

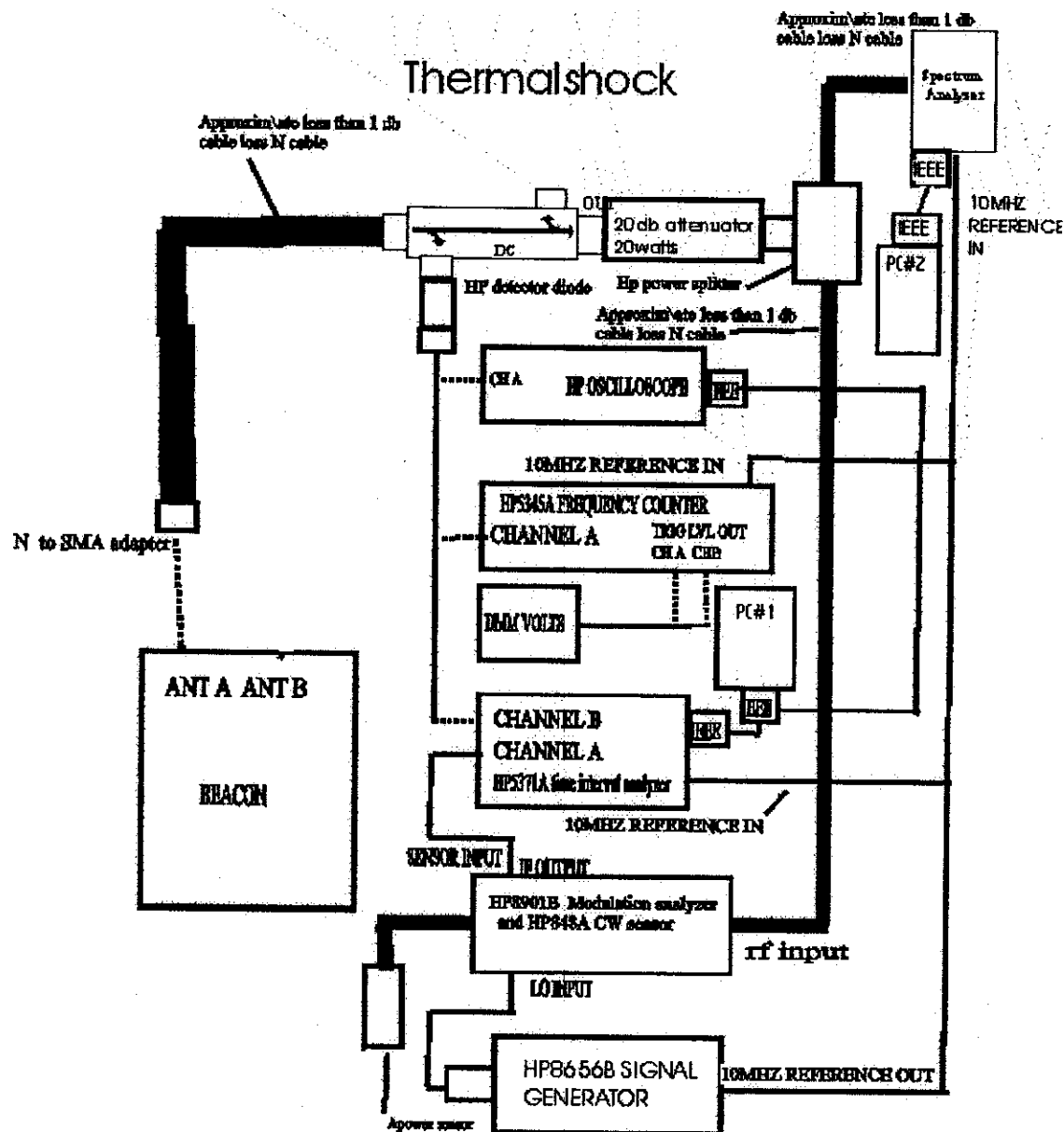
Attachment AK
Thermal Shock Test Results

DO204 Thermal Shock Test Method

Paragraph 2.3.2.4

- 1) OBTAIN dme DOC Y1-02-1053 and DO-204 documents FOR REFERENCE AND SET UP.
- 2) CONNECT EQUIPMENT UP AS INDICATED IN PARAGRAPH 3.1 of Y1-02-1053
- 3) Perform para. 3.1 through 3.10 of Y1-02-1053
- 4) Instead of connecting equipment as shown in figure 1A of Y1-02-1053, set up as shown here in this attachment appendix A called "Thermalshock" setup using a fresh battery in the beacon and placing the beacon in a cardboard box with open cover to allow the cover to be quickly closed when removed from chamber "A" and brought and just taken out of the box to go into chamber "B" for the most rapid thermal shock effect.
- 5) Set a fixed chamber "A" to -20 degree C and the secondary chamber "B" to +10 degree C as indicated by DO204 para 2.3.2.4.
- 6) Set up thermal data acquisition unit with separate PC to monitor chamber temperature and beacon temperature in chamber A but attach it to an UPS to allow movement to chamber B Program it for at least 30 second intervals but don't have it start acquiring data yet.
- 7) Initiate PC software called FREQUENCY4.EXE on PC#1 and insert 252 (3.5 hr*3600sec/50sec) for the data acquisition count. Set the **HP8656B** to **407.528 Mhz** at **0.0 dbm**. Set the **HP8901B** to frequency mode at **406.028 Mhz with range hold on**. Start running the software after the beacon has been on for more than 15 minutes.
- 8) Initiate data acquiring on the thermal data acquisition unit and execute the programmed temperatures for both chambers for an overnight soak of about 11 hours. The beacon and the box its held in is removed and carried over with thermal data acquisition unit and UPS and just taken out of the box to go into chamber "B" for the most rapid thermal shock effect. The beacon is just turned on at that point by a magnet pulled out after the Antenna A is connected to the test equipment. Note the transfer must be done fairly quickly.
- 9) After the 15 minute warm up, start the data collection on the FREQUENCY4.EXE program on PC#1 and the "burn_in_test_select2.vi" on PC#2 with the 121.5, 243 and 406 power level annunciation points turned on with a 14 minute interval and a thermal shock file name for the beacon in question.
- 10) Let the program continue for the 3.5 hours until it accumulated all of the "thermal shock data" for frequency and power. Then stop the thermal data acquisition unit, the "burn_in_test_select2.vi" and turn the beacon off (magnet back in)
- 11) Copy the "binarydata1.txt" through "binarydata252.txt" files to a working directory elsewhere on the hard drive. Copy the tr.exe file and hexid.exe to that directory too.
- 12) Go to the dos window and execute this string in the working directory as follows: "tr binarydata 252 18"
- 13) Copy and rename the resulting file "stability.txt" to "stability18.txt" (or equiv) and plot the **medium term residual, and medium slope** in Excel spreadsheet with the temperature data of the data acquisition unit PC for that same time interval. This will be the medium term thermal shock graphs.
- 14) Go to the dos window and execute this string in the working directory as follows: "tr binarydata 252 10"
- 15) Copy and rename the resulting file "stability.txt" to "stability10.txt" (or equiv) and plot the **frequency and short term**, in Excel spreadsheet with the temperature data of the data acquisition unit PC for that same time interval. This will be the frequency and short term thermal shock graphs.
- 16) Go to the dos window and execute this string in the working directory as follows: "hexid binarydata1.txt"
- 17) Copy and rename the resulting file "hexid.txt" to "binarydata1timezero.txt" (or equiv).
- 18) Do the same in paragraph 16 and 17 but with the binarydata # 36,72,108,144,180,216,252 renaming each time for every 30 minutes. Verify the Hex ID is correct for each.
- 19) Print out the "burn_in_test_select2.vi" output text file and check the 406 power exceeds 35 dbm for each 30 min interval.

