FCC CFR47 PART 22 TYPE ACCEPTANCE

TEST REPORT

FOR

WIRELESS LOCAL LOOP SUBSCRIBER UNIT

MODEL: SU-200

FCC ID: NT7SU-200

REPORT NUMBER: 98E7210

ISSUE DATE: APRIL 13, 1998

Prepared for

DIVA COMMUNICATIONS
32930 ALVARADO-NILES RD STE 350
UNION CITY, CA 94587
USA

Prepared by

COMPLIANCE ENGINEERING SERVICES, INC.
1366 BORDEAUX DRIVE
SUNNYVALE, CA 94089, USA
TEL: (408) 752-8166
FAX: (408) 752-8168

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3. AUTHORIZATION LETTER
4. PROPOSED FCC ID LABEL FORMAT
5. REQUEST FOR CONFIDENTIALITY LETTER

1. VERIFICATION OF COMPLIANCE

COMPANY NAME: DIVA COMMUNICATIONS
32930 ALVARADO-NILES RD STE 350
UNION CITY, CA 94587

CONTACT PERSON: JOHN MONTGOMERY

TELEPHONE NO: 510-986-6441

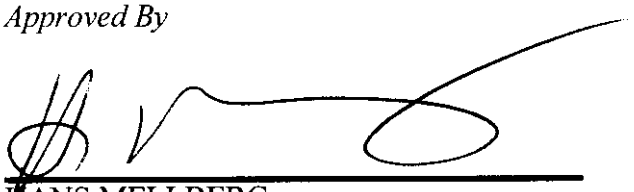
MODEL NO/NAME: SU-200
SERIAL NO: N/A

DATE TESTED: APRIL 13, 1998

TYPE OF EQUIPMENT:	WIRELESS LOCAL LOOP SUBSCRIBER UNIT
MEASUREMENT DISTANCE:	3 METER
TECHNICAL LIMIT:	FCC 22.359, 22.917
FCC RULES:	PART 15, PART 22
EQUIPMENT AUTHORIZATION PROCEDURE	TYPE ACCEPTANCE
MODIFICATIONS MADE ON EUT	YES (X)NO

The above equipment was tested by Compliance Consulting Services for compliance with the requirements set forth in the FCC CFR 47, PART 15 AND 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.

Approved By



HANS MELLBERG
DIRECTOR OF ENGINEERING

COMPLIANCE CONSULTING SERVICES
1366 BORDEAUX DRIVE SUNNYVALE, CA 94089 USA
DOCUMENT NO:CCSUP4031A
TEL:(408) 752-8166 FAX:(408) 752-8168

2. PRODUCT DESCRIPTION

Wireless Local Loop Subscriber Unit SU-200

The DIVA-2000 Wireless Local Loop is a fully integrated wireless access system designed to provide telephone service to residential and business subscribers. Using digital cellular technology, The DIVA-200 Wireless Local Loop can be deployed as a high capacity macrocellular wireless network to connect its subscribers to the Public Switched Telephone Network (PSTN). The DIVA-2000 Wireless Local Loop is an adaptation of the Personal Digital Cellular (PDC) Japanese standard, a digital wireless technology that has over 20 million subscribers and is second only to the Global System for Mobile communications (GSM) standard in terms of worldwide usage. The DIVA wireless local loop system has been deployed internationally for over 2 years. The DIVA-2000 Wireless Local Loop is composed of four major system elements:

3. TEST FACILITY

The open area test sites and conducted measurement facilities used to collect the radiated and conducted 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.

4. 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))

5. MEASUREMENT INSTRUMENTATION

Radiated emissions were measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, ridged waveguide, liner horn. EMI receivers were used for line conducted readings, spectrum analyzers with pre-selectors and quasi-peak detectors were used to perform radiated measurements. Receiving equipment (i.e., receiver, analyzer, quasi-peak adapter, pre-selector) and LISNs conform to CISPR specification for "Radio Interference Measuring Apparatus and Measurement Methods," Publication 16.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

6. 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.

7. UNITS OF MEASUREMENT

Measurements of radiated interference are reported in terms of dB(uV/m) at a specified distance. The indicated readings on the spectrum analyzer were converted to dB(uV/m) by use of appropriate conversion factors. Measurements of conducted interference are reported in terms of dB(uV).

The field strength is calculated by adding the Antenna Factor and Cable Factors, then by subtracting the Amplifier Gain from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG

Where FS = Field Strength
RA = Receiver Amplitude
AF = Antenna Factor
CF = Cable Attenuation Factor
AG = Amplifier Gain

Assume a receiver reading of 52.5 dBuV is obtained. The Antenna Factor of 7.4dB/m and a Cable Factor of 1.1dB is added. The Amplifier Gain of 29 dB is subtracted, giving a field strength of 32 dBuV/m. The 32 dBuV/m value was mathematically converted to its corresponding level in uV/m.

FS = 52.5 + 7.4 + 1.1 - 29 = 32 dBuV/m

Level in uV/m = Common Antilogarithm [(32 dBuV/m)/20] = 39.8 uV/m

8. CLASSIFICATION OF DIGITAL DEVICE

Class A includes digital devices that are marketed for use in commercial, industrial or business environments, excluding devices which are marketed for use by the general public or are intended to be used in the home.

Class B includes digital devices that are marketed for use in residential environments, notwithstanding use in commercial, business and industrial environments.

Note: The responsible party may also qualify a device intended to be marketed in a commercial, business or industrial environment as Class B device, and in fact is encouraged to do so provided the device complies with the technical specifications for a Class B digital device. In the event that a particular type of device has been found to repeatedly cause harmful interference to radio communications, the Commission may classify such a digital device as a Class B digital device, regardless of its intended use.

9. RADIATED EMISSION LIMITS

FCC PART 15 CLASS A

MEASURING DISTANCE OF 10 METER		
FREQUENCY RANGE (MHz)	FIELD STRENGTH (Microvolts/m)	FIELD STRENGTH (dBuV/m)
30-88	90	39.1
88-216	150	43.5
216-960	210	46.4
Above 960	300	49.5

FCC PART 15 CLASS B

MEASURING DISTANCE OF 3 METER		
FREQUENCY RANGE (MHz)	FIELD STRENGTH (Microvolts/m)	FIELD STRENGTH (dBuV/m)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

10. RADIATED EMISSION TEST PROCEDURE

The EUT and all other support equipment are placed on a wooden table 80 cm above the ground screen. Antenna to EUT distance is 3 meters . During the test, the table is rotated 360 degrees to maximize emissions and the antenna is positioned from 1 to 4 meters above the ground screen to further maximize emissions. The antenna is polarized in both vertical and horizontal positions.

EUT test configuration is according to Section 8 of ANSI C63.4/1992.

Monitor the frequency range of interest at a fixed antenna height and EUT azimuth. Frequency span should be small enough to easily differentiate between broadcast stations and intermittent ambients. Rotate EUT 360 degrees to maximize emissions received from EUT. If emission increases by more than 1 dB, or if another emission appears that is greater by 1 dB, return to azimuth where maximum occurred and perform additional cable manipulation to further maximize received emission.

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Move antenna up and down to further maximize suspected highest amplitude signal. If emission increased by 1 dB or more, or if another emission appears that is greater by 1dB or more, return to antenna height where maximum signal was observed and manipulate cables to produce highest emissions, noting frequency and amplitude.

11. AMBIENT CONDITIONS

The ambient conditions at the time of final tests were as follows:

	Radiated Emission	Conducted Emission
Temperature	**18°C**	**19°C**
Humidity	**60%**	**62%**

13. TEST EQUIPMENT LIST

Equipment	Manufacturer	Model No.	Serial No.	Site	Cal Date	Due Date
Spectrum Analyzer	H.P.	8593EM	3710A00205	A	05/97	05/98
Antenna	EMCO	3146	NSN=X100	A/F	10/97	10/98
Antenna	ARA	DRG-118/A	104	A/F	06/97	06/98
Pre-Amp	H.P.(P2)	8447D	2944A06265	A/F	09/97	09/98
Pre-Amp	H.P.	8449B	3008A00369	A/F	04-98	04/99
Antenna	Emco	3110	8908-1079	A/F	10/97	10/98
Thermal coupler	Tecktronics	DTM920	DTM920TW	N/A	4/98	4/99

14. SUPPORT EQUIPMENT

Device Type	Manufacturer	Model Number	Serial No.	FCC ID / DoC
PC	COMPUTERLINK	N/A	N/A	N/A
TEST INTERFACE BOX	KOKUSAI ELECTRONICS	N/A	N/A	N/A
DC POWER SUPPLY	SINPRO	SPU30-4	100072	N/A
TELEPHONE	AMTEL	N/A	N/A	2GUCHN-73412

15. TEST RESULT SUMMARY

FCC PART 15 Radiated Emission Test was conducted by operating the configuration as indicated below.

OATS No:A A / 3 meter	Data Report No. 980410A3	Date 4/10/98	Tested By: PETE KREBILL

Six Highest Radiated Emission Readings

Frequency Range Investigated				30 MHz TO 9000 MHz			
Freq (MHz)	Meter Reading (dBuV)	C.F. (dB/m)	Corrected Reading (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Reading Type (P/Q/A)	Polar (H/V)
169.53	40.00	-18.74	21.26	43.50	-22.24	P	H
127.27	41.80	-17.27	24.53	43.50	-18.97	P	H
247.90	46.90	-14.89	32.01	46.00	-13.99	P	H
221.45	46.70	-16.33	30.37	46.00	-15.63	P	H
218.00	44.60	-16.52	28.08	46.00	-17.92	P	H
261.00	45.00	-14.51	30.49	46.00	-15.51	P	H

C.F.(Correction Factor)=Antenna Factor+Cable Loss-Amplifier Gain
Corrected Reading = Metering Reading + C.F. Margin=Corrected Reading - Limits
P=Peak Reading H=Horizontal Polarization/Antenna
Q=Quasi-peak V=Vertical Polarization/Antenna
A=Average Reading
Comments:N/A

Final Conducted Emission Test was conducted by operating the worst mode as indicated above.

Conducted Room	Plot No. N/a	Date 04/10/98	Tested By: Kerwin Corpuz

Six Highest Conducted Emission Readings

Frequency Range Investigated				150 kHz TO 30 MHz			
Freq (MHz)	Meter Reading (dBuV)	C.F. (dB)	Corrected Reading (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Reading Type (P/Q/A)	Line (L1/L2)
12.79	41.2	0	41.2	48	-6.8	Q	1
13.2	41	0	41	48	-7	Q	1
1.07	39	0	39	48	-9	P	1
0.515	40.6	0	40.6	48	-7.4	P	1
12.87	42.1	0	42.1	48	-5.9	Q	2
13.385	43.1	0	43.1	48	-4.9	Q	2

C.F.(Correction Factor)=Insertion Loss + Cable Loss
Corrected Reading = Metering Reading + C.F.
Margin=Corrected Reading - Limits

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P=Peak Reading
Q=Quasi-peak
A=Average Reading

L1=Hot
L2=Neutral

FCC Rule 2.983

2.983 (a) Name of Applicant:

DIVA Communications
32930 Alvarado-Nile Road
Suite 350
Union City CA 94587

Name of Manufacturer and DIVA Licensee:

Kokusai Electric Co., LTD.
1007-176 Isumisawa
Chitose City Hokkaido
Japan 066-8666

2.983 (b) Equipment Identification:

DIVA Communications
Model Number: SU-200

2.983 (c) Planned for quantity production.

2.983 (d) Technical description:

SYSTEM DESCRIPTION

The DIVA-2000 Wireless Local Loop is a fully integrated wireless access system designed to provide telephone service to residential and business subscribers. Using digital cellular technology, The DIVA-200 Wireless Local Loop can be deployed as a high capacity macrocellular wireless network to connect its subscribers to the Public Switched Telephone Network (PSTN). The DIVA-2000 Wireless Local Loop is an adaptation of the Personal Digital Cellular (PDC) Japanese standard, a digital wireless technology that has over 20 million subscribers and is second only to the Global System for Mobile communications (GSM) standard in terms of worldwide usage. The DIVA wireless local loop system has been deployed internationally for over 2 years. The DIVA-2000 Wireless Local Loop is composed of four major system elements:

The **System Management Software (SMS)** provides centralized control and monitoring of a DIVA-2000 network.

The **Radio/Switch Controller (RSC)** directly links the DIVA-2000 subscribers to the local exchange of the PSTN and supports call traffic thought out a DIVA-2000 network. The RSC interfaces one or more remote Modular Base Stations (MBS's) with the local exchange via a twisted pair, microwave or fiber link.

The **Modular Base Station (MBS)** supports the radio interface to the DIVA-2000 subscribers, where multiple Modular Base Stations deployed at one or more DIVA-2000 base station sites define the wireless network's coverage and capacity.

The **Subscriber Unit (SU)** offers a standard telephone line interface to the subscriber and provides wireless connectivity via the DIVA-2000 Wireless Local Loop to the PSTN.

This application is for the Subscriber Unit (SU) which is located at the end users location, either residential or business.

The complete system consists of two RF units, one is the Modular Base Station (MBS), for which a separate application for type acceptance is being submitted, the other unit is the Subscriber Unit (SU) to which this application applies. DIVA's system is based on the Japanese Digital Cellular Standard defined in the Research and Development Center for Radio Systems (RCR) Personal Digital Cellular (PDC) Telecommunications System RCR STD-27B revised on 10 December 1992. This is the only modulation type used by the system. The PDC standard is similar to the North American Digital Cellular Standard (NADC) defined in EIA documents IS-54/55/56. See Table for 2.983 (d) (12) for a comparison of parameters. The major difference is that the PDC standard is based on a narrower bandwidth channel spacing, 25 kHz

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vs 30 kHz for NADC. This is achieved by using a lower symbol rate and sharper roll-off of the modulation filter. The DIVA 2000 system is designed to operate in the US AMPS freq. band using any of the 833 available 30 kHz AMPS channels.

