

TEST RESULT SUMMARY

FCC PART 90, Subpart C

MANUFACTURER'S NAME	Phoenix International
NAME OF EQUIPMENT	Skylinks Head Unit and Skylinks Power Supply
MODEL NUMBER	JDGT-0001 - Skylinks Head Unit JDGT-0002 - Skylinks Power Supply
MANUFACTURER'S ADDRESS	1441 44 th Street NW Fargo ND 58102
TEST REPORT NUMBER	W0387
TEST DATE	05 May 2000 13, 14, 26 July 2000

According to testing performed at TÜV Product Service Inc, the above-mentioned unit is in compliance with the electromagnetic compatibility requirements defined in FCC Part 90, Subpart C.

It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics. Any modifications necessary for compliance made during testing on the above mentioned date(s) must be implemented in all production units for compliance to be maintained.

TÜV Product Service Inc, as an independent testing laboratory, declares that the equipment tested as specified above conforms to the requirements of FCC Part 90, Subpart C.

Date: 17 August 2000

Location: Taylors Falls MN
USA



R. M. Johnson
Test Technician



J. P. Peltier
MN EMC Manager

Not Transferable

EMC EMISSION - TEST REPORT

Test Report File No. : **WC1G038701** Date of issue: 17 August 2000Model / Serial No. : **JDGT-0001 / PL0001X000146**
JDGT-0002 / XC001Product Type : Skylinks Head Unit and Skylinks Power SupplyApplicant : Phoenix InternationalManufacturer : Phoenix InternationalLicense holder : Phoenix InternationalAddress : 1441 44th Street NW
: Fargo ND 58102Test Result : ☒ **Positive** ☐ **Negative**Test Project Number : W0387
Reference(s)Total pages including
Appendices 48

TÜV Product Service Inc is a subcontractor to TÜV Product Service, GmbH according to the principles outlined in ISO/IEC Guide 25 and EN 45001.

TÜV Product Service Inc reports apply only to the specific samples tested under stated test conditions. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. TÜV Product Service Inc shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV Product Service Inc issued reports.

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EMISSIONS TEST REGULATIONS :

The emissions tests were performed according to following regulations:

- | | | |
|--|---|------------------------------------|
| ☐ - EN 50081-1 / 1991 | ☐ - Group 1 | ☐ - Group 2 |
| ☐ - EN 55011 / 1991 | ☐ - Class A | ☐ - Class B |
| ☐ - EN 55013 / 1990 | ☐ - Household appliances and similar | |
| ☐ - EN 55014 / 1987 | ☐ - Portable tools | |
| | ☐ - Semiconductor devices | |
| ☐ - EN 55014 / A2:1990 | ☐ - Household appliances and similar | |
| ☐ - EN 55014 / 1993 | ☐ - Portable tools | |
| | ☐ - Semiconductor devices | |
| ☐ - EN 55015 / 1987 | ☐ - Class A | ☐ - Class B |
| ☐ - EN 55015 / A1:1990 | ☐ - Class A | ☐ - Class B |
| ☐ - EN 55015 / 1993 | | |
| ☐ - EN 55022 / 1987 | | |
| ☐ - EN 55022 / 1994 | | |
| ☒ - FCC Part 90, Subpart C | | |
| ☐ - BS | ☐ - Class A | ☐ - Class B |
| ☐ - VCCI | ☐ - Class A | ☐ - Class B |
| ☐ - FCC Part 15 | ☐ - Class A | ☐ - Class B |
| ☐ - AS 3548 (1992) | ☐ - Class A | ☐ - Class B |
| ☐ - CISPR 11 (1990) | ☐ - Group 1 | ☐ - Group 2 |
| | ☐ - Class A | ☐ - Class B |
| ☐ - CISPR 22 (1993) | ☐ - Class A | ☐ - Class B |

Environmental conditions in the lab:

	<u>Actual</u>
Temperature	: 25 – 28 °C
Relative Humidity	: 49 - 50 %
Atmospheric pressure	: 98.5 – 98.9 kPa
Power supply system	: 60 Hz 120 VAC

Sign Explanations:

- ☐ - not applicable
- ☒ - applicable



Emissions Test Conditions: CONDUCTED EMISSIONS (Interference Voltage)

The **CONDUCTED EMISSIONS (INTERFERENCE VOLTAGE)** measurements were performed at the following test location:

☐ - Test not applicable

- ☐ - Wild River Lab Large Test Site (Open Area Test Site)
- ☐ - Wild River Lab Small Test Site (Open Area Test Site)
- ☐ - Oakwood Lab (Open Area Test Site)
- ☒ - Wild River Lab Screen Room
- ☐ - New Brighton Lab Shielded Room

Test equipment used :

Model Number	Manufacturer	Description	Serial Number	Cal Due
■ - ESHS-20	Rohde & Schwarz	EMI Receiver	837055/003	3-01
■ - 3825/2	Electro-Mechanics (EMCO)	50 Ω LISN	8812-1439	4-01

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST) and is calibrated annually.

Emissions Test Conditions: FREQUENCY STABILITY MEASUREMENTS

The **Frequency Stability Measurements** were performed at the following test location:

- ☒ - Phoenix Int'l
- ☐ - Wild River Lab Small Test Site (Open Area Test Site)
- ☐ - Oakwood Lab (Open Area Test Site)

☐ - Test not applicable

Test equipment used :

Manufacturer	Model	Asset Tag	Cal Sticker Due Date
Hewlett-Packard	5316A Universal Counter	PCT12050	1-2001
Hewlett-Packard	6296A DC Power Supply	PCT12041	(Cal Not Req.)
Hewlett-Packard	ESG-D3000A Signal Generator	(ILTech) 01275	10/3/00
Thermotron	S-16 Environmental Chamber	PCA00396	5/21/01
Omega	HH21 Digital Thermometer	(S/N) T-206843	(None)
Fluke	79 III Digital Multimeter	(ILTech) 01006	4/26/01
Pasternack	PE7048-20 10W 20dB Attenuator	N.A.	(None)
Narda	773-10 Attenuator	N.A.	(None)
Narda	773-6 Attenuator	N.A.	(None)

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST) and is calibrated annually.

Emissions Test Conditions: SPURIOUS EMISSIONS (Electric Field)

The Spurious *EMISSIONS (ELECTRIC FIELD)* measurements, in the frequency range of 30 MHz-2000 MHz, were tested in a horizontal and vertical polarization at the following test location :

☐ - Test not applicable

- ☐ - Wild River Lab Large Test Site (Open Area Test Site)
- ☒ - Wild River Lab Small Test Site (Open Area Test Site) – NSA measurements made 7-00, due 7-01
- ☐ - Oakwood Lab (Open Area Test Site)

at a test distance of :

- ☐ - 3 meters
- ☒ - 10 meters
- ☐ - 30 meters

Test equipment used :

Model Number	Manufacturer	Description	Serial Number	Cal Due
■ - 8566B	Hewlett-Packard	Spectrum Analyzer	2430A00930	5-01
■ - 85662A	Hewlett-Packard	Analyzer Display	2403A08134	5-01
■ - 85650A	Hewlett-Packard	Quasi-Peak Adapter	2521A01006	5-01
■ - ZHL-1042J	Mini-Circuits	Preamplifier	H081296-16	3-01
■ - EM-6917B	Electro-Metrics	Biconicalog Periodic	106	12-00

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST) and is calibrated annually.

Emissions Test Conditions: CONDUCTED EMISSIONS @ ANTENNA TERMINAL

The *Conducted Emission* measurements @ the *Antenna Terminal* were performed in the frequency range 450 MHz – 4.6 GHz at the following test location :

☐ - Test not applicable

- ☐ - Wild River Lab Large Test Site (Open Area Test Site)
- ☒ - Wild River Lab Small Test Site (Open Area Test Site)
- ☐ - Oakwood Lab (Open Area Test Site)
- ☐ - Wild River Lab Screen Room
- ☐ - New Brighton Lab Shielded Room

Test equipment used :

Model Number	Manufacturer	Description	Serial Number	Cal Date
■ - 8566B	Hewlett-Packard	Spectrum Analyzer	2430A00930	5-01
■ - 85662A	Hewlett-Packard	Analyzer Display	2403A08134	5-01
■ - 85650A	Hewlett-Packard	Quasi-Peak Adapter	2521A01006	5-01
■ - ZHL-1042J	Mini-Circuits	Preamplifier 30 – 4000 MHz	H081296-16	3-01
■ - EM-6917B	Electro-Metrics	Biconicalog Periodic 30–2000MHz	106	12-00
■ - 3115	Electro-Mechanics (EMCO)	Ridge Guide Antenna 2 – 18 GHz	2483	12-00
■ - AFT-8434-10F	Avantek	Preamplifier 4 – 8 GHz	2613A92801	3-01
■ - AWT-18037	Avantek	Preamplifier 8-18 GHz	2613A92801	3-01

Emissions Test Conditions: TRANSIENT FREQUENCY BEHAVIOR MEASUREMENTS

The *Transient Frequency Behavior Measurements* were performed at the following test location :

- ☐ - Wild River Lab Large Test Site (Open Area Test Site)
- ☒ - Wild River Lab Small Test Site (Open Area Test Site)
- ☐ - Oakwood Lab (Open Area Test Site)
- ☐ - Wild River Lab Screen Room

☐ - Test not applicable

Test equipment used :

Model Number	Manufacturer	Description	Serial Number	Cal Due
■ - 54615B	Hewlett-Packard	500 MHz 2- CH Oscilloscope	US35420841	9-00

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST) and is calibrated annually.

Emissions Test Conditions: OCCUPIED BANDWIDTH MEASUREMENTS

The *Occupied Bandwidth Measurements* were performed at the following test location :

- ☐ - Wild River Lab Large Test Site (Open Area Test Site)
- ☒ - Wild River Lab Small Test Site (Open Area Test Site)
- ☐ - Oakwood Lab (Open Area Test Site)
- ☐ - Wild River Lab Screen Room

☐ - Test not applicable

Test equipment used :

Model Number	Manufacturer	Description	Serial Number	Cal Due
■ - 8566B	Hewlett-Packard	Spectrum Analyzer	2430A00930	5-01
■ - 85662A	Hewlett-Packard	Analyzer Display	2403A08134	5-01
■ - 85650A	Hewlett-Packard	Quasi-Peak Adapter	2521A01006	5-01
■ - ZHL-1042J	Mini-Circuits	Preamplifier 30 – 4000 MHz	H081296-16	3-01
■ - EM-6917B	Electro-Metrics	Biconicalog Periodic 30–2000MHz	106	12-00

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST) and is calibrated annually.

Equipment Under Test (EUT) Test Operation Mode - Emission tests :

The device under test was operated under the following conditions during emissions testing:

- ☐ - Standby
- ☐ - Test program (H - Pattern)
- ☐ - Test program (color bar)
- ☐ - Test program (customer specific)
- ☐ - Practice operation
- ☐ - Normal Operating Mode
- ☒ - Running Scaddie.exe – initializing navigation.

Configuration of the device under test:

- ☒ - See Constructional Data Form in Appendix B - Page B2
- ☐ - See Product Information Form in Appendix B - beginning on Page B3

The following peripheral devices and interface cables were connected during the measurement:

- | | |
|----------------------------------|--------------|
| ☐ - _____ | Type : _____ |
| ☐ - _____ | Type : _____ |
| ☐ - _____ | Type : _____ |
| ☐ - _____ | Type : _____ |
| ☐ - _____ | Type : _____ |
| ☐ - _____ | Type : _____ |
| ☐ - _____ | Type : _____ |
| ☐ - _____ | Type : _____ |

☒ - unshielded power cable

☐ - unshielded cables

☒ - shielded cables

MPS.No.: _____

☐ - customer specific cables

☐ - _____

☐ - _____

Emission Test Results:

Conducted emissions 450 kHz - 30 MHz

The requirements are ☒ - MET ☐ - NOT MET

Minimum margin of compliance _____ 7 dB at _____ 455.0 kHz

Maximum margin of non-compliance _____ dB at _____ MHz

Remarks: FCC Class A limit.

Frequency Stability

The requirements are ☒ - MET ☐ - NOT MET

Range 1 _____ fL = 449.99963 MHz _____ fH = 449.99974 MHz

Range 2 _____ fL = 459.99966 MHz _____ fH = 459.99974 MHz

Range 3 _____ fL = 469.97460 MHz _____ fH = 469.97477 MHz

Remarks: The Frequency Stability Measurement results are within the requirements of FCC Part 90. Refer to data in Appendix A for detailed test results.

Spurious Radiated emissions (electric field) 30 MHz - 2000 MHz

The requirements are ☒ - MET ☐ - NOT MET

Minimum margin of compliance _____ 3 dB at _____ 99.98 MHz

Maximum margin of non-compliance _____ dB at _____ MHz

Remarks: FCC Class A limit.

