ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR FCC CERTIFICATION

Test Report No.	**: E082R-032**
AGR No.	**: A077A-024**
Applicant	**: 2MTECH Inc.**
Address	**: 7th Block, 1st Lot, Naksan-ri, Waegwan-eup, Chilgok-gun, Gyeongsanbuk-do, 718-801, Korea**
Manufacturer	**: 2MTECH Inc.**
Address	**: 7th Block, 1st Lot, Naksan-ri, Waegwan-eup, Chilgok-gun, Gyeongsngbuk-do, 718-801, Korea**
Type of Equipment	**: 7 inch Navigation System (FM Transmitter)**
FCC ID.	**: UJO-2MT-SM400**
Model Name	**: LANDNAVI-RICH7**
Multiple Model Name	**: A7, SM400, PN-7000PLUS**
Serial number	**: N/A**
Total page of Report	**: 17 pages (including this page)**
Date of Incoming	**: January 07, 2008**
Date of Issuing	**: February 19, 2008**

SUMMARY

The equipment complies with the regulation of ***FCC CRF 47 PART 15, SUBPART C, SECTION 15.239***.

This test report contains only the results of a single test of the sample supplied for the examination. It is not a general valid assessment of the features of the respective products of the mass-production.

Prepared by: _____

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EMC Div.
ONETECH Corp.

Reviewed by: _____

Y. K. Kwon / Director
EMC Div.
ONETECH Corp.

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1. VERIFICATION OF COMPLIANCE

-. APPLICANT : 2MTECH Inc.

-. ADDRESS : 7th Block, 1st Lot, Naksan-ri, Waegwan-eup, Chilgok-gun, Gyeongsangbuk-do, 718-801, Korea

-. CONTACT PERSON : Mr. Chul-Gu, Jung / Assistant Manager

-. TELEPHONE NO : +82-54-977-2500

-. BRAND NAME : LANDNAVI

-. FCC ID : UJO-2MT-SM400

-. MODEL NAME : LANDNAVI-RICH7

-. SERIAL NUMBER : N/A

-. DATE : February 19, 2008

DEVICE TYPE	Low Power Communication Device Transmitter
E.U.T. DESCRIPTION	7 inch Navigation System (FM Transmitter)
THIS REPORT CONCERNS	ORIGINAL GRANT
MEASUREMENT PROCEDURES	Charter 13 of ANSI C63.4: 2003
TYPE OF EQUIPMENT TESTED	PRE-PRODUCTION
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	CERTIFICATION
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC PART 15 SECTION 15.239
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	Yes
FINAL TEST WAS CONDUCTED ON	3 METER OPEN AREA TEST SITE

-. The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

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2. GENERAL INFORMATION

2.1 Product Description

The 2MTECH Inc., Model LANDNAVI-RICH7 (referred to as the EUT in this report) is a 7 inch Navigation System that has the FM transmitter from 88.5 MHz to 107.5 MHz for audio signal of FM radio receiver. This test report only covers for FM transmitting mode. The class B personal computer device mode will be issued by Declaration of Conformity report. Product specification described herein was obtained from product data sheet or user's manual.

CHASSIS TYPE	Plastic
LIST OF EACH OSC. OR CRY. FREQ.(FREQ.>=1MHz)	12 MHz on CPU Board 24.576 MHz on Video Input Processor, Audio Processor 12 MHz on IR IC 48MHz on USB Board
POWER REQUIREMENT	DC 12-24V, 1.5A from a car battery
TX FREQUENCY RANGE	88.5 MHz ~ 107.5 MHz (range into 100 kHz Step)
NUMBER OF LAYERS	8 Layers
EXTERNAL CONNECTOR	AV In, EAR, USB, GPS ANT., DC In, SD Card

2.2 Model Differences

-. The following lists consist of the added model and their differences.

	Model Name	Model Differences
Basic Model	LANDNAVI-RICH7	-
Multiple Models	A7, SM400, PN-7000PLUS	Only type designation, except for the model designation according to buyer's request.

