36-01352

LOCKHEED MARTIN

DYNAMICS TEST LABORATORIES

TEST PROCEDURE 6862 (ACIS-400-74-01)

RANDOM VIBRATION TEST
OF THE
ACIS FLIGHT UNIT
POWER SUPPLY & MECHANISM CONTROLLER

P/N 849AC420000-009
OPTION II

BASIC PROCEDURE APPROVAL

ACTIVITY	SIGNATURE	DATE
PREPARED BY	Conrad Dreher	10/18/96
TESTING ORGANIZATION		
ENGINEERING (PIE)		
QUALITY		
OCCUPATIONAL SAFETY AND HEALTH		
SYSTEM SAFETY		
TEST REQUIREMENTS		
RELEASE		

VALIDATION APPROVAL

ACTIVITY	SIGNATURE	DATE
TEST CONDUCTOR		
TESTING ORGANIZATION		
ENGINEERING PIE		
QUALITY		
OCCUPATIONAL SAFETY AND HEALTH		
SYSTEM SAFETY		
TEST REQUIREMENTS		

EFFECTIVITY:

PCN DATE: 10/18/96
PCN: NEW

REVISION PAGE

PCN	Page Revised	Paragraph Revised	Description of Change	Date
New			Initial Release	

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ADMINISTRATIVE DATA

TEST AGENCY:	Lockheed Martin Astronautics Mail Stop V4912 Dynamics Test Laboratories P.O. Box 179 Denver, Colorado, 80201
TEST NUMBER:	6862
TEST ITEMS:	ACIS FU Power Supply & Mechanism Controller (PSMC)
PART NUMBER:	849AC420000-009
MAC DOCUMENT:	TP 6862/DREHER

1.0 SCOPE

1.1 This Procedure provides the information necessary for the performance of the random vibration testing of the ACIS Flight Unit Power Supply & Mechanism Controller (FU PSMC). The testing consists of a random vibration test in all three axes at Protoflight test levels. PSMC protoflight vibration levels are as defined in the ACIS Power and Thermal Control Specification (36-02101, Rev. D), as per verbal agreement with MSFC engineering.

1.2 The vibration testing program will be conducted at the Dynamic Test Laboratories (DTL) Acoustic Vibration Laboratory (DTL/AVL) of Lockheed Martin Astronautics (LMA), Denver, Colorado.

1.3 The purpose of the ACIS FU PSMC random vibration test is to test the FU PSMC to the protoflight level random vibration environments, applied separately in each of the three orthogonal axes, to verify the design and workmanship of the FU PSMC as part of its flight acceptance. In addition, it is intended to determine the resonant frequencies of the PSMC as mounted with and without standoffs (flexures).

1.3 Success Criteria

1.3.1 The Test will be deemed successful if the Power Supply & Mechanism Controller can survive the Protoflight level random vibration environments, applied separately in each of the three orthogonal axes, without structural or electrical integrity failure. Electrical integrity will be verified by successfully passing post-vibration functional tests per PSMC Test Procedure (ACIS-400-24-02) after the completion of each test axis.

Note: Prior to proceeding from one vibration axis to the next, actual hardware response shall be evaluated and correlated to predicted responses. An engineering judgement shall be made as to the acceptability to continue the vibration test following each axis. The acceptance level characterization suite (-6 dB test) shall be subject to the same constraints.

2.0 SUPPORT REQUIREMENTS

2.1 Equipment

2.1.1 All test equipment required for vibration testing will be logged in the Instrumentation and Equipment List, TABLE 1. All equipment will have current calibration per MIL-STD-45662. Calibration shall be traceable to the National Institute of Standards and Technology.

2.2 Documents

Documents listed below, which are not specifically called out in the body of this procedure, are available for information only.

2.2.1 Reference Documents

2.2.1.1 MMAG SOI LAB0212119, standard Operating Checklist, Rev. 2.

2.2.1.2 MMAG SOI LAB0212152, Shock and Vibration Fixture Installation, Rev. New.

2.2.1.3 MMAG SOI LAB0212157, Ling B-335 Dual Vibration System, Rev. 1.

2.2.1.4 MMAG SOI LAB0212251, SD1201 RV Control System, Rev. 2.

2.2.1.5 MMAG SOI LAB0212254, AVL Patch Rev. 4.

2.2.1.6 MMAG SOI LAB0212133, 400AT Vibe Control System Rev New.

2.2.1.7 MMAG SOI LAB0212264, Accelerometers, Rev. 1.

2.2.1.8 MMAG SOI LAB0212140 LMS RV Control System Rev New.

2.2.1.9 MMAG SOI LAB0212272, UD4000 Vibration System, Rev. New.

2.2.1.10 MMAG SOI LAB0212273, UD T1000 Shaker System, Rev New.

2.2.1.11 MMAG SOI LAB0212288, PCB 12 Channel Power Supply, Rev. New.

2.2.1.12 MMAG SOI LAB0212290, PCB 492M02 Sensor Simulator, Rev. New.

2.2.1.13 MMAG SOI LAB0212295, HP5427A Random Vibration Control, Rev. 1.

2.2.1.14 MMAG SOI LAB0212300, Ling 8072B Power Amplifier, Rev. 1.

2.2.1.15 MMAG SOI LAB0212301, Unholtz-Dickie TA460 Solid State Power Amplifier, Rev. 1.

2.2.1.16 MMAG SOI LAB0212304, Analog Abort System Verification, Rev. 3.

2.2.1.17 MMAG MP 9D001, ESD Handling

2.2.2 Source Documents

2.2.2.1 VEPM Verification Engineering Practices Manual

2.2.2.2 M-61-58, Safety Standard Manual.

2.2.2.3 M-64-125, System Safety Engineering Manual.

2.2.2.4 M-67-45, Test Methods and Controls, Rev. 3.

2.2.2.5 ACIS-400-74-01, ACIS Flight Unit Power Supply & Mechanism Controller Test Plan.

2.2.2.6 ACIS-400-24-02, ACIS Power Supply & Mechanism Controller Test Procedure.

2.2.2.7 ACIS-36-02101, ACIS PTS Specification

2.3 Power

2.3.1 115 VAC/10/30 AMP.

