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AD 844 396



GENERAL REPORT SUMMARY SHEET

COMPONENT/PART NAME PER GENERIC CODE TRANSDUCERS-PRESSURE, GAS, VOLTAGE		2. PROGRAM OR WEAPON SYSTEM APOLLO		ACCESS. NO. C9550	
4. ORIGINATOR'S REPORT TITLE STEAM DUCT PRESSURE TRANSDUCER ECS ITEM 8.17		5. ORIGINATOR'S REPORT NO. DTD-191		3. DAY MO. YR. TEST COMPL. 1 68 REPT. COMPL. 18 1 68	
		6. TEST TYPE, ETC. DEVELOPMENT			

7. THIS TEST (SUPERSEDES) (SUPPLEMENTS) REPORT NO:

8. OUTLINE, TABLE OF CONTENTS, SUMMARY, OR EQUIVALENT DESCRIPTION:

MFGR: AIRESEARCH

The present Item 8.17 Steam Duct Pressure Transducer (P/N 837036-1) has been determined to be unacceptable because of its inability to maintain a stable calibration. A majority of the calibration shift problems have occurred during acceptance testing, but some units have been rejected after use in the field and during qual testing. The reasons for the shifts have been:

- . Mechanical instability of the sensing diaphragm.
- . Sensitivity to minor overpressurization of the sensing diaphragm.
- . Corrosion of the diaphragm and the "E" core pole pieces caused by the moisture of the pressure media.
- . Gain shifts caused by internal electronic instability.
- . Calibration changes caused by pressure inlet fitting torque.

Because of the basic design problems associated with this unit it was deemed impractical to attempt to modify this design to obtain an acceptable transducer.

AiResearch has undertaken an extensive survey of other transducer manufacturers in an attempt to find an acceptable replacement. Test samples were obtained from six manufacturers that were judged to have a workable approach to this problem. A developmental test program was initiated and tests were conducted on the new transducers. Preliminary results of this testing have been transmitted to North American Rockwell by AiResearch Report No. DTD-183, dated 16 October 1967. Since that report, developmental testing has continued, and the development test results on one transducer type are very encouraging. The transducer is manufactured by the Pace-Wiancko Division of the Whittaker Corporation, North Hollywood, Calif. The results of this testing have indicated that the Pace-Wiancko transducer will meet or exceed the requirements for this application. As a result of the encouraging test results on the Pace-Wiancko transducer, a EDCP will be submitted to incorporate this transducer into the ECS system. Testing, however, will continue on both the Pace-Wiancko and transducers from other suppliers.

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DEVELOPMENTAL DATA TRANSMITTAL
STEAM DUCT PRESSURE TRANSDUCER

ECS ITEM 8.17
NAR/SD PROJECT APOLLO
NAR P.O. MSJ7XAZ-450029A

Report No. DTD-191

18 January 1968

Prepared by R. E. Durham

Approved

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No. of Pages 84

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DEVELOPMENTAL DATA TRANSMITTAL
STEAM DUCT PRESSURE TRANSDUCER
ECS ITEM 8.17
NAR/SD PROJECT APOLLO
NAR P.O. M5J7XAZ-450029A

INTRODUCTION

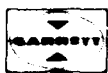
The present Item 8.17 Steam Duct Pressure Transducer (P/N 837036-1) has been determined to be unacceptable because of its inability to maintain a stable calibration. A majority of the calibration shift problems have occurred during acceptance testing, but some units have been rejected after use in the field and during qual testing. The reasons for the shifts have been:

- Mechanical instability of the sensing diaphragm.
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- Gain shifts caused by internal electronic instability.
- Calibration changes caused by pressure inlet fitting torque.

Because of the basic design problems associated with this unit it was deemed impractical to attempt to modify this design to obtain an acceptable transducer.

AIResearch has undertaken an extensive survey of other transducer manufacturers in an attempt to find an acceptable replacement. Test samples were obtained from six manufacturers that were judged to have a workable approach to this problem. A developmental test program was initiated and tests were conducted on the new transducers. Preliminary results of this testing have been transmitted to North American Rockwell by AIResearch Report No. DTD-183, dated 16 October 1967. Since that report, developmental testing has continued, and the development test results on one transducer type are very encouraging. The transducer is manufactured by the Pace-Wiancko Division of the Whittaker Corporation, North Hollywood, California. The results of this testing have indicated that the Pace-Wiancko transducer will meet or exceed the requirements for this application. As a result of the encouraging test results on the Pace-Wiancko transducer, a EDCP will be submitted to incorporate this transducer into the ECS system. Testing, however, will continue on both the Pace-Wiancko and transducers from other suppliers.

This report presents a summary of the development tests completed to date, on the Pace-Wiancko transducers. The testing was conducted from August 1967 through January 1968.



SUMMARY

Based on the successful completion of the developmental testing at this time a design decision has been made to submit an EDCP to incorporate the improved Pace-Wiancko into the steam duct pressure transducer application. This transducer is identified by Part Number 836706-2.

The decision is based on the results of the development tests and design investigations completed to this date on five test specimens. The Pace-Wiancko design incorporates a stretched diaphragm that has proved to be exceptionally stable during pressure cycling tests. No major problems were encountered either with moisture or electronic instability. The transducer is insensitive to fitting torque since the pressure fitting is installed with a torque of 150 lb-in. and securely locked with a set screw.

To further increase the confidence level in this design, development tests are continuing. Further tests will include water testing, corrosive contaminate oxygen-humidity testing (COH), continued steam environment testing and disassembly.

TEST SPECIMENS

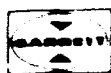
Five development test transducers were obtained from Pace-Wiancko for this testing. The units are identified by the following serial and part numbers:

<u>Serial No.</u>	<u>Part Number</u>
22319	837036-2
22320	837036-2
22321	837036-2
22322	837036-2
22323	836706-2*

Initial delivery was taken on Part No. 837036-2 Serial Nos. 22319 through 22322, and testing was started. Tests on those units indicated that some design changes were desirable in order to improve the transducer stability. The design changes as discussed later in this report were:

1. Modification of the "E" core magnetic circuit to reduce magnetic circuit leakage.
2. Increased the diaphragm movement from approximately 0.0005 to 0.001 inch.
3. Improved pressure fitting installation procedure.
4. EMI filtering to meet SS-1313-R, Rev. 1 requirements.
5. Modification of sensing chamber to provide more space for possible contamination.
6. Improved case sealing: silicone adhesive instead of a gasket.

* Purchased as an 836706-1, but updated to an 836706-2 configuration with exception of improved electronic package sealing.



6. Improved case sealing: silicone adhesive instead of a gasket.

These changes have been incorporated into transducer S/N 22323, except for the improved case seal. The improved transducer design has been reidentified by Part Number 836706-2. Two transducers (S/N 22321 and 22322) are presently being reworked to incorporate the change. In other words, all of the tests included in this report were done on the initial configuration except for the tests conducted on unit S/N 22323, which had been revised to the new configuration.

The transducer has a double "E" core/diaphragm type pressure sensing element. The "E" cores are hermetically sealed under inconel covers. The case halves are made from passivated 416 type stainless steel, and the sensing diaphragm is made from 410 type stainless steel. To obtain a high degree of dimensional stability, the diaphragm is prestretched. This operation allows the diaphragm to be subjected to a considerable overpressure without calibration shift.

TEST DESCRIPTIONS

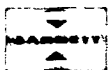
Five transducers were evaluated during this program. For clarity of presentation, the development tests and activities will be discussed separately for each transducer and not in the sequence in which the tests were done. Table 1 presents a summary of the tests completed to date on each test specimen. As shown on Table 1, a major portion of the test program has been completed on this unit. At the present time, the test program is continuing and the S/N 22323 is currently undergoing a water test. Future tests scheduled include further steam endurance testing where the transducer is operated while mounted on a steam generator, a corrosive contaminate oxygen-humidity test, and final disassembly inspection of the transducers.

Transducer 837036-2, S/N 22319 Testing

The S/N 22319 transducer was received from Pace-Wiancko and subjected to an initial calibration test. The results of this test and the results of the calibration test conducted by Pace-Wiancko are presented on Figure 1. The calibrations were quite similar and well within the ± 200 mv acceptable limit.

1. Pressure Cycling

Following the initial calibration test the transducer was subjected to 20,000 working pressure cycles between 0.05 and 0.30 psia. Calibration checks were conducted at intervals during this test. The results of these intermediate calibration checks are presented on Figure 2. Although the transducer appears to be out of calibration at the 4,750 cycle calibration, test equipment error is suspected to have caused these high readings. A post calibration test showed that the transducer was within the allowable tolerances. The results of this test are presented on Figure 3.



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A pressure test was conducted by subjecting the transducer to 500 pressure cycles between approximately 0 and 14.7 psia. Following this test the transducer remained within calibration limits as shown by Curve 1 of Figure 4.

2. Extreme Temperature Test

Following the pressure testing the transducer was tested for calibration at the extreme temperatures of 0, 150 and 200°F. Room temperature calibration checks were made after the 0 and 200°F extremes. The results of this testing are presented on Figure 4.

3. Water Test

The transducer was then subjected to a water test. The sensing cavity of the transducer was filled with tap water, drained and allowed to stand at room temperature for a five day period. Tap water was used for this test in order to simulate to some degree the contaminants that may be present in waste water. However, as found by later analysis, the contamination level of tap water is excessive.

Following the five day storage period, the transducer was subjected to a calibration test. The results of that test are presented on Figure 5. The transducer was found to exceed the 4 percent maximum allowable calibration shift below approximately .175 psia.

As a result of this out of tolerance operation, the transducer was disassembled and examined. The sensing chamber was found to contain brown deposits on the diaphragm as shown on Figure 6.

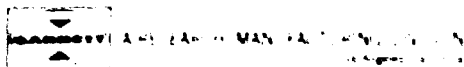
Chemical analysis showed that the contamination did not originate within the transducer. The contamination was apparently deposits caused by the tap water. It was concluded that the calibration shift was caused by the deposition of contaminants between the pole pieces and the diaphragm while stored at room pressure. As the pressure was decreased the deposition tended to inhibit movement of the diaphragm to the low pressure position. This resulted in a positive shift of the transducer calibration.

It should be pointed out that this test is felt to be too severe because of the excessive contamination contained in tap water. This test is presently being repeated with distilled water which provides more realistic conditions.

Transducer 837036-2, S/N 22320 Testing

Following receipt of this transducer a calibration test was conducted to insure that the unit was within acceptable limits. The results of this test are presented on Figure 7.

The transducer was subjected to an ATP test per ATP SS-1759-R, ICM F. The data sheets from this test (Figure 8) show that the unit met the requirements and was acceptable.



1. Evaporator Steam Duct Test

The transducer was installed in the steam duct of an evaporator being used in a subsystem test. The transducer successfully sensed low-pressure steam pressure for a period of 282 hours. Intermediate calibration tests showed that the unit was functioning successfully (see Figure 9). Following the 282 hour exposure, the transducer was removed and subjected to a ATP test. The data sheets are presented on Figure 10.

2. Temperature Test per SS-1625-R

The transducer was installed into a test setup and subjected to the temperature profile as shown on Figure 11. No damage or degradation was observed as a result of this test. The post-test calibration data sheet is shown on Figure 12.

3. Vibration Test per SS-1560-R

The transducer was installed into a vibration fixture and supplied pressure of approximately 8 mm Hg A. Photographs of the setup in each axis are shown on Figure 13. The transducer was subjected to random vibration inputs simulating launch, flight and high Q abort conditions. The inputs are presented on Figure 14. Data traces during vibration in the three axes are presented on Figure 15. The results of a post calibration test, conducted following vibration, are presented on Figure 16. The calibration showed that the transducer was within nominal requirements.

4. Shock Test per SS-1560-R

The transducer was subjected to a 78G shock test through the X+ axis. A photograph of the test setup is shown on Figure 17. The test was conducted at the Ogden Technology Laboratories, Inc., and their report is presented on Figure 18. A photograph of the shock calibration and impact shock trace is presented on Figure 19. A post test calibration check is presented on Figure 20. The transducer was within the required calibration limits.

5. Steam Endurance Test

A low pressure steam fixture was constructed to simulate the ECU evaporator steam environment in the pressure range between 5 and 10 mm Hg A. The fixture was capable of mounting up to eight transducers at one time, and could therefore expedite specimen exposures. The transducer was mounted on the fixture and was exposed to steam on a 24 hour a day basis. Performance was monitored on a continuous strip recording and was continuously within the nominal requirements. The transducers remained on the steam fixture in excess of 15 days, and a total of 360 hours were accumulated. Combining these hours with those accumulated on the previous evaporator steam test a total of 642 hours of life test cycles have been accumulated on this transducer.

6. Magnetic Field Effects

To determine the effect of a magnetic environment on the transducer operation, the transducer was mounted into a test setup and subjected to a magnetic field of 5 gauss. A calibration test was run at 0, 25, 50, 75, and 100 percent full scale, and at each level the magnetic field was changed from 0 to 5 to 0 gauss. A photograph of the test setup is shown on Figure 21. A data trace of this test is presented on Figure 22. The magnetic field resulted in no preceptable change in calibration at any level.

7. Attitude Test

An attitude test was performed to determine if the transducer is sensitive to any mounting attitude. The unit was pressurized to specific pressure levels within the calibration range. At each pressure level the transducer was calibration tested in both a + and - direction in the X, Y and Z axis. The results of this test are presented on Figure 23. No detrimental effects were observed and the unit was within calibration limits in all attitudes.

This transducer is presently awaiting further tests.

Transducer 837036-2, S/N 22321 Testing

After receipt of this transducer an ATP test was conducted per SS-1759-R, ICN F. The results of this test are presented on Figure 24. The transducer was out of calibration at the lower pressures. The transducer was returned to the supplier and a transformer was replaced, however, the calibration was still out of tolerance. A decision was made to retain this unit at AIREsearch for development of the EMI filters since testing with S/N 22322 had revealed that the transducer did not meet the RF conducted susceptibility requirements. Discussion of that test is presented later in this report. Later failure analysis was to show that the shift was caused by a magnetic leakage problem.

1. EMI Test per SS-1313-R, Rev. 1

The transducers was modified with three separate EMI filter systems based on the findings from the EMI tests on transducer S/N 22322. The final fix was successful, and the test report from Genisco Technology Corporation is included in Appendix A of this report.

2. Modification

Following the successful completion of the EMI test the unit was returned to the supplier for failure investigation and modification. The failure report is presented on Figure 25. The failure report shows that a basic design modification was necessary to improve the transducer magnetic circuit design. The transducer is presently at the supplier being modified to the improved design and with other changes necessary to bring the transducer to the P/N 836706-2 configuration.



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Transducer 837036-2, S/N 22322

Following receipt of this transducer from the supplier, a calibration check showed the transducer was acceptable. The calibration data is presented on Figure 26.

1. Evaporator Steam Duct Test

Following the initial calibration test, the unit was installed in the steam duct used for system testing. A total of 167 hours were accumulated in this test setup. Following this test an ATP was completed and is presented on Figure 27.

2. EMI Test Per SS-1313-R, Rev. 1

The transducer was sent to Genisco Technology Corporation for EMI testing. As mentioned previously, the EMI was found to exceed the RF conducted susceptibility requirements. The data sheet from that test is presented on Figure 28. As a result of this test a filter system was developed that corrected the problem. The complete EMI test on transducer S/N 22321 is presented in Appendix A.

3. Steam Endurance Test

Following the EMI test the transducer was installed in the steam generator test fixture as previously described. The unit was functionally subjected to the steam environment for 216 hours or approximately 9 days. At this time the unit was removed from the steam fixture and subjected to an ATP checkout. The transducer exceeded the minimum allowable tolerance at all but the highest test pressure. The data sheets are presented on Figure 29. The unit was returned to the supplier and the sensing cavity was opened. No evidence of either corrosion or contamination was found. The transducer was given a detailed failure analysis.

4. Modification

As shown on Figure 25 the calibration shift was caused by the magnetic path problem as previously discussed. The calibration shift of both this transducer and transducer S/N 22321 are attributed to the same cause. This transducer is presently being updated to the 836706-2 configuration that eliminates magnetic flux leakage as discussed in Figure 25.

Transducer 836706-2, S/N 22323 Testing

This transducer configuration is revised to include the fixes determined to be necessary during the previous tests. The unit, however, did not incorporate a silicone adhesive for improved cover and electrical connector to case sealing. A gasket was used for this unit. The gasket is not considered to be a sufficient moisture barrier and the use of the silicone adhesive will ensure a positive seal.



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1. Extreme Temperature Test

Before the start of this test, to check the repeatability of the transducer, two calibrations were made 24 hours apart. As shown on Figure 30 the two calibrations were very close. Three of the calibration points on the second calibration check were made following a proof pressure of 22.5 psia. This test illustrates the high pressure margin and the excellent stability of this transducer.

The transducer was then subjected to temperature extremes at 0, 150, and 200°F with intermediate room temperature calibration checks. These results are also shown on Figure 30. The calibration was well within the nominal range for all these tests.

2. Pressure Cycling Test

Following the temperature cycling test, the transducer was subjected to 20,000 working pressure cycles and 500 ambient range pressure cycles. Working pressure cycles were between 0.05 and 0.30 psia and ambient range cycles were between 0 and 14.7 psia. The results of the calibration check following this test were well within the acceptable limits (in a band of $\pm 1.5\%$) and are shown on Figure 30.

3. Steam Endurance Test

The transducer was installed in the continuous steam generator and functionally subjected to 360 hours or over 15 days exposure. Following this exposure the unit was subjected to a post-test ATP calibration check. The data sheets, Figure 31 show the unit was within the nominal tolerances.

4. Water Test

The water soak test is presently in progress on this transducer. At this time the transducer has completed three out of four of the projected water soak cycles.

For this test, the transducer sense chamber is vacuum filled with distilled water and allowed to stand for approximately 48 hours. The water is then removed by heating to 150°F in a vacuum. The transducer is then checked for calibration shift.

Four water soak cycles as described above, are planned for this test. Three cycles are complete and the results are presented in the following figures:

<u>Figure</u>	<u>Calibration</u>
32	After first soak
33	After second soak
34	After third soak

The transducer is presently in its fourth and last cycle. As shown by the data sheets, the calibration has remained within acceptable limits.



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CONCLUSIONS AND RECOMMENDATIONS

Based on the encouraging results of the testing completed to date, AIREsearch has decided to submit an EDCP for the incorporation of the P/N 836706-2 Pace-Wiancko transducer in the Item 8.17 steam duct pressure application. At this time the transducer has proved its ability to retain a calibration within the required tolerance range.

The problems experienced with unit Serial Numbers 22321 and 22322 have apparently been successfully resolved by the changes incorporated for the 836706-2 configuration. The transducer, revised to that configuration, has been shown to remain stable and well within the required tolerance range.

The water soak tests, conducted on the new configuration, have not shown any indication of the extreme calibration drift that was experienced on the S/N 22319 transducer. This further supports the conclusion that the impurities contained in the tap water were a contributing cause of that calibration change.

The upward shift of the transducer output experienced on S/N 22321 and 22322 was attributed to an undesirable feature of the transducer magnetic circuit. The revised configuration, S/N 22323 incorporates an Inconel ring around the "E" core which provides a high reluctance path between the "E" core and the magnetically permeable stainless steel case half. In the previous design, magnetic leakage through the case half formed a part of the path through the diaphragm and back to the "E" core. This leakage path plus minute shifts within the "E" core assembly were the cause of the calibration shifts. The inconel ring used in the new design provides a high reluctance path that attenuates case half leakage and reduces the transducer sensitivity to these minute shifts within the "E" core assembly. The sensor output is increased by an appreciable factor because of the resulting magnetic field concentration. The output was further increased by increasing the diaphragm movement from 0.0005 to 0.001 inch.

This approach has been used as a fix for a similar instability problem experienced on a ΔP transducer for the Grumman LEM application. According to Pace-Wiancko that unit has been successfully qualified.

The transducer initially had an EMI problem having exceeded required limits in the radio frequency conducted susceptibility test. This problem was resolved by inclusion of an improved EMI filter system.

To further prove the integrity of the 836706-2 configuration, the development tests are continuing and will include further functional steam testing, corrosive contaminate oxygen-humidity testing, and disassembly inspection of the units following the test program.

TABLE I

PACE-WIANCKO TRANSDUCER
DEVELOPMENT TEST HISTORY

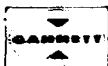
Inclusive Test Dates	Test	Remarks	Applicable Figure No.
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Part Number 837036-2, S/N 22319

1 to 30 Aug 1967	Initial Calibration Test	Passed	1
	Pressure Cycling Test	20,000 working pressure cycles, calibration test, and 500 ambient range cycles: Passed	2, 3, and 4
	Extreme Temperature Test	Calibration at 0, 150, and 200°F: Passed	4
	Water Test	Filled sense cavity with tap water and soaked for 5 days	-
	Calibration Test	Out of allowable calibration tolerance	5
	Disassembly	Contamination found in sensing chamber--unit scrapped	

Part Number 837036-2, S/N 22320

10 Sept. 1967 to 3 Jan 1968	Initial Calibration Test	Passed	7
	ATP per SS-1759-R, ICN-F	Passed	8
	Evaporator Steam Duct Test	Ran a total of 282 hours under system test conditions. Passed two intermediate calibration tests	9
	ATP per SS-1759-R, ICN-F	Passed	10
	Temperature Test per SS-1625-R	Passed this test and post-test calibration check	11, 12
	Vibration Test per SS-1625-R	Vibration in 3 axes at launch flight and high Q abort	15
	Calibration Test	Passed	16
	Shock Test per SS-1560-R	78G shock in the X axis	19



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TABLE I (Continued)

Inclusive Test Dates	Test	Remarks	Applicable Figure No.
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Part Number 837036-2, S/N 22320 (Continued)

	Calibration Test	Passed	20
	Steam Endurance Test	Ran a total of 360 hours on a steam generator. Unit operated within tolerance requirements	-
	Magnetic Field Effects Test	Exposed to a 0 to 5 gauss magnetic field to determine the effect on calibration. Passed with no preceptable effect	22
	Attitude	Determined the effect of attitude on calibration. Operation was within tolerance limits	23

Part Number 837036-2, S/N 22321

28 Oct 1967 to present	ATP per SS-1759-R, ICN-F	Out of calibration tolerance limit. Returned to supplier. Unit not repaired--Returned to AIRsearch for EMI tests	24
	EMI Test per SS-1313-R, Revision 1	Transducer used to develop EMI filter system. Passed subsequent EMI test following modification	Appendix A
	Modification	Returned to supplier for failure analysis and modification to 836706-2 configuration	25

Part Number 837036-2, S/N 22322

4 Oct 1967 to present	Evaporator Steam Duct Test	Ran a total of 167 hours under system test conditions	-
	ATP per SS-1759-R, ICN-F	Passed	27
	EMI Test per SS-1313-R, Revision 1	Did not pass RF conducted test. The required filtering was developed using S/N 22321	28



TABLE I (Continued)

Inclusive Test Dates	Test	Remarks	Applicable Figure No.
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Part Number 837036-2, S/N 22322 (Continued)

	Steam Endurance Test	Ran a total of 216 hours on a steam generator. Unit was out of calibration on a subsequent ATP test.	29
	Modification	Returned transducer to supplier--opened chamber no contamination or corrosion noticed. Failure analysis conducted and unit is now being modified to 836706-2 configuration.	25

Part Number 836706-2*, S/N 22323

16 Nov 1967 to present	Initial Calibration	Passed	30
	Extreme Temperature Test	Passed	30
	Pressure Cycling Test	20,000 working cycles and 500 ambient range cycles	30
	Steam Endurance Test	Ran a total of 360 hours on a steam generator. Unit was within tolerance on a subsequent ATP	31
	Water Test	Filled sensing cavity with distilled water. Presently in fourth water soak	32, 33, and 34

* This transducer did not incorporate the silicone adhesive case sealing of this configuration, otherwise it is identical.



