Product Integrity Laboratory
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Certification Test Report
CFR 47 FCC Part 90.210 (e)
Industry Canada RSS 119, Issue 7

Stealth Alarms Inc
Tele-Link

SIU3A
FCC ID # UBLSIU3A
IC ID#: 6548A-SIU3A

Project Code CG-336
(Report CG-336-RA-1-2)

Revision: 2

July 19, 2006

Prepared for: Stealth Alarm Systems Inc.

Author: Glen Moore
EMC Manager

Approved by: Nick Kobrosly
Lab Manager

Report Summary

NTS Canada

Product Integrity Laboratory
5151-47th Street, N.E. Calgary Alberta T3J 3R2

Accreditation Numbers: FCC 101386
IC 46405-3978 File # IC3978-2
Standards Council of Canada Accredited Laboratory No. 440

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EUT Description:

EUT Description	Manufacturer	Model	Revision	Serial Number
Wireless Alarm system transmitter	Microlynx	SIU3A	2V0	001

Test Summary

Appendix	Test/Requirement Description	Deviations* from:			Pass / Fail	Applicable Rule Parts
		Base Standard	Test Basis	NTS Procedure		
A	Rated Power Output	No	No	No	PASS	FCC PART 2.1033 (c)(6)(7) and 2.1046 (a), 90.210e, 90.279, 90.205, RSS Gen, RSS 119 Issue 7 section 5.4
B	Occupied Bandwidth	No	No	No	PASS	FCC PART 2.1033 (c)(6)(7) and 2.1046 (a), 90.210e, RSS Gen, RSS 119 Issue 5/RSS Gen
C	Emission Mask	No	No	No	PASS	FCC 2.1051(h), FCC 90.210 e), RSS 119 Issue 7 – 5.8.4 Table 7
D	Spurious Emissions	No	No	No	PASS	FCC 2.1051 (h), FCC 90.210 e), RSS 119 Issue 7 – 5.8.4 Table 7
E	Field Strength of Spurious Radiation	No	No	No	PASS	FCC 2.1053 (h), FCC 90.210 e), RSS 119 Issue 7 – 5.8.4 Table 7
F	Frequency Stability	No	No	No	PASS	2.1055 a)1), 90.213, RSS 119 Issue 7, 5.3
G	Transient Frequency Behaviour	No	No	No	PASS	90.210e, RSS 119 Issue 7
H	AC Powerline Conducted Emissions	No	No	No	PASS	15.209, RSS Gen
I	Test Equipment List	No	No	No	NA	NA

Test Result: The product presented for testing complied with test requirements as shown above.

Digitally signed by gmoore
DN: cn=gmoore, c=US, o=nts, email=glen.moore@ntscorp.com
Date: 2006.07.20 18:18:26 -06'00'

Prepared By: _____
Glen Moore
EMC Manager

Table of Contents

REGISTER OF REVISIONS

Revision	Date	Description of Revisions
1	July 19, 2006	Release

1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this document is to describe the tests applied by NTS Canada to demonstrate compliance of the SIU3 to FCC Part 90.210e) p and the equivalent sections of Industry Canada's RSS 119.

2.0 TEST EUT DESCRIPTION

2.1 CONFIGURATION

Description of EUT

	Name	Model	Revision	Serial Number
EUT	SIU3	SIU3	1v0	001, 003
Classification	Mobile			
Size and Weight	9 ¼ H x 6 ¼ "W x 2 ¼ "D , 13.8 ounces			
Power	120 VAC Supply			
Frequency Range	Canada: 406.1MHz – 430 MHz and 450 MHz - 470 MHz USA: 416 MHz-430 MHz and 450 MHz- 470 MHz			
Bandwidth	6 KHz per spectral mask E			
Synthesizer step size	6.25 KHz			
Data Rate	4800 bps			
Transmitter duty cycle	Less than 10%			
Operating temperature	-30 c to 50 c			
Output power	33.0 dBm (2 watts) rated output power			
Functional Description	Wireless alarm transmitter			

2.1.1 FCC 2.1033 VOLTAGES AND CURRENT (8)

The typical operating parameters for the PA are

Vdd = 10.0 V
Id = 500 mA typical

2.1.2 FCC 2.1033 (9) FACTORY TUNE UP PROCEDURE

The production tune-up procedure is as follows.
With EUT in test mode set to maximum power and transmitting four packets per second, measure the power at the bottom, bottom middle, top middle and top frequencies (406.1, 430, 450, 470 MHz). If the power is within 33 +/- 1 dB, make no further adjustments. If the power is more than +/- 1 dB send commands to the microprocessor to reduce the gate bias on the PA until the power is within spec.

The gate bias is controlled by a pulse-width-modulated output of the microprocessor. The PWM frequency is approximately 100 kHz.

2.2 SUPPORT CABLES

Quantity	Model/Type	Routing		Shielded / Unshielded	Description	Cable Length (m)
		From	To			
1	Power	Power Supply	EUT	Unsheilded	Permanent connection to power supply	1.0

2.3 METHOD OF OPERATION DURING TESTS

Unless otherwise noted in the test report the EUT was tested while in a continuous transmit mode where possible. The EUT was tuned to a low, middle, and high channel to perform power, occupied bandwidth, and spurious/harmonic tests. While transmitting the EUT was setup to operate at the intended maximum power output available to the end user. For all test cases pre-scans were completed in all modes to determine worst case levels.

APPENDICES

APPENDIX A: RF POWER OUTPUT

A.1. Base Standard & Test Basis

Requirements	FCC PART 2.1033 (c)(6)(7) and 2.1046 (a), 90.210e, 90.279, 90.205, RSS Gen, RSS 119 Issue 7 section 5.4
Test Method	TIA/EIA 603

A.2. Specifications

IC RSS 119: 30 Watts. The output power shall be within +/- 1.0 dB of the manufacturers rated output power
FCC: 90.279 250 watts
90.205 100 Watts

A.3. Measurement Uncertainty

Expanded Uncertainty (K=2)
1.11/-1.22

A.4. Test conditions

Standard test conditions

A.5. Test Procedure

EIA/TIA 603

A.6. Test Results

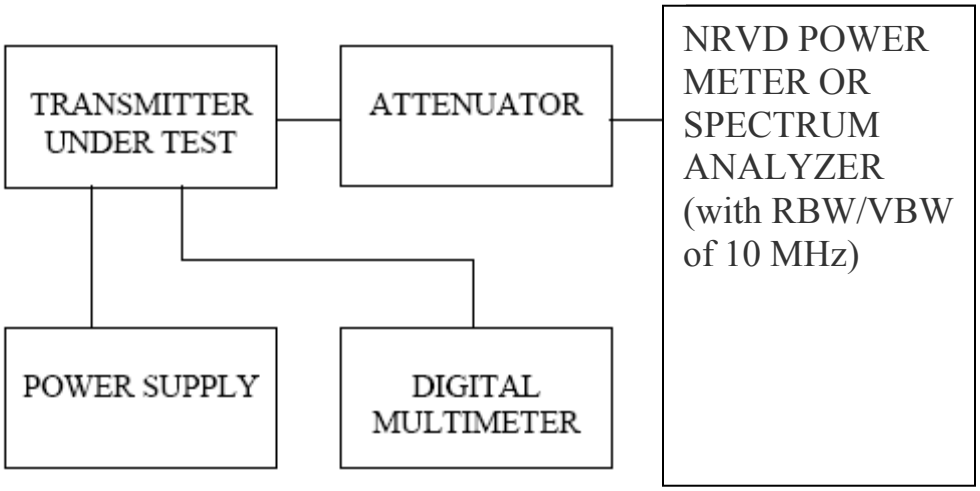
The EUT is in compliance with the limits as specified above

EUT Transmit Channel	Measured Output Power (Conducted) (dBM)	EIRP (dBmwith 5 dbi Antenna Gain	ERP (EIRP-2.15) dbm	ERP (Watts)
406.1 MHz	33.4	38.4	36.3	4.3
430 MHz	33	38	35.9	3.9
450 MHz	32.9	37.9	35.8	3.8
470 MHz	32.6	37.6	35.5	3.5

A.7. Operating Mode During Test

The SIU3A was tested while in a continuous transmit mode. The EUT was tuned to a low, middle, and high channel to perform power, occupied bandwidth, and spurious/harmonic tests. For conducted emissions the device was tuned to its center frequency. The EUT continuously transmitted a pulsed modulated packet with a payload. While transmitting the EUT was setup to operate at maximum power.

A.8. TEST SETUP



A.9. Tested By

This testing was conducted in accordance with the ISO 17025:1999 scope of accreditation, table 1; Quality Manual.