2.4 Software

2.4.1 Appropriate to Digital Control System as specified in the applicable SOI.

2.5 Automated Test Sequences

None

3.0 SPECIAL CONSIDERATIONS

3.1 Abbreviations and Acronyms

ACIS	AXAF CCD Imaging Spectrometer
AMP	Ampere
ASD	Acceleration Spectral Density
AVL	Acoustic Vibration Laboratory
DTL	Dynamics Test Laboratories
Cal.	Calibration
CPU	Calibrate Prior to Use
dB	Decibel
ESD	Electro-Static Discharge
EU	Engineering Unit (Non-Flight)
FU	Flight Unit
g or G	Acceleration due to Gravity
Hz	Hertz (Cycle per Sec)
ID	Identification
in.	inch(es)
in-lbs	inch-pounds
lbs.	pounds
MARS	Martin Anomaly Reporting System
LMA	Lockheed Martin Astronautics
NCR	No Calibration Required
N/A	Not Applicable
No.	Number
PA	Public Address
P.I.E.	Product Integrity Engineer
P/N	Part Number
PSMC	Power Supply & Mechanism Controller
PSD	Power Spectral Density g^2 /Hz
psi	pounds per square inch
Q	Quality
QC	Quality Control
RMS	Root Mean Square
S/N	Serial Number
SOI	Standard Operating Instruction
TC	Test Conductor
UUT	Unit Under Test

3.2 Safety Considerations

3.2.1 Prior to performing this procedure, the operator(s) will be responsible for reading and understanding the complete procedure, noting those actions required to safely terminate any critical situation that might develop. Safe operating practices will be adhered to during all operations performed.

3.2.2 The material appearing within a NOTE, CAUTION, or WARNING precedes the information which it is intended to emphasis. A NOTE is used to provide general information, sequencing directions, or a reminder. A CAUTION is used to prevent personnel from damaging equipment. A WARNING is used to prevent personnel from endangering their safety or the safety of others.

3.2.3 The Test Conductor will insure that only properly trained and certified personnel participate in the test operation, and that all personnel have been briefed by the Program PIE regarding special safety requirements of the hardware.

3.2.4 Test supervision is directly responsible for the safety of personnel and equipment, and the implementation of all safety requirements applicable to this procedure.

3.2.5 All testing performed by this procedure will be performed in compliance with the requirements of Safety standard Manual M-61-58, and M-64-125.

3.2.6 The Test Conductor shall maintain personnel control around the operating area.

3.2.7 All personnel within the immediate vicinity of the vibration exciters shall be equipped with suitable ear protection.

3.2.8 System Safety and Occupational Safety and Health are to be notified a minimum of 24 hours prior to testing.

3.2.9 Deviations from safety standards or regulations will be made only with the concurrence of Occupational Safety and Health.

3.3 Operational Considerations

3.3.1 All testing will be conducted at laboratory ambient temperature and pressure conditions.

3.3.2 Testing will be in accordance with the instructions of MMAG M-67-45, Rev 3 Test Methods and Controls.

3.3.3 Dynamic fixture evaluation will be performed in accordance with M-67-45 Section 8.21.2. Fixture evaluation deviations from M-67-45 will be at the Test Conductors discretion.

3.3.4 Vibration test fixtures will be evaluated and approved for use in each axis prior to full level vibration testing of the actual test item in the particular axis. Fixture evaluation may be omitted in those cases where the fixture possesses a current certification.

3.3.5 When test equipment specified in the test procedure is not available for a test, substitute equipment may be authorized by the Test Engineer with the concurrence of the Test conductor. An information flag shall be entered in the Instrumentation and Equipment List (TABLE 1) and the Procedure History Sheet (TABLE 3) which identifies the acceptable substitute equipment by name, manufacturing model, serial number, and cal. due date. Authorizing signatures shall be entered on the Procedure History Sheet Flag Item. PCN incorporation is not required for temporary equipment substitution.

3.3.6 An AVL Patch Sheet shall be used for system traceability.

3.3.7 The Vibration Test will be performed in the axis sequence dictated by equipment availability and convenience, at the discretion of the Test Conductor.

3.3.8 The steps within this procedure may be completed out of sequence at the discretion of the Test Conductor, with concurrence of the program representative.

3.3.9 During all vibration, a minimum of two accelerometers will be used. A Control, and Monitor, accelerometer shall be used to monitor real time by the Vibration Control System operator. By comparing the accelerometer outputs, the operator will be able to detect any malfunctions of the vibration system and, therefore, take the immediate necessary corrective action. In addition an specimen protection abort will be used to prevent an overtest.

3.3.10 During vibration testing, the outputs of all transducers shall be recorded on magnetic tape.

3.3.11 A test log shall be maintained during all phases of testing.

3.3.12 The Power Supply & Mechanism Controller has ESD-sensitive hardware, and will be handled per MP9D001.

3.3.13 Cleanliness: The FU PSMC will be bagged prior to testing and will remain bagged up to the time of actual testing to maintain cleanliness. Contact with the uncovered areas of the test item shall be minimized.

3.3.14 Instrumentation and wires used within the bagged volume shall be wiped clean using a lint-free cloth and IPA (or other suitable solvent).

3.3.15 Transportation/Installation/Removal: The FU PSMC shall be lifted and transported by program personnel familiar with the hardware and properly certified.

3.4 Data Requirements

3.4.1 Representative photographs shall be taken of each vibration axis test setup as required.

3.4.2 Random Data for any given axis of vibration will be provided as log-log Mean Squared Acceleration Spectral Density (MSASD) vs Frequency (Hz) plots of:

a. the individual control accelerometers, or
b. the average of the control accelerometers,
c. selected inline and crosstalk measurement accelerometers (at the discretion of the Dynamics Engineer).

3.4.3 The equipment and instrumentation used for these tests shall be logged in the Instrumentation and Equipment List (TABLE 1).

4.0 OPERATIONS

4.1 Prerequisites

4.1.1 A pretest meeting for all Test personnel will take place prior to test. This is the responsibility of DTL Test Conductor.

TC ____

4.1.2 Record the FU PSMC part and serial number.

FU PSMC P/N _____ S/N _____

TC ____ QC ____

NOTE:
Cleanliness: The FU PSMC will be bagged prior to testing and will remain bagged up to the time of actual testing to maintain cleanliness. Contact with the uncovered areas of the test item shall be minimized, and only when using lint-free gloves.

4.2 Preparations

4.2.1 Verify that all equipment requiring calibration is within calibration and will remain in calibration for the duration of the test. Verify that all equipment being used in the test is recorded in the Instrumentation and Equipment List (TABLE 1).

TC ____ QC ____

4.2.2 Verify that all personnel involved in test operations possess the proper certification.

TC ____ QC ____

4.2.3 Perform Uncertainty Analysis Table 2 on T&ME used to show compliance with engineering tolerances for test environments.

