M. Flom Associates, Inc.
International Compliance Testing Laboratory
3356 N. San Marcos Place, Suite 107
Chandler, AZ 85225
toll-free: (866) 311-3268
fax: (480) 926-3598
http://www.mflom.com
info@mflom.com

Date: December 22, 2005

Federal Communications Commission
Via: Electronic Filing

Attention: Authorization & Evaluation Division

Applicant: Honeywell International Inc.
Equipment: NC860A / NC861A
FCC ID: GB8NC861A
FCC Rules: 87, 2.1043(b)(2), Class II Permissive Change

Gentlemen:

On behalf of the Applicant, enclosed please find Application Form 731, Engineering Test Report and all pertinent documentation, the whole for approval of the referenced equipment as shown i.e.:

a) Application Form
b) Test Report
c) Filing Fees
d) Copy of Original Grant
e) Expository Statement (included in the Test Report)
f) Photos (not applicable as no hardware changes made)

We trust the same is in order. Should you need any further information, kindly contact the writer who is authorized to act as agent.

Sincerely yours,

Michael Schafer, President

enclosure(s)
cc: Applicant
MS/del

Original Grant

COPY

FEDERAL COMMUNICATIONS
COMMISSION
WASHINGTON, D.C. 20554

COPY

GRANT OF EQUIPMENT
AUTHORIZATION
Certification

Honeywell International Inc.
Commercial Electronic Systems - Phoenix
21111 N. 19th Avenue
Phoenix, AZ 85027
United States

Date of Grant: 08/29/2002

Application Dated: 06/25/2002

Attention: Steve O'Hanian , Certifications Engineer

NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER: GB8NC861A
Name of Grantee: Honeywell International Inc.
Equipment Class: Licensed Non-Broadcast Station Transmitter
Notes: Aircraft Transceiver

Grant Notes	FCC Rule Parts	Frequency Range (MHZ)	Output Watts	Frequency Tolerance	Emission Designator
	87	117.975 - 152.0	22.0	20.0 PM	6K00A3E

Mail To:
Morton Flom, President
M. Flom Associates, Inc.
3356 N. San Marcos Place, Suite 107
Chandler, AZ 85225

EA637090

New Grant Request

BM	87	118.000 – 136.975	22.0	2ppm	6K00A3E
BM	87	118.000 – 136.975	22.0	2ppm	14K0G1D

BM: The output power is continuously variable from the value listed in this entry to 50%-55% of the value listed.

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Transmitter Certification

of

Model: NC860A / NC861A
FCC ID: GB8NC861A

to

Federal Communications Commission

Rule Part(s) 87, 2.1043(b)(2)

Date of report: December 22, 2005

On the Behalf of the Applicant:

Honeywell International Inc.

At the Request of: P.O. 2798902

Honeywell Inc., Business & Commuter Aviation Systems
5353 W. Bell Rd.
Glendale, AZ 85308-3999

Attention of: Charles Dosdall, Manager
602 436 4653

Supervised by: David E. Lee, Quality Assurance Manager

The Applicant has been cautioned as to the following:

15.21 **Information to the User**.

The users manual or instruction manual for an intentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

15.27(a) **Special Accessories**.

Equipment marketed to a consumer must be capable of complying with the necessary regulations in the configuration in which the equipment is marketed. Where special accessories, such as shielded cables and/or special connectors are required to enable an unintentional or intentional radiator to comply with the emission limits in this part, the equipment must be marketed with, i.e. shipped and sold with, those special accessories. However, in lieu of shipping or packaging the special accessories with the unintentional or intentional radiator, the responsible party may employ other methods of ensuring that the special accessories are provided to the consumer, without additional charge.

Information detailing any alternative method used to supply the special accessories for a grant of equipment authorization or retained in the verification records, as appropriate. The party responsible for the equipment, as detailed in § 2.909 of this chapter, shall ensure that these special accessories are provided with the equipment. The instruction manual for such devices shall include appropriate instructions on the first page of text concerned with the installation of the device that these special accessories must be used with the device. It is the responsibility of the user to use the needed special accessories supplied with the equipment.

Table of Contents

Required information per ISO/IEC Guide 25-1990, paragraph 13.2:

a) **Test Report**

b) Laboratory: M. Flom Associates, Inc.
(FCC: 31040/SIT) 3356 N. San Marcos Place, Suite 107
(Canada: IC 2044) Chandler, AZ 85225

c) Report Number: d0590051

d) Client: Honeywell Inc., Business & Commuter Aviation Systems
5353 W. Bell Rd.
Glendale, AZ 85308-3999

e) Identification: NC860A / NC861A
FCC ID: GB8NC861A
EUT Description: VHF/AM Airborne Navigation/Communications Transceiver

f) EUT Condition: Not required unless specified in individual tests.

g) Report Date: December 22, 2005
EUT Received: September 16, 2005

h, j, k): As indicated in individual tests.

i) Sampling method: No sampling procedure used.

l) Uncertainty: In accordance with MFA internal quality manual.

m) Supervised by:

David E. Lee, Quality Assurance Manager

n) Results: The results presented in this report relate only to the item tested.

o) Reproduction: This report must not be reproduced, except in full, without written permission from this laboratory.

Accessories used during testing:

Type	Quantity	Manufacturer	Model	Serial No.	FCC ID
Break Out Box	1	Honeywell	none	none	none

Sub-part
2.1033(c)(14):

Test and Measurement Data

All tests and measurement data shown were performed in accordance with FCC Rules and Regulations, Volume II; Part 2, Sub-part J, Sections 2.947, 2.1033(c), 2.1041, 2.1046, 2.1047, 2.1079, 2.1051, 2.1053, 2.1055, 2.1057 and the following individual Parts:

_____	21 – Domestic Public Fixed Radio Services
_____	22 – Public Mobile Services
_____	22 Subpart H - Cellular Radiotelephone Service
_____	22.901(d) - Alternative technologies and auxiliary services
_____	23 – International Fixed Public Radiocommunication services
_____	24 – Personal Communications Services
_____	74 Subpart H - Low Power Auxiliary Stations
_____	80 – Stations in the Maritime Services
_____	80 Subpart E - General Technical Standards
_____	80 Subpart F - Equipment Authorization for Compulsory Ships
_____	80 Subpart K - Private Coast Stations and Marine Utility Stations
_____	80 Subpart S - Compulsory Radiotelephone Installations for Small Passenger Boats
_____	80 Subpart T - Radiotelephone Installation Required for Vessels on the Great Lakes
_____	80 Subpart U - Radiotelephone Installations Required by the Bridge-to-Bridge Act
_____	80 Subpart V - Emergency Position Indicating Radio Beacons (EPIRB'S)
_____	80 Subpart W - Global Maritime Distress and Safety System (GMDSS)
_____	80 Subpart X - Voluntary Radio Installations
X	87 – Aviation Services
_____	90 – Private Land Mobile Radio Services
_____	94 – Private Operational-Fixed Microwave Service
_____	95 Subpart A - General Mobile Radio Service (GMRS)
_____	95 Subpart C - Radio Control (R/C) Radio Service
_____	95 Subpart D - Citizens Band (CB) Radio Service
_____	95 Subpart E - Family Radio Service
_____	95 Subpart F - Interactive Video and Data Service (IVDS)
_____	97 - Amateur Radio Service
_____	101 – Fixed Microwave Services

Standard Test Conditions
and
Engineering Practices

Except as noted herein, the following conditions and procedures were observed during the testing:

In accordance with ANSI C63.4-1992/2003, and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 10° to 40°C (50° to 104 °F) unless the particular equipment requirements specify testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.

Prior to testing, the EUT was tuned up in accordance with the manufacturer's alignment procedures. All external gain controls were maintained at the position of maximum and/or optimum gain throughout the testing.

Measurement results, unless otherwise noted, are worst-case measurements.

THE AMERICAN
ASSOCIATION
FOR LABORATORY
ACCREDITATION

ACCREDITED LABORATORY

A2LA has accredited

M. FLOM ASSOCIATES, INC.
Chandler, AZ

for technical competence in the field of

Electrical Testing

The accreditation covers the specific tests and types of tests listed on the agreed scope of accreditation. This laboratory meets the requirements of ISO/IEC 17025 - 1999 "General Requirements for the Competence of Testing and Calibration Laboratories" and any additional program requirements in the identified field of testing.

Presented this 16th day of June 2004.

President
For the Accreditation Council
Certificate Number 2152-01
Valid to August 31, 2006

For tests or types of tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

A2LA

"A2LA has accredited M. Flom Associates, Inc. Chandler, AZ for technical competence in the field of Electrical Testing. The accreditation covers the specific tests and types of tests listed on the agreed scope of accreditation. This laboratory meets the requirements of ISO/IEC 17025 – 1999 'General Requirements for the Competence of Testing and Calibration Laboratories' and any additional program requirements in the identified field of testing."

Certificate Number: **2152-01**

Expository Statement

Permissive Change

Applicant: Honeywell International Inc.

FCC ID: GB8NC861A

The applicant has made design changes/improvements to the originally FCC approved equipment.

Data contained herein confirms that a Permissive Change to the unit has been effected and that the performance of the unit is at or better than the levels originally reported to the commission. The FCC ID covers two manufacturers model numbers NC860A and NC861A, which are electrically identical. The EUT was an NC860A.

The following changes/improvements have been made:

a) the addition of a new modulation type D8PSK that is to be designated as 14K0G1D.
b) the correction of the authorized frequency range of the original Grant to 118.000 - 136.975 to bring it in to line with Part 87 limits.
c) Addition of Grant Note BM

No other changes have been made.

Re a): The new protocol employs a bit transmission rate of 31,500 bits per second over the air/ground link using a single 25 kHz channel. The increased utilization of the 25 kHz channel is achieved by employing a more bandwidth efficient modulation scheme known as Differential Eight Phase Shift Keying or D8PSK. A D8PSK transmitter transmits a carrier whose phase is modulated by the data as one of eight possible angles: 0, $\pi/8$, $\pi/4$, $3\pi/8$, $\pi/2$, $5\pi/8$, $3\pi/4$ or $7\pi/8$ radians. The rate at which the carrier phase is changed is the modulation rate. The difference in the phase between successive phase changes, which may also be equal to 0, $\pi/8$, $\pi/4$, $3\pi/8$, $\pi/2$, $5\pi/8$, $3\pi/4$ or $7\pi/8$ radians, is known as a D8PSK symbol. Since there are 8 possible phase differences, each phase change (D8PSK symbol) represents three bits of information: 000, 001, 011, 010, 110, 111, 101, or 100. Hence, if the phase changes at a 10.5 kHz rate, the data transmission rate is equal to 31.5 kbps. In other words, the VDL Mode 2 D8PSK modulator uses the bits in the message, 3 at a time, to select the carrier phase change at a rate of 10,500 D8PSK symbols per second. Thus, a 10.5 kHz D8PSK phase modulation rate corresponds to a D8PSK data transmission rate of 31.5 kbps.

The D8PSK modulation of the phase of the VHF carrier is accomplished using a quadrature modulator. The inputs to the quadrature modulator are the real (in-phase) and imaginary (quadrature) parts of the D8PSK symbol phase, and the VHF carrier. The real component of the D8PSK phase modulates the amplitude of the carrier while the imaginary component modulates the amplitude of the 90 degree phase shifted version of the carrier; hence the name quadrature modulator. Summing the two amplitude modulated quadrature carriers produces the D8PSK modulated VHF carrier.

In order to limit the spectrum occupancy of the modulated signal to less than 25 kHz, the in-phase (real) and quadrature (imaginary) component inputs to the quadrature modulator signal are filtered using identical low-pass filters with raised cosine spectrum. The Raised Cosine filters limit the bandwidth occupied by the modulated carrier to 16.8 kHz. The quadrature-modulated carrier is then amplified to produce a 15-20 Watt transmitter output. Note that the amplitude of the D8PSK modulated carrier changes significantly whenever there is a phase change of π radians.

If the power amplifier were perfectly linear for all input signal levels or if the modulated carrier had constant amplitude, then the spectrum occupancy of the transmitter output would be limited to 16.8 kHz. Since neither is true, non-liner inter-modulation products are generated when the input level of the quadrature modulated carrier approaches the saturation level of the amplifier. This effect is also referred to as spectrum re-growth. The levels of the inter-modulation products are well below those of the desired output but they inject higher emissions into adjacent channels than those produced by a perfectly linear amplifier. Thus, in order to maintain D8PSK output emissions into adjacent channels at very low levels, highly linear amplifiers or techniques that linearize the output of the amplifier are used. D8PSK modulation was chosen for VDL Mode 2 because it is bandwidth and power efficient. It offers the best compromise between achievable data rate within a 25 kHz channel and attainable communications range with a 18 W transmitter.

