



FCC CFR47 PART 24 SUBPART E
CLASS II PERMISSIVE CHANGE TEST REPORT
FOR
MCBTS 1900 SINGLE CARRIER POWER AMPLIFIER

MODEL: ORIOLE 2

FCC ID: I2O-ORIOLE1
(GRANTED ON 02/02/1999)

REPORT NUMBER: 99U0485

ISSUE DATE: AUGUST 31, 1999

Prepared for
SPECTRIAN, INC.
350 WEST JAVA DRIVE
SUNNYVALE, CA 94089

Prepared by
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d.B.a.
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NVLAQ[®]
LAB CODE:200065-0

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1. VERIFICATION OF COMPLIANCE

COMPANY NAME: SPECTRIAN, INC.
 350 WEST JAVA DRIVE
 SUNNYVALE CA 94089

CONTACT PERSON: BILL HENNING Jr. / MANAGER , AMPLIFIER ENGINEERING

TELEPHONE NO: (408) 543-5977

MODEL NO/NAME: ORIOLE 2

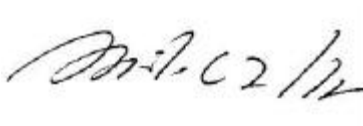
SERIAL NO: N/A

DATE TESTED: AUGUST 13, 1999

TYPE OF EQUIPMENT:	MCBTS 1900 SINGLE CARRIER POWR AMPLIFIER
MEASUREMENT DISTANCE:	(X) 3 METER () 10 METER
FCC RULES:	PART 2, PART 15, PART 24 SUBPART E
EQUIPMENT AUTHORIZATION PROCEDURE	CLASS II PERMISSIVE CHANGE
MODIFICATIONS MADE ON EUT	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
DEVIATIONS FROM MEASUREMENT PROCEDURE	<input type="checkbox"/> YES (refer to section 20 for comments) <input checked="" type="checkbox"/> NO

The above equipment was tested by Compliance Certification Services for compliance with the requirements set forth in the FCC CFR 47, PART 2, PART 15 and PART 24. 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.

Reviewed By



MIKE C.I. KUO / VICE PRESIDENT
COMPLIANCE CERTIFICATION SERVICES

(6) Function of Each Active Device

Refer to Block Diagram . **Confidentiality is requested for this item.**

(7) Complete Circuit Diagrams and Functional Diagram

Refer to Schematics Diagram. **Confidentiality is requested for this item.**

(8) Instructions/Installation Manual

Not applicable for this product.

(9) Tune-up/Optimization Procedure

Not applicable for this product. This amplifier is Plug-n-Play.

(10) Means for Frequency Stabilization

Not applicable for this product.

(11) Means for Limiting Modulation

Not Applicable.

(11) Means for Limiting Power

The output power of this amplifier is 42.5dBm maximum. There are no power level controls within the amplifier. These are controlled by the system. The amplifier does contain a closed loop for correction.

(11) Means for Attenuating Higher Audio Frequencies

Not Applicable.

(12) Description of Digital Modulation Techniques

Not Applicable

2.983(e) Standard Test Conditions

The transmitter was tested under the following conditions:

Room Temperature: 20 - 23 °C

Relative Humidity: 35 - 50%

DC Supply Voltage: 25.5 – 26.5 Vdc.

Section 2.983(f) Equipment Identification

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

Section 2.983(g) Photographs

Photographs of the equipment, internal and external views, are found in the
External photos and internal photos files.

