FCC CFR47 PART 22 REQUIREMENT

CERTIFICATION REPORT

FOR

PDA WITH 800MHz CDMA & AMPS DUAL MODE CELLULAR PHONE

MODEL: CB-0801US

FCC ID: PGVCB-0801

REPORT NUMBER: 01I0909-1

ISSUE DATE: AUGUST 16, 2001

Prepared for
CYBERBANK CORPORATION
18TH FLOOR. MIRAE BLDG, 1306-6
SEOCHO-DONG, SEOCHO-GU, SEOUL
KOREA 137-855

Prepared by
COMPLIANCE CERTIFICATION SERVICES
561F MONTEREY ROAD,
MORGAN HILL, CA 95037, USA
TEL: (408) 463-0885

LAB CODE:200065-0

EXHIBITS

EXHIBIT 1: EUT External Photos

EXHIBIT 2: EUT Internal Photos

EXHIBIT 3: FCC ID Labeling

EXHIBIT 4: Schematic

EXHIBIT 5: Block Diagram

EXHIBIT 6: Operational Description

EXHIBIT 7: Report of Measurements

EXHIBIT 8: User Manual

COMPLIANCE CERTIFICATION SERVICES DOCUMENT NO: CCSUP4031C
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1. FCC CERTIFICATION INFROMATION

Inspection Institution: COMPLIANCE CERTIFICATION SERVICES
561F MONTEREY ROAD,
MORGAN HILL, CA 95037, USA

TEL: (408) 463-0885 FAX: (604) 463-0888

Applicant: CYBERBANK CORPORATION
Manufacturer: CYBERBANK CORPORATION
Brand Name: CYBERBANK
Model No/Name: CB-0801US Serial No: N/A

LAB CODE:200065-0

ITEM	TESTING ITEM	APPLIED SPECIFICATION	TESTING RESULTS	REMARK
1	Conducted Emission	Section 15.107	Pass	
2	Radiated Emission	Section 15.109	Pass	
3	Frequency Stability	Section 22.355	Pass	
4	Output Power	Section 22.913	Pass	
5	Modulation Requirement	Section 22.915	Pass	
6	Emission Limit	Section 22.917	Pass	
7	Electronic Serial Number Protection	Section 22.919	Pass	
8	Dial 911- Call processing	Section 22.921	Pass	
9	Cellular System Compatibility	Section 22.933	Pass	
10	SAR limit	Section 2.1093	Pass	

Note 1: Please refer to each test section for detailed instrument list.

The above equipment was tested by Compliance Certification Services for compliance with the requirements set forth in the FCC PART 22. The results of testing in this report apply to the product/system, which was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties. **Warning** : This document reports conditions under which testing was conducted and results of tests performed. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification will constitute fraud and shall nullify the document.

Tested By: Approved & Released By:

KERWIN CORPUZ
EMC ASSOCIATE ENGINEER
COMPLIANCE CERTIFICATION SERVICES

STEVE CHENG
EMC MANAGER
COMPLIANCE CERTIFICATION SERVICES

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1.1 DETAILED CERTIFICATION INFORMATION

The following information is in accordance with FCC Rules, 47CFR Part2, Subpart J, and Sections 2.1033 – 2.1055.

2.1033(c)(1) Applicant:

CYBERBANK CORPORATION
18th Floor. Mirae Bldg, 1306-6
Seocho-dong, Seocho-gu, Seoul
Korea 137-855

2.1033(c)(2) FCC ID: PGVCB-0801

2.1033(c)(3) Instructions/Installation Manual

Refer to Attachment: Installation and Service manual.

2.1033(c)(4) Types of Emissions

AMPS: F8W, F1D
CDMA: F9W

2.1033(c)(5) Frequency Range

Transmitter: 824 - 849 MHz
Receiver: 869 - 894 MHz

2.1033(c)(6) Range of Operating Power

CDMA: -50dBm to +25.5dBm
AMPS: -50dBm to +26.8dBm

2.1033(c)(7) Maximum Power Rating

CDMA: 0.355 Watts (25.5dBm)
AMPS: 0.478 Watts (26.8dBm)

2.1033(c)(8) Applied voltages and currents into the final transistor elements

3.4 to 4.3 Volts DC, 0.5 Amps into IC U515

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2.1033(c)(9) Tune-up/Optimization Procedure

Refer to Attachment: Installation and Service manual.

2.1033(c)(10) Complete Circuit Diagrams and Functional Block Diagram

Refer Attachment: Schematics and Parts list.
.

2.1033(c)(10a) Means for Frequency Stabilization

A high quality TCXO (temperature compensated crystal oscillator, please refer to attached data sheet for TCXO spec) has been used in the PLLVCO circuit to generate the low drift precise reference frequency. To further reduce the frequency error the "Frequency Tracking Loop" of MSM3000 chip will perform a fine adjustment to the Rx and Tx UHF and IF frequency by adjusting the TCXO oscillator in the Mobile Station. The CDMA and DFM frequency-tracking loop reduce IF an UHF frequency error. The Base Station supplies the frequency reference information to adjust the Mobile Station. When frequency error is detected, a variable tuning voltage is fed back to the TCXO crystal oscillator via the TRK_LO_ADJ PDM output. After RC filtering, a DC tuning voltage is applied to the TCXO crystal oscillator's control voltage input. The voltage controlled TCXO oscillator adjusts its frequency of oscillation accordingly.

2.1033(c)(10b) Means for Limiting Modulation

A device is incorporated into the MSM3000 chip that limits any modulation in excess of 100%. This device precedes the modulator of the transmitter. It is instantaneous in action for controlling the modulation wave introduced into the transmitters frequency modulator.

2.1033(c)(10c) Means for Limiting Power

AGC circuit

2.1033(c)(11)Equipment Identification

A drawing of the equipment identification nameplate appears under Attachment: PROPOSED FCC ID LABEL FORMAT.

2.1033(c)(12)Photographs

Photographs of the equipment, internal and external views, are found in the Attachment: EUT Photographs.

2.1033(c)(13) Description of Digital Modulation Techniques

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OQPSK

2.1033(c)(14) Standard Test Conditions

The transmitter was tested under the following conditions:

Room Temperature: 24 - 27 °C
Relative Humidity: 55 - 60%
DC Supply Voltage: 3.7VDC
The transmitter was aligned and tuned up according to manufacturer's alignment procedure, prior to testing. All data presented represents the worst case parameter being measured.

2.1033 Description of Various Base Station Configurations

Not applicable.

2.1033 Use of Various Power Supplies

Not applicable.

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2. REQUIREMENTS OF PROVISION

2.1. GENERAL TECHNICAL REQUIMENTS

a). Section 15.107 – Conducted Emission for digital device
b). Section 15.109 – Radiated Emission for digital device
c). Section 22.355 – Frequency Stability
d). Section 22.913 – Output Power
e). Section 22.915 – Modulation Requirement
f). Section 22.917 – Emission Limit for Cellular
g). Section 22.919 – Electronic Serial Number Protection
h). Section 22.921 – Dial 911- Call processing
i). Section 22.933 – Cellular System Compatibility reference OET Bull. 53
j). Section 2.1093 – SAR limit

2.2. MEASUREMENTS REQUIRED

a). RF Output Power
For transmitters, the power output shall be measured either directly on the antenna output terminal or by using substitution method depends on the antenna mount method.

b). Modulation Characteristics
For Voice Modulated Communication Equipment, a curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be submitted.

c). Occupied Bandwidth
Other than single sideband or independent sideband transmitter when modulated by a 2500 Hz tone at an input level 16 dB greater than that necessary to produce 50 percent modulation.

d). Spurious Emissions at Antenna Terminals
The radio frequency voltage or power generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminal when properly loaded.

e). Field Strength of Spurious Emission
Measurement shall be made to detect spurious emission that may be radiated directly from the cabinet, control circuit, power leads, or intermediate circuit elements under normal condition of installation and operation.

f). Frequencies Stability
- The frequency stability shall be measured with variation of the ambient temperature.

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- The frequency stability shall be measured with variation of primary supply voltage or reduce DC power value to Battery-End-Point.

2.3. LABELING REQUIREMENT

Each equipment for which a type acceptance application is filed on or after May 1, 1981 shall bear an identification plate or label pursuant to section 2.925 (Identification of equipment) and section 2.926 (FCC Identifier).

2.4. USER INFORMATION

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for the compliance could void the user's authority to operate the equipment.

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3. TEST FACILITY

3.1. TEST METHODOLOGY

Both conducted and radiated testing were performed according to the procedures documented on chapter 13 of ANSI C63.4 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057.

3.2. TEST FACILITY

The open area test sites and conducted measurement facilities used to collect the radiated data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

3.3. ACCREDITATION AND LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code:200065-0 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government. In addition, the test facilities are listed with Federal Communications Commission (reference no: 31040/SIT (1300B3) and 31040/SIT(1300F2))

3.4. MEASURING INSTRUMENT CALIBRATION

The measuring equipment which was utilized in performing the tests documented herein has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment which is traceable to recognized national standards.

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------ *PART 15 TEST RESULT* -------

TEST EQUIPMENT:

TEST EQUIPMENTS LIST				
Name of Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Due Date**
Spectrum Analyzer	HP100Hz - 22GHz	8566B	2140A01296	5/4/02
Spectrum Display	HP	85662A	2152A03066	5/10/02
Quasi-Peak Detector	HP9K - 1GHz	85650A	2811A01335	5/4/02
RF Preselector	HP20Hz-2GHz	85685A	2817A00756	5/4/02
Antenna, BiLog	Chase EMC Ltd.30 - 2000MHz	CBL6112	2049	12/11/01
EMI Test Receiver	Rohde & Schwarz	ESHS 20	827129/006	4/2/02
LISN	Fischer 9k - 100MHz	FCC-LISN-50/250-25-2	114	7/5/01
Line Filter	Lindgren 10k - 10GHz	LMF-3489	497	N.C.R.

SUPPORT EQUIPMENT:

Following is the list all supporting equipment and/or peripherals needed to make the Equipment Under Test (EUT) function properly. For equipment undergoing FCC Pt. 15 Class B testing please include all internal boards, as well as external peripherals, indicating either DoC or the FCC ID. Attach separate sheet of paper if necessary.

TEST PERIPHERALS				
Device Type	**Manufacturer**	**Model Number**	**Serial Number**	**FCC ID**
PC	WYLE INT.	SR440BX	CCS # 01357	DoC
MONITOR	NOKIA	920C	CCS # 00973	DoC
KEYBOARD	HP	P/N: 5183-7399	B94902206	DoC
MOUSE	ACER	P/N: 90.AB362.003	80241954	EMJMUSJQ
PRINTER	HP	2225C	2930S52630	DSIX6XU2225

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TEST I / O CABLES								
Cable No	I/O Port	# of I/O Port	Connector Type	Type of Cable	Cable Length	Data Traffic	Bundled	Remark
1	mouse	1	PS/2	Un-shielded	1.8m	Yes	No	N/A
2	keyboard	1	PS/2	Shielded	1.7m	Yes	No	N/A
3	VGA	1	DSUB15	Shielded	1.6m	Yes	Yes	Ferrite on both ends of cable
4	RS232	1	SERIAL	Shielded	1.6m	Yes	Yes	N/A
5	printer	1	PARALLEL	Shielded	1.0m	No	No	N/A
6	DC power	1	permanent	Un-shielded	2.0m	No	Yes	N/A
7	AC	1	US 115V	Un-shielded	2m	No	No	N/A
8	AC	1	US 115V	Un-shielded	1.8m	No	No	N/A
9	AC	1	US 115V	Un-shielded	1.8m	No	No	N/A
10	AC	1	US 115V	Un-shielded	2m	No	Yes	N/A

AMBIENT CONDITION: (AT THE TIME OF FINAL TESTS)

	Radiated Emission	Conducted Emission
Temperature	29° C	25° C
Humidity	**55%**	**60%**

FREQUENCY RANGED INVETIGATED:

CONDUCTED EMISSIONS:	**450KHz TO 30MHz**
RADIATED EMISSIONS:	**30MHz TO 1GHz**

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4. RADIATED EMISSION

TEST RESULT SUMMARY:

PRELIMINARY RADIATED EMISSION TESTS:

Preliminary Radiated Emission Test			
Mode of operation	Date	Data Report No.	Worst Mode
IDLE	**8/14/01**	**010814A1**	☒

Final Radiated Emission Test

COMPLIANCE Certification Services

FCC, VCCI, CISPR, CE, AUSTEL, NZ
UL, CSA, TUV, BSMI, DHHS, NVLAP

561F MONTEREY ROAD, SAN JOSE, CA 95037-9001
PHONE: (408) 463-0885 FAX: (408) 463-0888

Project #: 01I0909-1
Report #: 010814A1
Date& Time: 08/14/01 8:28 AM
Test Engr: KERWIN CORPUZ

Company: CYBERBANK CORPORATION
EUT Description: 800MHz CDMA/AMPS DUAL MODE CELLPHONE(CB-0801US)
Test Configuration : EUT/PC/MONITOR/KB/MOUSE/PRINTER
Type of Test: FCC CLASS B
Mode of Operation: IDLE

(•) A-Site ( ) B-Site ( ) C-Site ( ) F-Site [6 Worst Data] [Descending]

Freq. (MHz)	Reading (dBuV)	AF (dB)	Closs (dB)	Pre-amp (dB)	Level (dBuV/m)	Limit FCC_B	Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter)	Mark (P/Q/A)
BROADBAND EMISSION: 100 - 235 MHz											
125.50	21.60	13.17	1.53	0.00	36.30	43.50	-7.20	3mV	225.00	1.00	P
101.87	19.70	12.57	1.32	0.00	33.59	43.50	-9.91	3mV	225.00	1.00	P
183.35	19.80	10.45	1.78	0.00	32.03	43.50	-11.47	3mV	270.00	1.00	P
193.24	17.50	10.90	1.85	0.00	30.25	43.50	-13.25	3mV	270.00	1.00	P
197.65	17.60	11.09	1.88	0.00	30.58	43.50	-12.92	3mV	270.00	1.00	P
211.29	17.10	11.94	1.95	0.00	30.99	43.50	-12.51	3mV	270.00	1.00	P
108.16	18.00	12.83	1.38	0.00	32.20	43.50	-11.30	3mH	0.00	2.50	P
110.57	17.00	12.92	1.40	0.00	31.32	43.50	-12.18	3mH	0.00	2.50	P
112.39	15.70	13.00	1.42	0.00	30.11	43.50	-13.39	3mH	0.00	2.50	P
123.98	15.60	13.22	1.52	0.00	30.34	43.50	-13.16	3mH	0.00	2.50	P
170.20	19.60	11.48	1.73	0.00	32.81	43.50	-10.69	3mH	200.00	2.50	P
72.24	19.80	7.35	1.10	0.00	28.25	40.00	-11.75	3mH	200.00	2.50	P
181.92	19.50	10.39	1.77	0.00	31.66	43.50	-11.84	3mH	200.00	2.50	P
197.61	15.90	11.09	1.88	0.00	28.88	43.50	-14.62	3mH	270.00	2.50	P
210.97	15.60	11.92	1.94	0.00	29.47	43.50	-14.03	3mH	270.00	2.50	P
SPOT CHECK X, Y and Z AXIS. X is the worse position.											
SCAN 30 - 1000 MHz, VERTICAL AND HORIZONTAL POLARIZATION											
Total data #: 15											
V.2a											

