# DFS PORTION OF
# FCC CFR47 PART 15 SUBPART E

# CERTIFICATION TEST REPORT
# FOR

## ORiCONP AP-700 ACCESS POINT

## MODEL NUMBER: AP-AG-AT-01

## FCC ID: HZB-AP700

## REPORT NUMBER: 07U11098-1, REVISION B

## ISSUE DATE: JUNE 25, 2007

*Prepared for*
**PROXIM WIRELESS**
**2115 O NEL DRIVE**
**SAN JOSE, CA 95131, USA**

*Prepared by*
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NVLAP LAB CODE 200065-0

Revision History

| Rev. | Issue Date | Revisions | Revised By |
|---|---|---|---|
| -- | 6/13/07 | Initial Issue | M. Heckrotte |
| B | 6/25/07 | Corrected company address. | S. Radecki |

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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** PROXIM WIRELESS
2115 O NEL DRIVE
SAN JOSE, CA 95131, USA

**EUT DESCRIPTION:** ORiCONP AP-700 ACCESS POINT

**MODEL:** AP-AG-AT-01

**SERIAL NUMBER:** 07UT19560028

**DATE TESTED:** JUNE 4 – 7, 2007

| APPLICABLE STANDARDS | |
|---|---|
| **STANDARD** | **TEST RESULTS** |
| FCC PART 15 SUBPART E (DFS REQUIREMENTS) | NO NON-COMPLIANCE NOTED |

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note**: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:

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EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

# 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 15 and FCC 06-96 APPENDIX "COMPLIANCE MEASUREMENT PROCEDURES FOR UNLICENSED-NATIONAL INFORMATION INFRASTRUCTURE DEVCIES OPERATING IN THE 5250-5350 MHz AND 5470-5725 MHz BANDS INCORPORATING DYNAMIC FREQUENCY SELECTION".

# 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.com.

# 4. CALIBRATION AND UNCERTAINTY

## 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

## 4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| PARAMETER | UNCERTAINTY |
|---|---|
| Radiated Emission, 30 to 200 MHz | +/- 3.3 dB |
| Radiated Emission, 200 to 1000 MHz | +4.5 / -2.9 dB |
| Radiated Emission, 1000 to 2000 MHz | +4.5 / -2.9 dB |
| Power Line Conducted Emission | +/- 2.9 dB |

Uncertainty figures are valid to a confidence level of 95%.

# 5. LIMITS AND RESULTS

## 5.1. DYNAMIC FREQUENCY SELECTION

### 5.1.1. LIMITS

§15.407 (h) and FCC 06-96 APPENDIX "COMPLIANCE MEASUREMENT PROCEDURES FOR UNLICENSED-NATIONAL INFORMATION INFRASTRUCTURE DEVCIES OPERATING IN THE 5250-5350 MHz AND 5470-5725 MHz BANDS INCORPORATING DYNAMIC FREQUENCY SELECTION".

**Table 1: Applicability of DFS requirements prior to use of a channel**

| **Requirement** | **Operational Mode** | | |
|---|---|---|---|
| | **Master** | **Client (without radar detection)** | **Client (with radar detection)** |
| *Non-Occupancy Period* | Yes | Not required | Yes |
| *DFS Detection Threshold* | Yes | Not required | Yes |
| *Channel Availability Check Time* | Yes | Not required | Not required |
| *Uniform Spreading* | Yes | Not required | Not required |

**Table 2: Applicability of DFS requirements during normal operation**

| **Requirement** | **Operational Mode** | | |
|---|---|---|---|
| | **Master** | **Client** (without DFS) | **Client** (with DFS) |
| *DFS Detection Threshold* | Yes | Not required | Yes |
| *Channel Closing Transmission Time* | Yes | Yes | Yes |
| *Channel Move Time* | Yes | Yes | Yes |

**Table 3: Interference Threshold values, Master or Client incorporating In-Service Monitoring**

| **Maximum Transmit Power** | **Value (see note)** |
|---|---|
| ≥ 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<br>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. | |

**Table 4: DFS Response requirement values**

| **Parameter** | **Value** |
|---|---|
| *Non-occupancy period* | 30 minutes |
| *Channel Availability Check Time* | 60 seconds |
| *Channel Move Time* | 10 seconds |
| *Channel Closing Transmission Time* | 200 milliseconds + approx. 60 milliseconds over remaining 10 second period |
| The instant that the *Channel Move Time* and the *Channel Closing Transmission Time* begins is as follows:<br>• For the Short pulse radar Test Signals this instant is the end of the *Burst*.<br>• For the Frequency Hopping radar Test Signal, this instant is the end of the last radar burst generated.<br>• For the Long Pulse radar Test Signal this instant is the end of the 12 second period defining the radar transmission.<br>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 to facilitate channel changes (an aggregate of approximately 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions. | |

**Table 5 – Short Pulse Radar Test Waveforms**

| Radar Type | Pulse Width (Microseconds) | PRI (Microseconds) | 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 |

**Table 6 – Long Pulse Radar Test Signal**

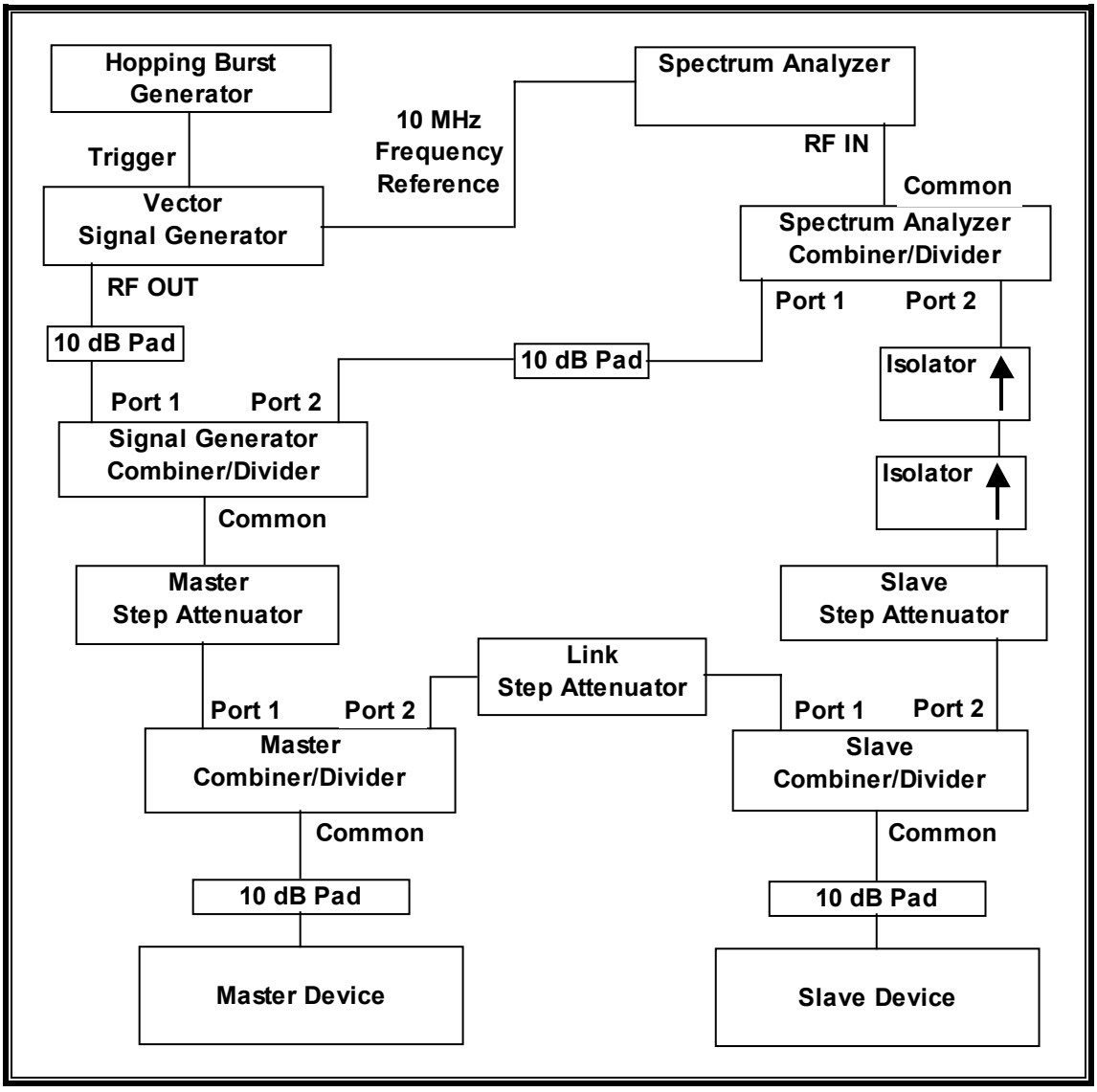
| Radar Waveform | Bursts | Pulses per Burst | Pulse Width (µsec) | Chirp Width (MHz) | PRI (µsec) | Minimum Percentage of Successful Detection | Minimum Trials |
|---|---|---|---|---|---|---|---|
| 5 | 8-20 | 1-3 | 50-100 | 5-20 | 1000-2000 | 80% | 30 |

**Table 7 – Frequency Hopping Radar Test Signal**

| Radar Waveform | Pulse Width (µsec) | PRI (µsec) | Burst Length (ms) | Pulses per Hop | Hopping Rate (kHz) | Minimum Percentage of Successful Detection | Minimum Trials |
|---|---|---|---|---|---|---|---|
| 6 | 1 | 333 | 300 | 9 | .333 | 70% | 30 |

## 5.1.2. TEST AND MEASUREMENT SYSTEM

**CONDUCTED METHOD SYSTEM BLOCK DIAGRAM**



## SYSTEM OVERVIEW

The short pulse and long pulse signal generating system utilizes the NTIA software. The Vector Signal Generator has been validated by the NTIA. The hopping signal generating system utilizes the CCS simulated hopping method and system, which has been validated by the DoD, FCC and NTIA. The software selects waveform parameters from within the bounds of the signal type on a random basis using uniform distribution.

