

KTL Test Report: 8L0388EUSCA

Applicant: ADEMCO Group
165 Eileen Way
Syosset, NY 11791

**Equipment Under Test:
(E.U.T.)** NSA 1000

FCC ID: CFSK3852

In Accordance With: **FCC Part 22, Subpart H and RSS-118**
800 MHz Cellular Subscriber Units

Tested By: KTL Dallas, Inc.
802 N. Kealy
Lewisville, TX 75057-3136

Authorized By:

Tom Tidwell, RF Engineering Lab Manager

Date: May 1999

Total Number of Pages: 48

EQUIPMENT: NSA 1000
FCC ID: CFSK3852

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EQUIPMENT: NSA 1000
FCC ID: CFSK3852

Section 1. Summary of Test Results

Manufacturer: Niigata Seimitsu Co. Ltd.

Model No.: NSA 1000

Serial No.: 005

General: **All measurements are traceable to national standards.**

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 22, Subpart H and RSS-118.



New Submission



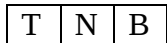
Production Unit



Class II Permissive Change



Pre-Production Unit



Equipment Code

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.

See " Summary of Test Data".



NVLAP LAB CODE: 100426-0

TESTED BY: Ronald Gaytan DATE: 03/10/99
Ronald Gaytan, Senior RF Technician

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EQUIPMENT: NSA 1000

FCC ID: CFSK3852

Summary Of Test Data

NAME OF TEST	PARA. NO.	SPEC.	MEAS.	RESULT
RF Power Output	2.1046	7W ERP	.7228 Watts	Complies
Audio Frequency Response	2.1047	6dB/Octave	Not Required	N/A
Audio Low Pass Filter Response	2.1047	Graph	Not Required	N/A
Modulation Limiting	2.1047	Graph	Not Required	N/A
Occupied Bandwidth (Voice & SAT)	2.1049	Mask	Not Required	N/A
Occupies Bandwidth (WB Data & SAT)	2.1049	Mask	See Plots	Complies
Occupied Bandwidth (ST)	2.1049	Mask	See Plots	Complies
Occupied Bandwidth (SAT)	2.1049	Mask	See Plots	Complies
Spurious Emissions at Antenna Terminals	2.1051	-13 dBm	-31.07 dBm	Complies
Field Strength of Spurious Emissions	2.1053	82.3 dBμV/m	64.6 dBμV/m	Complies
Frequency Stability	2.1055	2.5 ppm	0.086 ppm	Complies

Footnotes For N/A's:

The Equipment Under Test is used in a wireless security system. The E.U.T. only dials to the central office when activated. Voice information cannot be transmitted.

Test Conditions: Temperature: 20°C
 Humidity: 52%

EQUIPMENT: NSA 1000
FCC ID: CFSK3852

Section 2. General Equipment Specification

Frequency Range:	824 – 849 MHz
Tunable Bands:	1
Necessary Bandwidth:	40 kHz
Type of Modulation and Designator:	AMPS (40K0F1D)
Data Source:	Internal
Output Impedance:	50 ohms
RF Power Output (rated):	.631 watts
Number of Channels:	832
Duty Cycle:	Continuous
Channel Spacing:	30 kHz
Operator Selection of Frequency:	Software Controlled
Power Output Adjustment Capability:	Software Controlled

EQUIPMENT: NSA 1000
FCC ID: CFSK3852

Description of Modifications For Class II Permissive Change

Not Applicable

EQUIPMENT: NSA 1000
FCC ID: CFSK3852

Modifications Made During Testing

Not Applicable

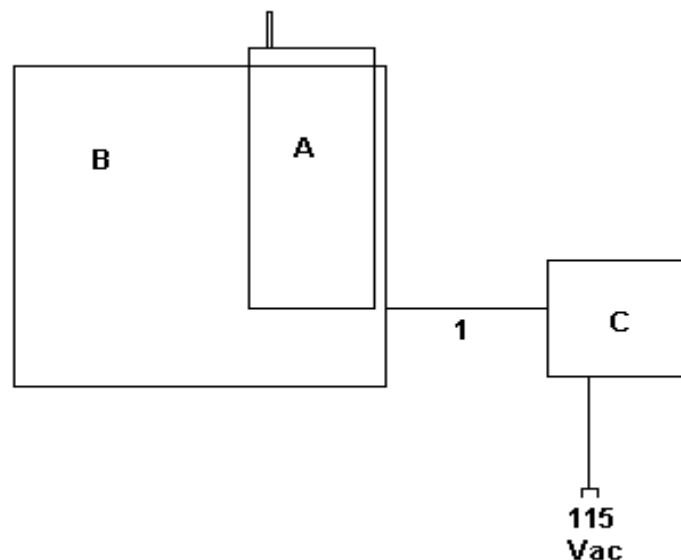
EQUIPMENT: NSA 1000
FCC ID: CFSK3852

Theory of Operation

The NSA 1000 is used in a wireless residential / commercial security system. The E.U.T. only dials the number of the subscriber company when the security system is activated.

System Diagram

EQUIPMENT IN TEST SETUP



	Description
A	Ademco/Niigata Seimitsu / Wireless Security System / MO# NSA 1000 / S/N# 005
B	Ademco/Niigata Seimitsu / Test Jig / MO# NSA1010 JIG2 / S/N# None
C	Hewlett Packard / DC Power Supply / MO# 6206B / S/N# 1145A04258

CABLES

	Description	Length(m)
1	DC Power leads 22 Gauge Stranded wire	1.0

EQUIPMENT: NSA 1000

FCC ID: CFSK3852

Section 3. RF Power Output

NAME OF TEST: RF Power Output	PARA. NO.: 2.1046
TESTED BY: Ron Gaytan	DATE: 03/02/99

Test Results: Complies.

Measurement Data:

Channel	Output Power (dBm)	Rated Power (dBm)	Measured / Rated (dB)
384	28.6	28	0.6

EQUIPMENT: NSA 1000
FCC ID: CFSK3852

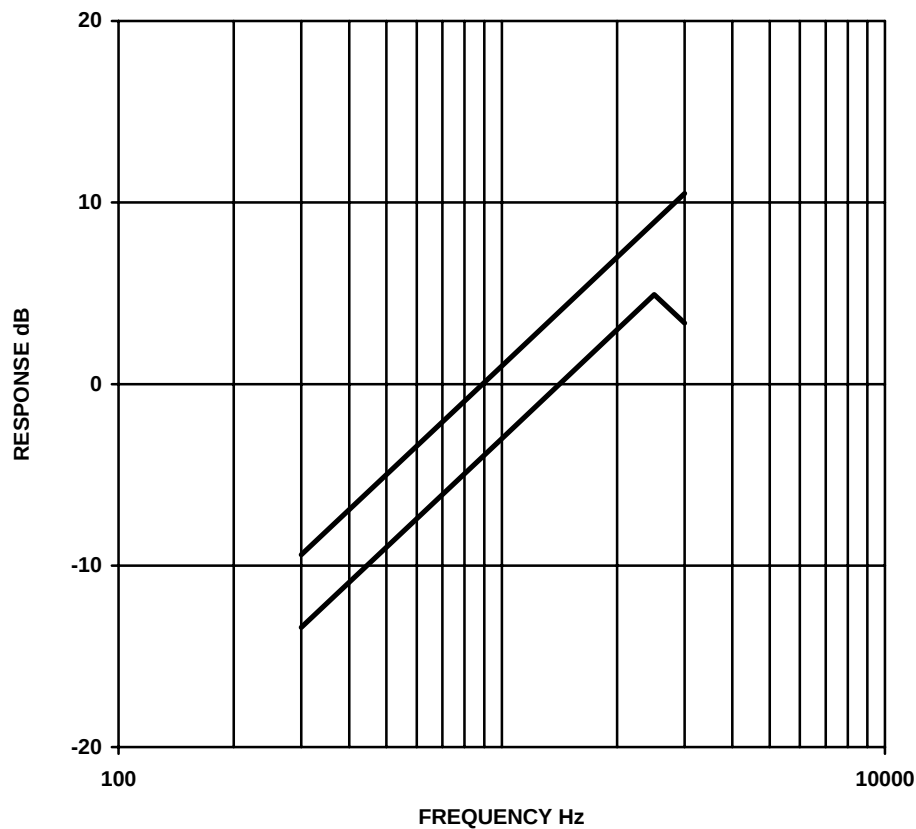
NAME OF TEST: Audio Frequency Response

PARA. NO.: 2.1047

TESTED BY: Not Applicable

DATE:

Not Applicable



EQUIPMENT: NSA 1000
FCC ID: CFSK3852

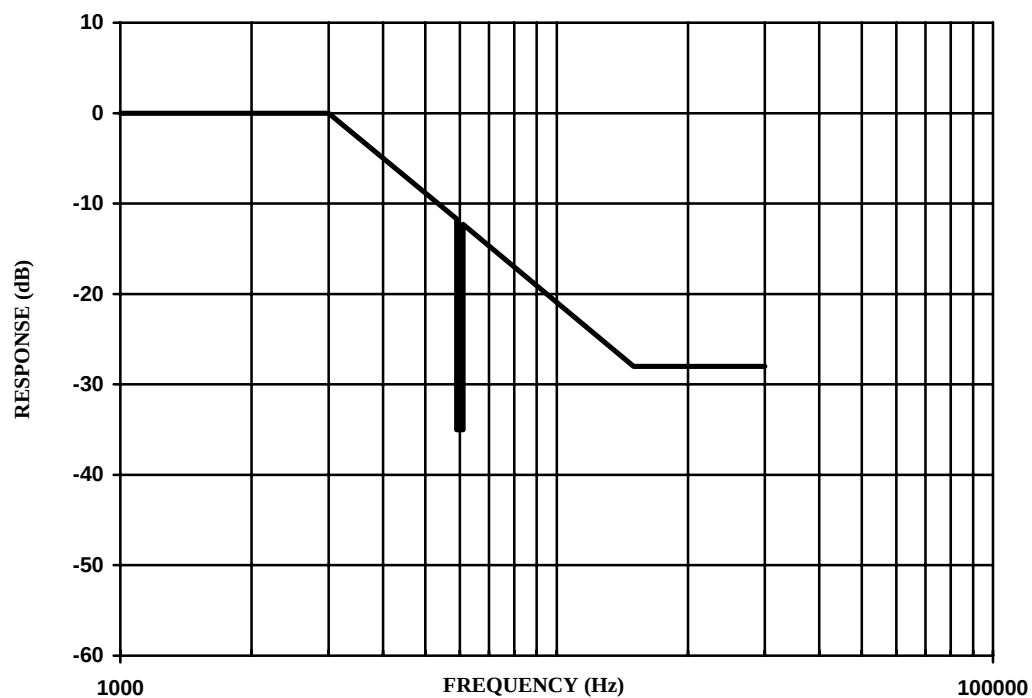
NAME OF TEST: Audio Low Pass Filter Response

PARA. NO.: 2.1047

TESTED BY: Not Applicable

DATE:

Not Applicable



EQUIPMENT: NSA 1000
FCC ID: CFSK3852

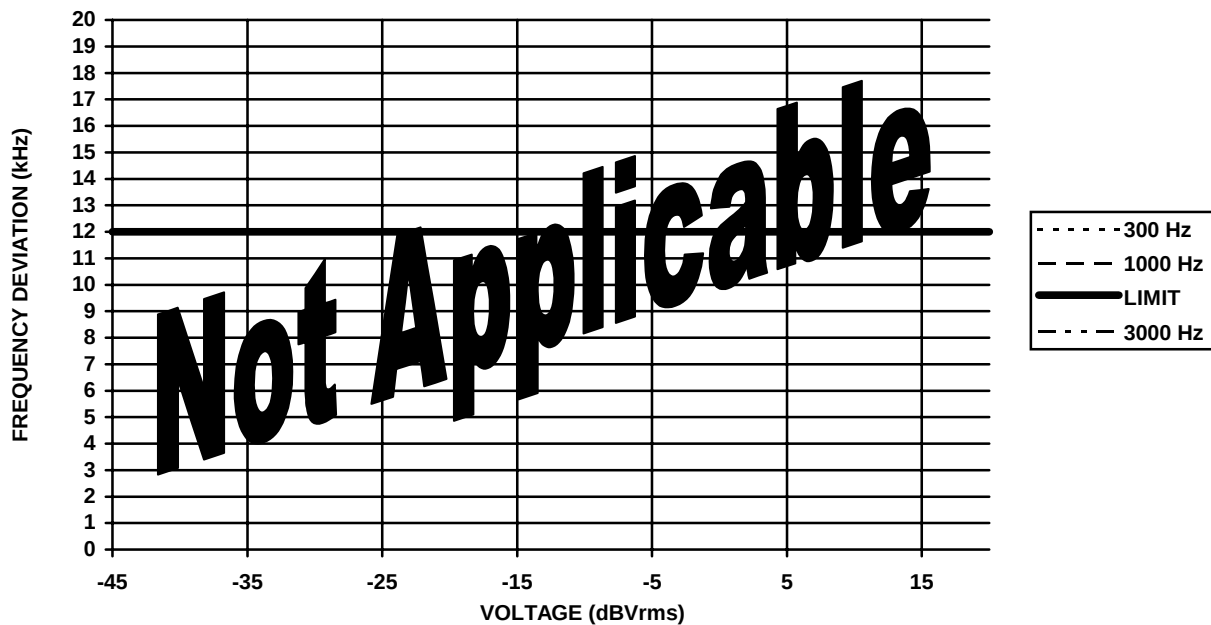
NAME OF TEST: Modulation Limiting

PARA. NO.: 2.1047

TESTED BY: Ron Gaytan

DATE: 03/02/99

SAT Deviation: 2.20 kHz
WB Data Deviation: 8.70 kHz
ST Deviation: 8.32 kHz



EQUIPMENT: NSA 1000
FCC ID: CFSK3852

Section 4. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth (Voice & SAT)	PARA. NO.: 2.1049
TESTED BY: Not Applicable	DATE:

Not Applicable

Test Results: Not Applicable

Test Data: Not Applicable

KTL Dallas, Inc.

FCC PART 22, SUBPART H & RSS-118
800 MHz CELLULAR SUBSCRIBER UNITS
PROJECT NO.: 8L0388EUSCA

EQUIPMENT: NSA 1000

FCC ID: CFSK3852

NAME OF TEST: Occupied Bandwidth (WB Data)	PARA. NO.: 2.1049
TESTED BY: Ron Gaytan	DATE: 03/03/99

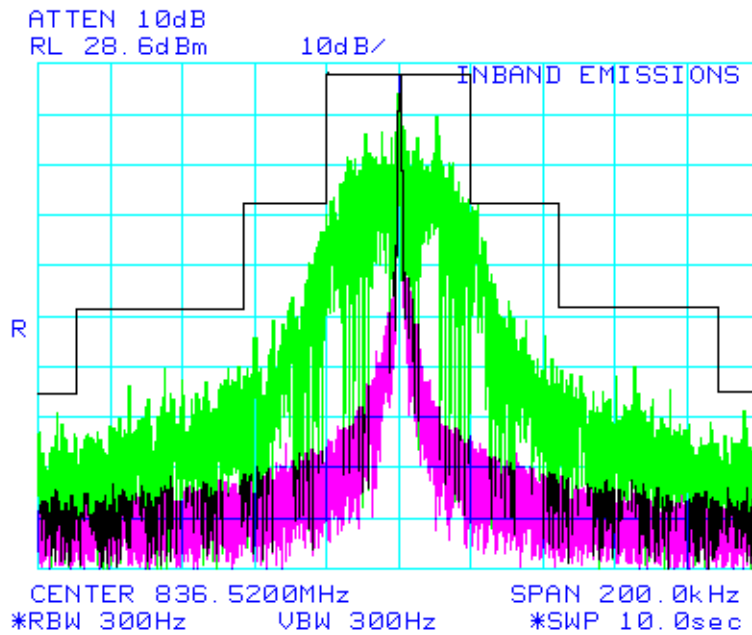
Test Results:

Complies.

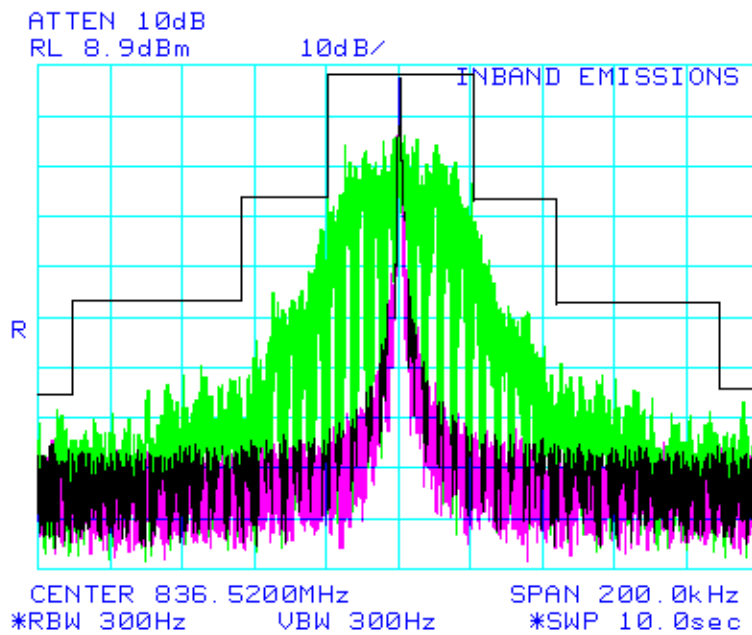
Test Data:

See attached graph(s).

