MET Laboratories, Inc. *Safety Certification - EMI - Telecom Environmental Simulation*
33439 WESTERN AVENUE ! UNION CITY, CALIFORNIA 94587-3201 ! PHONE (510) 489-6300 ! FAX (510) 489-6372

March 27, 2007

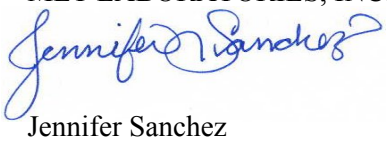
Firetide
16795 Lark Ave, Suite 200
Los Gatos, CA 95032

Dear Paul Richards,

Enclosed is the Dynamic Frequency Selection (DFS) test report for compliance testing of the Firetide, 6100 & 6200 as tested to the requirements of Title 47 of the CFR, Ch. 1 (10-1-03 ed.), Title 47 of the CFR, Part 15.407 sub part E for Intentional Radiators.

Thank you for using the services of MET Laboratories, Inc. If you have any questions regarding these results or if MET can be of further service to you, please feel free to contact me.

Sincerely yours,
MET LABORATORIES, INC.



Jennifer Sanchez
Documentation Department

Reference: (\Firetide\EMCS21543-FCCDFS)

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Dynamic Frequency Selection
Test Report

for the

Firetide
Model 6100 & 6200

Verified under
the FCC Certification Rules
contained in
Title 47 of the CFR, Part 15.407
for Intentional Radiators

MET Report: EMC21543-FCCDFS

March 27, 2007

Prepared For:

Firetide
16795 Lark Ave, Suite 200
Los Gatos, CA 95032

Prepared By:
MET Laboratories, Inc.
4855 Patrick Henry Dr., Building 6
Santa Clara, CA 95054

Dynamic Frequency Selection
Test Report

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Shawn McMillen, Project Engineer
Electromagnetic Compatibility Lab

Jennifer Sanchez
Documentation Department

Engineering Statement: The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of Part 15.407, of the FCC Rules under normal use and maintenance.

Tony Permsombut, Manager
Electromagnetic Compatibility Lab

Report Status Sheet

Revision	Report Date	Reason for Revision
∅	March 27, 2007	Initial Issue.

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List of Terms and Abbreviations

ACF	**A**ntenna **C**orrection **F**actor
Cal	**Cal**ibration
d	**M**easurement **D**istance
dB	**D**eci**b**els
dBµA	**D**eci**b**els above one **micro**amp
dBµV	**D**eci**b**els above one **micro**volt
dBµA/m	**D**eci**b**els above one **micro**amp **per m**eter
dBµV/m	**D**eci**b**els above one **micro**volt **per m**eter
E	**E**lectric Field
DSL	**D**igital **S**ubscriber **L**ine
EUT	**E**quipment **U**nder **T**est
f	**F**requency
FCC	**F**ederal **C**ommunications **C**ommission
Hz	**H**ert**z**
kHz	**k**ilo**h**ert**z**
kPa	**k**ilo**pa**scal
kV	**k**ilo**v**olt
MHz	**M**ega**h**ertz
µ	**microf**arad
µ**s**	**micros**econds
PRF	**P**ulse **R**epetition **F**requency
RF	**R**adio **F**requency
RMS	**R**oot-**M**ean-**S**quare
V/m	**V**olts **per m**eter

I. Executive Summary

A. Purpose of Test

An EMC evaluation was performed to determine compliance of the Firetide 6100 & 6200, with the Dynamic Frequency Selection (DFS) requirements of part §15.407 sub part E. All references are to the most current version of Title 47 of the Code of Federal Regulations in effect. In accordance with §2.1033, the following data is presented in support of the Certification of the 6100 & 6200. Firetide should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the 6100 & 6200, has been **permanently** discontinued.

B. Executive Summary

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, §15.407, in accordance with Firetide, purchase order number 1650.

Reference	Description	Results
15.407 (h)(1)	Transmit Power Control (TCP)	Compliant
15.407 (h)(2)	Radar Detection Function of Dynamic Frequency Selection (DFS)	Compliant
15.407 (h)(2)(ii)	Channel Availability Check Time	Compliant
15.407 (h)(2)(iii)	Channel Move Time and Channel Closing Time	Compliant
15.407 (h)(2)(iv)	Non-Occupancy Period	Compliant

Table 1 Executive Summary of EMC Part 15.407 DFS ComplianceTesting

II. Equipment Configuration

A. Overview

MET Laboratories, Inc. was contracted by Firetide to perform DFS testing on the 6100 & 6200, under Firetide's purchase order number 1650.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the Firetide 6100 & 6200.

The results obtained relate only to the item(s) tested.

Model(s) Tested:	6100 & 6200	
Model(s) Covered:	6100 & 6200	
EUT Specifications:	Primary Power: 100-240V	
	FCC ID: REP-6100-1 REP-6200-1	
	Type of Modulations:	-Orthogonal Frequency Division Multiplexing (OFDM)
	Equipment Code:	NII
	DFS EUT Frequency Ranges:	5250MHz – 5350MHz 5745MHz – 5825MHz
Analysis:	The results obtained relate only to the item(s) tested.	
Environmental Test Conditions:	Temperature: 15-35º C	
	Relative Humidity: 30-60%	
	Barometric Pressure: 860-1060 mbar	
Evaluated by:	Shawn McMillen	
Date(s):	March 27, 2007	

B. References

ET Docket FCC 60-96	Compliance Measurement Procedures for Unlicensed National Information Infrastructure Devices (UNII) Operating in the 5250-5350 MHz and 5470-5725 MHz Band Incorporating Dynamic Frequency Selection
CFR 47, Part 15, Subpart E	Unlicensed National Information Infrastructure Devices (UNII)
ANSI/NCSL Z540-1-1994	Calibration Laboratories and Measuring and Test Equipment - General Requirements
ANSI/ISO/IEC 17025:2000	General Requirements for the Competence of Testing and Calibration Laboratories

C. Test Site

All testing was performed at MET Laboratories, Inc., 4855 Patrick Henry Drive, Building 6, Santa Clara, California 95054. All equipment used in making physical determinations is accurate and bears recent traceability to the National Institute of Standards and Technology.

Radiated Emissions measurements were performed in a 10 meter semi-anechoic chamber (equivalent to an Open Area Test Site). In accordance with §2.948(a)(3), a complete site description is contained at MET Laboratories. In accordance with §2.948(d), MET Laboratories has been accredited by A2LA (Certificate Number 591.02).

D. Description of Master Device

1. The Firetide 6100 Indoor Unit operates in the following bands:
   a) 2400-2483.5 MHz
   b) 4945-4990 MHz
   c) 5150-5250 MHz
   d) 5250-5350 MHz
   e) 5470-5725 MHz
   f) 5725-5850 MHz

2. The Firetide 6200 Outdoor Unit operates in the following bands:
   a) 2400-2483.5 MHz
   b) 4945-4990 MHz
   c) 5250-5350 MHz
   d) 5470-5725 MHz
   e) 5725-5850 MHz

3. The maximum EIRP of the equipment in the 5GHz band is 39.9 dBm, and the minimum possible antenna gain is 16dBi.

4. Antennas used with Indoor and Outdoor units. For antenna gain patterns see additional FCC attachments for this filing.

Indoor Unit Antennas		
Model No. / Gain	**Frequency Band**	**Vendor**
C812-510010-A / 5dBi @ 50Ω	2.4	Wha Yu
C812-510012-A / 5dBi @ 50Ω	5.1-5.8	Wha Yu

Outdoor Unit Antennas		
Model No. / Gain	**Frequency Band**	**Vendor**
C812-510010-A / 5dBi @50Ω	2.4	Wha Yu
MA-WA24-1X / 16dBi @50Ω	2.4	Mars
MFB24008 / 8dBi @50Ω	2.4	Maxrad
MA-WO24-8X / 7.5dBi @50Ω	2.4	Mars
SF-245W / 7.5dBi @50Ω	2.4	NCG Comet
MA-WD24-6XB / 15.5dBi @50Ω	2.4	Mars
MMO24580608 / 6dBi & 8dBi @50Ω	2.4/5.1-5.8 (Dual Band)	Maxrad
MMO58010NF / 10dBi @50Ω	5.1-5.8	Maxrad
MA-WO55-10 / 10dBi @50Ω	5.1-5.8	Mars
C812-510012-A / 5dBi @50Ω	5.1-5.8	Wha Yu
MA-WD50-6X / 16dBi @50Ω	5.1-5.8	Mars

5. RF output power for Indoor and Outdoor units

Maximum RF Output Power		
Carrier Channel	**Frequency (MHz)**	**Measured Peak Output Power dBm**
52	5260	23.9
64	5320	23.4
100	5500	23.9
120	5600	23.2
110	5700	23.7
Minimum RF Output Power		
Carrier Channel	**Frequency (MHz)**	**Measured Peak Output Power dBm**
52	5260	5.2
64	5320	5.8
100	5500	6.7
120	5600	7.0
110	5700	7.3

6. The Master device has the TPC capability such that it can operate at least 6 dB lower than the 30 dBm EIRP limit. This capability was demonstrated with measurements showing reduced power levels.

7. System testing was performed with the designated MPEG test file that streams full motion video at 30 frames per second from the Master to the Client IP based system.

8. The Master requires 125 seconds to complete its power-on cycle.

9. The Master device provides, on aggregate, uniform loading of the 5250-5350 MHz and 5470-5725 MHz spectrum by selecting an operating channel among the available channels using a random algorithm.

The Firetide 6100 Indoor & 6200 Outdoor Unit is a Wireless Mesh Node.

Photograph 1. Firetide Model 6100

Photograph 2. Firetide Model 6200

III. DFS Radar Waveform Description and Calibration

DFS Requirements

DFS Detection Thresholds

Interference Threshold values, Master or Client incorporating In-Service Monitoring

Maximum Transmit Power	Value
≥ 200 milliwatt	-64 dBm
< 200 milliwatt	-62 dBm

Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna
Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.

DFS Response requirement values

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2
U-NII Detection Bandwidth	Minimum 80% of the 99% power bandwidth. See Note 3.

Note 1: The instant that the *Channel Move Time* and the *Channel Closing Transmission Time* begins is as follows:

- For the Short pulse radar Test Signals this instant is the end of the *Burst*.
- For the Frequency Hopping radar Test Signal, this instant is the end of the last radar *Burst* generated.
- For the Long Pulse radar Test Signal this instant is the end of the 12 second period defining the radar transmission.

Note 2: The *Channel Closing Transmission Time* is comprised of 200 milliseconds starting at the beginning of the *Channel Move Time* plus any additional intermittent control signals required facilitating *Channel* changes (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.
Note 3: During the *U-NII Detection Bandwidth* detection test, radar type 1 is used and for each frequency step the minimum percentage of detection is 90%. Measurements are performed with no data traffic.

Required Radar Test Waveforms

This section provides the parameters for required test waveforms, minimum percentage of successful detections, and the minimum number of trials that must be used for determining DFS conformance. Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test waveforms.

Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (µsec)	PRI (µsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Trials
1	1	1428	18	60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120

A minimum of 30 unique waveforms are required for each of the short pulse radar types 2 through 4. For short pulse radar type 1, the same waveform is used a minimum of 30 times. If more than 30 waveforms are used for short pulse radar types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms. The aggregate is the average of the percentage of successful detections of short pulse radar types 1-4.

