



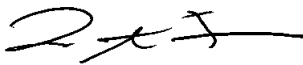
**FCC Part 25, Certification Application
of the
Axonn, L.L.C.
Satellite Transmitter Unit (STU)**

**Issue Date: September 20, 2004
UST Project No: 04-0017**



I certify that I am authorized to sign for the manufacturer and that all of the statements in this report and in the Exhibits attached hereto are true and correct to the best of my knowledge and belief:

UNITED STATES TECHNOLOGIES, INC. (AGENT RESPONSIBLE FOR TEST):

By: 

Name: Louis A Feudi

Title: Operations Manager

Date: September 20, 2004

**Axonon, L.L.C.
2021 Lakeshore Drive, Suite 533
New Orleans, LA 70122**

By: _____

Name: _____

Title: _____

Date: _____

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Company Name: Axonn, L.L.C
Model: STU
FCC ID: L2V2100-0149
Date: September 20, 20004

MEASUREMENT/TECHNICAL REPORT

This report concerns (check one): Original grant X
Class II change _____

Equipment type: Mobile User to Satellite Transmitter

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? yes _____ No X

If yes, defer until: _____
date

N.A. agrees to notify the Commission by N.A.
date

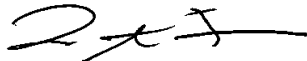
of the intended date of announcement of the product so that the grant can be issued on that date.

Report prepared by:

United States Technologies, Inc.
3505 Francis Circle
Alpharetta, GA 30004

Phone Number: (770) 740-0717
Fax Number: (770) 740-1508

Report reviewed by:



Louis A. Feudi
Operations Manager

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SECTION 1

GENERAL INFORMATION

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GENERAL INFORMATION

1.1 Product Description

The Equipment Under Test is the Axonn, L.L.C. Model STU. The EUT is a mobile “user to satellite” transmitter module that operates at the following 4 transmit frequencies: 1611.25 MHz, 1613.75 MHz, 1616.26 MHz, & 1618.75 MHz. The STU provides a modem functionality to transmit bursts of data containing user information to a satellite constellation. The satellites operate as linear transponders and the signal is redirected to a ground station where the user information is extracted and distributed.

For the purpose of this test the EUT was placed into a high power (+22 dBm) constant TX mode of operation.

Axonn, L.L.C. has attested that the unit is identical to the AXTracker configuration, with the same layout and parts as listed in this application. **See letter on following page provided by Axonn.**

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July 1, 2004

Via Facsimile (770) 740-1508

Holger Schneit
US Technologies Inc
3505 Francis Circle
Alpharetta, GA 30004

Dear Holger,

The Satellite Transmitter Unit (STU) remains in the same form, with the same layout and parts as when it was last tested by US Technologies in the past. No changes have been made to the unit or parts, with none expected. We are resubmitting the STU for approval under the FCC modular classification rules for use in other designs. The FCC ID for the STU will be: L2V2100-0149.

If you have any questions or require any further information please feel free to contact me.

Best regards,

A handwritten signature in black ink, appearing to read "Scott Quillin", is written over a light blue horizontal line.

Scott Quillin
Senior Project Engineer

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1.2 Related Submittal(s)/Grant(s)

The EUT is subject to the following authorizations:

- a) Certification as a transmitter as specified by Part 25.
- b) Verification to Digital Emissions as specified in Part 15.

The information contained in this report is presented for the Part 25 authorization for the EUT.

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SECTION 2

TEST AND MEASUREMENTS

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TEST AND MEASUREMENTS

2.1 Configuration of Tested System

Prepared in accordance with the requirements of the FCC Rules and Regulations Part 2 & 25. All measurements are peak unless stated otherwise. The video filter associated with the spectrum analyzer was off throughout the evaluation process. Interconnecting cables were manipulated as necessary to maximize emissions. A block diagram of the tested system is shown in Figure 1. Test configuration photographs for spurious emissions are shown in Figure 2.

