



CALIFORNIA AMPLIFIER TEST REPORT

FOR THE

ECCO MUSTANG CELLULAR AMPLIFIER, 520038

FCC PART 24

COMPLIANCE

DATE OF ISSUE: AUGUST 28, 2003

PREPARED FOR:

PREPARED BY:

California Amplifier 460 Calle San Pablo Camarillo, CA 93012 Mary Ellen Clayton CKC Laboratories, Inc. 5473A Clouds Rest Mariposa, CA 95338

P.O. No.: 29582 W.O. No.: 80997 Date of test: August 25-27, 2003

Report No.: FC03-056

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ADMINISTRATIVE INFORMATION

DATE OF TEST: August 25-27, 2003

DATE OF RECEIPT: August 25, 2003

PURPOSE OF TEST: To demonstrate the compliance of the Ecco

Mustang Cellular Amplifier, 520038 with the

requirements for FCC Part 24 devices.

TEST METHOD: FCC Part 24

FREQUENCY RANGE TESTED: 150 kHz - 1000 MHz

MANUFACTURER: California Amplifier

460 Calle San Pablo Camarillo, CA 93012

REPRESENTATIVE: Shawn Aleman

TEST LOCATION: CKC Laboratories, Inc.

5473A Clouds Rest Mariposa, CA 95338



SUMMARY OF RESULTS

As received, the California Amplifier Bidirectional Amplifier, 520038 was found to be fully compliant with the following standards and specifications:

United States

FCC Part 24

CONDITIONS FOR COMPLIANCE

No modifications to the EUT were necessary to comply.

APPROVALS

Steve Behm, Director of Engineering Services

QUALITY ASSURANCE:

TEST PERSONNEL:

Joyce Walker, Quality Assurance Administrative

Manager

Randy Clark, EMC Engineer

Mike Wilkinson, Lab Manager

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EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The EUT tested by CKC Laboratories was representative of a production unit

EQUIPMENT UNDER TEST

Bidirectional Amplifier

Manuf: California Amplifier

Model: 520038 Serial: 001 FCC ID: Pending

PERIPHERAL DEVICES

The EUT was tested with the following peripheral device(s):

Power Divider <u>ESG</u>

Manuf: Anaren Manuf: Agilent Model: 40276 Model: E4437B Serial: 600D-7949 Serial: US39260124

FCC ID: NA FCC ID: DoC

ESG DC Power Supply

Manuf: Agilent Manuf: Topward Electric Instruments Co., Ltd.

 Model:
 E4437B
 Model:
 TPS-2000

 Serial:
 US39260294
 Serial:
 920035

 FCC ID:
 DoC
 FCC ID:
 NA

MEASUREMENT UNCERTAINTY

TEST	HIGHEST UNCERTAINTY
Radiated Emissions	+/- 2.94 dB
Conducted Emissions	+/- 1.56 dB

Note: Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k=2. Statements of compliance are based on the nominal values only.

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TEMPERATURE AND HUMIDITY DURING TESTING

The temperature during testing was within $+15^{\circ}$ C and $+35^{\circ}$ C. The relative humidity was between 20% and 75%.

FCC 2.1033(c)(3) USER'S MANUAL

The necessary information is contained in a separate document.

FCC 2.1033 (c)(4) TYPE OF EMISSIONS

CDMA – 1M25F9W and GSM – 280kGXW

FCC 2.1033(c)(5) FREQUENCY RANGE

1850-1910 MHz and 1930-1990 MHz.

FCC 2.1033(c)(6) OPERATING POWER

19 dBm

FCC 2.1033(c)(7) MAXIMUM POWER RATING

2 Watts

FCC 2.1033(c)(8) DC VOLTAGES

6V. 1.5A maximum

FCC 2.1033(c)(9) TUNE-UP PROCEDURE

Levels are factory set and the customer has no control over it.

FCC 2.1033(c)(10) SCHEMATICS AND CIRCUITRY DESCRIPTION

The necessary information is contained in a separate document.

FCC 2.1033(c)(11) LABEL AND PLACEMENT

The necessary information is contained in a separate document.

FCC 2.1033(c)(12) SUBMITTAL PHOTOS

The necessary information is contained in a separate document.

FCC 2.1033(c)(13) MODULATION INFORMATION

QPSK up to 64 QAM

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FCC 2.1033(c)(14)/2.1046/24.232 - RF POWER OUTPUT

Equipment is a bi-directional amplifier repeater for broadband PCS. The downstream input is connected to a signal generator through a power divider. The input to the amplifier is set such that the maximum power output is achieved at the customer supplied antenna connectors. Maximum Allowable Power Output is 19dBm.

Block Tested: A-F

Modulation Tested: GSM and CDMA Frequency Range Investigated: Carrier.

The measured CDMA channel power at the customer provided antenna terminals is shown in the table below.

Block	Upstream 1850-1910 MHz	Downstream 1930-1990MHz
A	19.0 dBm	19.0 dBm
В	19.0 dBm	19.0 dBm
С	19.0 dBm	19.0 dBm
D	19.0 dBm	19.0 dBm
Е	19.0 dBm	19.0 dBm
F	19.0 dBm	19.0 dBm

The measured GSM channel power at the customer provided antenna terminals is shown in the table below.

Block	Upstream	Downstream			
	1850-1910 MHz	1930-1990MHz			
A	19.0 dBm	19.0 dBm			
В	19.0 dBm	19.0 dBm			
C	19.0 dBm	19.0 dBm			
D	19.0 dBm	19.0 dBm			
Е	19.0 dBm	19.0 dBm			
F	19.0 dBm	19.0 dBm			

Using the maximum power output of the EUT for both GSM and CDMA modulations, the EIRP is calculated by adding the gain of the antenna.

EIRP = Power Output + 8.5 dBi

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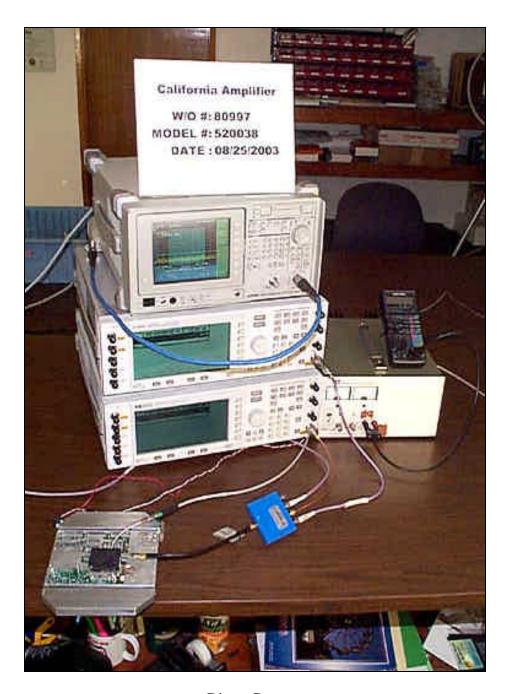
	Upstream 1850-1910 MHz	Downstream 1930-1990MHz
Maximum Power Output	19.0	19.0
Antenna Gain (dBi)	8.5	8.5
Maximum EIRP (dBm)	27.5	27.5
Maximum EIRP (Watts)	0.56	0.56
24.232 Limit (Watts)	2.0	2.0
Result	Pass	Pass

Test Equipment

Test Equipment								
Description Asset #		Manufacturer	Model #	Serial #	Cal Date	Cal Due		
Spectrum Analyzer,	02111	HP	8593EM	3624A00159	5/12/03	5/11/05		
9kHz to 26.5 GHz								
Cable-HF	P01403	Semiflex	58758-23	0038	1/21/03	1/21/04		

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Direct Connect



FCC 2.1055(d)/24.235 Frequency Stability Under Voltage Variations

Equipment is a bi-directional amplifier repeater for broadband PCS. The signal input is connected to the signal generators through a power divider. The input to the amplifier is set such that the maximum power output is achieved at the customer supplied antenna connectors. Maximum Allowable Power Output is 19dBm.

Frequency stability under voltage variations. Since voltage variations of $\pm 15\%$ of the nominal DC input voltage would be destructive to the equipment under test, voltage variations are performed within the manufacturer's declared input voltage range. The manufacturer's declared operating voltage is 6.00 ± 0.20 VDC. This method was agreed upon between CKC Laboratories, Inc. and California Amplifier prior to test.

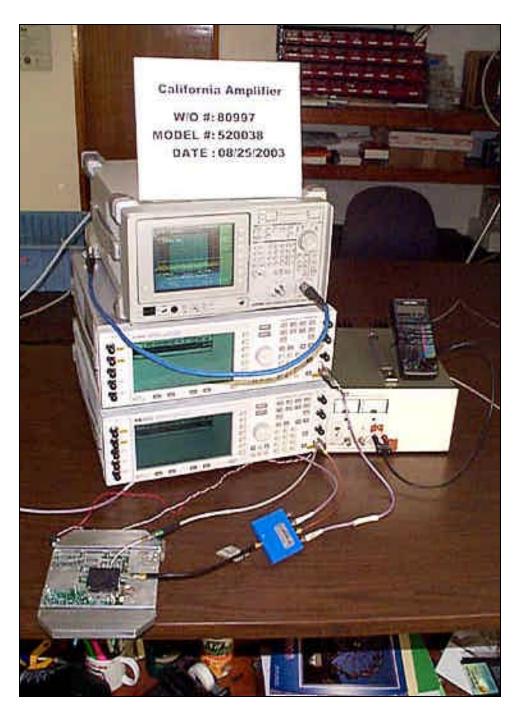
Results of test: The equipment demonstrated frequency stability sufficient to keep the transmit frequency within the authorized channel block.