Adding the G1D designator to the GB8NC861A requires that the frequency tolerance change from 20ppm to 2pm (87.133(a)(5) note 12). While the original submission showed frequency tolerance better than 2ppm a new set of test figures are included to support the 2ppm notation for both 6K00A3E and 14K0G1D designators.

Re b): The original frequency range on the Grant was to cover the extended frequency capability of the unit for operations outside the USA and Canada. These capabilities / frequencies are not permitted under Part 87 in the USA or RSS-141 in Canada and the Grant is requested to be modified accordingly.

Re c): The unit does have adjustable power and the communications only version GB8TR865A carries the Grant Note BM which also applies to this unit.

List of General Information Required for Certification

In Accordance with FCC Rules and Regulations,
Volume II, Part 2 and to 87, 2.1043(b)(2), and Confidentiality

Sub-part 2.1033

(c)(1): **Name and Address of Applicant**:

Honeywell International Inc.
Commercial Electronic Systems
21111 N. 19th Avenue
Phoenix, AZ 85027

Manufacturer:

Applicant

(c)(2): **FCC ID**: GB8NC861A

Model Number: NC860A / NC861A

(c)(3): **Instruction Manual(s):**
Please see original exhibits

(c)(4): **Type of Emission**: 14K0G1D, 6K00A3E

(c)(5): **Frequency Range, MHz**: 118.000 to 136.975

(c)(6): **Power Rating, Watts**: 22.0
____ Switchable X Variable ____ N/A

FCC Grant Note: BM

(c)(7): **Maximum Power Rating, Watts**: 100

DUT Results: Passes X Fails _____

(c)(8): Voltages & currents in all elements in final RF stage, including final transistor or solid-state device:

Collector Current, A	=	8.5
Collector Voltage, Vdc	=	24
Supply Voltage, Vdc	=	28

(c)(14): **Test and Measurement Data**:

Follows

Name of Test: Carrier Output Power (Conducted)

Specification: 47 CFR 2.1046(a)

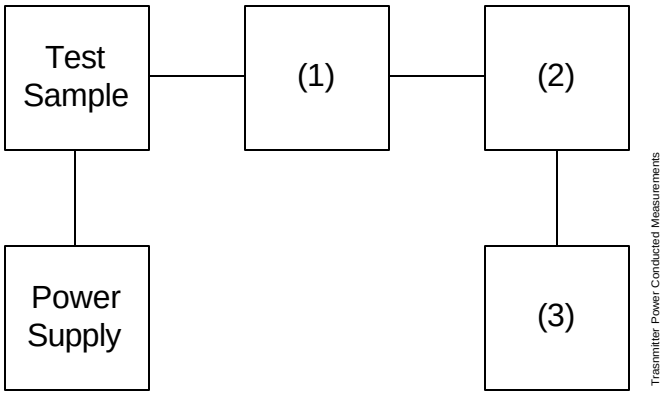
Guide: ANSI/TIA/EIA-603-1992, Paragraph 2.2.1

Measurement Procedure

A) The EUT was connected to a resistive coaxial attenuator of normal load impedance, and the unmodulated output power was measured by means of an RF Power Meter.

B) Measurement accuracy is ±3%.

Transmitter Test Set-Up: RF Power Output



	Asset	Description	s/n	Cycle	Last Cal
(1)	**Coaxial Attenuator**				
X	i00231/2	PASTERNACK PE7021-30 (30 dB)	231 or 232	NCR	
	i00122/3	NARDA 766 (10 dB)	7802 or 7802A	NCR	
(2)	**Power Meters**				
X	i00020	HP 8901A Power Mode	2105A01087	12 mo.	Apr-05
(3)	**Frequency Counter**				
X	i00020	HP 8901A Frequency Mode	2105A01087	12 mo.	Apr-05

Name of Test: Carrier Output Power (Conducted)

Measurement Results
(Worst case)

Frequency of Carrier, MHz	=	127.000, 118.000, 136.975
Ambient Temperature	=	23°C ± 3°C

Power Setting	RF Power, Watts
High	22.0

Performed by: Fred Chastain, Test Technician

Name of Test: Unwanted Emissions (Transmitter Conducted)

Specification: 47 CFR 2.1051

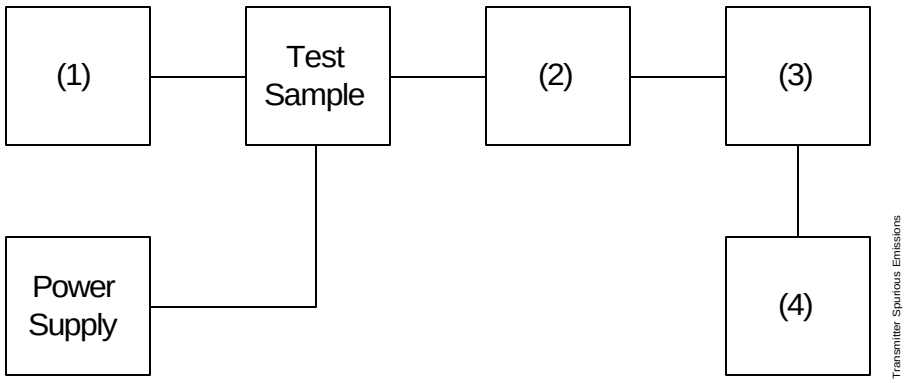
Guide: ANSI/TIA/EIA-603-1992, Paragraph 2.2.13

Measurement Procedure

A) The emissions were measured for the worst case as follows:
   1). within a band of frequencies defined by the carrier frequency plus and minus one channel.
   2). from the lowest frequency generated in the EUT and to at least the 10th harmonic of the carrier frequency, or 40 GHz, whichever is lower.

B) The magnitude of spurious emissions that are attenuated more than 20 dB below the permissible value need not be specified.