EQUIPMENT: NSA 1000
FCC ID: CFSK3852



PROJECT #8L0388e
OCCUPIED BANDWIDTH
CHANNEL 384
WIDEBAND DATA
TX MUTED



PROJECT #8L0388e
OCCUPIED BANDWIDTH
CHANNEL 384
LOW POWER
WIDEBAND DATA
TX MUTED

KTL Dallas, Inc.

FCC PART 22, SUBPART H & RSS-118
800 MHz CELLULAR SUBSCRIBER UNITS
PROJECT NO.: 8L0388EUSCA

EQUIPMENT: NSA 1000

FCC ID: CFSK3852

NAME OF TEST: Occupied Bandwidth (ST)	PARA. NO.: 2.1049
TESTED BY: Ron Gaytan	DATE: 03/03/99

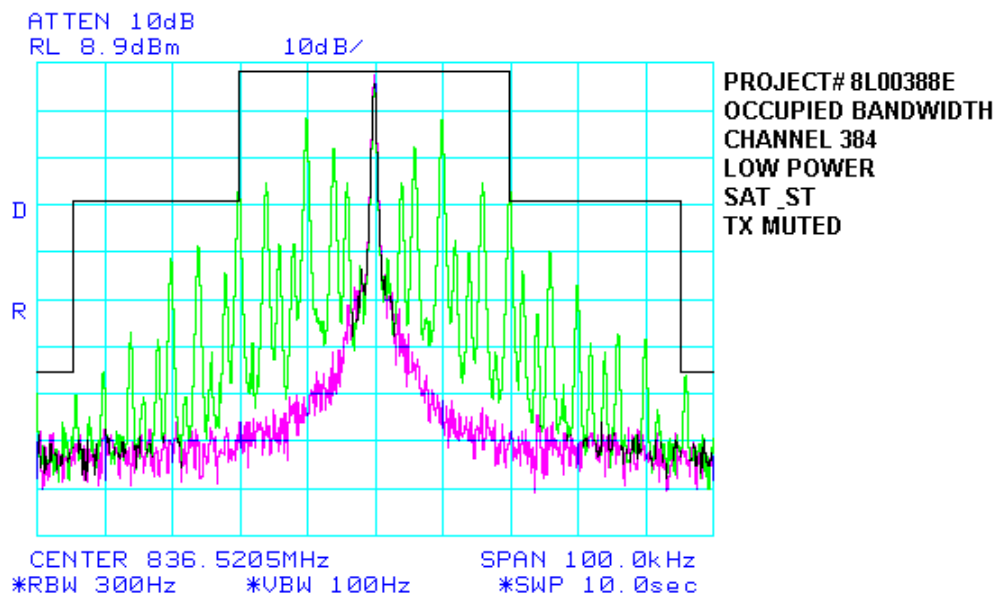
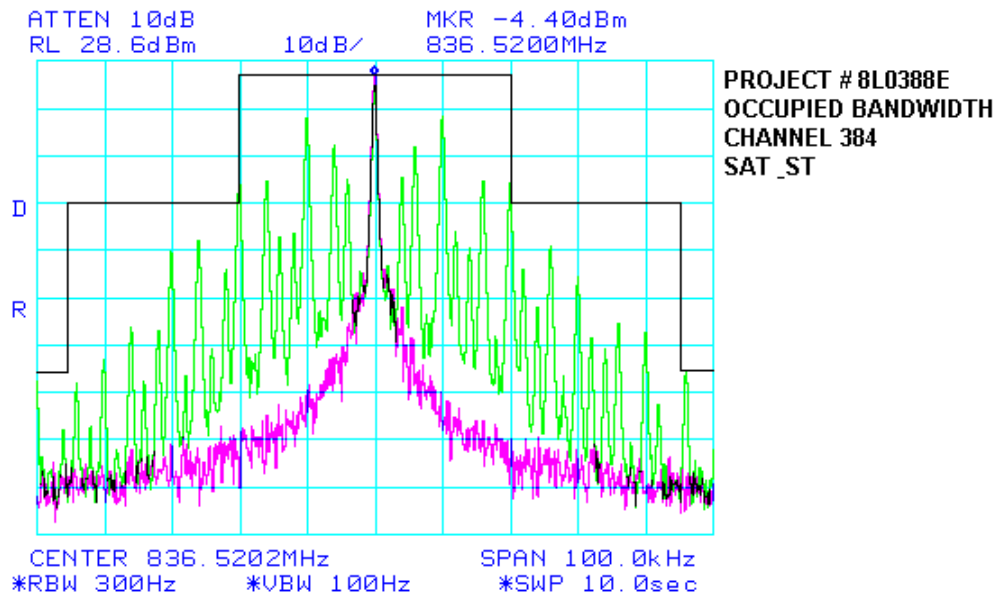
Test Results:

Complies.

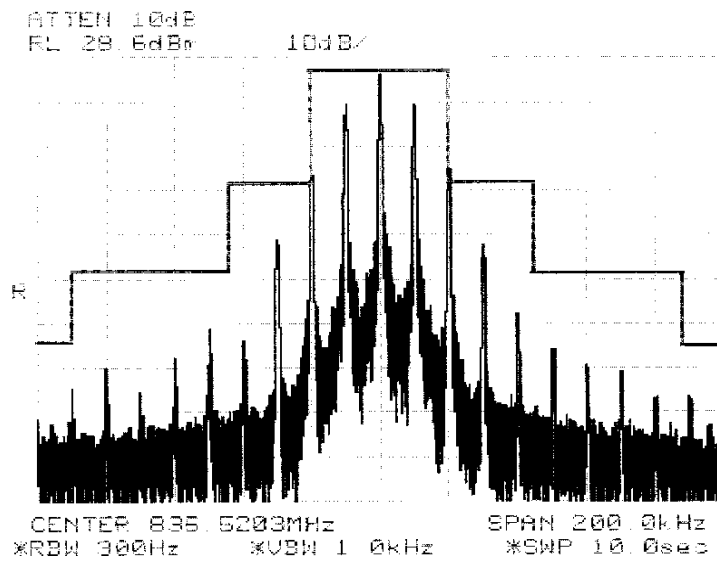
Test Data:

See attached graph(s).

EQUIPMENT: NSA 1000
FCC ID: CFSK3852



EQUIPMENT: NSA 1000
FCC ID: CFSK3852



KTL Dallas, Inc.

FCC PART 22, SUBPART H & RSS-118
800 MHz CELLULAR SUBSCRIBER UNITS
PROJECT NO.: 8L0388EUSCA

EQUIPMENT: NSA 1000

FCC ID: CFSK3852

NAME OF TEST: Occupied Bandwidth (SAT)	PARA. NO.: 2.1049
TESTED BY: Ron Gaytan	DATE: 03/03/99

