

FCC PART 15B

MEASUREMENT AND TEST REPORT

For

NINGBO BAIHUANG ELECTRIC APPLIANCES CO., LTD.

NO. 180, YANSHAN RD, HUXIMEN, HENGHE TOWN, CIXI, NINGBO, China

FCC ID: Q92-BHD9829U

Report Type: Original Report	Product Type: Remote Control Lamp Holder
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Report Number: RKS170103004-00A	
Report Date: 2017-01-06 Kamp Chen	
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Manufacturer	NINGBO BAIHUANG ELECTRIC APPLIANCES CO., LTD.
Model	BHD9829U (FCC ID: Q92-BHD9829U)
Product	Remote Control Lamp Holder
Power input	AC :120V, rated power :60W
Output Voltage	AC :120V
Operation frequency	433.92MHz
Dimension	50mm×50mm×86.6mm

Note: The product's series model number: BHD0312U-RF. The difference between them was explained in the attached declaration letter.

**All measurement and test data in this report was gathered from production sample serial number: 20170103005 (Assigned by BACL, Kunshan). The EUT was received on 2017-01-03.*

Objective

This report is prepared on behalf of NINGBO BAIHUANG ELECTRIC APPLIANCES CO., LTD. in accordance with Part 2-Subpart J, and Part 15-Subparts A and B of the Federal Communication Commissions rules.

The objective of the manufacturer is to determine the compliance of EUT with FCC Part 15, Class B.

Related Submittal(s)/Grant(s)

FCC Part 15.231 submission with FCC ID: Q92-BH-V.

FCC Part 15.231 submission with FCC ID: Q92-BH-U.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2014, 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.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Kunshan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The test site A used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu province, China

Test site at Bay Area Compliance Laboratories Corp. (Kunshan) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 06, 2014. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 815570. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

Test Mode : Normal operation

EUT Exercise Software

No exercise software was used.

Special Accessories

No special accessory was used.

Equipment Modifications

No modification was made to the EUT tested.

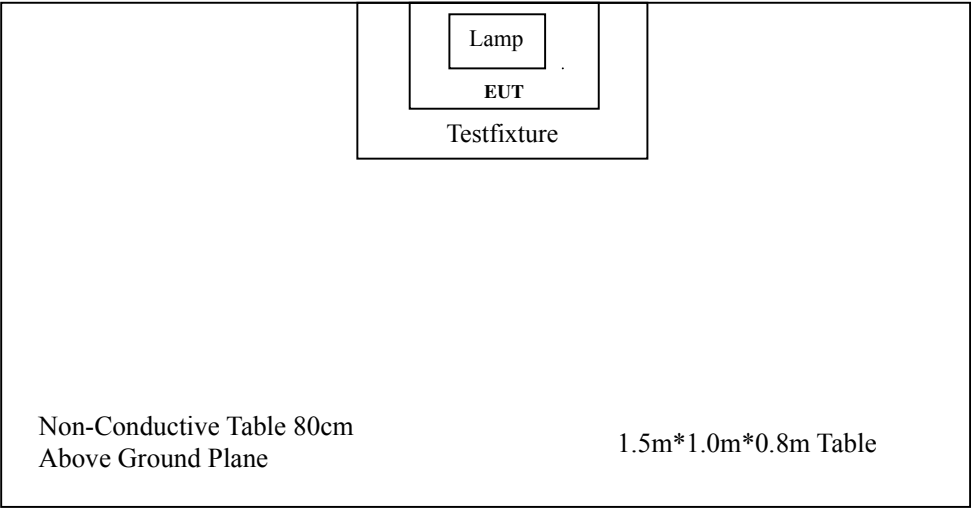
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
NA	Lamp	Oppel 13III 90W	/
/	Testfixture	/	/

External I/O Cable

Cable Description	Length (m)	From/Port	To
/	/	/	/

Block Diagram of Radiated Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§15.107	Conducted Emissions	Compliance
§15.109	Radiated Emissions	Compliance

Applicable Standard

Measurement Uncertainty

Item		Measurement Uncertainty	U_{cispr}
AMN	150kHz~30MHz	3.26 dB	3.4 dB

Diagram illustrating the test setup for EMI testing:

- Vertical Reference Ground Plane:** A vertical plane on the left side of the setup.
- EUT (Equipment Under Test):** Positioned on a table, 40cm from the Vertical Reference Ground Plane.
- LISN (Line Impedance Stabilization Network):** Positioned on a table, 80cm from the Vertical Reference Ground Plane. It is bonded to the Horizontal Reference Ground Plane.
- Horizontal Reference Ground Plane:** A horizontal plane at the bottom of the setup.
- Test Receiver:** Positioned on a table to the right, connected to the LISN.