Test Equipment

rest Equipment								
Description Asset #		Manufacturer	Model #	Model # Serial #		Cal Due		
Spectrum Analyzer, 9kHz to 26.5 GHz	02111	HP	8593EM	3624A00159	5/12/03	5/11/05		
Cable-HF	P01403	Semiflex	58758-23	0038	1/21/03	1/21/04		

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Direct Connect



FCC 2.1033(c)(14)/2.1047(a) - MODULATION CHARACTERISTICS - AUDIO FREQUENCY RESPONSE

Not applicable to this unit.

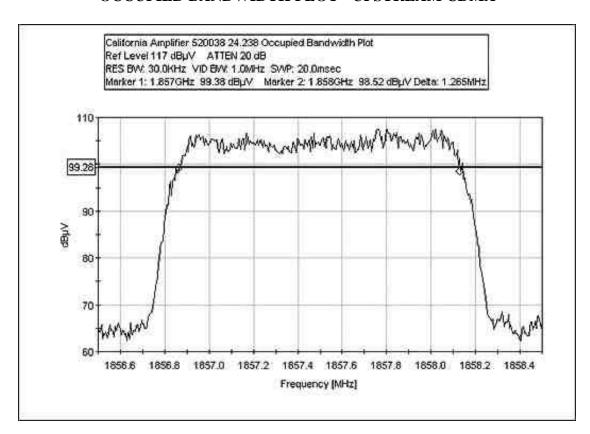
FCC 2.1033(c)(14)/2.1047(b) MODULATION CHARACTERISTICS – Modulation Limiting Response

Not applicable to this unit.

FCC 2.1033(c)(14)/2.1049(i)- OCCUPIED BANDWIDTH

Test Conditions: Equipment is a bi-directional amplifier repeater for broadband PCS. The signal input is connected to the signal generators through a power divider. The input to the amplifier is set such that the maximum power output is achieved at the customer supplied antenna connectors. Maximum Allowable Power Output is 19dBm. CDMA - RBW = 100 kHz, GSM - RBW = 3 kHz.

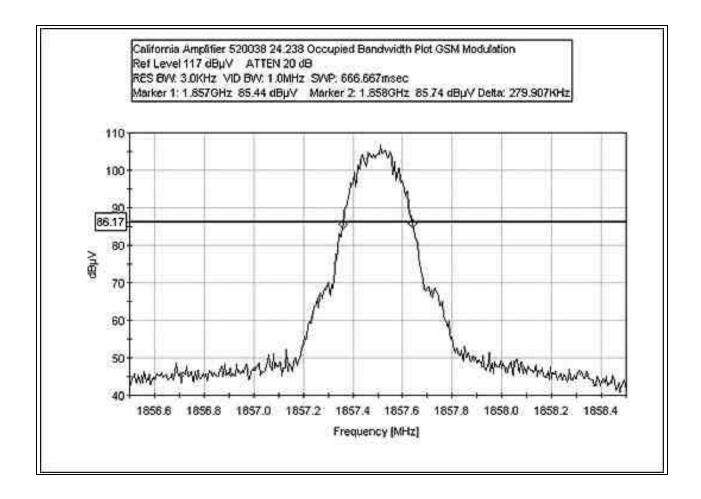
OCCUPIED BANDWIDTH PLOT - UPSTREAM CDMA



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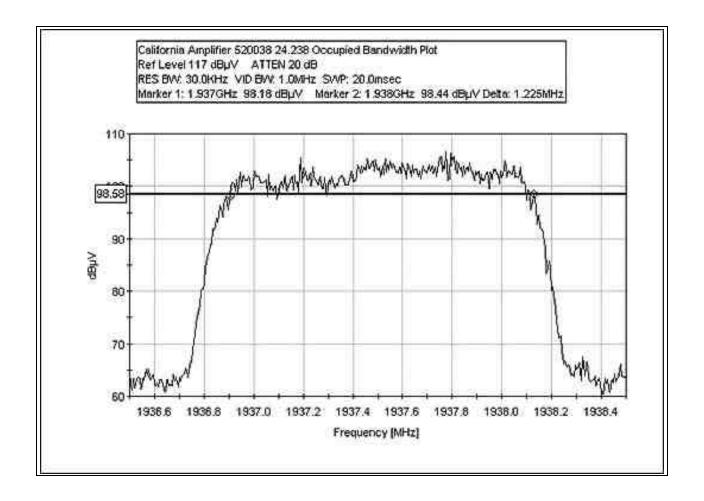
OCCUPIED BANDWIDTH PLOT - UPSTREAM GSM



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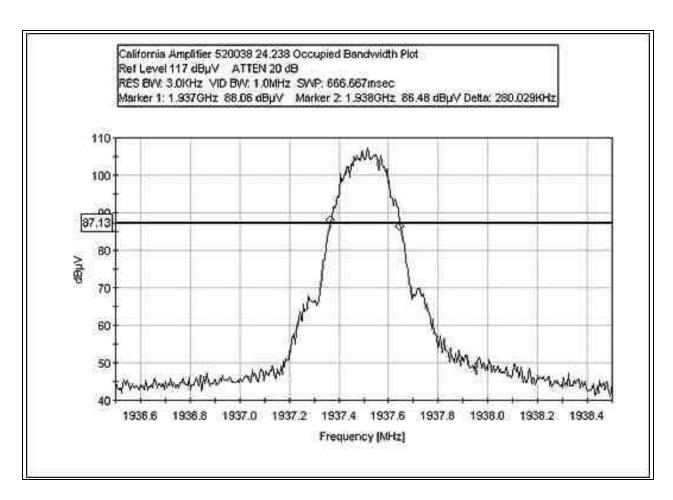
OCCUPIED BANDWIDTH PLOT - DOWNSTREAM CDMA



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OCCUPIED BANDWIDTH PLOT - DOWNSTREAM GSM



Test Equipment

Description	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer,	02111	HP	8593EM	3624A00159	5/12/03	5/11/05
9kHz to 26.5 GHz						
Cable-HF	P01403	Semiflex	58758-23	0038	1/21/03	1/21/04

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FCC 2.1033(c)(14)/2.1051/24.238 - SPURIOUS EMISSIONS AT ANTENNA TERMINAL

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: California Amplifier
Specification: 24.238 Block F

Work Order #: 80997 Date: 08/26/2003
Test Type: Antenna Terminals
Equipment: Bidirectional Amplifier Sequence#: 3

Manufacturer: California Amplifier Tested By: Randal Clark

Model: 520038 S/N: 001

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N	
Bidirectional Amplifier*	California Amplifier	520038	001	

Support Devices:

Function	Manufacturer	Model #	S/N	
Power Divider	Anaren	40276	600D-7949	
ESG	Agilent	E4437B	US39260124	
ESG	Agilent	E4437B	US39260294	
DC Power Supply	Topward Electric	TPS-2000	920035	
	Instruments Co., Ltd			

Test Conditions / Notes:

Equipment is a bi-directional amplifier repeater for broadband PCS. The signal input is connected to the signal generators through a power divider. The input to the amplifier is set such that the maximum power output is achieved at the customer supplied antenna connectors. Maximum Allowable Power Output is 19dBm. Intermodulation Attenuation Test (3 Signal Method) Blocks Tested: A-F Downstream Modulation Tested: CDMA. RBW=1MHz and VBW=1MHz except in the 1MHz bandwidth outside of the assigned block where RBW=100kHz and VBW=1MHz. Three input signals are chosen such that in the 15 MHz channel blocks the lowest and highest channels are selected in addition to the third lowest channel. In the 5 MHz channel blocks the lowest and highest channels are selected in addition to the second lowest channel. Frequency Range tested: 20 MHz – 20 GHz. No EUT Emissions detected within 20dB of the limit.

