704[illegible]	0.044
T	J706[illegible] -	J704T	0.075		T	J702[illegible] -	J704T	0.0[illegible]4

B

4.1 TEST CONDITIONS AND PROCEDURES (continued)

General Test Results: Satisfactory

Date: 7-30-59

Specimen S/N 021 Kinetics Corp.

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

Paragraph	Specification Requirement	Remarks
4.2.1.1d	+160°F w/ 95% R.H. Test - Proof cycle @ ambient pressure	
1.4	Operating Time: Start 114.5 hrs. Stop 115.4 hrs. Assembly Cycles 5 Start _____ hrs. Stop _____ hrs.	

Notes: 1. Dielectric strength and Insulation Resistance cannot be tested at +160°F Hg. Hereafter on this test, NA will be entered in the data box when this environment is performed.

Para. 4.1.9
For para. 4.2.1.1d Specimen S/N 001 Kinetics Corp. Spec.

Date: 7-30-59
Engineer: R. T. Mobley
CVAC Insp: ----------
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	.262	3 max	X	
18V	d	.248	3 max		X
30V	f	.117	2 max		X
30V	i	.133	2 max	X	
25V	j	.140	2 max		X
25V	j	.163	2 max	X	

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 CONTINUITY AND NON-CONTINUITY
All switches satisfactory

Para 4.1.8 step	YES	NO see note	Switch Position Internal	External
a	X		X	
i	X			X
j	X		X	
j	X			X

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 50.[illegible] milliseconds

Internal to External 46.7 milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.E.C. Chan. No.	In to Ex msec	Ex to In msec
P14	F	4.60	5.63
P32	G	6.74	8.15
P30	H	5.81	9.7[illegible]
P36	I	2.22	3.0
P40	J	9.52	9.62
P18	K	6.02	6.68
P20	L	6.02	7.7
P26	M	2.54	4.7

Circuit	C.E.C. Chan. No.	In to Ex msec	Ex to In msec
P42	N	2.06	5.1
P22	O	7.22	9.0
P34	P	2.99	11.1
P44	Q	7.30	9.4
P16	R	4.45	5.1
P28	S	9.37	11.6
P38	T	2.62	3.0

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FORM 11

VOLTAGE DROP: Maximum Control Voltage (30 V.)

	Switch in External Position				Switch in Internal Position		
SW. MK.	CIRCUIT		DATA	SW. MK.	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[illegible]	J705[illegible]	0.129	D	J701A	J705[illegible]	0.167
E	J706E	J705C	0.128	E	J701A	J705C	0.161
F	J706E	J703A	0.100	F	J702[illegible]	J703A	.057
G	J706[illegible]	J703D	0.122	G	J702B	J703D	.074
H	J706X	J703F	0.100	H	J702B	J703F	.036
I	J706a	J703G	0.120	I	J702C	J703G	.079
J	J706f	J703K	0.084	J	J702C	J703K	.028
K	J706G	J703L	0.122	K	J702A	J703L	.065
L	J706L	J703M	0.130	L	J702A	J703M	.069
M	J706M	J703P	0.138	M	J702B	J703P	.082
N	J706K	J703N	0.128	N	J702C	J703N	.085
O	J706[illegible]	J704A	0.118	O	J702A	J704A	.088
P	J706d	J704C	0.110	P	J702B	J704C	.054
Q	J706R	J704J	0.101	Q	J702C	J704J	.059
R	J706F	J704N	0.124	R	J702A	J704N	.091
S	J706X	J704R	0.112	S	J702B	J704R	.056
T	J706b	J704T	0.100	T	J702C	J704T	.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: 7-30-59 Page: 33

Test Engr: R.T. Mobley Report 7A2236

VAC Insp: NA USAF Insp: NA

VOLTAGE PROB: Minimum Control Voltage (25 V.)

Switch in External Position				Switch in Internal Position			
Sw. No.	CIRCUIT		DATA	Sw. No.	CIRCUIT		DATA
A	J701C -	J701D	.113	A	J701A -	J701D	.159
B	J706F -	J705L	.129	B	J701A -	J705L	.166
C	J706C -	J705K	.135	C	J701A -	J705K	.174
D	J706G -	J705J	.127	D	J701A -	J705J	.172
E	J706F -	J705C	.126	E	J701A -	J705C	.163
F	J706E -	J703A	.094	F	J702A -	J703A	.056
G	J706C -	J703D	~~.039~~ .124	G	J702F -	J703D	.074
H	J706Y -	J703F	.095	H	J702B -	J703F	.036
I	J706a -	J703G	.120	I	J702C -	J703G	.079
J	J706f -	J703K	.083	J	J702D -	J703K	.028
K	J706C -	J703L	.120	K	J702A -	J703L	.065
L	J706H -	J703M	.145	L	J702A -	J703M	.069
M	J706a -	J703P	.140	M	J702B -	J703P	.081
N	J706g -	J703R	.130	N	J702C -	J703R	.085
O	J706J -	J704A	.122	O	J701A -	J704A	.088
P	J706J -	J704C	.110	P	J702B -	J704C	.054
Q	J706E -	J704J	.102	Q	J702C -	J704J	.059
R	J706F -	J704N	.124	R	J701A -	J704N	.092
S	J706J -	J704P	.112	S	J702B -	J704P	.056
T	J706L -	J704C	.100	T	J702C -	J704T	.042

B

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results: Undetermined - See Re-test

Specimen S/N 001 KENETICS

Date: 7/30/59
Test Engr: MOBLEY-LAVENDER-HANSON
CVAC Insp: NA
USAF Insp: NA

Paragraph	Specification Requirement	Remarks
4.2.1.1 d)	+160°F Hot test Proof cycle @ 1 mm Hg.	
1.4	Operating Time: Start 1154 hrs. Stop 1159 hrs. Assembly Cycles 10 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. 4.4.9
For para. 4.2.11.d Specimen S/N 001 Kinetics Date: 7-30-59
Engineer: Hanson Lauenborg
CVAC Insp: N/A
USAF Insp: N/A

• 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
10V	a	.254	3 max	X	
10V	d	.243	3 max		X
30V	f	.132	2 max		X
30V	i	.151	2 max	X	
25V	j	.133	2 max		X
25V	j	.171	2 max	X	

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 4.1.6 step	YES	NO see note	Switch position Internal	External
[illegible]				
[illegible]	X		X	
[illegible]	X		X	
[illegible]				X

CYCLE SEQUENCE TIME: (20 [illegible] seconds minimum)

External to Internal _____ milliseconds See re-run of
Internal to External _____ milliseconds this test 8-3-59

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
P12	F				P42	N		
P32	G		Note		P22	O		
P30	H				P34	P	See Note	
P36	I	See			P24	Q		
P40	J				P16	R		
P18	K				P28	S		
P20	L				P38	T		
P26	M							

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FORM 1[illegible]

4.2.1.1 d. +160° @ [illegible]

VOLTAGE DROP: Maximum Control Voltage (30 V.)

	Switch in External Position			Switch in Internal Position	
SW. MX.	CIRCUIT	DATA	SW. MX.	CIRCUIT	DATA
A	J701C - J701D	0.116	A	J701A - J701D	0.159
B	J701P - J705L	0.132	B	J701A - J705L	0.169
C	J701T - J705K	0.134	C	J701A - J705K	0.170
D	J706 - J705[illegible]	0.124	D	J701A - J705[illegible]	0.175
E	J70[illegible] - J705[illegible]	0.168	E	J701A - J705[illegible]	0.166
F	J702B - J702A	0.044	F	J702A - J702[illegible]	0.056
G	J702[illegible] - J702[illegible]	0.135	G	J702B - J702D	0.074
H	J702[illegible] - J702F	0.130	H	J702[illegible] - J702F	0.066
I	J702[illegible] - J702C	0.142	I	J702C - J702[illegible]	0.080
J	J702[illegible] - J702K	0.088	J	J702C - J702A	0.028
K	J702[illegible] - J702[illegible]	0.142	K	J702A - J702[illegible]	0.069
L	J702E - J702M	0.130	L	J702A - J702[illegible]	~~0.300~~ 0.069
M	J702[illegible] - J702P	0.145	M	J702B - J702P	0.08[illegible]
N	J702[illegible] - J702[illegible]	0.134	N	J702C - J702[illegible]	0.087
O	J702[illegible] - J702[illegible]	0.120	O	J702[illegible] - J702A	0.088
P	J702[illegible] - J702[illegible]	0.113	P	J702[illegible] - J702[illegible]	0.054
Q	J702[illegible] - J702[illegible]	0.122	Q	J702C - J702[illegible]	0.060
R	J702F - J702A	0.146	R	J702A - J702[illegible]	0.092
S	J702X - J702B	0.112	S	J702B - J702[illegible]	0.056
T	J702[illegible] - J702T	0.102	T	J702C - J702T	0.044

CONTINUITY CHECK:

All circuits indicated continuity . . . . Yes [ ] No [ ] See Notes

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

115.6 SPECIMEN TEMP. +200°F.

PRESSURE WAS 1.4 MM Hg 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 Engr: Mobley/Lavender/Hanson Report 7A2236

60° @ 1mm Hg. VAC Insp: NA KAF 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	0.112	A	J701A - J701D	0.153
B	J706F -	J705L	0.131	B	J701A - J705L	0.171
C	J706T -	J705E	0.157	C	J701A - J705K	0.174
D	J706[illegible] -	J705J	0.130	D	J701A - J705[illegible]	0.170
E	J706[illegible] -	J705C	0.130	E	J701A - J705C	0.166
F	J706[illegible] -	J705A	0.045	F	J701A - J705A	0.058
G	J706[illegible] -	J705D	0.108	G	J701A - J705D	0.076
H	J706Y -	J705F	0.103	H	J701A - J705F	0.038
I	J706[illegible] -	J705G	0.103	I	J701A - J705G	0.082
J	J706[illegible] -	J705[illegible]	~~0.3~~ 0.033	J	J701A - J705[illegible]	0.027
K	J706[illegible] -	J705L	0.126	K	J701A - J705L	0.067
L	J706F -	J705M	0.132	L	J701A - J705M	0.072
M	J706[illegible] -	J705P	0.147	M	J701A - J705P	0.083
N	J706[illegible] -	J705R	0.136	N	J701A - J705R	0.089
O	J706[illegible] -	J705[illegible]	0.125	O	J701A - J705[illegible]	0.070
P	J706[illegible] -	J705C	0.112	P	J701A - J705C	0.056
Q	J706[illegible] -	J705[illegible]	0.108	Q	J701A - J705[illegible]	0.063
R	J706[illegible] -	J705[illegible]	0.121	R	J701A - J705[illegible]	0.074
S	J706[illegible] -	J705[illegible]	0.116	S	J701A - J705[illegible]	0.058
T	J706[illegible] -	J705[illegible]	0.103	T	J701A - J705[illegible]	0.045

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

°F.
T
NDIANT

B

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results: Satisfactory

Date: 7-31-59

Test Engr: R. T. Mobley

CVAC Insp: NA

USAF Insp:

Specimen S/N 001 Kinetics Corp. Specimen

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 115.4 hrs. Stop 0.4 hrs. Assembly Cycles 8 Start _____ hrs. Stop _____ hrs.	

Notes:

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

Date: 7-31-'59
Engineer: R. T. Mahley
CVAC Insp: ----------
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	.205	1 max		X
18V	d	.223	1 max	X	
30V	f	.118	2 max	X	
30V	i	.119	2 max		X
25V	j	.155	2 max	X	
25V	j	.053	2 max		X

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
g	X			X
i	X		X	
j	X			X
j	X		X	

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 48 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
P14	F	6	5.5
P32	G	6	6.5
P30	H	3.5	8.5
P34	I	3.5	8.0
P40	J	11.5	13.25
P18	K	6	8.0
P20	L	6	6.5
P26	M	2.5	3.0

Circuit	C.E.C. Chan. No.	In to Ex msec	Ex to In msec
P42	N	2.5	6.5
P22	O	9	9.0
P34	P	6	6.5
P44	Q	7	9.5
P16	R	5	5.5
P28	S	9	11.0
P38	T	2.5	2.0

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SAN DIEGO

FORM 11

VOLTAGE DROP: Maximum Control Voltage (30 V.)

	Switch in Internal 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	J706[illegible] -	J705J	0.113	D	J701A -	J705J	0.159
E	J706F -	J705C	0.112	E	J701A -	J705C	0.153
F	J706B -	J703A	0.066	F	J702A -	J703A	0.042
G	J706c -	J703D	0.100	G	J702B -	J703D	0.066
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	0.0[illegible]
M	J706W -	J703P	0.110	M	J702B -	J703P	0.0[illegible]
N	J706[illegible] -	J703B	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	J702C -	J704J	0.049
R	J706F -	J704N	0.155	R	J702A -	J704N	0.081
S	J706X -	J704R	0.097	S	J702B -	J704R	0.046
T	J706b -	J704T	0.021	T	J702C -	J704T	0.036

CONTINUITY CHECK:

All circuits indicated continuity . . . . Yes [X] No [ ] See Notes

4.2.1.1e +40°F @ 95% R.H.

A

Date: 7-31-59 Page 39

Test Engr: R. T. Mobley Report 7A2236

QVAC Insp: NA QSAP 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	0.091	A	J701A -	J701D	0.143
B	J706P -	J705L	0.119	B	J701A -	J705L	0.151
C	J706T -	J705K	0.140 MOW	C	J701A -	J705K	0.174
D	J706S -	J705J	~~0.140~~ 0.114	D	J701A -	J705J	0.154
E	J706R -	J705C	0.111	E	J701A -	J705C	0.150
F	J706E -	J703A	0.067	F	J702A -	J703A	~~0.140~~ MOW 0.041
G	J706C -	J703D	0.105	G	J702B -	J703D	~~0.065~~ MOW 0.064
H	J706Y -	J703F	0.076	H	J702B -	J703F	~~0.065~~ MOW 0.025
I	J706a -	J703C	0.100	I	J702C -	J703C	~~0.082~~ MOW 0.068
J	J706Z -	J703K	0.061	J	J702C -	J703K	~~0.082~~ MOW 0.020
K	J706C -	J703L	0.104	K	J702A -	J703L	~~0.140~~ MOW 0.056
L	J706H -	J703M	0.110	L	J702A -	J703M	~~0.140~~ MOW 0.059
M	J706W -	J703P	0.114	M	J702B -	J703P	~~0.065~~ MOW 0.069
N	J706Q -	J703R	0.110	N	J702C -	J703R	~~0.082~~ MOW 0.073
O	J706U -	J704A	0.102	O	J704A -	J704A	0.076
P	J706V -	J704C	0.091	P	J702B -	J704C	0.044
Q	J706[illegible] -	J704[illegible]	0.085	Q	J702C -	J704[illegible]	0.048
R	J706X -	J704D	0.113	R	J702A -	J704D	0.080
S	J706T -	J704B	0.095	S	J702B -	J704[illegible]	0.045
T	J706[illegible] -	J704[illegible]	0.084	T	J702C -	J704[illegible]	0.035

B

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results: Sat. Re-Test Date: 7-31-59

Specimen S/N 001. KINETICS

Test Engr: HURLEY-HANSON-LAVENDER
CVAC Insp: NA
USAF Insp:

Paragraph	Specification Requirement	Remarks
4.2.1.1c	-30°F @ 1mm Hg. Re-run of 001.	
1.4	Operating Time: Start 116.4 hrs. Stop 116.8 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 PROOF CYCLE +13°F

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Para. 4.4.9 Re-Test
For para. 4.2.1.6 Specimen S/N 001 Kinetics Comp. Spec.

Date: 7-31-59
Engineer: R.T. Mobley
CVAC Insp: ----
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	X	
18V	d	.204	3 max		X
30V	f	.189	2 max		X
30V	i	.149	2 max	X	
25V	i	.163	2 max		X
25V	i	.164	2 max	X	

DIELECTRIC STRENGTH:
All circuits satisfactory - - Could not do YES [ ] NO [ ]

INSULATION RESISTANCE:
All circuits measured greater than 10 megohms - - - YES [ ] NO [ ]
Could not do

SWITCH CONTINUITY AND NON-CONTINUITY
All switches satisfactory

Para 4.1.6 step	YES	NO see note	Switch position Internal	External
f	X		X	
f	X			X
i	X		X	
i	X			X

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 50 milliseconds

Internal to External 50 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	8	7		P42	M	3	3.5
P32	G	9	6.5		P22	O	10	8.0
P30	H	5	8.0		P34	P	7.5	6.5
P36	J	4.5	4.5		P44	Q	11	8.0
P40	K	12	10.5		P16	R	7	6.0
P18	L	8.5	9.5		P28	S	13	11.0
P20	M	11	7		P38	T	3	2.5
P26	N	5	3.5					

FORM NO. A-70

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FORM 11

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	0.082	A	J701A -	J701D	~~0.147~~ 0.127
B	J706P -	J705L	0.119	B	J701A -	J705L	~~0.127~~ 0.149
C	J706T -	J705K	0.112	C	J701A -	J705K	0.147
D	J706 -	J705	0.109	D	J701A -	J705	0.149
E	J706 -	J705C	0.104	E	J701A -	J705C	0.139
F	J706R -	J705A	0.058	F	J702 -	J70	0.036
G	J706 -	J703	0.098	G	J702B -	J70 D	0.060
H	J706 -	J703F	0.064	H	J702B -	J70	0.020
I	J706 -	J703G	0.094	I	J702C -	J703G	0.063
J	J706 -	J703K	0.053	J	J702C -	J703K	0.017
K	J706G -	J703L	0.095	K	J702A -	J703L	0.050
L	J706H -	J703M	0.100	L	J702A -	J703M	0.053
M	J706 -	J703P	0.100	M	J702B -	J703P	0.064
N	J706 -	J703R	0.100	N	J702C -	J703R	0.069
O	J706 -	J704A	0.095	O	J702 -	J704A	0.072
P	J706 -	J704C	0.090	P	J702B -	J704C	0.039
Q	J706 -	J704J	0.073	Q	J702C -	J704J	0.042
R	J706 -	J704N	0.095	R	J702A -	J704N	0.074
S	J706 -	J704P	0.086	S	J702B -	J704P	0.040
T	J706 -	J704T	0.074	T	J702C -	J704T	0.030

CONTINUITY CHECK:

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

¶ 4.2.1.1(c) Re-Test -30°F @ 1mm Hg.

A

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Test Engr: R.T. Mobley Report 7A2236

CVAC Insp: NA SSAF 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	0.085	A	J701A - J701D	0.129
B	J701F -	J705L	0.118	B	J701A - J705L	0.153
C	J706T -	J705K	0.113	C	J701A - J705K	0.154
D	J706[illegible] -	J705[illegible]	0.108	D	J701A - J705[illegible]	0.149
E	J706[illegible] -	J705C	0.106	E	J701A - J705C	0.143
F	J706[illegible] -	J703A	0.054	F	J702A - J703A	0.0[illegible]
G	J706[illegible] -	J703D	0.048	G	J702B - J703D	0.063
H	J706[illegible] -	J703F	0.066	H	J702B - J703F	0.022
I	J706[illegible] -	J703C	0.014	I	J702C - J703C	0.065
J	J706[illegible] -	J703K	0.054	J	J702[illegible] - J703K	0.017
K	J706C -	J703L	0.075	K	J702A - J703L	0.052
L	J706H -	J703M	0.100	L	J702A - J703M	0.055
M	J706[illegible] -	J703P	0.100	M	J702B - J703P	0.065
N	J706[illegible] -	J703R	0.077	N	J702C - J703R	0.070
O	J706[illegible] -	J704A	0.045	O	J702A - J704A	0.077
P	J706[illegible] -	J704C	0.040	P	J702[illegible] - J704C	0.040
Q	J706[illegible] -	J704[illegible]	0.014	Q	J702[illegible] - J704[illegible]	0.047
R	J706F -	J704N	0.049	R	J702[illegible] - J704N	0.077
S	J706[illegible] -	J704R	0.057	S	J702[illegible] - J704[illegible]	0.042
T	J706[illegible] -	J704[illegible]	0.075	T	J702[illegible] - J704[illegible]	0.052

B

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results: Re-Test Satisfactory

Specimen S/N 001. Kinetics Corp. Specimen

Date: 8-3-'51
Test Engr: R. T. Mobley
CVAC Insp: NA
USAF Insp:

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

Notes: 1. Achieved 1mm Hg in 4½ minutes
2. CEC run I to E to I mag #. 159
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 this proof cycle to determine if any damage had been done to the dialectric strength when potting deformed.