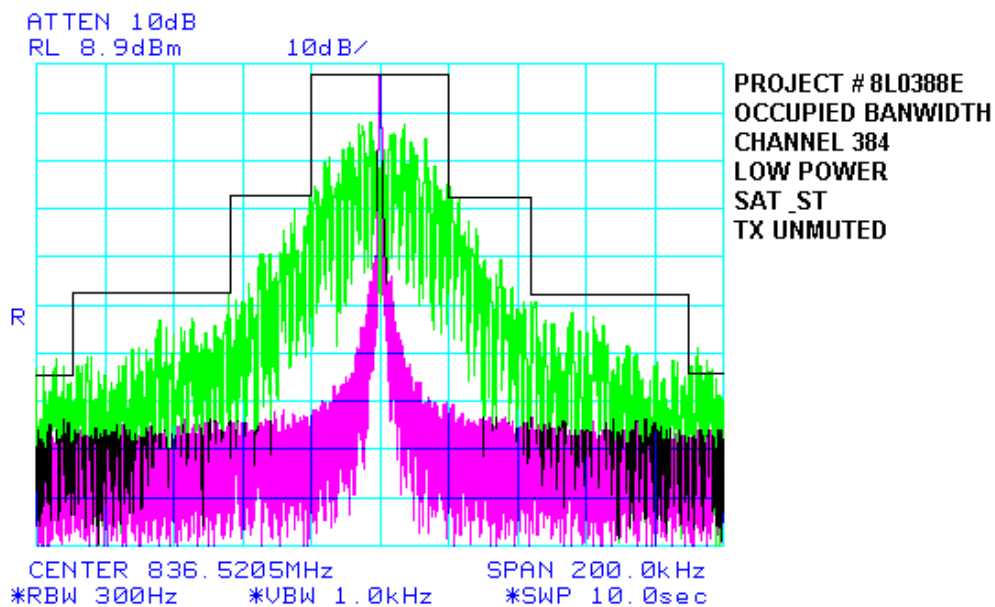
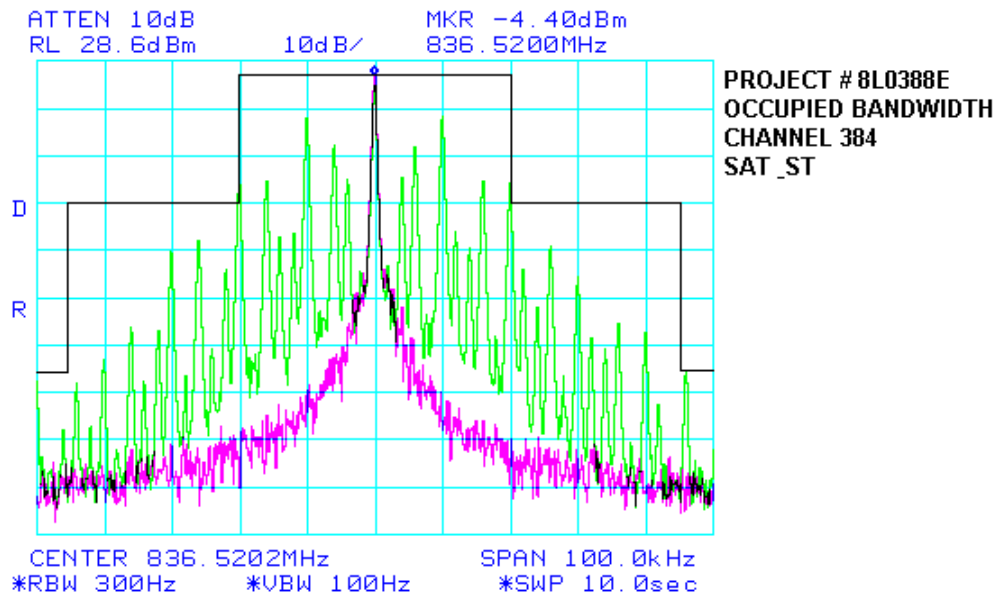
Test Results:

Complies.

Test Data:

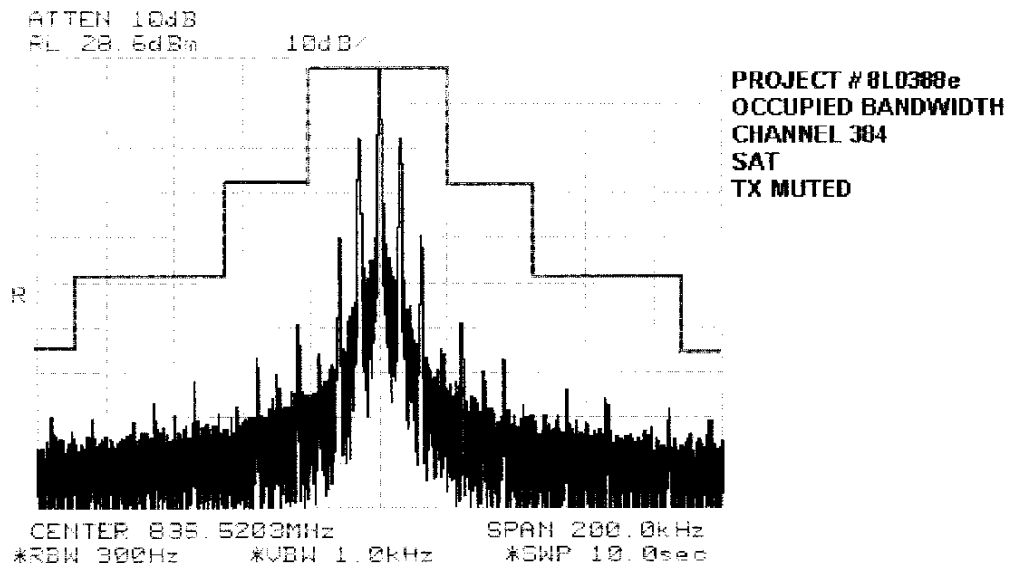
See attached graph(s).

EQUIPMENT: NSA 1000
FCC ID: CFSK3852



EQUIPMENT: NSA 1000
FCC ID: CFSK3852

ocwsatl.bmp HP 8594E <18> 03/29/99 12:29:29 PM



EQUIPMENT: NSA 1000
FCC ID: CFSK3852

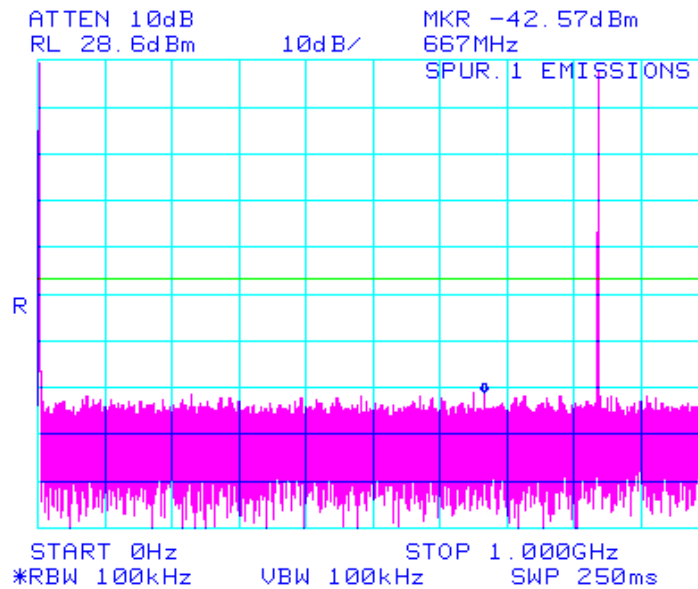
Section 5. Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions At Antenna Terminals	PARA. NO.: 2.1051
TESTED BY: Ron Gaytan	DATE: 03/02/99

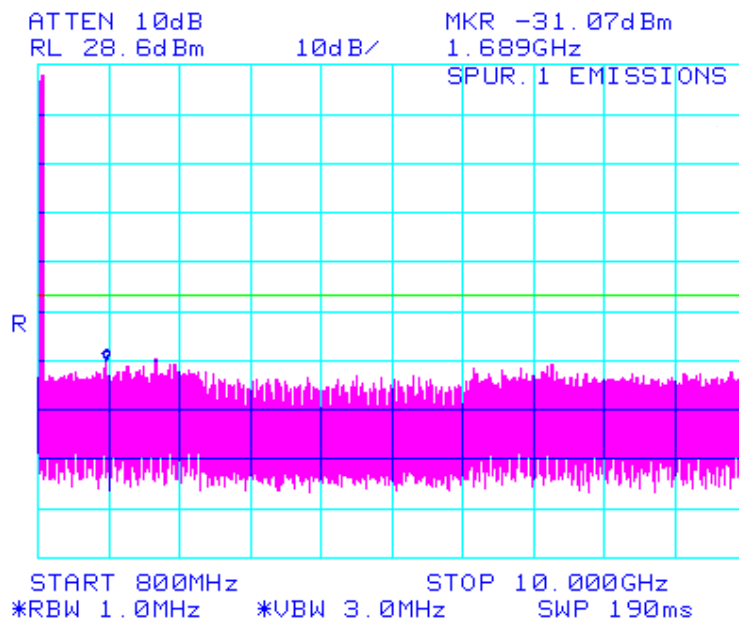
Test Results: Complies.

Test Data: See attached graphs.

EQUIPMENT: NSA 1000
FCC ID: CFSK3852



PROJECT # 8L0388E
ANTENNA SPURIOUS EM.
CHANNEL 384
WIDE BAND DATA
TX UNMUTED



PROJECT # 8L0388E
ANTENNA SPURIOUS EM.
CHANNEL 384
WIDE BAND DATA
TX UNMUTED

EQUIPMENT: NSA 1000
FCC ID: CFSK3852

Section 6. Field Strength of Spurious Emissions

NAME OF TEST: Field Strength of Spurious Emissions	PARA. NO.: 2.1053
TESTED BY: Ron Gaytan	DATE: 03/01/99

Test Results: Complies.
The maximum field strength is 64.6 dBuV/m @ 1.667 GHz @ 3m.

Test Data: See attached tables.

