


**FCC PART 15 SUBPART B and C
TEST REPORT***for***SIX STATION DECODER****Model: ICD-600**

Prepared for

HUNTER INDUSTRIES
1940 DIAMOND STREET
SAN MARCOS, CALIFORNIA 92078Prepared by: 

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DATE: JUNE 8, 2009

	REPORT	APPENDICES					TOTAL
	BODY	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	
PAGES	14	2	2	2	9	6	35

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TABLE OF CONTENTS

Section / Title	PAGE
<i>GENERAL REPORT SUMMARY</i>	4
<i>SUMMARY OF TEST RESULTS</i>	4
1. PURPOSE	5
2. ADMINISTRATIVE DATA	6
2.1 Location of Testing	6
2.2 Traceability Statement	6
2.3 Cognizant Personnel	6
2.4 Date Test Sample was Received	6
2.5 Disposition of the Test Sample	6
2.6 Abbreviations and Acronyms	6
3. APPLICABLE DOCUMENTS	7
4. DESCRIPTION OF TEST CONFIGURATION	8
4.1 Description of Test Configuration – EMI	8
4.1.1 Cable Construction and Termination	9
5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT	9
5.1 EUT and Accessory List	10
5.2 EMI Test Equipment	11
6. TEST SITE DESCRIPTION	12
6.1 Test Facility Description	12
6.2 EUT Mounting, Bonding and Grounding	12
6.3 Facility Environmental Characteristics	12
7. TEST PROCEDURES	13
7.1 RF Emissions	13
7.1.1 Radiated Emissions (Spurious, Fundamental, and Harmonics) Test	13
8. CONCLUSIONS	14

LIST OF APPENDICES

APPENDIX	TITLE
A	Laboratory Recognitions
B	Modifications to the EUT
C	Additional Models Covered Under This Report
D	Diagram, Charts, and Photos <ul style="list-style-type: none">• Test Setup Diagram• Antenna and Amplifier Factors• Radiated Emissions Photos
E	Data Sheets

LIST OF FIGURES

FIGURE	TITLE
1	Plot Map And Layout of 3 Meter Radiated Test Site
2	Plot Map and Layout of 10 Meter Radiated Test Site

GENERAL REPORT SUMMARY

Compatible Electronics Inc. generates this electromagnetic emission test report, which is an independent testing and consulting firm. The test report is based on testing performed by Compatible Electronics personnel according to the measurement procedures described in the test specifications given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced without the written permission of Compatible Electronics, unless done so in full.

This report must not be used to claim product endorsement by NVLAP, NIST or any other agency of the U.S. Government.

Device Tested: Hunter Industries
Model: ICD-600
S/N: N/A

Product Description: The EUT is a six station decoder.

Modifications: The EUT was not modified in order to meet the specifications.

Customer: Hunter Industries
1940 Diamond Street
San Marcos, California 92078

Test Date(s): June 1 and 2, 2009

Test Specifications: EMI requirements
CFR Title 47, Part 15 Subpart B; and Subpart C, Sections 15.205 and 15.209

Test Procedure: ANSI C63.4

Test Deviations: The test procedure was not deviated from during the testing.

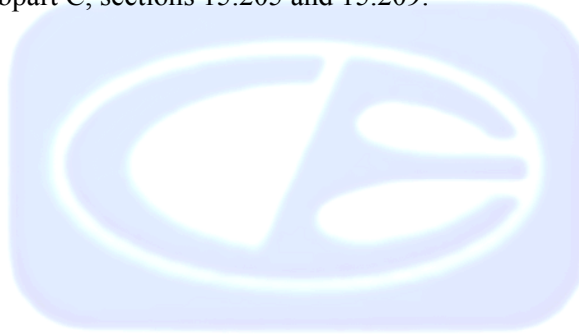
SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions 150 kHz to 30 MHz	The EUT does not directly or indirectly connect to the AC mains, thus this test was not performed.
2	Radiated RF Emissions 9 kHz – 1000 MHz	Complies with the Class B limits of CFR Title 47, Part 15, Subpart B; and Subpart C Sections 15.205 and 15.209. Highest reading in relation to spec limit: 42.65 dBuV/m @ 451.210 MHz (*U _c = 2.23 dB)

*U_c = combined standard uncertainty

1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the Six Station Decoder, Model: ICD-600. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205 and 15.209.