Name: Glen Moore
Function: EMC Manager

APPENDIX B: OCCUPIED BANDWIDTH

B.1. Base Standard & Test Basis

Requirements	FCC PART 2.1033 (c)(6)(7) and 2.1046 (a), 90.210e, RSS Gen, RSS 119 Issue 5/RSS Gen
Test Method	TIA/EIA 603

B.2. Specifications

B.3. Measurement Uncertainty

Expanded Uncertainty (K=2)
1.11/-1.22

B.4. Test conditions

Standard test conditions

B.5. Test Procedure

EIA/TIA 603

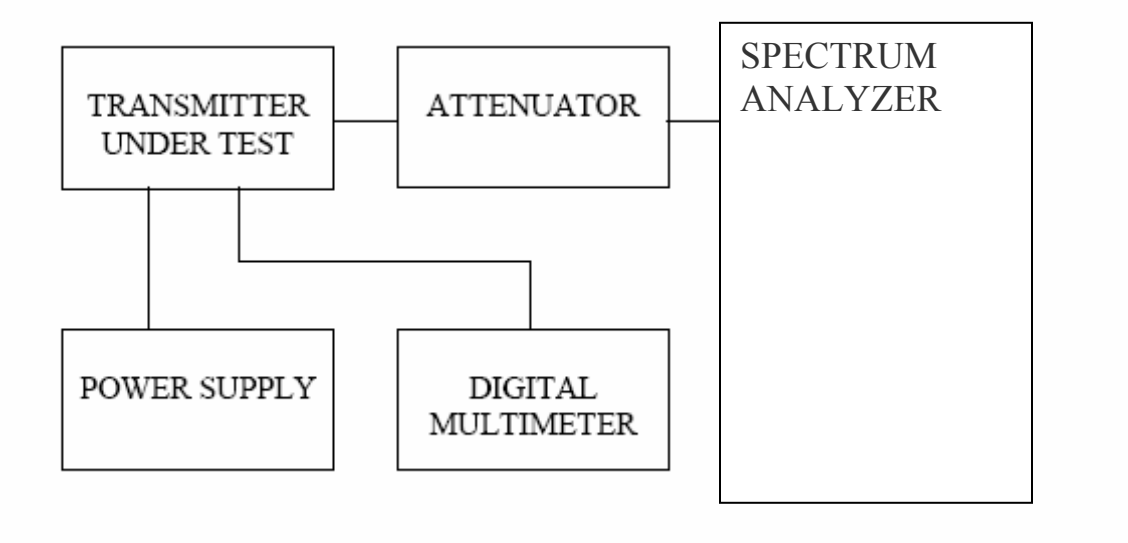
B.6. Test Results

EUT Transmit Channel	99%BW (kHz)
406.1 MHz	4.61
430 MHz	4.77
450 MHz	4.69
470 MHz	4.69

B.7. Operating Mode During Test

The SIU3A was tested while in a continuous transmit mode. The EUT was tuned to a low, middle, and high channel to perform power, occupied bandwidth, and spurious/harmonic tests. For conducted emissions the device was tuned to its center frequency. The EUT continuously transmitted a pulsed modulated packet with a payload. While transmitting the EUT was setup to operate at maximum power.

B.8. Test Setup



B.9. Tested By

This testing was conducted in accordance with the ISO 17025:1999 scope of accreditation, table 1; Quality Manual.

Name: Glen Moore
Function: EMC Manager

Figure 1 Occupied Bandwidth 406.1 MHz

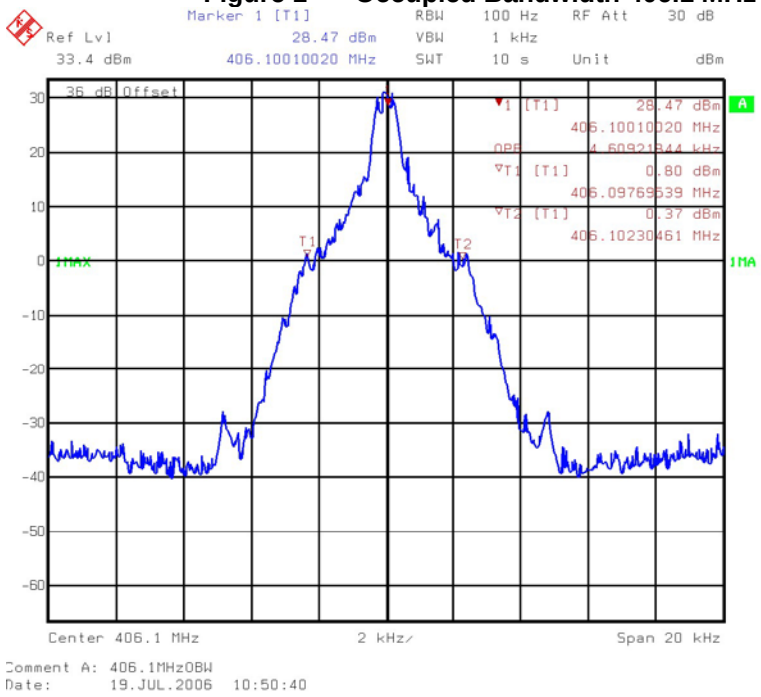


Figure 2 Occupied Bandwidth 430 MHz

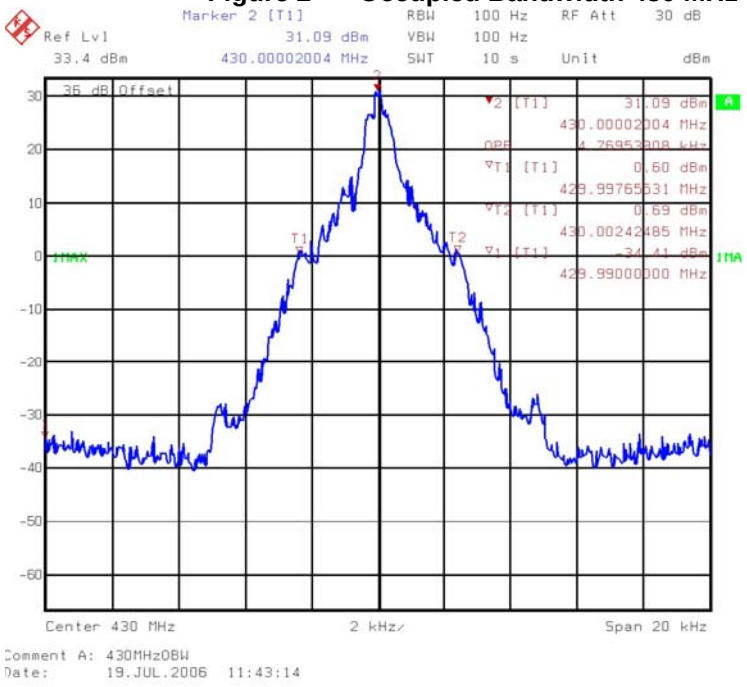


Figure 3 Occupied Bandwidth 450 MHz

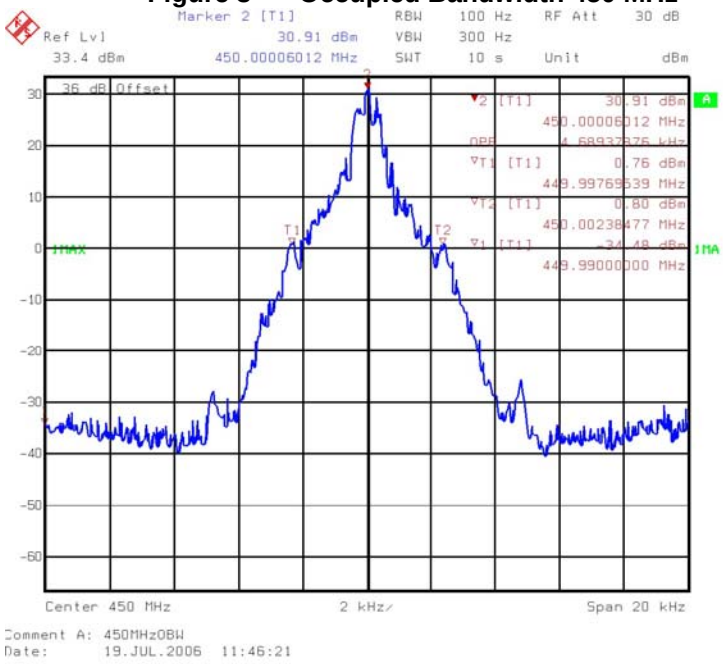
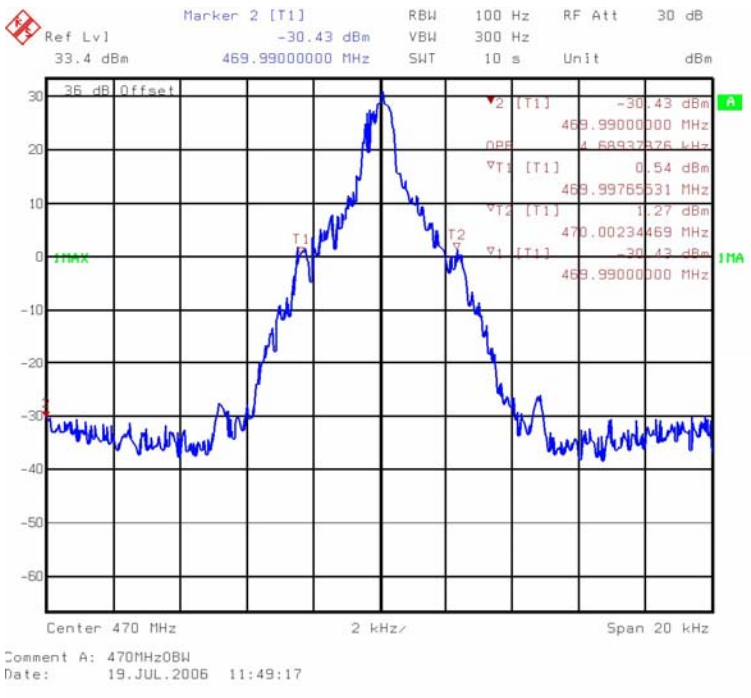


Figure 4 Occupied Bandwidth 470 Mhz



APPENDIX C: EMISSION MASK

C.1. Base Standard & Test Basis

Base Standard	FCC 2.1049 (h), FCC 90.210 e), RSS 119 Issue 7 – 5.8.4 Table 7
Test Basis/Method	TIA/EIA 603

C.2. Specifications

FCC 90.210 Emission masks.

