FCC PART 15, SUBPART B and C
TEST REPORT

for

PURCHEK WHEEL

P/N: W-9400

Prepared for

GATEKEEPER SYSTEMS, LLC
9331 IRVINE BOLUEVARD
IRVINE, CALIFORNIA 92618

Prepared by: Kyle Fujimoto

KYLE FUJIMOTO

Approved by: _____

MICHAEL CHRISTENSEN

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DATE: NOVEMBER 16, 2004

	REPORT BODY	APPENDICES					TOTAL
		A	***B***	***C***	***D***	***E***	
PAGES	16	2	2	2	10	8	**40**

TABLE OF CONTENTS

LIST OF APPENDICES

APPENDIX	TITLE
A	Laboratory Recognitions
B	Modifications to the EUT
C	Additional Models Covered Under This Report
D	Diagrams, Charts, and Photos • Test Setup Diagrams • Radiated Emissions Photos • Antenna and Effective Gain Factors
E	Data Sheets

LIST OF FIGURES

FIGURE	TITLE
1	Plot Map And Layout of Radiated Test Site

GENERAL REPORT SUMMARY

This electromagnetic emission test report is generated by Compatible Electronics Inc., 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:	Purchek Wheel P/N: W-9400 S/N: N/A
Product Description:	See Expository Statement.
Modifications:	The EUT was not modified during the testing.
Manufacturer:	Gatekeeper Systems, LLC 9331 Irvine Boulevard Irvine, California 92618
Test Date:	November 11, 2004
Test Specifications:	EMI requirements CFR Title 47, Part 15 Subpart B; and Subpart C, Sections 15.205, 15.209, and 15.231
Test Procedure:	ANSI C63.4: 2003
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 - 30 MHz	This test was not performed because the EUT operates on batteries only and cannot be plugged into the AC public mains.
2	Radiated RF Emissions, 10 kHz - 4340 MHz	Complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.231.
3	-20 dB Bandwidth of the Fundamental	Complies with the limits of Subpart C, sections 15.231 [c].

1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the Purchek Wheel P/N: W-9400. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4: 2003. 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, 15.209, and 15.231.

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 92823.

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

Gatekeeper Systems, LLC

Steve Hannah V.P. Engineering

Compatible Electronics, Inc.

Kyle Fujimoto Test Engineer
Michael Christensen Lab Manager

2.4 Date Test Sample was Received

The test sample was received prior to its qualification testing on November 11, 2004.

2.5 Disposition of the Test Sample

The test sample was returned to Gatekeeper Systems, LLC on November 11, 2004.

2.6 Abbreviations and Acronyms

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

RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
HP	Hewlett Packard
ITE	Information Technology Equipment
CML	Corrected Meter Limit
LISN	Line Impedance Stabilization Network
PCB	Printed Circuit Board
TX	Transmit
RX	Receive

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	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

Setup and operation of the equipment under test.

Specifics of the EUT and Peripherals Tested

The Purchek Wheel P/N: W-9400 (EUT) was tested a floor standing unit. The wheel was mounted directly on top of the turntable. The wheel will normally be mounted to typical shopping carts found in most grocery and department stores.

The antenna is a PCB trace.

This 433.92 MHz transmission is broadcast only upon proper decode of the VLF activation signal and terminates prior to completion of the wheel lock cycle. The transmitter sends this message at the start of the lock cycle then terminates prior to the start of the locking motor drive signal emanated from the microprocessor. The transmit time is less than 1 second and the entire cycle time from receipt of the VLF signal, transmission of the 433.92MHz lock signal, and execution of the wheel lock cycle is less than 5 seconds.

The final radiated data was taken in the mode described above. Please see Appendix E for the data sheets.

