

**MEASUREMENT AND TECHNICAL REPORT**

**SCS CORPORATION**  
10905 Technology Place  
San Diego, CA 92127

**DATE: 03 November 2000**

**This Report Concerns:** Original Grant:  X Class II Change:

**Equipment Type:** 9 Antenna InstaScan Scanner, Model U519

**Deferred grant requested per 47 CFR 0.457(d)(1)(ii)?** Yes:  No:   
**Defer until:**

*Company Name agrees to notify the Commission by:* N/A  
of the intended date of announcement of the product so that the grant can be issued on that date.

**Transition Rules Request per 15.37?** Yes:  \*No:

*(\*) FCC Part 15, Paragraphs 15.209(b); 15.247(a)(i); (a)(1); (b)(2)*

*Report Prepared by:*

**TÜV PRODUCT SERVICE**  
10040 Mesa Rim Road  
San Diego, CA 92121-2912  
Phone: 619 546 3999  
Fax: 619 546 0364

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## 1 GENERAL INFORMATION

### 1.1 Product Description

---

EUT Description 9 Antenna RF Identification Transceiver  
EUT Name 9 Antenna InstaScan Scanner  
Model No.: U519 Serial No.: 519001  
Product Options: \_\_\_\_\_  
Configurations to be tested: 9 Antennas, multiplexing

### Power Requirements

Voltage: 120 VAC (If battery powered, make sure battery life is sufficient to complete testing.)  
# of Phases: 1  
Current (Amps/phase(max)): 1 Current (Amps/phase(nominal)): 0.2  
Other \_\_\_\_\_

### Typical Installation and/or Operating Environment

(ie. Hospital, Small Business, Industrial/Factory, etc.)  
Industrial

**EUT Power Cable**

<input type="checkbox"/> Permanent	OR	<input checked="" type="checkbox"/> Removable	Length (in meters):	2
<input type="checkbox"/> Shielded	OR	<input checked="" type="checkbox"/> Unshielded		
<input type="checkbox"/> Not Applicable				

**EUT Interface Ports and Cables**

Type	Interface		Shielding		Termination	Connector Type	Port Termination	Length (in meters)	Removable	Permanent
	Analog	Digital	Qty	Yes	No					
RS-232	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1	<input type="checkbox"/>	<input checked="" type="checkbox"/>		Metalized 9-pin D-sub	Characteristic Impedance	4	<input checked="" type="checkbox"/> <input type="checkbox"/>
RF	<input checked="" type="checkbox"/>	<input type="checkbox"/>	9	<input checked="" type="checkbox"/>	<input type="checkbox"/>	braid	coaxial	SMA	50 ohm	<input checked="" type="checkbox"/> <input type="checkbox"/>
Power cord	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1	<input type="checkbox"/>	<input type="checkbox"/>		Universal Power Cord	Characteristic Impedance	2	<input checked="" type="checkbox"/> <input type="checkbox"/>

**EUT Software.**

Revision Level: 53\_04

Description: Standard Firmware to control the scanner functions.

**EUT Operating Modes to be Tested**

1. Normal operation, multiplexing antennas (in previous tests, this has proven to be worst case)

**EUT System Components --**

Description	Model #	Serial #	FCC ID #
InstaScan Scanner	U519	5190001	MKR U519
RF Cables (9)	N/A	N/A	
Seavey Antenna	0015-804	130978-130987	

**Support Equipment --**

<i>Description</i>	<i>Model #</i>	<i>Serial #</i>	<i>FCC ID #</i>
Toshiba Laptop Computer	PA1230U VCD	03733928-1	CJ6UK436

**Oscillator Frequencies**

<i>Frequency</i>	<i>Derived Frequency</i>	<i>Component #/ Location</i>	<i>Description of Use</i>
20 MHz		Y1/Transmitter section of PCB	Main clock for entire scanner PCB

**Power Supply**

<i>Manufacturer</i>	<i>Model #</i>	<i>Serial #</i>	<i>Type</i>
Power Components Intl.	DUT-45W-V-9	N/A	<input checked="" type="checkbox"/> Switched-mode: (Frequency) 200 KHz