Except as indicated elsewhere in this part, transmitters used in the radio services governed by this part must comply with the emission masks outlined in this section. Unless otherwise stated, per paragraphs (d)(4), (e)(4), and (m) of this section, measurements of emission power can be expressed in either peak or average values provided that emission powers are expressed with the same parameters used to specify the unmodulated transmitter carrier power. For transmitters that do not produce a full power unmodulated carrier, reference to the unmodulated transmitter carrier power refers to the total power contained in the channel bandwidth. Unless indicated elsewhere in this part, the table in this section specifies the emission masks for equipment operating in the frequency bands governed under this part.

Applicable Emission Masks

Frequency band (MHz)	Mask for equipment with Audio low pass filter	Mask for equipment without audio low pass filter
Below 25 \1\	A or B	A or C
25-50	B	C
72-76	B	C
150-174 \2\	B, D, or E	C, D, or E
150 Paging-only	B	C
220-222	F	F
421-512 \2\	B, D, or E	C, D, or E
450 Paging-only	B	G
806-809/851-854	B	H
809-824/854-869 \3\	B	G
896-901/935-940	I	J
902-928	K	K
929-930	B	G
4940-4990 MHz	L or M	L or M.
5850-5925 \4\	.....	
All other bands	B	C

\1\ Equipment using single sideband J3E emission must the requirements of Emission Mask A. Equipment using other emissions must meet the requirements of Emission Mask B or C, as applicable.
\2\ Equipment designed to operate with a 25 kHz channel bandwidth must meet the requirements of Emission Mask B or C, as applicable. Equipment designed to operate with a 12.5 kHz channel bandwidth must meet the requirements of Emission Mask D, and equipment designed to operate with a 6.25 kHz channel bandwidth Must meet the requirements of Emission Mask E.
\3\ Equipment used in this licensed to EA or non-EA systems shall comply with the emission mask provisions of § 90.691.
\4\ DSRCS Roadside Units equipment in the 5850-5925 MHz band is governed under subpart M of this part.

(e) *Emission Mask E—6.25 kHz or less channel bandwidth equipment.* For transmitters designed to operate with a 6.25 kHz or less bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

(1) On any frequency from the center of the authorized bandwidth f_0 to 3.0 kHz removed from f_0: Zero dB.

(2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 3.0 kHz but no more than 4.6 kHz: At least 30 + 16.67(f_d−3 kHz) or 55 + 10 log (P) or 65 dB, whichever is the lesser attenuation.

(3) On any frequency removed from the center of the authorized bandwidth by more than 4.6 kHz: At least 55 + 10 log (P) or 65 dB, whichever is the lesser attenuation.

(4) The reference level for showing compliance with the emission mask shall be established using a resolution bandwidth sufficiently wide (usually two to three times the channel bandwidth) to capture the true peak emission of the equipment under test. In order to show compliance with the emissions mask up to and including 50 kHz removed from the edge of the authorized bandwidth, adjust the resolution bandwidth to 100 Hz with the measuring instrument in a peak hold mode. A sufficient number of sweeps must be measured to insure that the emission profile is developed. If video filtering is used, its bandwidth must not be less than the instrument resolution bandwidth. For emissions beyond 50 kHz from the edge of the authorized bandwidth, see paragraph (m) of this section. If it can be shown that use of the above instrumentation settings do not accurately represent the true interference potential of the equipment under test, then an alternate procedure may be used provided prior Commission approval is obtained.

C.3. Measurement Uncertainty

Expanded Uncertainty (K=2)
1.11/-1.22

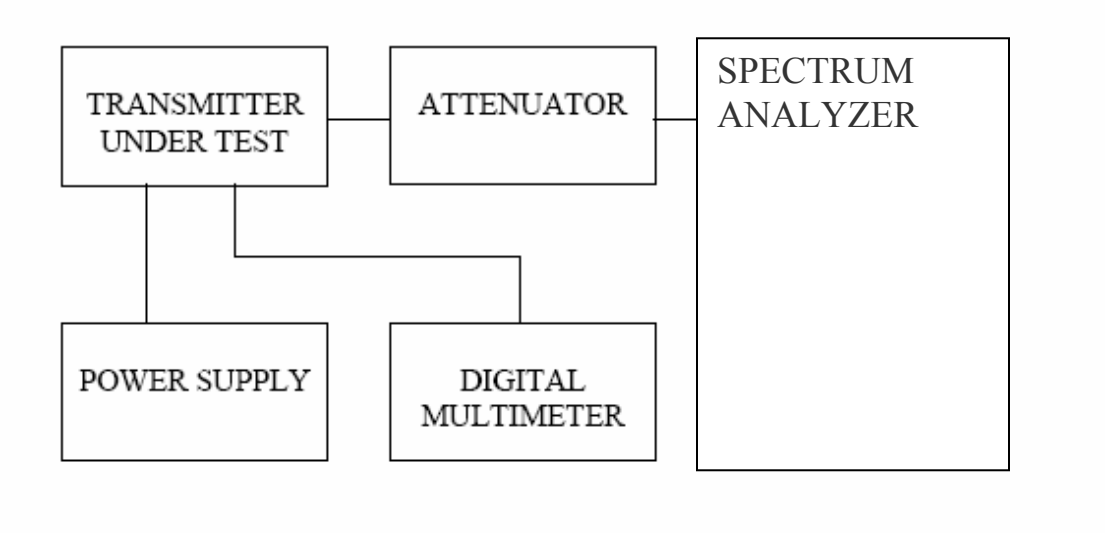
C.4. Test Method

RF conducted as per EIA/TIA 603

C.5. Test Results

Pass, See plots on following pages. Note that only the worst case data is presented

C.6. Test Setup

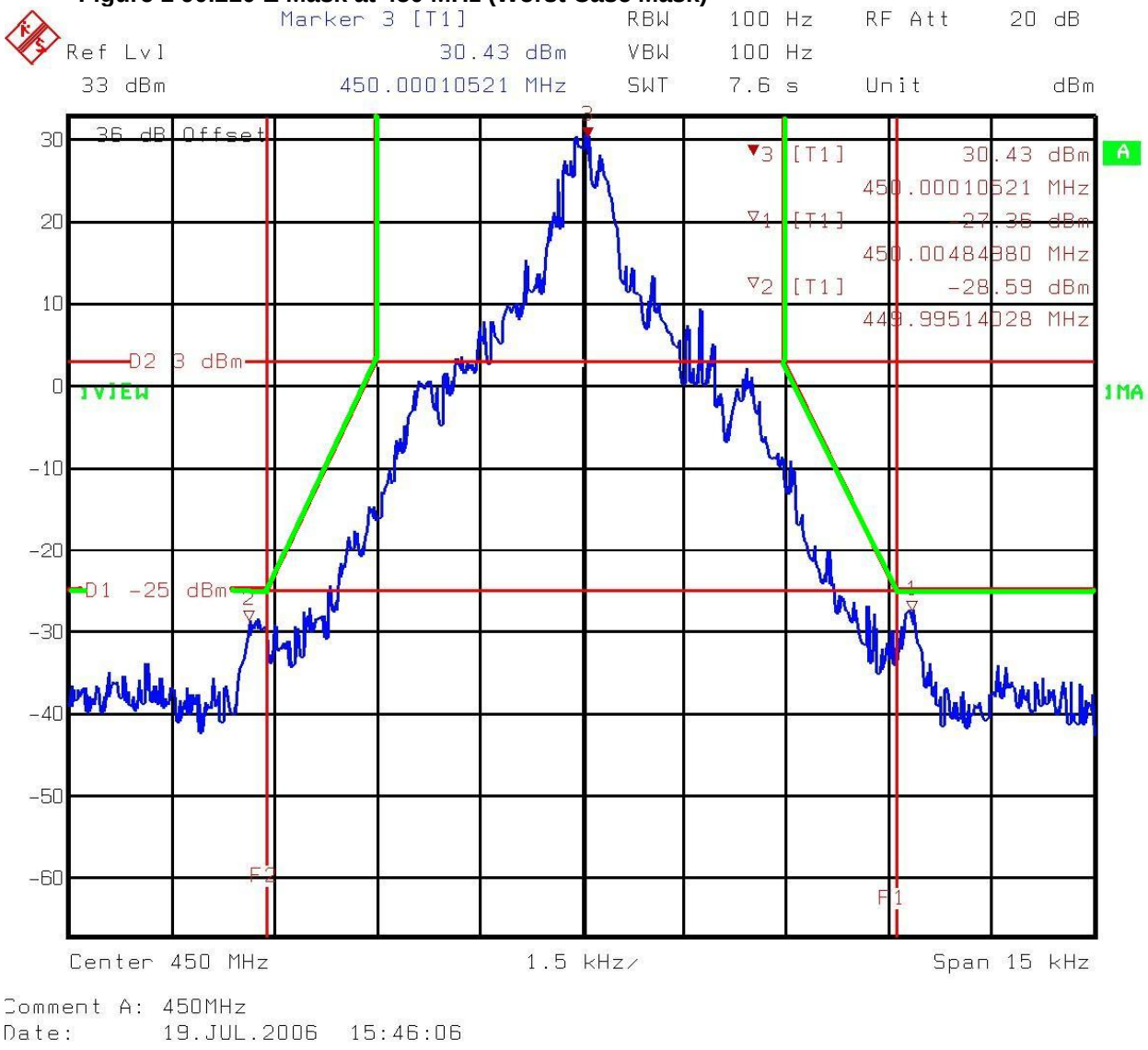


C.7. Tested By

This testing was conducted in accordance with the ISO 17025:1999 scope of accreditation, table 1; Quality Manual.