Long Pulse Radar Test Waveform

Radar Type	Pulse Width (µsec)	Chirp Width (MHz)	PRI (µsec)	Number of Pulses per Bursts	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

The parameters for this waveform are randomly chosen. Thirty unique waveforms are required for the Long Pulse radar test signal. If more than 30 waveforms are used for the Long Pulse radar test signal, then each additional waveform must also be unique and not repeated from the previous waveforms.

Each waveform is defined as follows:

1) The transmission period for the Long Pulse Radar test signal is 12 seconds.
2) There are a total of 8 to 20 Bursts in the 12 second period, with the number of Bursts being randomly chosen. This number is Burst_Count.
3) Each Burst consists of 1 to 3 pulses, with the number of pulses being randomly chosen. Each Burst within the 12 second sequence may have a different number of pulses.
4) The pulse width is between 50 and 100 microseconds, with the pulse width being randomly chosen. Each pulse within a Burst will have the same pulse width. Pulses in different Bursts may have different pulse widths.
5) Each pulse has a linear FM chirp between 5 and 20 MHz, with the chirp width being randomly chosen. Each pulse within a Burst will have the same chirp width. Pulses in different Bursts may have different chirp widths. The chirp is centered on the pulse. For example, with radar frequency of 5300 MHz and a 20 MHz chirped signal, the chirp starts at 5290 MHz and ends at 5310 MHz.
6) If more than one pulse is present in a Burst, the time between the pulses will be between 1000 and 2000 microseconds, with the time being randomly chosen. If three pulses are present in a Burst, the time between the first and second pulses is chosen independently of the time between the second and third pulses.
7) The 12 second transmission period is divided into even intervals. The number of intervals is equal to Burst_Count. Each interval is of length (12,000,000 / Burst_Count) microseconds. Each interval contains one Burst. The start time for the Burst, relative to the beginning of the interval, is between 1 and [(12,000,000 / Burst_Count) – (Total Burst Length) + (One Random PRI Interval)] microseconds, with the start time being randomly chosen. The step interval for the start time is 1 microsecond. The start time for each Burst is chosen independently.

A representative example of a Long Pulse radar test waveform:

1) The total test signal length is 12 seconds.
2) 8 Bursts are randomly generated for the Burst_Count.
3) Burst 1 has 2 randomly generated pulses.
4) The pulse width (for both pulses) is randomly selected to be 75 microseconds.
5) The PRI is randomly selected to be at 1213 microseconds.
6) Bursts 2 through 8 are generated using steps 3 – 5.
7) Each Burst is contained in even intervals of 1,500,000 microseconds. The starting location for Pulse 1, Burst 1 is randomly generated (1 to 1,500,000 minus the total Burst 1 length + 1 random PRI interval) at the 325,001 microsecond step. Bursts 2 through 8 randomly fall in successive 1,500,000 microsecond intervals (i.e. Burst 2 falls in the 1,500,001 – 3,000,000 microsecond range).

Graphical Representation of a Long Pulse radar Test Waveform

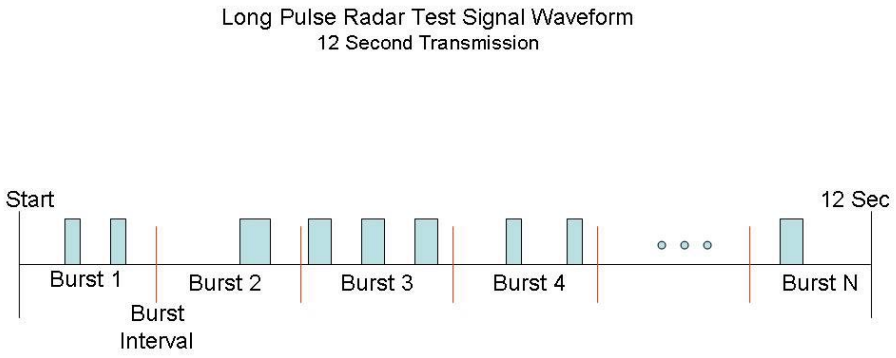


Figure 1. Long Pulse Radar Test Signal Waveform

Frequency Hopping Radar Test Waveform

Radar Type	Pulse Width (µsec)	PRI (µsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Trials
6	1	333	9	.333	300	70%	30

For the Frequency Hopping Radar Type, the same *Burst* parameters are used for each waveform. The hopping sequence is different for each waveform and a 100-length segment is selected1 from the hopping sequence defined by the following algorithm:

The first frequency in a hopping sequence is selected randomly from the group of 475 integer frequencies from 5250 – 5724 MHz. Next, the frequency that was just chosen is removed from the group and a frequency is randomly selected from the remaining 474 frequencies in the group. This process continues until all 475 frequencies are chosen for the set. For selection of a random frequency, the frequencies remaining within the group are always treated as equally likely.

Radar Waveform Calibration

The following equipment setup was used to calibrate the conducted Radar Waveform. A spectrum analyzer was used to establish the test signal level for each radar type. During this process there were no transmissions by either the Master or Client Device. The spectrum analyzer was switched to the zero span (Time Domain) mode at the frequency of the Radar Waveform generator. Peak detection was utilized. The spectrum analyzer's resolution bandwidth (RBW) was set to 1MHz and the video bandwidth (VBW) was set to 3 MHz. See Figure 2.

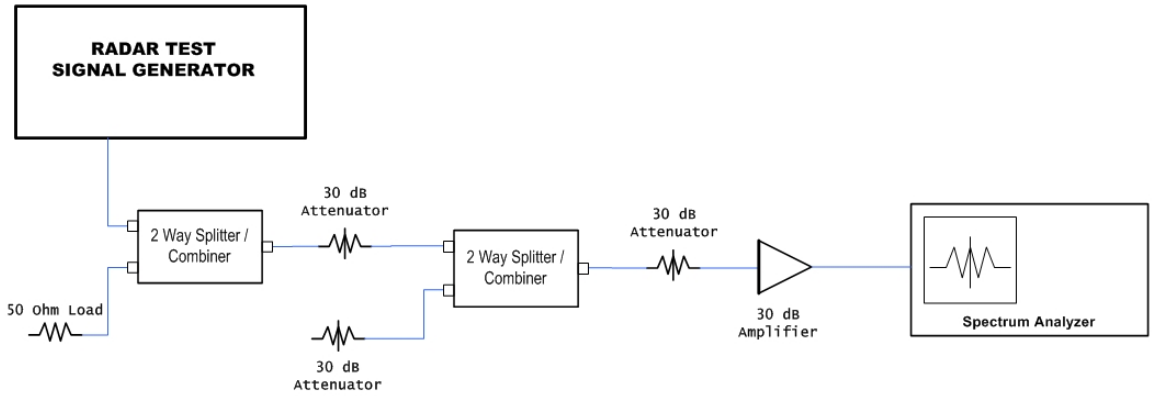
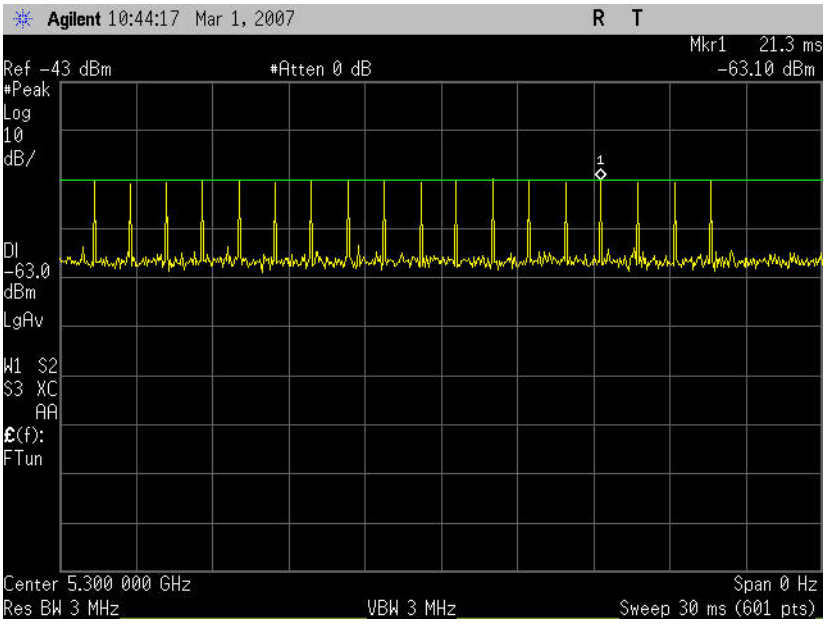
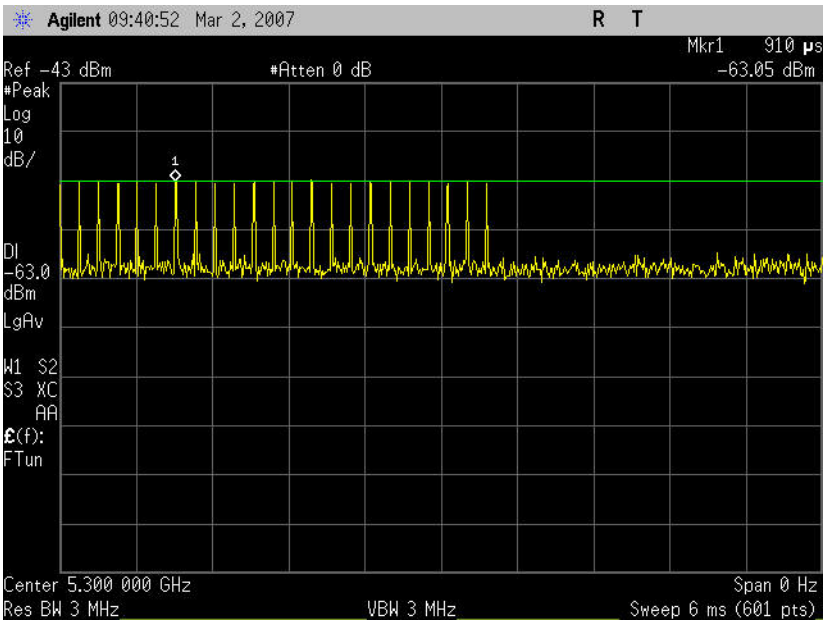


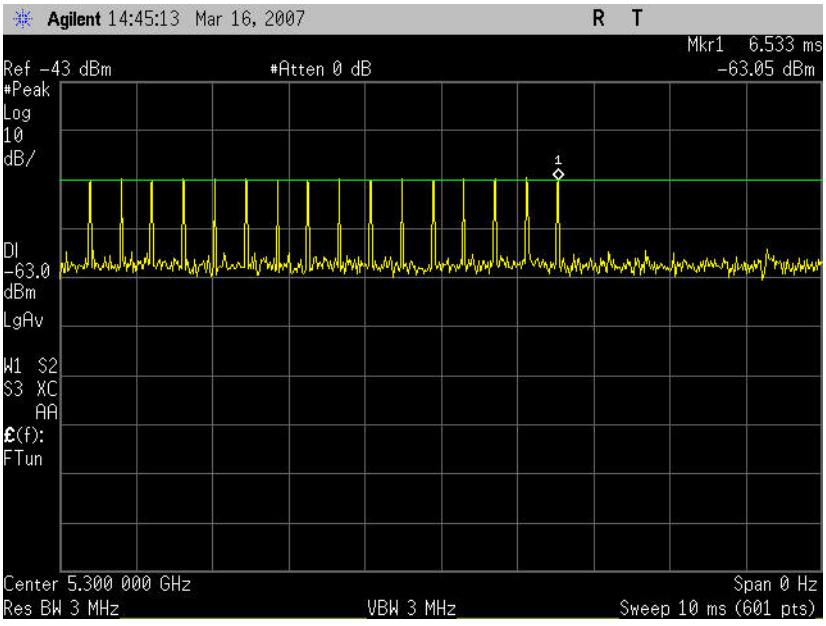
Figure 2. Radar Waveform Calibration Setup