- The measurement procedure of EUT setup is according with ANSI C63.4-2014. The related limit was specified in FCC Part 15.107 Class B.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the EUT was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All final data was recorded in the Quasi-peak and average detection mode.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	834115/007	2016-11-25	2017-11-24
Rohde & Schwarz	LISN	ESH3-Z5	862770/011	2016-10-10	2017-10-09
ROHDE&SCHWARZ	LISN	ENV216	3560655016	2016-11-25	2017-11-24
Rohde & Schwarz	CE Test software	EMC 32	100357	--	--
MICRO-COAX	Coaxial Cable	Cable-6	006	2016-09-08	2017-09-07

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

Corrected Factor & Margin Calculation

The Corrected factor is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.107 Class B, the worst margin reading as below:

8.54 dB at 0.160000 MHz in the **Line** conducted mode

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level complies with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

In BACL, $U_{(Lm)}$ is less than U_{cispr} , if L_m is less than L_{lim} , it implies that the EUT complies with the limit.

Test Data

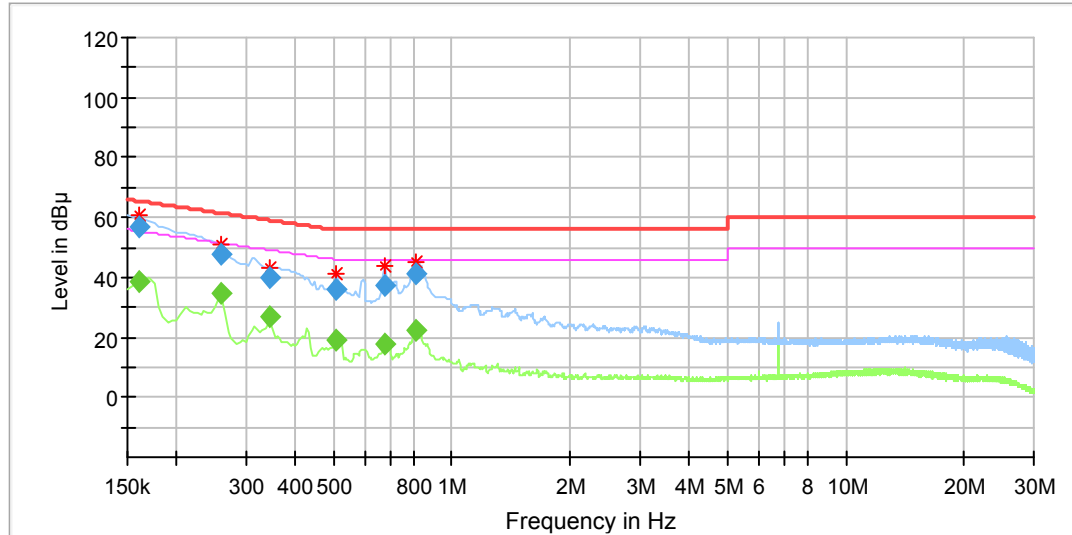
Environmental Conditions

Temperature:	22 °C
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Phil Zhu on 2017-01-04.

