



ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR FCC CLASS B CERTIFICATION

Test Report No. : E04OR-039

Applicant : JAWON MEDICAL CO., LTD.

Address : 13Lot, 21 Block, Jinryang Industrial Complex, Kyungsan-City, Kyungbuk, Korea

Manufacturer : JAWON MEDICAL CO., LTD.

Address : 13Lot, 21 Block, Jinryang Industrial Complex, Kyungsan-City, Kyungbuk, Korea

Type of Equipment : Wrist type NIBP

FCC ID. : RIXECHOFT

Model Name : Echo FT

Multiple Model Name : Echo T, Echo FS, Echo F, Echo S

Serial Number : N/A

Total page of Report : 14 pages (including this page)

Date of Incoming : September 20, 2004

Date of Issuing : October 12, 2004

SUMMARY

The equipment complies with the regulation; **PART 15 SUBPART B, Class B Computing Device Peripherals.**

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:

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**1. VERIFICATION OF COMPLIANCE**

APPLICANT : JAWON MEDICAL CO., LTD.
ADDRESS : 13Lot, 21 Block, Jinryang Industrial Complex, Kyungsan-City, Kyungbuk, Korea
CONTACT PERSON : Mr. Jong-Hwan, Cho / Senior Engineer
TELEPHONE NO. : +82-53-856-0993
FCC ID : RIXECHOFT
MODEL NAME : Echo FT
SERIAL NUMBER : N/A
DATE : October 12, 2004

DEVICE TYPE	Peripheral Device for Class B Personal Computing Device -UNINTENTIONAL RADIATOR
E.U.T. DESCRIPTION	Wrist type NIBP
THIS REPORT CONCERNS	ORIGINAL GRANT
MEASUREMENT PROCEDURES	ANSI C63.4: 2001
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.



2. GENERAL INFORMATION

2.1 Product Description

The JAWON MEDICAL CO., LTD., Model Echo FT (referred to as the EUT in this report) is a Wrist type NIBP that is indicated for use in the noninvasive measurement of systolic and diastolic blood pressure and heart rate in adult age 18 and over, in a home care environment. The 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)	8 MHz on the main board
POWER REQUIREMENT	DC 6V, 500mA, 6W from the AC/DC Adaptor
NUMBER OF LAYERS	4 Layers
EXTERNAL CONNECTORS	USB Connector

2.2 Model Differences:

- The following list consists of added model name and their difference. The basic and added models are identical except for following difference.

	Model Name	Model Differences
Basic Model	Echo FT	-
Multiple Models	Echo S	This model can change inflate pressure by manually.
	Echo F	This model can inflate and deflate using Fussy logic.
	Echo FS	This model can save 3 users and has Echo F model's function.
	Echo T	This model has clock function and has Echo F model's function.

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	Description	FCC ID	Connected to
Echo FT	JAWON MEDICAL CO., LTD.	Wrist type NIBP(EUT)	RIXECHOFT	Notebook PC
HITR-060500E	HanilTransformer Co., Ltd.	AC/DC Adaptor	N/A	EUT
PP01L	DELL	Notebook PC	DoC	-
2225C	HP	PRINTER	DSI6XU2225	Notebook PC
020-0470	CARDINAL	MODEM	GDE0196	Notebook PC

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FCC-004 (Rev.0)

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EMC Testing Dept : 426-1 Daessangryung-Ri, Chowol-Myun, Kwangju-City, Kyunggi-Do, 464-860, Korea. (TEL: +82-31-765-8289, FAX: +82-31-766-2904)



2.5 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4: 2001. Radiated testing was performed at a distance of 3 meters from the 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-Myun, Kwangju-City, Kyounggi-Do, 464-080, Korea. Description details of test facilities were submitted to the Commission on January 18, 2002. (Registration Number: 92819)



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	N/A	ECHO-ARM	N/A
Sub Board	N/A	COM MODULE	N/A

3.2 EUT exercise Software

- The EUT was operated with normal operating condition and measured data was transmitted to Notebook PC during the test.