The short pulse types 2, 3 and 4, and the long pulse type 5 parameters are randomized at run-time.

The hopping type 6 pulse parameters are fixed while the hopping sequence is based on the August 2005 NTIA Hopping Frequency List. The initial starting point randomized at run-time and each subsequent starting point is incremented by 475. Each frequency in the 100-length segment is compared to the boundaries of the EUT Detection Bandwidth and the software creates a hopping burst pattern in accordance with Section 7.4.1.3 Method #2 Simulated Freqeuncy Hopping Radar Waveform Generating Subsystem of FCC 06-96 APPENDIX. The frequency of the signal generator is incremented in 1 MHz steps from $F_L$ to $F_H$ for each successive trial. This incremental sequence is repeated as required to generate a minimum of 30 total trials and to maintain a uniform frequency distribution over the entire Detection Bandwidth.

The signal monitoring equipment consists of a spectrum analyzer set to display 8001 bins on the horizontal axis. The time-domain resolution is 2 msec / bin with a 16 second sweep time, meeting the 10 second short pulse reporting criteria. The aggregate ON time is calculated by multiplying the number of bins above a threshold during a particular observation period by the dwell time per bin, with the analyzer set to peak detection and max hold.

Should multiple RF ports be utilized for the Master and/or Slave devices (for example, for diversity or MIMO implementations), additional combiner/dividers are inserted between the Master Combiner/Divider and the pad connected to the Master Device (and/or between the Slave Combiner/Divider and the pad connected to the Slave Device). Additional pads are utilized such that there is one pad at each RF port on each EUT.

## SYSTEM CALIBRATION

A 50 ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected in place of the master device and the signal generator is set to CW mode. The amplitude of the signal generator is adjusted to yield a level of –64 dBm as measured on the spectrum analyzer.

Without changing any of the instrument settings, the spectrum analyer is reconnected to the Common port of the Spectrum Analyzer Combiner/Divider. Measure the amplitude and calculate the difference from –64 dBm. Adjust the Reference Level Offset of the spectrum analyzer to this difference.

The spectrum analyzer displays the level of the signal generator as received at the antenna ports of the Master Device. The interference detection threshold may be varied from the calibrated value of –64 dBm and the spectrum analyzer will still indicate the level as received by the Master Device.

Set the signal generator to produce a radar waveform, trigger a burst manually and measure the level on the spectrum analyzer. Readjust the amplitude of the signal generator as required so that the peak level of the waveform is at a displayed level equal to the required or desired interference detection threshold. Separate signal generator amplitude settings are determined as required for each radar type.

## ADJUSTMENT OF DISPLAYED TRAFFIC LEVEL

Establish a link between the Master and Slave, adjusting the Link Step Attenuator as needed to provide a suitable received level at the Master and Slave devices. Stream the video test file to generate WLAN traffic. Confirm that the WLAN traffic level, as displayed on the spectrum analyzer, is at lower amplitude than the radar detection threshold. For Master Device testing confirm that the displayed traffic does not include Slave Device traffic. For Slave Device testing confirm that the displayed traffic does not include Master Device traffic.

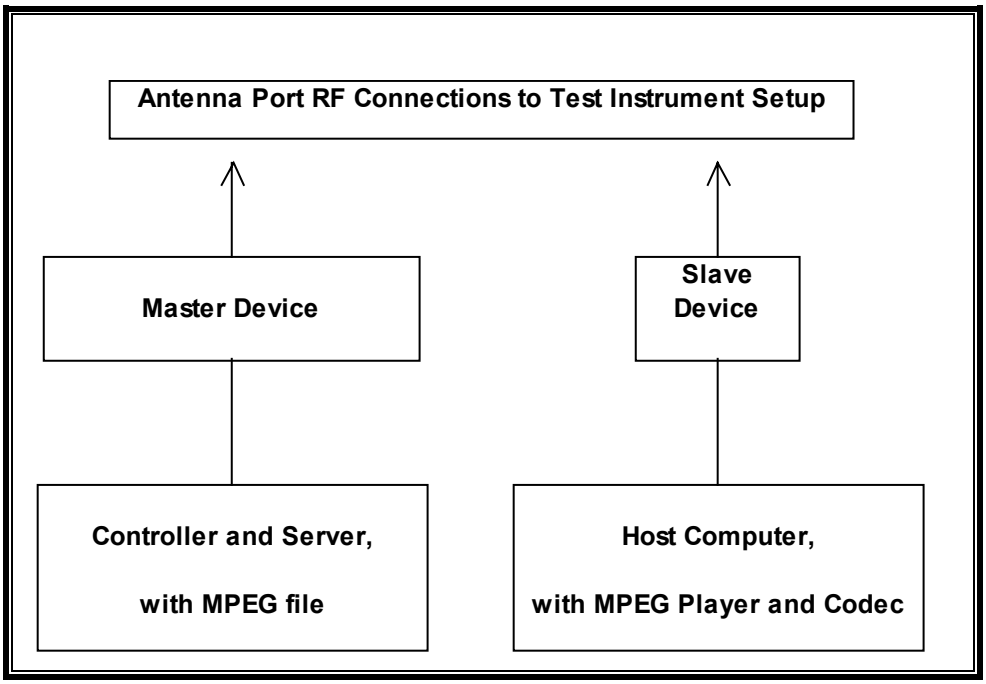
If a different setting of the Master Step Attenuator is required to meet the above conditions, perform a new System Calibration for the new Master Step Attenuator setting.

## TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the DFS tests documented in this report:

| TEST EQUIPMENT LIST | | | | |
|---|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **Serial Number** | **Cal Due** |
| Spectrum Analyzer 3 Hz ~ 44 GHz | Agilent / HP | E4446A | US42070220 | 7/29/2007 |
| Vector Signal Generator 250kHz-20GHz | Agilent / HP | E8267C | US43320336 | 11/2/2007 |
| High Speed Digital I/O Card | National Instruments | PCI-6534 | HA1612845 | 1/16/2008 |

## CONDUCTED METHOD EUT TEST SETUP




## SUPPORT EQUIPMENT

The following test and measurement equipment was utilized for the DFS tests documented in this report:

| PERIPHERAL SUPPORT EQUIPMENT LIST | | | | |
|---|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **Serial Number** | **FCC ID** |
| AC Adapter | DELL | ADP-60NH B | MOW0552488919 | DoC |
| Laptop | DELL | Inspiron 1300 | CN-0GD366-70166-62M-0908 | QDS-BRCM1017 |
| AC Adapter | Targus | 800-0111-001 A | 032006 A | DoC |
| Laptop | HP | Compaq nx6110 | CNU533210L | DoC |
| Slave Device | Askey | Prototype | Prorotype | N/A |

## 5.1.3. DESCRIPTION OF EUT

**DESCRIPTION OF EUT WITH RESPECT TO §15.407 (h) REQUIREMENTS**

The EUT operates over the 5250 – 5350 and 5470-5725 MHz ranges.

The EUT is a Master Device.

The highest gain antenna assembly utilized with the EUT has a gain of 33.4 dBi. The lowest gain antenna assembly utilized with the EUT has a gain of 0 dBi.

The highest radiated power level is 30 dBm EIRP.

The rated output power of the Master unit is > 23dBm (EIRP). Therefore the required interference threshold level is –64 dBm. After correction for antenna gain and procedural adjustments, the required conducted threshold at the antenna port is –64 + 0 + 1 = -63dBm.

The calibrated conducted DFS Detection Threshold level is set to –64 dBm. The tested level is lower than the required level hence it provides margin to the limit.

The EUT incorporates a 50-ohm coaxial antenna port that is connected to the test system to perform conducted tests.

The Slave device associated with the EUT during these tests does not have radar detection capability.

WLAN traffic is generated by streaming the video file TestFile.mp2 "6 ½ Magic Hours" from the Master to the Slave in full motion video mode using the media player with the V2.61 Codec package.

TPC is required since the maximum EIRP is greater than 500 mW (27 dBm).

The EUT utilizes the 802.11a architecture with a 20 MHz nominal channel bandwidth.

The software installed in the access point is revision 3.6.0.

Test results show that the EUT requires 43.21 seconds to complete its initial power-up cycle.

**MANUFACTURER'S STATEMENT REGARDING UNIFORM CHANNEL SPREADING**

This statement is in a separate document.

**MANUFACTURER'S STATEMENT REGARDING TPC**

This statement is in a separate document.