SUBSCRIBER UNIT (SU) DESCRIPTION

The Subscriber Unit transmits in the uplink band (824.01 to 848.97 MHz) and receives in the downlink band (869.01 to 893.97 MHz). Since the system is TDMA, the subscriber unit only transmits on one or two of the six available time slots. The subscriber units operates in a manner similar to cellular mobiles. Upon power up, the subscriber unit searches for an available control channel, then receives direction from the Modular Base Station as to which channel and slot to transmit on. In addition, the SU transmitter power is controlled by the base station over a 20 dB range to minimize the transmitted power level consistent with a minimum signal level received at the Modular Base Station. The modulation, coding and ID used in the system only allow the SU to be controlled by an authorized DIVA Modular Base Station. The SU also uses a Modular Base Station transmit channel as a freq. reference to set it's internal reference oscillator prior to transmission. In this way the Modular Base Station controls the frequency accuracy of the SU transmitter.

The SU can be installed by the end user (subscriber) using the built in antennas. A higher gain antenna may be installed. This antenna and interface cable combination would be such that the maximum ERP would not exceed the FCC cellular mobile limit of 38.5 dBm (7 W) ERP, FCC 47CFR22.913(a). The antenna and cable would be provided by the Service Provider. A multi-pin connector is provided on the SU for this purpose and is connected to the antenna via a custom cable harness provided by DIVA to the Service Provider.

2.983 (d)

(1) Emission Type: Digital Cellular Standard RCR (RCR STD-27B)

(2) TX Frequency: 824.01 to 848.97 MHz in 30 kHz channels (AMPS frequencies)
RX Frequency: 869.01 to 893.97 Mhz in 30 kHz channels (AMPS frequencies)
TX/RX channel spacing: 45 MHz (per AMPS)

(3) Max. TX power @ ant. port: 0.8 W +20%, -50% (29.0 dBm)
TX power range: 0.008 W to 0.8 W (controlled by Base Station)
Antenna Gain: Less than 9 dB.

(4) FCC maximum ERP: 7 W (reference)

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(5) CIRCUIT DESCRIPTION: Transmitter

At the transmitter output is a filter (L301/302,C330/331/332) used to reduce transmitter noise and spurious emissions. The power amplification is provided by Q303, a class AB biased GaAs FET (Q303). The drain of Q303 is biased at 5.8 Vdc through Q307 which switches the +6Vdc supply and is controlled by PA-EN through Q302. The gate bias is supplied by the -5Vdc supply and is factory adjusted by R314 for a quiescent drain current bias of 300 mA. Q301 provides an interlock to turn Q303's drain supply off if the -5Vdc supply fails.

Class A bipolar RF amplifier stages Q304 and Q305 provide gain in the transmit path The base and collector of these transistors are biased from the +6Vdc line. The base bias is switched on and off by Q308 using the MOD-EN control line.

A dual gate FET (Q306) is used to control the transmitter power. The P-CONT line is controlled through digital hardware and firmware to set the transmitter power in response to base station commands. The Base Station sets the transmitter power to the minimum level possible which insures reliable reception of the SU channel. The P-CONT line controls the voltage on the second gate (G2) of Q306, providing a means of controlling the gain of the device. The drain of Q303 is also switched on and off in response to the MOD-EN control line to provide additional attenuation in the transmitter path when the transmitter is turned off.

Bandpass filter FL301 provides out of band rejection of the transmitter modulator A301. A301 is a quadrature modulator which digitally modulates the LO with the base band I and Q inputs provided by the digital section. These inputs are filtered in A405 to provide the required roll-off factor (0.5) required by the PDC standard.

There are no user or service provider adjustments in the transmitter circuits.

(6) Not applicable

(7) See Confidential Schematics – Attachment 4

(8) See User Guide – Attachment 3

(9) Alignment: The following alignments are made at the factory:

Set bias current for transmitter power amplifier transistor using R314.
Calibrate transmitter output power levels and program calibration table using maintenance port J3.
Calibrate receiver RSSI levels and program calibration table using maintenance port J3 .

There are no user or service provider alignments provided.

(10) CIRCUIT DESCRIPTION: Frequency reference and local oscillators

The frequency reference used is a voltage controlled temperature compensated TCXO (A205). The uncorrected tolerance of the reference is +/- 3 ppm over all operating conditions. The AFC input is used to align the TCXO with the Base Station's transmitted carrier (which is +/- 0.3 ppm). This is done through the digital signal processing of the received signal IF (450 kHz) in firmware and hardware (A401/405/406) prior to transmission. The tracking error is less than 0.3 ppm.

The frequency reference is routed to the two LO frequency synthesizers. One is fixed at 45.45 MHz (A202, CR201 and Q204) and one in stepable from 778.56 to 803.52 MHz in 30 kHz steps (A203 and A204). These two LO's are then mixed to provide a 824.01 to 848.97 MHz LO which used to supply the carrier for the transmitter modulator and the first IF stage mixer (Q105) of the receiver. The 45.45 MHz LO also supplies the second IF mixer (A102) in the receiver. Since the same LO's are used in both the receiver and transmitter, using the RX 450 kHz IF for a frequency reference to align the TCXO (A205) insures the transmitted carrier is aligned to the base station's transmitted carrier.

(11) At the transmitter output is a filter (L301/302,C330/331/332) used to reduce transmitter noise and spurious emissions. The power amplification is provided by Q303, a class AB biased GaAs FET (Q303). The drain of Q303 is biased at 5.8 Vdc through Q307 which switches the +6Vdc supply and is controlled by PA-EN through Q302. The gate bias is supplied by the -5Vdc supply and is factory adjusted by R314 for a quiescent drain current bias of 300 mA. Q301 provides an interlock to turn Q303's drain supply off if the -5Vdc supply fails.

(12) COMPARISON OF DIVA WLL SUBSCRIBER UNIT AIR INTERFACE PARAMETERS TO NADC (REFERENCE)

General:

Parameter (over temp)	**DIVA**	**NADC**	**Units**
Frequency Band:			
Downlink:	869.01 to 893.97	869.01 to 893.97	MHz
Uplink:	824.01 to 848.97	824.01 to 848.97	MHz
Channel spacing:	30	30	kHz
TX/RX channel spacing:	45	45	MHz
symbol rate:	21	24.3	ksymbols/sec
Frame length	40	40	ms
Slots/frame	6	6	Slots
rolloff factor:	0.5	0.35	square root raised cosine filter.
Occupied BW:	32	~40	kHz (99.5% total power)
Modulation	PI/4 DQPSK	PI/4 DQPSK	
TX RF Power Var.	+2 / -4	+2 / -4	dB Max.

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TX RF Pwr Cntrl Step:	4	4	dB
TX RF Pwr Cntrl Rng:	20 (Class II)	22 (class III)	dB
Unlocked Freq. stability:	+/- 3.0	+/- 2.5	ppm. (see below)
Locked TX Freq. stability.	+/- 0.6	N/A	ppm
TX Base station tracking	+/- 0.3	+/- 0.25	ppm.
TX Carrier off power	-60	-60	dBm Max.
TX Carrier Rise/fall time	0.119 (within 14 dB)	2 (to within 2 dB)	mS

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FCC PART 2 TYPE ACCEPTANCE TEST REQUIREMENT:

SECTION 2.985 RF POWER OUTPUT

	MEASURED RF POWER OUTPUT
	0.537 WATTS

SECTION 2.987 MODULATION CHARACTERISTICS

PI/4 DQPSK W/ RJ11 T1 INTERFACE

SECTION 2.989 OCCUPIED BANDWIDTH

CHANNEL/ FREQUENCY	PLOT #
990/869.1MHZ	1
383/881.49MHZ	2
799/893.97MHZ	3

SECTION 2.991 SPURIOUS EMISSION AT ANTENNA TERMINALS

Out of band emission plots are from 30MHz to 8940MHz with 30k RES B/W as specified in 22.917(f). In band emission plots show compliance with 22.917(d)(1) & (2). 1^{ST} in band plot shows emission removed 20KHz with limit of 26dBc, with 300Hz RES B/W as specified in 22.917(h). 2^{ND} in band plot shows emissions removed 45KHz with limit of 45dBc, with 300Hz RES B/W as specified in 22.917(h). 3^{RD} in band plot shows emissions removed 60KHz with limit of 45dBc, a 10KHz RES B/W was used because the spectrum analyzer was not displaying the signal realistically, as seen in plot # 8, with 30KHz B/w. Mobile emissions in base band plots show compliance with FCC 22.917(f).

CHANNEL	**PLOT DESCRIPTION**	**PLOT#**
#990/824.01MHZ	OUT OF BAND LOW	4
#990	OUT OF BAND HIGH	5
#990	1^{ST} IN BAND	6

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#990	2ND IN BAND	7
#990	3RD IN BAND	8
#383/836.49MHZ	OUT OF BAND LOW	9
#383	OUT OF BAND HIGH	10
#383	1ST IN BAND	11
#383	2ND IN BAND	12
#383	3RD IN BAND	13
#799/848.97MHZ	OUT OF BAND LOW	14
#799	OUT OF BAND HIGH	15
#799	1ST IN BAND	16
#799	2ND IN BAND	17
#799	3RD IN BAND	18
#799	MOBILE EMISSIONS IN BASE BAND	19

SECTION 2.993 FIELD STRENGTH OF SPURIOUS RADIATION

Technical Limits applied :Section, 22.917 emission masks

See attached chart # 22

SECTION 2.995 FREQUENCY STABILITY

See attached plot and chart # 20 & 21

See attached plot and chart # 23, 24 & 25

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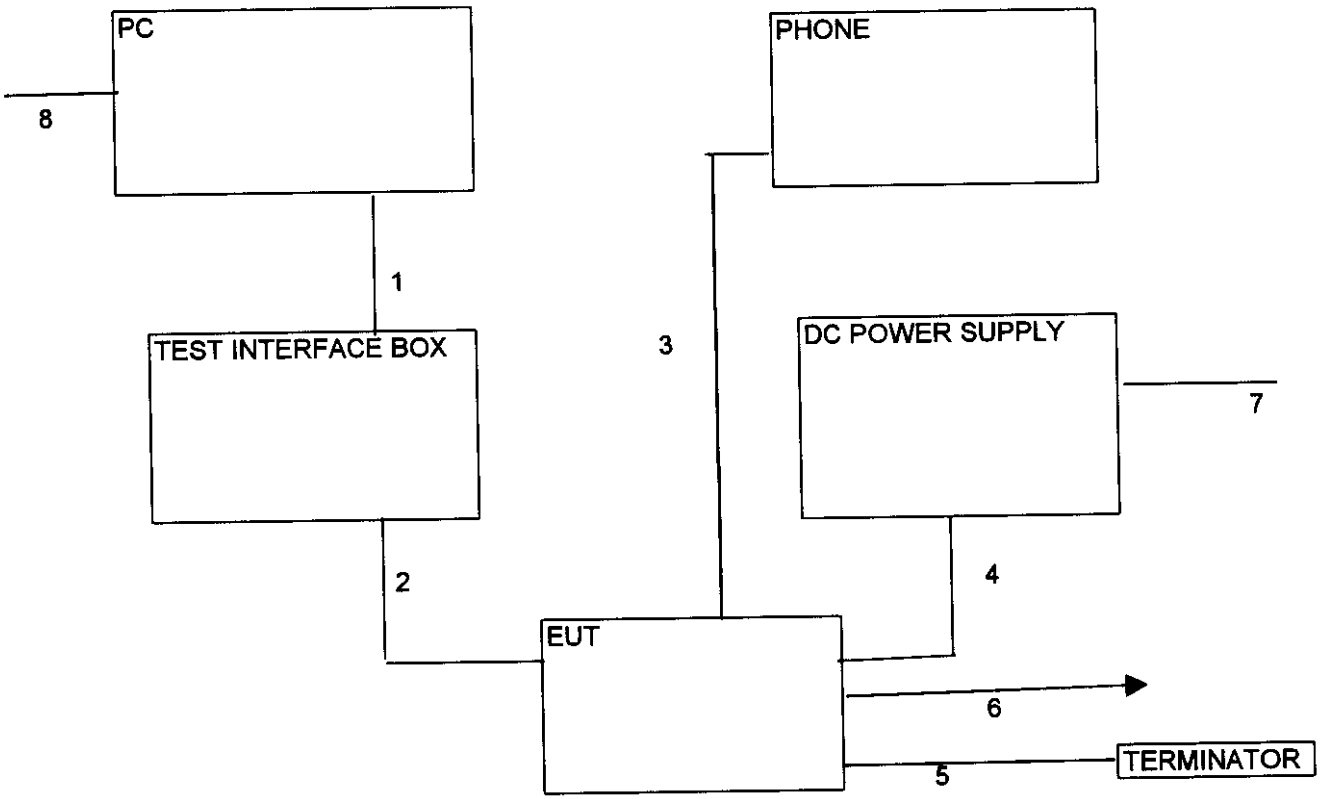
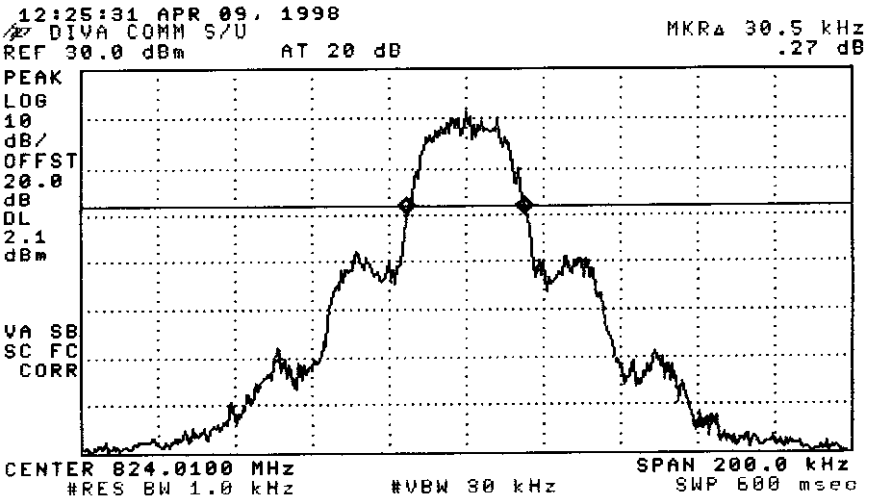
17.0 BLOCK DIAGRAM

