

Attachment Two

SUBPART C *INTENTIONAL RADIATOR*

Figure of Fundamental Frequency Harmonics Test set-up

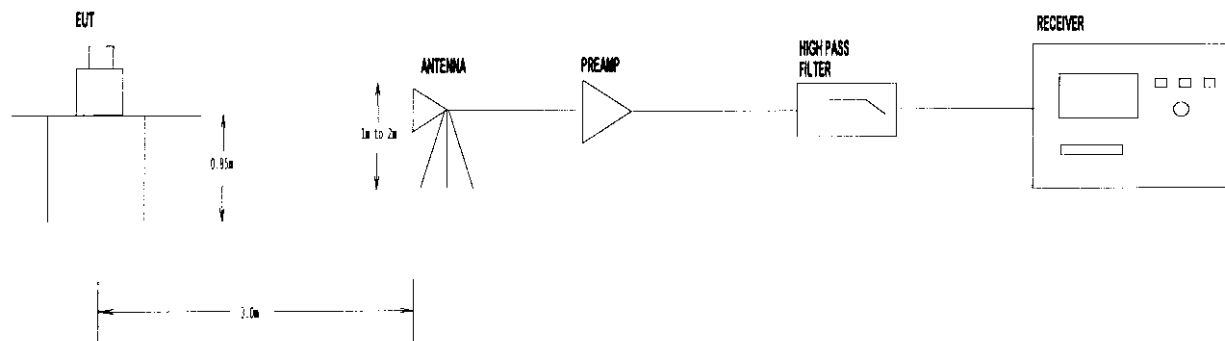


Figure 1

Intentional Radiator Test Procedure

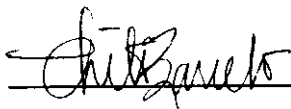
The EUT was set-up as shown in figure 1 inside an anechoic chamber. The EUT was then operated in the “Spread Spectrum Mode” for which data was gathered for channel occupancy, spacing, and bandwidth. After this procedure, the EUT was operated to remain at a predetermined frequency (Low, Medium, and High channels). In this mode, the individual channels were checked for the 20dB bandwidths, spurious, and modulation products emission. Finally, the fundamental frequency harmonics are checked recording the maximum average level while moving the antenna between one and two meters.

ATTACHMENT TWO - BANDWIDTH MEASUREMENT DATA

CLIENT:	Whisper Communications	TEST REFERENCE:	FCC Part 15 Subpart C Section §15.247
EUT MODEL:	GE-I70/RMI	PRODUCT:	Remote Meter Interface
SERIAL NO.:	Engineering sample	EUT DESIGNATION:	Light Industrial
TEMPERATURE:	18°C	HUMIDITY:	60%
ATM PRESSURE:	1017 Mbar	GROUNDING:	Grounded through power cord
TESTED BY:	Chito L. Barcelo	DATE OF TEST:	02/13/98

TEST RESULTS	
15.247.a.1.i	The EUT has 128 channels available of which 50 channels are used randomly each time the meter is activated. Each of the channels are separated by 185kHz spacing and with the average time of occupancy of 0.2 seconds as verified with a stopwatch. (refer to plot data on next page)
15.247.b	The maximum peak output power of the transmitter is 80mW (+19 dBm) which is less than 1 watt.

SIGNED:



REVIEWED:





14:16:57 FEB 19, 1998

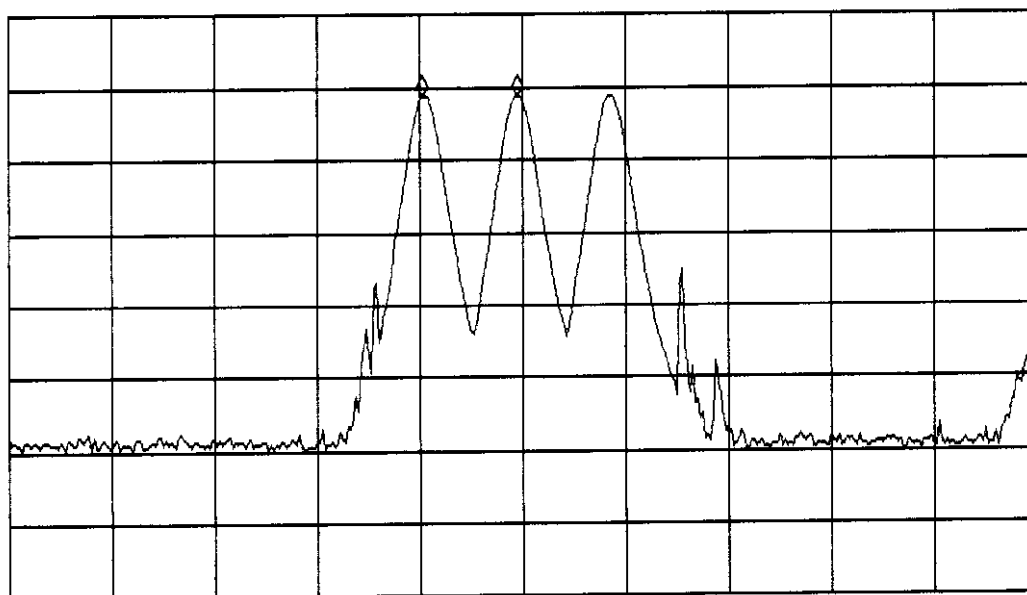
CHANNEL SPACING

MARKER Δ
185 kHz
-.03 dB

ACTV DET: PEAK
MEAS DET: PEAK QP
MKR Δ 185 kHz
-.03 dB

LOG REF OFFST 6.0 dB
10 REF 128.0 dB μ V
dB/
#ATN
40 dB

MA SB
SC FC
ACORR



CENTER 915.275 MHz
#IF BW 30 kHz

AUG BW 30 kHz

SPAN 2.000 MHz
SWP 20.0 msec



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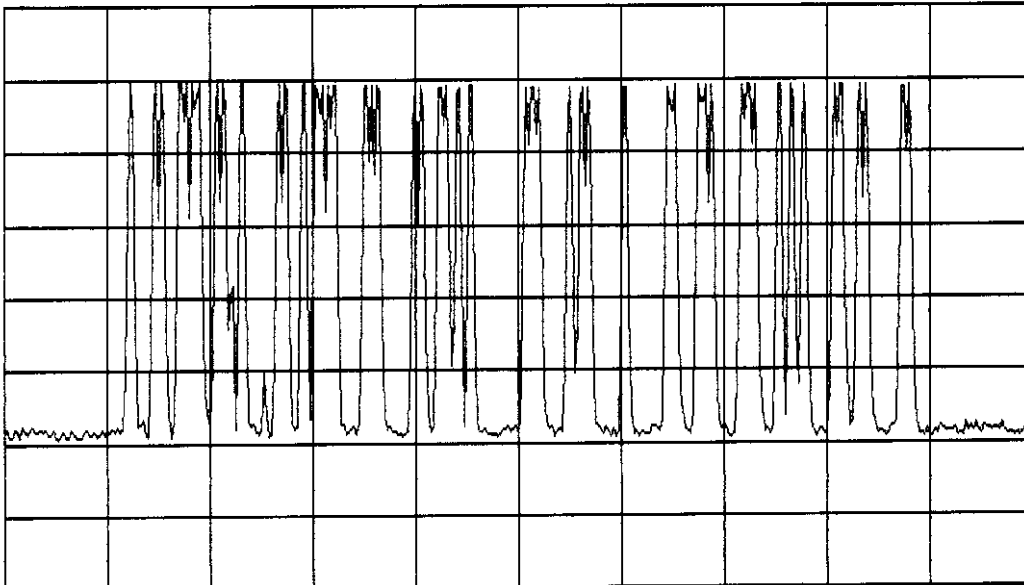
SPECTRUM SHOWING 50 CHANNELS

