

EMC Laboratory

MMR TRANSCIVER

Manufactured by
Tadiran-Telematics

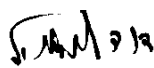
EMC Test Report

APPENDIX 2

September. 2002

REPAIRED:

D. Lanuel



DATE

10/9/02

APPROVED:

S. Cohen



DATE

September 12, 2002

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APPENDIX 2

**Test results as composite device
operated with *COMPAQ* pocket PC**

1. OUT OF BAND RADIATED FIELD STRENGTH MEASUREMENT TEST ACCORDING TO 15.249 & 15.209

Testing Engineer: D.Lanuel *[Signature]*

Date 11/09/02

1.1. General

The test was performed to measure Radiated emission at RX Mode and Out of Band Spurious emissions at TX Mode. The EUT was connected to a Compaq pocket PC.

1.2. Test Results Summary & Conclusions

1.2.1. The EUT was found in compliance with 15.209 & 15.249 Requirements

1.3. Limits of Radiated Interference Field Strength according 15.209

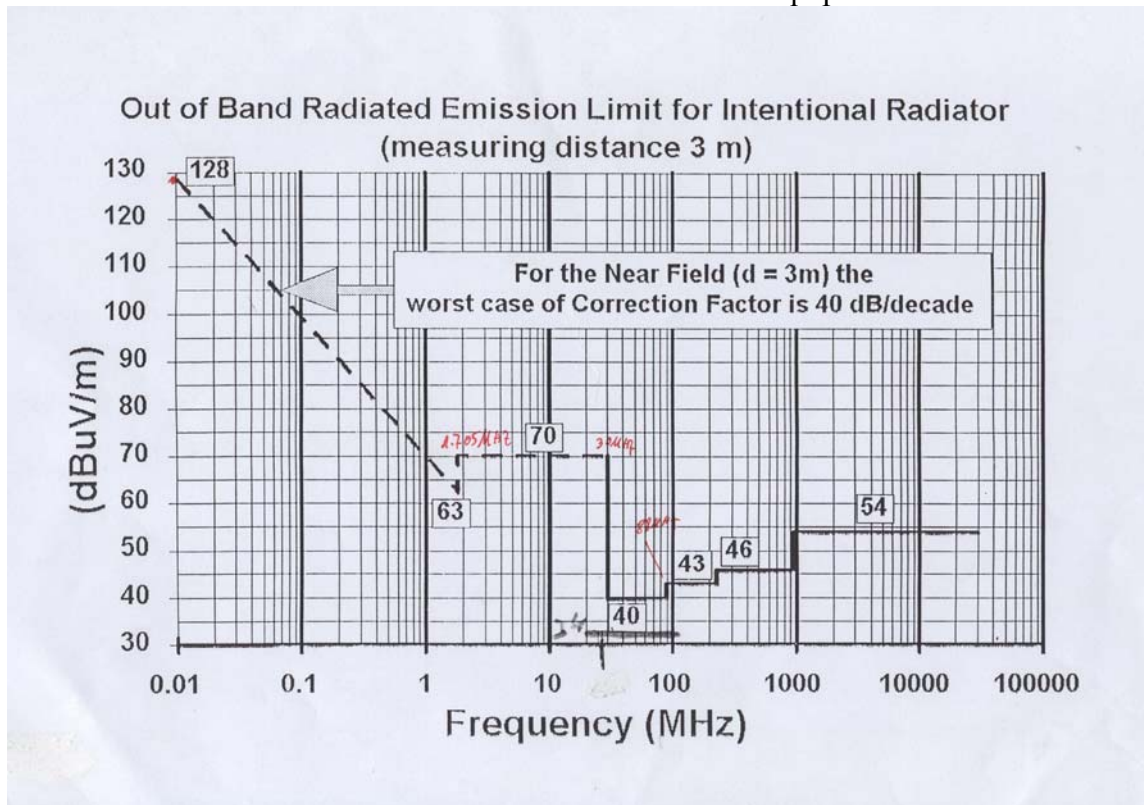
The test unit shall meet the limits of Table 1 for Class B equipment.

Table 1 Limits For Class B equipment

Frequency Range (MHz)	Quasi-peak Limits (dB μ V/m)
30 - 88	40
88 - 216	43
216 - 960	46
Above 960	54

1.4. Limits of Radiated Interference Field Strength according 15.209

The test unit shall meet the limits of Table 1 for Class B equipment.



1.5. Test Instrumentation and Equipment

Table RE-A Test Instrumentation and Equipment

Item	Model	Manufacturer	Next Date Calibration
Spectrum Analyzer	8597A	HP	01/08/03
Spectrum Analyzer	8593E	HP	31/01/03
Biconical Antenna	94455-1	ZINGER	10.04.03
Log-Periodic Antenna	AT-1000	AR	10.04.03
Low Noise Amplifier (0-1GHz)	AM-1300-N	MITEQ	14.01.03
Low Noise Amplifier (1-2GHz)	SMC-09	MITEQ	14.01.03
Low Noise Amplifier (2-6GHz)	MWA-02060-4025	ELISRA	14.01.03
Low Noise Amplifier (6-18GHz)	MWA-06180-4165	ELISRA	06.06.03

1.6. Preliminary Results
Table RE-B-1 Preliminary Test Results for RX Mode 15.107

Mode Of Operation	Antenna Polarization	Frequency Range MHz	Res. BW (kHz)	Plot No.	Compliance Y/N
RX-916.3MHz	Vertical	1000-2000	1000	Plot RE/25	Y
	Horizontal			Plot RE/26	Y
	Vertical	2000-2800		Plot RE/27	Y
	Horizontal			Plot RE/28	Y
	Vertical	2800-6000		Plot RE/29	Y
	Horizontal			Plot RE/30	Y

Table RE-B-2 Preliminary Test Results for TX Mode 15.209

Mode Of Operation	Antenna Polarization	Frequency Range MHz	Res. BW (kHz)	Plot No.	Compliance Y/N
TX-916.3MHz	Vertical	0.009-0.15	0.2	Plot RE/31	Y
	Horizontal	0.15-30	9	Plot RE/32	Y
	Vertical	30-200	120	Plot RE/33	Y
	Horizontal			Plot RE/34	Y
	Vertical	200-902		Plot RE/35	Y
	Horizontal			Plot RE/12	Y
	Vertical	902-928		Plot RE/13	Y
	Horizontal			Plot RE/14	Y
	Vertical	928-1000		Plot RE/15	Y
	Horizontal			Plot RE/16	Y
	Vertical	1000-2000	1000	Plot RE/17	Y
	Horizontal			Plot RE/18	Y
	Vertical	2000-2800		Plot RE/19	Y
	Horizontal			Plot RE/20	Y
	Vertical	2800-6000		Plot RE/21	Y
	Horizontal			Plot RE/22	Y
	Vertical	6000-9200		Plot RE/23	Y
	Horizontal			Plot RE/24	Y

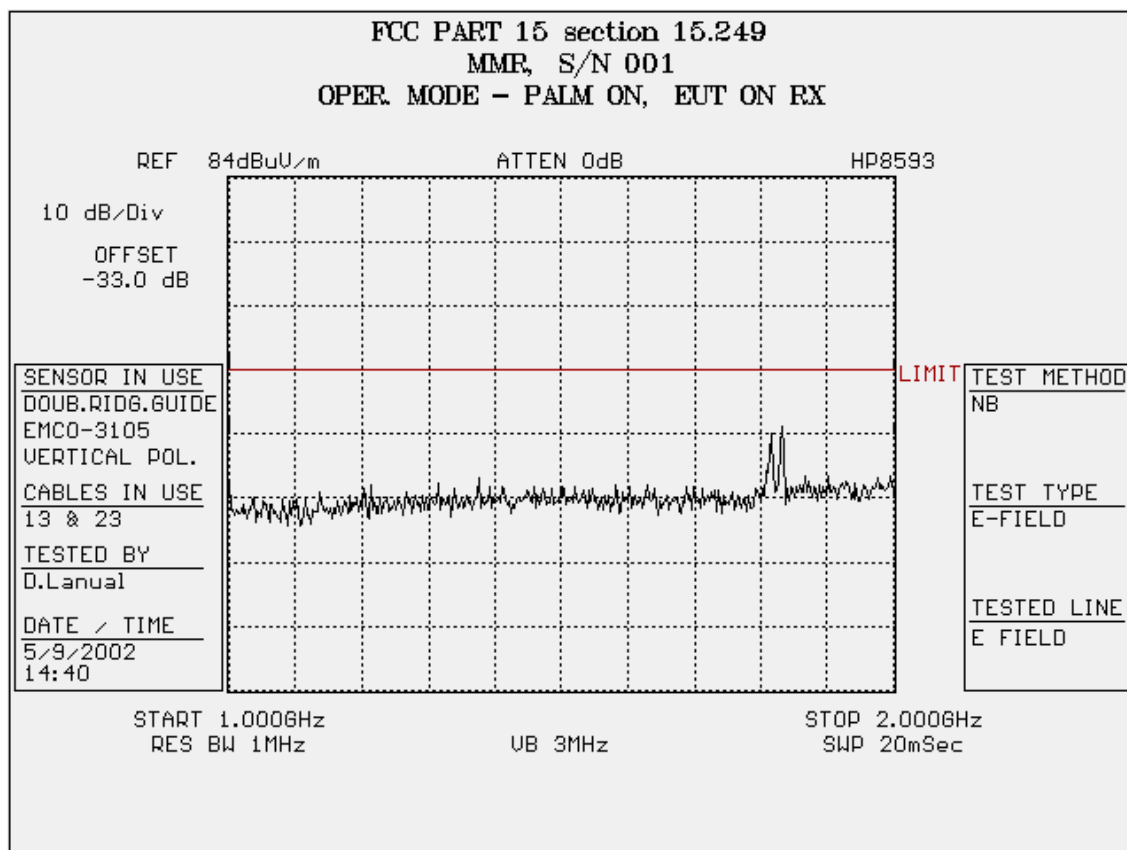
Table RE-E Six Highest Emissions RX Mode 15.107

Mode Of Operation	Freq. (MHz)	Quasi-peak Reading (*) (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Polarity Ver/Hor	Height (m)	Azimuth Angle ϕ (deg)
RX	1820.0	44.0	54	10	V	1.9	-24