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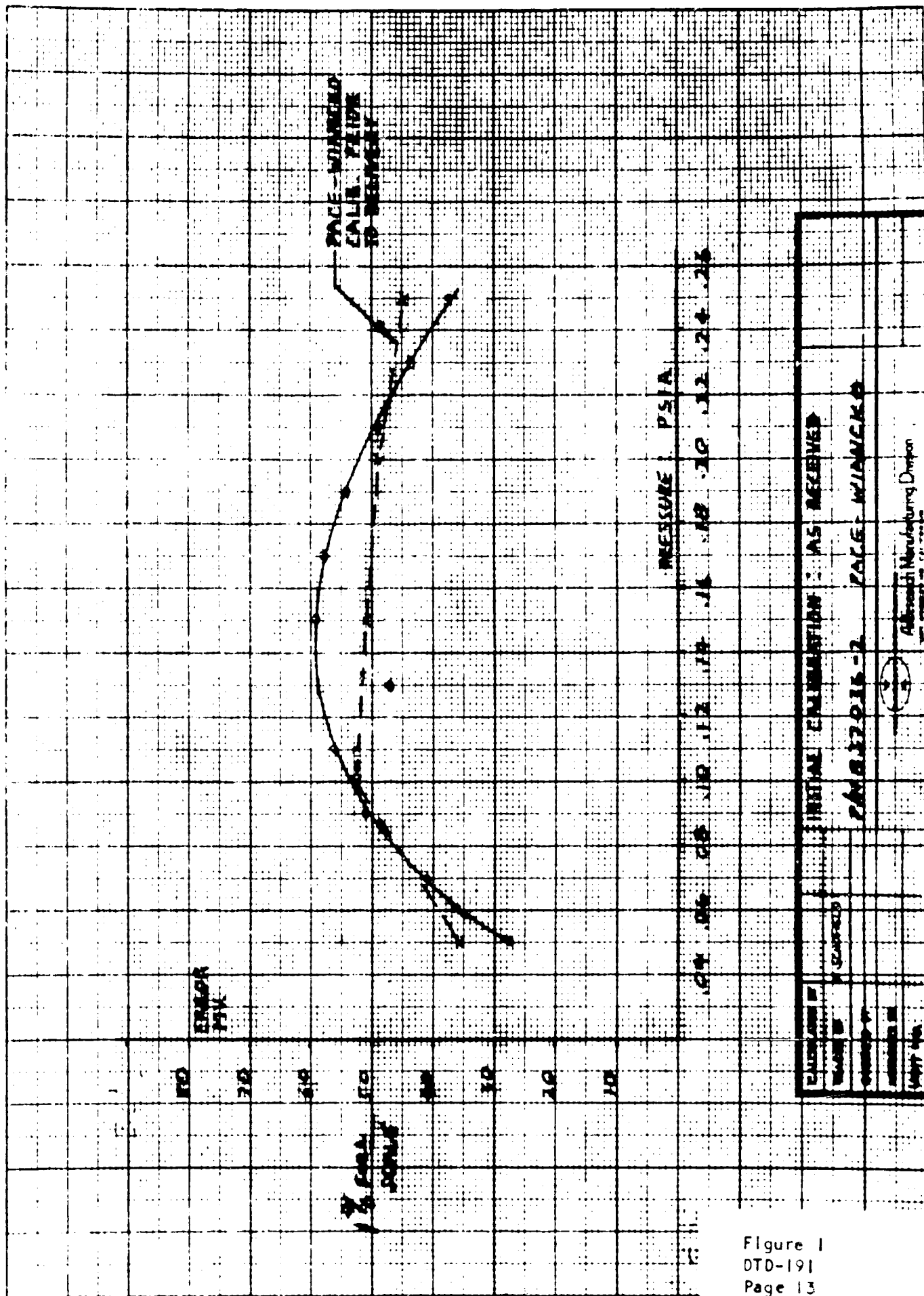


Figure 1
OTD-191
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DEVELOPMENT TEST
DATA SHEET

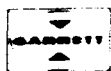
P/N 837036-2 S/N 22319

PRESSURE CYCLE TEST

PRESSURE RANGE .05 - .30 PSIA

CYCLES IN THOUSANDS	PRESSURE		OUTPUT - VOLTS			DATE
	PSIA	INS. Hg. A	NOMINAL	READ	ERROR MV	
4,750	.05	.10180	0	.092	+ 92	8-4-67
	.15	.30541	2.5	2.588	+ 188	
	.25	.50903	5.0	5.218	+ 218	
6,000	.05	.10180	0	.048	+ 48	8-4-67
	.15	.30541	2.5	2.608	+ 108	
	.25	.50903	5.0	5.073	+ 73	
7,002	.05	.10180	0	0.055	+ 55	8-5-67
	.15	.30541	2.5	2.586	+ 86	
	.25	.50903	5.0	5.048	+ 48	
8,000	.05	.10180	0	0.058	+ 58	8-5-67
	.15	.30541	2.5	2.588	+ 88	
	.25	.50903	5.0	5.050	+ 50	
10,000	.05	.10180	0	.059	+ 59	8-5-67
	.15	.30541	2.5	2.590	+ 90	
	.25	.50903	5.0	5.049	+ 49	
15,145	.05	.10180	0	0.0558	+ 55.8	8-7-67
	.15	.30541	2.5	2.577	+ 77	
	.25	.50903	5.0	5.028	+ 28	
20,000	.05	.10180	0	0.047	+ 47	8-8-67
	.15	.30541	2.5	2.572	+ 72	
	.25	.50903	5.0	5.029	+ 29	

CALIBRATED BY: NORM SCHOFIELD



P/N 837036-2 S/N 22319
(MFD BY PACE-WIANCKO)

AFTER 20,000 SMALL RANGE CYCLES
BEFORE 500 PROOF PRESS. CYCLES

PSIA	In. Hg A	OUTPUT - VOLTS		
		NOMINAL	INC.	INC. ERROR
.05	.10180	0	0.039	+ 39
.07	.14253	0.50		
.09	.18325	1.0	1.055	+ 55
.11	.22397	1.5		
.13	.26469	2.0	2.057	+ 57
.15	.30541	2.5		
.17	.34614	3.0	3.062	+ 62
.19	.38686	3.5		
.21	.42758	4.0	4.045	+ 45
.23	.46830	4.5		
.25	.50903	5.0	5.022	+ 22

CALIBRATED BY: KEN WILKEN

ERRORS
MV. 7.41

TEST MECHANISM REFERENCE LISTED

- 1 — ROOM TEMP. AND 100 PSIA
- 2 — 100 PSIA
- 3 — ROOM TEMP
- 4 — 150°F
- 5 — 200°F
- 6 — ROOM TEMP

140

120

100 2%

80

60

40

20

PSIA

0.5

1.0

1.5

2.0

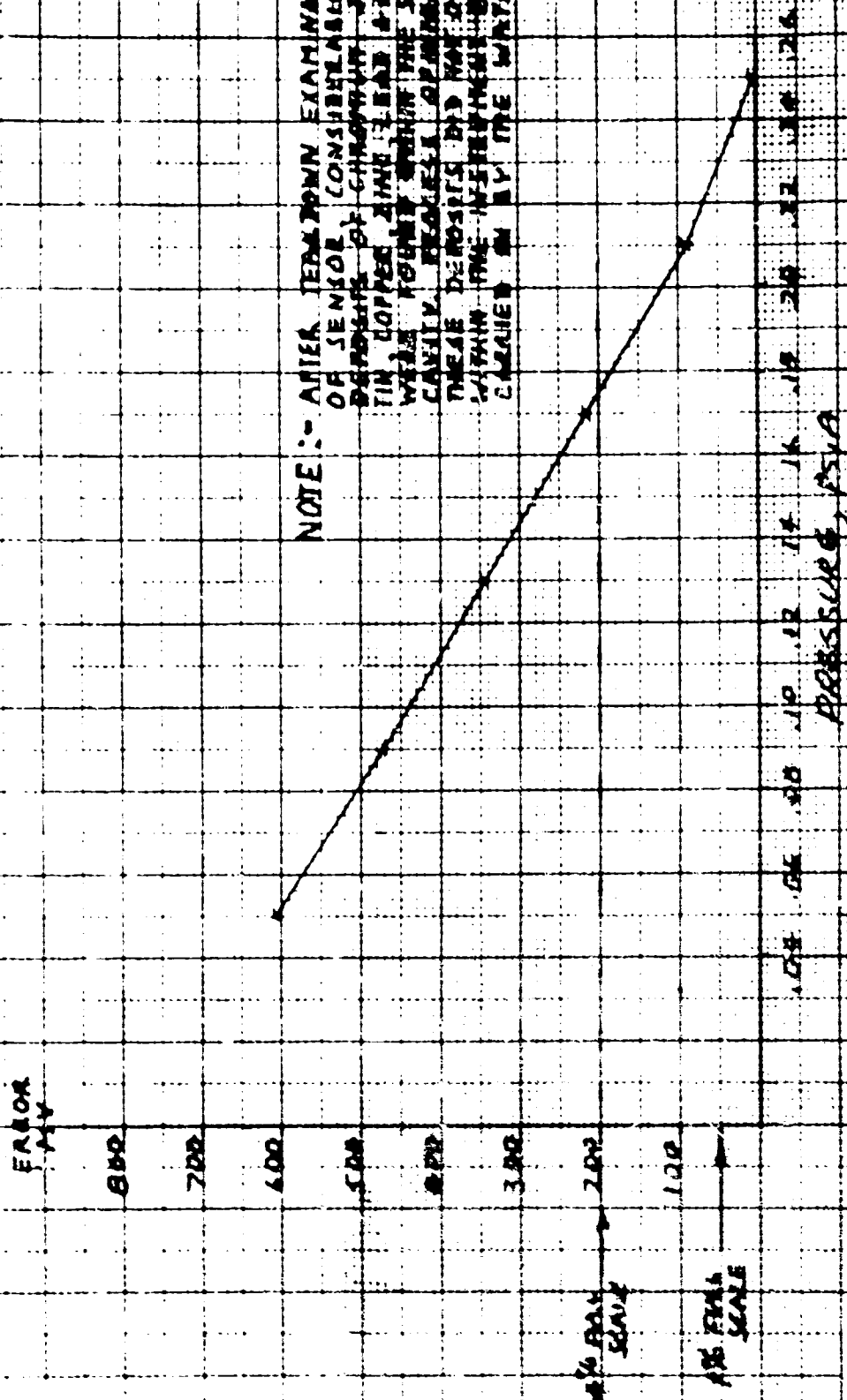
2.5

EXTREME TEMP TEST

Approved Manufacturing Division
and Testing of Materials

DATE OF
TEST
BY
TESTER
APPROVED BY
DATE

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RECEIVED IN	FINAL EVALUATION AFTER TRAINING WITH
TRAINING IN	TECHNIQUES FOR 5 DAYS
CLASSIFIED BY	P/N 8320336-2
APPROVED BY	PAE-MSB/MLG
DATE	APPROVED BY: [Signature] DATE: 11/11/03
	APPROVED BY: [Signature] DATE: 11/11/03

Figure 5
DIO-19
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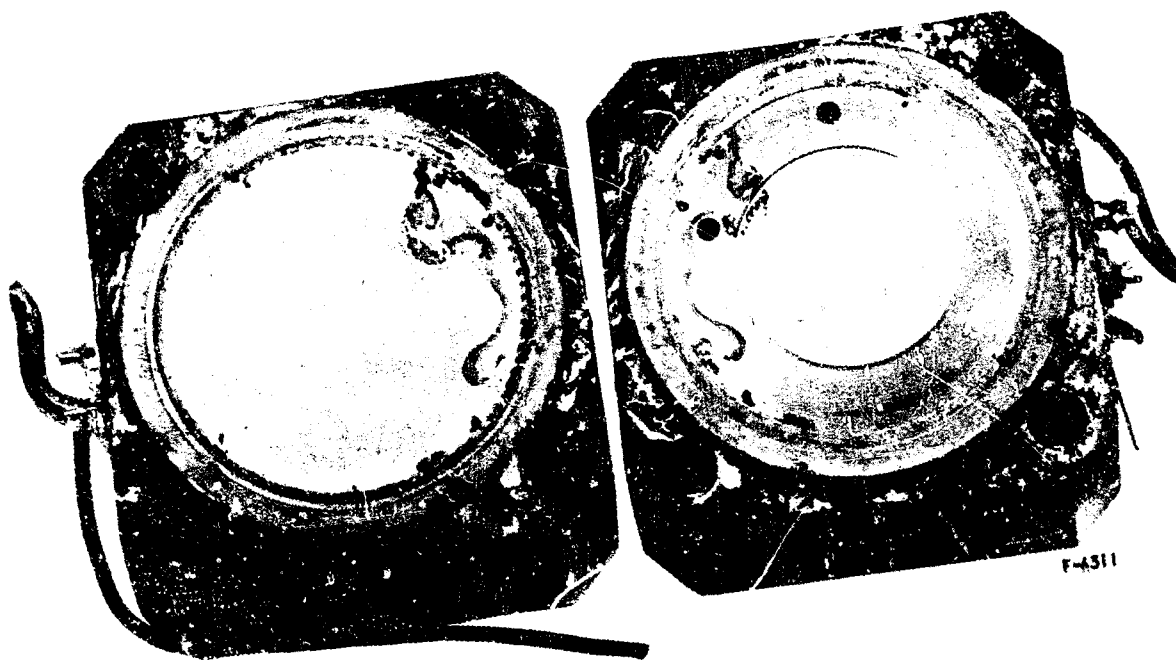


Figure 6. Transducer Disassembly Showing
Deposits: P/N 837036-2, S/N 22319



AIRSEARCH MANUFACTURING DIVISION
Los Angeles, California

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DATE: 10 Sept 67

DEVELOPMENT TEST
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P/N 837036-2 S/N 22320
(MFD BY PACE-WIANCKO)

INITIAL ACCURACY TEST

MM Hg.	OUTPUT - VOLTS				
	PSIA	INS. Hg. A	NOMINAL	ACTUAL	ERROR, mv
2.58	.05	.10180	0	+ .032	+.32
3.62	.07	.14253	0.50	.543	+.43
4.65	.09	.18325	1.0	1.049	+ 49
5.69	.11	.22397	1.5	1.553	+ 53
6.72	.13	.26469	2.0	2.056	+ 56
7.75	.15	.30541	2.5	2.557	+ 57
8.79	.17	.34614	3.0	3.058	+ 58
9.82	.19	.38686	3.5	3.557	+ 57
10.86	.21	.42758	4.0	4.056	+ 56
11.89	.23	.46830	4.5	4.555	+ 55
12.92	.25	.50903	5.0	5.053	+ 53

CALIBRATED BY: N. SCHOFIELD



AIRSEARCH MANUFACTURING DIVISION
Los Angeles, California

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Interim Change Notice Letter: F
ATP No.: SS-1759-R
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ACCEPTANCE TEST
DATA SHEET

Use black ink. No
erasures permitted.

STEAM DUCT PRESSURE TRANSDUCER 837036-2

NAA REF. SPEC. ME 1 NASA

Part Number 837036-2 S/N 2.2.320

Date 9-13-67 Barometer 29.9 In. Hg abs Amb Temp 75 °F

Tested by A Cunningham Test Facility 1402

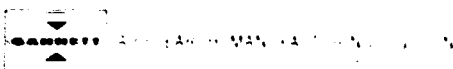
Examination of Product: Accept Reject

Remarks: FWO-3404-20017-62-2153

Dimensional Check Verified:

Para. 4.6 Calibration Test (Prior To Proof Pressure Test) Accept 9-13-67 Reject 12-11-67

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+28.0 ±0.5	+28.0
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	+0.0740
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.2601
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.601
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref 75% of range	vdc	+3.7500 ±0.2000	+3.8530
Specimen pressure	mm Hg abs	12.929	12.929
Output voltage, Ref 100% of range	vdc	+5.0000 ±0.2000	+5.1010
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref. 75% of range	vdc	+3.7500 ±0.2000	+3.8521
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.6000
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.3362
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	+0.0632



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ACCEPTANCE TEST DATA SHEET (CONT)
STEAM DUCT PRESSURE TRANSDUCER 837086-2

P/N 838036-2
S/N 22320

NAA REF. SPEC. ME NASA

Proof Pressure Test (Nitrogen Gas Test Fluid): Accept ⁴⁻¹³⁻⁶⁷ 32113 Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen pressure	psig	20.0 +0.2, -0	20.0
Time at pressure	minutes	3	3

External Leakage Test (Nitrogen Gas Test Fluid): Accept ⁴⁻¹³⁻⁶⁷ 32113 Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen pressure	psig	6.0 +0.2, -0	6.0
Time at pressure	minutes	15	15
External leakage in 15 minutes	scc	0.5 max	0.0

Diode Test: Accept ⁴⁻¹³⁻⁶⁷ 32113 Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+30.0 ±0.1	+30.0
Diode voltage (SWI at pos 2)	vdc	+1.0 max	0.0
Diode voltage (SWI at pos 1)	vdc	+1.0 max	0.0

Maximum Output Voltage Test: Accept ⁴⁻¹³⁻⁶⁷ 32113 Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen output voltage	vdc	+6.5 max	+6.27



AND LABORATORY MANUFACTURING

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ACCEPTANCE TEST DATA SHEET (CONT)
STEAM DUCT PRESSURE TRANSDUCER 83/036-2

P/N 837036 2
S/N 2 2 2 2 0

NAA REF. SPEC. ME NASA

Input Current Test:

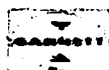
Accept 32113 Reject 9-13-67

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Input current (SWI at pos 1)	ma	40 max	20
Input current (SWI at pos 2)	ma	40 max	20

Calibration Test:

Accept 32113 Reject 9-13-67

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+28.0 $\pm$ 0.5	+28.0
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 $\pm$ 0.2000	+0.0682
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 $\pm$ 0.2000	+1.3410
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 $\pm$ 0.2000	+2.6030
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref 75% of range	vdc	+3.7500 $\pm$ 0.2000	+3.8570
Specimen pressure	mm Hg abs	12.929	12.929
Output voltage, Ref 100% of range	vdc	+5.0000 $\pm$ 0.2000	+5.1060
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref. 75% of range	vdc	+3.7500 $\pm$ 0.2000	+3.8626
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 $\pm$ 0.2000	+2.6066
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 $\pm$ 0.2000	+1.3420
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 $\pm$ 0.2000	+0.0626



RESEARCH MANUFACTURING DIVISION
U.S. AIR FORCE

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ACCEPTANCE TEST DATA SHEET (CONT)
 STEAM DUCT PRESSURE TRANSDUCER 837036-2

P/N 837036-2
 S/N 22320

NAA REF. SPEC. ME NASA

Calibration Test (cont)

STEP	TEST PARAMETER	UNITS	REQUIRED	ACTUAL
9c	Specimen pressure	mm Hg abs	5.171	5.171
	Output voltage	vdc	+1.2500 ±0.2000	+1.3450
11f	Pressure (PS2)	In. Hg abs	1.0 ±0.5	1.0
11g	Output voltage	vdc	+1.2500 ±0.2000	+1.3430
11h	Specimen pressure	mm Hg abs	5.171	5.171
13b	(1) Specimen pressure	mm Hg abs	5.171	5.171
	(2) Output voltage	vdc	+1.2500 ±0.2000	+1.3410
	(3) Pressure PS2	In. Hg abs	1.0 ±0.5	1.0
	(4) Time at test	hours	3	3

Input Voltage Variation Test:

Accept 32113 Reject 9-1367

INLET PRESSURE (mm Hg abs)		INPUT VOLTAGE (vdc)		OUTPUT VOLTAGE (vdc)	
REQUIRED	ACTUAL	REQUIRED	ACTUAL	REQUIRED	ACTUAL
2.586	2.586	+25.0 ±0.1	+25.0	0.0000 ±0.2000	+0.0580
	2.586	+30.0 ±0.1	+30.0	0.0000 ±0.2000	+0.0580
12.929	12.929	+25.0 ±0.1	+25.0	+5.0000 ±0.2000	+5.073
	12.929	+30.0 ±0.1	+30.0	+5.0000 ±0.2000	+5.072

Output Ripple Test:

Accept 32113 Reject 9-1367

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Output ripple voltage	mv rms	10 max	1.8

Isolation Resistance Test:

Accept 32113 Reject 9-1367

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Potential	vdc	100	100
Resistance	megohms	100 min	5.8 x 10 ⁵

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ACCEPTANCE TEST DATA SHEET (CONT)
STEAM DUCT PRESSURE TRANSDUCER 837036-2

P/N 837036-2
S/N 22320

NAA REF. SPEC. ME _____ NASA _____

Insulation Resistance Test:

9-13-67
Accept 32113 Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Potential	V _{dc}	100	100
Resistance	megohms	50 min	1×10^5

Weight: _____ lb.

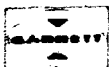
Remarks: _____

Test Specimen Status:

Accept _____ Reject _____

By _____

Inspection: AIRsearch Q.C. NAA Q.C. DCAS-QAR



2000年12月29日

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DEVELOPMENT TEST
DATA SHEET

P/N 837036-2 S/N 22320
(MFD BY PACE-WIANCKO)

		OUTPUT - VOLTS			
PSIA	INS.Hg.A	NOMINAL	INITIAL ACCURACY AS RECEIVED 9-10-67	65 HOURS SYSTEM TEST INC. 5 START-RUN AND SHUT-DOWN CYCLES 9-25-67	174 HOURS TOTAL SYSTEM TEST INC. 15 START-RUN AND SHUT-DOWN CYCLES 10-11-67
.05	.10180	0	+ .032	+ .038	+ .048
.07	.14253	0.50	.543		
.09	.18325	1.0	1.049	1.055	1.060
.11	.22397	1.5	1.553		
.13	.26469	2.0	2.056	2.056	2.056
.15	.30541	2.5	2.557		
.17	.34614	3.0	3.058	3.051	3.064
.19	.38686	3.5	3.557		
.21	.42758	4.0	4.056	4.044	4.054
.23	.46830	4.5	4.555		
.25	.50903	5.0	5.053	5.034	5.036

CALIBRATED BY: N. SCHOFIELD

Interim Change Notice Letter: F
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ACCEPTANCE TEST
DATA SHEET

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STEAM DUCT PRESSURE TRANSDUCER 837036-2-1

NAA REF. SPEC. ME NASA 0040000 22320

Part Number 837036-2-1 S/N 22320

Date 10-28-67 Barometer 29.9 In. Hg abs Amb Temp 74 °F

Tested by A Cunningham Test Facility 1402

Examination of Product: Accept Reject

Remarks: FWO 3404-200117-69-2154

Dimensional Check Verified:

Para. 4.6 Calibration Test (Prior To Proof Pressure Test) Accept 32113 Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+28.0 ±0.5	+28.0
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	+0.0160
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.2520
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.4750
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref 75% of range	vdc	+3.7500 ±0.2000	+3.6880
Specimen pressure	mm Hg abs	12.929	12.929
Output voltage, Ref 100% of range	vdc	+5.0000 ±0.2000	+4.8890
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref. 75% of range	vdc	+3.7500 ±0.2000	+3.6880
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.4720
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.254
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	+0.0130

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ACCEPTANCE TEST DATA SHEET (CONT)
STEAM DUCT PRESSURE TRANSDUCER 837036-12-1

P/N 837036-2-1
S/N 22320

NAA REF. SPEC. ME

NASA 004000022320

10-28-67

Proof Pressure Test (Nitrogen Gas Test Fluid): Accept 32/13 Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen pressure	psig	20.0 +0.2, -0	20.0
Time at pressure	minutes	3	3

10-28-67

External Leakage Test (Nitrogen Gas Test Fluid): Accept 32/13 Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen pressure	psig	6.0 +0.2, -0	6.0
Time at pressure	minutes	15	15
External leakage in 15 minutes	scc	0.5 max	0.0

10-28-67

Diode Test:

Accept 32/13 Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen Input voltage	vdc	+30.0 ±0.1	+30.0
Diode voltage (SW1 at pos 2)	vdc	+1.0 max	0.0
Diode voltage (SW1 at pos 1)	vdc	+1.0 max	0.0

10-28-67

Maximum Output Voltage Test:

Accept 32/13 Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen output voltage	vdc	+6.5 max	6.26

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ACCEPTANCE TEST DATA SHEET (CONT) P/N 837036-2-1
STEAM DUCT PRESSURE TRANSDUCER 837036-2-1 S/N 22320

NAA REF. SPEC. ME NASA 004000022320

Input Current Test: 10-28-67
Accept 32113 Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Input current (SWI at pos 1)	ma	40 max	19
Input current (SWI at pos 2)	ma	40 max	19

Calibration Test: 32113 Accept Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+28.0 $\pm$ 0.5	+28.0
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 $\pm$ 0.2000	+0.0270
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 $\pm$ 0.2000	+1.2600
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 $\pm$ 0.2000	+2.4800
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref 75% of range	vdc	+3.7500 $\pm$ 0.2000	+3.6900
Specimen pressure	mm Hg abs	12.929	12.929
Output voltage, Ref 100% of range	vdc	+5.0000 $\pm$ 0.2000	+4.8900
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref. 75% of range	vdc	+3.7500 $\pm$ 0.2000	+3.6900
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 $\pm$ 0.2000	+2.4800
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 $\pm$ 0.2000	+1.2550
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 $\pm$ 0.2000	+0.0170

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ACCEPTANCE TEST DATA SHEET (CONT)
STEAM DUCT PRESSURE TRANSDUCER 837030-52-1

P/N 837036-2-1
S/N 22320

NAA REF. SPEC. ME

NASA 004000022320

Calibration Test (cont)

STEP	TEST PARAMETER	UNITS	REQUIRED	ACTUAL
9c	Specimen pressure	mm Hg abs	5.171	5.171
	Output voltage	vdc	+1.2500 $\pm$ 0.2000	+1.2350
11f	Pressure (PS2)	in. Hg abs	1.0 $\pm$ 0.5	1.0
11g	Output voltage	vdc	+1.2500 $\pm$ 0.2000	+1.2370
11h	Specimen pressure	mm Hg abs	5.171	5.171
13b	(1) Specimen pressure	mm Hg abs	5.171	5.171
	(2) Output voltage	vdc	+1.2500 $\pm$ 0.2000	1.2278
	(3) Pressure PS2	in. Hg abs	1.0 $\pm$ 0.5	0.85
	(4) Time at test	hours	3	3

Input Voltage Variation Test:

Accept _____ Reject _____

INLET PRESSURE (mm Hg abs)		INPUT VOLTAGE (vdc)		OUTPUT VOLTAGE (vdc)	
REQUIRED	ACTUAL	REQUIRED	ACTUAL	REQUIRED	ACTUAL
2.580	2.586	+25.0 $\pm$ 0.1	25.0	0.0000 $\pm$ 0.2000	+0.0249
	2.586	+30.0 $\pm$ 0.1	30.0	0.0000 $\pm$ 0.2000	+0.0250
12.929	12.929	+25.0 $\pm$ 0.1	25.0	+5.0000 $\pm$ 0.2000	+4.8507
	12.929	+30.0 $\pm$ 0.1	30.0	+5.0000 $\pm$ 0.2000	+4.8515

Output Ripple Test:

Accept _____ Reject _____

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Output ripple voltage	mv rms	10 max	1.9

Isolation Resistance Test:

Accept _____ Reject _____

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Potential	vdc	100	120
Resistance	megohms	100 min	1.22

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ACCEPTANCE TEST DATA SHEET (CONT) P/N 837036-2-1
STEAM DUCT PRESSURE TRANSDUCER 837036-32-1 S/N 22320

NAA REF. SPEC. ME NASA 004000022320

Insulation Resistance Test:

Accept_____ **Reject**_____

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Potential	vdc	100	100
Resistance	megohms	50 min	9×10^4

Weight: _____ lb.

Remarks: _____

Test Specimen Status:

Accept _____ Reject _____

By _____

Inspection:

AiResearch Q.C.

NAA O. C.

DCAS-OAR



AIRSEARCH MANUFACTURING DIVISION
Los Angeles, California

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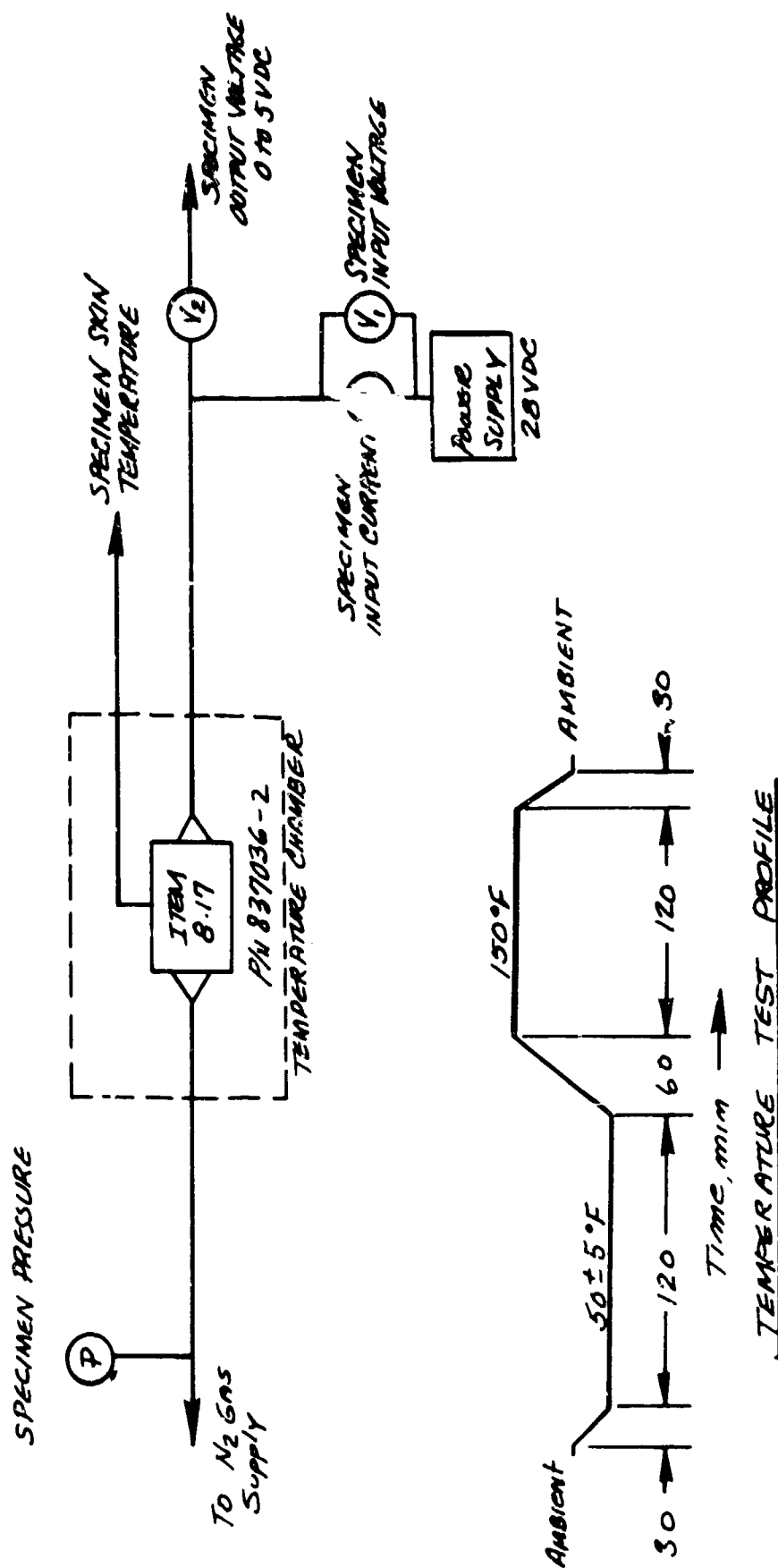


Figure 11. Temperature Test Setup

Interim Change Notice Letter: F
ATP No.: 88-1789-A
Effective Date: 22-May 1967.