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5. CONDUCTED EMISSION

Preliminary Conducted Emission Test:

Preliminary Conducted Emission Test			
Mode of operation	Date	Data Report/Plot No.	Worst Mode
IDLE/BATTERY CHARGING	**8/13/01**	**01I0909**	☒

Final Conducted Emission Test:

CONDUCTED EMISSIONS DATA (115VAC 60Hz)

Freq.	Reading			Closs	Limit	FCC_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.48	37.92	--	--	0.00	48.00	--	-10.08	--	L1
0.52	36.64	--	--	0.00	48.00	--	-11.36	--	L1
16.39	39.32	--	--	0.00	48.00	--	-8.68	--	L1
0.67	34.59	--	--	0.00	48.00	--	-13.41	--	L2
0.76	34.32	--	--	0.00	48.00	--	-13.68	--	L2
16.11	35.77	--	--	0.00	48.00	--	-12.23	--	L2
6 Worst Data									

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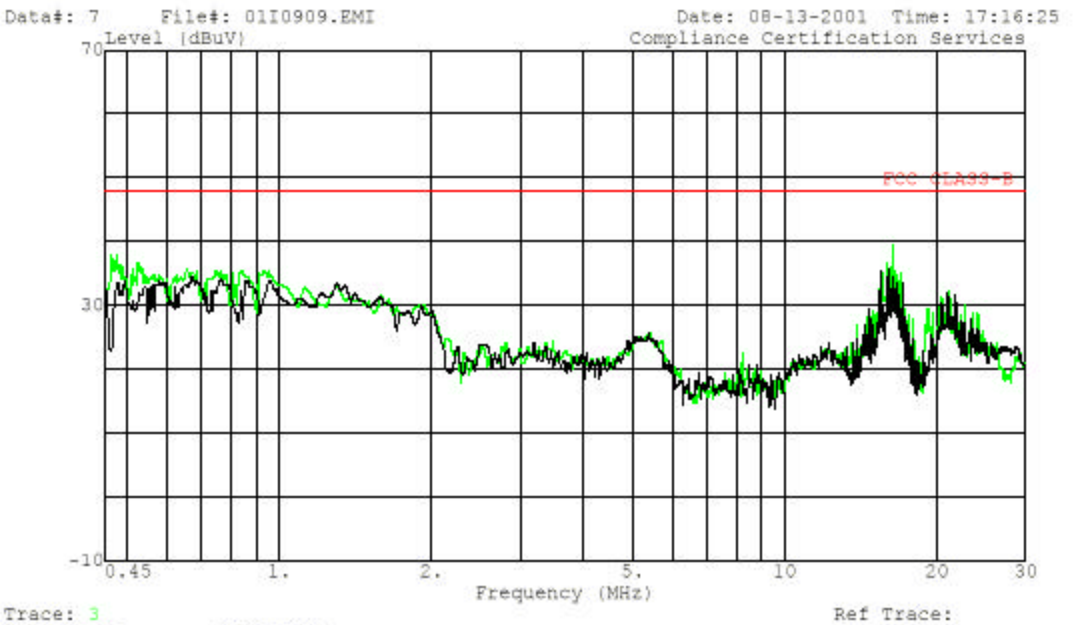
Line Conduction Emissions Plot:

561 F Monterey Road, Route 2
Morgan Hill, CA 95037-9001 USA
Tel: (408) 463-0885
Fax: (408) 463-0888



Trace: 3 Ref Trace:
Project No. : 01I0909-1
Report No. : 010813LC
Test Engr : KERWIN CORPUZ
Company : CYBERBANK CORPORATION
EUT Description : 800MHz CDMA/AMPS DUAL MODE CELLPHONE
Model : CB-0801US
EUT Config. : EUT/PC/MONITOR/KB/MOUSE/PRINTER
Type of Test : FCC CLASS B
Mode of Operation: IDLE/BATTERY CHARGING
: PEAK: L1(Green), L2(Black)
: 115Vac, 60Hz

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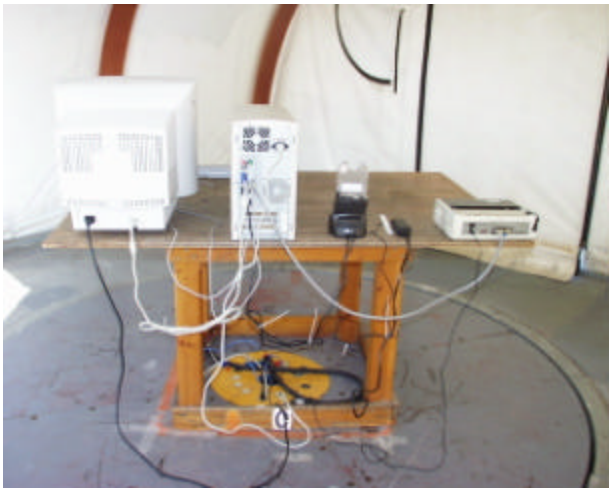
Setup Photos:

Radiated Emissions



Line Conducted Emissions

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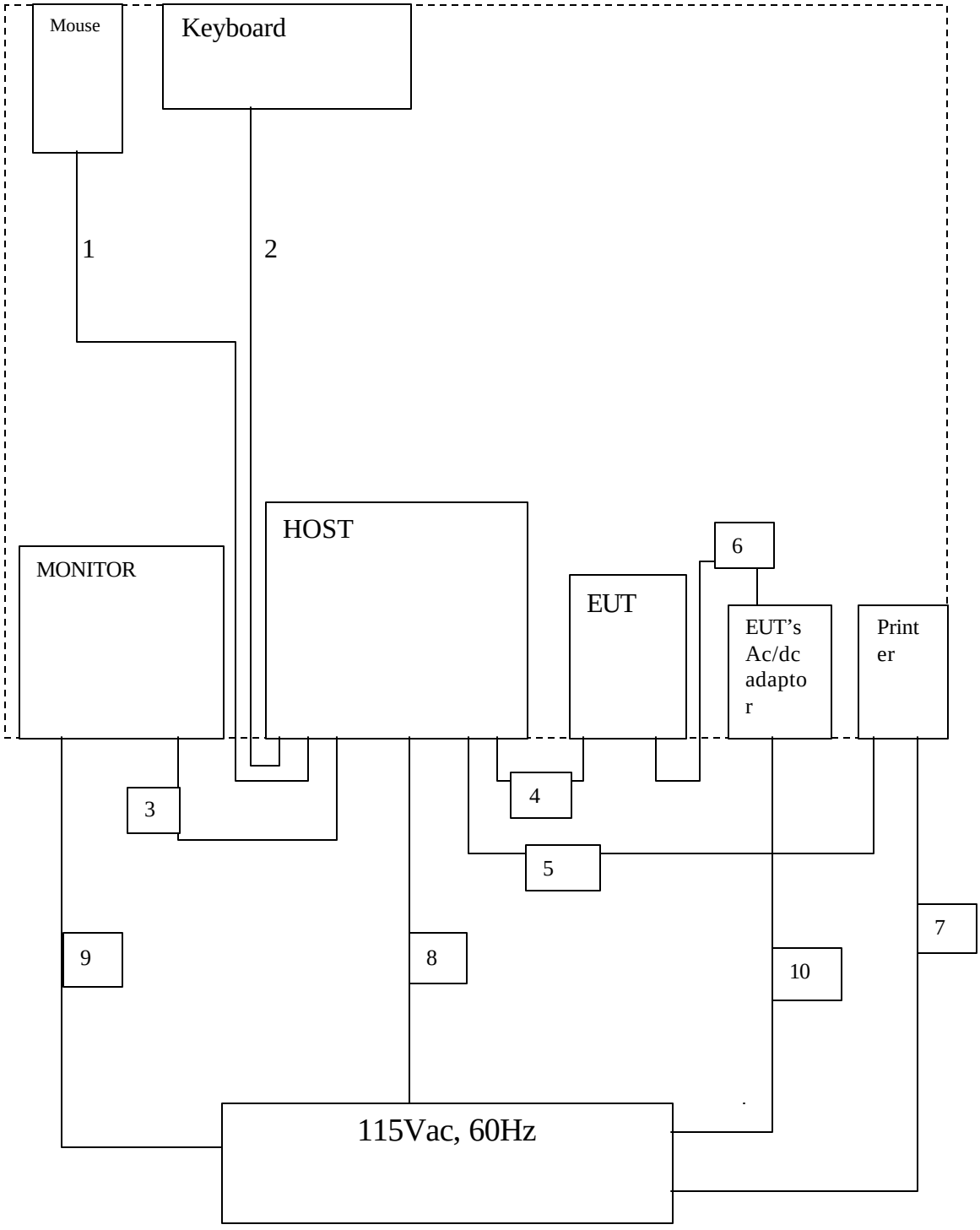
Configuration Block Diagram



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------ *PART 22 TEST RESULT* -------

6. OUTPUT POWER AND HARMONICS EMISSION MEASUREMENT

6.1. PROVISION APPLICABLE

SEC. 22.913 EFFECTIVE RADIATED POWER LIMITS.

According to section 22.913, the output power shall not exceed 7 watts (ERP).

SEC. 22.917 EMISSION LIMITATIONS FOR CELLULAR.

```
    (e) Out of band emissions. The mean power of emissions must be
attenuated below the mean power of the unmodulated carrier (P) on any
frequency twice or more than twice the fundamental frequency by:
at least 43+10 log P dB.
    (h) Measurement procedure. The following spectrum analyzer bandwidth
settings should be used for measurement of spurious emissions:
    (1) In the radiotelephony mode or the supervisory audio tone mode:
    -Not more than 45 kHz removed from the carrier 300 Hz;
    -More than 45 kHz removed from the carrier 30 kHz.
    (2) In Wideband data mode or the signaling tone mode:
    -Not more than 60 kHz removed from the carrier 300 Hz;
    -More than 60 kHz removed from the carrier 30 kHz.
```

6.2. MEASUREMENT PROCEDURE

1). On a test site, the EUT shall be placed on a turntable, and in the position closest to the normal use as declared by the user.

2). The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the frequency of the transmitter.

3). The output of the test antenna shall be connected to the measuring receiver.

4). The transmitter shall be switched on, if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.

5). The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.

6). The transmitter shall than be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.

7). The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.

8). The maximum signal level detected by the measuring receiver shall be noted.

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9). The transmitter shall be replaced by a tuned dipole (substitution antenna).

10). The substitution antenna shall be oriented for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.

11). The substitution antenna shall be connected to a calibrated signal generator.

12). If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.

13). The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.
14). The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.

15). The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.

16). The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.

17). The measure of the effective radiated power is the larger of the two levels recorded, at the input to the substitution antenna, corrected for the gain of the substitution antenna if necessary.

18). Repeat above substitution measurement procedure for fundamental and all harmonica emissions.

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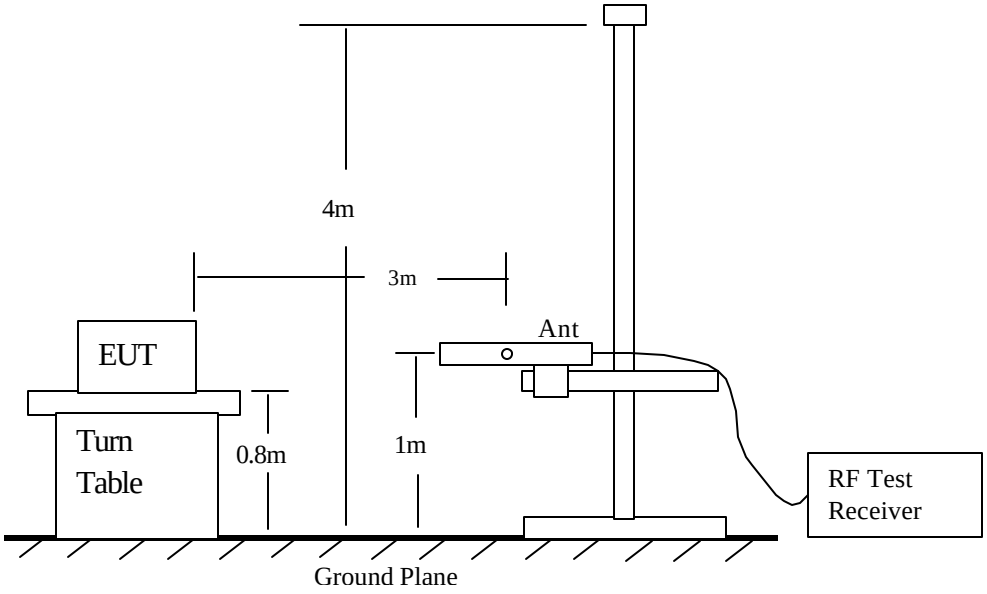