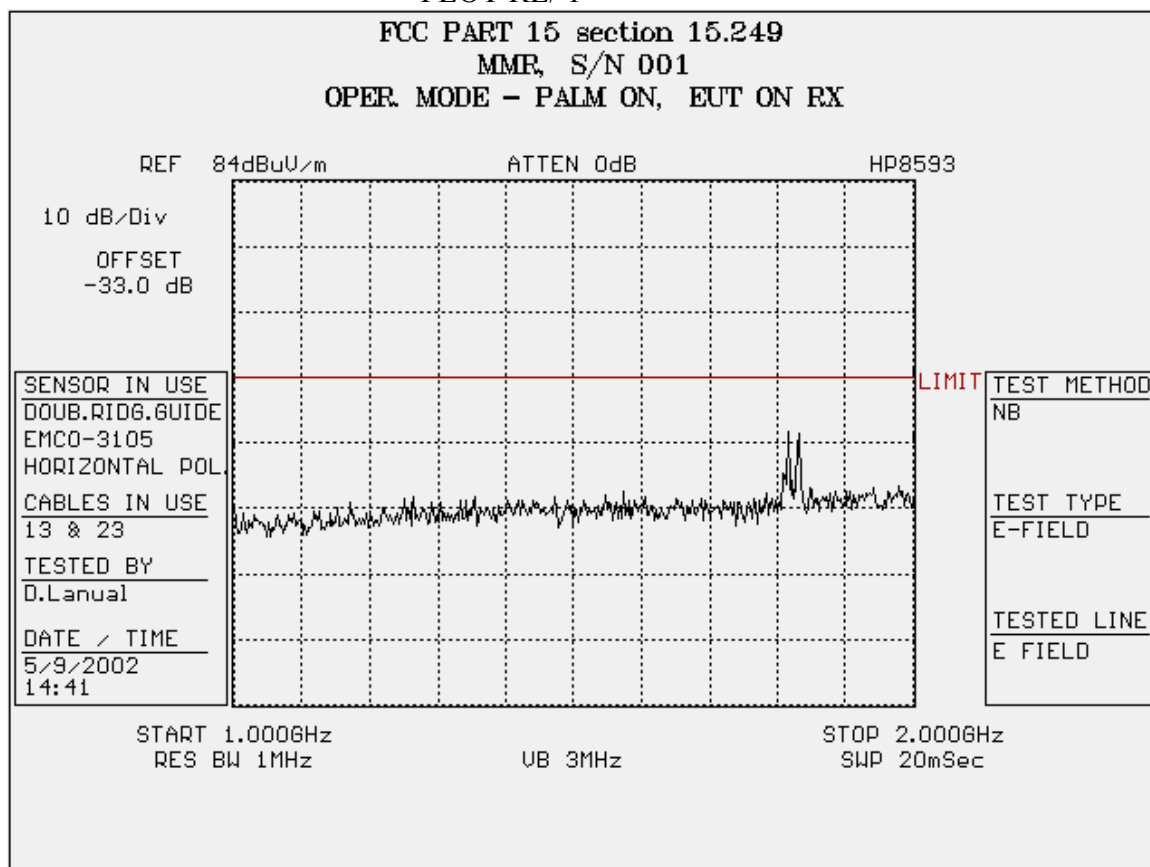
(*) Resolution B/W = 1000 kHz

Table RE-E Six Highest Emissions Spurious TX Mode 15.209

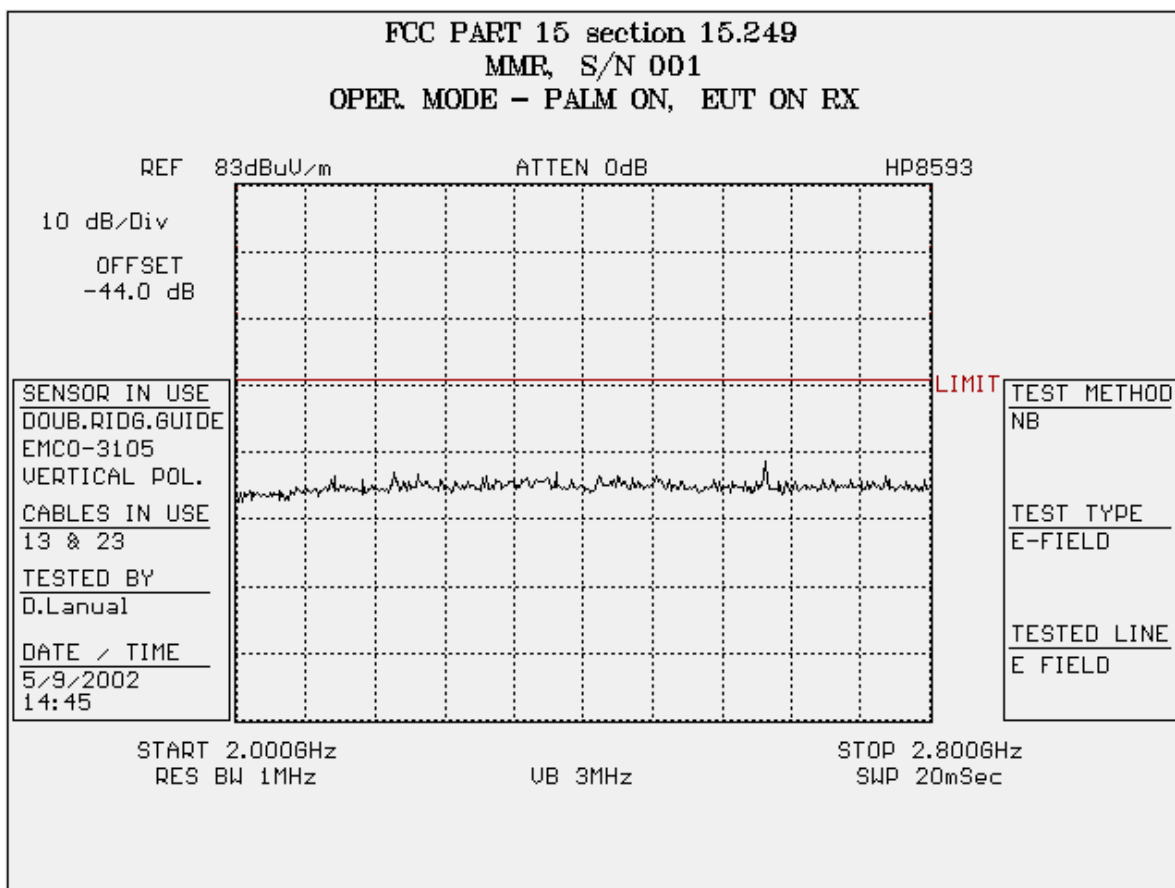
Mode Of Operation	Freq. (MHz)	Quasi-peak Reading (*) (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Polarity Ver/Hor	Height (m)	Azimuth Angle ϕ (dig)
	303.5	34.0	46.0	12	V	2.3	-23
	704.0	37.0	46.0	9	V	2.2	-24
	845.0	42.7	46.0	3.3	V	2.4	-25
	1300.0	44.0	54.0	10	V	2.0	-23
	1840.0	47.5	54.0	6.5	H	1.9	-25
	3664.0	42.0	54.0	12	V	2.0	-24