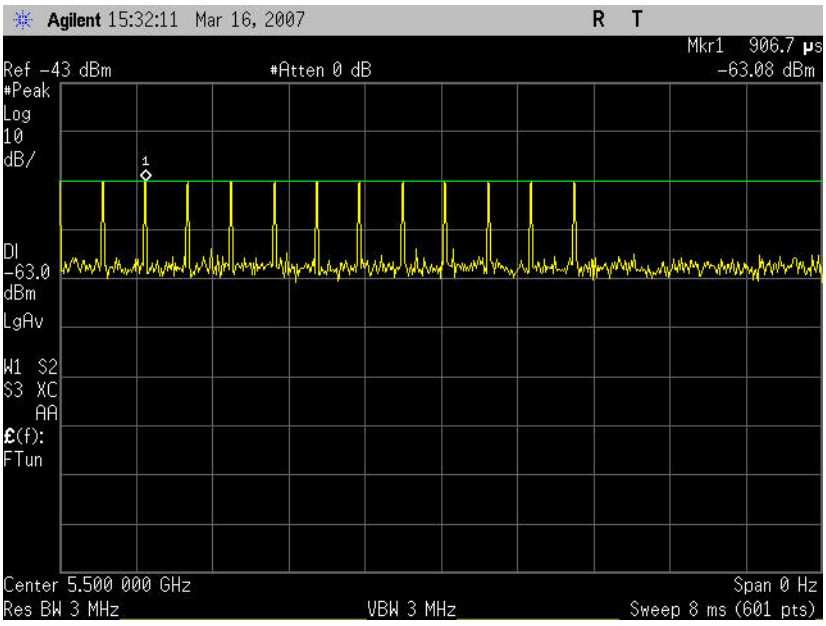
Plot 1. Bin 1 Calibration



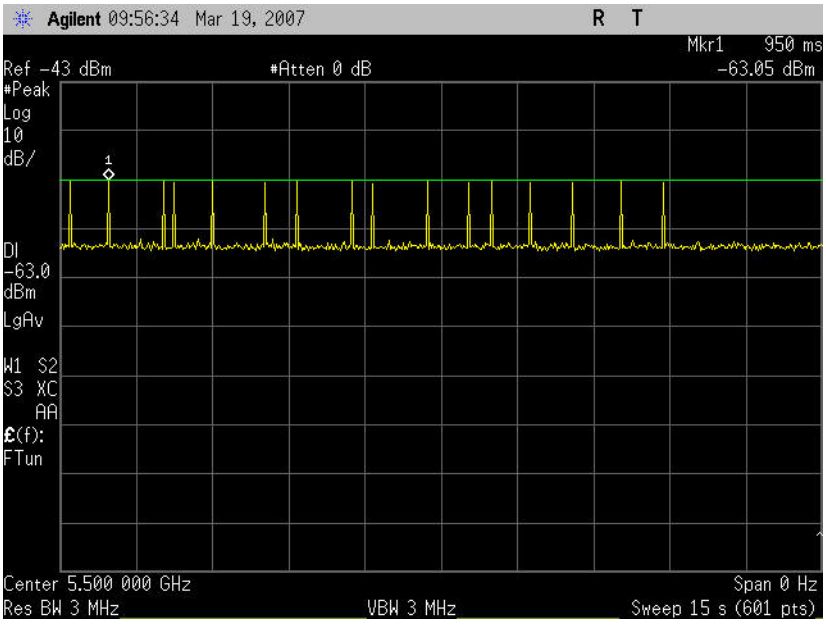
Plot 2. B in 2 Calibration



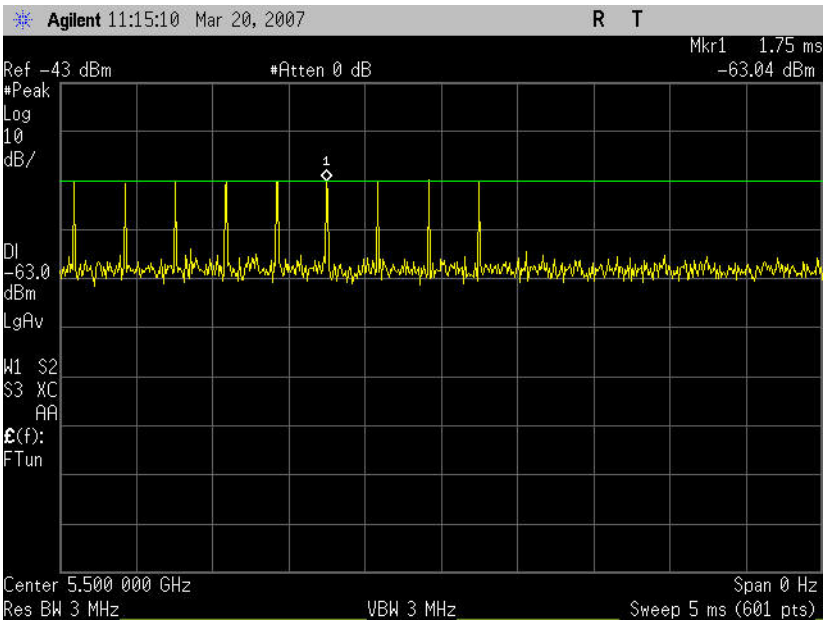
Plot 3. Bin 3 Calibration



Plot 4. Bin 4 Calibration



Plot 5. Bin 5 Calibration



Plot 6. Bin 6 Calibration

Test Setup for EUT

1. A spectrum analyzer is used as a monitor to verify that the UUT has vacated the Channel within the (Channel Closing Transmission Time and Channel Move Time, and does not transmit on a Channel during the Non-Occupancy Period after the detection and Channel move. It is also used to monitor UUT transmissions during the Channel Availability Check Time.
2. Figure 3 shows the test setup used to generate the Radar Waveforms.

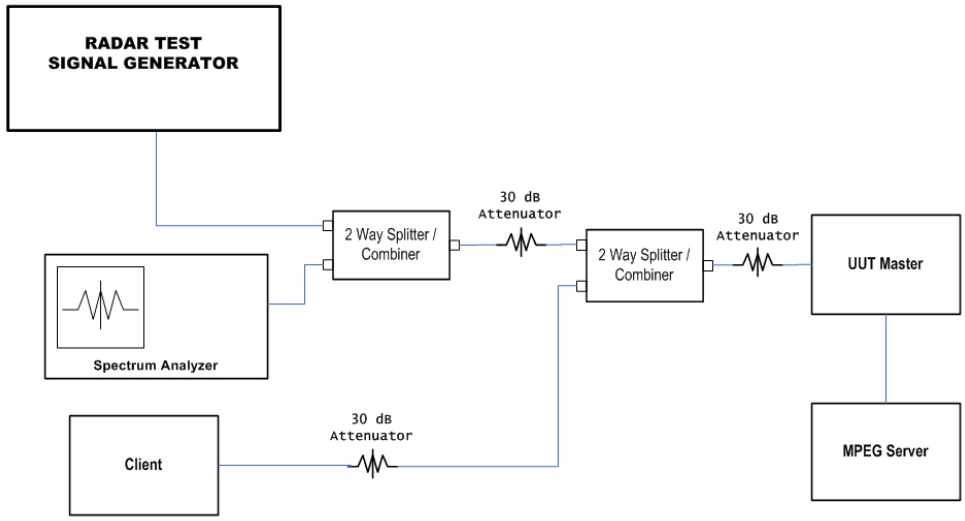
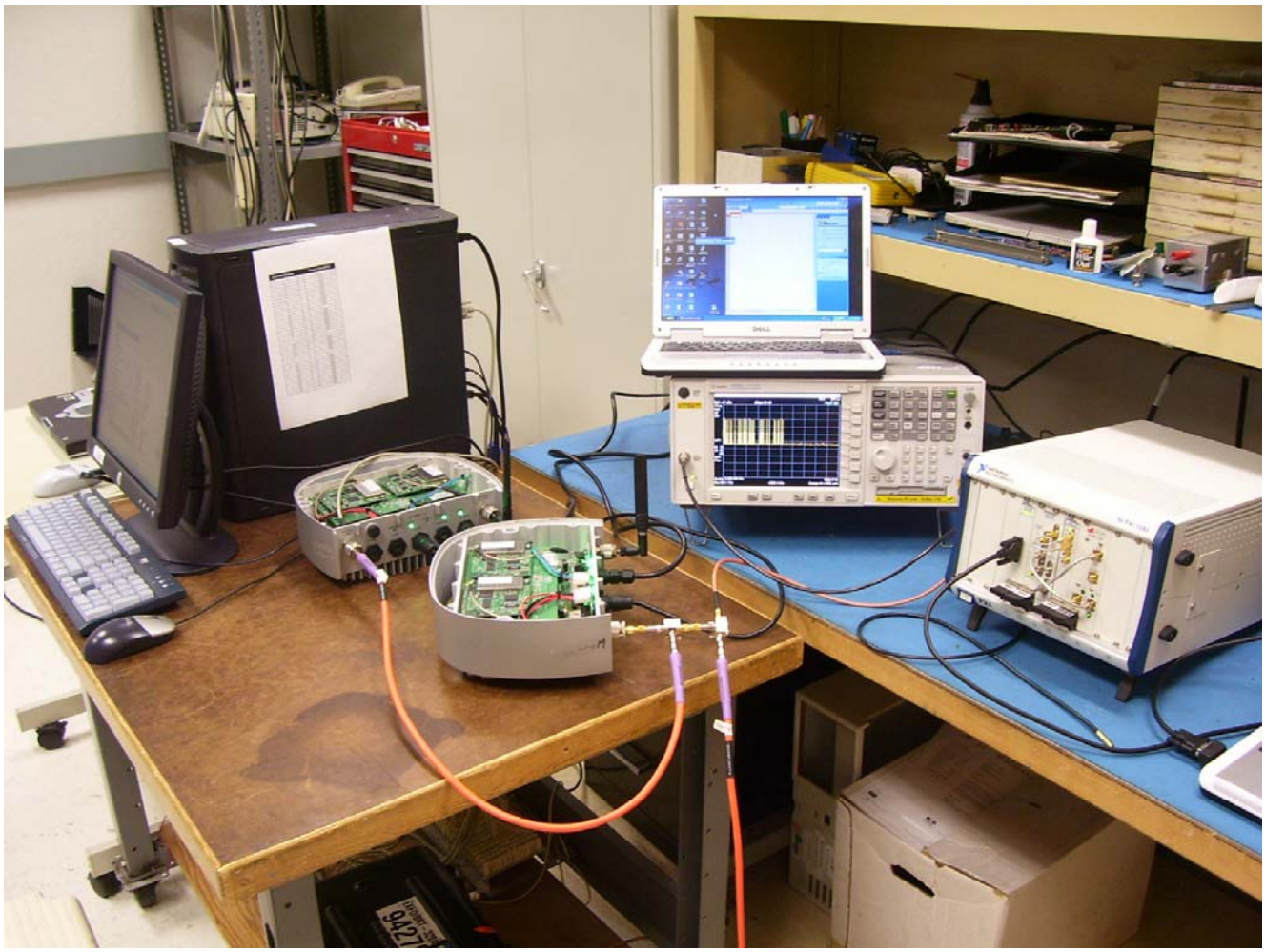


Figure 3. Test Setup for Master Device

Photograph 3. Radar Test Signal Generator



Photograph 4. EUT Test Setup Photograph

IV. DFS Procedures and Test Results

UNII Detection Bandwidth

Test Requirement(s): **§ 15.407** A minimum 80% detection rate is required across a EUT's 99% bandwidth.