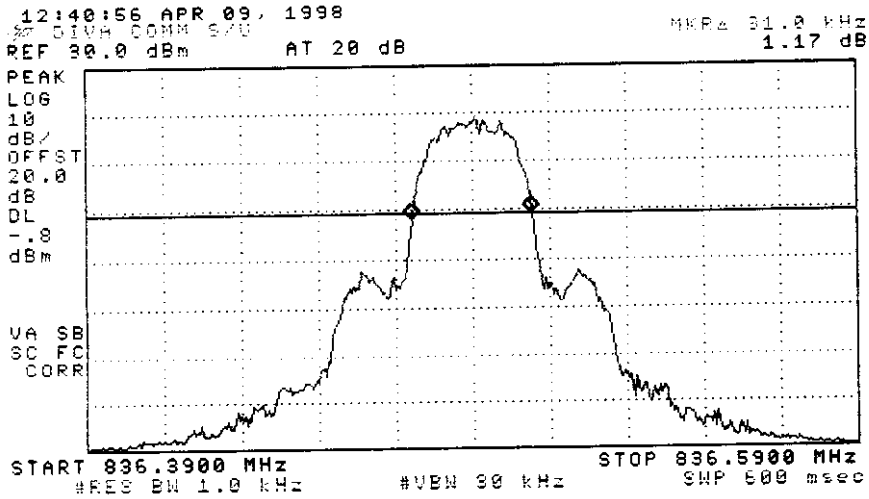


ATTACHMENTS:

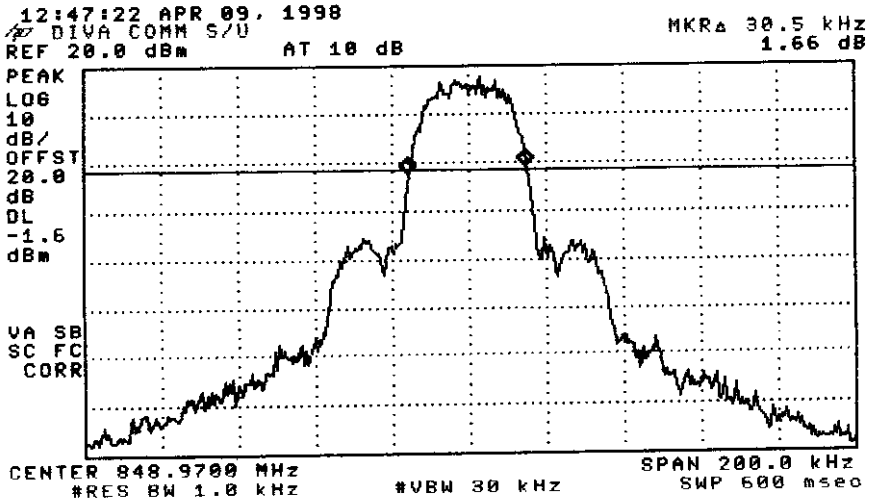
1. TEST RESULTS


12:25:31 APR 09, 1998
DIVA COMM S/U
REF 30.0 dBm
AT 20 dB
MKRΔ 30.5 kHz
.27 dB
PEAK
LOG
10
dB/
OFFST
20.0
dB
DL
2.1
dBm
VA SB
SC FC
CORR
CENTER 824.0100 MHz
#RES BW 1.0 kHz
#VBW 30 kHz
SPAN 200.0 kHz
SWP 600 msec

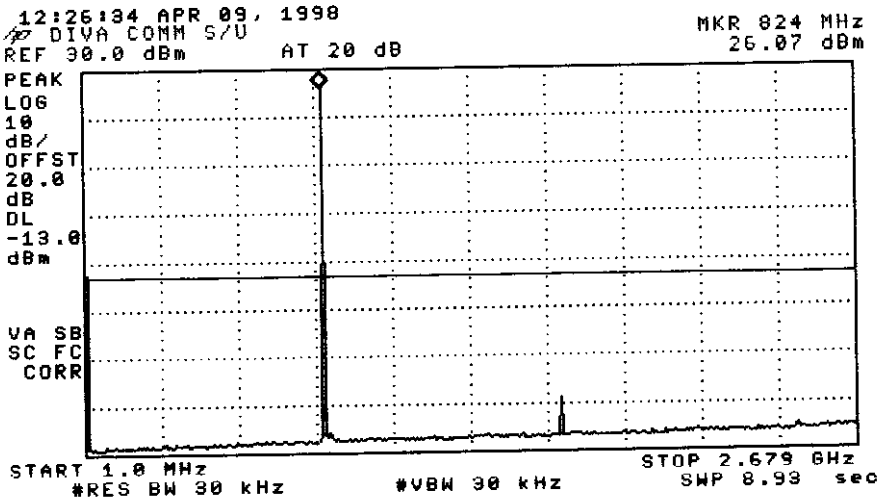
1


12:40:56 APR 09, 1998
DIVA COMM S/U
REF 30.0 dBm
AT 20 dB
MKRΔ 31.0 kHz
1.17 dB
PEAK
LOG
10
dB/
OFFST
20.0
dB
DL
-.8
dBm
VA SB
SC FC
CORR
START 836.3900 MHz
#RES BW 1.0 kHz
#VBW 30 kHz
STOP 836.5900 MHz
SWP 600 msec

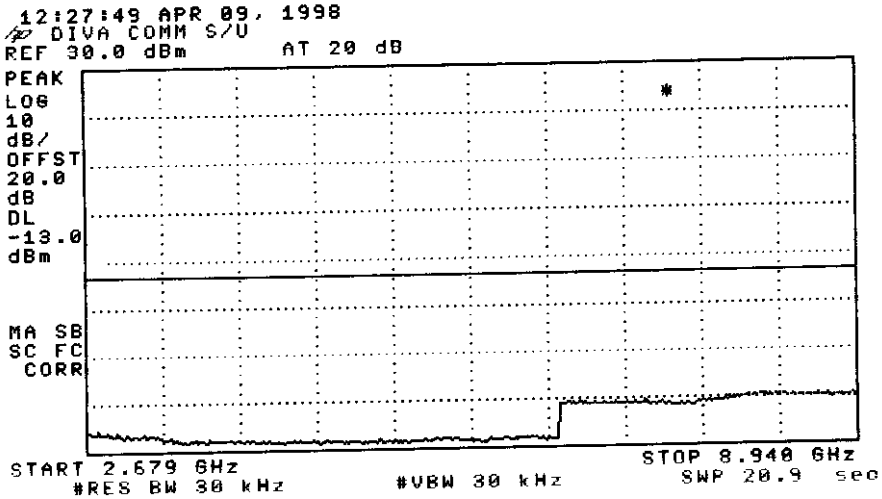
2


12:47:22 APR 09, 1998
DIVA COMM S/U
REF 20.0 dBm
AT 10 dB
MKRΔ 30.5 kHz
1.66 dB
PEAK
LOG
10
dB/
OFFST
20.0
dB
DL
-1.6
dBm
VA SB
SC FC
CORR
CENTER 848.9700 MHz
#RES BW 1.0 kHz
#VBW 30 kHz
SPAN 200.0 kHz
SWP 600 msec

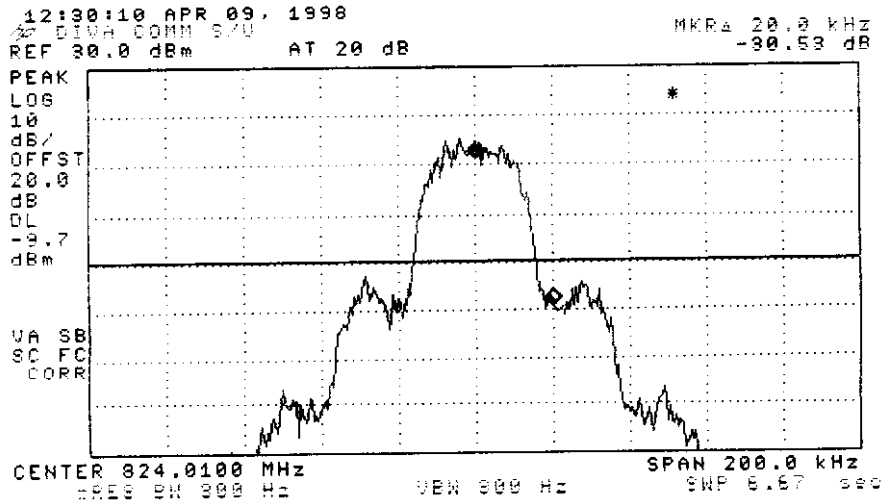
3


12:26:34 APR 09, 1998
DIVA COMM S/U
REF 30.0 dBm
AT 20 dB
MKR 824 MHz
26.07 dBm
PEAK
LOG
10
dB/
OFFST
20.0
dB
DL
-13.0
dBm
VA SB
SC FC
CORR
START 1.0 MHz
#RES BW 30 kHz
#VBW 30 kHz
STOP 2.679 GHz
SWP 8.93 sec

