Report of Equipment Authorization

for the

PMNTU Transmitter

Certified under the FCC Rules
contained in
Title 47 of the CFR, Part 15, Subpart B
15.249 for 902 - 928 MHz Operation

MET REPORT EMI1308F
August 16, 2000

PREPARED FOR:

HBC-Radiomatic
Haller Strasse 49-53
D-74564 Crailsheim
Germany

PREPARED BY:

MET Laboratories, Inc.
914 West Patapsco Avenue
Baltimore, Maryland 21230-3432

August 16, 2000

HBC-Radiomatic
Haller Strasse 49-53
D-74564 Crailsheim

Attention: Juergen Schneider

Regarding: Certification of the PMNTU Transmitter under Part 15, Subpart B of the FCC Rules as a Transmitter
MET Report: EMI1308F

Dear Juergen Schneider:

Enclosed is a report of of compliance in accordance with FCC Part 15, Subpart B of Title 47 of the Code of Federal Regulations, Section 15.209 and 15.249 for the PMNTU Transmitter.

Based on these results, MET Laboratories, Inc. certifies that the PMNTU Transmitter, tested as configured, meets the requirements and interference limitations contained in Section 15.209 and 15.249 under Part 15, Subpart B of Title 47 of the Code of Federal Regulations.

If you have any questions concerning this report or your responsibilities as a manufacturer of Certified equipment, please contact us at your convenience. Thank you for using MET's testing services.

Sincerely,

MET Laboratories, Inc.

Tony Permsombut
Project Engineer

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MET Laboratories, Inc.
914 West Patapsco Avenue
Baltimore, Maryland 21230-3432

Test Engineer: _____
Tony Permsombut

Report Writer: _____
Joanna Kolasinski

Reviewed by: _____
Chris Harvey
EMI Laboratory Director

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LEGAL STATEMENT

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EXHIBIT 1

MANUFACTURER & PRODUCT INFORMATION

ENGINEERING STATEMENT

MANUFACTURER & PRODUCT INFORMATION

TYPE OF AUTHORIZATION:	Certification for Transmitter
FCC IDENTIFIER:	NO9PMNTU4
APPLICABLE FCC RULES:	2.907; 2.103 to 2.1041; 15.209 ; 15.249
CLIENT:	HBC-Radiomatic Haller Strasse 49-53 D-74564 Crailsheim Germany
EQUIPMENT:	PMNTU Transmitter
TESTING DATE(S):	3/10/00

ENGINEERING STATEMENT

I ATTEST: the measurements shown in this report were made in accordance with the procedures indicated, and that the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

I FURTHER ATTEST: on the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of Part 15 of the FCC Rules under normal use and maintenance.

Tony Permsombut
Project Engineer

EXHIBIT 2

INTRODUCTION

TEST SITE

MEASUREMENT PROCEDURES

INSTRUMENTATION

TEST CONFIGURATION

MODIFICATIONS STATEMENT

PHOTOGRAPHS

INTRODUCTION

An EMI evaluation to determine compliance of the PMNTU Transmitter with the requirements of Part 15, Subpart B was conducted. (All references are to the most current version of Title 47 of the Code of Federal Regulations in effect). In accordance with §2.955(a)(3), the following data is presented in support of the certification of the PMNTU Transmitter. HBC-Radiomatic should retain a copy of this document should be kept on file for at least two years after the manufacturing of the PMNTU Transmitter has been **permanently** discontinued, as per §2.955(b).

TEST SITE

All testing was conducted at MET Laboratories, Inc., 914 West Patapsco Avenue, Baltimore, Maryland 21230-3432. Radiated emissions measurements were performed on an open area test site (OATS). In accordance with §2.948(a)(3), a complete site description is contained at MET Laboratories. In accordance with §2.948(d), MET Laboratories has been accredited by the National Voluntary Laboratory Accreditation Program (Lab Code: 100273-0)

MEASUREMENT PROCEDURES

As required by §15.209, *radiated emissions measurements* were made in accordance with the general procedures of ANSI C63.4-1992 "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40 GHz". The measurements were performed over the frequency range of 30 MHz to 10 GHz using broadband antennas as the input transducer to a spectrum analyzer. The measurements were made with the detector set for "quasi-peak" within a bandwidth of 120 kHz for emissions below 1 GHz. A preliminary RF scan was performed in an RF-shielded enclosure.