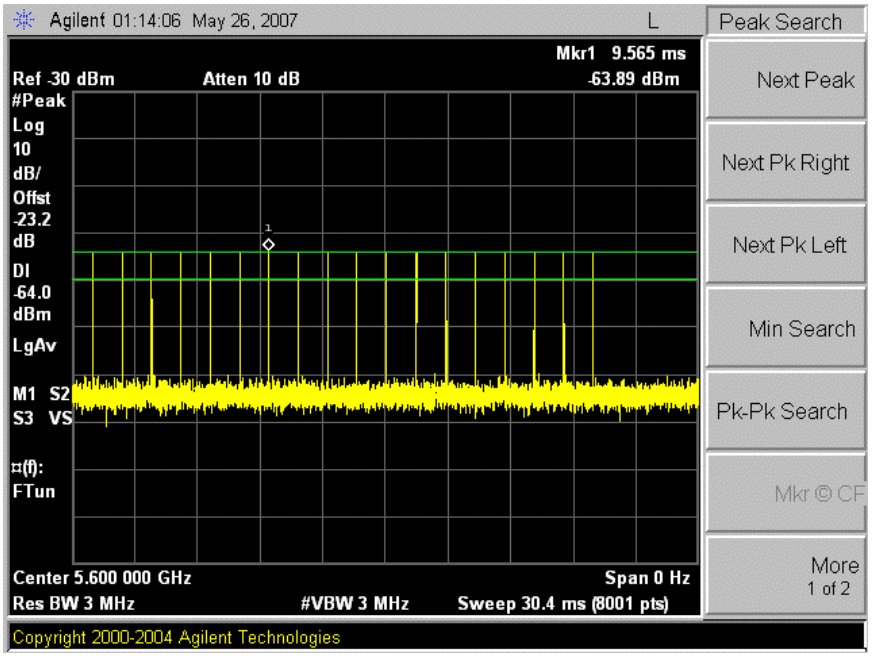
### 5.1.4. TEST CHANNEL AND METHOD

All tests were performed at a channel centre frequency of 5600 MHz. Measurements were performed using conducted test methods.

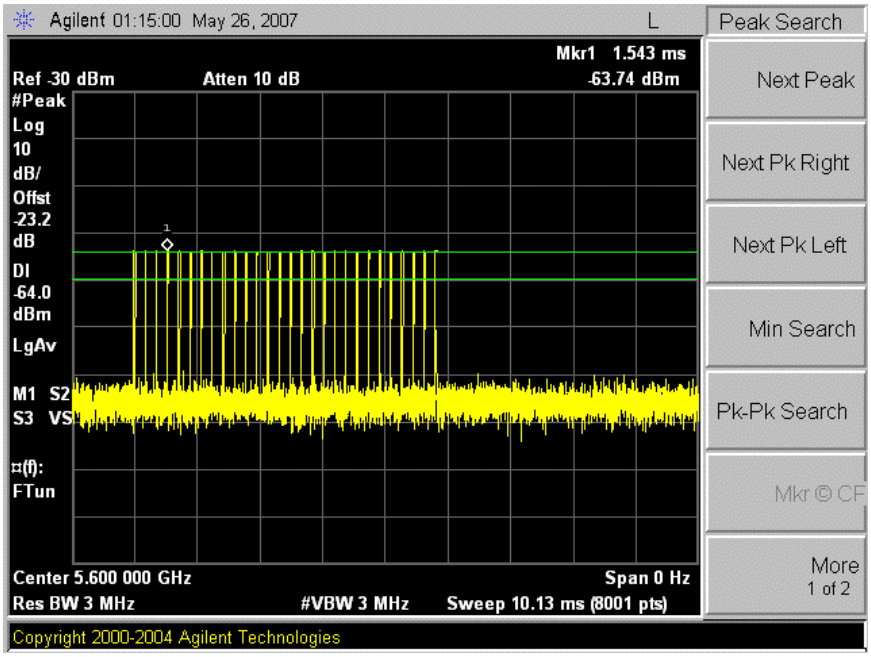
### 5.1.5. PLOTS OF RADAR WAVEFORM, AND WLAN TRAFFIC