Test Procedure: All UNII channels for this device have identical Channel bandwidths. Therefore, all DFS testing was done at 5300 MHz.

A single *Burst* of the short pulse radar type 1 is produced at 5300 MHz at a -63dBm level. The UUT is set up as a standalone device (no associated Client and no traffic).

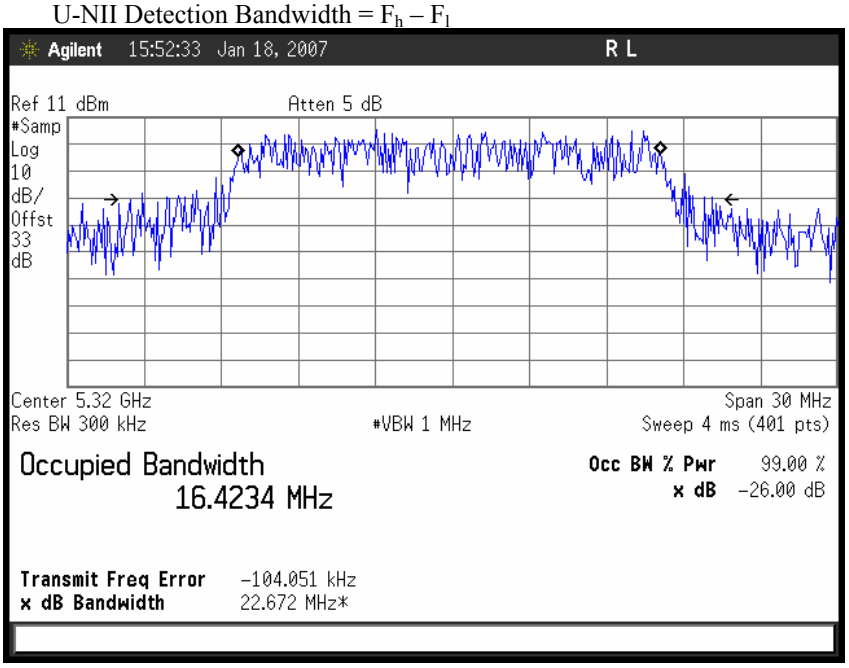
A single radar Burst is generated for a minimum of 10 trials, and the response of the UUT is noted. The UUT must detect the Radar Waveform 90% or more of the time.

The radar frequency is increased in 1 MHz steps, repeating the above test sequence, until the detection rate falls below 90%. The highest frequency at which detection is greater than or equal to 90% is denoted as F_h.

The radar frequency is decreased in 1 MHz steps, repeating the above test sequence, until the detection rate falls below 90%. The lowest frequency at which detection is greater than or equal to 90% is denoted as F_l.

The U-NII Detection Bandwidth is calculated as follows:

U-NII Detection Bandwidth = $F_h - F_l$



Test Results: The EUT is compliant with this test requirement.

EUT Frequency- 5300MHz											
	DFS Detection Trials (1=Detection, 0= No Detection)										
Radar Frequency (MHz)	1	2	3	4	5	6	7	8	9	10	Detection Rate (%)
5291	0	1	0	0	1	0	0	0	0	1	30
5292 (F_L)	1	1	1	1	1	1	1	1	1	1	100
5293	1	1	1	1	1	1	1	1	1	1	100
5294	1	1	1	1	1	1	1	1	1	1	100
5295	1	1	1	1	1	1	1	1	1	1	100
5296	1	1	1	1	1	1	1	1	1	1	100
5297	1	1	1	1	1	1	1	1	1	1	100
5298	1	1	1	1	1	1	1	1	1	1	100
5299	1	1	1	1	1	1	1	1	1	1	100
5300	1	1	0	1	1	1	1	1	1	1	90
5301	1	0	1	1	1	1	1	1	1	1	90
5302	1	1	1	1	1	1	1	1	1	1	100
5303	1	1	1	1	1	1	1	1	1	1	100
5304	1	1	1	1	1	1	1	1	1	1	100
5305	1	1	1	1	1	1	1	1	1	1	100
5306	1	1	1	1	1	1	1	1	1	1	100
5307	1	1	1	1	1	1	1	1	1	1	100
5308 (F_H)	1	1	1	1	1	1	1	1	1	1	100
5309	0	1	0	0	1	0	0	0	0	0	20
Detection Bandwidth = F_H - F_L = 5308 MHz – 5292 MHz = 16 MHz											
EUT 99% Bandwidth = 16.4 MHz											
16.4 MHz * 80% = 13.1 MHz											

Table 2. UNII Detection Bandwidth Test Results

Test Engineer: Shawn McMillen

Test Date: March 20, 2007

Initial Channel Availability Check Time

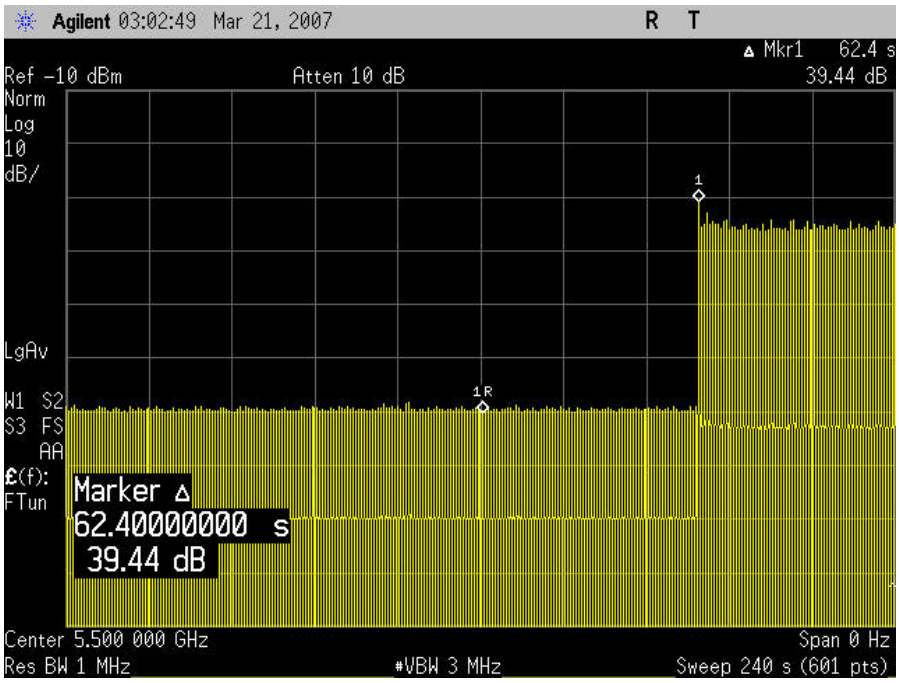
Test Requirements: **§ 15.407** The Initial Channel Availability Check Time tests that the UUT does not emit beacon, control, or data signals on the test Channel until the power-up sequence has been completed and the U-NII device checks for Radar Waveforms for one minute on the test Channel. This test does not use any of the Radar Waveforms and only needs to be performed one time.

The UUT should not transmit any beacon or data transmissions until at least 1 minute after the completion of the power-on cycle.

The initial power up time of the UUT is indicated by marker 1 in the plot. Initial beacons/data transmissions are indicated by marker 1R.

Test Procedure: The U-NII device is powered on and instructed to operate at 5300 MHz. At the same time the UUT is powered on, the spectrum analyzer is set to 5300MHz with a zero span and a 2.5 minute sweep time. The analyzer is triggered at the same time power is applied to the U-NII device.

Test Results The Equipment complies with § 15.407 Initial Channel Availability Check Time.



Plot 7. Initial Channel Availability Check Time

Test Engineer: Shawn McMillen

Test Date: March 20, 2007

Radar Burst at the Beginning of the Channel Availability Check Time

Test Requirements: **§ 15.407** A Radar Burst at the Beginning of the Channel Availability Check Time tests that the UUT does not emit beacon, control, or data signals on the test Channel if it has detected a radar burst during that time period until the power-up sequence has been completed and the U-NII device checks for Radar Waveforms for one minute on the test Channel. The steps below define the procedure to verify successful radar detection on the selected Channel during a period equal to the Channel Availability Check Time and avoidance of operation on that Channel when a radar Burst with a level equal to the DFS Detection Threshold + 1 dB (-63dBm) occurs at the beginning of the Channel Availability Check Time.

Test Procedure: The UUT is powered on at T0. T1 denotes the instant when the UUT has completed its power-up sequence. The Channel Availability Check Time commences at instant T1 and will end no sooner than T1 + 60 seconds.

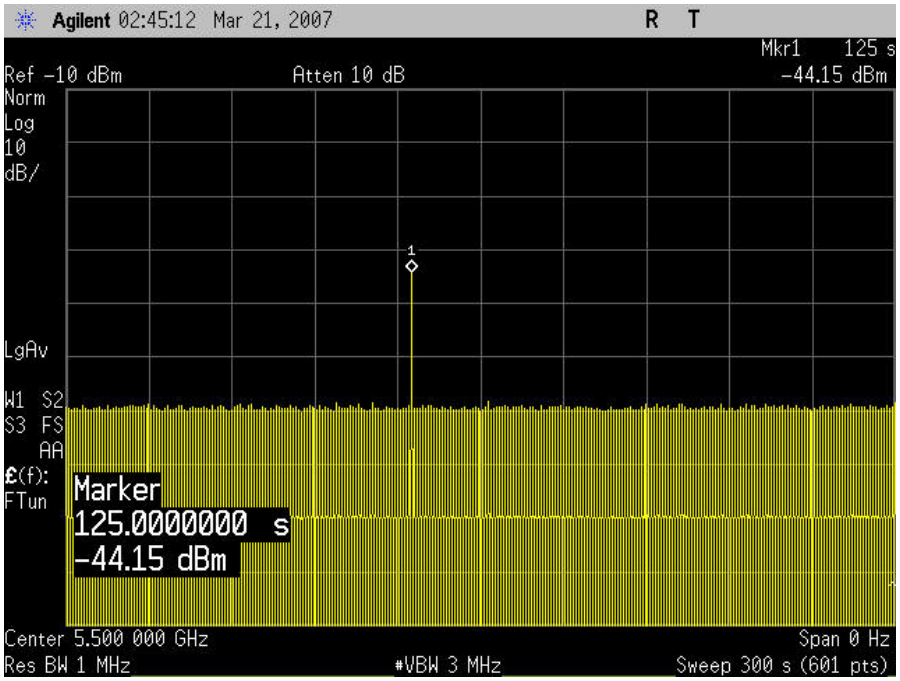
A single Burst of short pulse of radar type 1 at -63 dBm will commence within a 6 second window
starting at T1.