2. ADMINISTRATIVE DATA

2.1 Location of Testing

The EMI tests described herein were performed at the test facility of Compatible Electronics, 114 Olinda Drive, Brea, California.

2.2 Traceability Statement

The calibration certificates of all test equipment used during the test are on file at the location of the test. The calibration is traceable to the National Institute of Standards and Technology (NIST).

2.3 Cognizant Personnel

Hunter Industries

Pete Woytowitz Engineering Manager, Controllers

Compatible Electronics Inc.

Alex Benitez Test Technician

Michael Christensen Lab Manager, Brea Division

2.4 Date Test Sample was Received

The test sample was received prior to the date of testing.

2.5 Disposition of the Test Sample

The test sample has not yet been returned as of the date of this report.

2.6 Abbreviations and Acronyms

The following abbreviations and acronyms may be used in this document.

FCC	Federal Communications Commission
RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
ITE	Information Technology Equipment
LISN	Line Impedance Stabilization Network
NVLAP	National Voluntary Laboratory Accreditation Program
CFR	Code of Federal Regulations
N/A	Not Applicable
Ltd.	Limited
Inc.	Incorporated
IR	Infrared

3. APPLICABLE DOCUMENTS

The following documents are referenced or used in the preparation of this EMI Test Report.

SPEC	TITLE
CFR Title 47, Part 15	FCC Rules – Radio frequency devices (including digital devices)
ANSI C63.4: 2003	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

4. DESCRIPTION OF TEST CONFIGURATION**4.1 Description of Test Configuration – EMI**

During the test, the Six Station Decoder, Model: ICD-600 (EUT) was connected to the Decoder System and six loads via its power and station leads, respectively. During the test, the EUT was continuously communicating with the Decoder System.

It was determined that the emissions were at their highest level when the EUT was operating in the above configuration. The final emissions data was taken in this mode of operation and any cables were maximized. All initial investigations were performed with the measurement receiver in manual mode scanning the frequency range continuously. Photographs of the test setup are in Appendix D of this report.

4.1.1 Cable Construction and Termination

Cable 1 This is a 1-meter unshielded cable connecting the EUT to the (+) lead coming from the transceiver. The cable is hard wired at the EUT end and has a banana type connector at the transceiver end.

Cable 2 This is a 1-meter unshielded cable connecting the EUT to the (-) lead coming from the transceiver. The cable is hard wired at the EUT end and has a banana type connector at the transceiver end.

Cable 3 (Station 1)
This is a 0.5-meter unshielded cable consisting of two wires connecting the EUT to the 100 ohm resistor. The cables are hard wired at the EUT end and are terminated via the 100 ohm resistor.

Cable 4 (Station 2)
This is a 0.5-meter unshielded cable consisting of two wires connecting the EUT to the 100 ohm resistor. The cables are hard wired at the EUT end and are terminated via the 100 ohm resistor.

Cable 5 (Station 3)
This is a 0.5-meter unshielded cable consisting of two wires connecting the EUT to the 100 ohm resistor. The cables are hard wired at the EUT end and are terminated via the 100 ohm resistor.

Cable 6 (Station 4)
This is a 0.5-meter unshielded cable consisting of two wires connecting the EUT to the 100 ohm resistor. The cables are hard wired at the EUT end and are terminated via the 100 ohm resistor.

Cable 7 (Station 5)
This is a 0.5-meter unshielded cable consisting of two wires connecting the EUT to the 100 ohm resistor. The cables are hard wired at the EUT end and are terminated via the 100 ohm resistor.