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ACCEPTANCE TEST DATA SHEET

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STEAM DUCT PRESSURE TRANSDUCER 837054-2 - 2 - /

NAA DET. SPEC. NO. _____ **NASA**

Part Number 832036-2-1 S/N 22320

Date 11-2-67 Barometer 29.9 in. Hg abs Amb Temp 24 °F

Tested by A Cunningham Test Facility 1402

Examination of Product: Accept _____ Reject _____

Remarks: _____

Dimensional Check Verified: 1-2-61

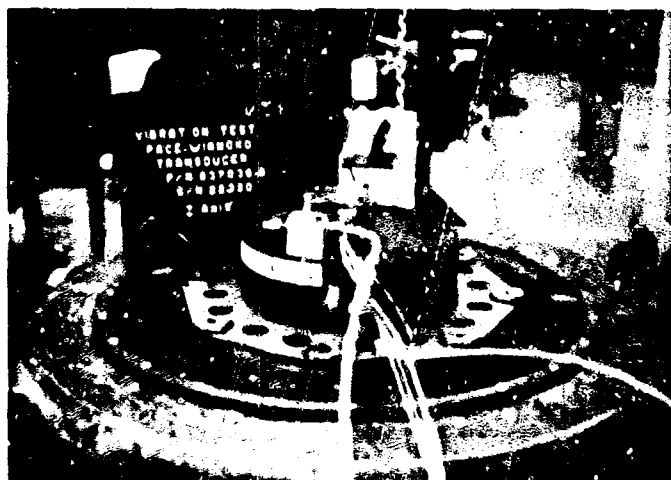
Para. 4.6 Calibration Test (Prior To Proof Pressure Test) Accept 32 Reject 3

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+28.0 ±0.5	+28.0
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	-0.0120
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.2240
Specimen pressure	mm Hg abs	7.737	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.4500
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref 75% of range	vdc	+3.7500 ±0.2000	+3.6690
Specimen pressure	mm Hg abs	12.929	12.929
Output voltage, Ref 100% of range	vdc	+5.0000 ±0.2000	+4.8860
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref. 75% of range	vdc	+3.7500 ±0.2000	+3.6670
Specimen pressure	mm Hg abs	7.737	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	2.4450
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.2230
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	-0.0150



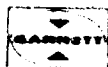
AIRSEARCH MANUFACTURING DIVISION

Figure 12
DTD-191
Page 32



F-8621

Figure 13. Vibration Test Setup
P/N 837036-2, S/N 22320



AIRCRAFT RESEARCH MANUFACTURING DIVISION



VIBRATION TEST RANDOM SPECTRUM 80 FILTER ANALYSIS

ZONE I-C/M ATMOSPHERIC FLIGHT LEVEL

FORM 2105
PART NAME PRE-MANCO TRANSPOSER P/N 837036-2 S/N 22320 EMO NO. 2404-20017-62-8734 PROCEDURE NO. 53-1685-2 PARAGRAPH NO. 54
FIXTURE NO. T-602637 VIBRATION SYST. NO. 1 CONTROL ACCEL ENDFCO M/N 2233 S/N 65-72 AMBIENT CONDITIONS: PRESS. 29.85 μ g TEMP. 77 $^{\circ}$ F REL. HUMID. 68%
TEST AXIS Y TOTAL MINUTES: REQUIRED 2.5 ACTUAL 2.5 INPUT G RMS: 5.0 ACTUAL 5.0 FILTER BAND WIDTH 25 CPS FIRST FILTER CENTER FREQ. 25 CPS
APOLLO TEST ENGINEER W. H. PAGE VIBRATION TECHNICIAN T. W. KLEY AIRESEARCH QC MAA DCAS-044
CROSSTALK: AXIS G RMS AXIS G RMS SPECIMEN: REMARKS

SHEET 1 OF 9
DATE NOV-2-1967 START TIME

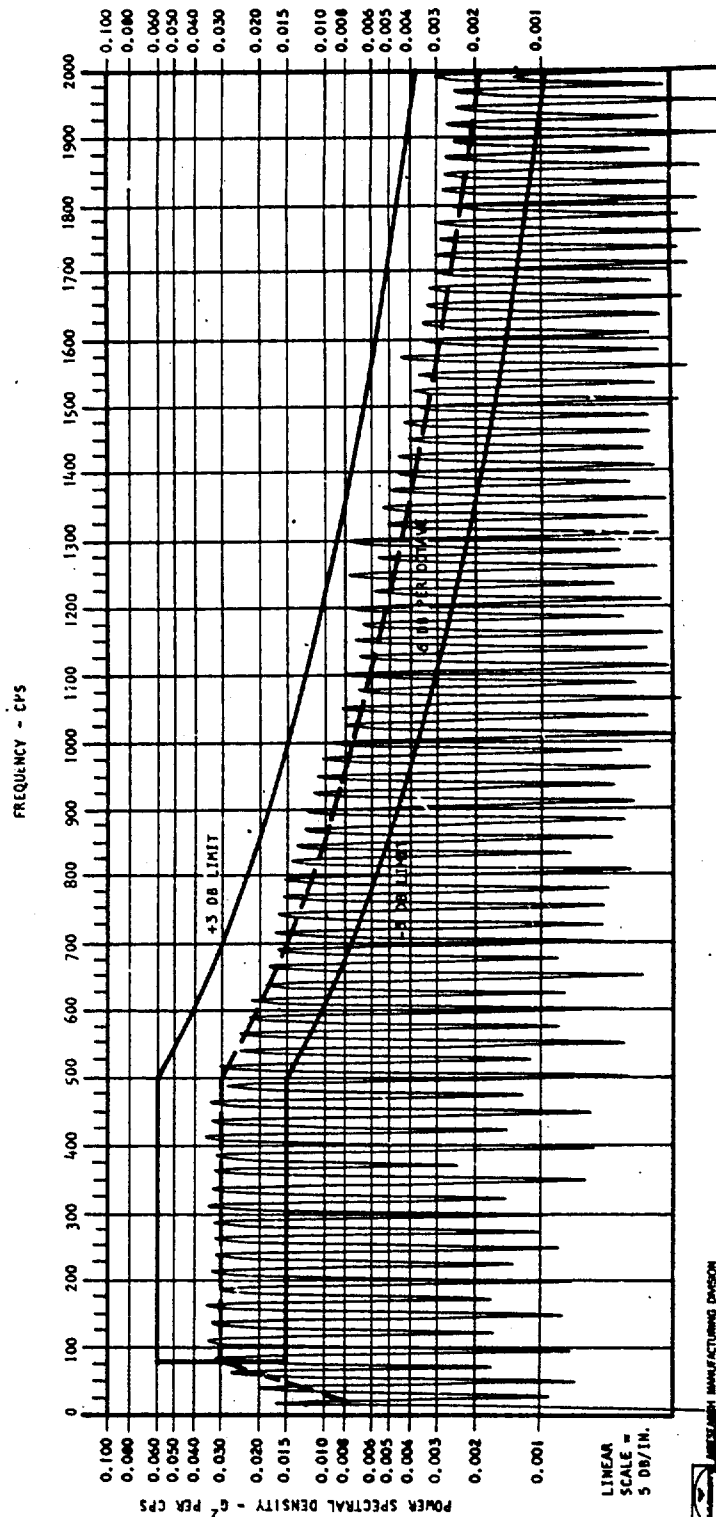


Figure 14. Y Axis Vibration Spectrum-Launch

VIBRATION TEST RANDOM SPECTRUM 80 FILTER ANALYSIS ZONE 1-C/M SPACE FLIGHT LEVEL

SHEET 2 OF 9
DATE MAY 8-1967 START TIME
PART NAME WINDING TRANSDUCER P/N 837036-2 S/N 22320 EVO NO. 2404 POINT 1A-2154 PROCEDURE NO. SE-1685-A PARAGRAPH NO. 5.4
FIXTURE NO. T-6016-57 VIBRATION SYST. NO. 1 CONTROL ACCEL ENVELOPE M/N 8235 S/N 66-7E AMBIENT CONDITIONS: PRESS. 29.96" HUMID. 68%
TEST AXIS Y TOTAL MINUTES: REQUIRED 12.5 ACTUAL 12.5 INPUT G RMS: REQUIRED 2.4 ACTUAL 2.4 FILTER BAND WIDTH 25 CPS FIRST FILTER CENTER FREQ. 25 CPS
APOLLO TEST ENGINEER L.H. LAPORE VIBRATION TECHNICIAN THAKLEY AIRESEARCH QC. NAA DEAS-QAR
CROSSTALK: AXIS G RMS AXIS G RMS SPECIMEN: G RMS REMARKS

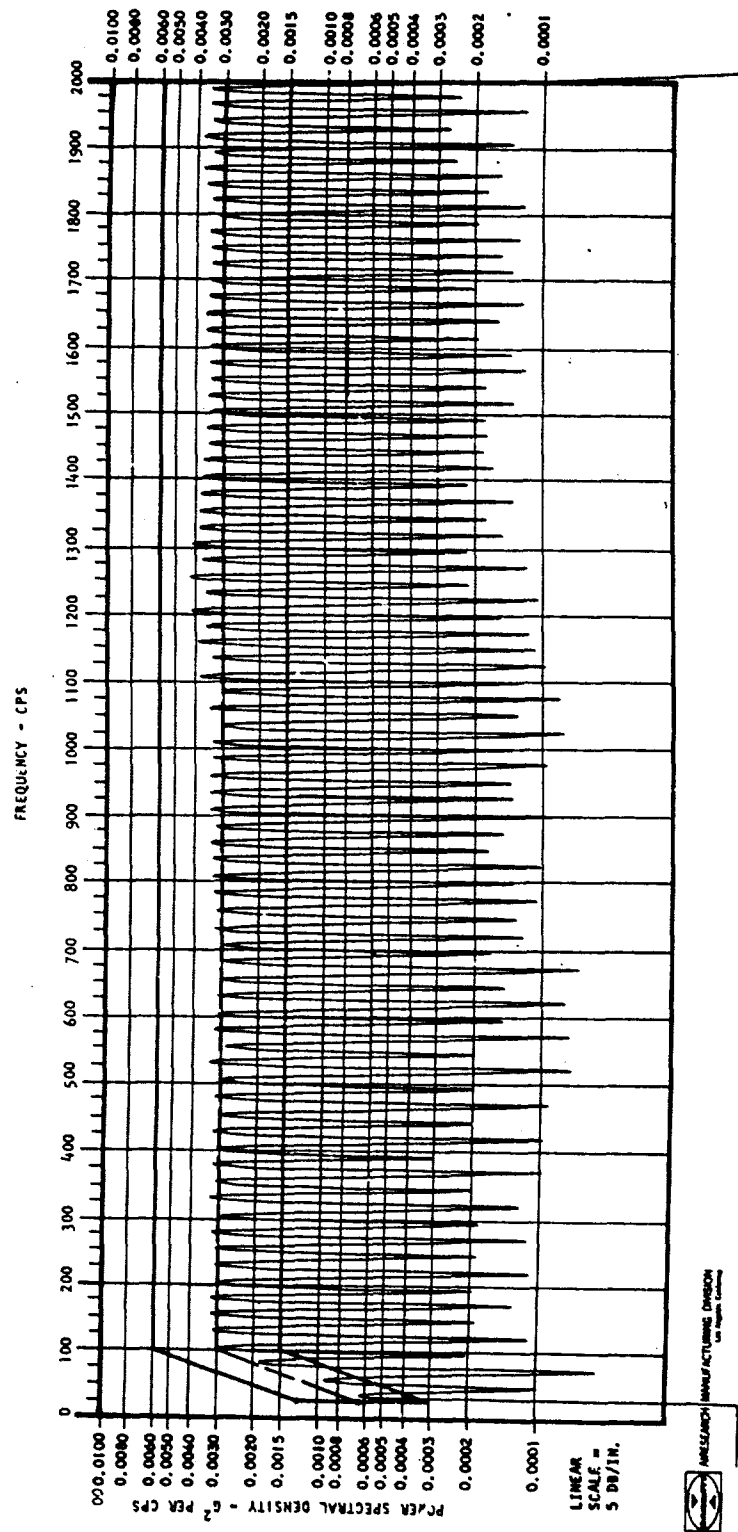


Figure 14. Y Axis Vibration Spectrum-Flight



AIRESEARCH MANUFACTURING DIVISION
Los Angeles, California

VIBRATION TEST RANDOM SPECTRUM 80 FILTER ANALYSIS ZONE I-C/M HI-Q ABORT LEVEL

FORM 2107
PART NAME PRE-MANUO TRANSFER P/N 837036-2 S/N 22820 EVO NO. 8408-200MT-69-2154 PROCEDURE NO. SS-1625-R PARAGRAPH NO. 5.6
DATE MMY-7-1967 START TIME
FIXTURE NO. T-602637 VIBRATION SYST. NO. 1 CONTROL ACCEL ENVELOPE M/N 2233 S/N SC-77 AMBIENT CONDITIONS: PRESS. 29.85" Hg TEMP. 77°F REL. HUMID. 63%
TEST AXIS Y TOTAL MINUTES: REQUIRED 2.5 ACTUAL 2.5 INPUT G RMS: REQUIRED 7.7 ACTUAL 7.7 FILTER BAND WIDTH 25 CPS FIRST FILTER CENTER FREQ. 25 CPS
APOLLO TEST ENGINEER L.H. LAPAGE VIBRATION TECHNICIAN T. WALKLEY AIRSEARCH QC MAA DCAS-QAR
CROSSTALK: AXIS G RMS, AXIS G RMS; SPECIMEN: G RMS REMARKS

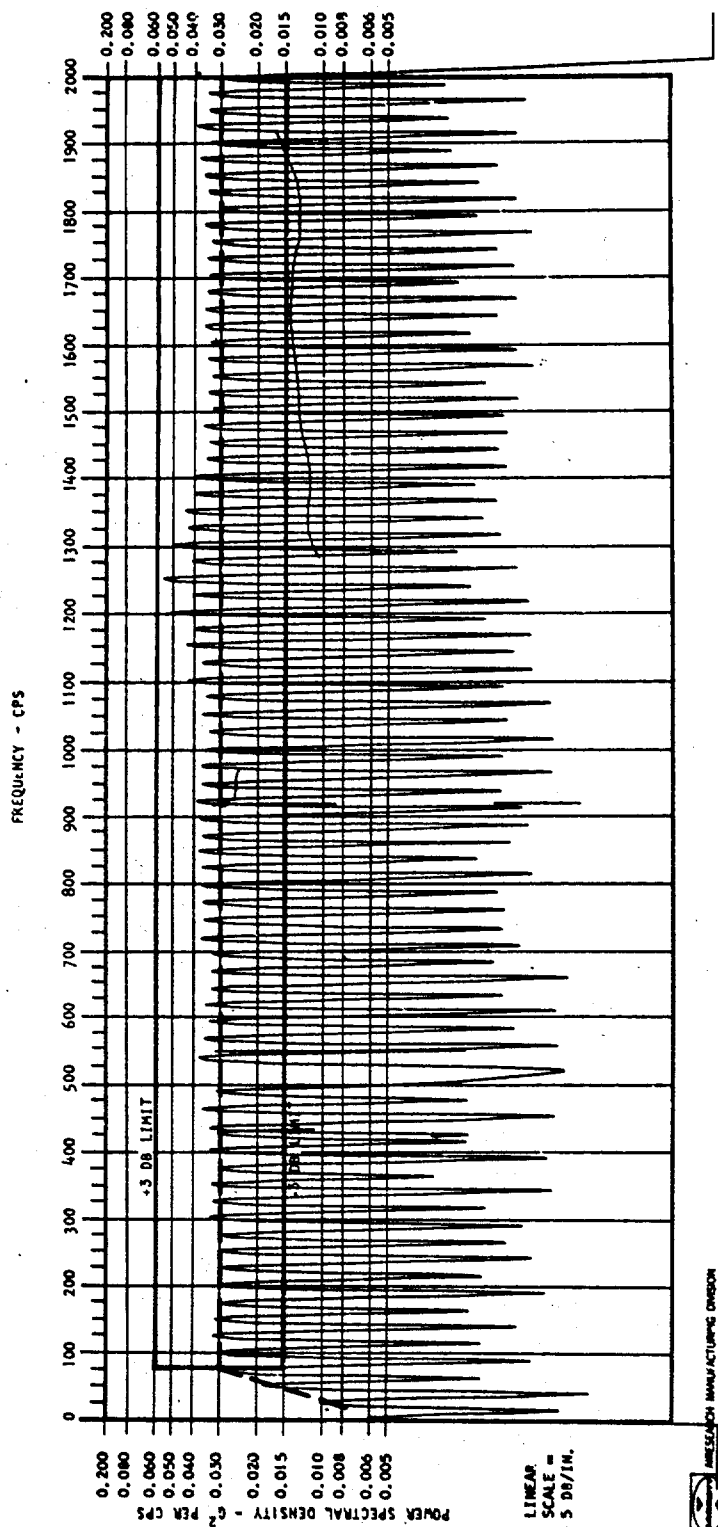


Figure 14. Y Axis Vibration Spectrum-High Q Abort



VIBRATION TEST RANDOM SPECTRUM 80 FILTER ANALYSIS

ZONE I-C/M ATMOSPHERIC FLIGHT LEVEL

FORM 2105
PART NAME WANGS TRANSUCKER P/N 837036-2 S/N 22370 EMO NO. 2464-20967-69-2154 PROCEDURE NO. 55-1525-E PARAGRAPH NO. 5-4
FIXTURE NO. T-603637 VIBRATION SYST. NO. 1 CONTROL ACCEL ENVELOPE M/N 2153 S/N C-72 AMBIENT CONDITIONS: PRESS. 29.85 49 TEMP. 77°F REL. HUMID. 63%
TEST AXIS X TOTAL MINUTES: REQUIRED 2.5, ACTUAL 2.5 INPUT G RMS: REQUIRED 5.0, ACTUAL 5.0 FILTER BAND WIDTH 25 CPS FIRST FILTER CENTER FREQ. 25 CPS
APOLLO TEST ENGINEER L.H. LADAGE VIBRATION TECHNICIAN TWAKLEY AIRSEARCH QC NAA DCAS-QM
CROSSTALK: _____ AXIS _____ G RMS, _____ AXIS _____ G RMS SPECIMEN: _____ REMARKS _____

SHEET 4 OF 9

DATE MM-P-1957 START TIME _____

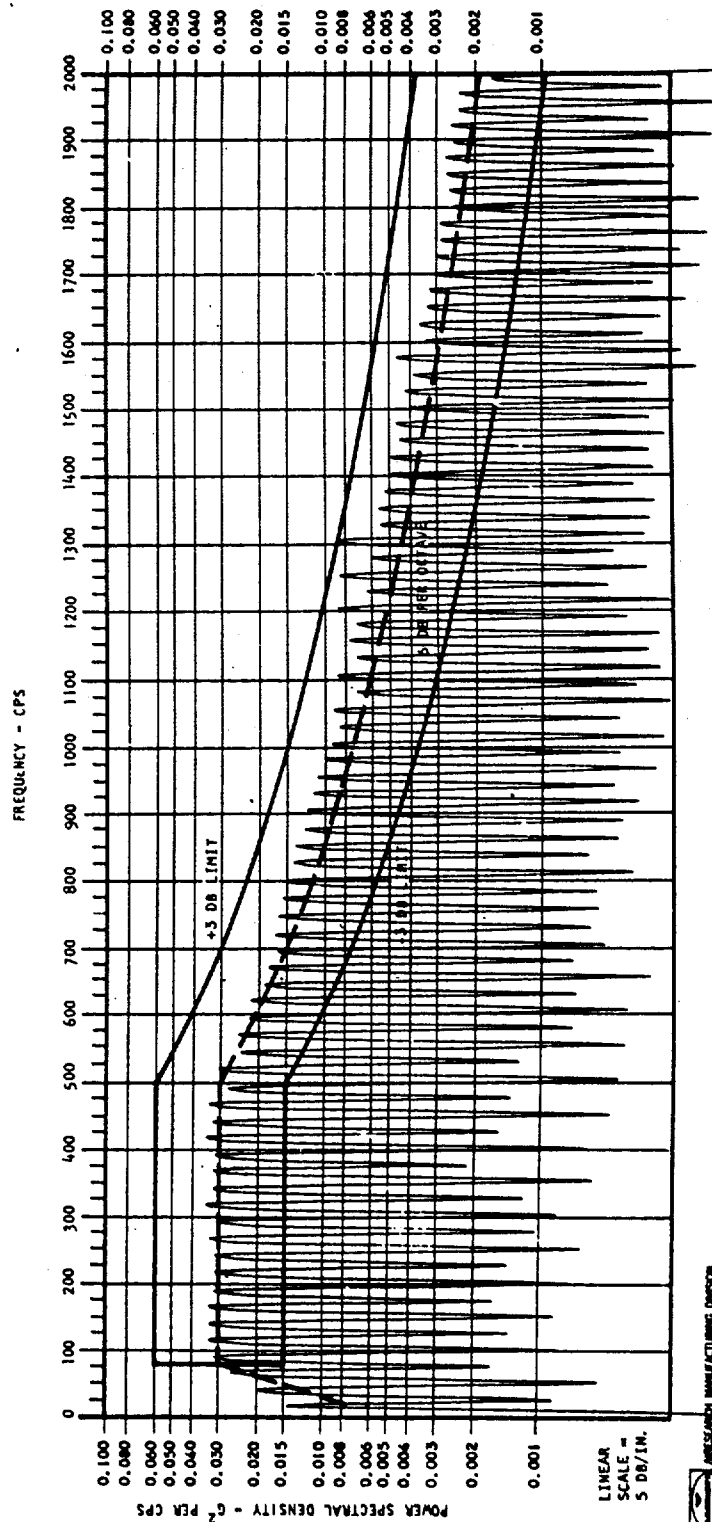


Figure 14. X Axis Vibration Spectrum-Launch



AIRSEARCH MANUFACTURING DIVISION
Los Angeles, California

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VIBRATION TEST RANDOM SPECTRUM 80 FILTER ANALYSIS ZONE I-C/M SPACE FLIGHT LEVEL

PART NAME PCE-WINGCO TRANSDUCER P/N 837036-2 S/N 22320 EMO NO. 2404-10087-69-1564 PROCEDURE NO. 55-1678-B PARAGRAPH NO. 5.4
 FIXTURE NO. T-602657 VIBRATION SYST. NO. 1 CONTROL ACCEL ENVELOPE M/N 2288 S/N 66-72 AMBIENT CONDITIONS: PRESS. 29.95 Hg TEMP 77 F REL. HUMID. 23 %
 TEST AXIS X TOTAL MINUTES: REQUIRED 12.5 ACTUAL 12.5 INPUT G RMS: REQUIRED 2.4 ACTUAL 2.4 FILTER BAND WIDTH 25 CPS FIRST FILTER CENTER FREQ. 25 CPS
 APOLLO TEST ENGINEER L.H. Lippert VIBRATION TECHNICIAN T. WAKLEY AIRESEARCH QC MAA DCAS-QAR
 CROSS-TALK: AXIS G RMS, AXIS G RMS; SPECIMEN: G RMS REMARKS

SHEET 5 OF 9

DATE MAY-8-1967 START TIME

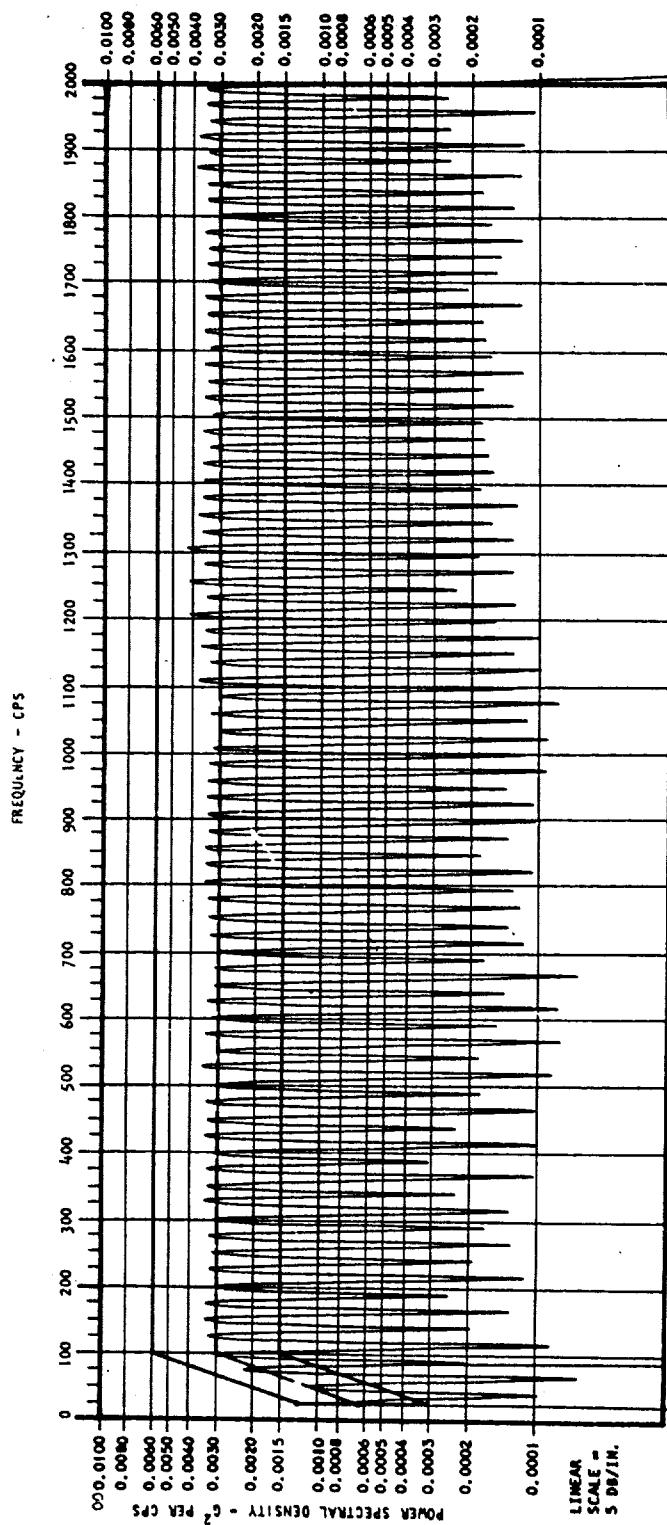


Figure 14. X Axis Vibration Spectrum-Flight



AIRESEARCH MANUFACTURING DIVISION
Los Angeles, California

412

VIBRATION TEST RANDOM SPECTRUM 80 FILTER ANALYSIS ZONE I-C/M HI-Q ABORT LEVEL

FORM 2107
SHEET 6 OF 9
DATE NOV-2-1967 START TIME
PART NAME PAC-MANSCO TRANSFER P/N 287036-2 S/N 22370 EMO NO 3404-200MT-69-2154 PROCEDURE NO. SE-1625-R PARAGRAPH NO. 5.4
FIXTURE NO. T-602637 VIBRATION SYST. NO. 1 CONTROL ACCEL ENDEVCO M/N 2232 S/N 4C-72 AMBIENT CONDITIONS: PRESS. 29.85 IN. Hg TEMP. 77.7 F REL. HUMID. 68 %
TEST AXIS X TOTAL MINUTES: REQUIRED 2.5, ACTUAL 2.5 INPUT G RMS: REQUIRED 7.7, ACTUAL 7.7 FILTER BAND WIDTH 25 CPS FIRST FILTER CENTER FREQ. 25 CPS
APOLLO TEST ENGINEER L.L. LARSEN VIBRATION TECHNICIAN T. WAXLEY AIRSEARCH QC NAA DCAS-QAR
CROSSTALK: AXIS G RMS, AXIS G RMS, SPECIMEN: G RMS REMARKS