**PLOTS OF RADAR WAVEFORMS**

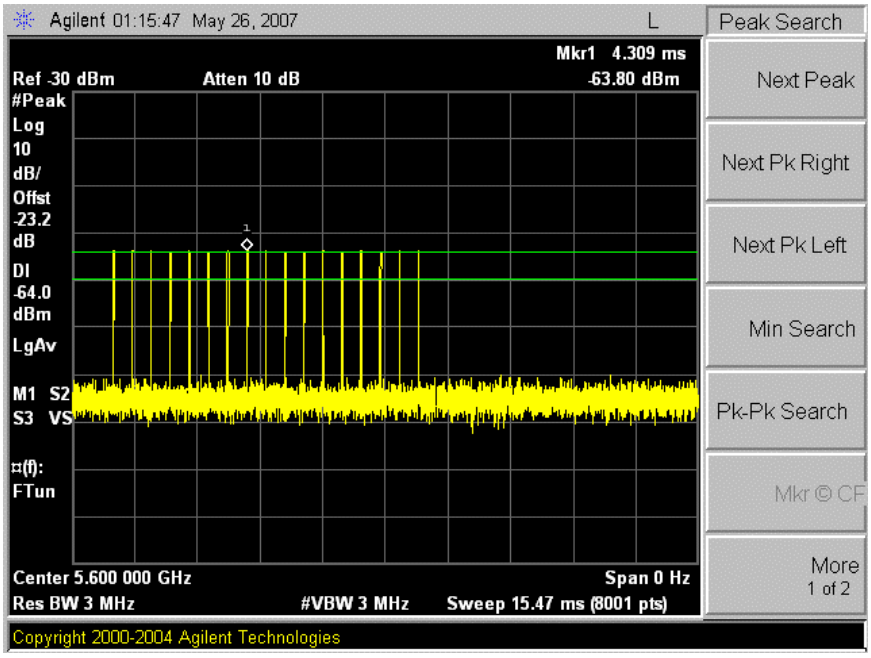
SHORT PULSE RADAR TYPE 1



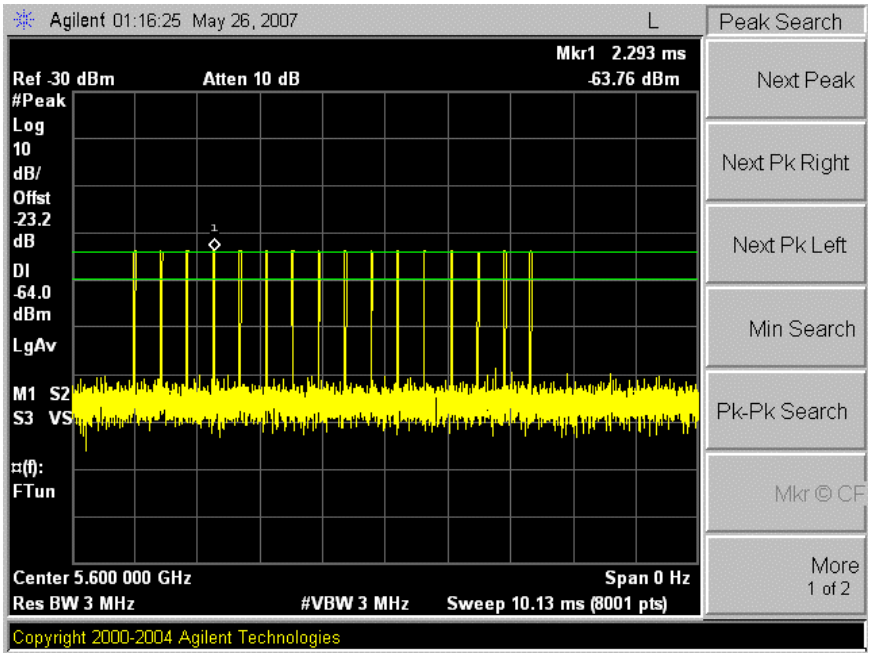
SAMPLE OF RADAR TYPE 2



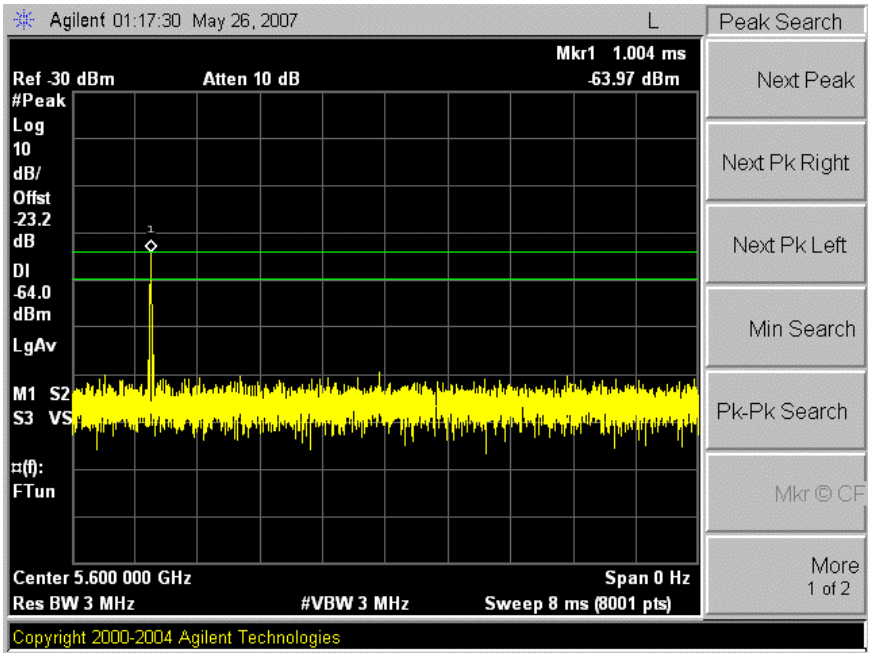
SAMPLE OF RADAR TYPE 3



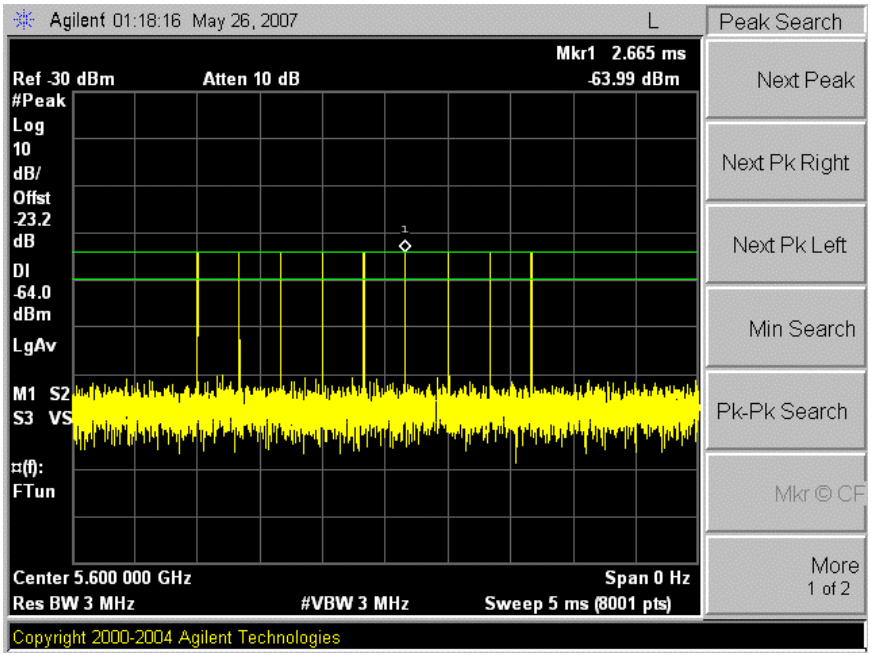
SAMPLE OF RADAR TYPE 4



SAMPLE OF SINGLE BURST OF RADAR TYPE 5

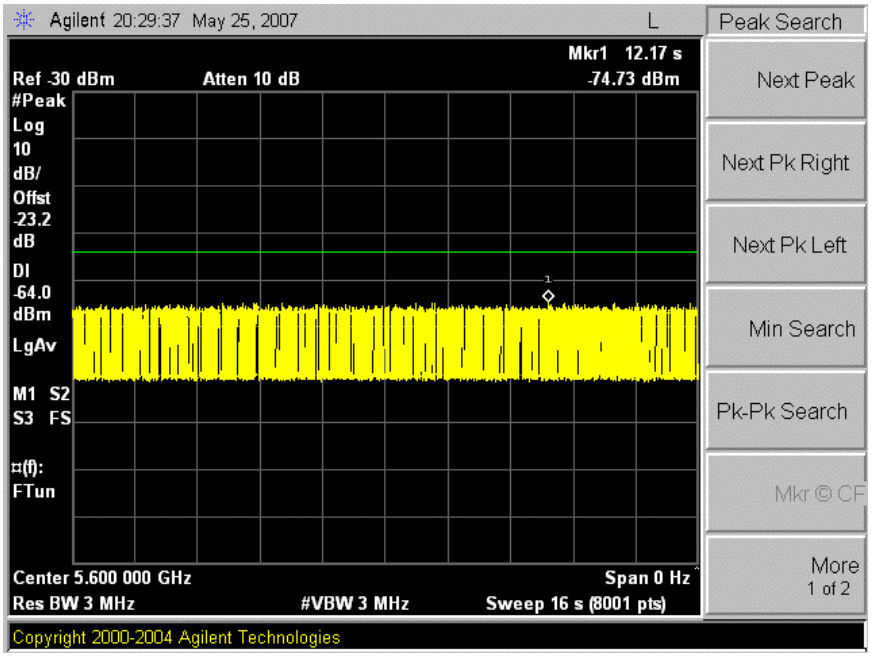


SINGLE BURST OF RADAR TYPE 6



**PLOT OF WLAN TRAFFIC FROM MASTER**

WLAN TRAFIC



## 5.1.6. CHANNEL AVAILABILITY CHECK TIME

**TEST PROCEDURE TO DETERMINE INITIAL POWER-UP CYCLE TIME**

A link was established on channel, then the EUT was rebooted. The time from the cessation of traffic to the re-initialization of traffic was measured as the time required for the EUT to complete the total power-up cycle. The time to complete the initial power-up period is 60 seconds less than this total power-up time.

**TEST PROCEDURE FOR TIMING OF RADAR BURST**

With a link established on channel, the EUT was rebooted. A radar signal was triggered within 0 to 6 seconds after the initial power-up period, and transmissions on the channel were monitored on the spectrum analyzer.

The Non-Occupancy list was cleared. With a link established on channel, the EUT was rebooted. A radar signal was triggered within 54 to 60 seconds after the initial power-up period, and transmissions on the channel were monitored on the spectrum analyzer.

## CHANNEL AVAILABILITY CHECK TIME RESULTS

No non-compliance noted:

| Time required for EUT to complete the initial power-up cycle (sec) |
|---|
| 43.21 |

If a radar signal is detected during the channel availability check then the PC controlling the EUT displays a message stating that radar was detected.

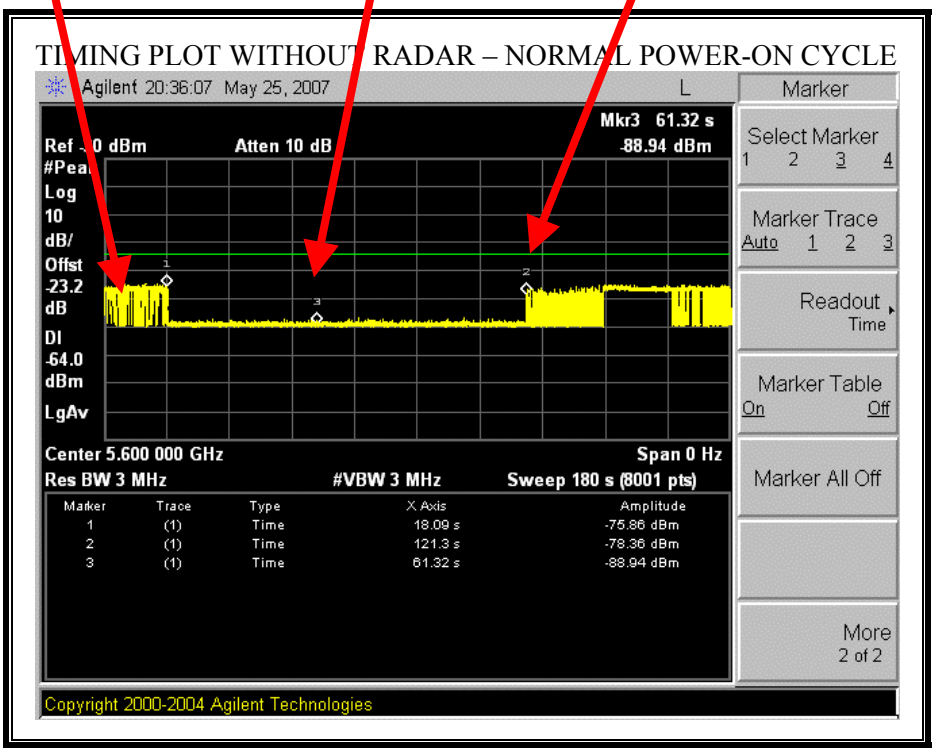
| Timing of Radar Burst | Display on Control Computer | Spectrum Analyzer Display |
|---|---|---|
| No Radar Triggered | EUT marks Channel as active | Transmissions begin on channel after completion of the initial power-up cycle and the 60 second CAC |
| Within 0 to 6 second window | EUT indicates radar detected<br><br>EUT does not display any radar parameter values | No transmissions on channel |
| Within 54 to 60 second window | EUT indicates radar detected<br><br>EUT does not display any radar parameter values | No transmissions on channel |

