

# SERMS<sub>srl</sub>

Laboratorio per lo Studio degli Effetti delle Radiazioni sui Materiali per lo Spazio  
Via Pentima Bassa, 21 Terni - 05100 TR  
phone/fax: +39.0744.49.29.13  
Spin Off Accademico dell'Università Degli Studi di Perugia

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## TEST REPORT VIBRATION TEST

doc: ug-crate vibration  
data: 11/02/087  
rev: A01  
pag: 1 di 15  
file: VIBRPT55-S1105C-A01-11LUG2K8.doc

CUSTOMER: G&A Engineering - Orticola (AQ) - Italy - phone: +39.0863.90.90.03

## TEST REPORT VIBRATION TEST

VIBRPT55-S1105C-A01-11LUG2K8.doc

date: July 11<sup>th</sup>, 2008

Prot.: 795-08/SERMS srl

*signature*

test report prepared by:	11/07/08	Ing. Stefano Lucidi QA manager	
test report controlled by:	11/07/08	Ing. A. Alvino Test Responsible	
approved by:	11/07/08	Dott.ssa L. Di Masso Lab. Responsible	

### change record

date	change description	revision
11/07/08	first issue	A01

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### **NOTICE**



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#### **TEST REPORT DESCRIPTION**

This document is generated by the S.E.R.M.S. Laboratory and reports on the setup, the operation and the results of the test performed on the customer Device Under Test (D.U.T.); several sections compose this report: all of them have been integrated and adapted to the specific tests performed on the D.U.T.

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UG_MWL_X.001.....	<b>ERRORE. IL SEGNALIBRO NON È DEFINITO.</b>
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UG_MWL_Z.001 .....	<b>ERRORE. IL SEGNALIBRO NON È DEFINITO.</b>

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### **GENERAL INFORMATION**

Job Number: .....**S1105C**  
Universal test number: ..**VIBTEST55**  
Test performed on: UG CRATE FM (flight module)

contractor: .....**G&A ENGINEERING**  
contractor responsible: ..**ING. RENATO BELLAROSA**  
subcontractor: .....**INFN-ROMA**  
test engineer:.....**ANTONIO ALVINO**  
quality assurance: .....**STEFANO LUCIDI**

### **APPLICABLE LAWS AND RULES**

**UGcrate\_QM2tests-v12 (13/02/08)**

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#### **S.E.R.M.S Lab. - INTERNAL TEST PROCEDURE**

**D.L. 19 settembre 1994, n.626**

Attuazione delle direttive 89/391/CEE, 89/654/CEE, 89/655/CEE, 89/656/CEE, 90/269/CEE, 90/270/CEE, 90/394/CEE e 90/679/CEE riguardanti il miglioramento della sicurezza e della salute dei lavoratori sul luogo di lavoro, e successive modifiche;

**MIL-HDBK-831 23 April 1999**

Preparation of Test Reports (guidance only);

**UNI -10653 - November 1997**

Quality product technical documentation (guidance only) ;

**UNI CEI EN45001**

general criterion for test laboratory operation;

**UNI CEI 70001**

norm certificate test laboratory terms and definitions;

**UNI CEI 70011**

guide for test result presentation;

**UNI 9513**

vibration and shocks : vocabulary.

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### SERMS FACILITY - QUALITY ASSURANCE INFORMATION

Item	Manufacturer	Last valid cal/maintenance	Next cal/maintenance Due date	Status
Control System	Spectral Dynamics	23 MARCH 2007 (c)	22 MARCH 2008 (dd) (TBC)	Done 2 April 08
Shaker	Ling Electronics	5 APRIL 2007 (m)	5 APRIL 2008 (TBC)	Done
Slip Tables	Team Corporation	15 MARCH 2007 (m)	15 MARCH 2008 (TBC)	Done
Sensor	Metra-Mess	28 JUNE 2006 (c)	28 JUNE 2008 (dd) (TBC)	Planned