Para. 4.1.9 Re-Test
For para. 2.2.1.d Specimen S/N 001 Kinetics Corp. Specimen

Date: 8-3-59
Engineer: R. T. Mabley
CVAC Insp: ----------
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	.287	1 max	X	
18V	d	.247	1 max		X
30V	f	.118	2 max		X
30V	i	.141	2 max	X	
25V	j	.156	2 max		X
25V	j	.152	2 max	X	

DIELECTRIC STRENGTH:
All circuits satisfactory - Performed at end of Proof Cycle YES [X] NO [ ]

INSULATION RESISTANCE: See note
All circuits measured greater than 10 megohms - - - YES [X] NO [ ]

SWITCH CONTINUITY AND NON-CONTINUITY
All switches satisfactory

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

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 38.1 milliseconds

Internal to External 61.6 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	9.8	8.04	P42	N	2.64	[illegible]
P32	G	12.15	8.82	P22	O	11.82	12.42
P30	H	11.85	8.82	P34	P	12.10	14.62
P36	I	6.32	2.28	P44	Q	15.10	12.42
P10	J	12.60	18.0	P16	R	1.42	1.48
P18	K	8.60	10.15	P28	S	6.08	11.15
P20	L	8.30	8.82	P38	T	2.40	[illegible]
P26	M	5.70	4.26				

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VOLTAGE DROP: Maximum Control Voltage (30 V.)

	Switch in External Position				Switch in Internal Position			
SW. MK.	CIRCUIT	DATA		SW. MK.	CIRCUIT	DATA		SW. MK.
A	J701C - J701D	0.108		A	J701A - J701D	0.147		A
B	J706E - J705L	0.127		B	J701A - J705L	0.172		B
C	J706[illegible] - J705K	0.132		C	J701A - J705K	0.173		C
D	J706[illegible] - J705J	0.127		D	J701A - J705J	0.170		D
E	J706F - J705C	0.122		E	J701A - J705C	0.~~170~~ 0.167		E
F	J706[illegible] - J701A	0.100		F	J702A - J701A	0.051		F
G	J706c - J703D	0.123		G	J702B - J703D	0.077		G
H	J706X - J703F	0.106		H	J702D - J703F	0.034		H
I	J706a - J703G	0.122		I	J702C - J703G	0.083		I
J	J706[illegible] - J703K	0.090		J	J702C - J703K	0.023		J
K	J706G - J703L	0.122		K	J702A - J703L	0.070		K
L	J706H - J703M	0.130		L	J702A - J703M	0.076		L
M	J706W - J703P	0.141		M	J702B - J703P	0.084		M
N	J706[illegible] - J703H	0.133		N	J702C - J703H	0.088		N
O	J706J - J704A	0.130		O	J702A - J704A	0.088		O
P	J706d - J704C	0.114		P	J702B - J704C	0.058		P
Q	J706R - J704J	0.105		Q	J702C - J704J	0.061		Q
R	J706F - J704N	0.131		R	J702A - J704N	0.089		R
S	J706X - J704R	0.115		S	J702B - J704R	0.060		S
T	J706b - J704T	0.102		T	J702C - J704T	0.046		T

CONTINUITY CHECK:

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

4.2.1.1(d) +160°F Hot test @ 1mm Hg.
Re-run of this test on SN 001

Date: 8-3-'59 Page 45

Test Engr: R. T. Mobley Report 7A2236

CVAC Insp: NA USAF 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	J706F -	J705L	0.130	B	J701A -	J705L	0.169
C	J706E -	J705K	0.134	C	J701A -	J705K	0.172
D	J706E -	J705J	0.129	D	J701A -	J705J	0.169
E	J706F -	J705C	0.124	E	J701A -	J705C	0.165
F	J706E -	J703A	0.098	F	J702A -	J703A	0.051
G	J706C -	J703D	0.120	G	J702B -	J703D	0.026
H	J706F -	J703F	0.102	H	J702B -	J703F	0.035
I	J706a -	J703G	0.118	I	J702C -	J703G	0.081
J	J706f -	J703K	0.087	J	J702[illegible] -	J703K	0.023
K	J706C -	J703L	0.120	K	J702A -	J703L	0.069
L	J706H -	J703M	0.124	L	J702A -	J703M	0.075
M	J706H -	J703P	0.135	M	J702B -	J703P	0.082
N	J706[illegible] -	J703R	0.130	N	J702[illegible] -	J703R	0.087
O	J706[illegible] -	J704A	0.124	O	J703A -	J704A	0.086
P	J706[illegible] -	J704C	0.110	P	J703B -	J704C	0.057
Q	J706[illegible] -	J704[illegible]	0.101	Q	J703[illegible] -	J704[illegible]	0.060
R	J706F -	J704A	0.126	R	J703A -	J704A	0.087
S	J706T -	J704B	0.110	S	J703B -	J704[illegible]	0.060
T	J706L -	J704T	0.100	T	J703C -	J704[illegible]	0.045

B

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results: Satisfactory

Specimen S/N 001. Kinetics Corp. Specimen

Date: 10-16-57
Test Engr: R. T. Mobley
CVAC Insp: NA
USAF Insp:

Paragraph	Specification Requirement	Remarks
4.4	Post Acceleration Proof Cycle	Midwest Recording I-E-I Mag.# 137 record # 876
1.4	Operating Time: Start 162.1 hrs. Stop 162.5 hrs. Assembly Cycles 24 Start _____ hrs. Stop _____ hrs.	

Notes: 1. Results of Operating Acceleration were completely satisfactory

Para. 4.4
For para. 4.4 Specimen S/N Cal Kinetics Corp.

Date: 10-16-51
Engineer: [illegible] 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 Ext	Ext. to Int
18V	a	.130	3 max		
18V	d	.134	3 max		
30V	f	.072	2 max		
30V	i	.042	2 max		
25V	j	.095	2 max		
25V	j	.108	2 max		

DIELECTRIC STRENGTH:
All circuits satisfactory - - - - - - - - - - - - YES [X] NO [ ]

INSULATION RESISTANCE:
All circuits measured greater than 10 megohms - - - YES [X] NO [ ]

SWITCH CONTINUITY AND NON-CONTINUITY
All switches satisfactory

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

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 52 milliseconds

Internal to External 50 milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.E.C. Chan. No.	In to Ex msec	Ex to In msec
P1[illegible]	F	6.4	6.2
P3[illegible]	G	6.4	6.2
P3[illegible]	H	6.4	6.2
P34	I	[illegible]	[illegible]
P40	J	[illegible]	4
P18	K	6.4	6.4
P20	L	[illegible]	4.5
P26	M	[illegible]	[illegible]

Circuit	C.E.C. Chan. No.	In to Ex msec	Ex to In msec
P[illegible]	N	[illegible]	3.5
P22	[illegible]	[illegible]	[illegible]
P3[illegible]	[illegible]	[illegible]	[illegible]
P[illegible]	[illegible]	[illegible]	[illegible]
P1[illegible]	[illegible]	[illegible]	6.5
P2[illegible]	[illegible]	[illegible]	[illegible]
P3[illegible]	[illegible]	[illegible]	[illegible]

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FORM 11

VOLTAGE DROP: Maximum Control Voltage (30 V.)

	Switch in External Position			Switch in Internal Position		
SW. MK.	CIRCUIT	DATA	SW. MK.	CIRCUIT	DATA	
A	J701C - J701D	0.108	A	J701A - J701D	0.141	
B	J706P - J705L	~~0.069~~ .126	B	J701A - J705L	0.159	
C	J706T - J705K	0.055 .141	C	J701A - J705K	0.174	
D	J706[illegible] - J705J	0.064 .132	D	J701A - J705J	0.164	
E	J706[illegible] - J705C	NA See Note	E	J701A - J705C	~~2~~ NA See Note	
F	J706R - J703A	0.090	F	J702A - J703A	0.053	
G	J706[illegible] - J703D	0.110	G	J702B - J703D	0.066	
H	J706Y - J703F	0.100	H	J702A - J703F	0.037	
I	J706[illegible] - J703G	0.108	I	J702C - J703G	0.072	
J	J706[illegible] - J703K	0.032	J	J702C - J703K	0.028	
K	J706G - J703L	0.110	K	J702A - J703L	0.063	
L	J706H - J703M	0.111	L	J702A - J703M	0.066	
M	J706W - J703P	0.104	M	J702B - J703P	0.062	
N	J706[illegible] - J703R	0.116	N	J702C - J703R	0.075	
O	J706[illegible] - J704A	0.115	O	J702A - J704A	0.079	
P	J706d - J704C	0.091	P	J702B - J704C	0.052	
Q	J706R - J704J	0.098	Q	J702C - J704J	0.051	
R	J706F - J704N	0.118	R	J702A - J704N	0.080	
S	J706X - J704R	0.078	S	J702B - J704R	0.055	
T	J706b - J704T	0.081	T	J702C - J704T	0.058	

CONTINUITY CHECK:

All circuits indicated continuity . . . . Yes [X] No [ ] See Notes

except 1 D.C. ckt. See Note

4.4 Post Acceleration Proof Cycle

Date: 10-16-57 Page 46

Test Engr: E.T. Mobley Report 7A2236

QVAC Insp: NA USAF Insp: NA

VOLTAGE DROP: Minimum Control Voltage (25 V.)

Sw. Mk.	Switch in Internal Position CIRCUIT		DATA	Sw. Mk.	Switch in Internal Position CIRCUIT		DATA
A	J701C -	J701D	0.111	A	J701A -	J701D	0.146
B	J706P -	J705L	0.129	B	J701A -	J705L	0.164
C	J706T -	J705K	0.142	C	J701A -	J705K	0.179
D	J706S -	J705J	0.133	D	J701A -	J705J	0.167
E	J706P -	J705C	NA	E	J701A -	J705C	NA *
F	J706Z -	J703A	0.072	F	J702A -	J703A	0.055
G	J706c -	J703D	0.111	G	J702B -	J703D	0.067
H	J706Y -	J703F	0.102	H	J702B -	J703F	0.040
I	J706a -	J703G	0.108	I	J702C -	J703G	0.073
J	J706S -	J703K	0.083	J	J702C -	J703K	0.029
K	J706C -	J703L	0.110	K	J702A -	J703L	0.064
L	J706H -	J703M	0.111	L	J702A -	J703M	0.023
M	J706N -	J703P	0.105	M	J702B -	J703P	0.062
N	J706T -	J703R	0.118	N	J702C -	J703R	0.016
O	J706J -	J704A	0.115	O	J702A -	J704A	0.080
P	J706L -	J704C	0.099	P	J702B -	J704C	0.054
Q	J706M -	J704J	0.120	Q	J702C -	J704J	0.060
R	J706F -	J704S	0.118	R	J702A -	J704S	0.030
S	J706X -	J704R	0.120	S	J702B -	J704R	0.057
T	J706L -	J704T	0.091	T	J702C -	J704T	0.040

See note on 1st of these 3 sheets

B

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results: Satisfactory Date: 10-19-59

Test Engr: R. T. Meeley

Specimen S/N 001. Kinetics

CVAC Insp: NA

USAF Insp: NA

Paragraph	Specification Requirement	Remarks
4.5	Life Test	
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.

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FORM 73

VOLTAGE DROP: Maximum Control Voltage (~~[illegible]~~ 29.5 V)

	Switch in External Position			Switch in Internal Position	
SW. MK.	CIRCUIT	DATA	SW. MK.	CIRCUIT	DATA
A	J701C - J701D	0.103	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	J702A - J705C	NA
F	J706R - J703A	.088	F	J702A - J703A	.053
G	J706c - J703D	.108	G	J702B - J703D	.064
H	J706Y - J703F	.096	H	J702B - J703F	.040
I	J706a - J703G	.108	I	J702C - J703G	.071
J	J706P - J703K	.080	J	J702C - J703K	.027
K	J706G - J703L	.108	K	J702A - J703L	.064
L	J706H - J703M	29	L	J702A - J703M	.062
M	J706W - J703P	.104	M	J702B - J703P	.061
N	J706g - J703R	.114	N	J702C - J703R	.073
O	J706J - J704A	.115	O	J702A - J704A	.082
P	J706d - J704C	.095	P	J702B - J704C	.052
Q	J706R - J704J	.092	Q	J702C - J704J	.058
R	J706F - J704N	.115	R	J702A - J704N	.081
S	J706[illegible] - 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 Feb 1959 Page 50

Test Engr: R. T. Malloy Report 7A2236

GVAC Insp: NA USAF 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	NA		A	J701A -	J701D	NA
B	J706F -	J705L			B	J701A -	J705L	
C	J706T -	J705K			C	J701A -	J705X	
D	J706S -	J705J			D	J701A -	J705J	
E	J706F -	J705C			E	J701A -	J705C	
F	J706E -	J703A			F	J702A -	J703A	
G	J706c -	J703D			G	J702B -	J703D	
H	J706Y -	J703F			H	J702B -	J703F	
I	J706a -	J703C			I	J702C -	J703C	
J	J706Z -	J703K			J	J702C -	J703K	
K	J706C -	J703L			K	J702A -	J703L	
L	J706H -	J703M			L	J702A -	J703M	
M	J706W -	J703P			M	J702B -	J703P	
N	J706c -	J703R			N	J702C -	J703R	
O	J706L -	J704A			O	J702A -	J704A	
P	J706M -	J704C			P	J702A -	J704C	
Q	J706R -	J704J			Q	J702A -	J704J	
R	J706Z -	J704N			R	J702A -	J704N	
S	J706X -	J704R			S	J702B -	J704R	
T	J706L -	J704Z			T	J702C -	J704Z	

COMPANY
SAN DIEGO

FORM 73

Directly across contacts at 500 cycles

VOLTAGE DROP: Maximum Control Voltage (30 V.)

Switch in External Position				Switch in Internal Position				
SW. NK.	CIRCUIT		DATA	SW. NK.	CIRCUIT		DATA	SW. NK.
A	J701C -	J701D	.033	A	J701A -	J701D	.053	A
B	J706P -	J705L	.012	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	This circuit NG	E	J701A -	J705C	This circuit NG	E
F	J706m -	J703A	.007	F	J702A -	J703A	.011	F
G	J706n -	J703D	.007	G	J702B -	J703D	.009	G
H	J706X -	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	.005	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	J706Q -	J704J	.006	Q	J702C -	J704J	.010	Q
R	J706F -	J704N	.010	R	J702A -	J704N	.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 the test set 3rd & 4th columns.

A

Date: 11-6-59

Page 51

Test Engr: R. T. Mobley

Report 7A2236

CVAC Insp: NA

USAF Insp: NA

VOLTAGE DROP: ~~Minimum Control Voltage (25 V.)~~ – Made using test set up at 350 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	~~0.123~~ 0.136	C	J701A -	J705K	0.141
D	J706S -	J705J	0.134	D	J701A -	J705J	0.144
E	J706R -	J705C	N.A.	E	J701A -	J705C	NA
F	J706Z -	J703A	0.090	F	J702A -	J703A	0.057
G	J706c -	J703D	0.098	G	J702B -	J703D	0.257
H	J706Y -	J703F	0.100	H	J702B -	J703F	0.241
I	J706a -	J703G	0.053	I	J702C -	J703G	0.264
J	J706f -	J703K	~~0.110~~ 0.110	J	J703G -	J703K	0.320
K	J706G -	J703L	0.110	K	J702A -	J703L	0.003
L	J706H -	J703M	0.110	L	J702A -	J703M	0.000
M	J706W -	J703P	0.100	M	J702B -	J703P	0.027
N	J706g -	J703R	0.110	N	J702C -	J703R	0.301
O	J706J -	J704A	0.110	O	J702A -	J704A	0.030
P	J706d -	J704C	0.100	P	J702B -	J704C	0.023
Q	J706B -	J704J	0.014	Q	J702C -	J704J	0.030
R	J706X -	J704N	0.125	R	J702A -	J704N	0.054
S	J706X -	J704P	0.110	S	J702B -	J704P	0.033
T	J706b -	J704T	0.113	T	J702C -	J704T	0.045

at end

B

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results: Satisfactory

Date: 14 July 1959

Test Engr: R. T. Mobley

Specimen S/N Kinetics Corp. 002

CVAC Insp:

USAF Insp: NA

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

Notes: 1. An Initial Satisfactory Performance Test and Ambient Conditions Proof Cycle were run on this specimen 4-14-59, and the specimen failed on the latter test. The specimen was filed and sent to the shop for repair. Data was recorded in Engineering Notebook 7402 and data sheets not used.

Para. 4.1.8
For para. 4.1.8 Specimen S/N 002 Kinetics Corp. Specimen
Date: 14 July 1959
Engineer: [illegible] R.T. Smobley
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		X
18V	d	.102	3 max	X	
30V	f	.122	2 max	X	
30V	i	.144	2 max		X
25V	j	.142	2 max	X	
25V	j	.201	2 max		X

DIELECTRIC STRENGTH:
All circuits satisfactory - - - - - - - - - - - - YES [X] NO [ ]

INSULATION RESISTANCE:
All circuits measured greater than 10 megohms - - - YES [X] NO [ ]

SWITCH CONTINUITY AND NON-CONTINUITY
All switches satisfactory

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

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 21 milliseconds.

Internal to External 21 milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.F.C. Chan. No.	In to Ex meas.	Ex to In meas.		Circuit	C.F.C. Chan. No.	In to Ex meas.	Ex to In meas.
P14	F	All satisfactory			P42	N	Sat	Sat
P32	G				P22	O		
P30	H				P24	P		
P36	I				P44	Q		
P40	J				P16	R		
P18	K				P28	S		
P20	L	✓	✓		P38	T	✓	✓
P26	M							

CONVAIR
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VOLTAGE DROP: Maximum Control Voltage (30 V.)