As per §15.249 , operation within the bands 902-928 MHz :

(a) the field strength of the emissions from intentional radiators operated within these frequency bands shall comply with the following :

Fundamental Frequency	Field Strength of fundamental (millivolts/meter)	Field Strength of harmonics (microvolts/meter)
902 -928 MHz	50	500

(b) Field strength limit is specified at a distance of 3 meters using quasi-peak detector at 120 kHz bandwidth.
(c) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emissions limits in §15.209, whichever is the lesser attenuation.
(d) As shown in §15.35(b), for frequencies above 1000 MHz , the above field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

MODIFICATIONS STATEMENT

No modifications were made during testing.

INSTRUMENTATION

Radiated emissions measurements were made using the following equipment:

Nomenclature	Manufacturer	Model	MET #	Cal Due
Spectrum Analyzer	Hewlett Packard	8593EM	1U0002	10/29/00
Pre-Amplifier	Hewlett Packard	8449B	1U0027	12/28/00
Bilog Antenna	Schaffner-Chase	CBL6140A	1U0040	4/30/00
Horn Antenna	EMCO	3115	1U0037	2/5/01
Test Room	Lundgreen	Fact4	1U0032	5/19/00

Description of EUT

The EUT is a transmitter that consists of a battery-operated transmitter with an integral antenna housing with an emergency-stop push button and various position controls. The transmitter is used to control hydraulic cranes or machines. The EUT operates at various frequencies from the low of 902.075 MHz to a high of 918.128 MHz (center of channels) which are selected by utilizing individual reference oscillators.