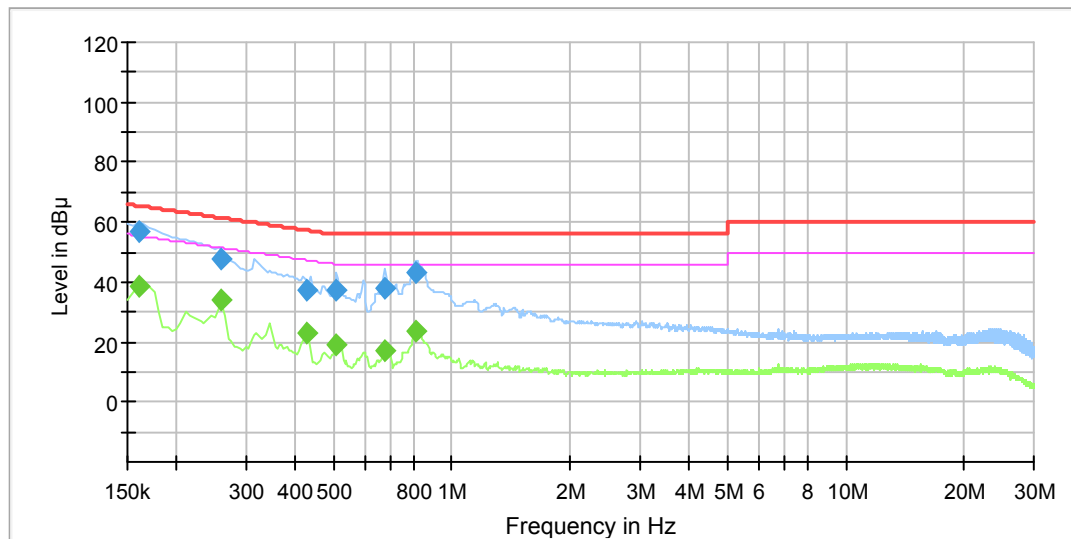
Test Mode : Normal operation

Line



Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Limit (dB μ V)	Margin (dB)	Line	Corr. (dB)
0.160000	---	38.70	55.46	16.76	L1	10.3
0.160000	56.92	---	65.46	8.54	L1	10.3
0.260000	---	34.38	51.43	17.05	L1	10.3
0.260000	47.53	---	61.43	13.90	L1	10.3
0.345000	---	26.77	49.08	22.31	L1	10.3
0.345000	39.74	---	59.08	19.34	L1	10.3
0.510000	---	19.00	46.00	27.00	L1	10.3
0.510000	35.85	---	56.00	20.15	L1	10.3
0.675000	---	18.09	46.00	27.91	L1	10.3
0.675000	37.35	---	56.00	18.65	L1	10.3
0.810000	---	22.03	46.00	23.97	L1	10.3
0.810000	40.94	---	56.00	15.06	L1	10.3

Neutral



Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Limit (dB μ V)	Margin (dB)	Line	Corr. (dB)
0.160000	---	38.46	55.46	17.00	N	10.3
0.160000	56.84	---	65.46	8.62	N	10.3
0.260000	---	34.31	51.43	17.12	N	10.3
0.260000	47.53	---	61.43	13.90	N	10.3
0.430000	---	23.07	47.25	24.18	N	10.3
0.430000	37.31	---	57.25	19.94	N	10.3
0.510000	---	18.90	46.00	27.10	N	10.3
0.510000	36.98	---	56.00	19.02	N	10.3
0.675000	---	17.41	46.00	28.59	N	10.3
0.675000	37.90	---	56.00	18.10	N	10.3
0.810000	---	23.87	46.00	22.13	N	10.3
0.810000	43.16	---	56.00	12.84	N	10.3

FCC §15.109 - RADIATED EMISSIONS

Applicable Standard

FCC §15.109

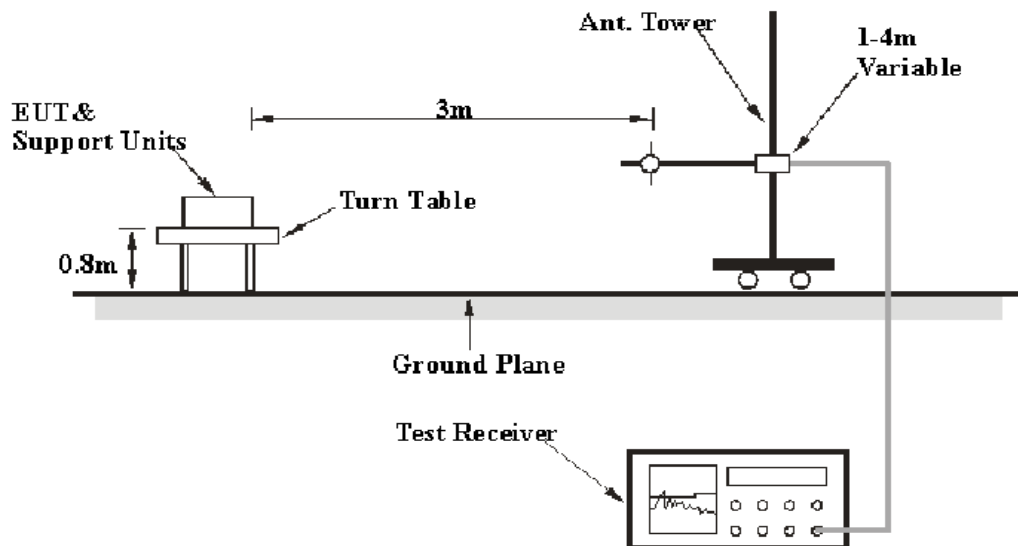
Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