Transducer Legend:

T1=Cable HF P-1403

Measurement Data:	Reading listed by margin.	Test Distance: None
-------------------	---------------------------	---------------------

#	Freq	Rdng	T1	-	-		Dist	Corr	Spec	Margin	Polar
	MHz	dΒμV	dB	dB	dB	dB	Table	dΒμV	dΒμV	dB	Ant
1	1965.500M	72.0	+1.9				+0.0	73.9	94.0	-20.1	None
									Block C		
									Downstrea	am	
2	1998.800M	72.0	+1.9				+0.0	73.9	94.0	-20.1	None
									Block C		
									Downstrea	am	
3	2001.300M	71.9	+1.9				+0.0	73.8	94.0	-20.2	None
									Block C		
									Downstrea	am	

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4	1966.800M	71.6	+1.9	+0.0	73.5	94.0	-20.5	None
						Block C Downstream		
5	1938.800M	71.3	+1.9	+0.0	73.2	94.0	-20.8	None
Ì						Block B		
						Downstream		
6	1941.800M	71.1	+1.9	+0.0	73.0	94.0	-21.0	None
						Block B		
						Downstream		
7	1963.500M	71.0	+1.9	+0.0	72.9		-21.1	None
						Block C		
						Downstream		
8	1973.000M	70.8	+1.9	+0.0	72.7		-21.3	None
	-,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					Block B		- 1 - 1 - 1
						Downstream		
9	1976.000M	70.5	+1.9	+0.0	72.4		-21.6	None
	1770.000111	70.5	1 1.0	10.0	, 2	Block B	21.0	rione
						Downstream		
10	1956.500M	69.3	+1.9	+0.0	71.2		-22.8	None
10	1730.300141	07.3	11.7	10.0	/1.2	Block A	22.0	TOHE
						Downstream		
11	1954.000M	69.2	+1.9	+0.0	71.1		-22.9	None
11	1954.000W	09.2	T1.9	+0.0	/1.1	Block A	-22.9	None
						Downstream		
12	1948.500M	68.4	+1.9	+0.0	70.3		-23.7	None
12	1940.300W	00.4	⊤1.9	+0.0	70.5	Block B	-23.1	None
						Downstream		
12	1992.000M	66.5	+1.9	+0.0	68.1		-25.6	None
13	1992.000W	00.5	T1.9	+0.0	00.4	Block C	-23.0	None
						Downstream		
1.4	1973.800M	66.4	+1.9	+0.0	68.3		-25.7	None
17	1773.0001	00.4	11.7	10.0	00.5	Block C	-23.1	None
						Downstream		
15	1966.800M	63.9	+1.9	+0.0	65.8		-28.2	None
13	1900.000W1	03.9	+1.9	+0.0	03.8	Block B	-20.2	None
						Downstream		
1.6	1966.500M	62.7	+1.9	+0.0	64.6		-29.4	None
10	1300.300IVI	02.7	+1.7	+0.0	04.0		-27.4	none
						Block A		
17	1963.250M	61.5	+1.9	+0.0	62.4	Downstream 94.0	-30.6	None
1 /	1703.230W	01.3	+1.7	+0.0	63.4	94.0 Block E	-30.0	None
1.0	1042 5003 4	(0.0	.10	.00	(2.9	Downstream	21.2	NI
18	1943.500M	60.9	+1.9	+0.0	62.8		-31.2	None
						Block D		
10	1022 5001 4	60.7	.10	.00	60.6	Downstream	21.4	Na
19	1923.500M	60.7	+1.9	+0.0	62.6		-31.4	None
						Block A		
20	000 0003 4	(1.1	. 0. 0		(1.1	Downstream	20.0	NT.
20	990.880M	61.1	+0.0	+0.0	61.1		-32.9	None
						Block E		
						Downstream		

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21 1000 00014	50.7	. 1.0	0.0 (0.6 0.4 0.2 2.4 N
21 1968.800M	58.7	+1.9	+0.0 60.6 94.0 -33.4 None
			Block A Downstream
22 1006.000M	58.7	+1.3	+0.0 60.0 94.0 -34.0 None
22 1000.000WI	36.7	⊤1.5	Block C
			Downstream
23 968.500M	60.0	+0.0	+0.0 60.0 94.0 -34.0 None
25 700.500141	00.0	10.0	Block B
			Downstream
24 961.250M	59.9	+0.0	+0.0 59.9 94.0 -34.1 None
2. 901.2001.1	0,,,	. 0.0	Block D
			Downstream
25 3905.000M	56.9	+2.7	+0.0 59.6 94.0 -34.4 None
			Block B
			Downstream
26 3897.000M	56.1	+2.7	+0.0 58.8 94.0 -35.2 None
			Block D
			Downstream
27 3935.880M	56.0	+2.7	+0.0 58.7 94.0 -35.3 None
			Block E
			Downstream
28 1953.880M	56.7	+1.9	+0.0 58.6 94.0 -35.4 None
			Block D
			Downstream
29 5916.250M	55.0	+3.4	+0.0 58.4 94.0 -35.6 None
			Block F
			Downstream
30 997.000M	57.8	+0.0	+0.0 57.8 94.0 -36.2 None
			Block F
			Downstream
31 5903.000M	54.4	+3.4	+0.0 57.8 94.0 -36.2 None
			Block E
22 22 4 5 2 5 2 5 2 5			Downstream
32 3946.250M	55.0	+2.7	+0.0 57.7 94.0 -36.3 None
			Block F
33 5934.300M	54.0	. 2. 4	Downstream 26.4 November 26.4
33 3934.300M	54.2	+3.4	+0.0 57.6 94.0 -36.4 None
			Block C Downstream
34 1967.880M	55.6	+1.9	+0.0 57.5 94.0 -36.5 None
J+ 1707.00UNI	55.0	⊤1.7	+0.0 37.3 94.0 -30.3 None Block F
			Downstream
35 3865.300M	54.5	+2.6	+0.0 57.1 94.0 -36.9 None
33 3003.300141	5 7.5	12.0	Block A
			Downstream
36 3964.800M	54.2	+2.7	+0.0 56.9 94.0 -37.1 None
23 230 11000171	2 1.2		Block C
			Downstream
37 1495.000M	55.0	+1.6	+0.0 56.6 94.0 -37.4 None
			Block B
			Downstream

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38	1477.800M	55.0	+1.6	+0.0	56.6	94.0	-37.4	None
						Block A		
						Downstrea	m	
39	1522.800M	54.7	+1.6	+0.0	56.3	94.0	-37.7	None
						Block C		
						Downstrea	m	
40	1512.500M	53.6	+1.6	+0.0	55.2	94.0	-38.8	None
Î						Block F		
						Downstrea	m	
41	943.500M	54.9	+0.0	+0.0	54.9	94.0	-39.1	None
Î						Block A		
						Downstrea	m	
42	1507.380M	52.6	+1.6	+0.0	54.2	94.0	-39.8	None
Î						Block E		
						Downstrea	m	
43	1973.630M	51.9	+1.9	+0.0	53.8	94.0	-40.2	None
Î						Block E		
						Downstrea	m	
44	1487.630M	51.8	+1.6	+0.0	53.4	94.0	-40.6	None
İ						Block D		
						Downstrea	m	
45	1978.750M	51.3	+1.9	+0.0	53.2	94.0	-40.8	None
į		2 1.0	>	. 0.0		Block F	.0.0	
						Downstrea	m	
						= 0		

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Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: California Amplifier
Specification: 24.238 Block C (Upstream)

 Work Order #:
 80997
 Date:
 08/26/2003

 Test Type:
 Antenna Terminals
 Time:
 10:37:20

Equipment: **Bidirectional Amplifier** Sequence#: 2

Manufacturer: California Amplifier Tested By: Randal Clark

Model: 520038 S/N: 001

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N	
1 direction	Triulial acturer	1110401 11	5/11	
Bidirectional Amplifier*	California Amplifier	520038	001	

Support Devices:

Function	Manufacturer	Model #	S/N
Power Divider	Anaren	40276	600D-7949
ESG	Agilent	E4437B	US39260124
ESG	Agilent	E4437B	US39260294
DC Power Supply	Topward Electric	TPS-2000	920035
	Instruments Co., Ltd		

Test Conditions / Notes:

Equipment is a bi-directional amplifier repeater for broadband PCS. The signal input is connected to the signal generators through a power divider. The input to the amplifier is set such that the maximum power output is achieved at the customer supplied antenna connectors. Maximum Allowable Power Output is 19dBm. Intermodulation Attenuation Test (3 Signal Method) Blocks Tested: A-F Upstream. Modulation Tested: CDMA. RBW=1MHz and VBW=1MHz except in the 1MHz bandwidth outside of the assigned block where RBW=100kHz and VBW=1MHz Three input signals are chosen such that in the 15 MHz channel blocks the lowest and highest channels are selected in addition to the third lowest channel. In the 5 MHz channel blocks the lowest and highest channels are selected in addition to the second lowest channel. Frequency Range tested: 20 MHz – 20 GHz. No EUT Emissions detected within 20dB of the limit.

Transducer Legend:

T1=Cable HF P-1403

Measu	rement Data:	Re	eading lis	ted by m	nargin.		Te	st Distanc	e: None		
#	Freq	Rdng	T1				Dist	Corr	Spec	Margin	Polar
	MHz	dΒμV	dB	dB	dB	dB	Table	dΒμV	dΒμV	dB	Ant
1	1886.800M	70.0	+1.8				+0.0	71.8	94.0	-22.2	None
									Block C U	Jpstream	
2	1884.300M	69.6	+1.8				+0.0	71.4	94.0	-22.6	None
									Block C U	Jpstream	
3	1868.500M	66.3	+1.8				+0.0	68.1	94.0	-25.9	None
									Block B U	Jpstream	
4	5603.800M	64.3	+3.2				+0.0	67.5	94.0	-26.5	None
									Block D U	Jpstream	
5	1842.000M	65.3	+1.8				+0.0	67.1	94.0	-26.9	None