Transmitter Test Set-Up: Spurious Emission



	Asset	Description	s/n		
(1) **Audio Oscillator/Generator**					
X	i00017	HP 8903A Audio Analyzer	2216A01753	12 mo.	Apr-05
	i00002	HP 3336B Synthesizer / Level Gen.	1931A01465	12 mo.	Apr-05
(2) **Coaxial Attenuator**					
X	i00231/2	PASTERNACK PE7021-30 (30 dB)	231 or 232	NCR	
	i0012/3	NARDA 766 (10 dB)	7802 or 7802A	NCR	
(3) **Filters; Notch, HP, LP, BP**					
		None required			
(4) **Spectrum Analyzer**					
X	i00048	HP 8566B Spectrum Analyzer	2511A01467	12 mo.	Oct-05
	i00029	HP 8563E Spectrum Analyzer	3213A00104	12 mo.	May-05

Name of Test: Unwanted Emissions (Transmitter Conducted)

Measurement Results
(Worst Case)

Summary:

Frequency of carrier, MHz	=	127.000, 118.000, 136.975
Spectrum Searched, GHz	=	0 to 10 x F_C
Maximum Response, Hz	=	N/A
All Other Emissions	=	= 20 dB Below Limit
Limit(s), dBc	-(43+10xLOG P) =	56.42 (22 Watts)

Tabulated Results follow:

Measurement Results

g0590061: 2005-Sep-16 Fri 09:44:00
State: 2:High Power Ambient Temperature: 23°C ± 3°C

Frequency Tuned, MHz	Frequency Emission, MHz	Level, dBm	Level, dBc
127.000000	30.570000	-23.70	-80.12
136.975000	32.110000	-20.60	-77.02
127.000000	35.610000	-22.80	-79.22
118.000000	39.610000	-23.20	-79.62
127.000000	44.060000	-25.90	-82.32
127.000000	47.560000	-26.30	-82.72
118.000000	52.570000	-24.10	-80.52
127.000000	52.600000	-32.60	-89.02
136.975000	52.600000	-25.10	-81.52
127.000000	57.610000	-23.00	-79.42
136.975000	61.600000	-23.50	-79.92
118.000000	65.560000	-26.40	-82.82
127.000000	69.560000	-33.50	-89.92
127.000000	74.580000	-28.20	-84.62
136.975000	75.480000	-33.70	-90.12
118.000000	78.600000	-23.40	-79.82
127.000000	79.510000	-31.60	-88.02
136.975000	82.120000	-35.80	-92.22
127.000000	83.030000	-30.30	-86.72
136.975000	84.500000	-33.40	-89.82

g0590061: 2005-Sep-16 Fri 09:44:00
State: 2:High Power Ambient Temperature: 23°C ± 3°C

Frequency Tuned, MHz	Frequency Emission, MHz	Level, dBm	Level, dBc
127.000000	84.500000	-34.80	-91.22
127.000000	86.550000	-37.40	-93.82
127.000000	86.790000	-43.80	-100.22
136.975000	86.790000	-32.50	-88.92
118.000000	86.790000	-29.90	-86.32
127.000000	88.060000	-24.50	-80.92
118.000000	89.080000	-24.90	-81.32
118.000000	91.340000	-30.10	-86.52
127.000000	91.360000	-33.60	-90.02
136.975000	91.360000	-28.70	-85.12
127.000000	91.540000	-26.50	-82.92
136.975000	91.870000	-29.90	-86.32
118.000000	92.050000	-29.50	-85.92
118.000000	92.550000	-23.50	-79.92
136.975000	93.610000	-21.80	-78.22
118.000000	93.650000	-24.80	-81.22
118.000000	95.940000	-24.00	-80.42
136.975000	95.940000	-23.60	-80.02
127.000000	96.600000	-33.90	-90.32
118.000000	98.580000	-32.90	-89.32
127.000000	100.100000	-36.10	-92.52
136.975000	100.520000	-45.00	-101.42
118.000000	100.540000	-44.70	-101.12
118.000000	101.620000	-46.30	-102.72
136.975000	102.920000	-37.20	-93.62
136.975000	103.050000	-37.20	-93.62
127.000000	103.420000	-25.80	-82.22
118.000000	104.540000	-29.50	-85.92
136.975000	105.030000	-29.00	-85.42
118.000000	105.030000	-37.90	-94.32
127.000000	105.050000	-28.50	-84.92
118.000000	105.530000	-31.40	-87.82
127.000000	106.940000	-26.30	-82.72
136.975000	107.400000	-21.20	-77.62
136.975000	109.600000	-24.30	-80.72
127.000000	110.070000	-23.20	-79.62
127.000000	113.560000	-22.20	-78.62
136.975000	114.180000	-23.50	-79.92
127.000000	116.360000	-25.30	-81.72

g0590061: 2005-Sep-16 Fri 09:44:00

State: 2:High Power Ambient Temperature: 23°C ± 3°C

Frequency Tuned, MHz	Frequency Emission, MHz	Level, dBm	Level, dBc
136.975000	116.530000	-38.10	-94.52
127.000000	125.510000	-24.10	-80.52
136.975000	125.580000	-23.90	-80.32
127.000000	125.670000	-25.60	-82.02
127.000000	126.000000	-36.00	-92.42
127.000000	127.620000	-37.20	-93.62
118.000000	127.890000	-24.10	-80.52
127.000000	128.150000	-26.20	-82.62
118.000000	130.570000	-29.10	-85.52
118.000000	131.580000	-21.10	-77.52
136.975000	134.690000	-28.90	-85.32
127.000000	140.520000	-29.60	-86.02
127.000000	140.630000	-40.10	-96.52
127.000000	144.040000	-31.80	-88.22
118.000000	144.540000	-23.50	-79.92
118.000000	145.030000	-26.10	-82.52
118.000000	148.420000	-25.70	-82.12
127.000000	148.440000	-25.70	-82.12
136.975000	148.480000	-23.40	-79.82
127.000000	149.080000	-20.10	-76.52
136.975000	150.750000	-26.30	-82.72
118.000000	156.580000	-23.50	-79.92
127.000000	156.600000	-26.40	-82.82
118.000000	157.570000	-31.30	-87.72
127.000000	157.610000	-30.30	-86.72
136.975000	157.610000	-34.00	-90.42
118.000000	158.100000	-21.80	-78.22
118.000000	158.600000	-21.30	-77.72
127.000000	162.540000	-21.90	-78.32
136.975000	166.630000	-24.60	-81.02
118.000000	170.570000	-24.90	-81.32
127.000000	179.480000	-24.30	-80.72
127.000000	179.640000	-25.10	-81.52
118.000000	182.370000	-22.00	-78.42
118.000000	190.070000	-25.20	-81.62
118.000000	235.687000	-32.70	-89.12
118.000000	236.090000	-26.70	-83.12
127.000000	254.000000	-35.00	-91.42
136.975000	274.050000	-37.80	-94.22
136.975000	298.800000	-26.30	-82.72

g0590061: 2005-Sep-16 Fri 09:44:00
State: 2:High Power Ambient Temperature: 23°C ± 3°C