#### SENSORS LIST

CH	MODEL ACC	SERIAL	CALIBRATION DATE	SENSE mV/g
56	KS 94-100	5007	28/06/2006	103,07
28	KS 94	3012	27/06/2006	14,52

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### TEST LEVEL SUMMMARY

*The subtests performed are:*

All Axes	20 Hz	0.01 g <sup>2</sup> /Hz
	20-80 Hz	+3 dB/Octave
	80-500 Hz	0.04 g <sup>2</sup> /Hz
	500-2000 Hz	-3 dB/Octave
	2000 Hz	0.01 g <sup>2</sup> /Hz
Overall = 6.8 Grms		

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### TEST DIARY

test begun: .....April 22, 2008

test completed: .....April 22, 2008

The following table shown the subtests performed for the UG-CRATE equipment:

Vibration test UG CRATE					
NOME FILE	DATA	INIZIO	FINE	CHANNELS	NOTE
UG_Z	Apr, 22 - 2008	12.15	12.16	CTRL - CH 28;	TSC
UG_Y	Apr, 22 - 2008	15.03	15.04	CTRL - CH 28;	TSC
UG_X	Apr, 22 - 2008	16.07	16.08	CTRL - CH 28;	TSC

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### **TEST RESULTS**

The device under test has been tested with random vibration along its three orthogonal axes in April 2008 at S.E.R.M.S. Lab. in Terni.

The planned tests have been executed according to the test procedure and the required input levels have been verified.

Visual inspections of the D.U.T. have been performed after each sub-test.

**FOR ALL SUBTEST (EACH SINGLE AXIS) PERFORMED, NO DAMAGE HAS BEEN REPORTED, AND ALL SUB-TEST HAS BEEN NORMALLY COMPLETED.**

The complete set of test data recorded will be provided on customer request; in this report only the most significant test data will be summarized.

### **REMARKS**

All the functional test on the equipment are reported on the following customer document:

***INSERT THE G&A CONTROL DOCUMENT NUMBER***

**R1.**

none



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## Z-AXIS

Details on the performed sub-tests are shown in this section. Note that for each sub-test all the information on the collected data will be reported in "SUB-TEST PARAMETERS AND SUB-TEST GRAPHS" section of this document.

### *Sub-test description*

The general view of the test setup for the Z-axis is shown in figure 1. For the Z-axis sub-test the **DUT** has been mounted on a fixture matching the Z-axis of the DUT with the slip table axis, as shown below. Many sensors (channels or CH) have been used during this sub-test. They were fixed on the DUT by cyanoacrylic glue.



**FIGURE 1: Z-Axis test set-up.**

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## Y-AXIS

Details on the performed sub-tests are shown in this section. Note that for each sub-test all the information on the collected data will be reported in "SUB-TEST PARAMETERS AND SUB-TEST GRAPHS" section of this document.

### *Sub-test description*

The general view of the test setup for the Y-axis is shown in figure 2. For the Y-axis sub-test the **DUT** has been mounted on a fixture matching the Y-axis of the DUT with the slip table axis, as shown below. Many sensors (channels or CH) have been used during this sub-test. They were fixed on the DUT by cyanoacrylic glue.



**FIGURE 2: Y-Axis: test set-up.**

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## X-AXIS

Details on the performed sub-tests are shown in this section. Note that for each sub-test all the information on the collected data will be reported in "SUB-TEST PARAMETERS AND SUB-TEST GRAPHS" section of this document.

### *sub-test description*

The general view of the test setup for the X-axis is shown in figure 3. For the X-axis sub-test the **DUT** has been mounted over the fixture matching the X-axis of the DUT with the slip table axis, as shown below. Many sensors (channels or CH) have been used during this sub-test. They were fixed on the DUT by cyanoacrylic glue.

