ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR FCC CLASS B CERTIFICATION

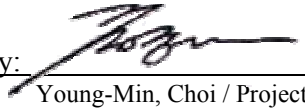
Test Report No.	**: E056R-029**
Applicant	**: HUMAX Co., Ltd.**
Address	**: Humax Bldg., 212-1, Yubang-Dong, Yongin-Si, Gyeonggi-Do, 449-080, Korea**
Manufacturer	**: HUMAX Co., Ltd.**
Address	**: Humax Bldg., 212-1, Yubang-Dong, Yongin-Si, Gyeonggi-Do, 449-080, Korea**
Type of Equipment	**: IP TV RECEIVER (Peripheral Device for Class B Computing Device)**
FCC ID	**: O6ZRG-200**
Model Name	**: RG-200**
Serial number	**: N/A**
Total page of Report	**: 15 pages (including this page)**
Date of Incoming	**: April 11, 2005**
Date of Issuing	**: June 16, 2005**

SUMMARY

The equipment complies with the regulation; ***FCC CFR 47 PART 15 SUBPART B, Class B.***

This test report contains only the result 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: 
Young-Min, Choi / Project Engineer
EMC Div.
ONETECH Corp.

Reviewed by: 
Y. K. Kwon / Director
EMC Div.
ONETECH Corp.

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1. VERIFICATION OF COMPLIANCE

APPLICANT	: HUMAX Co., Ltd.
ADDRESS	: Humax Bldg., 212-1, Yubang-Dong, Yongin-Si, Gyeonggi-Do, 449-080, Korea
CONTACT PERSON	: Mr. Jung-Jae, Choi / Engineering Manager
TELEPHONE NO	: +82-31-600-6362
FCC ID	: O6ZRG-200
MODEL NO/NAME	: RG-200
BRAND NAME	: HUMAX
SERIAL NUMBER	: N/A
DATE	: June 16, 2005

EQUIPMENT CLASS	JBP - Peripheral Device for Class B Computing Device
E.U.T. DESCRIPTION	IP TV RECEIVER – UNINTENTIONAL RADIATOR
THIS REPORT CONCERNS	ORIGINAL GRANT
MEASUREMENT PROCEDURES	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)	PART 15 SUBPART B, SECTION 15.101
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	No
FINAL TEST WAS CONDUCTED ON	3 METER OPEN AREA TEST SITE

-. This device has shown compliance with the conducted emissions limits in 15.107 adopted under FCC 02-107 (ET Docket 98-80). The device may be marketed after July 11, 2005 affected by the 15.37(j) transition provisions.

-. 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 HUMAX Co., Ltd., Model RG-200 (referred to as the EUT in this report) is an IP TV RECEIVER that is two kinds of memory types, HDD or CF memory, and has a RF modulator for TV interfacing and Peripheral Device for Class B Computing Device functions. The report for the TV INTERFACE DEVICE with Part 15 shall be issued with other report number and submitted as composite device simultaneously. Product specification described herein was obtained from product data sheet or user's manual.

CHASSIS TYPE	Metal
LIST OF EACH OSC. OR CRY. FREQ.(FREQ.>=1MHz)	14.31818MHz, 16.83MHz, 24.576MHz, 25MHz, 33MHz, 66MHz, 48MHz and 133MHz on the main board. 24.000MHz on the front board
NUMBER OF LAYERS	4 Layers: Main Board, 2Layers: SCART Board and Front Board, 1 Layer: PU311S
ELECTRICAL RATING	AC 120V~, 60Hz, 2.0A
TUNER M/N / MFR	RMVP13450WD / SAMSUNG
EXTERNAL TERMINALS	Video Out, Audio Out, S-Video Out, Optical Out, Coaxial Out, IR Out, RS-232 Port, VGA Port, USB 2 Ports, Ethernet Port

2.2 Model Differences

-. None

2.3 Related Submittal(s) / Grant(s)

Original submittal only

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
RG-200	HUMAX Co., Ltd.	N/A	IP TV RECEIVER (EUT)	-
PP05LC	Dell Computer.	N/A	Notebook PC	EUT
LT201CB	KTV Global	DoC	LCD TV	EUT
LT 416	LEADER	N/A	Pattern Generator	EUT
MO56UO	N/A	N/A	Mouse	EUT
3500U	BTC	N/A	Keyboard	EUT