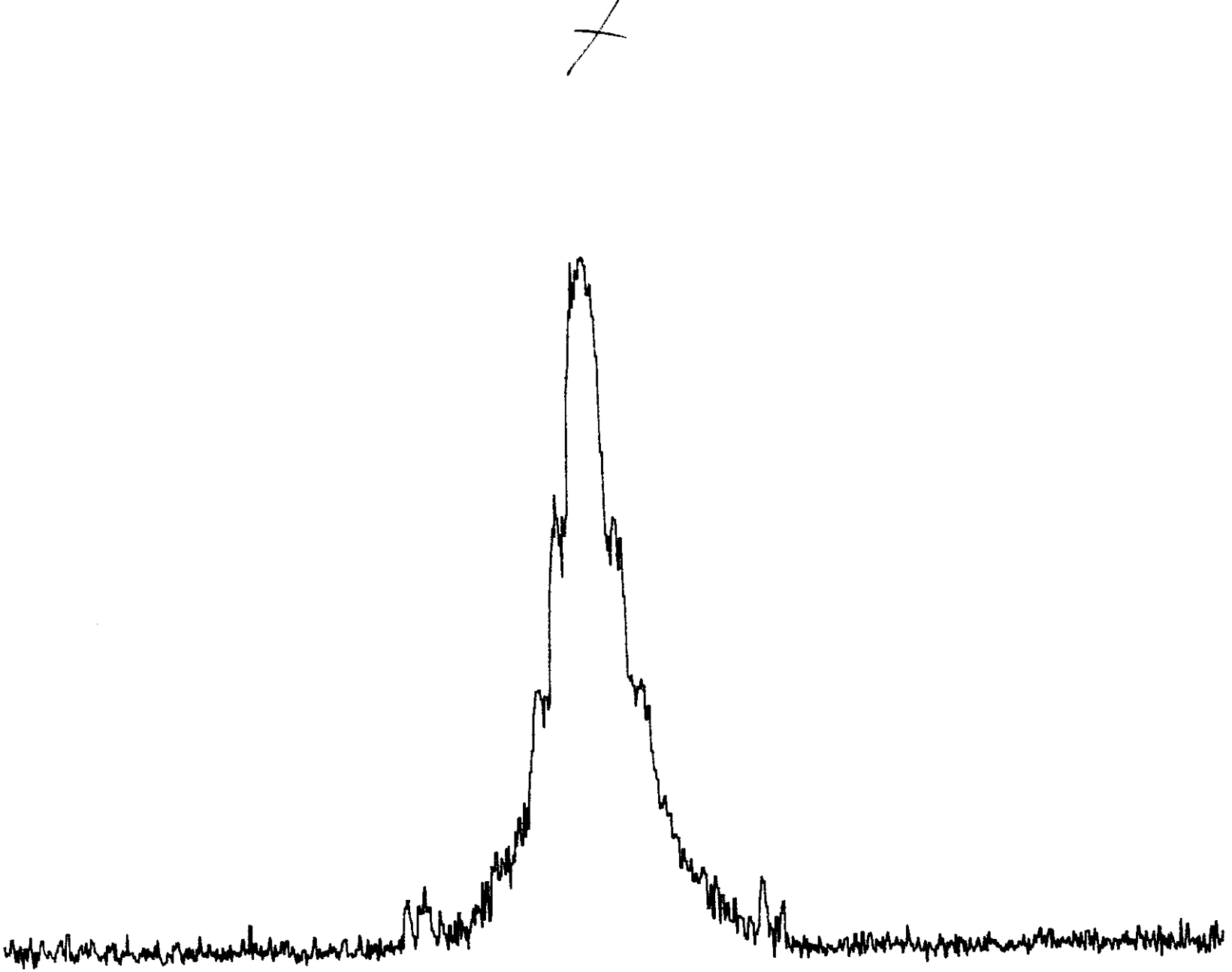
4

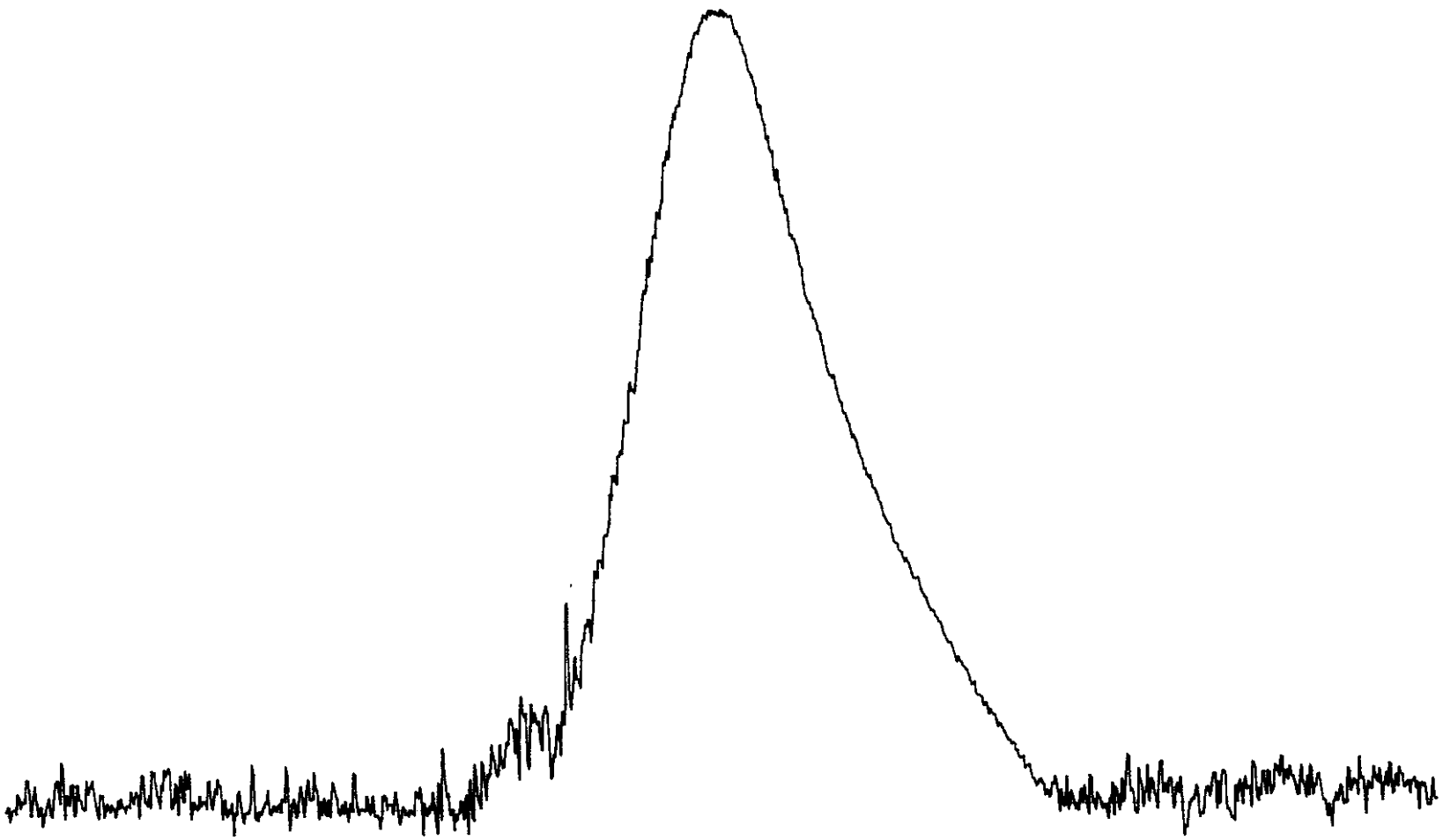

12:27:49 APR 09, 1998
DIVA COMM S/U
REF 30.0 dBm
AT 20 dB
PEAK
LOG
10
dB/
OFFST
20.0
dB
DL
-13.0
dBm
MA SB
SC FC
CORR
START 2.679 GHz
#RES BW 30 kHz
#VBW 30 kHz
STOP 8.940 GHz
SWP 20.9 sec

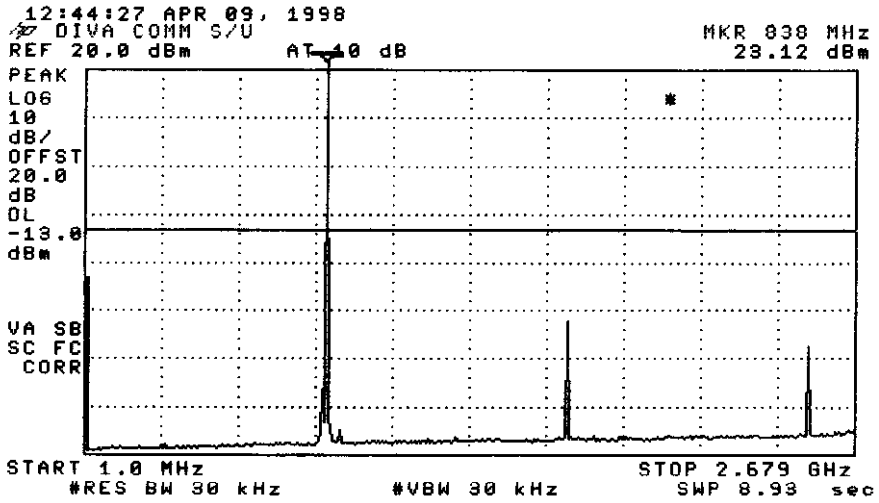
5


12:30:10 APR 09, 1998
DIVA COMM S/U
REF 30.0 dBm
AT 20 dB
MKRΔ 20.0 kHz
-30.53 dB
PEAK
LOG
10
dB/
OFFST
20.0
dB
DL
-9.7
dBm
VA SB
SC FC
CORR
CENTER 824.0100 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 200.0 kHz
SWP 8.67 sec

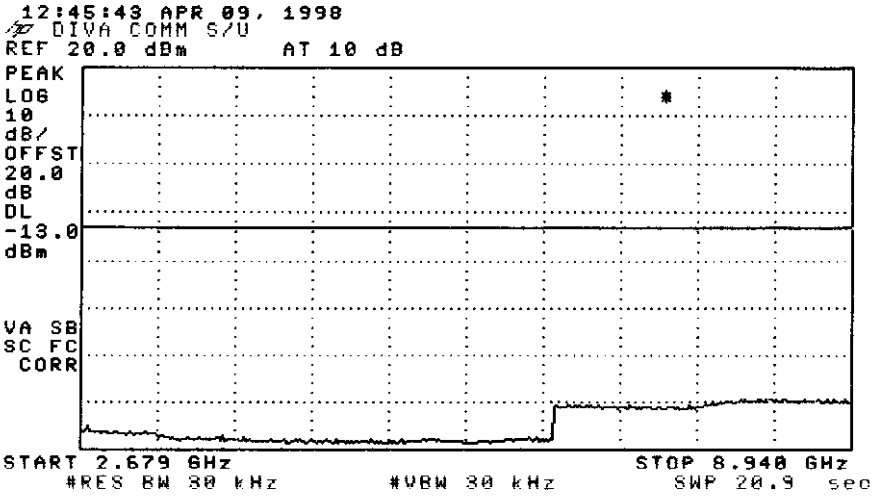
6



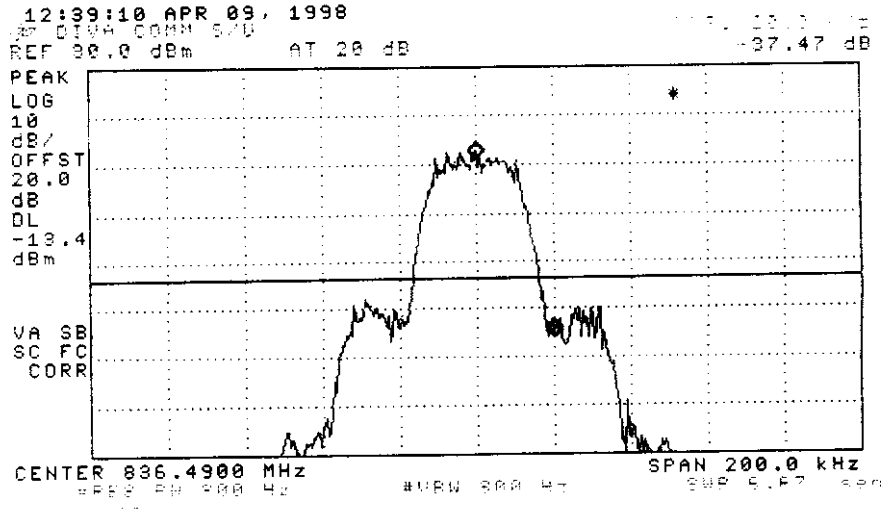



12:44:27 APR 09, 1998
DIVA COMM S/U
REF 20.0 dBm
AT 10 dB
MKR 838 MHz
23.12 dBm
PEAK
LOG
10
dB/
OFFST
20.0
dB
DL
-13.0
dBm
VA SB
SC FC
CORR
START 1.0 MHz
#RES BW 30 kHz
#VBW 30 kHz
STOP 2.679 GHz
SWP 8.93 sec

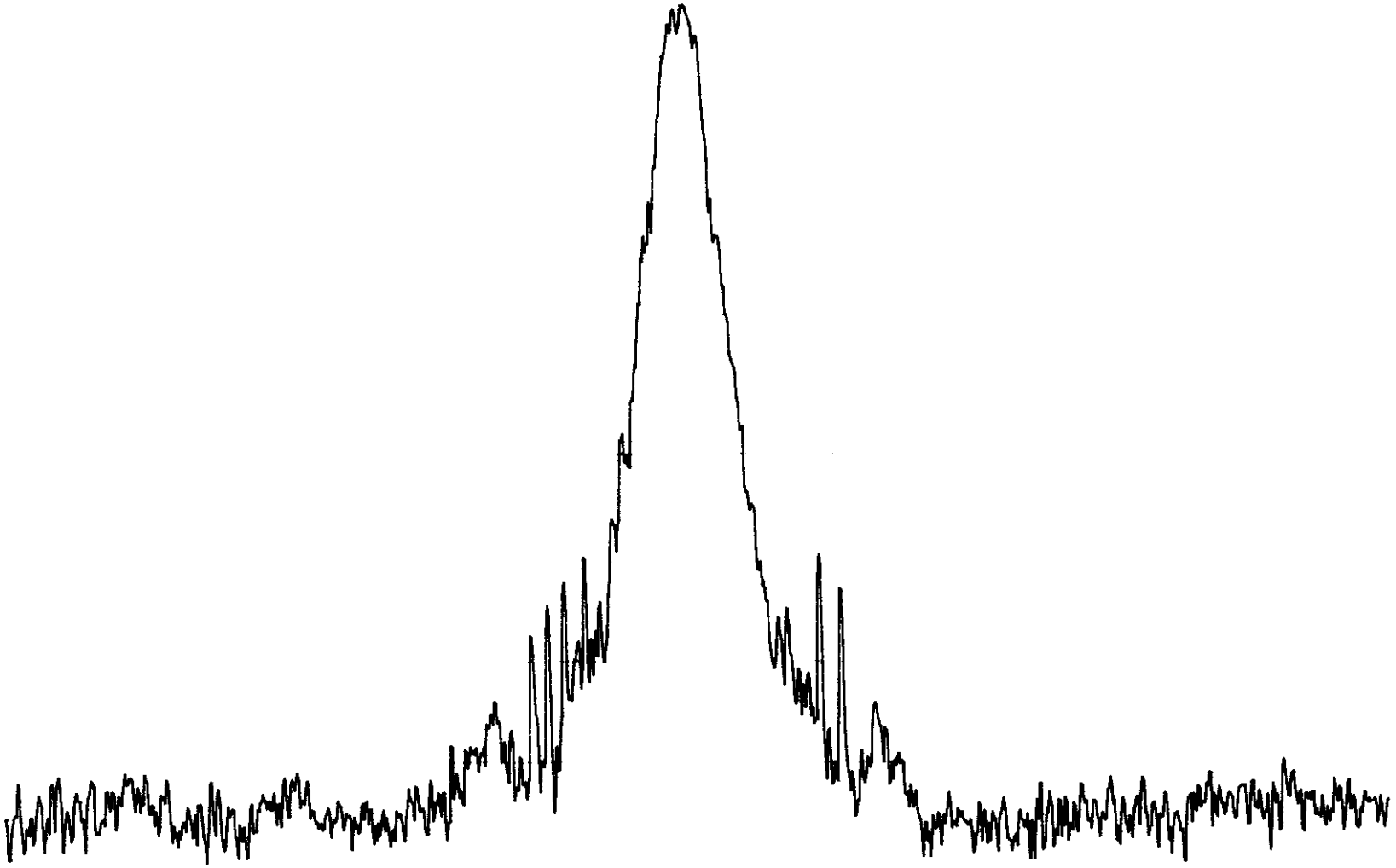
9

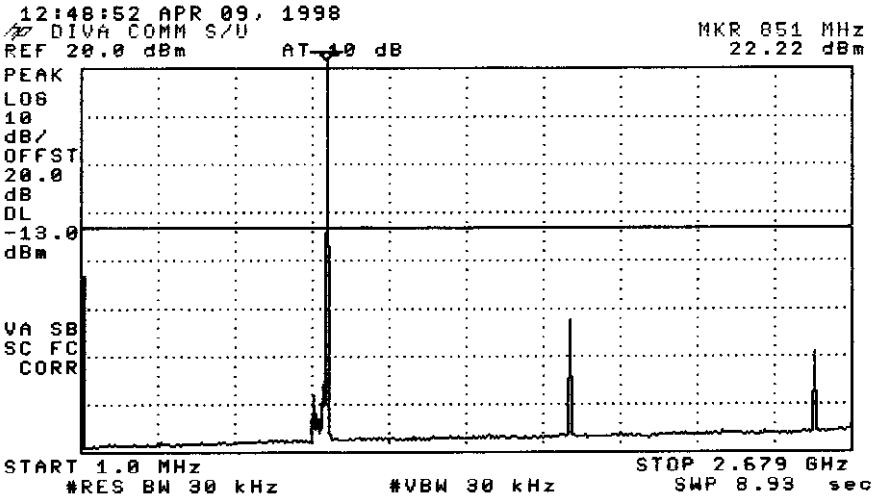

12:45:43 APR 09, 1998
DIVA COMM S/U
REF 20.0 dBm
AT 10 dB
PEAK
LOG
10
dB/
OFFST
20.0
dB
DL
-13.0
dBm
VA SB
SC FC
CORR
START 2.679 GHz
#RES BW 30 kHz
#VBW 30 kHz
STOP 8.940 GHz
SWP 20.9 sec

10

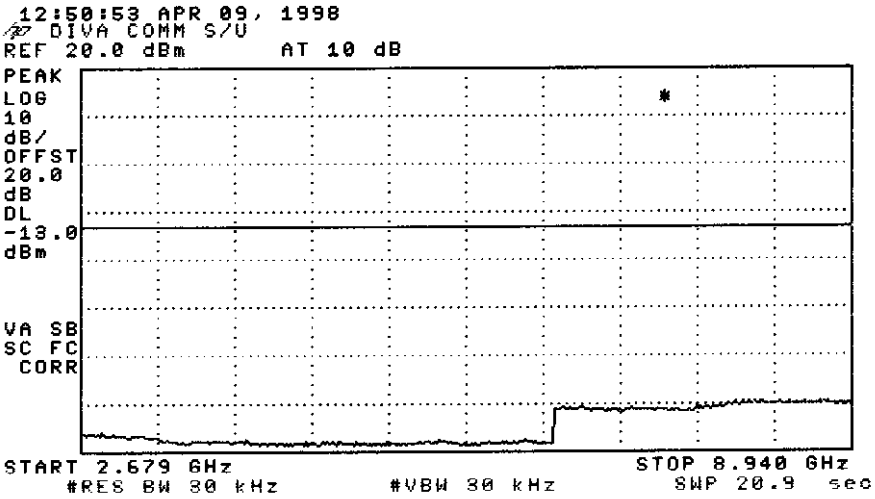

12:39:10 APR 09, 1998
DIVA COMM S/U
REF 30.0 dBm
AT 20 dB
-37.47 dB
PEAK
LOG
10
dB/
OFFST
20.0
dB
DL
-13.4
dBm
VA SB
SC FC
CORR
CENTER 836.4900 MHz
#RES BW 300 Hz
#VBW 300 Hz
SPAN 200.0 kHz
SWP 5.27 sec