TC ____ QC ____

4.2.4 Verify that the FU PSMC has successfully passed the pre-test functional per ACIS-400-24-02 test procedure.

TC ____ QC ____

4.2.5 Bond accelerometer blocks and mount accelerometers to FU PSMC, and fixturing per Figure 4. Allow for 24 hr. bond cure time (at RT.) with M358 adhesive.
NOTE: Do not apply adhesive directly to the PSMC chassis; first apply Kapton tape to the bond location and then bond to the tape.

TC ____ QC ____

4.3 Detailed Operations

4.3.1 **Bare Fixture Test**

4.3.1.1 Install vibration fixture (LAB06597) on the shaker system per Figure 1, 2, or 3 (as applicable). Torque the fixture mounting bolts per (LAB0212152).

Torque Wrench _____ Cal_____

TC X____ Y____ Z____ QC X____ Y____ Z____

4.3.1.2 Verify the S/N of each accelerometer prior to installation, each accelerometer will be numbered and recorded on the patch sheet at this time, the accelerometers can then be installed per Figure 1, 2, or 3 (as applicable).

TC X____ Y____ Z____ QC X____ Y____ Z____

4.3.1.3 Set up the Random Vibration Control System to control the spectrum of the Figure 5 Protoflight Test level (Ref. LAB0212251, LAB0212140, LAB0212133, or LAB0212295, as applicable).

TC X____ Y____ Z____ QC X____ Y____ Z____

4.3.1.4 Patch the vibration system for Random and fill out an AVL Patch Sheet (Ref. LAB0212254).

TC X____ Y____ Z____ QC X____ Y____ Z____

4.3.1.5 Set the analog abort levels on the Control and Monitor accelerometers to shut down at 20% over the Figure 5 Protoflight Test level.

TC X____ Y____ Z____ QC X____ Y____ Z____

4.3.1.6 Verify proper hookup of all Control, Monitor and Specimen abort accelerometers and calibrate the Analog Abort Chassis by supplying a simulator signal at the accelerometer location on the fixture and verifying response at the proper Control System input (Ref SOI LAB0212290).

TC X____ Y____ Z____ QC X____ Y____ Z____

4.3.1.7 Conduct a tap check of all accelerometers to verify operation.

TC X____ Y____ Z____ QC X____ Y____ Z____

4.3.1.8 Verify that the remote abort switch operates properly.

TC X____ Y____ Z____ QC X____ Y____ Z____

4.3.1.9 Verify AVL patch sheet (Ref. LAB0212254).

TC X____ Y____ Z____ QC X____ Y____ Z____

4.3.1.10 Verify AVL vibration pre-run checklist.

TC X____ Y____ Z____ QC X____ Y____ Z____

4.3.1.11 Run the Figure 5 Protoflight Test level for a minimum of 60 seconds, and plot the Control accelerometer output to demonstrate controllability. Repeat as necessary to verify system control.

TC X____ Y____ Z____ QC X____ Y____ Z____

4.3.2 **Fixture Evaluation / Data Verification**

CAUTION
The Power Supply & Mechanism Controller has ESD-sensitive hardware, and will be handled per MP9D001.
Cleanliness: The FU PSMC will be bagged prior to testing and will remain bagged up to the time of actual testing to maintain cleanliness. Contact with the uncovered areas of the test item shall be minimized, and only when using lint-free gloves.

4.3.2.1 Attach FU PSMC to fixture using shims, flexures (for Y1 run only), and 1/4 -28 fasteners per Figure 4. Torque all fasteners to 75 ± 5 in-lbs above any running torque.

TC X____ Y1____ Y2____ Z____ QC X____ Y1____ Y2____ Z____

Torque Wrench _____ Cal_____

4.3.2.2 Attach accelerometer wires to test item accelerometers and other instrumentation.

TC X____ Y1____ Y2____ Z____ QC X____ Y1____ Y2____ Z____

4.3.2.3 Conduct a Tap Check of all accelerometers.

TC X____ Y1____ Y2____ Z____ QC X____ Y1____ Y2____ Z____

4.3.2.4 Verify the operation of the Remote Abort switch.

TC X____ Y1____ Y2____ Z____ QC X____ Y1____ Y2____ Z____

4.3.2.5 Verify the AVL Patch Sheet (Ref. LAB0212254).

TC X____ Y1____ Y2 ____ Z____ QC X____ Y1____ Y2____ Z____

4.3.2.6 Verify AVL vibration pre-run checklist.

TC X____ Y1____ Y2____ Z____ QC X____ Y1____ Y2____ Z____

NOTE
If a Fixture Evaluation has been performed in the last year the data will be reduced, and compared to previous fixture evaluation data.

4.3.2.7 Perform a vibration test at -14 dB below the Figure 5 Protoflight Test level for a minimum of 60 seconds and reduce all accelerometer Data as required by Dynamics/Test Requirements. If necessary, repeat to obtain acceptable fixture evaluation results. Photograph test setup.

TC X____ Y1____ Y2____ Z____ QC X____ Y1____ Y2____ Z____

4.3.3 **-6 dB test**

Note: Before proceeding from one vibration axis to the next, ensure actual and predicted responses correlate properly.

4.3.3.1 Set up the Random Vibration Control System to control at -6 dB of the spectrum of the Figure 5 Protoflight Test level (Ref. LAB0212251, LAB0212140, LAB0212133, or LAB0212295, as applicable).

TC X____ Y____ Z____ QC X____ Y____ Z____

4.3.3.2 Conduct a tap check of all accelerometers to verify operation.

TC X____ Y____ Z____ QC X____ Y____ Z____

4.3.3.3 Verify that the remote abort switch operates properly.

TC X____ Y____ Z____ QC X____ Y____ Z____

4.3.3.4 Verify AVL patch sheet (Ref. LAB0212254).

TC X____ Y____ Z____ QC X____ Y____ Z____

4.3.3.5 Verify AVL vibration pre-run checklist.

TC X____ Y____ Z____ QC X____ Y____ Z____

4.3.3.6 Run the Figure 5 Protoflight Test level at -6 dB for a minimum of 60 seconds, and plot the Control accelerometer output to demonstrate controllability. Repeat as necessary to verify system control.

TC X____ Y____ Z____ QC X____ Y____ Z____

4.3.4 **Protoflight Vibration Test.**

Note: Before proceeding from one vibration axis to the next, ensure actual and predicted responses correlate properly.