EQUIPMENT: NSA 1000

FCC ID: CFSK3852

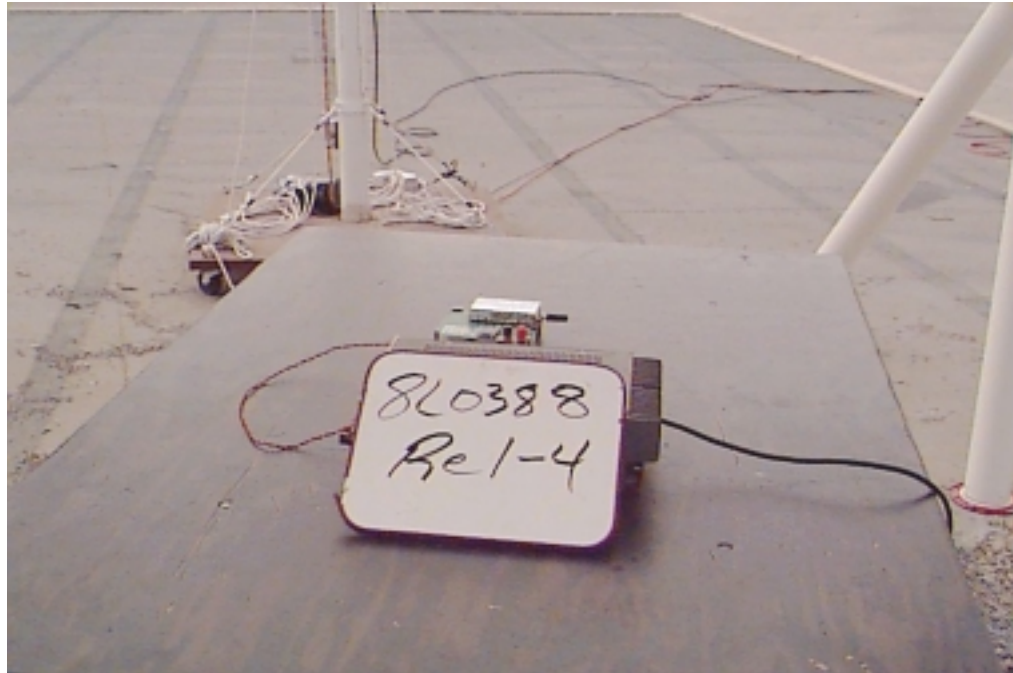
Test Data - Radiated Emissions Test # RE-4

Emission Frequency (MHz)	Ant. Pol. (H/V)	Det. Atten. (dB)	Meter Reading (dBuV)	Antenna Factor (dB)	Path Loss (dB)	RF Gain (dB)	Corrected Reading (dBuV/m)	Spec. Limit (dBuV/m)	CR/SL Delta (dB)	Pass Fail Marginal	Notes
836.5	V	0.0	117.0	20.8	8.2	28.1	117.9	46.0	71.94	Fail	KTL # 2624 FUNDAMENTAL
835.0	V	0.0	120.0	20.8	8.2	28.1	120.9	46.0	74.94	Fail	KTL # 101 FUNDAMENTAL
30.0	V	0.0	14.0	11.8	1.4	27.8	-0.6	40.0	-40.57	Pass	
122.0	V	0.0	14.0	11.4	3.0	27.0	1.5	43.5	-42.05	Pass	
290.0	V	0.0	14.0	20.7	4.9	27.2	12.3	46.0	-33.7	Pass	
836.5	H	0.0	116.0	20.8	8.2	28.1	116.9	46.0	70.94	Fail	KTL # 2624 FUNDAMENTAL
835.0	H	0.0	119.2	20.8	8.2	28.1	120.1	46.0	74.14	Fail	KTL # 101 FUNDAMENTAL
30.0	H	0.0	14.0	11.8	1.4	27.8	-0.6	40.0	-40.57	Pass	
122.0	H	0.0	14.0	11.4	3.0	27.0	1.5	43.5	-42.05	Pass	
290.0	H	0.0	14.0	20.7	4.9	27.2	12.3	46.0	-33.7	Pass	
301.0	H	0.0	14.0	20.4	5.0	27.3	12.1	46.0	-33.91	Pass	
550.0	H	0.0	14.0	19.9	6.5	27.9	12.5	46.0	-33.5	Pass	
800.0	H	0.0	14.0	21.1	8.2	28.1	15.2	46.0	-30.8	Pass	
301.0	V	0.0	14.0	20.4	5.0	27.3	12.1	46.0	-33.91	Pass	
550.0	V	0.0	14.0	19.9	6.5	27.9	12.5	46.0	-33.5	Pass	
800.0	V	0.0	14.0	21.1	8.2	28.1	15.2	46.0	-30.8	Pass	
SCANNED 30-1000 MHz											

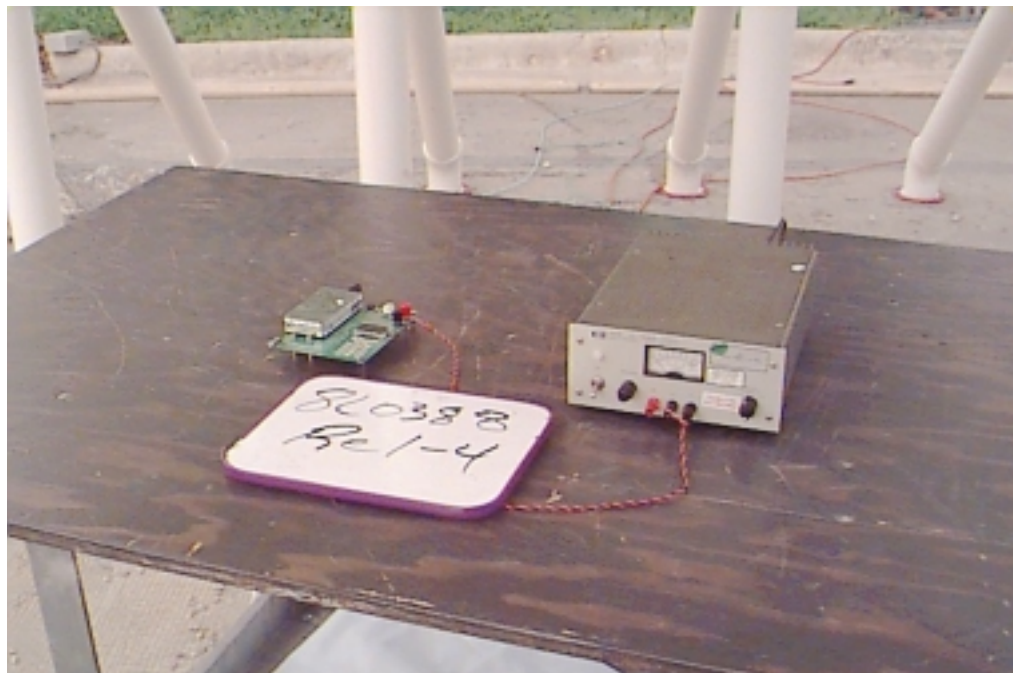
EQUIPMENT: NSA 1000
FCC ID: CFSK3852

Radiated Emissions Photographs for Test # RE-4

FRONT VIEW:



REAR VIEW:



EQUIPMENT: NSA 1000

FCC ID: CFSK3852

Test Data – Microwave Radiated Emissions Test # REM-1

Freq. (GHz)	Meter Reading (dBm)	Antenna Factor (dB)	Cable Loss (dB)	RF Gain (dB)	Conver. Factor	Corrected Reading (dBuv)	Spec. Limit (dBuv)	Pol.	Comments:
.836519	96.7	22.6	.6			120	82.2	V	KTL # 2624
.835	100	22.6	.6			123	82.2	V	Peak Detector
.835	98	22.6	.6			121	82.2	V	AVG. Detector
1.667	35	27	2.6			64.6	82.2	V	Peak Detector
1.667	34	27	2.6			63.6	82.2	V	AVG. Detector
2.504	32	29.1	3.2			64.3	82.2	V	Peak Detector
2.504	28	29.1	3.2			60.3	82.2	V	AVG. Detector
3.338	25	30.4	3.8			59.2	82.2	V	Pk. Det. Noise Floor
3.338	10	30.4	3.8			44.2	82.2	V	Avg. Det. Noise Floor
4.170	14	32	4.2			50.2	82.2	V	Pk. Det. Noise Floor
4.170	2	32	4.2			38.2	82.2	V	Avg. Det. Noise Floor
5.007	15	33.9	4.7			53.6	82.2	V	Peak Detector
5.007	3	33.9	4.7			41.6	82.2	V	AVG. Detector
5.840	15	35	5.1			55.1	82.2	V	Pk. Det. Noise Floor
5.840	3	35	5.1			43.1	82.2	V	Avg. Det. Noise Floor
7.509	16	37	5.9			58.9	82.2	V	Pk. Det. Noise Floor
7.509	2	37	5.9			44.9	82.2	V	Avg. Det. Noise Floor
8.359	16	37.5	6.3			59.8	82.2	V	Pk. Det. Noise Floor
8.359	2	37.5	6.3			45.8	82.2	V	Avg. Det. Noise Floor