Thermalshock



Qualification Data Sheet

Date: 12/31/02	Test: TITELMAC SHOCK TEST
Test Unit Description	SRB-406 ELT, PN P3-03-0041-001, revision 05, Serial # 2007
Test Unit Configuration	Antenna "A" PN A3-06-2053-001 rev 02 SN N/A Antenna "B" PN A3-06-2053-001 rev 02 SN N/A Digital CCA PN A3-07-0038-800 rev 07 SN 0016 RF CCA PN A3-07-0039-800 rev 07 SN 0002 Battery pack A3-03-1006-001 rev 04 SN 020143 Lanyard PN A3-05-0099-001 rev 03.
Description of Test Method (ex: Eurocae ED-62, para x.x)	DO-204 2,3,2,4
Pass/Fail Criteria	DO-204. 2,3,2,4
Authorized Deviations	NONE
Test Location	DME ORLANDO
Purchase Order #	N/A
Test Equipment Arrangement (if necessary)	SEE ATTACHED DATA TEST METHOD SHEET
List of Calibrated Equipment	SEE ATTACHED DATA SHEETS
DME Test Engineer	KEN HEPP
DME QA Representative	KEN KOTYK
Lab Test Engineer/Technician	NONE
Other Witness	NONE
Test Unit Authorized Deviations	NONE
Test Data	SEE ATTACHED STABILITY GRAPHS ALL PASS KWH/MPH
Data Reduction/Calculations	SEE ATTACHED GRAPHS
Test Deviations	NONE
Test Performed Prior to this Test	POST VSWR
Next Test to be Performed	
Test Engineer Signature	K. HEPP
QA Signature	K. KOTYK
Other Witness Signature	N/A
NMR #	N/A
Notes	N/A

Thermal Shock

TEST EQUIPMENT LIST CALC SHEET

Robert

DO204-2,3,24

NO ANTENNAS

12/31/02

BAF = 020143

DIGITAL PCB (A3-07-0038) Serial Number: 0010

Test Equipment	Model	Serial No. or Control No.	Cal. Due
SPECAN	HP 8568B	OR 3063	9/18/03
GENERATOR	HP 8656B	OR 1091	5/18/03
MOD ANA #1	HP 8901B	OR 1093	2/28/03
SCOPE	HP 5450B	OR 0627	8/29/03
TIME + FREQ ANA	HP 5371A	2842A00760	6/11/03
MOD ANA #2	HP 8901B	3704A05771	12/11/03
POWER SENSOR	HP 8481A	OR 1092	2/28/03
FLUKE DMM	FLUKE 8050A	OR 1090	6/14/03
FREQ COUNTER	HP 5345A	OR 2008	9/10/03
FLUKE DMM	FLUKE 8890A	OR 1046	11/18/03

TEST DATA SHEETS
RF BEACON ASSEMBLY
A3-07-1032

SPECTRUM ANALYZER OFFSET DETERMINATION AND PRETEST					
Para.	Description	Min.	Results	Max.	Pass / Fail (circle one)
3.3	HP8656 setting for 121.5MHZ	-0.5	+0.3 dBm	+0.5	P F
3.4	HP8656 setting for 243 MHz	-0.5	+0.3 dBm	+0.5	P F
3.5	HP8656 setting for 406.028 MHZ	-0.5	+0.3 dBm	+0.5	P F