Cable 8 (Station 6)
This is a 0.5-meter unshielded cable consisting of two wires connecting the EUT to the 100 ohm resistor. The cables are hard wired at the EUT end and are terminated via the 100 ohm resistor.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT**5.1 EUT and Accessory List**

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
SIX STATION DECODER (EUT)	HUNTER INDUSTRIES	ICD-600	N/A	M3UICDDEC
DECODER System	HUNTER INDUSTRIES	ICD-HP	N/A	M3UICDHP

5.2 EMI Test Equipment

EQUIPMENT TYPE	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. CYCLE
GENERAL TEST EQUIPMENT USED FOR ALL RF EMISSIONS TESTS					
Spectrum Analyzer – Main Section	Hewlett Packard	8566B	3638A08768	August 22, 2008	1 Year
Spectrum Analyzer – Display Section	Hewlett Packard	85662A	3701A22262	August 22, 2008	1 Year
Quasi-Peak Adapter	Hewlett Packard	85650A	2811A01363	August 22, 2008	1 Year
Computer	Hewlett Packard	4530	US91912319	N/A	N/A
RF RADIATED EMISSIONS TEST EQUIPMENT					
Radiated Emissions Data Capture Program	Compatible Electronics	2.0	N/A	N/A	N/A
Biconical Antenna	Com Power	AB-900	15182	February 23, 2009	1 Year
Log Periodic Antenna	Com Power	AL-100	16252	June 27, 2008	1 Year
Preamplifier	Com-Power	PA-103	1582	January 12, 2009	1 Year
Loop Antenna	Com Power	AL-130	17089	September 29, 2008	1 Year
Turntable	Com Power	TT-100	N/A	N/A	N/A
Antenna-Mast	Com Power	AM-100	N/A	N/A	N/A

6. TEST SITE DESCRIPTION**6.1 Test Facility Description**

Please refer to section 2.1 and 7.1.2 of this report for EMI test location.

6.2 EUT Mounting, Bonding and Grounding

The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

The EUT was not grounded.

6.3 Facility Environmental Characteristics

When applicable refer to the data sheets in Appendix E for the relative humidity, air temperature, and barometric pressure.

7. TEST PROCEDURES

The following sections describe the test methods and the specifications for the tests. Test results are also included in this section.

7.1 RF Emissions

7.1.1 Radiated Emissions (Spurious, Fundamental, and Harmonics) Test

The spectrum analyzer was used as a measuring meter along with the quasi-peak adapter. A preamplifier was used to increase the sensitivity of the instrument. The spectrum analyzer was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the spectrum analyzer records the highest measured reading over all the sweeps.

The measurement bandwidths and transducers used for the radiated emissions test were:

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
9 kHz to 150 kHz	200 Hz	Active Loop Antenna
150 kHz to 30 MHz	9 kHz	Active Loop Antenna
30 MHz to 300 MHz	120 kHz	Biconical Antenna
300 MHz to 1 GHz	120 kHz	Log Periodic Antenna

The open field test site of Compatible Electronics, Inc. was used for radiated emission testing. This test site is set up according to ANSI C63.4. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength). The loop antenna was also rotated in the horizontal and vertical axis in order to ensure accurate results.

The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from the EUT. The EUT was tested at a 3 meter test distance to obtain the final test data for the spurious emissions. The EUT was tested at a 10 meter test distance to obtain the final test data for the fundamental and the harmonic emissions. The final qualification data sheets are located in Appendix E.

Test Results:

The EUT Complies with the **Class B** limits of **CFR** Title 47, Part 15, Subpart B; and Subpart C Sections 15.205 and 15.209.

8. CONCLUSIONS

The Six Station Decoder, Model: ICD-600, as tested, meets all of the **Class B** specification limits defined in CFR Title 47, Part 15, Subpart B for the digital portion; and the limits defined in Subpart C, sections 15.205 and 15.209 for the transmitter portion.