2.3 Related Submittal(s) / Grant(s)

-. Original submittal only

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2.4 Test System Details

The model numbers for all the equipments which were used in the tested system is:

Model	Manufacturer	FCC ID	Description	Connected to
LANDNAVI-RICH7	2MTECH Inc.	UJO-2MT-SM400	7 inch Navigation System (EUT)	-
DVD2000	TAEYOUNG TELSTAR	N/A	DVD Player	EUT
N/A	Ga-on Int.	N/A	USB Memory	EUT
N/A	N/A	N/A	Earphone	EUT
N/A	Sandisk	N/A	SD Memory	EUT

2.5 Test Methodology

The radiated testing was performed according to the procedures in chapter 7, 13 of ANSI C63.4: 2003 and performed at a distance of 3 meters from EUT to the antenna.

2.6 Test Facility

The open area test site and conducted measurement facilities are located on at 307-51 Daessangryung-ri, Chowol-eup, Gwangju-si, Gyeonggi-do, 464-080, Korea. Description details of test facilities were submitted to the Commission on August 30, 2005. (Registration Number: 340658)

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3. SYSTEM TEST CONFIGURATION

3.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
Main Board	2MTECH	SM400M REV0.6	N/A
Key Board	N/A	KEY REV0.5	N/A
Sub Board	N/A	TM100MS SUB Rev0.1	N/A
GPS Board	N/A	JC-19X58-SW-REV.03	N/A
LCD	N/A	LTP700WV-F01-0AA	N/A

3.2 EUT exercise Software

The Model, LANDNAVI-RICH7 is included a FM transmitter designed to operate on function in the 88.5 ~ 107.5 MHz. The EUT has audio input ports, so the input ports were connected to a DVD player and than the movie file was transmitted with maximum audio output level during the test.

3.3 Cable Description

Ports Name	Shielded	Ferrite Bead	Metal Shell	Length (m)	Connected to
AV In (1)	N	N	BOTH END	1.5	DVD Player
AV In (2)	N	N	BOTH END	1.5	DVD Player
EAR	N	N	EUT END	1.5	Headphone
USB	N/A	N/A	EUT END	Direct Inserted	Memory Stick
GPS Ant.	N	N	EUT END	2.0	GPS Ant.
DC In	N	N	EUT END	1.2	Car Battery
SD Card	N/A	N/A	EUT END	Direct Inserted	SD Card

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3.4 Equipment Modifications

To achieve compliance to FCC Rules, the following change(s) was made by 2MTECH Inc. during compliance testing:

-. The cap was added to the power signal of main board.

-. The FB 14 &15&21 of main board was removed and then shorted.

-. The ground of Main board(JK 1,2,3) was reinforced.

-. The ground of GPS CUP part was connected to the ground of Main PCB by capper tape.

-. The ground of GPS CUP part was connected to the ground of Main PCB by capper gasket.

-. The ground of Main Board was connected to the ground of enclosure by capper gasket.

-. The ground of Main Board was connected to the ground of LCD panel by capper gasket.

-. The R121 was changed to 130ohm on the FM module output line.

-. The C309, C310 was changed to 120ohm on the FM module output line.

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3.5 Configuration of Test System

Line Conducted Test: It is not need to test this requirement, because the EUT shall be operated by car battery.

Radiated Emission Test: Preliminary radiated emissions test were conducted using the procedure in ANSI C63.4: 2003 8.3.1.1 and 13.1.4.1 to determine the worse operating conditions. Final radiated emission tests were conducted at 3 meter open area test site.

Occupied Bandwidth Measurement:

This measurement is performed with the antenna located close enough to give a full-scale deflection of the modulated carrier on the spectrum analyzer.

Tuning Range Measurement:

This measurement is performed with the search coil located close to the EUT enough to get a full-scale of the modulated carrier on the spectrum analyzer.

3.6 Antenna Requirement

According to section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Antenna Construction:

FM transmitter antenna of the EUT is fixed inside the EUT, no consideration of replacement by the user.