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Block A Upstream



6	5617.000M	63.8	+3.2	+0.0 67.0	94.0 -27.0 Block B Upstream	None
7	1918.500M	64.9	+1.9	+0.0 66.8	94.0 -27.2	None
,	1710.50011	01.7	11.7	10.0	Block C Upstream	110110
8	5569.000M	63.0	+3.2	+0.0 66.2	94.0 -27.8	None
0	3309.000WI	05.0	⊤3.4	+0.0 00.2	Block A Upstream	None
9	1874.300M	63.9	+1.8	+0.0 65.7	94.0 -28.3	None
9	1874.300M	03.9	+1.8	+0.0 63.7		None
10	1861.500M	63.7	+1.8	+0.0 65.5	Block C Upstream 94.0 -28.5	None
10	1801.300M	03.7	+1.8	+0.0 63.3		None
1.1	7540,00014	C1 4	2.0	.0.0	Block B Upstream	N T
11	7548.000M	61.4	+3.8	+0.0 65.2	94.0 -28.8	None
					Block E Upstream	
12	1873.800M	62.4	+1.8	+0.0 64.2	94.0 -29.8	None
					Block A Upstream	
13	7570.000M	59.9	+3.8	+0.0 63.7	94.0 -30.3	None
					Block F Upstream	
14	12.100M	63.2	+0.0	+0.0 63.2	94.0 -30.8	None
					Block B Upstream	
15	1887.000M	61.4	+1.8	+0.0 63.2	94.0 -30.8	None
					Block B Upstream	
16	7489.000M	58.5	+3.8	+0.0 62.3	94.0 -31.7	None
					Block B Upstream	
17	1893.300M	60.2	+1.8	+0.0 62.0	94.0 -32.0	None
					Block B Upstream	
18	7468.800M	58.2	+3.8	+0.0 62.0	94.0 -32.0	None
	, , , , , , , , , , , , , , , , , , , ,				Block D Upstream	
19	5725.500M	58.6	+3.3	+0.0 61.9	94.0 -32.1	None
17	3723.3001.1	20.0	13.3	10.0	Block C Upstream	TVOILE
20	854.000M	61.3	+0.0	+0.0 61.3	94.0 -32.7	None
20	054.0001	01.5	10.0	10.0 01.5	Block B Upstream	TVOILE
21	5694.000M	57.4	+3.3	+0.0 60.7	94.0 -33.3	None
21	3094.000IVI	37.4	⊤3.3	+0.0 00.7	Block C Upstream	None
22	1904.500M	58.8	+1.8	+0.0 60.6	94.0 -33.4	None
22	1904.300M	38.8	+1.8	+0.0 00.0	Block E Upstream	None
	0.05014	60.2	. 0. 0	.0.0	*	3.7
23	9.950M	60.3	+0.0	+0.0 60.3	94.0 -33.7	None
2.4	1072 0007		4.0	0.0	Block C Upstream	
24	1853.000M	58.5	+1.8	+0.0 60.3	94.0 -33.7	None
					Block E Upstream	
25	5679.500M	56.9	+3.3	+0.0 60.2	94.0 -33.8	None
					Block F Upstream	
26	3745.000M	57.3	+2.6	+0.0 59.9	94.0 -34.1	None
					Block B Upstream	
27	3773.300M	56.7	+2.6	+0.0 59.3	94.0 -34.7	None
					Block E Upstream	
28	1893.380M	56.9	+1.8	+0.0 58.7	94.0 -35.3	None
					Block E Upstream	
29	3735.000M	55.9	+2.6	+0.0 58.5	94.0 -35.5	None
				. 0.0	Block D Upstream	
30	3705.000M	55.9	+2.6	+0.0 58.5	94.0 -35.5	None
	2702.000111	55.7	. 2.0	10.0 30.3	Block A Upstream	1,0110
<u> </u>					Diock 11 Opsicalii	



31	3783.300M	55.8	+2.6	+0.0	58.4	94.0	-35.6	None
						Block F Up	stream	
32	1880.880M	56.6	+1.8	+0.0	58.4	94.0	-35.6	None
						Block E Up	ostream	
33	5661.300M	54.4	+3.3	+0.0	57.7	94.0	-36.3	None
						Block E Up	ostream	
34	891.600M	57.6	+0.0	+0.0	57.6	94.0	-36.4	None
						Block C Up	ostream	
35	1860.880M	55.4	+1.8	+0.0	57.2	94.0	-36.8	None
						Block D U ₁	pstream	
36	3817.000M	54.3	+2.6	+0.0	56.9	94.0	-37.1	None
						Block C Up	ostream	
37	1882.000M	54.9	+1.8	+0.0	56.7	94.0	-37.3	None
						Block F Up	stream	
38	1902.000M	52.8	+1.8	+0.0	54.6	94.0	-39.4	None
						Block F Up	stream	
39	1876.880M	52.1	+1.8	+0.0	53.9	94.0	-40.1	None
						Block D U ₁	pstream	
40	1928.800M	49.0	+1.9	+0.0	50.9	94.0	-43.1	None
						Block C Up	ostream	

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Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: California Amplifier
Specification: 24,238 Block F

 Work Order #:
 80997
 Date:
 08/26/2003

 Test Type:
 Antenna Terminals
 Time:
 14:08:20

Equipment: **Bidirectional Amplifier** Sequence#: 4
Manufacturer: California Amplifier Tested By: Randal Clark

Model: 520038 S/N: 001

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N	
1 direction	Triulial acturer	1110401 11	5/11	
Bidirectional Amplifier*	California Amplifier	520038	001	

Support Devices:

Function	Manufacturer	Model #	S/N	
Power Divider	Anaren	40276	600D-7949	
ESG	Agilent	E4437B	US39260124	
ESG	Agilent	E4437B	US39260294	
DC Power Supply	Topward Electric	TPS-2000	920035	
	Instruments Co., Ltd			
Modulation Input	HP	204D	1105A02034	
Signal Generator	HP	8673C	2822A00551	

Test Conditions / Notes:

Equipment is a bi-directional amplifier repeater for broadband PCS. The signal input is connected to the signal generators through a power divider. The input to the amplifier is set such that the maximum power output is achieved at the customer supplied antenna connectors. Maximum Allowable Power Output is 19dBm. Intermodulation Attenuation Test (3 Signal Method) Blocks Tested: A-F Downstream. Modulation Tested: GSM. RBW=1MHz and VBW=1MHz except in the 1MHz bandwidth outside of the assigned block where RBW=100kHz and VBW=1MHz Three input signals are chosen such the lowest and highest channels in the block are selected in addition to the third lowest channel. Frequency Range tested: 20 MHz – 20 GHz.

Transducer Legend:

T1=Cable HF P-1403

Measi	Measurement Data:		Reading listed by margin.				Test Distance: None				
#	Freq	Rdng	T1				Dist	Corr	Spec	Margin	Polar
	MHz	dΒμV	dB	dB	dB	dB	Table	dΒμV	dBμV	dB	Ant
1	1961.750M	74.4	+1.9				+0.0	76.3	94.0	-17.7	None
									Block E		
									Downstrea	am	
2	1966.500M	74.3	+1.9				+0.0	76.2	94.0	-17.8	None
									Block F		
									Downstrea	am	
3	1941.750M	72.1	+1.9				+0.0	74.0	94.0	-20.0	None
									Block D		
									Downstrea	am	

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1	1949.300M	72.1	+1.9	+0.0	74.0	94.0	-20.0	None
4	1949.300M	72.1	+1.9	+0.0	74.0	Block B	-20.0	None
						Downstream		
5	1978.630M	71.7	+1.9	+0.0	73.6	94.0	-20.4	None
						Block F		
						Downstream		
6	1969.630M	71.5	+1.9	+0.0	73.4	94.0	-20.6	None
_						Block F		
						Downstream		
7	1962.000M	71.2	+1.9	+0.0	73.1		-20.9	None
,	1702.000111	, 1.2	11.7	. 0.0	73.1	Block C	20.7	rione
						Downstream		
8	1973.380M	70.6	+1.9	+0.0	72.5		-21.5	None
O	1773.300W	70.0	11.7	10.0	12.5	Block E	-21.5	None
						Downstream		
0	1944.630M	69.1	+1.9	+0.0	71.0		-23.0	None
7	1944.030W	09.1	+1.5	+0.0	/1.0	Block D	-23.0	None
10	1064 62014	60.0	. 1.0	.00	70.0	Downstream	22.2	NT.
10	1964.630M	68.9	+1.9	+0.0	70.8		-23.2	None
						Block E		
	2002.0007.5		1.0		5 00	Downstream		
11	2003.000M	68.9	+1.9	+0.0	70.8		-23.2	None
						Block C		
						Downstream		
12	1953.380M	68.6	+1.9	+0.0	70.5		-23.5	None
						Block D		
						Downstream		
13	1936.800M	68.5	+1.9	+0.0	70.4		-23.6	None
						Block B		
						Downstream		
14	1958.000M	68.1	+1.9	+0.0	70.0	94.0	-24.0	None
						Block A		
						Downstream		
15	1978.300M	67.7	+1.9	+0.0	69.6	94.0	-24.4	None
						Block B		
						Downstream		
16	1971.000M	65.8	+1.9	+0.0	67.7	94.0	-26.3	None
						Block E		
						Downstream		
17	1976.000M	65.1	+1.9	+0.0	67.0	94.0	-27.0	None
						Block F		
						Downstream		
18	1951.000M	65.0	+1.9	+0.0	66.9		-27.1	None
						Block D		
						Downstream		
19	1937.880M	62.2	+1.9	+0.0	64.1		-29.9	None
	3 2	~-· -		. 0.0		Block D		
						Downstream		
20	1966.000M	62.1	+1.9	+0.0	64.0		-30.0	None
20	1700.000111	02.1	1 1.7	10.0	07.0	Block B	50.0	1 10110
						Downstream		
						Downsticalli		