Name: Glen Moore
Function: EMC Manager

Figure 1 90.210 E Mask at 450 MHz (Worst Case Mask)



Note: E Mask is outlined on plot in bright green, display lines and markers on screen in red were used to provide exact amplitude and frequency intersection points for Mask.

APPENDIX D: CONDUCTED SPURIOUS EMISSIONS

D.1. Base Standard & Test Basis

Base Standard	FCC Part 90, RSS 119
Test Basis/Test Method	TIA/EIA 603

D.2. Specifications

See 90.210 Mask specifications

D.3. Measurement Uncertainty

Expanded Uncertainty (K=2)
+1.11/-1.22

D.4. Test Method

EIA/TIA 603. All measurements were taken using a peak detector with max hold.

D.5. Test Results

Compliant. The maximum measured conducted spurious emission was -25.4 dBm at 812.2 MHz while transmitting on channel 406.1 MHz. No other emissions were detected. The EUT meets the requirements with a 0.4 dB margin

EUT Transmit Channel	Spurious Frequency	Level dBm	Limit
406.1 MHz	812.2	-25.4	-25 dBm
430 MHz	860	-28.4	-25 dBm
450 MHz	900	-27.4	-25 dBm
470 MHz	940	-28.2	-25 dBm

D.6. Sample Calculation

None.

D.7. Test Data

See plots following. Note that Only worst case plots were provided

D.8. Tested By

This testing was conducted in accordance with the ISO 17025:1999 scope of accreditation, table 1; Quality Manual.

Name: Glen Moore
Function: EMC Manager

Figure 5 Conducted Spurious

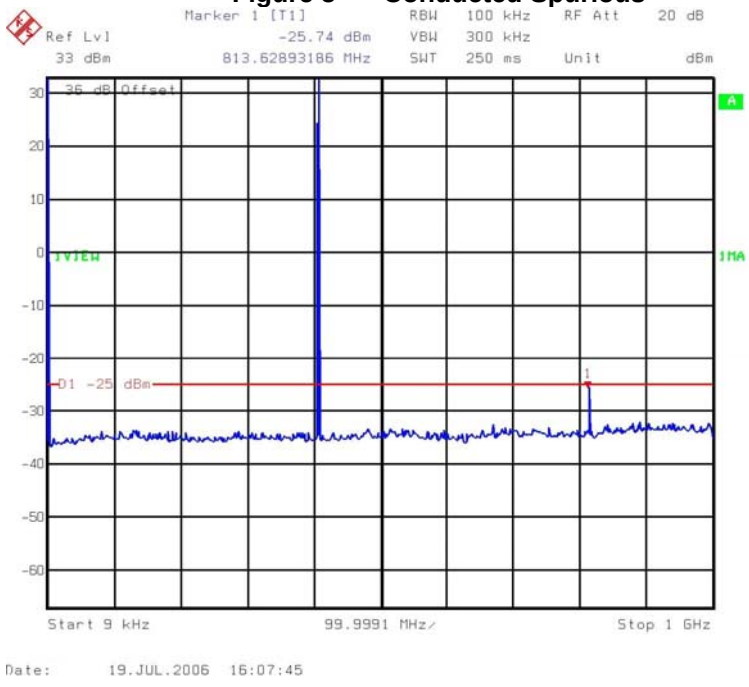


Figure 6 Conducted Spurious

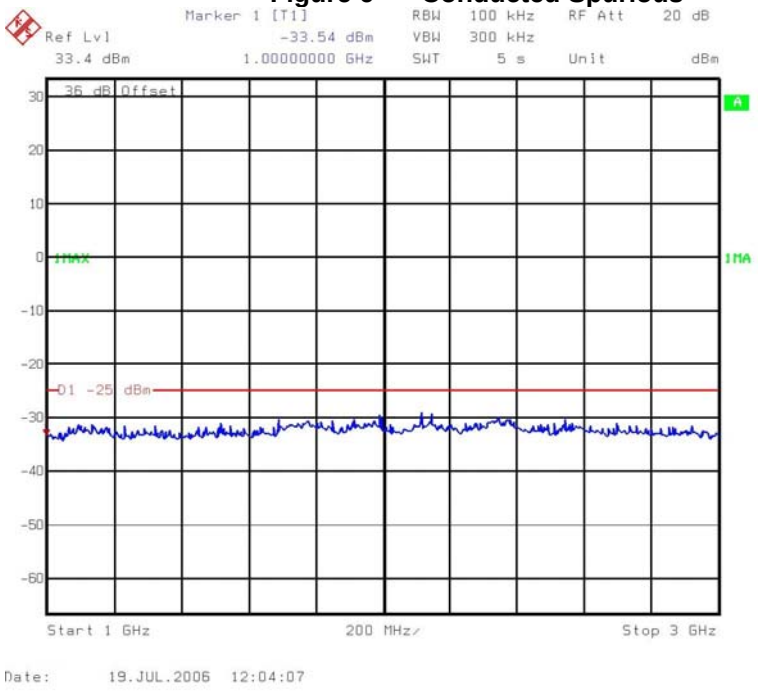
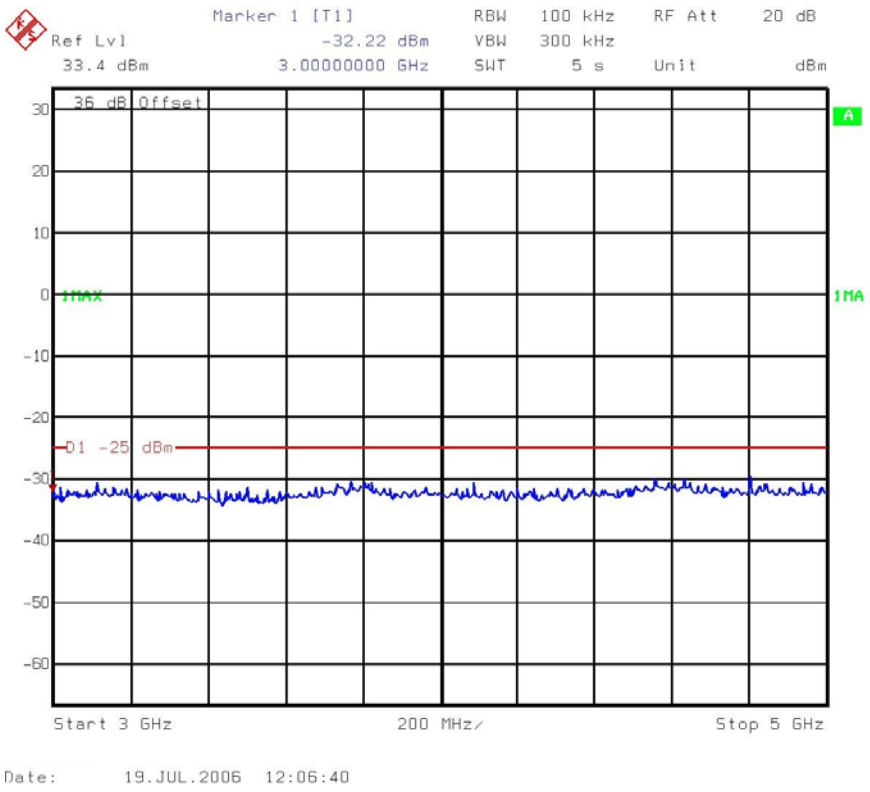


Figure 7 Conducted Spurious



Note: Only worst case plots are shown. No spurious components were detected above 1 GHz

APPENDIX E: FIELD STRENGTH OF SPURIOUS RADIATION

E.1. Base Standard & Test Basis

Base Standard	CFR Title 47 – Telecommunications, Chapter I – FCC Part 90.210, RSS 119
Test Basis/Method	TIA/EIA 603

E.2. Specifications

2.3.1.1.1 90.210 Emission masks.

(3) On any frequency removed from the center of the authorized bandwidth by more than 4.6 kHz: At least 55 + 10 log (P) or 65 dB, whichever is the lesser attenuation.