4.3.4.1 Conduct a Tap Check of all accelerometers.

TC X____ Y____ Z____ QC X____ Y____ Z____

4.3.4.2 Verify the operation of the Remote Abort Switch.

TC X____ Y____ Z____ QC X____ Y____ Z____

4.3.4.3 Verify the AVL Patch Sheet (Ref. SOI LAB0212254).

TC X____ Y____ Z____ QC X____ Y____ Z____

4.3.4.4 Verify AVL vibration pre-run checklist.

TC X____ Y____ Z____ QC X____ Y____ Z____

4.3.4.5 Ensure 28 Vdc power is applied at the A and B PSMC power input connectors and verify input current monitors are properly hooked up for continuous monitoring during vibration.

TC X___ Y___ Z___ QC X___ Y___ Z___

4.3.4.6 Perform a vibration test at the Figure 5 Protoflight level for 60 seconds, recording all accelerometer data during test. Reduce all accelerometer data as required by Dynamics.

TC X___ Y___ Z___ QC X___ Y___ Z___

4.3.4.7 Remove FU PSMC from the fixture.

TC X___ Y___ Z___ QC X___ Y___ Z___

4.3.4.8 Inspect items for structural damage (ACIS program personnel).

TC X___ Y___ Z___ QC X___ Y___ Z___

4.3.4.9 Perform post-test functional per ACIS-400-24-02 Test Procedure and ACIS-400-74-01 Test Plan.

TC X___ Y___ Z___ QC X___ Y___ Z___

4.3.4.10 Repeat all applicable steps from 4.3.1.1 through 4.3.4.9 until all axes of vibration have been completed.

TC X___ Y___ Z___ QC X___ Y___ Z___

4.3.4.11 Remove the Test Article Assembly from the (LAB06597) fixture.

TC X___ Y___ Z___ QC X___ Y___ Z___

4.4 **Securing the Test**

4.4.1 Verify that the Random Vibration Protoflight test has been successfully completed and that all Data is satisfactory.