TEST CONFIGURATION

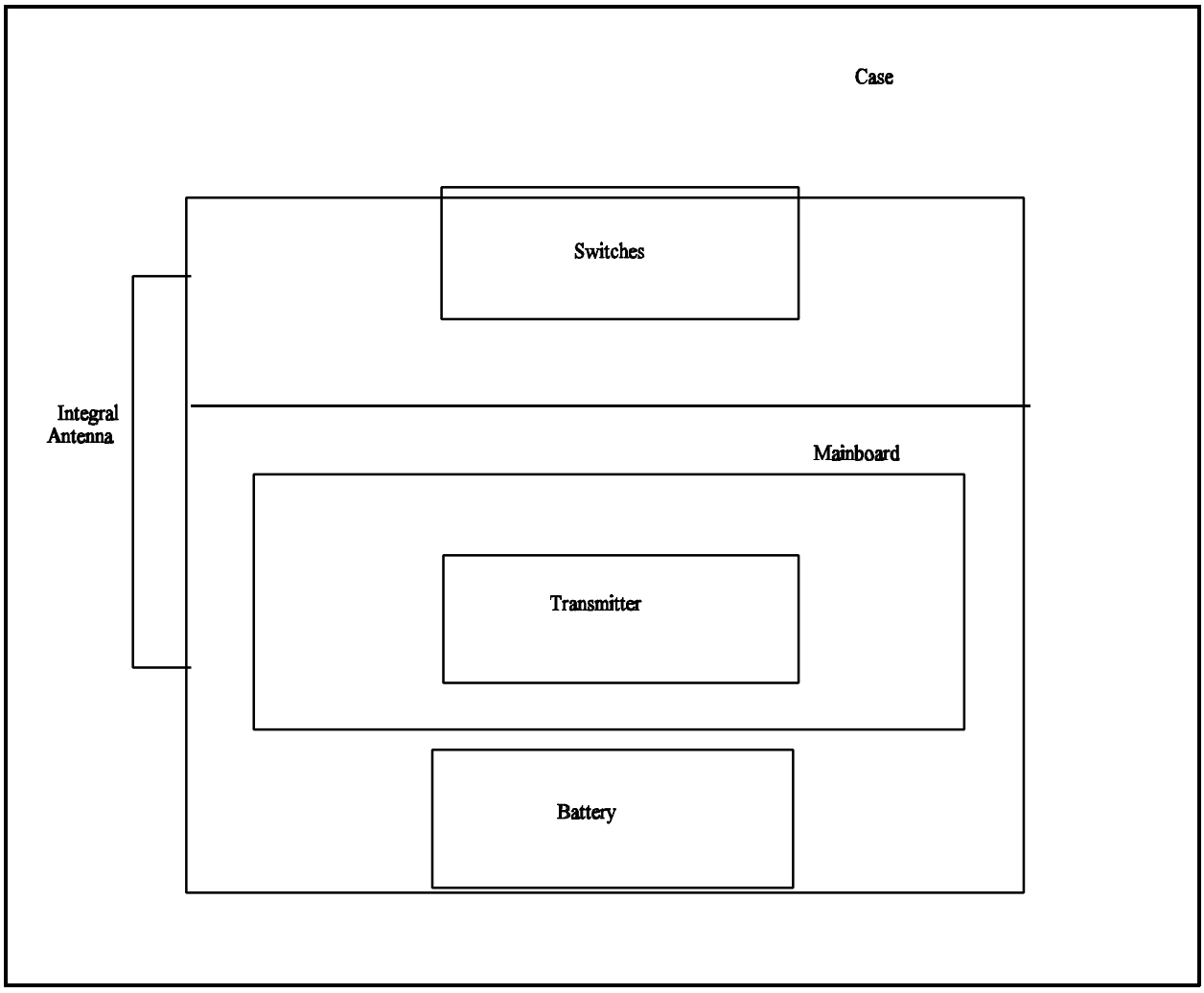

Figure 1. Test Configuration Block Diagram

EUT and Support Equipment

Description	Manufacturer	Model#
Case	HBC-radiomatic	PM
Switches	Various	HBC-radiomatic
Mainboard	HBC-radiomatic	72.11.039
Transmitter	HBC-radiomatic	FuS 10 AA
Battery	HBC-radiomatic	FuB 10 AA