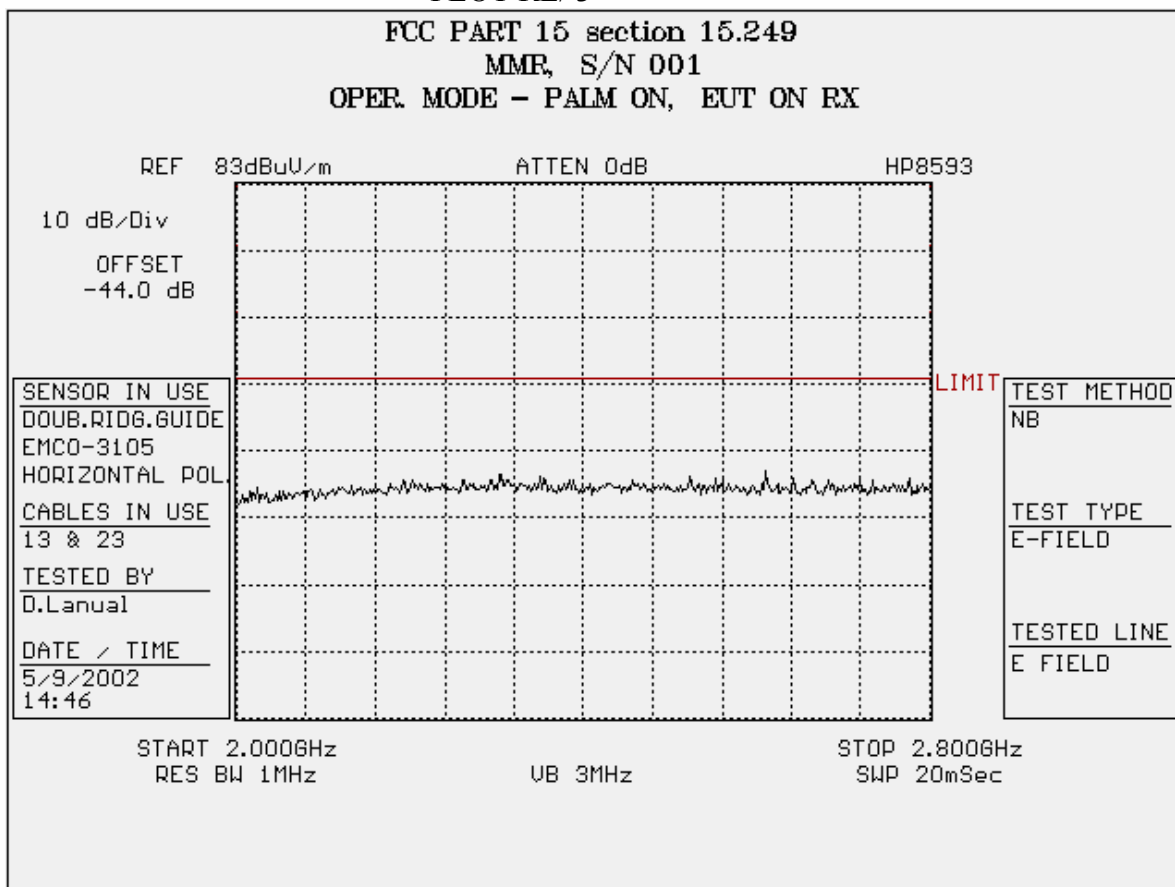
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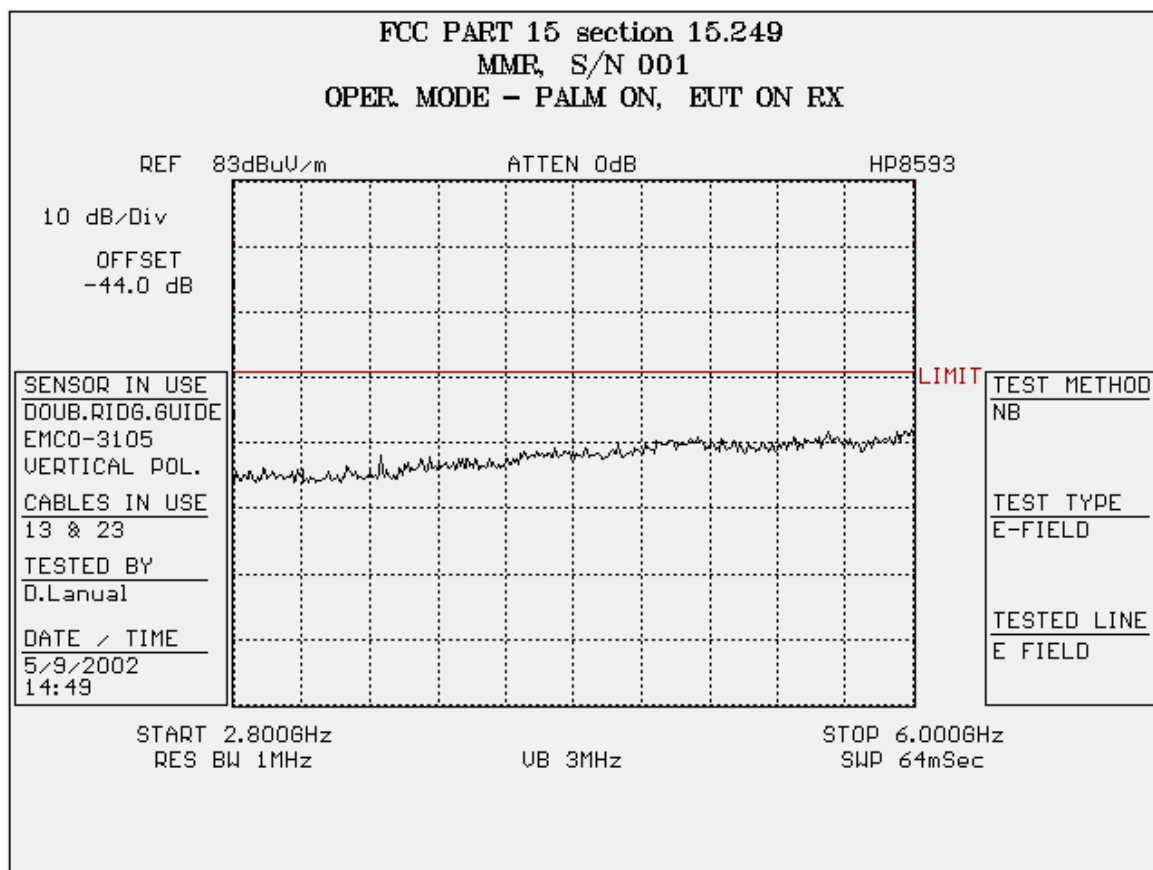
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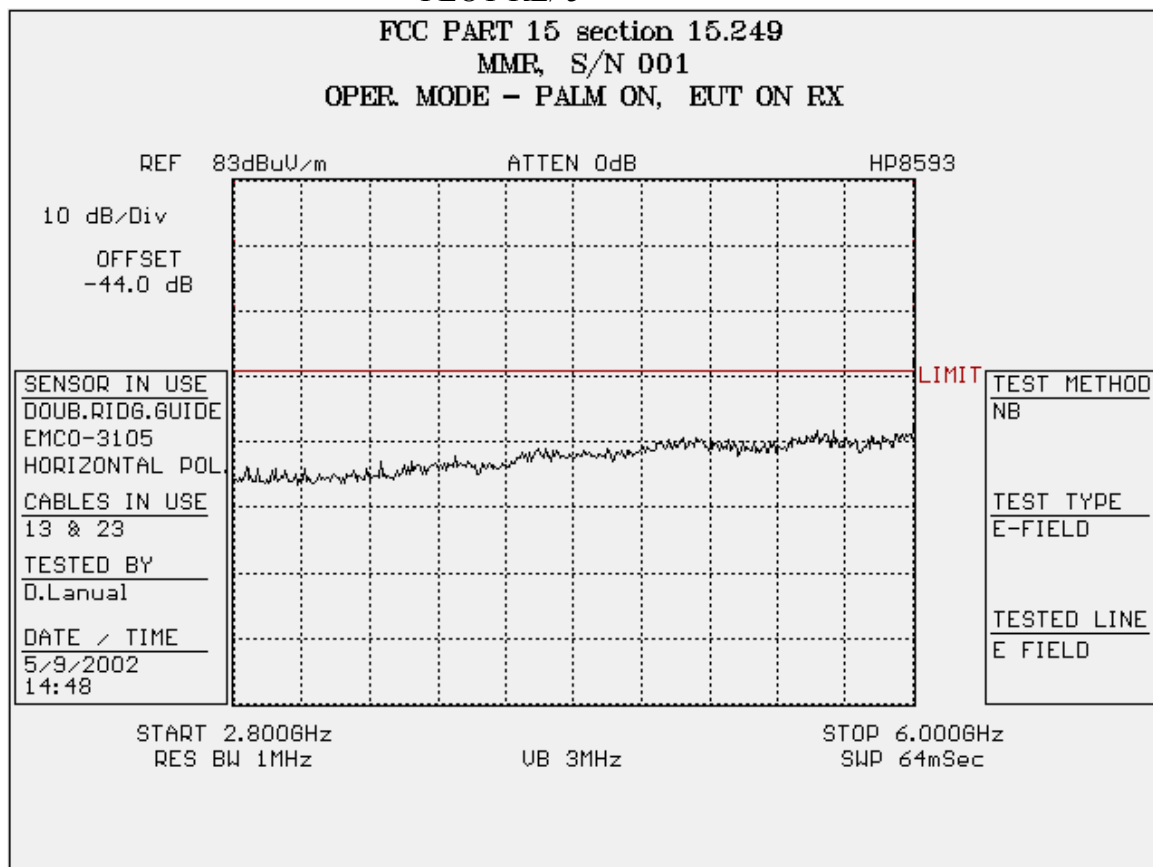
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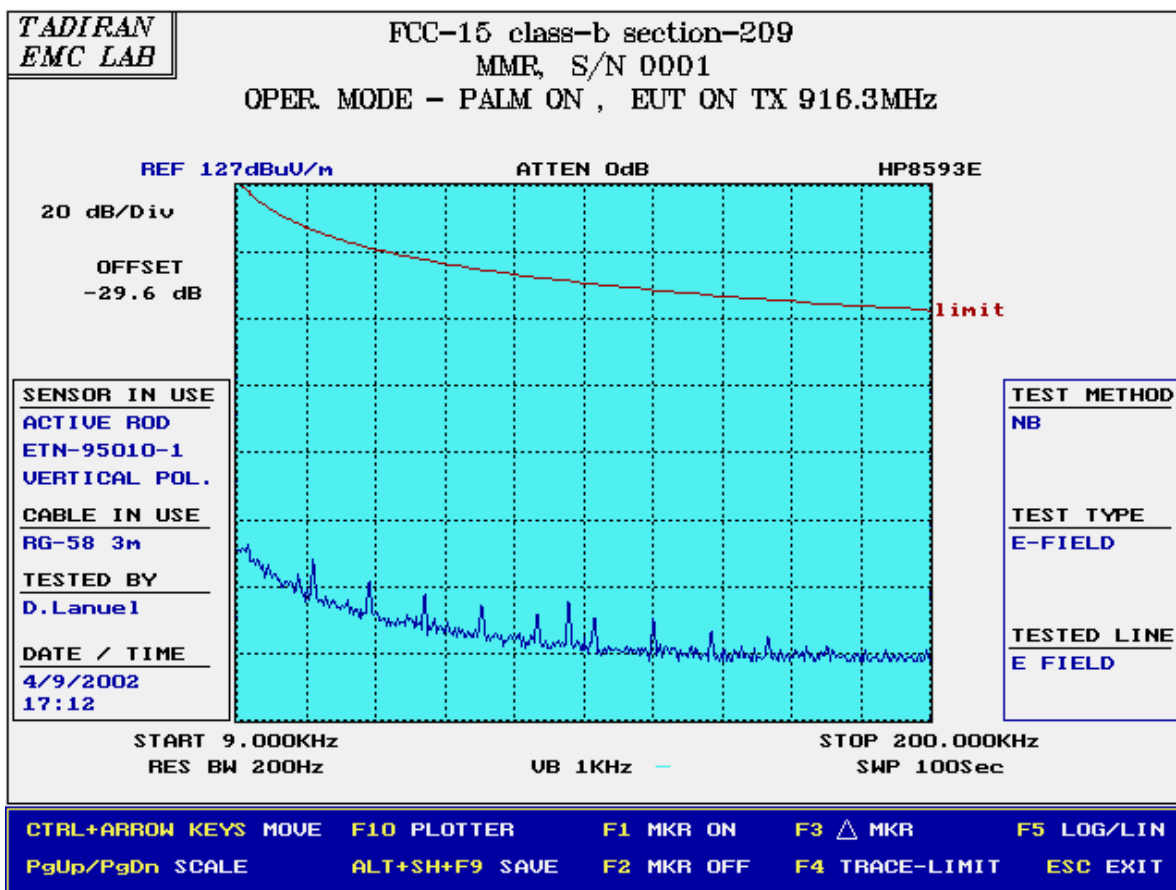
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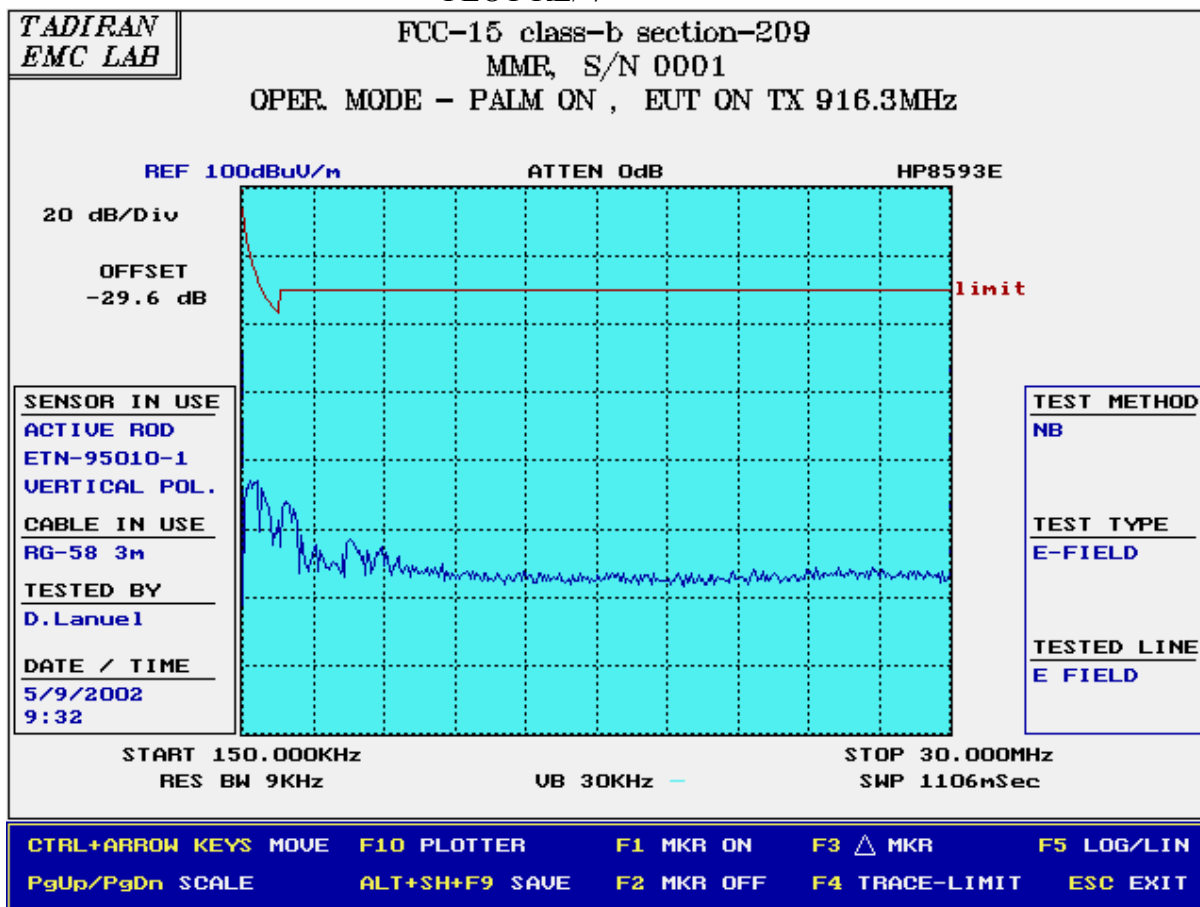