Fig 1: Radiated Emission Measurement 30 to 1000 MHz

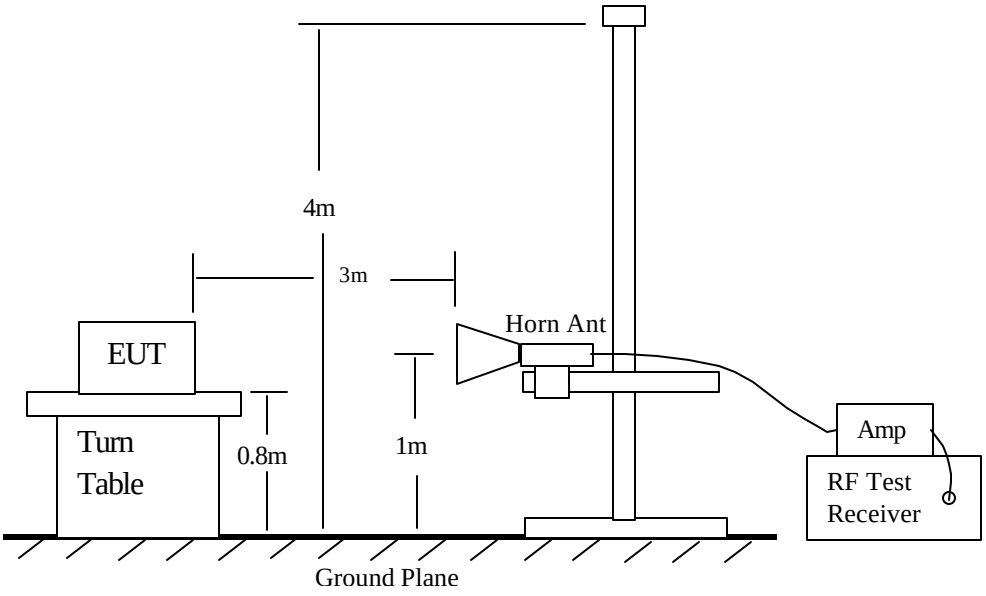

Fig 2: Radiated Emission Above 1000 MHz

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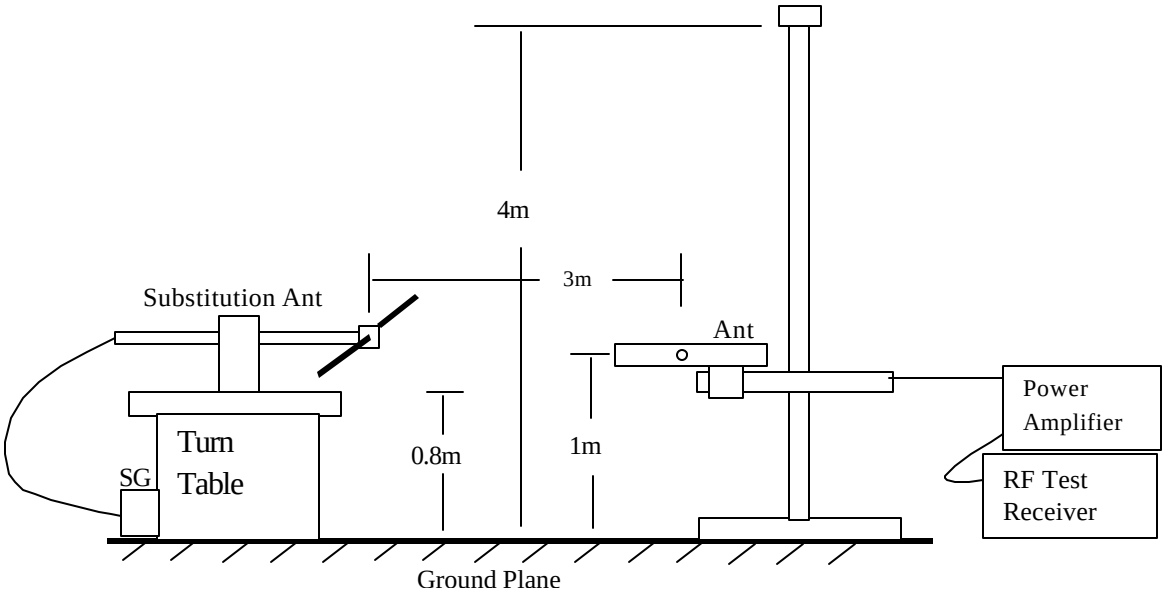

Fig 3: Radiated Emission – Substitution Method setup

6.3. OUTPUT POWER TEST EQUIPMENT

EQUIPMENT	MANUFACTURE	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Spectrum Analyzer	HP	8566B	2140A01296	05/04/02
RF Preselector	HP	856854A	2817A00756	05/04/02
Bilog Antenna	CHASE EMC LTD	CBL6112	2049	12/11/01
Dipole Antenna	COMPLIANCE DESIGN	ROBERTS	116	5/5/02
Power Amplifier	MINI CIRCUITS	ZHL-42W	D072701-5	N/A
RF Synthesizer	HP	83732B	US34490599	2/11/02

6.4. MEASUREMENT RESULT

6.4.1. Conducted Power Output

AMPS MODE MAXIMUM OUTPUT: 478 mW (26.8dBm)
CDMA MODE MAXIMUM OUTPUT: 355 mW (25.5dBm)

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6.4.2. Radiated Power Output

Compliance Certification Services

Radiated Power (ERP) 8/14/01
22.913(a) A-Site (3 meter)
Kerwin Corpuz

CYBERBANK CORPORATION
800MHz CDMA/AMPS Dual Mode Cell Phone (CB-0801US)

***** *AMPS* *****

frequency (MHz)	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	ERP (dBm)	Limit (dBm)	Margin (dB)
fundamental (LOW)							
824.64V	90.3	24	0.2	-1.5	22.3	38.45	-16.15
824.64H	90.5	24.2	0.2	-1.5	22.5	38.45	-15.95
fundamental (MID)							
836.52V	90.5	24.3	0.2	-1.5	22.6	38.45	-15.85
836.52H	90.4	24.2	0.2	-1.5	22.5	38.45	-15.95
fundamental (HI)							
848.37V	90.5	24.4	0.2	-1.5	22.7	38.45	-15.75
848.37H	90.1	24	0.2	-1.5	22.3	38.45	-16.15

Spot Check X, Y and Z AXIS of EUT. Worse case position X axis.
NOTE: H=horizontal and V=vertical
SA: Spectrum Analyzer
SG: Signal Generator
CL: cable loss (6ft) N TYPE
Gain (dBi): EUT's antenna

EPR = SG reading - CL + Gain (dBi)
Margin = EPR - Limit

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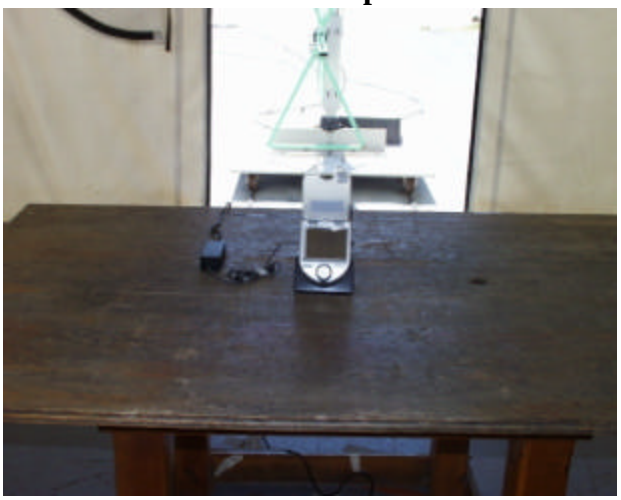
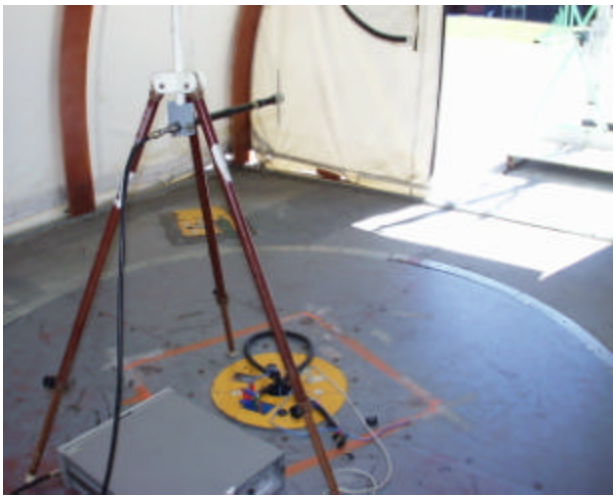
Setup Photos:

Power Output



Substitution Method



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7. MODULATION CHARACTERISTICS

7.1. PROVISIONS APPLICABLE

SEC. 2.1047 MODULATION CHARACTERISTICS.

For Voice Modulated Communication Equipment, the frequency response of the audio modulation circuit over a range of 100 to 5000 Hz shall be measured.

IS98a CDMA/AMPS STANDARD.

AMPS Cellular Phone that transmits emission type F1D and F8W must not exceed a peak frequency deviation of ± 12 KHz, CDMA Cellular Phone that transmits emission type F1D must not exceed a peak frequency deviation of ± 8 KHz.

7.2. MEASUREMENT METHOD

7.2.1. Modulation Limit

1). Configure the EUT as shown in figure 4, adjust the audio input for 60% of rated system deviation at 1 KHz using this level as a reference (0 dB) and vary the input level from -20 to +20 dB. Record the frequency deviation obtained as a function of the input level.

2). Repeat step 1 with input frequency changing to 300, 1004, and 2500 Hz in sequence.

7.2.2. Audio Frequency Response

1). Configure the EUT as shown in figure 4.

2). Adjust the audio input for 20% of rated system deviation at 1 KHz using this level as a reference (0 dB).

3). Vary the Audio frequency from 100 Hz to 10 KHz and record the frequency deviation.

4). Audio Frequency Response = 20 $\log_{10}$ (Deviation of test frequency / Deviation of 1KHz reference).

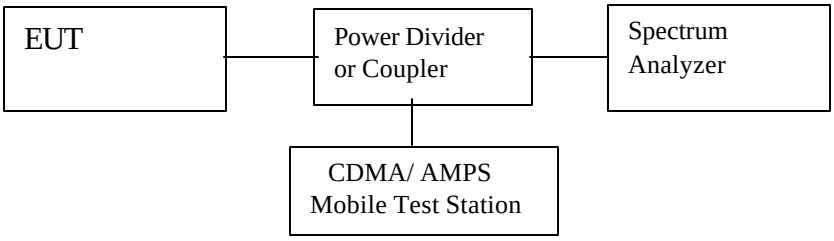

Figure 4: Modulation characteristic measurement configuration

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7.3. MEASUREMENT INSTRUMENT

EQUIPMENT	MANUFACTURE	MODEL NO.	CAL. DUE DATE
CDMA Mobile Test Station	HP	8924C	02/13/2003
Power Divider	MINI CIRCUITS	ZFSC-2-2500	NA
Attenuator	MINI CIRCUITS	MCL BW-S20W2	NA

7.4. MEASUREMENT RESULT

a). Modulation Limit: Channel # 29 - 825.87 MHz

Modulation Level (dB)	Peak Freq. Deviation At 300 Hz (KHz)	Peak Freq. Deviation At 1004 Hz (KHz)	Peak Freq. Deviation At 1500 Hz (KHz)	Peak Freq. Deviation At 2500 Hz (KHz)
-20	2.7	3.51	3.83	5.01
-15	2.81	3.51	4.42	5.92
-10	2.91	4.06	5.25	7.23
-5	3.01	4.8	6.22	8.02
0	3.21	5.75	7.58	8.38
+5	3.5	6.87	8.5	8.6
+10	3.77	8.47	8.99	8.82
+15	6.75	9.81	9.24	8.82
+20	10.56	10.49	9.06	8.85

b). Modulation Limit: Channel # 384 - 836.52 MHz

Modulation Level (dB)	Peak Freq. Deviation At 300 Hz (KHz)	Peak Freq. Deviation At 1004 Hz (KHz)	Peak Freq. Deviation At 1500 Hz (KHz)	Peak Freq. Deviation At 2500 Hz (KHz)
-20	2.31	3.56	4.65	6.49
-15	2.4	4.19	5.56	7.77
-10	2.51	5.02	6.66	8.31
-5	2.64	6.08	7.97	8.55
0	2.88	7.44	8.71	8.78
+5	3.17	8.92	9.09	9.01
+10	5.41	10.06	9.41	9.05
+15	10.13	8.10	8.53	9.07
+20	8.3	8.02	8.17	9.02

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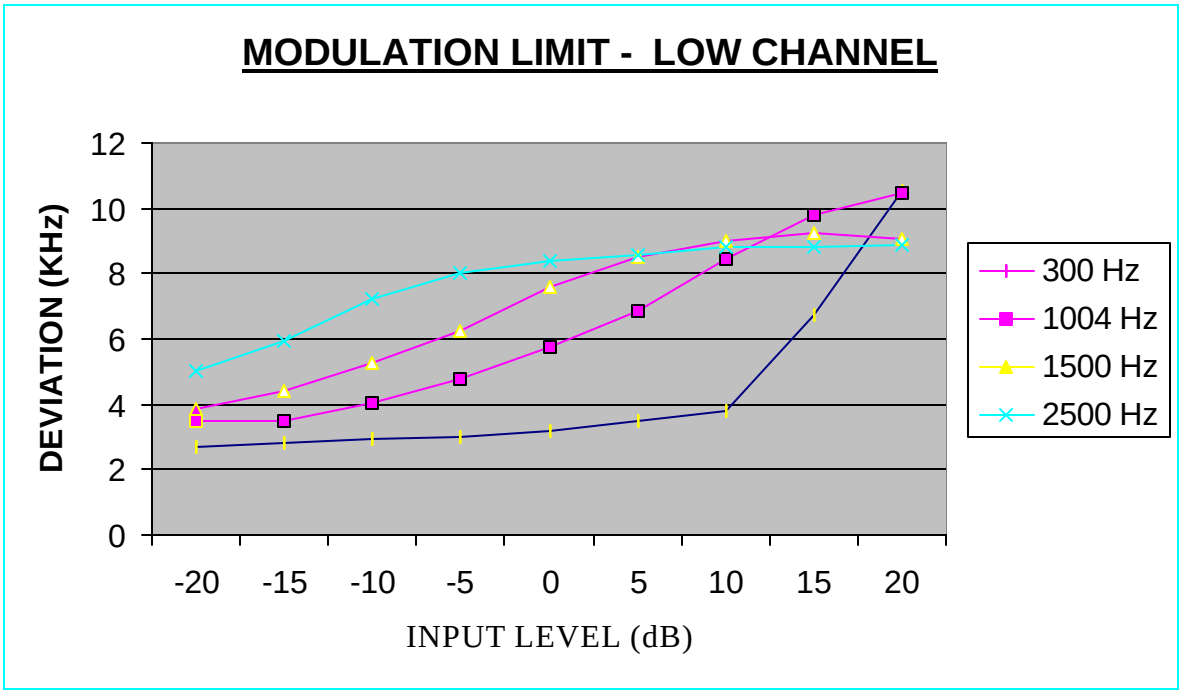
c). Modulation Limit: Channel # 770 – 848.10 MHz

Modulation Level (dB)	Peak Freq. Deviation At 300 Hz (KHz)	Peak Freq. Deviation At 1004 Hz (KHz)	Peak Freq. Deviation At 1500 Hz (KHz)	Peak Freq. Deviation At 2500 Hz (KHz)
-20	2.38	3.76	4.51	6.27
-15	2.44	4.33	5.32	7.55
-10	2.54	5.1	6.44	8.12
-5	2.68	6.0	7.87	8.39
0	2.89	7.17	8.65	8.56
+5	3.13	8.67	9.01	8.86
+10	5.33	9.88	9.27	8.87
+15	10.01	8.04	8.43	8.88
+20	8.17	7.94	8.06	8.90