Switch in External Position				Switch in Internal Position			
SW. MK.	CIRCUIT		DATA	SW. MK.	CIRCUIT		DATA
A	J701C -	J701D	.106	A	J701A -	J701D	.204
B	J706P -	J705L	.126	B	J701A -	J706L	.172
C	J706T -	J705K	.123	C	J701A -	J706K	.161
D	J706[illegible] -	J705[illegible]	.140	D	J701A -	J706[illegible]	.163
E	J706[illegible] -	J705C	.129	E	J701A -	J705C	.152
F	J706K -	J703[illegible]	.074	F	J702A -	J703[illegible]	.043
G	J706c -	J703D	.110	G	J702B -	J703D	.067
H	J706X -	J703F	.094	H	J702B -	J703F	.035
I	J706m -	J703C	.115	I	J702C -	J703C	.075
J	J706[illegible] -	J703K	.102	J	J702C -	J703K	.022
K	J706G -	J703L	.101	K	J702A -	J703L	.058
L	J706H -	J703M	.108	L	J702A -	J703M	.057
M	J706W -	J703P	.115	M	J702B -	J703P	.069
N	J706[illegible] -	J703[illegible]	.119	N	J702C -	J703[illegible]	.075
O	J706[illegible] -	J704A	.110	O	J702A -	J704A	.080
P	J706[illegible] -	J704C	.108	P	J702B -	J704C	.056
Q	J706R -	J704J	.108	Q	J702C -	J704J	.065
R	J706F -	J704N	.118	R	J702A -	J704N	.080
S	J706X -	J704R	.108	S	J702B -	J704R	.062
T	J706b -	J704T	.102	T	J702C -	J704T	.044

CONTINUITY CHECK:

All circuits indicated continuity . . . . Yes [X] No [ ] See Notes

4.1.8 Initial Satisfactory Kinetics Corp. Specimen S/N 002

A

Date: 14 July 1959 Page 54

Test Engr: J.H. West / R.T. Mobley Report 7A2236

CVAC Insp: Na USAF 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	.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	J706R -	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 -	J703K	.083	J	J702C -	J703K	.023
K	J706C -	J703L	.102	K	J702A -	J703L	.059
L	J706H -	J703M	.108	L	J702A -	J703M	.067
M	J706W -	J703P	.115	M	J702B -	J703P	.070
N	J706g -	J703R	.118	N	J702C -	J703R	.077
O	J706J -	J704A	.112	O	J702A -	J704A	.079
P	J706[illegible] -	J704C	.110	P	J702B -	J704C	.056
Q	J706[illegible] -	J704J	.108	Q	J702C -	J704J	.065
R	J706F -	J704N	.114	R	J702A -	J704N	.080
S	J706X -	J704R	.108	S	J702B -	J704R	.062
T	J706[illegible] -	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 1094 hrs. Stop 1098 hrs. Assembly Cycles 6. Start _____ hrs. Stop _____ hrs.	

Notes: 1. made switch transfer @ INT. EXT. INT. 215 C.P.S. 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

Test Engr: R. T. Madley

Specimen S/N 002 Kinetics Corp. Specimen

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 - pipper
1.4	Operating Time: Start 110.0 hrs. Stop 110.5 hrs. Assembly Cycles 4 Start _____ hrs. Stop _____ hrs.	

Notes: 1. Made switch later @ 120 CPS Int.-Ext.-Int. 5-125 CPS Midwest Eng. #137

2. It was determined at about 200 CPS that CEC-mtr. switch was in wrong position which meant we missed 5-200 CPS. This axis will be re-run at end of sys. testing.

3. No records obtained on this day —

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results: Satisfactory

Specimen S/N 002 Kinetics Corp. Specimen

Date: 7-20-59
Test Engr: R.T. Mobley/L. Hanson
CVAC Insp: NA
USAF Insp: NA

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

Notes: 1. Made SWITCH TXFER @ 140 CPS INT-EXT-INT 5-250 CPS MIDWEST MAG #137

2. 250-500 C.P.S. 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-'59

Test Engr: R. T. Mobley

CVAC Insp: NA

USAF Insp: NA

Specimen S/N 222 Kinetics Corp. Switch

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

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

Para. 4.1.9
For para. 4.3 Specimen S/N 002
Kin tics Corp.

Date: 7-24-59
Engineer: R. T. Mobley
CVAC Insp: ------NA---
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	a	.206	3 max		
18V	d	.193	3 max		
30V	f	.115	2 max		
30V	i	.128	2 max		
25V	j	.141	2 max		
25V	j	.143	2 max		

DIELECTRIC STRENGTH:
All circuits satisfactory - - - - - - - - - - - - - YES [X] NO [ ]

INSULATION RESISTANCE:
All circuits measured greater than 10 megohms - - - YES [X] NO [ ]

SWITCH CONTINUITY AND NON-CONTINUITY
All switches satisfactory

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

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 66 milliseconds

Internal to External 68 milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.K.C. Chan. No.	In to Ex mass	Ex to In mass
P14	[illegible]	All S. Satisfactory	
P22	[illegible]		
P30	[illegible]		
P36	[illegible]		
P20	[illegible]		
P18	[illegible]		
P20	[illegible]		
P26	[illegible]		

Circuit	C.K.C. Chan. No.	In to Ex mass	Ex to In mass
P[illegible]	[illegible]	All S. Satisfactory	
P[illegible]	[illegible]		
P[illegible]	[illegible]		
P[illegible]	[illegible]		
P[illegible]	[illegible]		
P[illegible]	[illegible]		
P[illegible]	[illegible]		

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FORM 11

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	.112		A	J701A - J701D	.183	
B	J706P - J705L	.116		B	J701A - J705L	.169	
C	J706T - J705K	.114		C	J701A - J705K	.146	
D	J706 - J705J	.119		D	J701A - J705J	.148	
E	J706 - J705C	.127		E	J701A - J705C	.145	
F	J706B - J703A	.074		F	J702A - J703A	.044	
G	J706c - J703D	.108		G	J702B - J703D	.065	
H	J706Y - J703F	.094		H	J702B - J703F	.034	
I	J706m - J703C	.125		I	J702C - J703C	.073	
J	J706P - J703K	.097		J	J702C - J703K	.022	
K	J706G - J703L	.100		K	J702A - J703L	.055	
L	J706H - J703M	.102		L	J702A - J703M	.097	
M	J706W - J703P	.126		M	J702B - J703P	.066	
N	J706[illegible] - J703[illegible]	.118		N	J702C - J703[illegible]	.069	
O	J706J - J704A	.111		O	J702A - J704A	.088	
P	J706d - J704C	.111		P	J702B - J704C	.051	
Q	J706R - J704J	.106		Q	J702C - J704J	.059	
R	J706F - J704N	.155		R	J702A - J704N	.081	
S	J706X - J704R	.109		S	J702B - J704R	.054	
T	J706b - J704T	.100		T	J702C - J704T	.040	

CONTINUITY CHECK:

All circuits indicated continuity . . . . Yes [X] No [ ] See Notes

4.3 Post Vibration Proof Cycle
Dinetics SN 902

A

Date: 7-24-59 Page 60

Test Engr: R. T. Mobley Report 7A2236

CVAC Insp: NA TEAP 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	.094	A	J701A -	J701D	.156
B	J706P -	J706L	.120	B	J701A -	J706L	.155
C	J706C -	J706K	.115	C	J701A -	J706K	.149
D	J706S -	J706J	.123	D	J701A -	J706J	.149
E	J706P -	J706C	.121	E	J701A -	J706C	.144
F	J706E -	J703A	.074	F	J702A -	J703A	.046
G	J706C -	J703D	.108	G	J702B -	J703D	.066
H	J706T -	J703F	.096	H	J702B -	J703F	.035
I	J706a -	J703C	.110	I	J702C -	J703C	.070
J	J706f -	J703K	.079	J	J702C -	J703K	.023
K	J706G -	J703L	.100	K	J702A -	J703L	.055
L	J706H -	J703M	.104	L	J702A -	J703M	.065
M	J706N -	J703P	.112	M	J702B -	J703P	.067
N	J706[illegible] -	J703R	.115	N	J702B -	J703R	.070
O	J706[illegible] -	J704A	.114	O	J704A -	J704A	.088
P	J706[illegible] -	J704C	.103	P	J704B -	J704C	.052
Q	J706[illegible] -	J704J	.100	Q	J704B -	J704J	.060
R	J706[illegible] -	J704S	.118	R	J704A -	J704S	.090
S	J706T -	J704R	.100	S	J704B -	J704R	.055
T	J706[illegible] -	J704T	.100	T	J704C -	J704T	.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 Engr: R. T. Mooley
CVAC Insp: NA
USAF Insp: NA

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

Notes: 1. This test was attempted 7-27-59 in Benco Box #8. The unit was subjected to the test per 4.2.1.1 requirement of specimen - N 01. The Benco Box malfunctioned and the temperature rose from 150°F to 250° in 50 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. specimen

Test Engr: 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 @ 30" 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

Para. 4.1.1
For para. 4.2.1.1 Specimen S/N 001 Kinetics Corp. Specimen

Date: 8-4-59
Engineer: R. T. Mobley
CVAC Insp: ----------
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	.282	3 max	X	
18V	d	.264	3 max		X
30V	f	.119 .099	2 max		X
30V	i	.123	2 max	X	
25V	j	.142	2 max		X
25V	j	.171	2 max	X	

DIELECTRIC STRENGTH:
All circuits satisfactory - - - - - - - - - - - - - YES [X] 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	X		X	
i	X			X
j	X		X	
j				X

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.E.C. Chan. No.	In to Ex msec	Ex to In msec
P14	F	All satisfactory	
P32	G		
P30	H		
P36	I		
P40	J		
P18	K		
P20	L	✓	✓
P26	M		

Circuit	C.F.C. Chan. No.	In to Ex msec	Ex to In msec
P42	N	All satisfactory	
P22	O		
P34	P		
P44	Q		
P16	R		
P28	S		
P38	T	✓	✓

FORM S 470

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VOLTAGE DROP: Maximum Control Voltage (30 V.)

	Switch in External Position				Switch in Internal Position		
SW. MK.	CIRCUIT		DATA	SW. MK.	CIRCUIT		DATA
A	J701C -	J701D	.108	A	J701A -	J701D	.200
B	J706P -	J705L	P2M .037 .116	B	J701A -	J706L	.199
C	J706T -	J705K	P2M .043 .107	C	J701A -	J705K	.141
D	J706 -	J705	P2M .035 .116	D	J701A -	J705J	.148
E	J706P -	J705C	P2M .014 .136	E	J701A -	J705C	.146
F	J706B -	J701A	.070	F	J702A -	J701A	.032
G	J706c -	J701D	.076	G	J702B -	J701D	.063
H	J706X -	J701F	.072	H	J702B -	J701F	.022
I	J706a -	J701G	.165	I	J702C -	J701G	.078
J	J706f -	J701K	.138	J	J702C -	J701K	.016
K	J706G -	J701L	.091	K	J702A -	J701L	.055
L	J706H -	J701M	.102	L	J702A -	J701M	.170
M	J706W -	J704P	.120	M	J702B -	J703P	.064
N	J706K -	J703P	.140	N	J702C -	J703R	.070
O	J706J -	J704A	.100	O	J702A -	J704A	.078
P	J706d -	J704C	.091	P	J702B -	J704C	.047
Q	J706R -	J704J	.089	Q	J702C -	J704J	.049
R	J706F -	J704N	.171	R	J702A -	J704N	.077
S	J706X -	J704R	.093	S	J702B -	J704R	.050
T	J706b -	J704T	.112	T	J702C -	J704T	.042

CONTINUITY CHECK:

All circuits indicated continuity . . . . Yes [X] No [ ] See Notes

4.2.1.1(C) - 65°F Cold Test
Proof cycle @ 30°F 30" Hg.

A

Date: 8-4-59 Page 64

Test Engr: R. T. Mobley Report 7A2236

CVAC Insp: NA USAF 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	0.121	A	J701A - J701D	.217
B	J706P -	J705L	0.114	B	J701A - J705L	.163
C	J706T -	J705K	0.104	C	J701A - J705K	.140
D	J706S -	J705J	0.115	D	J701A - J705J	.151
E	J706R -	J705C	0.118	E	J701A - J705C	.153
F	J706E -	J703A	0.059	F	J702A - J703A	.033
G	J706c -	J703D	0.095	G	J702B - J703D	.064
H	J706Y -	J703F	0.070	H	J702B - J703F	.024
I	J706a -	J703G	0.195	I	J702C - J703G	.072
J	J706f -	J703K	0.066	J	J702C - J703K	.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	J702B - J703P	.066
N	J706g -	J703R	0.100	N	J702C - J703R	.070
O	J706J -	J704A	0.100	O	J702A - J704A	.078
P	J706d -	J704C	0.090	P	J702B - J704C	.048
Q	J706R -	J704J	0.083	Q	J702C - J704J	.054
R	J706F -	J704N	0.112	R	J702A - J704N	.077
S	J706X -	J704P	0.090	S	J702B - J704P	.050
T	J706b -	J704T	0.087	T	J702C - J704T	.040

B

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results: Unsatisfactory

Date: 8-4-59

Test Engr: Edwards/Lavender/West

Specimen S/N 001 Kinetics Corp. Specimen

CVAC Insp: NA

USAF Insp:

Paragraph	Specification Requirement	Remarks
4.2.1.1(c)	-60°F Cold Test Proof Cycle at -30°F, 1mm Hg.	Specimen temp. -29°F @ beginning of 1mm run 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 117.6 hrs. Stop 118.0 hrs. Assembly Cycles 6 Start ___ hrs. Stop ___ hrs.	

Notes: 1. 1 mm @ 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
For para. 4.2.1.(c) Specimen S/N 001 Kinetics Corp. Specimen

Date: 8-4-'59
Engineer: _____
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	a	.338	3 max	X	
18V	d		3 max		
30V	f	.037	2 max		X
30V	i	.192	2 max	X	
25V	j	.171	2 max		X
25V	j	X	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
g	X		X	
i	X			X
j	X		X	
j				

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	C.E.C. Chan. No.	In to Ex msec	Ex to In msec
P14	F		
P32	G		
P30	H		
P36	I		
P40	J		
P18	K		
P20	L		
P26	M		

Circuit	C.E.C. Chan. No.	In to Ex msec	Ex to In msec
P42	N		
P22	O		
P34	P		
P44	Q		
P16	R		
P28	S		
P38	T		

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VOLTAGE DROP: Maximum Control Voltage (30 V.)

	Switch in External Position			Switch in Internal Position			VOLT
SW. MK.	CIRCUIT	DATA	SW. MK.	CIRCUIT	DATA		SW.
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	J706[illegible] - J705J	.112	D	J701A - J705J	.139		D
E	J706[illegible] - J705C	.115	E	J701A - J705C	.133		E
F	J706R - J703A	.058	F	J702A - J703A	.029		F
G	J706C - J703D	.093	G	J702B - J703D	.060		G
H	J706Y - J703F	.070	H	J702B - J703F	.019		H
I	J706a - J703G	.132	I	J702C - J703G	.066		I
J	J706T - J703K	.098	J	J702C - J703K	.014		J
K	J706G - J703L	.082	K	J702A - J703L	.050		K
L	J706H - J703M	.095	L	J702A - J703M	.073		L
M	J706W - J703P	.102	M	J702B - J703P	.062		M
N	J706[illegible] - J703R	.103	N	J702C - J703R	.066		N
O	J706J - J704A	.100	O	J702A - J704A	.073		O
P	J706[illegible] - J704C	.088	P	J702B - J704C	.044		P
Q	J706R - J704J	.081	Q	J702C - J704J	.046		Q
R	J706F - J704N	.112	R	J702A - J704N	.073		R
S	J706X - J704R	.090	S	J702B - J704R	.046		S
T	J706b - J704T	.092	T	J702C - J704T	.035		T

CONTINUITY CHECK:

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

NA

4.2.1.1.1 Cold Test @ 1mm Hg.

A

Date: 8-4-59 Page 67

Test Engr: Mobley / West Report 7A2236

CVAC Insp: NA USAF 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	Because of failure could not get these data.	A	J701A -	J701D	.174
B	J706P -	J705L		B	J701A -	J705L	.149
C	J706T -	J701K		C	J701A -	J705K	.140
D	J706S -	J705J		D	J701A -	J705J	.142
E	J706R -	J705C		E	J701A -	J705C	.137
F	J706E -	J703A		F	J702A -	J703A	.030
G	J706C -	J703D		G	J702B -	J703D	.061
H	J706T -	J703F		H	J702B -	J703F	.031
I	J706a -	J703C		I	J702C -	J703C	.067
J	J706P -	J702K		J	J702C -	J702K	.015
K	J706Q -	J702L		K	J702A -	J702L	.051
L	J706M -	J703M		L	J702A -	J703M	.069
M	J706N -	J702P		M	J702B -	J702P	.063
N	J706Q -	J703R		N	J702C -	J703R	.067
O	J706C -	J704A		O	J702A -	J704A	.064
P	J706U -	J704C		P	J702B -	J704C	.045
Q	J706R -	J704J		Q	J702C -	J704J	.048
R	J706P -	J704N		R	J702A -	J704N	.024
S	J706T -	J704P		S	J702B -	J704P	.048
T	J706L -	J704I		T	J702C -	J704I	.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. T. Mobley
CVAC Insp: ____
USAF Insp: NA

Paragraph	Specification Requirement	Remarks
4.4	Operating Accel.	The specimen was mounted on CEVAT and run per appl. 4 once fwd. and once reversed in each axis
1.4	Operating Time: 1 hr. Start ____ hrs. Stop ____ hrs. Assembly Cycles 14 Start ____ hrs. Stop ____ hrs.	

Notes: 1. CEC recordings made during 30 sec. runs in each axis looked good for all 6 runs.
2. AC switch transfer time and cycle seq. measured at the end of each 30 second run. Data for these on the next 3 pages.

+ "Z" Axis ✱ - "Z" Axis

Para. 4.1.8 k & l
For para. 4.4 Specimen S/N 665
Kinetics Corp.

Date:
Engineer: E. L. Mazl
CVAC Insp:
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		3 max		
18V	d		3 max		
30V	f		2 max		
30V	i	NA	2 max	NA	
25V	j		2 max		
25V	j		2 max		

DIELECTRIC STRENGTH:
All circuits satisfactory - - - - - - - - - - - - YES NA NO

INSULATION RESISTANCE:
All circuits measured greater than 10 megohms - - - YES NA NO

SWITCH CONTINUITY AND NON-CONTINUITY
All switches satisfactory

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

CYCLE SWITCH TIME: (20 milliseconds minimum)

External to Internal 74 milliseconds ✱ - "Z" Axis

Internal to External 54 milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.F. Chan. No.	In to Ex msec		Ex to In msec	
P11	F	8	2	3	9.8
P12	J	7.8	[illegible]	8	7.5
P13	H	8.4	2	8.5	7.5
P14	I	8.2	8.2	8.3	8
P15	I	8	7	8	6.8
P16	I	10	8	7.2	1
P20	L	7	2.5	7.5	8
P21	M	10.5	1	7.5	5

Circuit	C.F. Chan. No.	In to Ex msec		Ex to In msec	
P21	M	8.5	7.8	6.2	6.2
P22		1	8.8	1.5	6.5
P23	I	7.2	9.8	10.2	6.2
P24	I	5.5	7.8	6.5	2
P25	H	8.4	[illegible]	7.8	7.5
P26	I	6.5	6	8	6.6
P30	I	7	7.8	8.2	5.5
P31		+2	-2	+2	-2

+"X"A ... + -X A ...