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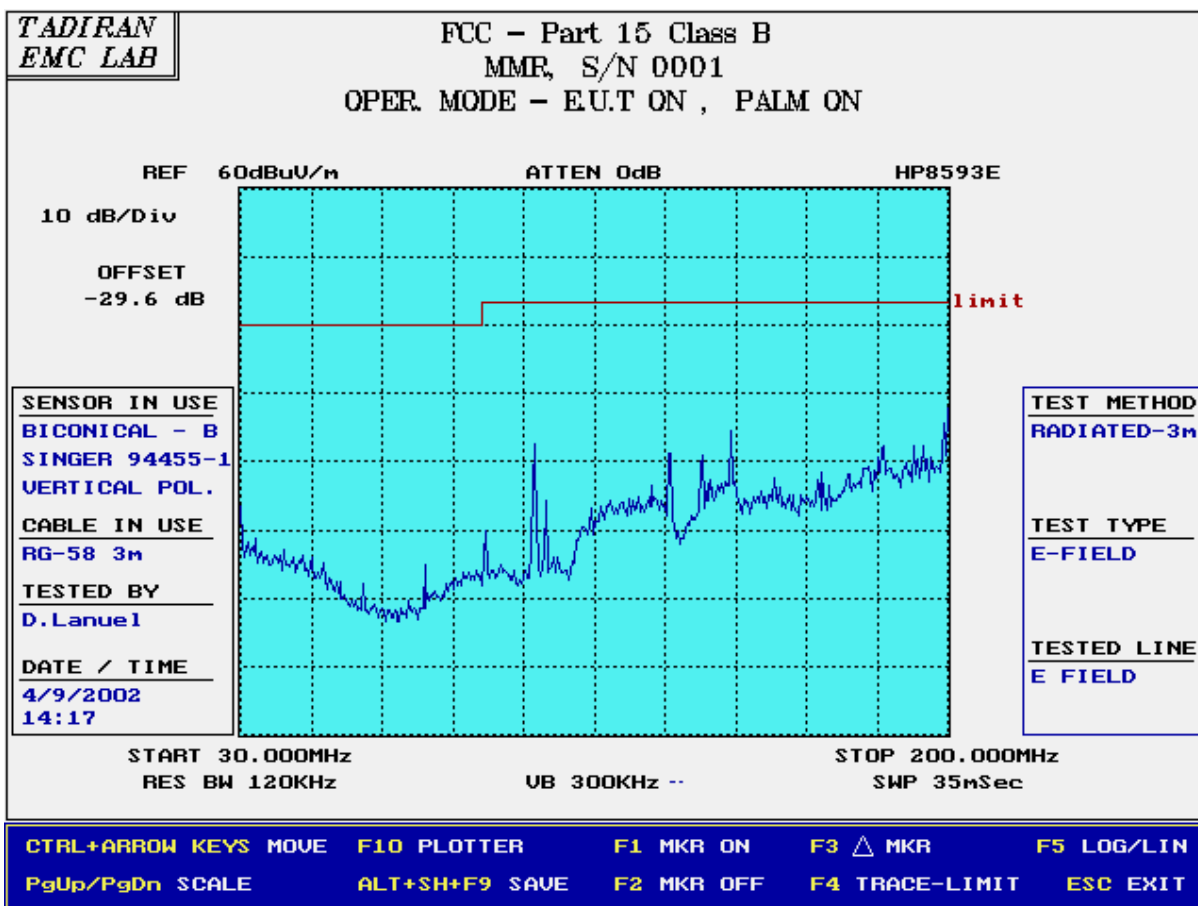
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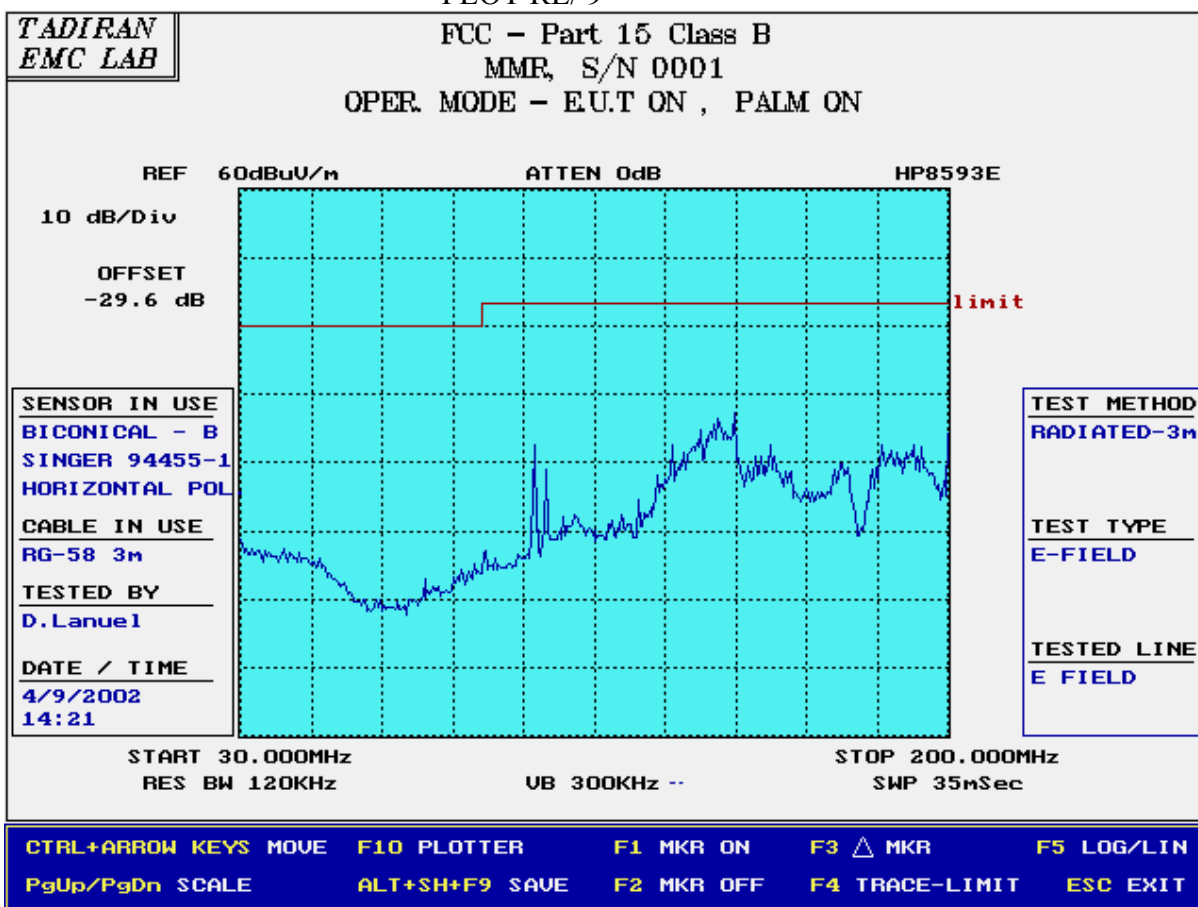
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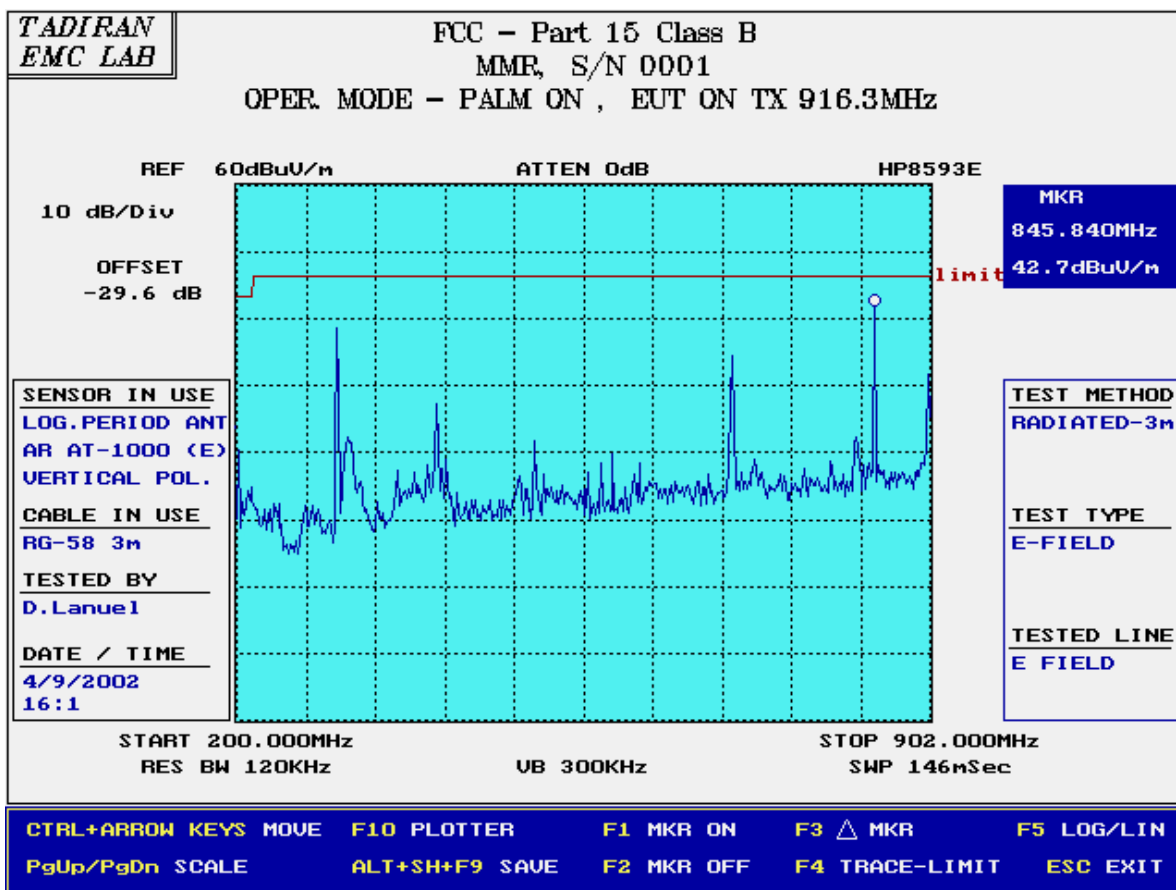
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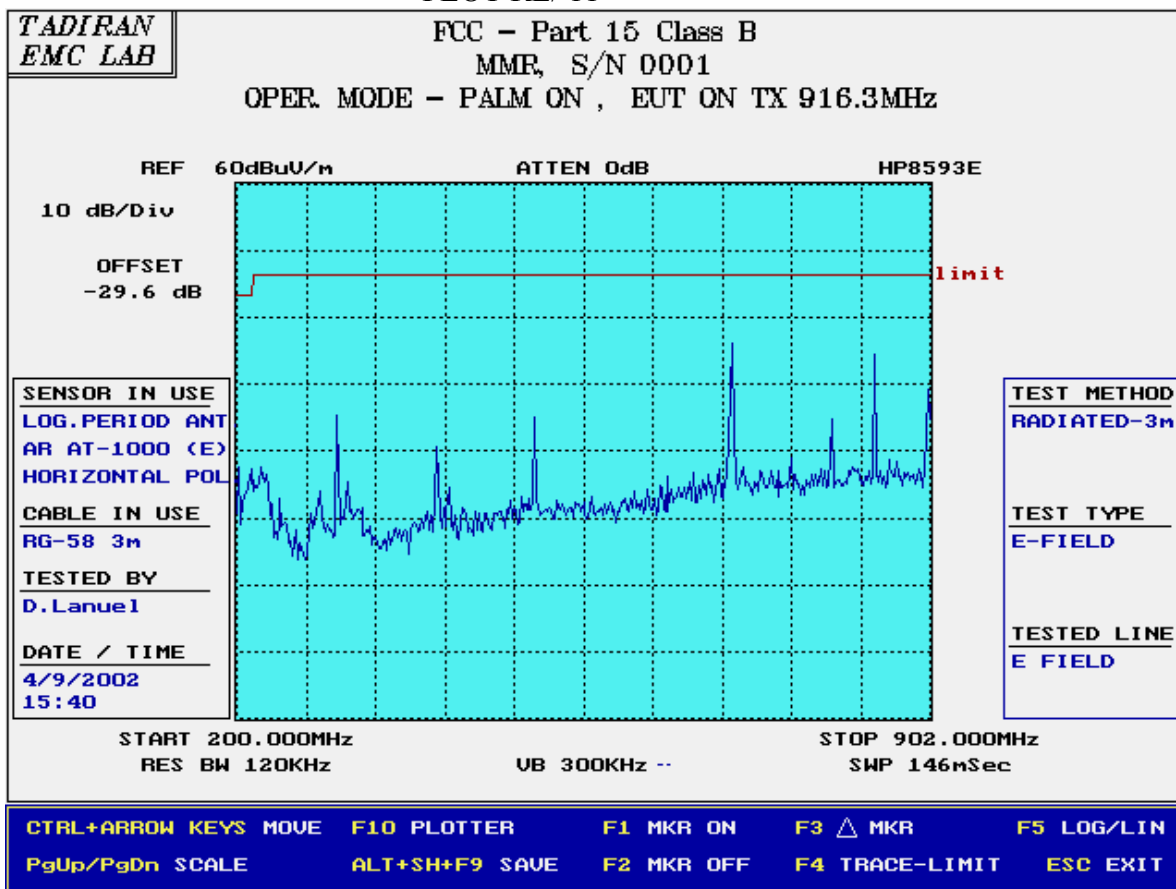
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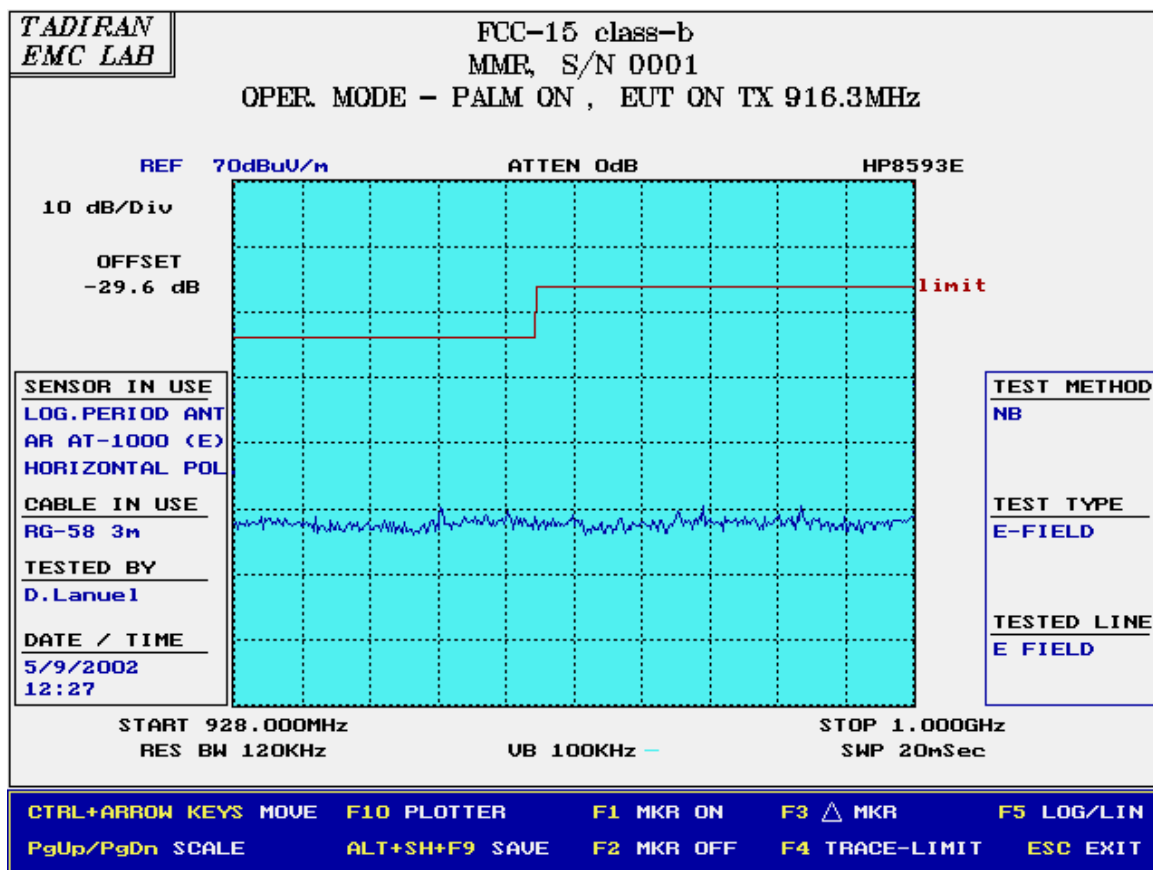