Conducted Emissions @ Antenna Terminal 450 MHz – 4.6 GHz

The requirements are ☒ - MET ☐ - NOT MET

Minimum margin of compliance _____ 6 dB at _____ 1840.0 MHz

Maximum margin of non-compliance _____ dB at _____ MHz

Remarks: _____

Occupied Bandwidth Measurements

The requirements are ☒ - MET ☐ - NOT MET

Remarks: The Occupied Bandwidth Measurement results are within the requirements of FCC Part 90.209 and 90.210. Refer to data in Appendix A for detailed test results.

Transient Frequency Behavior

The requirements are ☒ - MET ☐ - NOT MET

Remarks: The Transient Frequency Behavior complies with the requirements of FCC Part 90.214. Refer to data in Appendix A for detailed test results.

DEVIATIONS FROM STANDARD:

None.

GENERAL REMARKS:

Testing was performed on different dates. Data and pictures referencing W0242 are from testing on 05 May 2000. Data and pictures referencing W0387 are from testing on July 13 and 14, 2000.

SUMMARY:

The requirements according to the technical regulations are

☒ - met

☐ - **not** met.

The device under test does

☒ - fulfill the general approval requirements mentioned on page 3.

☐ - **not** fulfill the general approval requirements mentioned on page 3.

Testing Start Date: 05 May 2000

Testing End Date: 26 July 2000

- TÜV PRODUCT SERVICE INC -



J. P. Peltier
MN EMC Manager



Tested By:
R. M. Johnson

Test-setup photo(s):
Conducted emission 10/150 kHz - 30 MHz

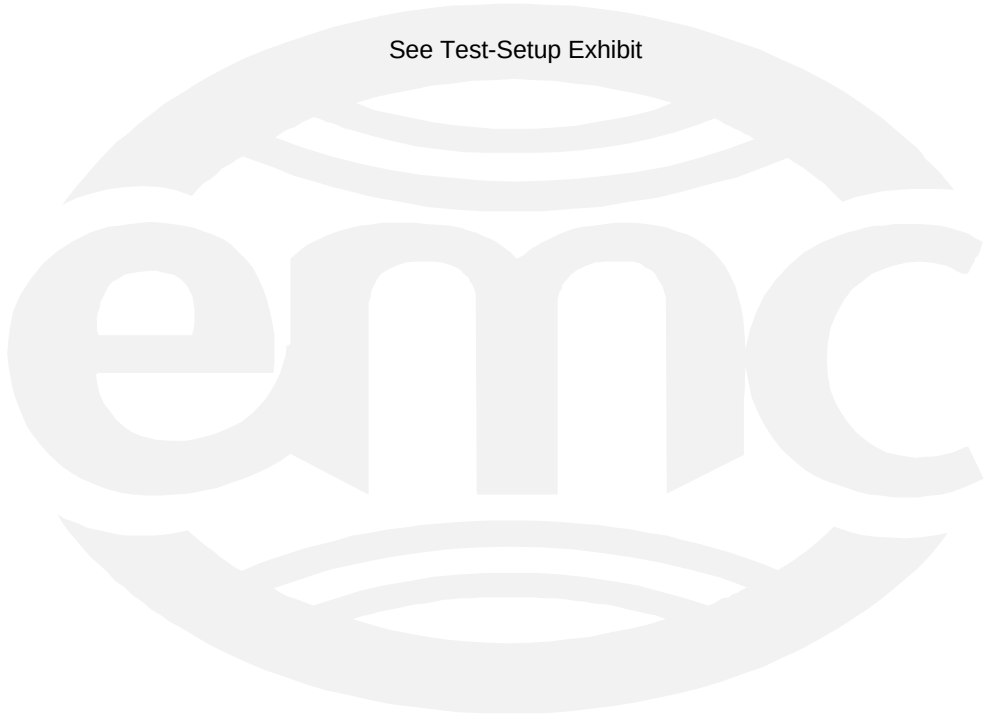
See Test-Setup Exhibit

Test-setup photo(s) Radiated emission 30 MHz - 4.6 GHz

See Test-Setup Exhibit

Test-setup photo(s):
Radiated emission 30 MHz - 4.6 GHz

See Test-Setup Exhibit



Test-Setup Photo(s)
Frequency Stability:

See Test-Setup Exhibit



Appendix A

Test Data Sheets
and
Test Setup Drawing(s)



TEST SETUP FOR EMISSIONS TESTING

WILD RIVER LAB
Small Test Site (STS)

See Test-Setup Exhibit

TEST SETUP FOR EMISSIONS TESTING

WILD RIVER LAB
Screen Room

See Test-Setup Exhibit

COLOR SKYLINKS HEAD UNIT FREQUENCY STABILITY TEST**26-Jul-00 RWY**

Data taken on 25JUL00 in Design Validation Lab at Phoenix International in Springfield, IL by Ahmad Fallah and Dick Young.
 Intent is to satisfy requirements of FCC Part 90, paragraph 90.213.

(See worksheets "Equipment & Methods" and "Photos" for details on test configuration.)

[1] Frequency Stability w/Varying Supply Voltage, Room Temperature (25C +/- 2)

The Skylinks Head Unit mounts on golf carts and those carts may contain 12VDC, 36VDC or 48VDC electrical systems.

Range 1: 12VDC +/-15%

Nominal Frequency

Measured Transmit Frequency

450.000MHz	449.99970	449.99972	449.99969
460.000MHz	459.99973	459.99974	459.99973
469.975MHz	469.97464	469.97465	469.97465
	Vin = 10.2V	Vin = 12.0V	Vin = 13.8V

Range 2: 36VDC +/-15%

Nominal Frequency

Measured Transmit Frequency

450.000MHz	449.99968	449.99971	449.99968
460.000MHz	459.99968	459.99966	459.99967
469.975MHz	469.97467	469.97462	469.97460
	Vin = 30.6V	Vin = 36.0V	Vin = 41.4V

Range 3: 48VDC +/-15%

Nominal Frequency

Measured Transmit Frequency

450.000MHz	449.99968	449.99970	449.99968
460.000MHz	459.99965	459.99966	459.99966
469.975MHz	469.97464	469.97464	469.97464
	Vin = 40.8V	Vin = 48.0V	Vin = 55.2V

[2] Frequency Stability Over Temperature (All Set-Points +/- 2C), Vin = 13.8VDC

Temperature

Measured Transmit Frequency

-30C	449.99974	459.99974	469.97468
-20C	449.99971	459.99974	469.97471
-10C	449.99979	459.99974	469.97477
0C	449.99971	459.99972	469.97481
10C	449.99965	459.99965	469.97467
20C	449.99963	459.99967	469.97470
30C	449.99969	459.99972	469.97469
40C	449.99966	459.99972	469.97466
50C	449.99968	459.99967	469.97468
Nominal Frequency>	450.000MHz	460.000MHz	469.975MHz

[3] Summary Of Readings

Frequency Stability spec is 2.5PPM, which works out to the following:

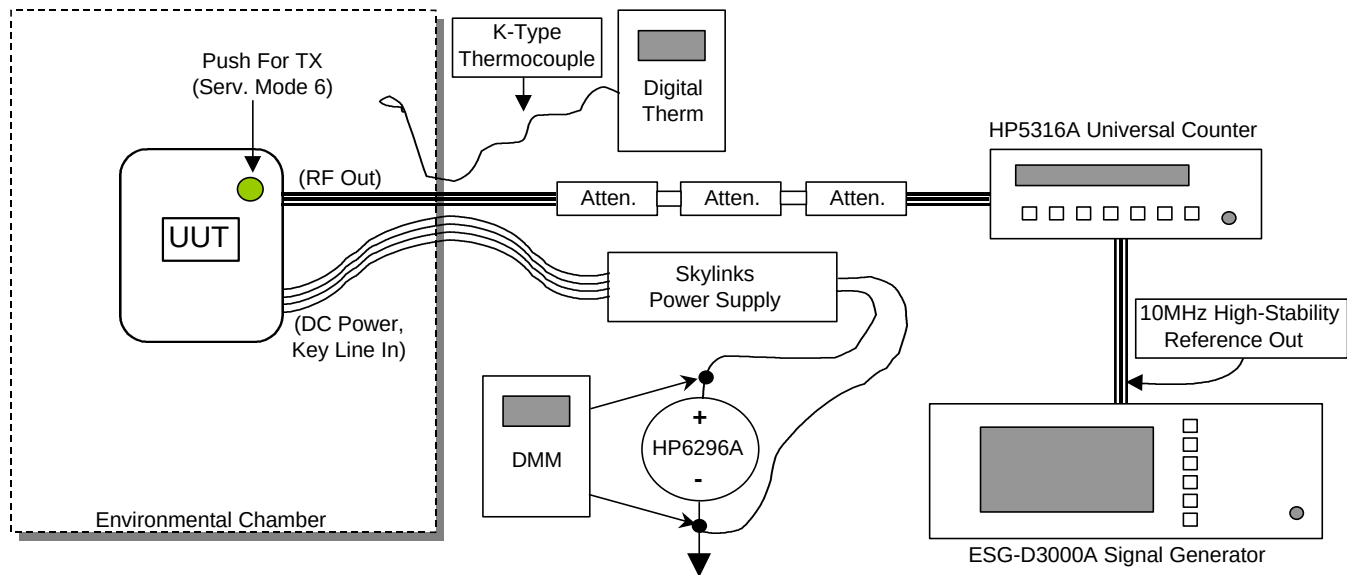
Nominal Frequency	Error in Hz, 2.5PPM	Largest Observed Errors, This Dataset	
		In Hz	In PPM
450.000MHz	1125	370	0.82
460.000MHz	1150	350	0.78
469.975MHz	1175	400	0.89

EQUIPMENT AND METHODS

[1] Equipment Listing

Manufacturer	Model	Asset Tag	Cal Sticker Due Date	Function
Hewlett-Packard	5316A Universal Counter	PCT12050	1-2001	Read frequency of TX signal
Hewlett-Packard	6296A DC Power Supply	PCT12041	(Cal Not Req.)	Provide Vin to Skylinks Power Supply
Hewlett-Packard	ESG-D3000A Signal Generator	(ILTech) 01275	10/3/00	Provide High-Stab. Reference to HP5316A
Thermotron	S-16 Environmental Chamber	PCA00396	5/21/01	Allow adjustment of temperature to unit
Omega	HH21 Digital Thermometer	(S/N) T-206843	(None)	Monitor chamber temperature
Fluke	79 III Digital Multimeter	(ILTech) 01006	4/26/01	Read output voltage of HP6296A
Pasternack	PE7048-20 10W 20dB Attenuator	N.A.	(None)	Reduce TX signal level for input to counter
Narda	773-10 Attenuator	N.A.	(None)	"
Narda	773-6 Attenuator	N.A.	(None)	"