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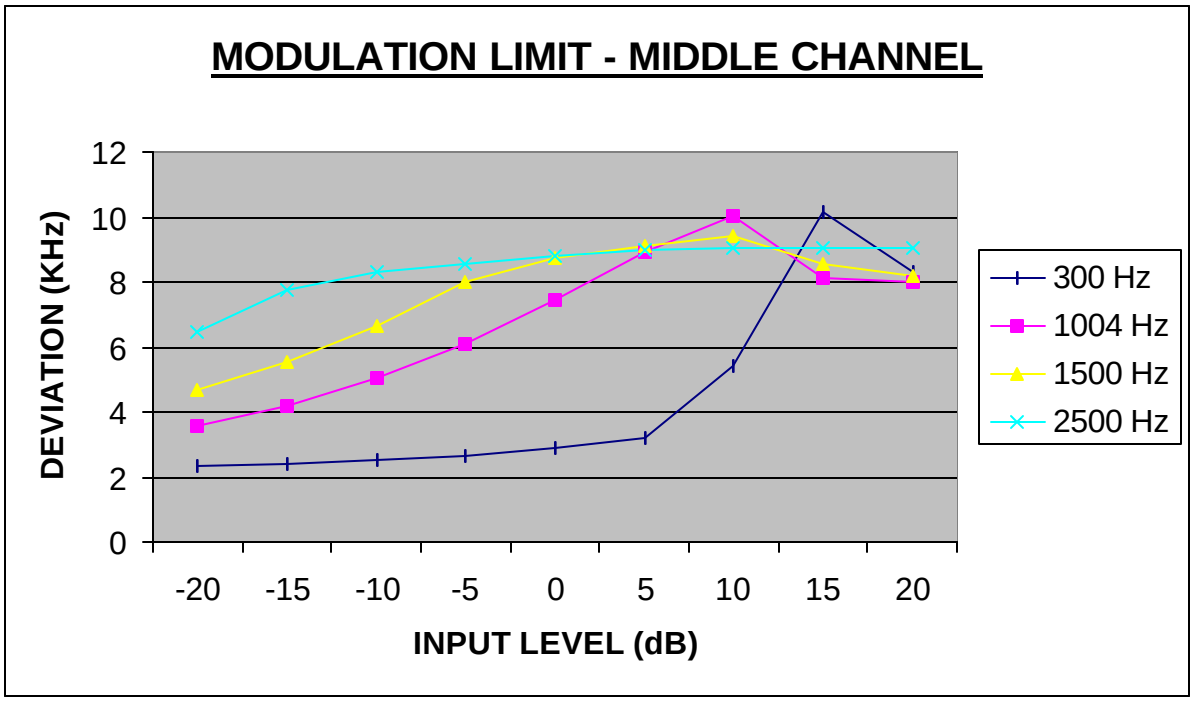

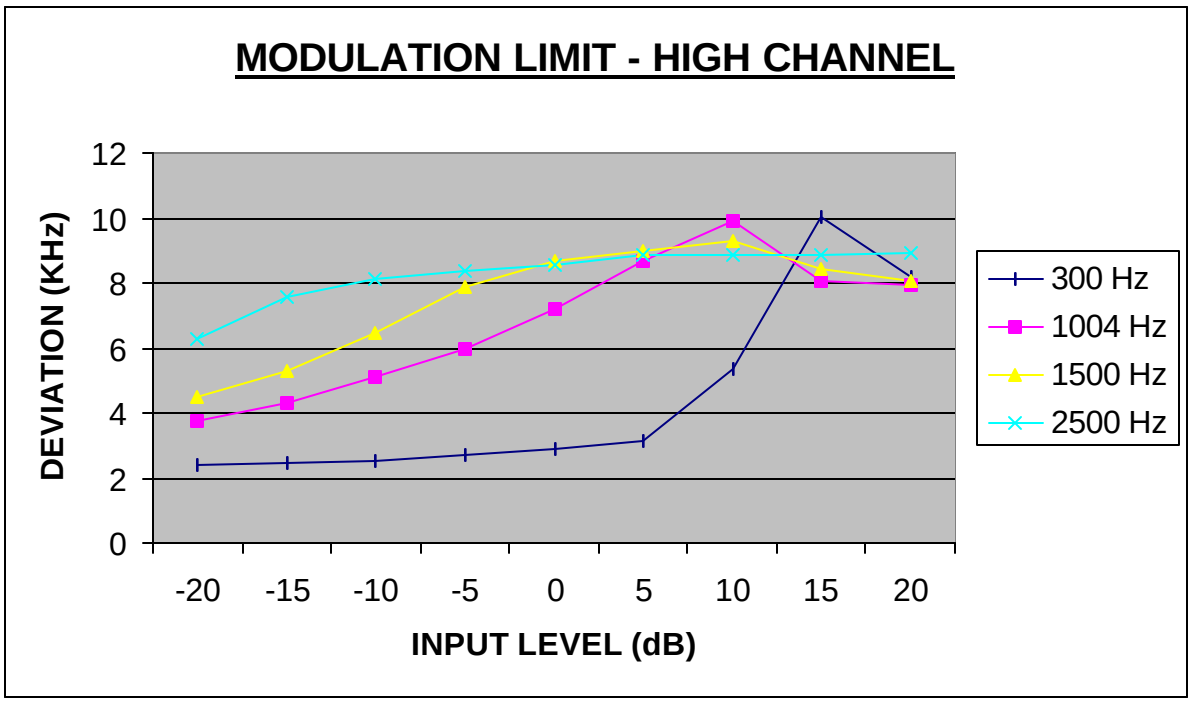

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d). Audio Frequency Response: Middle Channel #384 – 836.52 MHz

Frequency (Hz)	Deviation (KHz)
100	2.17
200	2.1
300	2.54
400	3.23
500	3.67
600	4.2
700	4.78
800	5.27
900	5.79
1000	6.27
1200	8.05
1400	9.36
1600	10.4
1800	10.8
2000	10.73
2200	10.69
2400	10.76
2600	10.65
2800	9.89
3000	7.89
3200	7.4
3400	5.89
3600	3.59
3800	2.38
4000	2.42
4200	2.41
4400	2.44
4600	2.46
4800	2.66
5000	2.53

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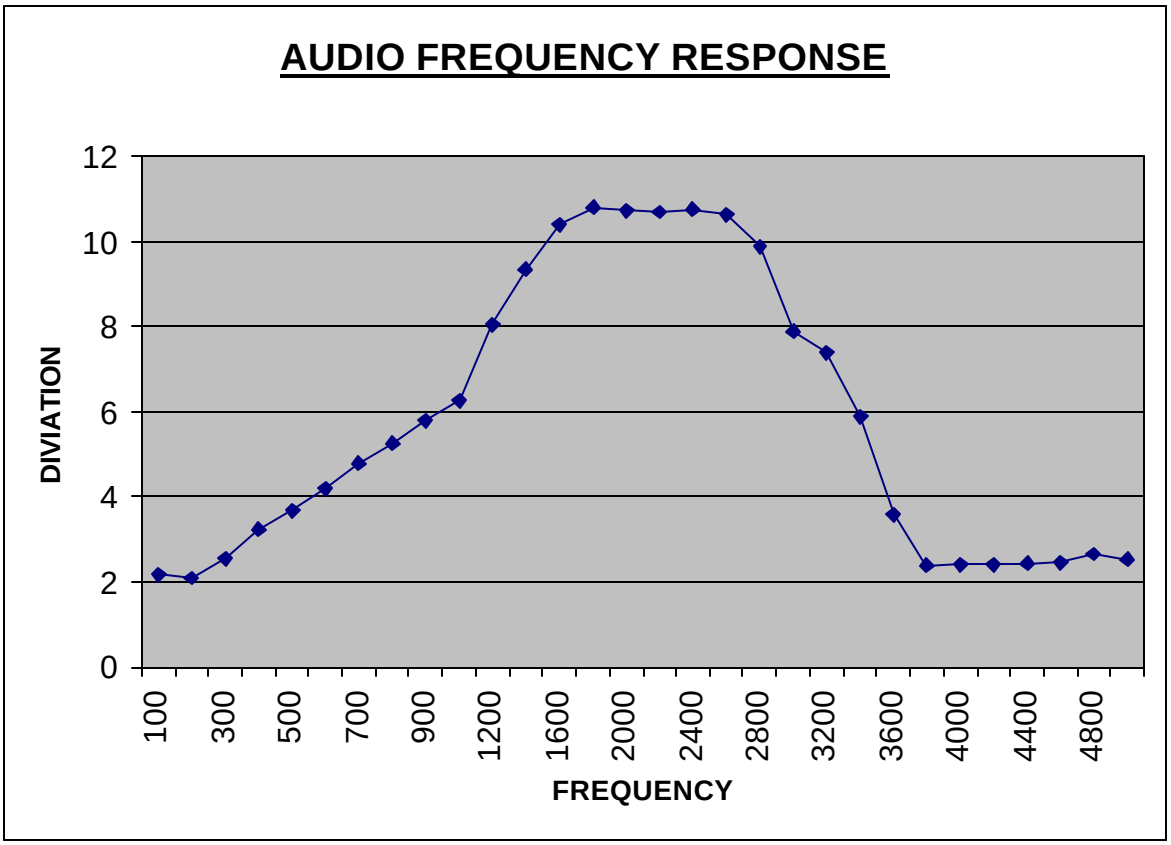

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8. EMISSION BANDWIDTH AND EMISSION MASK

8.1. PROVISIONS APPLICABLE

SEC. 22.917 EMISSION LIMITATIONS FOR CELLULAR.

The rules in this section govern the spectral characteristics of emissions in the Cellular Radiotelephone Service.

(a) Analog radiotelephony emissions. F3E emissions must be used only on the communication channels.

(b) F3E/F3D emission mask for use with audio filter. For F3E and F3D emissions, except as provided in paragraph (c) of this section, the mean power of emissions must be attenuated below the mean power of the unmodulated carrier wave (P) as follows:

(1) On any frequency removed from the carrier frequency by more than 20 kHz but not more than 45 kHz:
at least 26 dB;

(2) On any frequency removed from the carrier frequency by more than 45 kHz, up to the first multiple of the carrier frequency:
at least 60 dB or 43 + 10 log P dB, whichever is the lesser attenuation.

(c) Alternative F3E/F3D emission mask. For F3E and F3D emissions, transmitters may comply with the emission limitations in this paragraph in lieu of compliance with paragraph (b) of this section and the audio filter requirement of Sec. 22.915.

(1) The mean power of any emission removed from the carrier frequency by a displacement frequency (f<INF>d</INF> in kHz) must be attenuated below the mean power of the unmodulated carrier (P) as follows:

(i) On any frequency removed from the carrier frequency by more than 12 kHz but not more than 20 kHz:
at least 117 log (f<INF>d</INF><divide>12) dB;

(ii) On any frequency removed from the carrier frequency by more than 20 kHz, up to the first multiple of the carrier frequency:
at least 100 log (f<INF>d</INF><divide>11) dB or 60 dB or 43 + 10 log P dB, whichever is the lesser attenuation;

(2) For mobile stations, modulating signals other than the supervisory audio tone in the frequency range of 5.9 to 6.1 kHz must be attenuated, relative to the level at 1 kHz, at least 35 dB.

(d) F1D emission mask. For F1D emissions, the mean power of emissions must be attenuated below the mean power of the unmodulated carrier (P) as follows:

(1) On any frequency removed from the carrier frequency by more than 20 kHz but not more than 45 kHz:
at least 26 dB;

(2) On any frequency removed from the carrier frequency by more than 45 kHz but not more than 90 kHz:
at least 45 dB;

(3) On any frequency removed from the carrier frequency by more than 90 kHz, up to the first multiple of the carrier frequency:
at least 60 dB or 43+10 log P dB, whichever is the lesser attenuation.

(e) Out of band emissions. The mean power of emissions must be attenuated below the mean power of the unmodulated carrier (P) on any frequency twice or more than twice the fundamental frequency by:
at least 43+10 log P dB.