4. PRELIMINARY TEST

4.1 AC Power line Conducted Emission Test

During Preliminary Test, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
It is not need to test this requirement, because the EUT shall be operated by car battery.	

4.2 Radiated Emission Test

During Preliminary Test, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
Transmit the RF Signal continuously	X

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5. FINAL RESULT OF MEASURMENT

Preliminary test was done in normal operation mode. And the final measurement was selected for the maximized emission level

5.1 Radiated Emission Test (Within the permitted 200 kHz band)

The following table shows the highest levels of radiated emission on both polarizations of horizontal and vertical.

Humidity Level : 37 % Temperature: 8 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.239 (b)

Type of Test : Low Power Communication Device Transmitter

Result : PASSED BY –1.90 dB at 98.0 MHz under average mode

EUT : 7 inch Navigation System Date: January 17, 2008

Distance : 3 Meter

Radiated Emission			Ant	Correction Factors		Total	Limit	Margin
Freq. (MHz)	Amp. (dBuV)	Detect Mode	Pol.	Ant. (dBuV/m)	Cable (dB)	Amp. (dBuV/m)	(dBuV/m)	(dB)
88.5	34.70	Quasi-Peak	H	8.27	2.17	45.14	68.00	-22.86
	28.70	Quasi-Peak	V	8.27	2.17	39.14	68.00	-28.86
	32.30	Average	H	8.27	2.17	42.74	48.00	-5.26
	26.40	Average	V	8.27	2.17	36.84	48.00	-11.16
98.0	36.40	Quasi-Peak	H	10.00	2.20	48.60	68.00	-19.40
	31.30	Quasi-Peak	V	10.00	2.20	43.50	68.00	-24.50
	33.90	Average	H	10.00	2.20	46.10	48.00	-1.90
	29.00	Average	V	10.00	2.20	41.20	48.00	-6.80
107.5	31.20	Quasi-Peak	H	11.34	2.20	44.74	68.00	-23.26
	28.70	Quasi-Peak	V	11.34	2.20	42.24	68.00	-25.76
	28.90	Average	H	11.34	2.20	42.44	48.00	-5.56
	26.40	Average	V	11.34	2.20	39.94	48.00	-8.06

Radiated Emission Tabulated Data

Tested by: In-Sub, Youn / Test Engineer

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5.2 Radiated Emission Test (Outside of the specified 200 kHz band)

The following table shows the highest levels of radiated emission on both polarizations of horizontal and vertical.

Humidity Level : 39 % Temperature: 10 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.209 (a)

Type of Test : Low Power Communication Device Transmitter

Result : PASSED BY –5.67 dB at 438.10 MHz

EUT : 7 inch Navigation System Date: January 17, 2008

Frequency range : 30MHz – 1000MHz

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

Distance : 3 Meter

Remark : Other emissions

Radiated Emission		Ant	Correction Factors		Total	FCC	
Freq. (MHz)	Amp. (dBuV)	Pol.	Ant. (dBuV/m)	Cable (dB)	Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
44.23	16.70	V	13.10	1.67	31.47	40.00	-8.53
66.40	19.80	H	6.35	1.93	28.08	40.00	-11.92
95.20	21.20	V	9.50	2.20	32.90	43.52	-10.62
115.70	20.70	V	12.42	2.14	35.26	43.52	-8.26
132.40	17.90	V	13.90	2.50	34.30	43.52	-9.22
176.10	16.90	H	15.64	2.83	35.37	43.52	-8.15
270.41	18.80	H	17.97	3.08	39.85	46.02	-6.17
320.90	19.10	H	14.86	3.43	37.39	46.02	-8.63
438.10	17.40	H	18.62	4.33	40.35	46.02	-5.67
494.20	16.10	H	19.54	4.58	40.22	46.02	-5.80

It was not observed any emissions up to 10th harmonic frequencies of fundamental frequency except above test data.