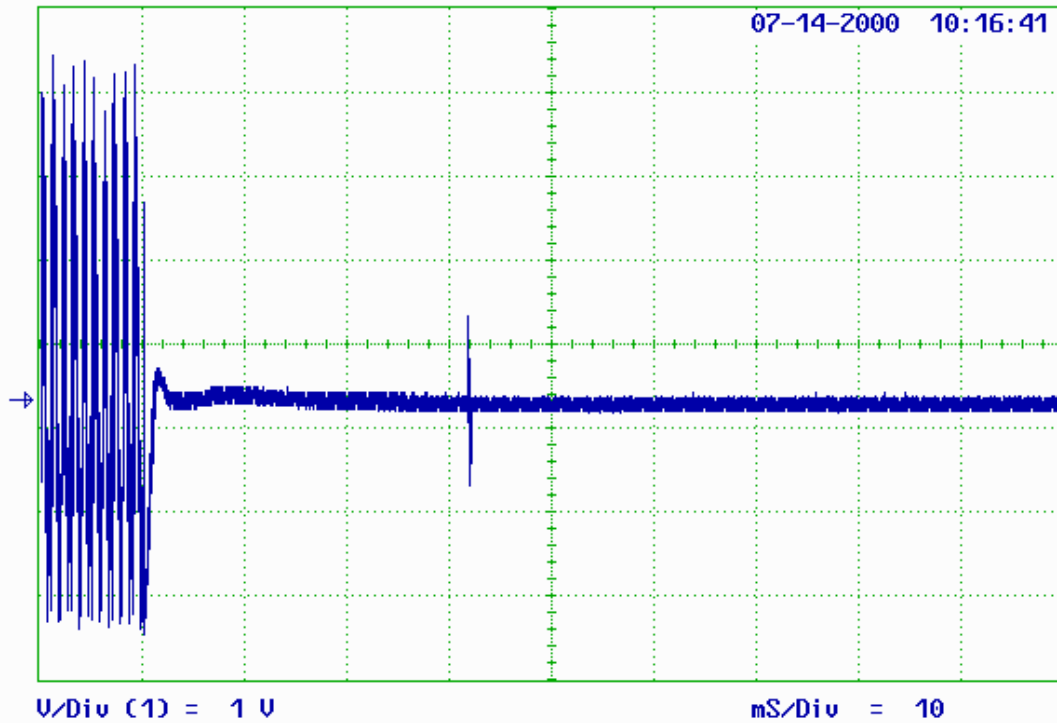
[2] Block Diagram Of Test



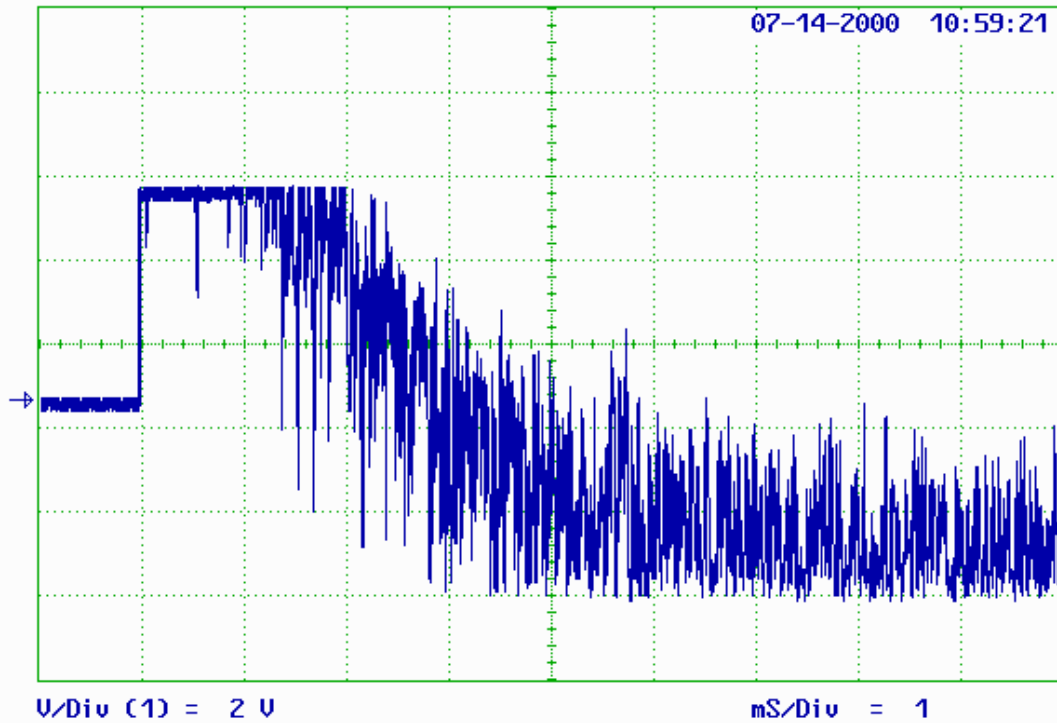
[3] Methodology Notes

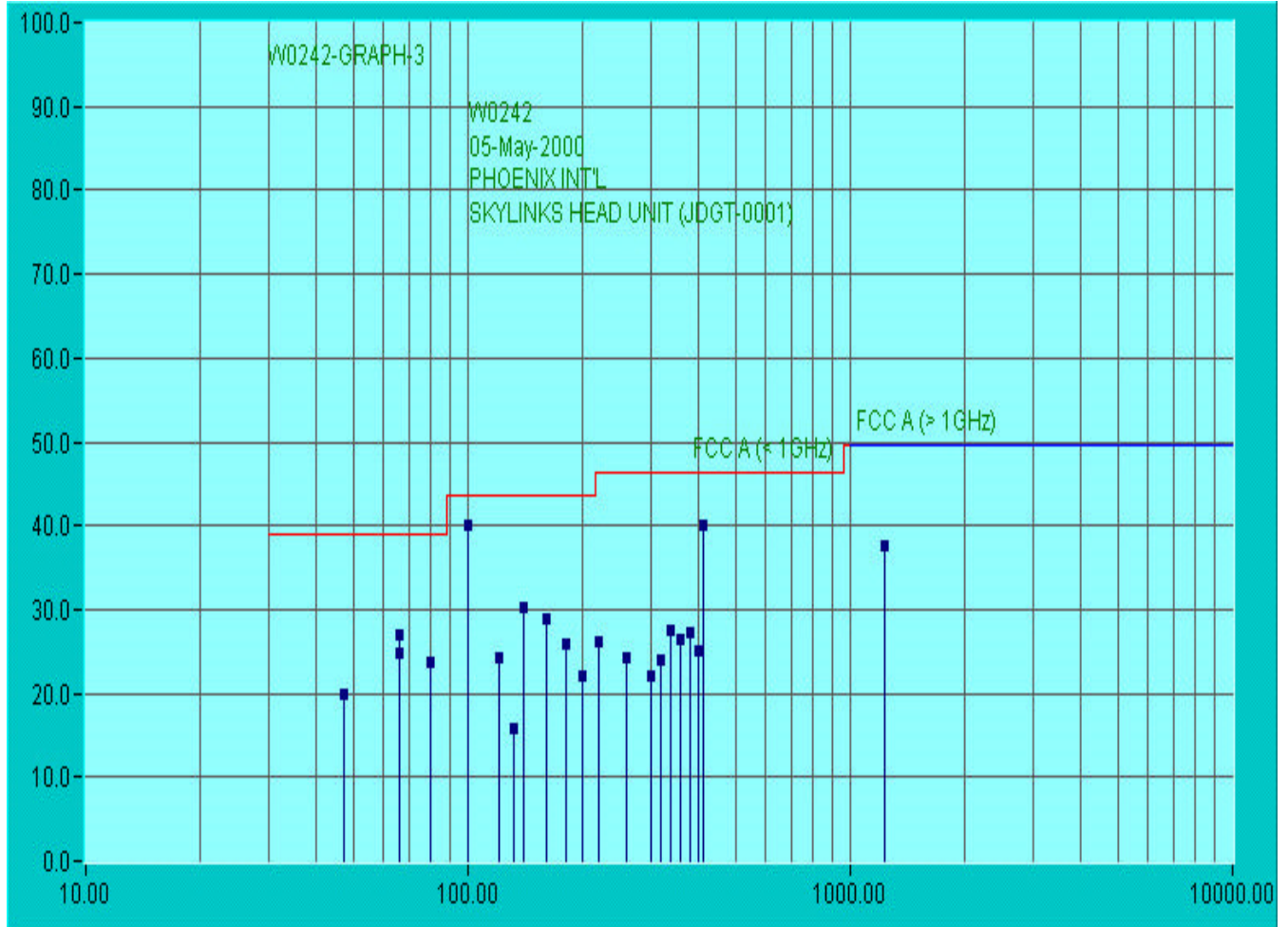
The Signal Generator was left on for over 48 Hours prior to testing to warm-up High-Stability Reference (Option 1E5). Counter set to External Reference, Gate Time = 1sec. Last reading at end of 15 second TX burst was recorded. Attenuators (36dB total) used on TX output to allow around 0dBm at counter (below Damage Level). Chamber allowed to achieve set point (+/- 2degC) for a few minutes at each temperature, then door opened briefly to press button for TX.

Transient Frequency Response:
Switch On Condition



Transient Frequency Response:
Switch Off Condition





Radiated Electromagnetic Emissions



Test Report #:	W0242 Run 03	Test Area:	STS 10m	
Test Method:	FCC Part 15	Test Date:	05-May-2000	
EUT Model #:	SKYLINKS HEAD UNIT (JDGT-0001)	EUT Power:	12VDC	
EUT Serial #:		Temperature:	25	°C
Manufacturer:	PHOENIX INT'L	Relative Humidity:	49	%
EUT Description:	GOLF COURSE NAVIGATION DISPLAY	Air Pressure:	98.9	kPa
Notes:	CART UNIT			

FREQ (MHz)	LEVEL (dBuV)	CABLE / ANT / PREAMP (dB)	FINAL (dBuV/m)	POL / HGT / AZ (m) (DEG)	DELTA1 FCC A (< 1GHz)	DELTA2 FCC A (> 1GHz)
47.42	32.6 Qp	1.5 / 14.1 / 28.4	19.8	V / 1.0 / 0.0	-19.3	N/A
66.14	42.0 Qp	1.8 / 9.5 / 28.3	24.9	V / 1.0 / 0.0	-14.2	N/A
66.35	44.1 Qp	1.8 / 9.5 / 28.3	27.1	V / 1.0 / 0.0	-12.0	N/A
79.99	41.0 Qp	1.9 / 6.5 / 28.3	21.1	V / 1.0 / 0.0	-18.0	N/A
99.98	53.0 Qp	2.1 / 8.1 / 28.2	34.9	V / 1.0 / 0.0	-8.6	N/A
119.98	40.5 Qp	2.3 / 7.6 / 28.2	22.2	V / 1.0 / 0.0	-21.3	N/A
132.20	33.9 Qp	2.4 / 7.6 / 28.2	15.7	V / 1.0 / 0.0	-27.8	N/A
139.98	44.4 Qp	2.4 / 8.6 / 28.2	27.3	V / 1.0 / 0.0	-16.2	N/A
159.98	44.1 Qp	2.7 / 8.0 / 28.1	26.6	V / 1.0 / 0.0	-16.9	N/A
179.98	42.4 Qp	2.8 / 8.7 / 28.1	25.8	V / 1.0 / 0.0	-17.7	N/A
199.99	37.1 Qp	3.0 / 10.1 / 28.1	22.1	V / 1.0 / 0.0	-21.4	N/A
219.98	40.0 Qp	3.2 / 10.3 / 28.1	25.4	V / 1.0 / 0.0	-21.0	N/A
259.99	32.8 Qp	3.5 / 11.3 / 28.1	19.4	V / 1.0 / 0.0	-27.0	N/A
299.99	33.0 Qp	3.7 / 12.6 / 28.1	21.2	V / 1.0 / 0.0	-25.2	N/A
320.00	34.9 Qp	3.9 / 13.5 / 28.1	24.1	V / 1.0 / 0.0	-22.3	N/A
339.99	35.7 Qp	4.0 / 14.2 / 28.1	25.7	V / 1.0 / 0.0	-20.7	N/A
360.00	35.4 Qp	4.1 / 15.1 / 28.2	26.3	V / 1.0 / 0.0	-20.1	N/A
379.99	35.3 Qp	4.2 / 15.9 / 28.2	27.3	V / 1.0 / 0.0	-19.1	N/A
400.00	32.8 Qp	4.4 / 16.0 / 28.2	25.0	V / 1.0 / 0.0	-21.4	N/A
411.20	44.8 Qp	4.5 / 16.0 / 28.2	37.1	V / 1.0 / 0.0	-9.3	N/A
1233.65	32.0 Av	8.5 / 24.4 / 27.2	37.6	V / 1.0 / 0.0	N/A	-11.9
119.98	41.1 Qp	2.3 / 7.6 / 28.2	22.8	V / 1.0 / 90.0	-20.7	N/A
139.98	47.5 Qp	2.4 / 8.6 / 28.2	30.3	V / 1.0 / 90.0	-13.2	N/A
219.98	40.7 Qp	3.2 / 10.3 / 28.1	26.1	V / 1.0 / 90.0	-20.3	N/A
259.99	35.6 Qp	3.5 / 11.3 / 28.1	22.3	V / 1.0 / 90.0	-24.1	N/A

Tested by: ROSS M. JOHNSON

Printed

Signature

Reviewed by: T. K. Swanson

Printed

Signature

Radiated Electromagnetic Emissions



Test Report #:	<u>W0242 Run 03</u>	Test Area:	<u>STS 10m</u>	
Test Method:	<u>FCC Part 15</u>	Test Date:	<u>05-May-2000</u>	
EUT Model #:	<u>SKYLINKS HEAD UNIT (JDGT-0001)</u>	EUT Power:	<u>12VDC</u>	
EUT Serial #:	<u></u>	Temperature:	<u>25</u>	°C
Manufacturer:	<u>PHOENIX INT'L</u>	Relative Humidity:	<u>49</u>	%
EUT Description:	<u>GOLF COURSE NAVIGATION DISPLAY</u>	Air Pressure:	<u>98.9</u>	kPa
Notes:	<u>CART UNIT</u>			

FREQ (MHz)	LEVEL (dBuV)	CABLE / ANT / PREAMP (dB)	FINAL (dBuV/m)	POL / HGT / AZ (m) (DEG)	DELTA1 FCC A (< 1GHz)	DELTA2 FCC A (> 1GHz)
99.98	56.0 Qp	2.1 / 8.1 / 28.2	37.9	V / 1.0 / 180.0	-5.6	N/A
159.98	46.5 Qp	2.7 / 8.0 / 28.1	29.0	V / 1.0 / 180.0	-14.5	N/A
259.99	37.6 Qp	3.5 / 11.3 / 28.1	24.3	V / 1.0 / 180.0	-22.1	N/A
299.99	33.9 Qp	3.7 / 12.6 / 28.1	22.1	V / 1.0 / 180.0	-24.3	N/A
411.20	47.7 Qp	4.5 / 16.0 / 28.2	40.0	V / 1.0 / 180.0	-6.4	N/A
79.99	43.6 Qp	1.9 / 6.5 / 28.3	23.7	V / 1.0 / 270.0	-15.4	N/A
99.98	57.4 Qp	2.1 / 8.1 / 28.2	39.4	V / 1.0 / 270.0	-4.1	N/A
119.98	42.5 Qp	2.3 / 7.6 / 28.2	24.2	V / 1.0 / 270.0	-19.3	N/A
219.98	40.8 Qp	3.2 / 10.3 / 28.1	26.2	V / 1.0 / 270.0	-20.2	N/A
339.99	37.5 Qp	4.0 / 14.2 / 28.1	27.5	V / 1.0 / 270.0	-18.9	N/A
MAXIMIZED.						
99.98	58.0 Qp	2.1 / 8.1 / 28.2	40.0	V / 2.5 / 0.0	-3.5	N/A
MAXED ANTENNA AND ROTATED EUT 360 DEGREES.						
NO NEW OR HIGHER EMISSIONS FOUND WITH HORIZONTAL POLARIZATION AT ALL AZIMUTHS.						
END OF SCAN 30 - 2000MHZ.						