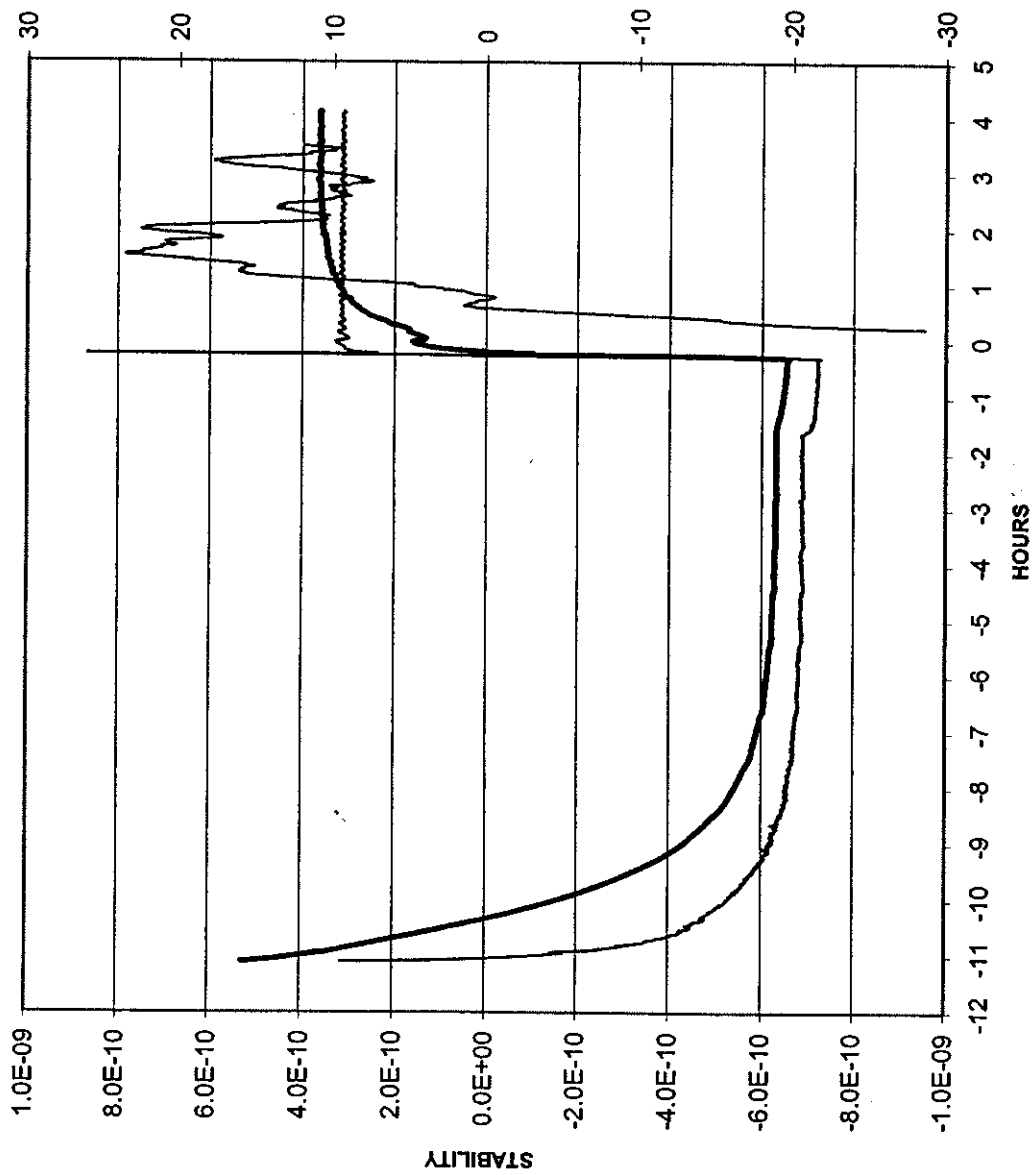
RF beacon 121.5/243 Mhz Tests

Para.	Description	Min.	Results	Max.	Pass / Fail (circle one)
4.1.1	Peak Power at 121.5 MHz	17.0dBm	_____ dBm	N/A	P F
	UUT current during 121.5/243 Mhz broadcast	N/A	_____ mA	100mA	P F
4.1.2	Frequency 121.5 MHz $\pm$ 6 kHz	121.494	_____ MHz	121.506	P F
4.1.3	121.5 MHz Bandwidth $\geq$ +12.5 kHz	N/A	_____ dBc	-25dBc	P F
	121.5 MHz Bandwidth $\leq$ -12.5 kHz	N/A	_____ dBc	-25dBc	P F
	121.5 MHz Bandwidth $\geq$ +25 kHz	N/A	_____ dBc	-30dBc	P F
	121.5 MHz Bandwidth $\leq$ -25 kHz	N/A	_____ dBc	-30dBc	P F
4.1.4	Peak Power at 243 MHz	17.0dBm	_____ dBm	N/A	P F
4.1.5	Frequency 243 MHz $\pm$ 12 kHz	242.988	_____ MHz	243.012	P F