QC ___

Program Representative _____

4.4.2 Reconfigure AVL test equipment to nominal configuration.

TC ___

4.4.4 Hold a post-test meeting to close any flags.

TC ___

APPENDIX

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Section 5.1

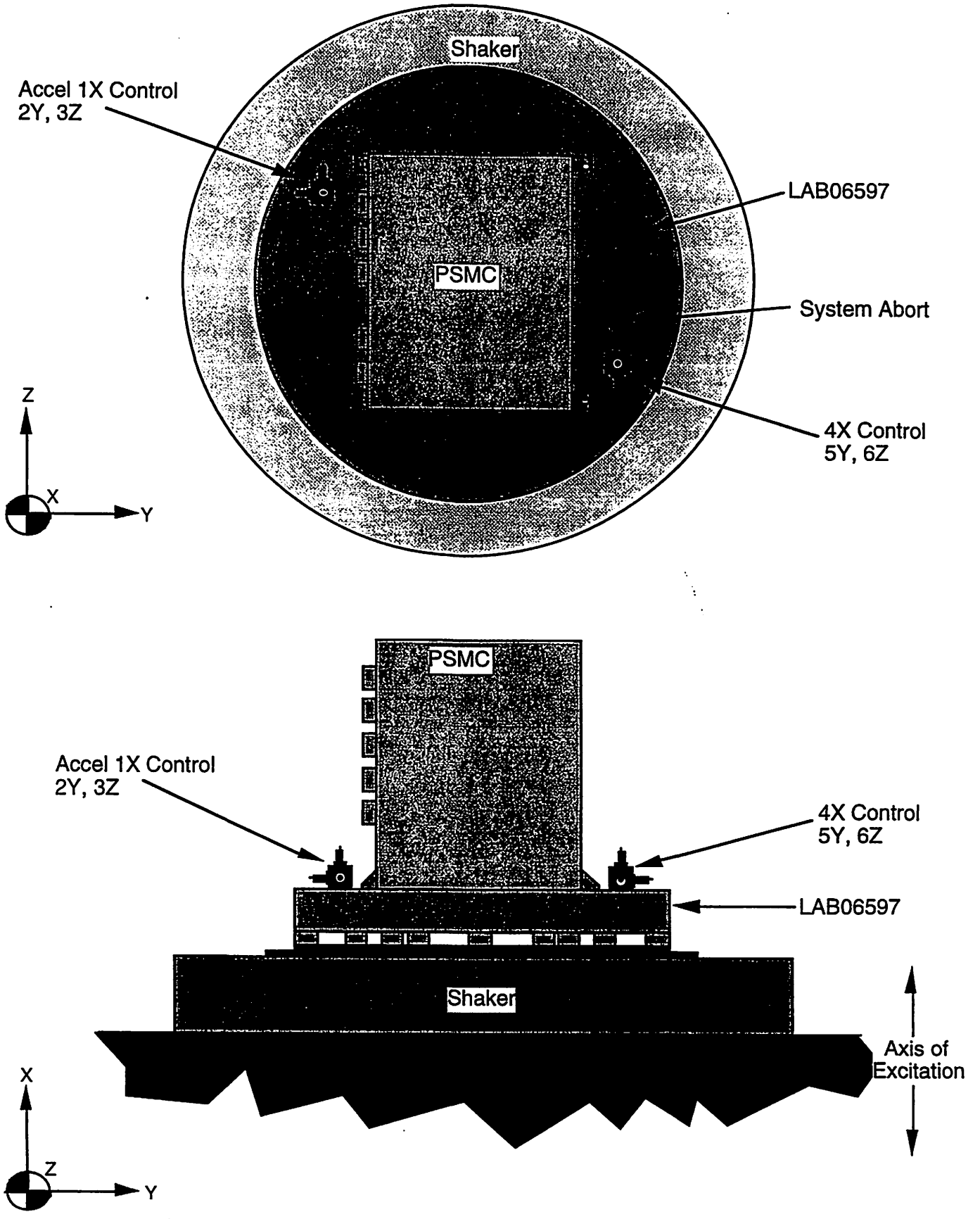


FIGURE 1. Test Setup, Accelerometer Locations and Axis Designation: X-Axis

Section 5.2

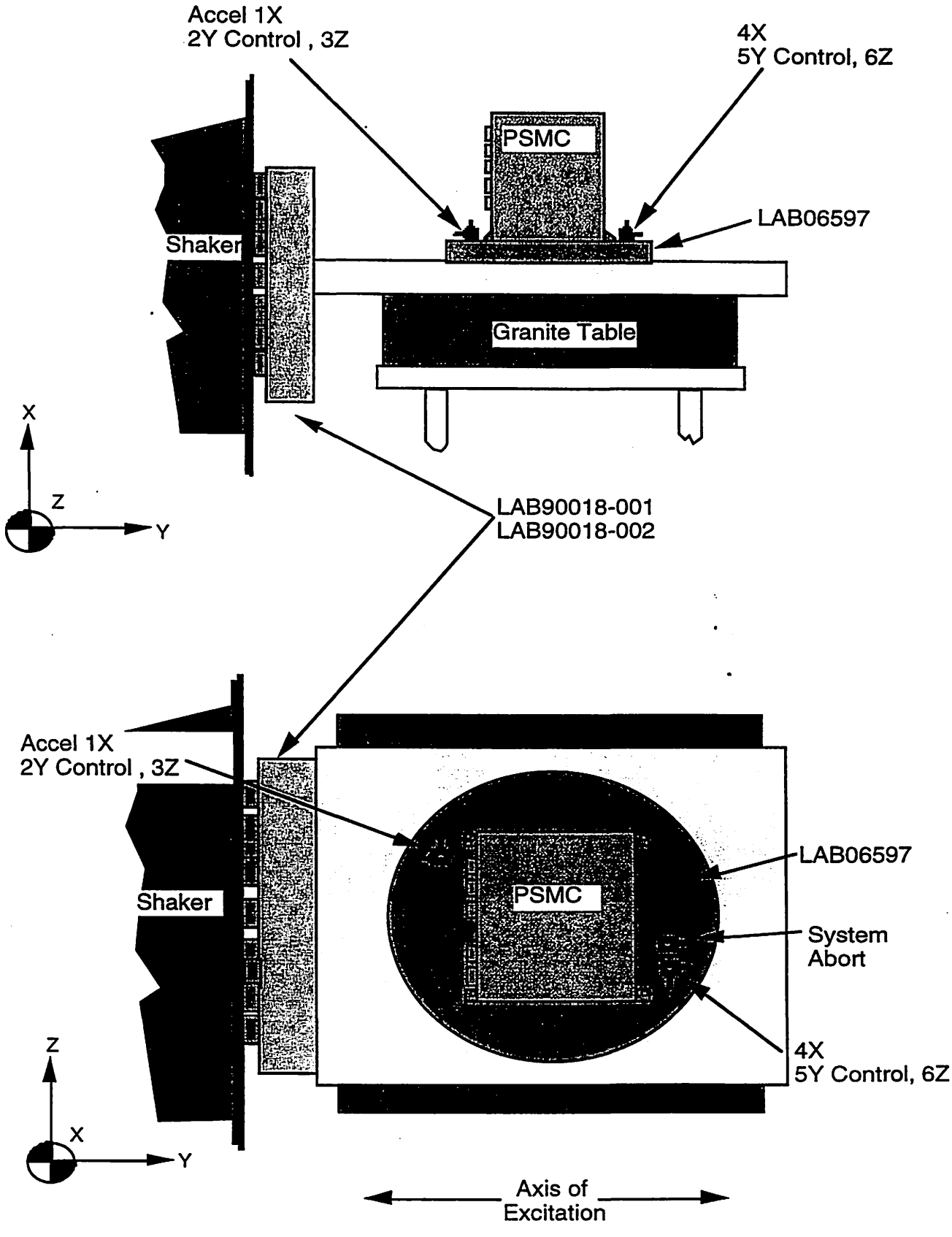


FIGURE 2. Test Setup, Accelerometer Locations and Axis Designation: Y-Axis

