October 20, 2000

Elite Electronic Engineering, Inc.
1516 Center Circle
Downers Grove, IL 60515

Attn: Richard King

Dear Richard:

Enclosed you will find a certification application for a Bidirectional Amplifier, Model No. 510, FCC ID: NVRCSI510-01. Certification is requested under FCC Parts 2 & 90. This application is being filed by Retlif Testing Laboratories on behalf of Cellular Specialties The applicable filing fee and certification agreement have been mailed to your attention.

I trust that you will find this application to be complete; however, should you have any questions or require any additional information, please feel free to contact us.

Very truly yours,

RETLIF TESTING LABORATORIES

Scott Wentworth
Manager
Enc. (as stated)

CERTIFICATION APPLICATION

Applicant/Manufacturer:	**Cellular Specialties** **670 North Commercial Street** **Manchester, NH 03101**
Equipment under Test (EUT):	**The EUT is a Bidirectional Amplifierused to amplify cellular signals in the Special Mobile Radio (SMR) Band.**
Model:	**510**
FCC ID Number:	**FCC ID: NVRCSI510-01**
Applicable Test Standard:	**FCC Parts 2 & 90 SMR Operations and 90.219 Use of Signal Boosters**
Device Classification:	**Mobile**
EUT Frequency Range:	**Uplink: 806 MHz to 821 MHz** **Downlink: 851 MHz to 866 MHz**
EUT Gain:	**Uplink: 63dB** **Downlink: 61dB**
Measured Power Output @ 1dB Compression Point:	**Uplink: +32.1dBm = 1622mW** **Downlink: +31.6dBm = 1445mW**
Protocols used with this device:	**TDMA**
Power Output Rating Based on Intermodulation Data (For Certification Grant):	**Uplink: 550mW** **Downlink: 550mW**
RF Exposure + Antenna Installation:	**See AttachedInstallation/Users Manual and MPE Evaluation**
Power Ratings Per Channel:	**See Report Section 1**
Measurements Required by FCC:	**See Report Section 2 (Summary of Test Program) and the following Test Report Data Attachments:** **-RF Power Output** **-Intermodulation Characteristics** **-Occupied Bandwidth** **-Spurious Emissions at Antenna Terminals**

-Field Strength of Spurious Radiation
-Frequency Stability

SECTION 1

ACTUAL POWER RATINGS PER CHANNEL:

# Channels	Uplink (dBm)	Downlink (dBm)
1	28.0	28.0
2	24.0	24.0
3	21.7	21.7
4	20.0	20.0
5	18.7	18.7
6	17.7	17.7
7	16.8	16.8
8	16.0	16.0
9	15.3	15.3
10	14.7	14.7
11	14.2	14.2
12	13.7	13.7
13	13.2	13.2
14	12.8	12.8
15	12.4	12.4
16	12.0	12.0
17	11.6	11.6
18	11.3	11.3
19	11.0	11.0
20	10.7	10.7

SECTION 2
SUMMARY OF TEST PROGRAM

POWER OUTPUT

Measurement Procedure:

The uplink and downlink of the test sample were alternately connected through external attenuators to a spectrum analyzer. Each link had an unmodulated signal sent to the input. The level of the input signal was adjusted to achieve maximum output power of the amplifier.

Testing was performed at 3 frequencies (low, mid and high) within each passband (uplink and downlink). The levels of the input signals and maximized output power levels were recorded and are shown below.

UPLINK (Power Input @ 1dB Gain Compression Point):

Frequency (MHz)	Input (dBm)	Output (dBm)
806	-29	31.0
813.5	-29	31.9
821	-28	32.1

DOWNLINK (Power Input @ 1dB Gain Compression Point):

Frequency (MHz)	Input (dBm)	Output (dBm)
851	-28	31.6
858	-28	31.5
866	-27	31.4

For complete test data, see electronic Test Report Attachment, **RF Power Output Data**.

INTERMODULATION CHARACTERISTICS

Measurement Procedure:

Three CW signals were injected, in turn, to the uplink and downlink via a three way power combiner. Two signals were close together and at the low end of the passband, one signal was close to the high end of the passband. The output of each signal generator was adjusted so that the three output fundamental frequencies were equal in magnitude. At the input power levels used all intermodulation products were at -13dBm or below. The requested power rating of the device for the certification grant is derived by summing the levels of the three input signals for each the uplink and downlink.

For complete test data, including actual X/Y plots of intermodulation signals, see electronic Test Report Attachment, **Intermodulation Characteristics Data**.

OCCUPIED BANDWIDTH

Measurement Procedure:

The signal generator output was connected to the spectrum analyzer with a power level which was ascertained during the Power Output test. A 16kHz sine wave FM 1kHz modulation signal was then applied to the carrier. Waveforms were then noted on an X-Y plot. Next, the signal generator was connected to the EUT and the output of the EUT was connected to the spectrum analyzer. These output waveforms, CW and modulated, were then compared to the input waveforms to show that there was no change in the shape of the applied signal after amplification. The above procedure was repeated using a 16kHz square wave FM 1kHz modulation. Testing was performed at three frequencies (low, mid and high) within each passband (uplink and downlink).

For complete test data, see electronic Test Report Attachment, **Occupied Bandwidth Data**.

An explanation of the data is as follows: There are two signals superimposed on each plot, one signal is the waveform before modulation, the other is the modulated carrier. In each case the center of the grid shows a narrowband signal projecting out from the center of the modulation envelope. This signal is actually the stored unmodulated signal.

The two plots on the left of each page are the input signals to the amplifier. On the right are plots of the signals taken at the output of the amplifier.

The two top plots (left and right) utilize sine wave modulation. The two bottom plots (left and right) utilize square wave modulation as described above.

ANTENNA CONDUCTED EMISSIONS

Measurement Procedure:

The signal generator output was connected in turn to the uplink and downlink input ports of the EUT. The input power level was at the level which was ascertained during the Power Output test. A spectrum analyzer was connected to the output of the EUT. The input test frequencies were (low, mid and high) within each passband (uplink and downlink). The level of any spurious emission was recorded. Testing was performed in the frequency range of 30MHz to 9GHz. The spurious emissions limit is -13dBm as specified in FCC Part 90.

For complete test data, including harmonic and spurious emissions measured at antenna terminal, see electronic Test Report Attachment, **Antenna Conducted Data**.

FIELD STRENGTH OF SPURIOUS RADIATION

Measurement Procedure:

The test sample was placed on a 80cm high wooden test stand which was located 3 meters from the test antenna on an FCC listed test site. A signal generator was connected to the uplink input of the amplifier. The signal generator output was set to provide the input power level necessary to achieve maximum output power of the amplifier at 3 signals within the passband (low, mid and high). Field strength measurements of each out of band emission were taken and recorded. This procedure was repeated for the downlink input of the amplifier. FCC Part 90 specifies that out of band emissions must be attenuated by 43 + 10log P. The calculated field strength limit at 3 meters for out of band emissions is 84.4dBuV/M. The frequency range of the test was 30MHz - 9GHz.

For complete test data, see electronic Test Report Attachment, **Radiated Emissions Data**.

FREQUENCY STABILITY MEASUREMENTS

Measurement Procedure (Frequency vs. Voltage):

The RF output of the signal generator was connected to the input (uplink and downlink) of the test sample, and the output was connected to a spectrum analyzer. The input signal level was varied. Measurements were taken with the EUT supplied with signals at levels -15, -30, and -60 dB from the maximum input power.

For complete test data, see electronic Test Report Attachment, **Frequency Stability Data**.