**TIMING PLOT WITHOUT RADAR DURING CAC**

AP is rebooted
Traffic ceases
Start of Initial Power-up cycle

End of Initial Power-up cycle
Start of CAC

End of CAC
Traffic is Initiated



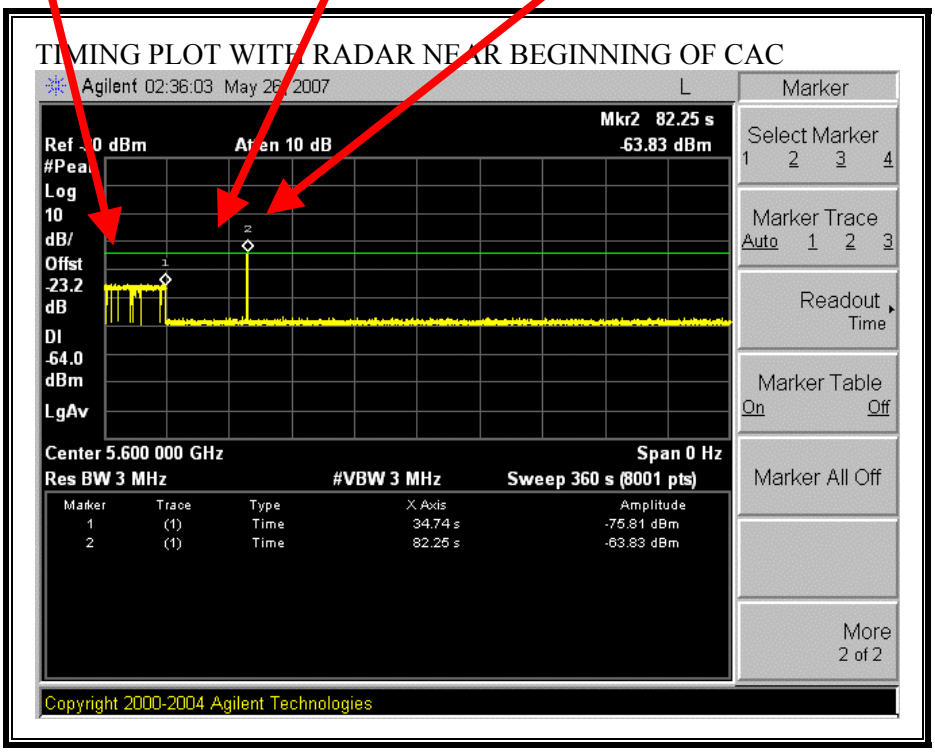

The initial power-up cycle requires (121.3 – 18.09 – 60) = 43.21 seconds.

**TIMING PLOT WITH RADAR NEAR BEGINNING OF CAC**

AP is rebooted
Traffic ceases
Start of Initial Power-up cycle

End of Initial Power-up cycle
Start of CAC

Radar Signal Applied




The radar signal is applied (82.25 – 34.74) = 47.51 seconds after reboot, which is (47.51 – 43.21) = 4.3 seconds after the start of the CAC period.

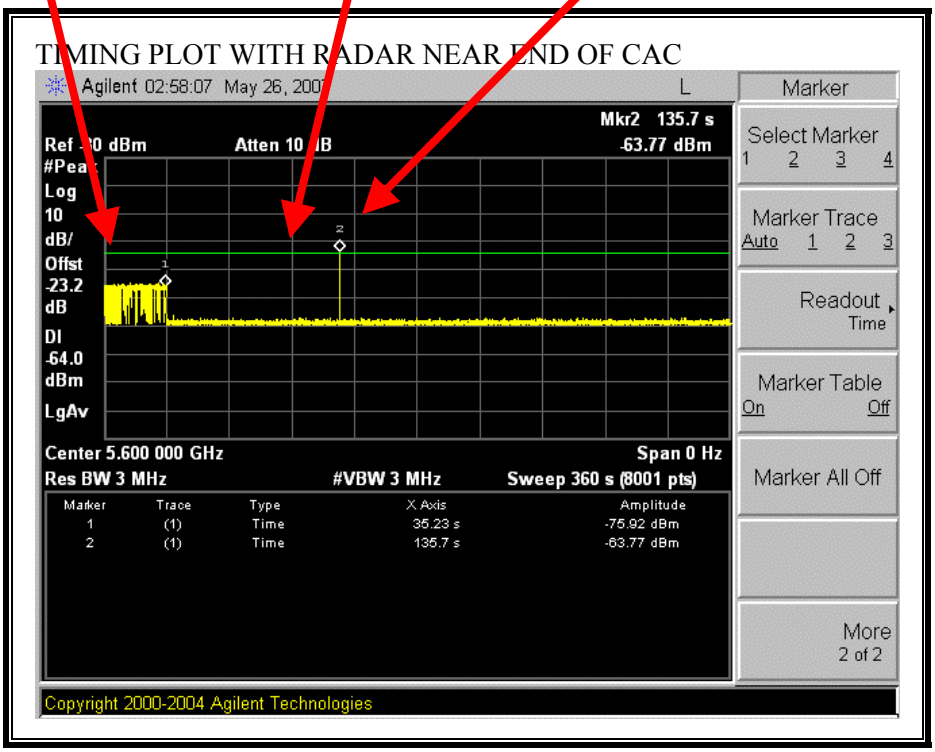
No EUT transmissions were observed after the radar signal.

**TIMING PLOT WITH RADAR NEAR END OF CAC**

AP is rebooted
Traffic ceases
Start of Initial Power-up cycle

End of Initial Power-up cycle
Start of CAC

Radar Signal Applied




The radar signal is applied (135.7 – 35.23) = 100.47 seconds after reboot, which is (100.47 – 43.21) = 57.26 seconds after the start of the CAC period.

No EUT transmissions were observed after the radar signal.

## 5.1.7. CHANNEL MOVE TIME AND CHANNEL CLOSING TRANSMISSION TIME

### GENERAL REPORTING NOTES

The reference marker is set at the end of last radar pulse.

### SHORT PULSE RADAR REPORTING NOTES

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time =
(Number of analyzer bins showing transmission) * (dwell time per bin)

The observation period over which the aggregate time is calculated
Begins at (Reference Marker + 200 msec)
and
Ends no earlier than (Reference Marker + 10 sec).

### LONG PULSE RADAR REPORTING NOTES

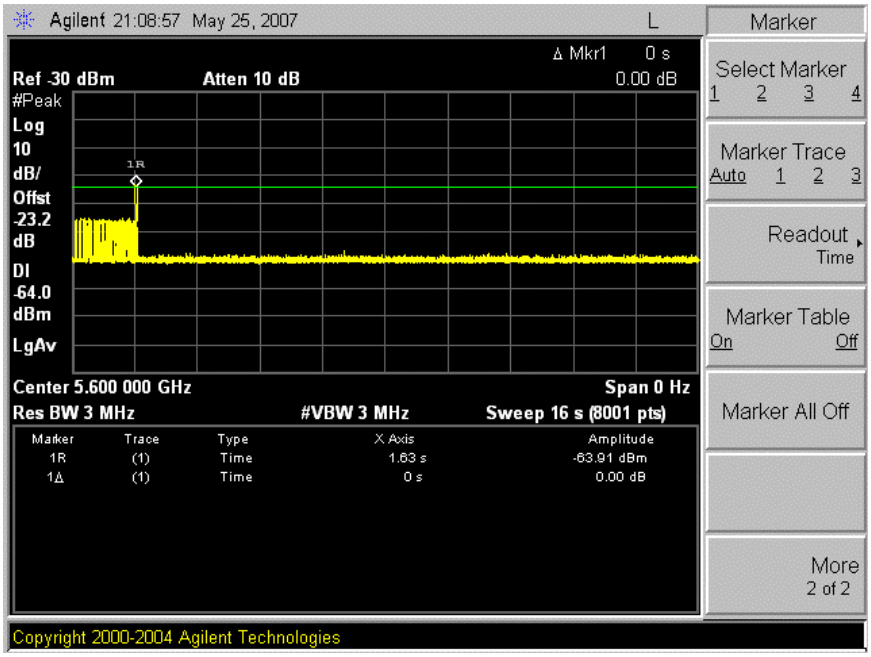
The delta marker is set to 10 seconds after the end of the radar pulse.

## CHANNEL MOVE TIME RESULTS

No non-compliance noted:

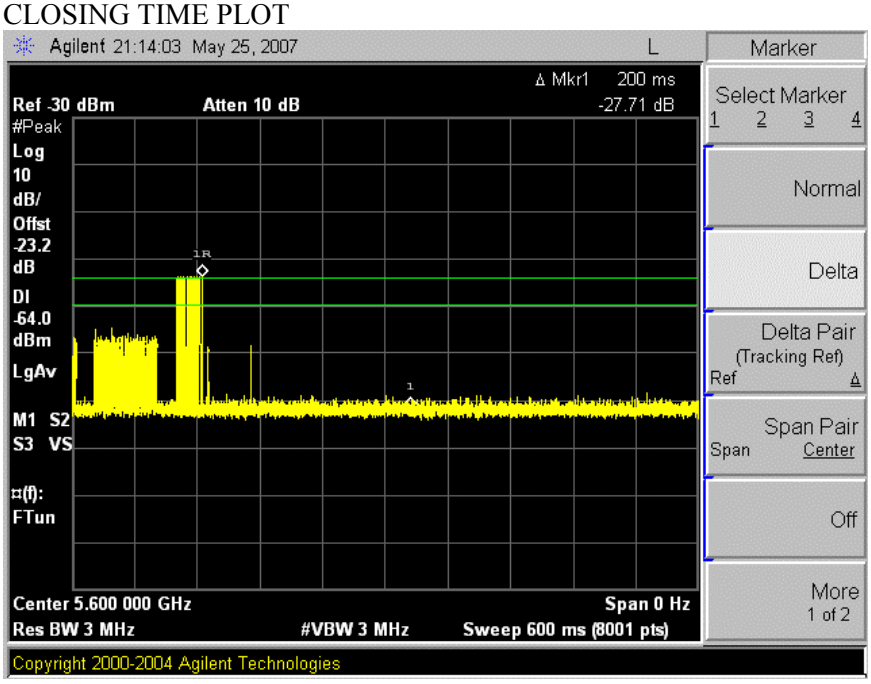
| Channel Move Time (s) | Limit (s) |
|---|---|
| 0.000 | 10 |