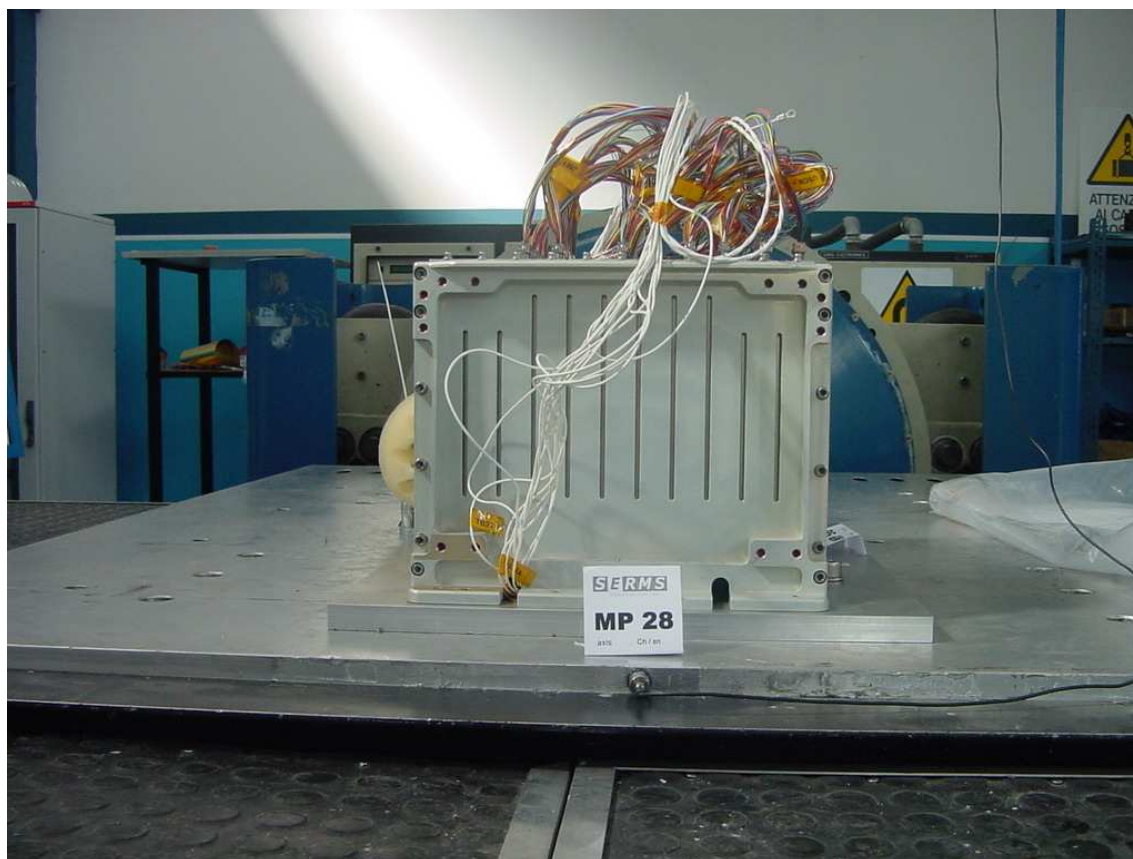


FIGURE 3: X-axis test set-up.

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### **SUB-TEST GRAPHS**

The S.E.R.M.S. Lab. guarantees that the test set-up and management is done only by authorized and qualified members of the S.E.R.M.S staff according to the customer specifications.  
After the input of the test engineer, the control system records the parameters for all the different sub-tests and automatically generates the corresponding printable output files.  
The graphs are automatically generated during the test by the control system and directly inserted into this report;