E.3. Measurement Uncertainty

Expanded Uncertainty (K=2)
1.11/-1.22

Calculations

Limit = 55 + 10 Log (2w)

= 58 dbc

ERP Limit = 33 dbm (2 w) – 58 db
= -25 dbm

Product Integrity Laboratory V2.5

Project Number: CG-336 **Tester:** Deniz Demirci
Model: Microlynx Telalink **Test ID:** RE02-10m-336 RE03-10m-336
Comments: Conf13: Board SIU3 2V0 #001,FreqB:470.00 MHz, attenuation to '80', In packet mode Tx '32.4dBm
Conf15: Board SIU3 2V0 #001,Freq4:450.00 MHz, attenuation to '74', In packet mode Tx '33dBm
Conf16: Board SIU3 2V0 #001,Freq3:430.00 MHz, attenuation to '7A', In packet mode Tx '33dBm'

Standard: FCC Part 22 **Measurement Distance:** <1GHz 10 meters, >1GHz 3 meters

Antenna Polarization	Frequency (MHz)	Configuration	Emission Level (dBµV/m)	Signal Generator Level (dBm)	Tx Cable Loss (dB)	Tx Antenna Gain (dBi)	Dipole Gain (dBi)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)
Horizontal	860.00	Conf16	66.14	-28.94	0.86	4.60	2.15	-27.35	-25.00	2.35
Horizontal	900.00	Conf15	67.04	-28.10	0.94	4.20	2.15	-26.99	-25.00	1.99
Horizontal	1290.00	Conf16	69.29	-31.60	1.07	7.01	2.15	-27.81	-25.00	2.81
Horizontal	1350.00	Conf15	68.91	-32.20	1.10	7.84	2.15	-27.61	-25.00	2.61
Horizontal	1410.00	Conf13	72.84	-31.10	1.12	8.26	2.15	-26.11	-25.00	1.11
Vertical	1410.00	Conf13	72.21	-31.80	1.12	8.26	2.15	-26.81	-25.00	1.81
Horizontal	1720.00	Conf16	69.14	-33.00	1.22	8.43	2.15	-27.94	-25.00	2.94
Horizontal	1800.00	Conf15	70.23	-32.00	1.24	8.54	2.15	-26.85	-25.00	1.85
Horizontal	1880.00	Conf13	70.47	-31.80	1.26	8.56	2.15	-26.65	-25.00	1.65
Horizontal	2350.00	Conf13	68.31	-34.50	1.42	9.02	2.15	-29.05	-25.00	4.05

Positive Margin indicates a Pass

Note: All measurements were taken with a peak detector. The transmitter was configured to transmit the maximum duration of transmissions, and maximum duty cycle for the measurements

F4. Test Results

Compliant. The worst case emission level is -26.11 dBm @ 1410 MHz. 1.11 db below the limit

E.4. Test Data & Photographs

Worst case data is presented above

E.5. Tested By

This testing was conducted in accordance with the ISO 17025:1999 scope of accreditation, table 1; Quality Manual.

Name: Glen Moore
Function: EMC Manager

APPENDIX F: FREQUENCY STABILITY

F.1. Base Standard & Test Basis

Base Standard	2.1055 a)1), 90.213, RSS 119 Issue 7, 5.3
Test Basis/Method	RSS 119, TIA/EIA 603

F.2. Limits

FCC: Mobile stations designed to operate with a 6.25 kHz channel bandwidth must have a frequency stability of 1.0 ppm or 470 Hz
IC RSS 119 : Mobile stations designed to operate with a 6.25 kHz channel bandwidth must have a frequency stability of 0.5ppm or 235 Hz

F.3. Test Results

Complies, the worst case frequency drift is less than .5 ppm

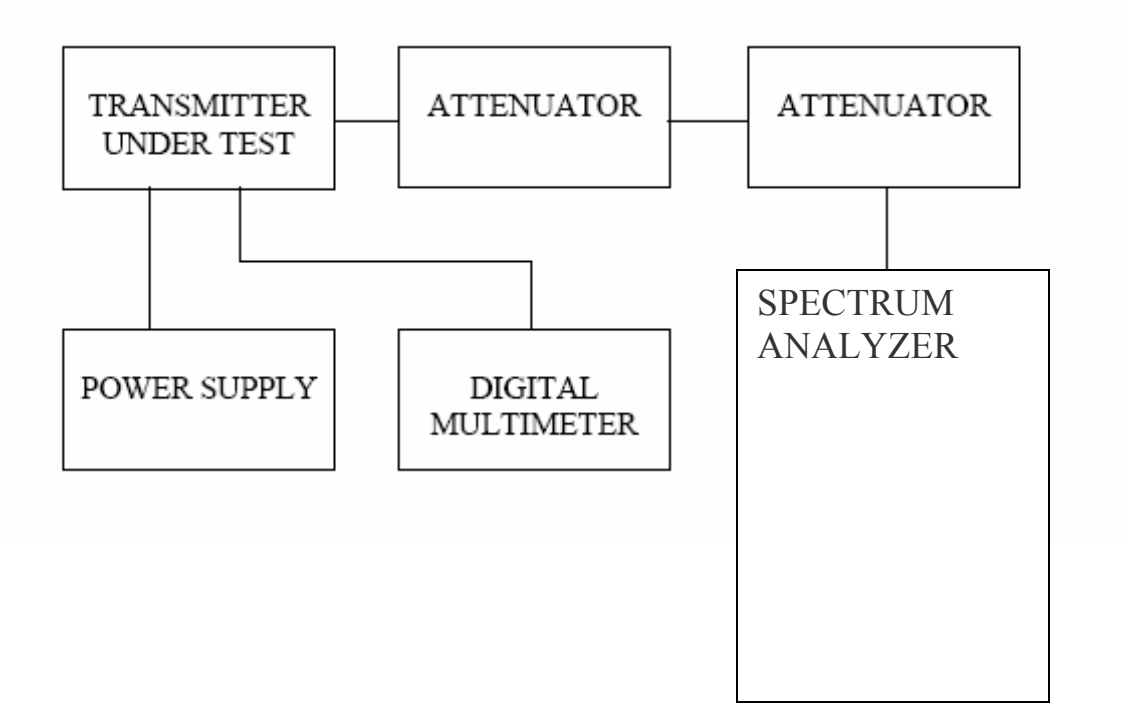
Minutes	Temperature deg.C	Measured Frequency (Hz)	Delta Freq. (Hz)	Pass/Fail
1	-30	469999926.9	73	Pass
2	-30	469999922.9	77	Pass
3	-30	469999924.9	75	Pass
4	-30	469999922.9	77	Pass
5	-30	469999926.9	73	Pass
6	-30	469999922.9	77	Pass
7	-30	469999922.9	77	Pass
8	-30	469999924.9	75	Pass
9	-30	469999924.9	75	Pass
10	-30	469999922.9	77	Pass
1	-20	469999950.9	49	Pass
2	-20	469999950.9	49	Pass
3	-20	469999948.9	51	Pass
4	-20	469999950.9	49	Pass
5	-20	469999950.9	49	Pass
6	-20	469999950.9	49	Pass
7	-20	469999952.9	47	Pass
8	-20	469999952.9	47	Pass
9	-20	469999950.9	49	Pass
10	-20	469999950.9	49	Pass
1	-10	469999912.8	87	Pass
2	-10	469999912.8	87	Pass
3	-10	469999916.8	83	Pass
4	-10	469999912.8	87	Pass
5	-10	469999910.8	89	Pass

6	-10	469999912.8	87	Pass
7	-10	469999912.8	87	Pass
8	-10	469999914.8	85	Pass
9	-10	469999914.8	85	Pass
10	-10	469999912.8	87	Pass
1	0	469999942.9	57	Pass
2	0	469999946.9	53	Pass
3	0	469999946.9	53	Pass
4	0	469999944.9	55	Pass
5	0	469999944.9	55	Pass
6	0	469999944.9	55	Pass
7	0	469999946.9	53	Pass
8	0	469999946.9	53	Pass
9	0	469999946.9	53	Pass
10	0	469999950.9	49	Pass
1	10	470000051.1	-51	Pass
2	10	470000053.1	-53	Pass
3	10	470000055.1	-55	Pass
4	10	470000053.1	-53	Pass
5	10	470000053.1	-53	Pass
6	10	470000051.1	-51	Pass
7	10	470000055.1	-55	Pass
8	10	470000053.1	-53	Pass
9	10	470000051.1	-51	Pass
10	10	470000051.1	-51	Pass
1	20	470000063.1	-63	Pass
2	20	470000061.1	-61	Pass
3	20	470000061.1	-61	Pass
4	20	470000059.1	-59	Pass
5	20	470000061.1	-61	Pass
6	20	470000061.1	-61	Pass
7	20	470000061.1	-61	Pass
8	20	470000063.1	-63	Pass
9	20	470000059.1	-59	Pass
10	20	470000063.1	-63	Pass
1	30	470000037.1	-37	Pass
2	30	470000039.1	-39	Pass
3	30	470000035.1	-35	Pass
4	30	470000035.1	-35	Pass
5	30	470000039.1	-39	Pass
6	30	470000035.1	-35	Pass
7	30	470000035.1	-35	Pass
8	30	470000033.1	-33	Pass
9	30	470000033.1	-33	Pass