MOVE TIME PLOT



## CHANNEL CLOSING TIME RESULTS

CLOSING TIME PLOT



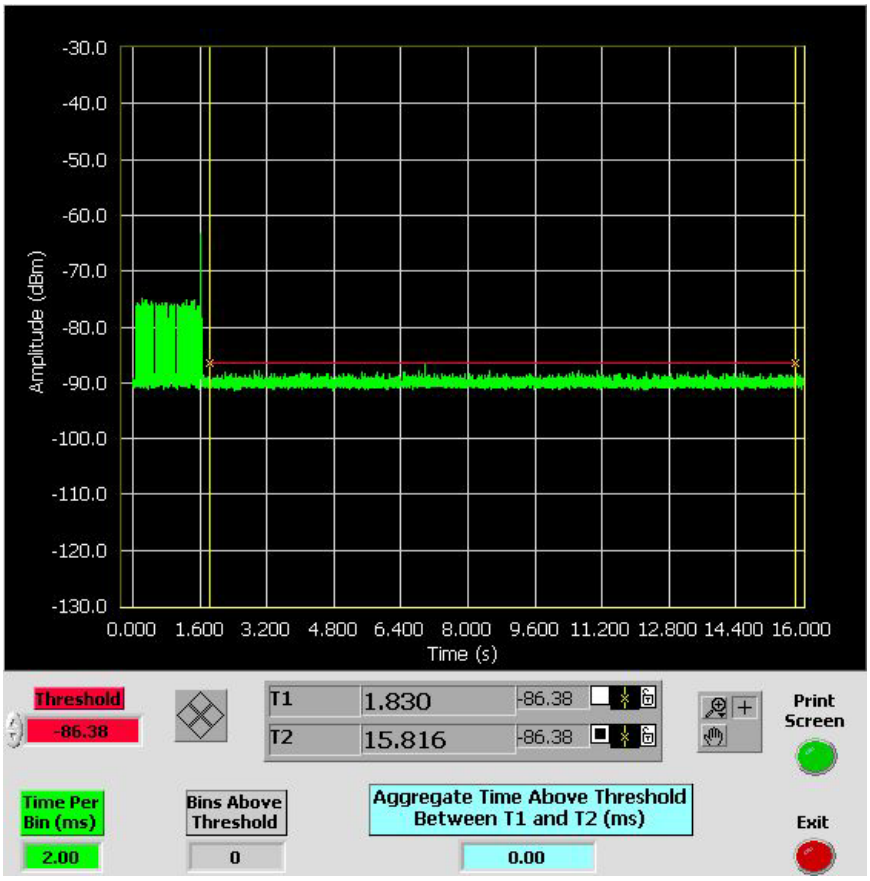
## AGGREGATE CHANNEL CLOSING TRANSMISSION TIME RESULTS

No non-compliance noted:

| Aggregate Transmission Time (ms) | Limit (ms) | Margin (ms) |
|---|---|---|
| 0.00 | 60 | 60.00 |

No transmissions are observed during the aggregate monitoring period.

AGGREGATE CLOSING TIME PLOT

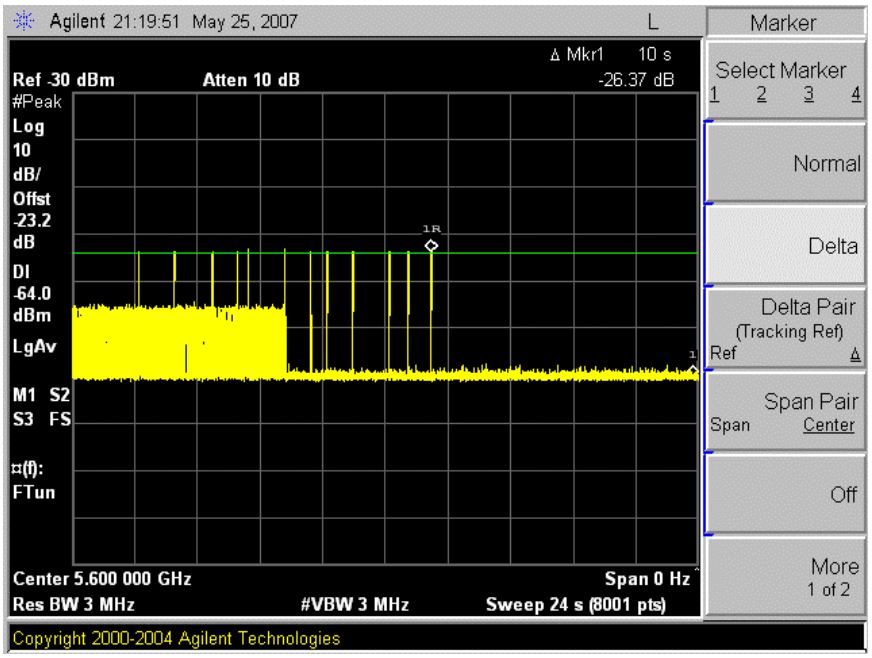


## LONG PULSE CHANNEL MOVE TIME RESULTS

No non-compliance noted:

The traffic ceases prior to 10 seconds after the end of the radar waveform.

MOVE TIME PLOT FOR LONG PULSE RADAR

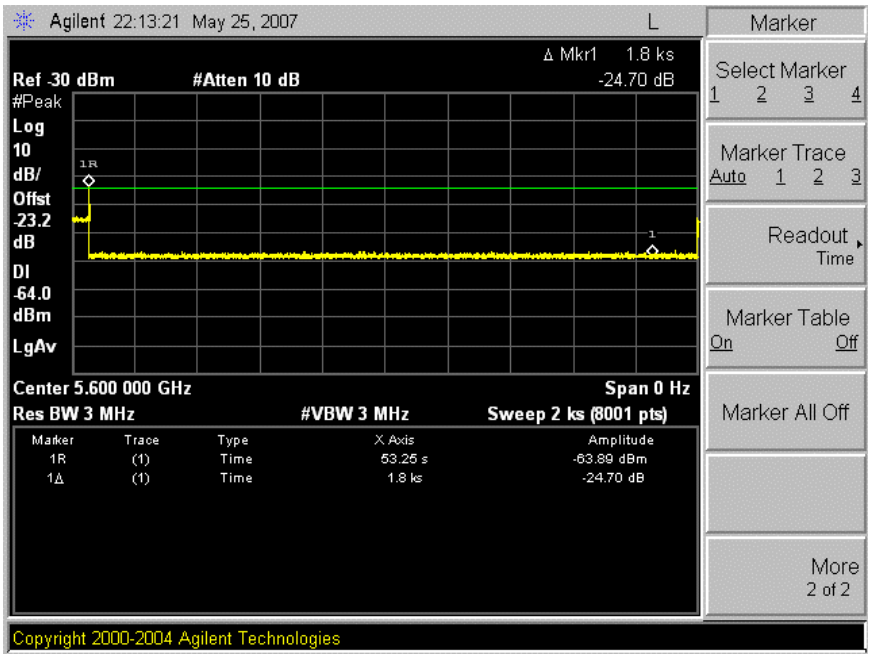


## 5.1.8. NON-OCCUPANCY PERIOD

**RESULTS**

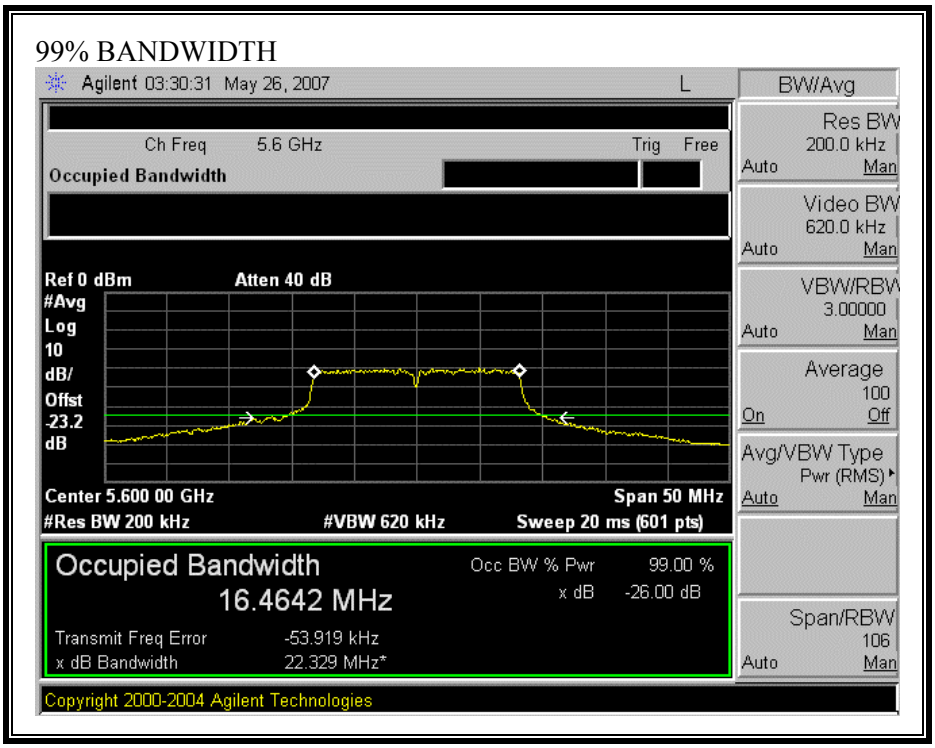
No non-compliance noted: No EUT transmissions were observed on the test channel during the 30 minute observation time.