11

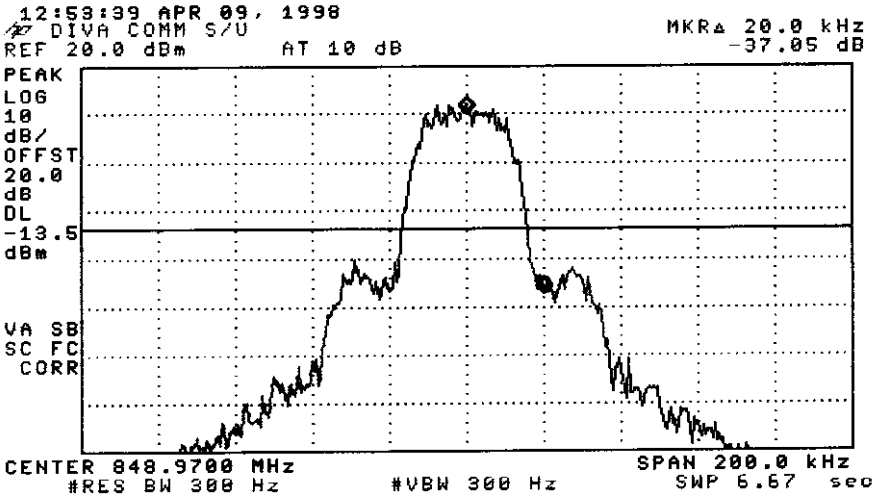



12:48:52 APR 09, 1998
DIVA COMM S/U
REF 20.0 dBm
AT 10 dB
MKR 851 MHz
22.22 dBm
PEAK
LOG
10
dB/
OFFST
20.0
dB
DL
-13.0
dBm
VA SB
SC FC
CORR
START 1.0 MHz
#RES BW 30 kHz
#VBW 30 kHz
STOP 2.679 GHz
SWP 8.93 sec

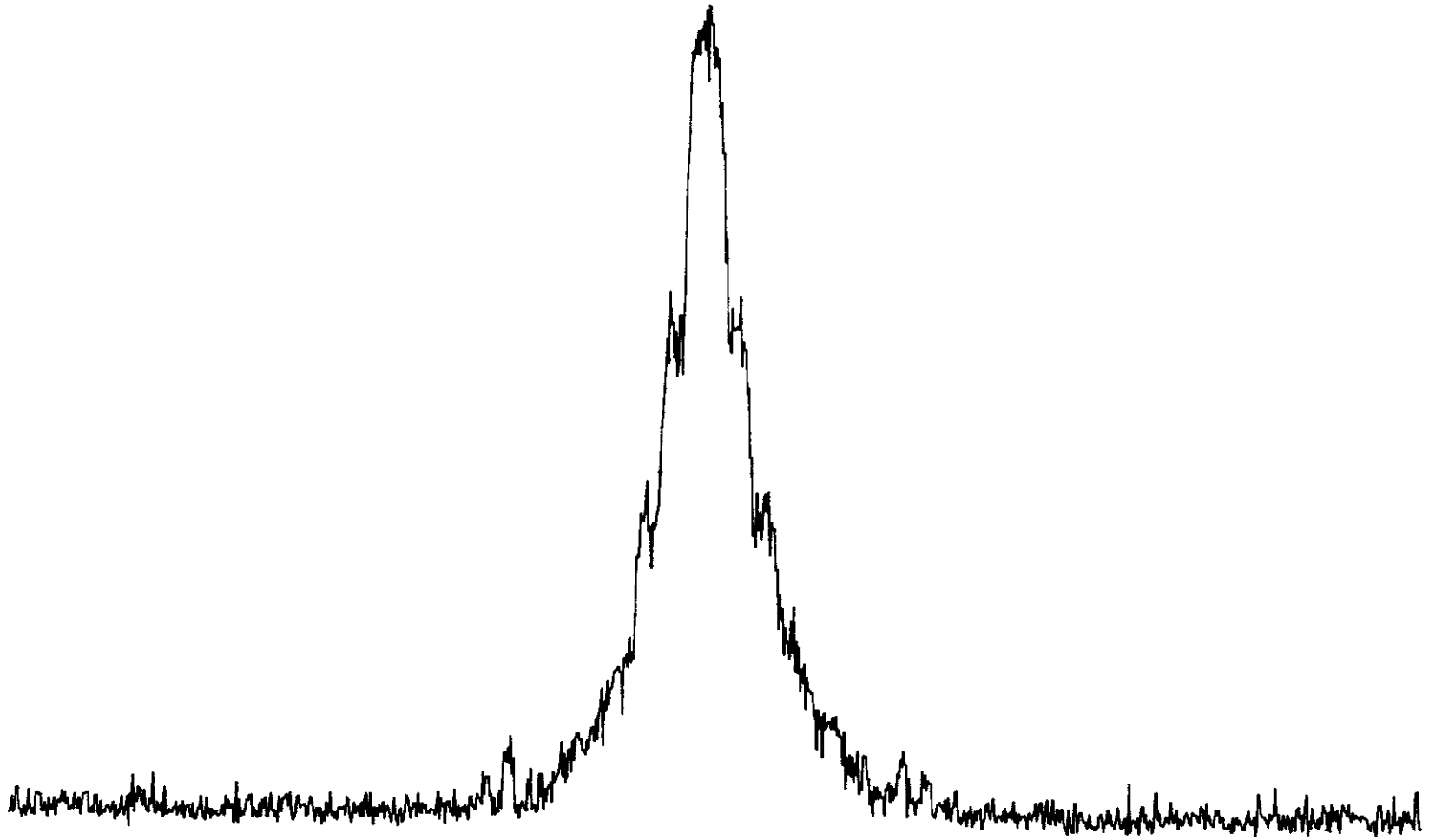
14

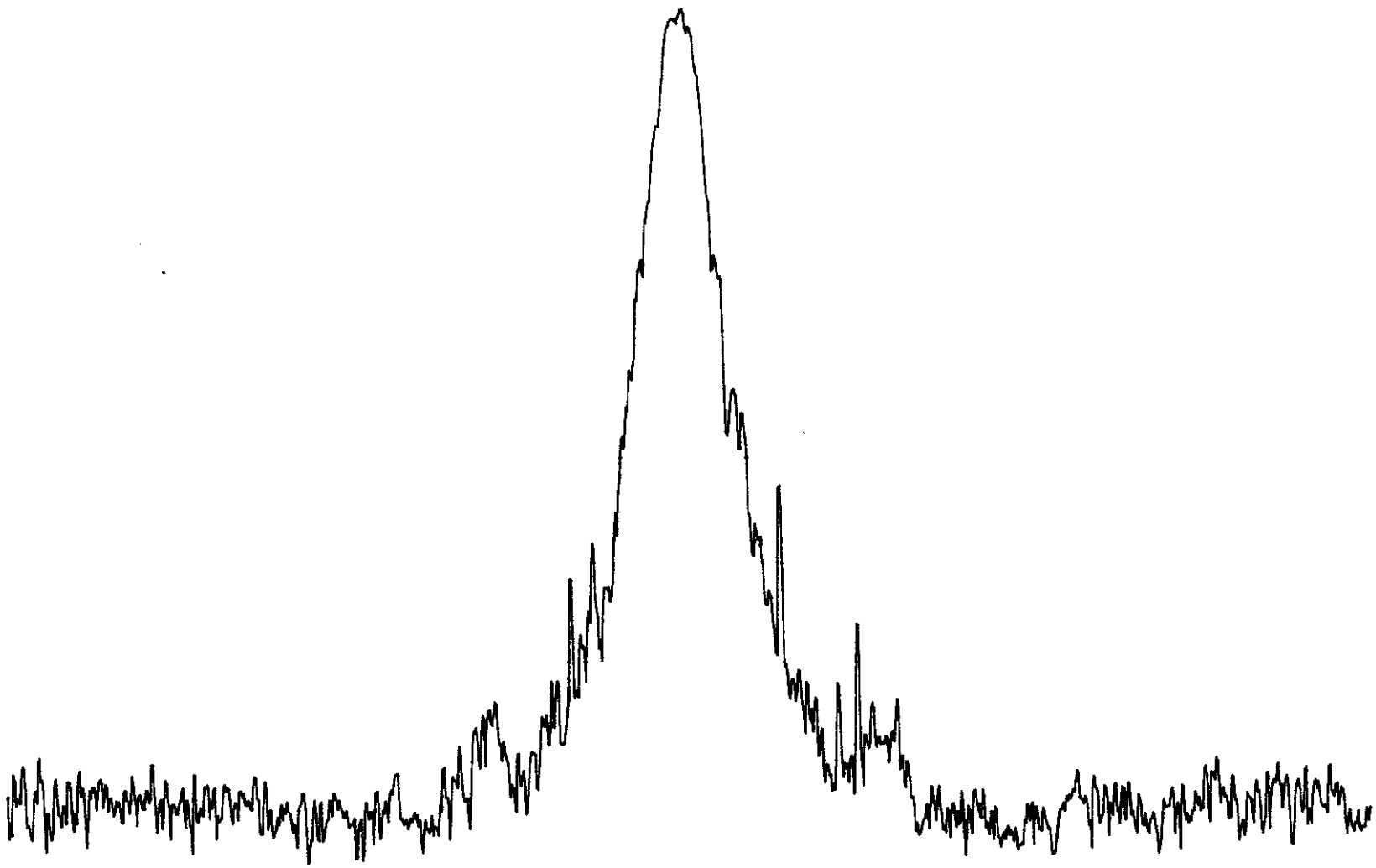

12:50:53 APR 09, 1998
DIVA COMM S/U
REF 20.0 dBm
AT 10 dB
PEAK
LOG
10
dB/
OFFST
20.0
dB
DL
-13.0
dBm
VA SB
SC FC
CORR
START 2.679 GHz
#RES BW 30 kHz
#VBW 30 kHz
STOP 8.940 GHz
SWP 20.9 sec

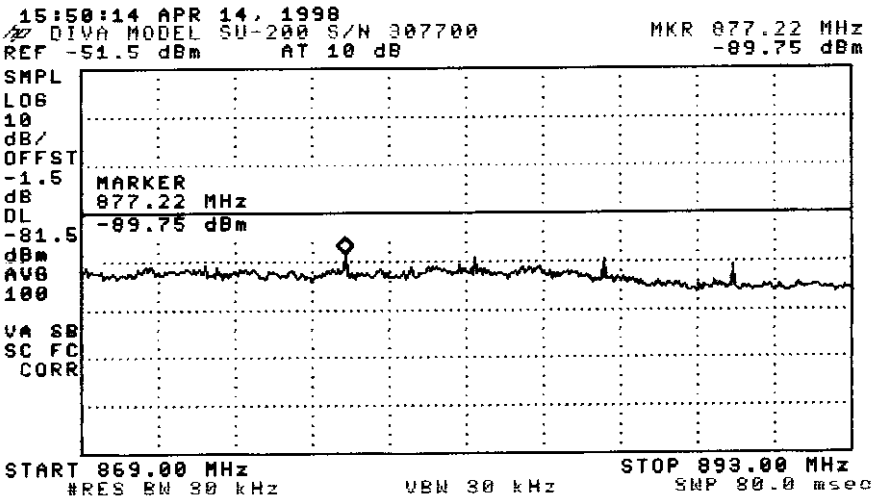
15


12:53:39 APR 09, 1998
DIVA COMM S/U
REF 20.0 dBm
AT 10 dB
MKRΔ 20.0 kHz
-37.05 dB
PEAK
LOG
10
dB/
OFFST
20.0
dB
DL
-13.5
dBm
VA SB
SC FC
CORR
CENTER 848.9700 MHz
#RES BW 300 Hz
#VBW 300 Hz
SPAN 200.0 kHz
SWP 6.67 sec