(f) Mobile emissions in base frequency range. The mean power of any

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```
emissions appearing in the base station frequency range from cellular
mobile transmitters operated must be attenuated to a level not to exceed
-80 dBm at the transmit antenna connector.
    (g) Interference from spurious emissions. If any emission from a
transmitter operating in this service results in interference to users
of another radio service, the FCC may require a greater attenuation of
that emission than specified in this section.
    (h) Measurement procedure. The following spectrum analyzer bandwidth
settings should be used for measurement of spurious emissions:
    (1) In the radiotelephony mode or the supervisory audio tone mode:
    -Not more than 45 kHz removed from the carrier 300 Hz;
    -More than 45 kHz removed from the carrier 30 kHz.
    (2) In the wideband data mode or the signaling tone mode:
    -Not more than 60 kHz removed from the carrier 300 Hz;
    -More than 60 kHz removed from the carrier 30 kHz.
```

8.2. MEASUREMENT METHOD

a). Check the calibration of the measurement instrument using either an internal calibrator or a known signal from an external generator.

b). Set-up the test equipments as shown in the following Figure (5).

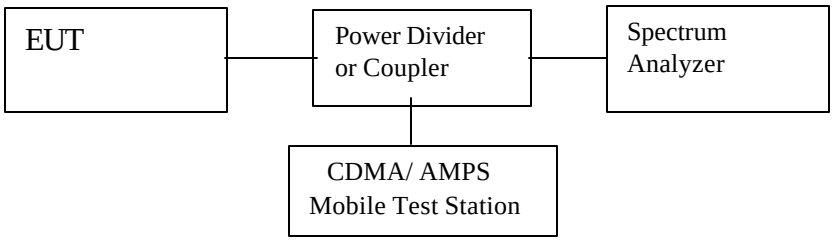

Figure 5: Emission Bandwidth measurement configuration

c). Set the level of audio signal generator to obtain 16 dB greater than required for the rated 50% modulation.

d). The occupied bandwidth is measured with the spectrum analyzer set at 5 KHz/div scan and 10 dB/div.

8.3. MEASUREMENT INSTRUMENT

EQUIPMENT	MANUFACTURE	MODEL NO.	CAL. DUE DATE
Spectrum Analyzer	HP	8593EM	06/20/02
CDMA Mobile Test Station	HP	8924C	11/20/2002
Power Divider	MINI CIRCUITS	ZFSC-2-2500	NA

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8.4. MEASUREMENT RESULT

For emission bandwidth and emission mask measurement results please refer to the following plots.

CDMA	PLOT NO.
LOW channel occupied bandwidth (-20dBm)	1
Out of Band (30 MHz – 2.9 GHz)	2
Out of Band (2.9 – 9 GHz)	3
MID channel occupied bandwidth (-20dBm)	4
Out of Band (30 MHz – 2.9 GHz)	5
Out of Band (2.9 – 9 GHz)	6
HIGH channel occupied bandwidth (-20dBm)	7
Out of Band (30 MHz – 2.9 GHz)	8
Out of Band (2.9 – 9 GHz)	9
AMPS	
LOW channel Unmodulated	10
LOW channel with Signaling Tone	11
LOW channel with Wideband Data	12
LOW channel with Supervisory Audio Tone	13
LOW channel with Supervisory Audio Tone + Voice	14
LOW channel with Voice	15
Out of Band (30 MHz – 2.9 GHz)	16
Out of Band (2.9 – 9 GHz)	17
MID channel Unmodulated	18
MID channel with Signaling Tone	19
MID channel with Wideband Data	20
MID channel with Supervisory Audio Tone	21
MID channel with Supervisory Audio Tone + Voice	22
MID channel with Voice	23
Out of Band (30 MHz – 2.9 GHz)	24
Out of Band (2.9 – 9 GHz)	25
HIGH channel Unmodulated	26
HIGH channel with Signaling Tone	27
HIGH channel with Wideband Data	28
HIGH channel with Supervisory Audio Tone	29
HIGH channel with Supervisory Audio Tone + Voice	30
HIGH channel with Voice	31
Out of Band (30 MHz – 2.9 GHz)	32
Out of Band (2.9 – 9 GHz)	33
Mobile Emissions in Base Frequency Range	34

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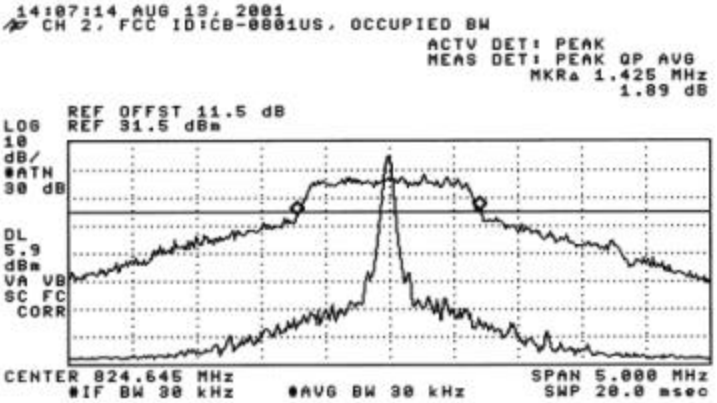

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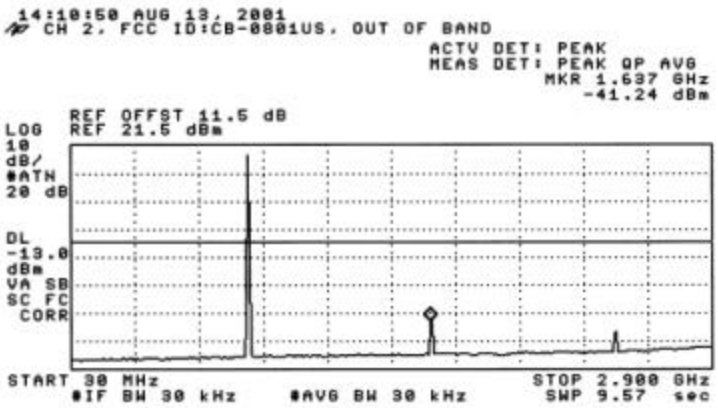

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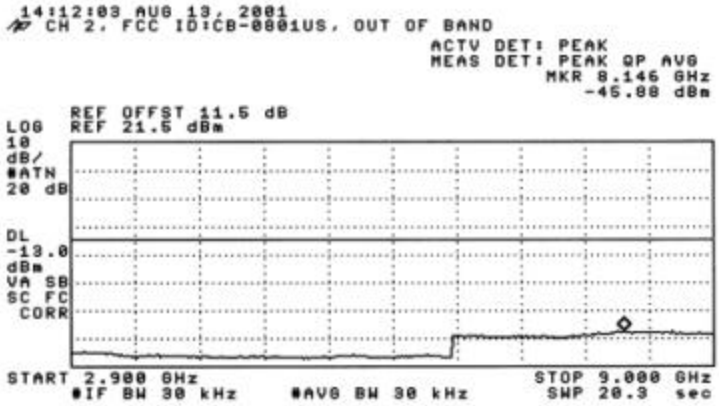

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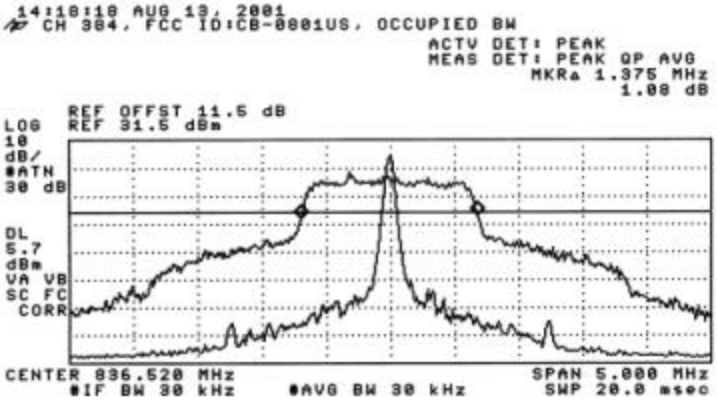

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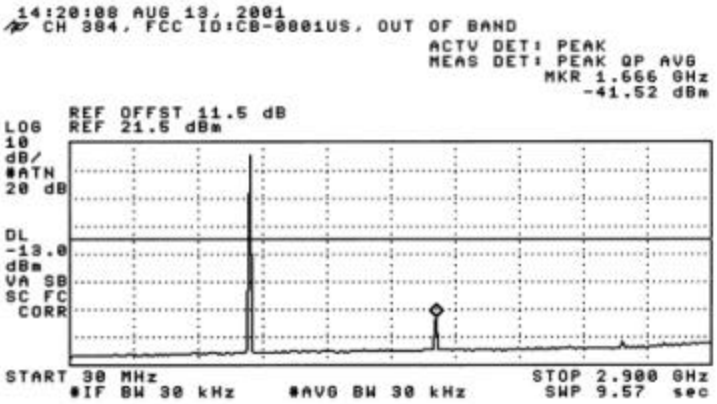

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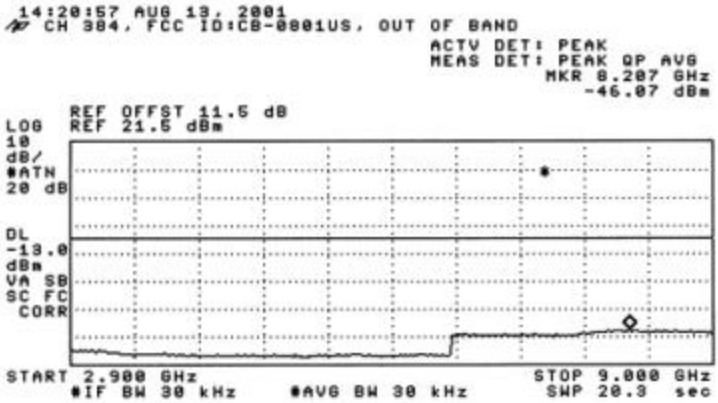

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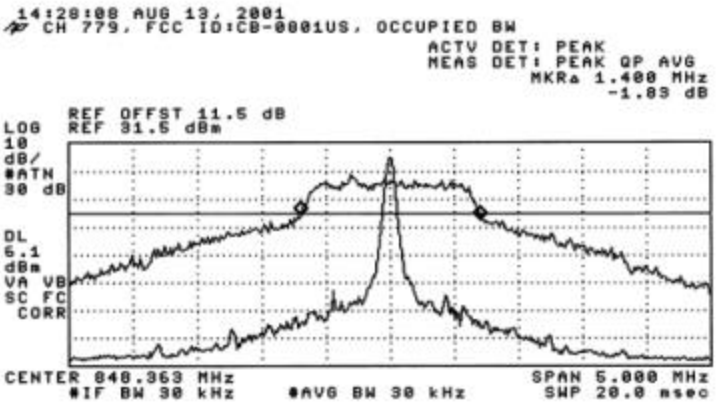

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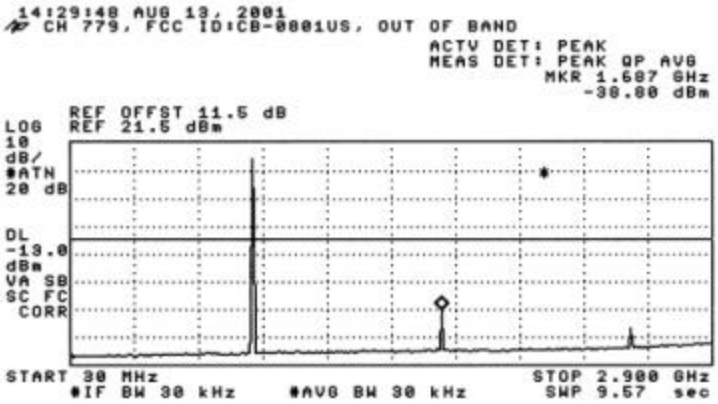

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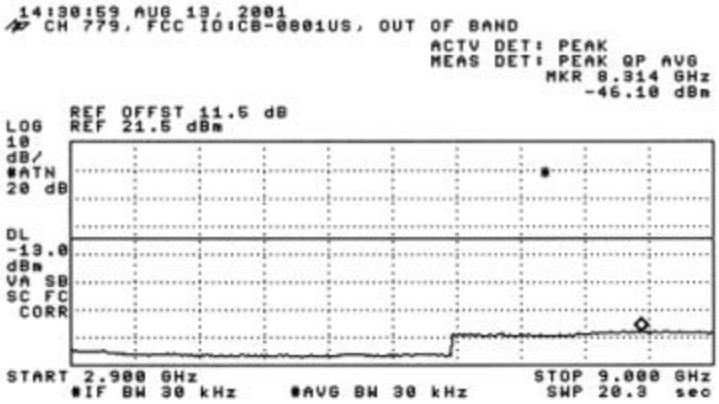

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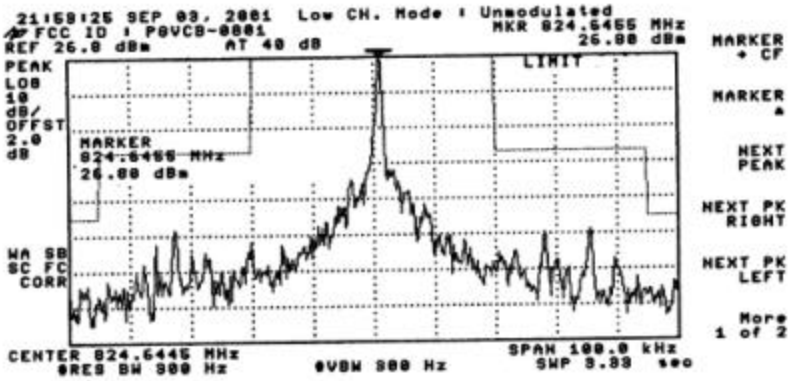

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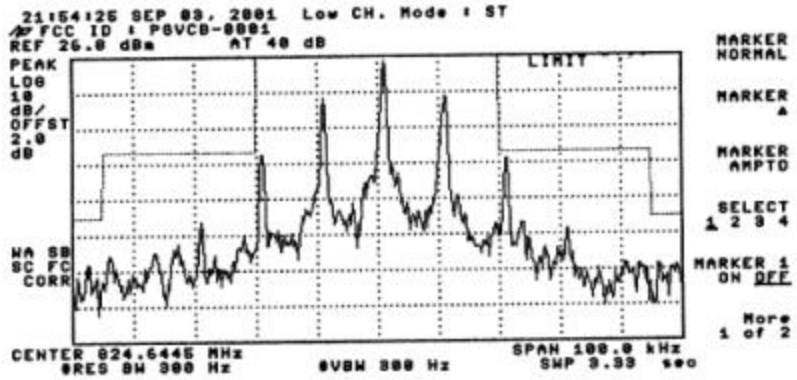

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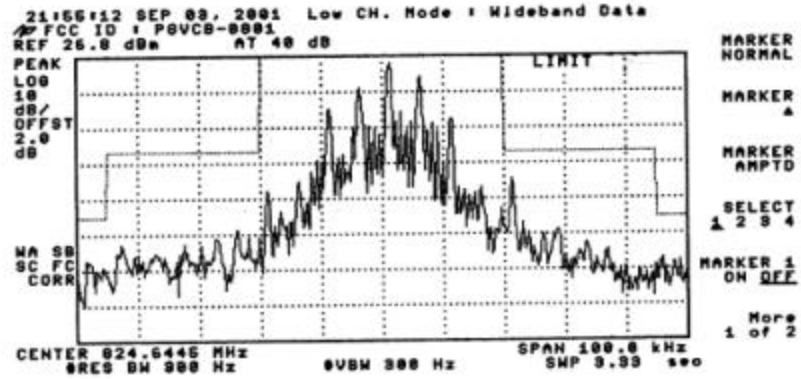

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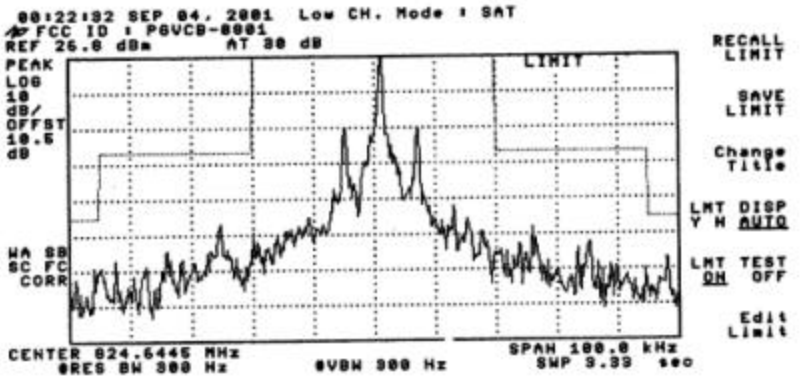

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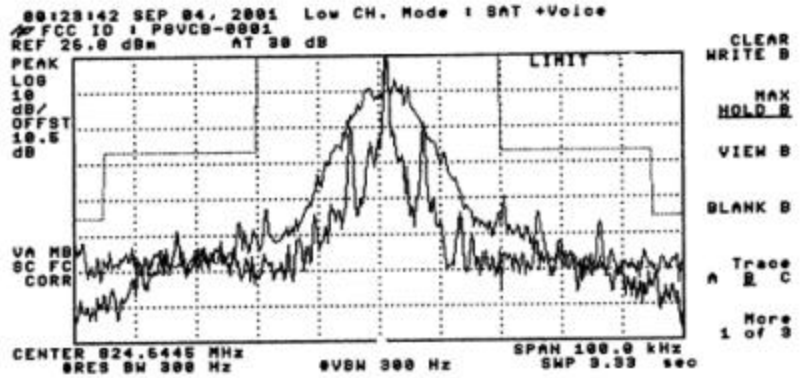

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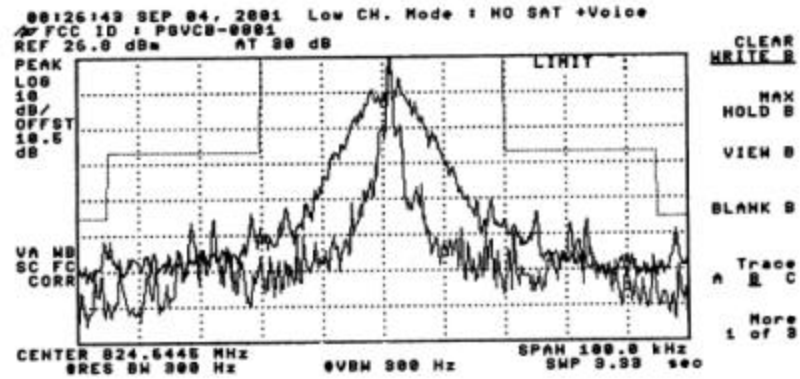

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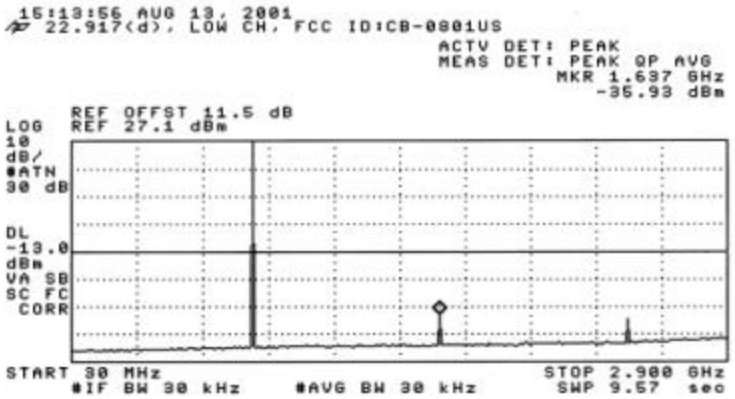

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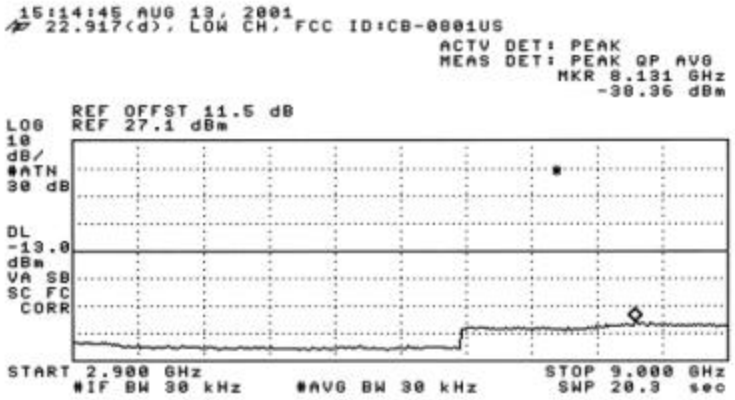

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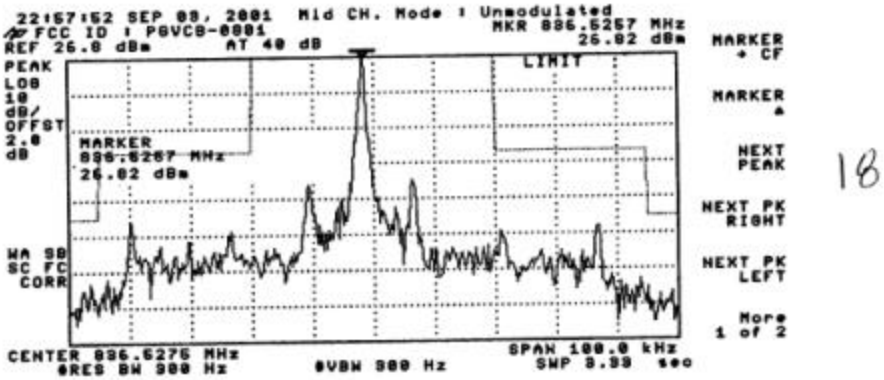

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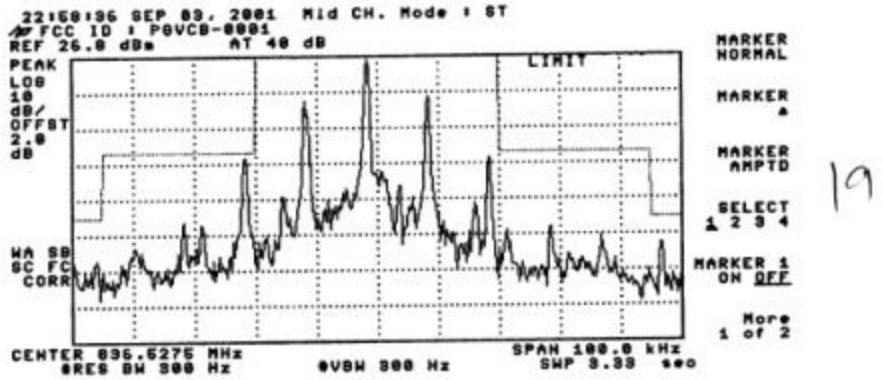

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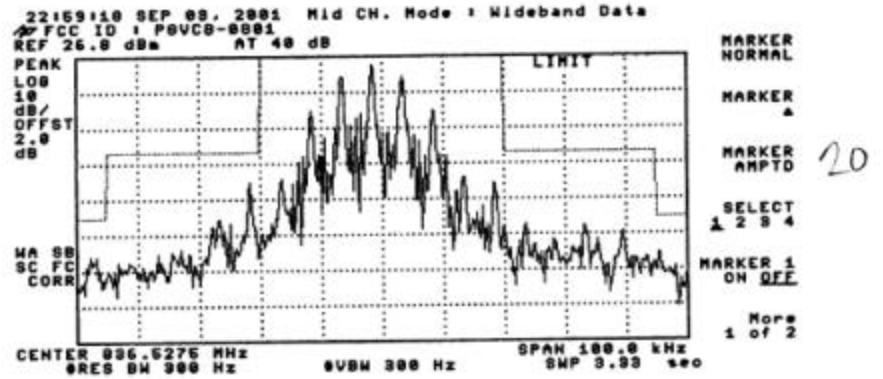

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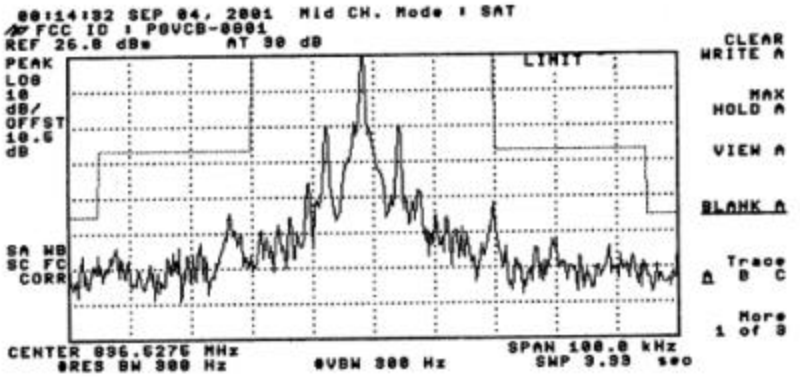

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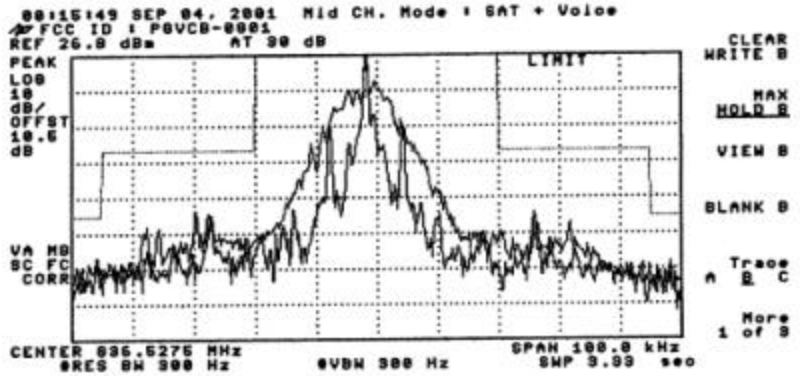

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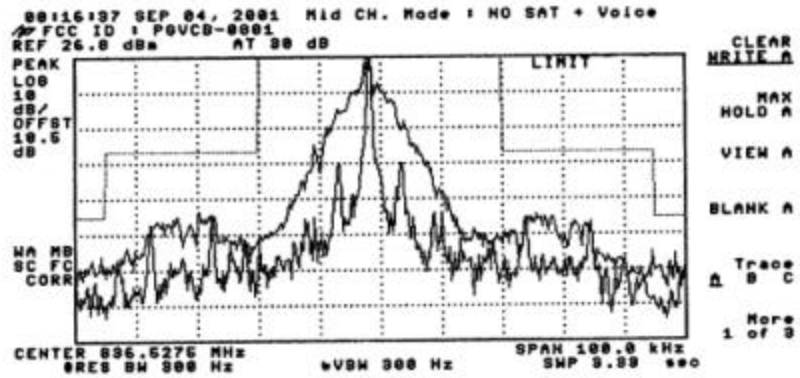

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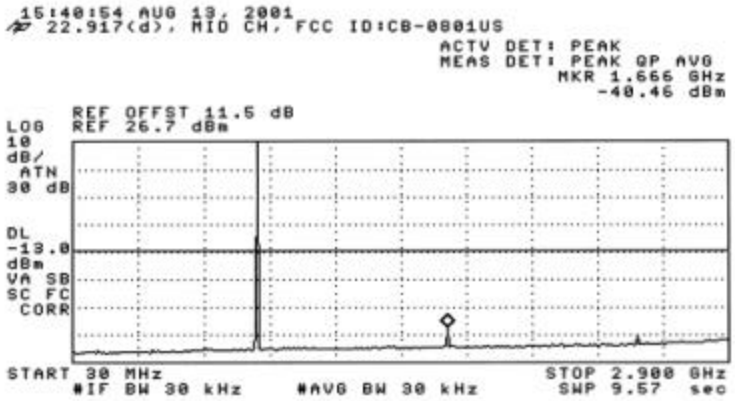

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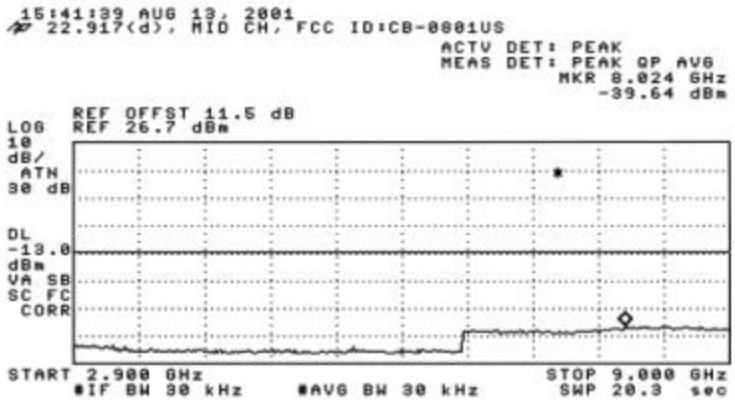