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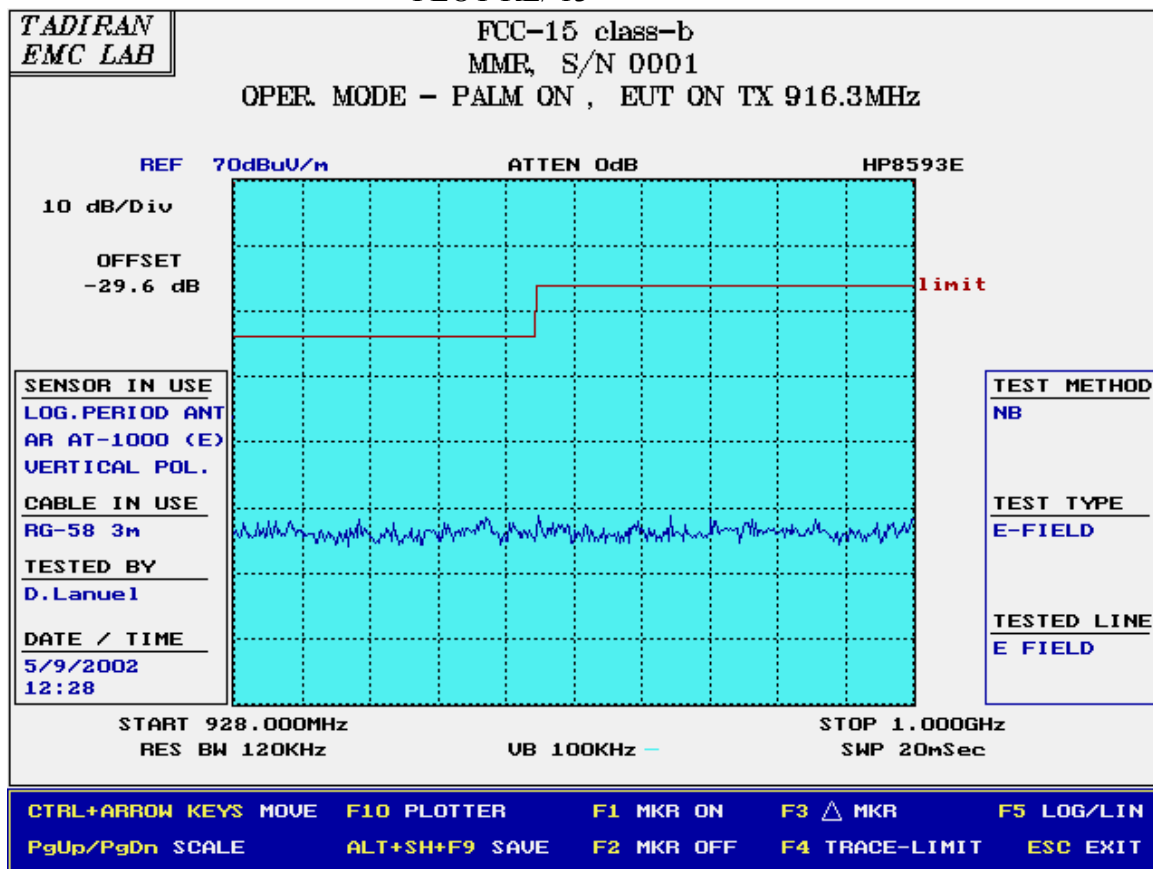
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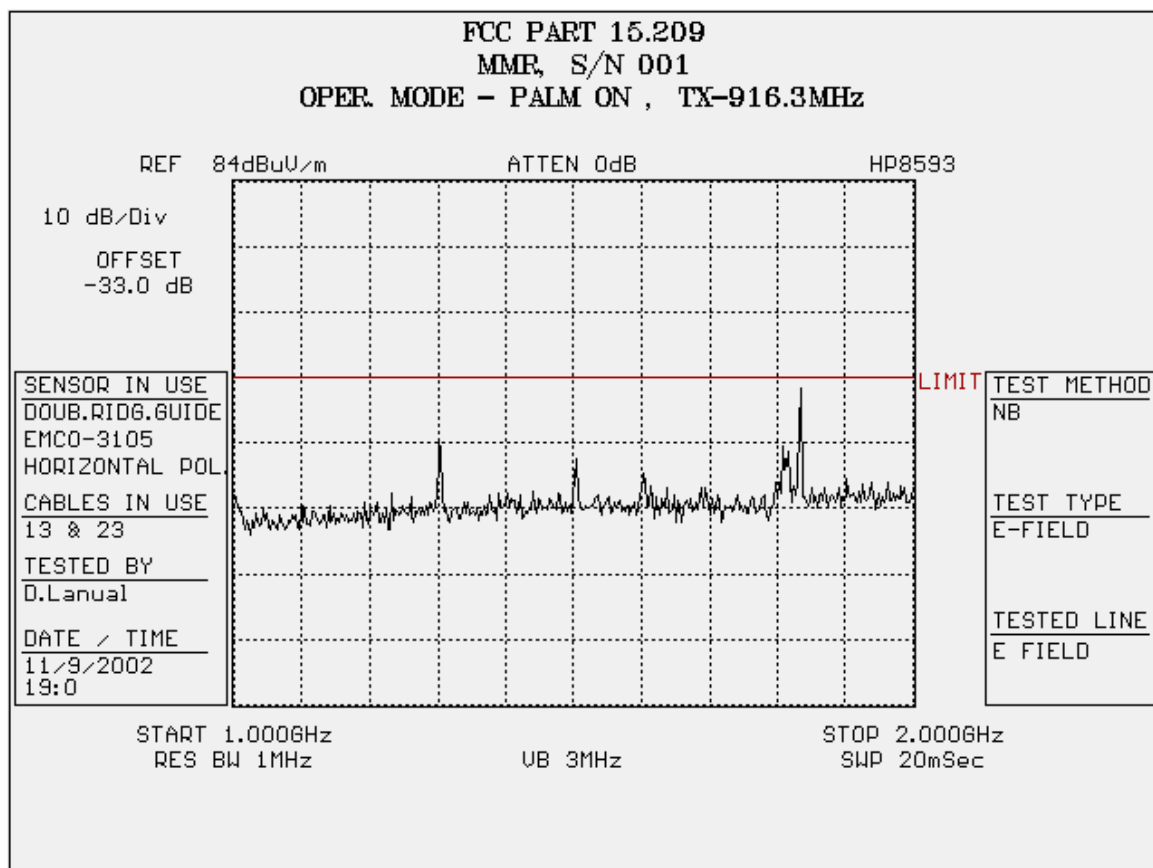
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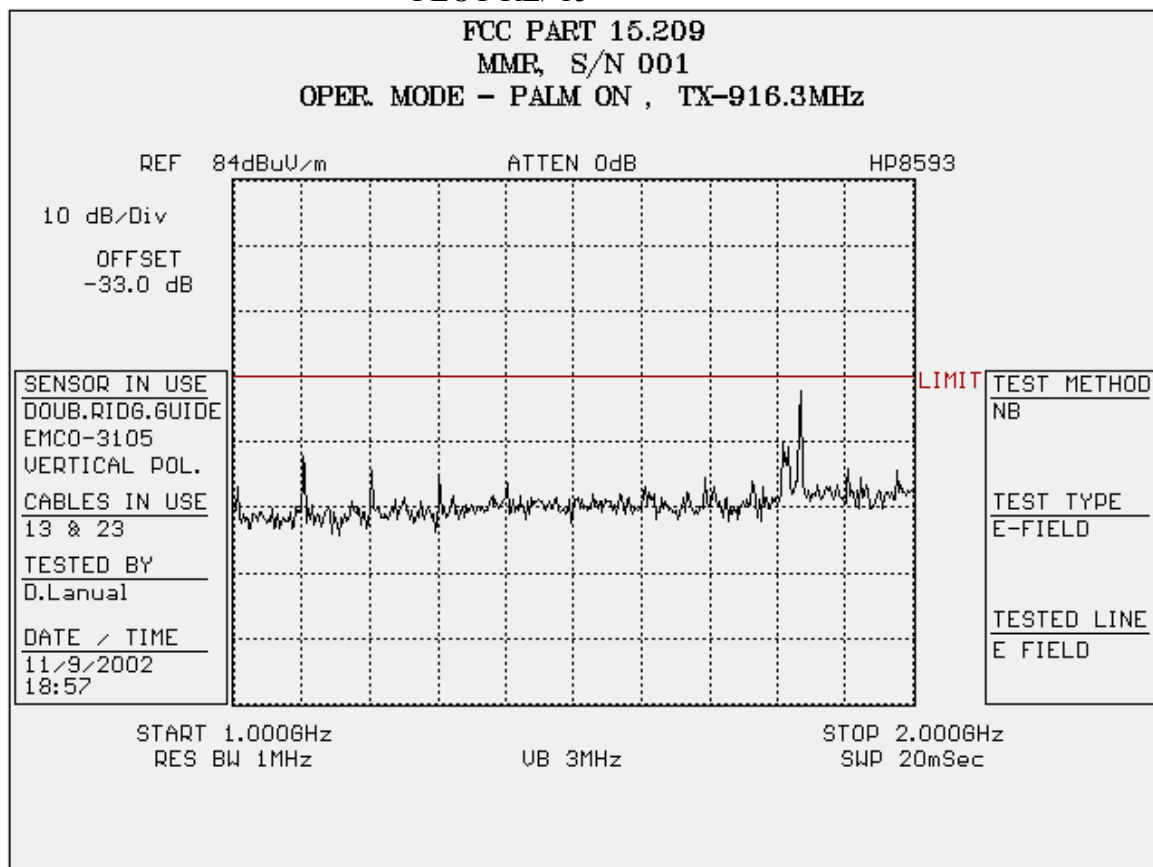
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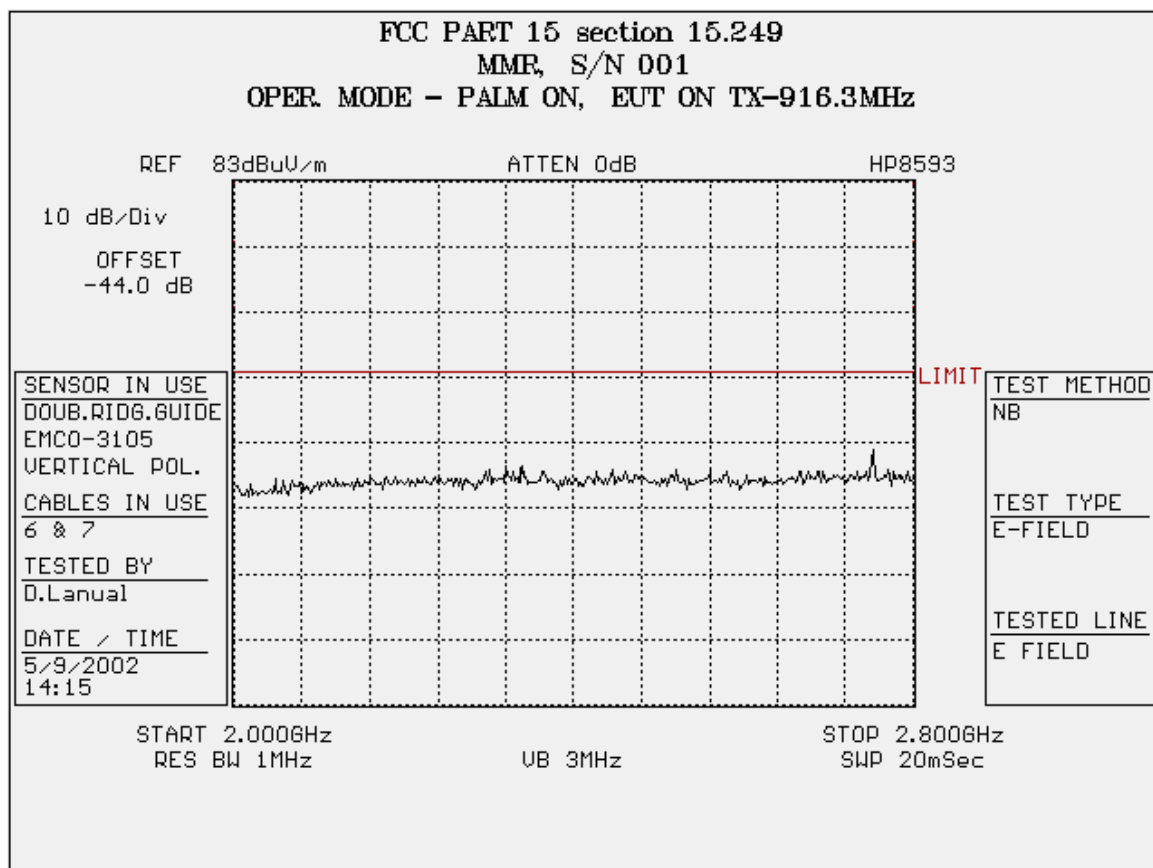
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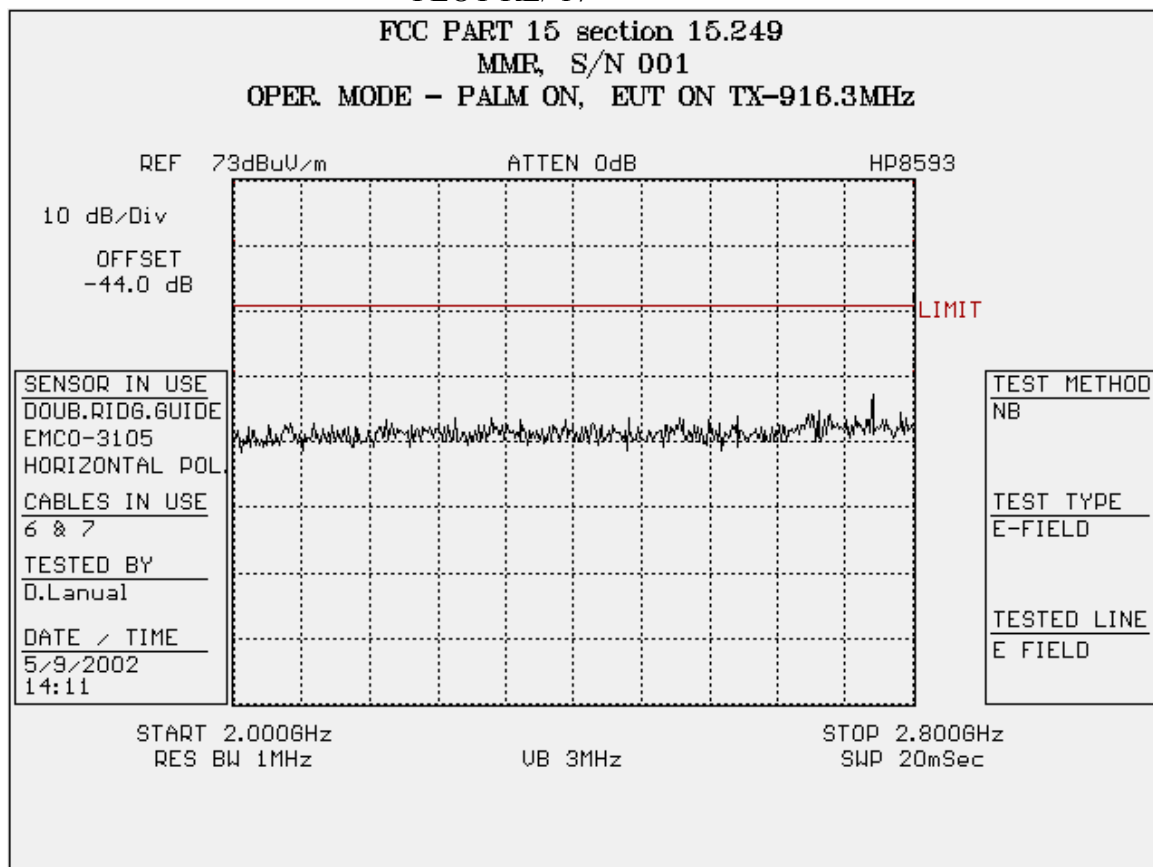