Section: 5.3

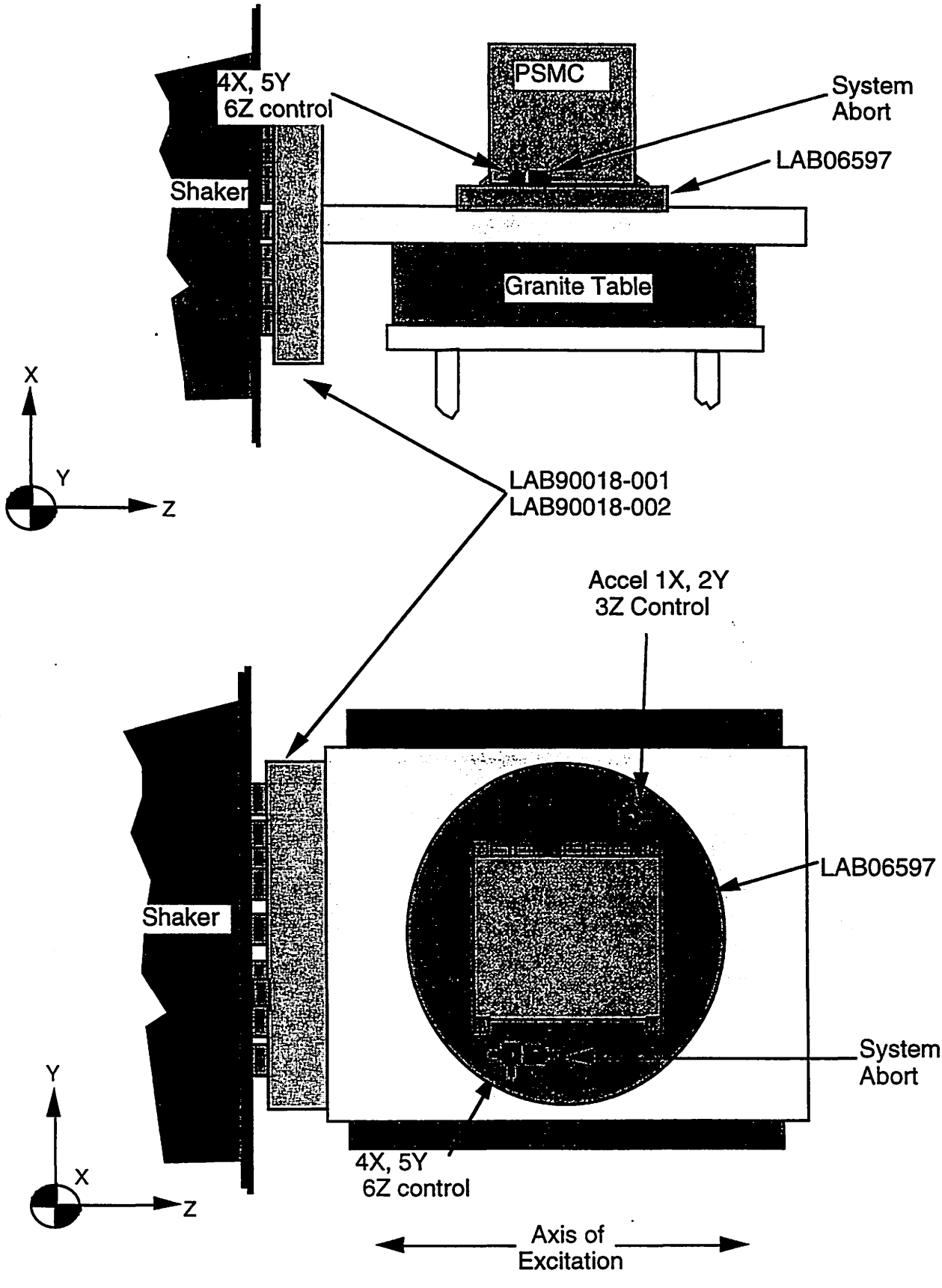
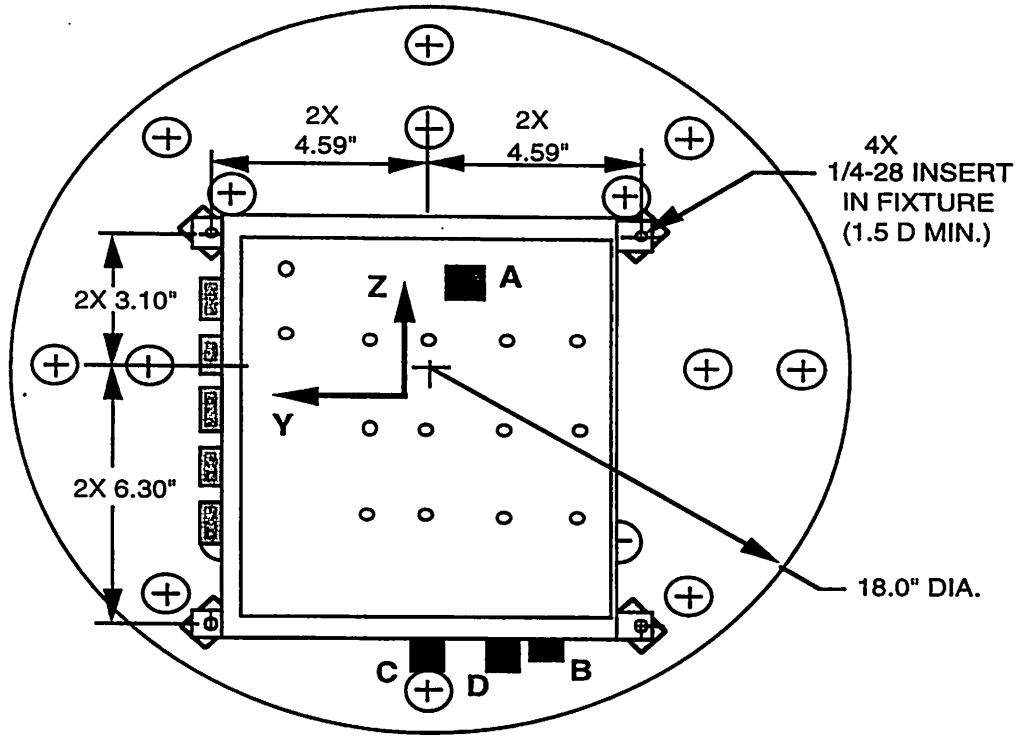
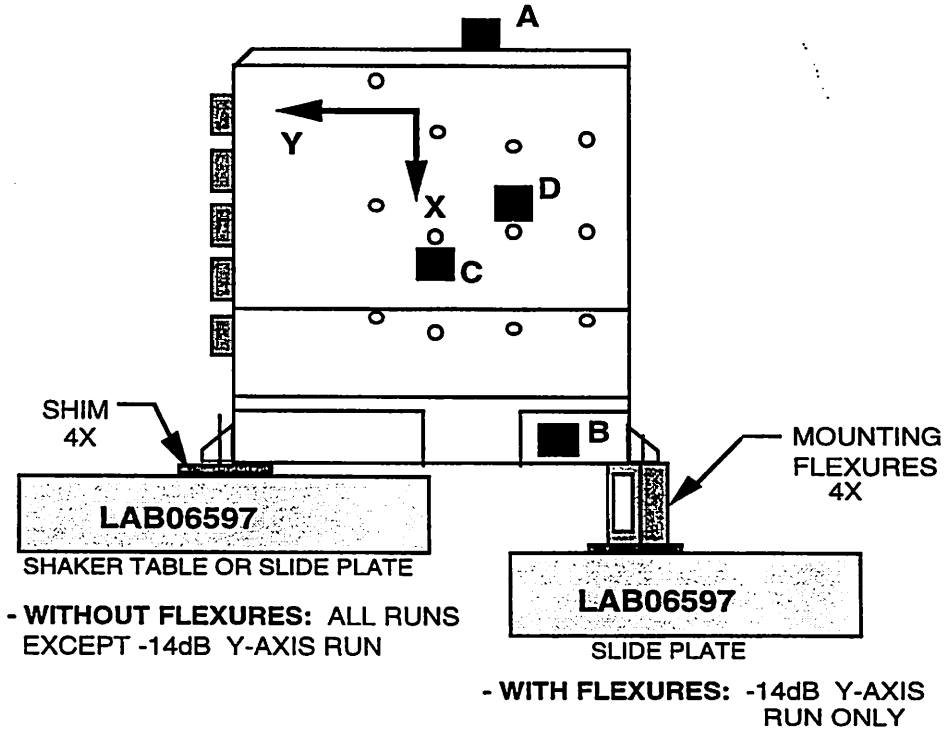


FIGURE 3. Test Setup, Accelerometer Locations and Axis Designation: Z-Axis

Section: 5.4





- **WITHOUT FLEXURES:** ALL RUNS EXCEPT -14dB Y-AXIS RUN

- **WITH FLEXURES:** -14dB Y-AXIS RUN ONLY

A = Accels 7x, 8y 9z
C = Accels 13x, 14y 15z

B = Accels 10x, 11y 12z
D = Accels 16x, 17y 18z

FIGURE 4. FU PSMC Accelerometer Locations and Axis Designation.