**Power Line Filters**

<i>Manufacturer</i>	<i>Model #</i>	<i>Location in EUT</i>
None		

**Critical EMI Components (Capacitors, ferrites, etc.)**

<i>Description</i>	<i>Manufacturer</i>	<i>Part # or Value</i>	<i>Qty</i>	<i>Component #/ Location</i>
25 Pin Filtered Connector	Metuchen	56-524-014-GBL	2	P1 and P2 - Internal Scanner PCB

**EMC Critical Detail --**

PCB Housing acts as EMI enclosure

## 1 GENERAL INFORMATION (continued)

### 1.2 Related Submittal/Grant

None

### 1.3 Tested System Details

The FCC IDs for all equipment, plus descriptions of all cables used in the tested system are:

None

### 1.4 Test Methodology

Purpose of Test: To demonstrate compliance with the ANSI C63.4 setup.

Test Performed:  1. Conducted Emissions, FCC Part 15, Paragraphs 15.247((a)(i); (a)(1); (b)(2)  
 2. Radiated Emissions EN55022: 1992 Class B limit, 30 - 1,000 MHz, 10 meters  
 3. Radiated Emission per FCC Part 15, Paragraphs 15.247(a); (c); (d)  
4. Engineering evaluations  
5. Frequency Stability, Part 2, Paragraph 2.995, and Part 87, Paragraph 87.133  
RF Output Power, Part 2, Paragraph 2.985, Part 22, Paragraph 22.917

Both Conducted and radiated testing were performed according to the procedures in FCC/ANSI C63.4 and CSA 108.8 - M1983. Radiated testing was performed at an antenna-to-EUT distance of 3 meters (1 - 10 GHz).

### 1.5 Test Facility

The open area test site and conducted measurement data were tested by:

TÜV PRODUCT SERVICE  
10040 Mesa Rim Road  
San Diego, CA 92121-2912  
Phone: 619 546 3999  
Fax: 619 546 0364

The Test Site Data and performance comply with ANSI 63.4 and are registered with the FCC, 7435 Oakland Mills Rd, Columbia Maryland 21046. All Measurement Data is acquired according to the content of FCC Measurement Procedure and ANSI C63.4, unless supplemented with additional requirements as noted in the test report.

## 1.6 System Information

	Equipment Specifications	Frequency Range: 903-927.5 MHz Rated RF Output Power: 0.70 Watts Frequency Tolerance: +/-100 ppm Emissions Designator: 314KK1D Micro. Model No.: 80C52
	Direct Sequence Gain	N/A
	Description of Receiver Compliance for 15.247(a)(1)	The receiver employs a homodyne architecture. The LO signal in the receiver is split from the transmitted RF early in the transmitter chain, and is therefore, at the same frequency. The received signal is mixed with the LO signal to create a baseband IF. The IF signal is filtered to 1 MHz, which matches the hopping channel bandwidth.
	Scanning Receiver Information	N/A
	Cert. for 60 GHz Transmitters	N/A
	Tune-up Procedure	During final assembly, the output power is adjusted such that the EIRP will not exceed 36 dBm over specified operating conditions. The adjustment is made by setting a digital potentiometer, within the unit, while monitoring the output power. The final potentiometer value is fixed in non-volatile memory.

## **2. SYSTEM TEST CONFIGURATION**

### **2.1 Justification**

The 9 Antenna InstaScan Scanner was initially tested for FCC emission in the following configuration:

See Block Diagram.

### **2.2 EUT Exercise Software**

None

### **2.3 Special Accessories**

None

### **2.4 Modification**

None

### **2.5 Configuration of Tested System**

See Block Diagram.

### **3 RADIATED EMISSION EQUIPMENT/DATA**

The following data lists the significant emission frequencies, measured levels, correction factor (which includes cable and antenna corrections), the corrected reading, and the limit.

See following page(s).