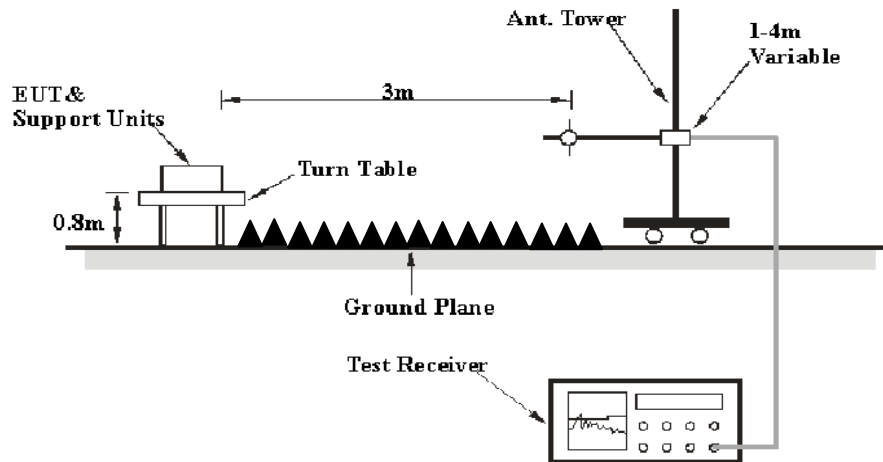
Item		Measurement Uncertainty	U_{cispr}
Radiated Emission	30MHz~1GHz	5.91dB	6.3 dB
	1GHz~6GHz	4.68dB	5.2 dB
	6 GHz ~18 GHz	4.92dB	5.5 dB
	18GHz up	4.88dB	NA

EUT Setup

Below 1G



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2014. The specification used was the FCC Part 15.109 Class B limits.

Above 1GHz:**EMI Test Receiver Setup**

The system was investigated from 30 MHz to 2 GHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
1GHz-2GHz	1MHz	3MHz	-	PK
	1MHz	1Hz	-	AV

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the Quasi-peak detector mode from 30 MHz to 1 GHz, Peak and average detection mode above 1 GHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sonoma Instrument	Amplifier	330	171377	2016-12-12	2017-12-11
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2016-11-25	2017-11-24
Sunol Sciences	Broadband Antenna	JB3	A090314-2	2016-01-09	2019-01-08
Champrotek	Chamber	Chamber A	T-KSEMC049	-	-
R&S	Auto test Software	EMC32	100361	-	-
ETS	Horn Antenna	3115	6229	2016-01-11	2019-01-10
Rohde & Schwarz	Signal Analyzer	FSIQ26	100048	2016-11-25	2017-11-25
Narda	Pre-amplifier	AFS42-00101800	2001270	2016-12-12	2017-12-11
haojintech	Coaxial Cable	Cable-1	001	2016-12-12	2017-12-11
haojintech	Coaxial Cable	Cable-2	002	2016-12-12	2017-12-11
haojintech	Coaxial Cable	Cable-3	003	2016-12-12	2017-12-11
MICRO-COAX	Coaxial Cable	Cable-4	004	2016-12-12	2017-12-11
MICRO-COAX	Coaxial Cable	Cable-5	005	2016-12-12	2017-12-11

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Results Summary

According to the data in the following table, the EUT complied with the FCC §15.109 Class B, with the worst margin reading of:

14.38 dB at 30.955850 MHz in the Vertical polarization mode

Refer to CISPR16-4-2:2011+A1-2014 and CISPR 16-4-1:2009, the measured level complies with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

In BACL, $U_{(Lm)}$ is less than U_{cispr} , if L_m is less than L_{lim} , it implies that the EUT complies with the limit.