The sample used for testing was received by U.S. Technologies on July 16, 2002 in good condition, the EUT was re-tested with a second antenna (+5.5 dBi) on October 1, 2004. The test data was taken from AxTracker unit testing, FCC ID: L2V070878 for the +4 dBi antenna. The unit was re-tested for spurious harmonics and RF Power Output on 10/1/04, and EIRP values gained were using Table 2b.

2.2 Test Facility

Testing was performed at US Tech's measurement facility at 3505 Francis Circle, Alpharetta, GA. This site has been fully described and registered by the FCC under Registration Number 91037. Additionally, this site has also been fully described and submitted to Industry Canada (IC), and has been approved under file IC2982.

2.3 Test Equipment

Table 2 describes test equipment used to evaluate this product.

2.4 Modifications

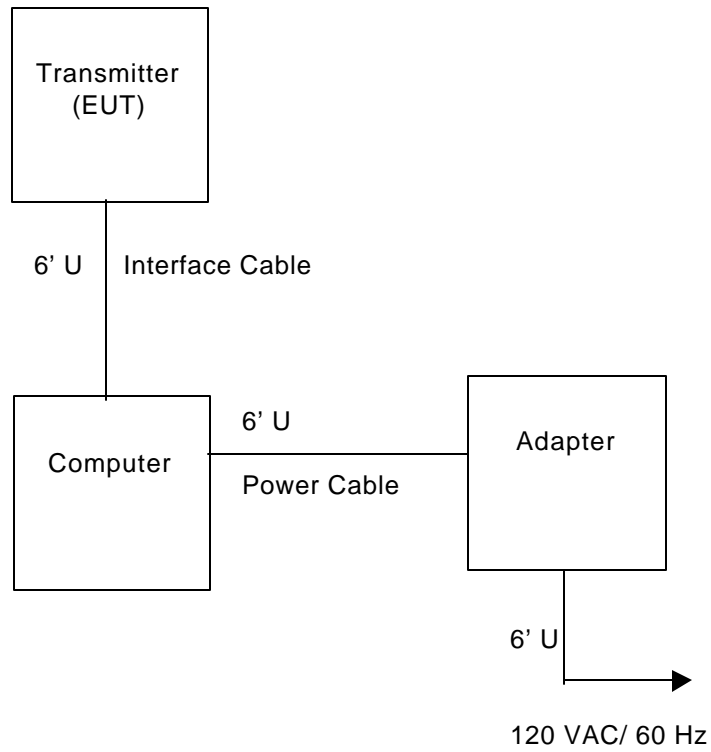
No modifications were made by US Tech to bring the EUT into compliance with FCC Part 25 limits for the transmitter portion of the EUT.