Section: 5.5

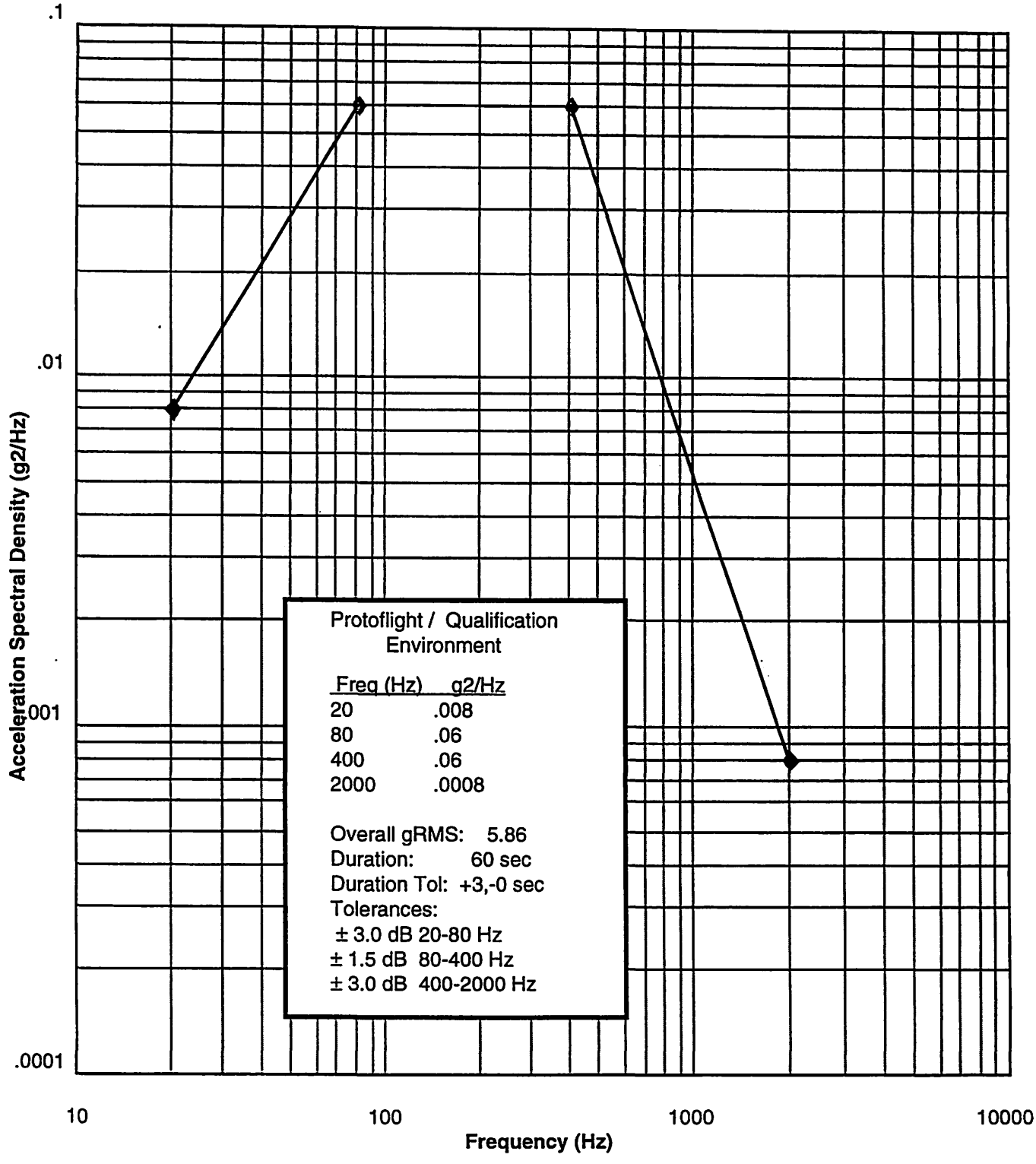


FIGURE 5. ACIS PSMC Protoflight Random Vibration Spectrum.