ACTV DET: PEAK
MEAS DET: PEAK QP

LOG REF OFFST 6.0 dB
10 REF 128.0 dBμV

dB/
#ATN
40 dB

VA SB
SC FC
ACORR



START 900.00 MHz

#IF BW 30 kHz

AVG BW 30 kHz

STOP 930.00 MHz

SWP 100 msec

ATTACHMENT TWO - FUNDAMENTAL FREQUENCY HARMONICS DATA

CLIENT:	Whisper Communications	TEST REFERENCE:	FCC Part 15 Subpart C Section §15.247
EUT MODEL:	GE-I70/RMI	PRODUCT:	Remote Meter Interface
SERIAL NO.:	Engineering sample	EUT DESIGNATION:	Light Industrial
TEMPERATURE:	18°C	HUMIDITY:	60%
ATM PRESSURE:	1017 Mbar	GROUNDING:	Grounded through power cord
TESTED BY:	Chito L. Barcelo	DATE OF TEST:	02/13/98

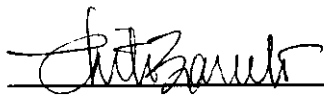
15.247.a & c	There are no significant spurious emission or modulation products generated by the EUT within and beyond 100kHz of the fundamental transmitter frequency. All harmonics of the fundamental transmitter frequencies meet 54 dBμV/m. §15.247 a. No harmonics are present beyond the seventh (refer to data below)
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TEST RESULTS						
LOW	Signal #	Frequency (MHz)	Average [dB μ V/m]	Limit [dB μ V/m]	Delta, Average [dB]	Correction Factor [dB]
	1	903.390	117.5			23.8
	2	1806.785	53.3	54.0	-0.7	29.2
	3	2710.179	52.1	54.0	-1.9	6.4
	4	3613.569	45.8	54.0	-8.2	9.4
	5	4516.979	51.9	54.0	-2.1	10.4
	6	5420.367	43.1	54.0	-10.9	13.0
	7	6323.748	43.5	54.0	-10.5	13.8
MEDIUM						
	1	914.911	116.2			23.9
	2	1829.832	53.8	54.0	-0.2	29.3
	3	2744.733	46.5	54.0	-7.5	6.6
	4	3659.644	42.0	54.0	-12.0	9.5
	5	4574.560	52.5	54.0	-1.5	10.6
	6	5489.471	44.5	54.0	-9.5	13.2
	7	6404.890	43.3	54.0	-10.7	13.8

HIGH	1	925.350	115.3			23.9
	2	1850.700	53.7	54.0	-0.3	29.4
	3	2776.060	49.0	54.0	-5.0	-0.2
	4	3701.410	39.4	54.0	-14.6	3.4
	5	4626.775	50.2	54.0	-3.8	4.6
	6	5552.125	41.2	54.0	-12.8	7.3
	7	6477.475	40.0	54.0	-14.0	7.8

Note: Signals 1 are the fundamental frequencies.

SIGNED:



REVIEWED:

■ **EMC Compliance Management Group**, 670 National Ave. Mountain View, CA 94043

■ Tel: 650-988-0900 Fax: 650-988-6647 e-mail: support@emc-turntech.com

■ VCCI Approved Lab for ITE Product EMI Measurements

■ Approved by Assessment Services, A UK Competent Body, as meeting the requirements of EN45001. Appr. #: 14082

■ Accredited by the National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code 200068-0