See test setup photos for radiated emissions test setup.

# Radiated Electromagnetic Emissions

Test Report #:	S0414 Run 1		Test Area:	Site 3 Roof		Temperature:	25	°C
Test Method:	FCC Part 15, 15.209(a)		Test Date:	16-Oct-2088		Relative Humidity:	45	%
EUT Model #:	U519	15.205 (d) 15.247 (e)	EUT Power:	115 Vac to 9 VDC Power Converter		Air Pressure:	100.1	kPa
EUT Serial #:	U5190013					Page:	2 of 2	
Manufacturer:	SCS Corp.					Level Key		
EUT Description:	9 Antenna RF Identification Transceiver					Pk – Peak	Nb – Narrow Band	
Notes:						Qp – QuasiPeak	Bb – Broad Band	
						Av - Average		

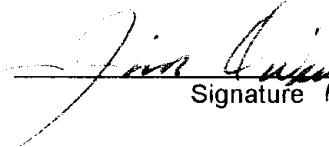
FREQ (MHz)	LEVEL (dBuV)	CABLE / ANT / PREAMP (dB) (dB/m) (dB)	FINAL (dBuV/m)	POL / HGT / AZ (m) (DEG)	DELTA1 (dB) FCC A (> 1GHz)	DELTA2 (dB)
9275.00	42.3 Pk	10.3 / 39.3 / 37.3	54.5	H / 1.0 / 0.0	-52.6	N/A
Mid Channel Harmonics Measurements Below						
1830.00	69.5 Pk	4.1 / 28.1 / 39.9	61.8	H / 1.0 / 0.0	-44.0	N/A
Change Polarity						
1830.00	72.2 Pk	4.1 / 28.1 / 39.9	64.5	V / 1.0 / 0.0	-39.8	N/A
Low Channel Harmonic Measurements Below						
1806.00	58.6 Pk	4.1 / 28.0 / 39.9	50.8	V / 1.0 / 0.0	-55.3	N/A
2709.00	47.6 Pk	5.3 / 31.1 / 39.5	44.5	V / 1.0 / 0.0	-15.5	N/A
3612.00	40.4 Pk	6.7 / 33.2 / 39.7	40.6	V / 1.0 / 0.0	-19.4	N/A
4515.00	41.5 Pk	7.3 / 33.5 / 40.6	41.7	V / 1.0 / 0.0	-18.3	N/A
5418.00	40.4 Pk	7.5 / 36.0 / 38.6	45.3	V / 1.0 / 0.0	-14.7	N/A
Polarity Change						
1806.00	60.5 Pk	4.1 / 28.0 / 39.9	52.7	H / 1.0 / 0.0	-51.7	N/A
2709.00	48.8 Pk	5.3 / 31.1 / 39.5	45.7	H / 1.0 / 0.0	-14.3	N/A
3612.00	40.6 Pk	6.7 / 33.2 / 39.7	40.8	H / 1.0 / 0.0	-19.2	N/A
4515.00	41.6 Pk	7.3 / 33.5 / 40.6	41.8	H / 1.0 / 0.0	-18.2	N/A
5418.00	39.9 Pk	7.5 / 36.0 / 38.6	44.8	H / 1.0 / 0.0	-15.2	N/A
Mid Channel Harmonics – remeasured below						
2745.00	42.0 Pk	5.4 / 31.1 / 39.5	39.0	H / 1.0 / 0.0	-21.0	N/A
2745.00	46.5 Pk	5.4 / 31.1 / 39.5	43.5	V / 1.0 / 0.0	-16.5	N/A

Tested by: \_\_\_\_\_ R Rodel  
Printed

  
Signature

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Reviewed by: \_\_\_\_\_ Jim Owen  
Printed