4.1.6	243 MHz Bandwidth $\geq$ +12.5 kHz	N/A	_____ dBc	-25dBc	P F
	243 MHz Bandwidth $\leq$ -12.5 kHz	N/A	_____ dBc	-25dBc	P F
	243 MHz Bandwidth $\geq$ +25 kHz	N/A	_____ dBc	-30dBc	P F
	243 MHz Bandwidth $\leq$ -25 kHz	N/A	_____ dBc	-30dBc	P F
4.1.7	121.5 Mhz Modulation depth	N/A	_____ dBc	-22dBc	P F
4.1.8	364.5 MHz harmonic	N/A	_____ dBc	-30dBc	P F
	486 MHz harmonic	N/A	_____ dBc	-30dBc	P F
4.1.9	121.5 /243 Mhz Duty cycle	45%	_____ %	67%	P F

N/A

NO DATA TAKEN
HERE

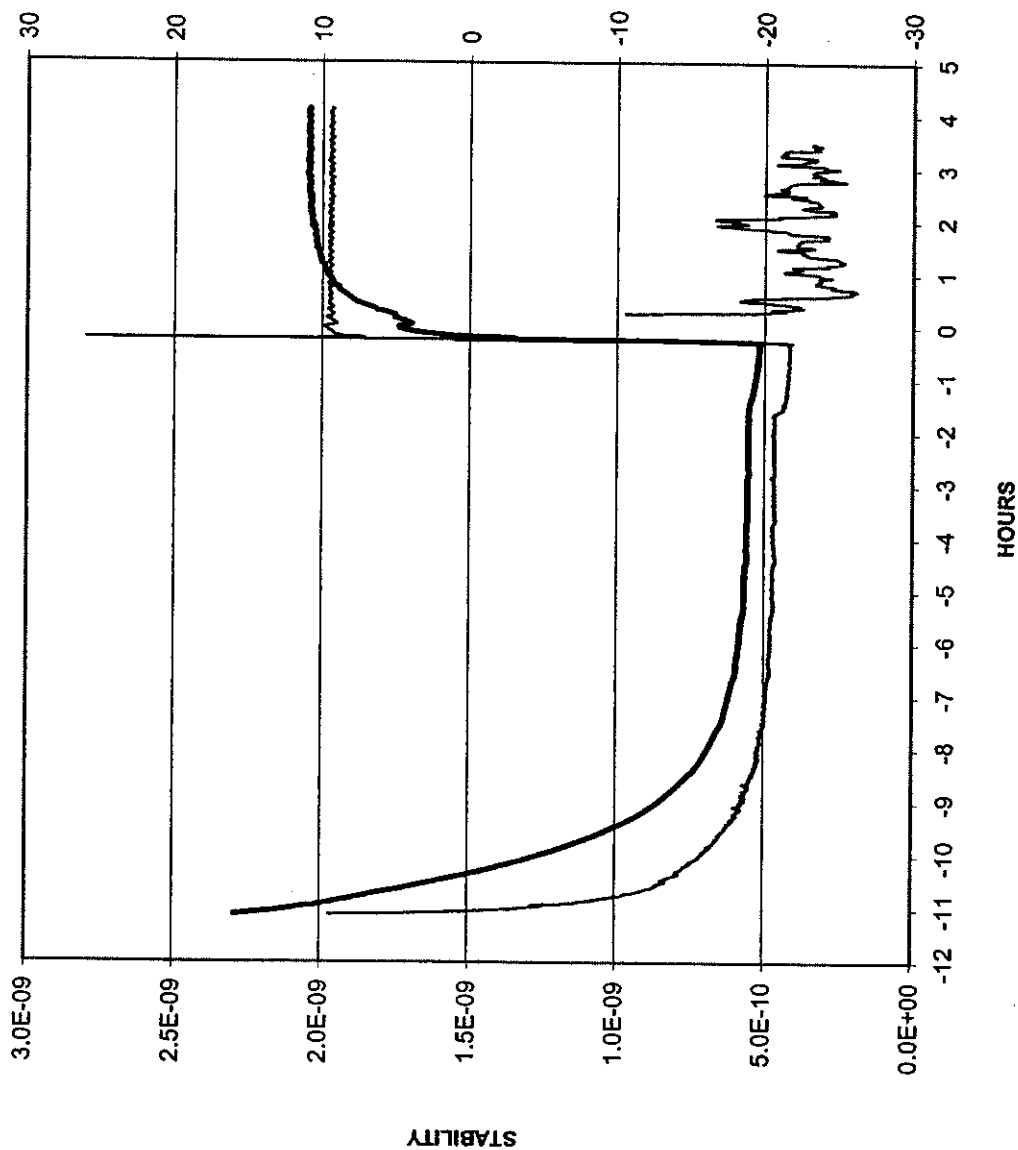
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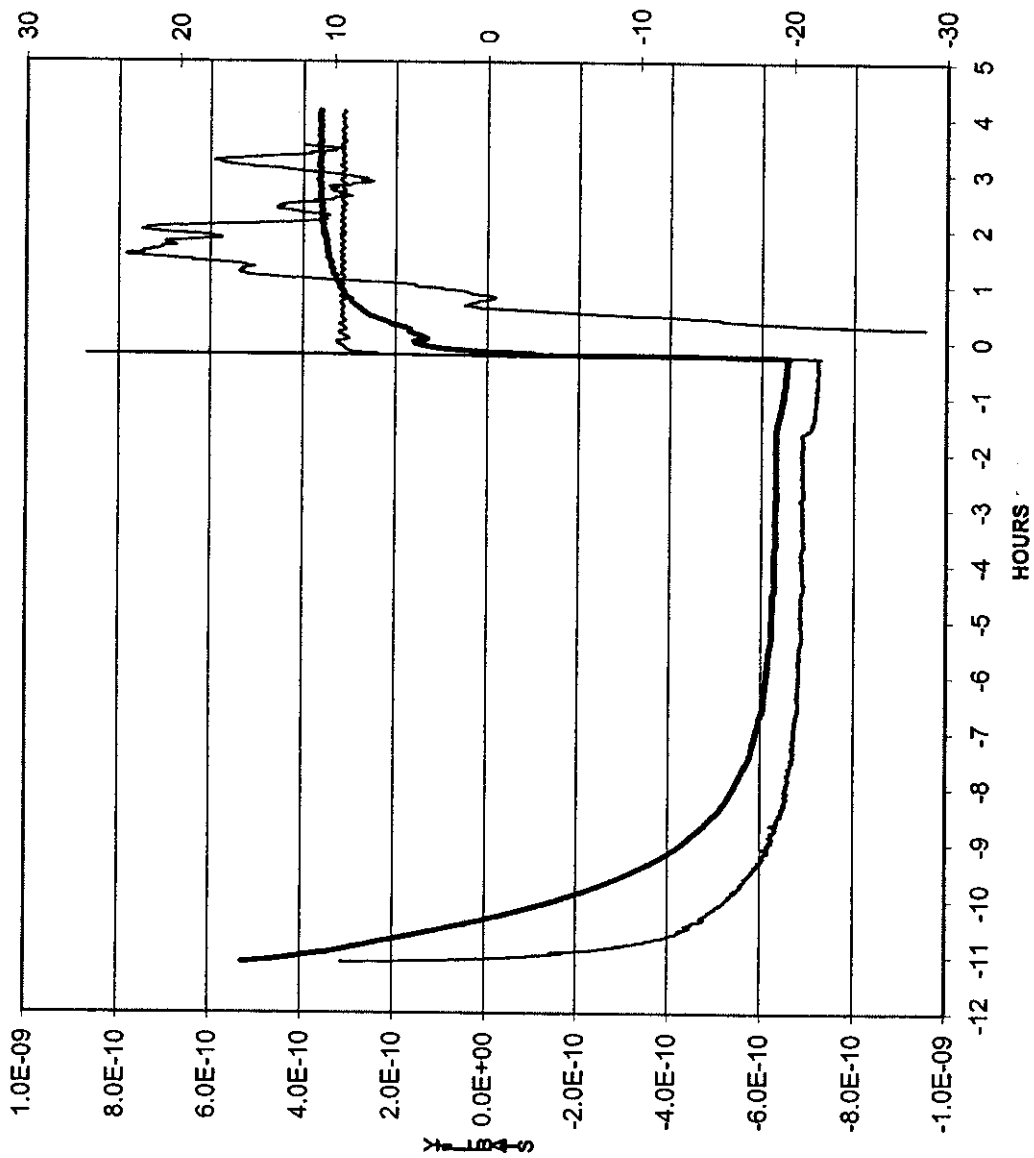
12/31/02
Kut H. H. H. H. H.