10	30	470000033.1	-33	Pass
1	40	470000007	-7	Pass
2	40	470000011	-11	Pass
3	40	470000009	-9	Pass
4	40	470000009	-9	Pass
5	40	470000007	-7	Pass
6	40	470000007	-7	Pass
7	40	470000007	-7	Pass
8	40	470000007	-7	Pass
9	40	470000007	-7	Pass
10	40	470000005	-5	Pass
1	50	469999966.9	33	Pass
2	50	469999962.9	37	Pass
3	50	469999962.9	37	Pass
4	50	469999964.9	35	Pass
5	50	469999962.9	37	Pass
6	50	469999964.9	35	Pass
7	50	469999966.9	33	Pass
8	50	469999962.9	37	Pass
9	50	469999962.9	37	Pass
10	50	469999964.9	35	Pass

Minutes	Temperature deg.C	Measured Frequency (Hz)	Delta Freq. (Hz)	Pass/Fail	Comments
1	20.11	470000017	-17	Pass	85%
2	20.27	470000021	-21	Pass	100%
3	20.34	470000019	-19	Pass	115%
4	20.1	470000021	-21	Pass	115%
5	20.24	470000029	-29	Pass	115%

F.4. Test Setup diagram



F.5. Tested By

This testing was conducted in accordance with the ISO 17025:1999 scope of accreditation, table 1; Quality Manual.
Name: John Yam

APPENDIX G: TRANSIENT FREQUENCY BEHAVIOUR

G.1. Base Standard & Test Basis

Requirements	90.210e, RSS 119 Issue 7
Test Method	TIA/EIA 603

G.2. Specifications

Transient Frequency Behavior for Equipment Designed to Operate on 6.25 kHz Channels

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t1 \4\.....	±6.25 kHz	5.0 ms	10.0 ms
t2.....	±3.125 kHz	20.0 ms	25.0 ms
t3 \4\.....	±6.25 kHz	5.0 ms	10.0 ms

G.3. Test conditions

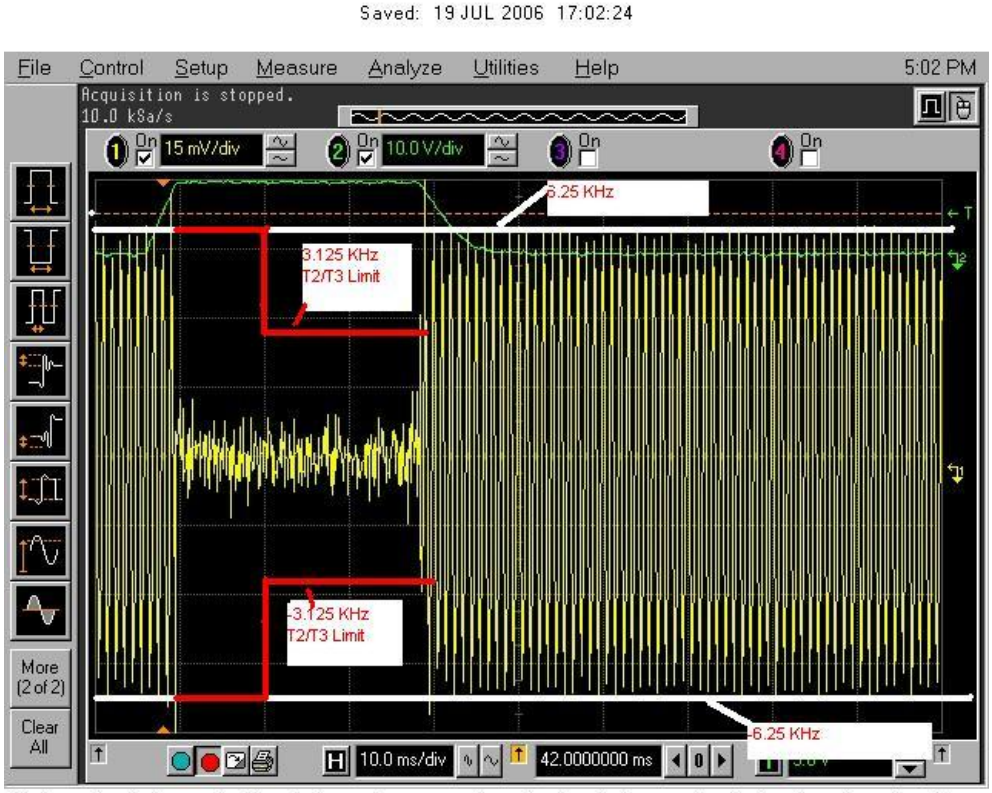
Standard test conditions

G.4. Test Procedure

EIA/TIA 603

G.5. Test Results

Compliant. See test plots below



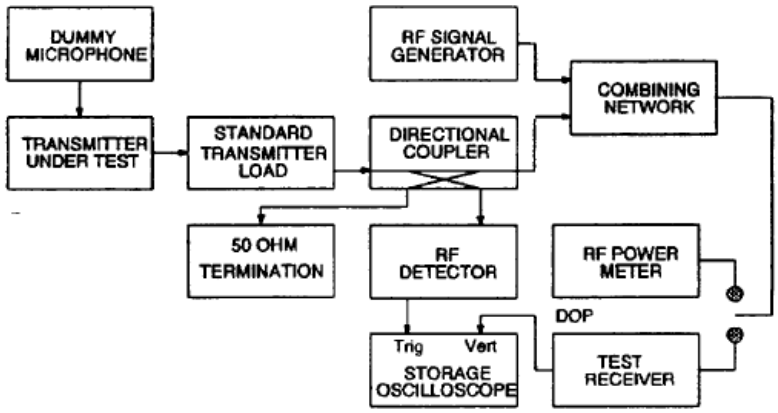
This transmitter deploys a pulsed tranmission mode never operates with a tranmission exceeding the time above for on time (25 ms), there for t3 limit is also t2 limit which is tighter during keydown period

Channel 1	Scale 15 mV/div Offset 2.4 mV BW limit off Coupling DC Impedance 50 Ohms Attenuation 1.000 : 1 Atten units ratio Skew 0.0 s Ext adapter None Ext coupler None Ext gain 1.00E+00 Ext offset 0.0E+00
Channel 2	Scale 10.0 V/div Offset -29.410 V BW limit off Coupling DC Impedance 1M Ohm Attenuation 10.00 : 1 Atten units ratio Skew 0.0 s Ext adapter None Ext coupler None Ext gain 1.00E+00 Ext offset 0.0E+00
Time base	Scale 10.0 ms/div Position 42.000000 ms Reference center
Trigger	Mode edge Sweep triggered Hysteresis normal Holdoff time 60 ns Coupling DC Source channel 2 Trigger level 5.6 V Slope rising

G.6. Operating Mode During Test

The SIUA3 was tested as per methodology in TIA/EIA 603.

G.7. Test Setup



G.8. Tested By

This testing was conducted in accordance with the ISO 17025:1999 scope of accreditation, table 1; Quality Manual.

Name: Glen Moore
Function: EMC Manager

APPENDIX H: CONDUCTED EMISSIONS 150 KHZ – 30 MHZ

H.1. Base Standard & Test Basis

Base Standard	CFR Title 47 – Telecommunications, Chapter I - FCC Part 15.207 – Radio Frequency Devices
Test Basis	ANSI C63.4 - 2003 Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
Test Method	NTS Conducted Emissions Test Method E011R1

H.2. Specifications

Frequency	**Limit**	
	Quasi-Peak	**Average**
MHz	**dBµV**	**dBµV**
0.150 – 0.500	66 to 56[1]	56 to 46[1]
0.500 – 5.00	56	46
5.00 – 30.00	60	50

Note 1: decrease with the logarithm of the frequency

H.3. Measurement Uncertainty

Conducted Current Emissions 150 kHz – 30 MHz	**Measurement Uncertainty**	**Expanded Uncertainty (K=2)**
(dB)	+1.21/-1.33	+2.41/-2.66

H.4. Test Results

Compliant. The worst case emission level was 32.84dBµV at 7.77MHz with a margin of 17.16dB.

H.5. Sample Calculation

Correction Factor = LISN Correction Factor + Cable Loss
Corrected Value = Measurement + Correction Factor
Margin = Limit – Corrected Emission Level

H.6. Tested By

This testing was conducted in accordance with the ISO 17025:1999 scope of accreditation, table 1; Quality Manual.