3.3 Cable Description

	Power Cord Shielded (Y/N)	I/O cable Shielded (Y/N)	Length (M)
Wrist type NIBP (EUT)	N	Y	1.5(P), 1.5(D)
AC/DC ADAPTOR	N/A	N	1.5(P)
NOTEBOOK PC	N	-	1.8(P)
PRINTER	N	Y	1.8(P), 1.5(D)
MODEM	N	N	1.8(P), 1.5(D)

* The marked "(D)" means the I/O Cable and "(P)" means the Power Cable.

3.4 Noise Suppression Parts on Cable

	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
Wrist type NIBP (EUT)	N	N/A	Y	BOTH END
AC/DC ADAPTOR	N	N/A	Y	EUT END
NOTEBOOK PC	-	-	-	-
PRINTER	N	N/A	Y	BOTH END
MODEM	N	N/A	Y	BOTH END

3.5 Equipment Modifications

- None



3.6 Configuration of Test System

Line Conducted Test: The EUT was connected to AC/DC adaptor and AC/DC adaptor 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: 2001 7.2.3 to determine the worse operating conditions.

The EUT was inserted to USB port of PC and the power line of PC 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: 2001 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: 2001 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)
Normal operation and data transmission mode	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)
Normal operation and data transmission mode	X



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 : 42% Temperature : 20°C
 Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.107(a)
 Type of Test : CLASS B
 Result : PASSED BY -9.93 dB at 0.17 MHz under PC power line mode

EUT : Wrist type NIBP Date: October 11, 2004

Operating Condition : Normal operation and data transmission mode

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

Remark : Used by AC/DC Adaptor

Frequency (MHz)	Line	Peak (dBuV)		Margin (dB)
		Emission level	Q.P Limits	
0.19	N	37.13	64.04	-26.91
0.32	N	35.07	59.71	-24.64
0.74	N	32.22	56.00	-23.78
18.20	N	34.78	60.00	-25.22
18.79	H	33.52	60.00	-26.48
19.34	H	35.45	60.00	-24.55
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.



Remark : Used by PC power line

Frequency (MHz)	Line	Peak (dBuV)		Margin (dB)
		Emission level	Q.P Limits	
0.15	N	50.09	66.00	-15.91
0.16	H	48.93	65.46	-16.53
0.17	N	54.79	64.72	-9.93
0.19	H	45.21	64.04	-18.83
0.23	N	49.23	62.27	-13.04
0.29	N	43.61	60.52	-16.91
Frequency (MHz)	Line	Average (dBuV)		Margin (dB)
		Emission level	Limits	
0.17	N	42.56	54.72	-12.16
0.23	N	37.88	52.45	-14.57
0.29	N	31.47	50.52	-19.05