SN2007 THERMALSHOCK MEDIUM TERM RESIDUAL



SN2007 THERMALSHOCK MEDIUM TERM SLOPE



— medium slope +/-1e-9limit
 — CHAMBER DEG C
 — BEACON TEMP

12/31/02

W. J. P. / J. P. / J. P.

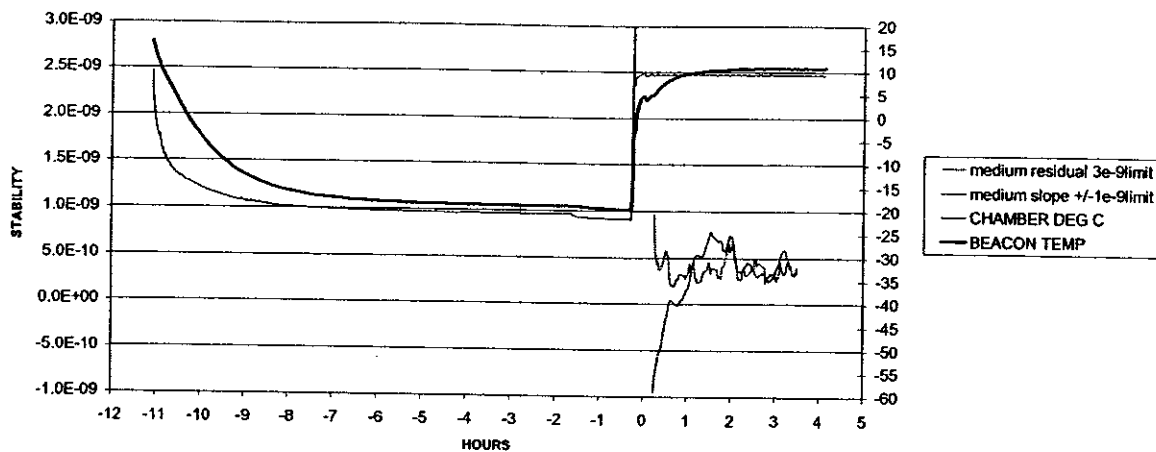


ORL
SOOT
DME

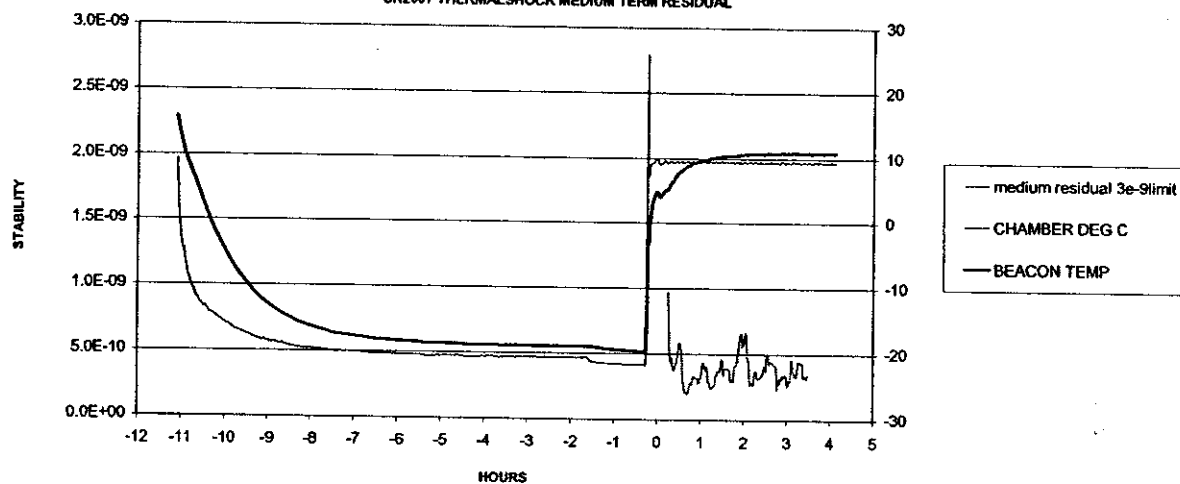
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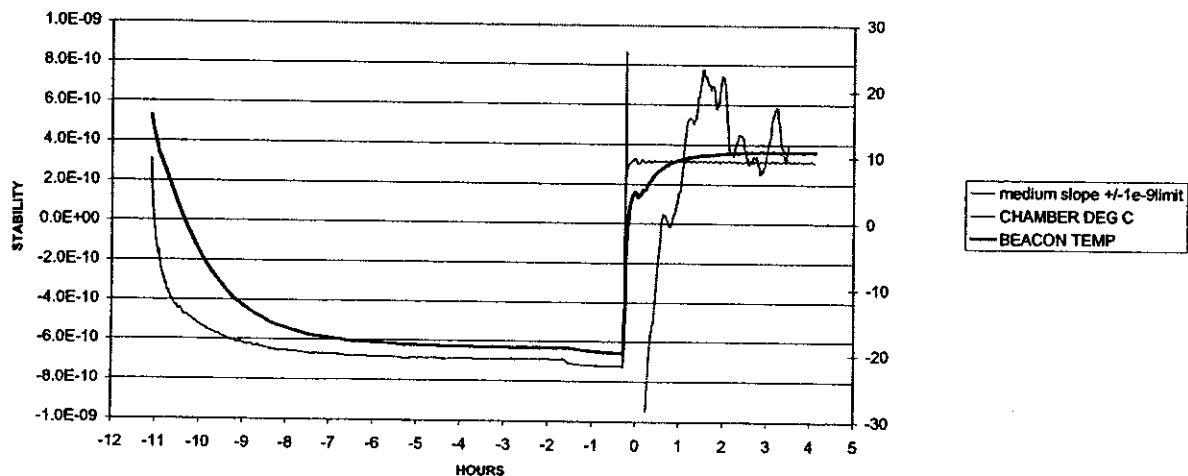
SN2007 THERMALSHOCK MEDIUM TERM GRADIENT GROUP