4.1.1 Cable Construction and Termination

There were no external cables connected to the EUT.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
PURCHEK WHEEL (EUT)	GATEKEEPER SYSTEMS, LLC	P/N: W-9400	N/A	**SOXW9400**

5.2 EMI Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. CYCLE
Radiate Emissions Data Capture Program	Compatible Electronics	2.0	N/A	N/A	N/A
Spectrum Analyzer – Main Section	Hewlett Packard	8566B	3638A08768	June 24, 2004	1 Year
Spectrum Analyzer – Display Section	Hewlett Packard	85662A	3701A22262	June 24, 2004	1 Year
Quasi-Peak Adapter	Hewlett Packard	85650A	2811A01363	June 24, 2004	1 Year
EMI Receiver	Rhode & Schwarz	ESIB40	100194	November 24, 2003	1 Year
Preamplifier	Com-Power	PA-102	1017	January 6, 2004	1 Year
Biconical Antenna	Com Power	AB-900	15227	April 21, 2004	1 Year
Log Periodic Antenna	Com Power	AL-100	16203	February 18, 2004	1 Year
Antenna Mast	Com-Power	AM-100	N/A	N/A	N/A
Turntable	Com-Power	TT-100	N/A	N/A	N/A
Computer	Hewlett Packard	4530	US91912319	N/A	N/A
Monitor	Hewlett Packard	D5258A	TW74500641	N/A	N/A
Loop Antenna	Com-Power	AL-130	17089	September 4, 2004	1 Year
Horn Antenna	Antenna Research	DRG-118/A	1053	January 16, 2004	1 Year
Microwave Preamplifier	Com-Power	PA-122	25195	August 19, 2004	1 Year

6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to section 2.1 and 7.1 of this report for EMI test location.

6.2 EUT Mounting, Bonding and Grounding

The EUT was mounted directly to the turntable.

The EUT was not grounded.

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 Radiated Emissions (Spurious and Harmonics) Test

The spectrum analyzer and EMI Receiver were used as a measuring meter along with the quasi-peak adapter. Amplifiers were used to increase the sensitivity of the instrument. The Com Power Preamplifier Model: PA-102 was used for frequencies from 30 MHz to 1 GHz, and the Com-Power Microwave Preamplifier Model: PA-122 was used for frequencies above 1 GHz. The spectrum analyzer was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the spectrum analyzer and EMI Receiver record 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
1 GHz to 4.34 GHz	1 MHz	Horn 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: 2003. 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 gunsight method was used when measuring with the horn antenna in order to ensure accurate results. The loop antenna was also rotated in the horizontal and vertical axis in order to ensure accurate results.

7.2 Radiated Emissions (Spurious and Harmonics) Test (continued)

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 final test data. The final qualification data sheets are located in Appendix E.

Test Results:

The EUT complies with the limits of CFR Title 47, Part 15, Subpart B; and Subpart C, section 15.205, 15.209 and 15.231 for radiated emissions.

7.3 Bandwidth of the Fundamental

The -20 dB bandwidth was checked to see that it was within 0.25% of the fundamental frequency for the EUT. Data sheets of the –20 dB bandwidth are located in Appendix E.

Test Results:

The EUT complies with the limits of CFR Title 47, Part 15, Subpart C, section 15.231 [c].

8. CONCLUSIONS

The Purchek Wheel P/N: W-9400 meets all of the Class B specification limits defined in CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.231.

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

Radio-Frequency Technologies (Competent Body)

APPENDIX B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC 15.231 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.

No modifications were made to the EUT during the testing.