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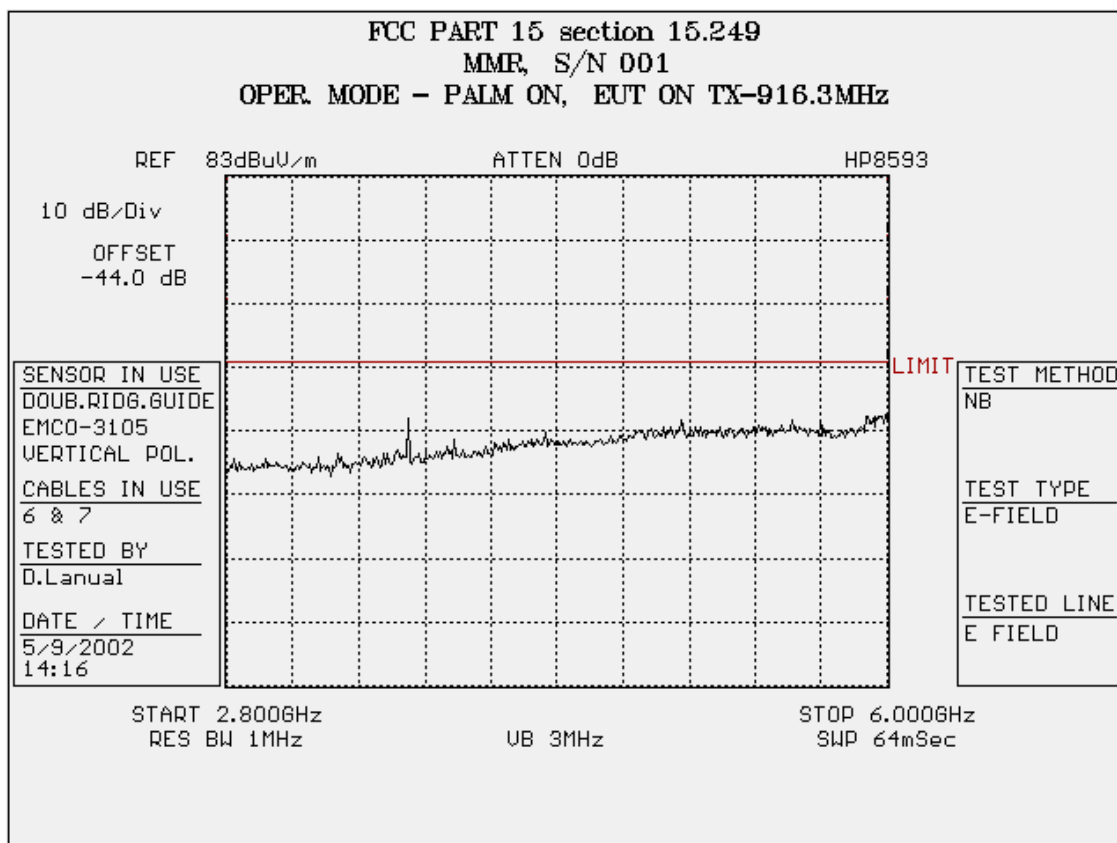
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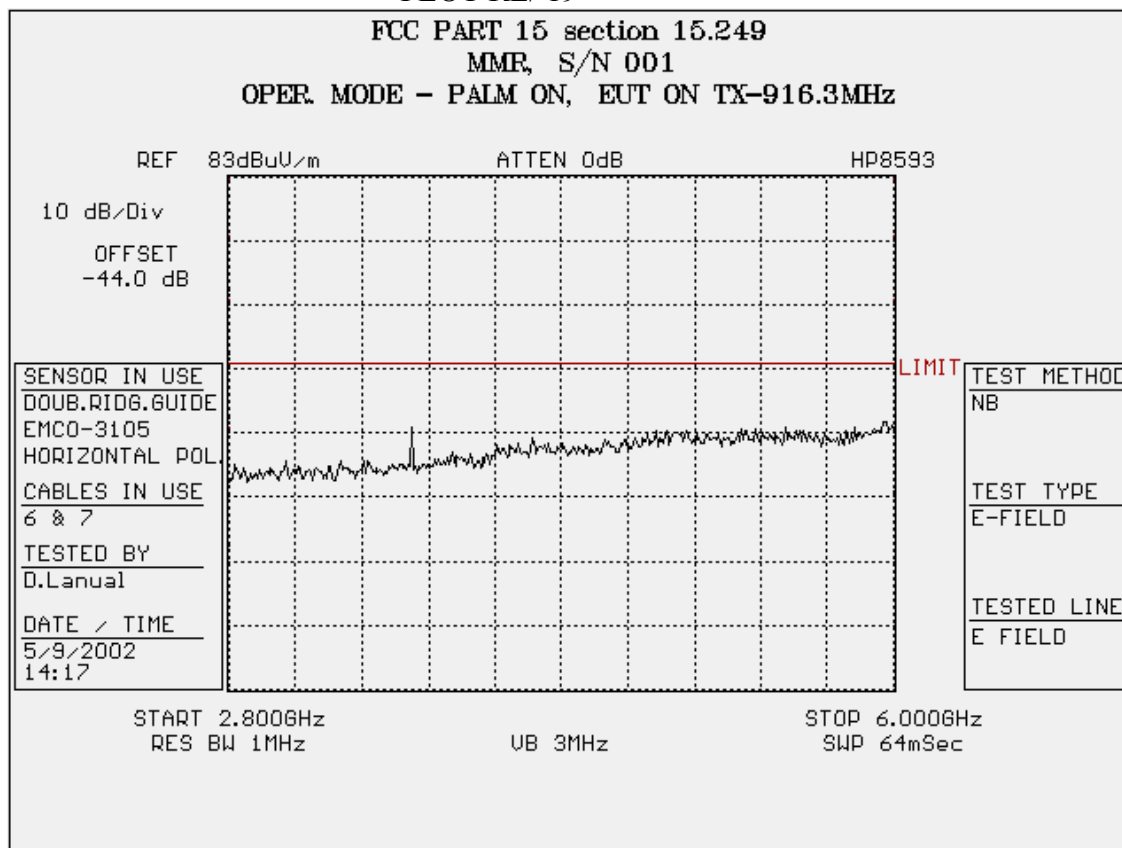
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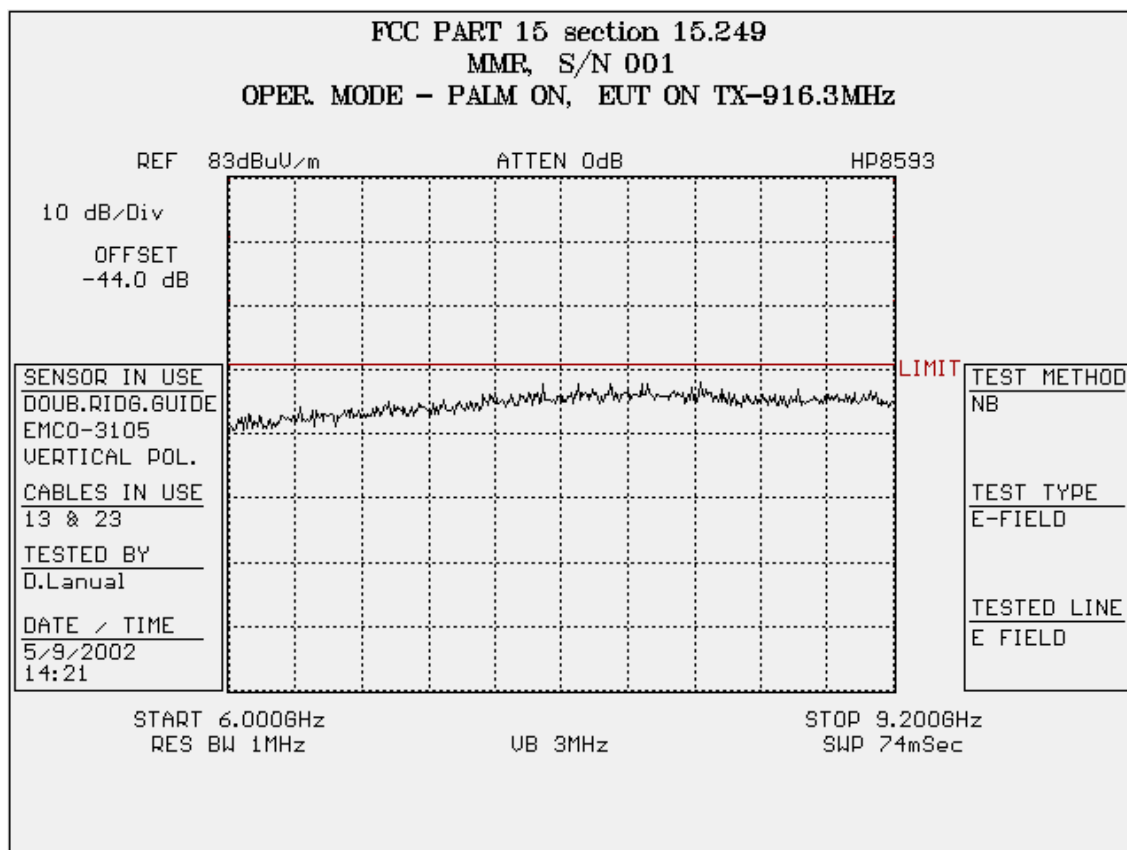
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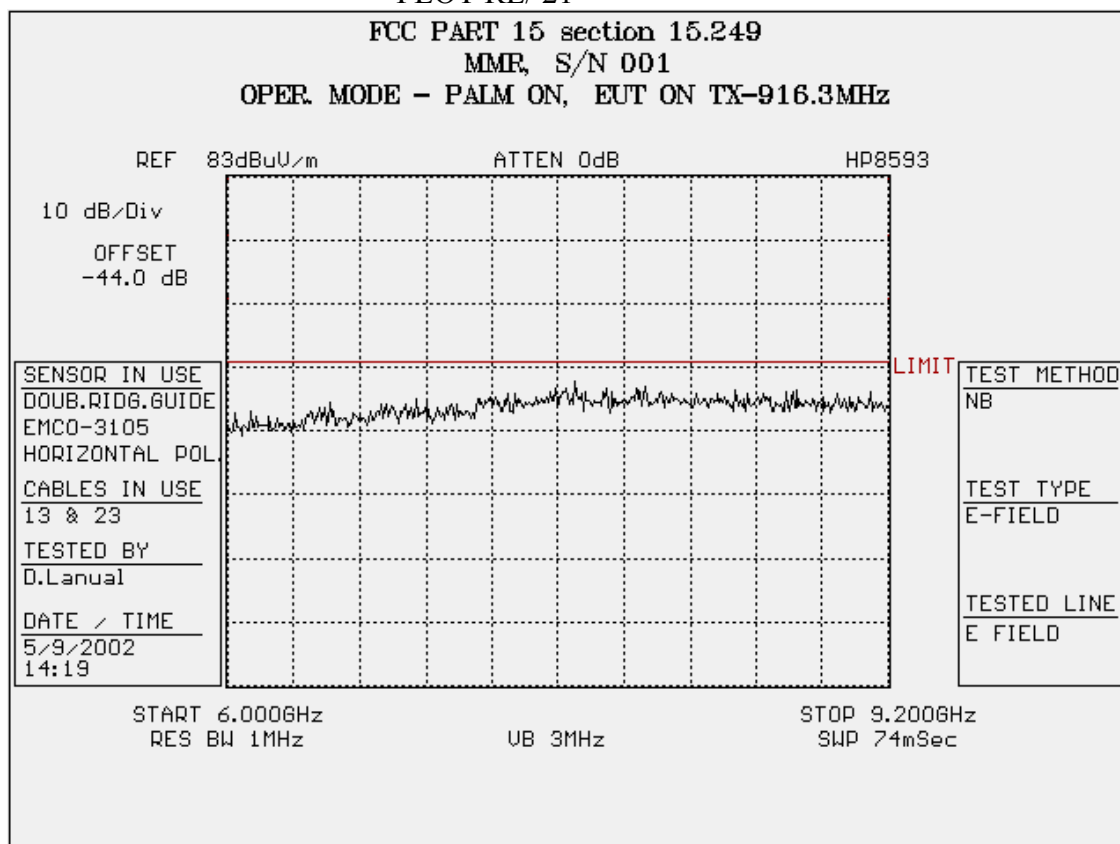
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PLOT RE/ 20