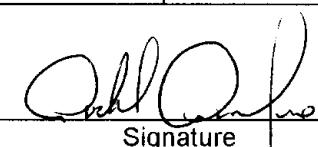
  
Signature

# Radiated Electromagnetic Emissions

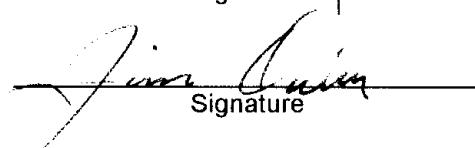
Test Report #:	S0414 Run 1		Test Area:	Site 3 Roof		Temperature:	25	°C
Test Method:	FCC Part 15 <u>15.209(a)</u>		Test Date:	16-Oct-2008		Relative Humidity:	45	%
EUT Model #:	U519	<u>15.205(d)</u>	EUT Power:	115 Vac to 9 VDC Power Converter		Air Pressure:	100.1	kPa
EUT Serial #:	U5190013					Page:	1 of 2	
Manufacturer:	SCS Corp.					Level Key		
EUT Description:	9 Antenna RF Identification Transceiver					Pk – Peak	Nb – Narrow Band	
Notes:						Qp – QuasiPeak	Bb – Broad Band	
						Av - Average		

FREQ (MHz)	LEVEL (dBuV)	CABLE / ANT / PREAMP (dB) (dB/m) (dB)	FINAL (dBuV/m)	POL / HGT / AZ (m) (DEG)	DELTA1 (dB) FCC A (> 1GHz)	DELTA2 (dB)
903.00	98.6 Pk	2.4 / 23.3 / 0.0	124.4	H / 1.0 / 0.0	N/A	N/A
903.00	100.3 Pk	2.4 / 23.3 / 0.0	126.1	V / 1.0 / 0.0	N/A	N/A
Low Channel Fundamental Measurements Above						
915.00	98.4 Pk	2.4 / 23.5 / 0.0	124.3	V / 1.0 / 0.0	N/A	N/A
915.00	99.9 Pk	2.4 / 23.5 / 0.0	125.8	H / 1.0 / 0.0	N/A	N/A
Mid Channel Fundamental Measurements Above						
927.50	101.1 Pk	2.4 / 23.6 / 0.0	127.1	H / 1.0 / 0.0	N/A	N/A
927.50	97.3 Pk	2.4 / 23.6 / 0.0	123.3	V / 1.0 / 0.0	N/A	N/A
High Channel Fundamental Measurements Above						
High Channel Harmonics Below						
1855.00	75.5 Pk	4.1 / 28.2 / 39.8	68.0	V / 1.0 / 0.0	-35.3	N/A
Below readings are ambient						
2782.50	35.0 Pk	5.5 / 31.2 / 39.5	32.2	V / 1.0 / 0.0	-27.8	N/A
3710.00	35.0 Pk	6.9 / 33.5 / 39.9	35.5	V / 1.0 / 0.0	-24.5	N/A
4637.50	35.0 Pk	7.3 / 33.9 / 40.6	35.6	V / 1.0 / 0.0	-24.4	N/A
5565.00	38.9 Pk	7.5 / 36.3 / 38.1	44.6	V / 1.0 / 0.0	-58.7	N/A
6492.50	43.2 Pk	8.0 / 36.3 / 37.1	50.4	V / 1.0 / 0.0	-52.9	N/A
7420.00	42.3 Pk	8.7 / 38.5 / 36.5	52.9	V / 1.0 / 0.0	-7.1	N/A
8347.50	41.2 Pk	9.7 / 37.6 / 37.0	51.5	V / 1.0 / 0.0	-8.5	N/A
9275.00	42.3 Pk	10.3 / 39.3 / 37.3	54.5	V / 1.0 / 0.0	-48.8	N/A
Polarity Change						
1855.00	73.5 Pk	4.1 / 28.2 / 39.8	66.0	H / 1.0 / 0.0	-41.1	N/A
2782.50	42.3 Pk	5.5 / 31.2 / 39.5	39.5	H / 1.0 / 0.0	-20.5	N/A
3710.00	41.8 Pk	6.9 / 33.5 / 39.9	42.3	H / 1.0 / 0.0	-17.7	N/A
4637.50	41.1 Pk	7.3 / 33.9 / 40.6	41.7	H / 1.0 / 0.0	-18.3	N/A
5565.00	39.2 Pk	7.5 / 36.3 / 38.1	44.9	H / 1.0 / 0.0	-62.2	N/A
6492.50	43.9 Pk	8.0 / 36.3 / 37.1	51.1	H / 1.0 / 0.0	-56.0	N/A
7420.00	42.8 Pk	8.7 / 38.5 / 36.5	53.4	H / 1.0 / 0.0	-6.6	N/A
8347.50	43.6 Pk	9.7 / 37.6 / 37.0	53.9	H / 1.0 / 0.0	-6.1	N/A