20dB BW LOW

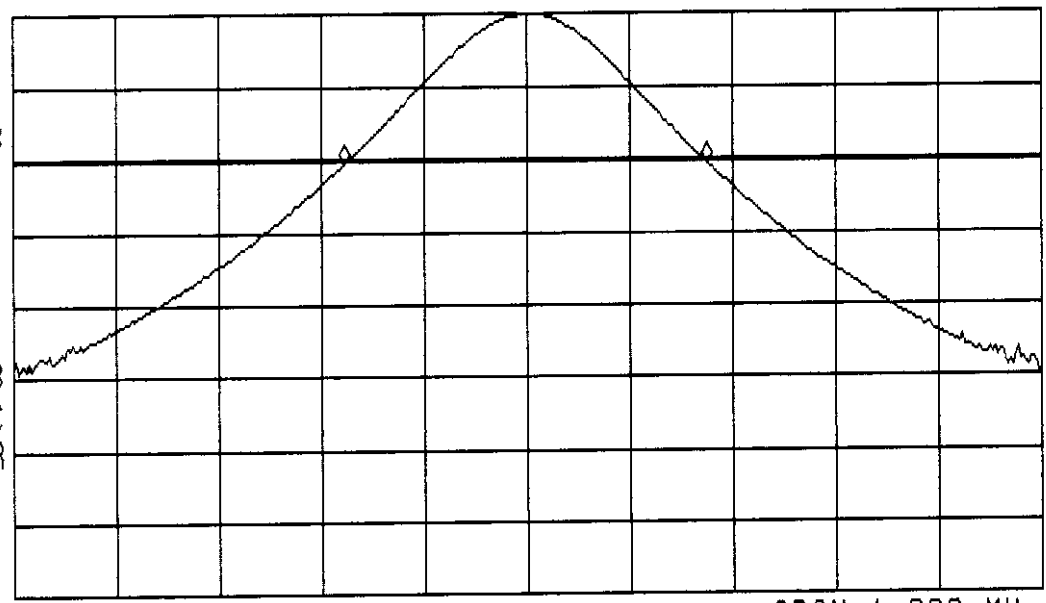
MARKER Δ
353 kHz
.14 dB

ACTV DET: PEAK
MEAS DET: PEAK QP
MKR Δ 353 kHz
.14 dB

REF OFFST 6.0 dB
REF 118.0 dB μ V

LOG
10
dB/
#ATN
40 dB

DL
97.7
dB μ V
VA SB
SC FC
ACORR



CENTER 903.390 MHz SPAN 1.000 MHz
#IF BW 100 kHz AVG BW 30 kHz SWP 20.0 msec

hp 17:32:34 FEB 19, 1998 FUNDAMENTAL FREQUENCY HARMONICS
20dB BW HIGH

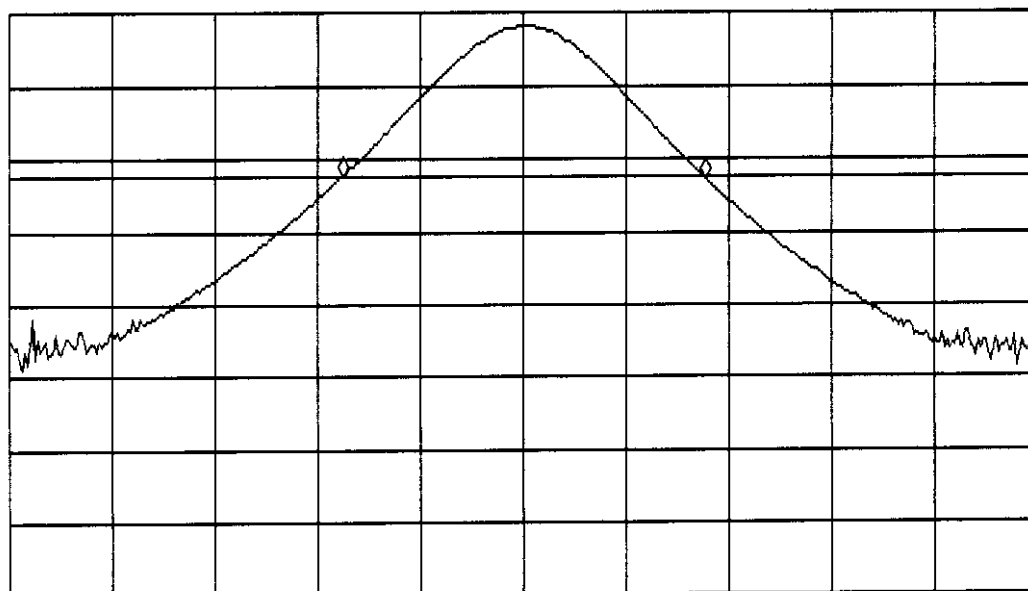
MARKER Δ
353 kHz
-.58 dB

ACTV DET: PEAK
MEAS DET: PEAK QP
MKR Δ 353 kHz
-.58 dB

LOG REF OFFST 6.0 dB
REF 118.0 dB μ V

10
dB/
#ATN
30 dB

DL
95.4
dB μ V
VA SB
SC FC
ACORR



CENTER 925.350 MHz
#IF BW 100 kHz

AUG BW 30 kHz

SPAN 1.000 MHz