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Radiated Electromagnetic Emissions



Test Report #:	<u>W0242 Run 03</u>	Test Area:	<u>STS 10m</u>	
Test Method:	<u>FCC Part 15</u>	Test Date:	<u>05-May-2000</u>	
EUT Model #:	<u>SKYLINKS HEAD UNIT (JDGT-0001)</u>	EUT Power:	<u>12VDC</u>	
EUT Serial #:	<u></u>	Temperature:	<u>25</u>	°C
Manufacturer:	<u>PHOENIX INT'L</u>	Relative Humidity:	<u>49</u>	%
EUT Description:	<u>GOLF COURSE NAVIGATION DISPLAY</u>	Air Pressure:	<u>98.9</u>	kPa
Notes:	<u>CART UNIT</u>			

FREQ (MHz)	LEVEL (dBuV)	CABLE / ANT / PREAMP (dB)	FINAL (dBuV/m)	POL / HGT / AZ (m) (DEG)	DELTA1 FCC A (< 1GHz)	DELTA2 FCC A (> 1GHz)
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***** MEASUREMENT SUMMARY *****						
47.42	32.6 Qp	1.5 / 14.1 / 28.4	19.8	V / 1.0 / 0.0	-19.3	N/A
66.14	42.0 Qp	1.8 / 9.5 / 28.3	24.9	V / 1.0 / 0.0	-14.2	N/A
66.35	44.1 Qp	1.8 / 9.5 / 28.3	27.1	V / 1.0 / 0.0	-12.0	N/A
79.99	43.6 Qp	1.9 / 6.5 / 28.3	23.7	V / 1.0 / 270.0	-15.4	N/A
99.98	58.0 Qp	2.1 / 8.1 / 28.2	40.0	V / 2.5 / 0.0	-3.5	N/A
119.98	42.5 Qp	2.3 / 7.6 / 28.2	24.2	V / 1.0 / 270.0	-19.3	N/A
132.20	33.9 Qp	2.4 / 7.6 / 28.2	15.7	V / 1.0 / 0.0	-27.8	N/A
139.98	47.5 Qp	2.4 / 8.6 / 28.2	30.3	V / 1.0 / 90.0	-13.2	N/A
159.98	46.5 Qp	2.7 / 8.0 / 28.1	29.0	V / 1.0 / 180.0	-14.5	N/A
179.98	42.4 Qp	2.8 / 8.7 / 28.1	25.8	V / 1.0 / 0.0	-17.7	N/A
199.99	37.1 Qp	3.0 / 10.1 / 28.1	22.1	V / 1.0 / 0.0	-21.4	N/A
219.98	40.8 Qp	3.2 / 10.3 / 28.1	26.2	V / 1.0 / 270.0	-20.2	N/A
259.99	37.6 Qp	3.5 / 11.3 / 28.1	24.3	V / 1.0 / 180.0	-22.1	N/A
299.99	33.9 Qp	3.7 / 12.6 / 28.1	22.1	V / 1.0 / 180.0	-24.3	N/A
320.00	34.9 Qp	3.9 / 13.5 / 28.1	24.1	V / 1.0 / 0.0	-22.3	N/A
339.99	37.5 Qp	4.0 / 14.2 / 28.1	27.5	V / 1.0 / 270.0	-18.9	N/A
360.00	35.4 Qp	4.1 / 15.1 / 28.2	26.3	V / 1.0 / 0.0	-20.1	N/A
379.99	35.3 Qp	4.2 / 15.9 / 28.2	27.3	V / 1.0 / 0.0	-19.1	N/A
400.00	32.8 Qp	4.4 / 16.0 / 28.2	25.0	V / 1.0 / 0.0	-21.4	N/A
411.20	47.7 Qp	4.5 / 16.0 / 28.2	40.0	V / 1.0 / 180.0	-6.4	N/A
1233.65	32.0 Av	8.5 / 24.4 / 27.2	37.6	V / 1.0 / 0.0	N/A	-11.9

Tested by: ROSS M. JOHNSON

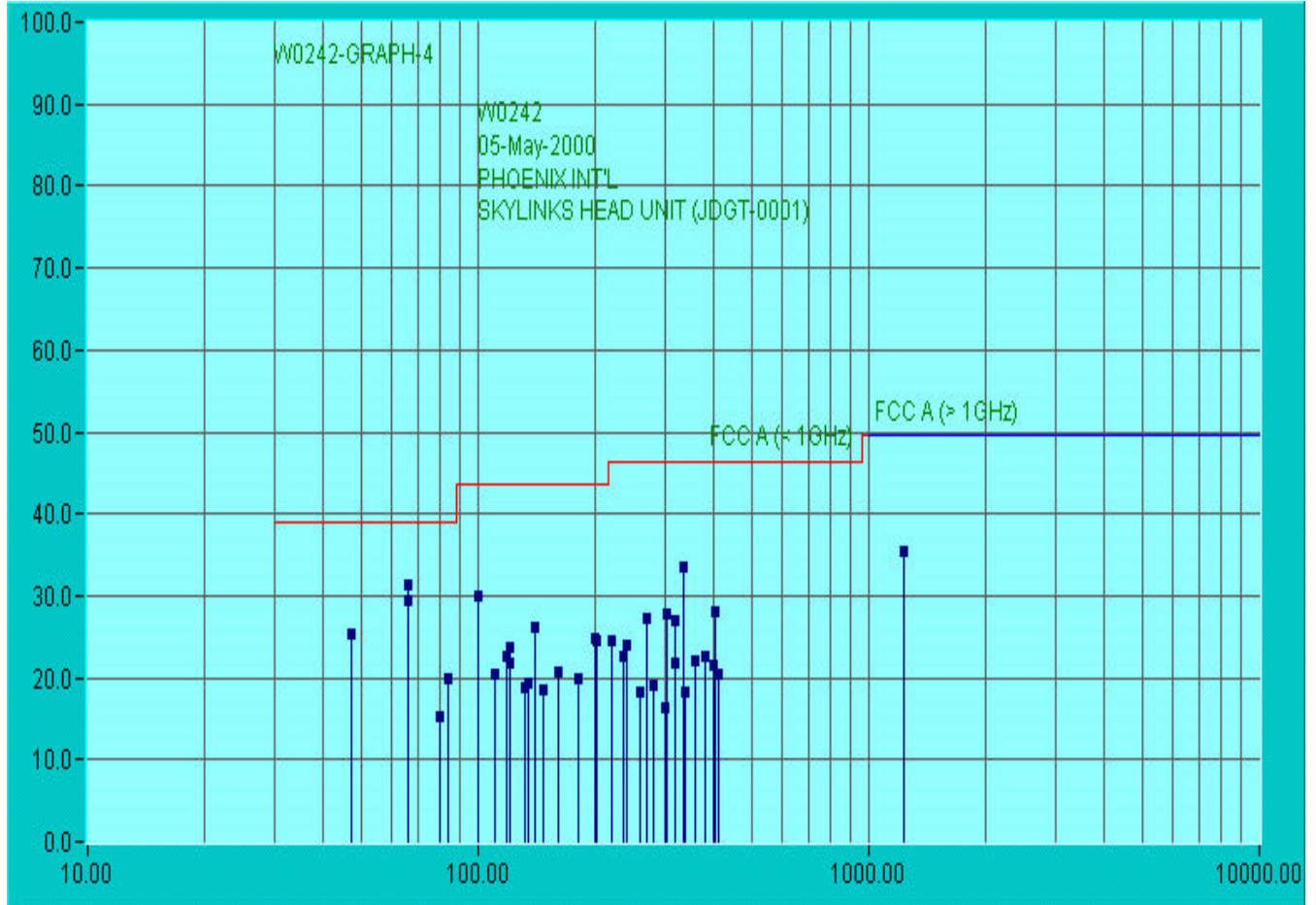
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Radiated Electromagnetic Emissions



Test Report #:	W0242 Run 04	Test Area:	STS 10m	
Test Method:	FCC Part 15	Test Date:	05-May-2000	
EUT Model #:	SKYLINKS HEAD UNIT (JDGT-0001)	EUT Power:	12VDC	
EUT Serial #:		Temperature:	25	°C
Manufacturer:	PHOENIX INT'L	Relative Humidity:	49	%
EUT Description:	GOLF COURSE NAVIGATION DISPLAY	Air Pressure:	98.9	kPa
Notes:	BASE UNIT			

FREQ (MHz)	LEVEL (dBuV)	CABLE / ANT / PREAMP (dB)	FINAL (dBuV/m)	POL / HGT / AZ (m) (DEG)	DELTA1 FCC A (< 1GHz)	DELTA2 FCC A (> 1GHz)
47.39	38.2 Qp	1.5 / 14.1 / 28.4	25.4	V / 1.0 / 0.0	-13.7	N/A
66.12	43.9 Qp	1.8 / 9.5 / 28.3	26.9	V / 1.0 / 0.0	-12.2	N/A
66.35	43.2 Qp	1.8 / 9.5 / 28.3	26.1	V / 1.0 / 0.0	-13.0	N/A
79.99	35.1 Qp	1.9 / 6.5 / 28.3	15.2	V / 1.0 / 0.0	-23.9	N/A
99.98	43.0 Qp	2.1 / 8.1 / 28.2	25.0	V / 1.0 / 0.0	-18.5	N/A
119.98	38.3 Qp	2.3 / 7.6 / 28.2	20.1	V / 1.0 / 0.0	-23.4	N/A
132.20	31.2 Qp	2.4 / 7.6 / 28.2	13.1	V / 1.0 / 0.0	-30.4	N/A
139.98	41.4 Qp	2.4 / 8.6 / 28.2	24.3	V / 1.0 / 0.0	-19.2	N/A
159.99	36.9 Qp	2.7 / 8.0 / 28.1	19.4	V / 1.0 / 0.0	-24.1	N/A
179.98	36.6 Qp	2.8 / 8.7 / 28.1	20.0	V / 1.0 / 0.0	-23.5	N/A
199.99	38.8 Qp	3.0 / 10.1 / 28.1	23.7	V / 1.0 / 0.0	-19.8	N/A
219.98	35.1 Qp	3.2 / 10.3 / 28.1	20.5	V / 1.0 / 0.0	-25.9	N/A
259.99	31.7 Qp	3.5 / 11.3 / 28.1	18.3	V / 1.0 / 0.0	-28.1	N/A
299.99	28.2 Qp	3.7 / 12.6 / 28.1	16.3	V / 1.0 / 0.0	-30.1	N/A
320.00	32.6 Qp	3.9 / 13.5 / 28.1	21.9	V / 1.0 / 0.0	-24.5	N/A
319.76	37.8 Qp	3.9 / 13.5 / 28.1	27.0	V / 1.0 / 0.0	-19.4	N/A
339.99	28.2 Qp	4.0 / 14.2 / 28.1	18.3	V / 1.0 / 0.0	-28.1	N/A
360.00	31.2 Qp	4.1 / 15.1 / 28.2	22.2	V / 1.0 / 0.0	-24.2	N/A
379.99	28.9 Qp	4.2 / 15.9 / 28.2	20.9	V / 1.0 / 0.0	-25.5	N/A
400.00	28.4 Qp	4.4 / 16.0 / 28.2	20.6	V / 1.0 / 0.0	-25.8	N/A
411.20	28.2 Qp	4.5 / 16.0 / 28.2	20.5	V / 1.0 / 0.0	-25.9	N/A
1233.65	29.7 Av	8.5 / 24.4 / 27.2	35.3	V / 1.0 / 0.0	N/A	-14.2
84.13	39.7 Qp	1.9 / 6.5 / 28.3	19.8	V / 1.0 / 0.0	-19.3	N/A
110.45	37.9 Qp	2.2 / 8.5 / 28.2	20.4	V / 1.0 / 0.0	-23.1	N/A
117.79	40.6 Qp	2.3 / 8.0 / 28.2	22.7	V / 1.0 / 0.0	-20.8	N/A
121.12	40.1 Qp	2.3 / 7.6 / 28.2	21.8	V / 1.0 / 0.0	-21.7	N/A
134.62	37.2 Qp	2.4 / 7.9 / 28.2	19.3	V / 1.0 / 0.0	-24.2	N/A