NON-OCCUPANCY PERIOD PLOT



## 5.1.9. DETECTION BANDWIDTH

**REFERENCE PLOT OF 99% POWER BANDWIDTH**




**RESULTS**

No non-compliance noted:

| FL (MHz) | FH (MHz) | Detection Bandwidth (MHz) | 99% Power Bandwidth (MHz) | Ratio of Detection BW to 99% Power BW (%) | Minimum Limit (%) |
|---|---|---|---|---|---|
| 5590 | 5608 | 18 | 16.464 | 109.3 | 80 |

## DETECTION BANDWIDTH PROBABILITY

DETECTION BANDWIDTH PROBABILITY RESULTS

| Detection Bandwidth Test Results | | | | |
|---|---|---|---|---|
| FCC Type 1 Waveform: 1 us Pulse Width, 1428 us PRI, 18 Pulses per Burst | | | | |
| Frequency (MHz) | Number of Trials | Number Detected | Detection (%) | Mark |
| 5589 | 10 | 8 | 80 | |
| 5590 | 10 | 10 | 100 | FL |
| 5591 | 10 | 10 | 100 | |
| 5592 | 10 | 9 | 90 | |
| 5593 | 10 | 10 | 100 | |
| 5594 | 10 | 10 | 100 | |
| 5595 | 10 | 10 | 100 | |
| 5596 | 10 | 10 | 100 | |
| 5597 | 10 | 10 | 100 | |
| 5598 | 10 | 10 | 100 | |
| 5599 | 10 | 10 | 100 | |
| 5600 | 10 | 10 | 100 | |
| 5601 | 10 | 10 | 100 | |
| 5602 | 10 | 10 | 100 | |
| 5603 | 10 | 10 | 100 | |
| 5604 | 10 | 10 | 100 | |
| 5605 | 10 | 10 | 100 | |
| 5606 | 10 | 10 | 100 | |
| 5607 | 10 | 10 | 100 | |
| 5608 | 10 | 10 | 100 | FH |
| 5609 | 20 | 15 | 75 | |

## 5.1.10. IN-SERVICE MONITORING

**RESULTS**

No non-compliance noted:

| FCC Radar Test Summary | | | | |
|---|---|---|---|---|
| Signal Type | Number of Trials | Detection (%) | Limit (%) | Pass/Fail |
| FCC TYPE 1 | 30 | 96.67 | 60 | Pass |
| FCC TYPE 2 | 30 | 96.67 | 60 | Pass |
| FCC TYPE 3 | 30 | 93.33 | 60 | Pass |
| FCC TYPE 4 | 30 | 100.00 | 60 | Pass |
| Aggregate | | 96.67 | 80 | Pass |
| FCC TYPE 5 | 30 | 93.33 | 80 | Pass |
| FCC TYPE 6 | 38 | 92.11 | 70 | Pass |

**TYPE 1 DETECTION PROBABILITY**

| Data Sheet for FCC Fixed Radar Type 1 | |
|---|---|
| 1 us Pulse Width, 1428 us PRI, 18 Pulses per Burst | |
| Trial | Successful Detection (Yes/No) |
| 1 | Yes |
| 2 | Yes |
| 3 | Yes |
| 4 | Yes |
| 5 | Yes |
| 6 | Yes |
| 7 | Yes |
| 8 | Yes |
| 9 | Yes |
| 10 | Yes |
| 11 | Yes |
| 12 | Yes |
| 13 | Yes |
| 14 | Yes |
| 15 | Yes |
| 16 | No |
| 17 | Yes |
| 18 | Yes |
| 19 | Yes |
| 20 | Yes |
| 21 | Yes |
| 22 | Yes |
| 23 | Yes |
| 24 | Yes |
| 25 | Yes |
| 26 | Yes |
| 27 | Yes |
| 28 | Yes |
| 29 | Yes |
| 30 | Yes |

**TYPE 2 DETECTION PROBABILITY**

| Data Sheet for FCC Short Pulse Radar Type 2 | | | | |
|---|---|---|---|---|
| Waveform | Pulse Width (us) | PRI (us) | Pulses Per Burst | Successful Detection (Yes/No) |
| 2001 | 2.8 | 212.00 | 28 | Yes |
| 2002 | 1.5 | 185.00 | 26 | Yes |
| 2003 | 2.4 | 156.00 | 25 | Yes |
| 2004 | 2.7 | 176.00 | 28 | Yes |
| 2005 | 1.4 | 159.00 | 23 | Yes |
| 2006 | 1.1 | 172.00 | 24 | Yes |
| 2007 | 1.9 | 230.00 | 25 | Yes |
| 2008 | 3.4 | 228.00 | 23 | Yes |
| 2009 | 2.7 | 206.00 | 26 | Yes |
| 2010 | 4.5 | 199.00 | 29 | Yes |
| 2011 | 1 | 166.00 | 29 | Yes |
| 2012 | 4.2 | 208.00 | 29 | Yes |
| 2013 | 1.1 | 163.00 | 27 | Yes |
| 2014 | 4.8 | 209.00 | 27 | Yes |
| 2015 | 3.1 | 197.00 | 25 | Yes |
| 2016 | 2.3 | 150.00 | 25 | Yes |
| 2017 | 1.5 | 226.00 | 28 | Yes |
| 2018 | 1.3 | 162.00 | 23 | Yes |
| 2019 | 2.6 | 198.00 | 29 | Yes |
| 2020 | 2.4 | 223.00 | 26 | Yes |
| 2021 | 3.7 | 159.00 | 27 | Yes |
| 2022 | 1.4 | 205.00 | 25 | No |
| 2023 | 4.3 | 163.00 | 23 | Yes |
| 2024 | 2.9 | 151.00 | 23 | Yes |
| 2025 | 2.7 | 153.00 | 29 | Yes |
| 2026 | 3.7 | 186.00 | 29 | Yes |
| 2027 | 4.4 | 214.00 | 29 | Yes |
| 2028 | 1.2 | 155.00 | 26 | Yes |
| 2029 | 4.8 | 166.00 | 23 | Yes |
| 2030 | 1.8 | 177.00 | 28 | Yes |

**TYPE 3 DETECTION PROBABILITY**

| Data Sheet for FCC Short Pulse Radar Type 3 | | | | |
|---|---|---|---|---|
| Waveform | Pulse Width (us) | PRI (us) | Pulses Per Burst | Successful Detection (Yes/No) |
| 3001 | 9.9 | 423.00 | 18 | Yes |
| 3002 | 7.2 | 420.00 | 16 | Yes |
| 3003 | 7.8 | 302.00 | 18 | Yes |
| 3004 | 8.2 | 347.00 | 18 | Yes |
| 3005 | 9.5 | 400.00 | 16 | Yes |
| 3006 | 8.8 | 256.00 | 17 | Yes |
| 3007 | 8.2 | 305.00 | 16 | Yes |
| 3008 | 9.1 | 254.00 | 17 | Yes |
| 3009 | 7.4 | 312.00 | 16 | Yes |
| 3010 | 6.1 | 265.00 | 18 | Yes |
| 3011 | 6.2 | 297.00 | 17 | Yes |
| 3012 | 6.9 | 489.00 | 16 | Yes |
| 3013 | 7.3 | 457.00 | 17 | Yes |
| 3014 | 8.5 | 400.00 | 17 | Yes |
| 3015 | 7.1 | 281.00 | 17 | Yes |
| 3016 | 8.9 | 434.00 | 18 | Yes |
| 3017 | 8.5 | 492.00 | 17 | Yes |
| 3018 | 5.4 | 362.00 | 17 | Yes |
| 3019 | 6.3 | 270.00 | 16 | Yes |
| 3020 | 9.4 | 314.00 | 16 | No |
| 3021 | 5.4 | 309.00 | 16 | Yes |
| 3022 | 9.9 | 344.00 | 16 | Yes |
| 3023 | 7.9 | 467.00 | 16 | Yes |
| 3024 | 6.2 | 348.00 | 17 | Yes |
| 3025 | 7.1 | 395.00 | 16 | Yes |
| 3026 | 5.5 | 374.00 | 17 | No |
| 3027 | 7.8 | 309.00 | 18 | Yes |
| 3028 | 9.9 | 301.00 | 17 | Yes |
| 3029 | 8.6 | 273 | 17 | Yes |
| 3030 | 7.7 | 298 | 18 | Yes |