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FIGURE 1

TEST CONFIGURATION



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FIGURE 2a

Photograph(s) for Spurious Emissions

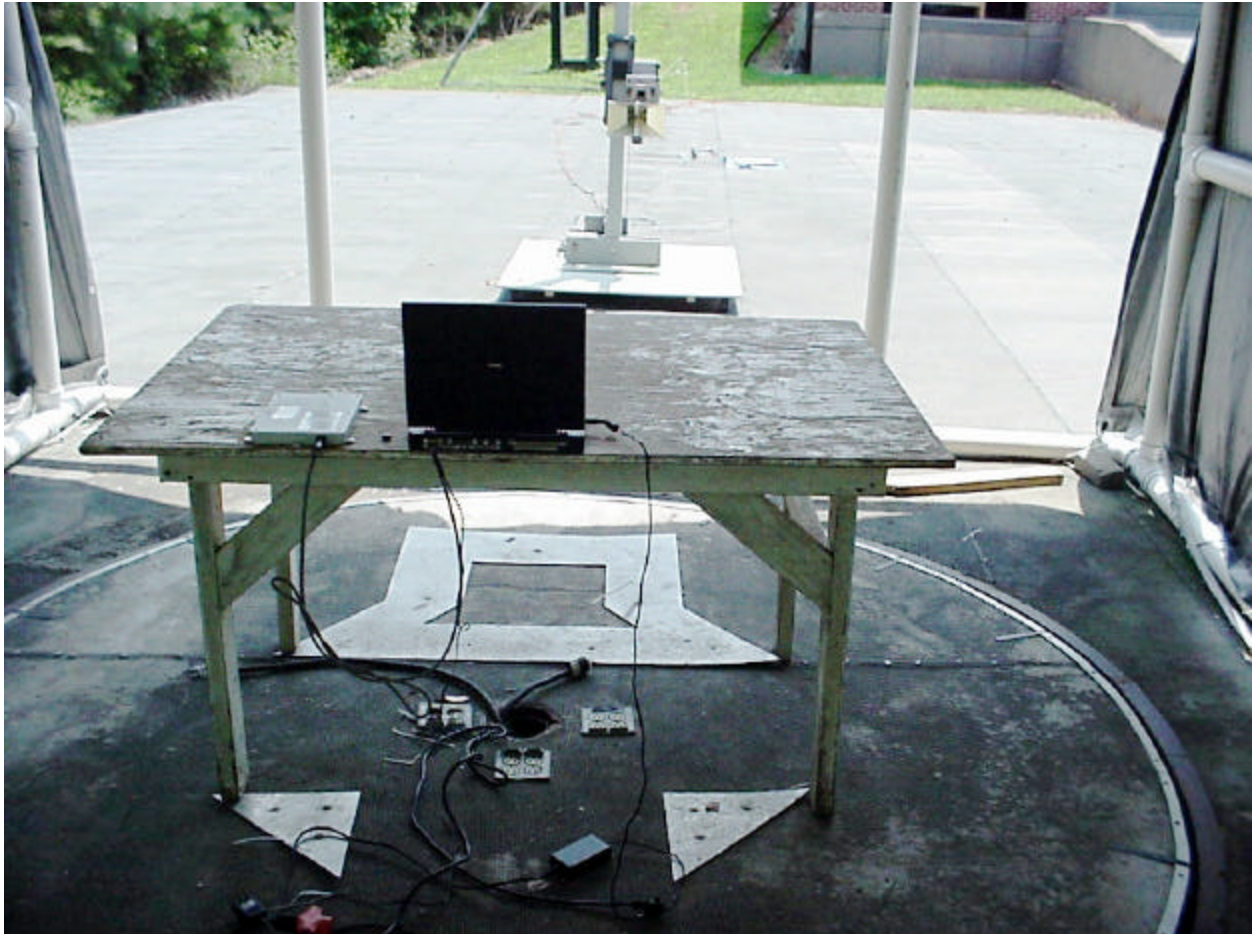


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FIGURE 2b

Photograph(s) for Spurious Emissions (Cont.)



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TABLE 1**EUT and Peripherals**

PERIPHERAL MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID:	CABLES P/D
Transmitter Axonn, L.L.C. (EUT)	STU With AXTracker	None	None	6' U
Computer Dell	Inspiron 3000 TS304	L5956	IIRT530HT	6' U
Adapter Dell	P3831231877 T	PA-3	N/A	6' U 120 VAC/ 60 Hz

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TABLE 2a
TEST INSTRUMENTS
(August 6, 2003)

EQUIPMENT	MODEL NUMBER	MANUFACTURER	SERIAL NUMBER	DATE OF LAST CALIBRATION
SPECTRUM ANALYZER	8558B	HEWLETT-PACKARD	2332A10055	2/28/03
SPECTRUM ANALYZER	8593E	HEWLETT-PACKARD	3205A00124	1/16/03
TEST RECEIVER	ESV	ROHDE & SCHWARZ	881485/040	11/21/02
RF PREAMP	8447D	HEWLETT-PACKARD	2944A07436	5/10/03
RF PREAMP	8449B	HEWLETT-PACKARD	3008A00480	5/30/03
BICONICAL ANTENNA	3110	EMCO	3115	7/22/03
LOG PERIODIC ANTENNA	3146	EMCO	3236	12/17/02
LISN (x 2) 8028-50-TS24-BNC	8028	SOLAR ELE.	910494 & 910495	1/10/03
CALCULATION PROGRAM	N/A	N/A	Ver. 5.2	N/A