Section 2.983 Description of Various Base Station Configurations

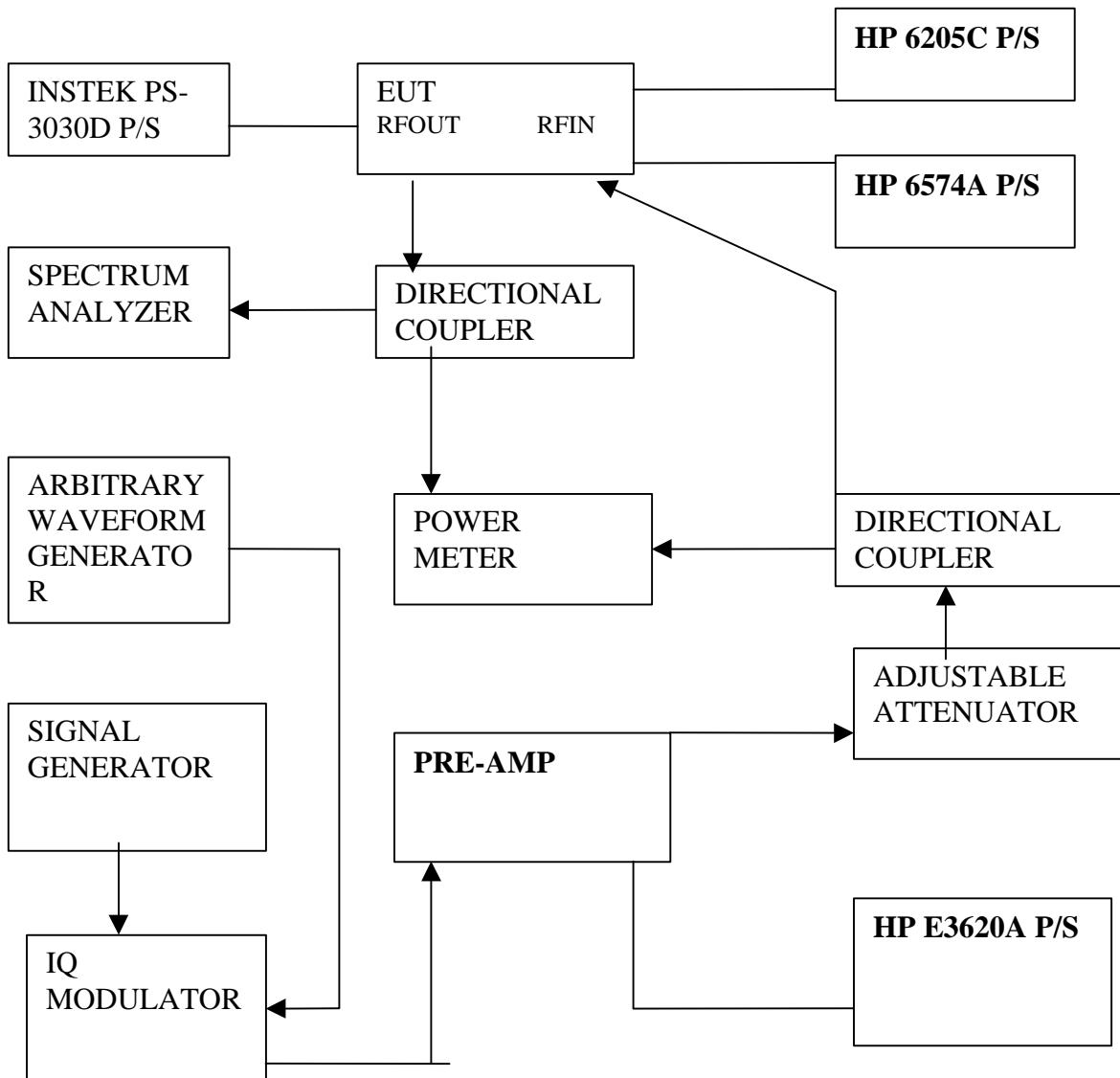
Not Applicable

Section 2.983 Use of Various Power Supplies

Not Applicable.