Tested by: In-Sub, Youn / Test Engineer

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5.3 Bandwidth of the operating frequency

Humidity Level : 41 % Temperature: 19 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.239 (a)

Result : PASSED

EUT : 7 inch Navigation System Date: January 18, 2008

Operating Condition : Transmit the RF signal.

Minimum Resolution Bandwidth : 10 kHz

Remark : Refer to test data in next page.

Frequency (MHz)	Measured Value (kHz)	Limit (kHz)	Margin (kHz)
88.5	184.5	200	-15.5
98.0	181.5		-18.5
107.5	187.0		-13.0

Tested by: In-Sub, Youn / Test Engineer

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Bottom Frequency (88.5MHz)

Middle Frequency (98.0MHz)

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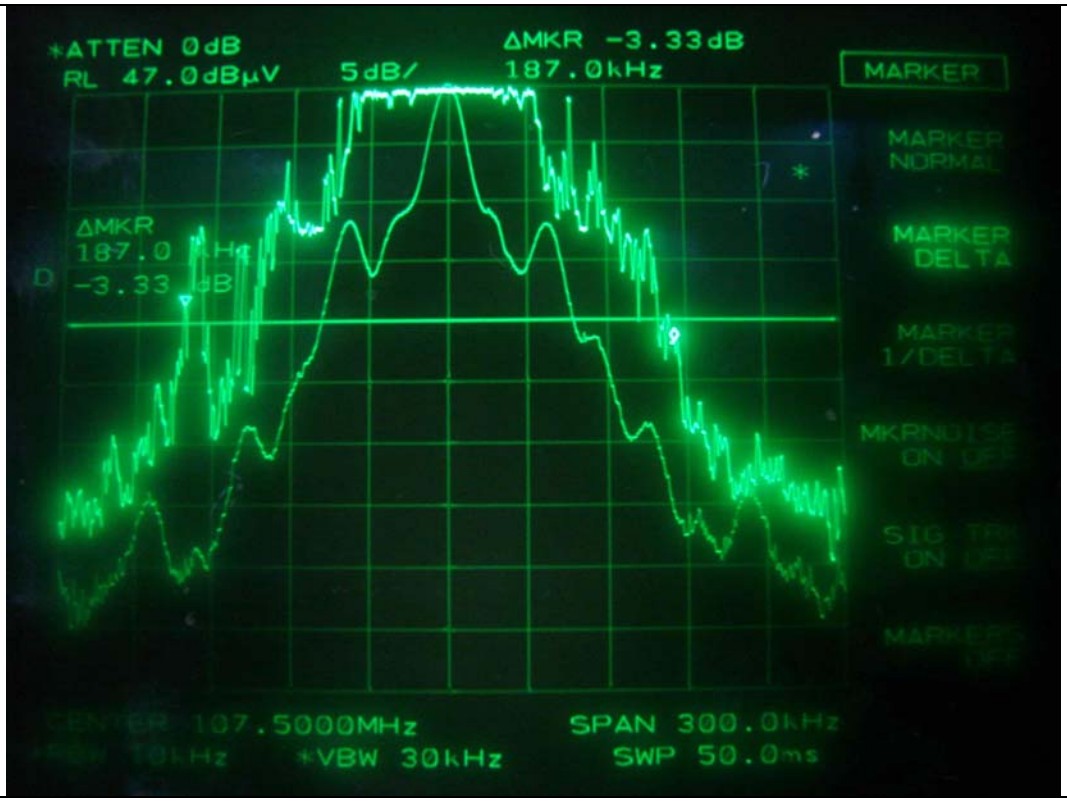

Top Frequency(107.5 MHz)

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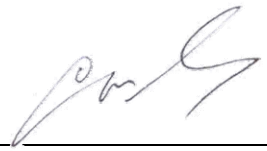
5.4 Tuning Range of the operating frequency

Humidity Level	: 41 %	Temperature: 19 °C
Limits apply to	: FCC CFR 47, PART 15, SUBPART C, SECTION 15.239 (a)	
Result	: PASSED	

EUT	: 7 inch Navigation System	Date: January 18, 2008
Operating Condition	: The lowest and highest frequency was adjusted by manual using up/down button on the side of the EUT and the spectrum was in max hold mode for capturing the spectrum.	
Test Result	: Met the requirement. Refer to test data in next page.	