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2.5 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4: 2003. Radiated testing was 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 426-1 Daessangryung-Ri, Chowol-Eup, Kwangju-City, Kyunggi-Do, 464-080, Korea. Description details of test facilities were submitted to the Commission on April 04, 2003. (Registration Number: 340658)

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	HUMAX Co., Ltd.	N/A	N/A
Front Board	HUMAX Co., Ltd.	RG-200 FRONT	N/A
Power Board	Sung Ho Electronics	PE 311S	N/A
HDD	Seagate	ST380012ACE	N/A
Memory	N/A	M2S5H04A PS	N/A
Scart Board	HUMAX Co., Ltd.	RG-200 SCART	N/A

3.2 EUT exercise Software

-. The EUT was operated with moving picture program that is recorded in memory(HDD or CF memory) during the test. The Notebook PC was connected to the EUT in order to the ping test via the LAN port from remote location.

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3.3 Cable Description

	Power Cord Shielded (Y/N)	I/O cable Shielded (Y/N)	Length (M)
IP TV RECEIVER	N	N	1.5(P), 1.5(D)
Notebook PC	N	-	1.5(P)
LCD TV	N	N	1.5(P), 1.5(D)
Pattern Generator	N	N	1.5(P), 1.5(D)
Mouse	N/A	N	1.5(D)
Keyboard	N/A	N	1.5(D)

* The marked "(P)" means the Power Cable and "(D)' means Signal Cable.

3.4 Noise Suppression Parts on Cable

	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
IP TV RECEIVER	N	N/A	Y	BOTH END
Notebook PC	-	-	-	-
LCD TV	N	N/A	Y	BOTH END
Pattern Generator	N	N/A	Y	BOTH END
Mouse	N	N/A	Y	Notebook PC END
Keyboard	N	N/A	Y	Notebook PC END

3.5 Equipment Modifications

-. None

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3.6 Configuration of Test System

Line Conducted Test: The power of the EUT was connected to LISN. All supporting equipments were connected to another LISN. Preliminary Power line Conducted Emission test was performed by using the procedure in ANSI C63.4: 2003 7.2.3 to determine the worse operating conditions.

Radiated Emission Test: Preliminary radiated emission test was conducted using the procedure in ANSI C63.4: 2003 8.3.1.1 to determine the worse operating conditions. Final radiated emission test was conducted at 3 meters open area test site.

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)
The EUT was operated with moving picture program that is recorded in memory(HDD or CF memory).	X

4.2 Radiated Emission Test

During Preliminary Test, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
The EUT was operated with moving picture program that is recorded in memory(HDD or CF memory).	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 Conducted Emission Test

Humidity Level : 43 % Temperature: 21 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.107(a)

Type of Test : CLASS B

Result : PASSED BY –3.33 dB at 0.34 MHz under HDD type(Average mode)

EUT : IP TV RECEIVER Date: April 14, 2005

Operating Condition : The EUT was operated with moving picture program.

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

Operating Condition : The HDD was installed into the EUT.

Frequency (MHz)	Line	Peak (dBuV)		Margin (dB)
		Emission level	Q.P Limits	
0.20	H	49.88	63.61	-13.73
0.34	N	46.90	59.20	-12.30
0.61	N	40.80	56.00	-15.20
2.37	N	40.77	56.00	-15.23
5.09	N	44.33	60.00	-15.67
5.28	H	45.21	60.00	-14.79
Frequency (MHz)	**Line**	**Average (dBuV)**		**Margin (dB)**
		Emission level	**Limits**	
0.20	H	42.74	53.61	-10.87
0.34	N	45.87	49.20	-3.33
0.61	N	40.35	46.00	-5.65
5.28	H	40.22	50.00	-9.78

Line Conducted Emission Tabulated Data

Remark : “H”: Hot Line, “N”: Neutral line

See next page for an overview sweep performed with peak and average detector.

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Operating Condition : The CF type memory was installed into the EUT.

Frequency (MHz)	Line	Peak (dBuV)		Margin (dB)
		Emission level	Q.P Limits	
0.20	N	49.98	63.61	-13.63
0.40	N	41.96	57.85	-15.89
0.73	N	38.39	56.00	-17.61
1.39	H	36.94	56.00	-19.06
6.27	N	46.30	60.00	-13.70
6.69	H	45.96	60.00	-14.04
Frequency (MHz)	**Line**	**Average (dBuV)**		**Margin (dB)**
		Emission level	**Limits**	
-				
-				

Line Conducted Emission Tabulated Data

Remark : "H": Hot Line, "N": Neutral line

Average mode was not measured, because Peak values were under the Average limit.