16



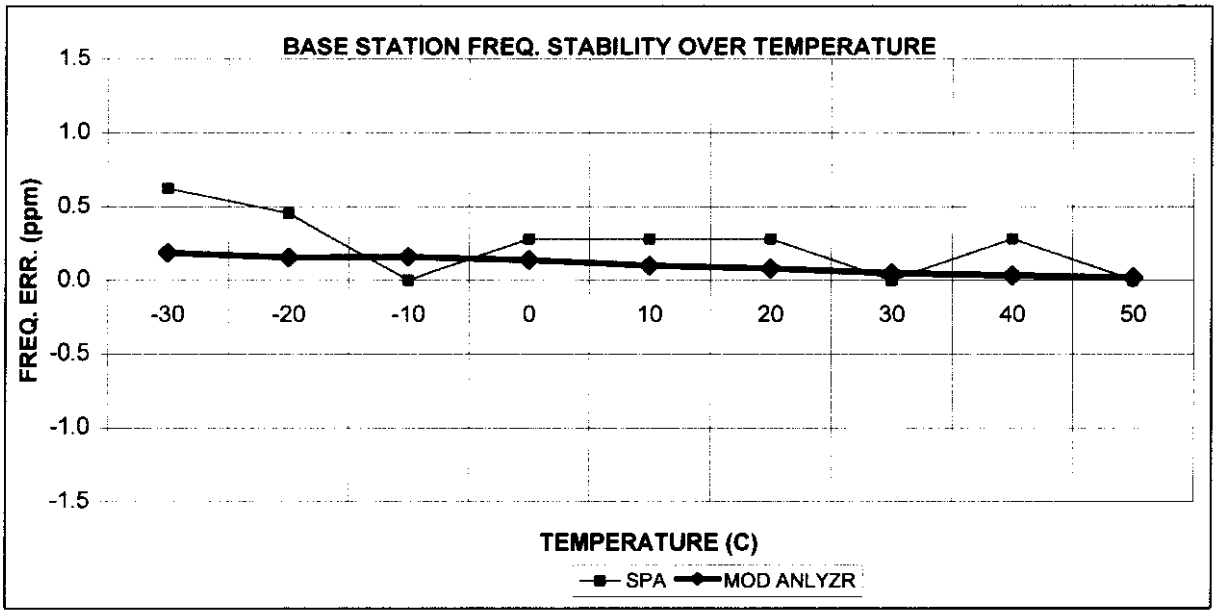


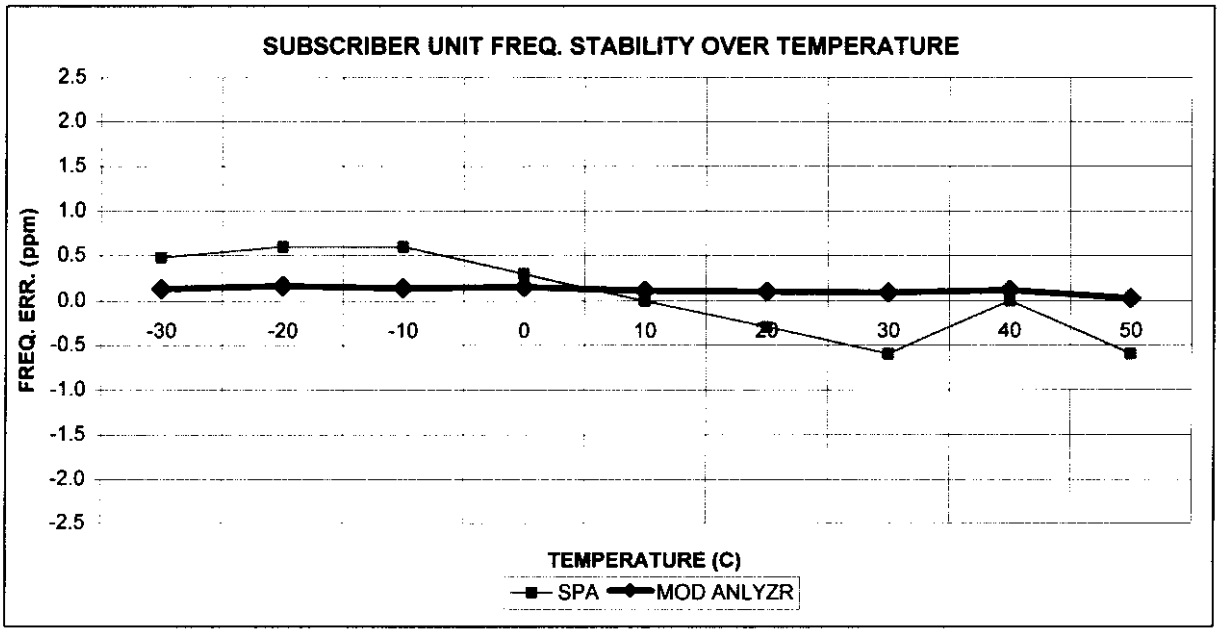

15:50:14 APR 14, 1998
DIVA MODEL SU-200 S/N 307700
REF -51.5 dBm
AT 10 dB
MKR 877.22 MHz
-89.75 dBm
SMPL
LOG
10
dB/
OFFST
-1.5
dB
DL
-81.5
dBm
AVG
100
MARKER
877.22 MHz
-89.75 dBm
VA SB
SC FC
CORR
START 869.00 MHz
#RES BW 30 kHz
VBW 30 kHz
STOP 893.00 MHz
SWP 80.0 msec

19

22.917 (f)

UNIT	Temperature (C)	IDEAL f(carrier) (Hz)	SPA f(high) (Hz)	SPA f(low) (Hz)	SPA f(center) (Hz)	SPA F(err) (Hz)	Modulation Analyzer F(err) (Hz)	SPA error (ppm)	Modulation Analyzer (ppm)
BASE STATION	-30	881,130,000	881,147,300	881,113,800	881,130,550	550	164	0.6	0.2
BASE STATION	-20	881,130,000	881,146,800	881,114,000	881,130,400	400	136	0.5	0.2
BASE STATION	-10	881,130,000	881,152,000	881,108,000	881,130,000	0	140	0.0	0.2
BASE STATION	0	881,130,000	881,154,000	881,106,500	881,130,250	250	120	0.3	0.1
BASE STATION	10	881,130,000	881,154,500	881,106,000	881,130,250	250	86	0.3	0.1
BASE STATION	20	881,130,000	881,154,000	881,106,500	881,130,250	250	69	0.3	0.1
BASE STATION	30	881,130,000	881,154,000	881,106,000	881,130,000	0	41	0.0	0.0
BASE STATION	40	881,130,000	881,154,000	881,106,500	881,130,250	250	27	0.3	0.0
BASE STATION	50	881,130,000	881,155,000	881,105,000	881,130,000	0	14	0.0	0.0
SUBSCRIBER UNIT	-30	836,130,000	836,145,800	836,115,000	836,130,400	400	113	0.5	0.1
SUBSCRIBER UNIT	-20	836,130,000	836,149,000	836,112,000	836,130,500	500	141	0.6	0.2
SUBSCRIBER UNIT	-10	836,130,000	836,157,000	836,104,000	836,130,500	500	120	0.6	0.1
SUBSCRIBER UNIT	0	836,130,000	836,158,000	836,102,500	836,130,250	250	132	0.3	0.2
SUBSCRIBER UNIT	10	836,130,000	836,164,000	836,096,000	836,130,000	0	94	0.0	0.1
SUBSCRIBER UNIT	20	836,130,000	836,163,500	836,096,000	836,129,750	-250	85	-0.3	0.1
SUBSCRIBER UNIT	30	836,130,000	836,163,000	836,096,000	836,129,500	-500	78	-0.6	0.1
SUBSCRIBER UNIT	40	836,130,000	836,163,500	836,096,500	836,130,000	0	99	0.0	0.1
SUBSCRIBER UNIT	50	836,130,000	836,161,500	836,097,500	836,129,500	-500	24	-0.6	0.0





DIVA COMMUNICATIONS
SUBSCRIBER UNIT SU-200

PETE KREBILL
4/13/98
SITE A

ALL READINGS ARE PEAK

F(MHz)	Level (dBuV)	AF (dB)	CL (dB)	AMP (dB)	FILTER (dB)	DIST (dB)	Total (dBuV/m)	Limit (dBuV/m)	Margin (dB)
LOW CHANNEL 824MHZ									
1648V	65.2	26.4	2.52	-35.5	10	-10	58.62	82	-23.38
2472V	71.6	29.4	3.06	-35.5	1	-10	59.56	82	-22.44
3296V	62.2	29.9	3.96	-35.5	1	-10	51.56	82	-30.44
4120H	64.5	32.3	5.04	-35.5	1	-10	57.34	82	-24.66
4944H	47.9	34.3	5.4	-35.5	1	-10	43.1	82	-38.9
5768NF	47.5	35.2	5.58	-35.5	1	-10	43.78	82	-38.22
6592NF	46.2	36	5.94	-35.5	1	-10	43.64	82	-38.36
7416NF	45.8	36.8	6.12	-35.5	1	-10	44.22	82	-37.78
8240NF	46	37.3	6.3	-35.5	1	-10	45.1	82	-36.9
MID CHANNEL 836MHZ									
1672V	68.2	26.4	2.52	-35.5	10	-10	61.62	82	-20.38
2508V	77.7	29.4	3.06	-35.5	1	-10	65.66	82	-16.34
3344V	61.2	29.9	3.96	-35.5	1	-10	50.56	82	-31.44
4180H	70.5	32.3	5.04	-35.5	1	-10	63.34	82	-18.66
5016H	50	34.3	5.4	-35.5	1	-10	45.2	82	-36.8
5852NF	47.5	35.2	5.58	-35.5	1	-10	43.78	82	-38.22
6688NF	46.2	36	5.94	-35.5	1	-10	43.64	82	-38.36
7524NF	45.8	36.8	6.12	-35.5	1	-10	44.22	82	-37.78
8360NF	46	37.3	6.3	-35.5	1	-10	45.1	82	-36.9
HIGH CHANNEL 848MHZ									
1696V	71.5	26.4	2.52	-35.5	10	-10	64.92	82	-17.08
2544V	74.6	29.4	3.06	-35.5	1	-10	62.56	82	-19.44
3392V	62.3	29.9	3.96	-35.5	1	-10	51.66	82	-30.34
4240H	69.1	32.3	5.04	-35.5	1	-10	61.94	82	-20.06
5088H	52.7	34.3	5.4	-35.5	1	-10	47.9	82	-34.1

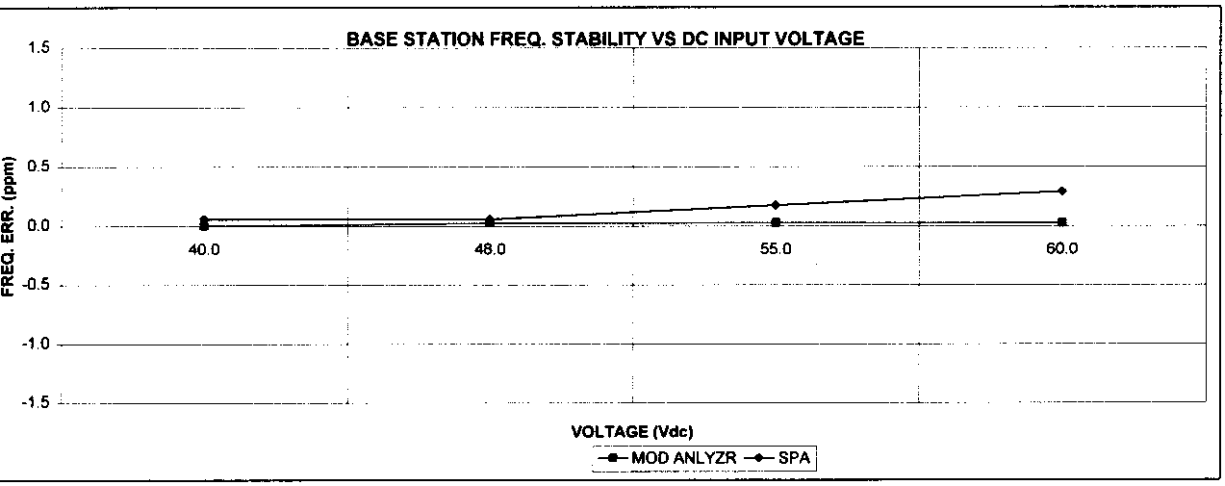
5936NF	47.5	35.2	5.58	-35.5	1	-10	43.78	82	-38.22
6784NF	46.2	36	5.94	-35.5	1	-10	43.64	82	-38.36
7632NF	45.8	36.8	6.12	-35.5	1	-10	44.22	82	-37.78
8480NF	46	37.3	6.3	-35.5	1	-10	45.1	82	-36.9

AF=ANTENNA FACTOR
CL=CABLE LOSS
AMP=AMPLIFIER GAIN
FILTER=FILTER INSERTION LOSS
DIST=DISTANCE CORRECTION

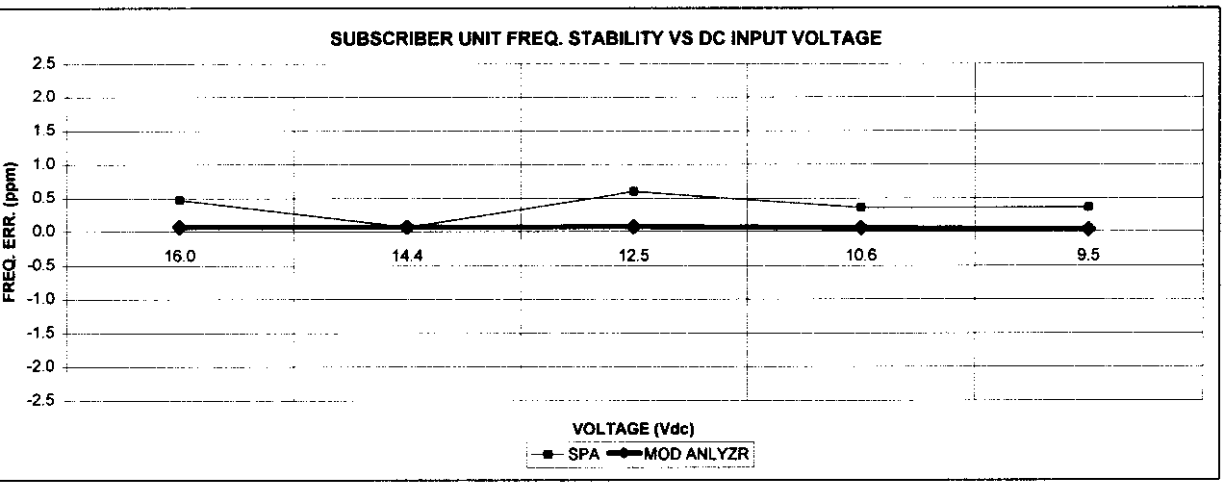
V=VERTICAL
H=HORIZONTAL
NF=NOISE FLOOR READING

ALL FREQUENCIES WERE MEASURED IN VERTICAL AND HORIZONTAL , ONLY HIGHEST READING WAS REPORTED.