APPENDIX A

LABORATORY RECOGNITIONS

LABORATORY RECOGNITIONS

Compatible Electronics has the following agency accreditations:

National Voluntary Laboratory Accreditation Program - Lab Code: 200528-0

Voluntary Control Council for Interference - Registration Numbers: R-983, C-1026, R-984 and C-1027

Bureau of Standards and Metrology Inspection - Reference Number: SL2-IN-E-1031

Conformity Assessment Body for the EMC Directive Under the US/EU MRA Appointed by NIST

Compatible Electronics is recognized or on file with the following agencies:

Federal Communications Commission

Industry Canada



APPENDIX B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC 15.209 and/or FCC **Class B** specifications.

All the rework described below was implemented during the test in a method that could be reproduced in all the units by the manufacturer.

There were no modifications made to the EUT.



APPENDIX C

***ADDITIONAL MODELS COVERED
UNDER THIS REPORT***

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

Six Station Decoder
Model: ICD-600
S/N: N/A

ALSO APPROVED UNDER THIS REPORT:

There were no additional models covered under this report.



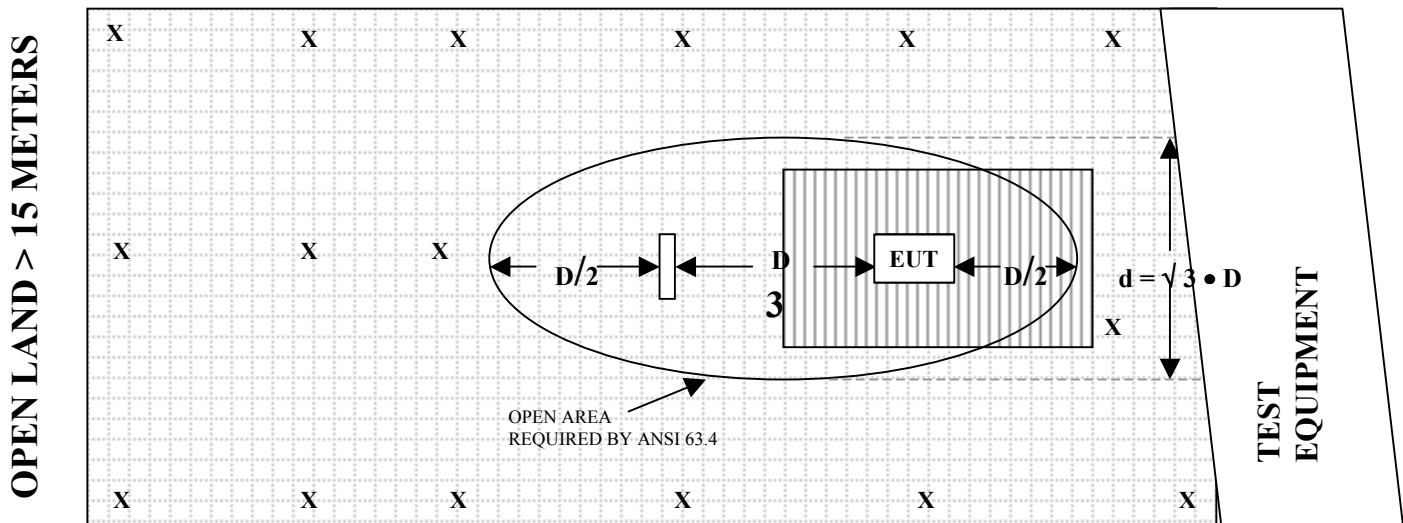


APPENDIX D

DIAGRAMS, CHARTS, AND PHOTOS

FIGURE 1: PLOT MAP AND LAYOUT OF 3 METER RADIATED TEST SITE