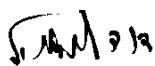
PLOT RE/ 21



PLOT RE/ 22

2. FINAL RADIATED INTERFERENCE FIELD STRENGTH MEASUREMENT

Testing Engineer: D.Lanuel



Date 11/09/02

2.1. Test Instrumentation and Equipment

Table RE-A Test Instrumentation and Equipment

Item	Model	Manufacturer	Next Date Cal.
Spectrum Analyzer	8568B+opt 462	HP	11.12.02
Preselector	85685A	HP	19/8/03
Quasi-Peak Detector	85650	HP	19/8/03
Biconical Antenna, (20 MHz - 200 MHz)	94455-1	Singer	10.04.03
Log-Periodic Antenna, (200-1000MHz)	AT-1000	AR	10.04.03
Computer	PENTIUM	IBM Compatible	N.P.C.R

2.2. Final Test Results

Table RE-F Six Highest Emissions RX Mode 15.107

Mode Of Operation	Freq. (MHz)	Quasi-peak Reading (*) (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Polarity Ver/Hor	Height (m)	Azimuth Angle ϕ (deg)
RX	1820	44.0	54	10	V	2.0	-22

(*) Resolution B/W = 120 kHz

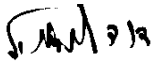
Table RE-G Six Highest Emissions Spurious TX Mode 15.209

Mode Of Operation	Freq. (MHz)	Quasi-peak Reading (*) (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Polarity Ver/Hor	Height (m)	Azimuth Angle ϕ (deg)
	303.5	32.0	46.0	14	V	2.0	-23
	704.0	38.5	46.0	8.5	V	2.1	-24
TX	845.0	42.8	46.0	3.2	V	2.5	-24
	1300.0	43.0	54.0	11	V	1.9	-23
	1840.0	46.5	54.0	7.5	H	1.7	-22
	3664.0	40.0	54.0	14	V	2.0	-24

(*) Resolution B/W = 120 kHz

3. CONDUCTED EMISSIONS, AC POWER LEADS 110V 60HZ ACCORDING TO FCC 15.207

Frequency Range: 450 kHz – 30 MHz

Testing Engineer: D.Lanuel 

Date : 11/9/02

3.1. Equipment Under Test Description and Operation

MMR, FAT, S/N 0001 manufactured by TADIRAN-Telematics

3.1.1. Modes of Operation

The MMR was set to Battery Charge at RX Mode and TX Mode the EUT was connected to a Compaq personal PC.

3.1.2. Operating Voltage 110 V, AC 60Hz

3.2. Test Results Summary & Conclusions

The MMR complies with FCC, Part 15.207 conducted emissions requirement.

3.3. Limits of Conducted Emission at Mains Terminals

The test unit shall meet the limits of Table 1 for FCC Part 15 Para 15.207 equipment.