APPENDIX C

ADDITIONAL MODELS COVERED UNDER THIS REPORT

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

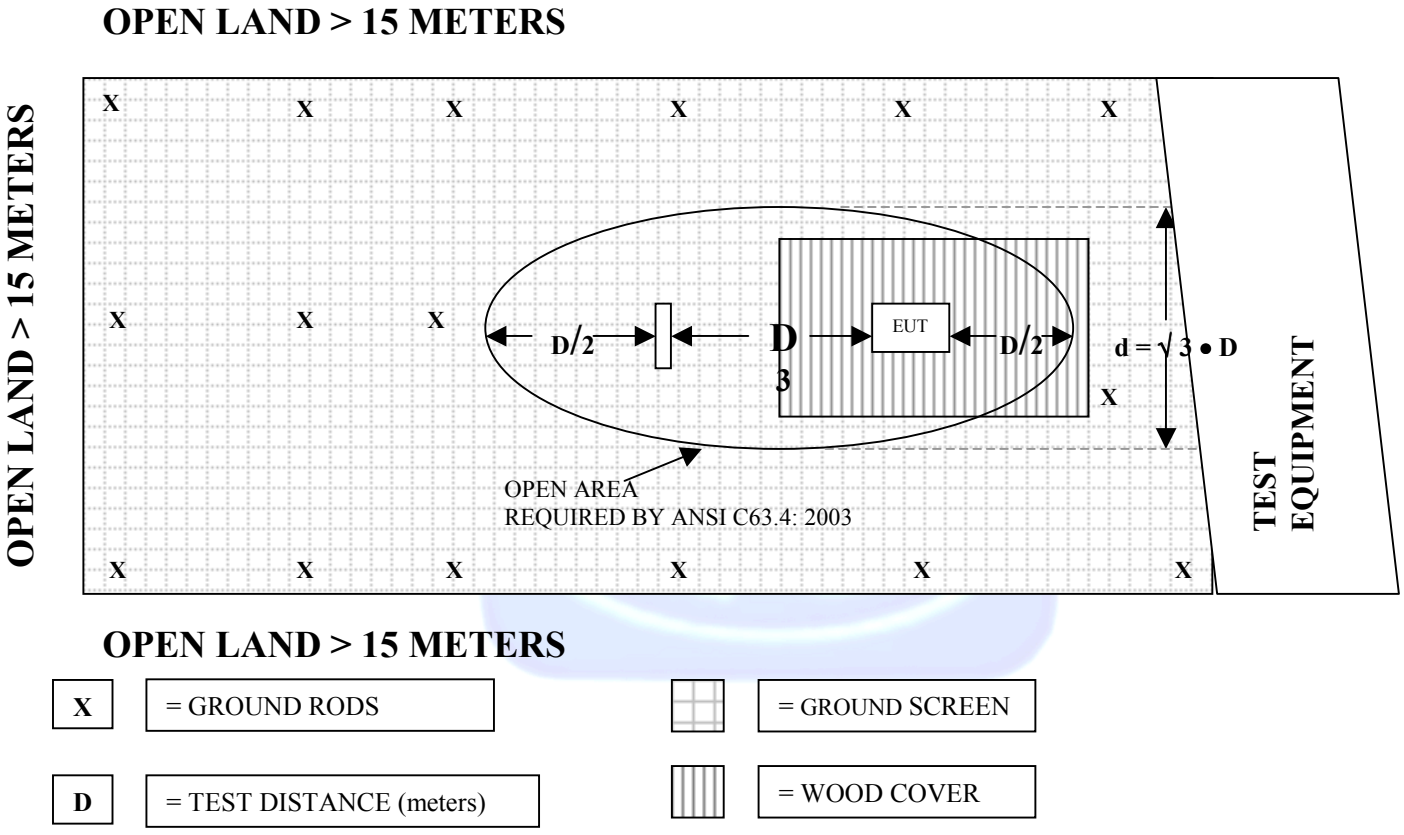
Purchek Wheel
P/N: W-9400
S/N: N/A

There were no additional models covered under this report.

APPENDIX D

DIAGRAMS, CHARTS, AND PHOTOS

FIGURE 1: PLOT MAP AND LAYOUT OF RADIATED TEST SITE



COM-POWER AB-900

BICONICAL ANTENNA

S/N: 15227

CALIBRATION DATE: APRIL 21, 2004

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	11.20	120	12.50
35	10.90	125	12.90
40	11.40	140	12.40
45	8.90	150	12.10
50	11.40	160	12.40
60	10.30	175	15.80
70	8.20	180	15.70
80	6.00	200	17.40
90	7.60	250	14.60
100	10.50	300	19.50

COM-POWER AL-100

LOG PERIODIC ANTENNA

S/N: 16203

CALIBRATION DATE: FEBRUARY 18, 2004

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
300	13.00	700	19.40
400	15.10	800	21.30
500	16.70	900	20.70
600	18.70	1000	22.60

COM-POWER PA-102

PREAMPLIFIER

S/N: 1017

CALIBRATION DATE: JANUARY 6, 2004

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	37.8	300	37.6
40	37.5	350	37.5
50	37.7	400	37.5
60	37.5	450	37.0
70	37.5	500	37.1
80	37.5	550	37.3
90	37.5	600	37.1
100	37.5	650	37.4
125	37.8	700	37.1
150	37.5	750	37.1
175	37.5	800	36.8
200	37.6	850	36.2
225	37.6	900	36.7
250	37.5	950	36.2
275	37.6	1000	35.3