Visual indication on the UUT of successful detection of the radar Burst will be recorded and reported. Observation of emissions at 5300MHz will continue for 2.5 minutes after the radar Burst has been generated.

Verify that during the 2.5 minute measurement window no UUT transmissions occurred at 5300MHz.

Test Results

The equipment complies with § 15.407 Radar Burst at the Beginning of the Channel Availability Check Time.



Plot 8. Beginning of Channel Availability Radar Burst

Test Engineer: Shawn McMillen

Test Date: March 20, 2007

Radar Burst at the End of the Channel Availability Check Time

Test Requirements: **§ 15.407** A Radar Burst at the End of the Channel Availability Check Time tests that the UUT does not emit beacon, control, or data signals on the test Channel if it has detected a radar burst during that time period until the power-up sequence has been completed and the U-NII device checks for Radar Waveforms for one minute on the test Channel. The steps below define the procedure to verify successful radar detection on the selected Channel during a period equal to the Channel Availability Check Time and avoidance of operation on that Channel when a radar Burst with a level equal to the DFS Detection Threshold + 1 dB (-63dBm) occurs at the end of the Channel Availability Check Time.

Test Procedure: The steps below define the procedure to verify successful radar detection on the selected Channel during a period equal to the Channel Availability Check Time and avoidance of operation on that Channel when a radar Burst with a level equal to the DFS Detection Threshold + 1 dB (-63dBm) occurs at the end of the Channel Availability Check Time.

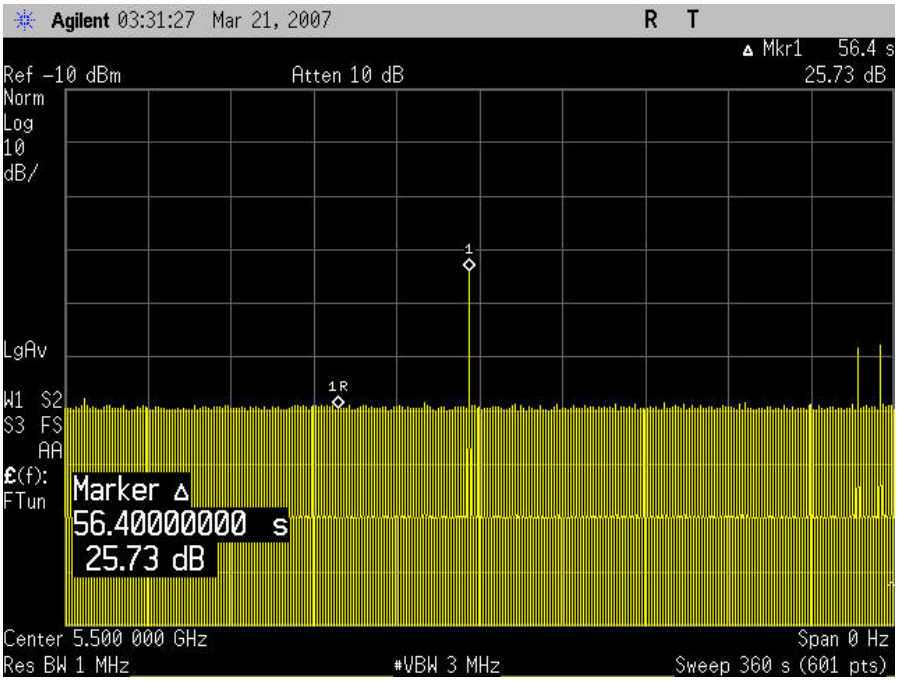
The UUT is powered on at T0. T1 denotes the instant when the UUT has completed its power-up sequence. The Channel Availability Check Time commences at instant T1 and will end no sooner than T1 + 60 seconds.

A single Burst of short pulse of radar type 1 at -63 dBm will commence within a 6 second window starting at T1+ 54 seconds.

Visual indication on the UUT of successful detection of the radar Burst will be recorded and reported. Observation of emissions at 5300MHz will continue for 2.5 minutes after the radar Burst has been generated.

Verify that during the 2.5 minute measurement window no UUT transmissions occurred at 5300MHz.

Test Results The equipment complies with § 15.407 Radar Burst at the End of the Channel Availability Check Time.



Plot 9. Radar burst at end of CACT

Test Engineer: Shawn McMillen

Test Date: March 20, 2007

In-Service Monitoring for Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period

Test Requirements: **§ 15.407**

Test Procedure: These tests define how the following DFS parameters are verified during In-Service Monitoring; Channel Closing Transmission Time, Channel Move Time, and Non-Occupancy Period.

The steps below define the procedure to determine the above mentioned parameters when a radar Burst with a level equal to the DFS Detection Threshold + 1dB (-63dBm) is generated on the Operating Channel of the U-NII device.

A U-NII device operating as a Client Device will associate with the UUT (Master) at 5300 MHz. Stream the MPEG test file from the Master Device to the Client Device on the selected Channel for the entire period of the test.

At time T0 the Radar Waveform generator sends a Burst of pulses for each of the radar types at -63dBm.

Observe the transmissions of the UUT at the end of the radar Burst on the Operating Channel for duration greater than 10 seconds. Measure and record the transmissions from the UUT during the observation time (Channel Move Time). Compare the Channel Move Time and Channel Closing Transmission Time results to the limits defined in the *DFS Response requirement values table*.

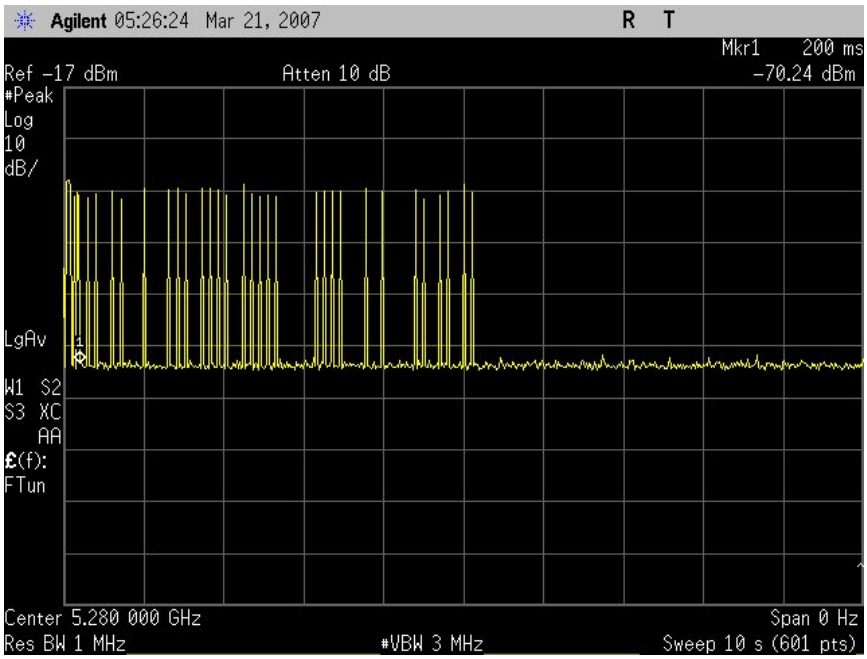
Test Results: The equipment complies with § 15.407 In-Service Monitoring for Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period.

For the Channel closing transmission time, there were a total of 23 control signals with a width of 180µs/pulse. Therefore, the total aggregate after 200ms = 4.14ms

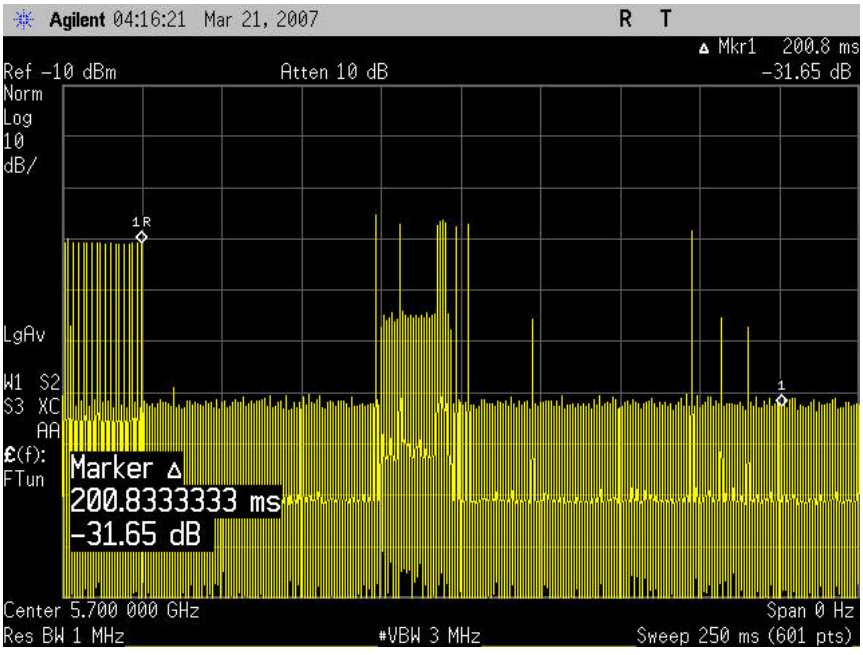
The EUT was confirmed to have vacated the channel for 30 minutes after detection of radar.