SECTION 3
EQUIPMENT LISTS

RF Power Output

EN	Type	Manufacturer	Description	Model No.	Cal Date	Due Date
3130	20 dB Attenuator	Narda	DC - 18 GHz	768-20	12/20/99	12/20/00
3138	10 DB Atten. (50 ohm)	Narda	DC - 5 GHz	768-10	4/12/00	4/12/01
3139	10 DB Atten. (50 ohm)	Narda	DC - 5 GHz	768-10	4/12/00	4/12/01
4895	Spectrum Analyzer	Hewlett Packard	9kHz - 22GHz	8593EM	2/17/00	2/17/01
530A	AM/FM Signal Generator	Marconi Instru.	10 kHz - 1.2 GHz	2023	3/21/00	7/11/01

Intermodulation Characteristics

EN	Type	Manufacturer	Description	Model No.	Cal Date	Due Date
3250	Signal Generator	Hewlett Packard	500 KHz - 1 GHz	8640B-OPT-32	9/5/00	9/5/01
4894	30 dB Attenuator	Tenuline	DC - 1 GHz	8322	10/7/99	10/7/00
4895	Spectrum Analyzer	Hewlett Packard	9kHz - 22GHz	8593EM	2/17/00	2/17/01
4995	Signal Generator	Marconi Instru.	10 kHz - 1 GHz	2022	6/27/00	6/27/01
530A	AM/FM Signal Generator	Marconi Instru.	10 kHz - 1.2 GHz	2023	3/21/00	3/21/01

Occupied Bandwidth

EN	Type	Manufacturer	Description	Model No.	Cal Date	Due Date
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4895	Spectrum Analyzer	Hewlett Packard	9kHz - 22GHz	8593EM	2/17/00	2/17/01
530A	AM/FM Signal Generator	Marconi Instru.	10 kHz - 1.2 GHz	2023	3/21/00	3/21/01

Spurious Emissions at the Antenna Terminals

EN	Type	Manufacturer	Description	Model No.	Cal Date	Due Date
3130	20 dB Attenuator	Narda	DC - 18 GHz	768-20	12/20/99	12/20/00
3138	10 DB Atten. (50 ohm)	Narda	DC - 5 GHz	768-10	4/12/00	4/12/01
3139	10 DB Atten. (50 ohm)	Narda	DC - 5 GHz	768-10	4/12/00	4/12/01
4895	Spectrum Analyzer	Hewlett Packard	9kHz - 22GHz	8593EM	2/17/00	2/17/01
530A	AM/FM Signal Generator	Marconi Instru.	10 kHz - 1.2 GHz	2023	3/21/00	7/11/01

SECTION 3 (Continued)
EQUIPMENT LISTS

Spurious Emissions

EN	Type	Manufacturer	Description	Model No.	Cal Date	Due Date
3116	Pre-Amplifier	Miteq	0.1 GHz - 18 GHz	AFS42-35	1/4/00	1/4/01
3117	Power Supply	B&K Precision	0-30 Vdc, 3.0 A	1630	2/23/00	2/23/01
3258	Double Ridge Guide	EMCO	1 - 18 GHz	3115	4/6/00	4/6/01
4202	Biconilog	EMCO	26 MHz - 2 GHz	3142	7/10/00	7/10/01
4895	Spectrum Analyzer	Hewlett Packard	9kHz - 22GHz	8593EM	2/17/00	2/17/01
4995	Signal Generator	Marconi Instru.	10 kHz - 1 GHz	2022	6/27/00	6/27/01

Frequency Stability

EN	Type	Manufacturer	Description	Model No.	Cal Date	Due Date
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3138	10 DB Atten. (50 ohm)	Narda	DC - 5 GHz	768-10	4/12/00	4/12/01
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530A	AM/FM Signal Generator	Marconi Instru.	10 kHz - 1.2 GHz	2023	3/21/00	7/11/01

EQUIPMENT LIST

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4995	Signal Generator	Marconi Instru.	10 kHz - 1 GHz	2022	6/27/00	6/27/01
530A	AM/FM Signal Generator	Marconi Instru.	10 kHz - 1.2 GHz	2023	3/21/00	3/21/01

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4895	Spectrum Analyzer	Hewlett Packard	9kHz - 22GHz	8593EM	2/17/00	2/17/01
530A	AM/FM Signal Generator	Marconi Instru.	10 kHz - 1.2 GHz	2023	3/21/00	7/11/01

Spurious Emissions at the Antenna Terminals

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4895	Spectrum Analyzer	Hewlett Packard	9kHz - 22GHz	8593EM	2/17/00	2/17/01
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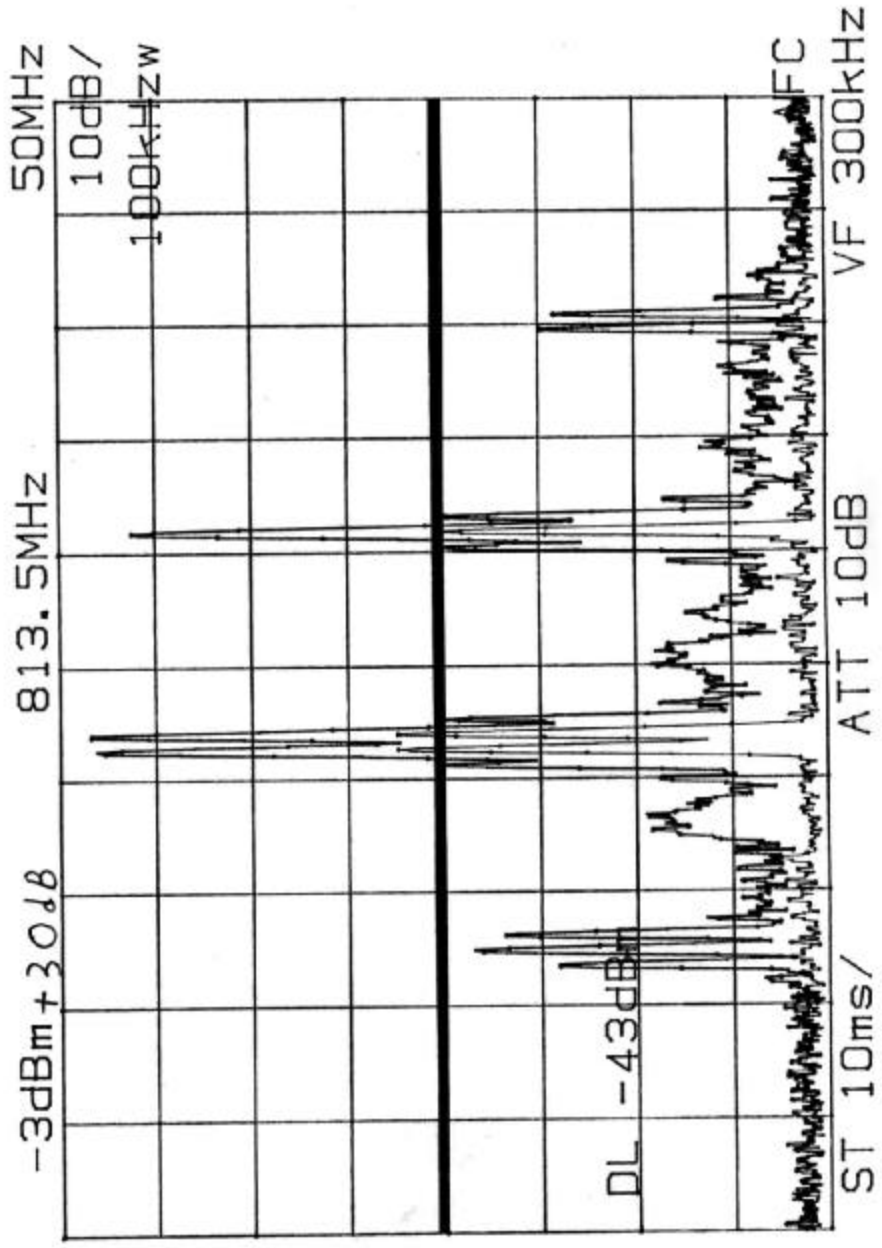
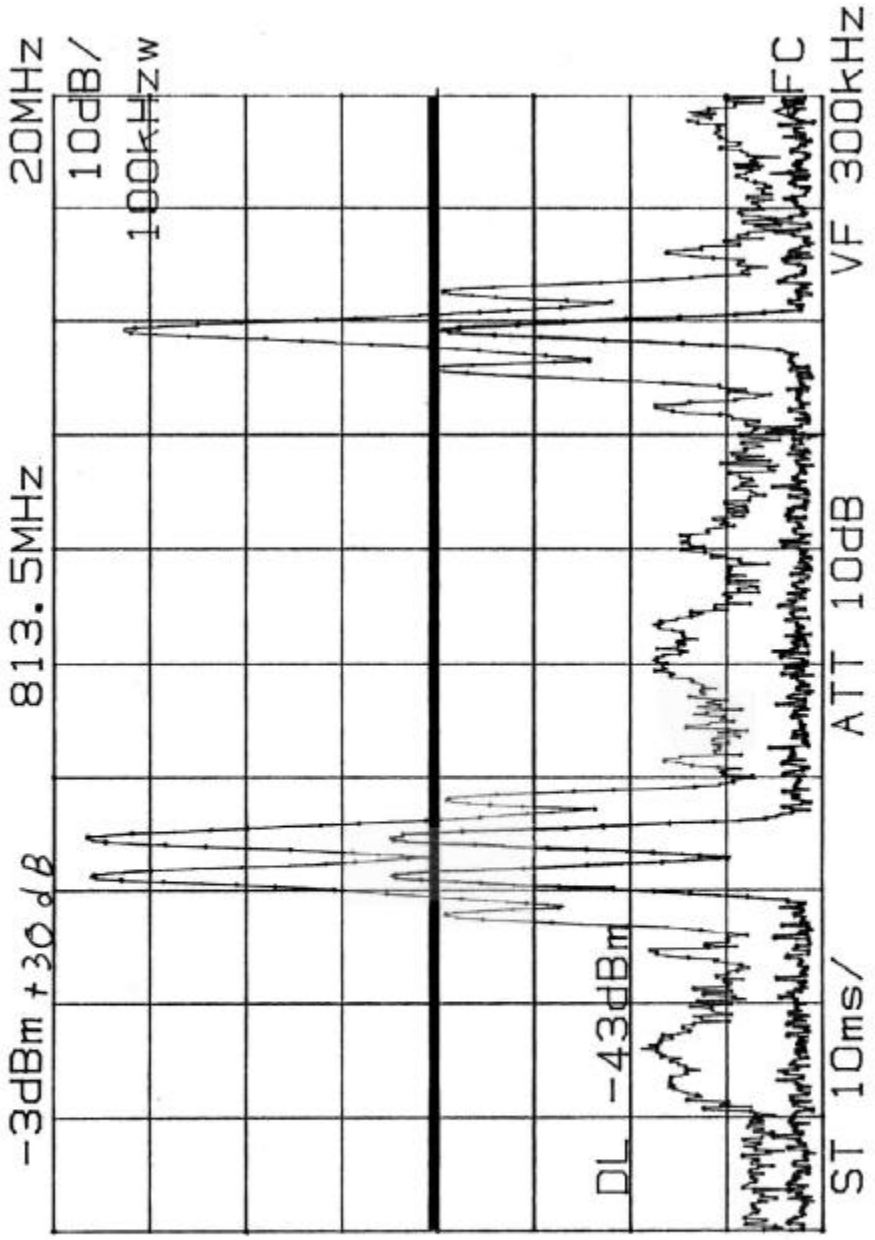