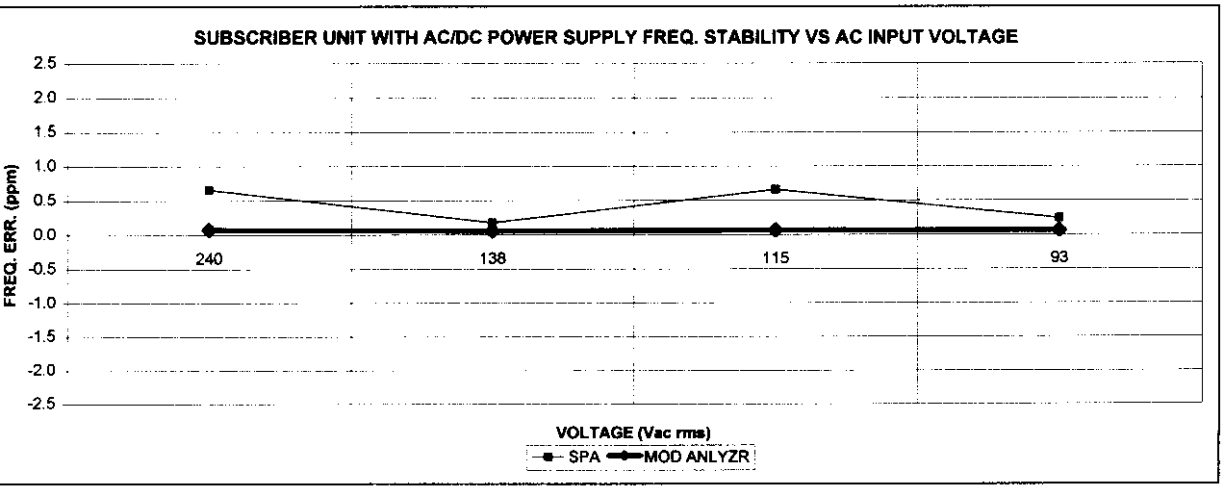
UNIT	Voltage (V)	Type (units)	IDEAL f(carrier) (Hz)	SPA f(high) (Hz)	SPA f(low) (Hz)	SPA f(center) (Hz)	SPA F(err) (Hz)	Modulation Analyzer F(err) (Hz)	SPA error (ppm)	Modulation Analyzer (ppm)
BASE STATION	40.0	Vdc	881,130,000	881,145,800	881,114,300	881,130,050	50	2	0.1	0.0
BASE STATION	48.0	Vdc	881,130,000	881,145,800	881,114,300	881,130,050	50	21	0.1	0.0
BASE STATION	55.0	Vdc	881,130,000	881,145,800	881,114,500	881,130,150	150	23	0.2	0.0
BASE STATION	60.0	Vdc	881,130,000	881,146,000	881,114,500	881,130,250	250	22	0.3	0.0
SUBSCRIBER UNIT, DC input	16.0	Vdc	836,130,000	836,114,500	836,146,300	836,130,400	400	54	0.5	0.1
SUBSCRIBER UNIT, DC input	14.4	Vdc	836,130,000	836,145,800	836,114,300	836,130,050	50	53	0.1	0.1
SUBSCRIBER UNIT, DC input	12.5	Vdc	836,130,000	836,146,000	836,115,000	836,130,500	500	59	0.6	0.1
SUBSCRIBER UNIT, DC input	10.6	Vdc	836,130,000	836,145,800	836,114,800	836,130,300	300	43	0.4	0.1
SUBSCRIBER UNIT, DC input	9.5	Vdc	836,130,000	836,146,300	836,114,300	836,130,300	300	21	0.4	0.0
SUBSCRIBER UNIT with AC/DC Supply	240	Vac (rms)	836,130,000	836,146,300	836,114,800	836,130,550	550	62	0.7	0.1
SUBSCRIBER UNIT with AC/DC Supply	138	Vac (rms)	836,130,000	836,146,000	836,114,300	836,130,150	150	48	0.2	0.1
SUBSCRIBER UNIT with AC/DC Supply	115	Vac (rms)	836,130,000	836,146,300	836,114,800	836,130,550	550	56	0.7	0.1
SUBSCRIBER UNIT with AC/DC Supply	93	Vac (rms)	836,130,000	836,146,000	836,114,400	836,130,200	200	51	0.2	0.1



23



24



25

PK

Compliance Engineering Services Inc.

Project No. : 98E7210
Report No. : 980410A3
Date : 04/10/1998
Time : 10:32
Test Engr : PETE K

>> 3 M RADIATED EMISSION DATA <<

Company : DIVA COMM
Equipment Under Test : SUBSCIBER UNIT
Test Configuration : EUT/BASE STATION
Type of Test : FCC CLASS B
Mode of Operation : RX

Freq.	dBuV	PreAmp	Ant	Cable	dBuV/m	Limit	Margin	Pol	Hgt(m)	Az
ilog 2049 ; Pre-pamp = 8447D-P2 2944A07781:										
169.53	40.00	-31.24	10.68	1.81	21.26	43.50	-22.24	H	1.0	0
127.27	41.80	-31.51	12.66	1.59	24.53	43.50	-18.97	H	1.0	0
247.90	46.90	-30.80	13.64	2.27	32.01	46.00	-13.99	H	1.0	0
221.45	46.70	-30.96	12.49	2.14	30.37	46.00	-15.63	H	1.0	0
218.00	44.60	-30.98	12.33	2.12	28.08	46.00	-17.92	H	1.0	0
261.00	45.00	-30.75	13.91	2.33	30.49	46.00	-15.51	H	3.0	1

otal # of data 6
. a2.2

COMPLIANCE ENGINEERING SERVICES INC. 27. Apr 98 09:20

RFI VOLTAGE

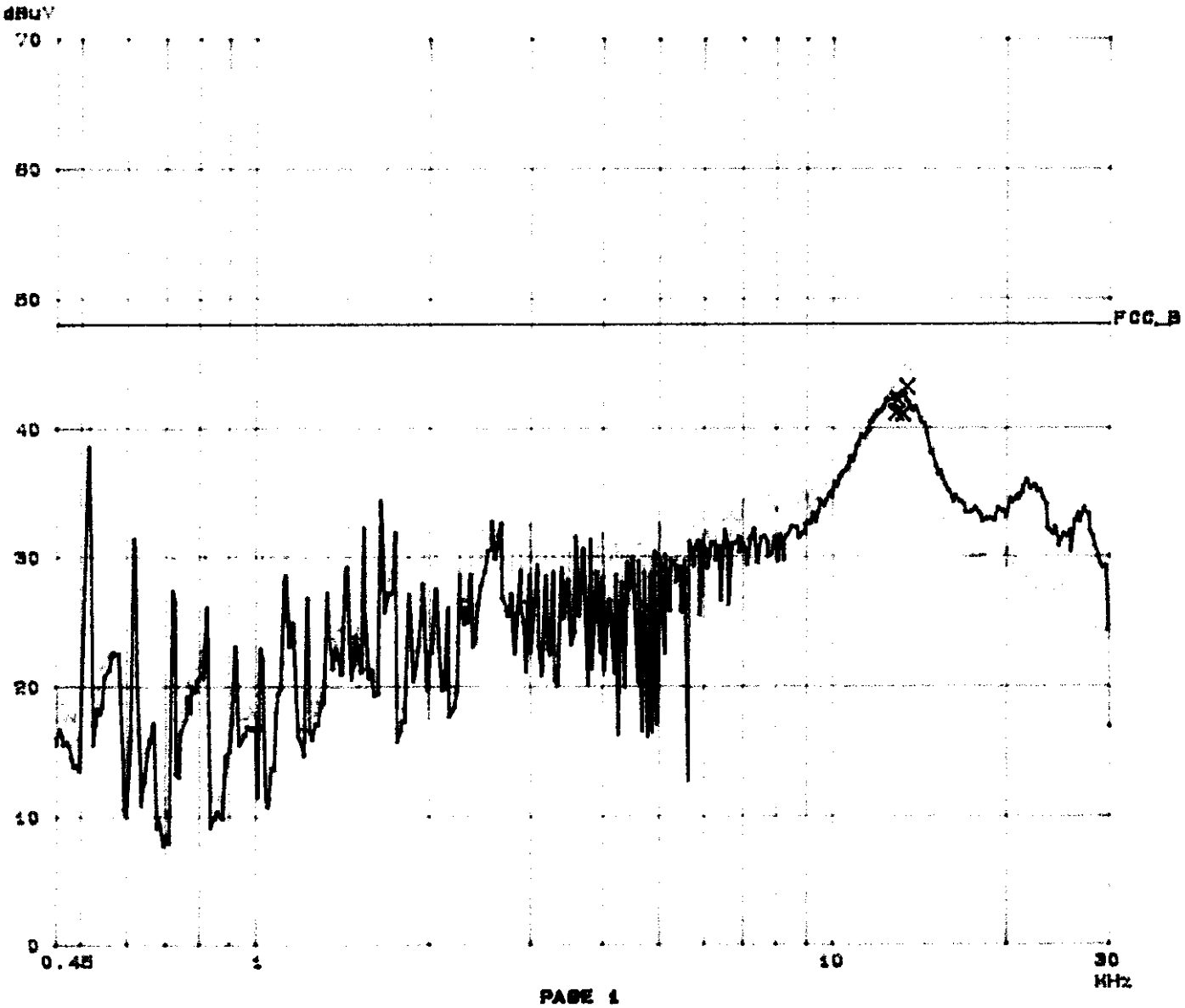
EUT: SU-2000
Manuf: DIVA COMMUNICATIONS
Op Cond: TX
Operator: PETE KREBILL
Test Spec: FCC CLASS B
Comment: LINE HOT=RED NEUTRAL=BLUE
120VAC, 60HZ

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
450k	500k	500Hz	10k	PK	100ms	AUTO	LN OFF	60dB
500k	30M	5k	10k	PK	20ms	AUTO	LN OFF	60dB

Final Measurement: x QP
Meas Time: 1 s
Subranges: 25
Acc Margin: 6dB

Transducer No.	Start	Stop	Name
1	9k	30M	FISCHER



16. EXTERNAL I/O CABLE CONSTRUCTION DESCRIPTION

CABLE NO: 1	
I/O Port: SERIAL	Number of I/O ports of this type:1
Number of Conductors:9	Connector Type:DB9
Capture Type: SCREW-IN	Type of Cable used:UN-SHIELDED
Cable Connector Type: PLASTIC	Cable Length: 2M
Bundled During Tests: NO	Data Traffic Generated: YES
Remark: N/A	

CABLE NO: 2	
Number of Conductors	Connector Type:
I/O Port: TEST PORT	Number of I/O ports of this type:
Capture Type:	Type of Cable used: UN-SHIELDED
Cable Connector Type:	Cable Length: 6M
Bundled During Tests:	Data Traffic Generated: YES
Remark:	

CABLE NO: 3	
I/O Port: PHONE	Number of I/O ports of this type:1
Number of Conductors: 2	Connector Type: RJ11
Capture Type: SNAP-IN	Type of Cable used: UNSHIELDED
Cable Connector Type: MOLDED	Cable Length:2M
Bundled During Tests: NO	Data Traffic Generated: YES
Remark: N/A	

CABLE NO: 4	
I/O Port: DC POWER	Number of I/O ports of this type:1
Number of Conductors: 2	Connector Type: N/A
Capture Type: BOLT-IN	Type of Cable used: UNSHIELDED
Cable Connector Type: METAL	Cable Length:3M
Bundled During Tests: NO	Data Traffic Generated: NO
Remark: N/A	

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CABLE NO: 5 & 6	
I/O Port: ANTENNA PORT	Number of I/O ports of this type:1
Number of Conductors: 2	Connector Type: TNC
Capture Type: SCREW-IN	Type of Cable used: SHIELDED
Cable Connector Type: METAL	Cable Length:3M
Bundled During Tests: NO	Data Traffic Generated: YES
Remark: N/A	

CABLE NO: 7 & 8	
I/O Port: AC POWER	Number of I/O ports of this type:1
Number of Conductors: 3	Connector Type: USA 110V TYPE
Capture Type: PUSH-IN	Type of Cable used: UNSHIELDED
Cable Connector Type: MOLDED	Cable Length:1.2M
Bundled During Tests: NO	Data Traffic Generated: NO
Remark: N/A	

COMPLIANCE CONSULTING SERVICES DOCUMENT NO:CCSUP4031A
1366 BORDEAUX DRIVE SUNNYVALE, CA 94089 USA TEL:(408) 752-8166 FAX:(408) 752-8168