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21 1957.130M	60.4	+1.9	+0.0 62.3 94.0 -31.7 None Block D
			Downstream
22 1947.000M	60.4	+1.9	+0.0 62.3 94.0 -31.7 None
			Block A
			Downstream
23 1925.800M	59.9	+1.9	+0.0 61.8 94.0 -32.2 None
25 1725.000101	37.7	11.7	Block A
			Downstream
24 1092 120M	59.8	+1.9	
24 1982.130M	39.6	+1.9	+0.0 61.7 94.0 -32.3 None Block F
25 4052 00015	70.0		Downstream
25 1963.000M	59.3	+1.9	+0.0 61.2 94.0 -32.8 None
			Block F
			Downstream
26 1917.000M	57.6	+1.9	+0.0 59.5 94.0 -34.5 None
			Block A
			Downstream
27 1971.500M	57.5	+1.9	+0.0 59.4 94.0 -34.6 None
			Block A
			Downstream
28 1928.300M	57.0	+1.9	+0.0 58.9 94.0 -35.1 None
			Block A
			Downstream
29 1495.300M	56.5	+1.6	+0.0 58.1 94.0 -35.9 None
2) 14)3.300W	30.3	11.0	Block B
			Downstream
30 3945.130M	55.0	+2.7	+0.0 57.7 94.0 -36.3 None
30 3943.130W	33.0	+2.7	+0.0 57.7 94.0 -30.3 None Block F
21 2024 00014	540	. 2. 7	Downstream 264 N
31 3934.880M	54.9	+2.7	+0.0 57.6 94.0 -36.4 None
			Block E
			Downstream
32 3875.300M	54.9	+2.7	+0.0 57.6 94.0 -36.4 None
			Block A
			Downstream
33 3895.130M	54.5	+2.7	+0.0 57.2 94.0 -36.8 None
			Block D
			Downstream
34 1522.800M	55.5	+1.6	+0.0 57.1 94.0 -36.9 None
			Block C
			Downstream
35 3964.500M	54.2	+2.7	+0.0 56.9 94.0 -37.1 None
			Block C
			Downstream
36 3914.800M	54.2	+2.7	+0.0 56.9 94.0 -37.1 None
30 371 1.000141	51.2	. 2.,	Block B
			Downstream
37 1477.800M	54.2	+1.6	+0.0 55.8 94.0 -38.2 None
31 1411.000WI	34.2	⊤1.∪	
			Block A
			Downstream

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38	997.300M	54.8	+0.0	+0.0	54.8	94.0	-39.2	None
						Block F		
						Downstream	n	
39	1507.380M	53.1	+1.6	+0.0	54.7	94.0	-39.3	None
İ						Block E		
						Downstream	n	
40	1512.750M	52.5	+1.6	+0.0	54.1	94.0	-39.9	None
İ						Block F		
						Downstream	n	
41	942.000M	53.5	+0.0	+0.0	53.5	94.0	-40.5	None
71	942.000W	33.3	+0.0	+0.0	33.3	Block A	-40.5	None
						Downstream		
42	1487.380M	51.5	+1.6	+0.0	53.1	94.0	-40.9	None
						Block D		
						Downstrean	1	
43	1992.000M	49.9	+1.9	+0.0	51.8	94.0	-42.2	None
						Block C		
						Downstream	n	
44	1973.500M	48.8	+1.9	+0.0	50.7	94.0	-43.3	None
İ						Block C		
						Downstream	n	
45	1936.800M	64.7	+1.9	+0.0	66.6	119.0	-52.4	None
1	1730.0001	U-T. /	11.7	10.0	00.0	Block A	32.4	TAOHE
						Downstrean		
						Downstream	11	

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Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: California Amplifier Specification: 24.238 Block F (Upstream)

Work Order #: Date: 08/26/2003 Test Type: Time: 15:18:37 **Antenna Terminals**

Equipment: **Bidirectional Amplifier** Sequence#: 5

Manufacturer: California Amplifier Tested By: Randal Clark

Model: 520038 S/N: 001

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N	
1 direction	171411414CtG1C1	1110401 11	Bill	
Bidirectional Amplifier*	California Amplifier	520038	001	

Support Devices:

Function	Manufacturer	Model #	S/N
Power Divider	Anaren	40276	600D-7949
ESG	Agilent	E4437B	US39260124
ESG	Agilent	E4437B	US39260294
DC Power Supply	Topward Electric	TPS-2000	920035
	Instruments Co., Ltd		
Modulation Input	HP	204D	1105A02034
Signal Generator	HP	8673C	2822A00551

Test Conditions / Notes:

Equipment is a bi-directional amplifier repeater for broadband PCS. The signal input is connected to the signal generators through a power divider. The input to the amplifier is set such that the maximum power output is achieved at the customer supplied antenna connectors. Maximum Allowable Power Output is 19dBm. Intermodulation Attenuation Test (3 Signal Method) Blocks Tested: A-F Upstream. Modulation Tested: GSM. RBW=1MHz and VBW=1MHz except in the 1MHz bandwidth outside of the assigned block where RBW=100kHz and VBW=1MHz. Three input signals are chosen such the lowest and highest channels in the block are selected in addition to the third lowest channel. Frequency Range tested: 20 MHz – 20 GHz.

Transducer Legend:

T1=Cable HF P-1403

Measu	rement Data:	Reading listed by margin.					Test Distance: None			
#	Freq	Rdng	T1				Dist	Corr	Spec	
	MH_{7}	$d\mathbf{R}_{\mathbf{H}}\mathbf{V}$	dВ	dВ	dВ	dВ	Table	$d\mathbf{R}_{\mathbf{H}}\mathbf{V}$	$d\mathbf{R} \mathbf{u} \mathbf{V}$	

#	Freq	Rdng	T1				Dist	Corr	Spec	Margin	Polar
	MHz	dΒμV	dB	dB	dB	dB	Table	dBμV	dΒμV	dB	Ant
1	1882.000M	73.4	+1.8				+0.0	75.2	94.0	-18.8	None
									Block C U	Jpstream	
2	1886.880M	73.0	+1.8				+0.0	74.8	94.0	-19.2	None
									Block F U	pstream	
3	1861.630M	72.5	+1.8				+0.0	74.3	94.0	-19.7	None
									Block D U	Jpstream	
4	1857.300M	72.3	+1.8				+0.0	74.1	94.0	-19.9	None
									Block B U	Jpstream	

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5	1837.000M	71.8	+1.8	+0.0 73.6 94.0 Block A	-20.4 Upstream	None
6	1881.380M	71.5	+1.8	+0.0 73.3 94.0	-20.7	None
0	1001.5001	71.5	11.0	Block E V		TTOILE
7	1873.630M	71.0	+1.8	+0.0 72.8 94.0	-21.2	None
/	10/3.030WI	/1.0	+1.0	+0.0 /2.8 94.0 Block D		None
- 0	1000 5001	(7.0	+1.8		_	NT
8	1898.500M	67.2	+1.8	+0.0 69.0 94.0	-25.0	None
-	1878.000M	(7.0	+1.8	+0.0 69.0 94.0		NT.
9	18/8.000M	67.2	+1.8		-25.0	None
				Block A		
10	1897.800M	66.3	+1.8	+0.0 68.1 94.0	-25.9	None
				Block B	•	
11	1893.630M	66.0	+1.8	+0.0 67.8 94.0	-26.2	None
				Block E V		
12	1857.380M	65.8	+1.8	+0.0 67.6 94.0	-26.4	None
				Block D	Upstream	
13	1866.000M	65.2	+1.8	+0.0 67.0 94.0	-27.0	None
				Block A	Upstream	
14	1877.250M	65.1	+1.8	+0.0 66.9 94.0	-27.1	None
İ				Block D		
15	1882.880M	64.6	+1.8	+0.0 66.4 94.0	-27.6	None
10	1002.000111	01.0	11.0	Block F U		Tione
16	1843.300M	63.9	+1.8	+0.0 65.7 94.0	-28.3	None
10	1043.300M	03.9	⊤1.0	Block B		None
17	1896.000M	63.3	+1.8	+0.0 65.1 94.0	-28.9	None
1 /	1090.000IVI	03.3	+1.6	+0.0 03.1 94.0 Block F U		None
1.0	55 (5 500) (61.8	+3.2		•	N
18	5565.500M	01.8	+3.2		-29.0	None
1.0	5.00.5503.5	60. 7	2.2	Block A	_	3.7
19	5600.750M	60.7	+3.2	+0.0 63.9 94.0	-30.1	None
				Block D		
20	1868.000M	62.0	+1.8	+0.0 63.8 94.0	-30.2	None
				Block C	•	
21	1823.000M	61.7	+1.8	+0.0 63.5 94.0	-30.5	None
				Block A	Upstream	
22	1902.630M	61.3	+1.8	+0.0 63.1 94.0	-30.9	None
				Block F U	Jpstream	
23	5625.500M	59.4	+3.3	+0.0 62.7 94.0	-31.3	None
				Block B	Upstream	
24	1848.300M	60.5	+1.8	+0.0 62.3 94.0	-31.7	None
				Block A	Upstream	
25	7415.800M	57.5	+3.8	+0.0 61.3 94.0	-32.7	None
İ			-	Block A		-
26	5700.500M	57.3	+3.3	+0.0 60.6 94.0	-33.4	None
		27.0		Block C		
27	7470.750M	56.3	+3.8	+0.0 60.1 94.0	-33.9	None
	, 1,0.,50111	50.5	13.0	Block D		110110
28	3714.800M	56.5	+2.6	+0.0 59.1 94.0	-34.9	None
20	J / 14.000IVI	50.5	±∠.U	+0.0 39.1 94.0 Block A		None
20	3734.880M	55.8	+2.6			None
29	3/34.08UW	33.8	+2.0		-35.6	none
				Block D	o pstream	