Name: Kuganesan Pararajasingam
Function: EMC Technician

H.7. Test Data

p1of1

Compliance Scan Peaks

FCC15B(QP) - AC 120V 09/05/2006 11:01

Product Integrity Laboratory V2.5

Project Name: CG-336 **Tester:** Alex Mathews
Model: Microlynx-Telelink (SIU3 Rev 1v 0) **Test ID:** CE02TC-10m-336
Comments: Conf#1: Board 001, Freq0 410.6 MHz, attenuation to '7A', In packet mode Tx '33dBm'

Pre-Compliance		Verified Compliance Scan														
Emission Frequency (MHz)	Emission Level (dBuV)	Peak Status	Emission Frequency (MHz)	QP Measured Level (dBuV/m)	QP Emission Level (dBuV/m)	FCC15B(QP) Limit (dBuV/m)	FCC15B(QP) Margin (dB)	Correction Factors (dB)								
0.1517	51.61	Verify	0.1602	25.91	38.15	65.45	27.30	12.24								
0.1633	50.77	Verify	0.1595	26.06	38.31	65.49	27.18	12.25								
0.1690	50.29	Verify	0.1640	25.55	37.72	65.26	27.54	12.17								
0.1981	47.49	Verify	0.1962	23.14	34.90	63.77	28.87	11.76								
0.2101	47.15	Verify	0.2074	22.33	33.98	63.31	29.33	11.65								
0.2224	44.92	Verify	0.2166	21.74	33.31	62.95	29.63	11.57								

p1of1

Compliance Scan Peaks

FCC15B(QP) - AC 120V 09/05/2006 11:01

Product Integrity Laboratory V2.5

Project Name: CG-336 **Tester:** Alex Mathews
Model: Microlynx-Telelink (SIU3 Rev 1v 0) **Test ID:** CE02TC-10m-336
Comments: Conf#1: Board 001, Freq0 410.6 MHz, attenuation to '7A', In packet mode Tx '33dBm'

Pre-Compliance		Verified Compliance Scan														
Emission Frequency (MHz)	Emission Level (dBuV)	Peak Status	Emission Frequency (MHz)	QP Measured Level (dBuV/m)	QP Emission Level (dBuV/m)	FCC15B(QP) Limit (dBuV/m)	FCC15B(QP) Margin (dB)	Correction Factors (dB)								
0.1527	49.74	Verify	0.1551	26.26	38.52	65.72	27.20	12.26								
0.1667	48.04	Verify	0.1618	25.73	37.86	65.37	27.51	12.13								
0.1694	48.36	Verify	0.1644	25.48	37.57	65.24	27.67	12.09								
0.1807	47.77	Verify	0.1749	24.84	36.79	64.72	27.94	11.95								
0.2051	46.23	Verify	0.2003	22.96	34.61	63.60	28.99	11.65								
0.2358	45.11	Verify	0.2314	21.03	32.42	62.40	29.98	11.39								

p1of1

Compliance Scan Peaks

FCC15B(AVG) - AC 120V

09/05/2006 10:29

Product Integrity Laboratory V2.5

Project Name: CG-336 **Tester:** Alex Mathews
Model: Microlynx-Telelink (SIU3 Rev 1v 0) **Test ID:** CE02TC-10m-336
Comments: Conf#1: Board 001, Freq0 410.6 MHz, attenuation to '7A', In packet mode Tx '33dBm'

Pre-Compliance		Verified Compliance Scan															
Emission Frequency (MHz)	Emission Level (dBuV)	Peak Status	Emission Frequency (MHz)	AV Measured Level (dBuV/m)	AV Emission Level (dBuV/m)	FCC15B(AVG) Limit (dBuV/m)	FCC15B(AVG) Margin (dB)	Correction Factors (dB)									
0.1517	51.61	Verify	0.1546	13.92	26.27	55.75	29.48	12.35									
0.1633	50.77	Verify	0.1575	13.64	25.93	55.59	29.66	12.23									
0.1690	50.29	Verify	0.1658	13.82	25.97	55.17	29.20	12.15									
0.1981	47.49	Verify	0.1928	13.24	25.04	53.92	28.88	11.80									
0.2101	47.15	Verify	0.2050	13.21	24.88	53.41	28.52	11.67									
0.2144	46.30	Verify	0.2080	13.06	24.70	53.28	28.58	11.64									

p1of1

Compliance Scan Peaks

FCC15B(AVG) - AC 120V

09/05/2006 10:29

Product Integrity Laboratory V2.5

Project Name: CG-336 **Tester:** Alex Mathews
Model: Microlynx-Telelink (SIU3 Rev 1v 0) **Test ID:** CE02TC-10m-336
Comments: Conf#1: Board 001, Freq0 410.6 MHz, attenuation to '7A', In packet mode Tx '33dBm'

Pre-Compliance		Verified Compliance Scan															
Emission Frequency (MHz)	Emission Level (dBuV)	Peak Status	Emission Frequency (MHz)	AV Measured Level (dBuV/m)	AV Emission Level (dBuV/m)	FCC15B(AVG) Limit (dBuV/m)	FCC15B(AVG) Margin (dB)	Correction Factors (dB)									
0.1527	49.74	Freq Adjust	0.1514	14.76	27.09	55.92	28.83	12.22									
0.1667	48.04	Selected															
0.1807	47.77	Verify	0.1768	13.52	25.44	54.63	29.19	11.92									
0.1927	47.27	Verify	0.1874	13.01	24.79	54.15	29.36	11.78									
0.2051	46.23	Verify	0.1971	13.24	24.92	53.73	28.81	11.63									
0.2084	46.53	Verify	0.2037	13.36	24.97	53.46	28.49	11.61									

Figure 8 CE –Line A1 – 150 kHz – 30 MHz (QP Detector)

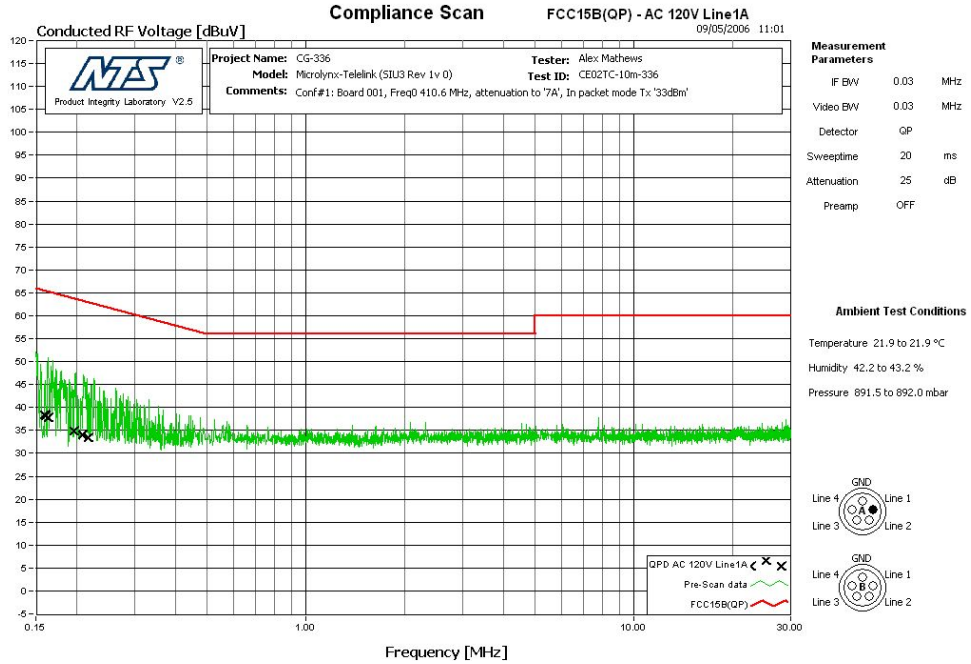


Figure 9 CE –Return A2 – 150 kHz – 30 MHz (QP Detector)

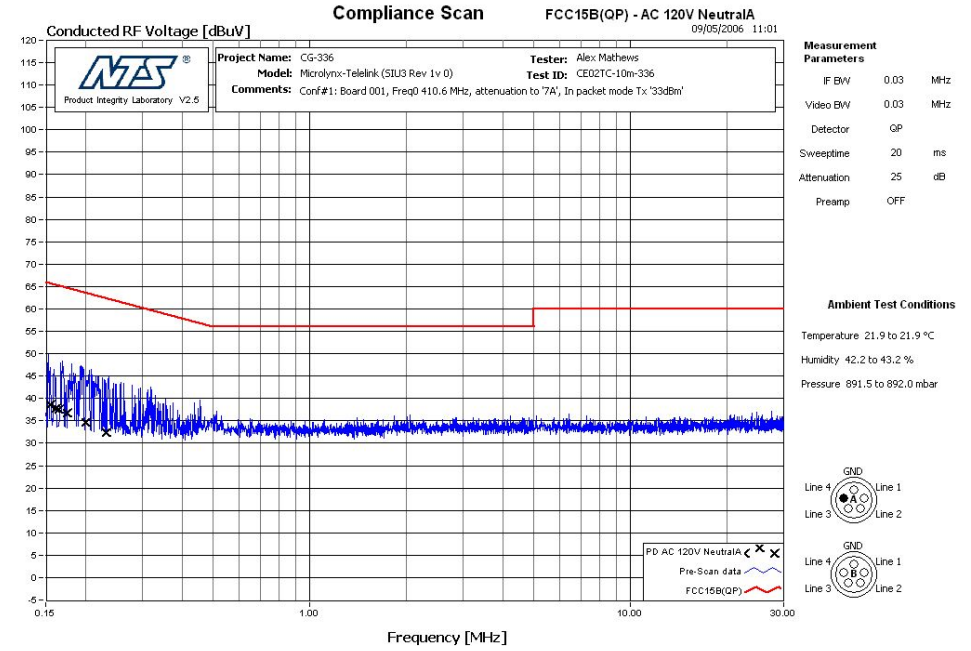


Figure 10 CE –Line A1 – 150 kHz – 30 MHz (Average Detector)