SN2007 THERMALSHOCK MEDIUM TERM RESIDUAL



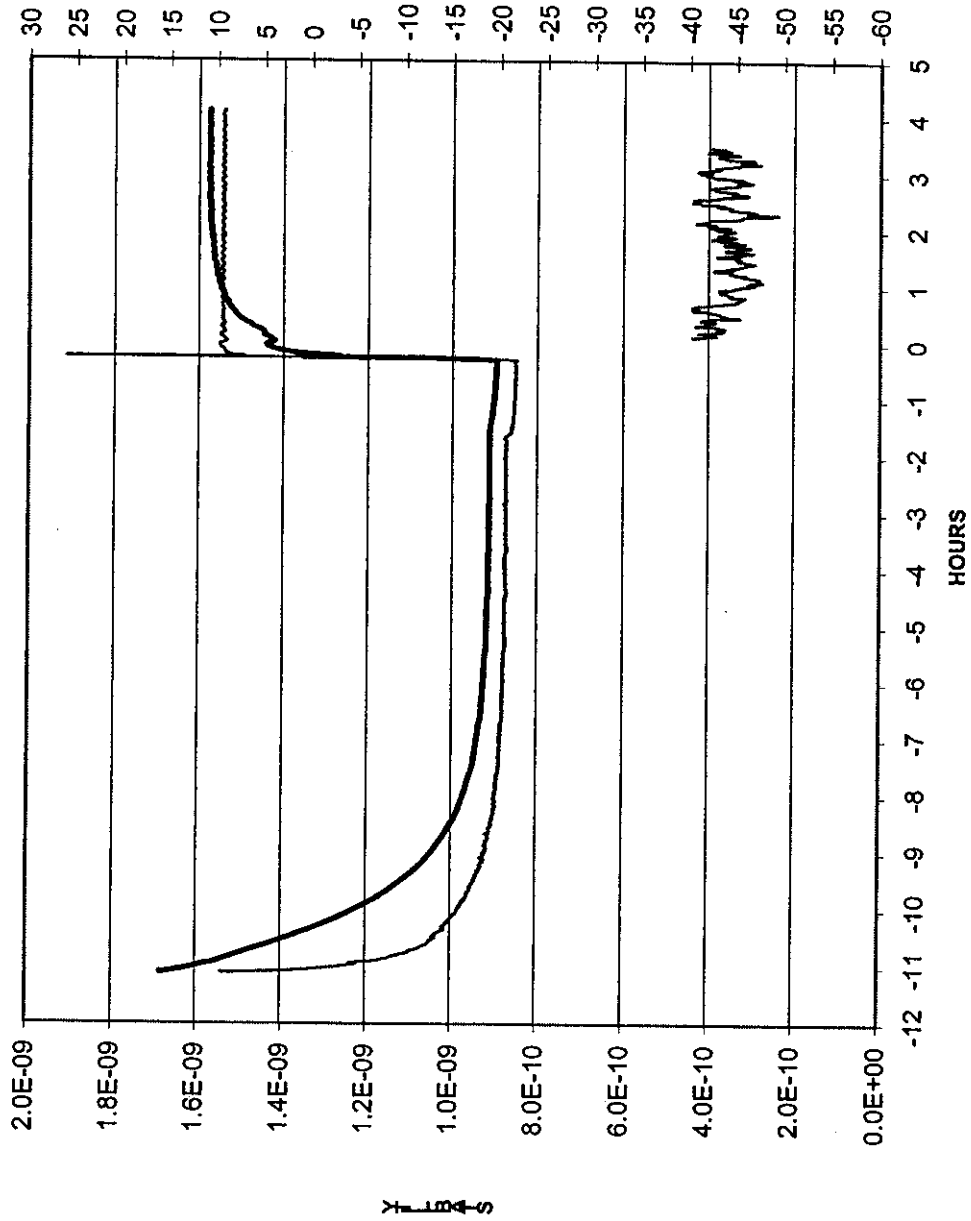
SN2007 THERMALSHOCK MEDIUM TERM SLOPE



THERMALSHOCKMEDIUMTERM

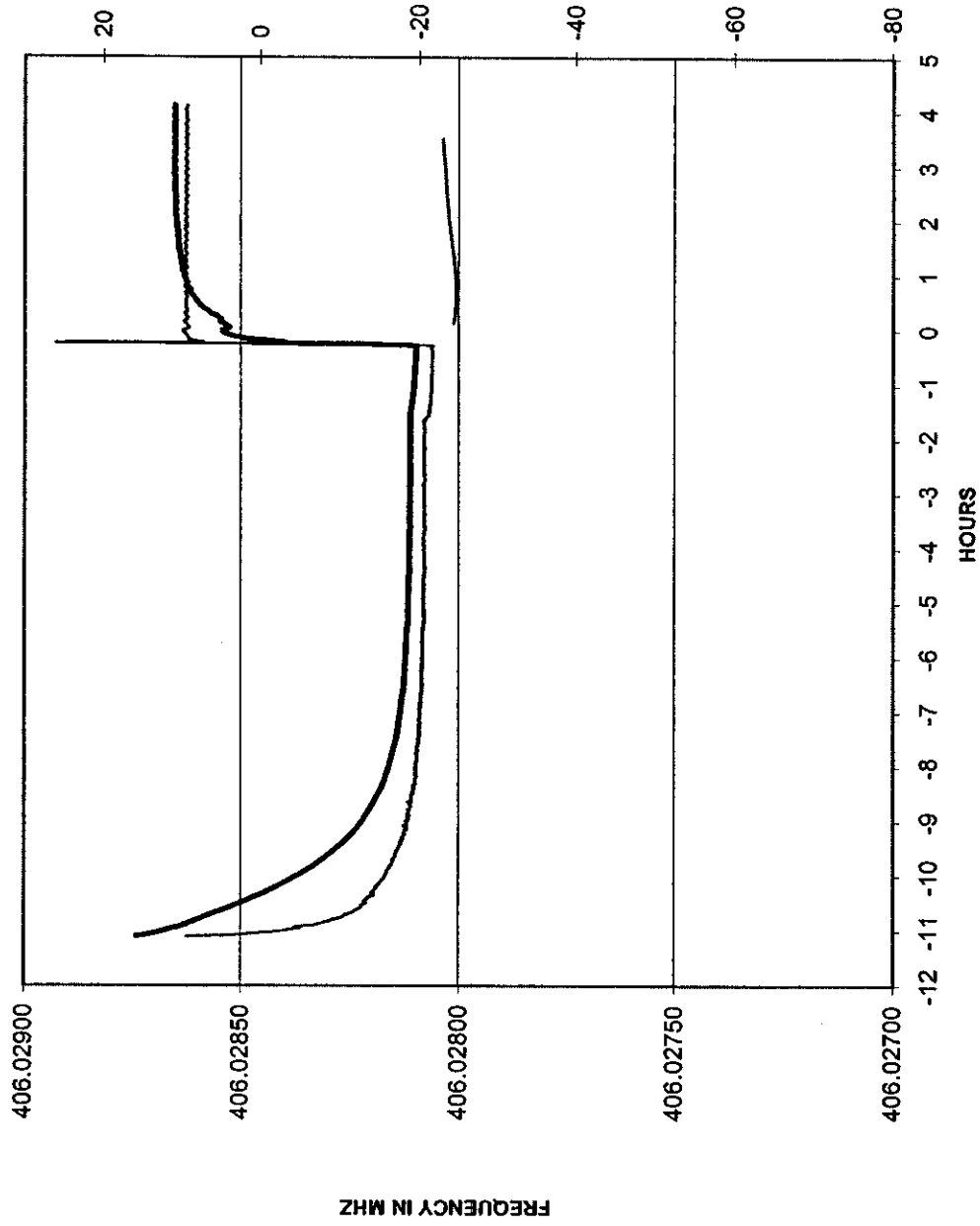
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12/31/02 13:34:50	54120.002	15.033334	3.933334	9.40E+00	1.09E+01	34:49.7	54120.04	1.09E+01
12/31/02 13:35:20	54150.002	15.041667	3.941667	9.39E+00	1.09E+01	35:19.7	54150.04	1.09E+01
12/31/02 13:35:50	54180.002	15.050001	3.950001	9.40E+00	1.09E+01	35:49.7	54180.04	1.09E+01
12/31/02 13:36:20	54210.002	15.058334	3.958334	9.42E+00	1.09E+01	36:19.7	54210.04	1.09E+01
12/31/02 13:36:50	54240.002	15.066667	3.966667	9.41E+00	1.09E+01	36:49.7	54240.04	1.09E+01
12/31/02 13:37:20	54270.002	15.075001	3.975001	9.42E+00	1.09E+01	37:19.7	54270.04	1.09E+01
12/31/02 13:37:50	54300.002	15.083334	3.983334	9.38E+00	1.09E+01	37:49.7	54300.04	1.09E+01
12/31/02 13:38:20	54330.002	15.091667	3.991667	9.41E+00	1.09E+01	38:19.7	54330.04	1.09E+01
12/31/02 13:38:50	54360.002	15.100001	4.000001	9.43E+00	1.09E+01	38:49.7	54360.04	1.09E+01
12/31/02 13:39:20	54390.002	15.108334	4.008334	9.48E+00	1.09E+01	39:19.7	54390.04	1.09E+01
12/31/02 13:39:50	54420.002	15.116667	4.016667	9.47E+00	1.09E+01	39:49.7	54420.04	1.09E+01
12/31/02 13:40:20	54450.002	15.125001	4.025001	9.50E+00	1.09E+01	40:19.7	54450.04	1.09E+01
12/31/02 13:40:50	54480.002	15.133334	4.033334	9.49E+00	1.09E+01	40:49.7	54480.04	1.09E+01
12/31/02 13:41:20	54510.002	15.141667	4.041667	9.48E+00	1.09E+01	41:19.7	54510.04	1.09E+01
12/31/02 13:41:50	54540.002	15.150001	4.050001	9.47E+00	1.10E+01	41:49.7	54540.04	1.10E+01
12/31/02 13:42:20	54570.002	15.158334	4.058334	9.43E+00	1.09E+01	42:19.7	54570.04	1.09E+01
12/31/02 13:42:50	54600.002	15.166667	4.066667	9.42E+00	1.09E+01	42:49.7	54600.04	1.09E+01
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12/31/02 13:43:50	54660.002	15.183334	4.083334	9.35E+00	1.09E+01	43:49.7	54660.04	1.09E+01
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12/31/02 13:44:50	54720.002	15.200001	4.100001	9.30E+00	1.09E+01	44:49.7	54720.04	1.09E+01
12/31/02 13:45:20	54750.002	15.208334	4.108334	9.33E+00	1.09E+01	45:19.7	54750.04	1.09E+01
12/31/02 13:45:50	54780.002	15.216667	4.116667	9.36E+00	1.09E+01	45:49.7	54780.04	1.09E+01