Line Conducted Emissions Tabulated Data

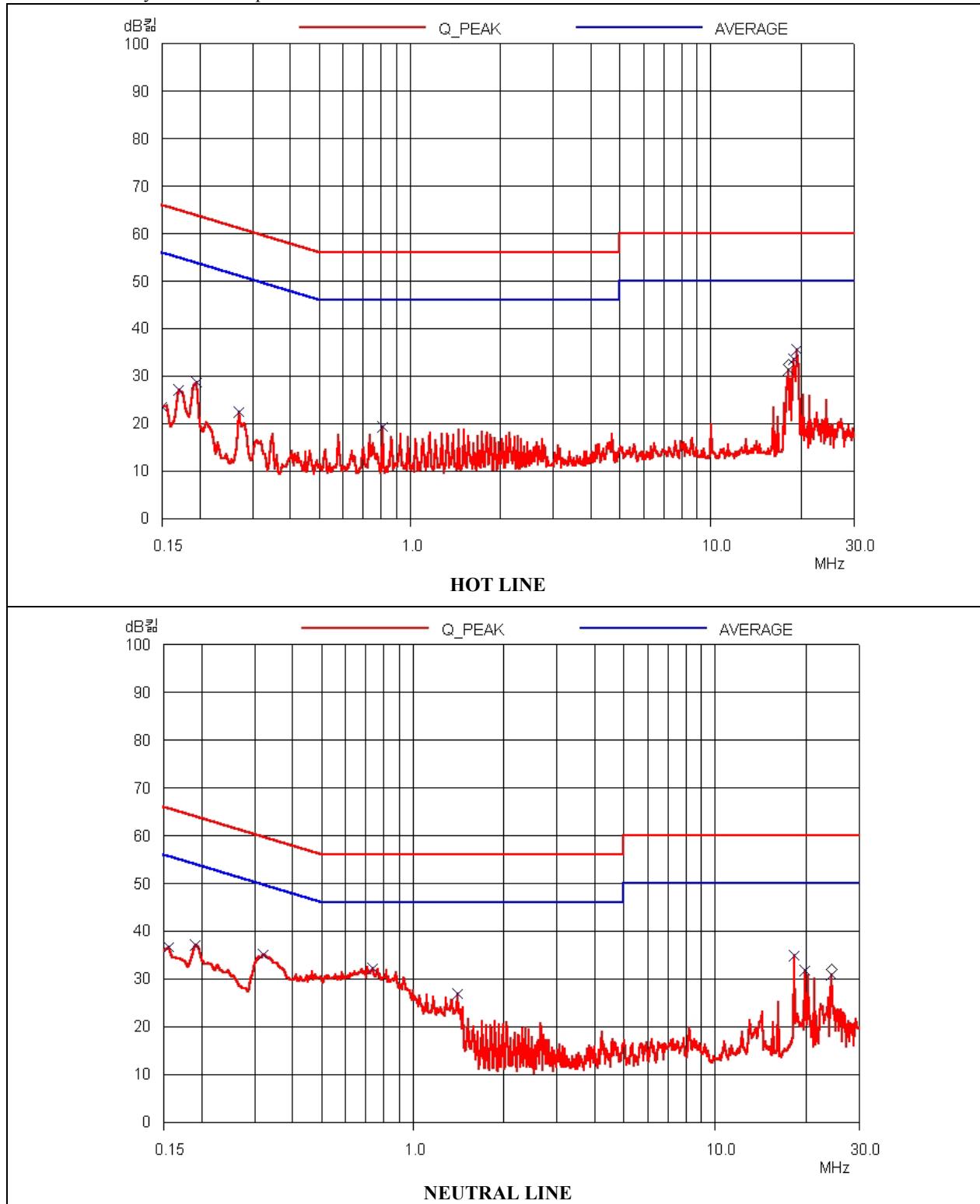
Remark : "H": Hot Line, "N": Neutral line