Frequency Tuned, MHz	Frequency Emission, MHz	Level, dBm	Level, dBc
118.000000	353.784000	-33.40	-89.82
118.000000	354.090000	-31.20	-87.62
127.000000	381.018000	-33.30	-89.72
136.975000	410.990000	-27.20	-83.62
118.000000	472.022000	-33.40	-89.82
127.000000	508.002000	-27.70	-84.12
136.975000	547.900000	-37.00	-93.42
136.975000	548.314000	-33.70	-90.12
118.000000	589.966000	-32.90	-89.32
127.000000	634.994000	-29.40	-85.82
136.975000	684.900000	-25.10	-81.52
136.975000	685.037000	-33.60	-90.02
118.000000	708.000000	-38.20	-94.62
118.000000	708.343000	-32.60	-89.02
127.000000	761.821000	-33.60	-90.02
127.000000	762.000000	-38.20	-94.62
136.975000	821.946000	-32.80	-89.22
118.000000	825.938000	-32.90	-89.32
127.000000	889.003000	-32.90	-89.32
118.000000	943.847000	-33.40	-89.82
118.000000	944.000000	-38.90	-95.32
136.975000	958.923000	-33.40	-89.82
127.000000	1016.000000	-37.30	-93.72
127.000000	1016.355000	-32.60	-89.02
118.000000	1062.000000	-41.40	-97.82
118.000000	1062.186000	-32.40	-88.82
136.975000	1095.353000	-32.90	-89.32
136.975000	1095.800000	-37.60	-94.02
127.000000	1143.007000	-28.80	-85.22
118.000000	1180.000000	-36.30	-92.72
118.000000	1180.133000	-32.70	-89.12
136.975000	1232.756000	-33.20	-89.62
127.000000	1269.834000	-32.20	-88.62
127.000000	1270.000000	-38.90	-95.32
136.975000	1369.750000	-39.60	-96.02
136.975000	1370.214000	-32.50	-88.92

Performed by: Fred Chastain, Test Technician

Name of Test: Emission Masks (Occupied Bandwidth)

Specification: 47 CFR 2.1049(c)(1)

Guide: ANSI/TIA/EIA-603-1992, Paragraph 2.2.11

Measurement Procedure

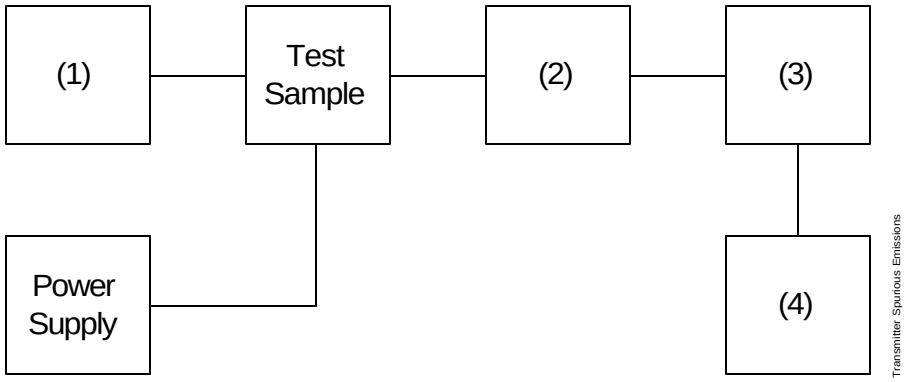
A) The EUT and test equipment were set up as shown below

B) For EUTs supporting audio modulation, the audio signal generator was adjusted to the frequency of maximum response and with output level set for ±2.5/±1.25 kHz deviation (or 50% modulation). With level constant, the signal level was increased 16 dB.

C) For EUTs supporting digital modulation, the digital modulation mode was operated to its maximum extent.

D) The Occupied Bandwidth was measured with the Spectrum Analyzer controls set as shown on the test results.

Transmitter Test Set-Up: Occupied Bandwidth



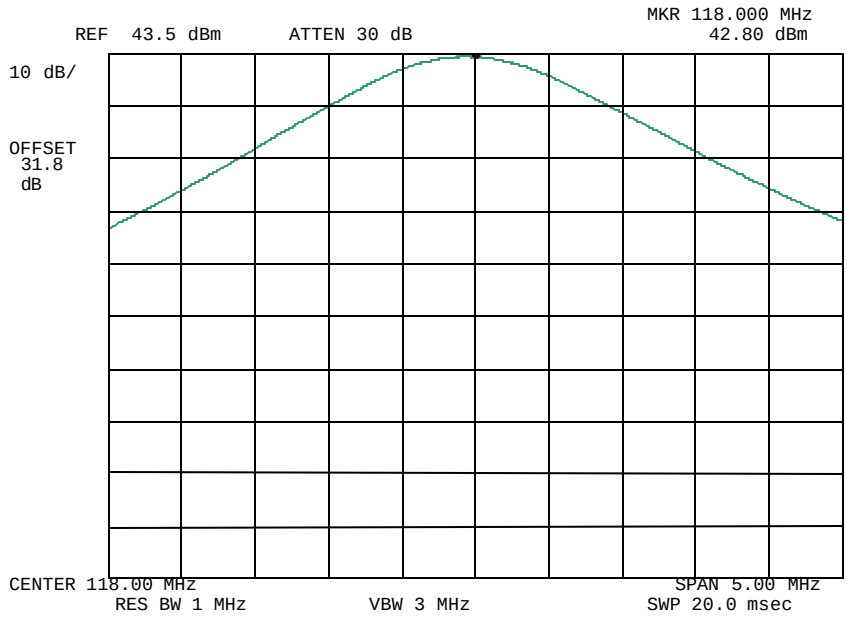
	Asset	Description	s/n	Cycle	Last Cal
(1) **Audio Oscillator/Generator**					
X	i00017	HP 8903A Modulation Meter	2216A01753	12 mo.	Apr-05
(2) **Coaxial Attenuator**					
X	i00231/2	PASTERNACK PE7021-30 (30 dB)	231 or 232	NCR	
	i00123	NARDA 766 (10 dB)	7802A	NCR	
(3) **Interface**					
X	i00021	HP 8954A Transceiver Interface	2146A00159	NCR	
(4) **Spectrum Analyzer**					
X	i00048	HP 8566B Spectrum Analyzer	2511A01467	12 mo.	Oct-05
	i00029	HP 8563E Spectrum Analyzer	3213A00104	12 mo.	May-05

Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g0590054: 2005-Sep-16 Fri 09:20:00
State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power: HIGH
Modulation: RF CW

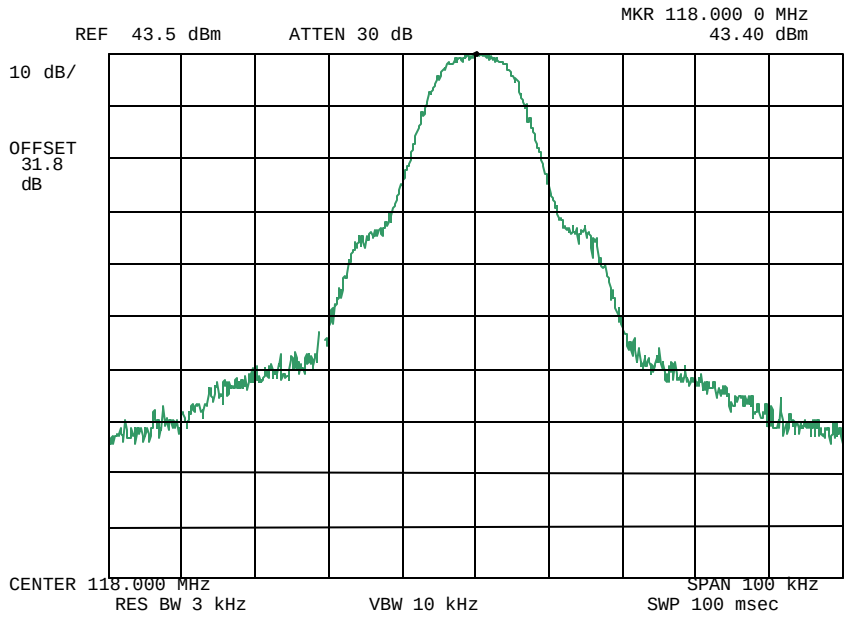
Performed by: Fred Chastain, Test Technician

Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g0590056: 2005-Sep-16 Fri 09:26:00
State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power: HIGH
Modulation: D8PSK

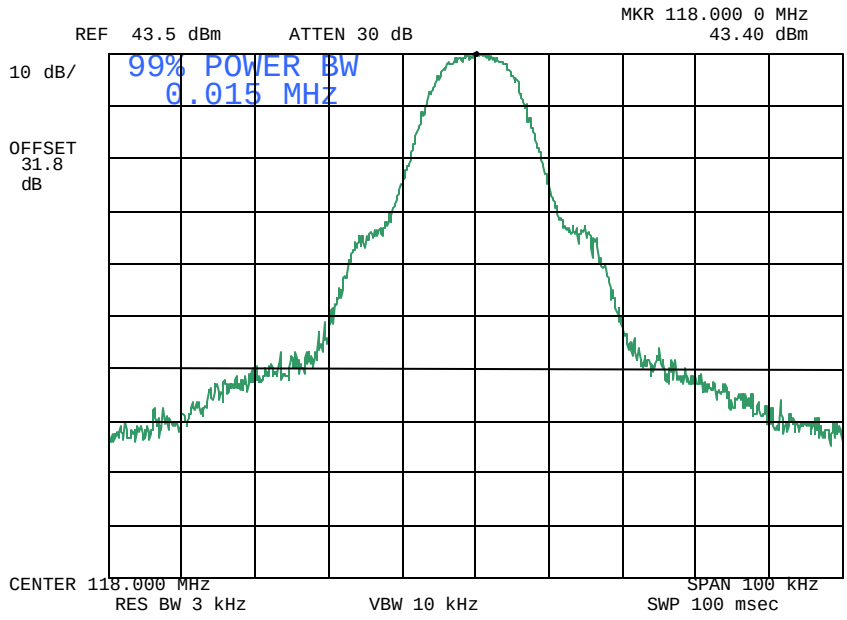
Performed by: Fred Chastain, Test Technician

Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g0590057: 2005-Sep-16 Fri 09:26:00
State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power: HIGH
Modulation: D8PSK
99% POWER BANDWIDTH

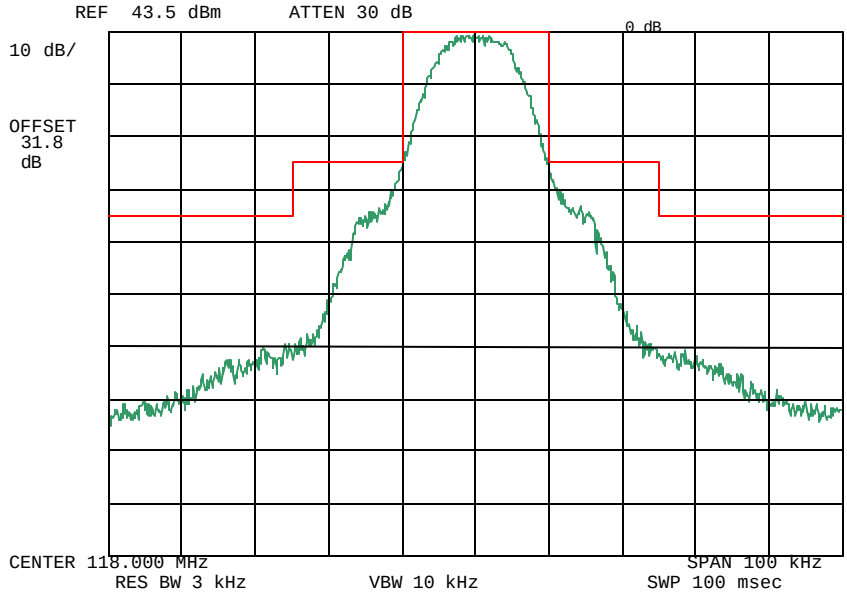
Performed by: Fred Chastain, Test Technician

Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g0590058: 2005-Sep-16 Fri 09:33:00
State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power: HIGH
Modulation: 14K0G1D
MASK: B, VHF/UHF 25kHz, w/LPF