EQUIPMENT: NSA 1000

FCC ID: CFSK3852

Test Data – Microwave Radiated Emissions Test # REM-1 (Continued)

Freq. (GHz)	Meter Reading (dBm)	Antenna Factor (dB)	Cable Loss (dB)	RF Gain (dB)	Conver. Factor	Corrected Reading (dBm)	Spec. Limit (dBm)	Pol.	Comments:
.836519	96.7	22.6	.6			120	82.2	H	KTL # 2624
.835	100	22.6	.6			123	82.2	H	Peak Detector
.835	98	22.6	.6			121	82.2	H	AVG. Detector
1.667	30	27	2.6			59.6	82.2	H	Peak Detector
1.667	28	27	2.6			57.6	82.2	H	AVG. Detector
2.504	37	29.1	3.2			69.3	82.2	H	Peak Detector
2.504	36	29.1	3.2			68.3	82.2	H	AVG. Detector
3.338	32	30.4	3.8			66.2	82.2	H	Peak Detector
3.338	30	30.4	3.8			64.2	82.2	H	AVG. Detector
4.170	14	32	4.2			50.2	82.2	H	Pk. Det. Noise Floor
4.170	2	32	4.2			38.2	82.2	H	Avg. Det. Noise Floor
5.007	15	33.9	4.7			53.6	82.2	H	Pk. Det. Noise Floor
5.007	3	33.9	4.7			41.6	82.2	H	Avg. Det. Noise Floor
5.840	15	35	5.1			55.1	82.2	H	Pk. Det. Noise Floor
5.840	3	35	5.1			43.1	82.2	H	Avg. Det. Noise Floor
7.509	16	37	5.9			58.9	82.2	H	Pk. Det. Noise Floor
7.509	2	37	5.9			44.9	82.2	H	Avg. Det. Noise Floor
8.359	16	37.5	6.3			59.8	82.2	H	Pk. Det. Noise Floor
8.359	2	37.5	6.3			45.8	82.2	H	Avg. Det. Noise Floor
									Scanned 1-10 Ghz

EQUIPMENT: NSA 1000
FCC ID: CFSK3852

Microwave Radiated Emissions Photographs for Test # REM-1

FRONT VIEW:



REAR VIEW:



EQUIPMENT: NSA 1000
FCC ID: CFSK3852

Section 7. Frequency Stability

NAME OF TEST: Frequency Stability	PARA. NO.: 2.1055
TESTED BY: Ron Gaytan	DATE: 03/10/99

Test Results: Complies. The worst-case frequency deviation is 72 Hz or 0.086 ppm.

Measurement Data: Standard Test Frequency: 836.520000 MHz
Standard Test Voltage: 6.33 Vdc

EQUIPMENT: NSA 1000*FCC ID:* CFSK3852

Test Data - Frequency Stability

Frequency (MHz)	Temperature (C°)	Voltage (VDC)	Frequency Deviation (Hz)	Frequency Deviation (ppm)	Limit (ppm)
836.52003	50	6.33	3	0.004	2.5
836.51992	40	6.33	-8	0.010	2.5
836.52005	30	6.33	5	0.006	2.5
836.52013	20	7.28 (115%)	13	0.016	2.5
836.52020	20	6.33	20	0.024	2.5
836.52022	20	5.38 (85%)	22	0.026	2.5
836.52042	10	6.33	42	0.050	2.5
836.52056	0	6.33	56	0.067	2.5
836.52059	-10	6.33	59	0.071	2.5
836.52072	-20	6.33	72	0.086	2.5
836.52066	-30	6.33	66	0.079	2.5

EQUIPMENT: NSA 1000
FCC ID: CFSK3852

Section 8. Test Equipment List

The listing below indicates the test equipment utilized for the test (s). Calibration interval on all items is typically 12 months from the calibration date shown.

KTL ID	Nomenclature	Manufacturer Model Number	Serial Number	Calibration Date
C1A	A O.A.T.S. Cable Set			04/03/98
CF31	Storm Cable (7.6 meters)	Semi Flex		11/11/98
100	Polarad Receiver	Rohde & Schwarz ESV	872149/28	10/07/98
101	Oscilloscope/DDM	Tektronix THS720	B032218	05/28/98
154	Power Sensor (0.10-18 GHz)	Hewlett Packard 8481A (50ohm,0.3uW-100mW)	2349A45632	02/08/99
156	Digital Power Meter	Hewlett Packard 436A	2512A22082	02/09/99
182	Limiter	Fischer FCC45013-1.2	NSN	02/05/99
494	Horn Antenna	A.H. Systems SAS-200/571	162	04/29/98
677	Receiver (1 - 18 GHz)	Electro Metrics EMC 50	185	08/26/98
946	27dB Gaing Preamp	ICC 27dB LNA	946	04/09/98
G1017B	Attenuator	Narda 776B-20	None	08/14/98
G1018	Attenuator	Narda 776B-10	None	10/27/98
G2017	Antenna, Log Periodic	A.H. Systems SAS-200/510	556	01/25/99
G2031	Biconical Antenna	ICC BCON-30300	N/A	11/17/98
G2624	Spectrum Analyzer	Hewlett Packard 8563E	3551A04428	10/05/98

EQUIPMENT: NSA 1000

FCC ID: CFSK3852

Test Equipment List (Continued):

The listing below indicates the test equipment utilized for the test (s). Calibration interval on all items is typically 12 months from the calibration date shown.

KTL ID	Nomenclature	Manufacturer Model Number	Serial Number	Calibration Date
G2630	Radio Communication Service Monitor	Rohde & Schwarz CMS53	883832/018	07/23/98
G5006	Environmental Chamber	Envirotronics SH27	129010083	12/14/98
		LAB # 5 (INDOOR)		
		SITE A O.A.T.S. (OPEN AREA TEST SITE) 10 Meter Site		
	Turntable, 4 foot	RF Consultants (Automated)		CNR
	Antenna Mast, 4 Meter	EMCO Part # 1050 (Automated)		CNR
		SITE D O.A.T.S. (OPEN AREA TEST SITE) 30 Meter Site		
	Turntable Flush Mounted, Metal Covered, 12 Foot	A.H. Systems (Automated)		CNR
	Antenna Mast, 5 Meter	ICC (Automated)		CNR

EQUIPMENT: NSA 1000
FCC ID: CFSK3852

ANNEX A

TEST METHODOLOGIES

EQUIPMENT: NSA 1000
FCC ID: CFSK3852**NAME OF TEST: RF Power Output****PARA. NO.: 2.1046****Test Conditions:** Standard Temperature & Humidity
Standard Test Voltage**Minimum Standard:** Para. No. 22.913(a). The E.R.P. of mobile transmitter and auxiliary test transmitter must not exceed 7 watts.

EIA is 19B Para. No. 3.2.1.3. The transmitter shall be compiled of 8 distinct power levels.

The output power shown above shall be maintained within the range of +2 dB, -4 dB of nominal dBW value

PL	I	II	III
0	+6	+2	-2
1	+2	+2	-2
2	-2	-2	-2
3	-6	-6	-6
4	-10	-10	-10
5	-14	-14	-14
6	-18	-18	-18
7	-22	-22	-22

Method Of Measurement:Detachable Antenna:

The power at antenna terminals is measured using an in-line power meter.

Integral Antenna:If the antenna is not detachable from the circuit then the Power Output is derived from the radiated field strength of the fundamental emission by using the plane wave relation $GP/4\pi R^2 = E^2/120\pi$ and proceeding as follows:

$$P = \frac{E^2 R^2}{30G} = \frac{E^2 3^2}{30G}$$

where,

P = the equivalent radiated power in watts

E = the maximum measured field strength in V/m

R = the measurement range (3 meters)

G = the numeric gain of the transmit antenna in relation to a halfwave dipole antenna

EQUIPMENT: NSA 1000
FCC ID: CFSK3852

NAME OF TEST: Audio Frequency Response	PARA. NO.: 2.1047
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Test Conditions: Standard Temperature & Humidity
Standard Test Voltage

Minimum Standard: IS-19-B. From 300 to 3000 Hz the audio frequency response shall not vary more than +1 to -3 dB from a true 6dB octave pre-emphasis characteristic as referred to 1000 Hz level (with the exception of a permissible 6dB per octave roll-off from 2500 to 3000 Hz).