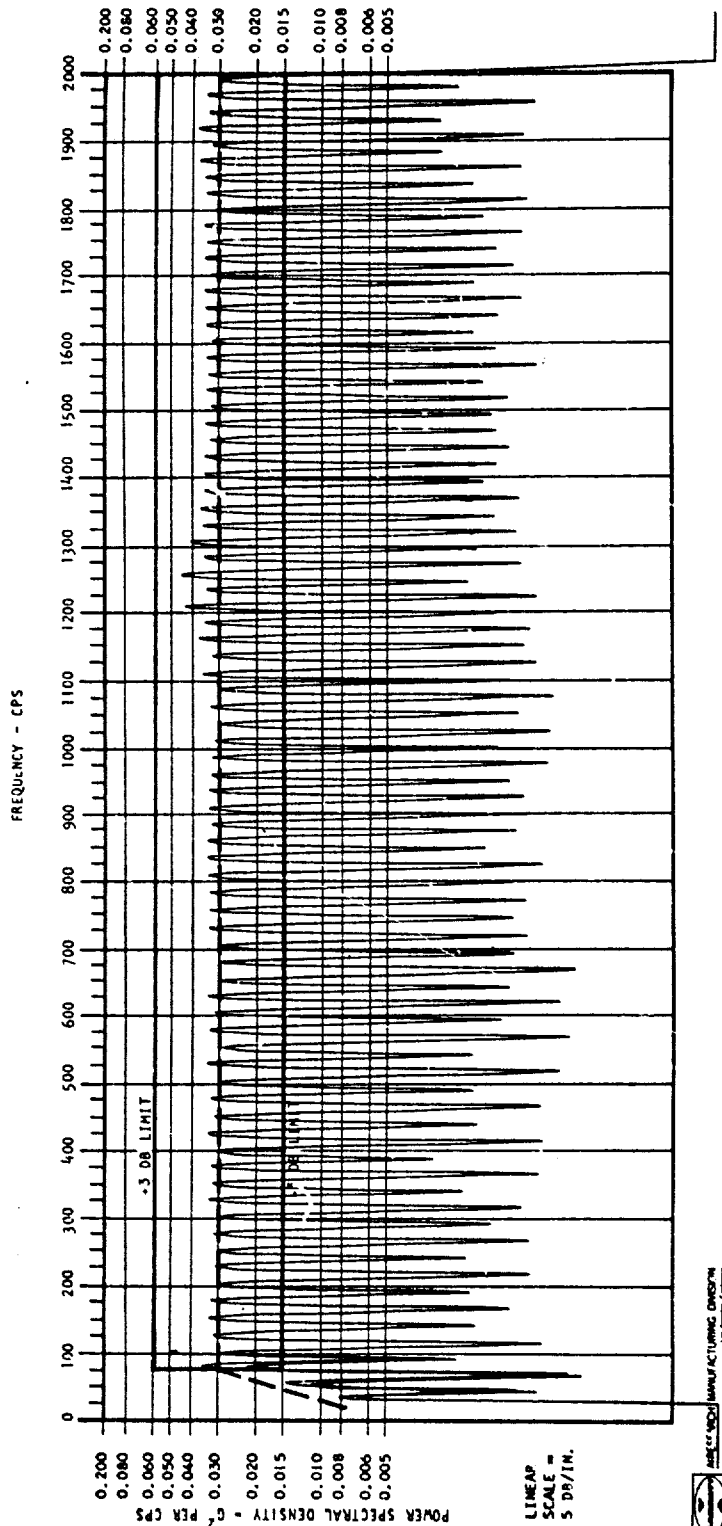


Figure 14. X Axis Vibration Spectrum-High Q Abort





VIBRATION TEST RANDOM SPECTRUM 80 FILTER ANALYSIS

ZONE I-C/M ATMOSPHERIC FLIGHT LEVEL

FORM 2105
PART NAME FACE-WINDUVE TRANSDUCER P/N 887036-2 S/N 22320 EVO NO. 3404-20087-69-4154 PROCEDURE NO. SE-1675-B PARAGRAPH NO. 5-4
FIXTURE NO. T-608657 VIBRATION SYST. NO. 1 CONTROL ACCEL ENVELOPE M/N 2232 S/N 66-78 AMBIENT CONDITIONS: PRESS. 29.16 °/g TEMP. 77 °F REL. HUMID. 68 %
TEST AXIS W TOTAL MINUTES: REQUIRED 2.5 ACTUAL 2.5 INPUT G RMS: REQUIRED 5.0 ACTUAL 5.0 FILTER BAND WIDTH 25 CPS FIRST FILTER CENTER FREQ. 25 CPS
APOLLO TEST ENGINEER L.H. LARICE VIBRATION TECHNICIAN T. WAKLEY AIRESEARCH QC NAA DCAS-QAR
CROSSTALK: AXIS C RMS AXIS G RMS SPECIMEN: REMARKS

SHEET 7 OF 9

DATE MM-8-1967 START TIME

FREQUENCY - CPS

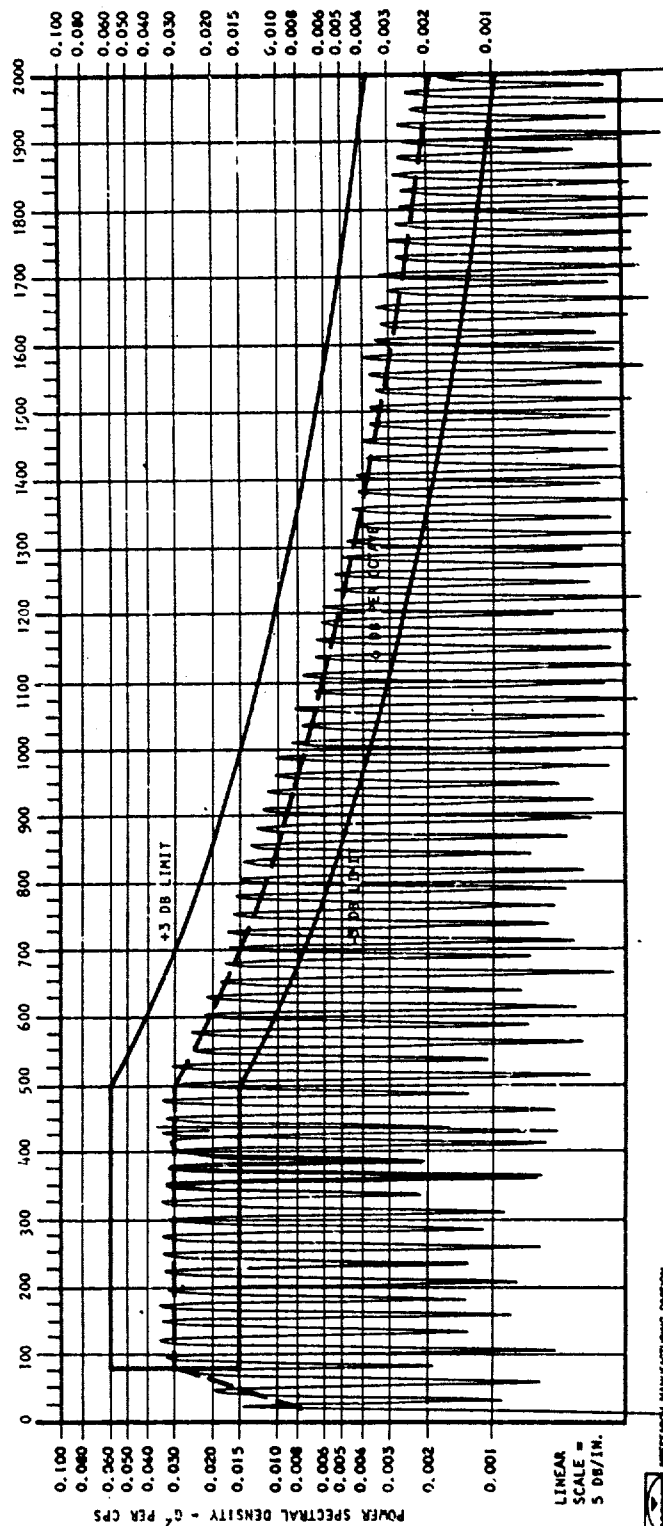


Figure 14. Z Axis Vibration Spectrum-Launch

VIBRATION TEST RANDOM SPECTRUM 80 FILTER ANALYSIS ZONE I-C/M SPACE FLIGHT LEVEL

SHEET 8 OF 9
DATE NOV. 8-1967 START TIME _____
PART NAME PLS. MIANCKO THERMOCOOL P/N 887036-2 S/N 223EO EVO NO. 3404-20017-69-2164 PROCEDURE NO. SS-1675-R PARAGRAPH NO. E4
FIGURE NO. T-602657 VIBRATION SYST. NO. 1 CONTROL ACCEL ENDEVCO N/M 2233 S/N 66-72 AMBIENT CONDITIONS: PRESS. 29.85"/Hg TEMP. 77°F REL. HUMID. 68%
TEST AXIS Z TOTAL MINUTES: REQUIRED 12.5 ACTUAL 12.5 INPUT G RMS: REQUIRED 2.4 ACTUAL 2.4 FILTER BAND WIDTH 20 CPS FIRST FILTER CENTER FREQ. 25 CPS
APOLLO TEST ENGINEER L.H. LARSEN VIBRATION TECHNICIAN T. WALKLEY AIRESEARCH QC NAA DCAS-QAR _____
CROSSALK: AXIS _____ G RMS, SPECIMEN: _____ G RMS, REMARKS _____

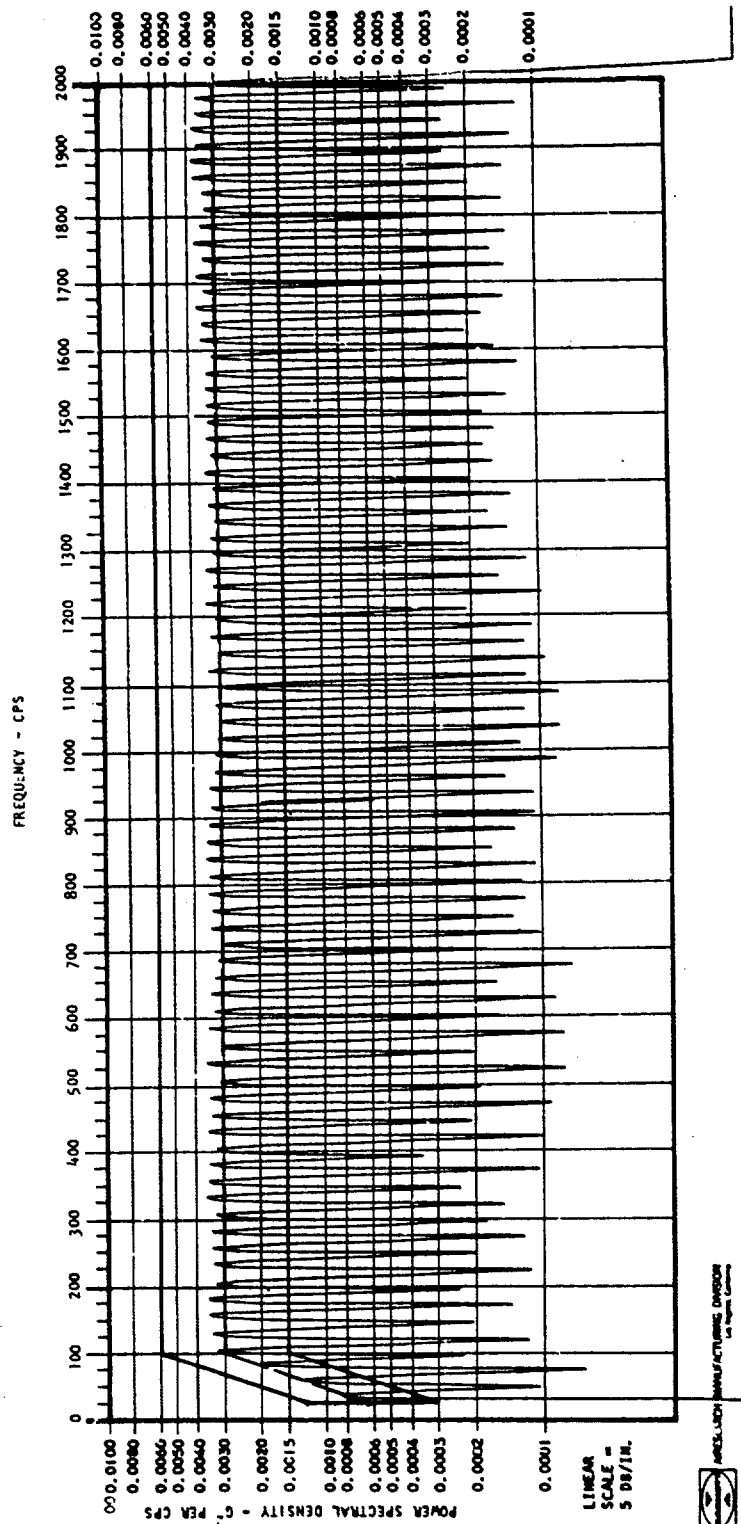


Figure 14. Z Axis Vibration Spectrum-Flight



AIRESEARCH MANUFACTURING DIVISION
Los Angeles, California



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Los Angeles, California

VIBRATION TEST RANDOM SPECTRUM 80 FILTER ANALYSIS ZONE I-C/M HI-Q ABORT LEVEL

FORM 2107
PART NAME WIAWKO TRANSVERSE P/N 887016-2 S/N 22320 ENV NO. 18A-20017-68-2164 PROCEDURE NO. SE-1685-6 PARAGRAPH NO. 5-4
FIXTURE NO. T-602687 VIBRATION SYST. NO. 1 CONTROL ACCEL ENDEVCO M/N 2283 S/N 86-78 AMBIENT CONDITIONS: PRESS. 29.85 TEMP. 77.7 REL. HUMID. 68%
TEST AXIS 2 TOTAL MINUTES: REQUIRED 2.5, ACTUAL 2.5 INPUT G RMS: REQUIRED 7.7, ACTUAL 7.7 FILTER BAND WIDTH 25 CPS FIRST FILTER CENTER FREQ. 25 CPS
APOLLO TEST ENGINEER L.H. LARSEN VIBRATION TECHNICIAN TERRY WAKLEY AIRESEARCH QC NAA DCAS-QAR
CROSSTALK: AXIS G RMS, AXIS G RMS, SPECIMEN: G RMS REMARKS

SHEET 1 OF

DATE NOV-2-1967 START TIME

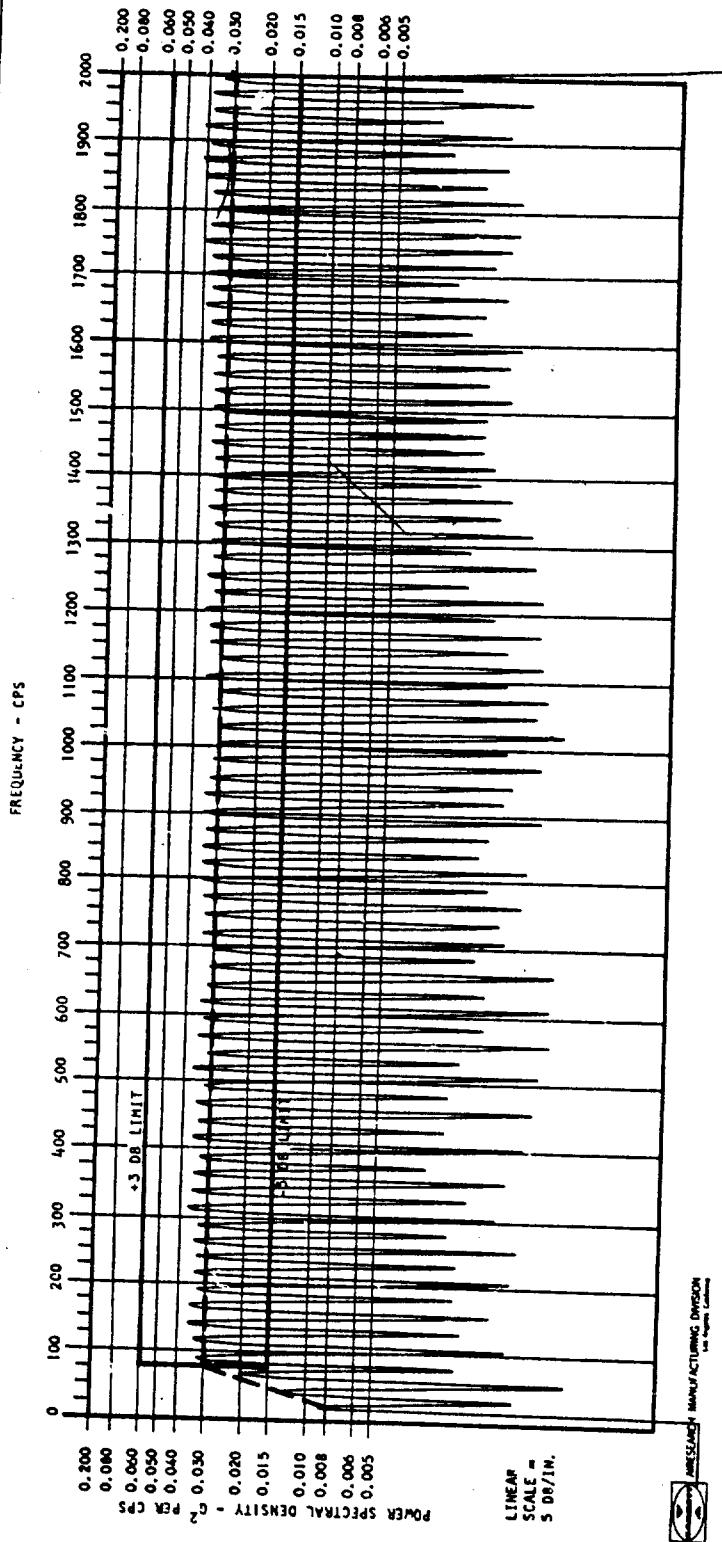
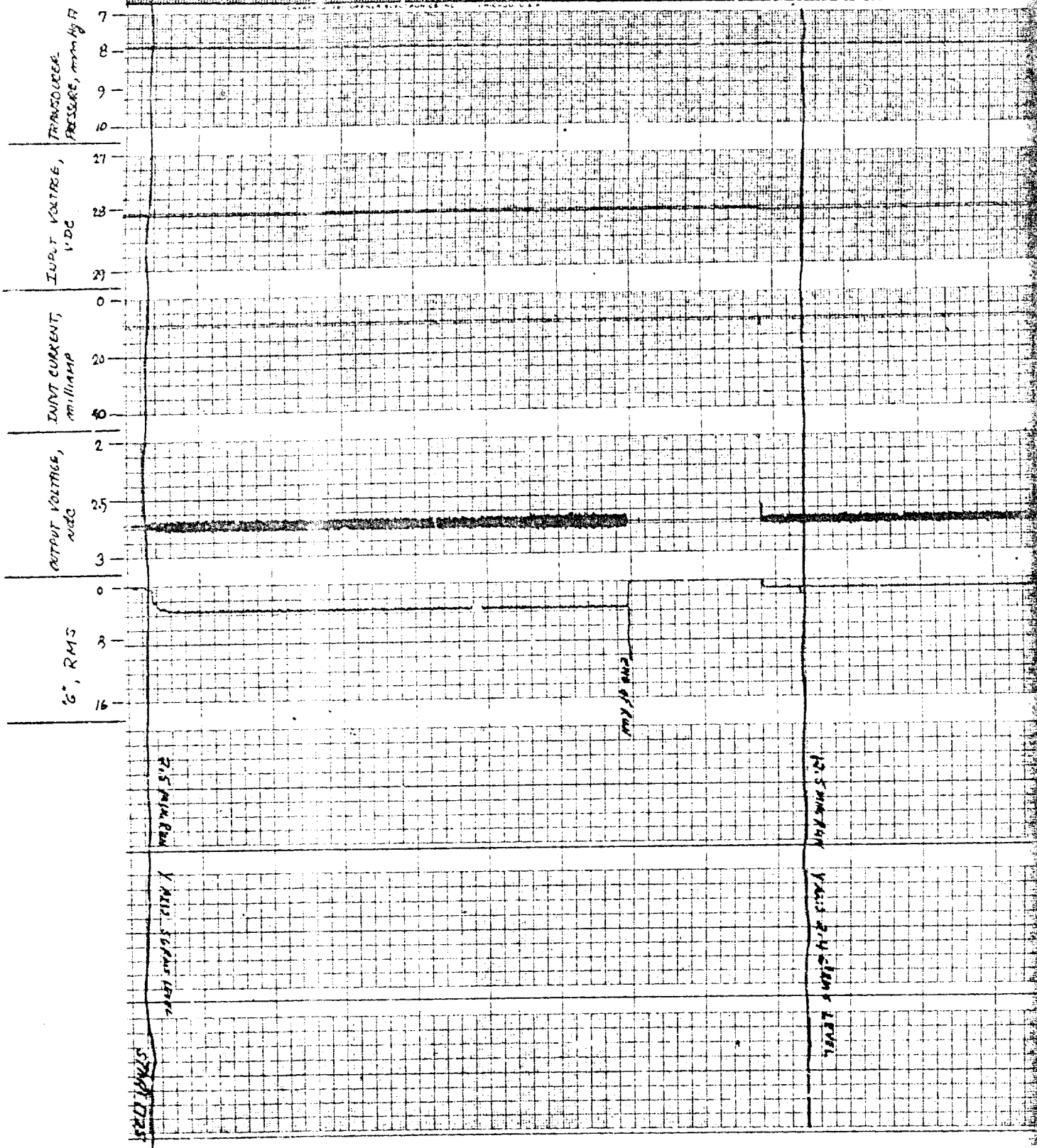
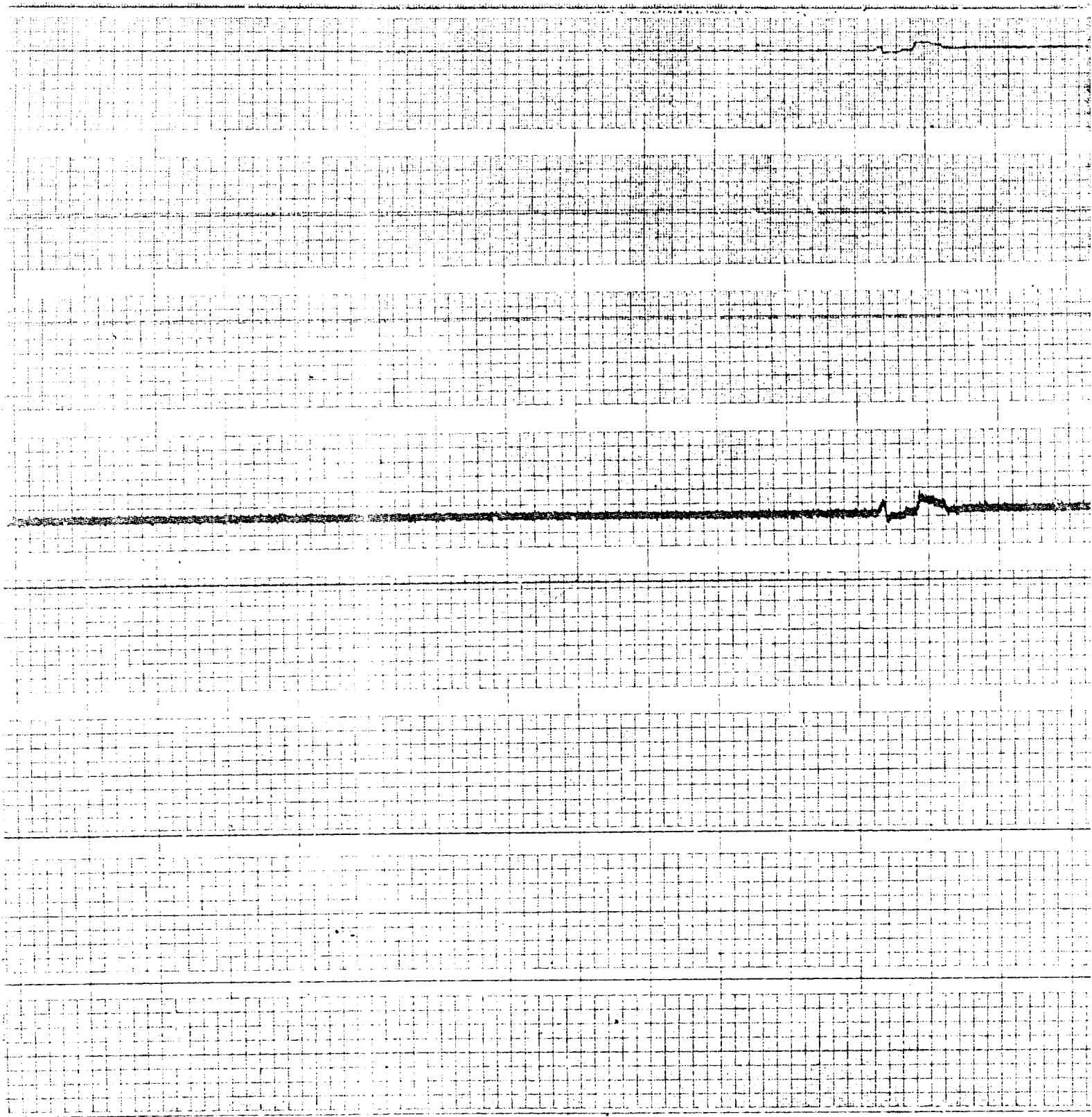


Figure 14. Z Axis Vibration Spectrum-High Q Abort



AIRRESEARCH MANUFACTURING DIVISION
Los Angeles, California

7



CHARGE AND BACKDOOR TO APPROX. 100.

CHARGE AND BACKDOOR TO APPROX. 100.