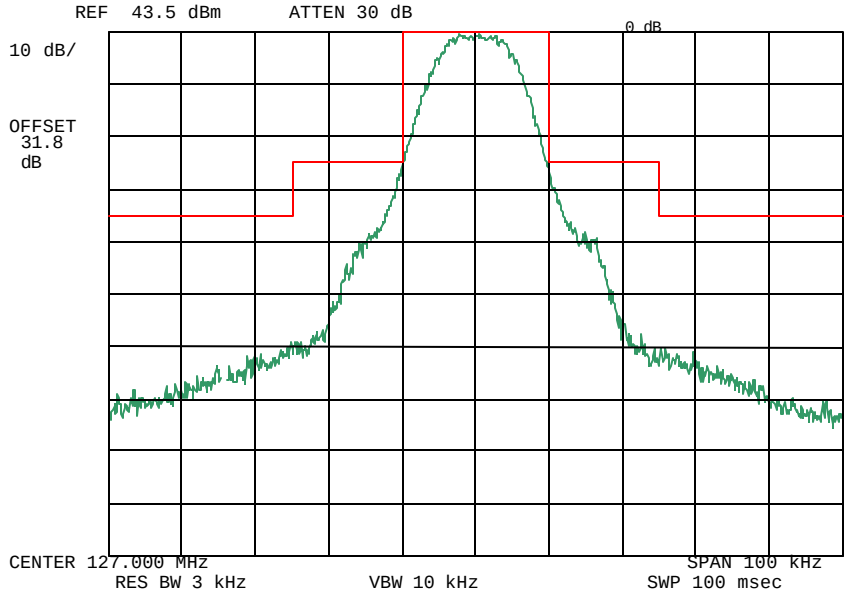
Performed by: Fred Chastain, Test Technician

Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g0590059: 2005-Sep-16 Fri 09:34:00
State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power: HIGH
Modulation: 14K0G1D
MASK: B, VHF/UHF 25kHz, w/LPF

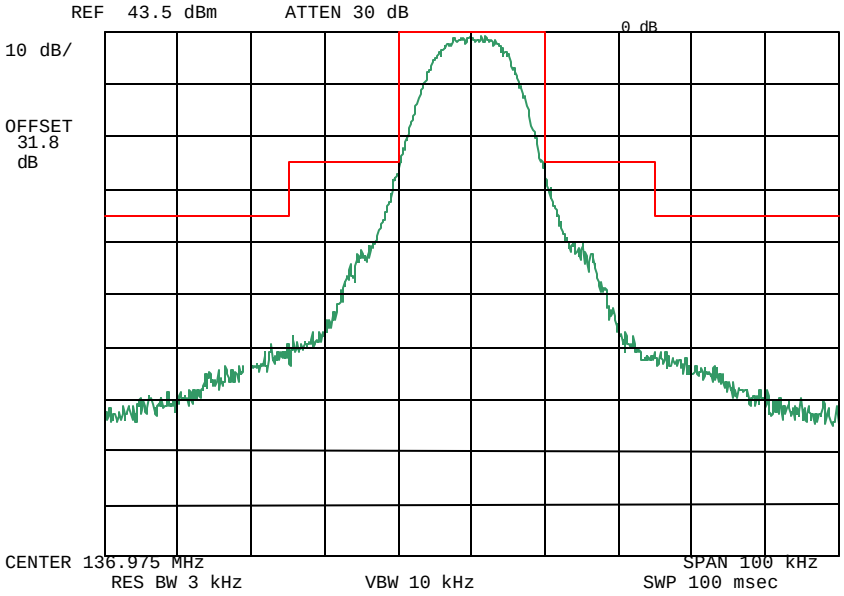
Performed by: Fred Chastain, Test Technician

Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g0590060: 2005-Sep-16 Fri 09:35:00
State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power: HIGH
Modulation: 14K0G1D
MASK: B, VHF/UHF 25kHz, w/LPF

Performed by: Fred Chastain, Test Technician

Name of Test: Frequency Stability (Temperature Variation)

Specification: 47 CFR 2.1055(a)(1)

Guide: ANSI/TIA/EIA-603-1992, Paragraph 2.2.2

Measurement Procedure

A) The EUT and test equipment were set up as shown on the following page.

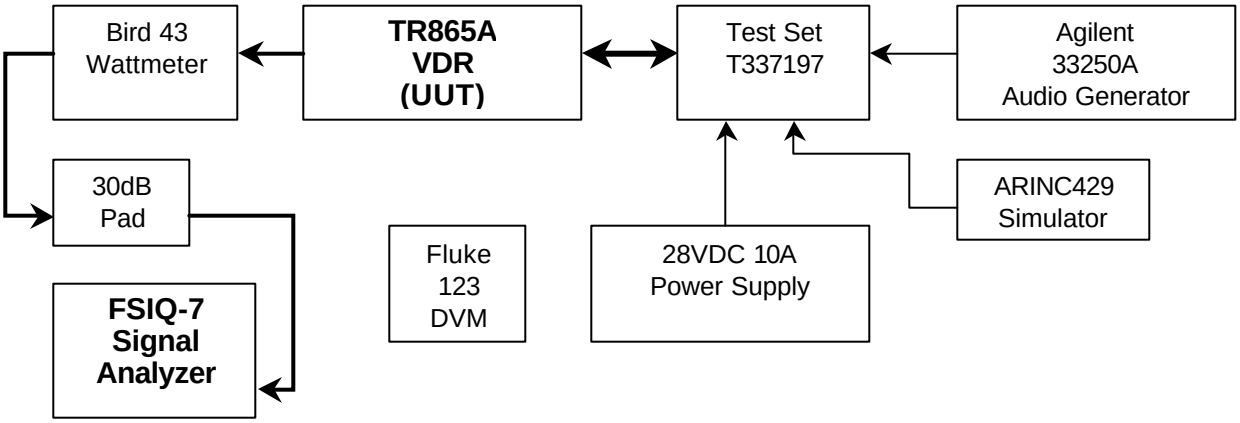
B) With all power removed, the temperature was decreased to -30°C and permitted to stabilize for three hours. Power was applied and the maximum change in frequency was noted within one minute.

C) With power OFF, the temperature was raised in 10°C steps. The sample was permitted to stabilize at each step for at least one-half hour. Power was applied and the maximum frequency change was noted within one minute.

D) The temperature tests were performed for the worst case.