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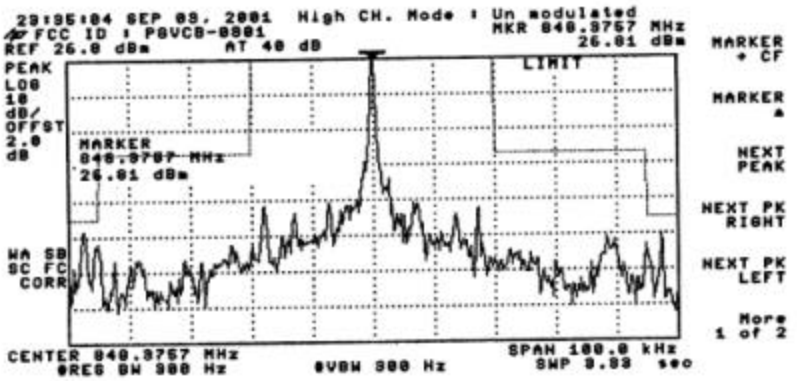

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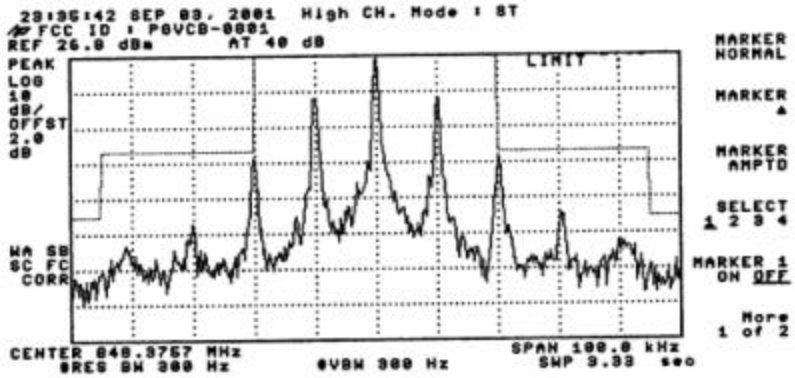

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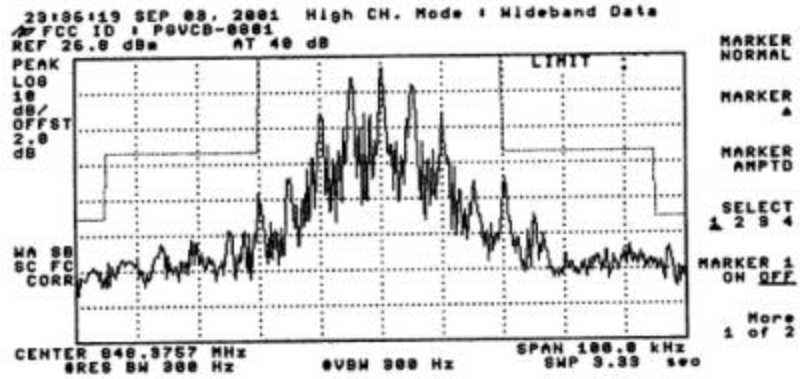

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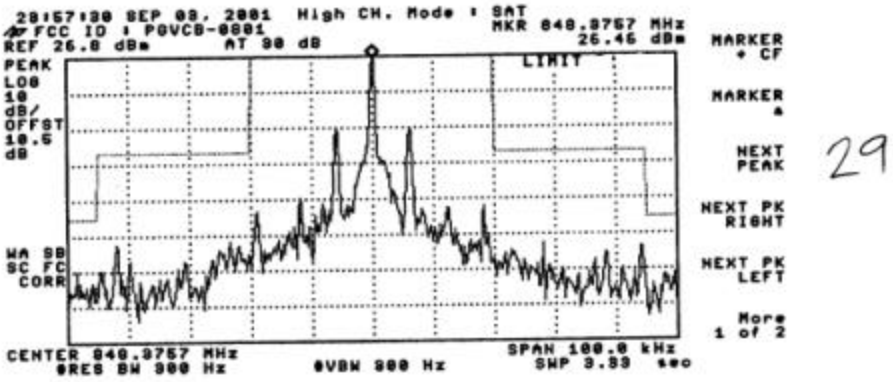

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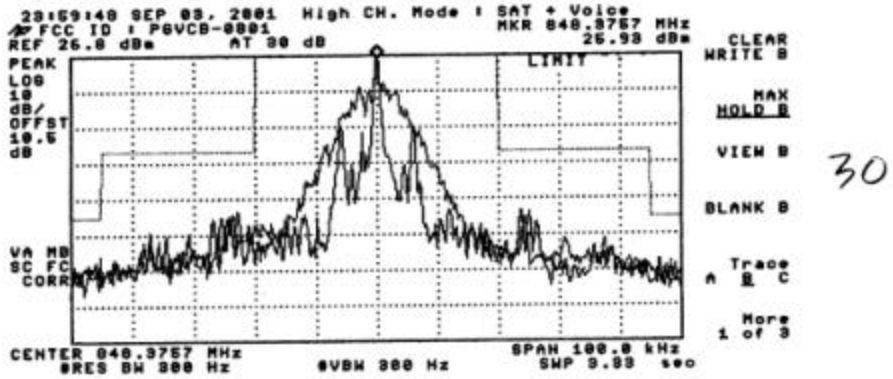

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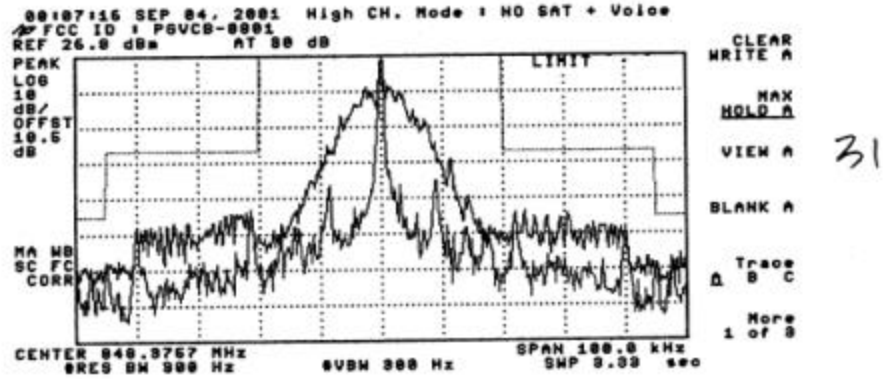

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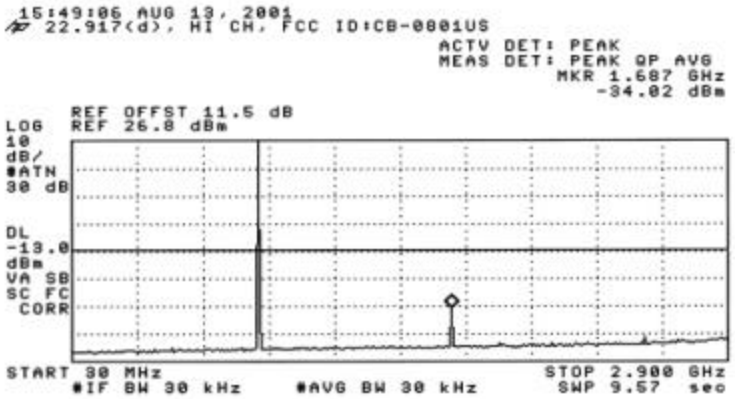

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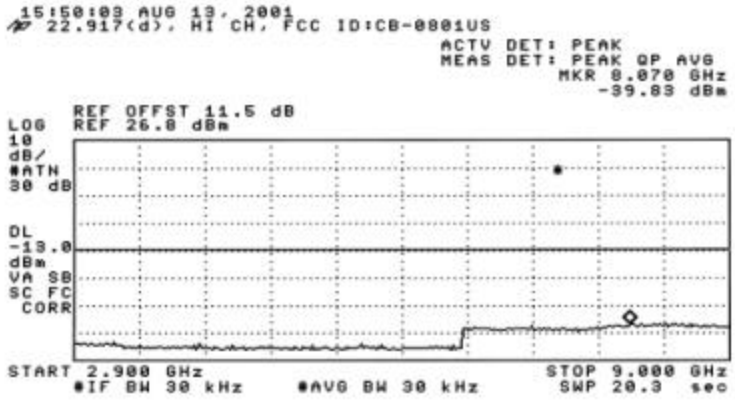

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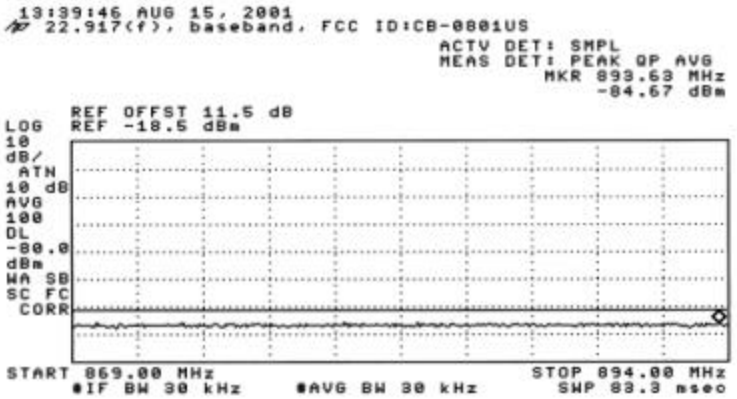

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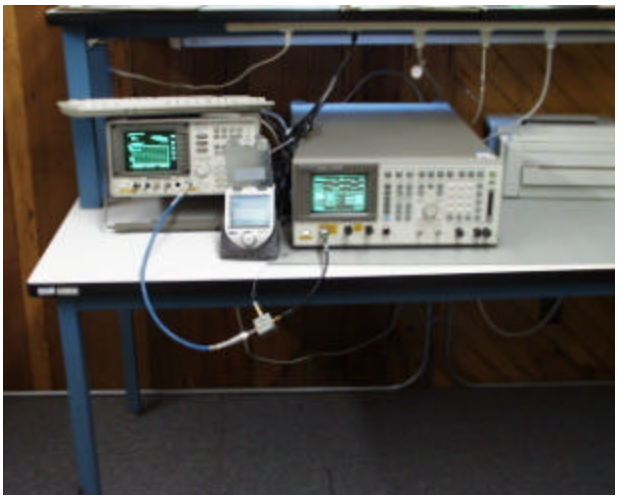
Setup Photos:

Emission Mask



Mobile Emission in Base Frequency Range

COMPLIANCE CERTIFICATION SERVICES DOCUMENT NO: CCSUP4031C
561F MONTEREY ROAD, MORGAN HILL, CA 95037 USA TEL: (408) 463-0885 FAX: (408) 463-0888
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9. FIELD STRENTH OF SPURIOUS EMISSION

9.1. PROVISIONS APPLICABLE

SEC. 2.1053 FIELD STRENTH OF SPURIOUS EMISSION.

Measurement shall be made to detect spurious emission that may be radiated directly from the cabinet, control circuits, power leads or intermediate circuit element under normal condition of installation and operation. Information submitted shall include the relative radiated power of spurious emission with reference to the rated power output of the transmitter,

SEC. 22.917 EMISSION LIMITATIONS FOR CELLULAR.

The rules in this section govern the spectral characteristics of emissions in the Cellular Radiotelephone Service.

(e) Out of band emissions. The mean power of emissions must be attenuated below the mean power of the unmodulated carrier (P) on any frequency twice or more than twice the fundamental frequency by:
at least 43+10 log P dB.

(h) Measurement procedure. The following spectrum analyzer bandwidth settings should be used for measurement of spurious emissions:
(1) In the radiotelephony mode or the supervisory audio tone mode:
-Not more than 45 kHz removed from the carrier 300 Hz;
-More than 45 kHz removed from the carrier 30 kHz.
(2) In the wideband data mode or the signaling tone mode:
-Not more than 60 kHz removed from the carrier 300 Hz;
-More than 60 kHz removed from the carrier 30 kHz.

9.2. MEASUREMENT PROCEDURE

1). On a test site, the EUT shall be placed on a turntable, and in the position closest to the normal use as declared by the user.

2). The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the frequency of the transmitter.

3). The output of the test antenna shall be connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.

4). The transmitter shall be switched on, if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.

5). The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.

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6). The transmitter shall than be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.

7). The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.

8). The maximum signal level detected by the measuring receiver shall be noted.

9). The measurement shall be repeated with the test antenna set to horizontal polarization.

10). Repeat 1-9 for EUT seat on x, y, z position

9.3. MEASUREMENT INSTRUMENT

EQUIPMENT	MANUFACTURE	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Spectrum Analyzer	HP	8566B	2140A01296	05/04/02
Amplifier	MITEQ	NSP2600-44	646456	04/12/02
Horn Antenna	EMCO	3115	9001-3245	06/20/02
Horn Antenna	EMCO	3115	2238	06/20/02
RF Synthesizer	HP	83732B	US34490599	2/11/02

Detector Function Setting of Test Receiver

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
30 to 1000	Quasi Peak/Peak	120 KHz/100 KHz	120 KHz/100 KHz
Above 1000	Average/ Peak	1 MHz	1 MHz

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9.4. MEASUREMENT RESULT

Compliance Certification Services

Out of Band Emissions 8/14/01
22.917(e) A-Site (1 meter)
Kerwin Corpuz

CYBERBANK CORPORATION
800MHz CDMA/AMPS Dual Mode Cell Phone (CB-0801US)

***** *AMPS* *****

frequency (MHz)	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
LOW=824.64 MHz								
1649.27V	48	-35	0.4	9.3	7.15	-28.25	-13	-15.25
1649.27H	44.9	-40	0.4	9.3	7.15	-33.25	-13	-20.25
2473.87V	67.2	-44	0.7	10.1	7.95	-36.75	-13	-23.75
2473.87H	66.7	-51	0.7	10.1	7.95	-43.75	-13	-30.75
3298.51V	55.8	-53.5	0.7	9.6	7.45	-46.75	-13	-33.75
3298.51H	54.2	-60	0.7	9.6	7.45	-53.25	-13	-40.25
4123.15V	38.8	-79	1	10	7.85	-72.15	-13	-59.15
4123.15H	41.1	-76	1	10	7.85	-69.15	-13	-56.15
4947.79V	43.4	-69	1	11.2	9.05	-60.95	-13	-47.95
4947.79H	36.9	-76	1	11.2	9.05	-67.95	-13	-54.95
5772.43*	35	-76	1.2	11	8.85	-68.35	-13	-55.35
6597.07*	37.3	-80	1.4	12.5	10.35	-71.05	-13	-58.05
7421.71*	38.5	-80	2.1	10.6	8.45	-73.65	-13	-60.65
8246.35*	37.7	-80	3.1	11.4	9.25	-73.85	-13	-60.85

Spot Check X, Y and Z AXIS of EUT. Worse case position X axis.
NOTE: * Measured noise floor (worse case vertical); H=horizontal and V=vertical
SA: Spectrum Analyzer, HP 8566B
SG: Signal Generator, HP 83732B
CL: cable loss (6ft) N TYPE
TX Antenna: EMCO 3115, S/N: 9001-3245 (dBi)
RX Antenna: EMCO 3115, S/N: 2238
Pre-Amp: MITEQ, NSP2600-44
HPF: High Pass Filter (MICROLAB, 2.4GHz)

Gain (dBd) = Gain (dBi) - 2.15
EPR = SG reading - CL + Gain (dBd)
Margin = EPR - Limit

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Compliance Certification Services

Out of Band Emissions 8/14/01