Test Engineer: Shawn McMillen

Test Date: March 20, 2007

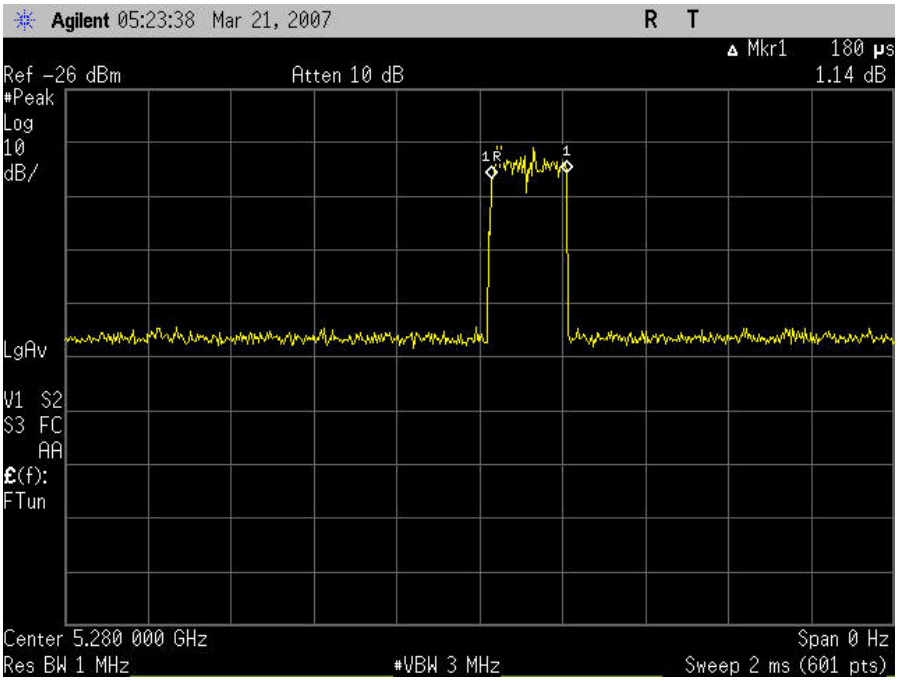


Plot 10. Channel Closing 10 sec Window

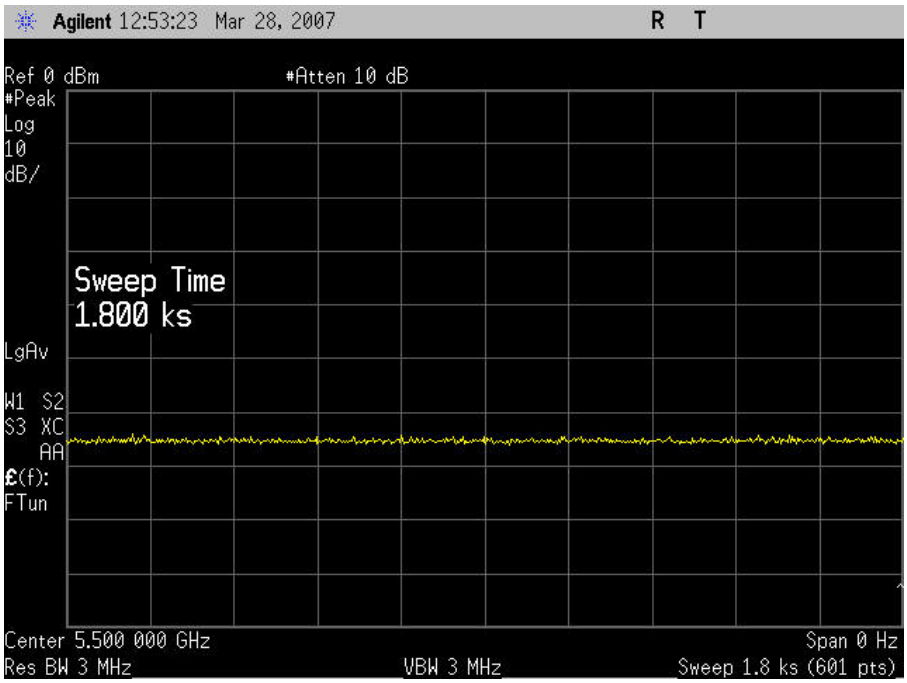


Plot 11. Channel Closing 250msec Window

***Note: This channel closing time was taken at an earlier time on a different channel then 5280MHz above, however all channels respond in the same manner.**



Plot 12. Width of Channel Closing Control Signals After 200msec



Plot 13. Non-Occupancy period/30 minutes

Statistical Performance Check

Test Requirements: **§ 15.407** During In-Service Monitoring, the EUT requires a minimum percentage of successful radar detections from all required radar waveforms at a level equal to the DFS Detection Threshold + 1dB.

Test Procedure: Stream the MPEG test file from the Master Device to the Client Device on the selected Channel for the entire period of the test. The Radar Waveform generator sends the individual waveform for each of the radar types 1-6 at -63dbm. Statistical data is gathered to determine the ability of the device to detect the radar test waveforms. The device can utilize a test mode to demonstrate when detection occurs to prevent the need to reset the device between trial runs. The percentage of successful detection is calculated by:

$$\frac{TotalWaveformDetections}{TotalWaveformTrials} \times 100$$

The Minimum number of trails, minimum percentage of successful detection and the average minimum percentage of successful detection are found in the Radar Test Waveforms section.

Test Results: The equipment complies with § 15.407 Statistical Performance Check.

Test Engineer: Shawn McMillen

Test Date: March 20, 2007

Statistical Performance Check Test Results

Radar Type	Trial #	Pulses per Burst	Pulse Width (usec)	PRI (usec)	Detection 1 = Yes, 0 = No
1	1	18	1	1428	1
	2	18	1	1428	1
	3	18	1	1428	1
	4	18	1	1428	1
	5	18	1	1428	1
	6	18	1	1428	1
	7	18	1	1428	1
	8	18	1	1428	1
	9	18	1	1428	1
	10	18	1	1428	1
	11	18	1	1428	0
	12	18	1	1428	1
	13	18	1	1428	1
	14	18	1	1428	1
	15	18	1	1428	1
	16	18	1	1428	1
	17	18	1	1428	1
	18	18	1	1428	1
	19	18	1	1428	1
	20	18	1	1428	1
	21	18	1	1428	1
	22	18	1	1428	1
	23	18	1	1428	1
	24	18	1	1428	1
	25	18	1	1428	1
	26	18	1	1428	1
	27	18	1	1428	1
	28	18	1	1428	1
	29	18	1	1428	1
	30	18	1	1428	1
	Detection Percentage				96.7% (> 60%)

Table 3. Radar 1 Test Results

Statistical Performance Check Test Results

Radar Type	Trial #	Pulses per Burst	Pulse Width	PRI	Detection
		23 to 29	1 to 5 us	150 to 230 us	1 = Yes, 0 = No
2	1	24	4.3	230	0
	2	26	3.9	190	1
	3	23	3.3	153	1
	4	27	4.2	219	1
	5	27	5.0	151	1
	6	29	3.8	162	1
	7	24	3.5	151	1
	8	24	2.3	197	1
	9	26	2.4	184	1
	10	26	4.5	185	1
	11	29	3.2	209	1
	12	25	5.0	206	1
	13	26	2.0	223	1
	14	27	3.8	173	1
	15	23	5.0	177	1
	16	28	2.8	216	0
	17	23	1.2	222	1
	18	25	3.2	157	0
	19	25	1.0	194	1
	20	23	4.1	180	1
	21	27	1.9	224	0
	22	23	1.2	211	1
	23	28	1.4	228	1
	24	23	3.4	151	1
	25	27	3.2	211	0
	26	27	3.5	151	1
	27	24	4.8	172	0
	28	27	4.6	154	1
	29	27	2.3	176	1
	30	24	3.0	171	1
	Detection Percentage				80% (> 60%)

Table 4. Radar 2 Test Results

Statistical Performance Check Test Results

Radar Type	Trial #	Pulses per Burst	Pulse Width	PRI	Detection
		16 to 18	6 to 10 us	200 to 500 us	1 = Yes, 0 = No
3	1	16	8.1	380	1
	2	16	8.3	328	1
	3	18	9.5	327	1
	4	17	9.4	409	1
	5	16	9.1	500	1
	6	18	6.0	443	1
	7	16	9.3	243	1
	8	16	7.3	334	1
	9	16	9.5	478	1
	10	17	8.0	212	1
	11	17	7.1	441	1
	12	17	9.8	232	1
	13	18	6.1	406	1
	14	17	9.2	236	1
	15	16	7.1	430	1
	16	18	9.5	404	1
	17	17	9.1	318	1
	18	17	6.0	464	1
	19	16	9.4	421	1
	20	17	8.5	268	1
	21	18	9.1	303	1
	22	18	9.1	391	1
	23	18	9.1	384	1
	24	18	7.4	296	1
	25	18	9.2	291	1
	26	17	7.3	332	1
	27	18	8.2	205	1
	28	16	7.4	385	1
	29	17	6.6	319	1
	30	17	9.3	212	1
	Detection Percentage				100% (> 60%)

Table 5. Radar 3 Test Results

Statistical Performance Check Test Results

Radar Type	Trial #	Pulses per Burst	Pulse Width	PRI	Detection
		12 to 16	11 to 20 us	200 to 500 us	1 = Yes, 0 = No
4	1	12	17.3	345	1
	2	14	13.3	214	1
	3	13	16.6	370	1
	4	12	17.6	468	1
	5	15	18.2	351	1
	6	15	15.8	204	1
	7	15	13.6	265	1
	8	12	17.5	280	1
	9	16	17.6	498	1
	10	16	17.7	350	1
	11	15	17.7	252	1
	12	15	19.4	382	1
	13	16	18.2	273	1
	14	16	12.1	422	1
	15	14	13.6	252	1
	16	15	17.9	298	1
	17	15	11.1	428	1
	18	12	15.0	461	1
	19	14	16.5	292	1
	20	12	17.0	227	1
	21	16	12.1	330	1
	22	12	16.0	419	1
	23	13	19.8	448	1
	24	13	12.9	450	1
	25	12	17.6	402	1
	26	13	18.1	398	1
	27	13	14.7	377	1
	28	16	13.5	366	1
	29	16	11.1	478	1
	30	13	13.5	421	0
	Detection Percentage				96.7% (> 60%)

Table 6. Radar 4 Test Results

Statistical Performance Check Test Results

Radar Type	Trial #	Filename*	Detection
			1 = Yes, 0 = No
5	1	bin5set315-trial1	1
	2	bin5set315-trial2	1
	3	bin5set315-trial3	1
	4	bin5set315-trial4	1
	5	bin5set315-trial5	0
	6	bin5set315-trial6	1
	7	bin5set315-trial7	1
	8	bin5set315-trial8	1
	9	bin5set315-trial9	1
	10	bin5set315-trial10	1
	11	bin5set315-trial11	1
	12	bin5set315-trial12	1
	13	bin5set315-trial13	1
	14	bin5set315-trial14	1
	15	bin5set315-trial15	1
	16	bin5set315-trial16	1
	17	bin5set315-trial17	1
	18	bin5set315-trial18	1
	19	bin5set315-trial19	1
	20	bin5set315-trial20	1
	21	bin5set315-trial21	1
	22	bin5set315-trial22	1
	23	bin5set315-trial23	1
	24	bin5set315-trial24	1
	25	bin5set315-trial25	1
	26	bin5set315-trial26	0
	27	bin5set315-trial27	1
	28	bin5set315-trial28	1
	29	bin5set315-trial29	1
	30	bin5set315-trial30	1
	Detection Percentage		**93.3% (> 60%)**

Table 7. Radar 5 Test Results

***See Bin5 Radar Characteristics Appendix A**

Statistical Performance Check Test Results

Radar Type	Trial #	Frequency (MHz)	Pulses/Hop	Pulse Width (usec)	PRI (usec)	Detection 1 = Yes, 0 = No
6	1	5493	9	1	333	1
	2	5494	9	1	333	1
	3	5495	9	1	333	1
	4	5496	9	1	333	1
	5	5497	9	1	333	1
	6	5498	9	1	333	1
	7	5499	9	1	333	1
	8	5500	9	1	333	1
	9	5501	9	1	333	1
	10	5502	9	1	333	1
	11	5503	9	1	333	1
	12	5504	9	1	333	1
	13	5505	9	1	333	1
	14	5506	9	1	333	1
	15	5507	9	1	333	1
	16	5493	9	1	333	1
	17	5494	9	1	333	1
	18	5495	9	1	333	1
	19	5496	9	1	333	1
	20	5497	9	1	333	1
	21	5498	9	1	333	1
	22	5499	9	1	333	1
	23	5500	9	1	333	1
	24	5501	9	1	333	1
	25	5502	9	1	333	1
	26	5503	9	1	333	1
	27	5504	9	1	333	1
	28	5505	9	1	333	1
	29	5506	9	1	333	1
	30	5507	9	1	333	1
	Detection Percentage					**100% (> 60%)**