OPEN LAND > 15 METERS

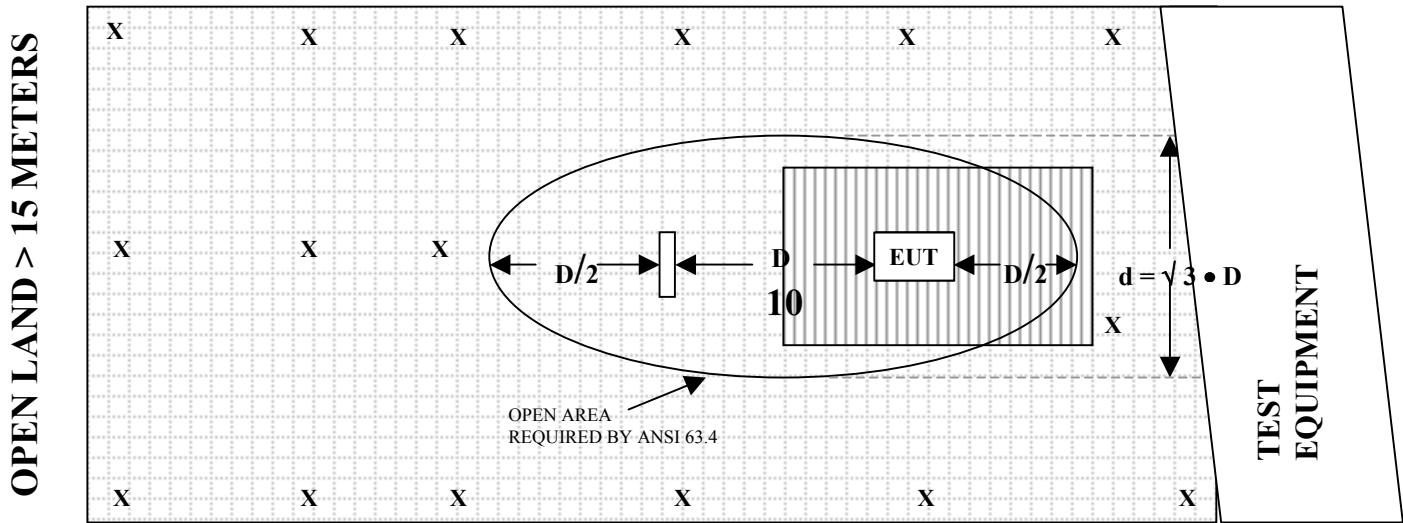


OPEN LAND > 15 METERS

- | | | | |
|---|--------------------------|--|-----------------|
| X | = GROUND RODS | | = GROUND SCREEN |
| D | = TEST DISTANCE (meters) | | = WOOD COVER |

FIGURE 2: PLOT MAP AND LAYOUT OF 10 METER RADIATED TEST SITE

OPEN LAND > 15 METERS



OPEN LAND > 15 METERS

- | | | | |
|---|--------------------------|--|-----------------|
| X | = GROUND RODS | | = GROUND SCREEN |
| D | = TEST DISTANCE (meters) | | = WOOD COVER |

COM-POWER AL-130**LOOP ANTENNA**

S/N: 17089

CALIBRATION DATE: SEPTEMBER 29, 2008

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	-41.57	9.93
0.01	-42.06	9.44
0.02	-42.43	9.07
0.05	-42.50	9.00
0.07	-42.10	9.40
0.1	-42.03	9.47
0.2	-44.50	7.00
0.3	-41.93	9.57
0.5	-41.90	9.60
0.7	-41.73	9.77
1	-41.23	10.27
2	-40.90	10.60
3	-41.20	10.30
4	-41.30	10.20
5	-40.70	10.80
10	-41.10	10.40
15	-42.17	9.33
20	-42.00	9.50
25	-42.20	9.30
30	-43.10	8.40

COM-POWER AB-900**BICONICAL ANTENNA**

S/N: 15182

CALIBRATION DATE: FEBRUARY 23, 2009

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	13.1	100	10.6
35	10.1	120	12.7
40	9.5	140	11.7
45	10.9	160	12.6
50	11.3	180	15.7
60	8.4	200	16.8
70	8.1	250	15.0
80	5.7	275	17.5
90	7.3	300	19.2