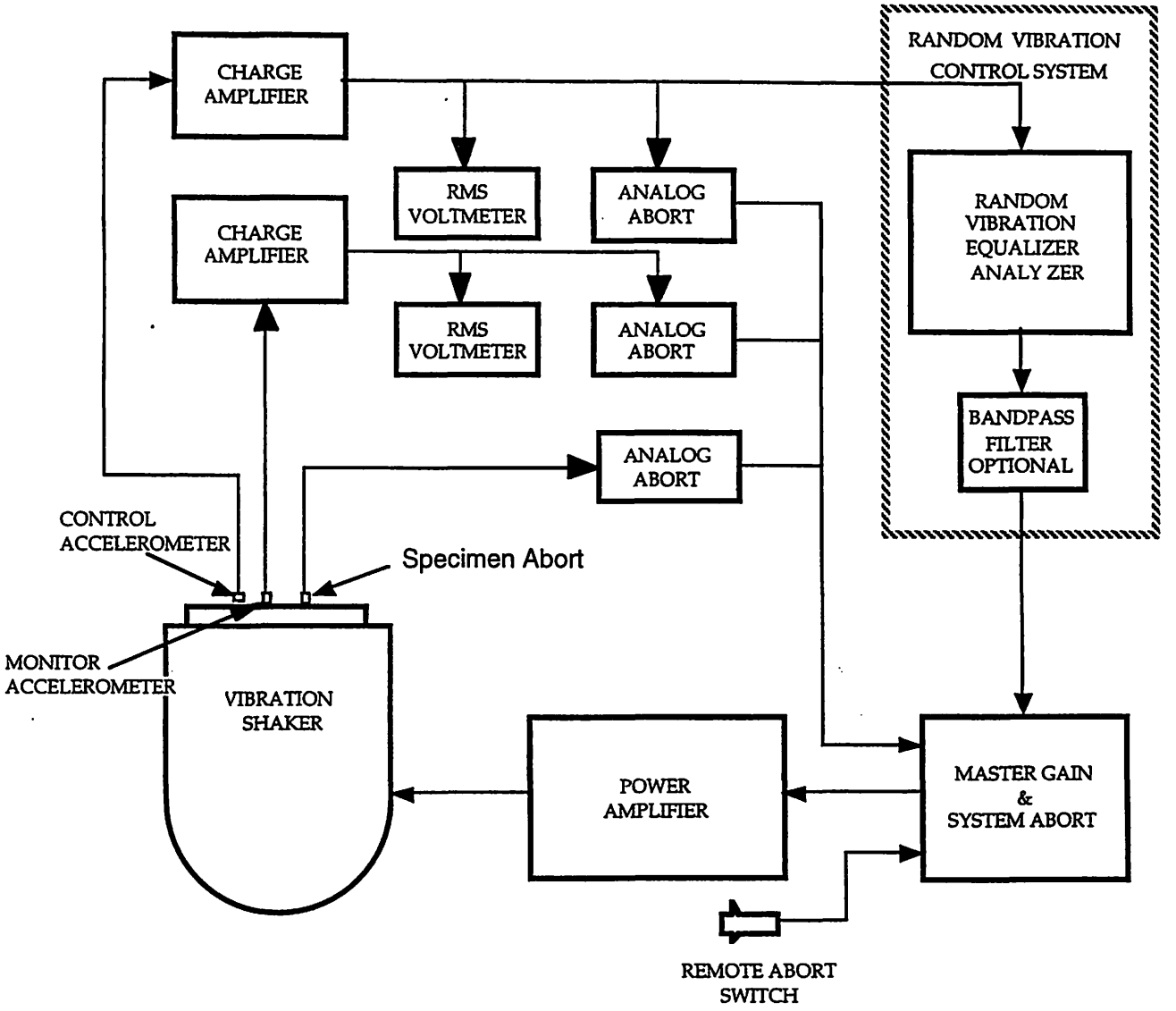


FIGURE 6. Random Vibration Block Diagram

Section: 5.7

TABLE 1

INSTRUMENTATION AND EQUIPMENT LIST

TEST ENVIRONMENT ____________

TEST ITEM ________________

ITEM NAME	MANUFACTURER	MODEL	SERIAL NUMBER	CAL. DUE	QC

Section: 5.8

TABLE 2

Test No:			Measurement:			Date:	
MANUFACTURER	MODEL	SENS	FREQ RESP	GAIN	LINEARITY	COMBINED	Measurement Uncertainty
Vibration Controllers:							
GenRad	2511	N/A	N/A	0.5	N/A	0.29	
GenRad	2530	N/A	N/A	0.5	N/A	0.29	
Spectral Dynamics	2552B	N/A	N/A	0.2	N/A	0.12	
HP	35655A	N/A	N/A	0.5	N/A	0.29	
HP	35656B	N/A	N/A	0.5	N/A	0.29	
HP	5427A	N/A	N/A	1.0	N/A	0.58	
Unholtz Dickie	400AT	N/A	N/A	0.5	N/A	0.29	
						0.00	
Signal Conditioners:							
Endevco	2775A	N/A	**	1.5	1.0	1.04	
Unholtz Dickie	D22 series	N/A	1.0	2.0	1.0	1.41	
						0.00	
Accelerometers:							
Endevco	2222C	1.5	2.0	N/A	0.5	1.47	
Endevco	2226C	1.5	2.0	N/A	0.2	1.45	
Endevco	2271A	1.5	2.0	N/A	0.1	1.44	
Endevco	2272	1.5	2.0	N/A	0.1	1.44	
Endevco	7250AM1-10	1.5	2.0	N/A	0.2	1.45	
Endevco	2258-10	1.5	2.0	N/A	0.2	1.45	
Endevco	7221	1.5	2.0	N/A	0.2	1.45	
PCB	353A04	1.5	2.0	N/A	1.0	1.55	
PCB	355A53	1.5	2.0	N/A	1.0	1.55	
PCB	306M58	1.5	2.0	N/A	0.2	1.45	
						0.00	

*** TOTAL COMBINED UNCERTAINTY (TCU): 0.00**

Accuracy Ratio Calculations	Computed Accuracy Ratio

The following notes apply to the above uncertainty analysis:

* Frequency response based on 10 Hz to 2 Khz working range.
* Expressions are in % unless otherwise noted.
* Transducer frequency responses tolerances are based on Metrology data sheets. Otherwise tolerances are +/-5.0%.
* Linearity specifications for accelerometers assumes 100 G maximum and reference to best fit straight line.
* All accuracy's are based on sine response. Gain accuracy's reference 1 Vac @ 1 KHz.
* Uncertainty analysis based on NIST Technical Note 1297 and NCSL Recommended Practice RP-12, Feb 1, 1994. Temperature @ 23 Degrees C.
* Rectangular distribution assumed for accuracy's. Coverage Factor of 1 assigned to TCU. Assumed flat within 10Hz to 2 KHz.

**

Section: 5.9

TABLE 3

LOCKHEED MARTIN

DYNAMIC SYSTEM/FIXTURE EVALUATION DATA SHEET

TEST REPORT NO.	PAGE NO.	DATE
LOCKHEED MARTIN SPECIFICATION PART NO.		NAME
VIBRATION SYSTEM MODEL NO.		S/N
TEST FIXTURE PART NO.		
LOCKHEED MARTIN TEST METHODS & CONTROL DOC. NO.		
TEST SPECIMEN PART NO.		S/N

FIXTURE EVALUATION WAS CONDUCTED WITH: (CIRCLE ONE USED)

DUMMY MASS DEVELOPMENT TYPE UNIT QUAL UNIT PROD. UNIT

DYNAMIC FIXTURE EVALUATION LEVEL

SINE_____ G's PEAK_____ SWEEP RATE _____

RANDOM____G's RMS_____ (SPECTRUM ON PAGE ____) RANGE _____ TO _____

SHOCK_____G's PEAK_____ (SPECTRUM ON PAGE ____)

SUMMARY OF RESULTS

LEGEND: 0K ALL DATA RECORDED ARE WITHIN SPECIFICATION LIMITS.
* DATA OUTSIDE SPECIFICATION LIMITS-DETAILS PROVIDED ON REVERSE SIDE OF THIS FORM.

AXIS OF APPLIED INPUT	X-AXIS OUTPUT	Y-AXIS OUTP UT	Z-AXIS OUTPUT
	REQ. RESULTS	REQ. RESULTS	REQ. RESULTS
X-AXIS			
Y-AXIS			
Z-AXIS			

ACCELEROMETER LOCATIONS ARE SHOWN PER PHOTOGRAPHS OR SKETCHES ON PAGE NO.

ANY DEVIATIONS FROM TEST METHODS CONTROL DOCUMENT SHOWN ON PAGE NO.

OPERATOR	DATE	VENDOR WITNESS
TEST FACILITY & LOCATION		
LOCKHEED MARTIN FIXTURE DRAWING APPROVAL		
DYNAMIC SYSTEM FIXTURE APPROVAL (Test)		
EXPIRATION DATE	LOCKHEED MARTIN TEST REQUIREMENTS	

Section: 5.10

TABLE 4

PROCEDURE HISTORY SHEET

ITEM	DATE	PARA	ENTRY	ORIG.	QUAL. VERIF	QUAL. ACCEP.

TEST CONDUCTOR_____DATE_____
QUALITY_____DATE_____
ENGINEERING _____DATE_____
QUALITY ENGINEERING_____DATE_____
CUSTOMER_____DATE_____
TEST LEAD_____DATE_____