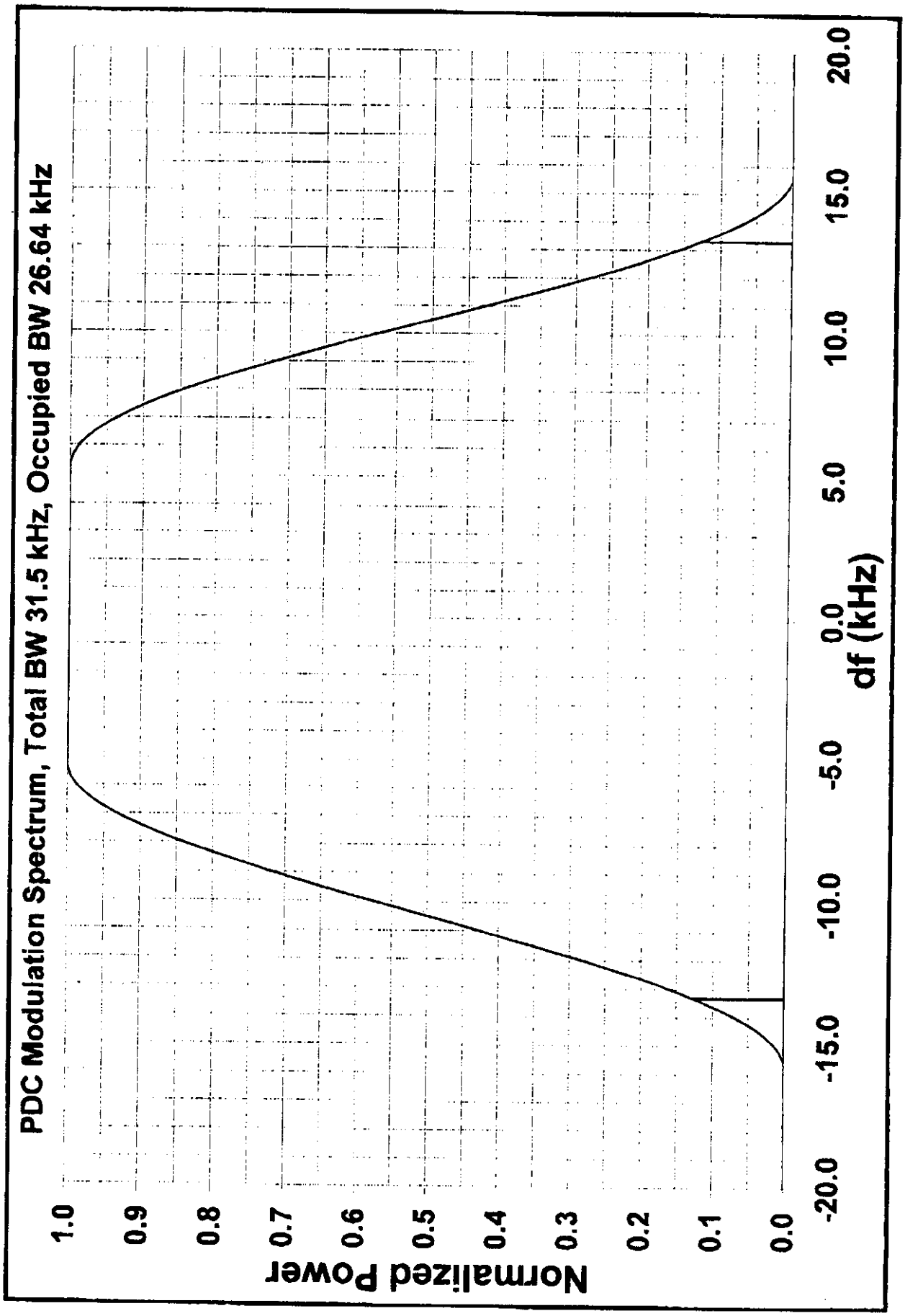
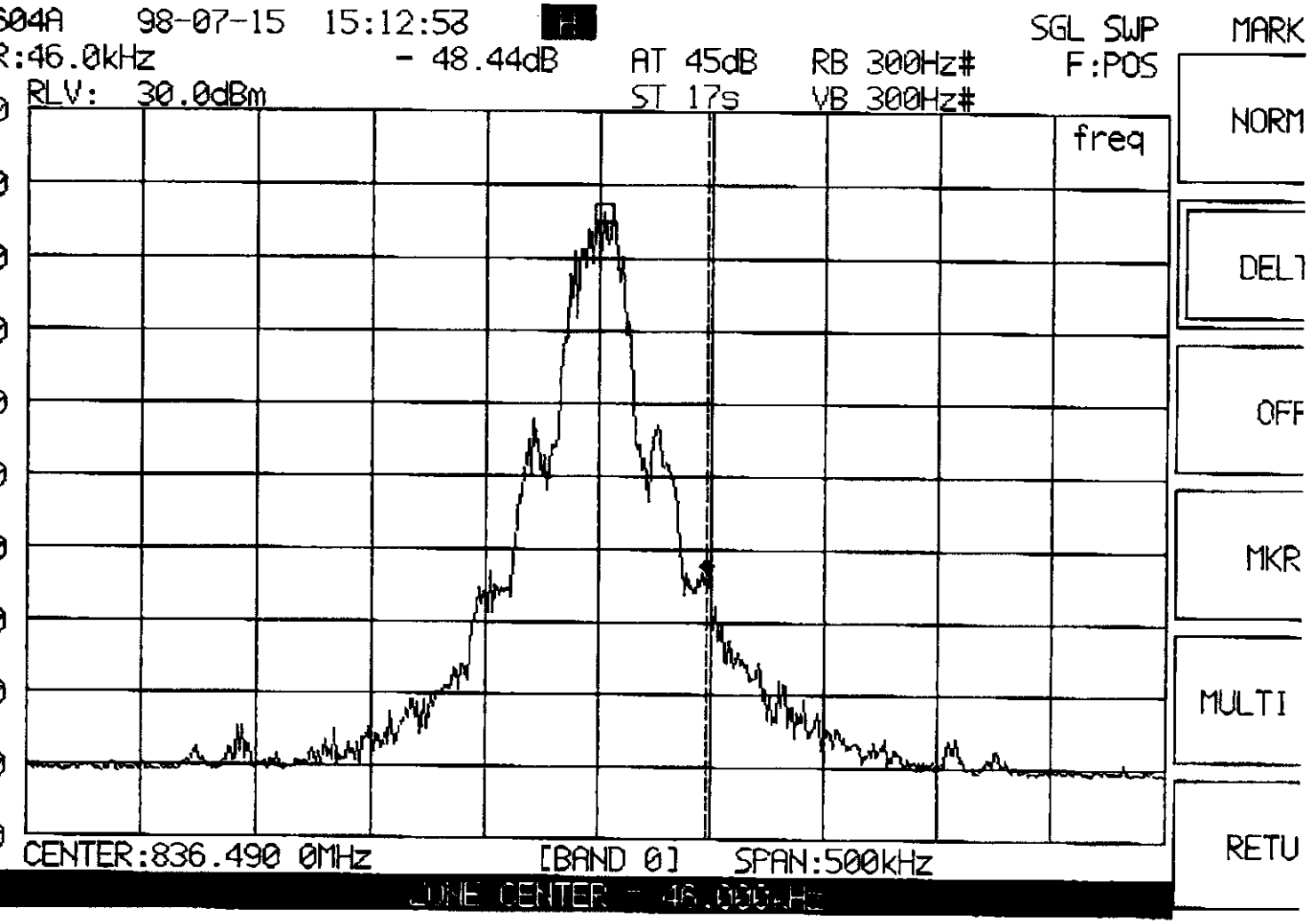


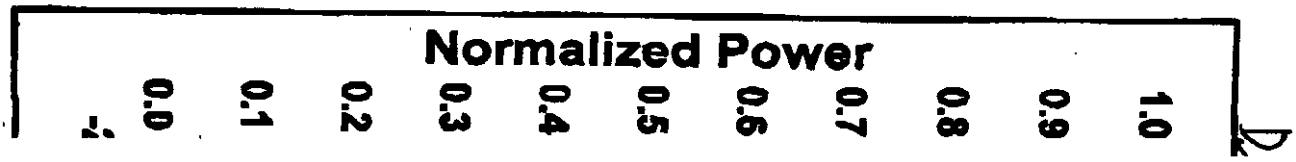
FIGURE 1

FOR ITEM # 1 (1824) & (1829)



PLOT # 12 (Retuken)

FOR EA89425 NT7SU-200 (1824)



COMPLIANCE CERTIFICATION SERVICES
Fax Cover Sheet
From: MIKE KUO
Sunnyvale, [illegible]
Phone: (408) 752-8166
Fax: (408) 752-8168

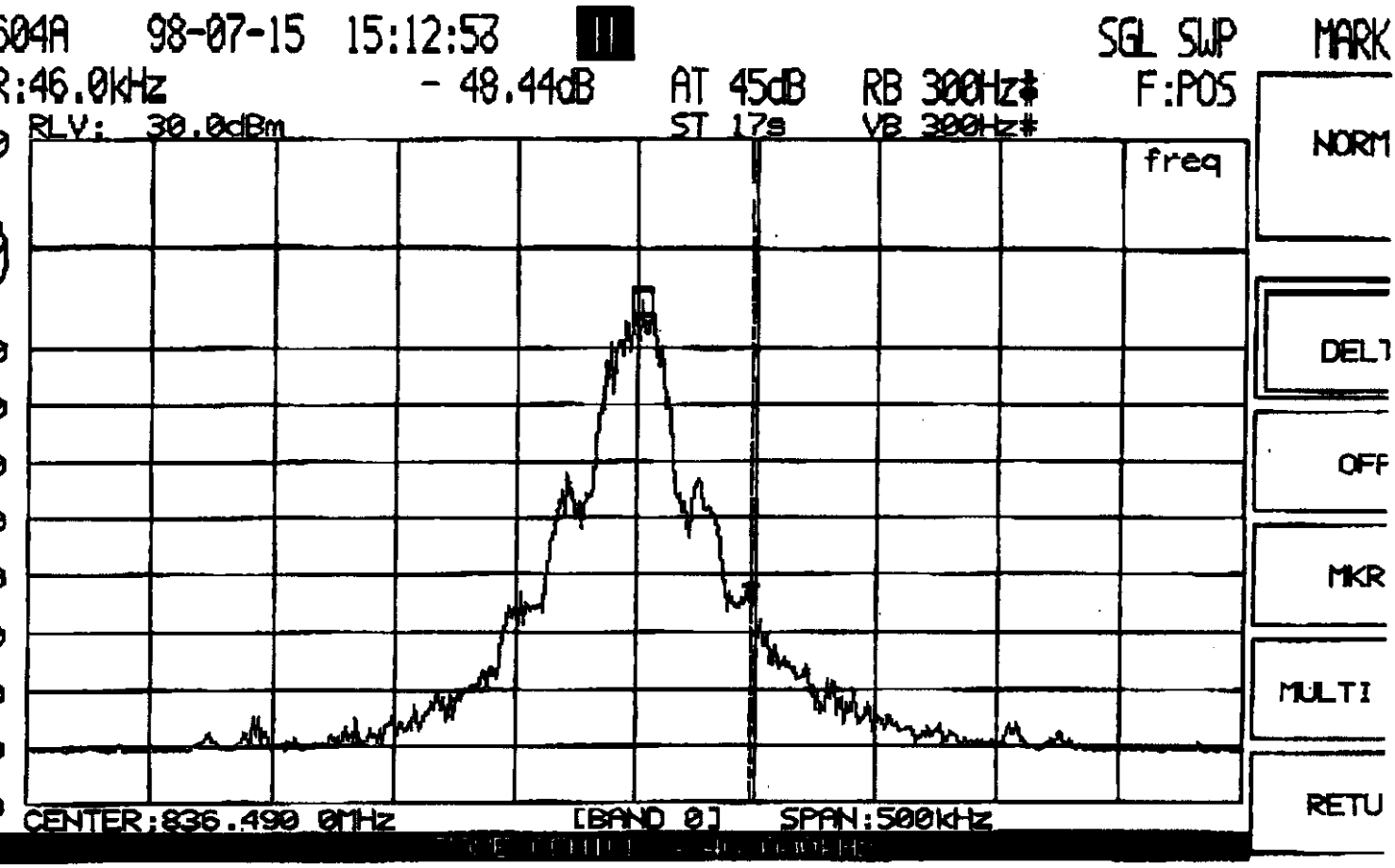
Date:	7/17/98
Pages:	1+1+1
To:	Frank Coperich
Company:	Federal Communications Commission
Fax Phone:	301-344-2050
Subject:	Diva Communications, FCC ID:NT7SU-200 (Corr. ID:1824) 99425

HI Frank :

Enclosed please find Figure 1 and Plot no.12 . If you have any question, please feel free to call me.

Best Regards

ina Communication / FCC ID: NT7SU-200 (CID#1824)



PLOT * 12 (Retuken)

Dula Communications FCC ID: NT7SU-200 (CORD ID: 1824)

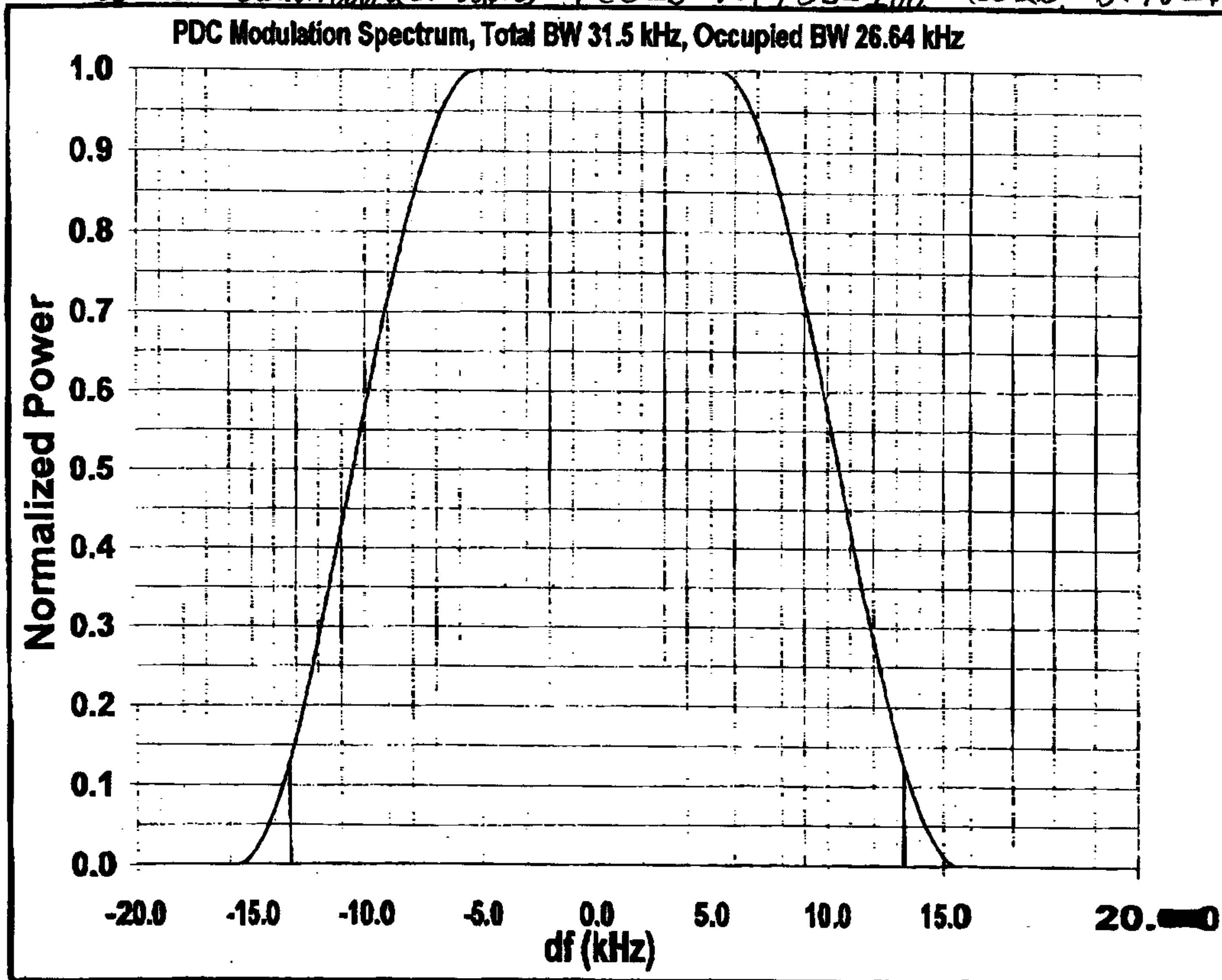


FIGURE 1