Customer:	Cellular Specialties
Test Sample:	Bidirectional Amplifier
Model No.:	510
Test Method:	Intermodulation Characteristics
Notes:	Para. 2.1047 Uplink
Date:	9-19-00
Tech:	M. Hippert
Sheet	2 of 4

Retlif Testing Laboratories

Report No. R-3662N

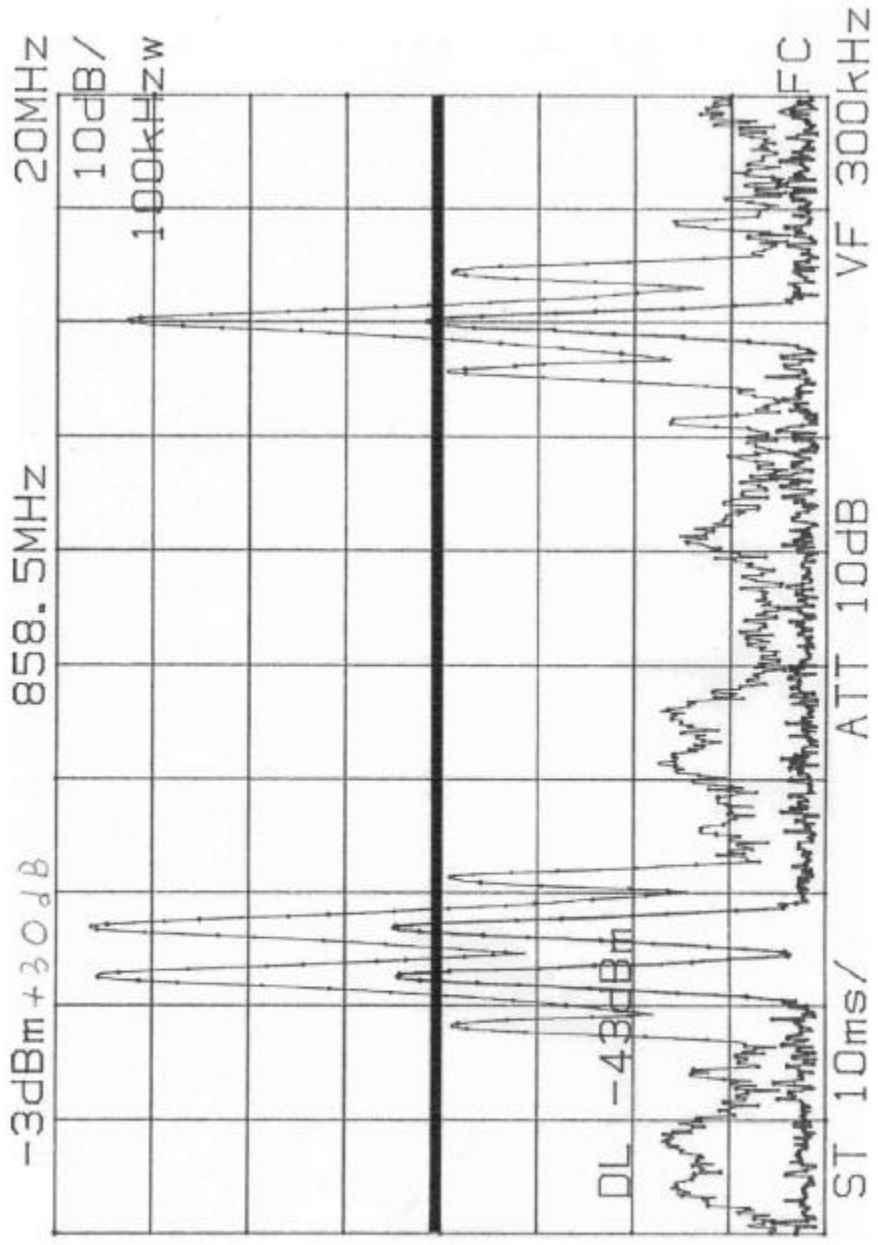


Customer:	Cellular Specialties
Test Sample:	Bidirectional Amplifier
Model No.:	510
Test Method:	Intermodulation Characteristics
Notes:	Para. 2.1047
	Uplink

Date: 9-19-00 Tech: M. Hippert Sheet 1 of 4

Retlif Testing Laboratories

Report No. R-3662N

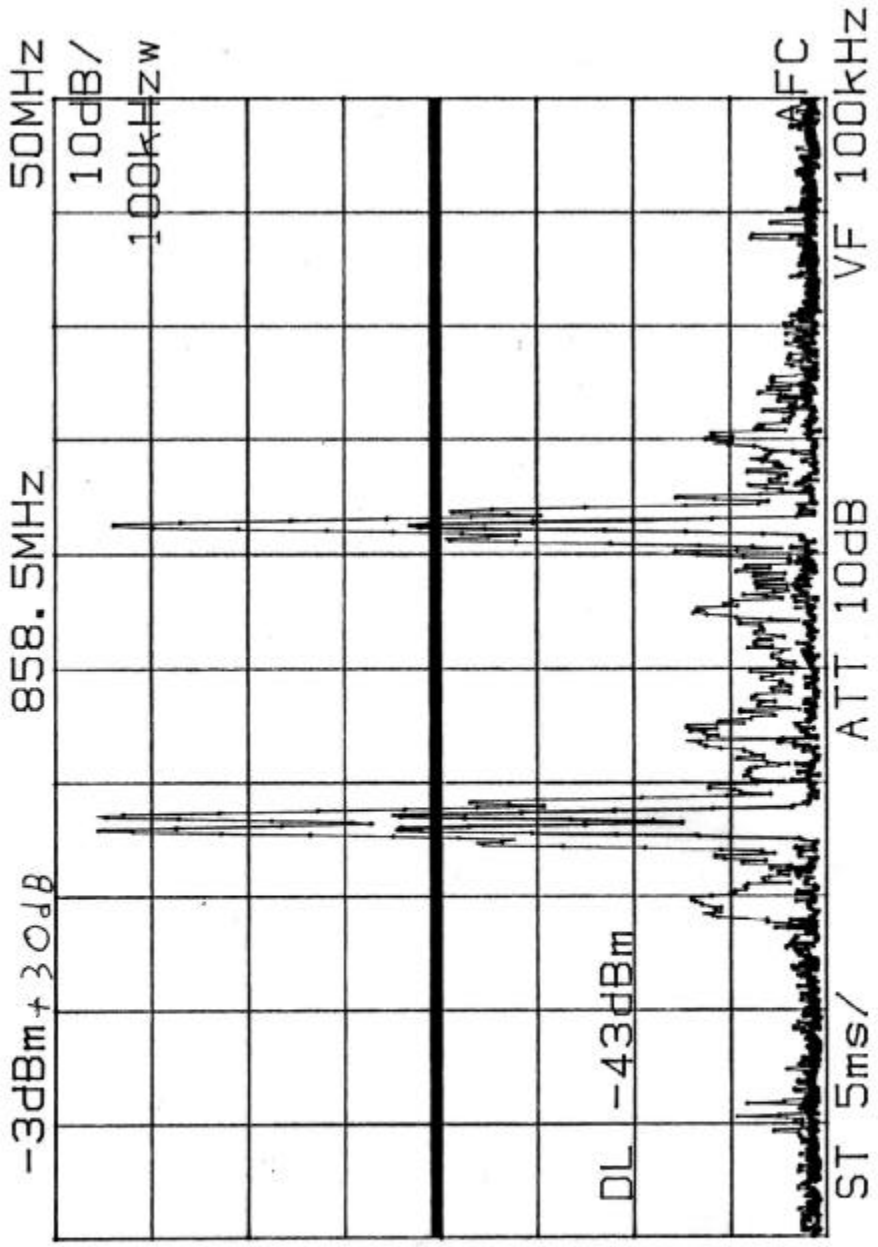


Customer:	Cellular Specialties
Test Sample:	Bidirectional Amplifier
Model No.:	510
Test Method:	Intermodulation Characteristics
Notes:	Para. 2.1047 Downlink