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### Z-AXIS

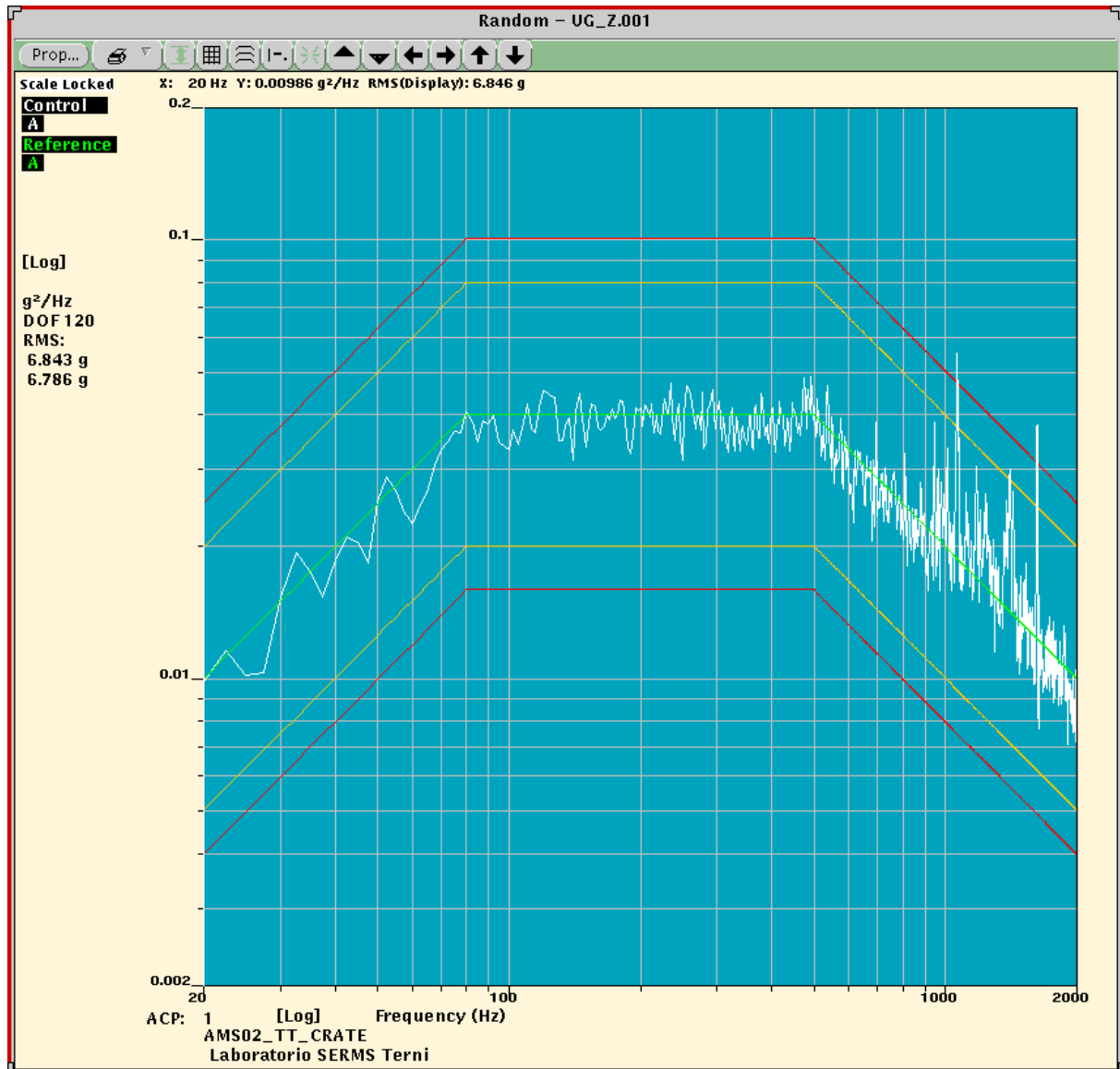


FIGURE 4: Z-AXIS random.