Photograph of Radiated Emissions Test Configuration

PMNTU Transmitter

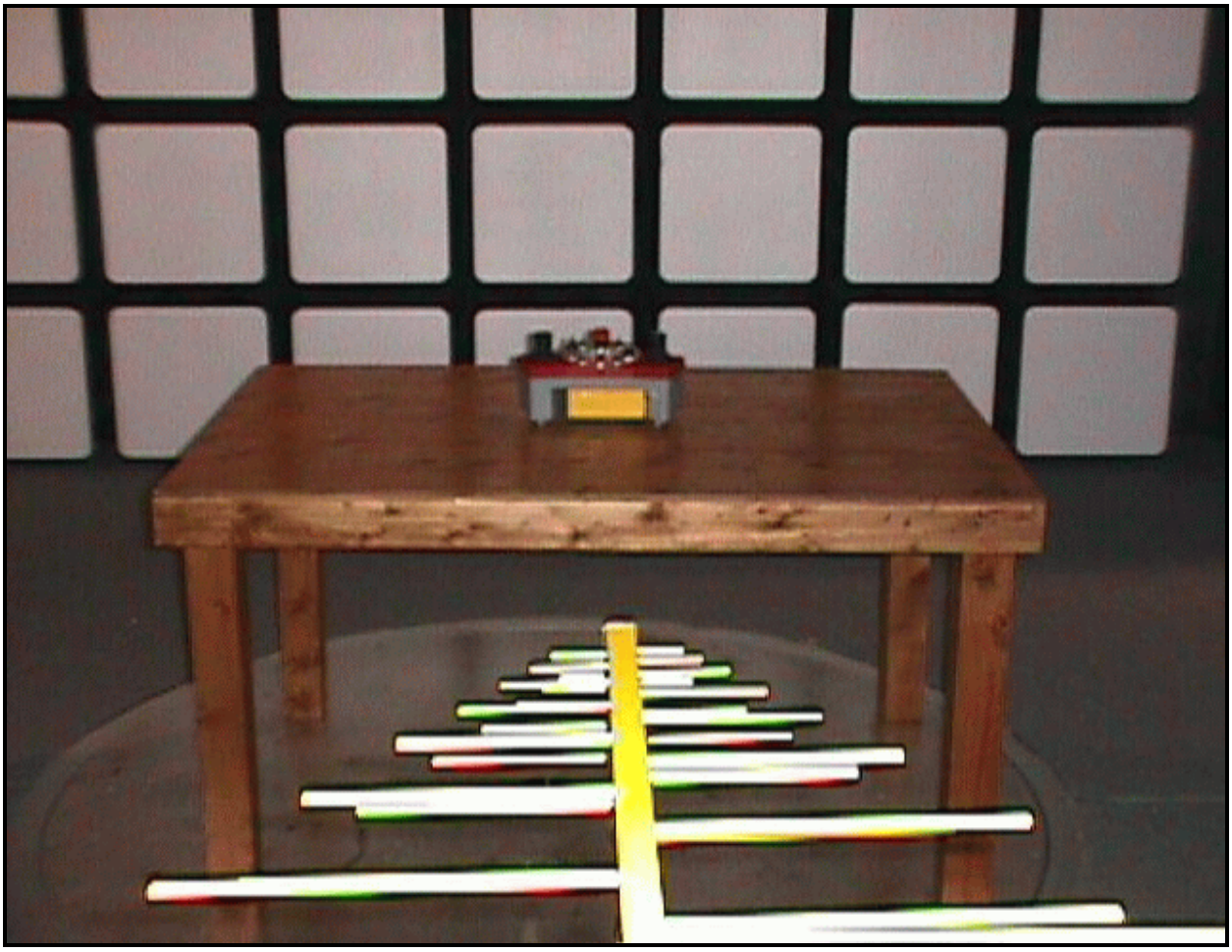

EXHIBIT 3

TEST DATA

SUBJECT:	Radiated Emissions	**MET REPORT:**	EMI1308F
	Low Oscillator	**MFG:**	HBC-Radiomatic
		TESTED BY:	Tony Persombut
	FCC Part 15	**TEST DATE:**	3/10/00

EUT: PMNTU Transmitter

TECHNICAL SPECIFICATION: 15.209 and 15.249

3m10

Frequency (MHz)	Limit (dBµV) @ 3m
30 - 88	40.00
88 - 216	43.52
216 - 230	46.00
230 - 960	46.00
960 - 10000	54.00
*902 - 928	94.00

*Note: This is the limit for the fundamental frequency.

Frequency (MHz)	Azimuth (°CCW - 0°=EUT facing ant.)	Polar-ity	Height (m)	Raw Amplitude (dBμV) @3m	Pre-Amp Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m) @3m
100.63	0	H	1	30.76	27.2	3.6	43.5
100.63	288	V	1	31.54	27.2	4.3	43.5
160.5	0	H	1	32.95	27	6	43.5
160.5	160	V	1	33.05	27	6	43.5
251.5	0	H	1	34.73	26.5	8.2	46
251.5	0	V	1	35.09	26.5	8.5	46
545.3	0	H	1	42.39	27.9	14.5	46
545.3	0	V	1	43.93	27.9	16	46
51	0	H	1	31.72	27.38	4.3	40
51	0	V	1	31.5	27.38	4.1	40
902.075	145	H	1	113.95	27.08	86.9	94
902.075	84	V	1.05	117.95	27.08	90.9	94