Para. 4.1.81f(1)
For para. 4.4 Specimen S/N 002
* Indicates out of tolerance

Date:
Engineer: M.T. Noble
CVAC Insp:
USAF Insp:

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	a		1 max		
18V	d		1 max		
30V	f	N/A	2 max	N/A	
30V	i		2 max		
25V	j		1 max		
25V	j		2 max		

DIELECTRIC STRENGTH:
All circuits satisfactory - - - - - - - - - - - YES [X] NO [ ]

INSULATION RESISTANCE:
All circuits measured greater than 10 megohms - - - YES [X] 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: (2[illegible] milli[illegible] cycle minimum)

External to Internal 78.4 milliseconds [illegible]

Internal to External [illegible] milliseconds [illegible]

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.F.C. Chan. No.	In to Ex msec	Ex to In msec
P12	E	7.8 7.5	8 9
P32	G	7.2 7.5	2 11
P30	H	6.5 8	10 10.5
P18	I	8 7.5	3.4 3.5
P20	I	6.2 7	6.2 7
P18	K	12 8	4 8.8
P20	L	7.8 8.5	7.3 8.3
P26	M	10 11.2	10 11

Circuit	C.F.C. Chan. No.	In to Ex msec	Ex to In msec
P12	N	7.8 6.5	7.5 5
P32		7.6 8.5	2 10
P34		7.5 7.5	11 9
P[illegible]		6.4 [illegible]	8.6 7
P18		2.3 2.2	7.5 7.2
P32		6 6	7.5 7.5
P34		6.8 7.5	7.5 5
		[illegible]	[illegible]

+ "y" Axis + "-y" Axis

Para. [illegible]
For para. [illegible] Specimen S/N [illegible]

Date: [illegible]
Engineer: [illegible]
CVAC Insp: ----------
NAA Insp: [illegible]

* Indicates out of tolerance

ASSEMBLY CYCLE OPERATION:

Control voltage	Para L.I.A 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	[illegible]	2 max	[illegible]	
30V	i		2 max		
25V	j		2 max		
25V	j		2 max		

DIELECTRIC STRENGTH:
All circuits satisfactory - - - - - - - - - - - - YES [illegible] NO [ ]

INSULATION RESISTANCE:
All circuits measured greater than 10 megohms - - - YES [illegible] NO [ ]

SWITCH CONTINUITY AND NON-CONTINUITY
All switches satisfactory

Para L.I.A step	YES	NO see note	Switch position Internal	External
[illegible]				
[illegible]				
[illegible]				
[illegible]				

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 50 milliseconds + -y Axis E to I +4

Internal to External 20 milliseconds + -y Axis I to E 60

RESPONSE TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.F.C. Chan. No.	In to Ex meas		Ex to In meas	
P[illegible]	[illegible]	8.5	8	8	8.5
P12	[illegible]	8	7.7	12.5	11.5
P[illegible]	[illegible]	8.5	8	11	11
P36	[illegible]	9	9	10.5	7.8
P[illegible]	[illegible]	6.5	6	7.5	7.2
P18	[illegible]	11	10.5	9	7
P[illegible]	[illegible]	7.5	7	9	7.5
P26	[illegible]	9.5	10	12.5	11

Circuit	C.F.C. Chan. No.	In to Ex meas		Ex to In meas	
P[illegible]	[illegible]	3	2	8	8
P22	[illegible]	9.5	8	10	7
P[illegible]	[illegible]	8	7	11.5	10.5
P[illegible]	[illegible]	5.8	5	8	8.5
P[illegible]	[illegible]	8	7	8	8
P[illegible]	[illegible]	7.5	6	8	8
P[illegible]	[illegible]	7.5	[illegible]	7.5	7
		[illegible]	[illegible]	[illegible]	[illegible]

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results: Failed

Specimen S/N [illegible] Kinetics Corp.

Date: 10-9-'57
Test Engr: R.T. Mabley
CVAC Insp: NA
USAF Insp:

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

Notes: 1. While sitting in storage in the Vib. Lab. the gnd. 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. J701A to J701D broke down @ 30 VBMS.
4. JR # 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 12 United Control Test Engr: R. T. Mobley
Specimen CVAC Insp: NA
USAF Insp: NA

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

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

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

Date: 6-10-'54
Engineer: R.T. 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 Ext	Ext. to Int
18V	a	1.39	3 max	X	
18V	d	1.31	3 max		X
30V	f	0.82	2 max	X	
30V	i	0.81	2 max		X
25V	j	0.97	2 max	X	
25V	j	0.97	2 max		X

DIELECTRIC STRENGTH:
All circuits satisfactory - - - - - - - - - - - - - YES [ ] NO [X] *

INSULATION RESISTANCE:
All circuits measured greater than 10 megohms - - - YES [X] NO [ ]

SWITCH CONTINUITY AND NON-CONTINUITY
All switches satisfactory

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

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 220 milliseconds

Internal to External 260 milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.E.C. Chan. No.	In to Ex max	Ex to In max
P14	F	5	6.3
P32	G	↑	↑
P30	H		
P36	I		
P40	J		
P18	K		
P20	L	↓	↓
P26	M	5	6.3

Circuit	C.F.C. Chan. No.	In to Ex max	Ex to In max
P42	N	5	6.3
P22	O	↑	↑
P34	P		
P44	Q		
P16	R		
P28	S	↓	↓
P38	T	5	6.3

CONVAIR
SAN DIEGO

FORM 71

VOLTAGE DROP: Maximum Control Voltage (30 V.)

Switch in External Position				Switch in Internal Position				
SW. NK.	CIRCUIT	DATA	SW. NK.	CIRCUIT	DATA			SW.
A	J701C - J701D	0.263	A	J701A - J701D	0.065			A
B	J706P - J705L	0.015	B	J701A - J705L	0.152			B
C	J706T - J705K	0.045	C	J701A - J705K	0.116			C
D	J706S - J705J	0.039	D	J701A - J705J	0.165			D
E	J706R - J705G	0.002	E	J702A - J705G	0.177			E
F	J706U - J703A	0.092	F	J702B - J703A	0.064			F
G	J706a - J703D	0.130	G	J702B - J703D	0.105			G
H	J706Y - J703F	0.110	H	J702B - J703F	0.024			H
I	J706e - J703G	0.125	I	J702C - J703G	0.100			I
J	J706f - J703K	0.080	J	J702C - J703K	0.040			J
K	J706G - J703L	0.128	K	J702A - J703L	0.082			K
L	J706H - J703M	0.142	L	J702A - J703M	0.095			L
M	J706W - J703P	0.144	M	J702B - J703P	0.108			M
N	J706g - J703R	0.131	N	J702C - J703R	0.112			N
O	J706J - J704A	0.138	O	J702A - J704A	0.110			O
P	J706d - J704C	0.094	P	J702B - J704C	0.059			P
Q	J706Z - J704J	0.089	Q	J702C - J704J	0.070			Q
R	J706V - J704M	0.142	R	J702A - J704M	0.110			R
S	J706X - J704R	0.115	S	J702B - J704R	0.067			S
T	J706b - J704T	0.097	T	J702C - J704T	0.036			T

CONTINUITY CHECK:

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

Initial Satisfactory

A

Date: 6-10-'59

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Test Engr: R. T. Mosley

Report 7A2236

CVAC Insp: NA

NSAF 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	J706S -	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	J706o -	J703D	0.125	G	J702B -	J703D	0.034
H	J706X -	J703F	0.101	H	J702B -	J703F	0.023
I	J706m -	J703G	0.120	I	J702C -	J703G	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	J706d -	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	J706b -	J704T	0.094	T	J702C -	J704T	0.037

B

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results: Satisfactory

Specimen S/N United Control Corp. 121

Date: 6-10-'59
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 - 30G @ 110CPS
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 Mag# - 5-230 cps #137, -250-2000 #506
5. Accelerometer outputs recorded CEC mag. # 26118 - 50% 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

Test Engr: R. T. Mabley

CVAC Insp: NA

USAF Insp: NA

Specimen S/N 121.
United Control Corp. specimen

Paragraph	Specification Requirement	Remarks
4.3	Operating Vib. Z Axis	No resonance occurred
1.4	Operating Time: Start 90.5 hrs. Stop 91.2 hrs. Assembly Cycles 8 Start _____ hrs. Stop _____ hrs.	

Notes: 1. Made switch Int. to Ext. to Int. at 260 Cps.
2. 400~ pwr. supply ckt. 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 from 5 - 125 was decided upon for all 3 Axes.

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results: Satisfactory Date: 6-11-59

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

Specimen S/N 121.
United Cont. Corp. Specimen

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

Notes: Mode Switch from Int. to Ext. to Int. at 350 Cps
Mode Switch at 1000 Cps Int. to Ext. to Int.
Cycle Sequence was well 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 Engr: R. T. Mobley

United Control Specimen CVAC Insp: NA

USAF Insp: NA

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

Notes: * During Proof Cycle 4.1.9 (para. 6), J702 A showed excessive current leakage and voltage breakdown.. Breakdown began at about 950 AC. J702B was marginal at 1500 V - Hypot breakdown light flickered on intermittently.

Para. 4.1.9
For para. 4.3 Specimen S/N 121
United Cont.

Date: 6-15-54
Engineer: R. T. Mabley
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
3[illegible]V	a	1151 ms	3 max		
18V	d	1456 ms	3 max		
30V	f	849 ms	2 max		
30V	i	715.5	2 max		
25V	j	1010 ms	2 max		
25V	j	8598	2 max		

DIELECTRIC STRENGTH:

See Note: *

All circuits satisfactory - - - - - - - - - - - - - YES [X] NO [X]

INSULATION RESISTANCE:

All circuits measured greater than 10 megohms - - - YES [X] NO [X]

SWITCH CONTINUITY AND NON-CONTINUITY

All switches satisfactory

Para 4.1.6 step	YES	NO see note	Switch position Internal	External
g				
i				
j				
j				

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 255 milliseconds

Internal to External 272 milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.E.C. Chan. No.	In to Ex msec	Ex to In msec
P14	P	3.2	3.1
P32	Q	3.2	3.1
P30	R	3.2	3.1
P36	I	3.2	3.1
P40	J	3.2	3.1
P18	K	3.2	3.1
P20	L	3.2	3.1
P26	M	3.2	3.1

Circuit	C.E.C. Chan. No.	In to Ex msec	Ex to In msec
P42	N	3.2	3.1
P22	O	3.2	3.1
P34	P	3.2	3.1
P44	Q	3.2	3.1
P16	R	3.2	3.1
P28	S	3.2	3.1
P38	T	3.2	3.1

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FORM 11

VOLTAGE DROP: Maximum Control Voltage (30 V.)

Switch in Internal Position				Switch in Internal Position			
SW. NO.	CIRCUIT	DATA	DATA	SW. NO.	CIRCUIT	DATA	
A	J701C - J701D	.231		A	J701A - J701D	.061	
B	J706P - J705L	.153		B	J701A - J705L	.111	
C	J706T - J705K	.114		C	J701A - J705K	.112	
D	J706S - J705J	.101		D	J701A - J705J	.113 .144	
E	J706R - J705H	.177		E	J702A - J705C	.215	
F	J706U - J703A	.091		F	J702B - J703A	.073	
G	J706a - J703D	.13		G	J702B - J703D	.10	
H	J706Y - J703F	.10		H	J702B - J703F	.030	
I	J706e - J703G	.12		I	J702C - J703G	.095	
J	J706X - J703K	.070		J	J702C - J703K	.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	J706g - J703R	.31		N	J702C - J703R	.105	
O	J706J - J704A	.125		O	J702A - J704A	.11	
P	J706d - J704C	.09		P	J702B - J704C	.057	
Q	J706R - J704J	.09		Q	J702C - J704J	.068	
R	J706V - 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

Post Vibration Proof Cycle
& Ambient Condition Proof Cycle Combined

A

Date: 6-15-59 Page 81

Test Engr: R. T. Mobley Report 7A2236

CVAC Insp: NA USAF Insp: NA

VOLTAGE DROP: Minimum Control Voltage (25 V.)

	Switch in Internal Position				Switch in Internal Position		
SW. MK.	CIRCUIT		DATA	SW. MK.	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	J706S -	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	J706X -	J703F	.10	H	J702B -	J703F	.029
I	J706a -	J703G	.125	I	J702C -	J703G	.096
J	J706f -	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	J706d -	J704C	.091	P	J702B -	J704C	.056
Q	J706R -	J704J	.091	Q	J702C -	J704J	.070
R	J706F -	J704N	.185	R	J702A -	J704N	.115
S	J706X -	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 121
United Control

Paragraph	Specification Requirement	Remarks
4.3.1.1 b)	Radiant Heat	Time — Spec. temp 1830 — 78°F 1915 — 124°F Radiant Heat On 2030 — 125 2100 — 144 2130 — 144 2155 — 144 2240 — 144 2315 — 144
1.4	Operating Time: Start NA hrs. Stop NA hrs. Assembly Cycles Start NA hrs. Stop NA hrs.	

Notes:

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results: Unsatisfactory

Date: 6-17-'59

Test Engr: R. T. Mobley

Specimen S/N 121.
United Control Spec.

CVAC Insp: NA

USAF Insp: NA

Paragraph	Specification Requirement	Remarks
4.2.1.1 c)	-65°F Cold test @ 30" Hg.	
1.4	Operating Time: 92.6 Start ~~62.6~~ hrs. Stop 93.3 hrs. Assembly Cycles 12 Start _____ hrs. Stop _____ hrs.	

Notes: 1. Dialectric strength test made at the end of -65°F @ 1mm Hg. test, after box pressure brought back to atmospheric.

2. The same failures occurred after during Hypot as occurred on DSFT. See next test for Hypot & failure details

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

Date: 6-17-'59
Engineer: R. T. Mobley
CVAC Insp: N/A
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	1.69	3 max		X
18V	d	1.83	3 max	X	
30V	f	1.03	2 max	X	
30V	i	.99	2 max		X
25V	j	1.24	2 max	X	
25V	j	1.21	2 max		X

DIELECTRIC STRENGTH:
All circuits satisfactory - - - - - - - - - - - - YES [ ] NO [X] *

INSULATION RESISTANCE:
All circuits measured greater than 10 megohms - - - YES [X] NO [ ]

SWITCH CONTINUITY AND NON-CONTINUITY
All switches satisfactory

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

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 315 milliseconds

Internal to External 336 milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.E.C. Chan. No.	In to Ex mode	Ex to In mode
P14	F	3	3
P32	G	↑	↑
P30	H		
P36	I		
P40	J		
P18	K		
P20	L	↓	↓
P26	M	3	3

Circuit	C.E.C. Chan. No.	In to Ex mode	Ex to In mode
P42	N	3	3
P22	O	↑	↑
P34	P		
P44	Q		
P16	R		
P28	S	↓	↓
P38	T	3	3

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FORM 71

VOLTAGE DROP: Maximum Control Voltage (30 V.)

Switch in External Position				Switch in Internal Position			
SW. MK.	CIRCUIT	DATA	DATA	SW. MK.	CIRCUIT	DATA	SW.
A	J701C - J701D	0.100		A	J701A - 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 - J705S	0.155		E	J702A - J705S	0.341	E
F	J706A - J703A	0.059		F	J702A - J703A	0.042	F
G	J706M - J703B	0.105		G	J702B - J703B	0.090	G
H	J706Y - J703F	0.088		H	J702B - J703F	0.021	H
I	J706a - J703G	0.097		I	J702C - J703G	0.088	I
J	J706f - J703K	0.060		J	J702C - J703K	0.030	J
K	J706G - J703L	0.~~710~~ 071		K	J702A - J703L	0.068	K
L	J706H - J703M	0.110		L	J702A - J703M	0.078	L
M	J706W - J703P	0.115		M	J702B - J703P	0.089	M
N	J706g - J703R	0.110		N	J702C - J703R	0.093	N
O	J706J - J704A	0.108		O	J702A - J704A	0.079	O
P	J706d - J704C	0.074		P	J702B - J704C	0.055	P
Q	J706R - J704J	0.069		Q	J702C - J704J	0.052	Q
R	J706F - J704N	0.110		R	J702A - J704N	0.082	R
S	J706X - J704R	0.088		S	J702B - J704R	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" Hg.

A

Date: 6-11-59 Page 85

Test Engr: R. T. Mobley Report 7A2236

CVAC Insp: NA USAF 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	0.293	A	J701A -	J701D	0.059
B	J706P -	J705L	0.148	B	J701A -	J705L	0.115
C	J706T -	J705K	0.117	C	J701A -	J705K	0.133
D	J706S -	J705J	0.128	D	J701A -	J705J	0.156
E	J706R -	J705Q	0.157	E	J701A -	J705Q	0.305
F	J706X -	J703A	0.056	F	J702A -	J703A	0.044
G	J706e -	J703D	0.105	G	J702B -	J703D	0.092
H	J706Y -	J703F	0.088	H	J702B -	J703F	0.022
I	J706m -	J703G	0.098	I	J702C -	J703G	0.088
J	J706C -	J703K	0.061	J	J702C -	J703K	0.030
K	J706D -	J703L	0.068	K	J702A -	J703L	0.071
L	J706E -	J703M	0.110	L	J702A -	J703M	0.079
M	J706W -	J703P	0.1615	M	J702B -	J703P	0.090
N	J706g -	J703R	0.120	N	J702C -	J703R	0.094
O	J706J -	J704A	0.110	O	J702A -	J704A	0.080
P	J706H -	J704C	0.076	P	J702B -	J704C	0.056
Q	J706Q -	J704J	0.070	Q	J702C -	J704J	0.052
R	J706P -	J704M	0.110	R	J702A -	J704M	0.023
S	J706X -	J704N	0.090	S	J702B -	J704N	0.062
T	J706b -	J704T	0.077	T	J702C -	J704T	0.035

B

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results:

Date: 6-17-59
Test Engr: R. T. Mobley
CVAC Insp: NA
USAF Insp: NA

Specimen S/N 121
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 95.3 hrs. Stop 95.8 hrs. Assembly Cycles Start 12 hrs. Stop ____ hrs.	

Notes:

1. Reached 1.3MM Hg. in 10 min. — 1MM Hg. 13 min.
2. During Hypot test J706E showed breakdown 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 @ 1MM Hg.
For para. 4.2.1.1 Specimen S/N 121
Unit 1 Cont.

Date: 6-17-54
Engineer: D. L. 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
15V	a	1.87	3 max		
15V	d	1.84	3 max		
30V	f	1.03	2 max		
30V	i	1.62	2 max		
25V	i	1.25	2 max		
25V	i	1.20	2 max		

DIELECTRIC STRENGTH:
All circuits satisfactory - - - - - - - - - - - - - YES [ ] NO [X]

See Note X

INSULATION RESISTANCE:
All circuits measured greater than 10 megohms - - - YES [X] NO [ ]

SWITCH CONTINUITY AND NON-CONTINUITY
All switches satisfactory

Para 4.1.6 step	YES	See note	Switch position Internal	External
f				
i				
i				
i				

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 370 milliseconds

Internal to External 322 milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.E.C. Chan. No.	Ex to Ex msec	Ex to In msec		Circuit	C.E.C. Chan. No.	Ex to Ex msec	Ex to In msec
P14	F	2.8	2.7		P42	M	2.8	2.7
P32	G				P22	O		
P30	S				P34	P		
P26	I				P44	Q		
P40	J				P16	R		
P18	K				P28	S		
P20	L				P38	T	2.8	2.7
P24	M	2.8	2.7					

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FORM 71

VOLTAGE DROP: Maximum Control Voltage (30 V.)