COM-POWER AL-100**LOG PERIODIC ANTENNA**

S/N: 16252

CALIBRATION DATE: JUNE 27, 2008

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
300	13.5	700	19.3
400	14.8	800	21.3
500	16.7	900	22.0
600	18.8	1000	22.8

COM-POWER PA-103**PREAMPLIFIER**

S/N: 1582

CALIBRATION DATE: JANUARY 12, 2009

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	33.6	300	33.4
40	33.7	350	33.2
50	33.6	400	33.2
60	33.5	450	33.1
70	33.6	500	32.9
80	33.6	550	33.0
90	33.7	600	32.8
100	33.7	650	33.0
125	33.5	700	32.7
150	33.6	750	32.9
175	33.7	800	32.6
200	33.4	850	32.6
225	33.4	900	32.6
250	33.4	950	32.4
275	33.3	1000	32.7



FRONT VIEW

HUNTER INDUSTRIES
SIX STATION DECODER
MODEL: ICD-600

FCC SUBPART B AND C – RADIATED EMISSIONS – 6/1/09 and 6/2/09

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

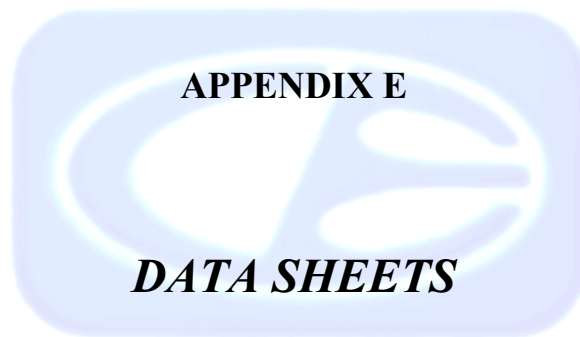


REAR VIEW

HUNTER INDUSTRIES
SIX STATION DECODER
MODEL: ICD-600

FCC SUBPART B AND C – RADIATED EMISSIONS - 6/1/09 and 6/2/09

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



Test Location : Compatible Electronics	Page : 1/2
Customer : HUNTER INDUSTRIES	Date : 6/01/2009
Manufacturer : HUNTER INDUSTRIES	Time : 9:26:07
Eut name : Six Station Decoder	Lab : A
Model : ICD-600	Test Distance : 3.0
Serial # : N/A	
Specification : FCC B	
Distance correction factor (20 * log(test/spec) :	0.00
Test Mode : TESTED BY: ALEX BENITEZ	
30 MHZ TO 1000 MHZ	
VERTICAL AND HORIZONTAL POLARIZATION	