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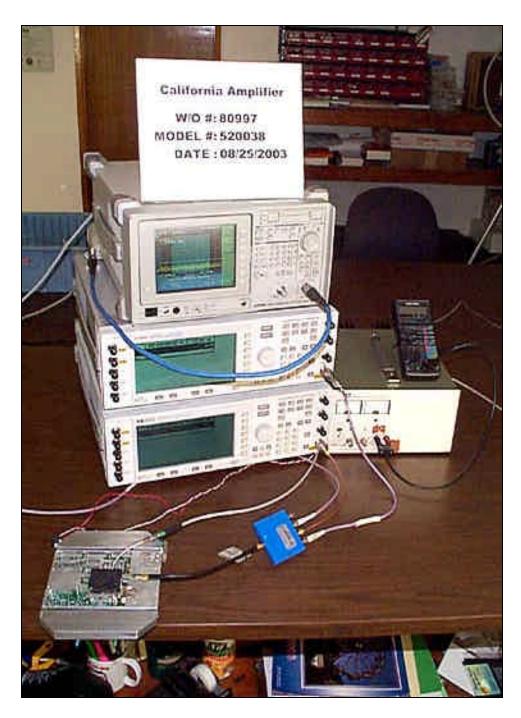
30 3775.250M	55.6	+2.6	+0.0 58.2 94.0 -35.8 None
			Block E Upstream
31 1911.500M	55.5	+1.9	+0.0 57.4 94.0 -36.6 None
			Block B Upstream
32 5675.380M	53.6	+3.3	+0.0 56.9 94.0 -37.1 None
			Block F Upstream
33 5661.000M	53.3	+3.3	+0.0 56.6 94.0 -37.4 None
			Block E Upstream
34 1922.800M	54.0	+1.9	+0.0 55.9 94.0 -38.1 None
			Block C Upstream
35 877.250M	55.3	+0.0	+0.0 55.3 94.0 -38.7 None
			Block F Upstream
36 3785.000M	52.7	+2.6	+0.0 55.3 94.0 -38.7 None
			Block F Upstream
37 852.300M	55.3	+0.0	+0.0 55.3 94.0 -38.7 None
			Block B Upstream
38 839.880M	54.9	+0.0	+0.0 54.9 94.0 -39.1 None
			Block D Upstream

Test Equipment

Description	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer,	02111	HP	8593EM	3624A00159	5/12/03	5/11/05
9kHz to 26.5 GHz						
Cable-HF	P01403	Semiflex	58758-23	0038	1/21/03	1/21/04

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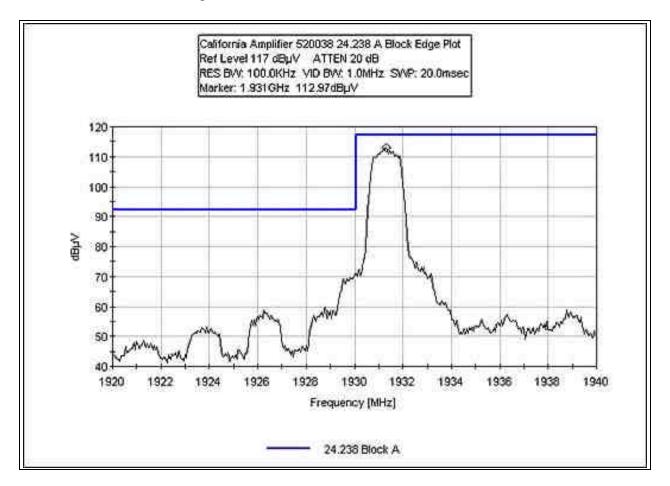
Direct Connect



BLOCK EDGE PLOT - DOWNSTREAM CDMA 24.238A LO

Test Setup: Equipment is a bi-directional amplifier repeater for broadband PCS. The signal input is connected to the signal generators through a power divider. The input to the amplifier is set such that the maximum power output is achieved at the customer supplied antenna connectors. Maximum Allowable Power Output is 19dBm.

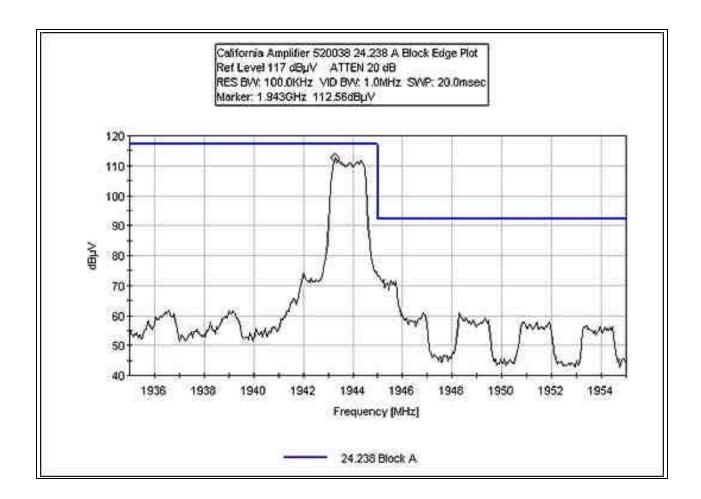
Block edge measurements are performed on the worst case modulation: CDMA. Input channels are selected such that the highest and lowest channels are used.



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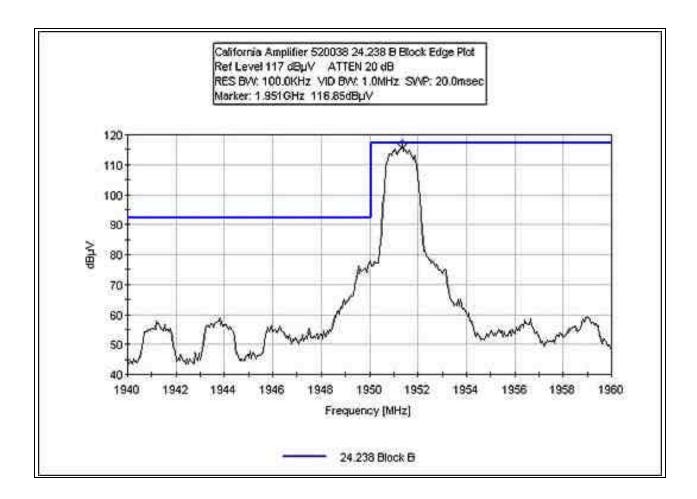
BLOCK EDGE PLOT - DOWNSTREAM CDMA 24.238A HIGH



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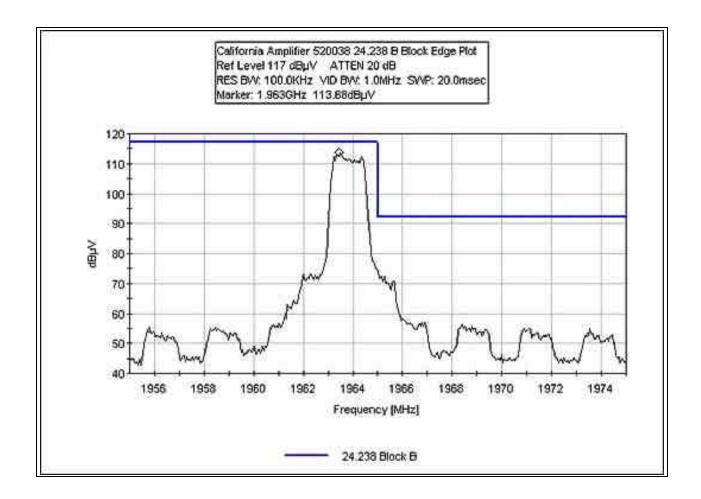
BLOCK EDGE PLOT - DOWNSTREAM CDMA 24.238B LOW



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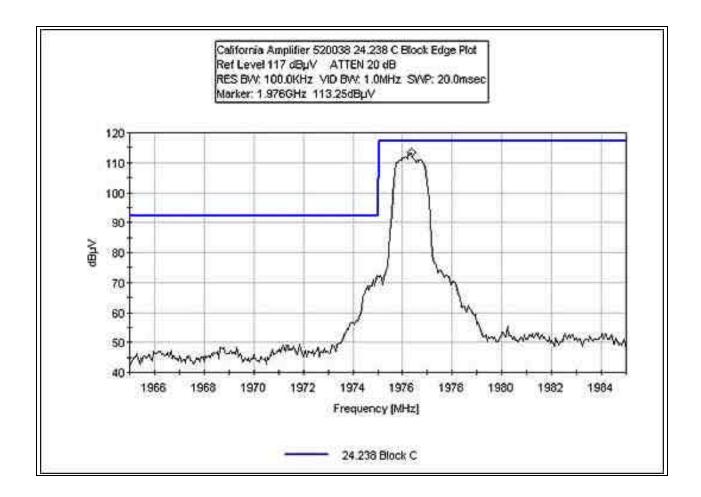
BLOCK EDGE PLOT - DOWNSTREAM CDMA 24.238B HIGH