TABLE 2b
TEST INSTRUMENTS
(October 1, 2004)

EQUIPMENT	MODEL NUMBER	MANUFACTURER	SERIAL NUMBER	DATE OF LAST CALIBRATION
SPECTRUM ANALYZER	8558B	HEWLETT-PACKARD	2332A10055	2/19/04
SPECTRUM ANALYZER	8593E	HEWLETT-PACKARD	3205A00124	12/30/03
TEST RECEIVER	ESV	ROHDE & SCHWARZ	881485/040	9/9/04
RF PREAMP	8447D	HEWLETT-PACKARD	2944A07436	4/29/04
RF PREAMP	8449B	HEWLETT-PACKARD	3008A00480	6/23/04
BICONICAL ANTENNA	3110	EMCO	3115	05/18/04
LOG PERIODIC ANTENNA	3146	EMCO	3236	06/30/04
LISN (x 2) 8028-50-TS24-BNC	8028	SOLAR ELE.	910494 & 910495	1/10/04
CALCULATION PROGRAM	N/A	N/A	Ver. 5.2	N/A

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2.5 Antenna Description

According to Axonn L.L.C., the EUT will incorporate an antenna with +4 dBi gain.
Additional information regarding the antenna was not provided.

According to Axonn L.L.C., the EUT will incorporate an antenna with +5.5 dBi gain.
Additional information regarding the antenna was not provided.

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2.6 RF Power Output (FCC Section 2.1046)

In bands shared coequally with terrestrial radio communications services, the equivalent isotropically radiated power transmitted in any direction towards the horizon by an earth station operating in frequency bands between 1 and 15 GHz, shall not exceed the limits below.

For angles of elevation of the horizon greater than 5 degrees there shall be no restriction as to the equivalent isotropically radiated power transmitted by an earth station towards the horizon.

FCC Minimum Standard (FCC Section 25.204 &)

EIRP < +40 dBW in any 4 kHz band for $\theta=0$ degrees

The manufacturer has stated that the EUT has a maximum output power of +22 dBm.

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TABLE 3
RF POWER OUTPUT

Frequency of Fundamental (MHz)	Measurement (dBm)	Measurement (Watt)
1611.18	21.85	0.153
1618.60	22.01	0.159

Note: Given the output power and antenna gain of +4 dBi, even the direct lobe of radiation meets the FCC's EIRP Requirement for $\theta = 0$ (+40 dBW)