See next page for an overview sweep performed with peak detector.

Tested by: Sue-Yong, Lee / Test Engineer

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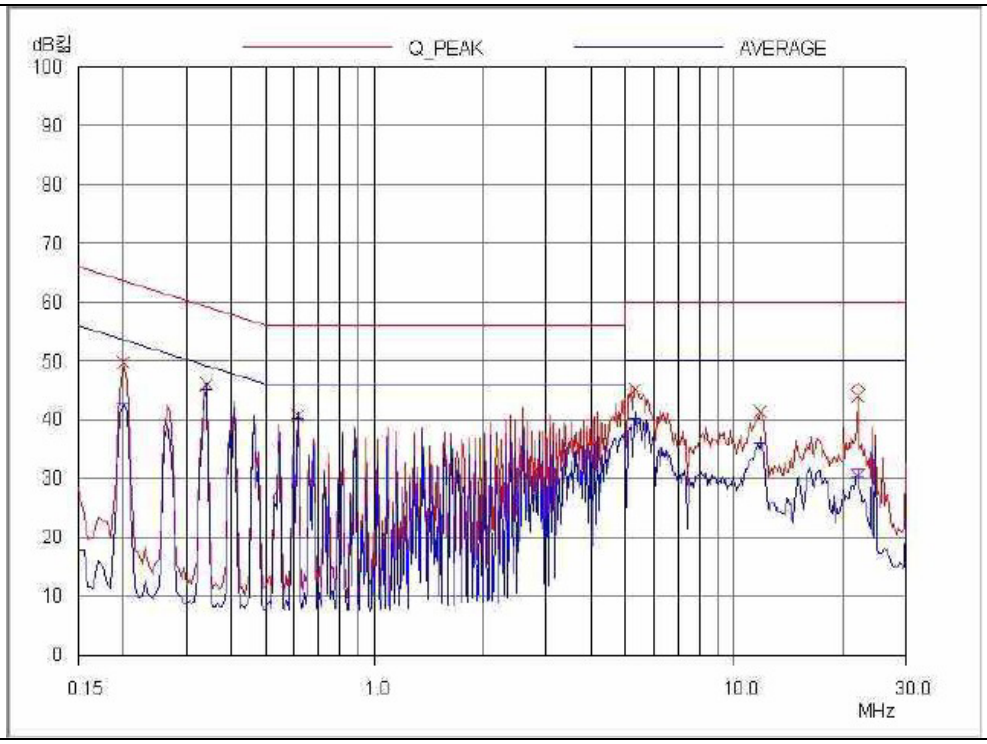
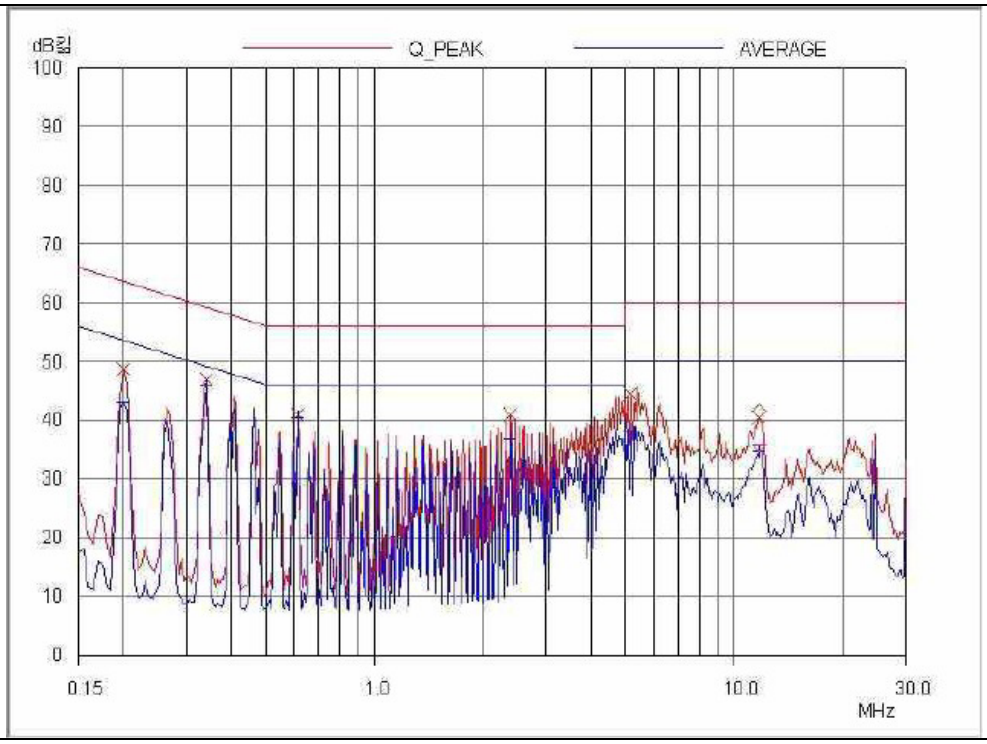
Operating Condition : The HDD was installed into the EUT.