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

Tested by: Hyun-Suck, Lee / Test Engineer

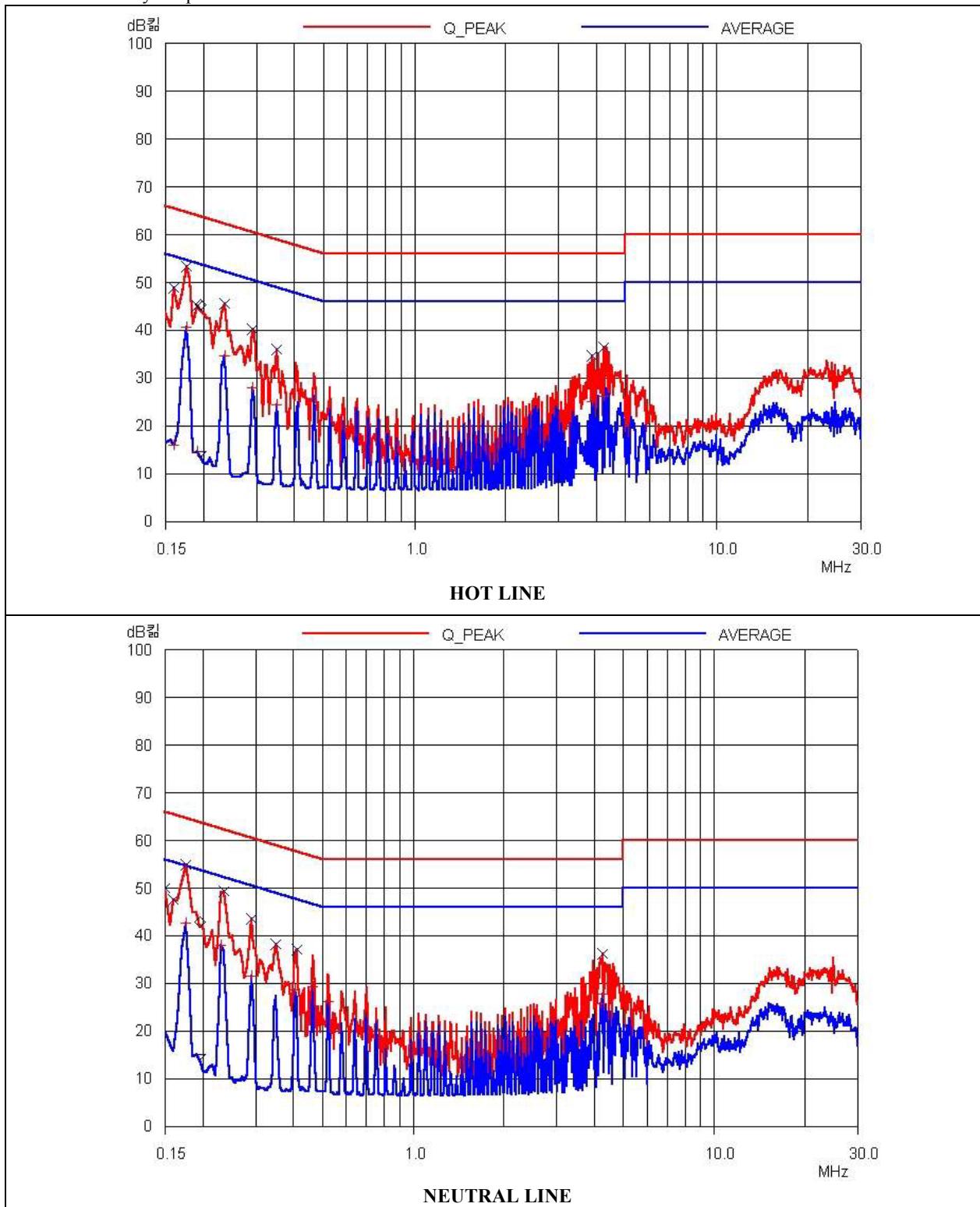


Remark: Used by AC/DC Adaptor





Remark: Used by PC power line



5.2 Radiated Emission Test for Digital mode

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

Humidity Level : 37 % Temperature : 21°C
Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109(a)
Type of Test : CLASS B
Result : PASSED BY -3.36 dB at 624.30 MHz

EUT : Wrist type NIBP Date: September 23,
2004
Operating Condition : Normal operation and data transmission mode
Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)
Frequency Range : 30 MHz – 1000 MHz
Distance : 3 Meter

Radiated Emission		Ant	Correction Factors		Total	FCC CLASS B	
Freq. (MHz)	Amp. (dBuV)	Pol.	Ant. (dBuV/m)	Cable (dB)	Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
49.52	16.50	V	11.39	1.20	29.09	40.00	-10.91
68.20	20.10	V	5.33	1.46	26.89	40.00	-13.11
128.40	19.62	H	13.49	2.03	35.14	43.52	-8.38
256.90	14.32	H	17.27	2.63	34.22	46.02	-11.80
460.10	18.50	H	17.12	3.50	39.12	46.02	-6.90
624.30	19.60	H	18.91	4.15	42.66	46.02	-3.36

Radiated Emission Tabulated Data

ellm

Tested by: Hyun-Suck, Lee / Test Engineer



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)



7. LIST OF TEST EQUIPMENT

No.	EQUIPMENTS	MFR.	MODEL	SER. NO.	LAST CAL	DUe CAL	USE
1.	Test receiver	R/S	ESVS 10	827864/005	DEC/03	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	8568B	3109A05456	JUL/04	12MONTH	■
5.	RF preselector	HP	85685A	3107A01264	APR/04	12MONTH	■
6.	Quasi-Peak Adapter	HP	85650A	3107A01542	JUL/04	12MONTH	■
7.	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	VULB9163 166	FEB/04	12MONTH	
8.	Biconical antenna	EMCO	3104C	9109-4443	MAY/04	12MONTH	
		Schwarzbeck	VHA9103	91031852	JAN/04		■
9.	Log Periodic antenna	EMCO	3146	9109-3213	FEB/04	12MONTH	
				9109-3217	MAY/04		
		Schwarzbeck	9108-A(494)	62281001	JAN/04		■
10.	LISN	EMCO	3825/2	9109-1867	JUL/04	12MONTH	■
				9109-1869	OCT/04		■
		Schwarzbeck	NSLK 8128	8128-216	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	■