22.917(e) A-Site (1 meter)
Kerwin Corpuz

CYBERBANK CORPORATION
800MHz CDMA/AMPS Dual Mode Cell Phone (CB-0801US)

***** *AMPS* *****

frequency (MHz)	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
MID=836.52 MHz								
1673.02V	40	-43	0.4	9.3	7.15	-36.25	-13	-23.25
1673.02H	36	-48	0.4	9.3	7.15	-41.25	-13	-28.25
2509.56V	62.4	-49.5	0.7	10.1	7.95	-42.25	-13	-29.25
2509.56H	65.3	-51	0.7	10.1	7.95	-43.75	-13	-30.75
3346.05V	55	-57	0.7	9.6	7.45	-50.25	-13	-37.25
3346.05H	55.1	-60	0.7	9.6	7.45	-53.25	-13	-40.25
4182.57V	38.7	-79	1	10	7.85	-72.15	-13	-59.15
4182.57H	41.8	-78	1	10	7.85	-71.15	-13	-58.15
5019.09V	48.3	-64	1	11.2	9.05	-55.95	-13	-42.95
5019.09H	42.3	-72	1	11.2	9.05	-63.95	-13	-50.95
5855.61*	35	-76	1.2	11	8.85	-68.35	-13	-55.35
6692.13*	37.3	-80	1.4	12.5	10.35	-71.05	-13	-58.05
7528.65*	38.5	-80	2.1	10.6	8.45	-73.65	-13	-60.65
8365.17*	37.7	-80	3.1	11.4	9.25	-73.85	-13	-60.85

Spot Check X, Y and Z AXIS of EUT. Worse case position X axis.
NOTE: * Measured noise floor (worse case vertical); H=horizontal and V=vertical
SA: Spectrum Analyzer, HP 8566B
SG: Signal Generator, HP 83732B
CL: cable loss (6ft) N TYPE
TX Antenna: EMCO 3115, S/N: 9001-3245 (dBi)
RX Antenna: EMCO 3115, S/N: 2238
Pre-Amp: MITEQ, NSP2600-44
HPF: High Pass Filter (MICROLAB, 2.4GHz)

Gain (dBd) = Gain (dBi) - 2.15
EPR = SG reading - CL + Gain (dBd)
Margin = EPR - Limit

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Compliance Certification Services

Out of Band Emissions 8/14/01
22.917(e) A-Site (1 meter)
Kerwin Corpuz

CYBERBANK CORPORATION
800MHz CDMA/AMPS Dual Mode Cell Phone (CB-0801US)

***** *AMPS* *****

frequency (MHz)	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
Hl=848.37 MHz								
1696.72V	32.9	-48.5	0.4	9.3	7.15	-41.75	-13	-28.75
1696.72H	30.1	-54	0.4	9.3	7.15	-47.25	-13	-34.25
2545.09V	60.7	-53	0.7	10.1	7.95	-45.75	-13	-32.75
2545.09H	62.1	-56.2	0.7	10.1	7.95	-48.95	-13	-35.95
3393.46V	50	-61	0.7	9.6	7.45	-54.25	-13	-41.25
3393.46H	51.4	-63.6	0.7	9.6	7.45	-56.85	-13	-43.85
4241.83V	42.6	-75	1	10	7.85	-68.15	-13	-55.15
4241.83H	37.8	-78	1	10	7.85	-71.15	-13	-58.15
5090.20V	48.2	-62	1	11.2	9.05	-53.95	-13	-40.95
5090.20H	42.6	-72	1	11.2	9.05	-63.95	-13	-50.95
5938.57*	35	-76	1.2	11	8.85	-68.35	-13	-55.35
6786.94*	37.3	-80	1.4	12.5	10.35	-71.05	-13	-58.05
7635.31*	38.5	-80	2.1	10.6	8.45	-73.65	-13	-60.65
8483.68*	37.7	-80	3.1	11.4	9.25	-73.85	-13	-60.85

Spot Check X, Y and Z AXIS of EUT. Worse case position X axis.
NOTE: * Measured noise floor (worse case vertical); H=horizontal and V=vertical
SA: Spectrum Analyzer, HP 8566B
SG: Signal Generator, HP 83732B
CL: cable loss (6ft) N TYPE
TX Antenna: EMCO 3115, S/N: 9001-3245 (dBi)
RX Antenna: EMCO 3115, S/N: 2238
Pre-Amp: MITEQ, NSP2600-44
HPF: High Pass Filter (MICROLAB, 2.4GHz)

Gain (dBd) = Gain (dBi) - 2.15
EPR = SG reading - CL + Gain (dBd)
Margin = EPR - Limit

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Compliance Certification Services

Out of Band Emissions 8/14/01
22.917(e) A-Site (1 meter)
Kerwin Corpuz

CYBERBANK CORPORATION
800MHz CDMA/AMPS Dual Mode Cell Phone (CB-0801US)

***** *CDMA* *****

frequency (MHz)	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
LOW=824.64 MHz								
1649.28V	37.7	-45	0.4	9.3	7.15	-38.25	-13	-25.25
1649.28H	34.5	-50	0.4	9.3	7.15	-43.25	-13	-30.25
2473.92V	59.9	-52	0.7	10.1	7.95	-44.75	-13	-31.75
2473.92H	64	-64	0.7	10.1	7.95	-56.75	-13	-43.75
3298.56V	54.3	-55	0.7	9.6	7.45	-48.25	-13	-35.25
3298.56H	53.3	-61	0.7	9.6	7.45	-54.25	-13	-41.25
4123.20V	39.6	-78	1	10	7.85	-71.15	-13	-58.15
4123.20H	38.3	-77	1	10	7.85	-70.15	-13	-57.15
4947.84V	40.4	-72	1	11.2	9.05	-63.95	-13	-50.95
4947.84H	44.6	-67	1	11.2	9.05	-58.95	-13	-45.95
5772.48*	35	-76	1.2	11	8.85	-68.35	-13	-55.35
6597.12*	37.3	-80	1.4	12.5	10.35	-71.05	-13	-58.05
7421.76*	38.5	-80	2.1	10.6	8.45	-73.65	-13	-60.65
8246.40*	37.7	-80	3.1	11.4	9.25	-73.85	-13	-60.85

Spot Check X, Y and Z AXIS of EUT. Worse case position X axis.
NOTE: * Measured noise floor (worse case vertical); H=horizontal and V=vertical
SA: Spectrum Analyzer, HP 8566B
SG: Signal Generator, HP 83732B
CL: cable loss (6ft) N TYPE
TX Antenna: EMCO 3115, S/N: 9001-3245 (dBi)
RX Antenna: EMCO 3115, S/N: 2238
Pre-Amp: MITEQ, NSP2600-44
HPF: High Pass Filter (MICROLAB, 2.4GHz)

Gain (dBd) = Gain (dBi) - 2.15
EPR = SG reading - CL + Gain (dBd)
Margin = EPR - Limit

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Compliance Certification Services

Out of Band Emissions 8/14/01
22.917(e) A-Site (1 meter)
Kerwin Corpuz

CYBERBANK CORPORATION
800MHz CDMA/AMPS Dual Mode Cell Phone (CB-0801US)

***** *CDMA* *****

frequency (MHz)	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
MID=836.52 MHz								
1673.02V	37.3	-46	0.4	9.3	7.15	-39.25	-13	-26.25
1673.02H	32	-52	0.4	9.3	7.15	-45.25	-13	-32.25
2509.56V	60.4	-51.5	0.7	10.1	7.95	-44.25	-13	-31.25
2509.56H	62	-54	0.7	10.1	7.95	-46.75	-13	-33.75
3346.05V	52.6	-60	0.7	9.6	7.45	-53.25	-13	-40.25
3346.05H	50.1	-65	0.7	9.6	7.45	-58.25	-13	-45.25
4182.57V	38.9	-79	1	10	7.85	-72.15	-13	-59.15
4182.57H	40.3	-79	1	10	7.85	-72.15	-13	-59.15
5019.09V	46.5	-66	1	11.2	9.05	-57.95	-13	-44.95
5019.09H	42.9	-71.5	1	11.2	9.05	-63.45	-13	-50.45
5855.61*	35	-76	1.2	11	8.85	-68.35	-13	-55.35
6692.13*	37.3	-80	1.4	12.5	10.35	-71.05	-13	-58.05
7528.65*	38.5	-80	2.1	10.6	8.45	-73.65	-13	-60.65
8365.17*	37.7	-80	3.1	11.4	9.25	-73.85	-13	-60.85

Spot Check X, Y and Z AXIS of EUT. Worse case position X axis.
NOTE: * Measured noise floor (worse case vertical); H=horizontal and V=vertical
SA: Spectrum Analyzer, HP 8566B
SG: Signal Generator, HP 83732B
CL: cable loss (6ft) N TYPE