Test Date: October 1, 2004

Tester

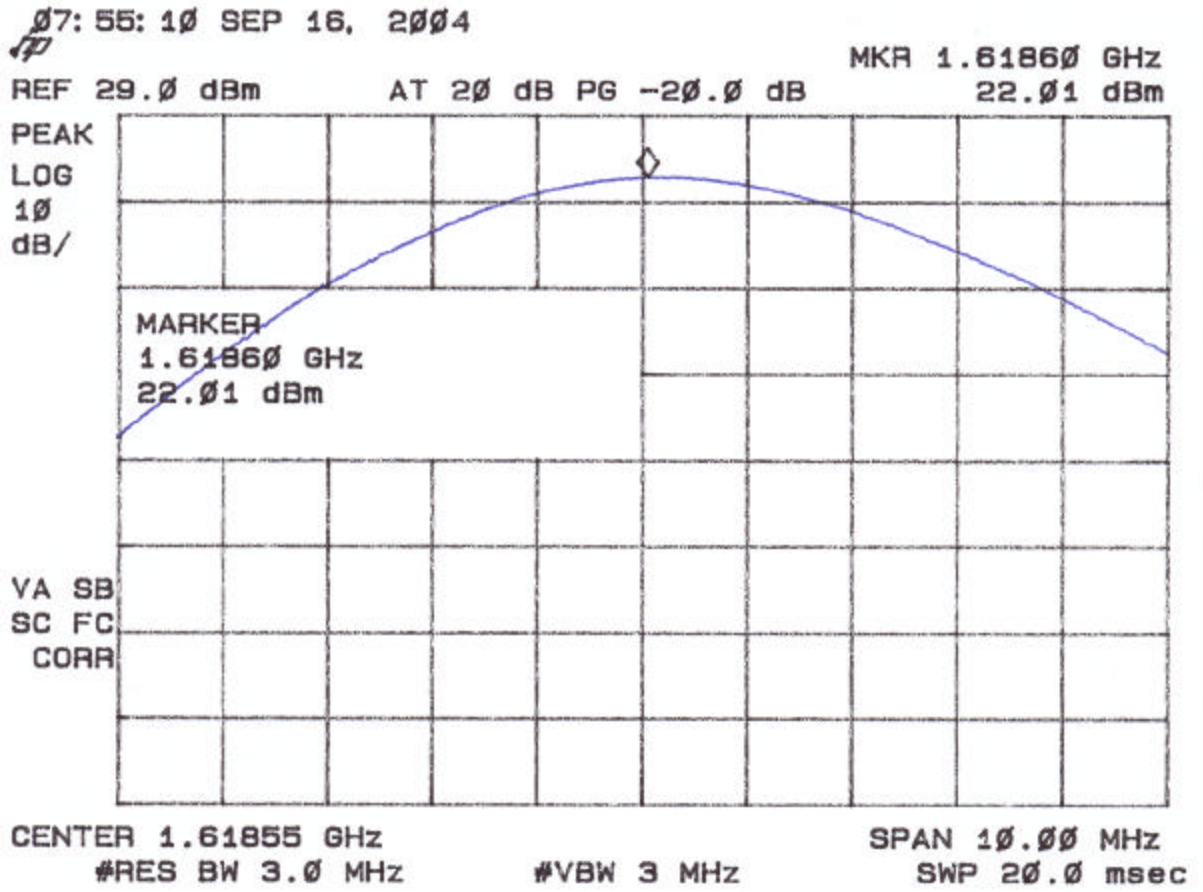
Signature: David P. Blethen

Name: David Blethen

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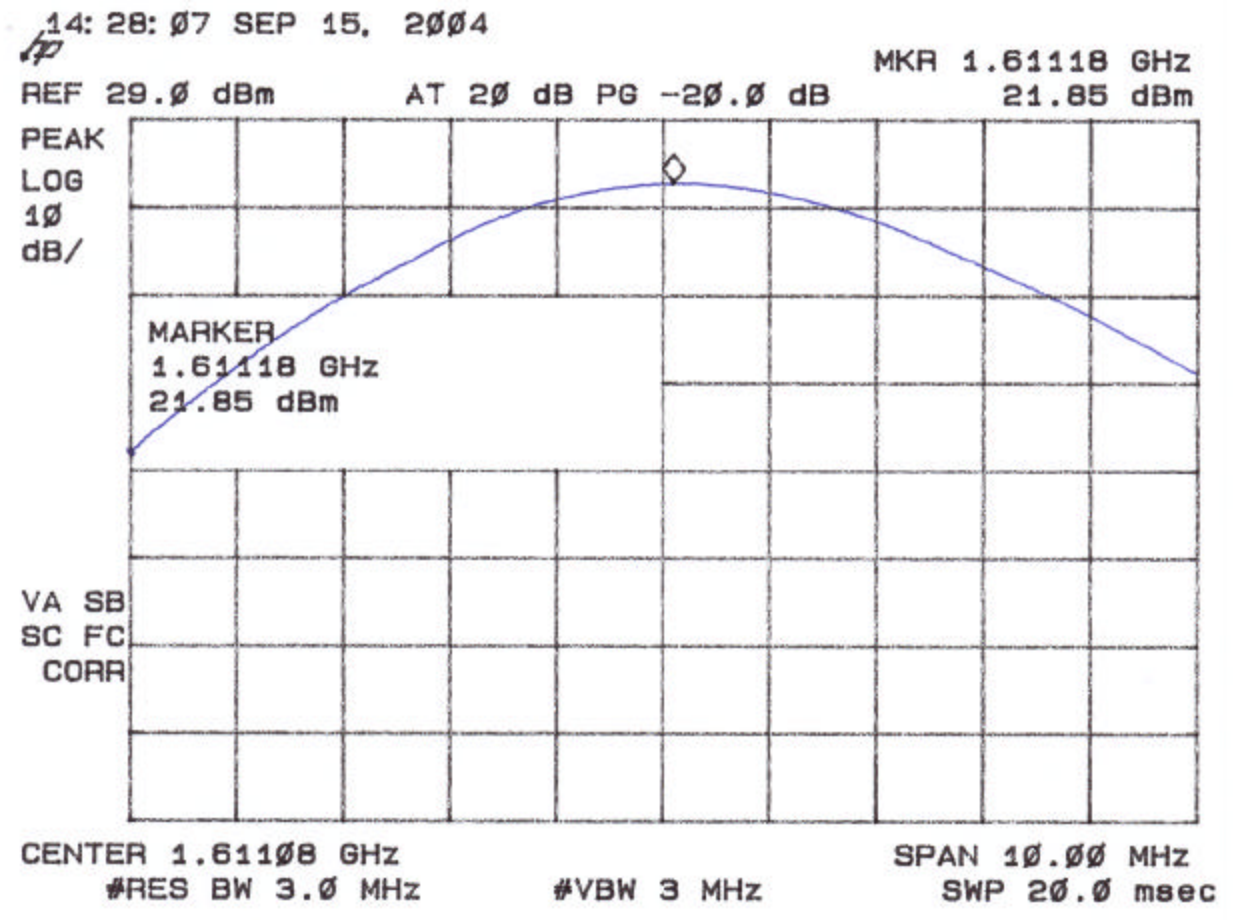
Figure 3a.
RF Power Output



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Figure 3b.
RF Power Output



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2.7 Modulation Characteristics (FCC Section 2.1047)

Since the device incorporates digital modulation techniques, this information is not necessary.

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**Figure 4.
Modulation Characteristics**

The EUT uses digital modulation techniques only which were employed during the tests for occupied bandwidth.

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2.8 Occupied Bandwidth (FCC Section 2.1049)

EUT was modulated by its own internal sources. Low and High Channels were tested. The bandwidth of the fundamental was measured using a spectrum analyzer. The results are shown in Figure 5a through Figure 5d. Long sweep times were applied near to the fundamental to ensure a good signal was obtained. Figure 5e is provided for 26 dB removal from peak signal for calculation of 99% Bandwidth. The manufacturer could not provide an unmodulated signal.

FCC Minimum Standard (FCC Section 25.202(f))

For out-of-band emissions for frequencies removed from the midpoint of the assigned frequency by more than 50% up to and including 100% of the authorized bandwidth (2.5 MHz), at least 25 dB.

For out-of-band emissions for frequencies removed from the midpoint of the assigned frequency by more than 100% up to and including 250% of the authorized bandwidth (2.5 MHz), at least 35 dB.

For out-of-band emissions for frequencies removed from the midpoint of the assigned frequency segment by more than 250% of the authorized bandwidth (2.5 MHz), at least $43 + 10 \log (P_{\text{Watts}})$ attenuation below the mean power of the transmitter.

For Lowest Channel = $43 + 10 \log (0.153) = 34.8 \text{ dB}$

For Highest Channel = $43 + 10 \log (0.159) = 35.0 \text{ dB}$

The following plots show that all emissions were at least 50.4 dB below the fundamental.

Note:

A 3 kHz RBW was used instead. This was deemed to be comparable to 4 kHz RBW.