4. TEST SETUP AND TEST RESULT :

Test Set-up

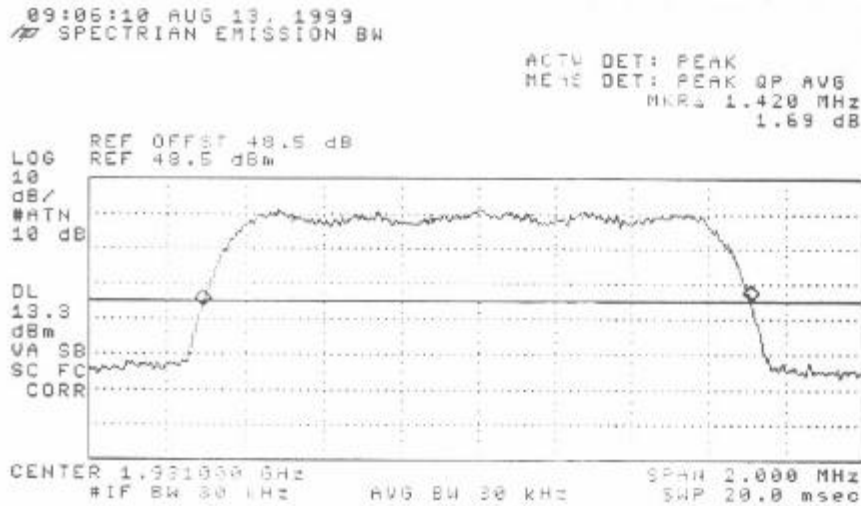


SECTION 2.1047 MEASUREMENT REQUIRED: MODULATION CHARACTERISTICS

Not Applicable

SECTION 2.1049 MEASUREMENT REQUIRED: OCCUPIED BANDWIDTH

Data on the bandwidth occupied by this transmitter is presented in graphical form using spectrum analyzer plots. Emission bandwidth (per 24.238b, the 26dB BW) was measured with RBW=30KHz, VBW=30KHz. Spectrum plot is supplied. Measured occupied bandwidth was 1.42MHz.



SECTION 2.1051 MEASUREMENTS REQUIRED: SPURIOUS AND HARMONIC EMISSION AT ANTENNA TERMINALS (SECTION 24.238 LIMITS)

Minimum standard: The magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under conditions specified in the instruction manual and/or alignment procedure, shall not be less than $43+10 \log(\text{mean output power in watts})$ dBc below the mean power output outside a licensee's frequency block.

24.238 (b) & (c) Compliance with out of band emissions requirement is based on test being performed with 1MHz analyzer RES BW. At block edges, RES BW may be adjusted to a level at least as large as 1% of emission bandwidth. For the EUT this is at least

For CDMA

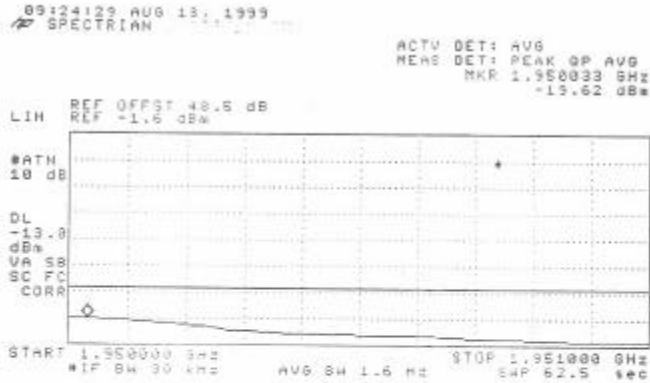
.01 * 1.42MHz = 14.2kHz. A RES BW of 30kHz was used for measurement.

Test Results

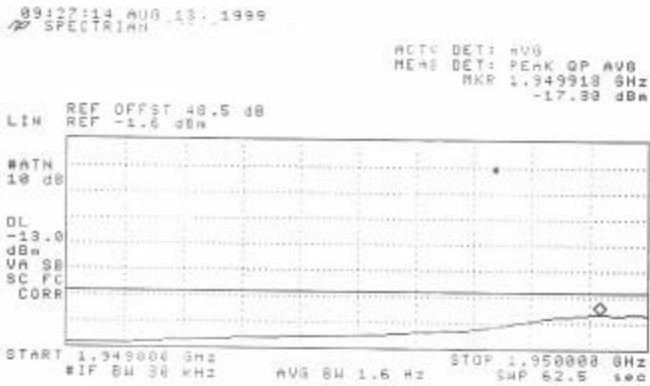
Please refer to the following table which indicates the chart number.

PLOT DESCRIPTION	PLOT NUMBER
BOTTOM BLOCK A	1
TOP BLOCK A	2
BOTTOM BLOCK D	3
TOP BLOCK D	4
BOTTOM BLOCK B	5
TOP BLOCK B	6
BOTTOM BLOCK E	7
TOP BLOCK E	8
BOTTOM BLOCK F	9
TOP BLOCK F	10
BOTTOM BLOCK C	11
TOP BLOCK C	12
OUT OF BAND LOW	13
OUT OF BAND HI	14
2 ND HARMONIC AVERAGE READING	15
INPUT PLOT	16

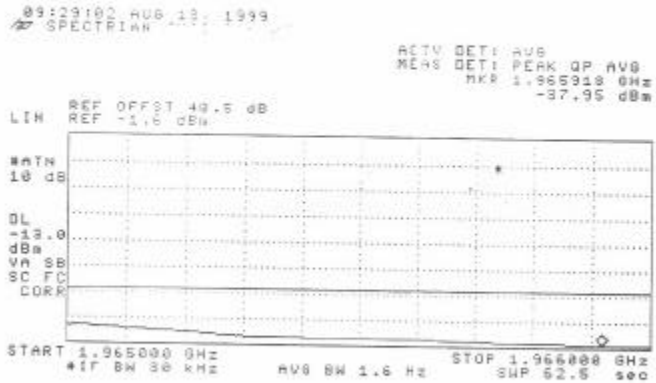
Plots at band edges use average.