HOT LINE



NEUTRAL LINE

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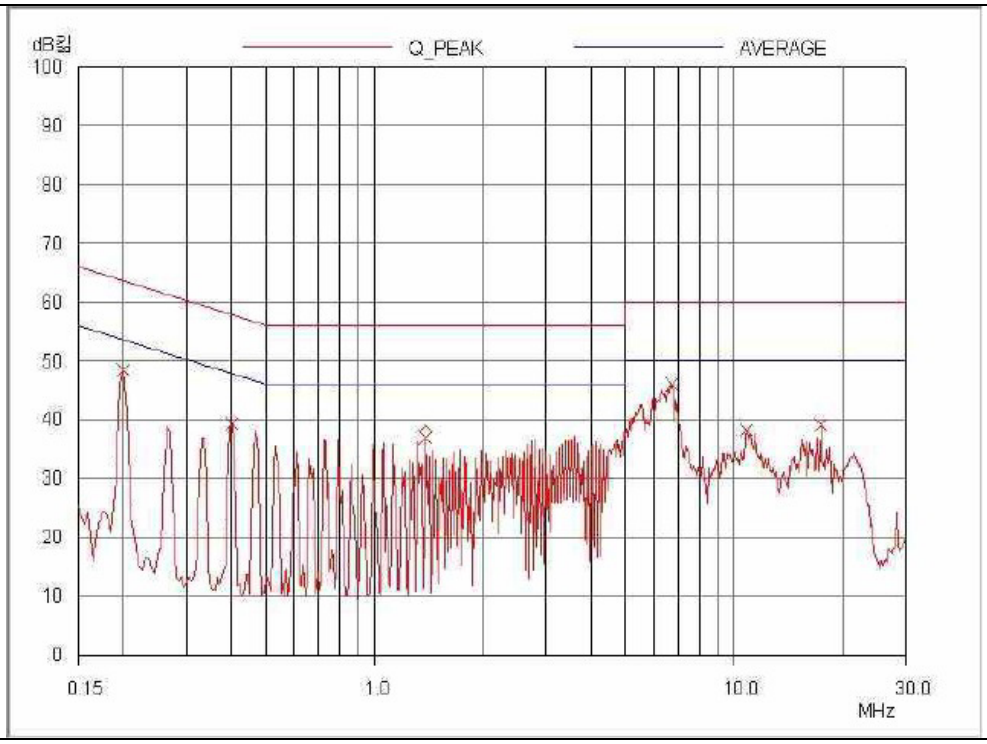
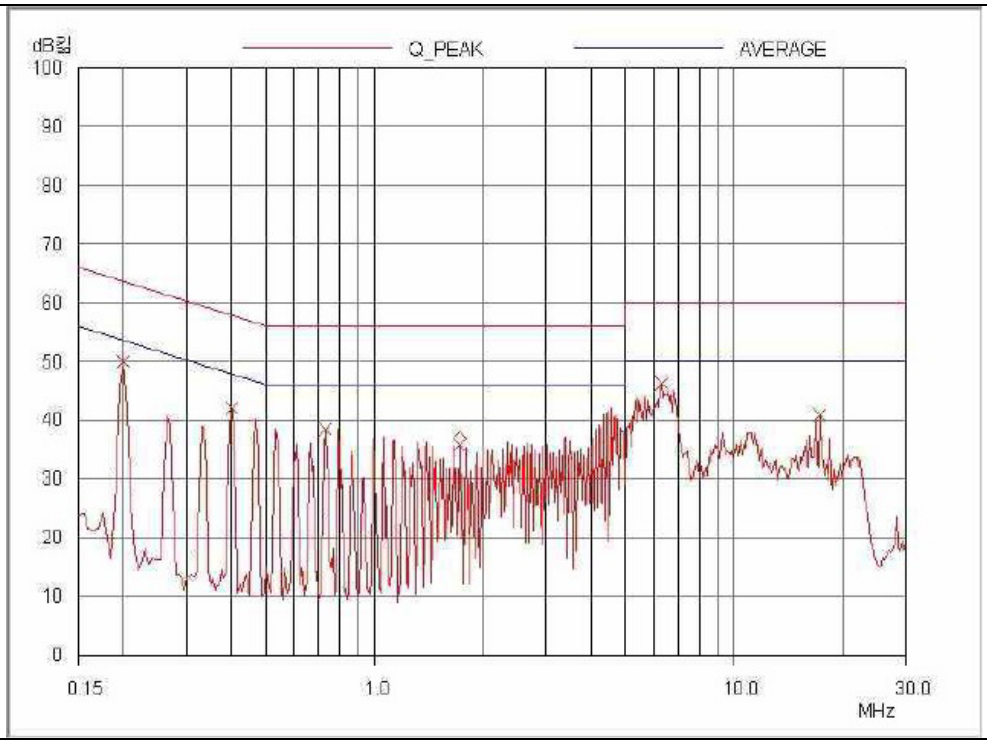
Operating Condition : The CF type memory was installed into the EUT.