SN2007 THERMALSHOCK SHORT TERM



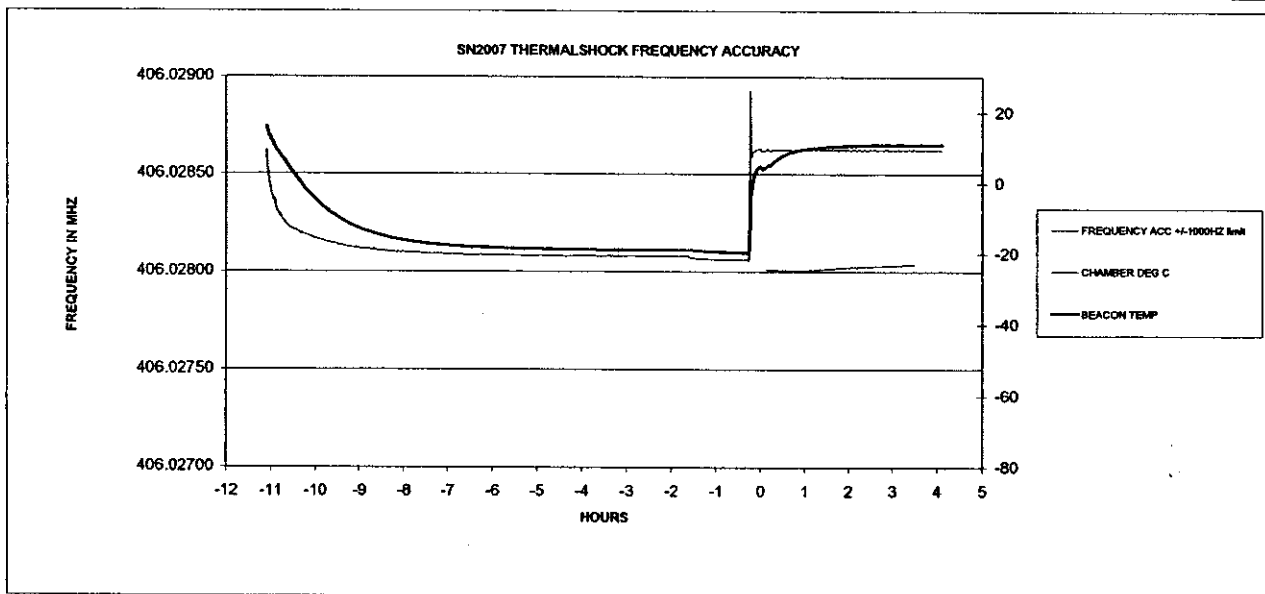
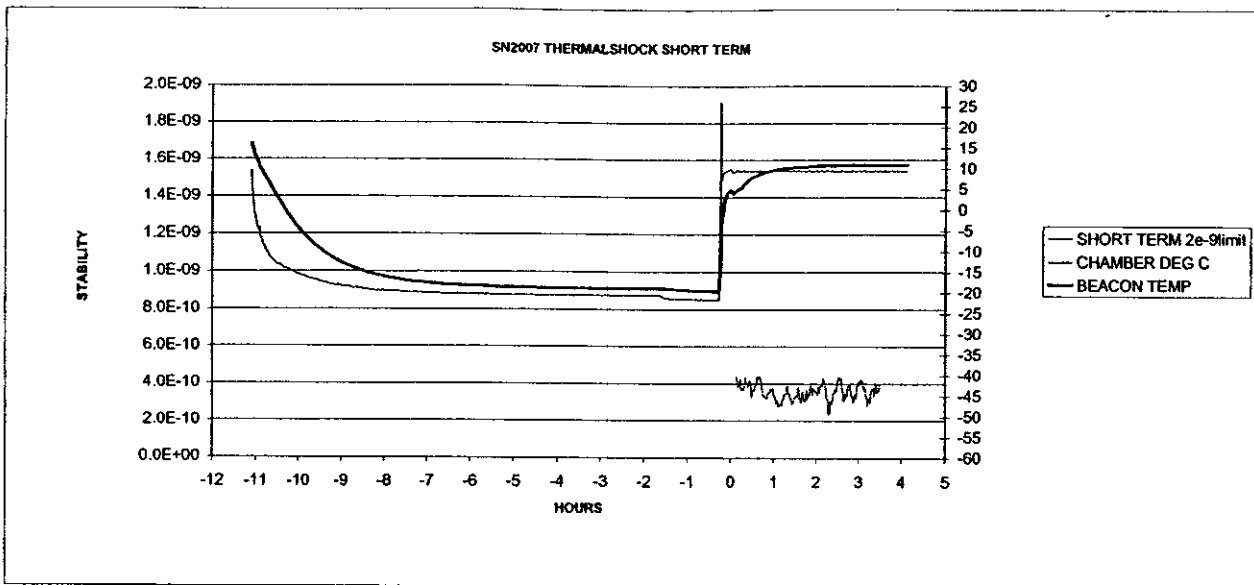
12/3/02
WFL
ORL
SOOT
DME
KJ

SN2007 THERMALSHOCK FREQUENCY ACCURACY



12/21/02
11/24/02
ORL
SOOT
DME
H

12/3/02
ALH
PSS



THERMALSHOCKSHORTTERM

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12/31/02 13:34:50	54120.002	15.033334	3.933334	9.40E+00	1.09E+01	34:49.7	54120.04	1.09E+01
12/31/02 13:35:20	54150.002	15.041667	3.941667	9.39E+00	1.09E+01	35:19.7	54150.04	1.09E+01
12/31/02 13:35:50	54180.002	15.050001	3.950001	9.40E+00	1.09E+01	35:49.7	54180.04	1.09E+01
12/31/02 13:36:20	54210.002	15.058334	3.958334	9.42E+00	1.09E+01	36:19.7	54210.04	1.09E+01
12/31/02 13:36:50	54240.002	15.066667	3.966667	9.41E+00	1.09E+01	36:49.7	54240.04	1.09E+01
12/31/02 13:37:20	54270.002	15.075001	3.975001	9.42E+00	1.09E+01	37:19.7	54270.04	1.09E+01
12/31/02 13:37:50	54300.002	15.083334	3.983334	9.38E+00	1.09E+01	37:49.7	54300.04	1.09E+01
12/31/02 13:38:20	54330.002	15.091667	3.991667	9.41E+00	1.09E+01	38:19.7	54330.04	1.09E+01
12/31/02 13:38:50	54360.002	15.100001	4.000001	9.43E+00	1.09E+01	38:49.7	54360.04	1.09E+01
12/31/02 13:39:20	54390.002	15.108334	4.008334	9.48E+00	1.09E+01	38:19.7	54390.04	1.09E+01
12/31/02 13:39:50	54420.002	15.116667	4.016667	9.47E+00	1.09E+01	38:49.7	54420.04	1.09E+01
12/31/02 13:40:20	54450.002	15.125001	4.025001	9.50E+00	1.09E+01	40:19.7	54450.04	1.09E+01
12/31/02 13:40:50	54480.002	15.133334	4.033334	9.49E+00	1.09E+01	40:49.7	54480.04	1.09E+01
12/31/02 13:41:20	54510.002	15.141667	4.041667	9.46E+00	1.09E+01	41:19.7	54510.04	1.09E+01
12/31/02 13:41:50	54540.002	15.150001	4.050001	9.47E+00	1.10E+01	41:49.7	54540.04	1.10E+01
12/31/02 13:42:20	54570.002	15.158334	4.058334	9.43E+00	1.09E+01	42:19.7	54570.04	1.09E+01
12/31/02 13:42:50	54600.002	15.166667	4.066667	9.42E+00	1.09E+01	42:49.7	54600.04	1.09E+01
12/31/02 13:43:20	54630.002	15.175001	4.075001	9.37E+00	1.09E+01	43:19.7	54630.04	1.09E+01
12/31/02 13:43:50	54660.002	15.183334	4.083334	9.35E+00	1.09E+01	43:49.7	54660.04	1.09E+01
12/31/02 13:44:20	54690.002	15.191667	4.091667	9.33E+00	1.09E+01	44:19.7	54690.04	1.09E+01
12/31/02 13:44:50	54720.002	15.200001	4.100001	9.30E+00	1.09E+01	44:49.7	54720.04	1.09E+01
12/31/02 13:45:20	54750.002	15.208334	4.108334	9.33E+00	1.09E+01	45:19.7	54750.04	1.09E+01
12/31/02 13:45:50	54780.002	15.216667	4.116667	9.36E+00	1.09E+01	45:49.7	54780.04	1.09E+01

HexID All bits
ADDC07C01440401 FFFE2F56EE03E00A20200C93EF50

DO-204

2.3.2.4 b

EVERY 30 MIN,

PA 44

[Signature]

12/31/02

ORL
SQ01
DME

[Signature]



HexID	All bits
ADDC07C01440401	FFFE2F56EE03E00A20200C93EF50



HexID All bits
ADDC07C01440401 FFFE2F56EE03E00A20200C93EF50



HexID

All bits

ADDC07C01440401 FFFE2F56EE03E00A20200C93EF50



HexID	All bits
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HexID All bits
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HexID

All bits

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PM

AKIA.