2

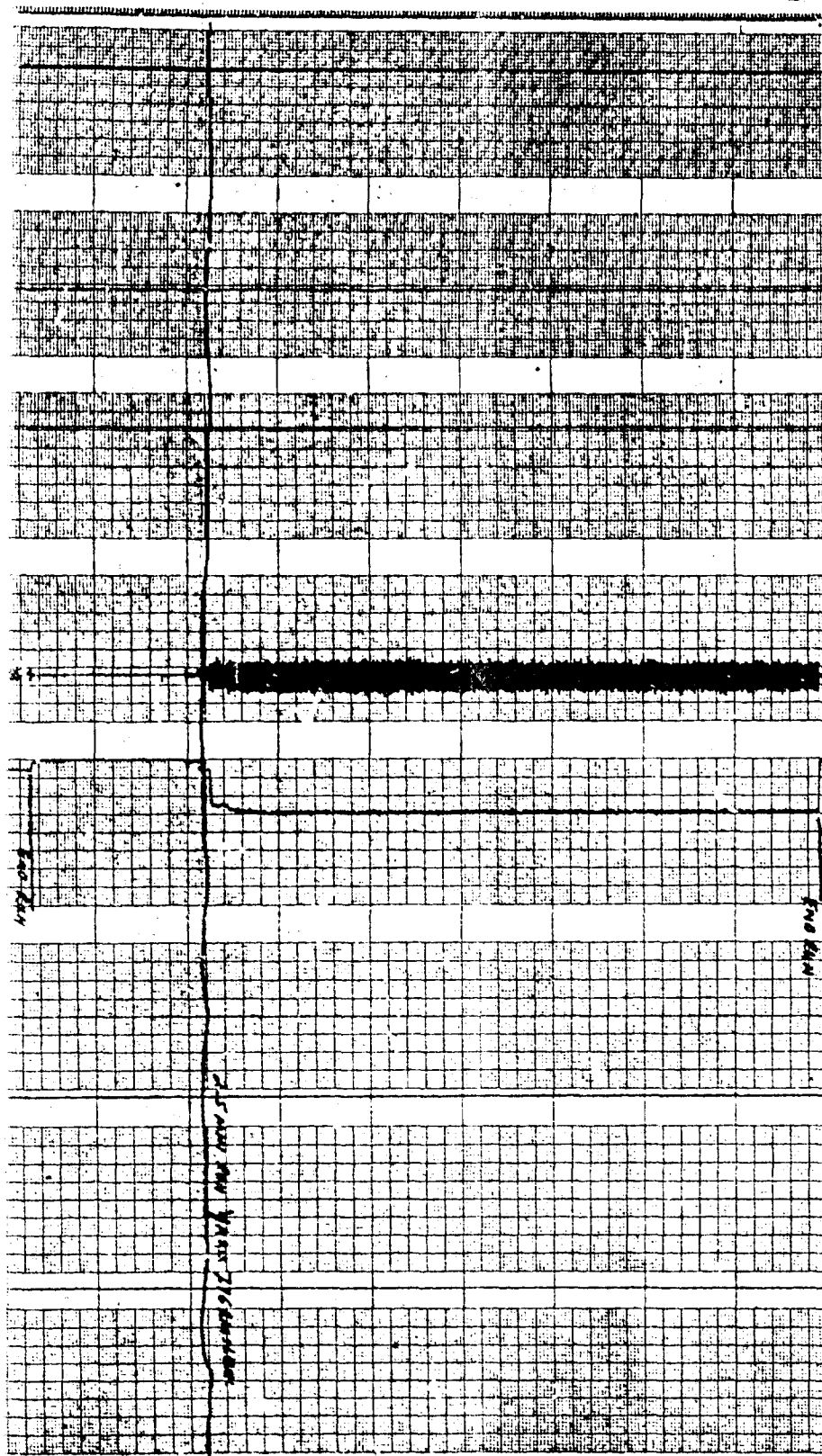
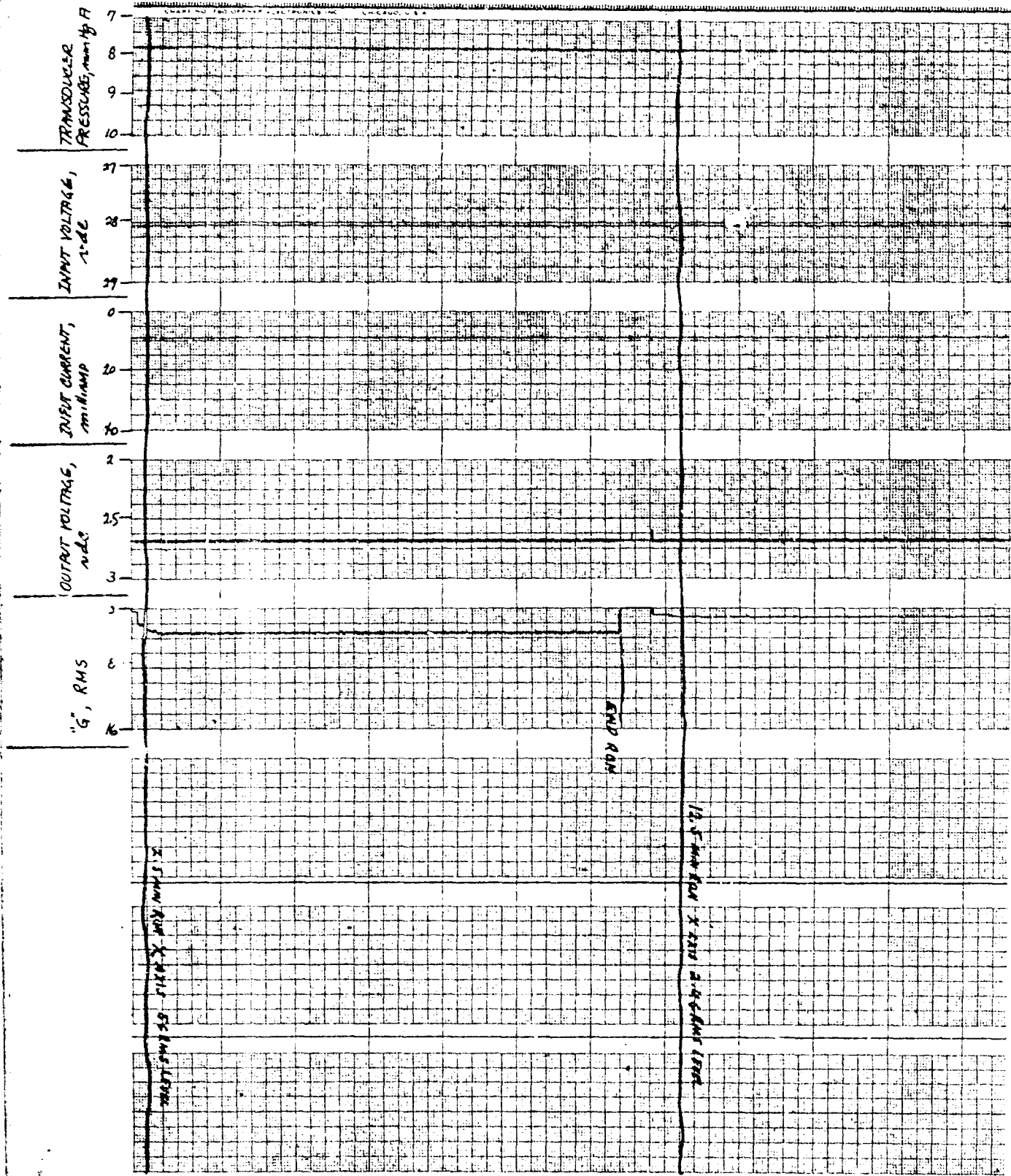


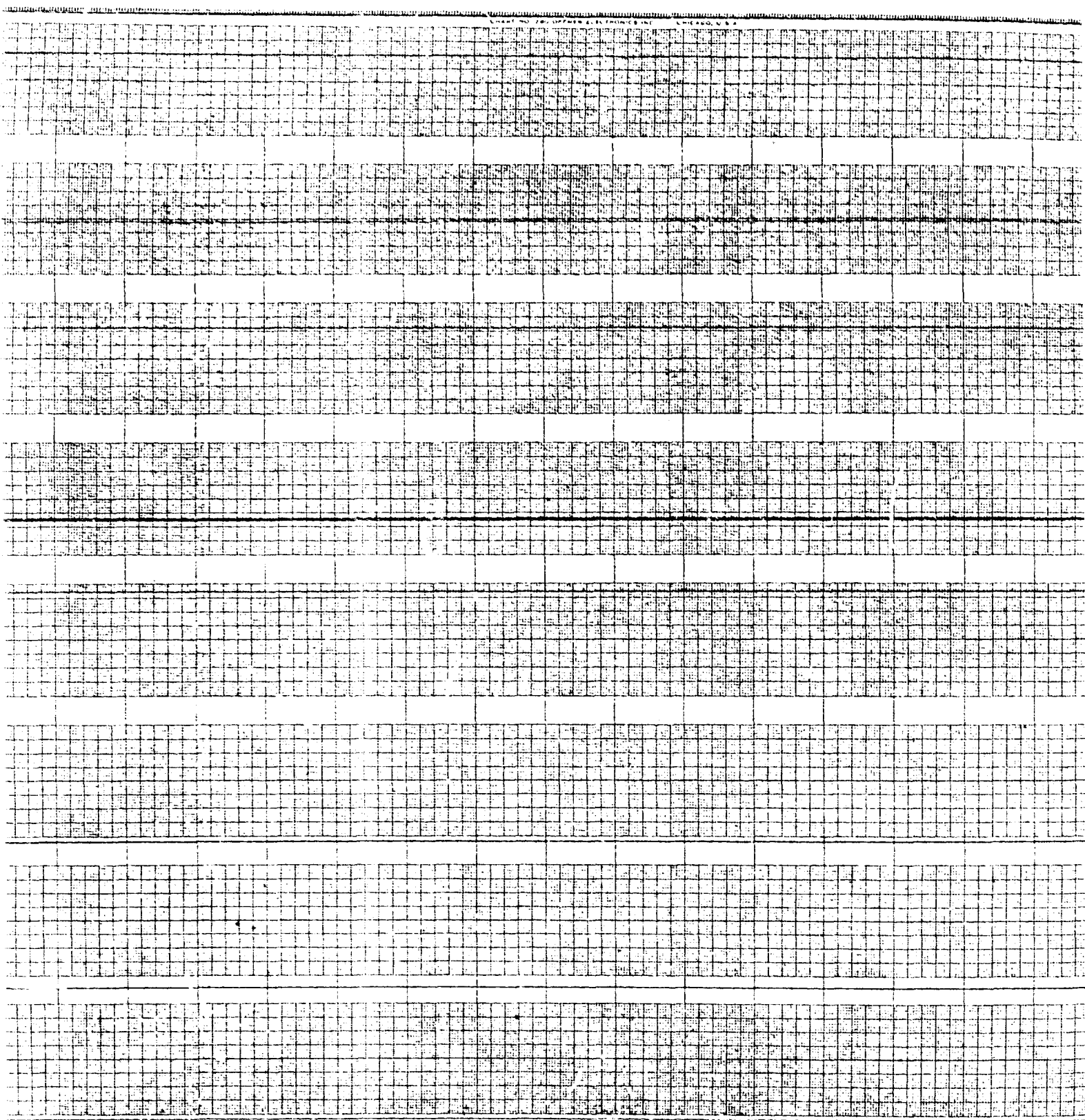
Figure 15. Y Axis Vibration Test Results. P/N 837036-2. S/N 22320

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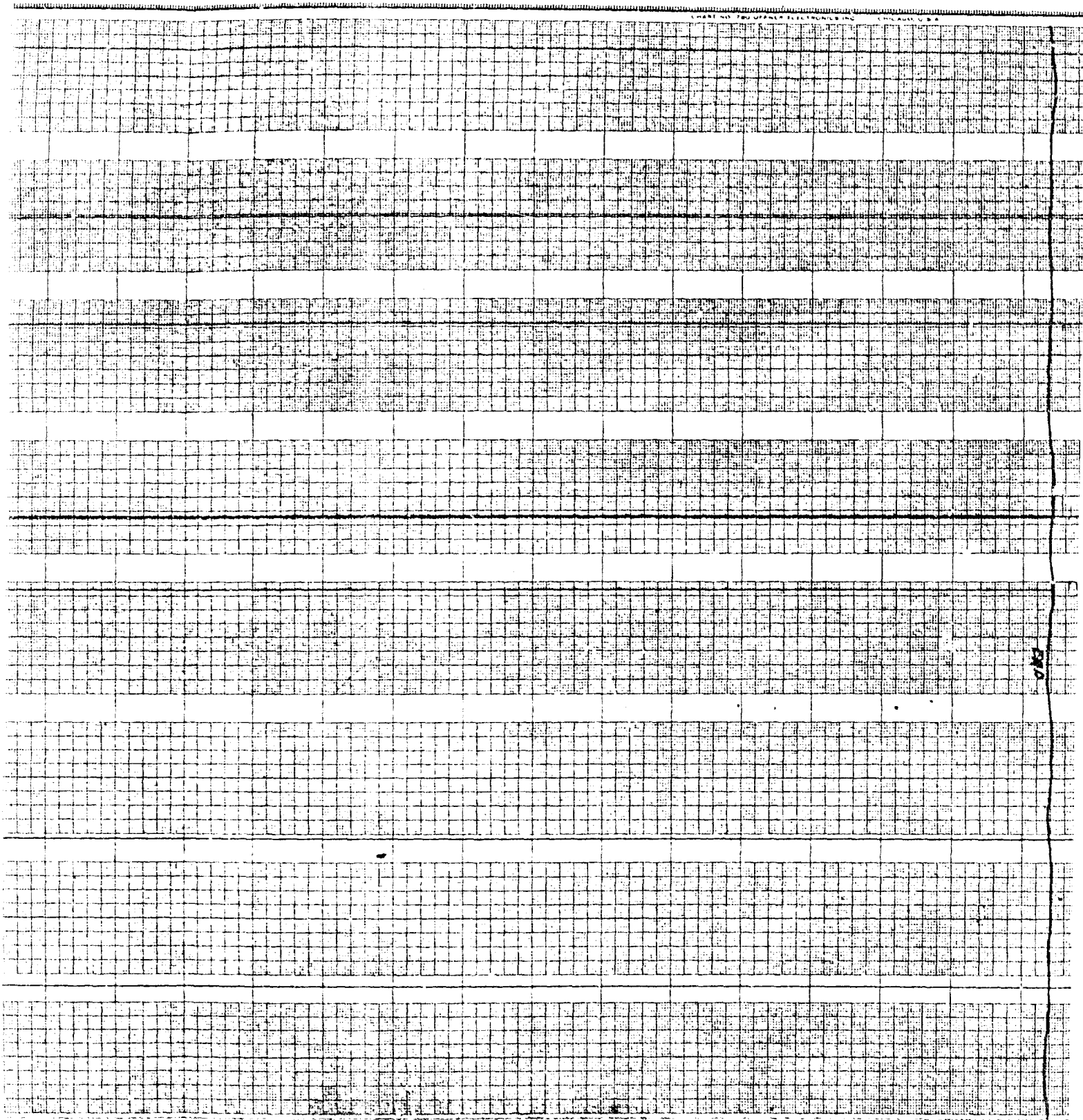
AIRESEARCH MANUFACTURING DIVISION
Los Angeles, California



B



CHART NO. 720 OFFICIAL ELECTRONICS INC. CHICAGO, U.S.A.



100

1 minute



C

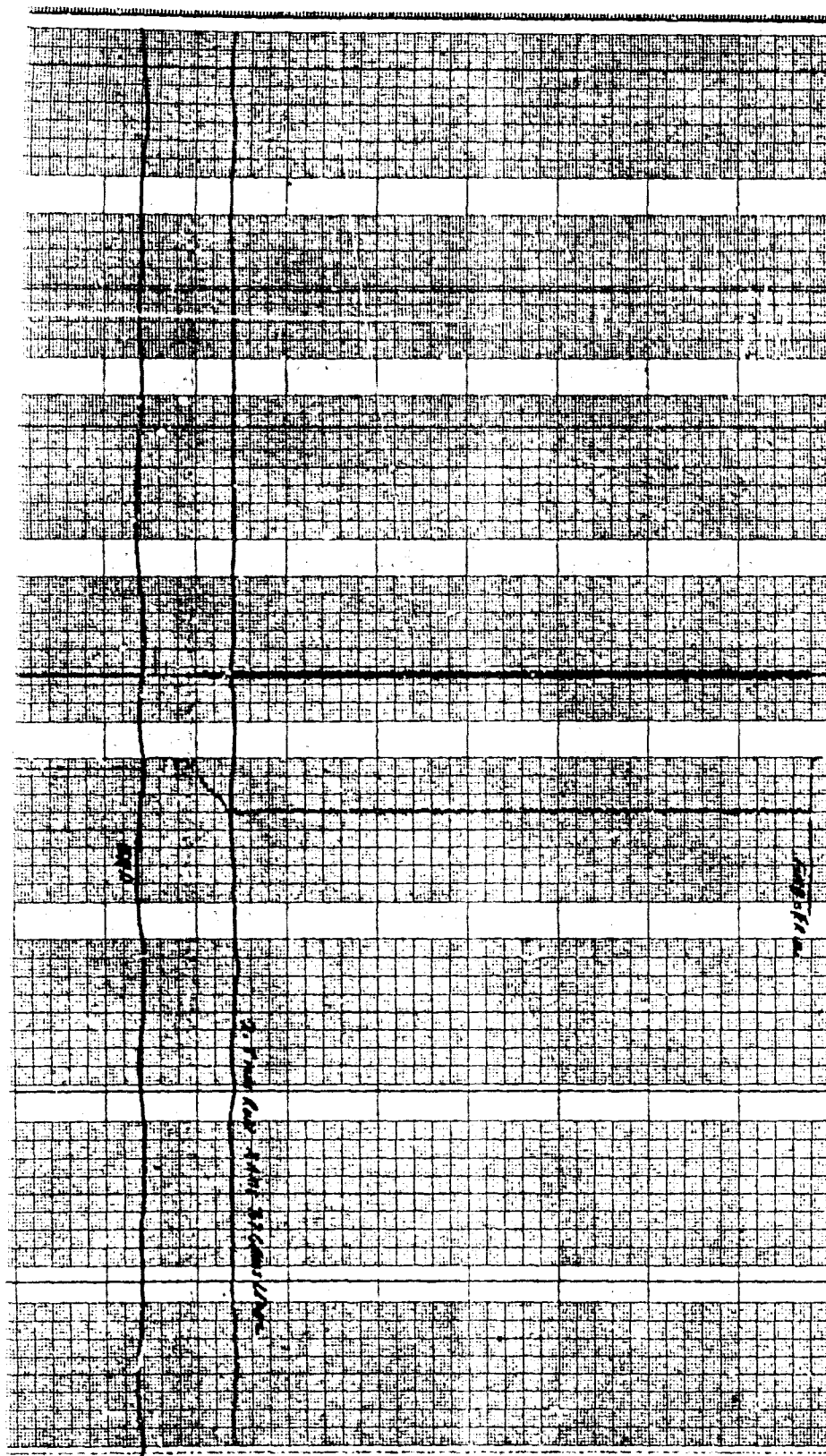
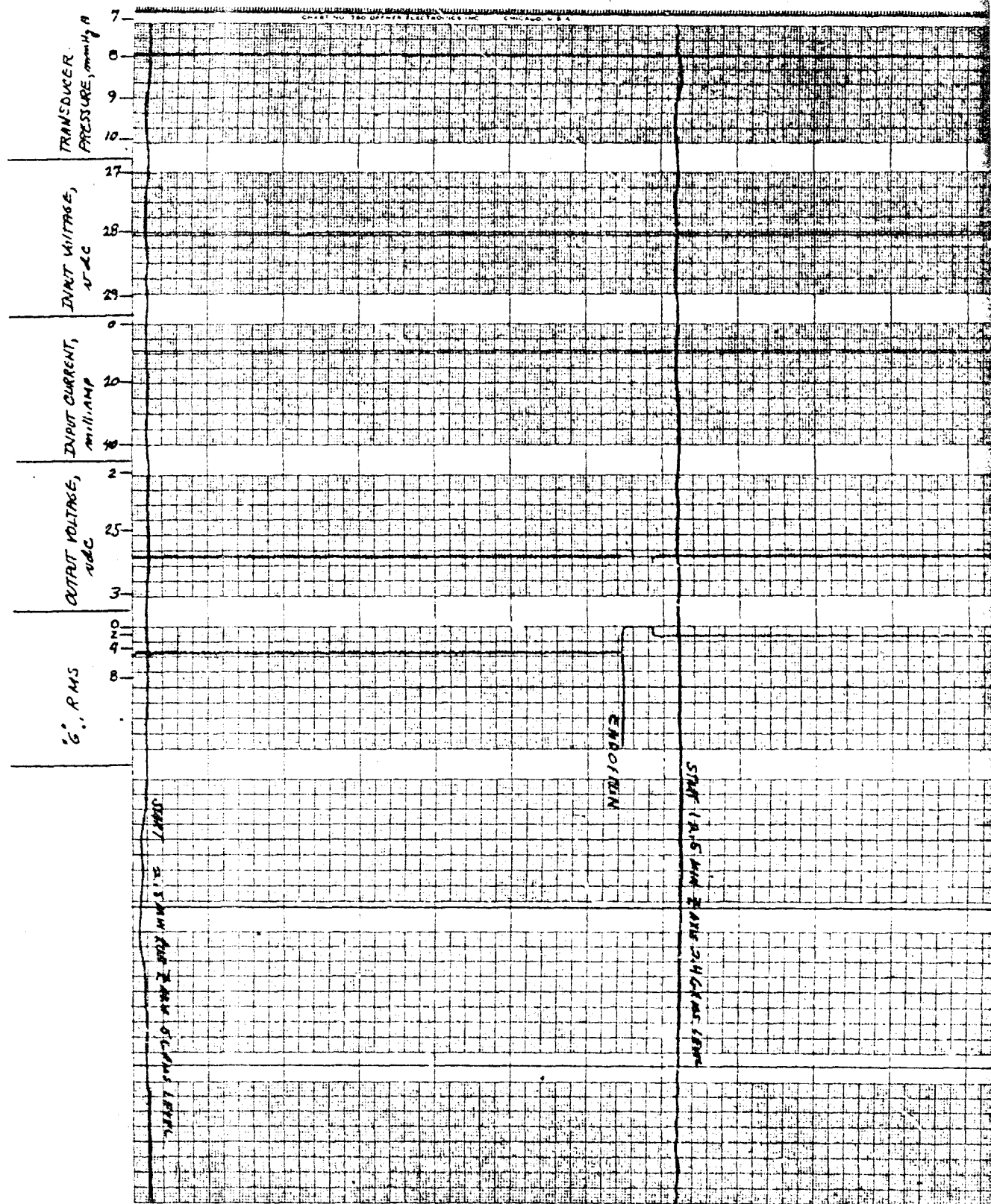
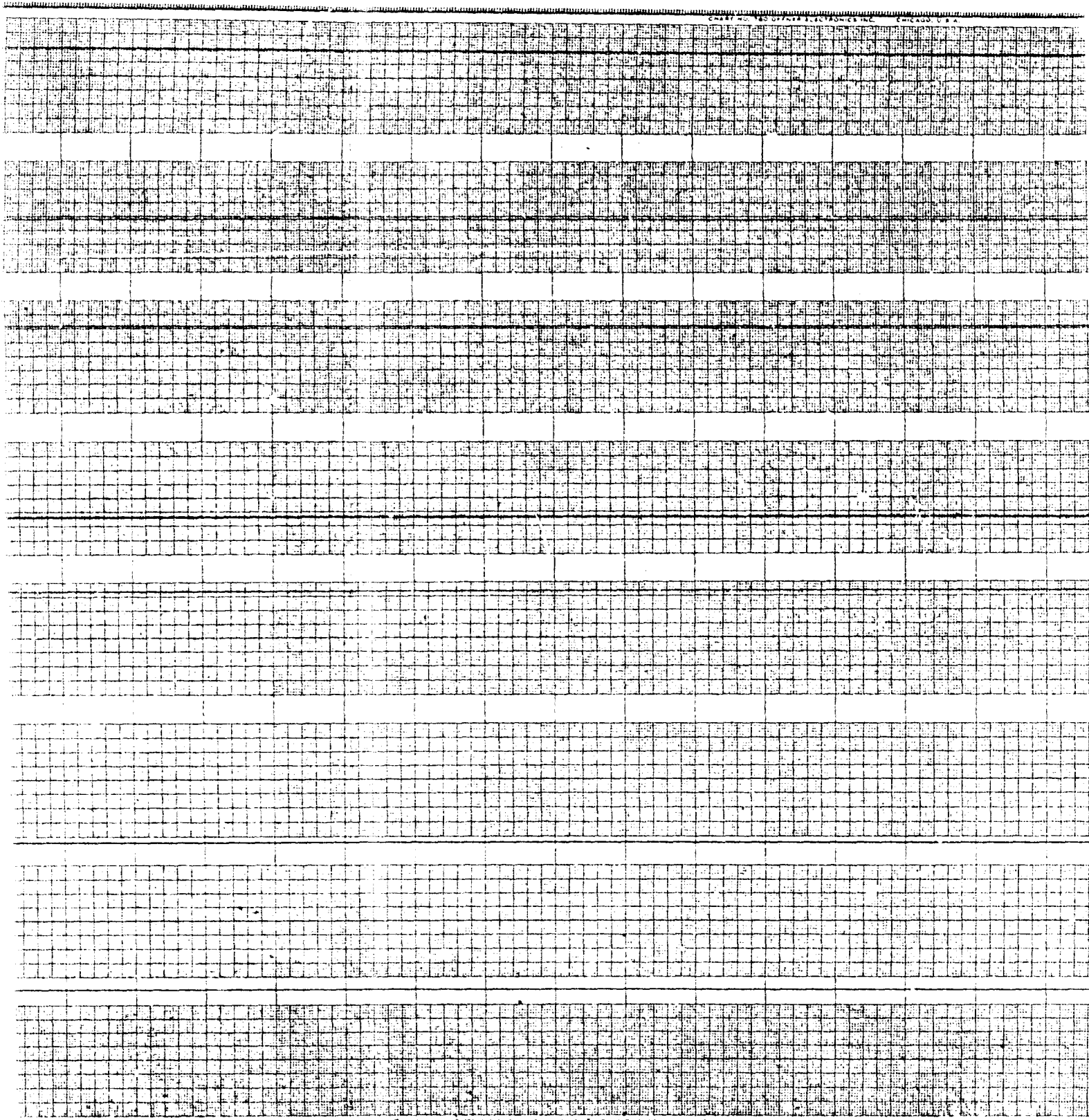


Figure 15. X Axis Vibration Test Results. P/N 837036-2. S/N 22320

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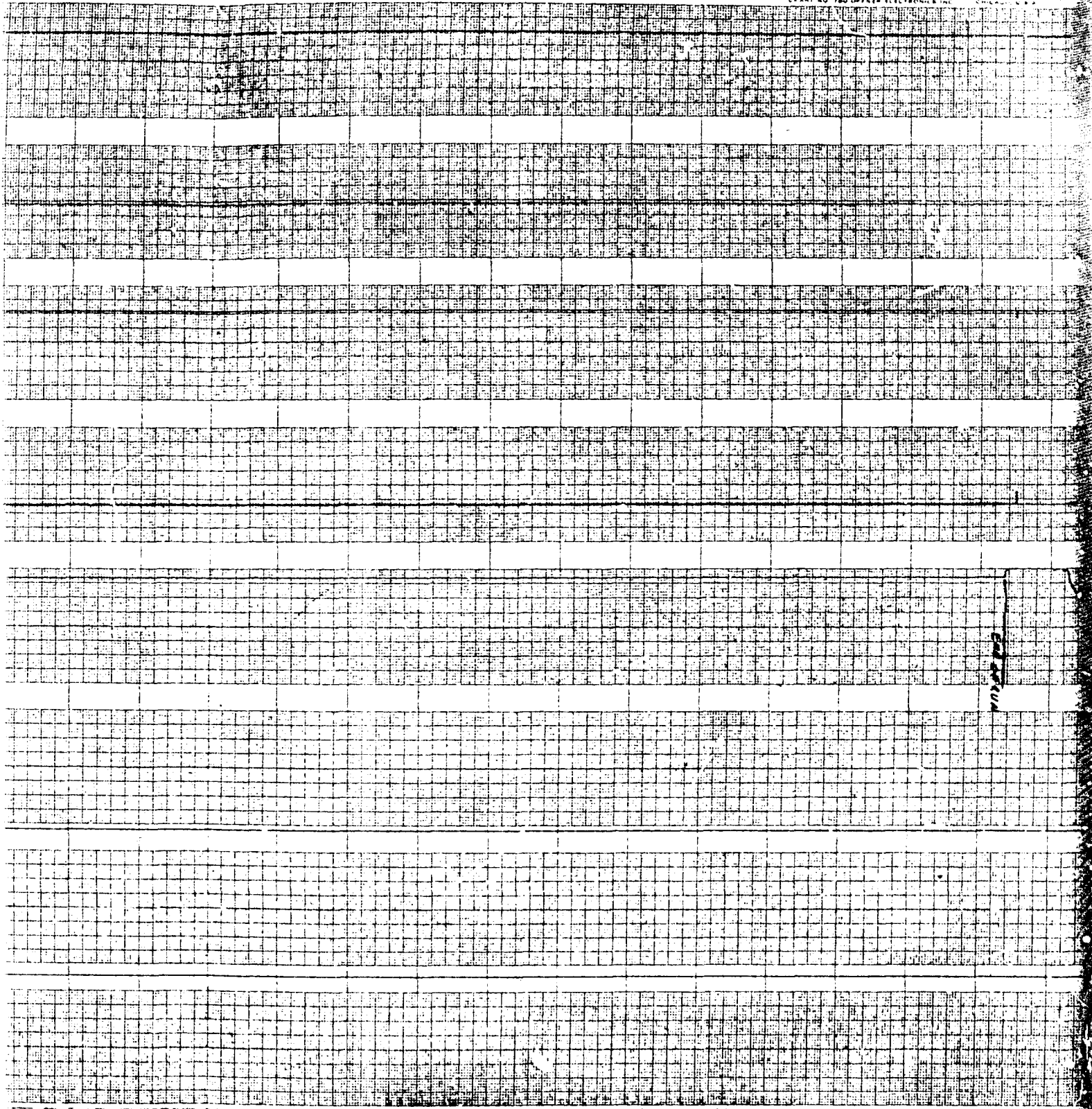
AIRESEARCH MANUFACTURING DIVISION
Los Angeles, California



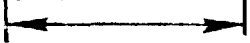
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Chart No. 180 OFFICE ELECTRONICS INC.