COM-POWER PA-122

MICROWAVE PREAMPLIFIER

S/N: 25195

CALIBRATION DATE: AUGUST 19, 2004

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	30.50	6.0	30.57
1.1	30.24	6.5	30.39
1.2	30.44	7.0	30.08
1.3	30.38	7.5	29.92
1.4	30.11	8.0	28.88
1.5	29.91	8.5	28.08
1.6	29.74	9.0	28.08
1.7	30.26	9.5	29.11
1.8	30.41	10.0	30.21
1.9	30.19	11.0	29.00
2.0	30.37	12.0	29.10
2.5	30.69	13.0	29.77
3.0	31.63	14.0	28.67
3.5	31.61	15.0	29.72
4.0	31.46	16.0	30.54
4.5	31.45	17.0	30.05
5.0	31.33	18.0	28.47
5.5	31.15		

ANTENNA RESEARCH DRG-118/A

HORN ANTENNA

S/N: 1053

CALIBRATION DATE: JANUARY 16, 2004

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	24.4	10.0	38.7
1.5	25.2	10.5	39.0
2.0	28.2	11.0	38.9
2.5	28.5	11.5	41.3
3.0	30.1	12.0	40.5
3.5	31.0	12.5	40.0
4.0	31.2	13.0	40.2
4.5	31.9	13.5	40.5
5.0	33.2	14.0	41.6
5.5	33.7	14.5	44.8
6.0	34.3	15.0	41.4
6.5	35.0	15.5	39.2
7.0	36.7	16.0	39.4
7.5	37.3	16.5	40.9
8.0	37.1	17.0	42.6
8.5	37.3	17.5	45.1
9.0	37.7	18.0	41.7
9.5	38.6		

COM-POWER AL-130

LOOP ANTENNA

S/N: 17089

CALIBRATION DATE: SEPTEMBER 4, 2004

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	-40.8	10.7
0.01	-40.9	10.6
0.02	-41.8	9.7
0.05	-42.0	9.5
0.07	-41.5	10.0
0.1	-41.7	9.8
0.2	-44.1	7.4
0.3	-41.6	9.9
0.5	-41.5	10.0
0.7	-41.4	10.1
1	-41.0	10.5
2	-40.6	10.9
3	-40.8	10.7
4	-41.0	10.5
5	-40.4	11.1
10	-40.7	10.8
15	-41.6	9.9
20	-41.3	10.2
25	-43.0	8.5
30	-42.6	8.9

FRONT VIEW

GATEKEEPER SYSTEMS, LLC
PURCHEK WHEEL
P/N: W-9400
FCC SUBPART B AND C – RADIATED EMISSIONS – 11-11-04

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

GATEKEEPER SYSTEMS, LLC
PURCHEK WHEEL
P/N: W-9400
FCC SUBPART B AND C – RADIATED EMISSIONS – 11-11-04

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

APPENDIX E

DATA SHEETS

RADIATED EMISSIONS

DATA SHEETS

FCC 15.231

Gatekeeper Systems, LLC
Purchek Wheel
P/N: W-9400

Date: 11/11/04
Lab: D
Tested By: Kyle fujimoto

Configuration -- Continuous Transmit Mode
Vertical Polarization - Fundamental and Harmonics
Duty Cycle: 14.4278611 %

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
433.92	77.67	V	100.8	-23.13	Peak	1	180	
433.92	60.854	V	80.8	-19.946	Avg	1	180	
867.92	66.8	V	80.8	-14	Peak	1.75	135	
867.92	49.984	V	60.8	-10.816	Avg	1.75	135	
1301.89	69.9	V	74	-4.1	Peak	1.75	135	
1301.9	53.084	V	54	-0.916	Avg	1.75	135	
1735.84	67.82	V	80.8	-12.98	Peak	1.75	135	
1735.84	51.004	V	60.8	-9.796	Avg	1.75	135	
2169.8	61.86	V	80.8	-18.94	Peak	1.75	135	
2169.8	45.044	V	60.8	-15.756	Avg	1.75	135	
2603.78	61.4	V	80.8	-19.4	Peak	1.75	135	
2603.78	44.584	V	60.8	-16.216	Avg	1.75	135	
3037.57	65.56	V	80.8	-15.24	Peak	1.75	135	
3037.57	48.744	V	60.8	-12.056	Avg	1.75	135	
3471.67	70.47	V	80.8	-10.33	Peak	1.75	135	
3471.67	53.654	V	60.8	-7.146	Avg	1.75	135	
3905.6	62.18	V	74	-11.82	Peak	1.75	135	
3905.6	45.364	V	54	-8.636	Avg	1.75	135	
4339.6	54.53	V	74	-19.47	Peak	1.75	135	
4339.6	37.714	V	54	-16.286	Avg	1.75	135	