Method Of Measurement:

Operate the transmitter with the compressor disabled, and monitor the output with a frequency deviation meter or standard test receiver without standard 750-microsecond de-emphasis, with expander disabled, and without C-message weighted filter (see 6.6.2). Apply a sine wave audio input to the transmitter external audio input port, vary the modulating frequency from 300 to 3000 Hz and observe the input levels necessary to maintain a constant ± 2.9 kHz system deviation.

EQUIPMENT: NSA 1000
FCC ID: CFSK3852

NAME OF TEST: Audio Low Pass Filter Response	PARA. NO.: 2.1047
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Test Conditions: Standard Temperature & Humidity
Standard Test Voltage

Minimum Standard: Para. No. 22.915 (d). For mobile stations, signals must be attenuated as a function of frequency as follows:

- i. In the frequency ranges 3.0 to 5.9 Hz and 6.1 to 15 kHz, 40 log (f/3) dB.
- ii. In the frequency range 5.9 to 6.1 kHz, 35 dB
- iii. In the frequency range above 15 kHz, 28 dB.

Method Of Measurement:

Adjust the audio input frequency to 1000 Hz and adjust the input level to 20 dB greater than that required to produce ± 8 kHz deviation. Note the output level on the frequency deviation meter or standard test receiver. Using the output level as reference (0dB), vary the modulating frequency from 3000 Hz to 30,000 Hz and observe the change in output while maintaining a constant audio input level.

EQUIPMENT: NSA 1000
FCC ID: CFSK3852

NAME OF TEST: Modulation Limiting	PARA. NO.: 2.1047
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Test Conditions: Standard Temperature & Humidity
Standard Test Voltage

Minimum Standard: 22.915(b)

The levels of the modulating signals must be set to the values specified below and must be maintained within $\pm 10\%$ of these values.

Voice: ± 12 kHz

SAT: ± 2 kHz

Wideband Data: ± 8 kHz

ST: ± 8 kHz

Method Of Measurement:

Voice: A 1 kHz audio tone is injected at levels between -45 and +20 dBVrms. The peak deviation is noted. This is repeated with a 300 Hz tone and a 3 kHz tone.

SAT: A SAT tone is generated by the mobile station and the peak deviation is measured.

Wideband Data: Wideband data is generated by the mobile station and the peak deviation is measured.

ST: ST data is generated by the mobile station and the peak deviation is measured.

EQUIPMENT: NSA 1000
FCC ID: CFSK3852

NAME OF TEST: Occupied Bandwidth (Voice & SAT)	PARA. NO.: 2.1049
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Test Conditions: Standard Temperature & Humidity
Standard Test Voltage

Minimum Standard: 22.917(b) The mean power of any emission removed from the carrier frequency by a displacement frequency (f_d in kHz) must be attenuated below the mean power of the unmodulated carrier (P) as follows:

(i) On any frequency removed from the carrier frequency by more than 20 kHz but not more than 45 kHz: at least 26 dB

(ii) On any frequency removed from the carrier frequency by more than 45 kHz, up to the first multiple of the carrier frequency:

at least 60 dB or $43 + 10 \log (P)$ dB, whichever is the lesser attenuation.

Method Of Measurement:

Spectrum Analyzer Settings:

RBW: 300 Hz
VBW: $\geq$ RBW
Span: 100 kHz
Sweep: Auto
Mask: CELLF3E

Input Signal Characteristics (F3E/F3D):

AF1 frequency: 2.5 kHz
AF1 level: 16 dB above the level sufficient to produce ± 6 kHz deviation with a 1 kHz tone.
SAT: 6000 Hz SAT
SAT level: sufficient to produce ± 2 kHz deviation.

EQUIPMENT: NSA 1000
FCC ID: CFSK3852

NAME OF TEST: Occupied Bandwidth (WB Data, ST & SAT) PARA. NO.: 2.1049
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Test Conditions: Standard Temperature & Humidity
 Standard Test Voltage

Minimum Standard: 22.917(d) The mean power of any emission removed from the carrier frequency by a displacement frequency (f_d in kHz) must be attenuated below the mean power of the unmodulated carrier (P) as follows:

(1) On any frequency removed from the carrier frequency by more than 20 kHz but not more than 45 kHz:

at least 26 dB

(2) On any frequency removed from the carrier frequency by more than 45 kHz but not more than 90 kHz:

at least 45 dB

(3) On any frequency removed from the carrier frequency by more than 90 kHz, up to the first multiple of the carrier frequency:

at least 60 dB or $43 + 10 \log (P)$ dB, whichever is the lesser attenuation.

Method Of Measurement:

Spectrum Analyzer Settings:

RBW: 300 Hz

VBW: $\geq$ RBW

Span: 200 kHz

Sweep: Auto

Mask: CELLF1D

Input Signal Characteristics:

RF level: Maximum recommended by manufacturer

10 kbps WB Data & SAT

ST

EQUIPMENT: NSA 1000
FCC ID: CFSK3852

NAME OF TEST: Spurious Emission at Antenna Terminals	PARA. NO.: 2.1051
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Test Conditions: Standard Temperature & Humidity
Standard Test Voltage

Minimum Standard: Para. No. 22.917(b). The mean power of emissions must be attenuated below the mean power of the unmodulated carrier on any frequency twice or more than twice the fundamental emission by at least $43 + 10 \log P$. This is equivalent to -13 dBm absolute power.

Method Of Measurement:

Spectrum Analyzer Settings:

RBW: 30 kHz (AMPS). As required for digital modulations.

VBW: $\geq$ RBW

Start Frequency: 0 MHz

Stop Frequency: 10 GHz

Sweep: Auto

EQUIPMENT: NSA 1000
FCC ID: CFSK3852

NAME OF TEST: Field Strength of Spurious Radiation	PARA. NO.: 2.1053
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Test Conditions: Outdoor Range
Standard Test Voltage

Minimum Standard: Para. No. 22.917(b). The mean power of emissions must be attenuated below the mean power of the unmodulated carrier on any frequency twice or more than twice the fundamental emission by at least $43 + 10 \log P$. This is equivalent to -13 dBm absolute power.

Calculation Of Field Strength Limit:

An example of attenuation requirement of $43 + 10 \log P$ is equivalent to -13 dBm (5×10^{-5} Watts) at the antenna terminal. We determine the field strength limit by using the plane wave relation.

$$GP/4\pi R^2 = E^2/120\pi$$

For emissions ≤ 1 GHz:

$G = 1.64$ (Dipole Gain)

$P = 10^{-5}$ Watts (Maximum spurious output power)

$R = 3\text{m}$ (Measurement Distance)

$$E = \frac{\sqrt{30GP}}{R}$$

$$E = \frac{\sqrt{30 \times 1.64 \times 5 \times 10^{-5}}}{3} = 0.016533 \text{ V / m} = 84.4 \text{ dB}\mu\text{V / m}$$

For emissions > 1 GHz:

$G = 1$ (Isotropic Gain)

$P = 1 \times 10^{-5}$ Watts (Maximum spurious output power)

$R = 3\text{m}$ (Measurement Distance)

$$E = 84.4 - 20 \log \sqrt{1.64} = 82.3 \text{ dB}\mu\text{V / m} @ 3\text{m}$$

The spectrum is searched to 10 GHz.

EQUIPMENT: NSA 1000
FCC ID: CFSK3852

NAME OF TEST: Frequency Stability**PARA. NO.: 2.1055**

Test Conditions: As per measurement data.

Minimum Standard: Para. No. 22.355. The transmitter carrier frequency shall remain within the tolerances given in Table C-1.

Freq. Range (MHz)	Mobile > 3 W	Mobile ≤ 3 W
821 to 896	2.5	2.5

Table C-1

Method Of Measurement:Frequency Stability With Voltage Variation:

The E.U.T. is placed in an environmental chamber and allowed to stabilize at +20 degrees Celsius for at least 15 minutes. The frequency counter and signal generator are phase locked with the same 10 MHz reference frequency by connecting the 10 MHz ref. out of the counter to the 10 MHz ref, in of the signal generator. With the voltage input to the E.U.T. set to 85% S.T.V., the frequency is measured in 30 second intervals for a period of 5 minutes. This procedure is repeated at 100% S.T.V. and 115% S.T.V.