**TYPE 4 DETECTION PROBABILITY**

| Data Sheet for FCC Short Pulse Radar Type 4 | | | | |
|---|---|---|---|---|
| Waveform | Pulse Width (us) | PRI (us) | Pulses Per Burst | Successful Detection (Yes/No) |
| 4001 | 10.6 | 397.00 | 16 | Yes |
| 4002 | 11.1 | 491.00 | 15 | Yes |
| 4003 | 14.8 | 488.00 | 14 | Yes |
| 4004 | 16.9 | 384.00 | 13 | Yes |
| 4005 | 15.1 | 323.00 | 14 | Yes |
| 4006 | 13.2 | 424.00 | 13 | Yes |
| 4007 | 18.5 | 410.00 | 13 | Yes |
| 4008 | 11 | 406.00 | 15 | Yes |
| 4009 | 10.1 | 288.00 | 12 | Yes |
| 4010 | 12.8 | 498.00 | 15 | Yes |
| 4011 | 17.5 | 487.00 | 14 | Yes |
| 4012 | 17.2 | 379.00 | 12 | Yes |
| 4013 | 13.1 | 439.00 | 12 | Yes |
| 4014 | 14.9 | 287.00 | 14 | Yes |
| 4015 | 12.3 | 368.00 | 12 | Yes |
| 4016 | 10.2 | 256.00 | 15 | Yes |
| 4017 | 12.2 | 252.00 | 12 | Yes |
| 4018 | 14.9 | 437.00 | 15 | Yes |
| 4019 | 17.5 | 460.00 | 16 | Yes |
| 4020 | 14.9 | 256.00 | 15 | Yes |
| 4021 | 15.1 | 346.00 | 12 | Yes |
| 4022 | 16.5 | 327.00 | 13 | Yes |
| 4023 | 18.5 | 380.00 | 15 | Yes |
| 4024 | 14.1 | 389.00 | 14 | Yes |
| 4025 | 19.1 | 317.00 | 12 | Yes |
| 4026 | 16.1 | 346.00 | 13 | Yes |
| 4027 | 14 | 391.00 | 13 | Yes |
| 4028 | 13.7 | 416.00 | 15 | Yes |
| 4029 | 10.8 | 350.00 | 16 | Yes |
| 4030 | 11.3 | 266.00 | 12 | Yes |

**TYPE 5 DETECTION PROBABILITY**

| Data Sheet for FCC Long Pulse Radar Type 5 | |
|---|---|
| Trial | Successful Detection (Yes/No) |
| 1 | Yes |
| 2 | Yes |
| 3 | Yes |
| 4 | Yes |
| 5 | Yes |
| 6 | Yes |
| 7 | Yes |
| 8 | Yes |
| 9 | Yes |
| 10 | Yes |
| 11 | Yes |
| 12 | Yes |
| 13 | Yes |
| 14 | Yes |
| 15 | No |
| 16 | Yes |
| 17 | Yes |
| 18 | Yes |
| 19 | Yes |
| 20 | No |
| 21 | Yes |
| 22 | Yes |
| 23 | Yes |
| 24 | Yes |
| 25 | Yes |
| 26 | Yes |
| 27 | Yes |
| 28 | Yes |
| 29 | Yes |
| 30 | Yes |

Note: The Type 5 randomized parameters are shown in a separate document.

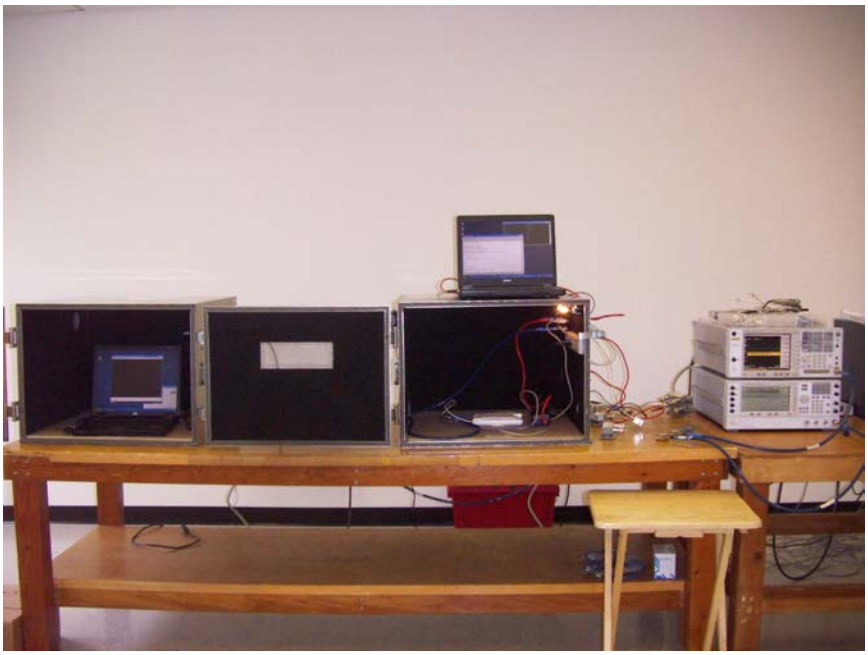
**TYPE 6 DETECTION PROBABILITY**

| Data Sheet for FCC Hopping Radar Type 6 | | | | |
|---|---|---|---|---|
| 1 us Pulse Width, 333 us PRI, 9 Pulses per Burst, 1 Burst per Hop | | | | |
| NTIA August 2005 Hopping Sequence | | | | |
| Trial | Starting Index Within Sequence (Base 1) | Signal Generator Frequency (MHz) | Hops within Detection BW | Successful Detection (Yes/No) |
| 1 | 310 | 5590 | 3 | Yes |
| 2 | 785 | 5591 | 2 | Yes |
| 3 | 1260 | 5592 | 3 | Yes |
| 4 | 1735 | 5593 | 3 | Yes |
| 5 | 2210 | 5594 | 7 | Yes |
| 6 | 2685 | 5595 | 5 | Yes |
| 7 | 3160 | 5596 | 9 | Yes |
| 8 | 3635 | 5597 | 7 | Yes |
| 9 | 4110 | 5598 | 5 | Yes |
| 10 | 4585 | 5599 | 2 | Yes |
| 11 | 5060 | 5600 | 5 | Yes |
| 12 | 5535 | 5601 | 2 | Yes |
| 13 | 6485 | 5602 | 3 | Yes |
| 14 | 6960 | 5603 | 2 | Yes |
| 15 | 7435 | 5604 | 5 | Yes |
| 16 | 7910 | 5605 | 3 | Yes |
| 17 | 8385 | 5606 | 6 | Yes |
| 18 | 8860 | 5607 | 4 | Yes |
| 19 | 9335 | 5608 | 5 | Yes |
| 20 | 9810 | 5590 | 7 | Yes |
| 21 | 10285 | 5591 | 2 | Yes |
| 22 | 10760 | 5592 | 5 | Yes |
| 23 | 11235 | 5593 | 2 | Yes |
| 24 | 11710 | 5594 | 3 | No |
| 25 | 12185 | 5595 | 3 | Yes |
| 26 | 12660 | 5596 | 2 | Yes |
| 27 | 13135 | 5597 | 3 | Yes |
| 28 | 13610 | 5598 | 4 | Yes |
| 29 | 14085 | 5599 | 2 | Yes |
| 30 | 14560 | 5600 | 4 | No |
| 31 | 15035 | 5601 | 3 | Yes |
| 32 | 15510 | 5602 | 2 | Yes |
| 33 | 15985 | 5603 | 3 | Yes |
| 34 | 16460 | 5604 | 3 | No |
| 35 | 16935 | 5605 | 9 | Yes |
| 36 | 17410 | 5606 | 6 | Yes |
| 37 | 17885 | 5607 | 2 | Yes |
| 38 | 18360 | 5608 | 8 | Yes |

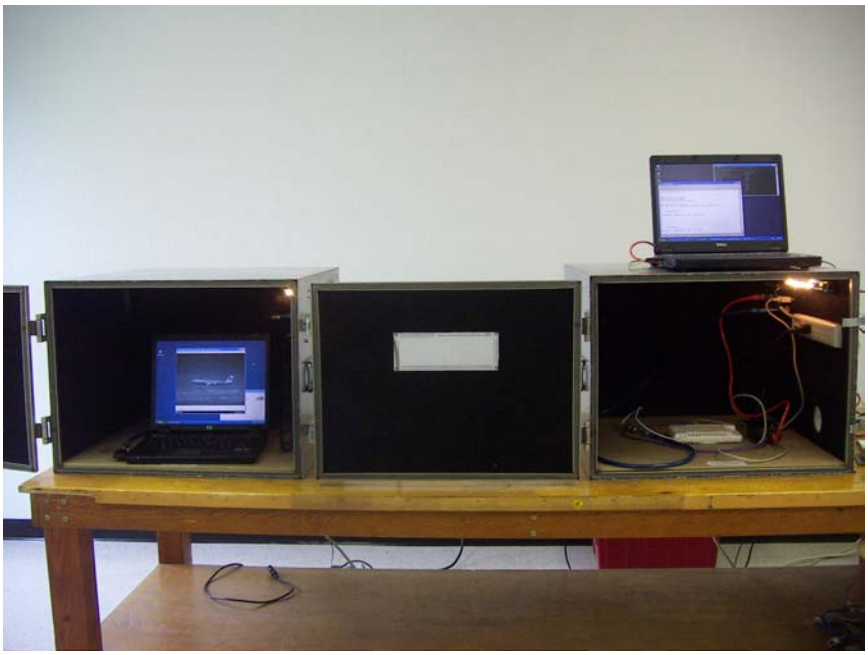
# 6. SETUP PHOTOS

**DFS MEASUREMENT SETUP**

DFS PHOTO



DFS FRONT PHOTO



# END OF REPORT