ADDENDUM TO CERTIFICATION
TEST REPORT FC00-003

FOR THE

WIRELESS CABLE MODEM TRANSCEIVER, 520004-1

FCC PART 2 AND PART 21
COMPLIANCE

DATE OF ISSUE: MARCH 27, 2000

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Part 2 & 21 CERTIFICATION TEST REPORT

ADMINISTRATIVE INFORMATION

DATE OF TEST:	February 18, 2000
PURPOSE OF TEST:	To demonstrate the compliance of the Wireless Cable Modem Transceiver, 520004-1, with the requirements for FCC Part 21 devices. This report contains additional testing using a different antenna than in the original test report.
MANUFACTURER:	California Amplifier, Inc. 460 Calle San Pablo Camarillo, CA 93012
REPRESENTATIVE:	Carlos Briceno
TEST LOCATION:	CKC Laboratories, Inc. 5473A Clouds Rest, Mariposa, CA 95338
TEST PERSONNEL:	Skip Doyle
TEST METHOD:	FCC Part 2 and 21
FREQUENCY RANGE TESTED:	9 kHz - 22 GHz
EQUIPMENT UNDER TEST:	**Wireless Cable Modem Transceiver** Manuf: California Amplifier Model: 520004-1 Serial: 0060000243 FCC ID: J26520004-1 (Pending) **Antenna** Manuf: California Amplifier Model: 560002 Serial: 929000887

SUMMARY OF RESULTS

The California Amplifier, Inc. Wireless Cable Modem Transceiver, 520004-1, was tested in accordance with FCC Part 21 devices. As received, the above equipment was found to be fully compliant with the limits of FCC Part 21 devices. The results in this report apply only to the items tested, as identified herein.

EQUIPMENT UNDER TEST (EUT) AND ADDENDUM DESCRIPTION

Up/Down converter working in conjunction with a cable modem. The original testing represents the transmitter (model 520004-1) with an external antenna (model 130135), and the addendum represents the transmitter (model 520004-1) mounted inside an antenna (model 560002). California Amplifier intends to sell both configurations under the same FCC ID number of J26520004-1.

MEASUREMENT UNCERTAINTY

Associated with data in this report is a ±4dB measurement uncertainty.

EUT OPERATING FREQUENCY

The EUT was operating at 2150-2162 MHz.

TEMPERATURE AND HUMIDITY DURING TESTING

The temperature during testing was within +15°C and + 35°C.
The relative humidity was between 20% and 75%.

PERIPHERAL DEVICES

The EUT was tested with the following peripheral devices:

Mouse
Manuf: Compaq
Model: P/N:141189-401
Serial: N/A
FCC ID: DZL211029

Keyboard
Manuf: Compaq
Model: M/N
Serial: B23N0A39E874G
FCC ID: AQ6MTN4XZ15

Modem
Manuf: Hybrid Networks
Model: N231
Serial: 82AAP001759
FCC ID: DoC

Computer
Manuf: Compaq Computer
Model: Deskpro
Serial: 6647HVS3Q701
FCC ID: DoC

2.1033(c)(14)/2.1053/21.106(i) - FIELD STRENGTH OF SPURIOUS RADIATION

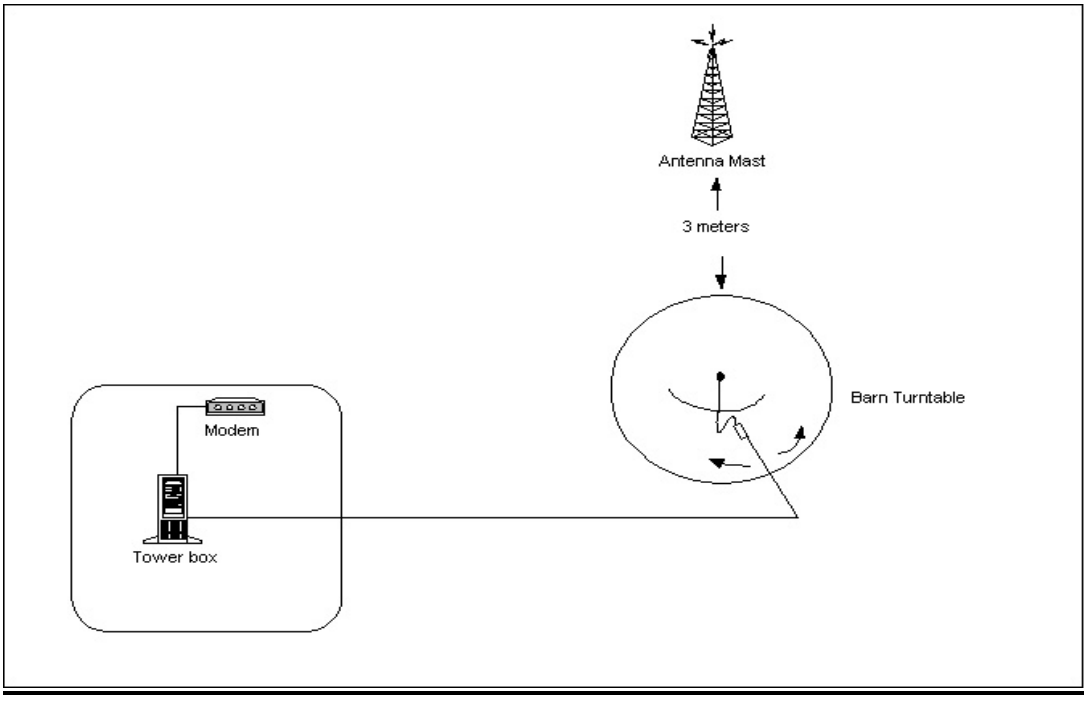
TEST METHOD AND PROCEDURE:

All harmonics and sub-harmonics of the carrier frequency were investigated. Measurements were also made to detect any spurious emissions that were directly radiated from the EUT under normal conditions of installation and operation. The information submitted includes the relative radiated power of each spurious and harmonic emissions with reference to the rated power output of the transmitter (assuming all emissions are radiated from half-wave dipole antennas).

VIDEO BANDWIDTH AND RESOLUTION BANDWIDTH SETTINGS:

Frequency Range	Signal Analyzer VBW & RBW Setting
9kHz – 150kHz	3kHz
150kHz - 30MHz	100kHz
30MHz – 1MHz	1MHz
1GHz – 22GHz	1MHz

DIAGRAM OF TEST SETUP USED FOR TEST:



TEST EQUIPMENT USED:

1. Spectrum Analyzer, Hewlett Packard, Model No. 8566B, S/N 2209A01404. Calibration date: July 7, 1999. Calibration due date: July 7, 2000.
2. Display, Hewlett Packard, Model No. 8566B, S/N 2403A08241. Calibration date: July 7, 1999. Calibration due date: July 7, 2000.
3. QP Adapter, Hewlett Packard, Model No. 85650A, S/N 1532A03198. Calibration date: July 7, 1999. Calibration due date: July 7, 2000.
4. Preamplifier, Hewlett Packard, Model No. 8447D, S/N 1937A02604. Calibration date: April 28, 1999. Calibration due date: April 28, 2000.
5. Preamplifier, Hewlett Packard, Model No. 8449B, S/N 300A00301. Calibration date: April 27, 1999. Calibration due date: April 27, 2000.
6. Biconical Antenna, A & H Systems, Model No. SAS-200/542, S/N 156. Calibration date: May 20, 1999. Calibration due date: May 20, 2000.
7. Log Periodic Antenna, A & H Systems, Model No. SAS-200/512, S/N 154. Calibration date: May 20, 1999. Calibration due date: May 20, 2000.
8. Horn Antenna, EMCO, Model No. 3115, S/N 4085. Calibration date. February 15, 1999. Calibration due date: February 15, 2000.
9. High Pass Filter, K & L, Model 91H31-300, S/N 00001. Calibration date. August 9, 1999. Calibration due date: August 9, 2000.
10. 10-Meter GHz Hardline Cable, includes GHz cables #1, 2 & 3.
11. 10-Meter Hardline Cable.

TEST CONDITIONS:

EUT is a Wireless Cable Modem operating at 2150-2162MHz. EUT receives power from modem via RG58 cable. Power to the cable is provided through the Power Inserter. EUT is continually sending packets via command from the PC. EUT is operating on Low Channel (2153MHz). Test was than redone in the same manner as stated above, except the EUT was operating at the High Channel (2159MHz). Power setting is 28 dBm and antenna gain is 17dBi.