Date: 9-19-00 Tech: M. Hippert Sheet 3 of 4

Retlif Testing Laboratories

Report No. R-3662N



Customer:	Cellular Specialties
Test Sample:	Bidirectional Amplifier
Model No.:	510
Test Method:	Intermodulation Characteristics
Notes:	Para. 2.1047
	Downlink

Date: 9-19-00 Tech: M. Hippert Sheet 4 of 4

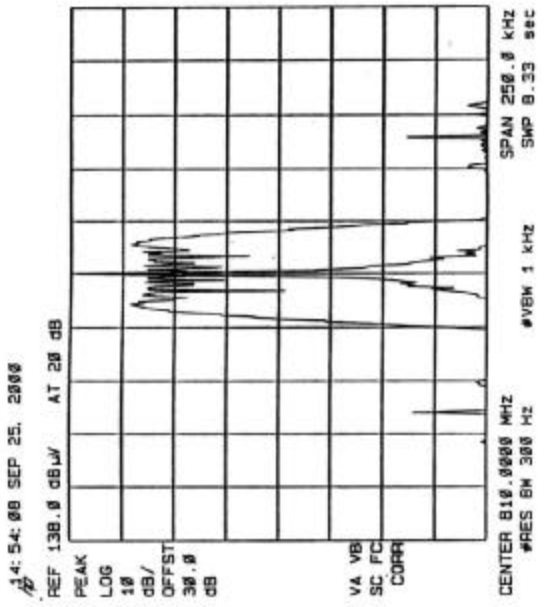
Retlif Testing Laboratories

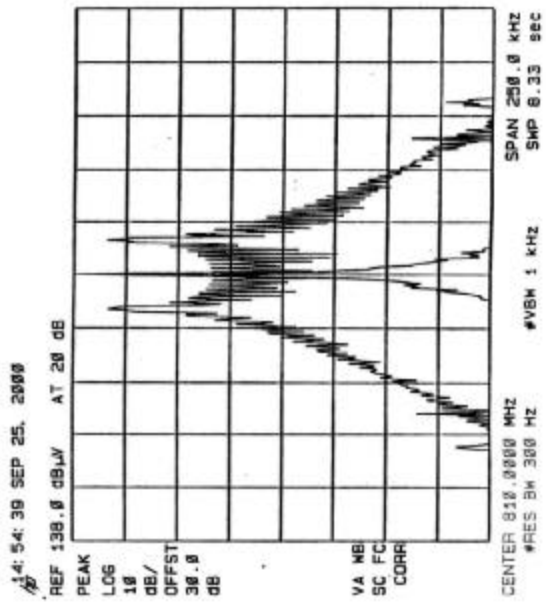
Report No. R-3662N

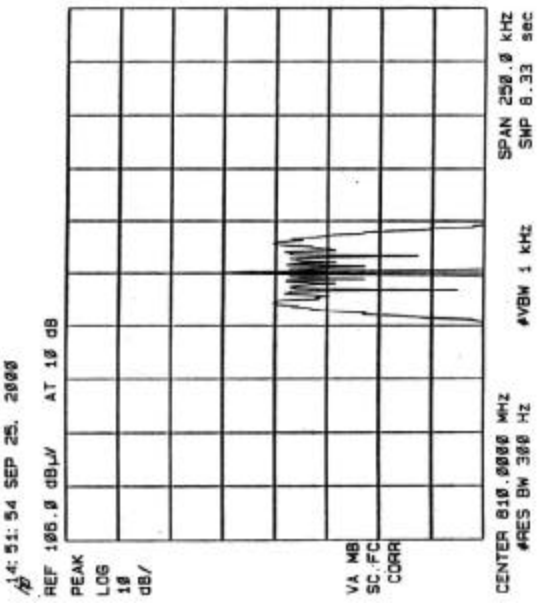
RETLIF TESTING LABORATORIES

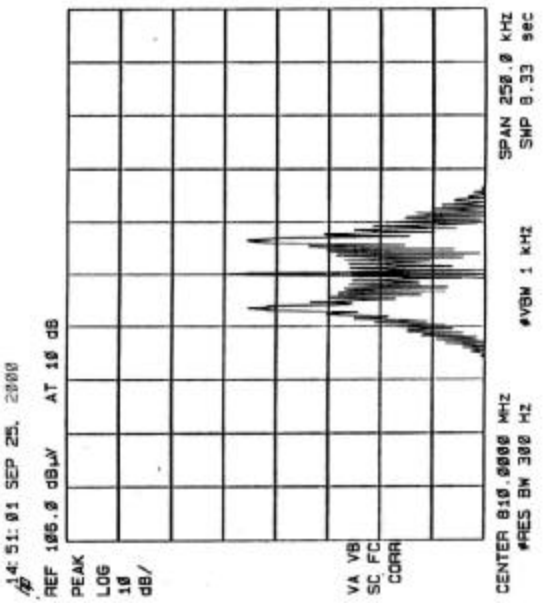
Test Method	Occupied Bandwidth		
Customer	Cellular Specialties, Inc.	Job No.	R-3662N
Test Sample	Bidirectional Amplifier		
Model No.	510	Serial No.	n/a
Test Specification	FCC Parts 2 and 90	Paragraph	2.1049
Operating Mode	Amplifying cellular telephone frequency signals		
Technician	M. Hippert	Date	9/25/00
Notes	Signal in vs Signal out Uplink		

Sheet 1 of 6









RETLIF TESTING LABORATORIES

Test Method	Occupied Bandwidth		
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Model No.	510	Serial No.	n/a
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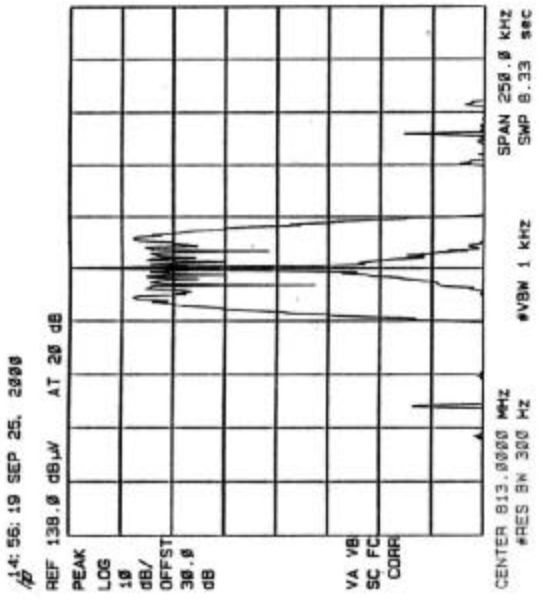
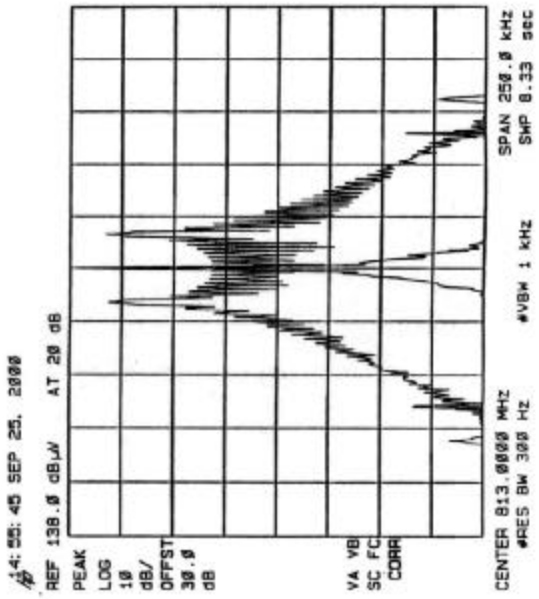
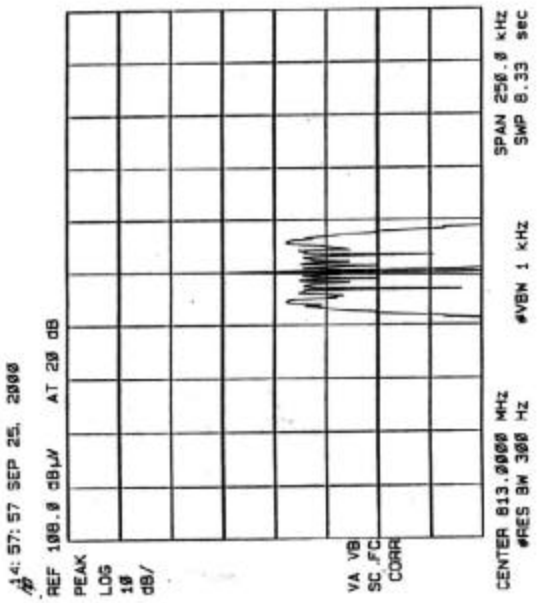
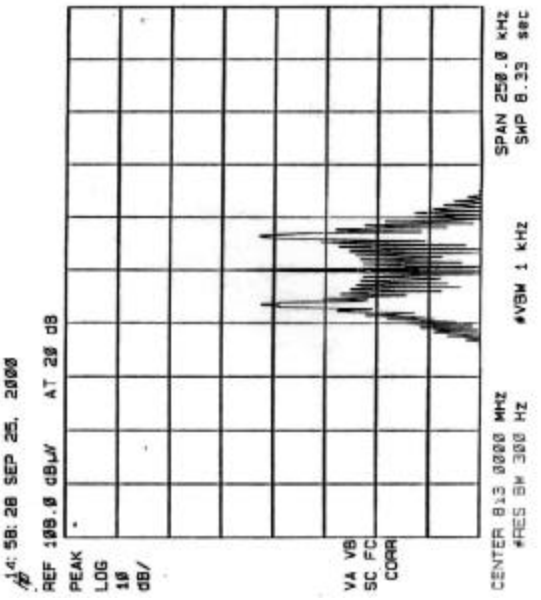
Technician	M. Hippert	Date	9/25/00
Notes	Signal in vs Signal out Uplink		