SWP 20.0 msec



13:52:36 FEB 19, 1998

FUNDAMENTAL FREQUENCY HARMONICS
20dB BW MEDIUM

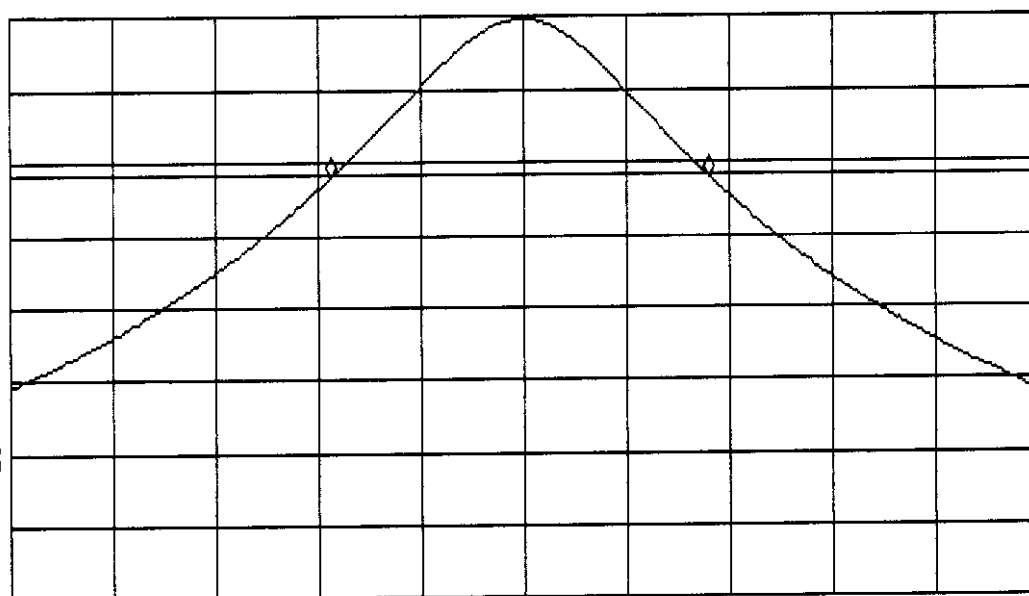
MARKER Δ
368 kHz
-.12 dB

ACTV DET: PEAK
MEAS DET: PEAK QP
MKR Δ 368 kHz
-.12 dB

LOG
10
dB/
#ATN
30 dB

DL
96.0
dB μ V
VA SB
SC FC
ACORR

REF OFFST 6.0 dB
REF 118.0 dB μ V



CENTER 914.913 MHz
#IF BW 100 kHz

AVG BW 30 kHz

SPAN 1.000 MHz
SWP 20.0 msec

LOW

Signal #	Freq. (MHz)	Ave. (dBμV)	Limit (dBμV)	Ave. Δ Limit (dB)	Corr. (dB)
1	903.390	117.5			23.8
2	1806.785	53.3	54.0	-0.7	29.2
3	2710.179	52.1	54.0	-1.9	6.4
4	3613.569	45.8	54.0	-8.2	9.4
5	4516.979	51.9	54.0	-2.1	10.4
6	5420.367	43.1	54.0	-10.9	13.0
7	6323.748	43.5	54.0	-10.5	13.8