Table 1 Limits for intentional radiator according 15.207

Frequency Range MHz	Quasi-peak Limits dBμV
0.45 – 30	48

3.4. Test Instrumentation and Equipment

Table CD-A – Test Instrumentation and Equipment

Item	Model	Manufacturer	Next Date Calibration
Spectrum Analyzer	8593E	HP	31/01/03
Signal Generator	2017	Marconi	1/06/03
LISN	FCC-LISN-3B	FISCHER	31/08/03

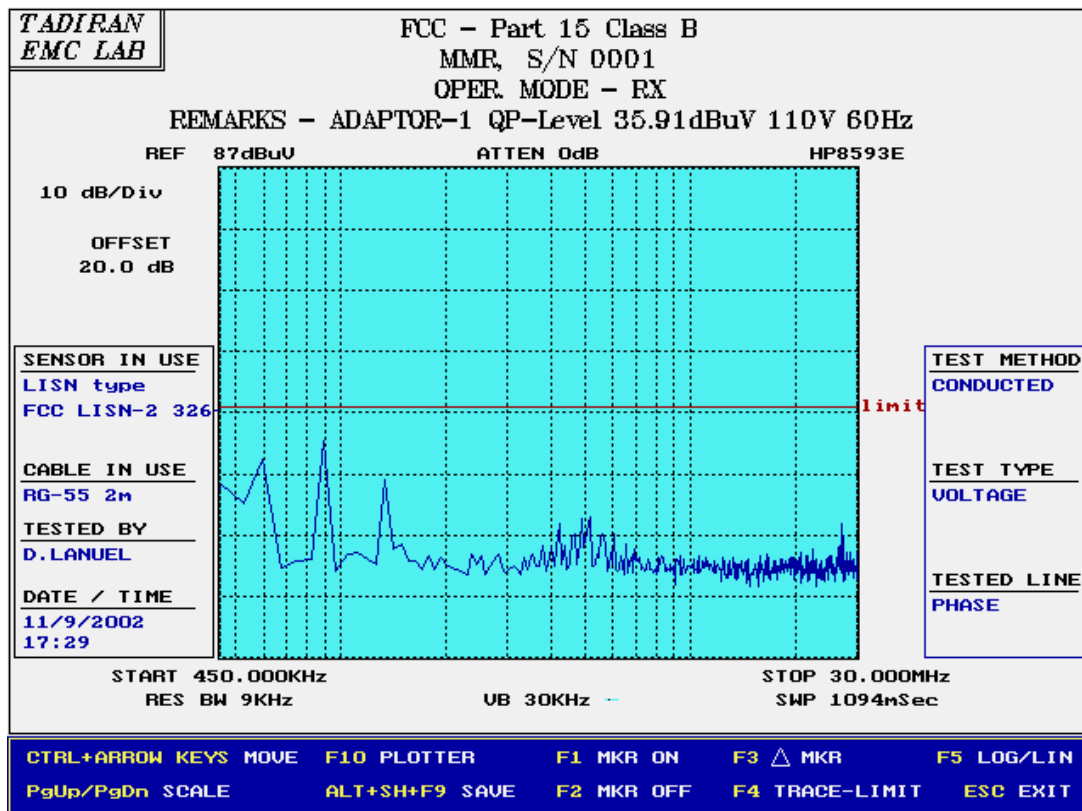
Table CE-C Test Results 110V 60Hz according 15.207

Lead P/N	Mode of Operation	Frequency Range (MHz)	Resolution BW (kHz)	Plot No.	Comply. Y/N
Phase	TX	0.45 – 30	9	CE/ 1	Y
Neutral		0.45 – 30		CE/ 2	Y
Phase	RX	0.45 – 30	9	CE/ 3	Y
Neutral		0.45 – 30		CE/ 4	Y

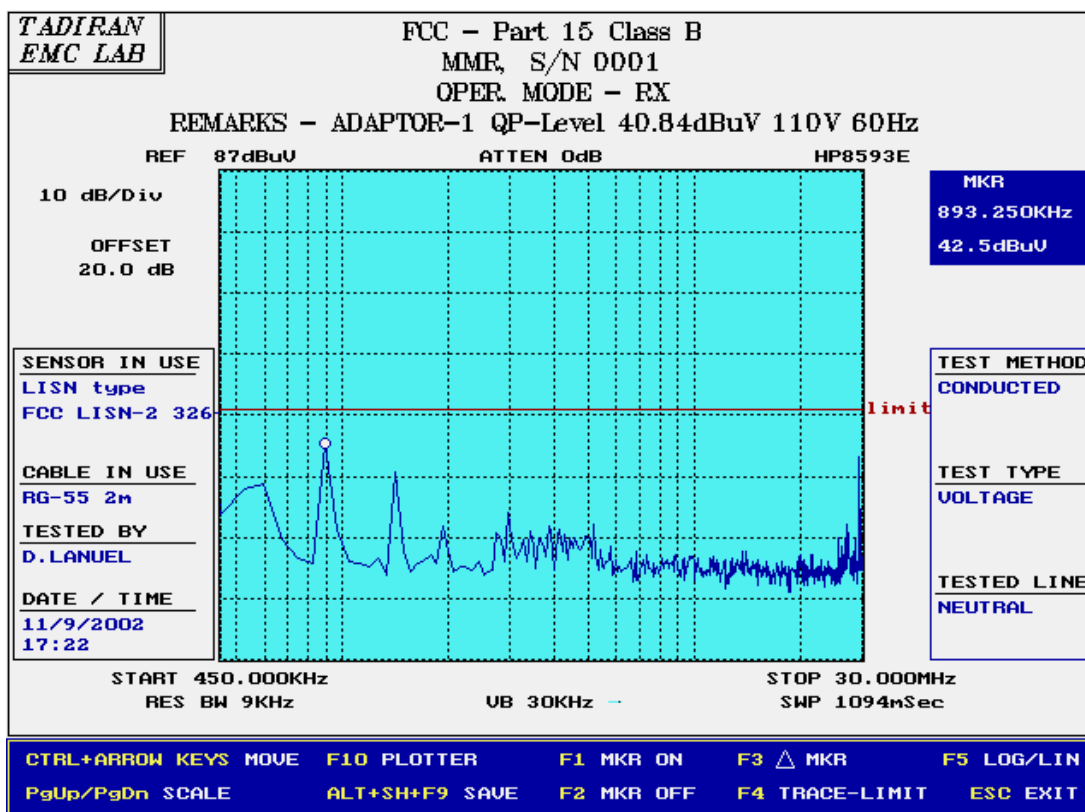
Table CE-D Six Highest Emissions

Lead P/N	Mode of Operation	Freq. (MHz)	Receiver Detector	Reading (dB μ V)	Limit (dB μ)	Margin (dB)
PHASE	TX	0.967	QUPEAK	35.86	48	12.2
Neutral		1.115	QUPEAK	36.05	48	11.95
PHASE	RX	0.893	QUPEAK	35.91	48	12.09
Neutral		0.893	QUPEAK	40.84	48	7.16

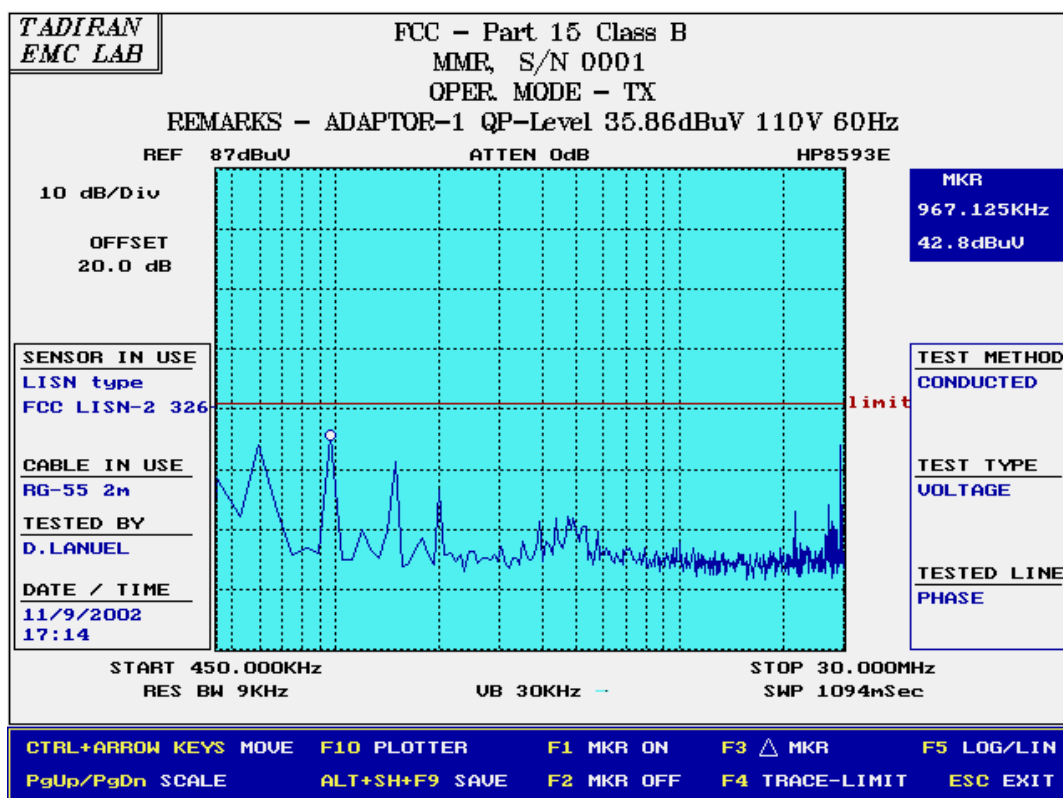
(*) Resolution B/W = 9 kHz



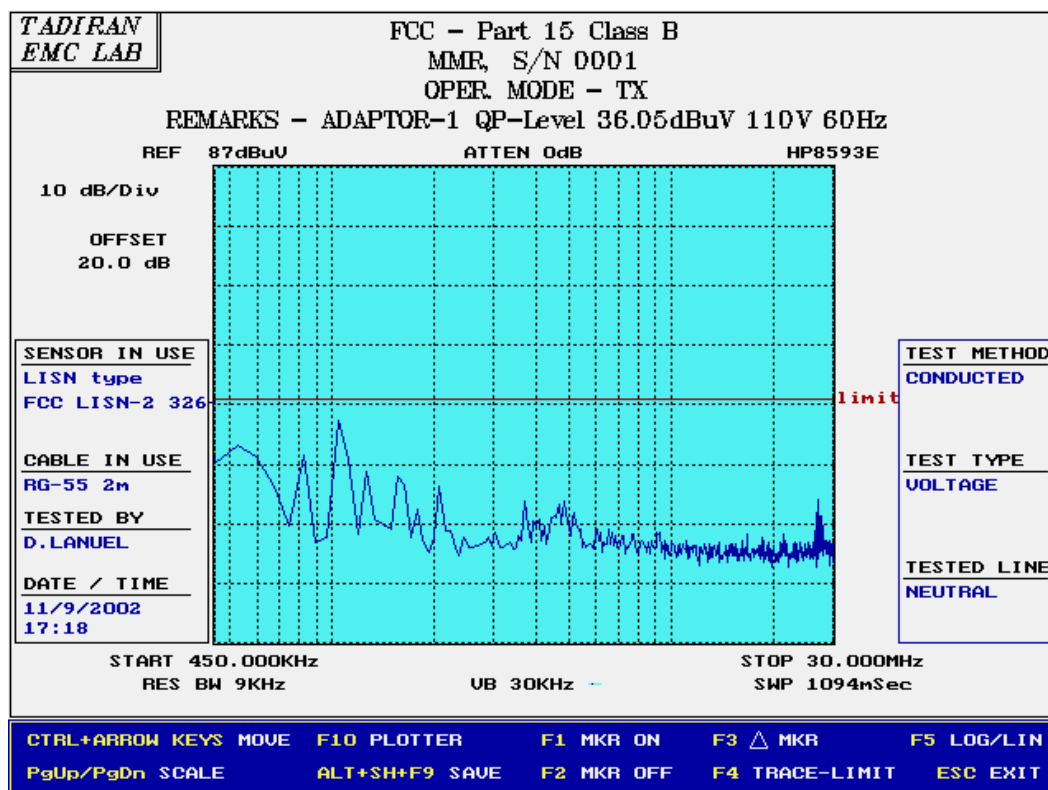
PLOT CE/1



PLOT CE/2



PLOT CE/ 3



PLOT CE/ 4