Sheet 2 of 6





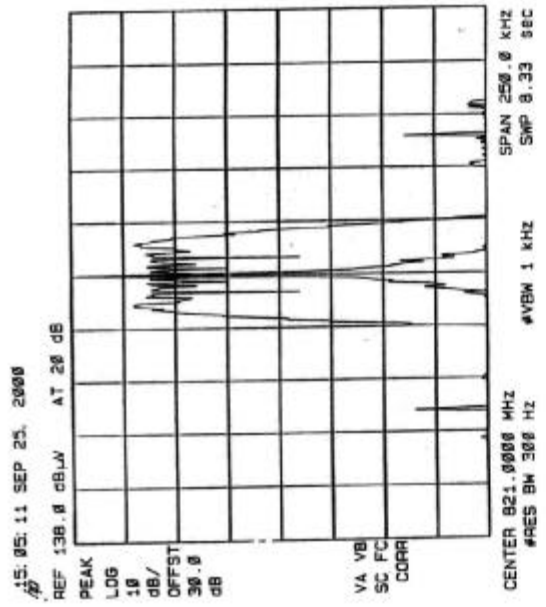


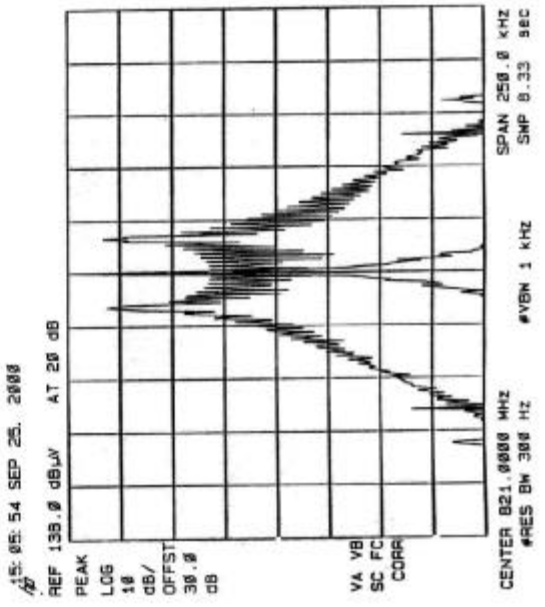


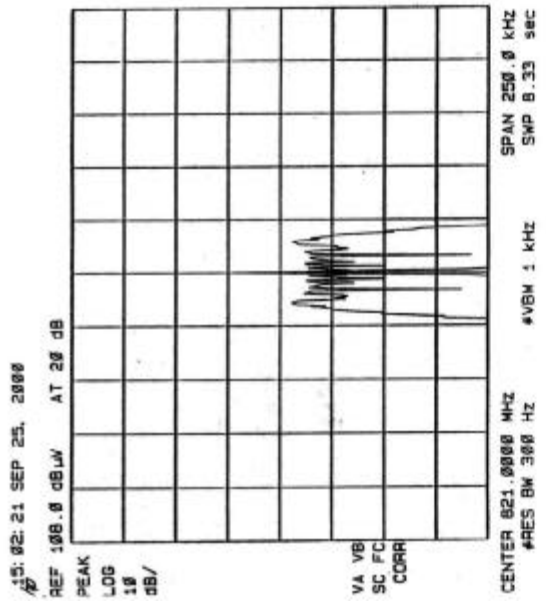
RETLIF TESTING LABORATORIES

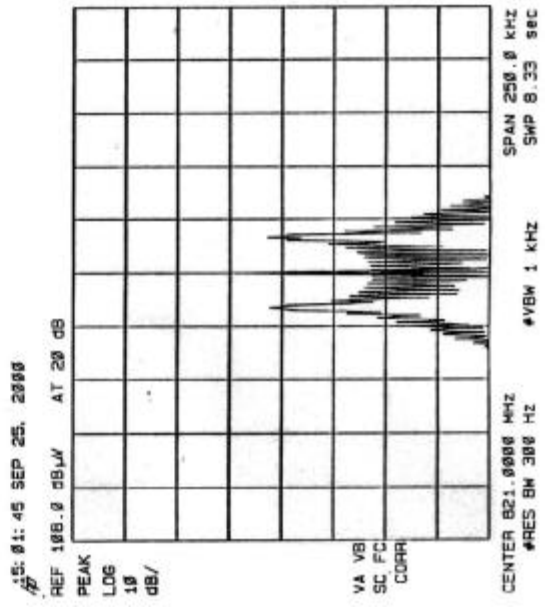
Test Method	**Occupied Bandwidth**		
Customer	Cellular Specialties, Inc.	Job No.	R-3662N
Test Sample	Bidirectional Amplifier		
Model No.	510	Serial No.	n/a
Test Specification	FCC Parts 2 and 90	Paragraph	2.1049
Operating Mode	Amplifying cellular telephone frequency signals		
Technician	M. Hippert	Date	9/25/00
Notes	Signal in vs Signal out Uplink		