Tested by: In-Sub, Youn / Test Engineer

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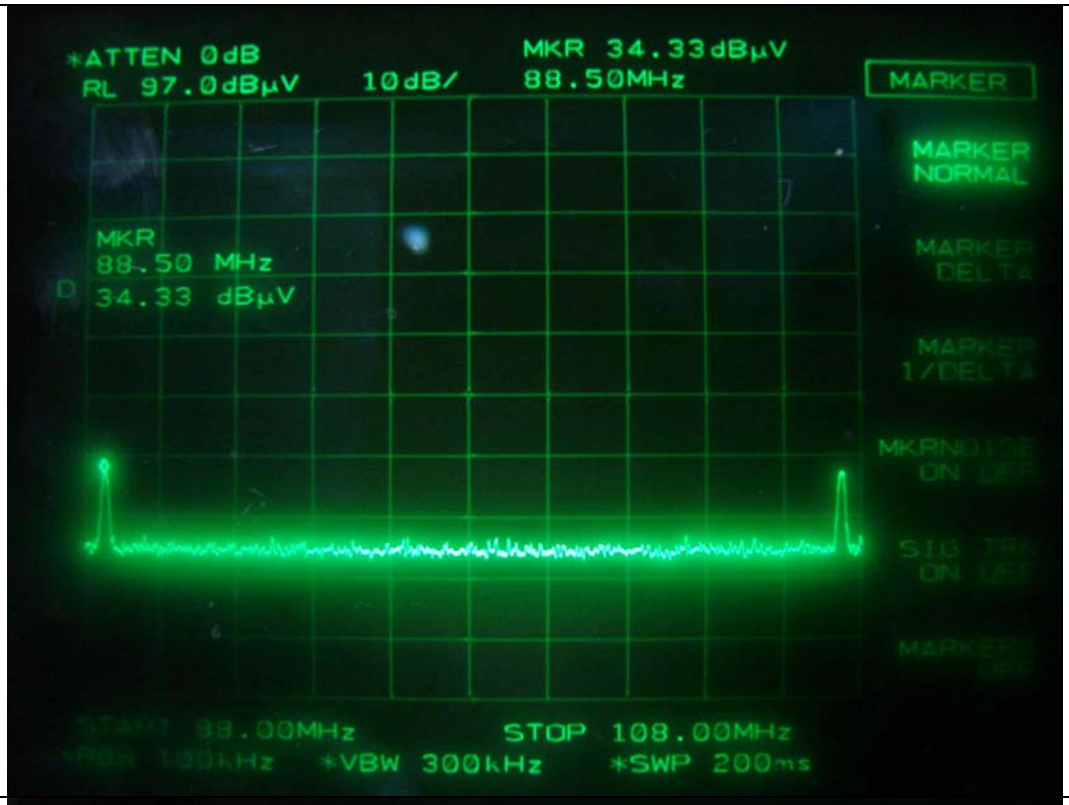