RP

HexID

All bits

ADDC07C01440401 FFFE2F56EE03E00A20200C93EF50



HexID All bits
ADDC07C01440401 FFFE2F56EE03E00A20200C93EF50

BEACON SN 2007tempshock
TIME START 9:45:20 AM
DATE START 12/31/2002

BEACON 121 OUTPUT POWER PASS
121 POWER PASS AT 19.50

BEACON 243 OUTPUT POWER PASS
243 POWER PASS AT 20.60

BEACON 406 OUTPUT POWER PASS
406 POWER PASS AT 36.50 ✓

BEACON SN 2007tempshock
TIME START 9:59:21 AM
DATE START 12/31/2002

BEACON 121 OUTPUT POWER PASS
121 POWER PASS AT 19.40

BEACON 243 OUTPUT POWER PASS
243 POWER PASS AT 20.50

BEACON 406 OUTPUT POWER PASS
406 POWER PASS AT 36.30 ✓

BEACON SN 2007tempshock
TIME START 10:13:16 AM
DATE START 12/31/2002

BEACON 121 OUTPUT POWER PASS
121 POWER PASS AT 19.40

BEACON 243 OUTPUT POWER PASS
243 POWER PASS AT 20.40

BEACON 406 OUTPUT POWER PASS
406 POWER PASS AT 36.30 ✓

BEACON SN 2007tempshock
TIME START 10:27:44 AM
DATE START 12/31/2002

BEACON 121 OUTPUT POWER PASS
121 POWER PASS AT 19.30

00204-

2.3.249 EVERY 30 MINUTES

TESTED EVERY 15 MINUTES

ALH/M

PASS.

12/31/02





BEACON 243 OUTPUT POWER PASS
243 POWER PASS AT 20.40

BEACON 406 OUTPUT POWER PASS
406 POWER PASS AT 36.20 ✓

BEACON SN 2007tempshock
TIME START 10:41:40 AM
DATE START 12/31/2002

BEACON 121 OUTPUT POWER PASS
121 POWER PASS AT 19.30

BEACON 243 OUTPUT POWER PASS
243 POWER PASS AT 20.40

BEACON 406 OUTPUT POWER PASS
406 POWER PASS AT 36.20 ✓

BEACON SN 2007tempshock
TIME START 10:56:08 AM
DATE START 12/31/2002

BEACON 121 OUTPUT POWER PASS
121 POWER PASS AT 19.20

BEACON 243 OUTPUT POWER PASS
243 POWER PASS AT 20.40

BEACON 406 OUTPUT POWER PASS
406 POWER PASS AT 36.20 ✓

BEACON SN 2007tempshock
TIME START 11:10:03 AM
DATE START 12/31/2002

BEACON 121 OUTPUT POWER PASS
121 POWER PASS AT 19.30

BEACON 243 OUTPUT POWER PASS
243 POWER PASS AT 20.30

BEACON 406 OUTPUT POWER PASS
406 POWER PASS AT 36.20 ✓



BEACON SN 2007tempshock
TIME START 11:24:04 AM
DATE START 12/31/2002

BEACON 121 OUTPUT POWER PASS
121 POWER PASS AT 19.30

BEACON 243 OUTPUT POWER PASS
243 POWER PASS AT 20.30

BEACON 406 OUTPUT POWER PASS
406 POWER PASS AT 36.20 ✓

BEACON SN 2007tempshock
TIME START 11:38:31 AM
DATE START 12/31/2002

BEACON 121 OUTPUT POWER PASS
121 POWER PASS AT 19.30

BEACON 243 OUTPUT POWER PASS
243 POWER PASS AT 20.30

BEACON 406 OUTPUT POWER PASS
406 POWER PASS AT 36.20 ✓

BEACON SN 2007tempshock
TIME START 11:52:59 AM
DATE START 12/31/2002

BEACON 121 OUTPUT POWER PASS
121 POWER PASS AT 19.20

BEACON 243 OUTPUT POWER PASS
243 POWER PASS AT 20.30

BEACON 406 OUTPUT POWER PASS
406 POWER PASS AT 36.20 ✓

BEACON SN 2007tempshock
TIME START 12:06:55 PM
DATE START 12/31/2002

BEACON 121 OUTPUT POWER PASS
121 POWER PASS AT 19.30



BEACON 243 OUTPUT POWER PASS
243 POWER PASS AT 20.30

BEACON 406 OUTPUT POWER PASS
406 POWER PASS AT 36.20 ✓

BEACON SN 2007tempshock
TIME START 12:21:22 PM
DATE START 12/31/2002

BEACON 121 OUTPUT POWER PASS
121 POWER PASS AT 19.20

BEACON 243 OUTPUT POWER PASS
243 POWER PASS AT 20.30

BEACON 406 OUTPUT POWER PASS
406 POWER PASS AT 36.20 ✓

BEACON SN 2007tempshock
TIME START 12:35:23 PM
DATE START 12/31/2002

BEACON 121 OUTPUT POWER PASS
121 POWER PASS AT 19.20

BEACON 243 OUTPUT POWER PASS
243 POWER PASS AT 20.30

BEACON 406 OUTPUT POWER PASS
406 POWER PASS AT 36.20 ✓

BEACON SN 2007tempshock
TIME START 12:49:51 PM
DATE START 12/31/2002

BEACON 121 OUTPUT POWER PASS
121 POWER PASS AT 19.20

BEACON 243 OUTPUT POWER PASS
243 POWER PASS AT 20.30

BEACON 406 OUTPUT POWER PASS



406 POWER PASS AT 36.20

BEACON SN 2007tempshock
TIME START 1:03:51 PM
DATE START 12/31/2002

BEACON 121 OUTPUT POWER PASS
121 POWER PASS AT 19.20

BEACON 243 OUTPUT POWER PASS
243 POWER PASS AT 20.30

BEACON 406 OUTPUT POWER PASS
406 POWER PASS AT 36.20 ✓

BEACON SN 2007tempshock
TIME START 1:18:19 PM
DATE START 12/31/2002

BEACON 121 OUTPUT POWER PASS
121 POWER PASS AT 19.20

BEACON 243 OUTPUT POWER PASS
243 POWER PASS AT 20.30

BEACON 406 OUTPUT POWER PASS
406 POWER PASS AT 36.20 ✓

BEACON SN 2007tempshock
TIME START 1:32:47 PM
DATE START 12/31/2002

BEACON 121 OUTPUT POWER PASS
121 POWER PASS AT 19.20

BEACON 243 OUTPUT POWER PASS
243 POWER PASS AT 20.30

BEACON 406 OUTPUT POWER PASS
406 POWER PASS AT 36.10 ✓