Sheet 3 of 6









RETLIF TESTING LABORATORIES

Test Method	Occupied Bandwidth		
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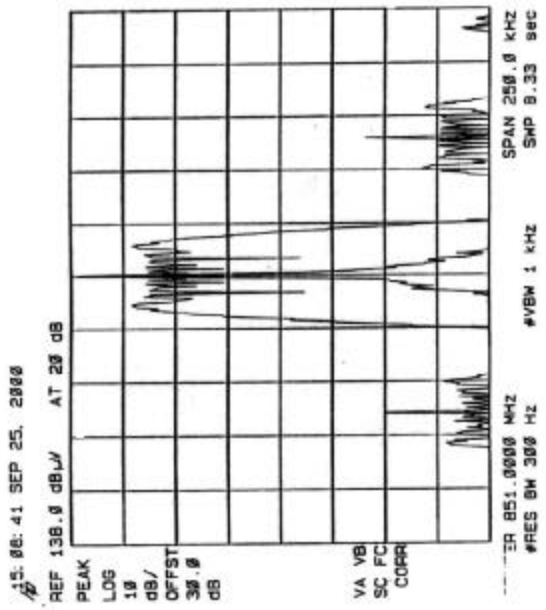
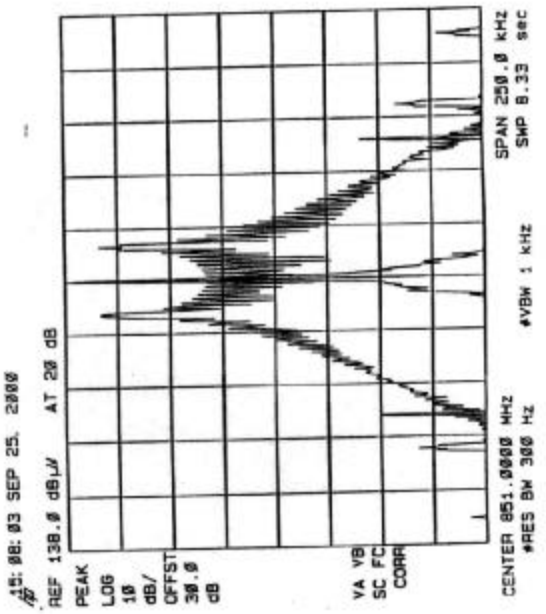
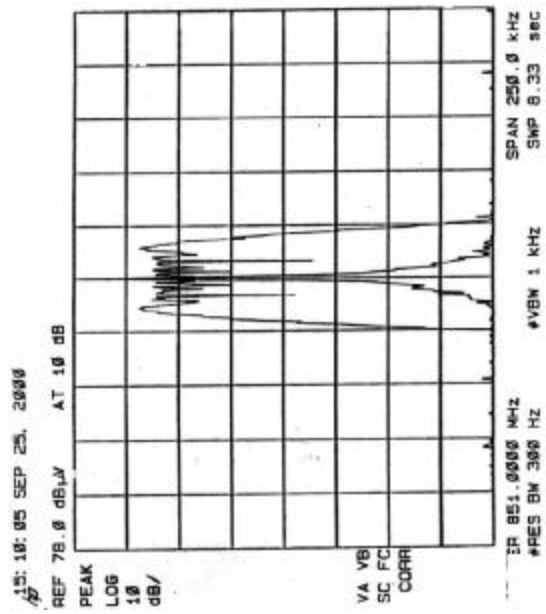
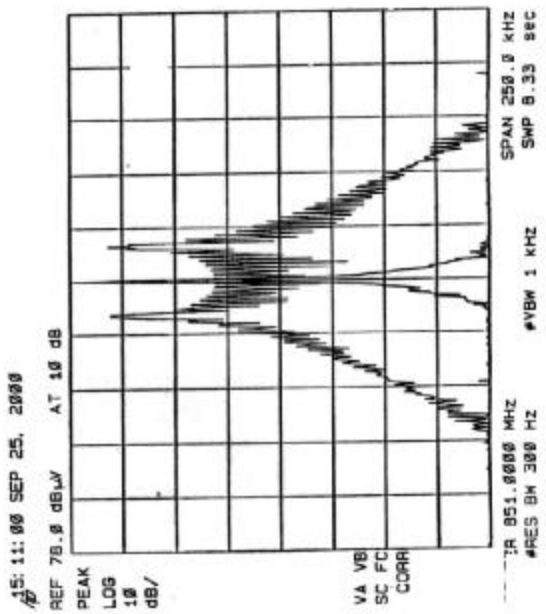
Test Sample	Bidirectional Amplifier		
Model No.	510	Serial No.	n/a
Test Specification	FCC Parts 2 and 90	Paragraph	2.1049
Operating Mode	Amplifying cellular telephone frequency signals		
Technician	M. Hippert	Date	9/25/00
Notes	Signal in vs Signal out Downlink		

Sheet 4 of 6





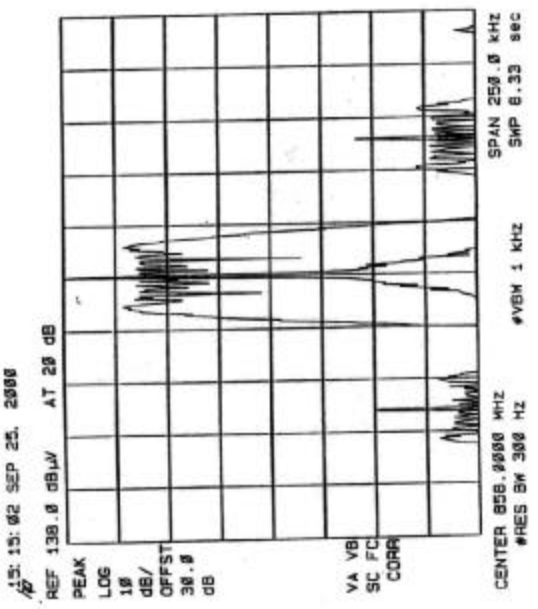


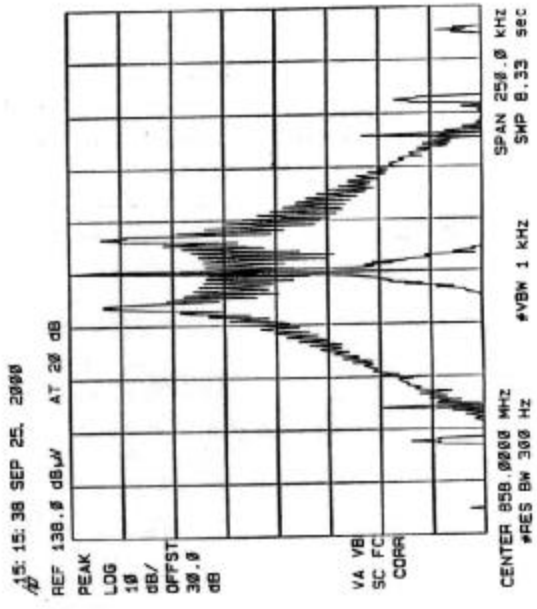


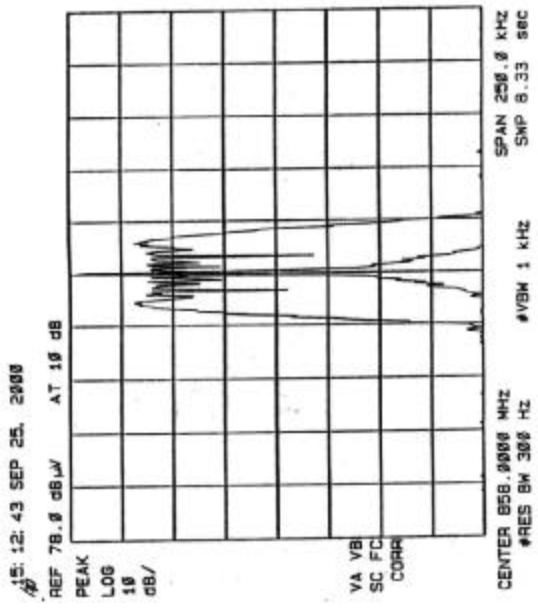
RETLIF TESTING LABORATORIES

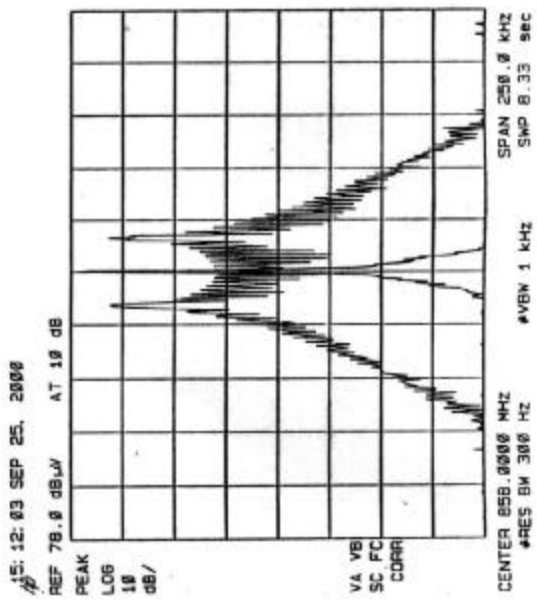
Test Method	**Occupied Bandwidth**		
Customer	Cellular Specialties, Inc.	Job No.	R-3662N
Test Sample	Bidirectional Amplifier		
Model No.	510	Serial No.	n/a
Test Specification	FCC Parts 2 and 90	Paragraph	2.1049
Operating Mode	Amplifying cellular telephone frequency signals		
Technician	M. Hippert	Date	9/25/00
Notes	Signal in vs Signal out Downlink		