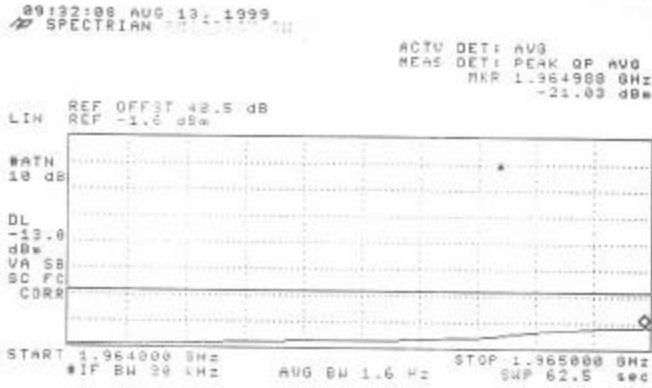
4



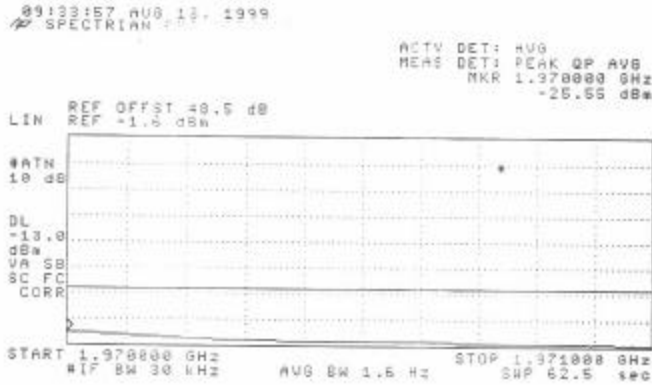
5



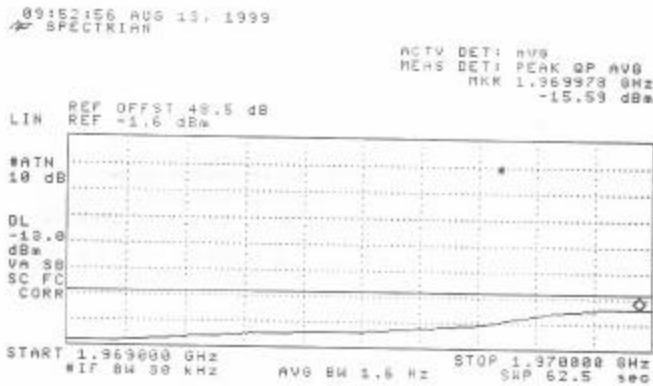
6



7



8



9

09:57:32 AUG 13, 1999
SPECTRUM

ACTV DET: AVG
MENS DET: PEAK QP AVG
MKR 1.975028 GHz
-19.40 dBm

LIN REF OFFSET 40.5 dB
REF -1.6 dBm

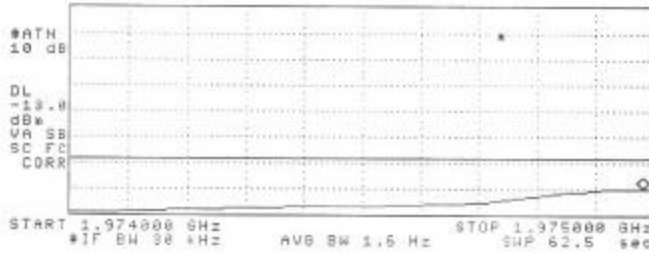


10

10:11:24 AUG 13, 1999
SPECTRUM

ACTV DET: AVG
MENS DET: PEAK QP AVG
MKR 1.974980 GHz
-19.72 dBm

LIN REF OFFSET 40.5 dB
REF -1.6 dBm

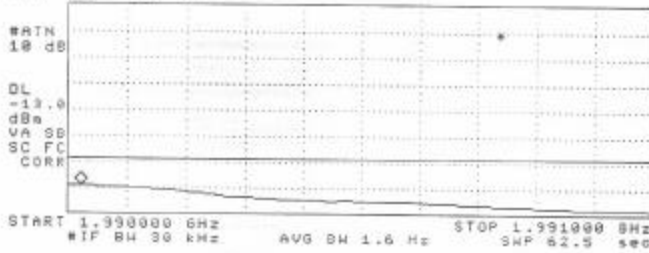


11

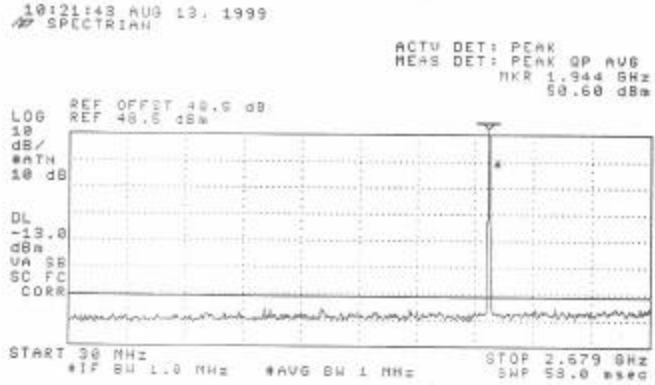
10:13:19 AUG 13, 1999
SPECTRUM

ACTV DET: AVG
MENS DET: PEAK QP AVG
MKR 1.990023 GHz
-19.72 dBm