Frequency (GHz)	Azimuth	Polar-ity	Height (m)	Raw Amplitude (dBμV) @1m	Pre-Amp Gain (dB)	Ant. Corr. (dB/m)	Cable Loss (dB)	Dist. Corr. Factor (dB) 1m to 3m	Corrected Amplitude (dBμV/m) @3m	Limit (dBμV/m) @3m
1.804	135	H	1	54.36	34.9	26.18	1.4	-9.54	37.5	54
1.804	90	V	1	58.1	34.9	26.06	1.4	-9.54	41.1	54
*2.706	240	H	1.05	48.92	34.73	28.98	1.89	-9.54	35.5	54
*2.706	80	V	1.03	57.83	34.73	28.87	1.89	-9.54	44.3	54
*3.608	0	H	1.07	55.49	34.7	31.96	2.28	-9.54	45.5	54
*3.608	180	V	1.03	50.92	34.7	31.92	2.28	-9.54	40.9	54
*4.51	315	H	1	51.78	34.6	32.52	3.01	-9.54	43.2	54
*4.51	225	V	1	51.07	34.6	32.52	3.01	-9.54	42.5	54
*5.412	225	H	1	45.1	34.5	34.64	3.76	-9.54	39.5	54
*5.412	315	V	1	43.75	34.5	34.8	3.76	-9.54	38.3	54
10	0	H	1	29.7	34.7	38.5	9.7	-9.54	33.7	54
10	0	V	1	29.79	34.7	38.4	9.7	-9.54	33.7	54

* Meets restricted band limits of 15.205

Note: The EUT was tested at 1m. The data has been corrected for comparison with the 3m limit using the formula: 20log(1m/3m) as expressed in the 'Dist. Corr. Factor' column.

Equipment meets the specifications of Part 15.209 and 15.249

SUBJECT:	Radiated Emissions Mid- Oscillator FCC Part 15	**MET REPORT:** **MFG:** **TESTED BY:** **TEST DATE:**	EMI1308F HBC-Radiomatic Tony Permsombut 3/10/00

EUT: PMNTU Transmitter

TECHNICAL SPECIFICATION: 15.209 and 15.249

3m10

Frequency (MHz)	Limit (dBµV) @ 3m
30 - 88	40.00
88 - 216	43.52
216 - 230	46.00
230 - 960	46.00
960 - 10000	54.00
*902 - 928	94.00

*Note: This is the limit for the fundamental frequency

Frequency (MHz)	Azimuth (°CCW - 0°=EUT facing ant.)	Polar-ity	Height (m)	Raw Amplitude (dBμV) @3m	Pre-Amp Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m) @3m
50.09	0	H	1	31.65	27.39	4.3	40
50.09	0	V	1	31.29	27.39	3.9	40
100.62	0	H	1	30.63	27.2	3.4	43.5
100.62	0	V	1	31.36	27.2	4.2	43.5
160	0	H	1	33.35	27	6.4	43.5
160	0	V	1	33.38	27	6.4	43.5
207.5	174	H	1.21	33.21	26.7	6.5	43.5
207.5	34	V	1	32.51	26/7	5.8	43.5
310	0	H	1	35.62	26.53	9.1	46
310	92	V	1	35.81	26.53	9.3	46
911.7	144	H	1.5	113.7	27.01	86.7	94
911.7	82	V	1.16	117.77	27.01	90.8	94

Frequency (GHz)	Azimuth	Polar-ity	Height (m)	Raw Amplitude (dBμV) @1m	Pre-Amp Gain (dB)	Ant. Corr. (dB/m)	Cable Loss (dB)	Dist. Corr. Factor (dB) 1m to 3m	Corrected Amplitude (dBμV/m) @3m	Limit (dBμV/m) @3m
1.824	135	H	1	53.38	34.9	26.28	1.4	-9.54	36.6	54
1.824	90	V	1	57.3	34.9	26.16	1.4	-9.54	40.4	54
*2.736	225	H	1.06	52.25	34.72	29.1	1.92	-9.54	39	54
*2.736	90	V	1	56.8	34.72	28.99	1.92	-9.54	43.9	54
*3.647	0	H	1.08	53.69	34.7	32.05	2.29	-9.54	43.8	54
*3.647	180	V	1.05	51.51	34.7	31.99	2.29	-9.54	47.3	54
*4.559	315	H	1.03	54.1	34.6	32.61	3.07	-9.54	45.6	54
*4.559	135	V	1	48.77	34.6	32.61	3.07	-9.54	40.3	54
*5.471	190	H	1.03	45.17	34.5	34.81	3.79	-9.54	39.7	54
*5.471	315	V	1.06	45.89	34.5	35	3.79	-9.54	40.6	54
10	0	H	1	29.65	34.7	38.5	9.7	-9.54	33.6	54
10	0	V	1	29.30	34.7	38.4	9.7	-9.54	33.2	54

* - Meets Restricted Band limits of 15.205

Note: The EUT was tested at 1m. The data has been corrected for comparison with the 3m limit using the formula: 20log(1m/3m) as expressed in the 'Dist. Corr. Factor' column.