FCC 15.231

Gatekeeper Systems, LLC
Purchek Wheel
P/N: W-9400

Date: 11/11/04
Lab: D
Tested By: Kyle fujimoto

Configuration -- Continuous Transmit Mode
Horizontal Polarization - Fundamental and Harmonics
Duty Cycle: 14.4278611 %

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
433.92	69.33	H	100.8	-31.47	Peak	2	180	
433.92	52.514	H	80.8	-28.286	Avg	2	180	
867.91	61.43	H	80.8	-19.37	Peak	1	225	
867.91	44.614	H	60.8	-16.186	Avg	1	225	
1301.89	63.35	H	74	-10.65	Peak	1.75	135	
1301.9	46.534	H	54	-7.466	Avg	1.75	135	
1735.84	64.56	H	80.8	-16.24	Peak	1.75	135	
1735.84	47.744	H	60.8	-13.056	Avg	1.75	135	
2169.8	63.61	H	80.8	-17.19	Peak	1.75	135	
2169.8	46.794	H	60.8	-14.006	Avg	1.75	135	
2603.78	59.47	H	80.8	-21.33	Peak	1.75	135	
2603.78	42.654	H	60.8	-18.146	Avg	1.75	135	
3037.57	63.19	H	80.8	-17.61	Peak	1.75	135	
3037.57	46.374	H	60.8	-14.426	Avg	1.75	135	
3471.67	62.64	H	80.8	-18.16	Peak	1.75	135	
3471.67	45.824	H	60.8	-14.976	Avg	1.75	135	
3905.6	63.45	H	74	-10.55	Peak	1.75	135	
3905.6	46.634	H	54	-7.366	Avg	1.75	135	
4339.6	54.82	H	74	-19.18	Peak	1.75	135	
4339.6	38.004	H	54	-15.996	Avg	1.75	135	

FCC 15.231

Gatekeeper Systems, LLC
Purchek Wheel
P/N: W-9400

Date: 11/11/04
Lab: D
Tested By: Kyle fujimoto

Configuration -- Continuous Transmit Mode

Digital Portion and Non Harmonic Emissions - Vertical Polarization - 10 kHz to 4400 MHz

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
32.02	28.68	V	40	-11.32	Peak	1	90	
36.03	25.12	V	40	-14.88	Peak	1	45	
40.02	27.86	V	40	-12.14	Peak	1	45	
66.27	31.6	V	40	-8.4	Peak	1	45	
75.99	21.41	V	40	-18.59	Peak	1	45	
80.82	26.19	V	40	-13.81	Peak	1	45	
86.02	21.04	V	44	-22.96	Peak	1	45	
109.56	23.25	V	43.5	-20.25	Peak	1	90	
117.11	23.21	V	43.5	-20.29	Peak	1	90	
123.2	14.11	V	43.5	-29.39	Peak	1	90	
132.77	17.9	V	43.5	-25.6	Peak	1	90	
135.21	17.48	V	43.5	-26.02	Peak	1	90	
172.81	19.14	V	43.5	-24.36	Peak	1	90	
188.78	25.87	V	43.5	-17.63	Peak	1	90	
339.98	16.46	V	46	-29.54	Peak	1	90	

FCC 15.231

Gatekeeper Systems, LLC — Date: 11/11/04
Purchek Wheel — Lab: D
P/N: W-9400 — Tested By: Kyle fujimoto