Sheet 5 of 6





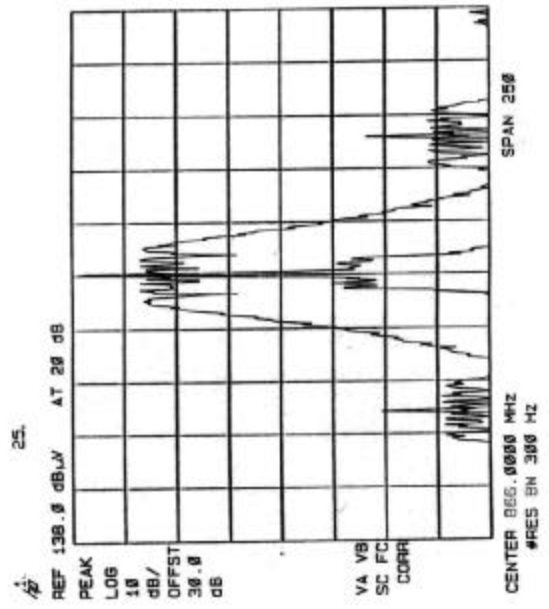


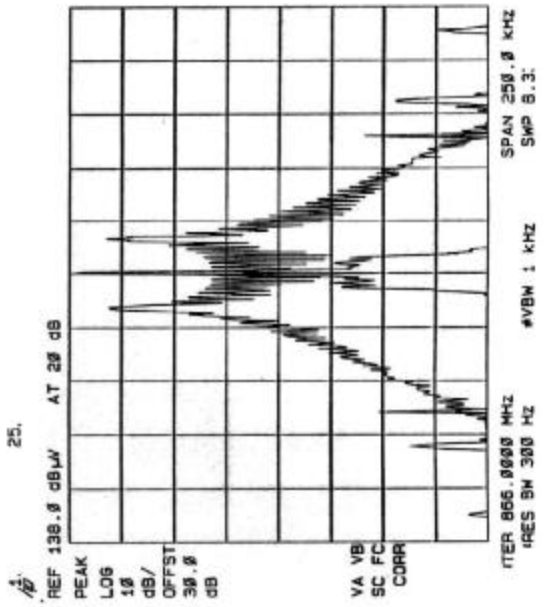


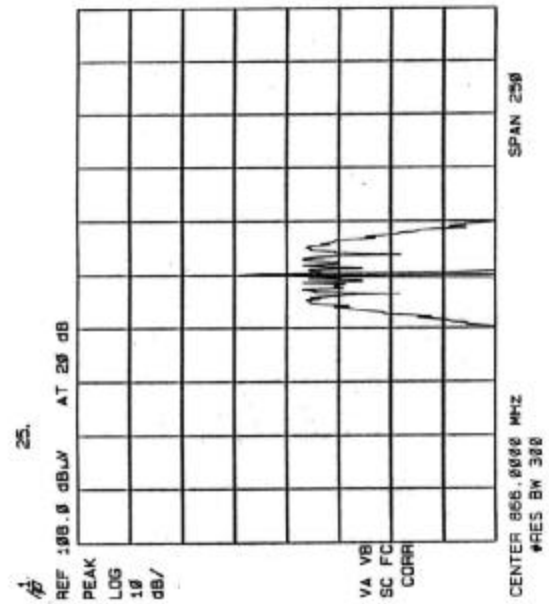
RETLIF TESTING LABORATORIES

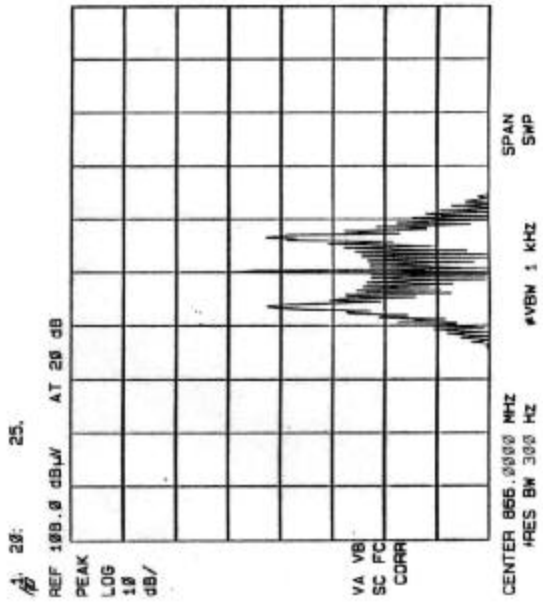
Test Method	**Occupied Bandwidth**		
Customer	Cellular Specialties, Inc.	Job No.	R-3662N
Test Sample	Bidirectional Amplifier		
Model No.	510	Serial No.	n/a
Test Specification	FCC Parts 2 and 90	Paragraph	2.1049
Operating Mode	Amplifying cellular telephone frequency signals		
Technician	M. Hippert	Date	9/25/00
Notes	Signal in vs Signal out Downlink		

Sheet 6 of 6









MODEL 510 BDA POWER PER CHANNEL

Channels	UpLink dBm	DownLink dBm
1	28.0	28.0
2	24.0	24.0
3	21.7	21.7
4	20.0	20.0
5	18.7	18.7
6	17.7	17.7
7	16.8	16.8
8	16.0	16.0
9	15.3	15.3
10	14.7	14.7
11	14.2	14.2
12	13.7	13.7
13	13.2	13.2
14	12.8	12.8
15	12.4	12.4
16	12.0	12.0
17	11.6	11.6
18	11.3	11.3
19	11.0	11.0
20	10.7	10.7

RETLIF TESTING LABORATORIES

TABULAR DATA SHEET

TEST METHOD: RF Power Output

CUSTOMER: Cellular Specialties | **JOB NO:** R-3662N

TEST SAMPLE: Bidirectional Amplifier

MODEL NO: 510 | **SERIAL NO:** n/a

TEST SPECIFICATION: FCC Parts 2 and 90

PARAGRAPH: 2.1046

OPERATING MODE: Amplifying cellular telephone frequency signals

TECHNICIAN: M. Hippert | **DATE:** 9-8-00

NOTES: Uplink Frequency: 806 - 821 MHz

Downlink Frequency: 851 - 866 MHz

Test Frequency	Power Input (at 1dB Compression)	Power Output	Gain					
MHz	dBm	dBm	dB					
(Uplink)								
806.0	-29.0	31.0	61.2					
813.0	-29.0	31.9	63.0					
821.0	-28.0	32.1	61.5					
(Downlink)								
851.0	-28.0	31.6	61.3					
858.0	-28.0	31.5	61.4					
866.0	-27.0	31.4	59.9					

RETLIF TESTING LABORATORIES

TABULAR DATA SHEET

TEST METHOD: Field Strength of Spurious Emissions 30 MHz to 9 GHz

CUSTOMER: Cellular Specialties | **JOB NO:** R-3662N

TEST SAMPLE: Bidirectional Amplifier

MODEL NO: 510 | **SERIAL NO:** n/a

TEST SPECIFICATION: FCC Parts 2 and 90

PARAGRAPH: 2.1053

OPERATING MODE: Amplifying cellular telephone frequency signals

TECHNICIAN: M. Hippert | **DATE:** 9-13-00

NOTES: Uplink Frequency: 806 - 821 MHz Spurious Emissions Limit = 84.4dBuV/m

Downlink Frequency: 851 - 866 MHz

Uplink Signal Level	Test Frequency	Measured Frequencies	Corrected Readings	Corrected Readings	Downlink Signal Level	Test Frequency	Measured Frequencies	Corrected Readings	Corrected Readings
dBm	MHz	GHz	Vertical dBuV/m	Horizontal dBuV/m	dBm	MHz	GHz	Vertical dBuV/m	Horizontal dBuV/m
-29.0	806.0	0.806	87.1	87.1	-28.0	851.0	0.851	80.9	80.3
I	I	1.612	63.0	59	I	I	1.702	56.5	53.1
I	I	2.418	48.8	44.1	I	I	2.553	50.6	46.2
I	I	3.224	58.9	62.1	I	I	3.404	56.9	56.6
I	I	4.030	45.5	45.5	I	I	4.255	54.0	50.7
I	I	4.836	58.1	56.1	I	I	5.106	40.7	41.7
I	I	5.642	42.5	44	I	I	5.957	42.5	45.8
I	I	6.448	41.7	42.3	I	I	6.808	40.2	39.2
I	I	7.254	40.3	40.5	I	I	7.659	44.1	42.3
-29.0	806.0	8.060	40.6	40.8	-28.0	851.0	8.510	42.5	40.5
-29.0	813.0	0.813	86.3	86.9	-28.0	858.0	0.858	94.6	93.4
I	I	1.626	61.2	55.1	I	I	1.716	54.8	53.0
I	I	2.439	49.8	45.2	I	I	2.574	48.3	46.7
I	I	3.252	58.8	65.3	I	I	3.432	55.5	57.3
I	I	4.065	51.2	46.2	I	I	4.290	52.5	51.7
I	I	4.878	51.7	52.2	I	I	5.148	39.4	40.6
I	I	5.691	42.4	42.7	I	I	6.006	40.6	40.8
I	I	6.504	39.8	40.9	I	I	6.864	39.2	39.8
I	I	7.317	40.1	40.5	I	I	7.722	41.7	40.4
-29.0	813.0	8.130	41.3	41.6	-28.0	858.0	8.580	41.9	40.5
-28.0	821.0	0.821	84.3	85.7	-27.0	866.0	0.866	80.6	77.1
I	I	1.642	58.0	57.3	I	I	1.724	52.9	51.7
I	I	2.463	48.3	49.4	I	I	2.582	54.9	53.5
I	I	3.284	59.1	61.5	I	I	3.440	57.9	59.8
I	I	4.105	50.2	44	I	I	4.298	53.6	51.3
I	I	4.926	50.2	51.1	I	I	5.156	41.6	40.9
I	I	5.747	49.3	44.3	I	I	6.014	43.7	42.9
I	I	6.568	44.8	42.9	I	I	6.872	40.7	39.2
I	I	7.389	40.3	41.1	I	I	7.730	42.1	41.8
-28.0	821.0	8.210	41.5	42.9	-27.0	866.0	8.588	40.7	43.9