TX Antenna: EMCO 3115, S/N: 9001-3245 (dBi)
RX Antenna: EMCO 3115, S/N: 2238
Pre-Amp: MITEQ, NSP2600-44
HPF: High Pass Filter (MICROLAB, 2.4GHz)

Gain (dBd) = Gain (dBi) - 2.15
EPR = SG reading - CL + Gain (dBd)
Margin = EPR - Limit

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Compliance Certification Services

Out of Band Emissions 8/14/01
22.917(e) A-Site (1 meter)
Kerwin Corpuz

CYBERBANK CORPORATION
800MHz CDMA/AMPS Dual Mode Cell Phone (CB-0801US)

***** *CDMA* *****

frequency (MHz)	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
Hl=848.37 MHz								
1696.74V	37.1	-44	0.4	9.3	7.15	-37.25	-13	-24.25
1696.74H	34.7	-50	0.4	9.3	7.15	-43.25	-13	-30.25
2545.11V	58.9	-55	0.7	10.1	7.95	-47.75	-13	-34.75
2545.11H	64.4	-54	0.7	10.1	7.95	-46.75	-13	-33.75
3393.48V	54.5	-57	0.7	9.6	7.45	-50.25	-13	-37.25
3393.48H	52.7	-62.1	0.7	9.6	7.45	-55.35	-13	-42.35
4241.85V	43	-75	1	10	7.85	-68.15	-13	-55.15
4241.85H	42.5	-73	1	10	7.85	-66.15	-13	-53.15
5090.22V	44.4	-66	1	11.2	9.05	-57.95	-13	-44.95
5090.22H	47.9	-64.5	1	11.2	9.05	-56.45	-13	-43.45
5938.59*	35	-76	1.2	11	8.85	-68.35	-13	-55.35
6786.96*	37.3	-80	1.4	12.5	10.35	-71.05	-13	-58.05
7635.33*	38.5	-80	2.1	10.6	8.45	-73.65	-13	-60.65
8483.70*	37.7	-80	3.1	11.4	9.25	-73.85	-13	-60.85

Spot Check X, Y and Z AXIS of EUT. Worse case position X axis.
NOTE: * Measured noise floor (worse case vertical); H=horizontal and V=vertical
SA: Spectrum Analyzer, HP 8566B
SG: Signal Generator, HP 83732B
CL: cable loss (6ft) N TYPE
TX Antenna: EMCO 3115, S/N: 9001-3245 (dBi)
RX Antenna: EMCO 3115, S/N: 2238
Pre-Amp: MITEQ, NSP2600-44
HPF: High Pass Filter (MICROLAB, 2.4GHz)

Gain (dBd) = Gain (dBi) - 2.15
EPR = SG reading - CL + Gain (dBd)
Margin = EPR - Limit

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Setup Photos:

Harmonic Measurement

Substitution Method

COMPLIANCE CERTIFICATION SERVICES DOCUMENT NO: CCSUP4031C
561F MONTEREY ROAD, MORGAN HILL, CA 95037 USA TEL: (408) 463-0885 FAX: (408) 463-0888
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10. FREQUENCY STABILITY MEASUREMENT

10.1. PROVISIONS APPLICABLE

SEC. 2.1055(a)(1) Frequency stability.

The frequency stability shall be measured with variation of ambient temperature from – 30°C to +50°C centigrade.

SEC. 2.1055(a)(2) Frequency stability.

For hand carried battery powered equipment, the frequency stability shall be measured with reducing primary supply voltage to the battery operating end point, which is specified by the manufacture.

SEC. 22.355 FREQUENCY TOLERANCE.

Except as otherwise provided in this part, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table C-1 of this section.

Table C-1.--Frequency Tolerance for Transmitters in the Public Mobile Services

Frequency range (MHz)	Base, fixed (ppm)	Mobile 3 watts (ppm)	Mobile <=3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929	5.0	n/a	n/a
929 to 960	1.5	n/a	n/a
2110 to 2220	10.0	n/a	n/a

10.2. MEASUREMENT METHOD

10.2.1. Frequency stability versus environmental temperature

1). Setup the configuration per figure 6 for frequencies measurement inside the environmental chamber. Set the temperature of the chamber to 25°C and Install new batteries to the EUT. Set SA Resolution Bandwidth low enough to obtain the desired frequency resolution and measure the EUT 25°C operating frequency as reference frequency.

2). Turn EUT off and set Chamber temperature to -30°C.

3). Allow sufficient time (approximately 20 to 30 minus after chamber reach the assigned temperature) for EUT to stabilize. Turn on EUT and measure the EUT operating frequency. Turn off EUT after the measurement.

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4). Repeat step 3 with a 10°C increased per stage until the highest temperature of +50°C reached, record all measured frequencies on each temperature step.

10.2.2. Frequency stability versus DC input voltage

1). Setup the configuration per figure 6 and set chamber temperature to 25°C. Use a variable DC power supply to power the EUT and set DC output voltage to EUT nominal input DC voltage. Set SA Resolution Bandwidth low enough to obtain the desired frequency resolution and measure the EUT 25°C operating frequency as reference frequency.

2). Slowly reduce the EUT input voltage to specified battery-end-point voltage and record the maximum frequency change.

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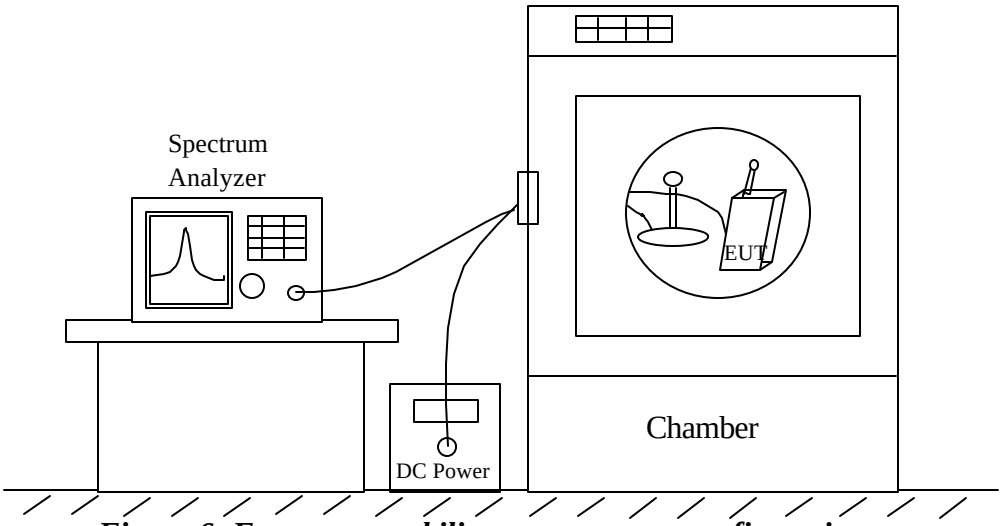

Figure 6: Frequency stability measurement configuration

10.3. MEASUREMENT INSTRUMENT

EQUIPMENT	MANUFACTURE	MODEL NO.	CAL. DUE DATE
Spectrum Analyzer	HP	8593EM	06/20/02
Attenuator	MINI CIRCUITS	MCL BW-S20W2	NA
Environmental Chamber	TENNY	TEN	5/12/01

10.4. MEASUREMENT RESULT

Reference Frequency: 848.100250 MHz		Limit: 2.5 ppm	
Environment Temperature (°C)	Power Supplied (Vdc)	Frequency deviation measured with time elapse	
		MHz	ppm
50	Fixed ext DC 3.8V	848.100165	-0.10
40	Fixed ext DC 3.8V	848.100150	-0.12
30	Fixed ext DC 3.8V	848.100200	-0.06
20	Fixed ext DC 3.8V	848.100250	0.00
10	Fixed ext DC 3.8V	848.100180	-0.08
0	Fixed ext DC 3.8V	840.100230	-0.02
-10	Fixed ext DC 3.8V	848.100170	-0.09
-20	Fixed ext DC 3.8V	848.100165	-0.10
-30	Fixed ext DC 3.8V	848.100160	-0.11

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b). Frequency stability versus input voltage (battery operation end point voltage is 3.4 Vdc)

Channel	Reference Frequency (MHz)	Frequency measured at end point voltage (MHz)	Frequency Deviation (Hz)	Limit (ppm)
LOW	825.870075	825.870075	0	2.5
MID	836.520075	836.520075	0	2.5
HI	848.100075	848.100075	0	2.5

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