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### Y-AXIS

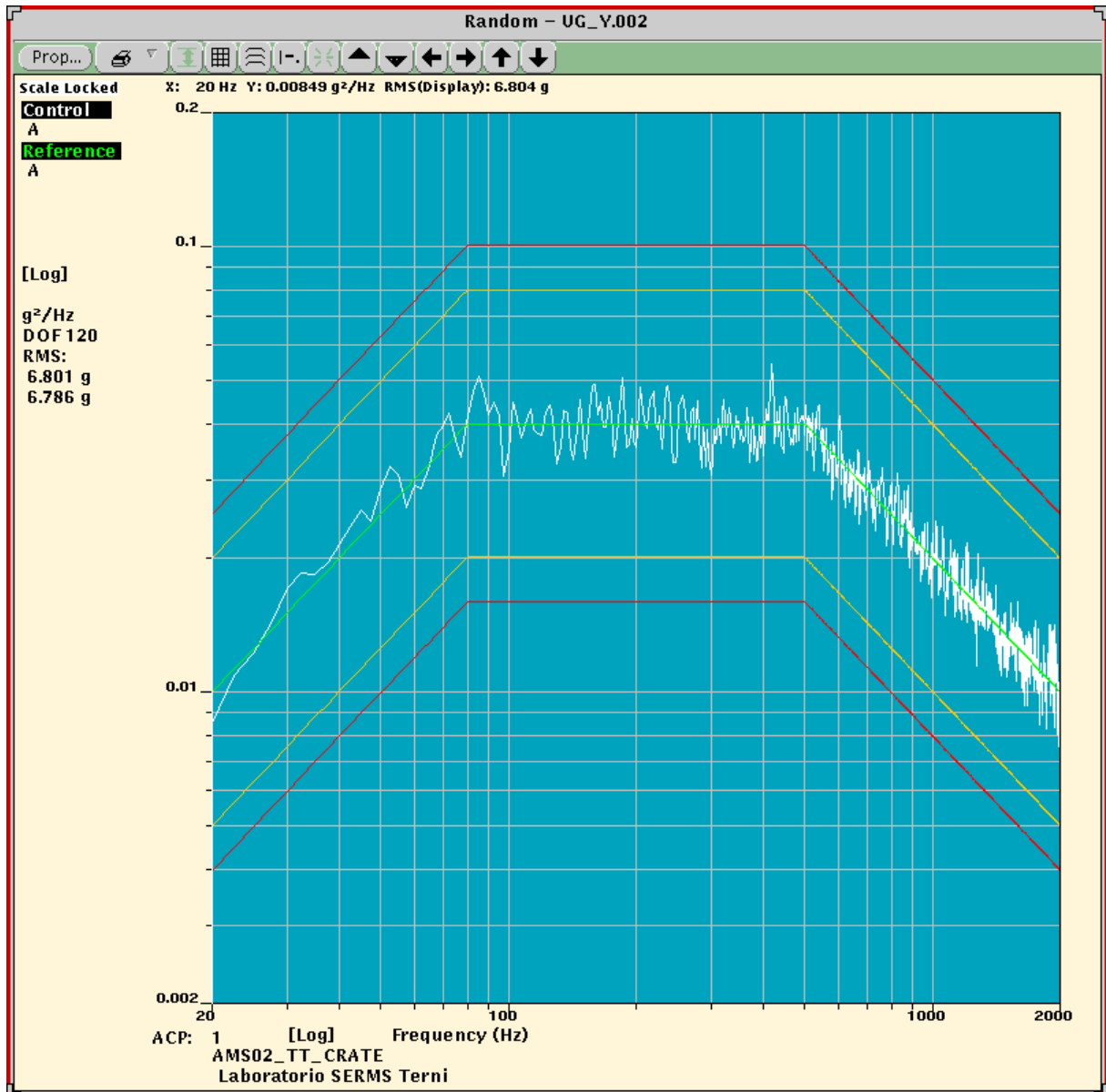


FIGURE 5: Y-AXIS random.