Switch in External Position				Switch in Internal Position			
SW. NO.	CIRCUIT	DATA	SW. NO.	CIRCUIT	DATA	SW. NO.
A	J701C - J701D	0.129	A	J701A - J701D	0.076	A
B	J706P - J705L	0.146	B	J701A - J705L	0.111	B
C	J706T - J705K	0.122	C	J701A - J705K	0.134	C
D	J706S - J705J	0.119	D	J701A - J705J	0.156	D
E	J706R - J705H	0.155	E	J702A - J703C	0.314	E
F	J706B - J703A	0.056	F	J702A - J703A	0.046	F
G	J706A - J703B	0.100	G	J702B - J703B	0.090	G
H	J706Y - J703F	0.089	H	J702B - J703F	0.022	H
I	J706a - J703G	0.100	I	J702C - J703G	0.090	I
J	J706t - J703K	0.063	J	J702C - J703K	0.030	J
K	J706G - J703L	0.070	K	J702A - J703L	0.073	K
L	J706H - J703M	0.110	L	J702A - J703M	0.083	L
M	J706W - J703P	0.120	M	J702A - J703P	0.092	M
N	J706g - J703R	0.115	N	J702C - J703R	0.095	N
O	J706J - J704A	0.110	O	J702A - J704A	0.082	O
P	J706d - J704C	0.070	P	J702C - J704C	0.055	P
Q	J706R - J704J	0.[illegible]9	Q	J702C - J704J	0.054	Q
R	J706F - J704N	0.113	R	J702A - J704N	0.080	R
S	J706X - J704R	0.090	S	J702B - J704R	0.067	S
T	J706b - J704T	0.039	T	J702C - J704T	0.038	T

CONTINUITY CHECK:

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

A.2.1.1 a) Sola test @ 1 [illegible]

A

Date: 6-17-59 Page 88

Test Engr: R. T. Mobley Report 7A2236

CVAC Insp: NA UNAF 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	0.100	A	J701A -	J701D	0.072
B	J706F -	J705L	0.144	B	J701A -	J705L	0.110
C	J706F -	J705K	0.128	C	J701A -	J705K	0.145
D	J706S -	J705J	0.122	D	J701A -	J705J	0.163
E	J706R -	J705C	0.159	E	J701A -	J705C	0.310
F	J706R -	J703A	0.058	F	J702A -	J703A	0.051
G	J706c -	J703D	0.110	G	J702B -	J703D	0.090
H	J706X -	J703F	0.093	H	J702B -	J703F	0.026
I	J706a -	[illegible]	0.102	I	J702C -	J703G	0.090
J	J706F -	J703K	0.066	J	J702C -	J703K	0.032
K	J706G -	J703L	0.066	K	J702A -	J703L	0.073
L	J706H -	J703M	0.115	L	J702A -	J703M	0.080
M	J706W -	J703P	0.120	M	J702B -	J703P	0.070
N	J706g -	J703R	0.120	N	J702C -	J703R	0.094
O	J706J -	J704A	0.112	O	J702A -	J704A	0.038
P	J706H -	J704C	0.078	P	J702B -	J704C	0.054
Q	J706R -	J704J	0.076	Q	J702C -	J704J	0.056
R	J706P -	J704N	0.115	R	J702A -	J704N	0.086
S	J706X -	J704R	0.972	S	J702B -	J704R	0.060
T	J706b -	J704T	0.080	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 Engr: R. T. Mobley
CVAC Insp: NA
USAF Insp: NA

Paragraph	Specification Requirement	Remarks
4.2.1.1 d)	Hot test 3 160° and 31" Hg	CEC Recording Ext. to Int. Int. to Ext. Int. to Ext.
1.4	Operating Time: Start 93.8 hrs. Stop 94.5 hrs. Assembly Cycles 8 Start _____ hrs. Stop _____ hrs.	

Notes:

Para. 4.1.9 i)
For para. 4.2.11 Specimen S/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
15V	a	1.36	3 max		
18V	d	1.16	3 max		
30V	f	.69	2 max		
30V	i	.72	2 max		
25V	j	.93	2 max		
25V	j	.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 4.1.8 step	YES	NO see note	Switch position Internal	External
f				
i				
j				
j				

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

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FORM 71

VOLTAGE DROP: Maximum Control Voltage (30 V.)

Switch in External Position				Switch in Internal Position			
SW. NO.	CIRCUIT	DATA	DATA	SW. NO.	CIRCUIT	DATA	SW.
A	J701C - J701D	0.240		A	J701A - J701D	0.059	A
B	J706P - J705L	0.179		B	J701A - J705L	0.130	B
C	J706T - J705K	0.142		C	J701A - J705K	0.150	C
D	J706S - J705J	0.155		D	J701A - J705J	0.190	D
E	J706R - J705H	0.198		E	J702A - J705H	0.229	E
F	J706R - J703A	0.115		F	J702B - J703A	0.075	F
G	J706a - J703B	0.130		G	J702B - J703B	0.108	G
H	J706Y - J703F	0.123		H	J702B - J703F	0.027	H
I	J706a - J703G	0.125		I	J702C - J703G	0.107	I
J	J706f - J703K	0.090		J	J702C - J703K	0.140	J
K	J706G - J703L	0.135		K	J702A - J703L	0.080	K
L	J706H - J703M	0.145		L	J702A - J703M	0.100	L
M	J706W - J703P	0.145		M	J702B - J703P	0.110	M
N	J706g - J703R	0.130		N	J702C - J703R	0.114	N
O	J706J - J704A	0.132		O	J702A - J704A	0.107	O
P	J706d - J704C	0.098		P	J702B - J704C	0.062	P
Q	J706R - J704J	0.094		Q	J702C - J704J	0.079	Q
R	J706F - J704N	0.140		R	J702A - J704N	0.109	R
S	J706X - J704R	0.120		S	J702B - J704R	0.072	S
T	J706b - J704T	0.120		T	J702C - J704T	0.037	T

CONTINUITY CHECK:

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

4.2.1.1 Hot Test - 160°F @
30" Hg.

A

Date: 6-18-59 Page 91

Test Engr: R. T. Mobley Report 7A2236

CVAC Insp: NA SBAP Insp: NA

VOLTAGE DROP: Minimum Control Voltage (25 V.)

	Switch In Internal Position				Switch In Internal Position		
SH. NK.	CIRCUIT		DATA	SH. NK.	CIRCUIT		DATA
A	J701C -	J701D	0.029		J701A -	J701D	0.061
B	J706P -	J705L	0.183		J701A -	J705L	0.139
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	0.100		J702A -	J703A	0.074
G	J706e -	J703D	0.135		J702B -	J703D	0.110
H	J706X -	J703F	0.125		J702B -	J703F	0.026
I	J706a -	J703G	0.130		J702C -	J703G	0.108
J	J706f -	J703K	0.091		J702C -	J703K	0.043
K	J706G -	J703L	0.155		J702A -	J703L	0.082
L	J706H -	J703M	0.147		J702A -	J703M	0.100
M	J706M -	J703P	0.150		J702B -	J703P	0.116
N	J706g -	J703R	0.131		J702C -	J703R	0.116
O	J706J -	J704A	0.135		J702A -	J704A	0.103
P	J706A -	J704C	0.102		J702B -	J704C	0.066
Q	J706R -	J704J	0.096		J702C -	J704J	0.080
R	J706W -	J704M	0.145		J702A -	J704M	0.105
S	J706X -	J704R	0.122		J702B -	J704R	0.076
T	J706b -	J704T	0.102		J702C -	J704T	0.089

B

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results:

Date: 6-18-59
Test Engr: R.T. Mabley
CVAC Insp: NA
USAF Insp: NA

Specimen S/N 121.
United Control Corp. Spec.

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 94.5 hrs. Stop 94.9 hrs. Assembly Cycles 10 Start _____ hrs. Stop _____ hrs.	

Notes: 1. Following discrepancies occurred on Hypot test
* a. J706E, switch Ext. - breakdown @ 175 VEMS
* b. J702A, switch Int. - breakdown @ 175 VEMS
* c. J702B, switch Int. - breakdown @ 1500 VEMS
Some intermittent breakdown @ 1375 VEMS
* d. J702A, to case on dialectric strength test measured [illegible] ua.
Note: e. J701A to case 4.5 ua
Note: f. J701C to case 2.5 ua

Para. 4.1.9
For para. 4.2.1.1 d1 Specimen S/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 4.1.6 step	Time (seconds)	Tolerance (seconds)	Type of assembly cycle Int. to Ext.	Ext. to Int.
18V	2	1.26	1 max		
18V	4	1.24	1 max		
30V	2	0.79	2 max		
30V	4	0.69	2 max		
29V	4	0.92	2 max		
29V	4	0.91	2 max		

* DIELECTRIC STRENGTH:
All circuits satisfactory - - - - - - - - - - - - YES [ ] NO [X]

* INSULATION RESISTANCE:
All circuits measured greater than 10 megohms - - - YES [ ] NO [X]

SWITCH CONTACTING AND NONCONTACTING
All switches satisfactory

Para 4.1.6 step	YES	NO see note	British (position) Internal	External
2				
2				
4				
4				

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 208 milliseconds

Internal to External 237 milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.E.C. Chan. No.	Ex to In msec	In to Ex msec		Circuit	C.E.C. Chan. No.	Ex to In msec	In to Ex msec
P14	F	4.8	3.2		P42	N	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					

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FORM 71

VOLTAGE DROP: Maximum Control Voltage (30 V.)

Switch in External Position				Switch in Internal Position			
SW. MK.	CIRCUIT	DATA	DATA	SW. MK.	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	J706S - J705M	0.166		D	J701A - J705M	0.265	
E	J706R - J705N	0.187		E	J702A - J705N	0.235	
F	J706U - J703A	0.118		F	J702B - J703A	0.071	
G	J706a - J703D	0.132		G	J702B - J703D	0.102	
H	J706Y - J703F	0.118		H	J702B - J703F	0.035	
I	J706e - J703G	0.130		I	J702C - J703G	0.112	
J	J706f - J703K	0.083		J	J702C - J703K	0.042	
K	J706Q - J703L	0.126		K	J702A - J703L	0.081	
L	J706H - J703M	0.147		L	J702A - J703M	0.103	
M	J706W - J703P	0.150		M	J702B - J703P	0.113	
N	J706g - J703R	0.135		N	J702C - J703R	0.120	
O	J706J - J704A	0.133		O	J702A - J704A	0.103	
P	J706d - J704C	0.100		P	J702B - J704C	0.065	
Q	J706R - J704J	0.094		Q	J702C - J704J	0.081	
R	J706V - 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: 6-19-59 Page 94

Test Engr: R. T. Mobley Report A2236

CVAC Insp: NA DSAF Insp: NA

VOLTAGE DROP: Minimum Control Voltage (25 V.)

	Switch in Internal Position				Switch in Internal Position		
SW. NK.	CIRCUIT		DATA	SW. NK.	CIRCUIT		DATA
A	J701C -	J701D	0.079	A	J701C -	J701D	0.062
B	J706P -	J705L	0.179	B	J701A -	J705L	0.132
C	J706T -	J705K	0.149	B	J701A -	J705K	0.137
D	J706B -	J705J	0.180	B	J701A -	J705J	0.214
E	J706R -	J705G	0.202	B	J701A -	J705G	0.236
F	J706R -	J703A	0.120	B	J702A -	J703A	0.074
G	J706c -	J703D	0.136	B	J702B -	J703D	0.114
H	J706X -	J703F	0.120	B	J702B -	J703F	0.025
I	J706m -	J703G	0.132	B	J702C -	J703G	0.114
J	J706K -	J703K	0.085	B	J702G -	J703K	0.044
K	J706Q -	J703L	0.129	B	J702A -	J703L	0.031
L	J706E -	J703M	0.150	B	J702A -	J703M	0.102
M	J706W -	J703P	0.151	B	J702B -	J703P	0.115
N	J706g -	J703R	0.138	B	J702C -	J703R	0.122
O	J706J -	J704A	0.135	B	J702A -	J704A	0.105
P	J706d -	J704C	0.100	B	J702E -	J704C	0.066
Q	J706R -	J704J	0.036	B	J702C -	J704J	0.082
R	J706Z -	J704M	0.145	B	J702A -	J704M	0.107
S	J706Y -	J704R	0.124	B	J702B -	J704R	0.078
T	J706b -	J704T	0.182	B	J702R -	J704T	0.041

B

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results:

Date: 6-19-59
Test Engr: E.T. Mabley
CVAC Insp: NA
USAF Insp: NA

Specimen S/N 121
United Control Corp. Spec.

Paragraph	Specification Requirement	Remarks
4.2.1.1 c)	+40°F @ 95% 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
J 702 A (switch Int.) broke down appx. 200 V AC
J 702 A to case → 60 ua
J 706 Y to case 13 ua
J 706 f to case 12 ua
J 702 A to J 706 Y 15 ua
J 706 Y to J 706 I 11 ua

Para. 4.1.1
Per para. 4.2.1.10 Specimen S/N 121 United Control Corp. Specimen

Date: 6-19-59
Engineer: E. T. Mabley
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
15V	A	1.57	3 max		
15V	A	1.44	3 max		
30V	I	.86	2 max		
30V	I	.88	2 max		
25V	I	.90	2 max		
25V	I	1.04	2 max		

DIELECTRIC STRENGTH:
All circuits satisfactory - - - - - - - - - - - - YES [ ] NO [X] See Note *

INSULATION RESISTANCE:
All circuits measured greater than 10 megohms - - - YES [ ] NO [X] *

SWITCH CONTINUITY AND NON-CONTINUITY
All switches satisfactory

Para 4.1.6 step	YES	NO see note	Switch position Internal	External
H				
I				
J				
J				

CYCLE SHORTCUT TIME: (20 milliseconds minimum)

External to Internal 267 milliseconds

Internal to External 270 milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.P.C. Chan. No.	Ex to In max	In to Ex max
P14	F	3.2	3.3
P32	G		
P30	H		
P34	I		
P40	J		
P18	K		
P20	L		
P26	M	3.2	3.3

Circuit	C.P.C. Chan. No.	In to Ex max	Ex to In max
P42	N	3.2	3.3
P22	O		
P36	P		
P44	Q		
P16	R		
P28	S		
P38	T	3.2	3.3

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FORM 11

VOLTAGE DROP: Maximum Control Voltage (30 V.) External

Switch in External Position				Switch in Internal Position			
SW. NK.	CIRCUIT	DATA	DATA	SW. NK.	CIRCUIT	DATA	SW.
A	J701C - J701D	0.066		A	J701A - J701D	0.200	A
B	J706P - J705L	0.156		B	J701A - J705L	0.161	B
C	J706T - J705K	0.135		C	J701A - J705K	0.130	C
D	J706S - J705J	0.202		D	J701A - J705J	0.152	D
E	J706R - J705M	0.322		E	J702A - J705C	0.180	E
F	J706R - J703A	0.066		F	J702B - J703A	0.072	F
G	J706a - J703D	0.091		G	J702B - J703D	0.110	G
H	J706Y - J703F	0.025		H	J702B - J703F	0.110	H
I	J706a - J703G	0.091		I	J702C - J703G	0.111	I
J	J706f - J703K	0.039		J	J702C - J703K	0.075	J
K	J706G - J703L	0.063		K	J702A - J703L	0.075	K
L	J706H - J703M	0.081		L	J702A - J703M	0.124	L
M	J706W - J703P	0.091		M	J702B - J703P	0.124	M
N	J706g - J703R	0.097		N	J702C - J703R	0.118	N
O	J706J - J704A	0.093		O	J702A - J704A	0.118	O
P	J706[illegible] - J704C	0.050		P	J702B - J704C	0.083	P
Q	J706R - J704J	0.065		Q	J702C - J704J	0.080	Q
R	J706P - J704N	0.092		R	J702A - J704N	0.123	R
S	J706X - J704R	0.071		S	J702B - J704R	0.116	S
T	J706b - J704T	0.035		T	J702C - J704T	0.098	T

CONTINUITY CHECK:

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

4.2.1.1(e) + 40°F @ 95% R.H.

A

Date: 6-19-59 Page 97

Test Engr: R. T. Mobley Report 7A2236

CVAC Insp: NA WSAF 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	0.029	A	J701A -	J701D	0.066
B	J706P -	J705L	0.162	B	J701A -	J705L	0.142
C	J706T -	J705K	0.137	C	J701A -	J705K	0.136
D	J706G -	J705J	0.146	D	J701A -	J705J	0.217
E	J706R -	J705G	0.180	E	J701A -	J705G	0.307
F	J706E -	J703A	0.072	F	J702A -	J703A	0.069
G	J706c -	J703D	0.111	G	J702B -	J703D	0.092
H	J706X -	J703F	0.111	H	J702B -	J703F	0.026
I	J706a -	J703G	0.110	I	J702C -	J703G	0.292
J	J706C -	J703K	0.072	J	J702C -	J703K	0.040
K	J706Q -	J703L	0.074	K	J702A -	J703L	0.065
L	J706H -	J703M	0.122	L	J702A -	J703M	0.082
M	J706N -	J703P	0.124	M	J702B -	J703P	0.092
N	J706g -	J703R	0.120	N	J702C -	J703R	0.100
O	J706J -	J704A	0.120	O	J702A -	J704A	0.092
P	J706A -	J704C	0.083	P	J702B -	J704C	0.052
Q	J706B -	J704J	0.078	Q	J702C -	J704J	0.066
R	J706F -	J704M	0.122	R	J702A -	J704M	0.094
S	J706X -	J704R	0.113	S	J702B -	J704R	0.070
T	J706b -	J704T	0.088	T	J702C -	J704T	0.036

B

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results: Unsatisfactory

Specimen S/N 121. United Control Corp. specimen

Date: 6-19-57
Test Engr: R.T. Mobley
CVAC Insp: NA
USAF Insp: NA

Paragraph	Specification Requirement	Remarks
4.2.1.1 +)	Post Env. @ Ambient Cond. Proof Cycle	
1.4	Operating Time: .4 hr. Start 95.5 hrs. Stop 95.9 hrs. Assembly Cycles 10 Start _____ hrs. Stop _____ hrs.	

Notes: X 1. During Hypot test (switch Ext.) had breakdown @ 200 VOMS on J 706 E

X 2. Dielectric strength test (Ext.) J 706 E → [illegible]

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

Para. 4.1.9
For para. 4.1.1.1 Specimen S/N 121
United Control Corp. Specimen

Date: 6-19-'59
Engineer: R. J. Mobly
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	1.46	3 max		
18V	d	1.40	3 max		
30V	f	0.73	2 max		
30V	i	0.83	2 max		
25V	j	0.99	2 max		
25V	j	0.96	2 max		

DIELECTRIC STRENGTH:
All circuits satisfactory - - - - - - - - - - - - YES [X] NO [X]

INSULATION RESISTANCE:
All circuits measured greater than 10 megohms - - - YES [X] NO [X]

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 240 milliseconds

Internal to External 228 milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum)

Circuit	C.E.C. Chan. No.	In to Ex msec	Ex to In msec
P14	F	3.3	3.2
P32	G	↑	↑
P30	H		
P36	I		
P40	J		
P18	K		
P20	L	↓	↓
P26	M	3.3	3.2

Circuit	C.F.C. Chan. No.	In to Ex msec	Ex to In msec
P42	N	3.2	3.2
P22	O	↑	↑
P34	P		
P44	Q		
P16	R		
P28	S	↓	↓
P38	T	3.2	3.2

CONVAIR
SAN DIEGO

FORM 11

8

VOLTAGE DROP: Maximum Control Voltage (30 V.)

Switch in External Position				Switch in Internal Position			
SW. NO.	CIRCUIT	DATA	DATA	SW. NO.	CIRCUIT	DATA	
A	J701C - 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 - J705J	0.226	
E	J706R - J702E	0.125		E	J702A - J705C	0.263	
F	J706[illegible] - J703A	0.082		F	J702[illegible] - J703A	0.080	
G	J706[illegible] - J703D	0.120		G	J702B - J703D	0.095	
H	J706Y - J703F	0.115		H	J702B - J703F	0.110	
I	J706a - J703G	0.120		I	J702C - J703G	0.096	
J	J706[illegible] - J703K	0.075		J	J702C - J703K	0.044	
K	J706G - 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	J706[illegible] - J703R	0.120		N	J702C - J703R	0.105	
O	J706J - J704A	0.125		O	J702A - J704A	0.110	
P	J706d - J704C	0.089		P	J702B - J704C	0.056	
Q	J706R - J704J	0.084		Q	J702C - J704J	0.070	
R	J706F - J704N	0.135		R	J702A - J704N	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: 6-19-59 Page 100

Test Engr: R. T. Mobley Report 7A2236

CVAC Insp: NA USAF Insp: NA

VOLTAGE DROP: Minimum Control Voltage (25 V.)