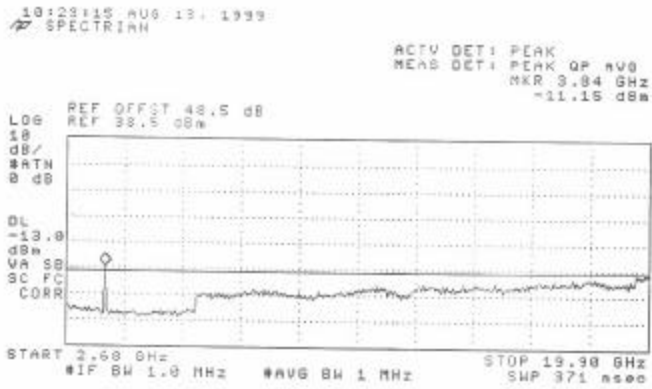
LIN REF OFFSET 40.5 dB
REF -1.6 dBm



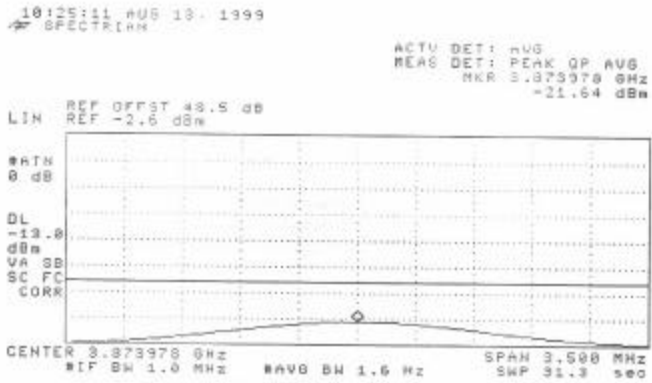
12



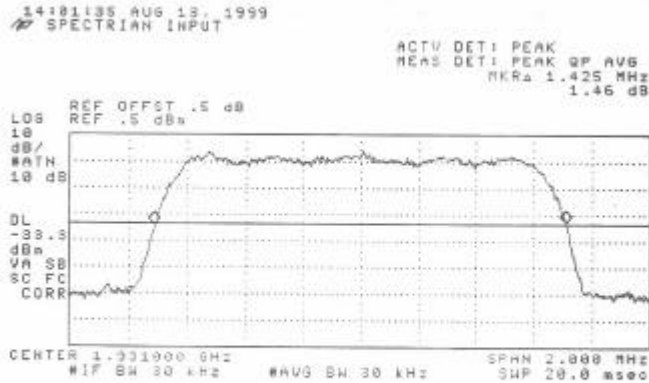
13



14



15

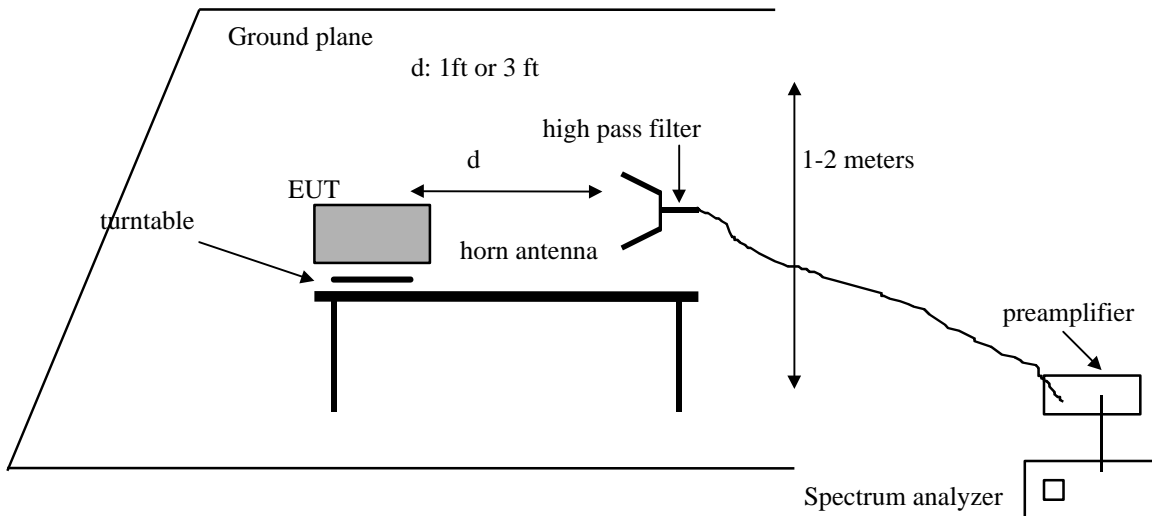


SECTION 2.1053 MEASUREMENT REQUIRED: FIELD STRENGTH OF SPURIOUS AND HARMONIC RADIATION

Measurement Equipment Used:

- HP 8593E Spectrum Analyzer
- HP 8449 B Preamplifier, 1-26 GHz
- ARA DRG-118/A Double Ridged Horn antenna, 1 - 18 GHz
- QIM "The Workhorse" low loss cable, 9 ft (loss: 0.85 dB/ft@ 26 GHz)

Test Set-Up



Minimum Requirement

The magnitude of each spurious and harmonic emission detected as being radiated from the EUT must be at a level more than $43 + 10 \log(\text{mean output power, watts})$ dB below the mean power output ($= -13$ dBm).

Resultant radiated field at 3 m from -13 dBm source feeding isotropic antenna: 82.4 dBuV/m

Test Method

The antenna output port of the EUT was terminated with a 50 ohm shielded termination. With the transmitter operating at full power, the EUT was rotated 360° and the search antenna was raised and lowered in both polarities, all in an attempt to maximize the levels of the received emission for each harmonic and spurious emission up to 10 fo.

Test Results

Corrected field strength readings extrapolated to 3m.