Pol	Freq MHz	Rdng dBuV	Cable loss dB	Ant factor dB	Amp gain dB	Cor'd rdg = R dBuV	Li mit = L dBuV/m	Del ta R- L dB
1H	359.581	50.20	4.80	14.32	33.20	36.12	46.00	-9.88
2H	322.377	51.80	4.49	13.83	33.31	36.81	46.00	-9.19
3H	365.551	51.60	4.86	14.39	33.20	37.66	46.00	-8.34
4H	449.619	47.60	5.50	15.80	33.10	35.79	46.00	-10.21
5V	315.266	54.30	4.43	13.72	33.34	39.12	46.00	-6.88
6V	324.672	53.40	4.51	13.86	33.30	38.46	46.00	-7.54
7V	450.912	47.10	5.51	15.82	33.10	35.34	46.00	-10.66
Above 7 readings were taken in the Y-Axis.								
8V	318.968	56.40	4.46	13.78	33.32	41.32	46.00	-4.68
9V	337.737	56.00	4.61	14.04	33.25	41.40	46.00	-4.60
10V	438.248	48.70	5.43	15.58	33.12	36.59	46.00	-9.41
11H	303.896	60.60	4.33	13.56	33.38	45.11	46.00	-0.89
12H	303.896Qp	56.16	4.33	13.56	33.38	40.67	46.00	-5.33
13H	343.618	54.40	4.65	14.11	33.22	39.94	46.00	-6.06
14H	449.912	52.60	5.50	15.80	33.10	40.80	46.00	-5.20
Above 7 readings were taken in the X-Axis.								
15H	317.984	60.20	4.45	13.76	33.32	45.09	46.00	-0.91
16H	317.984Qp	56.96	4.45	13.76	33.32	41.85	46.00	-4.15
17H	451.210	54.40	5.52	15.83	33.09	42.65	46.00	-3.35
18H	454.617	54.10	5.56	15.89	33.08	42.47	46.00	-3.53
19H	344.886	56.10	4.66	14.13	33.22	41.67	46.00	-4.33
20V	300.456	54.90	4.30	13.51	33.40	39.31	46.00	-6.69
21V	317.973	53.70	4.45	13.76	33.32	38.59	46.00	-7.41
22V	451.168	46.70	5.51	15.82	33.10	34.94	46.00	-11.06
Above 8 readings were taken in the Z-Axis.								
23V	293.368	31.20	4.20	18.76	33.37	20.79	46.00	-25.21
24V	170.354	52.00	2.98	14.25	33.68	35.55	43.50	-7.95
25V	260.182	39.40	3.84	16.05	33.36	25.93	46.00	-20.07
26V	173.819	50.70	3.00	14.78	33.70	34.78	43.50	-8.72
27H	173.944	46.90	3.00	14.80	33.70	31.00	43.50	-12.50
28H	299.168	47.10	4.29	19.15	33.40	37.14	46.00	-8.86
29H	297.642	46.20	4.26	19.05	33.39	36.12	46.00	-9.88
30H	229.935	44.70	3.48	15.67	33.40	30.46	46.00	-15.54
31H	150.709	49.40	2.90	12.20	33.60	30.90	43.50	-12.60
32H	173.939	47.60	3.00	14.80	33.70	31.70	43.50	-11.80

Test Location : Compatible Electronics
 Customer : HUNTER INDUSTRIES
 Manufacturer : HUNTER INDUSTRIES
 Eut name : Six Station Decoder
 Model : ICD-600
 Serial # : N/A
 Specification : FCC B
 Distance correction factor (20 * log(test/spec) : 0.00
 Test Mode : TESTED BY: ALEX BENITEZ
 30 MHZ TO 1000 MHZ
 VERTICAL AND HORIZONTAL POLARIZATION

Page : 2/2
 Date : 6/01/2009
 Time : 9:26:07
 Lab : A
 Test Distance : 3.0

Pol	Freq MHz	Rdng dBuV	Cable loss dB	Ant factor dB	Amp gain dB	Cor'd rdg = R dBuV	Li mi t = L dBuV/m	Del ta R- L dB
33H	151.643	48.60	2.91	12.24	33.61	30.14	43.50	-13.36
34H	174.003	44.70	3.00	14.81	33.70	28.81	43.50	-14.69
35H	299.045	48.20	4.29	19.14	33.40	38.23	46.00	-7.77
36V	151.920	51.40	2.91	12.25	33.61	32.95	43.50	-10.55
37V	174.024	53.20	3.00	14.81	33.70	37.31	43.50	-6.19
38V	299.124	48.60	4.29	19.14	33.40	38.63	46.00	-7.37
Above 6 readings were taken in the X-Axis.								
39V	299.920	43.90	4.30	19.20	33.40	33.99	46.00	-12.01
40V	178.663	47.60	3.06	15.50	33.65	32.51	43.50	-10.99
41V	151.660	55.20	2.91	12.24	33.61	36.74	43.50	-6.76
42H	299.217	45.00	4.29	19.15	33.40	35.04	46.00	-10.96
43H	141.315	50.10	2.80	11.76	33.57	31.10	43.50	-12.40
44H	258.093	46.20	3.83	15.84	33.37	32.50	46.00	-13.50
Above 6 readings were taken in the Y-Axis.								