PHOTOGRAPH OF TEST SETUP USED FOR TEST:

Front View

Back View

Test Data

FCC Part 2.1053/21-106(2)(a)(I)(ii)/21.908(a) Measurements required: Field strength of spurious radiation

Low Channel - 2153MHz

Polarity	Freq(MHz)	Reading in dBuV/m	PreAmp Factor	Cable Factor	Antenna	High Pass Filter	Corrected E (dBuV/M)	V/M	ERP (Watts)	Spec Limit Watts	Pass or Fail
Horizontal	12887.99	33.30	-33.50	25.60	40.00	3.1	68.50	0.002660725	0.000001295	0.000741000	Pass
Horizontal	10492.00	34.70	-33.90	24.60	37.60	2.3	65.30	0.001840772	0.000000620	0.000741000	Pass
Vertical	6638.01	31.30	-31.30	23.80	35.40	1.6	60.80	0.001096478	0.000000220	0.000741000	Pass
Horizontal	6638.00	30.70	-31.30	23.80	35.40	1.6	60.20	0.001023293	0.000000192	0.000741000	Pass
Vertical	6115.97	29.90	-29.60	22.40	35.40	0.9	59.00	0.000891251	0.000000145	0.000741000	Pass
Horizontal	6200.00	29.30	-29.80	23.00	35.40	1.1	59.00	0.000891251	0.000000145	0.000741000	Pass

Notes: Example: Frequency range investigated was from 500kHz to 22GHz. All spurious and harmonic emissions were investigated. Rated Power output of transmitter at 2153.121MHz = 0.741 Watts. EUT is a Wireless Cable Modem operating at 2150-2162MHz. EUT receives power from the modem via RG58 cable. Power to the cable is provided through the Power Inserter. EUT is continuously sending packets via command from the PC. EUT is operating on Low Channel (2153MHz) at 28 dBm. Antenna gain is 17dBi. OATS testing.

High Channel - 2159MHz

Polarity	Freq(MHz)	Reading in dBuV/m	PreAmp Factor	Cable Factor	Horn Antenna	High Pass Filter	Corrected E (dBuV/M)	V/M	ERP (Watts)	Spec Limit Watts	Pass or Fail
Vertical	15418.01	32.9	-30.8	27.7	38.1	6.4	74.3	0.005188000	0.000004924	0.000661000	Pass
Vertical	6684.01	30.6	-31.6	23.4	35.4	1.6	59.4	0.000933254	0.000000159	0.000661000	Pass
Horizontal	6648.01	29.9	-31.4	23.7	35.4	1.6	59.2	0.000912011	0.000000152	0.000661000	Pass
Horizontal	6116.00	29.5	-29.6	22.4	35.4	0.9	58.6	0.000851138	0.000000133	0.000661000	Pass
Horizontal	4792.00	32.2	-31.8	16.0	33.2	0.8	50.4	0.000331131	0.000000020	0.000661000	Pass
Vertical	2916.01	24.9	-32.1	10.3	31.6	15.0	49.7	0.000305492	0.000000017	0.000661000	Pass

Notes: Example: Frequency range investigated was from 500kHz to 22GHz. All spurious and harmonic emissions were investigated. Rated Power output of transmitter at 2159MHz = 0.661 Watts. EUT is a Wireless Cable Modem operating at 2150-2162MHz. EUT receives power from the modem via RG58 cable. Power to the cable is provided through the Power Inserter. EUT is continuously sending packets via command from the PC. EUT is operating on High Channel (2159MHz) at 28 dBm. Antenna gain is 17dBi. OATS testing.

CALCULATIONS

Note: The data taken is relative to the radiated power of each spurious emission with reference to the rated power

10 log (741mW/1mW) = 28.6dBm

28.6dBm - 60dBc = - 31.3

Inv Log (-31.3 dBm/10) = 0.000741W

Spec Limit = 0.000741 Watts for Low Channel (2153MHz)

10 log (661mW/1mW) = 28.2 dBm

28.2dBm - 60dBc = -31.79dBm

Inv Log (-31.79dBm/10) = 0.000661W

Spec Limit = 0.000661 Watts for High Channel (2159MHz)

ERP = $(Ed)^2/30(G)$

E = V/m

d= distance

G = Gain of Antenna (numerical gain of half wave dipole antenna 1.64)

Conversion of dBuV/m to V/m

[invlog(Reading in dBuV/m/20)]*.000001 = V/m