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Radiated Electromagnetic Emissions



Test Report #:	W0242 Run 04	Test Area:	STS 10m	
Test Method:	FCC Part 15	Test Date:	05-May-2000	
EUT Model #:	SKYLINKS HEAD UNIT (JDGT-0001)	EUT Power:	12VDC	
EUT Serial #:		Temperature:	25	°C
Manufacturer:	PHOENIX INT'L	Relative Humidity:	49	%
EUT Description:	GOLF COURSE NAVIGATION DISPLAY	Air Pressure:	98.9	kPa
Notes:	BASE UNIT			

FREQ (MHz)	LEVEL (dBuV)	CABLE / ANT / PREAMP (dB)	FINAL (dBuV/m)	POL / HGT / AZ (m) (DEG)	DELTA1 FCC A (< 1GHz)	DELTA2 FCC A (> 1GHz)
147.20	35.7 Qp	2.5 / 8.5 / 28.2	18.5	V / 1.0 / 0.0	-25.0	N/A
235.60	36.7 Qp	3.2 / 10.7 / 28.1	22.5	V / 1.0 / 0.0	-23.9	N/A
239.98	37.1 Qp	3.2 / 10.8 / 28.1	23.0	V / 1.0 / 0.0	-23.4	N/A
269.27	36.2 Qp	3.5 / 11.4 / 28.1	23.1	V / 1.0 / 0.0	-23.3	N/A
279.98	32.1 Qp	3.5 / 11.7 / 28.1	19.2	V / 1.0 / 0.0	-27.2	N/A
302.92	39.4 Qp	3.7 / 12.7 / 28.1	27.8	V / 1.0 / 0.0	-18.6	N/A
336.58	43.3 Qp	4.0 / 14.1 / 28.1	33.2	V / 1.0 / 0.0	-13.2	N/A
403.90	36.0 Qp	4.4 / 16.0 / 28.2	28.2	V / 1.0 / 0.0	-18.2	N/A
132.25	36.8 Qp	2.4 / 7.6 / 28.2	18.7	V / 1.0 / 90.0	-24.8	N/A
139.98	42.4 Qp	2.4 / 8.6 / 28.2	25.2	V / 1.0 / 90.0	-18.3	N/A
159.99	38.1 Qp	2.7 / 8.0 / 28.1	20.6	V / 1.0 / 90.0	-22.9	N/A
199.99	39.8 Qp	3.0 / 10.1 / 28.1	24.8	V / 1.0 / 90.0	-18.7	N/A
239.98	37.9 Qp	3.2 / 10.8 / 28.1	23.9	V / 1.0 / 90.0	-22.5	N/A
336.58	43.8 Qp	4.0 / 14.1 / 28.1	33.6	V / 1.0 / 90.0	-12.8	N/A
66.12	47.4 Qp	1.8 / 9.5 / 28.3	30.3	V / 1.0 / 180.0	-8.8	N/A
66.35	46.6 Qp	1.8 / 9.5 / 28.3	29.5	V / 1.0 / 180.0	-9.6	N/A
99.98	47.9 Qp	2.1 / 8.1 / 28.2	29.9	V / 1.0 / 180.0	-13.6	N/A
119.98	40.5 Qp	2.3 / 7.6 / 28.2	22.3	V / 1.0 / 180.0	-21.2	N/A
139.98	43.3 Qp	2.4 / 8.6 / 28.2	26.2	V / 1.0 / 180.0	-17.3	N/A
269.27	40.4 Qp	3.5 / 11.4 / 28.1	27.3	V / 1.0 / 180.0	-19.1	N/A
400.00	29.2 Qp	4.4 / 16.0 / 28.2	21.4	V / 1.0 / 180.0	-25.0	N/A
219.98	35.4 Qp	3.2 / 10.3 / 28.1	20.8	V / 1.0 / 270.0	-25.6	N/A
MAXIMIZED.						

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Radiated Electromagnetic Emissions



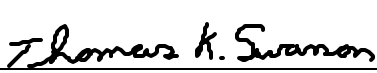
Test Report #:	<u>W0242 Run 04</u>	Test Area:	<u>STS 10m</u>	
Test Method:	<u>FCC Part 15</u>	Test Date:	<u>05-May-2000</u>	
EUT Model #:	<u>SKYLINKS HEAD UNIT (JDGT-0001)</u>	EUT Power:	<u>12VDC</u>	
EUT Serial #:				Temperature: <u>25</u> °C
Manufacturer:	<u>PHOENIX INT'L</u>			Relative Humidity: <u>49</u> %
EUT Description:	<u>GOLF COURSE NAVIGATION DISPLAY</u>			Air Pressure: <u>98.9</u> kPa
Notes:	<u>BASE UNIT</u>			

FREQ (MHz)	LEVEL (dBuV)	CABLE / ANT / PREAMP (dB)	FINAL (dBuV/m)	POL / HGT / AZ (m) (DEG)	DELTA1 FCC A (< 1GHz)	DELTA2 FCC A (> 1GHz)
66.12	48.3 Qp	1.8 / 9.5 / 28.3	31.3	V / 2.2 / 150.0	-7.8	N/A
MAXED ANTENNA AND ROTATED EUT 360 DEGREES.						
119.97	42.0 Qp	2.3 / 7.6 / 28.2	23.7	H / 3.0 / 0.0	-19.8	N/A
379.99	30.7 Qp	4.2 / 15.9 / 28.2	22.6	H / 3.0 / 0.0	-23.8	N/A
200.43	38.7 Qp	3.0 / 10.1 / 28.1	23.7	H / 3.0 / 0.0	-19.8	N/A
120.26	40.2 Qp	2.3 / 7.6 / 28.2	21.9	H / 3.0 / 0.0	-21.6	N/A
219.98	39.0 Qp	3.2 / 10.3 / 28.1	24.4	H / 3.0 / 270.0	-22.0	N/A
MAXIMIZED.						
200.43	39.5 Qp	3.0 / 10.1 / 28.1	24.4	H / 3.4 / 0.0	-19.1	N/A
MAXED ANTENNA AND ROTATED EUT 360 DEGREES.						
END OF SCAN 30 - 2000MHZ.						

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Radiated Electromagnetic Emissions



Test Report #:	W0242 Run 04	Test Area:	STS 10m	
Test Method:	FCC Part 15	Test Date:	05-May-2000	
EUT Model #:	SKYLINKS HEAD UNIT (JDGT-0001)	EUT Power:	12VDC	
EUT Serial #:		Temperature:	25	°C
Manufacturer:	PHOENIX INT'L	Relative Humidity:	49	%
EUT Description:	GOLF COURSE NAVIGATION DISPLAY	Air Pressure:	98.9	kPa
Notes:	BASE UNIT			

FREQ (MHz)	LEVEL (dBuV)	CABLE / ANT / PREAMP (dB)	FINAL (dBuV/m)	POL / HGT / AZ (m) (DEG)	DELTA1 FCC A (< 1GHz)	DELTA2 FCC A (> 1GHz)
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***** MEASUREMENT SUMMARY *****						
47.39	38.2 Qp	1.5 / 14.1 / 28.4	25.4	V / 1.0 / 0.0	-13.7	N/A
66.12	48.3 Qp	1.8 / 9.5 / 28.3	31.3	V / 2.2 / 150.0	-7.8	N/A
66.35	46.6 Qp	1.8 / 9.5 / 28.3	29.5	V / 1.0 / 180.0	-9.6	N/A
79.99	35.1 Qp	1.9 / 6.5 / 28.3	15.2	V / 1.0 / 0.0	-23.9	N/A
84.13	39.7 Qp	1.9 / 6.5 / 28.3	19.8	V / 1.0 / 0.0	-19.3	N/A
99.98	47.9 Qp	2.1 / 8.1 / 28.2	29.9	V / 1.0 / 180.0	-13.6	N/A
110.45	37.9 Qp	2.2 / 8.5 / 28.2	20.4	V / 1.0 / 0.0	-23.1	N/A
117.79	40.6 Qp	2.3 / 8.0 / 28.2	22.7	V / 1.0 / 0.0	-20.8	N/A
119.97	42.0 Qp	2.3 / 7.6 / 28.2	23.7	H / 3.0 / 0.0	-19.8	N/A
120.26	40.2 Qp	2.3 / 7.6 / 28.2	21.9	H / 3.0 / 0.0	-21.6	N/A
121.12	40.1 Qp	2.3 / 7.6 / 28.2	21.8	V / 1.0 / 0.0	-21.7	N/A
132.25	36.8 Qp	2.4 / 7.6 / 28.2	18.7	V / 1.0 / 90.0	-24.8	N/A
134.62	37.2 Qp	2.4 / 7.9 / 28.2	19.3	V / 1.0 / 0.0	-24.2	N/A
139.98	43.3 Qp	2.4 / 8.6 / 28.2	26.2	V / 1.0 / 180.0	-17.3	N/A
147.20	35.7 Qp	2.5 / 8.5 / 28.2	18.5	V / 1.0 / 0.0	-25.0	N/A
159.99	38.1 Qp	2.7 / 8.0 / 28.1	20.6	V / 1.0 / 90.0	-22.9	N/A
179.98	36.6 Qp	2.8 / 8.7 / 28.1	20.0	V / 1.0 / 0.0	-23.5	N/A
199.99	39.8 Qp	3.0 / 10.1 / 28.1	24.8	V / 1.0 / 90.0	-18.7	N/A
200.43	39.5 Qp	3.0 / 10.1 / 28.1	24.4	H / 3.4 / 0.0	-19.1	N/A
219.98	39.0 Qp	3.2 / 10.3 / 28.1	24.4	H / 3.0 / 270.0	-22.0	N/A
235.60	36.7 Qp	3.2 / 10.7 / 28.1	22.5	V / 1.0 / 0.0	-23.9	N/A
239.98	37.9 Qp	3.2 / 10.8 / 28.1	23.9	V / 1.0 / 90.0	-22.5	N/A
259.99	31.7 Qp	3.5 / 11.3 / 28.1	18.3	V / 1.0 / 0.0	-28.1	N/A
269.27	40.4 Qp	3.5 / 11.4 / 28.1	27.3	V / 1.0 / 180.0	-19.1	N/A
279.98	32.1 Qp	3.5 / 11.7 / 28.1	19.2	V / 1.0 / 0.0	-27.2	N/A

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Radiated Electromagnetic Emissions



Test Report #:	W0242 Run 04	Test Area:	STS 10m		
Test Method:	FCC Part 15	Test Date:	05-May-2000		
EUT Model #:	SKYLINKS HEAD UNIT (JDGT-0001)	EUT Power:	12VDC		
EUT Serial #:				Temperature:	25 °C
Manufacturer:	PHOENIX INT'L			Relative Humidity:	49 %
EUT Description:	GOLF COURSE NAVIGATION DISPLAY			Air Pressure:	98.9 kPa
Notes:	BASE UNIT				

FREQ (MHz)	LEVEL (dBuV)	CABLE / ANT / PREAMP (dB)	FINAL (dBuV/m)	POL / HGT / AZ (m) (DEG)	DELTA1 FCC A (< 1GHz)	DELTA2 FCC A (> 1GHz)
299.99	28.2 Qp	3.7 / 12.6 / 28.1	16.3	V / 1.0 / 0.0	-30.1	N/A
302.92	39.4 Qp	3.7 / 12.7 / 28.1	27.8	V / 1.0 / 0.0	-18.6	N/A
319.76	37.8 Qp	3.9 / 13.5 / 28.1	27.0	V / 1.0 / 0.0	-19.4	N/A
320.00	32.6 Qp	3.9 / 13.5 / 28.1	21.9	V / 1.0 / 0.0	-24.5	N/A
336.58	43.8 Qp	4.0 / 14.1 / 28.1	33.6	V / 1.0 / 90.0	-12.8	N/A
339.99	28.2 Qp	4.0 / 14.2 / 28.1	18.3	V / 1.0 / 0.0	-28.1	N/A
360.00	31.2 Qp	4.1 / 15.1 / 28.2	22.2	V / 1.0 / 0.0	-24.2	N/A
379.99	30.7 Qp	4.2 / 15.9 / 28.2	22.6	H / 3.0 / 0.0	-23.8	N/A
400.00	29.2 Qp	4.4 / 16.0 / 28.2	21.4	V / 1.0 / 180.0	-25.0	N/A
403.90	36.0 Qp	4.4 / 16.0 / 28.2	28.2	V / 1.0 / 0.0	-18.2	N/A
411.20	28.2 Qp	4.5 / 16.0 / 28.2	20.5	V / 1.0 / 0.0	-25.9	N/A
1233.65	29.7 Av	8.5 / 24.4 / 27.2	35.3	V / 1.0 / 0.0	N/A	-14.2