CALCULATED



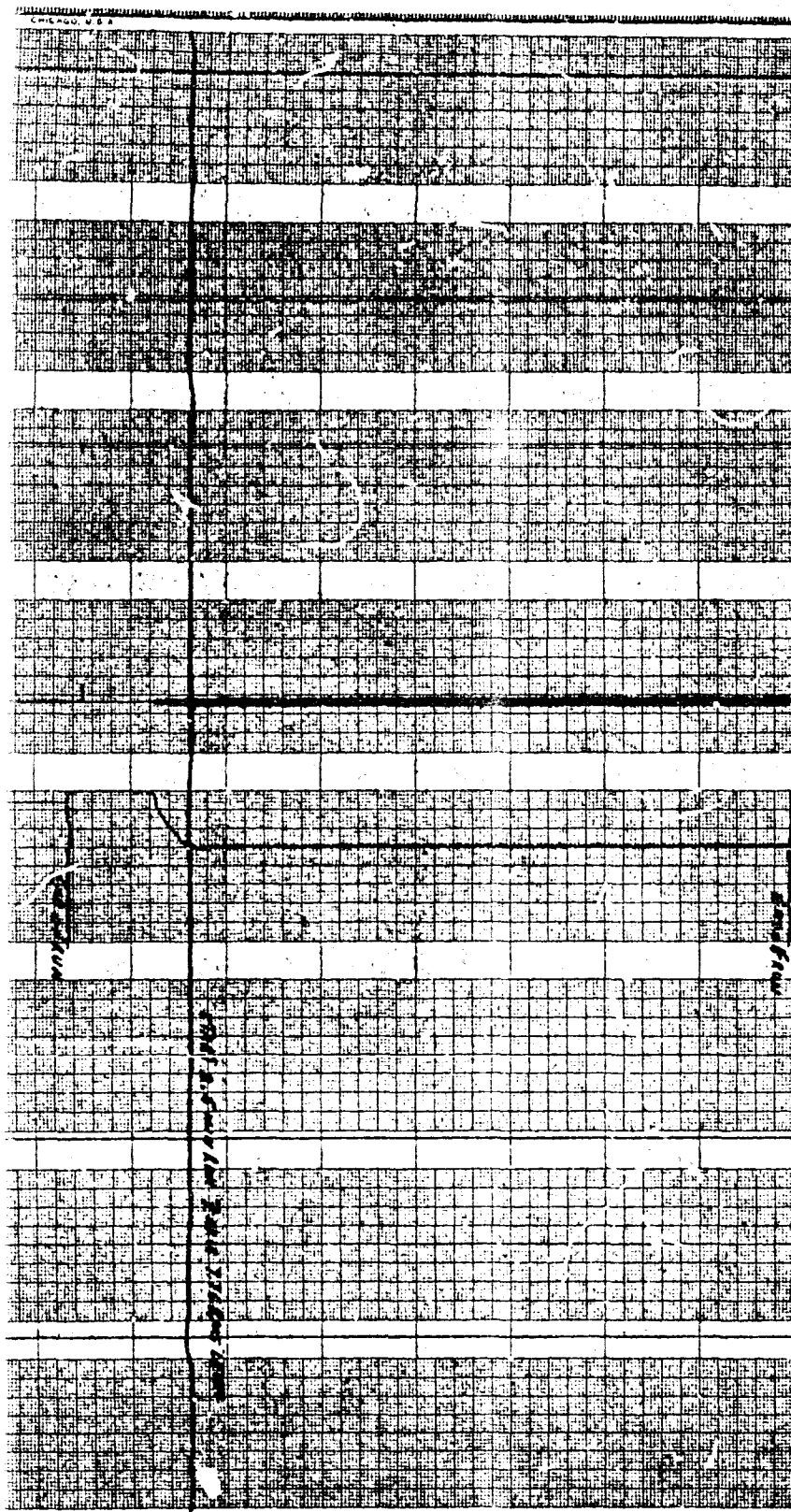
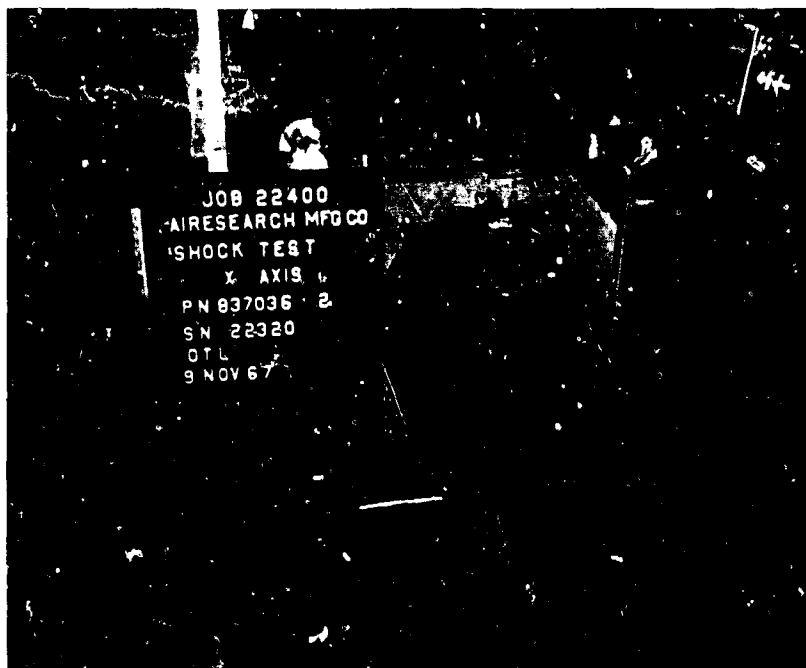


Figure 15 Z Axis Vibration Test Results. P/N 837036-2. S/N 22320

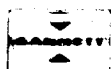
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D



F-8622

Figure 17. Shock Test Setup
P/N 837036-2,
S/N 22320



AMERICAN MANUFACTURING COMPANY
14 April 1967



MONTEREY PARK, DIVISION

OGDEN TECHNOLOGY LABORATORIES, INC.

Subsidiary of Ogden Corporation

21 NOVEMBER 1967

873 MONTEREY PASS ROAD, MONTEREY PARK, CALIFORNIA 91754

TELEPHONE: 213 - 289-4425 TWX: 213 - 288-3123

OGDEN TECHNOLOGY LABORATORIES REPORT NUMBER 22400

AIRESEARCH PURCHASE ORDER NUMBER 418-56664-7

- A. TEST: DEVELOPMENTAL SHOCK
- B. SAMPLE: TRANSDUCER
PART NUMBER 837036-2
SERIAL NUMBER 22320
- C. SPECIFICATION: AIRESEARCH QUALIFICATION TEST PROCEDURE
IMPACT SHOCK TEST, No. SS-1560-R,
DATED 4 OCTOBER 1967, PARAGRAPH 5.6
AND FIGURE 2
- D. RESULTS: THIS IS TO CERTIFY THAT THE SAMPLE WAS SUBJECTED
TO THE SHOCK TEST IN ACCORDANCE WITH THE
ABOVE SPECIFICATION.
- SINCE AIRESEARCH PERSONNEL PERFORMED ALL OF
THE OPERATIONAL TESTS, OGDEN TECHNOLOGY
LABORATORIES CANNOT CERTIFY THAT THE SAMPLE
PASSED OR FAILED.

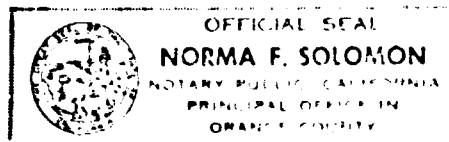
OGDEN TECHNOLOGY LABORATORIES

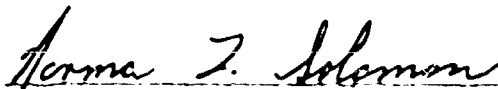


D. E. KARR

OPERATIONS MANAGER

SUBSCRIBED AND SWORN TO BEFORE ME THIS 21ST DAY OF NOVEMBER 1967





NORMA F. SOLOMON, NOTARY PUBLIC IN AND FOR THE COUNTY OF ORANGE, STATE OF CALIFORNIA. MY COMMISSION EXPIRES MARCH 6, 1971.

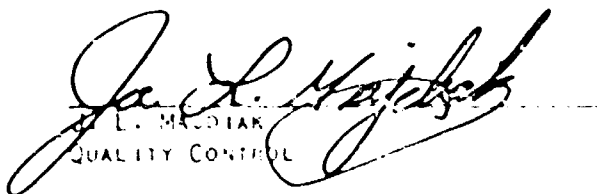
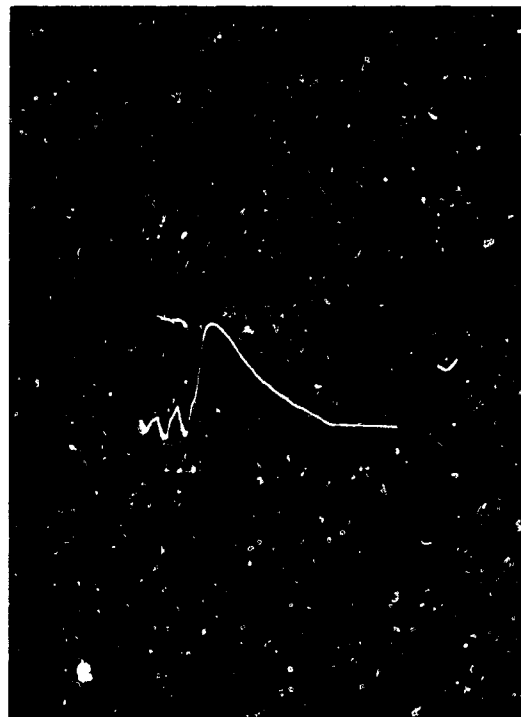

J. L. MACDIAK
QUALITY CONTROL

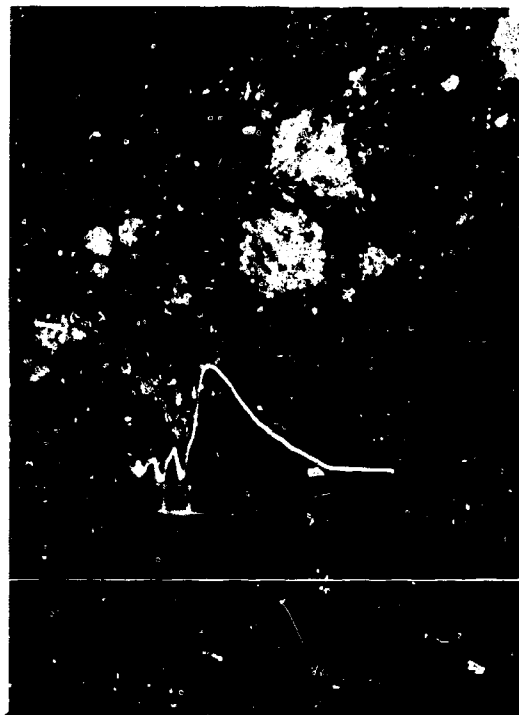
Figure 18 (page 1 of 3)
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EQUIPMENT LIST

DESCRIPTION	SYMBOL	UNIT	APPARATUS	CALIBRATION DUE DATE
<u>SHOCK TEST</u>				
SHOCK	--	--	TEKTRONIX OSCILLOSCOPE, MODEL 564, S.N. 0037J8	3/3/68 6 MONTHS
			ENDEVCO AMPLIFIER, MODEL 2614, S.N. FC12	1/11/68 3 MONTHS
			ENDEVCO ACCELEROMETER, MODEL 2213, S.N. JA26	1/11/68 6 MONTHS
			ROTOTEST LOW PASS FILTER, RTL No. E-3854	3/13/68 12 MONTHS
			BARRY CONTROLS SHOCK MACHINE, TYPE 15575, S.N. 064, RTL No. F-7076-1	BEFORE USE



76G IMPACT SHOCK X AXIS



CALIBRATION SHOCK PULSE F-8625

Figure 19. Shock Pulse Trace, P/N 837036-2, S/N 22320
Time base = 2ms/cm, Amplitude = 20g/cm
Vertical value = 76g, Horizontal value = 10 ms



Interim Change Notice Letter: F
 ATP No.: SS-1759-A
 Effective Date: 22 May 1967

SS-1759-A
 Data Sheet
 1 of 3

ACCEPTANCE TEST
 DATA SHEET

Use black ink. No
 erasures permitted.

STEAM BUC PRESSURE TRANSDUCER 837056-2

NAA REF. SPEC. NO. _____ NASA 004090022320

Part Number 837036-2 S/N 22320

Date 11-10-67 Barometer 29.8 in. Hg abs Amb Temp 74 °F

Tested by A Cunningham Test Facility 1402

Examination of Product: Accept _____ Reject _____

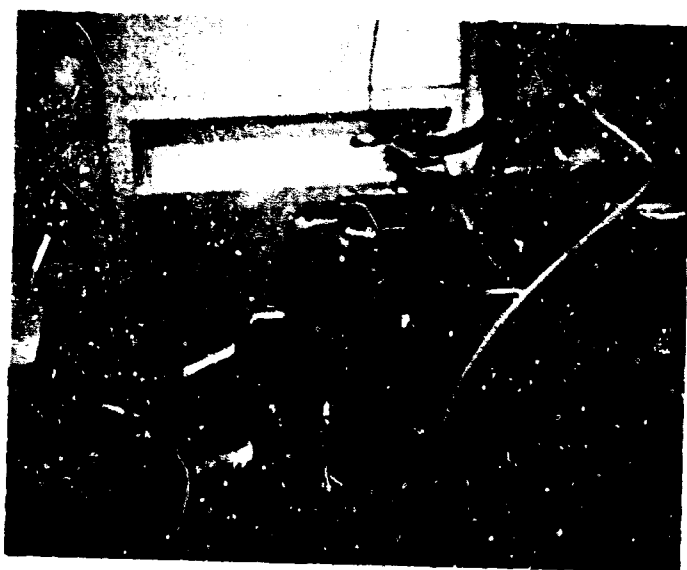
Remarks: EW03464-200117-68-2154

Dimensional Check Verified: 11-10-67

Para. 4.6 Calibration Test (Prior To Proof Pressure Test) Accept 72H Reject _____

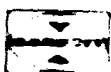
TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+28.0 ±0.5	+28.0
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	-0.0060
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.2310
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.4530
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref 75% of range	vdc	+3.7500 ±0.2000	+3.668
Specimen pressure	mm Hg abs	12.929	12.929
Output voltage, Ref 100% of range	vdc	+5.0000 ±0.2000	+4.8820
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref. 75% of range	vdc	+3.7500 ±0.2000	+3.6670
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.4520
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.230
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	-0.0040





F-8620

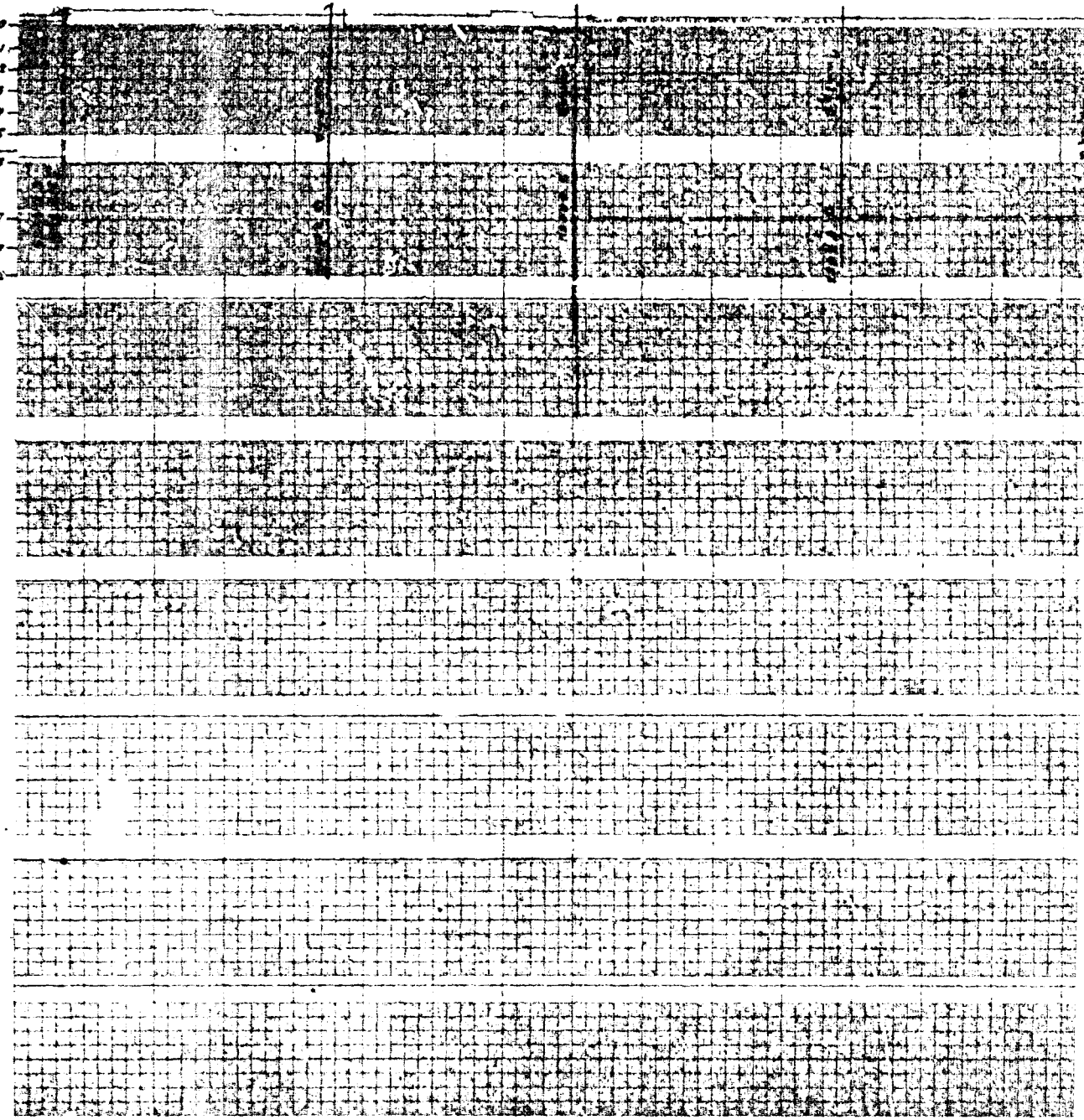
Figure 21. Magnetic Field Effects Test
P/N 837036-2, S/N 22320



AMERICAN MANUFACTURING SYSTEMS

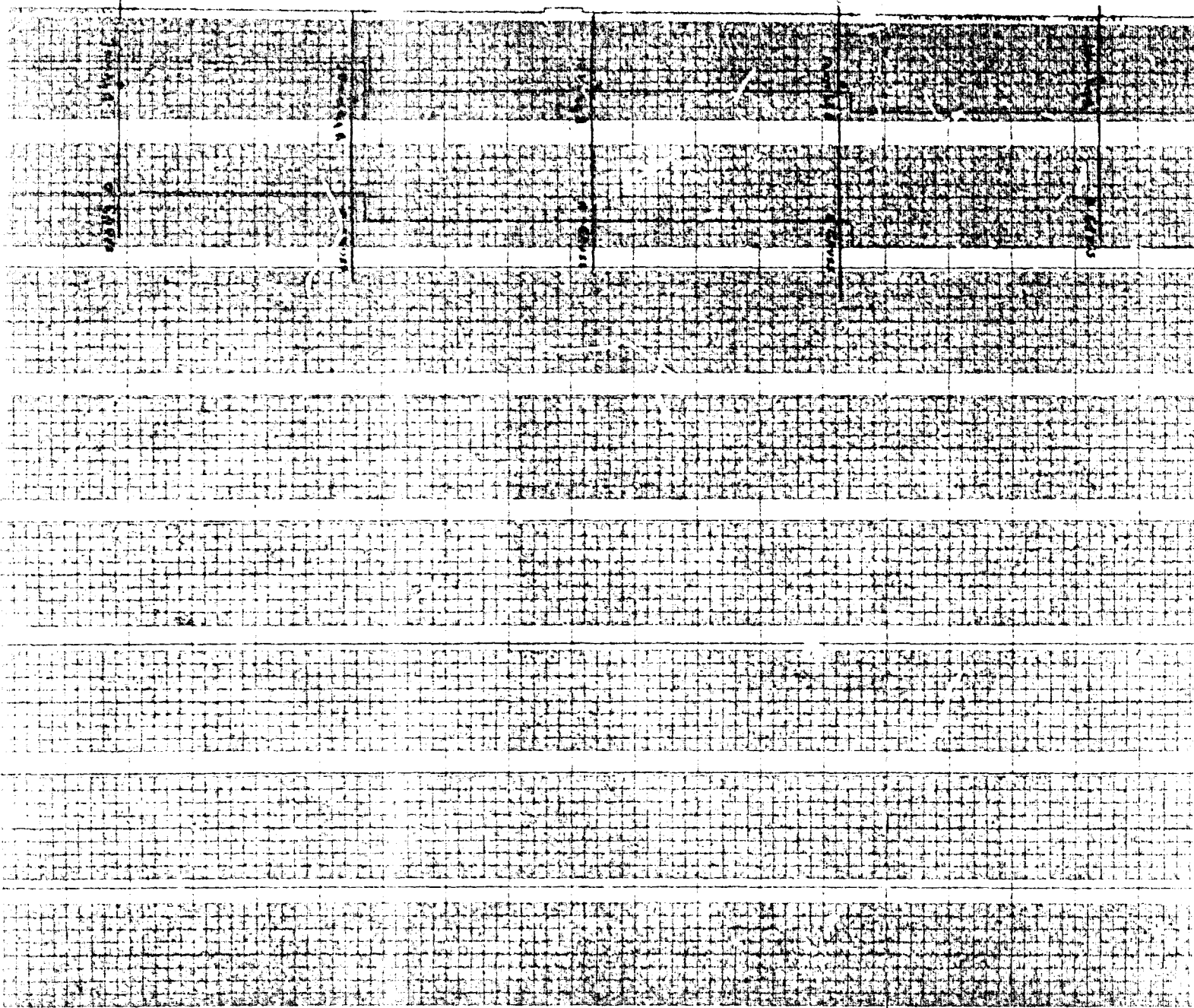
TRANSVERSE
CROSS SECTION, VAC

REVERSE
CROSS SECTION, VAC



AIRESEARCH MANUFACTURING DIVISION
Los Angeles, California

A



B



Figure 22. Magnetic Field Effect. P/N: 837034-2. S/N: 22320

Best Available Copy

C

DEVELOPMENT TEST
DATA SHEET

P/N 837036-2, S/N 22320
(MFG. BY PACE-WIANCKO)

ATTITUDE TEST RESULTS

Pressure MM Hg A	Attitude	Actual Output vdc	Acceptable Output vdc
3	X-	0.231	0.200 $\pm$ 0.2 ↕
3	X+	0.228	
3	Y-	0.231	
3	Y+	0.227	
3	Z-	0.229	
3	Z+	0.222	
7	X-	2.194	2.133 $\pm$ 0.2 ↕
7	X+	2.189	
7	Y-	2.222	
7	Y+	2.110	
7	Z-	2.117	
7	Z+	2.114	
10	X-	3.630	3.584 $\pm$ 0.2 ↕
10	X+	3.639	
10	Y-	3.635	
10	Y+	3.627	
10	Z-	3.622	
10	Z+	3.617	
12	X-	4.579	4.551 $\pm$ 0.2 ↕
12	X+	4.570	
12	Y-	4.585	
12	Y+	4.580	
12	Z-	4.600	
12	Z+	4.594	

Figure 23
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AIRSEARCH MANUFACTURING DIVISION
Los Angeles, California

Interim Change Notice Letter: F

ATP No.: 88-1759-R

Effective Date: 22 May 1967

88-1759-R

Data Sheet

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ACCEPTANCE TEST

Use black ink. No

erasures permitted.

STEAM DUCT PRESSURE TRANSDUCER 837036-2-1

NAA REF. SPEC. ME

NASA 004 0000 2232

Part Number

837036-2-1

S/N

2232/

Date 13-2-P-67

Barometer

In. Hg abs

And There

1

Tested by

A Cunniff's

Test Facility

1402

Examination of Product:

Accept

Project

Remarks :

EW0 3404-200117-69-2154

Dimensional Check Verified:

Para. 4.6 Calibration Test (Prior To Proof Pressure Test) Accept

Reluct

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+28.0 $\pm$ 0.5	+28.0
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 $\pm$ 0.2000	+0.4600 *
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 $\pm$ 0.2000	+1.6170 *
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 $\pm$ 0.2000	+2.7690 *
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref 75% of range	vdc	+3.7500 $\pm$ 0.2000	+3.9190
Specimen pressure	mm Hg abs	12.929	12.929
Output voltage, Ref 100% of range	vdc	+5.0000 $\pm$ 0.2000	+5.0770
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref. 75% of range	vdc	+3.7500 $\pm$ 0.2000	+3.9270
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 $\pm$ 0.2000	+2.775 *
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 $\pm$ 0.2000	+1.6000 *
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 $\pm$ 0.2000	+0.4210 *

* out of spec Readings



AIRESearch MANUFACTURING DIVISION

Figure 24

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WHITTAKER CORPORATION
PACE WIANCKO DIVISION
12838 SATOLLY AVE.
NORTH HOLLYWOOD, CALIF.

FORM NO. FR-1 PAGE 1
Report No.

FR-66-67

FAILURE REPORT

PW PART NO.

601555

CUSTOMER:

Airesearch

CUSTOMER O.C. DOCUMENT NO. (INCLUDE REVISION NO.)

PART NAME:

Transducer, Pressure,
Absolute

CUSTOMER PART OR DWG. NO.

837036-2-1 Rev. L

SERIAL NO.

22321 & 22322

DATE OF FAILURE:

POINT OF FAILURE; I.E. IN-PROCESS, ACCEPT, TEST, etc.

Airesearch

NATURE OF FAILURE: (COMPARE WITH ALLOWABLE TOL. LIMITS)

Positive shift in output.

TEST CONDITION, PREVIOUS HISTORY AND OPERATING TIME/NO. OF CYCLES
(INDICATE TIME IN HOURS AND TENTHS)

N/A

FAILURE CAUSE:

Failure was verified.

IMMEDIATE DISPOSITION:

Perform failure analysis to determine cause and establish corrective action.

(ATTACH ADDITIONAL PAGES IF NECESSARY)

REPORTED BY

12-28

APPROVED BY

FAILURE ANALYSIS REQ'D ☒

NOT REQ'D ☐



AIRESEARCH MANUFACTURING DIVISION
Los Angeles, California

Figure 25 (page 1 of 2)
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WHITTAKER CORPORATION
FACE WILKCO DIVISION
12838 SATICOY STREET
NORTH HOLLYWOOD, CALIF.

FORM NO. FR-2 PAGE 1

Report NO. FR-66-67

FAILURE ANALYSIS

PART NO. 601555 SERIAL NO. 22321 CUSTOMER P/N 837036-2-1 "L"
CUSTOMER S/N N/A CUSTOMER Airesearch

ANALYSIS: The upward shift of the transducers output has been explained as an undesirable feature of the magnetic circuit that was used. Magnetic leakage through the case half formed a part of the path through the diaphragm back to the "E" core. Minor shifts in the "E" core position due to instability in the potting compound would cause a reading offset.