	Switch in External Position				Switch in Internal Position		
SW. NK.	CIRCUIT		DATA	SW. NK.	CIRCUIT		DATA
A	J701C -	J701D	0.105	A	J701A -	J701D	0.069
B	J706P -	J705L	0.162	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 -	J705C	0.180	E	J701A -	J705C	0.259
F	J706E -	J703A	0.094	F	J702A -	J703A	0.084
G	J706c -	J703D	0.125	G	J702B -	J703D	0.092
H	J706X -	J703F	0.120	H	J702B -	J703F	0.037
I	J706m -	J703G	0.120	I	J702C -	J703G	0.098
J	J706Z -	J703K	0.028	J	J702C -	J703K	0.045
K	J706Q -	J703L	0.110	K	J702A -	J703L	0.079
L	J706H -	J703M	0.140	L	J702A -	J703M	0.092
M	J706W -	J703P	0.140	M	J702B -	J703P	0.092
N	J706g -	J703R	0.130	N	J702C -	J703R	0.110
O	J706J -	J704A	0.130	O	J702A -	J704A	0.115
P	J706d -	J704C	0.092	P	J702B -	J704C	0.056
Q	J706R -	J704J	0.088	Q	J702C -	J704J	0.072
R	J706F -	J704M	0.140	R	J70[illegible] -	J704M	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.
United Control Corp.

Test Engr: R. T. Mobley
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 Recorder Mag. #
4.4	Operating Time: Start 96.1 hrs. Stop 97.0 hrs. Assembly Cycles Start 14 hrs. Stop ____ hrs.	

* Notes: 1. During operating Accelleration AC switch [illegible] no greater than 7.5 milliseconds for any AC channel
* 2. Cycle sequence [illegible] no less than [illegible] seconds.
* [illegible] Engineering Note book

Para. 4.1.9
For para. 4.4 Specimen S/N 121
United Control Corp. Spec.

Date: 6-30-'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
18V	a	1.48	3 max	X	
18V	d	1.37	3 max		X
30V	f	0.84	2 max	X	
30V	i	0.70	2 max		X
25V	j	0.98	2 max	X	
25V	j	0.95	2 max		X

DIELECTRIC STRENGTH:
All circuits satisfactory - - - - - - - - - - - - - YES [X] NO [ ]

INSULATION RESISTANCE:
All circuits measured greater than 10 megohms - - - YES [X] NO [ ]

SWITCH CONTINUITY AND NON-CONTINUITY
All switches satisfactory

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

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

See note 1 previous page

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
P1	F		
P32	D	See Note 1 on previous page	
P31	B		
P36	I		
P43	J		
P18	K		
P20	L		
P26	M		

Circuit	C.E.C. Chan. No.	In to Ex msec	Ex to In msec
P42	N		
P22	C	See Note 1 previous page	
P34	P		
P44	Q		
P16	R		
P28	S		
P38	T		

CONVAIR
SAN DIEGO

FORM 71

VOLTAGE DROP: Maximum Control Voltage (30 V.)

Switch in External Position				Switch in Internal Position			
SW. NK.	CIRCUIT		DATA	SW. NK.	CIRCUIT		DATA
A	J701C -	J701D	.458	A	J701A -	J701D	.074
B	J706P -	J705L	.180	B	J701A -	J705L	.129
C	J706T -	J705K	.163	C	J701A -	J705K	.133
D	J706S -	J705N	.180	D	J701A -	J705N	.126
E	J706R -	J705M	.216	E	J702A -	J705C	.154
F	J706U -	J703A	.090	F	J702A -	J703A	.159
G	J706a -	J703D	.130	G	J702A -	J703D	.160
H	J706Y -	J703F	.116	H	J702B -	J703F	.030
I	J706a -	J703G	.130	I	J702C -	J703G	.170
J	J706f -	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	J706g -	J703R	.132	N	J702C -	J703R	.178
O	J706J -	J704A	.122	O	J702A -	J704A	.193
P	J706d -	J704C	.092	P	J702B -	J704C	.081
Q	J706R -	J704J	.092	Q	J702C -	J704J	.139
R	J706F -	J704M	.196	R	J702A -	J704M	.190
S	J706X -	J704R	.117	S	J702B -	J704R	.092
T	J706b -	J704T	.094	T	J702C -	J704T	.066

CONTINUITY CHECK:

All circuits indicated continuity . . . . Yes [X] No [ ] See Notes

4.4 Post Acceleration Proof Cycle

A

Date: 6-30-59 Page 103

Test Engr: R. T. Mobley Report 7A2236

CVAC Insp: NA USAF Insp: NA

VOLTAGE DROP: Minimum Control Voltage (25 V.)

Switch in External Position				Switch in Internal Position			
SW. NK.	CIRCUIT		DATA	SW. NK.	CIRCUIT		DATA
A	J701C -	J701D	.497	A	J701A -	J701D	.051
B	J706P -	J705L	.163	B	J701A -	J705L	.129
C	J706T -	J705K	.149	C	J701A -	J705K	.130
D	J706S -	J705J	.154	D	J701A -	J705J	.119
E	J706R -	J705G	.190	E	J701A -	J705G	.159
F	J706R -	J703A	.094	F	J702A -	J703A	.160
G	J706c -	J703D	.132	G	J702B -	J703D	.162
H	J706Y -	J703F	.110	H	J702B -	J703F	.030
I	J706a -	J703G	.130	I	J702C -	J703G	.172
J	J706f -	J703K	.079	J	J702C -	J703K	.082
K	J706D -	J703L	.105	K	J702A -	J703L	.156
L	J706E -	J703M	.147	L	J702A -	J703M	.172
M	J706W -	J703P	.145	M	J702B -	J703P	.160
N	J706g -	J703R	.133	N	J702C -	J703R	.180
O	J706J -	J704A	.124	O	J702A -	J704A	.195
P	J706d -	J704C	.094	P	J702B -	J704C	.082
	J706Z -	J704J	.095		J702C -	J704J	.140
R	J706V -	J704M	.132	R	J702A -	J704M	.193
S	J706X -	J704R	.127	S	J702B -	J704R	.092
T	J706b -	J704T	.100	T	J702C -	J704T	.067

B

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results: Marginal (Re-test) Date: 6-30-59

Specimen S/N 121. UNITED CONTROL CORP. SPECIMEN

Test Engr: R.T. MOBLEY / J. COURTRAIT
CVAC Insp: N/A
USAF Insp: N/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. TIMING - "B" 0253 18 CHANNEL C.E.C RECORDING RESONANCES: #1 - DRIVE 2 - "X" AXIS 3 - "Y" AXIS 4 - "Z" AXIS 5 - PIPPER MAG. NO. 199 CK 21 RECORD NO. 08233
1.4	Operating Time: Start 97.5 hrs. Stop 97.66 hrs. Assembly Cycles 2 Start _____ hrs. Stop _____ hrs	PIPS EVERY CYCLE FROM 5-20, " 5 CYCLES " 30-100, 110, 120, & 125. DOUBLE PIPS AT 5, 20, 125.

Notes:

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results: Marginal (Retest) Date: 6-30-52

Test Engr: R. T. Mobley

Specimen S/N 121.
United Control Corp.

CVAC Insp: NA

USAF Insp: NA

Paragraph	Specification Requirement	Remarks
4.3	OPERATING VIBRATION 5-125 cps "Y" Axis (re-run)	Recorder 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 Pipper Mag. # 26073
1.4	Operating Time: Start 970 hrs. Stop 972 hrs. Assembly Cycles 4 Start _____ hrs. Stop _____ hrs.	Pips every cycle 5-20 every 5 20-100 110, 120, 125 double pips @ 20, 125, 5

Notes: 1. Made a switch tx for I to E to I @ 90 CPS
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 S/N 121 United Control Corp. Specimen

Test Engr: R.T. MOBLEY / J. GURTRIGHT GRC
CVAC Insp: N/A
USAF Insp: N/A

Paragraph	Specification Requirement	Remarks
4.3	Operating Vib. 5 - 12.5 CPS "Z" AXIS (RERUN)	RECORDER MAG. NO. 159 SPEED #2, (16"/SEC.) TIMING "B" 18 CHANNEL C.E.C. RECORDING RESONANCES: #1 : DRIVE 2 - "X" AXIS MAG NO. 26073 3 - "Y" AXIS 4 - "Z" AXIS 5 PIPPER
1.4	Operating Time: Start 97.2 hrs. Stop 97.5 hrs. Assembly Cycles 2 Start _____ hrs. Stop _____ hrs.	PIPS EVERY CYCLE FROM 5-20 " 5 CYCLES FROM 20-100 110, 120, 125 DOUBLE PIPS AT 5, 20, 125 SEE NOTE 1 BELOW.

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 RUN THE "X" AXIS RESONANT SEARCH BEFORE RERUNNING THE "Z" AXIS

2. The accellerometer 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: R. T. MOBLEY / J. COURTRIGHT
CVAC Insp: N/A
USAF Insp: N/A

Paragraph	Specification Requirement	Remarks
4.3	OPERATING VIBRATION 5 - 125 C.P.S. RERUN OF "Z" AXIS (SEE NOTE 1 BELOW).	RECORDER MAG. No. 333 SPEED #2 (16" SEC) RECORD No. 0256 18 CHANNEL C.E.C. RECORDING RESONANCES: #1 - DRIVE 2 - "X" AXIS 3 - "Y" AXIS 4 - "Z" AXIS 5 - APPER MAG. No. 199CK.21 RECORD No. 08234
1.4	Operating Time: Start 97.66 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:

Date: July 7, 1959

Specimen S/N 121. United Control Corp. Specimen

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

Paragraph	Specification Requirement	Remarks
4.5	Life Test	
1.4	Operating Time: Start 97.9 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. 24 cycles required to obtain 301 cycles

CONVAIR
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FORM 73

VOLTAGE DROP: Maximum Control Voltage (30 V.)

Switch in External Position				Switch in Internal Position			
SW. MK.	CIRCUIT	DATA	DATA	SW. MK.	CIRCUIT	DATA	SW.
A	J701C - J701D	0.063 (+.050)		A	J701A - J701D	0.024	A
B	J706P - J705L	0.005		B	J701A - J705L	0.012	B
C	J706T - J705K	0.013		C	J701A - J705K	0.028	C
D	J706S - J705J	0.009		D	J701A - J705J	0.024	D
E	J706R - J705R	0.006		E	J702A - J703C	0.007	E
F	J706R - J703A	0.032		F	J702B - J703A	0.025	F
G	J706a - J703D	0.032		G	J702B - J703D	0.115	G
H	J706Y - J703F	0.031		H	J702B - J703F	~~0.115~~ 0.063	H
I	J706a - J703G	0.028		I	J702C - J703G	0.137	I
J	J706f - J703K	0.030		J	J702C - J703K	0.105	J
K	J706G - J703L	0.025		K	J702A - J703L	0.088	K
L	J706H - J703M	0.030		L	J702A - J703M	0.025	L
M	J706W - J703P	0.032		M	J702B - J703P	0.115	M
N	J706g - J703R	0.030		N	J702C - J703R	0.028	N
O	J706J - J704A	0.029		O	J702A - J704A	0.025	O
P	J706d - J704C	0.027		P	J702B - J704C	0.084	P
Q	J706R - J704J	0.031		Q	J702C - J704J	0.027	Q
R	J706F - J704N	0.025		R	J702A - J704N	0.027	R
S	J706X - J704R	0.027		S	J702B - J704R	0.082	S
T	J706b - J704T	0.028		T	J702C - J704T	0.090	T

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 Int Circ

Made at 500

A

Date: _____ Page 109

Test Engr: _____ Report 712236

CVAC Insp: _____ USAF Insp: _____

VOLTAGE DROP: Minimum Control Voltage (25 V.)

	Switch in External Position			Switch in Internal Position		
Sw. MK.	CIRCUIT		DATA	SW. MK.	CIRCUIT		DATA
A	J701B -	J701D		A	J701A -	J701D	
B	J706P -	J705L		B	J701A -	J705L	
C	J706T -	J705K		C	J701A -	J705K	
D	J706S -	J705J		D	J701A -	J705J	
E	J706R -	J705C		E	J701A -	J705C	
F	J706E -	J703A		F	J702A -	J703A	
G	J706c -	J703D		G	J702B -	J703D	0.030
3 H	J706X -	J703F		H	J702B -	J703F	0.029
I	J706a -	J703G		I	J702C -	J703G	0.028
J	J706f -	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	J706g -	J703R		N	J702C -	J703R	
O	J706J -	J704A		O	J702A -	J704A	
P	J706d -	J704C		P	J702B -	J704C	0.028
Q	J706R -	J704J		Q	J702C -	J704J	
R	J706F -	J704M		R	J702A -	J704M	
S	J706X -	J704R		S	J702B -	J704R	0.025
T	J706b -	J704T		T	J702C -	J704T	0.027

n in Internal Position

e at 500 cycles

B

CONVAIR ASTRONAUTICS

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

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

~~VOLTAGE DROP ACROSS (INDIVIDUAL) SWITCH CONTACTS~~ Using Test Set-up @ end of Life Test

SWITCH	CKT.	DATA Internal	SWITCH	CKT.	DATA External
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	0.129
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	0.076
R	P16-P13	0.110	R	P16-P17	0.137
S	P28-P25	0.063	S	P28-P29	0.112
T	P38-P37	0.032	T	P38-P41	0.042

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results: Failed

Specimen S/N 124 United Control Corp. Specimen

Date: July 14, 1957
Test Engr: R. T. Mobley
CVAC Insp: NA
USAF Insp: NA

Paragraph	Specification Requirement	Remarks
4.1.8	Initial Satisfactory	- See note 1 below - The Hypot breakdown was determined to be caused by the vendor using improper relays for the AC switch
1.4	Operating Time: Start 10[illegible]8 hrs. Stop 102.8 hrs. Assembly Cycles 0 Start _____ hrs. Stop _____ hrs.	

Notes: 1. During Hypot test with 1500 VRMS applied, leakage & breakdown occurred between J706F-J706G; J706H, J706G; intermittent between c & d and between a & b and between f & g and g & k

* 2. DC switch failed to transfer on third cycle when [illegible] opened. Motor 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 [illegible]. The [illegible] was [illegible] and sent to the vendor.

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

Date: July 14, '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
18V	a	1.933	3 max	X	
18V	d	1.514	3 max		X
* 30V	f		2 max		
30V	i		2 max		
25V	j		2 max		
25V	j		2 max		

DIELECTRIC STRENGTH:
* All circuits satisfactory - - - - - - - - - - - - - YES * [ ] NO [X]

INSULATION RESISTANCE:
All circuits measured greater than 10 megohms - - - YES [X] 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
f				
i				
j	✓	✓	✓	✓
j				

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal _____ milliseconds

Internal to External _____ 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.	Ex to Ex msec	Ex to In msec
P14	F			P42	N		
P32	G			P22	C		
P30	h			P34	[illegible]		
P36	I			P44	[illegible]		
P40	J			P16	[illegible]		
P18	K			P24	S		
P20	L	✓	✓	P38	T	✓	✓
P26	N						

4.1 TEST CONDITIONS AND PROCEDURES (Continued)

General Test Results: Satisfactory

Date: Oct. 5

Specimen S/N 124. United Control

Test Engr: H. Edwards
CVAC Insp: NA
USAF Insp:

Paragraph	Specification Requirement	Remarks
4.1.8	Initial Satisfactory	Initial Sat. 10/4
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 1.3VDC. 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: 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	1.449	3 max		X
18V	d	1.325	3 max	X	
30V	f	0.673	2 max	X	
30V	i	0.661	2 max		X
25V	j	0.781	2 max	X	
25V	j	0.914	2 max		X

DIELECTRIC STRENGTH:
All circuits satisfactory - - - - - - - - - - - - - YES [X] NO [ ]

INSULATION RESISTANCE:
All circuits measured greater than 10 megohms - - - YES [X] NO [ ]

SWITCH CONTINUITY AND NON-CONTINUITY
All switches satisfactory

Rec. No. 0849

Para 4.1.8 step	YES	NO see note	Switch position: Internal	External
g	X			X
i	X		X	
j	X			X
j	X		X	

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 200 milliseconds

Internal to External 200 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	1.0	1.0	P22	[illegible]	1.0	1.0
P32	G	↑	↑	P22		↑	↑
P30	H			P34	[illegible]		
P36	I			P[illegible]	[illegible]		
P20	J			P12	[illegible]		
P18	K			P28	[illegible]	↓	↓
P20	L	↓	↓	P38	[illegible]	[illegible]	[illegible]
P26	M	1.0	1.0				

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FORM 11

VOLTAGE DROP: Maximum Control Voltage (30 V.)

Switch in External Position				Switch in Internal Position			
Sw. MK.	CIRCUIT		DATA	Sw. MK.	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	J705N	.109
E	J706	J705C	.199	E	J701A	J705C	.204
F	J706B	J705A	.110	F	J702A	J703	.102
G	J706	J703D	.105	G	J702B	J703D	.089
H	J706X	J703N	.094	H	J702B	J703N	.031 .090
I	J706a	J703G	.105	I	J702C	J703G	.102
J	J706	J703K	.082	J	J702C	J703K	.052
K	J706G	J703L	.140	K	J702A	J703L	.106
L	J706H	J703M	.135	L	J702A	J703M	.099
M	J706M	J703P	.102	M	J702A	J703P	.080
N	J706	J703R	.113	N	J702C	J703R	.095
O	J706	J704A	.146	O	J702A	J704A	.149
P	J706U	J704C	.099	P	J702B	J704C	.078
Q	J706R	J704J	.093	Q	J702C	J704J	.078
R	J706Z	J704N	.158	R	J702A	J704N	.131
S	J706X	J704R	.148	S	J702B	J704R	.077
T	J706	J704T	.93	T	J702C	J704T	.042

CONTINUITY CHECK

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

4.8. Initial Satisfactory Performance Test

Date: Oct. 5 Page 115

Test Engr: H. Edwards Report 7A2236

CVAC Insp: NA HGAF 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	.064	A	J701A -	J701D	.824 *
B	J706P -	J705L	.132	B	J701A -	J705L	.128
C	J706T -	J705K	.168	C	J701A -	J705K	.111
D	J706S -	J705J	.177	D	J701A -	J705J	.112
E	J706R -	J705C	.193	E	J701A -	J705C	.185
F	J706E -	J703A	.111	F	J702A -	J703A	.099
G	J706C -	J703D	.106	G	J702B -	J703D	.087
H	J706Y -	J703F	.095	H	J702B -	J703F	.030
I	J706m -	J703G	.108	I	J702C -	J703G	.100
J	J706f -	J703K	.079	J	J702C -	J703K	.050
K	J706C -	J703L	.124	K	J702A -	J703L	.096
L	J706H -	J703M	.122	L	J702A -	J703M	~~.096~~ .030
M	J706W -	J703P	.098	M	J702B -	J703P	.078
N	J706g -	J703R	.111	N	J702C -	J703R	~~.078~~ .092
O	J706J -	J704A	.143	O	J702A -	J704A	.141
P	J706d -	J704C	.098	P	J702B -	J704C	.076
Q	J706R -	J704J	.090	Q	J702C -	J704J	.077
R	J706F -	J704N	.134	R	J702A -	J704N	.125
S	J706X -	J704R	.105	S	J702B -	J704R	.076
T	J706L -	J704T	.092	T	J702C -	J704T	.041

* 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: 124 United Control Specimen

Date: 10-6-59
Test Engr: R. I. Mobley
CVAC Insp: ____
USAF Insp: NA

Paragraph	Specification Requirement	Remarks
4.3	Operating Vib. "Y" Axis	#1 z axis 2 accell. record #2 Y Axis 3 #3 X Axis 4 #1 drive 1 25G/11 2,3 & 4 50G/inch Mag # 200CL31 Record # 17994 5-80cps 17995 80-2000cps
1.4	Operating Time: Start 159.4 hrs. Stop 160.0 hrs. Assembly Cycles 6 Start ____ hrs. Stop ____ hrs.	