MEDIUM

1	914.911	116.2			23.9
2	1829.832	53.8	54.0	-0.2	29.3
3	2744.733	46.5	54.0	-7.5	6.6
4	3659.644	42.0	54.0	-12.0	9.5
5	4574.560	52.5	54.0	-1.5	10.6
6	5489.471	44.5	54.0	-9.5	13.2
7	6404.890	43.3	54.0	-10.7	13.8

HIGH

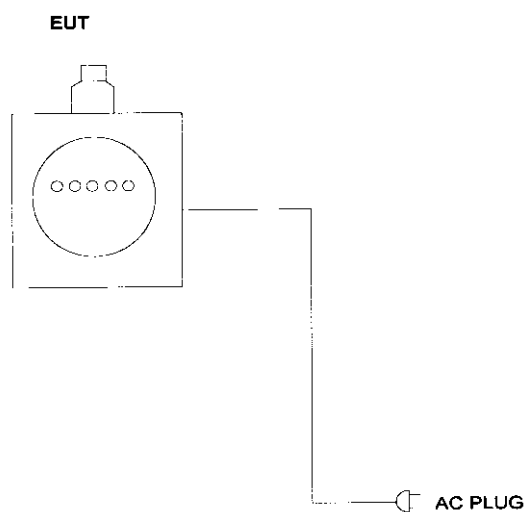
1	925.350	115.3			23.9
2	1850.700	53.7	54.0	-0.3	29.4
3	2776.060	49.0	54.0	-5.0	-0.2
4	3701.410	39.4	54.0	-14.6	3.4
5	4626.775	50.2	54.0	-3.8	4.6
6	5552.125	41.2	54.0	-12.8	7.3
7	6477.475	40.0	54.0	-14.0	7.8

tested without front plate

Attachment One

SUBPART B *UNINTENTIONAL RADIATOR*

Figure of Test Configuration



ATTACHMENT ONE - CONDUCTED EMISSION TEST

CLIENT:	Whisper Communications	TEST REFERENCE:	FCC Part 15 Subpart B & C Section §15.107
EUT MODEL:	GE-I70/RMI	PRODUCT:	Remote Meter Interface w/o Front Plate
SERIAL NO.:	Engineering sample	EUT DESIGNATION:	Light Industrial
TEMPERATURE:	18°C	HUMIDITY:	60%
ATM PRESSURE:	1017 Mbar	GROUNDING:	Grounded through power cord
TESTED BY:	Chito L. Barcelo	DATE OF TEST:	02/13/98

METHOD:	ANSI C63.4 1992
PROCEDURE:	Test performed in accordance with test method. Scan from 450kHz to 30MHz.
TEST VOLTAGE:	120VAC @ 60Hz
RESULTS:	The EUT meet the requirements of test reference for Conducted Emissions on both lines by 13.2 dB of Quasi-Peak detector.
M.U.:	Freq. $\pm 2 \times 10^{-7}$ x Center Freq., Amp ± 2.6 dB

Line	Frequency [MHz]	Corrected QP Reading [dB(μV)]	Delta QP [dB]	Limit [dB]
L1	0.540	34.8	-13.2	48.0
L1	0.752	32.0	-16.0	48.0
L1	22.932	26.4	-21.6	48.0
L2	0.540	30.4	-17.6	48.0
L2	22.935	28.2	-19.8	48.0
L2	0.752	27.7	-20.3	48.0

SIGNED:



REVIEWED: _____

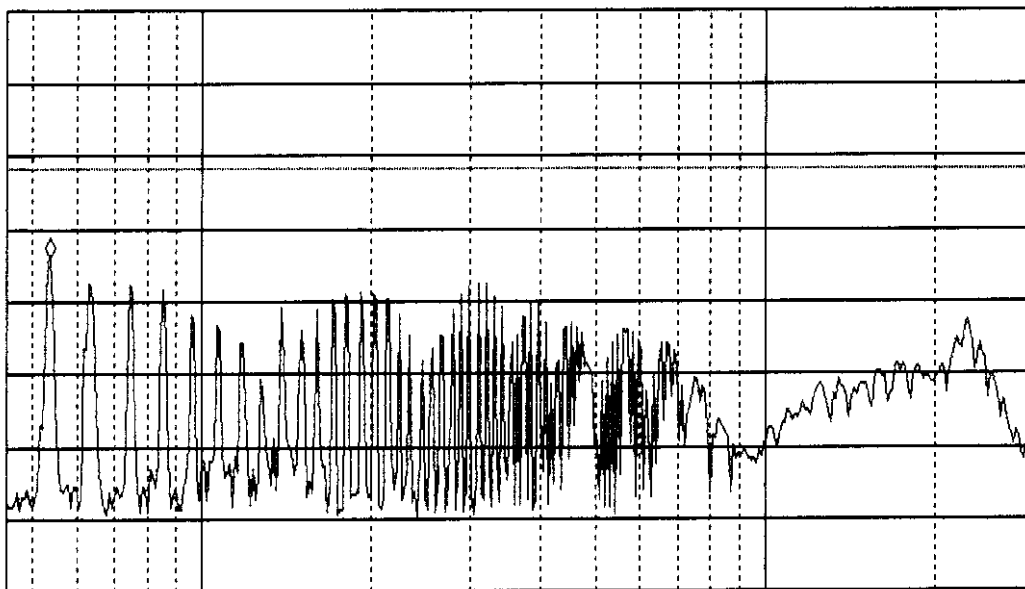
hp 15:23:49 FEB 13, 1998

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 540 kHz
35.72 dB μ V

LOG REF 70.0 dB μ V

10
dB/
ATN
10 dB

VA SB
SC FC
ACORR



START 450 kHz

IF BW 9.0 kHz

AVG BW 30 kHz

STOP 30.00 MHz

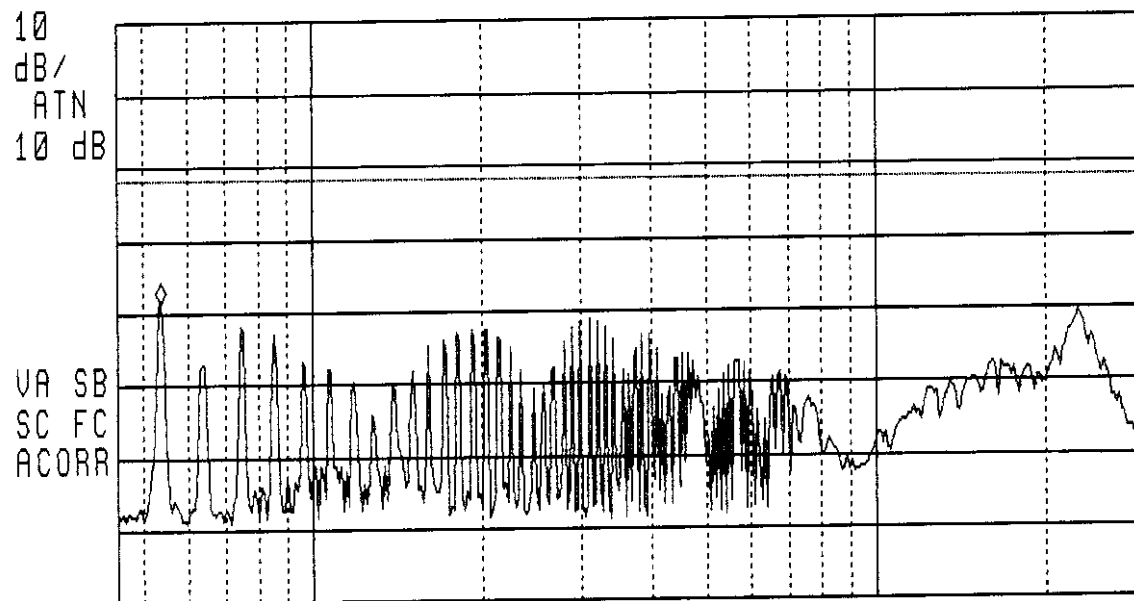
SWP 2.46 sec

Signal Number	Frequency (MHz)	Peak (dB μ V)	QP (dB μ V)	QP Delta L 1 (dB)	Corr (dB)
1	0.540000	35.1	34.8	-13.2	0.1
2	0.752500	32.3	32.0	-16.0	0.1
3	22.932500	28.4	26.4	-21.6	1.4

hp 15:15:51 FEB 13, 1998

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 540 kHz
31.28 dB μ V

LOG REF 70.0 dB μ V



START 450 kHz

IF BW 9.0 kHz

AUG BW 30 kHz

STOP 30.00 MHz

SWP 2.46 sec

Signal Number	Frequency (MHz)	Peak (dB μ V)	QP (dB μ V)	QP Delta L 1 (dB)	Corr (dB)
1	0.540000	31.8	30.4	-17.6	0.1
2	22.935000	30.5	28.2	-19.8	1.4
3	0.752500	28.3	27.7	-20.3	0.1

ATTACHMENT ONE - RADIATED EMISSION TEST

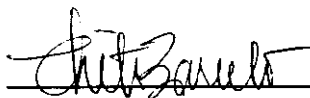
CLIENT:	Whisper Communications	TEST REFERENCE:	FCC Part 15 Subpart B & C Section §15.109
EUT MODEL:	GE-I70/RMI	PRODUCT:	Remote Meter Interface w/o Front Plate
SERIAL NO.:	Engineering sample	EUT DESIGNATION:	Light Industrial
TEMPERATURE:	18°C	HUMIDITY:	60%
ATM PRESSURE:	1017 Mbar	GROUNDING:	Grounded through power cord