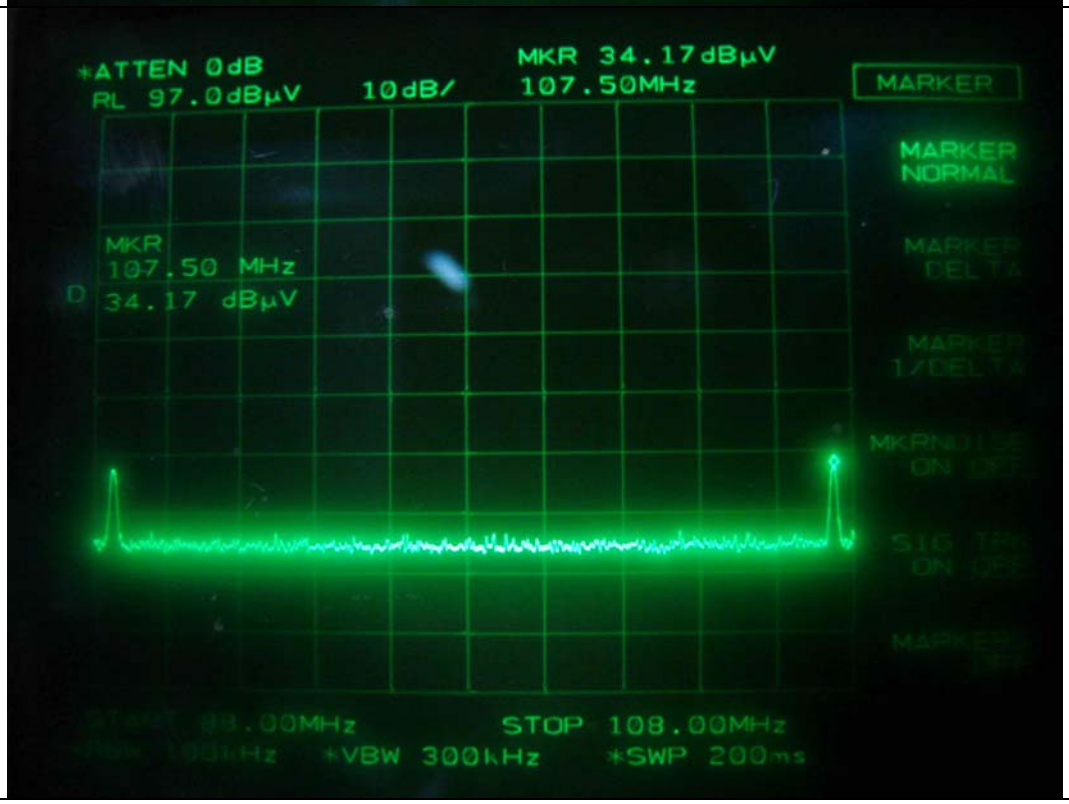

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6. FIELD STRENGTH CALCULATION

Meter readings are compared to the specification limit correcting for antenna and cable losses

+	Meter reading	(dBuV)
+	Cable Loss	(dB)
+	Antenna Factor (Loss)	(dB/meter)
=	Corrected Reading	(dBuV/meter)
-	Specification Limit	(dBuV/meter)
=	dB Relative to Spec	(+/- dB)

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7. LIST OF TEST EQUIPMENT

No.	EQUIPMENTS	MFR.	MODEL	SER. NO.	LAST CAL	DUE CAL	USE
1.	Test receiver	R/S	ESVS10	827864/005	DEC/07	12MONTH	■
2.	Test receiver	R/S	ESHS 10	834467/007	MAY/07	12MONTH	
3.	Spectrum analyzer	HP	8566B	2516A01677	JUN/07	12MONTH	■
4.	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	VULB9163 202	AUG/06	24MONTH	
5.	Biconical antenna	EMCO	3110	9003-1121	JUN/07	12MONTH	
		Schwarzbeck	VHA9103	91031852	FEB/08		■
6.	Log Periodic antenna	Schwarzbeck	9108-A(494)	62281001	FEB/08	12MONTH	■
7.	LISN	EMCO	3825/2	9109-1867	JUN/07	12MONTH	
				9109-1869	JUN/07		
		Schwarzbeck	NSLK 8126	8126-404	JUL/07		
8.	Position Controller	HD GmbH	HD100	N/A	N/A	N/A	■
9.	Turn Table	HD GmbH	DS420S	N/A	N/A	N/A	■
10.	Antenna Master	HD GmbH	MA240	N/A	N/A	N/A	■
11.	RF Amplifier	HP	8447D	2727A04987	JUN/07	12MONTH	■

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