Table 8. Radar 6 Test Results

V. Appendix A

Radar Type 5
Trial Number: 1
Number of Bursts in Trial: 14

Burst	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	1	54	5	--	--	156,965
2	2	91	5	1625	--	466,431
3	1	80	6	--	--	188,535
4	3	88	10	1422	1240	11,211
5	2	53	14	1234	--	611,499
6	2	55	8	1395	--	102,266
7	3	59	14	1044	1972	850,819
8	3	95	10	1819	1741	663,512
9	1	70	14	--	--	581,161
10	2	94	14	1413	--	12,963
11	3	50	8	1366	1247	612,185
12	1	73	18	--	--	38,112
13	1	78	10	--	--	13,221
14	3	81	20	1338	1988	258,400

Radar Type 5
Trial Number: 2
Number of Bursts in Trial: 15

Burst	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	3	100	19	1629	1942	446,995
2	3	60	15	1262	1317	767,241
3	2	62	17	1449	--	769,601
4	1	57	10	--	--	460,759
5	1	51	16	--	--	544,169
6	2	85	16	1901	--	126,792
7	3	87	17	1823	1096	97,568
8	3	67	12	1666	1130	512,231
9	3	86	5	1917	1044	649,198
10	2	68	13	1061	--	378,458
11	3	66	6	1330	1690	520,248
12	2	95	5	1319	--	254,766
13	2	59	16	1967	--	578,359
14	3	100	9	1839	1512	286,668
15	1	76	16	--	--	294,787

Radar Type 5
Trial Number: 3
Number of Bursts in Trial: 20

Burst	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	1	60	14	--	--	312,357
2	1	57	5	--	--	540,787
3	2	71	16	1131	--	593,358
4	1	61	14	--	--	534,532
5	3	62	13	1578	1566	179,077
6	1	63	11	--	--	503,562
7	3	92	12	1789	1378	26,016
8	1	82	20	--	--	42,301
9	2	68	13	1136	--	413,931
10	1	83	10	--	--	383,381
11	3	88	6	1708	1759	477,804
12	3	100	5	1383	1421	166,807
13	3	69	15	1542	1939	128,005
14	3	50	19	1685	1004	557,741
15	1	52	8	--	--	371,138
16	2	50	9	1923	--	548,070
17	1	62	14	--	--	221,509
18	3	93	6	1818	1126	481,814
19	3	85	15	1599	1488	21,721
20	1	70	15	--	--	466,761

Radar Type 5
Trial Number: 4
Number of Bursts in Trial: 20

Burst	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	1	70	16	--	--	310,292
2	2	50	20	1364	--	90,129
3	2	98	12	1996	--	544,070
4	2	56	15	1377	--	95,444
5	1	83	6	--	--	330,271
6	3	52	8	1850	1648	132,566
7	2	79	20	1014	--	26,173
8	3	79	9	1177	1905	550,316
9	2	97	17	1091	--	531,833
10	2	83	20	1901	--	368,949
11	1	85	10	--	--	168,158
12	3	94	16	1492	1443	248,738
13	1	73	12	--	--	506,385
14	1	100	10	--	--	363,628
15	3	69	17	1047	1694	119,125
16	1	72	15	--	--	110,582
17	2	77	7	1293	--	333,945
18	3	51	20	1878	1147	105,765
19	3	94	8	1635	1114	575,678
20	1	51	16	--	--	498,322

Radar Type 5
Trial Number: 5
Number of Bursts in Trial: 13

Burst	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	3	92	17	1084	1426	661,069
2	3	93	9	1889	1222	566,664
3	2	95	16	1814	--	597,523
4	1	74	14	--	--	414,059
5	1	88	12	--	--	435,086
6	3	98	18	1819	1816	385,422
7	1	86	5	--	--	785,738
8	3	95	6	1400	1680	872,347
9	2	79	16	1590	--	592,665
10	1	92	9	--	--	511,373
11	3	84	8	1070	1559	571,248
12	2	58	20	1935	--	395,237
13	2	65	12	1110	--	305,687

Radar Type 5
Trial Number: 6
Number of Bursts in Trial: 11

Burst	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	65	12	1831	--	713,612
2	2	83	13	1805	--	1,019,720
3	3	52	10	1085	1362	418,422
4	1	59	10	--	--	367,868
5	2	84	5	1580	--	541,251
6	1	84	20	--	--	343,886
7	2	85	17	1190	--	309,019
8	1	75	11	--	--	338,146
9	1	88	5	--	--	609,104
10	2	98	10	1513	--	767,249
11	3	56	18	1649	1249	485,740

Radar Type 5
Trial Number: 7
Number of Bursts in Trial: 18

Burst	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	3	60	15	1352	1572	132,230
2	3	57	17	1729	1754	631,067
3	3	92	13	2000	1601	205,686
4	3	91	18	1632	1102	33,972
5	1	69	14	--	--	560,176
6	2	84	10	1313	--	158,126
7	2	78	16	1854	--	102,993
8	1	63	16	--	--	295,298
9	2	63	19	1548	--	79,316
10	3	76	18	1434	1749	509,761
11	2	74	8	1458	--	400,331
12	1	64	10	--	--	287,727
13	1	97	8	--	--	516,603
14	1	66	5	--	--	538,069
15	3	94	19	1893	1719	230,801
16	2	100	19	1559	--	484,599
17	1	60	10	--	--	340,374
18	1	89	5	--	--	370,069

Radar Type 5
Trial Number: 8
Number of Bursts in Trial: 9

Burst	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	1	93	14	--	--	850,320
2	1	73	10	--	--	1,026,808
3	2	73	9	1050	--	89,192
4	3	59	18	1916	1952	1,025,457
5	3	62	6	1381	1533	150,876
6	3	68	6	1342	1705	257,412
7	1	81	5	--	--	1,260,554
8	2	77	16	1234	--	553,376
9	2	69	9	1624	--	105,617

Radar Type 5
Trial Number: 9
Number of Bursts in Trial: 19

Burst	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	3	81	19	1823	1803	469,710
2	1	59	11	--	--	592,752
3	1	58	8	--	--	110,418
4	3	98	19	1020	1765	287,751
5	2	99	5	1498	--	144,945
6	2	54	20	1264	--	42,801
7	2	91	19	1947	--	448,413
8	3	72	17	1504	1622	483,680
9	1	51	8	--	--	222,834
10	2	58	7	1658	--	598,420
11	3	55	13	1183	1322	489,763
12	3	90	8	1857	1696	102,646
13	1	60	11	--	--	200,175
14	2	64	20	1937	--	243,537
15	3	91	6	1289	1343	55,086
16	1	86	13	--	--	339,929
17	2	88	12	1242	--	590,672
18	3	64	20	1319	1494	534,368
19	1	90	7	--	--	233,464

Radar Type 5
Trial Number: 10
Number of Bursts in Trial: 20

Burst	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	1	67	8	--	--	148,676
2	1	91	13	--	--	442,813
3	3	50	9	1211	1407	522,016
4	2	84	11	1554	--	284,040
5	3	97	16	1856	1150	154,610
6	1	85	12	--	--	453,590
7	2	63	5	1334	--	294,511
8	1	82	15	--	--	343,785
9	1	66	6	--	--	225,237
10	2	74	12	1363	--	317,290
11	1	63	19	--	--	108,652
12	2	61	10	1045	--	480,199
13	3	92	17	1169	1622	273,174
14	1	90	9	--	--	285,636
15	1	96	12	--	--	278,663
16	2	81	7	1108	--	235,606
17	1	62	6	62	--	19,122
18	2	89	18	1040	--	511,246
19	1	71	20	--	--	576,302
20	3	58	10	1417	1703	519,046

Radar Type 5
Trial Number: 11
Number of Bursts in Trial: 13

Burst	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	3	56	10	1251	1816	249,223
2	2	87	14	1623	--	531,813
3	3	68	15	1292	1807	281,232
4	2	66	9	1855	--	62,795
5	3	98	17	1289	1300	692,890
6	1	91	13	--	--	348,436
7	2	75	17	1465	--	234,206
8	1	76	9	--	--	494,920
9	1	73	13	--	--	740,920
10	1	97	11	--	--	464,292
11	2	56	15	1965	--	465,552
12	2	55	9	1255	--	812,119
13	1	89	8	--	--	876,457

Radar Type 5
Trial Number: 12
Number of Bursts in Trial: 16

Burst	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	3	96	5	1289	1207	734,262
2	1	64	16	--	--	313,903
3	1	60	19	--	--	377,554
4	1	78	9	--	--	181,662
5	2	63	18	1319	--	545,110
6	3	99	8	1762	1017	715,263
7	3	71	18	1144	1964	71,578
8	1	93	18	--	--	65,771
9	3	70	17	1350	1959	510,355
10	1	75	5	--	--	248,616
11	3	82	5	1831	1984	222,919
12	2	96	5	1133	--	556,490
13	3	86	11	1186	1100	506,775
14	2	86	5	1984	--	675,393
15	2	53	11	1769	--	115,716
16	3	91	20	1911	1285	188,944

Radar Type 5
Trial Number: 13
Number of Bursts in Trial: 16

Burst	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	1	63	8	--	--	711,884
2	2	58	20	1355	--	422,846
3	3	59	17	1848	1593	120,443
4	2	84	10	1691	--	333,720
5	1	57	15	--	--	38,055
6	3	77	10	1274	1284	641,045
7	3	91	5	1075	1582	476,800
8	2	91	5	1684	--	677,726
9	3	92	7	1247	1541	186,943
10	1	99	11	--	--	251,845
11	2	62	11	1232	--	512,922
12	2	85	11	1314	--	440,017
13	2	94	11	1366	--	605,100
14	1	91	16	--	--	353,185
15	1	85	10	--	--	308,979
16	2	61	9	1768	--	378,650

Radar Type 5
Trial Number: 14
Number of Bursts in Trial: 9

Burst	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	85	14	1528	--	94,659
2	2	97	17	1438	--	611,659
3	2	74	15	1661	--	572,864
4	2	63	11	1754	--	821,778
5	2	74	11	1142	--	367,668
6	3	66	9	1012	1125	55,688
7	1	79	5	--	--	1,187,836
8	1	90	13	--	--	1,025,860
9	1	50	7	--	--	515,149

Radar Type 5
Trial Number: 15
Number of Bursts in Trial: 11

Burst	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	3	50	18	1476	1588	89,766
2	1	89	18	--	--	308,206
3	3	68	7	1321	1937	240,121
4	3	54	13	1077	1459	929,174
5	3	51	14	1756	1822	918,732
6	3	98	20	1655	1694	496,888
7	2	74	11	1956	--	692,384
8	1	79	18	--	--	263,436
9	1	87	5	--	--	566,389
10	1	68	16	--	--	1,040,723
11	2	98	15	1616	--	107,584

Radar Type 5
Trial Number: 16
Number of Bursts in Trial: 16

Burst	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	94	14	1151	--	215,178
2	1	55	14	--	--	630,589
3	3	57	16	1523	1202	120
4	1	68	11	--	--	196,073
5	1	59	15	--	--	500,442
6	1	88	10	--	--	32,653
7	3	69	10	1102	1365	485,623
8	1	100	13	--	--	24,456
9	3	77	7	1015	1945	550,753
10	3	51	17	1470	1701	506,867
11	2	72	6	1230	--	572,017
12	3	68	9	1039	1140	705,959
13	2	69	8	1948	--	360,093
14	3	70	11	1189	1881	313,475
15	1	99	17	--	--	186,569
16	2	72	19	1904	--	583,853