Notes: 1. Channel "A" (200A ckt.) was noted to have quite a bit of noise — an assembly cycle was made I to E @ speed #1 @ 48 cps to see what ckt. looked like. Back to 2 at 60 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. Mobley
CVAC Insp: ----
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
15V	a	NA	1 max		NA
15V	d		3 max		
30V	f		2 max		
30V	i		2 max		
25V	j		2 max		
25V	j		2 max		

DIELECTRIC STRENGTH:
All circuits satisfactory - - - - - - - - - - - - YES [NA] NO [ ]

INSULATION RESISTANCE:
All circuits measured greater than 10 megohms - - - YES [NA] NO [ ]

SWITCH CONTINUITY AND NON-CONTINUITY
All switches satisfactory

Para 4.1.6 step	YES	NO see note	Switch position Internal	External
f		NA		
i				
j				
j				

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 260 milliseconds

Internal to External 255 milliseconds

End of run (sweep)

POSITION TRANSFER TIME: (35 milliseconds maximum)

Circuit	C.F.C. Chan. No.	In to Ex meas	Ex to In meas	Circuit	C.F.C. Chan. No.	In to Ex meas	Ex to In meas
P12	F	1.5	1.5	P2	N	1.5	1.5
P32	G	1.5	1.0	P4		1.5	2.5
P30	H	2.0	2.0	P14		1.5	1.5
P36	I	1.5	1.5	P16		1.5	2.0
P40	J	1.5	2.0	P12		1.5	2.5
P18	K	1.5	1.5	P34		1.5	2.0
P20	L	1.5	1.5	P38		1.5	2.0
P26	M	1.5	2.0				

4.1 TEST CONDITIONS AND [illegible] (Continued)

General Test Results:

Specimen S/N 124 United Cont.

Date: 10-6-'59
Test Eng.: R.T. Mobley
CVAC Ins.: NA
SSAF Ins.:

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 record mag. # 159 accell. record mag. # 200CK21 record # 18000
1.4	Operating Time: Start 160.0 hrs. Stop 160.5 hrs. Assembly Cycles Start 6 hrs. Stop hrs.	Calib. and pos. same as "Y" Axis

Notes: 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 4, timing A, @ 140 Cps

Opn. Vib. "Z" Axis

Para. 4.3
For para. 4.3 Specimen S/N 124
United Control

Date: 10-6-59
Engineer: R. T. Mobley
CVAC Insp: ----------
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		3 max		
18V	d		3 max		
30V	f	NA	2 max	NA	
30V	i		2 max		
25V	j		2 max		
25V	j		2 max		

DIELECTRIC STRENGTH:
All circuits satisfactory - - - - - - - - - - - - - YES [NA] NO [ ]

INSULATION RESISTANCE:
All circuits measured greater than 10 megohms - - - YES [NA] 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				
j				

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 530 milliseconds

Internal to External 225 milliseconds

POSITION TRANSFER TIME: (15 milliseconds maximum) end of run

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	1.5	1.5	P42	N	1.5	1.5
P32	G	1.0	1.5	P22	O	2.0	1.5
P30	H	2.0	2.5	P34	P	1.8 1.0	1.0
P36	I	1.5	1.0	P44	Q	2.8 1.5	1.5
P40	J	1.5	1.0	P16	R	2.5 2.5	1.5
P18	K	1.5	1.5	P28	S	2.3	2.0
P20	L	1.5	1.5	P38	T	1.0	1.5
P26	M	2.0	2.0				

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results:

Specimen S/N 124 United Control Corp.

Date: 10-6-'59
Test Engr: R. T. 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. # 137 200-2000 SN
3. Assembly cycle ~~X~~ Ram Performed at 675 cps.

Para. 4.3 Opn. Vib. "X" Axis
For para. 4.[illegible] Specimen S/N 124 United Control

Date: 10-6-54
Engineer: Mobley-R.T.
CVAC Insp: ----------
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		3 max		
18V	d	NA	3 max	NA	
30V	f		2 max		
30V	i		2 max		
25V	j		2 max		
25V	j		2 max		

DIELECTRIC STRENGTH:
All circuits satisfactory - - - - - - - - - - - - NA [ ] 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				
i		NA		
i				
j				

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 max	Ex to In max		Circuit	C.E.C. Chan. No.	In to Ex max	Ex to In max
P14	F				P[illegible]	N		
P32	G				P22	X		
P30	H				P34	Y		
P36	I				P[illegible]	Z		
P40	J				P12	R		
P18	K				P28	S		
P20	L				P38	T		
P26	M							

4.1 TEST CONDITIONS AND PROCEDURES: (Continued)

General Test Results: See Note 2

Date: 10-9-'59

Specimen S/N 124 United Cont.

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

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 @ 124 u/sec.
2. Reducing Midwest data indicated that J701A to J701D was still intermittent - specimen was IRed (IR # 414475) 10-12-'59 and sent back to Vendor for repair & per verbal agreement with Mr. S.F. King, Elect. Des.

Post Vibration
proof cycle

Para. 4.3
For para. 4.3.1 Specimen S/N 124 U.C.

Date: 10-9-'59
Engineer: R.T. Moldey
CVAC Insp: ----------
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	1.93	3 max	X	
18V	d	1.59	3 max		X
30V	f	.871	2 max		X
30V	i	.726	2 max	X	
25V	j	1.04	2 max		X
25V	j	1.00	2 max	X	

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
g	X		X	
i	X			X
j	X		X	
j	X			X

CYCLE SEQUENCE TIME: (20 milliseconds minimum)

External to Internal 28[illegible] milliseconds

Internal to External 38[illegible] 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
P[illegible]	F	1	.2	P[illegible]	N	[illegible]	[illegible]
P32	G	.2	1	P[illegible]	[illegible]	1.8	[illegible]
P30	H	.8	2.2	P34	[illegible]	.8	1
P36	I	.8	.9	P[illegible]	[illegible]	1	.8
P[illegible]	J	1	1.2	P[illegible]	[illegible]	1.8	1.9
P18	K	2	.8	P[illegible]	S	1	2.8
P20	L	.8	.8	P[illegible]	T	.8	1
P26	M	1	2				

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VOLTAGE PROOF: 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 - J701D	.356	
B	J706P - J705L	.138		B	J701A - J705L	.130	
C	J706T - J705K	.174		C	J701A - J705K	.100	
D	J706S - J705J	.167		D	J701A - J705J	.099	
E	J706R - J705C	.203		E	J702A - J705C	.191	
F	J706a - J703A	.105		F	J702A - J703A	.089	
G	J706c - J703D	.108		G	J702B - J703D	.034	
H	J706Z - J703F	.087		H	J702B - J703F	.023	
I	J706e - J703G	.108		I	J702C - J703G	.104	
J	J706f - J703K	.071		J	J702C - J703K	.046	
K	J706G - J703L	.118		K	J702A - J703L	.088	
L	J706H - J703M	.122		L	J702A - J703M	.091	
M	J706W - J703P	.100		M	J702B - J703P	.035	
N	J706X - J703R	.111		N	J702C - J703R	.094	
O	J706J - J704A	.141		O	J702A - J704A	.138	
P	J706d - J704C	.096			J702B - J704C	.075	
Q	J706R - J704J	.089		Q	J702C - J704J	.074	
R	J706F - J704N	.135		R	J702A - J704N	.121	
S	J706X - J704R	.102		S	J702B - J704R	.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-'59 Page 124

Test Engr: R.T. Mobley Report 742236

USAF Insp: NA USAF 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	.122	A	J701A -	J701D	.440
B	J706A -	J705L	.152	B	J701A -	J705L	.127
C	J706F -	J705K	.166	C	J701A -	J705K	.104
D	J706G -	J705J	.176	D	J701A -	J705J	.107
E	J706P -	J705C	.214	E	J701A -	J705C	.214
F	J706E -	J703A	.105	F	J702A -	J703A	.092
G	J706c -	J703D	.108	G	J702B -	J703D	.095
H	J706I -	J703F	.088	H	J702B -	J703F	.023
I	J706a -	J703C	.108	I	J702C -	J703C	.102
J	J706f -	J703K	.072	J	J703C -	J703K	.046
K	J706C -	J703L	.118	K	J702A -	J703L	.088
L	J706H -	J703M	.124	L	J702A -	J703M	.092
M	J706N -	J703P	.100	M	J702B -	J703P	.086
N	J706g -	J703N	.111	N	J702C -	J703N	.095
O	J706J -	J702A	.142	O	J702A -	J702A	.044
P	J706d -	J702C	.097	P	J702B -	J702C	.076
Q	J706E -	J702D	.090	Q	J702C -	J702D	.075
R	J706F -	J702A	.136	R	J702A -	J702A	.122
S	J706J -	J702B	.102	S	J702B -	J702B	.074
T	J706L -	J702C	.092	T	J702C -	J702C	.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. 564-5) 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)

Bandwidth of Stimulus:	Avg. Noise Level:	Spike Noise Level:
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 5G 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:

Vibration Frequency(cps):	Amplification Factor:	g. Level:
220	4.5	36
290	5	40
460	6	48(*)
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 stimulii 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 190 VM between 1050 and 1100 cps, peaking at 1068 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 6 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 switchs, 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 1.5.

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 (spectography 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

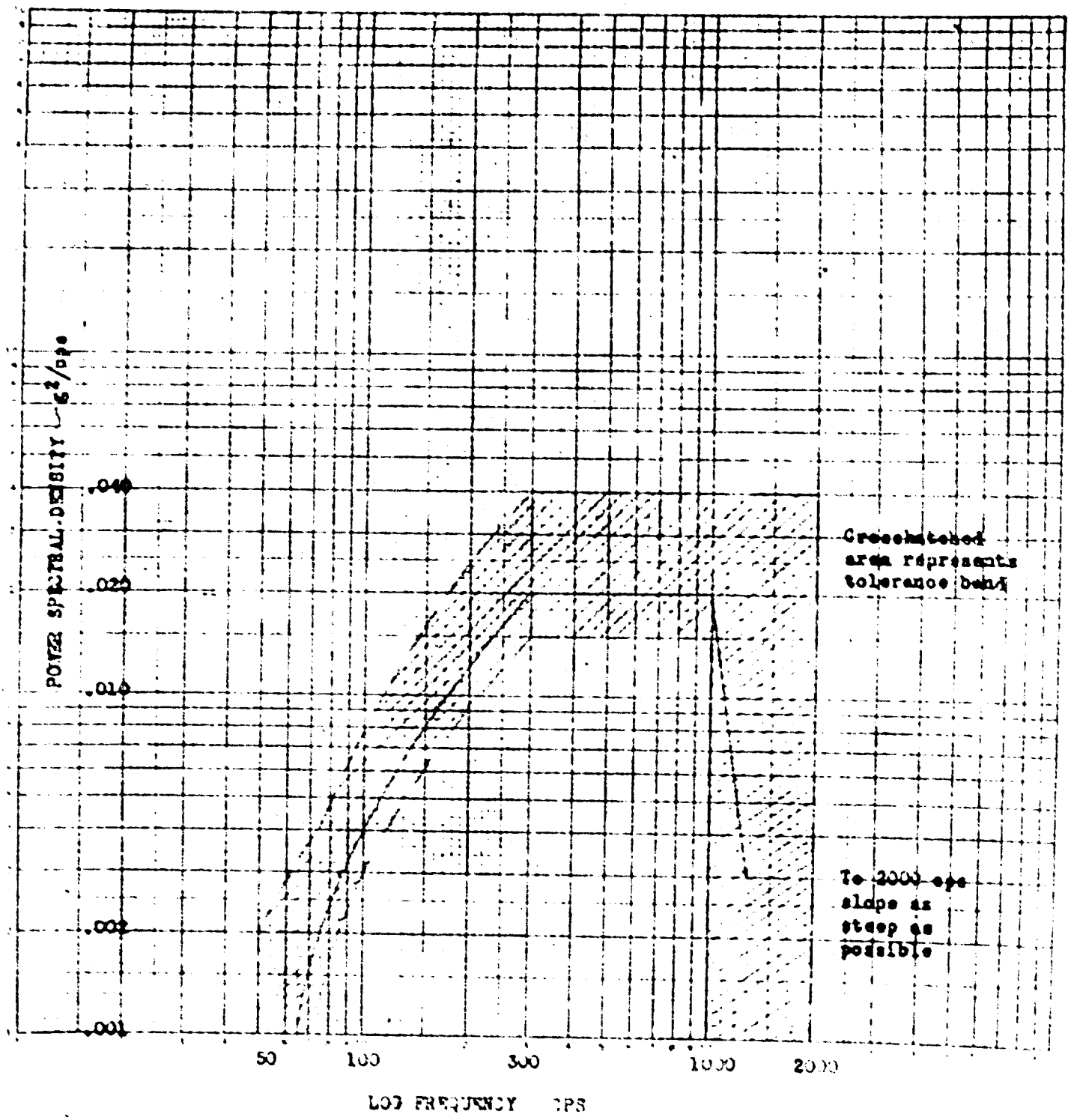
United Control Corporation has redesigned the 27-06166 and 27-06177 switches to use a rotary switching mechanism in lieu of relays for the AC circuits, however some components had been manufactured using relays, and are currently being used by CV-A