CORRECTIVE ACTION: S/N 22323 incorporates an inconel ring around the "E" core which provided a high reluctance path between the "E" core and the magnetically permeable stainless case half. In the new design the inconel ring provides a high reluctance path that removes case half leakage from the magnetic circuit and reduces the reading sensitivity to movement of the "E" core. As a result of the concentration of the magnetic field the output of the pickup is increased by a noticeable factor. In addition to this the movement of the diaphragm in S/N 22323 has been increased from approx. .0005 to .001 inch. This has increased output.

ANALYSIS PREPARED BY: [Signature] Title [Blank] Date 12/28/67

ANALYSIS APPROVED BY: [Signature] Title Figure 25 (page 2 of 2)
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Page 58

DEVELOPMENT TEST
DATA SHEET

P/N 837036-2 S/N 22322
(MFD BY PACE WIANCKO)

PRESSURE		OUTPUT VOLTS	
PSIA	INS Hg. A	NOMINAL	INITIAL CALIB. 10-4-67
.05	.10180	0	+ .060
.07	.14253	.5	.586
.09	.18325	1.0	1.091
.11	.22397	1.5	1.595
.13	.26469	2.0	2.094
.15	.30541	2.5	2.594
.17	.34614	3.0	3.091
.19	.38686	3.5	3.593
.21	.42758	4.0	4.089
.23	.46830	4.5	4.584
.25	.50903	5.0	5.073



AIRSEARCH MANUFACTURING DIVISION
Los Angeles, California

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ACCEPTANCE TEST DATA SHEET (CONT)
 STEAM DUCT PRESSURE TRANSDUCER 837056-2-1

P/N 837036-2-1
 S/N 22322

NAA REF. SPEC. ME KASA 00400022322

Proof Pressure Test (Nitrogen Gas Test Fluid): ¹¹⁻¹⁻⁶⁷ Accept 32/13 Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen pressure	psig	20.0 +0.2, -0	20.0
Time at pressure	minutes	3	3

External Leakage Test (Nitrogen Gas Test Fluid): ¹¹⁻¹⁻⁶⁷ Accept 32/13 Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen pressure	psig	6.0 +0.2, -0	6.0
Time at pressure	minutes	15	15
External leakage in 15 minutes	scf	0.5 max	0.0

Diode Test: ¹¹⁻¹⁻⁶⁷ Accept 32/13 Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+30.0 ±0.1	+30.0
Diode voltage (SWI at pos 2)	vdc	+1.0 max	0.0
Diode voltage (SWI at pos 1)	vdc	+1.0 max	0.0

Maximum Output Voltage Test: ¹¹⁻¹⁻⁶⁷ Accept 32/13 Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen output voltage	vdc	+6.5 max	+5.556

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Data Sheet
3 of 5

ACCEPTANCE TEST DATA SHEET (CONT)

P/N 837036-2-1

STEAM DUCT PRESSURE TRANSDUCER 837036-2-1 S/N 22322

NAA REF. SPEC. ME

NASA

Input Current Test:

Accept Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Input current (SWI at pos 1)	ma	40 max	17.5
Input current (SWI at pos 2)	ma	40 max	0.0 *

Calibration Test:

Accept 37412 Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+28.0 $\pm$ 0.5	+28.0
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 $\pm$ 0.2000	+0.1490
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 $\pm$ 0.2000	+1.3880
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 $\pm$ 0.2000	+2.6000
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref 75% of range	vdc	+3.7500 $\pm$ 0.2000	+3.8000
Specimen pressure	mm Hg abs	12.929	12.729
Output voltage, Ref 100% of range	vdc	+5.0000 $\pm$ 0.2000	+4.9550
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref. 75% of range	vdc	+3.7500 $\pm$ 0.2000	+3.7980
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 $\pm$ 0.2000	+2.5980
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 $\pm$ 0.2000	+1.3800
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 $\pm$ 0.2000	+0.1460

* No current reading pin F

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ACCEPTANCE TEST DATA SHEET (CONT)
STEAM DUCT PRESSURE TRANSDUCER 837036-2-1

P/N 837036-2-1
S/N 22322

NAA REF. SPEC. MIL-STD-883C NASA 004000022322

Calibration Test (cont)

STEP	TEST PARAMETER	UNITS	REQUIRED	ACTUAL
9c	Specimen pressure	mm Hg abs	5.171	5.171
	Output voltage	vdc	+1.2500 $\pm$ 0.2000	+1.3660
11f	Pressure (PS2)	In. Hg abs	1.0 $\pm$ 0.5	1.0
11g	Output voltage	vdc	+1.2500 $\pm$ 0.2000	+1.3620
11h	Specimen pressure	mm Hg abs	5.171	5.171
13b	(1) Specimen pressure	mm Hg abs	5.171	5.171
	(2) Output voltage	vdc	+1.2500 $\pm$ 0.2000	1.3459
	(3) Pressure PS2	In. Hg abs	1.0 $\pm$ 0.5	0.75
	(4) Time at test	hours	3	3

Input Voltage Variation Test: Accept 11-167 Reject 1747V

INLET PRESSURE (mm Hg abs)		INPUT VOLTAGE (vdc)		OUTPUT VOLTAGE (vdc)	
REQUIRED	ACTUAL	REQUIRED	ACTUAL	REQUIRED	ACTUAL
2.586	2.586	+25.0 $\pm$ 0.1	25.0	0.0000 $\pm$ 0.2000	+0.1171
	2.586	+30.0 $\pm$ 0.1	30.0	0.0000 $\pm$ 0.2000	+0.1165
12.929	12.929	+25.0 $\pm$ 0.1	25.0	+5.0000 $\pm$ 0.2000	4.9086
		+30.0 $\pm$ 0.1		+5.0000 $\pm$ 0.2000	4.9090

Output Ripple Test: Accept 11-167 Reject 1747V

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Output ripple voltage	mv rms	10 max	1.9

Isolation Resistance Test: Accept 11-167 Reject 1747V

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Potential	vdc	100	100
Resistance	megohms	100 min	4.2 giga

Intn: In Charge Notice Letter; F

ATP No.: 83-1780-R

Effective Date: 02-20-1987.

SS-1759-R

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ACCEPTANCE TEST DATA SHEET (CONT)

STEAM DUCT PRESSURE TRANSDUCER 037036-2-1

P/N P37036-2-1

SN 22322

NAA REF. SPEC. ME

NASA 004000022322

Insulation Resistance Test:

1-1-67 31472 ✓ Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Potential	vdc	100	100
Resistance	megohms	50 min	2.6 x 10 ⁴

Weight: _____ lb.

Remarks: _____

Test Specimen Status:

Accept _____ Reject _____

By _____

Inspection:

AIResearch Q.C.

NAA Q.C.

DCAS-04R



APRIL SEARCH MANUFACTURING DIVISION

Figure 1. Map of study area.

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C. S. H. Pressure Transducer Out. and No. Minesearch
 Reg. Pin 601555-1 Specification SS-1313-R
 Project _____ Test Order _____
 Conducted by Grady D. D. Approved/Witnessed by _____
 Date 11-11-67 Date _____
 Miscellaneous 100,000 u.v., .15 - 10,000 MC applied to each input
28VDC power line using the LISN. 400~ 30% Modulation. used.

Test and Requirements: HP-606 (56587/4) 1/2 A153 Col Rec 2-7-68
HP-655E 1/4 710-00545 (4-25-68) HP-612A 1/4 533-04704 (3-15-69)
HP-614A 1/4 721-03077 (4-10-68) HP-610C 1/4 148-01241 (4-11-68)
HP-618B 1/4 151-02920 (5-13-68) HP-670A 1/4 214-02566 (4-11-68)

+28V Line -28V Line

Freq. M.C.	Output DC Voltage	Output Ripple RMS.	Freq. M.C.	Output DC Voltage	Output Ripple RMS.
.15	3.68	9.9 mV.	.15	3.68	9.9 mV.
1.26	↑	11.3 "	1.26	"	12.6 "
52.9	↑	13.07 "	52.9	"	13.0 "
78.0	↑	14.14 "	78.0	"	14.2 "
121.0	↑	14.0 "	121.0	"	14.2 "
151.0	↑	12.7 "	151.0	"	13.0 "
172.0	↑	15.55 "	172.0	"	15.75 "
		9.9		"	9.9
		"		"	"
		"		"	"
		"		"	"
		"		"	"
		"		"	"
		"		"	"
		"		"	"
		"		"	"
		"		"	"
		"		"	"
		"		"	"
10,000		"	10,000	"	"

No Notable Change
of DC output
Voltage

Form 24-A-1



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ACCEPTANCE TEST
DATA SHEET

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erasures permitted.

STEAM DUCT PRESSURE TRANSDUCER 837036-2-1

NAA RES. SPEC. NO. _____ NASA 064000022322

Part Number 837036-2-1 S/N 22-322

Date 12-12-67 Barometer 29.9 In. Hg abs Amb Temp 74 °F

Tested by ACunningham Test Facility 1402

Examination of Product: Accept _____ Reject _____

Remarks: Dev. Findings only

Verification of out of Tolerance Condition

During Steam Test.

Dimensional Check Verified: _____

Para. 4.6 Calibration Test (Prior To Proof Pressure Test) Accept _____ Reject _____

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+28.0 ±0.5	+28.0
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	+0.2600
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.5280
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.7820
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref 75% of range	vdc	+3.7500 ±0.2000	+4.0160
Specimen pressure	mm Hg abs	12.929	12.929
Output voltage, Ref 100% of range	vdc	+5.0000 ±0.2000	+5.186
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref. 75% of range	vdc	+3.7500 ±0.2000	+4.0160
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.7810
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.5260
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	+0.2580



AIRESEARCH MANUFACTURING DIVISION
Los Angeles, California

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ACCEPTANCE TEST DATA SHEET (CONT)
STEAM DUCT PRESSURE TRANSDUCER 837036-2-1

P/N 837036-2-1
S/N 22-322

NAA REF. SPEC. AE NASA

Calibration Test (cont)

STEP	TEST PARAMETER	UNITS	REQUIRED	ACTUAL
9c	Specimen pressure	mm Hg abs	5.171	
	Output voltage	vdc	+1.2500 $\pm$ 0.2000	
11f	Pressure (PS2)	in. Hg abs	1.0 $\pm$ 0.5	
11g	Output voltage	vdc	+1.2500 $\pm$ 0.2000	
11h	Specimen pressure	mm Hg abs	5.171	
13b	(1) Specimen pressure	mm Hg abs	5.171	
	(2) Output voltage	vdc	+1.2500 $\pm$ 0.2000	
	(3) Pressure PS2	in. Hg abs	1.0 $\pm$ 0.5	
	(4) Time at test	hours	3	

Input Voltage Variation Test: Accept Reject

INLET PRESSURE (mm Hg abs)		INPUT VOLTAGE (vdc)		OUTPUT VOLTAGE (vdc)	
REQUIRED	ACTUAL	REQUIRED	ACTUAL	REQUIRED	ACTUAL
2.586		+25.0 $\pm$ 0.1		0.0000 $\pm$ 0.2000	
		+30.0 $\pm$ 0.1		0.0000 $\pm$ 0.2000	
12.929		+25.0 $\pm$ 0.1		+5.0000 $\pm$ 0.2000	
		+30.0 $\pm$ 0.1		+5.0000 $\pm$ 0.2000	

Output Ripple Test: Accept Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Output ripple voltage	mv rms	10 max	

Isolation Resistance Test: Accept 32113 Reject 12-12-67

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Potential	vdc	100	110
Resistance	megohms	100 min	1.6 $\times 10^5$



AIRCRAFT RESEARCH MANUFACTURING DIVISION
Los Angeles, California

Figure 29 page 2 of 3
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ACCEPTANCE TEST DATA SHEET (CONT)
STEAM DUCT PRESSURE TRANSDUCER BS7036-1

P/N _____
S/N 22-322

NAA REF. SPEC. ME _____ NASA _____

Insulation Resistance Test:

Accept 32.113 ¹²⁻¹²⁻⁶⁷ Reject _____

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Potential	vdc	100	100
Resistance	megohms	50 min	1×10^5

Weight: _____ lb.

Remarks: _____

Test Specimen Status:

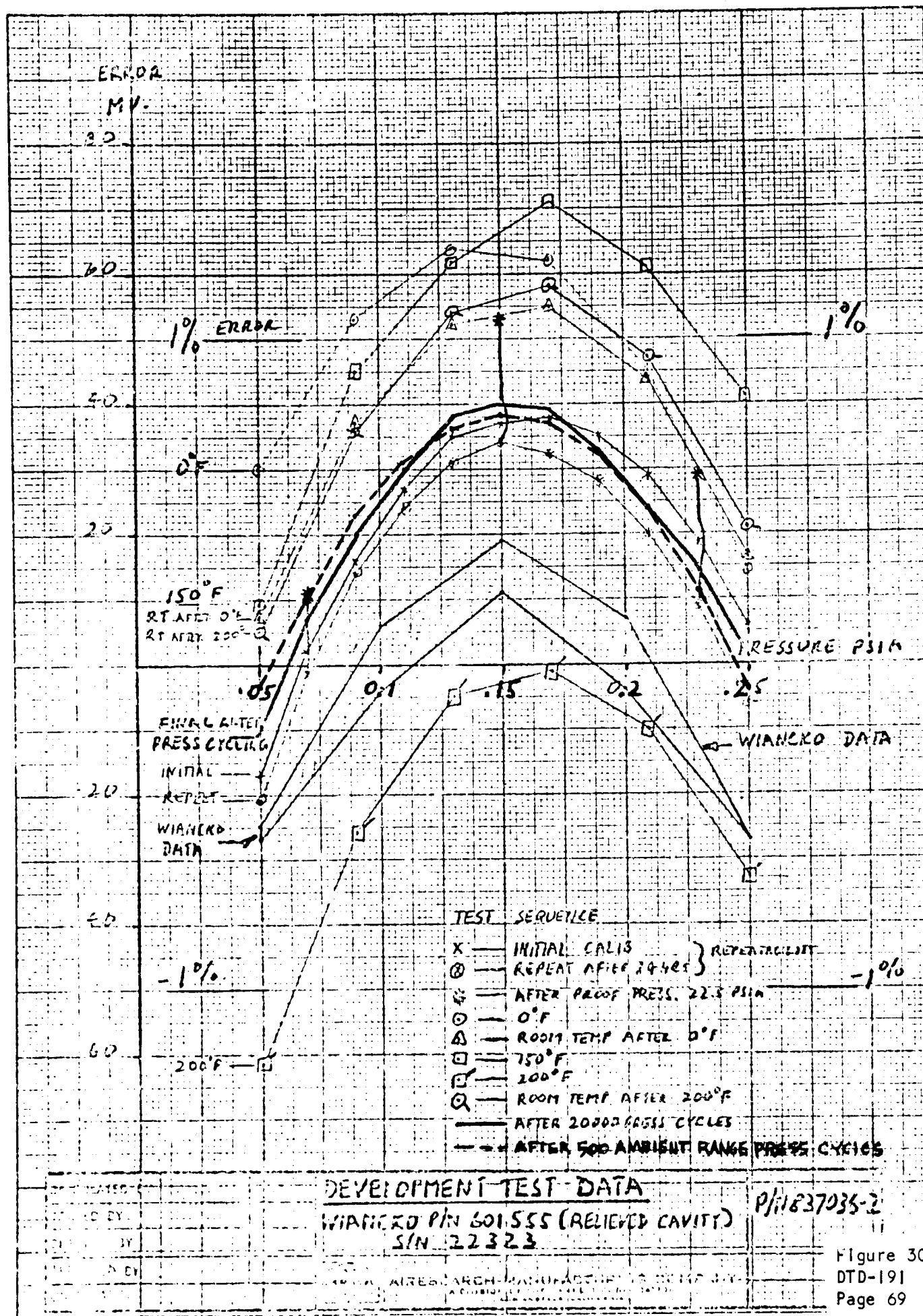
Accept _____ Reject _____

By _____

Inspection: AIRSEARCH Q.C. NAA Q.C. DCAS-QAR



AIRSEARCH MANUFACTURING DIVISION
Los Angeles, California



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ACCEPTANCE TEST DATA SHEET

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STEAM DUCT PRESSURE TRANSDUCER 837036-1

NAA REF. SPEC. ME NASA 204 000022323

Part Number 85103621 S/N 22323

Date 12-68 Barometer 29.92 In. Hg abs Amb Temp 70 °

Tested by E. G. B. G. Test Facility 1402

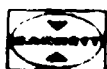
Examination of Product: _____ Accept: _____ Reject: _____

Remarks:

Dimensional Check Verified: _____

Para. 4.6 Calibration Test (Prior To Proof Pressure Test) Accept _____ Reject _____

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+28.0 $\pm$ 0.5	
Specimen pressure	mm Hg abs	2.586	
Output voltage, Ref 0% of range	vdc	0.0000 $\pm$ 0.2000	
Specimen pressure	mm Hg abs	5.171	
Output voltage, Ref 25% of range	vdc	+1.2500 $\pm$ 0.2000	
Specimen pressure	mm Hg abs	7.757	
Output voltage, Ref 50% of range	vdc	+2.5000 $\pm$ 0.2000	
Specimen pressure	mm Hg abs	10.343	
Output voltage, Ref 75% of range	vdc	+3.7500 $\pm$ 0.2000	
Specimen pressure	mm Hg abs	12.929	
Output voltage, Ref 100% of range	vdc	+5.0000 $\pm$ 0.2000	
Specimen pressure	mm Hg abs	10.343	
Output voltage, Ref. 75% of range	vdc	+3.7500 $\pm$ 0.2000	
Specimen pressure	mm Hg abs	7.757	
Output voltage, Ref 50% of range	vdc	+2.5000 $\pm$ 0.2000	
Specimen pressure	mm Hg abs	5.171	
Output voltage, Ref 25% of range	vdc	+1.2500 $\pm$ 0.2000	
Specimen pressure	mm Hg abs	2.586	
Output voltage, Ref 0% of range	vdc	0.0000 $\pm$ 0.2000	



AIRSEARCH MANUFACTURING DIVISION
LOS ANGELES, CALIFORNIA

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ACCEPTANCE TEST DATA SHEET (CONT)
 STEAM DUCT PRESSURE TRANSDUCER 857056-1

P/N 232236-2-1
 S/N 22223

NAA REF. SPEC. ME NASA 232236-2-223

Proof Pressure Test (Nitrogen Gas Test Fluid): Accept ☒ Reject ☐

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen pressure	psig	20.0 +0.2, -0	20.0
Time at pressure	minutes	3	3

External Leakage Test (Nitrogen Gas Test Fluid): Accept ☒ Reject ☐

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen pressure	psig	6.0 +0.2, -0	6.0
Time at pressure	minutes	15	15
External leakage in 15 minutes	scc	0.5 max	0.0

Diode Test: Accept ☐ Reject ☐

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+30.0 ±0.1	
Diode voltage (SW1 at pos 2)	vdc	+1.0 max	
Diode voltage (SW1 at pos 1)	vdc	+1.0 max	

Maximum Output Voltage Test: Accept ☐ Reject ☐

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen output voltage	vdc	+6.5 max	

OK TEST
 1-2-67
 H.Q.

Interim Change Notice Letter: F
ATP No.: SS-1759-R
Effective Date: 22 May 1967

SS-1759-R
Data Sheet
3 of 3

ACCEPTANCE TEST DATA SHEET (CONT)
STEAM DUCT PRESSURE TRANSDUCER 837036-1

P/N 837036-2-1
S/N 12323

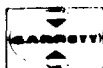
NAA REF. SPEC. ME NASA 004000022323

Input Current Test: Accept Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Input current (SWI at pos 1)	ma	40 max	
Input current (SWI at pos 2)	ma		

Calibration Test: Accept 250 Reject 1-3-68

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+28.0 ±0.5	+28.0
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	-0.0470
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.2450
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.5170
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref 75% of range	vdc	+3.7500 ±0.2000	+3.7640
Specimen pressure	mm Hg abs	12.929	12.929
Output voltage, Ref 100% of range	vdc	+5.0000 ±0.2000	+4.9900
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref. 75% of range	vdc	+3.7500 ±0.2000	+3.7580
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.5140
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.2430
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	-0.0440



AIRSEARCH MANUFACTURING DIVISION

Interim Change Notice Letter: F
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Effective Date: 22 May 1967

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ACCEPTANCE TEST DATA SHEET (CONT)
STEAM DUCT PRESSURE TRANSDUCER 837036-1

P/N 837036-2-1
S/N 22323

NAA REF. SPEC. NE NASA 004000022323

Calibration Test (cont)

STEP	TEST PARAMETER	UNITS	REQUIRED	ACTUAL
9c	Specimen pressure	mm Hg abs	5.171	5.171
	Output voltage	vdc	+1.2500 $\pm$ 0.2000	+1.2430
11f	Pressure (PS2)	in. Hg abs	1.0 $\pm$ 0.5	1.0
11g	Output voltage	vdc	+1.2500 $\pm$ 0.2000	1.2430
11h	Specimen pressure	mm Hg abs	5.171	5.171
13b	(1) Specimen pressure	mm Hg abs	5.171	5.171
	(2) Output voltage	vdc	+1.2500 $\pm$ 0.2000	1.241
	(3) Pressure PS2	in. Hg abs	1.0 $\pm$ 0.5	0.9
	(4) Time at test	hours	3	3

Input Voltage Variation Test: Accept _____ Reject _____

INLET PRESSURE (mm Hg abs)		INPUT VOLTAGE (vdc)		OUTPUT VOLTAGE (vdc)	
REQUIRED	ACTUAL	REQUIRED	ACTUAL	REQUIRED	ACTUAL
2.586		+25.0 $\pm$ 0.1		0.0000 $\pm$ 0.2000	
		+30.0 $\pm$ 0.1		0.0000 $\pm$ 0.2000	
12.929		+25.0 $\pm$ 0.1		+8.0000 $\pm$ 0.2000	
		+30.0 $\pm$ 0.1		+5.0000 $\pm$ 0.2000	

Output Ripple Test: Accept _____ Reject _____

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Output ripple voltage	mv rms	10 max	

Isolation Resistance Test: Accept _____ Reject _____

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Potential	vdc	100	100
Resistance	megohms	100 min	8.5×10^4



ANALYSIS MANUFACTURING DIVISION

Figure 01 Page 4 of 5
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Interim Change Notice Letter: F
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Effective Date: February 1968

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ACCEPTANCE TEST DATA SHEET (CONT)
STEAM DUCT PRESSURE TRANSDUCER 837036-1

P/N _____
S/N _____

NAA REF. SPEC. ME _____ NASA _____

Insulation Resistance Test: Accept _____ Reject _____

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Potential	vdc	100	
Resistance	megohms	50 min	

Weight: _____ lb.

Remarks: _____

Test Specimen Status:

Accept 130 Reject _____
By _____

QC 58
Inspection: Charles Brown N/A
AIRsearch Q.C. NAA Q.C. DCAS-QAR



Interim Change Notice Letter: F
ATP No.: 88-1799-R
Effective Date: 22-Mar-1967

88-1789-A
Data Sheet
1 of 8

ACCEPTANCE TEST DATA SHEET

Use black ink. No erasures permitted.

STEAM DUCT PRESSURE TRANSDUCER 837056-X - 2-1

NAA-REF. SPEC. NO. 449-0059-0001 NASA 004010022323

Part Number 837036-2 S/N 22-323

Date 1-8-68 Barometer 29.92 In. Hg abs Amb Temp 72 °F

Tested by H. Jenkins Test Facility 1402

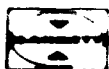
Examination of Product: Accept _____ Reject _____

Remarks: _____

Dimensional Check Verified: _____

Para. 4.6 Calibration Test (Prior To Proof Pressure Test) Accept _____ Reject _____

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	.dc	+28.0 $\pm$ 0.5	
Specimen pressure	mm Hg abs	2.586	
Output voltage, Ref 0% of range	vdc	0.0000 $\pm$ 0.2000	
Specimen pressure	mm Hg abs	5.171	
Output voltage, Ref 25% of range	vdc	+1.2500 $\pm$ 0.2000	
Specimen pressure	mm Hg abs	7.757	
Output voltage, Ref 50% of range	vdc	+2.5000 $\pm$ 0.2000	
Specimen pressure	mm Hg abs	10.343	
Output voltage, Ref 75% of range	vdc	+3.7500 $\pm$ 0.2000	
Specimen pressure	mm Hg abs	12.929	
Output voltage, Ref 100% of range	vdc	+5.0000 $\pm$ 0.2000	
Specimen pressure	mm Hg abs	10.343	
Output voltage, Ref. 75% of range	vdc	+3.7500 $\pm$ 0.2000	
Specimen pressure	mm Hg abs	7.757	
Output voltage, Ref 50% of range	vdc	+2.5000 $\pm$ 0.2000	
Specimen pressure	mm Hg abs	5.171	
Output voltage, Ref 25% of range	vdc	+1.2500 $\pm$ 0.2000	
Specimen pressure	mm Hg abs	2.586	
Output voltage, Ref 0% of range	vdc	0.0000 $\pm$ 0.2000	



ADMINISTRATIVE AND FINANCIAL DIVISION

Interim Change Notice Letter: F
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Effective Date: 22 May 1967

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ACCEPTANCE TEST DATA SHEET (CONT)
STEAM DUCT PRESSURE TRANSDUCER 837036-2-1

P/N 837036-2-1
S/N 22-323

NAA REF. SPEC. ME 444-0054-0001 NASA 004000022323

Proof Pressure Test (Nitrogen Gas Test Fluid): Accept Reject

1-8-68
FF194
FR 40

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen pressure	psig	20.0 +0.2, -0	20
Time at pressure	minutes	3	3

External Leakage Test (Nitrogen Gas Test Fluid): Accept Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen pressure	psig	6.0 +0.2, -0	6
Time at pressure	minutes	15	15
External leakage in 15 minutes	scc	0.5 max	0.0

Diode Test: Accept Reject

TEST PARAMETER	UNITS	REQUIRED ¹	ACTUAL
Specimen input voltage	vdc	+30.0 ±0.1	
Diode voltage (SW1 at pos 2)	vdc	+1.0 max	
Diode voltage (SW1 at pos 1)	vdc	+1.0 max	

Maximum Output Voltage Test: Accept Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen output voltage	vdc	+0.5 max	

Interim Change Notice Letter: F
ATP No.: SS-1759-R
Effective Date: 22 May 1967

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ACCEPTANCE TEST DATA SHEET (CONT)

P/N 837036-2-1

STEAM DUCT PRESSURE TRANSDUCER 837036-1

S/N 22-323

NAA REF. SPEC. ME 149-0059-0001 NASA 004000022323

Input Current Test:

Accept _____ Reject _____

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Input current (SWI ¹ at pos 1)	ma	40 max	
Input current (SWI at pos 2)	ma	40 max	

Calibration Test:

Accept QC 58 Reject _____

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+28.0 ±0.5	28.0
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	-0.1108
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.1832
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.4517
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref 75% of range	vdc	+3.7500 ±0.2000	+3.6920
Specimen pressure	mm Hg abs	12.929	12.929
Output voltage, Ref 100% of range	vdc	+5.0000 ±0.2000	+4.9094
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref. 75% of range	vdc	+3.7500 ±0.2000	+3.6919
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.4473
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.1812
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	-0.1097

CALIBRATION RUN AFTER FIRST DISTILLED
WATER EXPOSURE.



AIRSEARCH MANUFACTURING DIVISION
Los Angeles, California

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Effective Date: 22 May 1967

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ACCEPTANCE TEST DATA SHEET (CONT)
STEAM DUCT PRESSURE TRANSDUCER 837036-1

P/N 837036-2-1
S/N 22-323

NAA REF. SPEC. ME 449-0059-0001 NASA 004000022323

Insulation Resistance Test:

Accept ☒ QC 58 Reject ☐

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Potential	vdc	100	100
Resistance	megohms	50 min	1.5×10^5

Weight: _____ lb.

Remarks: FT stamp entered by mistake by technician H.Q.

Test Specimen Status:

Accept ☒ QC 58 Reject ☐

By _____

Inspection:

☒ QC 58

AIR Research Q.C.

NAA Q.C.