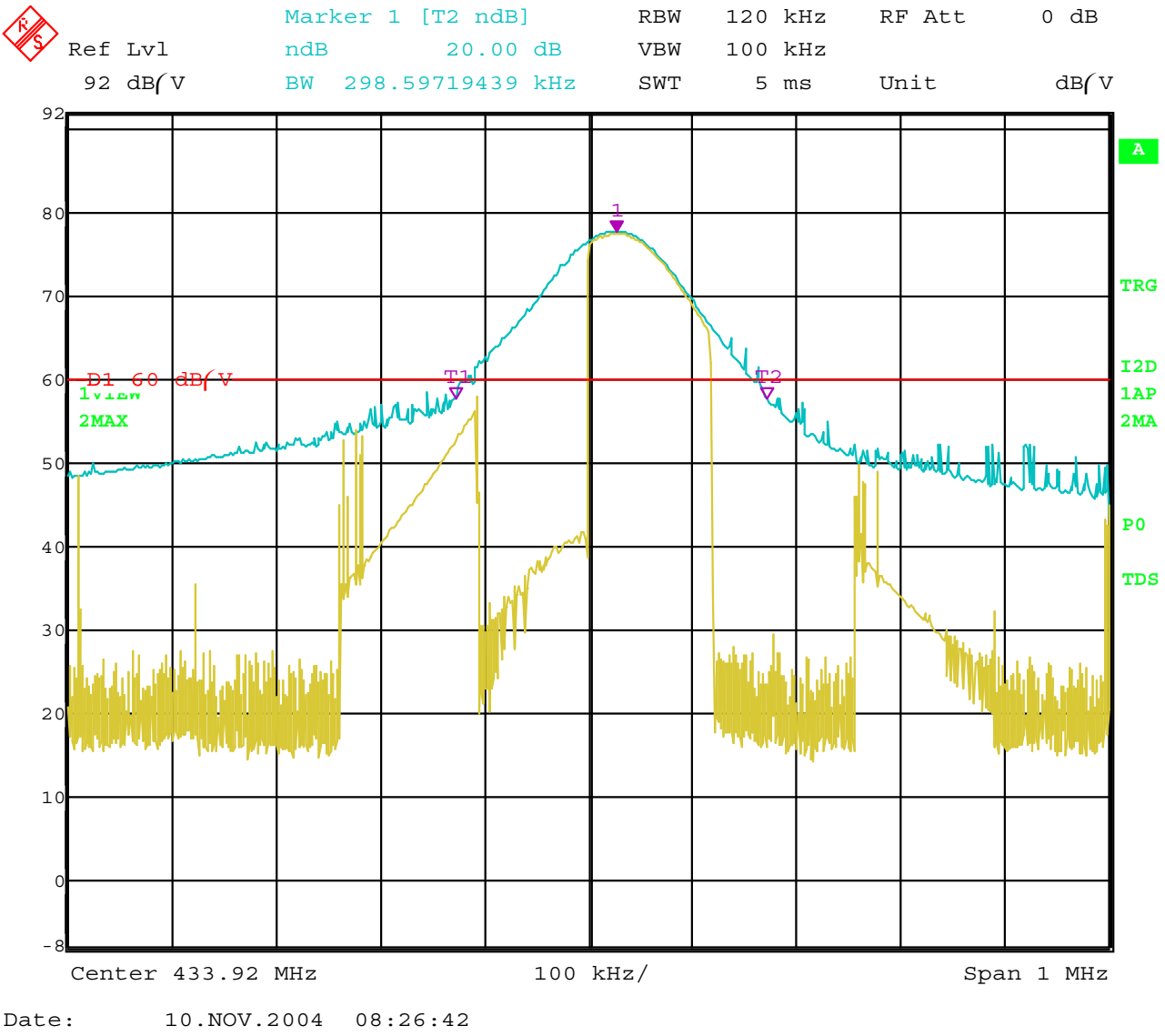
Configuration -- Continuous Transmit Mode

Digital Portion and Non Harmonic Emissions - Horizontal Polarization - 10 kHz to 4400 MHz

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
40.07	16.02	H	40	-23.98	Peak	2	0	
245.35	14.97	H	46	-31.03	Peak	1	90	
289.429	17.37	H	46	-28.63	Peak	2	0	
290.11	16.03	H	46	-29.97	Peak	2	0	
375.06	25.85	H	46	-20.15	Peak	1.25	180	
1636.5	37.66	H	54	-16.34	Peak	1.25	180	

-20 dB BANDWIDTH

DATA SHEET



-20 dB Bandwidth of the Fundamental