RETLIF TESTING LABORATORIES

TABULAR DATA SHEET

TEST METHOD: RF Power Output

CUSTOMER: Cellular Specialties, Inc. **JOB NO:** R-3662N

TEST SAMPLE: Bidirectional Amplifier

MODEL NO: 510 **SERIAL NO:** n/a

TEST SPECIFICATION: FCC Parts 2 and 90

PARAGRAPH: 2.1046

OPERATING MODE: Amplifying cellular telephone frequency signals

TECHNICIAN: M. Hippert **DATE:** 9-8-00

NOTES: Uplink Frequency: 806 - 821 MHz FCC ID: NVRCS1510-01

Downlink Frequency: 851 - 866 MHz

Test Frequency	Power Input (at 1dB Compression)	Power Output		Gain (Uncompressed)					
MHz	dBm	dBm		dB					
(Uplink)									
806.0	-29.0	31.0		61.2					
813.0	-29.0	31.9		63.0					
821.0	-28.0	32.1		61.5					
(Downlink)									
851.0	-28.0	31.6		61.3					
858.0	-28.0	31.5		61.4					
866.0	-27.0	31.4		59.9					

RETLIF TESTING LABORATORIES

TABULAR DATA SHEET

TEST METHOD: Spurious Emissions at the Antenna Terminals 30 MHz to 9 GHz

CUSTOMER: Cellular Specialties | **JOB NO:** R-3662N

TEST SAMPLE: Bidirectional Amplifier

MODEL NO: 510 | **SERIAL NO:** n/a

TEST SPECIFICATION: FCC Parts 2 and 90

PARAGRAPH: 2.1051

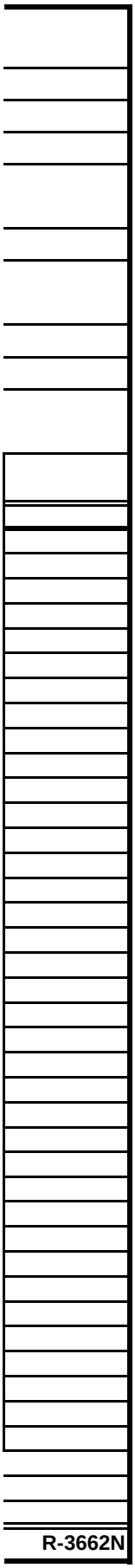
OPERATING MODE: Amplifying cellular telephone frequency signals

TECHNICIAN: M. Hippert | **DATE:** 9-13-00

NOTES: Uplink Frequency: 806 - 821 MHz

Downlink Frequency: 851 - 866 MHz

Uplink Input Signal	Test Frequency	Harmonic Frequencies	Reading	Limit	Downlink Input Signal	Test Frequency	Harmonic Frequencies	Reading	Limit
dBm	MHz	GHz	dBm	dBm	dBm	MHz	GHz	dBm	dBm
-29.0	806.0	0.806	30.8		-28.0	851.0	0.851	31.6	
I	I	1.612	-36.3	-13.0	I	I	1.702	-37.0	-13.0
I	I	2.418	-32.0	I	I	I	2.553	-27.9	I
I	I	3.224	>-45	I	I	I	3.404	>-45	I
I	I	4.030	>-45	I	I	I	4.255	>-45	I
I	I	4.836	>-45	I	I	I	5.106	>-45	I
I	I	5.642	>-45	I	I	I	5.957	>-45	I
I	I	6.448	>-45	I	I	I	6.808	>-38	I
I	I	7.254	>-38	I	I	I	7.659	>-38	I
-29.0	806.0	8.060	>-38	-13.0	-28.0	851.0	8.510	>-38	-13.0
-29.0	813.0	0.813	32.0		-28.0	858.0	0.858	31.5	
I	I	1.626	-35.0	-13.0	I	I	1.716	-36.8	-13.0
I	I	2.439	-28.0	I	I	I	2.574	-27.5	I
I	I	3.252	>-45	I	I	I	3.432	>-45	I
I	I	4.065	>-45	I	I	I	4.290	>-45	I
I	I	4.878	>-45	I	I	I	5.148	>-45	I
I	I	5.691	>-45	I	I	I	6.006	>-45	I
I	I	6.504	>-45	I	I	I	6.864	>-45	I
I	I	7.317	>-38	I	I	I	7.722	>-38	I
-29.0	813.0	8.130	>-38	-13.0	-28.0	858.0	8.580	>-38	-13.0
-28.0	821.0	0.821	32.0		-27.0	866.0	0.866	31.6	
I	I	1.642	-38.0	-13.0	I	I	1.724	-35.6	-13.0
I	I	2.463	-27.0	I	I	I	2.582	-27.0	I
I	I	3.284	>-45	I	I	I	3.440	>-45	I
I	I	4.105	>-45	I	I	I	4.298	>-45	I
I	I	4.926	>-45	I	I	I	5.156	>-45	I
I	I	5.747	>-45	I	I	I	6.014	>-45	I
I	I	6.568	>-38	I	I	I	6.872	>-38	I
I	I	7.389	>-38	I	I	I	7.730	>-38	I
-28.0	821.0	8.210	>-38	-13.0	-27.0	866.0	8.588	>-38	-13.0


R-3662N

RETLIF TESTING LABORATORIES

TABULAR DATA SHEET

TEST METHOD: Frequency Stability

CUSTOMER: Cellular Specialties | **JOB NO:** R-3662N

TEST SAMPLE: Bidirectional Amplifier

MODEL NO: 510 | **SERIAL NO:** n/a

TEST SPECIFICATION: FCC Parts 2 and 90

PARAGRAPH: 2.1055

OPERATING MODE: Amplifying cellular telephone frequency signals

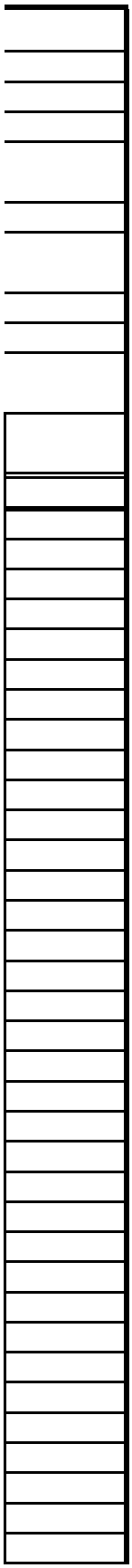
TECHNICIAN: M. Hippert | **DATE:** 9-8-00

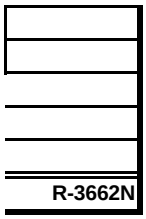
NOTES: Uplink Frequency: 806 - 821 MHz

Downlink Frequency: 851 - 866 MHz

Test Frequency	Input Power	Output Power	Measured Frequency					
MHz	dBm	dBm	MHz					
(Uplink)								
806.0	-29.0	31.0	806.0					
	-44.0	17.0	806.0					
	-59.0	1.9	806.0					
	-89.0	-27.8	806.0					
813.0	-29.0	31.9	813.0					
	-44.0	16.8	813.0					
	-59.0	2.1	813.0					
	-89.0	-28.0	813.0					
821.0	-28.0	32.1	821.0					
	-43.0	18.2	821.0					
	-58.0	2.9	821.0					
	-88.0	-26.0	821.0					
(Downlink)								
851.0	-28.0	31.6	851.0					
	-43.0	18.3	851.0					
	-58.0	3.0	851.0					
	-88.0	-27.0	851.0					
858.0	-28.0	31.5	858.0					
	-43.0	18.0	858.0					
	-58.0	3.1	858.0					
	-88.0	-26.0	858.0					
866.0	-27.0	31.4	866.0					
	-42.0	17.9	866.0					
	-57.0	3.0	866.0					
	-87.0	-25.0	866.0					

DATA SHEET 1 OF 1




R-3662N