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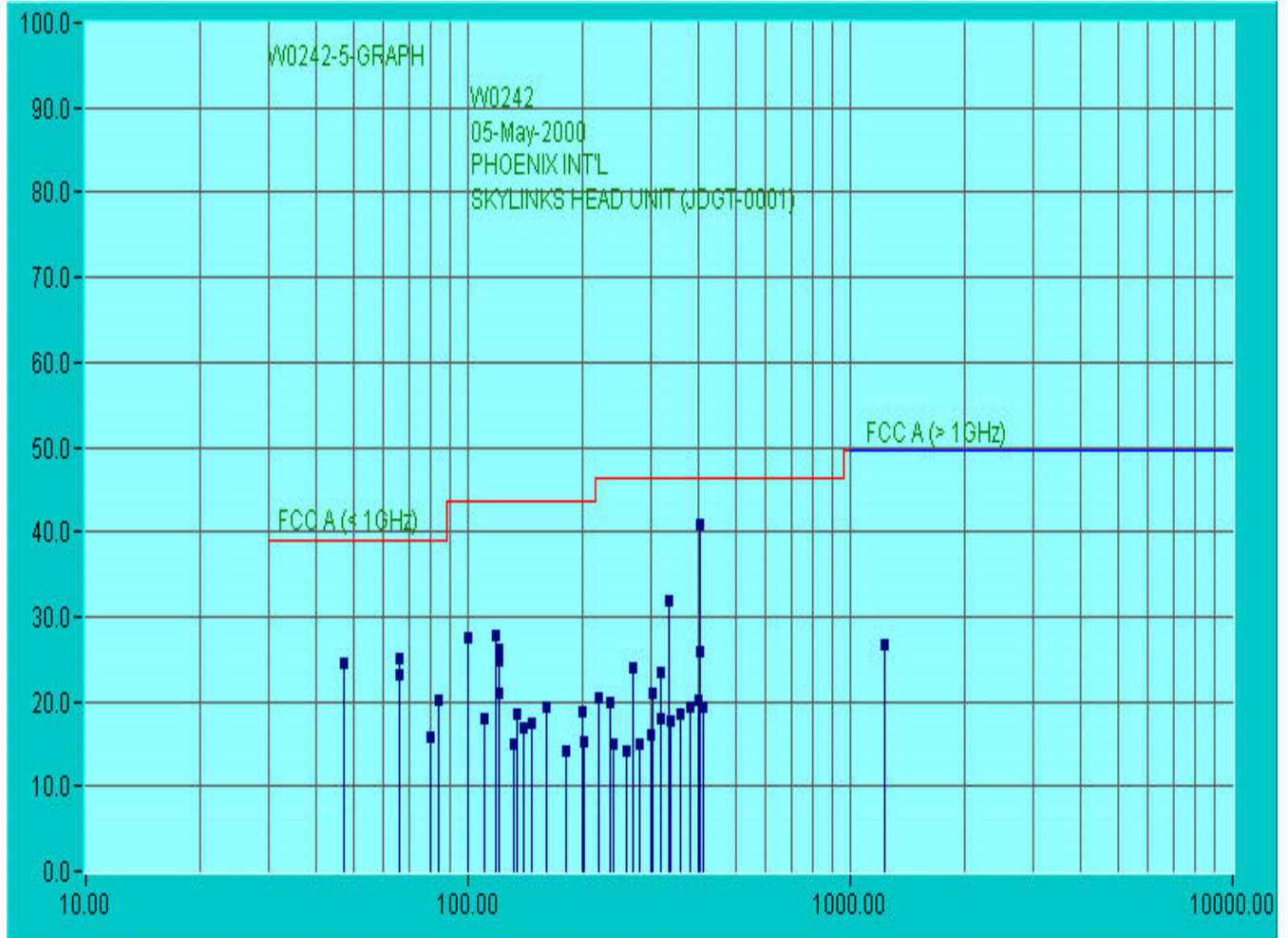
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Radiated Electromagnetic Emissions



Test Report #:	W0242 Run 05	Test Area:	STS 10m	
Test Method:	FCC Part 15	Test Date:	05-May-2000	
EUT Model #:	SKYLINKS HEAD UNIT (JDGT-0001)	EUT Power:	12VDC	
EUT Serial #:		Temperature:	25	°C
Manufacturer:	PHOENIX INT'L	Relative Humidity:	49	%
EUT Description:	GOLF COURSE NAVIGATION DISPLAY	Air Pressure:	98.9	kPa
Notes:	BASE UNIT (WITH NETMASTER)			

FREQ (MHz)	LEVEL (dBuV)	CABLE / ANT / PREAMP (dB)	FINAL (dBuV/m)	POL / HGT / AZ (m) (DEG)	DELTA1 FCC A (< 1GHz)	DELTA2 FCC A (> 1GHz)
47.39	37.3 Qp	1.5 / 14.1 / 28.4	24.5	V / 1.0 / 0.0	-14.6	N/A
66.12	40.3 Qp	1.8 / 9.5 / 28.3	23.2	V / 1.0 / 0.0	-15.9	N/A
66.30	42.1 Qp	1.8 / 9.5 / 28.3	25.1	V / 1.0 / 0.0	-14.0	N/A
66.30	42.3 Qp	1.8 / 9.5 / 28.3	25.2	V / 1.0 / 0.0	-13.9	N/A
79.99	35.7 Qp	1.9 / 6.5 / 28.3	15.8	V / 1.0 / 0.0	-23.3	N/A
84.13	40.1 Qp	1.9 / 6.5 / 28.3	20.2	V / 1.0 / 0.0	-18.9	N/A
99.98	45.7 Qp	2.1 / 8.1 / 28.2	27.6	V / 1.0 / 0.0	-15.9	N/A
110.45	35.5 Qp	2.2 / 8.5 / 28.2	18.0	V / 1.0 / 0.0	-25.5	N/A
117.79	45.6 Qp	2.3 / 8.0 / 28.2	27.7	V / 1.0 / 0.0	-15.8	N/A
119.97	44.5 Qp	2.3 / 7.6 / 28.2	26.2	V / 1.0 / 0.0	-17.3	N/A
120.26	43.2 Qp	2.3 / 7.6 / 28.2	24.9	V / 1.0 / 0.0	-18.6	N/A
121.12	39.3 Qp	2.3 / 7.6 / 28.2	21.0	V / 1.0 / 0.0	-22.5	N/A
132.25	33.0 Qp	2.4 / 7.6 / 28.2	14.9	V / 1.0 / 0.0	-28.6	N/A
134.62	36.5 Qp	2.4 / 7.9 / 28.2	18.6	V / 1.0 / 0.0	-24.9	N/A
139.98	33.9 Qp	2.4 / 8.6 / 28.2	16.8	V / 1.0 / 0.0	-26.7	N/A
147.20	34.6 Qp	2.5 / 8.5 / 28.2	17.4	V / 1.0 / 0.0	-26.1	N/A
159.99	36.8 Qp	2.7 / 8.0 / 28.1	19.3	V / 1.0 / 0.0	-24.2	N/A
179.98	31.0 Qp	2.8 / 8.7 / 28.1	14.3	V / 1.0 / 0.0	-29.2	N/A
199.99	33.9 Qp	3.0 / 10.1 / 28.1	18.9	V / 1.0 / 0.0	-24.6	N/A
200.43	30.3 Qp	3.0 / 10.1 / 28.1	15.3	V / 1.0 / 0.0	-28.2	N/A
219.98	35.1 Qp	3.2 / 10.3 / 28.1	20.5	V / 1.0 / 0.0	-25.9	N/A
235.60	34.2 Qp	3.2 / 10.7 / 28.1	20.0	V / 1.0 / 0.0	-26.4	N/A
239.98	28.9 Qp	3.2 / 10.8 / 28.1	14.9	V / 1.0 / 0.0	-31.5	N/A
259.99	27.5 Qp	3.5 / 11.3 / 28.1	14.2	V / 1.0 / 0.0	-32.2	N/A
269.27	37.2 Qp	3.5 / 11.4 / 28.1	24.0	V / 1.0 / 0.0	-22.4	N/A
279.98	27.9 Qp	3.5 / 11.7 / 28.1	15.0	V / 1.0 / 0.0	-31.4	N/A
299.99	27.9 Qp	3.7 / 12.6 / 28.1	16.0	V / 1.0 / 0.0	-30.4	N/A

Tested by: ROSS M. JOHNSON

Printed

Signature

Reviewed by: T. K. Swanson

Printed

Signature

Radiated Electromagnetic Emissions



Test Report #:	W0242 Run 05	Test Area:	STS 10m	
Test Method:	FCC Part 15	Test Date:	05-May-2000	
EUT Model #:	SKYLINKS HEAD UNIT (JDGT-0001)	EUT Power:	12VDC	
EUT Serial #:		Temperature:	25	°C
Manufacturer:	PHOENIX INT'L	Relative Humidity:	49	%
EUT Description:	GOLF COURSE NAVIGATION DISPLAY	Air Pressure:	98.9	kPa
Notes:	BASE UNIT (WITH NETMASTER)			

FREQ (MHz)	LEVEL (dBuV)	CABLE / ANT / PREAMP (dB)	FINAL (dBuV/m)	POL / HGT / AZ (m) (DEG)	DELTA1 FCC A (< 1GHz)	DELTA2 FCC A (> 1GHz)
302.92	32.5 Qp	3.7 / 12.7 / 28.1	20.9	V / 1.0 / 0.0	-25.5	N/A
319.76	34.2 Qp	3.9 / 13.5 / 28.1	23.5	V / 1.0 / 0.0	-22.9	N/A
320.00	28.8 Qp	3.9 / 13.5 / 28.1	18.0	V / 1.0 / 0.0	-28.4	N/A
336.58	42.0 Qp	4.0 / 14.1 / 28.1	31.8	V / 1.0 / 0.0	-14.6	N/A
339.99	27.7 Qp	4.0 / 14.2 / 28.1	17.7	V / 1.0 / 0.0	-28.7	N/A
360.00	27.6 Qp	4.1 / 15.1 / 28.2	18.6	V / 1.0 / 0.0	-27.8	N/A
379.99	27.4 Qp	4.2 / 15.9 / 28.2	19.3	V / 1.0 / 0.0	-27.1	N/A
400.00	27.9 Qp	4.4 / 16.0 / 28.2	20.1	V / 1.0 / 0.0	-26.3	N/A
403.90	33.6 Qp	4.4 / 16.0 / 28.2	25.9	V / 1.0 / 0.0	-20.5	N/A
411.20	27.1 Qp	4.5 / 16.0 / 28.2	19.4	V / 1.0 / 0.0	-27.0	N/A
1233.65	21.1 Av	8.5 / 24.4 / 27.2	26.7	V / 1.0 / 0.0	N/A	-22.8
404.87	42.6 Qp	4.4 / 16.0 / 28.2	34.8	V / 1.0 / 0.0	-11.6	N/A
MAXIMIZED.						
404.87	48.6 Qp	4.4 / 16.0 / 28.2	40.9	V / 1.0 / 270.0	-5.5	N/A
END OF SCAN.						