Frequency Stability With Temperature Variation:

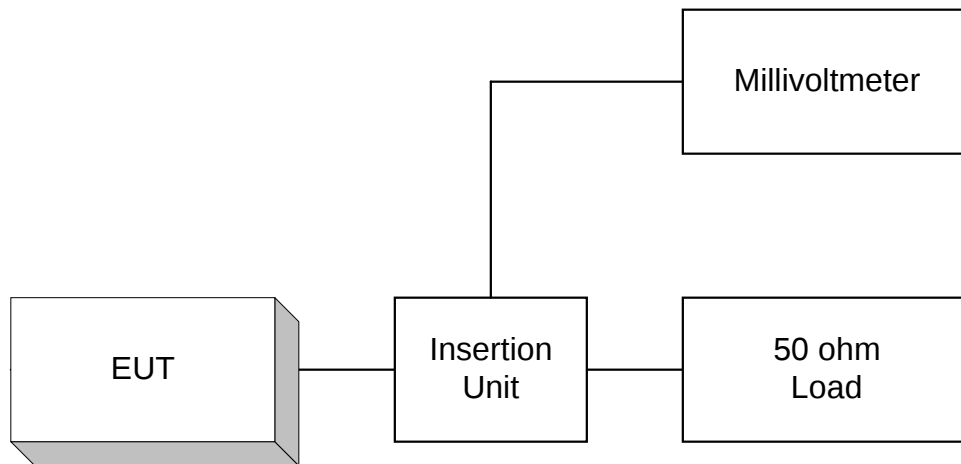
The input voltage to the E.U.T. is set to S.T.V. and the temperature of the environmental chamber is varied in 10 degree steps from -30 degrees C to +50 degrees C. The E.U.T. is allowed to stabilize at each temperature and the frequency is measured in 30 second intervals for a period of 5 minutes.

EQUIPMENT: NSA 1000
FCC ID: CFSK3852

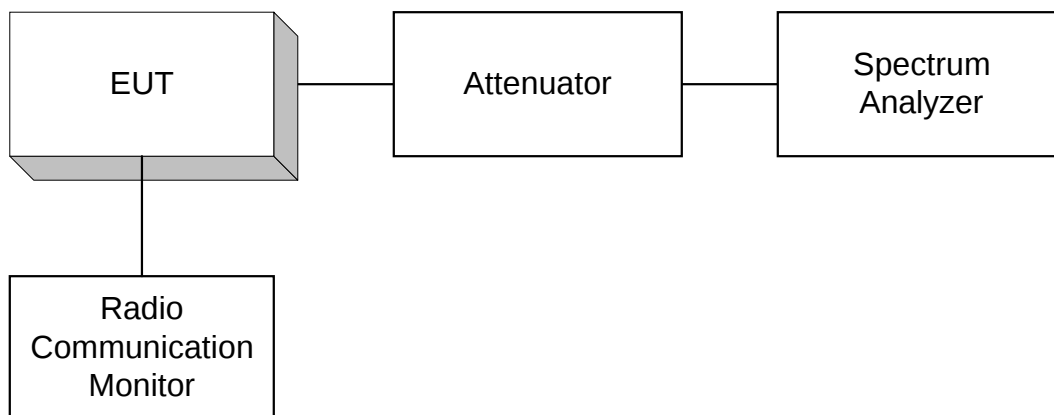
ANNEX B
TEST DIAGRAMS

EQUIPMENT: NSA 1000
FCC ID: CFSK3852

Para. No. 2.1046 - R.F. Power Output

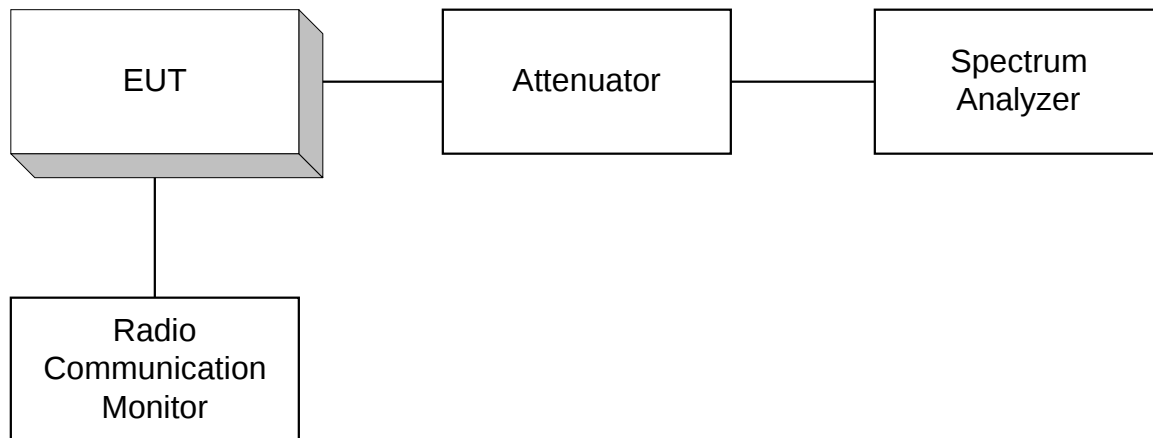


Para. No. 2.1049 - Occupied Bandwidth

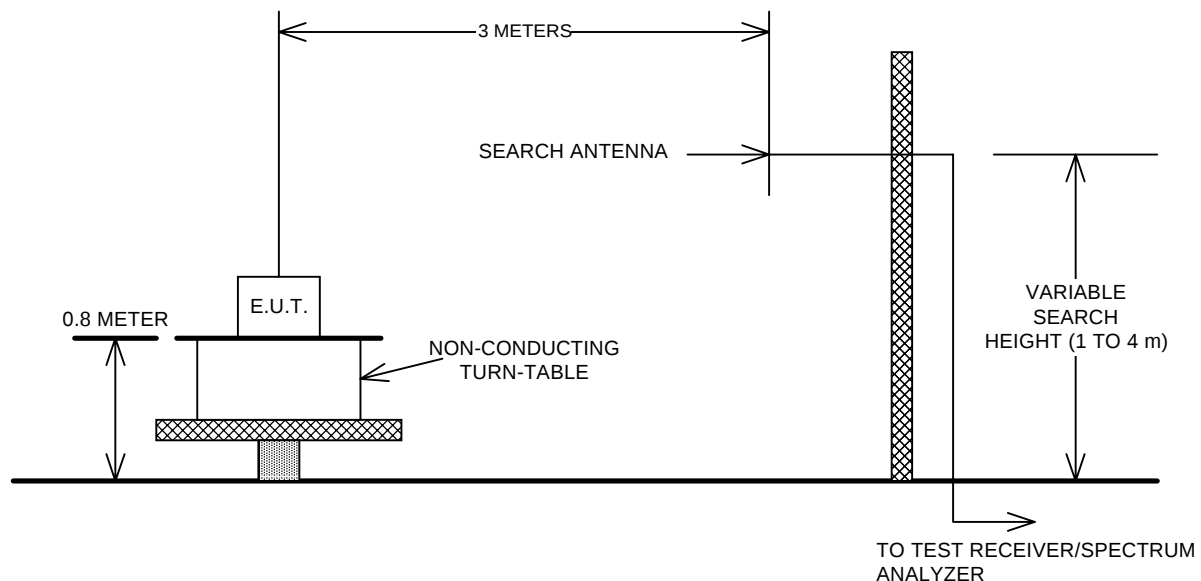


EQUIPMENT: NSA 1000
FCC ID: CFSK3852

Para. No. 2.1051 Spurious Emissions at Antenna Terminals

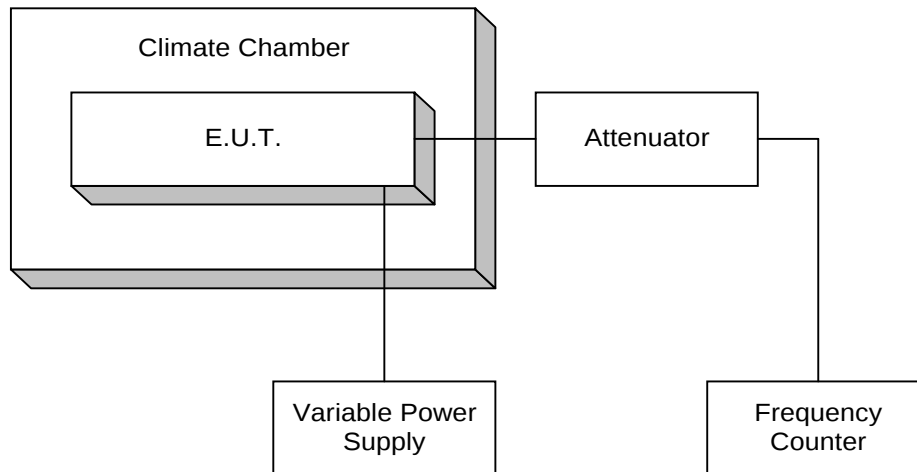


Para. No. 2.1053 - Field Strength of Spurious Radiation



EQUIPMENT: NSA 1000
FCC ID: CFSK3852

Para. No. 2.1055 - Frequency Stability



**Para. No. 2.1047 – Audio Frequency Response, Audio Low Pass Filter Response
And Modulation Limiting**