HOT LINE



NEUTRAL LINE

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5.2 Radiated Emission Test

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

Humidity Level : 41 % Temperature: 20 °C
Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109(a)
Type of Test : CLASS B
Result : PASSED BY –4.13dB at 398.23MHz under HDD Type

EUT : IP TV RECEIVER Date: April 20, 2005
Operating Condition : The EUT was operated with moving picture program.
Frequency range : 30MHz – 2000MHz
Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)
Distance : 3 Meter
Operating Condition : The HDD was installed into the EUT.

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)
164.70	20.22	V	15.47	2.40	38.09	43.52	-5.43
197.64	18.14	V	15.88	2.80	36.82	43.52	-6.70
239.31	21.54	V	16.77	3.23	41.54	46.02	-4.48
298.42	13.96	V	20.04	3.78	37.78	46.02	-8.24
398.23	22.08	H	15.42	4.39	41.89	46.02	-4.13
431.18	16.98	H	16.28	4.46	37.72	46.02	-8.30
798.43	10.90	H	20.41	7.19	38.50	46.02	-7.52

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Operating Condition : The CF type memory was installed into the EUT.

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)
64.89	24.56	V	6.49	1.50	32.55	40.00	-7.45
164.70	18.44	V	15.47	2.40	36.31	43.52	-7.21
197.64	18.60	V	15.88	2.80	37.28	43.52	-6.24
239.31	17.78	V	16.77	3.23	37.78	46.02	-8.24
382.73	20.55	H	15.07	4.33	39.95	46.02	-6.07
649.21	16.15	H	19.26	5.69	41.10	46.02	-4.92
719.95	13.89	H	20.83	6.60	41.32	46.02	-4.70

Tested by: Sue-Yong, Lee / Test Engineer

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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/04	12MONTH	■
2.	Test receiver	R/S	ESHS 10	834467/007	MAY/04	12MONTH	■
3.	Spectrum analyzer	HP	8566B	3407A08547	JUL/04	12MONTH	
4.	Spectrum analyzer	HP	85680B	3001A04955	APR/05	12MONTH	■
5.	RF preselector	HP	85685A	3107A01264	APR/05	12MONTH	■
6.	Quasi-Peak Adapter	HP	8574B	2811A01432	APR/05	12MONTH	■
7.	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	VULB9163 166	FEB/05	12MONTH	
8.	Biconical antenna	EMCO	3104C	9109-4443	MAY/04	12MONTH	
		Schwarzbeck	VHA9103	91031852	JAN/05		■
9.	Log Periodic antenna	EMCO	3146	9109-3213	FEB/05	12MONTH	
				9109-3217	MAY/04		
		Schwarzbeck	9108-A(494)	62281001	JAN/05		■
10.	LISN	EMCO	3825/2	9109-1867	JUL/04	12MONTH	
				9109-1869	OCT/04		■
		Schwarzbeck	NSLK 8126	8126-404	MAY/04		■
11.	Position Controller	HD GmbH	HD100	N/A	N/A	N/A	■
12.	Turn Table	HD GmbH	DS420S	N/A	N/A	N/A	■
13.	Antenna Master	HD GmbH	MA240	N/A	N/A	N/A	■

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