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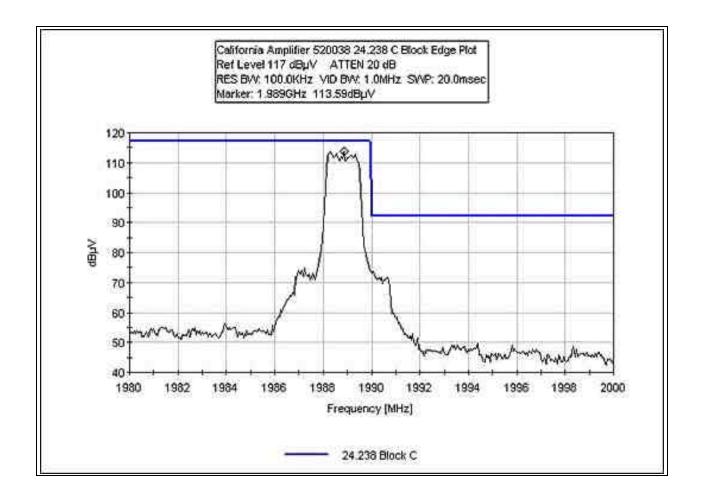
BLOCK EDGE PLOT - DOWNSTREAM CDMA 24.238C LOW



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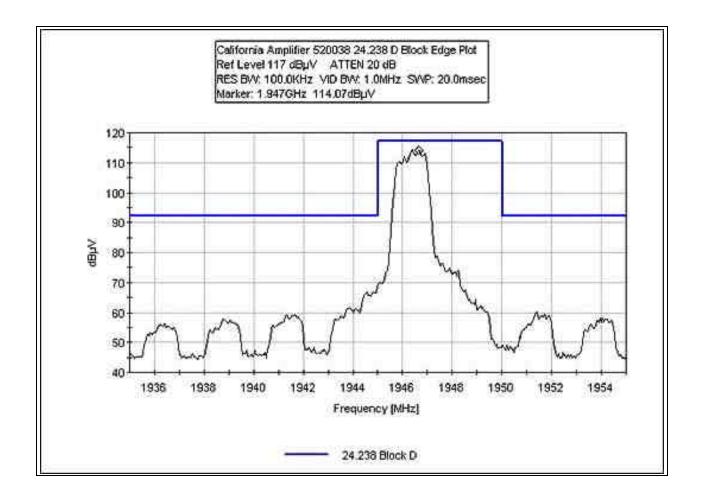
BLOCK EDGE PLOT - DOWNSTREAM CDMA 24.238C HIGH



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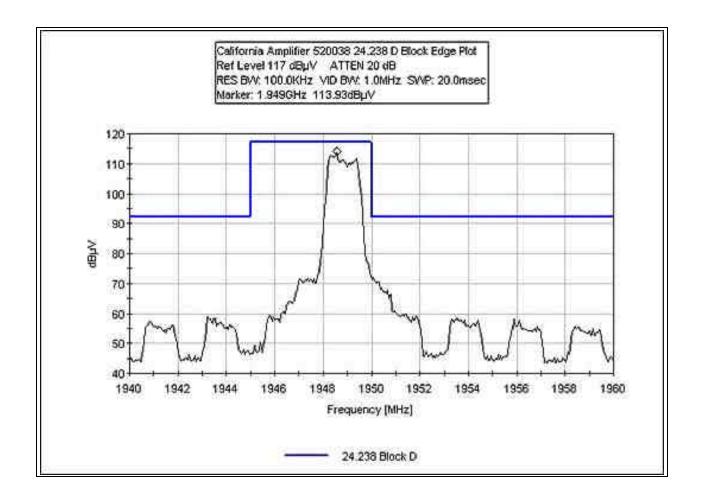
BLOCK EDGE PLOT - DOWNSTREAM CDMA 24.238D LOW



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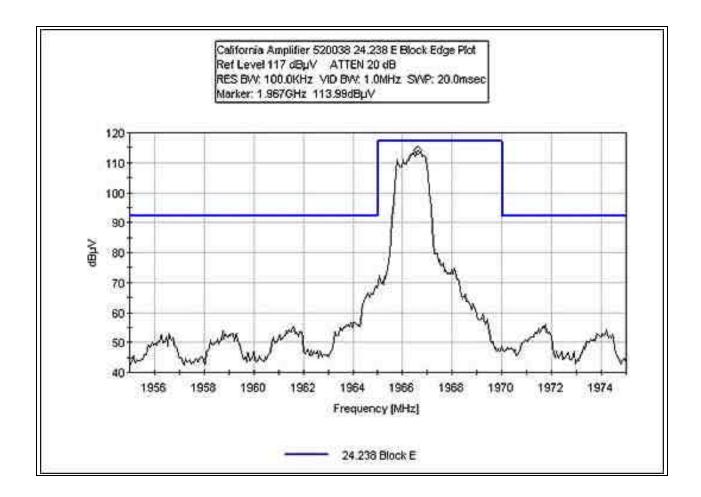
BLOCK EDGE PLOT - DOWNSTREAM CDMA 24.238D HIGH



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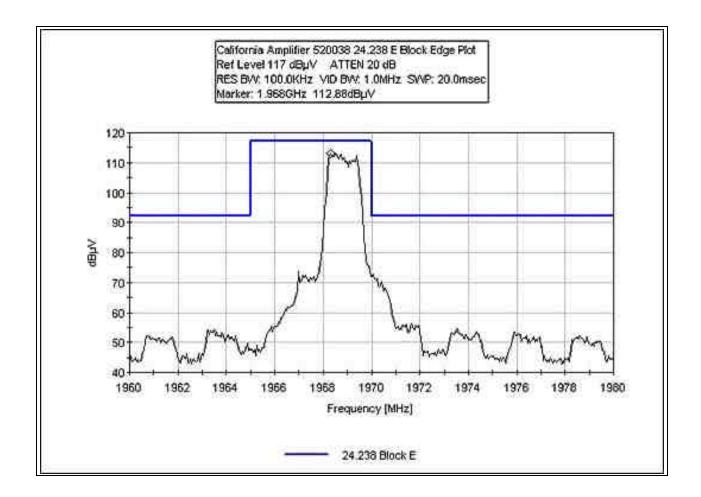
BLOCK EDGE PLOT - DOWNSTREAM CDMA 24.238E LOW



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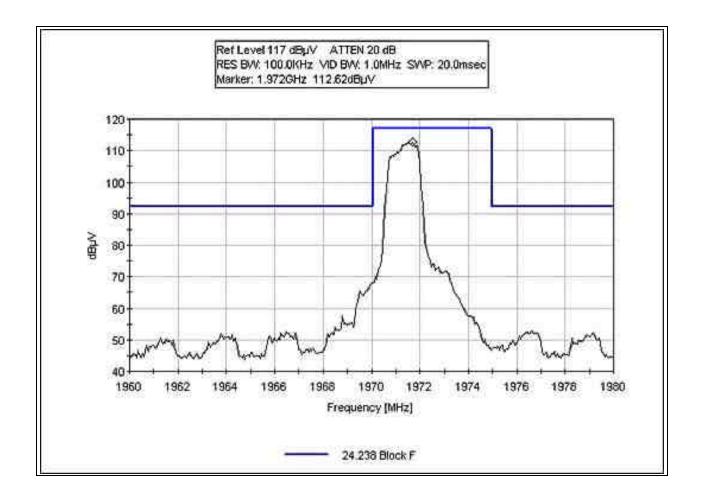
BLOCK EDGE PLOT - DOWNSTREAM CDMA 24.238E HIGH



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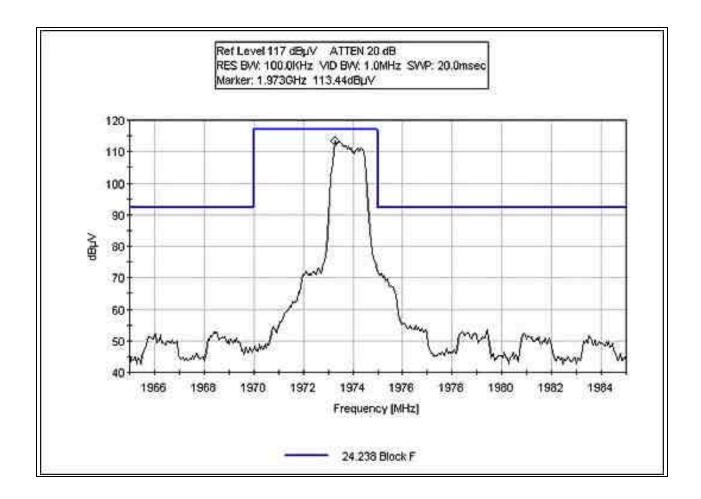
BLOCK EDGE PLOT - DOWNSTREAM CDMA 24.238F LOW



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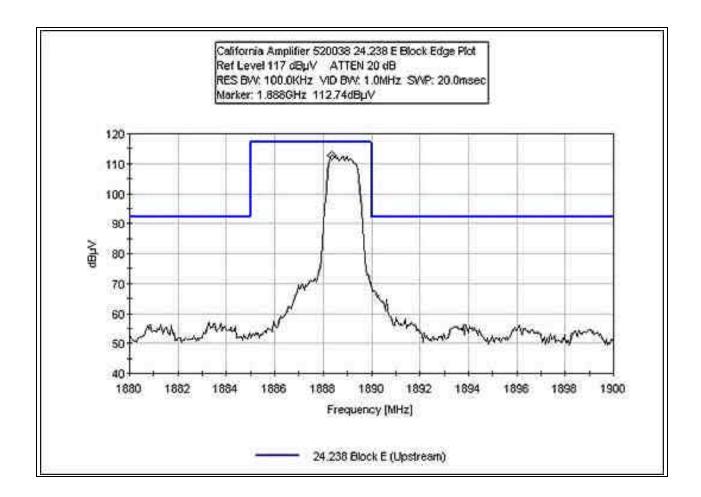
BLOCK EDGE PLOT - DOWNSTREAM CDMA 24.238F HIGH