Tested by: ROSS M. JOHNSON

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Signature

Reviewed by: T. K. Swanson

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Signature

Radiated Electromagnetic Emissions



Test Report #:	W0242 Run 05	Test Area:	STS 10m	
Test Method:	FCC Part 15	Test Date:	05-May-2000	
EUT Model #:	SKYLINKS HEAD UNIT (JDGT-0001)	EUT Power:	12VDC	
EUT Serial #:		Temperature:	25	°C
Manufacturer:	PHOENIX INT'L	Relative Humidity:	49	%
EUT Description:	GOLF COURSE NAVIGATION DISPLAY	Air Pressure:	98.9	kPa
Notes:	BASE UNIT (WITH NETMASTER)			

FREQ (MHz)	LEVEL (dBuV)	CABLE / ANT / PREAMP (dB)	FINAL (dBuV/m)	POL / HGT / AZ (m) (DEG)	DELTA1 FCC A (< 1GHz)	DELTA2 FCC A (> 1GHz)
---------------	-----------------	------------------------------	-------------------	-----------------------------	--------------------------	--------------------------

***** MEASUREMENT SUMMARY *****						
47.39	37.3 Qp	1.5 / 14.1 / 28.4	24.5	V / 1.0 / 0.0	-14.6	N/A
66.12	40.3 Qp	1.8 / 9.5 / 28.3	23.2	V / 1.0 / 0.0	-15.9	N/A
66.30	42.3 Qp	1.8 / 9.5 / 28.3	25.2	V / 1.0 / 0.0	-13.9	N/A
79.99	35.7 Qp	1.9 / 6.5 / 28.3	15.8	V / 1.0 / 0.0	-23.3	N/A
84.13	40.1 Qp	1.9 / 6.5 / 28.3	20.2	V / 1.0 / 0.0	-18.9	N/A
99.98	45.7 Qp	2.1 / 8.1 / 28.2	27.6	V / 1.0 / 0.0	-15.9	N/A
110.45	35.5 Qp	2.2 / 8.5 / 28.2	18.0	V / 1.0 / 0.0	-25.5	N/A
117.79	45.6 Qp	2.3 / 8.0 / 28.2	27.7	V / 1.0 / 0.0	-15.8	N/A
119.97	44.5 Qp	2.3 / 7.6 / 28.2	26.2	V / 1.0 / 0.0	-17.3	N/A
120.26	43.2 Qp	2.3 / 7.6 / 28.2	24.9	V / 1.0 / 0.0	-18.6	N/A
121.12	39.3 Qp	2.3 / 7.6 / 28.2	21.0	V / 1.0 / 0.0	-22.5	N/A
132.25	33.0 Qp	2.4 / 7.6 / 28.2	14.9	V / 1.0 / 0.0	-28.6	N/A
134.62	36.5 Qp	2.4 / 7.9 / 28.2	18.6	V / 1.0 / 0.0	-24.9	N/A
139.98	33.9 Qp	2.4 / 8.6 / 28.2	16.8	V / 1.0 / 0.0	-26.7	N/A
147.20	34.6 Qp	2.5 / 8.5 / 28.2	17.4	V / 1.0 / 0.0	-26.1	N/A
159.99	36.8 Qp	2.7 / 8.0 / 28.1	19.3	V / 1.0 / 0.0	-24.2	N/A
179.98	31.0 Qp	2.8 / 8.7 / 28.1	14.3	V / 1.0 / 0.0	-29.2	N/A
199.99	33.9 Qp	3.0 / 10.1 / 28.1	18.9	V / 1.0 / 0.0	-24.6	N/A
200.43	30.3 Qp	3.0 / 10.1 / 28.1	15.3	V / 1.0 / 0.0	-28.2	N/A
219.98	35.1 Qp	3.2 / 10.3 / 28.1	20.5	V / 1.0 / 0.0	-25.9	N/A
235.60	34.2 Qp	3.2 / 10.7 / 28.1	20.0	V / 1.0 / 0.0	-26.4	N/A
239.98	28.9 Qp	3.2 / 10.8 / 28.1	14.9	V / 1.0 / 0.0	-31.5	N/A
259.99	27.5 Qp	3.5 / 11.3 / 28.1	14.2	V / 1.0 / 0.0	-32.2	N/A
269.27	37.2 Qp	3.5 / 11.4 / 28.1	24.0	V / 1.0 / 0.0	-22.4	N/A
279.98	27.9 Qp	3.5 / 11.7 / 28.1	15.0	V / 1.0 / 0.0	-31.4	N/A

Tested by: ROSS M. JOHNSON

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Signature

Reviewed by: T. K. Swanson

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Signature

Radiated Electromagnetic Emissions



Test Report #:	<u>W0242 Run 05</u>	Test Area:	<u>STS 10m</u>	
Test Method:	<u>FCC Part 15</u>	Test Date:	<u>05-May-2000</u>	
EUT Model #:	<u>SKYLINKS HEAD UNIT (JDGT-0001)</u>	EUT Power:	<u>12VDC</u>	
EUT Serial #:				Temperature: <u>25</u> °C
Manufacturer:	<u>PHOENIX INT'L</u>			Relative Humidity: <u>49</u> %
EUT Description:	<u>GOLF COURSE NAVIGATION DISPLAY</u>			Air Pressure: <u>98.9</u> kPa
Notes:	<u>BASE UNIT (WITH NETMASTER)</u>			

FREQ (MHz)	LEVEL (dBuV)	CABLE / ANT / PREAMP (dB)	FINAL (dBuV/m)	POL / HGT / AZ (m) (DEG)	DELTA1 FCC A (< 1GHz)	DELTA2 FCC A (> 1GHz)
299.99	27.9 Qp	3.7 / 12.6 / 28.1	16.0	V / 1.0 / 0.0	-30.4	N/A
302.92	32.5 Qp	3.7 / 12.7 / 28.1	20.9	V / 1.0 / 0.0	-25.5	N/A
319.76	34.2 Qp	3.9 / 13.5 / 28.1	23.5	V / 1.0 / 0.0	-22.9	N/A
320.00	28.8 Qp	3.9 / 13.5 / 28.1	18.0	V / 1.0 / 0.0	-28.4	N/A
336.58	42.0 Qp	4.0 / 14.1 / 28.1	31.8	V / 1.0 / 0.0	-14.6	N/A
339.99	27.7 Qp	4.0 / 14.2 / 28.1	17.7	V / 1.0 / 0.0	-28.7	N/A
360.00	27.6 Qp	4.1 / 15.1 / 28.2	18.6	V / 1.0 / 0.0	-27.8	N/A
379.99	27.4 Qp	4.2 / 15.9 / 28.2	19.3	V / 1.0 / 0.0	-27.1	N/A
400.00	27.9 Qp	4.4 / 16.0 / 28.2	20.1	V / 1.0 / 0.0	-26.3	N/A
403.90	33.6 Qp	4.4 / 16.0 / 28.2	25.9	V / 1.0 / 0.0	-20.5	N/A
404.87	48.6 Qp	4.4 / 16.0 / 28.2	40.9	V / 1.0 / 270.0	-5.5	N/A
411.20	27.1 Qp	4.5 / 16.0 / 28.2	19.4	V / 1.0 / 0.0	-27.0	N/A
1233.65	21.1 Av	8.5 / 24.4 / 27.2	26.7	V / 1.0 / 0.0	N/A	-22.8

Tested by: ROSS M. JOHNSON

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	unit #1	unit #2	unit #3
MHz	dBm	dBm	dBm
450	36	36	36
900	-20	-23	-24
1350	-24	-24	-30
1800	-26	-32	-30
2250	-36	-33	-33
2700	-40	-28	-34
3150	-36	-34	-34
3600	-40	-34	-34
4050	-44	-34	-34
4500	-44	-33	-35
460	36	36	36
920	-23	-26	-23
1380	-22	-25	-28
1840	-19	-29	-26
2300	-35	-31	-32
2760	-43	-29	-34
3220	-39	-33	-34
3680	-38	-33	-33
4140	-43	-34	-36
4600	-43	-33	-36
469.5	36	36	36
939	-22	-22	-21
1408.5	-22	-25	-30
1880	-28	-28	-26
2347.5	-34	-31	-33
2814	-43	-32	-34
3286.5	-40	-33	-30
3756	-43	-34	-33
4225.5	-40	-34	-34
4695	-44	-34	-33

CONDUCTED FUNDAMENTAL/
HARMONICS-(HARMONIC LIMIT = -49dBc)

UNIT #1 - EMI FENCE SOLDERED 6 PTS
& RG174/U CABLE

UNIT #2 - FULL MOBAT EMI SHIELD
& COAX CABLE

UNIT #3 - EMI FENCE SOLDERED AT ALL
JOINTS & RG-188 COAX

MKR 449.9999 MHz
34.10 dBm

ATTEN 30 dB

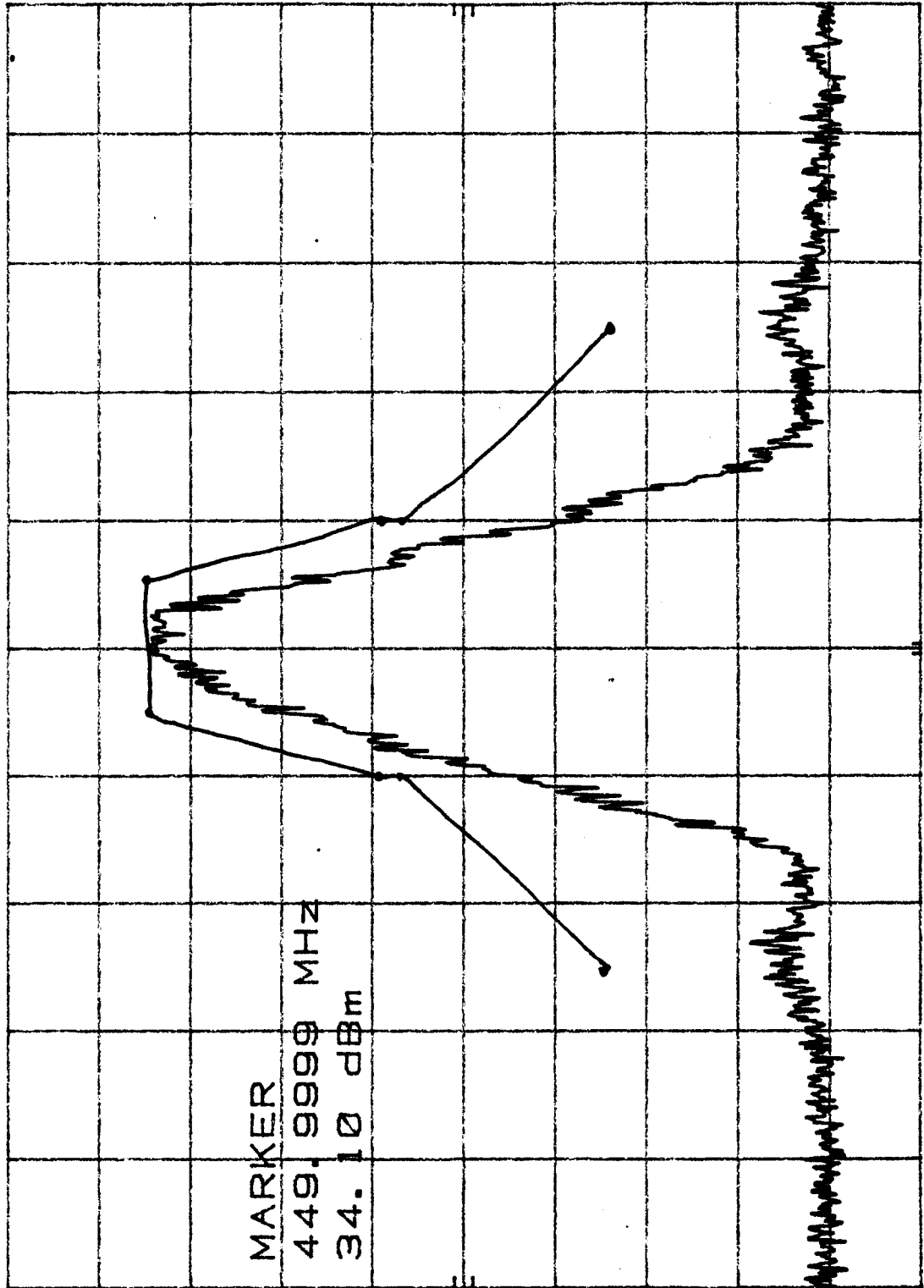
REF 50.0 dBm

hp
10 dB/

OFFSET
30.0
dB

MARKER
449.9999 MHz
34.10 dBm

CORR'D



CENTER 449.9999 MHz
RES BW 1 kHz

VBW 1 kHz

SPAN 100.0 kHz
SWP 300 msec

Appendix B

Constructional Data Form



EMC Test Plan and Constructional Data Form

PLEASE COMPLETE THIS DOCUMENT IN FULL, ENTERING N/A IF THE FIELD IS NOT APPLICABLE.

Applicant -- NOTE: This information will be input into your test report as shown below.
Press the F1 key at any time to get HELP for the current field selected.

Company: John Deere Golf Technologies

Address: 3159 Royal Drive - Suite 320
Alpharetta, GA 30022

Contact: Steven Valla Position: Project Manager

Phone: 770-521-7725 Fax: 770-754-1652

E-mail Address: svalla@jdstg.com

General Equipment Description -- NOTE: This information will be input into your test report as shown below.