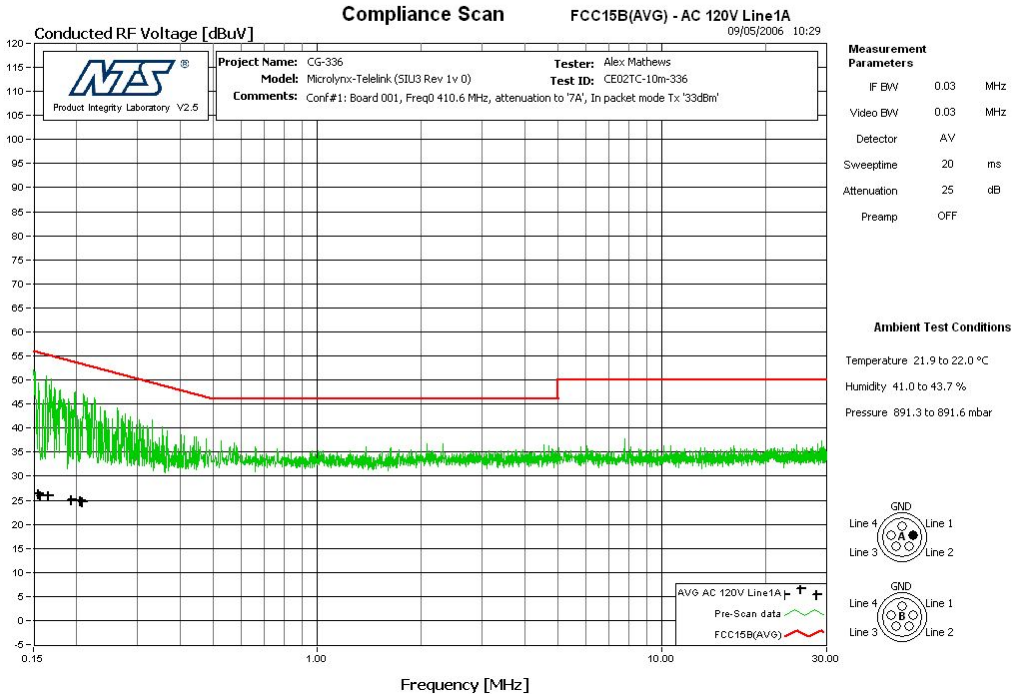
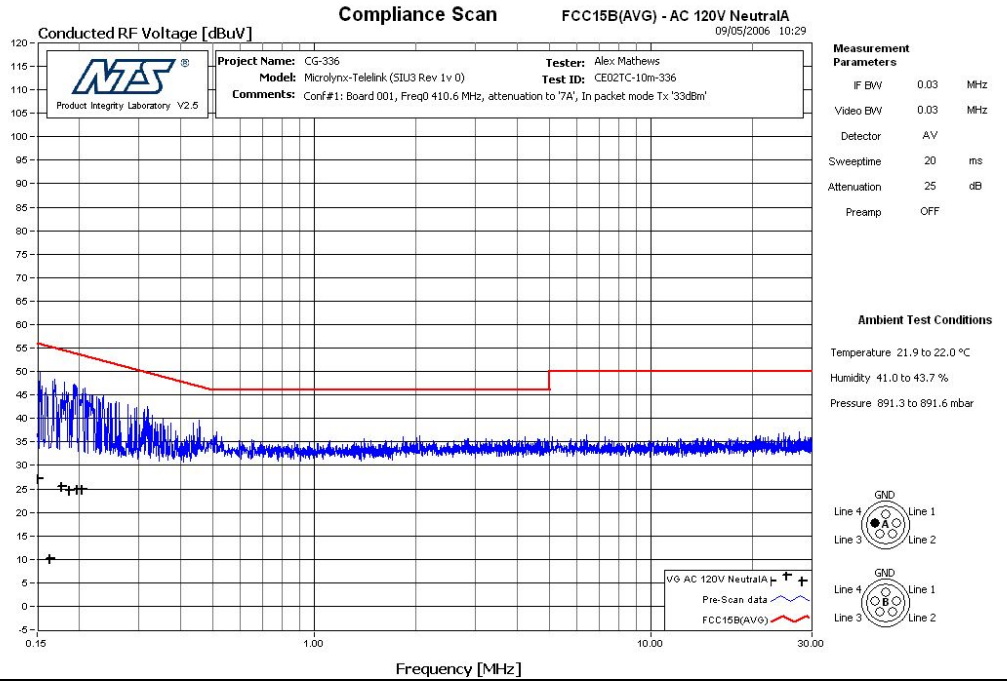


Figure 11 CE –Return A2 – 150 kHz – 30 MHz (Average Detector)



APPENDIX I: TEST EQUIPMENT LIST

I.1. Conducted Emissions 150 kHz – 30 MHz Measurement Equipment

Description		Manufacturer	Type/Model	Serial #	Cal Due	Cal Date
10m ANECHOIC CHAMBER						
A LISN Link					07JAN06	07JAN04
-LISN A Switch	☒ A	NA	NA	263177		
-Cable Switch to Limiter	☒ A	NA	NA	263164		
- Cable LISN to Switch	☒ A1	Succoflex	NA	263168	07JAN06	07JAN04
	☐ A2	Succoflex	NA	263169	07JAN06	07JAN04
	☐ A3	Succoflex	NA	263170	07JAN06	07JAN04
	☒ A4	Succoflex	NA	263171	07JAN06	07JAN04
- LISN	☐ A1	EMCO	38100/1SPEC	260454	07JAN06	07JAN04
- LISN	☐ A2	EMCO	38100/1SPEC	260268	07JAN06	07JAN04
- LISN	☐ A3	EMCO	38100/1SPEC	260458	07JAN06	07JAN04
- LISN	☐ A4	EMCO	38100/1SPEC	260265	07JAN06	07JAN04
- Table Top LISN	☒ TT	EMCO	3825	260354	08JAN06	08JAN04
CONTROL ROOM						
Test Receiver		Rohde & Schwarz	ESMI	260110 / 260111	05FEB06	05FEB07
Mast Controller		EMCO	2090	260166	N/A	N/A
Switch Matrix		TDL	SMC-002	260162	07JAN06	07JAN04
Cable Switch Matrix to Receiver		NA	NA	263166	07JAN06	07JAN04
A LISN Link					07JAN06	07JAN04
-LISN A Limiter	☒ A	NA	NA	263178		
-Cable Switch to Limiter	☒ A	NA	NA	263164		

I.2. Radiated Emissions 30 MHz – 1 GHz Measurement Equipment

Description	Manufacturer	Type/Model	Asset #	Cal Due	Cal Date
10m ANECHOIC CHAMBER					
Bilog Antenna	☐ Chase	CBL 6111B	260398	09JULY06	09JULY04
	☒ Chase	CBL 6112B	260301		
RF Cable	Suhner Succoflex	Ferrite bead loaded cable	260388	07JAN06	07JAN04
CONTROL ROOM					
Test Receiver	Rohde & Schwarz	ESMI	260110 / 260111	05FEB06	05FEB07
Mast Controller	EMCO	2090	260165	N/A	N/A
Multi Device Controller TT1 (Turntable)	07JAN06	07JAN04		N/A	N/A
RF 10m East site Link				Suhner Succoflex	NA
- Cable 1	Suhner Succoflex	NA	263135		
- Cable 2	Suhner Succoflex	NA	263161		
- Cable 3	Suhner Succoflex	NA	263162		
- Cable 4	TDL	SMC-002	260162		
- Switch Matrix Controller	Hewlett Packard	8447F	260164		
- Amplifier					

I.3. Radio/Radiated Emissions Measurement Equipment

Description	Manufacturer	Type/Model	Asset #	Cal Due	Cal Date
10m ANECHOIC CHAMBER					
Horn Antenna (Rx) 1 GHz – 18 GHz	EMCO	3115	260092	16Jun06	16JUN04
High pass filter	K&L	11SH10-3860	263124	08JAN06	08JAN04
High frequency Link				07JAN06	07JAN04
Step Attenuator/Switch (0dB & 10 dB)	HP	11713A	260048 260097		
LNA	Miteq	JSD000121	260477		
Cable from LNA to SA	Succoflex	101PEA	263187		
Spectrum Analyzer 9k-40GHz	Rohde & Schwarz	FSEK	260104	05APR06	05APR05
LNA DC Power Supply	Xantrex	LXO 30-2	260483	NA	NA
HPIB Extender	HP	37204	260096	N/A	N/A
Modulation analyzer	HP	8901B	N/A	01/May/06	01/May/06
Power Meter	R&S	NRVD	CG0030	13/Jun/2006	13/Jun/2007
Combiner	Weinshcel	1506A	N/A	NA	NA
30 dB Attenuator	Weinshcel	66-30-34	NA	NA	NA
Scope	HP	Infinium	NA	12/Dec/2005	12/Dec/2006
CONTROL ROOM					
PC with FSEK Manual ctrl S/W	N/A	N/A	N/A	N/A	N/A
HPIB Extender	HP	37204	260168	N/A	N/A
Mast Controller	EMCO	2090	260166	N/A	N/A
Multi Device Controller TT1	EMCO	2090	260165	N/A	N/A
Horn Antenna (Tx)	EMCO	3160	260088	N/A	N/A

END OF DOCUMENT