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### X-AXIS

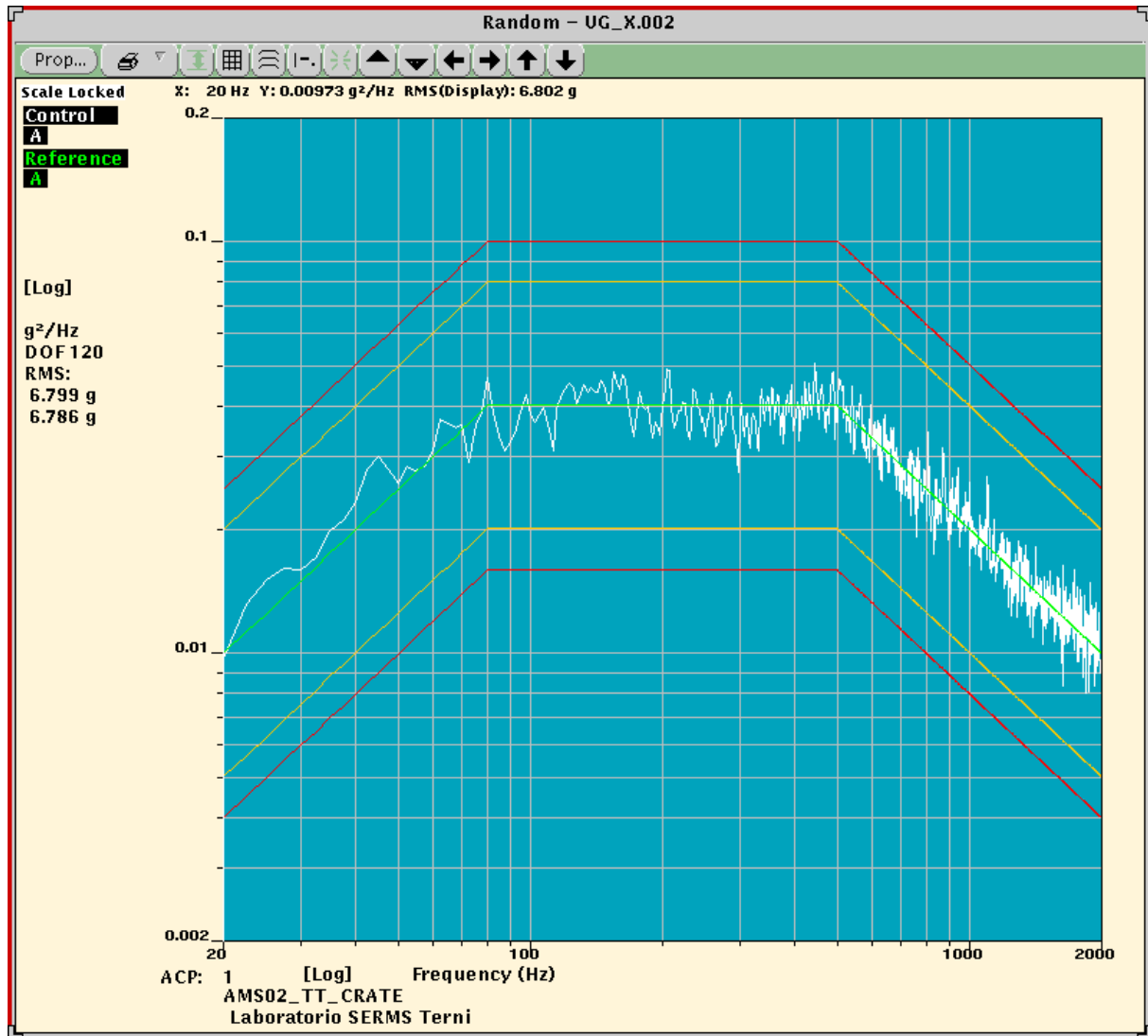


FIGURE 6: X-AXIS random.