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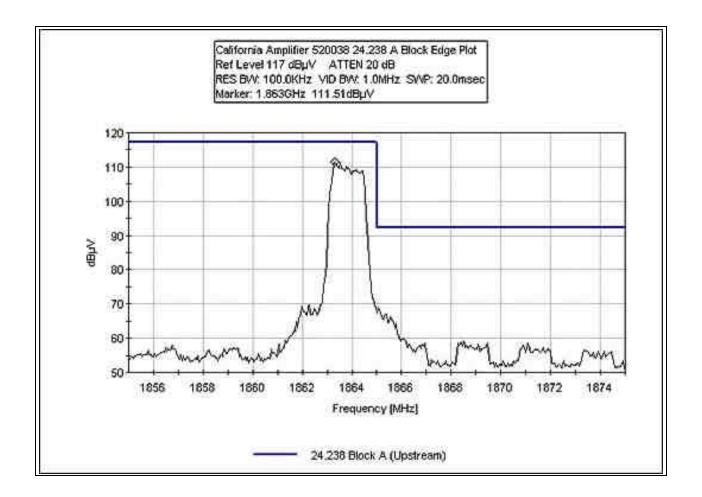
BLOCK EDGE PLOT - UPSTREAM CDMA E HIGH



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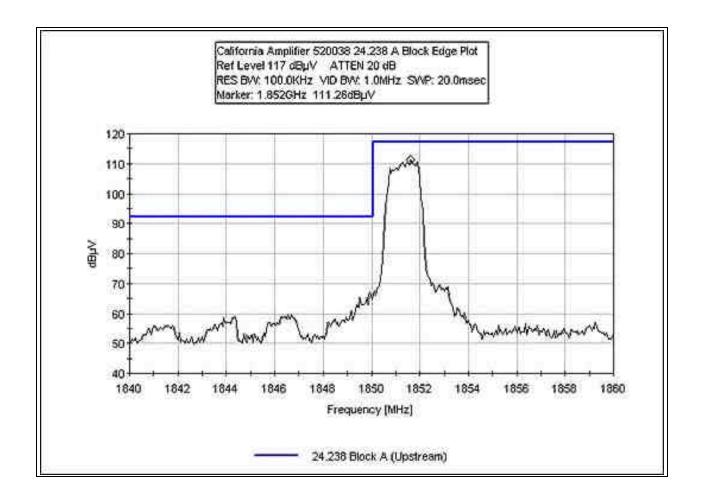
BLOCK EDGE PLOT - UPSTREAM CDMA A HIGH



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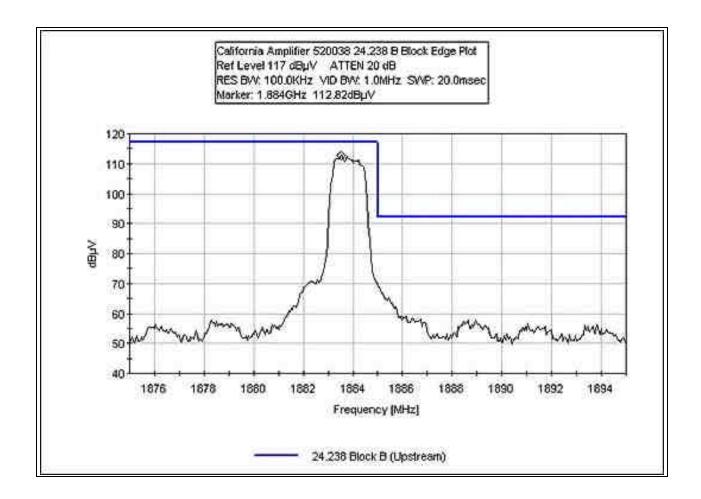
BLOCK EDGE PLOT - UPSTREAM CDMA A LOW



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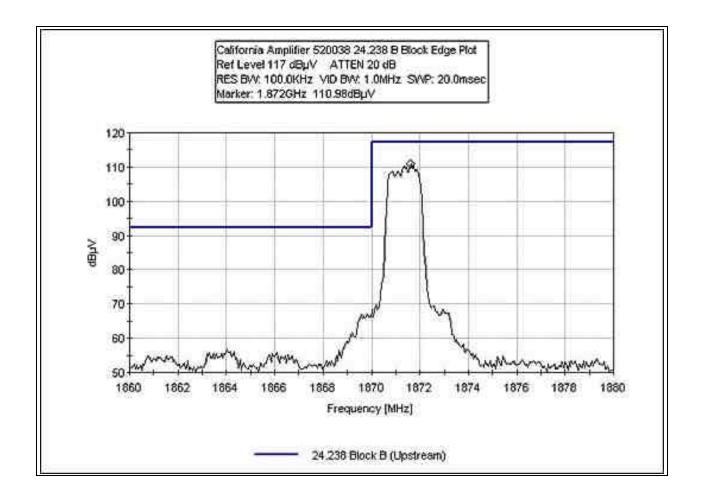
BLOCK EDGE PLOT - UPSTREAM CDMA B HIGH



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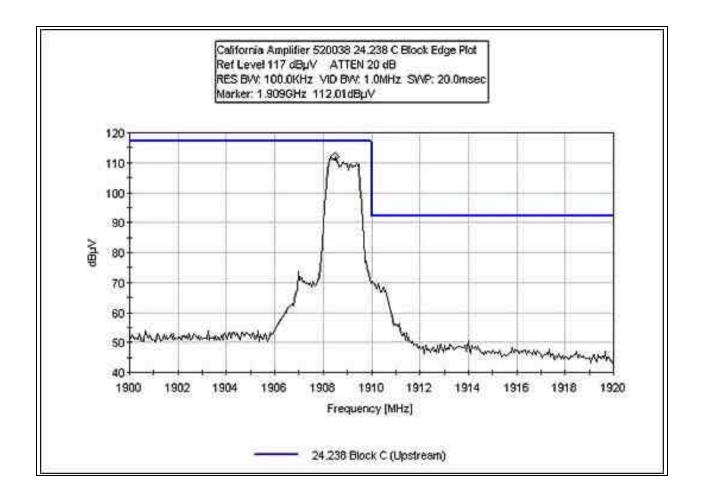
BLOCK EDGE PLOT - UPSTREAM CDMA B LOW



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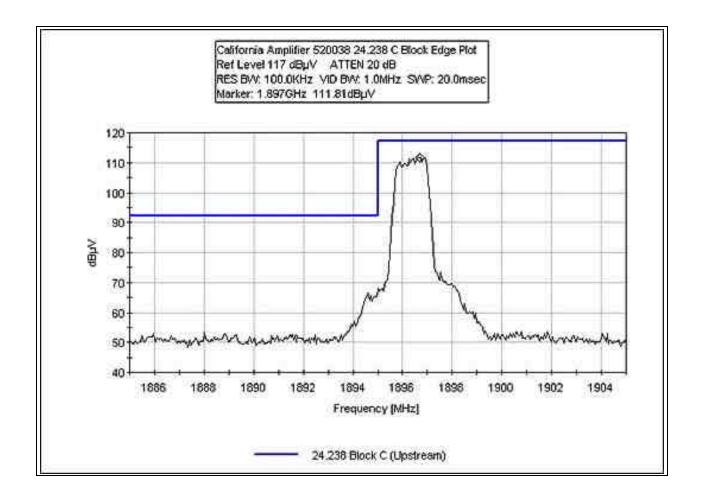
BLOCK EDGE PLOT - UPSTREAM CDMA C HIGH



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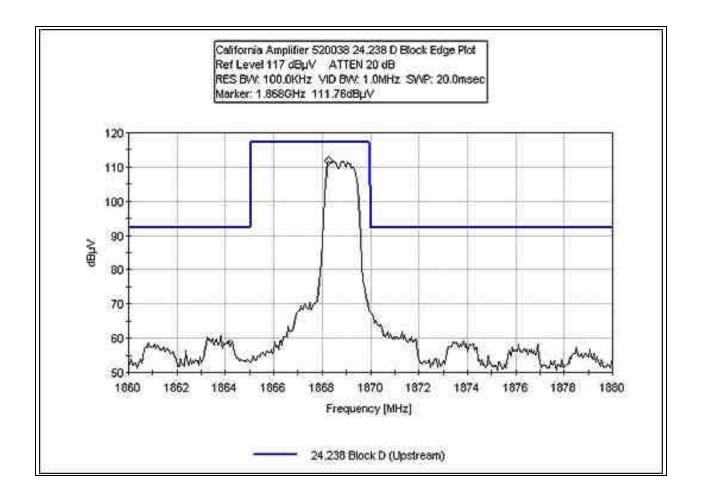
BLOCK EDGE PLOT - UPSTREAM CDMA C LOW



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BLOCK EDGE PLOT - UPSTREAM CDMA D HIGH



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