Name of Test: Frequency Stability (Temperature Variation)

Transmitter Test Set-up



Equipment List and Calibration Due Date

Description	Model No.	Asset No.	Cal Date
VDR Test Set	T-337197	1	CNR
UUT VDR	TR-865A	UCN 03110484	CNR
Signal Analyzer	FSIQ-7	A205592	10 Aug 2006
30 dB Pad (50W)	Bird 8321	AV02109	CNR
RF Power Meter	Bird 43	AV0175	13 Dec 2005
Power Supply	HP6553	D400081	CNR
Audio Generator	Agilent 33250A	A204198	16 May 2006
Digital Multi-Mtr	Fluke123	AV3810	23 Jun 2006

Test Data - Taken at 28VDC on Sept 19, 2005

Test Frequency (MHz)	Chamber Temperature @3Hr Dwell	Measured Frequency (MHz)	Frequency Error (Hz)	Test Limit Data Mode (.0002%) (Hz)	Test Limit Voice Mode (.0005%) (Hz)
118.000	-20°C	117.999938	-62	236Hz	590 Hz
	20°C	117.999973	-27	236Hz	590 Hz
	55°C	117.999963	-37	236Hz	590 Hz
127.000	-20°C	126.999933	-67	254Hz	635Hz
	20°C	126.999971	-29	254Hz	635Hz
	55°C	126.999960	-40	254Hz	635Hz
136.975	-20°C	136.974929	-71	274Hz	685 Hz
	20°C	136.974970	-30	274Hz	685 Hz
	55°C	136.974956	-44	274Hz	685 Hz

Name of Test: Frequency Stability (Voltage Variation)

Specification: 47 CFR 2.1055(d)(1)

Guide: ANSI/TIA/EIA-603-1992, Paragraph 2.2.2

Measurement Procedure

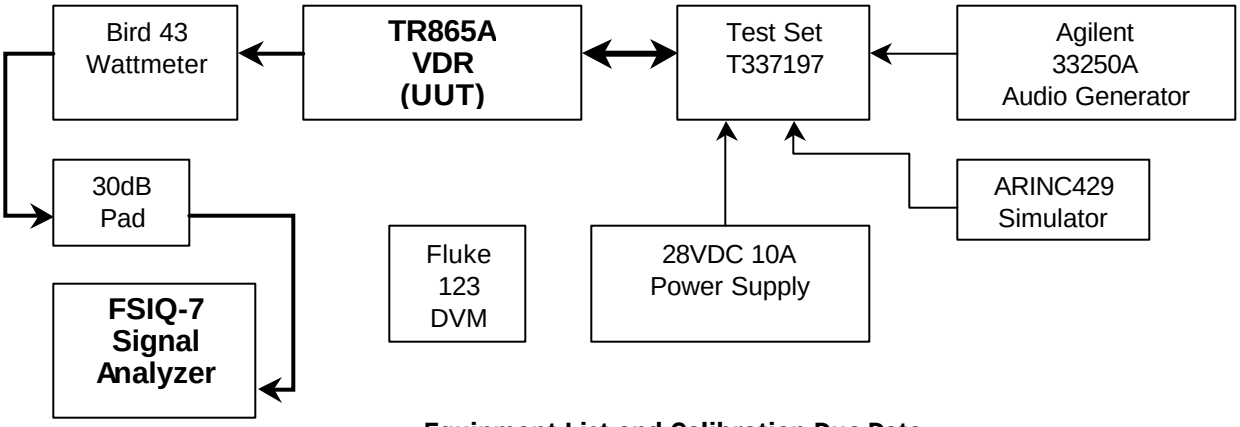
A) The EUT was placed in a temperature chamber (if required) at 25±5°C and connected as shown below.

B) The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.

C) The variation in frequency was measured for the worst case.

Results: Frequency Stability (Voltage Variation)

Transmitter Test Set-up



Equipment List and Calibration Due Date

Description	Model No.	Asset No.	Cal Date
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RF Power Meter	Bird 43	AV0175	13 Dec 2005
Power Supply	HP6553	D400081	CNR
Audio Generator	Agilent 33250A	A204198	16 May 2006
Digital Multi-Mtr	Fluke123	AV3810	23 Jun 2006

Test Data - Taken at 25°C on Sept 20, 2005

Test Frequency (MHz)	Supply Voltage (Volts)	Measured Frequency (MHz)	Frequency Error (Hz)	Test Limit Data Mode (.0002%) (Hz)	Test Limit Voice Mode (.0005%) (Hz)
118.000	18.0	117.999971	-29	236Hz	590 Hz
	22.4	117.999971	-29	236Hz	590 Hz
	23.8	117.999971	-29	236Hz	590 Hz
	28.0	117.999970	-30	236Hz	590 Hz
	32.2	117.999970	-30	236Hz	590 Hz
127.000	18.0	126.999965	-35	254Hz	635 Hz
	22.4	126.999966	-34	254Hz	635 Hz
	23.8	126.999966	-34	254Hz	635 Hz
	28.0	126.999967	-33	254Hz	635 Hz
	32.2	126.999967	-33	254Hz	635 Hz
136.975	18.0	135.974961	-39	274Hz	685 Hz
	22.4	135.974961	-39	274Hz	685 Hz
	23.8	135.974962	-38	274Hz	685 Hz
	28.0	135.974963	-37	274Hz	685 Hz
	32.2	135.974962	-38	274Hz	685 Hz

Name of Test: Necessary Bandwidth and Emission Bandwidth

Specification: 47 CFR 2.202(g)

Modulation = 6K00A3E

Necessary Bandwidth Calculation:

Maximum Modulation (M), kHz		0.206
Maximum Deviation (D), kHz	=	3.0
Constant Factor (K)	=	1
Necessary Bandwidth (B_N), kHz	=	(2xM)+(2xDxK)
	=	6.4

Modulation = 14K0G1D

Necessary Bandwidth Calculation:

Maximum Modulation (M), kHz		4.0
Maximum Deviation (D), kHz	=	3.0
Constant Factor (K)	=	1
Necessary Bandwidth (B_N), kHz	=	(2xM)+(2xDxK)
	=	14.0

Performed by: Fred Chastain, Test Technician

END OF TEST REPORT

Testimonial
and
Statement of Certification

This is to Certify:

1. **That** the application was prepared either by, or under the direct supervision of, the undersigned.

2. **That** the technical data supplied with the application was taken under my direction and supervision.

3. **That** the data was obtained on representative units, randomly selected.

4. **That**, to the best of my knowledge and belief, the facts set forth in the application and accompanying technical data are true and correct.

Certifying Engineer: David E. Lee, Quality Assurance Manager

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Chandler, Arizona 85225-7176
(480) 926-3100 phone, fax (480) 926-3598