8/13/99

PETE
KREBILL

SPECTRIAN
1900MHZ AMP

F(MHz)	Level (dBuV)	AF (dB)	CL (dB)	AMP (dB)	FILTER (dB)	DIST (dB)	Total (dBuV/m)	Limit (dBuV/m)	Margin (dB)
Vertical									
3862P	69.6	32.3	4.86	-35.5	1	-10.5	61.76	102	-40.24
3862A	58.1	32.3	4.86	-35.5	1	-10.5	50.26	82	-31.74
5793P	54.8	35.1	5.94	-35.5	1	-10.5	50.84	102	-51.16
5793A	34.2	35.1	5.94	-35.5	1	-10.5	30.24	82	-51.76
7724P	52.9	36.9	6.48	-35.5	1	-10.5	51.28	102	-50.72
7724A	36.5	36.9	6.48	-35.5	1	-10.5	34.88	82	-47.12
9655P	46.6	38.2	8.1	-35.5	1	-10.5	47.9	102	-54.1
9655A	34.1	38.2	8.1	-35.5	1	-10.5	35.4	82	-46.6
11586P	49.5	38.9	8.64	-35.5	1	-10.5	52.04	102	-49.96
11586A	36.4	38.9	8.64	-35.5	1	-10.5	38.94	82	-43.06
13517P	50.6	41.3	9.54	-35.5	1	-10.5	56.44	102	-45.56
13517A	38.2	41.3	9.54	-35.5	1	-10.5	44.04	82	-37.96
15448P	50.9	39.5	10.8	-35.5	1	-10.5	56.2	102	-45.8
15448A	38.2	39.5	10.8	-35.5	1	-10.5	43.5	82	-38.5
17379P	53	45.9	12.24	-35.5	1	-10.5	66.14	102	-35.86
17379A	39.9	45.9	12.24	-35.5	1	-10.5	53.04	82	-28.96
19310P	60	23.7	13.14	-35.5	1	-10.5	51.84	102	-50.16
19310A	42.1	23.7	13.14	-35.5	1	-10.5	69.44	82	-12.56
Horizontal									
3862P	71.8	32.3	4.86	-35.5	1	-10.5	63.96	102	-38.04
3862A	58.9	32.3	4.86	-35.5	1	-10.5	51.06	82	-30.94
5793P	52	35.1	5.94	-35.5	1	-10.5	48.04	102	-53.96
5793A	31.3	35.1	5.94	-35.5	1	-10.5	27.34	82	-54.66
7724P	51.1	36.9	6.48	-35.5	1	-10.5	49.48	102	-52.52
7724A	35.2	36.9	6.48	-35.5	1	-10.5	33.58	82	-48.42
9655P	46.3	38.2	8.1	-35.5	1	-10.5	47.6	102	-54.4
9655A	34.1	38.2	8.1	-35.5	1	-10.5	35.4	82	-46.6
11586P	48.9	38.9	8.64	-35.5	1	-10.5	51.44	102	-50.56
11586A	36.3	38.9	8.64	-35.5	1	-10.5	38.84	82	-43.16
13517P	51.2	41.3	9.54	-35.5	1	-10.5	57.04	102	-44.96
13517A	38.2	41.3	9.54	-35.5	1	-10.5	44.04	82	-37.96
15448P	50.7	39.5	10.8	-35.5	1	-10.5	56	102	-46
15448A	37.9	39.5	10.8	-35.5	1	-10.5	43.2	82	-38.8
17379P	52.9	45.9	12.24	-35.5	1	-10.5	66.04	102	-35.96
17379A	39.8	45.9	12.24	-35.5	1	-10.5	52.94	82	-29.06
19310P	61.1	23.7	13.14	-35.5	1	-10.5	52.94	102	-49.06
19310A	46.1	23.7	13.14	-35.5	1	-10.5	73.44	82	-8.56

AF=ANTENNA FACTOR
 AMP=AMPLIFIER GAIN
 CL=CABLE LOSS
 FILTER= HPF FILTER LOSS
 DIST=DISTANCE CORRECTION TO 3 meters

RES B/W=1MHZ
 VIDEO B/W=1MHZ PEAK 10HZ AVERAGE

SECTION 2.1055 MEASUREMENT REQUIRED: FREQUENCY STABILITY

Not applicable

SECTION 2.1046: RF POWER OUTPUT

Measured with power meter. All outputs were adjusted between 42.4 and 42.8dBm, during testing.

SECTION 1.1307 ROUTINE ENVIRONMENTAL EVALUATION

Not applicable

SECTION 15.109 RADIATED EMISSION LIMITS:

Compliance Engineering Services Inc. Project No. : 99U0485
Report No. : 990816A1
Date : 08/16/1999
Time : 10:07
>> 3 M RADIATED EMISSION DATA << Test Engr : PETE K

Company : SPECTRIAN
Equipment Under Test : 1900MHZ AMP
Test Configuration : EUT/4-POWER SUPPLIES/WAVEFORM GENERATOR/SIGNAL
GENERATOR/IQ MODULATOR/PRE-AMP
Type of Test : FCC CLASS B
Mode of Operation : IDLE

Freq. dBuV PreAmp Ant Cable dBuV/m Limit Margin Pol Hgt(m) Az
Bilog 2049 ; Pre-amp = 8447D-P1 2944A06833:
NO EMISSIONS DETECTED WITHIN 20dB OF LIMITS.

Total # of data 0
V. a2.2

5. TEST SETUP PHOTOS