TESTED BY:	Chito L. Barcelo	DATE OF TEST:	02/13/98

METHOD:	ANSI C63.4 1992, §15.109 (g) (2)
PROCEDURE:	Test performed in accordance with test method. Scan from 30MHz to 2000MHz.
RESULTS:	The EUT meets the requirements of test reference for Radiated Emissions on both polarities by 2.3 dB at 96.514MHz.
M.U.:	Freq. $\pm 2 \times 10^{-7}$ x Center Freq., Amp ± 2.6 dB

Frequency [MHz]	Polarity [V/H]	Corrected Reading [dB(μ V/m)]	Delta, QP [dB]	3 Meters Limit [dB(μ V/m)]	Correction Factor [dB]
96.514	V	41.2	-2.3	43.5	10.6
368.150	V	43.3	-2.7	46.0	15.8
304.310	V	42.8	-3.2	46.0	13.8
192.160	V	38.6	-4.9	43.5	10.6
176.810	V	38.0	-5.5	43.5	10.3
209.960	V	38.5	-7.5	46.0	13.6

1. The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the measured reading.
 2. All readings are quasi-peak unless stated otherwise, using a QPA bandwidth of 120kHz, with a 30 mS sweep time. A video filter was not used.

SIGNED:



REVIEWED:



- **EMC Compliance Management Group**, 670 National Ave. Mountain View, CA 94043
 ■ Tel: 650-988-0900 Fax: 650-988-6647 e-mail: support@emc-turntech.com
 ■ VCCI Approved Lab for ITE Product EMI Measurements
 ■ Approved by Assessment Services, A UK Competent Body, as meeting the requirements of EN45001. Appr. #: 14082
 ■ Accredited by the National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code 200068-0