DCAS-QAR



AIR RESEARCH MANUFACTURING DIVISION
Los Angeles, California

Interim Change Notice Letter: F
ATP No.: 88-1739-R
Effective Date: 22-Mar-1967

88-1759-R
Data Sheet
1 of 5

ACCEPTANCE TEST DATA SHEET

Use black ink. No erasures permitted.

STEAM DUCT PRESSURE TRANSDUCER 837036-1

NAA REF. SPEC. NE 1 NASA 004000022323

Part Number 137036-2 S/N 22323

Date 1-12-68 Barometer 29.92 In. Hg abs Amb Temp 70 °F

Tested by J. Kozel Test Facility 1402

Examination of Product: Accept 1 Reject

Remarks: RESEARCH

Dimensional Check Verified: (A) Sample

Para. 4.6 Calibration Test (Prior To Proof Pressure Test) Accept Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+28.0 ±0.5	+28.0
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	-0.0930
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.1980
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.4700
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref 75% of range	vdc	+3.7500 ±0.2000	+3.7100
Specimen pressure	mm Hg abs	12.929	12.929
Output voltage, Ref 100% of range	vdc	+5.0000 ±0.2000	+4.9300
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref. 75% of range	vdc	+3.7500 ±0.2000	+3.7100
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 ±0.2000	+2.4660
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 ±0.2000	+1.1960
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 ±0.2000	-0.1005



APRIL SEARCH MANUFACTURING DIVISION

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 Data Sheet
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ACCEPTANCE TEST DATA SHEET (CONT)
 STEAM DUCT PRESSURE TRANSDUCER 837036-1

P/N 837036-2
 S/N 22323

NAA REF. SPEC. ME _____ NASA 004000022323

Proof Pressure Test (Nitrogen Gas Test Fluid): ¹⁻¹²⁻⁶⁸ Accept (A) ^{4/11/80} Reject _____

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen pressure	psig	20.0 +0.2, -0	20.0
Time at pressure	minutes	3	3

External Leakage Test (Nitrogen Gas Test Fluid): ¹⁻¹²⁻⁶⁸ Accept (A) ^{4/11/80} Reject _____

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen pressure	psig	6.0 +0.2, -0	6.0
Time at pressure	minutes	15	15
External leakage in 15 minutes	scc	0.5 max	0.0

Diode Test: _____ Accept _____ Reject _____

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+30.0 ±0.1	N/A
Diode voltage (SWI at pos 2)	vdc	+1.0 max	
Diode voltage (SWI at pos 1)	vdc	+1.0 max	

Maximum Output Voltage Test: _____ Accept _____ Reject _____

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen output voltage	vdc	+6.5 max	N/A

Interim Change Notice Letter: F
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Effective Date: 22 May 1983

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Data Sheet
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ACCEPTANCE TEST DATA SHEET (CONT)
STEAM DUCT PRESSURE TRANSDUCER 837036-1

P/N 837036-2
S/N 22323

NAA REF. SPEC. NE NASA 004000022323

Calibration Test (cont)

STEP	TEST PARAMETER	UNITS	REQUIRED	ACTUAL
9c	Specimen pressure	mm Hg abs	5.171	
	Output voltage	vdc	+1.2500 $\pm$ 0.2000	
11f	Pressure (PS2)	In. Hg abs	1.0 $\pm$ 0.5	
11g	Output voltage	vdc	+1.2500 $\pm$ 0.2000	
11h	Specimen pressure	mm Hg abs	5.171	
13b	(1) Specimen pressure	mm Hg abs	5.171	
	(2) Output voltage	vdc	+1.2500 $\pm$ 0.2000	
	(3) Pressure PS2	In. Hg abs	1.0 $\pm$ 0.5	
	(4) Time at test	hours	3	

Input Voltage Variation Test:

Accept Reject

INLET PRESSURE (mm Hg abs)		INPUT VOLTAGE (vdc)		OUTPUT VOLTAGE (vdc)	
REQUIRED	ACTUAL	REQUIRED	ACTUAL	REQUIRED	ACTUAL
2.586		+25.0 $\pm$ 0.1		0.0000 $\pm$ 0.2000	
		+50.0 $\pm$ 0.1		0.0000 $\pm$ 0.2000	
12.929		+25.0 $\pm$ 0.1		+5.0000 $\pm$ 0.2000	
		+50.0 $\pm$ 0.1		+5.0000 $\pm$ 0.2000	

Output Ripple Test:

Accept Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Output ripple voltage	mV rms	10 max	

Isolation Resistance Test:

Accept Reject

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Potential	vdc	100	100
Resistance	megohms	100 min	7.5 $\times 10^3$



AMES RESEARCH MANUFACTURING DIVISION

Interim Change Notice Letter: F
ATP No.: SS-1759-R
Effective Date: 22 May 1975

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Data Sheet
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ACCEPTANCE TEST DATA SHEET (CONT)
STEAM DUCT PRESSURE TRANSDUCER 837036-1

P/N 837036-2
S/N 22323

NAA REF. SPEC. ME _____ NASA 004000022223

Insulation Resistance Test:

1-12-68
Accept ☒ Reject ☐

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Potential	vdc	100	
Resistance	megohms	50 min	2.0×10^5

Weight: _____ lb.

Remarks: _____

Test Specimen Status:

Accept ☒ Reject ☐

By P. K. K. K.

Inspection: AIRsearch Q.C. NAA Q.C. DCAS-QAR

ATP No.: 88-1759-A

Effective Date: 22 May 1967

ACCEPTANCE TEST DATA SHEET

Use black ink. No erasures permitted.

STEAM DUCT PRESSURE TRANSDUCER 837036-21-1

NAA REF. SPEC. NE NASA 004000025323

Part Number 837036-2-1 S/N 22-323

Date 1-16-68 Barometer 29.9 In. Hg abs Amb Temp 74 °F

Tested by A. Cunningham Test Facility 1402

Examination of Product: Accept _____ Reject _____

Remarks: _____

Dimensional Check Verified: 1-16-61

Para. 4.6 Calibration Test (Prior To Proof Pressure Test) Accept 3211 Reject 2

TEST PARAMETER	UNITS	REQUIRED	ACTUAL
Specimen input voltage	vdc	+28.0 $\pm$ 0.5	+ 28.0
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 $\pm$ 0.2000	- 0.0680
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 $\pm$ 0.2000	+ 1.2210
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 $\pm$ 0.2000	+ 2.4900
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref 75% of range	vdc	+3.7500 $\pm$ 0.2000	+ 3.7300
Specimen pressure	mm Hg abs	12.929	12.929
Output voltage, Ref 100% of range	vdc	+5.0000 $\pm$ 0.2000	+ 4.9500
Specimen pressure	mm Hg abs	10.343	10.343
Output voltage, Ref. 75% of range	vdc	+3.7500 $\pm$ 0.2000	+ 3.7300
Specimen pressure	mm Hg abs	7.757	7.757
Output voltage, Ref 50% of range	vdc	+2.5000 $\pm$ 0.2000	+ 2.4870
Specimen pressure	mm Hg abs	5.171	5.171
Output voltage, Ref 25% of range	vdc	+1.2500 $\pm$ 0.2000	+ 1.2100
Specimen pressure	mm Hg abs	2.586	2.586
Output voltage, Ref 0% of range	vdc	0.0000 $\pm$ 0.2000	- 0.0740



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Page 2

APPENDIX A

This Appendix contains:

ELECTROMAGNETIC INTERFERENCE TEST
REPORT FOR P/N 837036-2, S/N 22321,
DATED 12-2-67 (15 PAGES)

Type Test CONDUCTED INTER Page 1
28VDC CURRENT PROBE

Part No. 837036-2

Cust. and No. AI RESEARCH

Rating 1/N 2232-1

Specification SS-1313-R

Project

Test Order 10741

Conducted by N. Harting

Approved/Witnessed by

Date 12-2-'67

Date

Miscellaneous NM 40A 1/N 351-10

CAL DUE 1-27-'68

Test and Requirements:

Steady state mode of operation

PGT-100 VAC. Gauge reading: 10 mm of mercury. Cal. due 12-25-'67
Output 4VDC.

BROADBAND.

READING IN DB/1 μ A/MC

FREQ IN CPS	METER INDICATED DB	ATTENUATOR FACTOR DB	CORRECTION FACTOR DB/MC	CORRECTED VALUE DB/ μ A/MC	Spec LIMIT
- 30-1500 cps	20	20	2+34	76	100
+ 30-1500 cps	19	20	2+34	75	100

NO NARROW BAND READINGS DETECTED

Type Test Conducted Page ②
CP 28VDC INPUT

Part No. 837036-2 Cust. and No. PI RESEARCH
Rating 2/N 22321 Specification SS-1313-R
Project _____ Test Order 10741
Conducted by N. Horning Approved/Witnessed by _____
Date 12-6-'67 Date _____
Miscellaneous NM10A 2/N 239-15
Cal due 2-1-'68

Test and Requirements: steady state mode of operation
output 4VDC
vacuum gauge reading: 10 mm of mercury
calibrated: 10-24-'67, due 12-25-'67
BROADBAND

FREQ IN KC	METER INDICATED	ATTENUATOR FACTOR	CORRECTION FACTOR	CORRECTED VALUE	spec limit
15	3	0	91.5	94.5	154
26	3	A	79.5	82.5	143
30	3		77.5	80.5	140
50	4		71.0	75.0	129
60	8		69.0	77.0	125
100	21		60.5	81.5	114 $\frac{114.5}{1.01}$
120	21		59.5	80.5	110
140	15	V	59.5	74.5	106
150	11	0	59.0	70.0	105
15	3	0	91.5	94.5	154
26	2	A	79.5	81.5	143
30	2		77.5	79.5	140
50	4		71.0	75.0	129
60	7		69.0	76.0	125
100	21		60.5	81.5	114
120	21		59.5	81.5	110
140	15	V	59.5	74.5	106
150	11	0	59.0	70.0	105

Type Test Controlled Page 3
Current Probe 20000 input

Part No. 837036-2

Cust. and No. AIRESEBCH

Rating 2/N 22321

Specification SS-1313-2

Project

Test Order 10741

Conducted by N. Harding

Approved/Witnessed by

Date 12-6-'67

Date

Miscellaneous

NM10 A. A/N 250-20. Cal due

Test and Requirements

Steady state mode of operation
output 4 VDC

Vacuum gauge reading: 10 mm of mercury
Cal. due 12-25-'67

harmonic reading

Freq KC	meter INDICATED	ATTENUATION FACTOR	CORRECTED VALUE	SPEC. LIMIT
19	21	0	21	78
32	10	↑	10	68.7
58	5	↓	5	63.0
114	16	0	16	51.0
19	21	0	21	78.0
33	10	↑	10	68.7
58	3	↓	3	63.0
112	16	0	16	54.0

Type Test CONDUCTED INTER. Page (4)
28VDC LISA

Part No. 837036-2

Cust. and No. PIRESEARCH

Rating A/N 22321

Specification SS-1313-R

Project

Test Order 10741

Conducted by N. Horsting

Approved/Witnessed by

Date 12-2-'67

Date

Miscellaneous NM-20B A/N 235-19

Cal. due 2-27 '68

Test and Requirements

steady state mode of operation
output 4 VDC

vacuum gauge reading: 10 mm OF MERCURY

Calibrated: 10-24-'67, DUE 12-25-'67

BROADBAND READING

FREQ IN MC	+ A INPUT LINE METER READING DB	- D INPUT LINE METER READING DB	ATTENUATOR FACTOR DB	LISA FACTOR DB	CORRECTED VALUE		1313 R SPEC LIMITS
					A	D	
.15	14	13	0	49.5	63.5	62.5	115
.25	19	19	↑	45.5	61.5	61.5	108
.30	18	18	↑	45	63	63	106
.50	13	17	↑	43	61	60	99
.60	24	22	↑	42	66	64	97
1.00	15	13	↑	42	57	55	90
1.25	20	18	↑	41.5	61.5	59.5	89
2.00	7	6	↑	41.5	48.5	47.5	81
2.50	12	10	↑	41.5	53.5	51.5	↑
4.00	11	13	↑	40.5	51.5	53.5	↑
5.00	15	15	↑	↑	55.5	55.5	↑
6.00	13	15	↑	↑	53.5	55.5	↑
10.00	14	15	↑	↑	54.5	55.5	↑
13.50	12	13	↑	↑	52.5	53.5	↑
20.00	9 12	12	↑	↑	52.5	52.5	↑
22.50	9	7	↓	↓	49.5	47.5	↓
25.00	5	6	↓	↓	45.5	40.5	↓

NO NARROW BAND READINGS



GENISCO
TECHNOLOGY
CORPORATION

ENGINEERING TEST DATA

Type Test Radicated Interf. Page 5
28VDC input

Part No. 837036-2 Cust. and No. AIRESEARCH
Rating 2/N 22321 Specification SS
Project _____ Test Order 10741
Conducted by W. Horshing Approved/Witnessed by _____
Date 12-4-'67 Date _____
Miscellaneous _____

Test and Requirements: steady state mode of operation
output 4VDC
vacuum gauge reading: 10 mm of mercury
Gauge Bal. due: 12-25-'67

FREQ in KC.	METER INDICATED DB	ATTENUATOR Factor DB	antenna Correction Factor DB/MHZ	Corrected value DB/μw/MHZ	spec. limits
15	9	0	78.5	87.5	97
26	3	↑	71.5	74.5	92
35	4	↑	69.5	73.5	89.6
40	6	↑	69.0	75.0	88
65	11	↑	66.5	77.5	84
100	8	↑	65.5	73.5	80
125	5	10	65.5	70.5	79
150	3	0	65.5	62.5	
19	35	20	—	55	78
39	25	0	—	25	68.3
77	23	20	—	43	56
136	23	20	—	43	51.2

Scanning from 15Kc. - 150 Kc., readings were found at the indicated frequencies.



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CORPORATION

ENGINEERING TEST DATA

(6)

Type Test RADIATED
BROADBAND

Page

Part No. 237036-2

Cust. and No. AIRSEARCH

S/N
22321

Specification SS-1312-R

Project

Test Order 10741

Conducted by N. Northing

Approved/Witnessed by

Date 12-4-'67

Date

Miscellaneous NM 20 B 7/N 33-19

CAL. DUE 2-27-'68

Test and Requirements: READING TAKEN 1 FOOT FROM TEST SAMPLE
USING 41" ROD ANTENNA AND GROUND STRAP
CONNECTED TO GROUND PLANE AND METER
ALL BROADBAND READINGS
NO (LOW FREQUENCY) INTERFERENCE DETECTED

FREQ. MHz	METER INDICATED dB	ATTENUATOR FACTOR dB	CORRECTION FACTOR dB/mHz	CORRECTED VALUE dB/mHz	SPEC. LIMIT
.15	13	0	49.5	62.5	77
.20	18	0	45.5	63.5	75.2
.30	19	0	45.0	64.0	73
.50	21	0	43.0	64.0	70
.60	17	0	42.0	59.0	70
1.00	13	0	42.0	55	69.2
1.25	13	0	41.5	54.5	69.7
2.00	16	0	41.5	57.5	68.9
2.50	16	0	41.5	57.5	68.5
4.00	11	0	40.5	51.5	68
5.00	14	0	0	54.5	68
6.00	14	0	0	54.5	67.6
10.00	15	0	0	55.5	67.0
13.50	12	0	0	52.5	66.9
20.00	12	0	0	52.5	66.2
22.50	7	0	0	47.5	66.5
25.00	6	0	40.5	46.5	66.00

steady state mode of operation
output 4 VDC

vacuum gauge reading 10 mm of mercury

Gauge cal. due: 12-25-'67

DTD-191
Page A-6

Part No. 837036-2 Cust. and No. AIRSEARCH
 Rating 1/N 22321 Specification SS-1313-R
 Project _____ Test Order 10711
 Conducted by M. Husting Approved/Witnessed by _____
 Date 12-4-'67 Date _____
 Miscellaneous NM20B 1/N 235-19
CAL DUE 2-27-'68

Test and Requirements: 41" 200 ANTENNA

Scan FROM .15 MC TO 25 MC

NARROW BAND READINGS

FREQ IN MHZ	METER INDICATED DB	ATTENUATOR FACTOR DB/MHZ	CORRECTED VALUE DB/MHZ	1313 R SPEC. LIMITS
.29	37	0	37	23
.33	35	1	35	
.6	32		32	
.9	27		27	
1.2	26		26	
1.95	23		23	
2.35	17		17	23
3.55	12		12	22.5
4.00	10		10	22.0
8.00	11		11	19.7
9.8	21		21	19.0
16.5	16		16	17.4
24.0	7		7	16.0

15 MC

NOTE

After disconnecting the Simpson 10M leads, radiation from these leads came to an end. Therefore, the narrow band signals are detected anywhere, while scanning through the frequency range .15 - 25 MHz.



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CORPORATION

ENGINEERING TEST DATA

P

Type Test RADIATED INTERE Page

BROADBAND

28VDC INPUT

Part No. 837036-2

Cust. and No. PIRESEARCH

S/N
Rating 22321

Specification SS-1313-R

Project

Test Order 10741

Conducted by N. Hocking

Approved/Witnessed by

Date 12-4-'67

Date

Miscellaneous NM 30A 1/N 246-28, CAL. DUE 2-14-'68

Test and Requirements: USING 35 MC DIPOLE ANTENNA 1 FOOT AWAY
FROM TEST SAMPLE.

steady state mode of operation
output: 4VDC

Vacuum gauge reading: 10 mm of Hg
Cal. due: 12-25-'67

BROADBAND READINGS

FREQ IN MC.	METER INDICATED DB	ATTENUATOR FACTOR DB	CORRECTION FACTOR DB/MHz	CORRECTED VALUE DB/100/MHz	SS 1313 R SPEC. LIMIT
30	0	0	20+8	28	47
40	5			33	50.1
50	0			28	51
80	13			41	52.6
120	3			31	54
160	10			38	54.5
250	16			44	56
350	17			45	56.8
350	17			45	57
400	17	0	28	45	57.5

NO CW DETECTED FROM 25 - 400 MC.

NM 52 1/N 376-13, Cal. due 12-12-'67

NO CW DETECTED FROM 400 - 1000 MC.



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CORPORATION

ENGINEERING TEST DATA

Type Test CONDUCTED CP Page 9
21VDC

Part No. 837036-2 Cust. and No. HIRC SEARCH
Rating 2/N 22 321 Specification SS-1313-R
Project _____ Test Order 10741
Conducted by N. J. Dorn Approved/Witnessed by _____
Date 12-4-'67 Date _____
Miscellaneous NM20B 2/N 135-19
Cal due 2-27-'68

Test and Requirements: C.P. around each output line

With the C.P. around each output line, no
narrow band signals were detected. The scanned
Freq range ran from .15 - 25 MC

Type Test Conducted C.P. Page 10
Preference 2VDC INPUT

Part No. 837036-2 Cust. and No. AIRRESEARCH
 Reel No. A/N 22321 Specification SS-13-13-R
 Project _____ Test Order 10741
 Conducted by N. Horning Approved/Witnessed by _____
 Date 12-7-'67 Date _____
 Miscellaneous 11M10A. C/N 239-15
Cal due 2-1-'68

Test and Requirements: C.P. around back one of output lead.
steady state mode of operation
vacuum gauge reading: 10 mm of mercury
Gauge Cal due: 12-25-'67

BROAD BAND READING

FREQ N KHz	mV INDICATED		ATTENUATION FACTOR	CORRECTION FACTOR	CORRECTED VALUE		spec limit
	BROWN	BLUE			BROWN	BLUE	
14	0	2	0	91.5	91.5	93.5	156
20	2	0	1	84.0	86.0	84.0	148
26	2	0		79.5	81.5	79.5	143
40	2	1		74.0	76.0	75.0	134
60	0	0		69.0	69.0	69.0	124
80	10	9		64.5	74.5	73.5	118
100	8	8		62.5	70.5	70.5	114
125	0	1		60.5	60.5	61.5	108.5
150	2	1	0	59.0	61.0	60.0	104.5

no intermittent signals detected



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CORPORATION

ENGINEERING TEST DATA

Typo Test CONDUCTED Page 11
SUSCEPTIBILITY

Part No. 837036-2 Cust. and No. AI RESEARCH
Rating Q/N 22321 Specification SS 1313-R
Project _____ Test Order 10741
Conducted by N. Horsting Approved/Witnessed by _____
Date 12-1-'67 Date _____
Miscellaneous _____

Test and Requirements: SIGNAL FED THROUGH BOTH LISA ON INPUT LINE
steady state mode of operation
vac. gauge reading 10 mm of mercury
gauge cal. due 12-25-'67

TYPE 545A OSCILLOSCOPE

A/N 033091

CAL. DUE 3-18-'68

RESULTS: NO CHANGE IN
OUTPUT RIPPLE

NO CHANGE IN DC OUTPUT
LEVEL

SIGNAL GENERATORS.

- ① 606 CR. 59-582/U
Q/N A153. CAL. DUE 2-7-'68
- ② MODEL 606E. A/N 712 00548
CAL. DUE 5-22-'68
- ③ MODEL 612A A/N 533 04704
CAL. DUE 3-15-'68
- ④ MODEL 614A A/N 211-03092
CAL. DUE 4-10-'68
- ⑤ MODEL 616B A/N 143 01241
CAL. DUE 4-11-'68
- ⑥ MODEL 620A A/N 216 02566
CAL. DUE 4-11-'68
- ⑦ MODEL 622B A/N 151 02920
CAL. DUE 3-13-'68

Test conducted over the
freq. range of 0.15-10. GHz



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CORPORATION

ENGINEERING TEST DATA

Type Test *Audio*

Page *12*

Part No. *837036-2*

Cust. and No. *Adco*

Rating *2/N 22321*

Specification *SS-1313-R*

Project *570 JOHNSON*

Test Order *10741*

Conducted by *N. Hershberg*

Approved/Witnessed by

Date *12-7-67*

Date

Miscellaneous

Test and Requirements:



no change in output indication (DC and ripple)

Type 545 oscilloscope

S/N 033091

Cal. due 2-3-68

Model 400H vacuum tube voltmeter

S/N 41-00204

Cal. due 1-12-68

Audio Isolation transformer

McC. Gintoch Amplifier

812 Oscillator

steady state mode of operation

vacuum gauge reading 10 mm of mercury

output voltage 116.50

Input 28 VDC



Type Test RF Radiated susceptibility Page 13

Part No. 837036-2 Cust. and No. AIRSEARCH
 Rating Q/N 2-2-32-1 Specification SS 1313R
 Project _____ Test Order 10741
 Conducted by M. Hershing Approved/Witnessed by _____
 Date 12-7-67 Date _____
 Miscellaneous _____

Test and Requirements: steady state mode of operation
output 1V DC
Vacuum gauge reading: 10 mm of mercury
Gauge Cal due: 12-25-67

FREQ in	METER INDICATED	ATTENUATOR FACTOR			
FREQ. COVERED FROM 0.15 MHz - 10 GHz					
no change in output indications					
SIMPSON VOM.					
TYPE 545A OSCILLOSCOPE					
Q/N 033091 - CAL DUE 3-18-68					
SIGNAL GENERATORS:					
①	606 DR	54-58214	Q/N 1153	CAL DUE 2-7-68	
②	MODEL 618A	1/4 710-00548	Q/N 710-00548	CAL DUE 5-22-68	
③	"	612A	1/4 583-04704	CAL DUE 3-15-68	
④	"	614A	1/4 211-03092	CAL DUE 4-10-68	
⑤	"	616B	1/4 141-01241	CAL DUE 4-11-68	
⑥	"	620A	1/4 216-02566	CAL DUE 4-11-68	
⑦	"	618B	1/4 151-02920	CAL DUE 3-13-68	
ANTENNAS: ALL THE ANTENNAS SPECIFIED IN SPEC. 13-13 R.					

Type Test AF induced susceptibility Page 14

Part No. 837036-2

Cust. and No. AIR RESEARCH

Rating Q/N 29.32.1

Specification SS 1313R

Project _____

Test Order 10741

Conducted by M. Horsting

Approved/Witnessed by _____

Date 12-7-67

Date _____

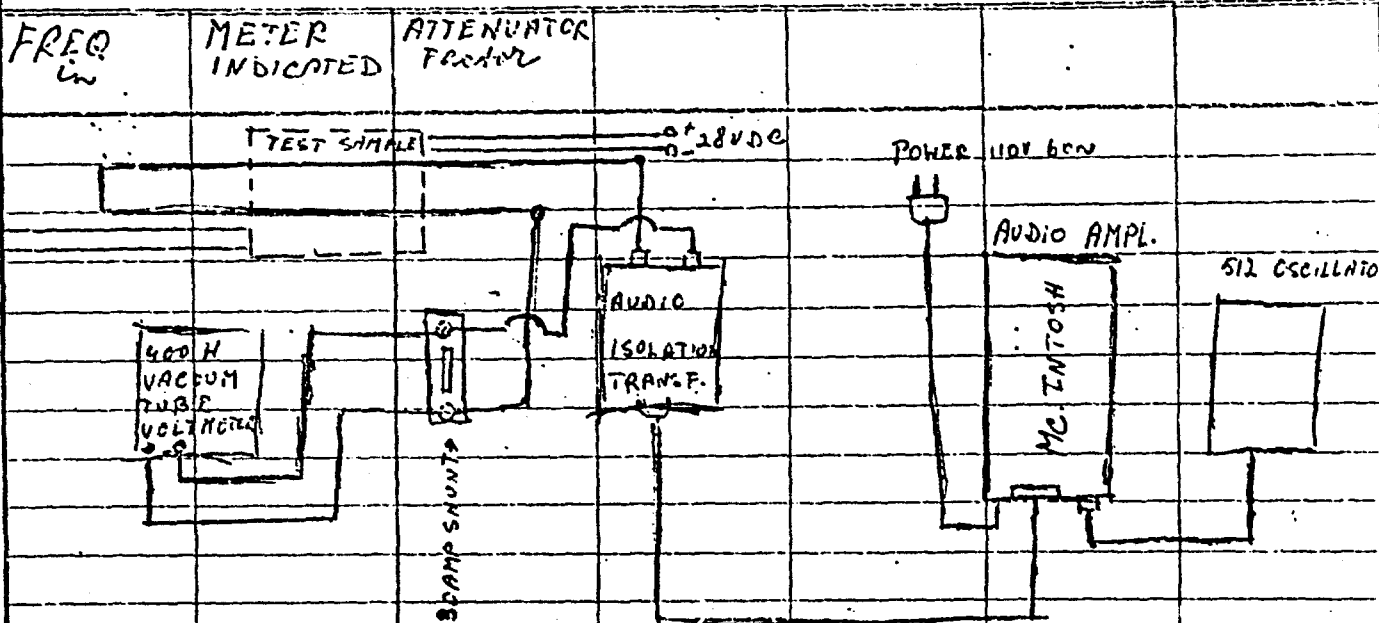
Miscellaneous _____

Test and Requirements: steady state mode of operation
output 4V DC

Vacuum gauge reading: 10 mm of mercury
Gauge cal. due: 12-25-67

SIMPSON
VOLT METER

LOAD SIMULATOR →



RESULT: no change in output indication

Test specimen subjected to 800 G magnetic field
Wire carrying 10 Amp.

Best Available Copy



Type Test Transient Page 15
Conducted Susceptibility

Part No. 837036-2 Cust. and No. AIRRESEARCH
Rating 2/N 2-2 32-1 Specification SS-1313E
Project _____ Test Order 10741
Conducted by N. Horsting Approved/Witnessed by _____
Date 12-7-'67 Date _____
Miscellaneous _____

Test and Requirements: Steady state mode of operation
output 4V Dc
vacuum gauge reading: 10 mm of mercury
Gauge. Bal. due: 12-25-1967

FREQ Cm	METER INDICATED	ATTENUATOR Factor				
no change in output indications						
TYPE 545A oscilloscope						
S/N 033091						
Cal. DUE 3-18-'68						
Transient Generator supply						
Transient susceptibility generator						
batteries						
Best Available Copy						

DTD-191
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