EUT Description Color Display Unit

EUT Name Skylinks Head unit and Skylinks power supply

Model No.: JDGT-0001 and JDGT-0002 Serial No.: PL0001X000146 and XC001

Product Options: _____

Configurations to be tested: Cart Display unit and Base-station unit.

Test Objective

- | | |
|--|--|
| ☐ EMC Directive 89/336/EEC (EMC) | ☒ FCC: Class ☒ A ☐ B Part <u>15</u> |
| Std: _____ | ☐ VCCI: Class ☐ A ☐ B |
| ☐ Machinery Directive 89/392/EEC (EMC) | ☐ BCIQ: Class ☐ A ☐ B |
| Std: _____ | ☐ Canada: Class ☐ A ☐ B |
| ☐ Medical Device Directive 93/42/EEC (EMC) | ☐ Australia: Class ☐ A ☐ B |
| Std: _____ | ☒ Other: <u>FCC Part 90</u> |
| ☐ Vehicle Directive 72/245/EEC (EMC) | |
| Std: _____ | |
| ☐ FDA Reviewers Guidance for Premarket Notification Submissions (EMC) | |

TÜV Product Service Certification Requested

- | | |
|---|---|
| ☒ Attestation of Conformity (AoC) | ☐ International EMC Mark (IEM) |
| ☐ Certificate of Conformity (CoC) | ☒ Compliance Document |
| Protection Class (N/A for vehicles) | ☐ Class I ☐ Class II ☐ Class III |
- (Press **F1** when field is selected to show additional information on Protection Class.)

EMC Test Plan and Constructional Data Form**Attendance**Test will be: ☒ Attended by the customer ☐ Unattended by the customer**Failure - Complete this section if testing will not be attended by the customer.**

If a failure occurs, TUV Product Service should:

- ☐ Call contact listed above, if not available then stop testing. (After hrs phone): _____
- ☐ Continue testing to complete test series.
- ☐ Continue testing to define corrective action.
- ☐ Stop testing.

EUT Specifications and RequirementsLength: 22 cm Width: 6 cm Height: 26.5 cm Weight: 1.16 kg**Power Requirements**

*Regulations require testing to be performed at typical power ratings in the countries of intended use.
(i.e., European power is typically 230 VAC 50 Hz or 400 VAC 50 Hz, single and three phase, respectively)*

Voltage: 12-volt Battery (If battery powered, make sure battery life is sufficient to complete testing.)

of Phases: _____

Current (Amps/phase(max)): _____ Current (Amps/phase(nominal)): _____

Other _____

Other Special Requirements

None

Typical Installation and/or Operating Environment

(ie. Hospital, Small Business, Industrial/Factory, etc.)

This system will be installed on golf courses. The cart unit will be installed on golf carts and the base-station unit will be installed in the club house or in a maintenance building.

EUT Power Cable

☐ Permanent OR ☒ Removable Length (in meters): 2

☐ Shielded OR ☐ Unshielded

☐ Not Applicable

EMC Test Plan and Constructional Data Form

EUT Interface Ports and Cables												
Interface			Shielding									
Type	Analog ☐	Digital ☐	Qty	Yes ☐	No ☐	Type	Termination	Connector Type	Port Termination	Length (in meters)	Removable ☐	Permanent ☐
EXAMPLE:												
RS232	☐	☒	2	☒	☐	Foil over braid	Coaxial	Metallized 9-pin D-Sub	Characteristic Impedance	6	☒	☐
UHF	☒	☐	1	☒	☐	Coaxial	Coaxial	TNC	50-Ohm Load	0	☒	☐
GPS	☒	☐	1	☒	☐	Coaxial	Coaxial	SMA	GPS Antenna Cable	2	☒	☐
	☐	☐		☐	☐						☐	☐
	☐	☐		☐	☐						☐	☐
	☐	☐		☐	☐						☐	☐
	☐	☐		☐	☐						☐	☐
	☐	☐		☐	☐						☐	☐
	☐	☐		☐	☐						☐	☐
	☐	☐		☐	☐						☐	☐
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	☐	☐		☐	☐						☐	☐
	☐	☐		☐	☐						☐	☐
	☐	☐		☐	☐						☐	☐

EMC Test Plan and Constructional Data Form

Revision Level:	Scaddie is 6.1.0, and Netmastr is 6.1.0
Description:	Scaddie.exe is the golfcart application program. Netmastr.exe is the base-station application.

1. Running Scaddie.exe - initializing navigation
- 2.
- 3.

Description	Model #	Serial #	FCC ID #
Display Unit	JDGT-0001	PL0001X000146	
Power supply unit	JDGT-0002	XC001	

Support Equipment -- List and describe all support equipment which is not part of the EUT. (i.e. peripherals, simulators, etc)			
Description	Model #	Serial #	FCC ID #
Power Supply	TUV's power supply		

<i>Frequency</i>	<i>Derived Frequency</i>	<i>Component # / Location</i>	<i>Description of Use</i>
9.8304MHz		Y2 / Display Unit	Modem
14.318MHz	20.0MHz	Y4 / Display Unit	Video
32.768KHz	33/66 MHz	Y3 / Display Unit	Processor

<i>Manufacturer</i>	<i>Model #</i>	<i>Serial #</i>	<i>Type</i>
Phoenix International	JDGT-0002	XC001	☒ Switched-mode: (Frequency) 100 KHz ☐ Linear ☐ Other: _____
			☐ Switched-mode: (Frequency) _____ ☐ Linear ☐ Other: _____

<i>Manufacturer</i>	<i>Model #</i>	<i>Location in EUT</i>
N/A		

EMC Test Plan and Constructional Data Form

**Critical EMI Components (Capacitors, ferrites, etc.)**

<i>Description</i>	<i>Manufacturer</i>	<i>Part # or Value</i>	<i>Qty</i>	<i>Component # / Location</i>
None				

EMC Critical Detail -- Describe other EMC Design details used to reduce high frequency noise.

An EMI fence was placed around the UHF transceiver in order to reduce the emissions to an acceptable level.

(PLEASE INSERT "ELECTRONIC SIGNATURE" BELOW IF POSSIBLE)

Authorization Signatures

Ahmad Fallah

7-31-2000

Customer authorization to perform tests
according to this test plan.

Date

Ahmad Fallah, Dave Ewen, Dick Young

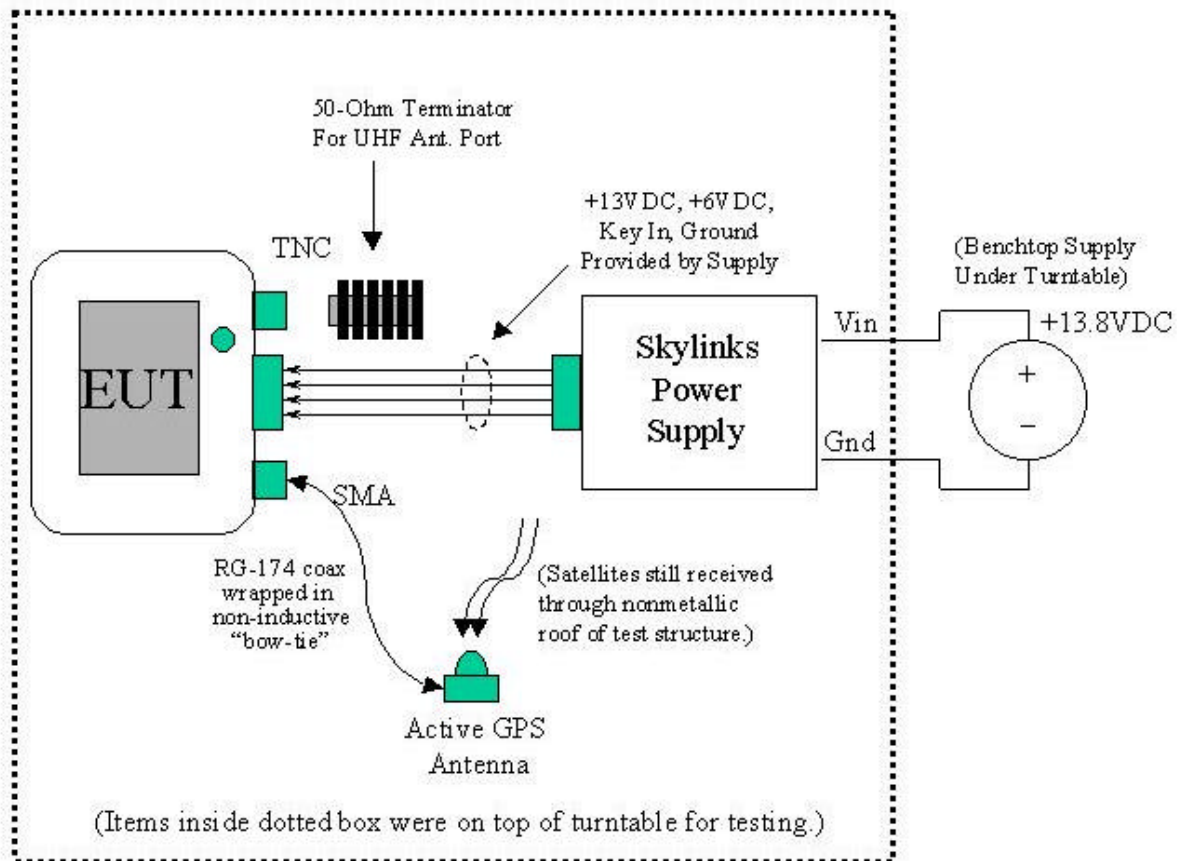
7-31-2000

Test Plan/CDF Prepared By (please print)

Date

Reviewed by TÜV Product Service Associate

Date



Appendix C

MEASUREMENT PROTOCOL

GENERAL INFORMATION

Test Methodology

In compliance with FCC Docket 92-152, "Harmonization of Rules for Digital Devices Incorporate International Standards", testing for FCC compliance may be done following the ANSI C63.4-1992 procedures.

Measurement Uncertainty

The test system for conducted emissions is defined as the LISN, tuned receiver or spectrum analyzer, and coaxial cable. The test system for radiated emissions is defined as the antenna, the pre-amplifier, the spectrum analyzer and the coaxial cable. These test systems have a measurement uncertainty of ± 4.5 dB. The equipment comprising the test systems are calibrated on an annual basis.

Justification

The Equipment Under Test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral into it's characteristic impedance or left unterminated. When appropriate, the cables are manually manipulated with respect to each other to obtain maximum emissions from the unit.

CONDUCTED EMISSIONS

The final level, expressed in dB μ V, is arrived at by taking the reading directly from the EMI receiver. This level is compared directly to the FCC limit.

To convert between dB μ V and μ V, the following conversions apply:

$$\text{dB}\mu\text{V} = 20(\log \mu\text{V})$$

$$\mu\text{V} = \text{Inverse log}(\text{dB}\mu\text{V}/20)$$

RADIATED EMISSIONS

The final level, expressed in dB μ V/m, is arrived at by taking the reading from the spectrum analyzer (Level dB μ V) and adding the antenna correction factor and cable loss factor (Factor dB) to it. This result then has the CISPR limit subtracted from it to provide the Delta which gives the tabular data as shown in the data sheets in Attachment B. The amplifier gain is automatically accounted for by using an analyzer offset.

Example:

Frequency (MHz)	Level (dB μ V)	+	Factor (dB)	=	Final (dB μ V/m)	-	FCC B Limit (dB μ V/m)	=	Delta FCC B (dB)
37.19	10.2	+	12.0	=	22.2	-	30.0	=	-7.8

DETAILS OF TEST PROCEDURES

General Standard Information

The test methods used comply with ANSI C63.4-1992 - "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz."

Conducted Emissions

Conducted emissions on the 50 Hz and/or 60 Hz power interface of the EUT are measured in the frequency range of 150 kHz to 30 MHz. The measurements are performed using a receiver, which has CISPR characteristic bandwidth and quasi-peak detection, and a Line Impedance Stabilization Network (LISN), with 50 Ω /50 μ H (CISPR 16) characteristics. Table top equipment is placed on a non-conducting table 80 centimeters above the floor and is positioned 40 centimeters from the vertical ground plane (wall) of the screen room. In some cases, a pre-scan using a spectrum analyzer is initially performed on the units comprising the system under test to locate the highest emissions. If the minimum passing margin appears to be less than 20 dB with a peak mode measurement, the emissions are re-measured using a tuned receiver or spectrum analyzer with quasi-peak and average detection and recorded on the data sheets.

Radiated Emissions

Radiated emissions from the EUT are measured in the frequency range of 30 to 4600 MHz using a spectrum analyzer and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection and measurements above 1000 MHz are made with a 1 MHz/6 dB bandwidth and peak detection. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimeters above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. Interface cables that are closer than 40 centimeters to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimeters from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna is positioned 3, 10 or 30 meters horizontally from the EUT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarizations and the EUT are rotated 360 degrees.