Radar Type 5
Trial Number: 17
Number of Bursts in Trial: 9

Burst	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	74	15	1145	--	277,879
2	1	72	5	--	--	1,021,738
3	3	84	9	1722	1589	1,020,797
4	3	64	14	1272	1471	984,145
5	3	73	20	1248	1493	13,609
6	1	70	7	--	--	896,502
7	2	54	16	1178	--	984,457
8	3	70	13	1275	1433	1,296,378
9	3	64	9	1780	1771	365,804

Radar Type 5
Trial Number: 18
Number of Bursts in Trial: 18

Burst	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	52	7	1932	--	348,927
2	2	65	16	1468	--	424,502
3	3	84	16	1219	1947	489,057
4	3	60	5	1330	1209	109,120
5	3	64	17	1902	1258	100,983
6	1	91	15	--	--	324,456
7	1	77	8	--	--	32,403
8	2	60	10	1876	--	191,733
9	2	60	20	1828	--	201,623
10	1	79	19	--	--	483,502
11	1	55	6	--	--	221,299
12	3	64	7	1974	1551	116,082
13	3	71	11	1379	1330	428,446
14	3	83	20	1079	1455	619,876
15	3	70	12	1699	1183	71,694
16	1	70	15	--	--	168,938
17	2	87	12	1974	--	161,067
18	1	91	17	--	--	247,803

Radar Type 5
Trial Number: 19
Number of Bursts in Trial: 12

Burst	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	1	71	20	--	--	358,904
2	3	73	11	1281	1387	772,380
3	2	90	13	1280	--	968,894
4	3	56	12	1087	1337	325,738
5	1	62	18	--	--	536,829
6	1	63	20	--	--	180,814
7	2	61	6	1082	--	38,735
8	2	84	19	1392	--	758,676
9	2	77	13	1311	--	793,556
10	3	74	16	1914	1679	72,933
11	1	86	14	--	--	620,304
12	3	63	7	1261	1199	800,857

Radar Type 5
Trial Number: 20
Number of Bursts in Trial: 12

Burst	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	3	89	9	1092	1822	389,181
2	1	69	14	--	--	836,978
3	1	98	9	--	--	872,667
4	3	91	18	1439	1097	472,982
5	2	59	19	1576	--	598,751
6	2	55	8	1713	--	991,834
7	2	94	14	1622	--	186,978
8	2	84	10	1047	--	262,233
9	3	58	11	1278	1477	126,550
10	1	79	20	--	--	243,890
11	1	69	8	--	--	783,989
12	2	67	15	1561	--	553,107

Radar Type 5
Trial Number: 21
Number of Bursts in Trial: 15

Burst	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	1	50	18	--	--	214,372
2	1	51	7	--	--	215,680
3	3	92	20	1329	1633	98,848
4	3	74	17	1451	1899	16,173
5	1	58	14	--	--	395,956
6	2	61	11	1031	--	168,320
7	2	52	15	1267	--	700,335
8	1	59	5	--	--	572,733
9	2	88	13	1774	--	237,130
10	1	88	5	--	--	122,903
11	2	100	19	1927	--	75,275
12	3	77	7	1260	1026	768,978
13	2	54	17	1866	--	71,106
14	1	79	8	--	--	624,929
15	3	92	18	1979	1130	171,424

Radar Type 5
Trial Number: 22
Number of Bursts in Trial: 16

Burst	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	1	87	8	--	--	331,873
2	3	93	14	1894	1431	58,419
3	2	71	5	1136	--	645,324
4	2	73	7	1761	--	499,388
5	3	64	15	1097	1164	338,983
6	3	100	18	1693	1536	424,038
7	2	57	6	1680	--	205,339
8	1	69	6	--	--	5,782
9	2	62	20	1410	--	73,808
10	2	76	7	1556	--	175,927
11	3	96	19	1424	1968	43,109
12	3	52	16	1614	1087	556,000
13	3	60	6	1911	1865	584,156
14	2	66	10	1720	--	315,068
15	2	53	19	1318	--	257,367
16	3	83	16	1604	1409	48,617

Radar Type 5
Trial Number: 23
Number of Bursts in Trial: 16

Burst	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	94	12	1942	--	249,669
2	1	93	15	--	--	247,302
3	2	82	15	1018	--	593,186
4	3	62	15	1178	1415	51,845
5	3	70	16	1078	1369	43,305
6	2	59	20	1642	--	325,192
7	2	59	13	1377	--	216,699
8	2	68	7	1376	--	545,430
9	2	83	20	1852	--	195,029
10	2	69	7	1086	--	513,785
11	1	64	20	--	--	605,339
12	1	64	5	--	--	295,906
13	2	77	9	1937	--	290,917
14	1	65	19	--	--	380,036
15	3	83	14	1932	1477	598,099
16	2	57	11	1633	--	671,678

Radar Type 5
Trial Number: 24
Number of Bursts in Trial: 19

Burst	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	3	67	11	1391	1102	503,888
2	3	82	14	1707	1801	416,694
3	3	70	13	1853	1437	147,917
4	3	50	9	1906	1625	373,639
5	2	55	11	1918	--	347,641
6	2	96	11	1072	--	205,692
7	1	90	13	--	--	229,703
8	2	60	12	1132	--	113,540
9	3	90	14	1929	1750	107,092
10	2	64	19	1444	--	319,999
11	2	69	12	1891	--	362,527
12	3	56	17	1733	1964	448,505
13	1	51	14	--	--	535,483
14	1	99	11	--	--	322,971
15	1	67	9	--	--	484,565
16	2	74	10	1738	--	581,191
17	1	67	8	--	--	63,362
18	2	90	7	1364	--	566,979
19	1	59	18	--	--	340,011

Radar Type 5
Trial Number: 25
Number of Bursts in Trial: 16

Burst	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	1	78	13	--	--	687,979
2	2	50	5	1791	--	291,591
3	3	62	18	1632	1114	510,843
4	3	68	15	1034	1285	410,234
5	3	79	18	1726	1030	51,749
6	1	74	5	--	--	202,973
7	1	85	8	--	--	207,021
8	3	68	12	1388	1574	316,810
9	2	89	17	1943	--	609,172
10	3	94	8	1433	1131	318,911
11	1	73	9	--	--	144,164
12	2	53	17	1607	--	611,788
13	3	89	5	1992	1548	721,131
14	2	61	8	1674	--	294,279
15	3	60	20	1313	1168	579,743
16	3	88	18	1054	1394	585,435

Radar Type 5
Trial Number: 26
Number of Bursts in Trial: 14

Burst	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	95	7	1131	--	216,069
2	3	61	13	1314	1873	761,428
3	3	95	18	1398	1085	645,861
4	1	71	12	--	--	829,172
5	3	65	7	1147	1450	292,570
6	3	89	19	1337	1238	170,684
7	2	99	19	1615	--	501,783
8	1	59	20	--	--	503,296
9	3	98	8	1512	1364	408,120
10	3	64	10	1524	1246	809,022
11	2	88	13	1341	--	25,412
12	1	92	10	--	--	460,338
13	1	50	9	--	--	625,952
14	2	74	18	1946	--	243,597

Radar Type 5
Trial Number: 27
Number of Bursts in Trial: 14

Burst	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	99	10	1377	--	134,000
2	3	71	6	1541	1032	800,041
3	3	66	19	1746	1188	353,838
4	3	93	10	1218	1650	338,688
5	3	73	13	1025	1206	318,024
6	2	91	13	1289	--	319,704
7	3	100	12	1475	1164	165,797
8	1	90	14	--	--	322,945
9	2	78	16	1637	--	630,515
10	3	69	18	1237	1129	479,020
11	2	54	14	1761	--	759,998
12	2	83	16	1053	--	79,089
13	3	86	6	1760	1179	570,469
14	2	63	17	1457	--	584,828

Radar Type 5
Trial Number: 28
Number of Bursts in Trial: 19

Burst	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	3	100	20	1599	1897	178,007
2	2	94	17	1738	--	420,654
3	1	95	19	--	--	479,874
4	3	78	12	1505	1398	462,821
5	2	86	20	1350	--	525,855
6	2	77	13	1451	--	367,981
7	2	53	19	1461	--	118,959
8	2	96	10	1863	--	612,727
9	2	57	8	1058	--	84,192
10	3	84	11	1340	1366	78,307
11	1	74	8	--	--	53,180
12	2	97	7	1239	--	206,452
13	1	69	19	--	--	309,021
14	3	95	17	1545	1210	542,393
15	3	78	10	1905	1205	103,227
16	1	93	9	--	--	609,292
17	2	65	9	1861	--	291,082
18	1	76	16	--	--	420,745
19	1	77	11	--	--	584,305

Radar Type 5
Trial Number: 29
Number of Bursts in Trial: 15

Burst	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	3	98	11	1548	1027	565,159
2	3	59	15	1163	1440	565,023
3	2	83	11	1436	--	779,010
4	3	85	6	1580	1356	249,033
5	2	79	10	1179	--	616,375
6	2	50	6	1135	--	692,339
7	2	73	13	1575	--	128,157
8	3	53	19	1017	1606	339,812
9	2	100	16	1239	--	314,124
10	1	65	10	--	--	270,507
11	1	79	10	--	--	204,729
12	2	66	19	1251	--	81,975
13	2	89	6	1391	--	361,696
14	2	59	19	1611	--	31,545
15	3	92	16	1658	1545	555,807

Radar Type 5
Trial Number: 30
Number of Bursts in Trial: 11

Burst	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	99	10	1654	--	560,232
2	2	92	18	1425	--	327,673
3	2	71	19	1562	--	67,914
4	2	68	19	1688	--	332,452
5	1	88	11	--	--	428,207
6	1	56	8	--	--	1,001,846
7	3	89	9	1659	1697	275,050
8	3	67	16	1749	1709	199,525
9	1	68	13	--	--	100,623
10	2	91	19	1592	--	6,784
11	1	76	10	--	--	1,011,655

VI. Test Equipment

Test Equipment

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ANSI/NCSL Z540-1-1994 and ANSI/ISO/IEC 17025:2000.

Description	Manufacturer	Model	Serial No.	Cal date	Cal due
Laptop computer	Dell	Inspiron 630m	4WVH891	See Note	
MXI-Express controller	National Instruments	PXI-8360	-	See Note	
Arbitrary Waveform Generator 16-Bit 100 MS/s	National Instruments	PXI-5421	-	See Note	
RF Upconverter 250 kHz to 2.7 GHz	National Instruments	PXI-5610	-	See Note	
RF Upconverter 4.9 to 6 GHz	ASCOR	7206	-	See Note	
Spectrum Analyzer 3 Hz to 50 GHz	Agilent	E4448A	MY46180580	2/2/2007	2/2/2008
Pre-amplifier 30 dB 1 to 26.5 GHz	Hewlett-Packard	8449B	3008A01235	11/28/2006	11/28/2007
Power Splitter 2.95 to 7.1 GHz	Mini-Circuits	ZX10-2-71	-	See Note	
Attenuator 10 dB DC to 18 GHz	Pasternack Enterprises	PE7005-10	-	See Note	
Attenuator 30 dB DC to 18 GHz	Pasternack Enterprises	PE7005-30	-	See Note	

Note: Functionally tested equipment is verified using calibrated instrumentation at the time of testing.

End of Report