Test Data

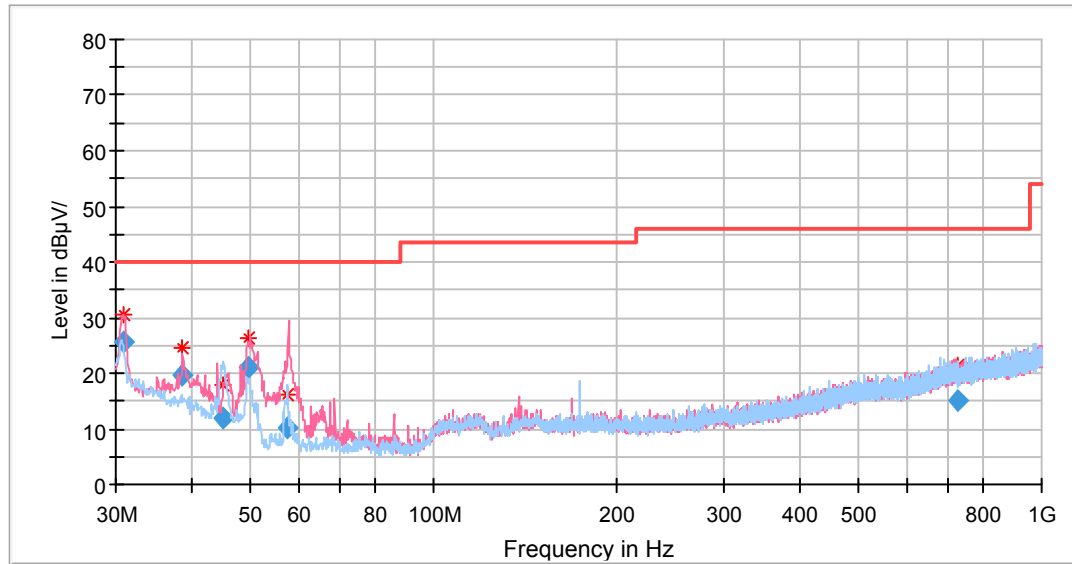
Environmental Conditions

Temperature:	27 °C
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Phil Zhu on 2017-01-04.

Test Mode: Normal operation

30MHz ~ 1GHz



Frequency (MHz)	QuasiPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
30.955850	25.62	40.00	14.38	100.0	V	211.0	-5.5
38.658350	19.56	40.00	20.44	100.0	V	259.0	-9.6
45.092050	11.97	40.00	28.03	100.0	H	273.0	-13.4
49.537300	20.90	40.00	19.10	100.0	V	22.0	-16.2
57.573350	10.08	40.00	29.92	199.0	V	148.0	-16.7
725.613300	14.92	46.00	31.08	100.0	V	246.0	-2.3

Above 1GHz

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB /m)
1294.619238	34.21	---	74.00	39.79	149.0	V	0.0	-10.2
1294.619238	---	20.79	54.00	33.21	149.0	V	0.0	-10.2
1308.026052	---	23.56	54.00	30.44	149.0	V	39.0	-7.0
1308.026052	37.00	---	74.00	37.00	149.0	V	39.0	-7.0
1338.026052	40.07	---	74.00	33.93	149.0	V	49.0	-3.5
1338.026052	---	25.85	54.00	28.15	149.0	V	49.0	-3.5
1557.905811	---	28.90	54.00	25.10	149.0	V	104.0	0.3
1557.905811	42.32	---	74.00	31.68	149.0	V	104.0	0.3
1872.126107	43.91	---	74.00	30.09	149.0	H	216.0	1.7
1872.126107	---	30.07	54.00	23.93	149.0	H	216.0	1.7
1958.066133	50.18	---	74.00	23.82	149.0	V	30.0	8.1
1958.066133	---	36.17	54.00	17.83	149.0	V	30.0	8.1

******* END OF REPORT *******