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



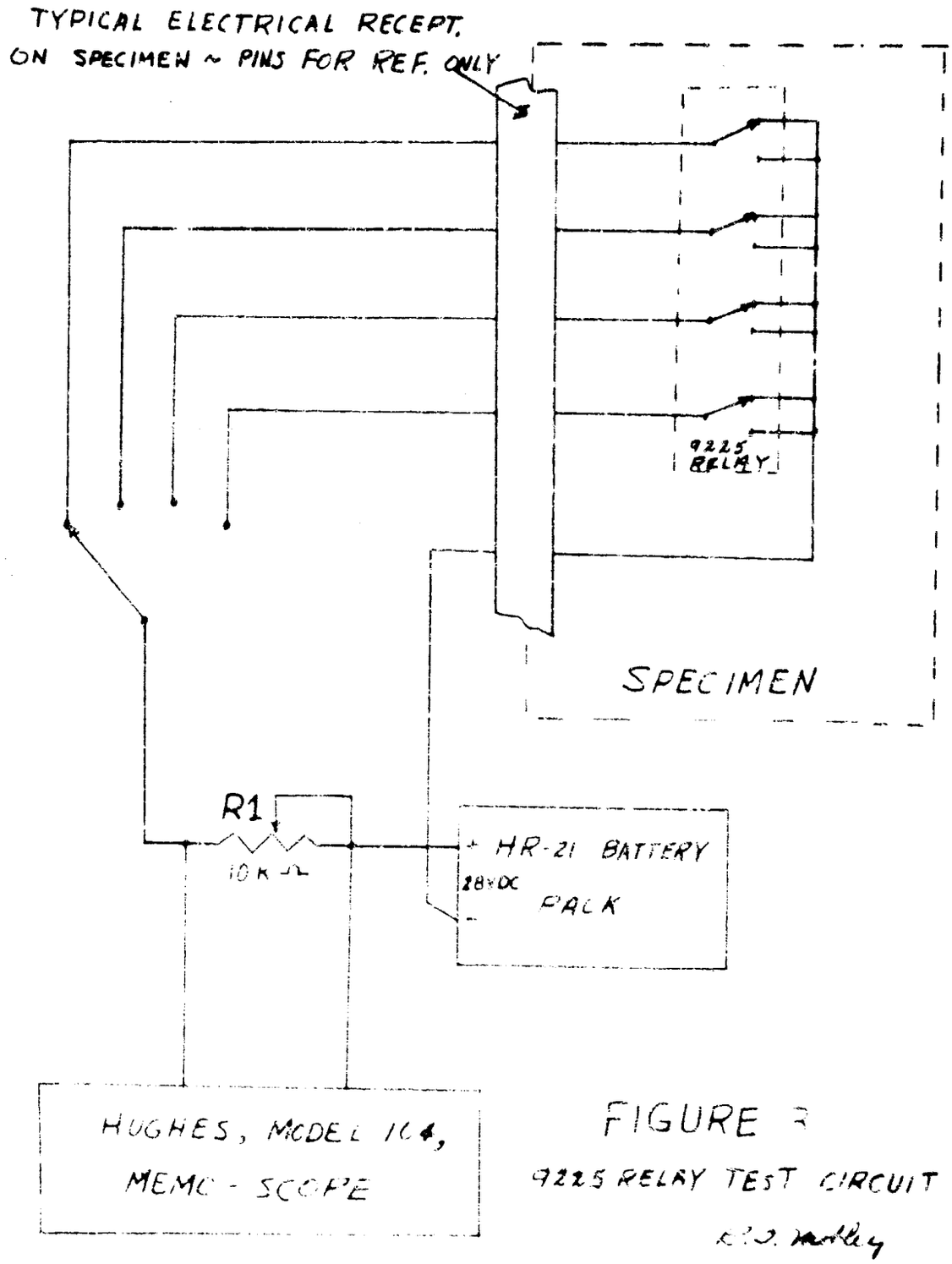


FIGURE 3

9225 RELAY TEST CIRCUIT

R.J. Hadley

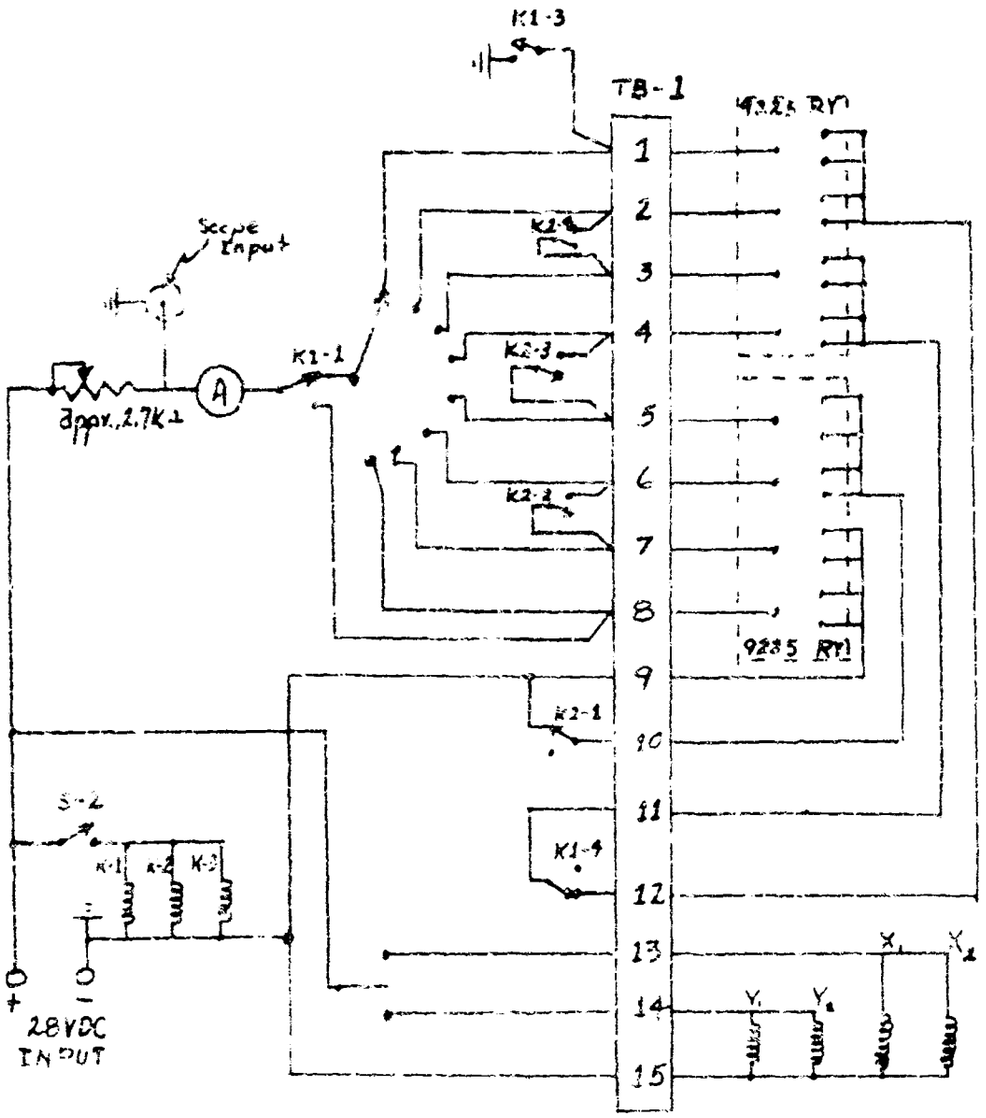
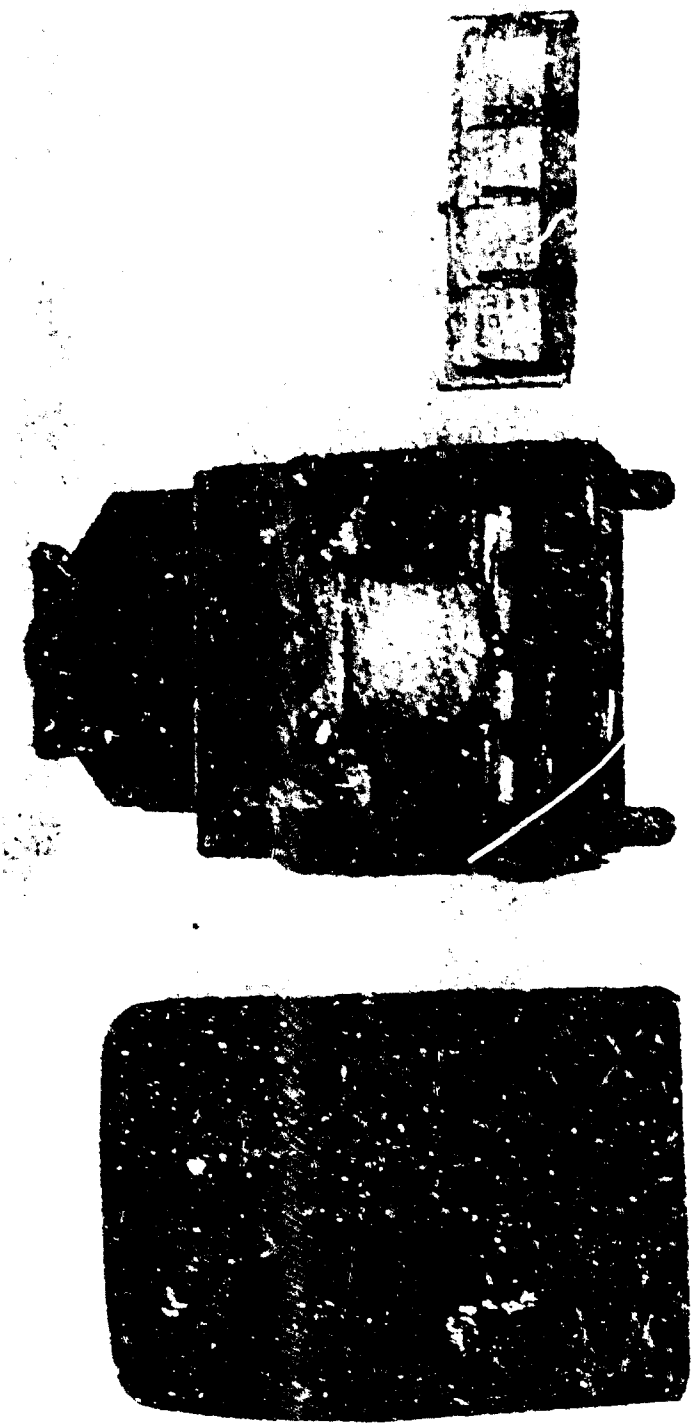


FIGURE 4

MAIN POWER CHANGEOVER SWITCH TEST SET
TO TEST 9225 RELAY NOISE

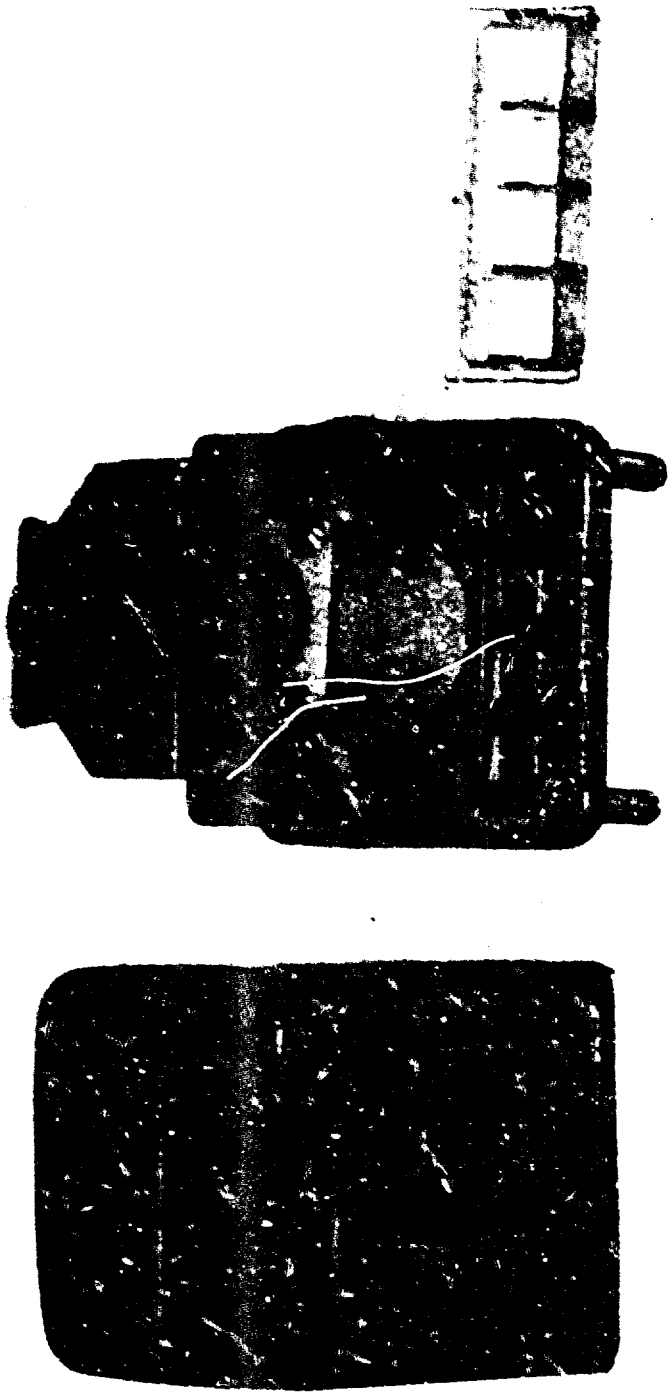
R.D. Motley



LEACH RELAY, 1/N 9225
[illegible]

FIGURE 5

Best Available Copy



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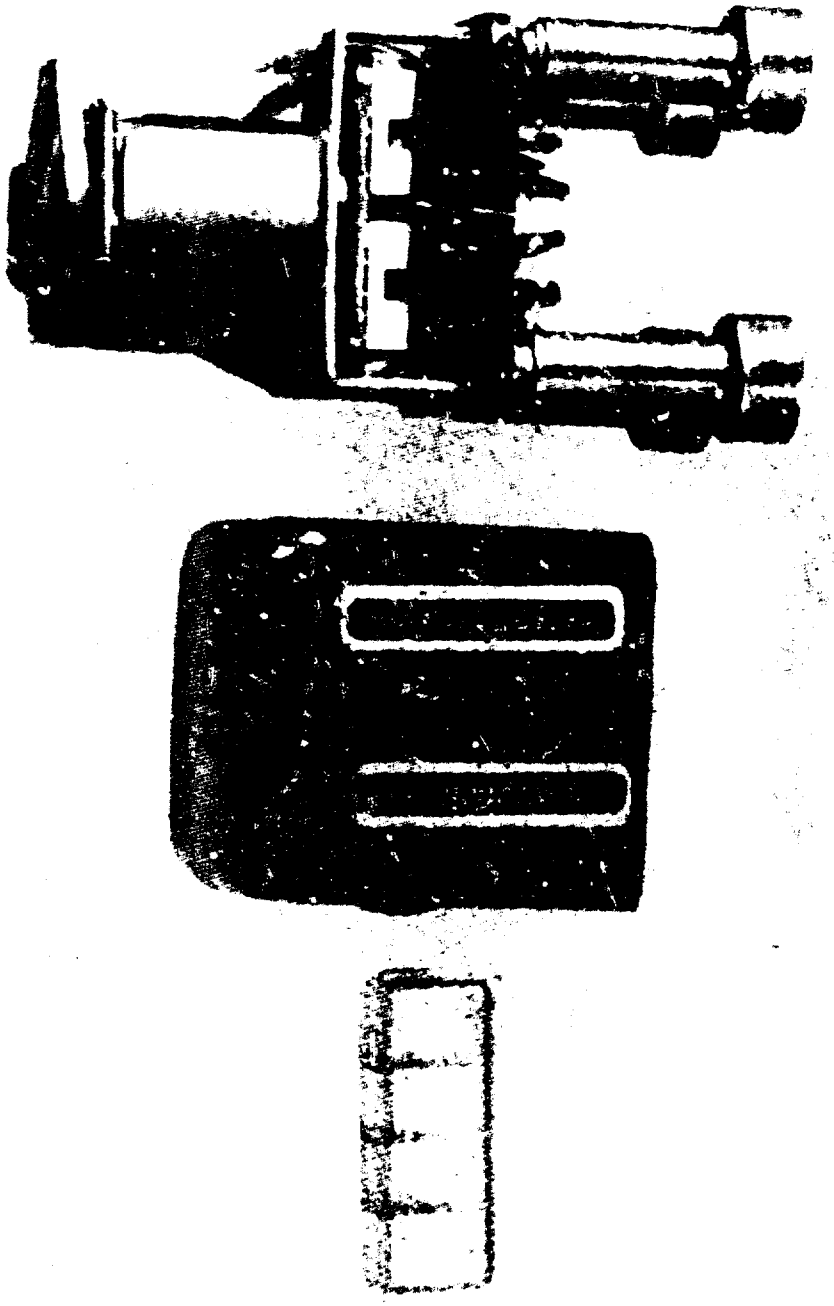
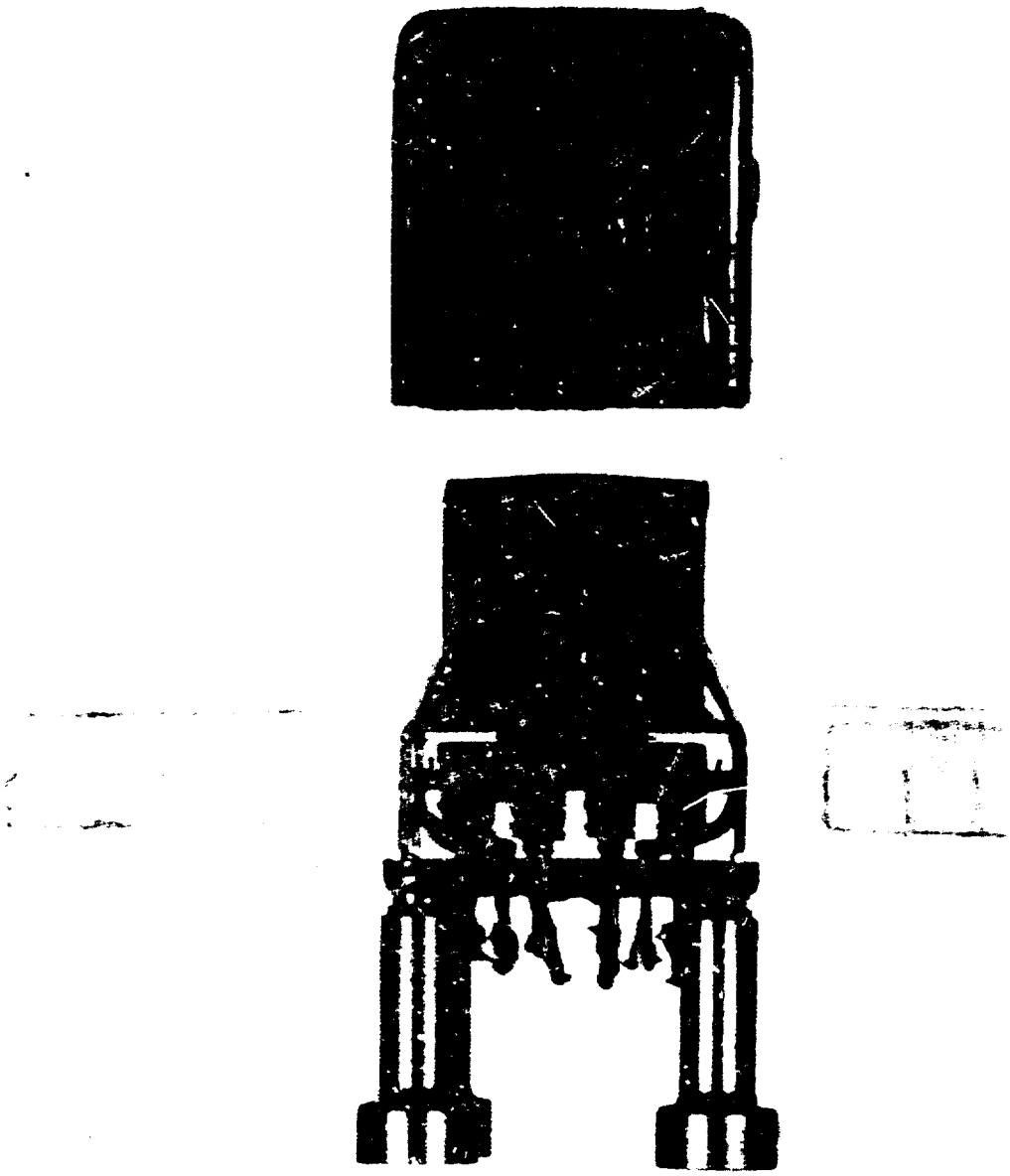


[illegible] PLAY, P/N 9205-5811 ([illegible])
[illegible]

FIGURE 7

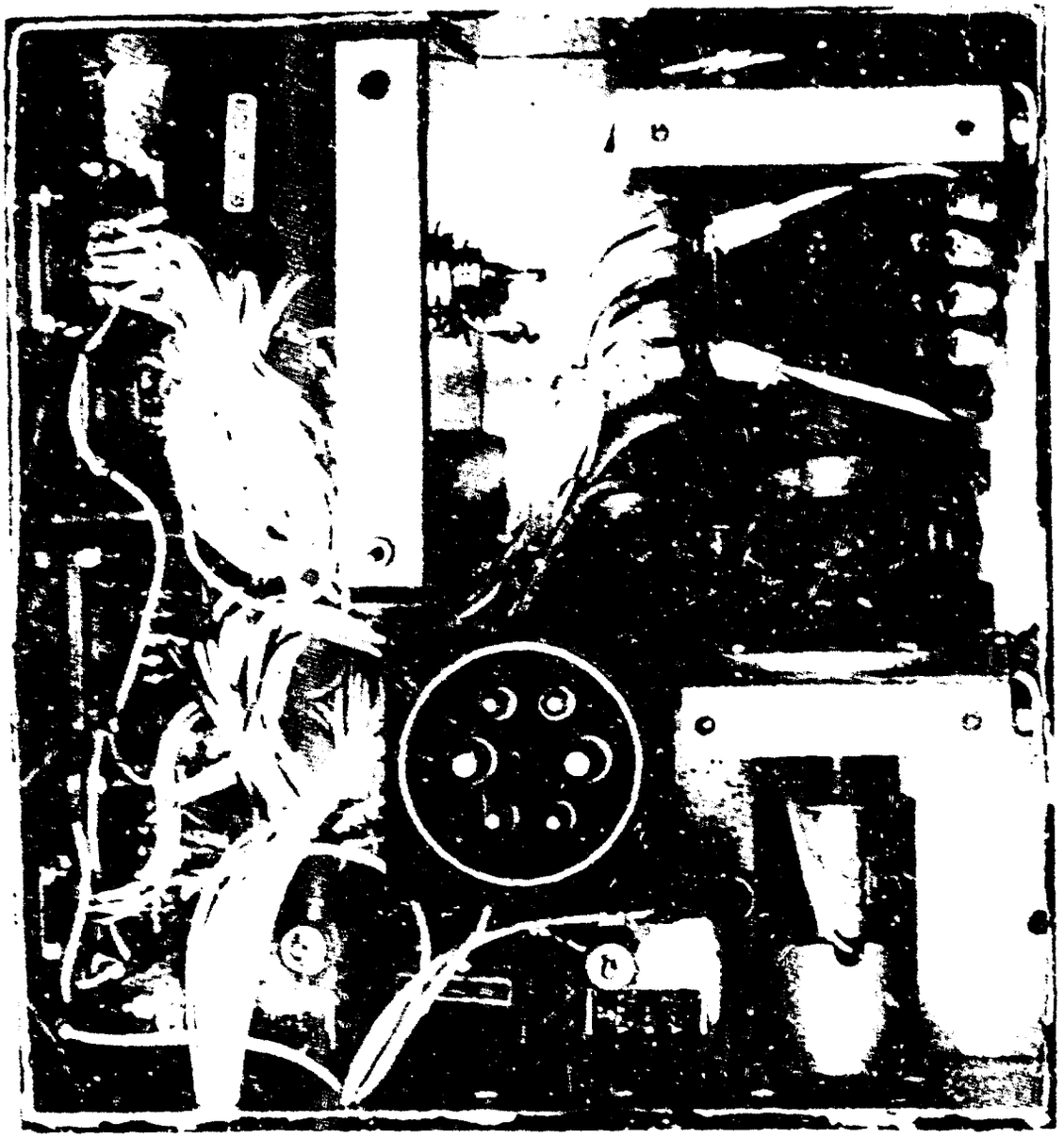
Best Available Copy



[illegible], P/N 9225-5811 ([illegible])
[illegible]

FIGURE 8

Best Available C



[illegible] CHANGE [illegible] SWITCH, P/N 27-[illegible]166-1
[illegible] INSTALL[illegible] (INSTRUMENTATION INCLUDED)

FIGURE 9

Best Available C