Equipment meets the specifications of Part 15.209 and 15.249

SUBJECT:	Radiated Emissions High Oscillator FCC Part 15	**MET REPORT:** **MFG:** **TESTED BY:** **TEST DATE:**	EMI1308F HBC-Radiomatic Tony Permsombut 2/24/00

EUT: PMNTU Transmitter

TECHNICAL SPECIFICATION: 15.209 and 15.249

3m10

Frequency (MHz)			Limit (dBµV) @ 3m
30	-	88	40.00
88	-	216	43.52
216	-	230	46.00
230	-	960	46.00
960	–	10000	54.00
*902	-	928	94.00

Note: This is the limit for the fundamental frequency.

Frequency (MHz)	Azimuth (°CCW - 0°=EUT facing ant.)	Polar-ity	Height (m)	Raw Amplitude (dBμV) @3m	Pre-Amp Gain (dB)	Corrected Amplitude (dBμV/m) @3m	Limit (dBμV/m) @3m
58.09	0	H	1	31.74	27.33	4.4	43.5
58.09	0	V	1	31.59	27.33	4.3	43.5
99.7	0	H	1	30.9	27.2	3.7	43.5
99.7	0	V	1	31.67	27.2	4.5	43.5
159.5	250	H	1.09	32.97	27	6	46
159.5	0	V	1	33.06	27	6.1	46
255.5	0	H	1	34.76	26.5	8.3	46
255.5	0	V	1	34.59	26.5	8.1	46
399.8	0	H	1	39.74	27.32	**12.4**	**46**
399.8	0	V	1	38.98	27.32	11.7	46
918.128	19	H	1.28	112.45	27	85.5	94
918.128	89	V	1.09	117.2	27	90.2	94

Frequency (GHz)	Azimuth	Polar-ity	Height (m)	Raw Amplitude (dBμV) @1m	Pre-Amp Gain (dB)	Ant. Corr. (dB/m)	Cable Loss (dB)	Dist. Corr. Factor (dB) 1m to 3m	Corrected Amplitude (dBμV/m) @3m	Limit (dBμV/m) @3m
1.836	135	H	1	53.89	34.9	26.35	1.4	-9.54	37.2	54
1.836	70	V	1.03	56.56	34.9	26.21	1.4	-9.54	39.7	54
*2.754	225	H	1	46.66	34.71	29.17	1.93	-9.54	33.5	54
*2.754	80	V	1	61.42	34.71	29.07	1.93	-9.54	48.2	54
*3.672	225	H	1.06	55.98	34.7	32.11	2.3	-9.54	46.2	54
*3.672	180	V	1.14	51.91	34.7	32.04	2.3	-9.54	42	54
*4.590	190	H	1.08	51.94	34.59	32.66	3.11	-9.54	43.6	54
*4.590	280	V	1.20	45.59	34.59	32.66	3.11	-9.54	37.2	54
5.508	225	H	1	46.26	34.5	34.9	3.8	-9.54	40.9	54
5.508	225	V	1	45.4	34.5	34.9	3.8	-9.54	40.3	54
10	0	H	1	29.82	34.7	38.5	9.7	-9.54	33.8	54
10	0	V	1	30.08	34.7	38.5	9.7	-9.54	33.9	54

* Meets Restriced Band limits of 15.205

Note: The EUT was tested at 1m. The data has been corrected for comparison with the 3m limit using the formula: 20log(1m/3m) as expressed in the 'Distance Correction' column.

Equipment meets the specifications of Part 15.209 and 15.249