Tested by: R Rodel  
Printed

  
Signature

Reviewed by: Jim Owen  
Printed

  
Signature

**Emissions Test Conditions: RADIATED EMISSIONS, FCC Part 15, Paragraphs 15.247(c); (d); (a)**

**The *RADIATED EMISSIONS* measurements were performed at the following test location :**

- **Test not applicable**

■ - Room (Small Open Area Test Site) San Diego

**Testing was performed at a test distance of:**

■ - 3 meters

**Test Equipment Used :**

<b>Model No.</b>	<b>Prop. No.</b>	<b>Description</b>	<b>Manufacturer</b>	<b>Serial No.</b>	<b>Cal Date</b>
3115	453	Antenna, Double Ridge Guide	EMCO	9412-4363	09/01
3146	244	Antenna, Log Periodic Dipole	EMCO	1063	12/00
8566B	744	Spectrum Analyzer	Hewlett Packard	211500842	10/01
85662B	741	Spectrum Analyzer Display	Hewlett Packard	2112A02185	10/01
AMF-SD-010180-35-10P	719	Pre-Amplifier	Miteq	549460	*
HP 8445B	--	RF Pre-Selector	Hewlett Packard	--	--
AA-190-06.00.0	728	Frequency Cables	United Microwave Pro	--	*
AA-190-06.00.0	729	Frequency Cables	United Microwave Pro	--	*
AA-190-30.00.0	732	Frequency Cables	United Microwave Pro	--	*

Remarks: (\*) Verified

### Field Strength Calculation

If a preamplifier was used during the Radiated Emission Testing, it is required that the amplifier gain must be subtracted from the Spectrum Analyzer (Meter) Reading. In addition, a correction factor for the antenna , cable used and a distance factor, if any, must be applied to the Meter Reading before a true field strength reading can be obtained. In the automatic measurement, these considerations are automatically presented as a part of the print out. In the case of manual measurements and for greater efficiency and convenience, instead of using these correlation factors for each meter reading, the specification limit was modified to reflect these correlation factors at each frequency value so that the meter readings can be compared directly to the modified specification limit. This modified specification limit is referred to as the "Corrected Meter Reading Limit" or simply the CMRL, which is the actual field strength present at the antenna. The quantity can be derived in the following manner:

$$\text{Corrected Meter Reading Limit (CMRL)} = \text{SAR} + \text{AF} + \text{CL} - \text{AG} - \text{DC}$$

Where, SAR = Spectrum Analyzer Reading

AF = Antenna Factor

CL = Cable Loss

AG = Amplifier Gain (if any)

DC = Distance Correction (if any)

Assume the following situation: A meter reading of 29.4 dBuV was obtained from a Class A computing device measured at 83 MHz. Assume an antenna factor of 9.2 dB, a cable loss of 1.4 dB and amplifier gain of 20.0 dB at 83 MHz. The final field strength would be determined as follows:

$$\text{CMRL} = 29.4 \text{ dBuV} + 9.2 \text{ dB} = 1.4 \text{ dB} - 20 \text{ dB/M} - 0.0 \text{ dB}$$

$$\text{CMRL} = 20.0 \text{ dBuV/M}$$

This result is well below the FCC and CSA Class A limit of 29.5 dbuV/m at 83 MHz.

For the manual mode of measurement, a table of corrected meter reading limit was used to permit immediate comparison of the meter reading to determine if the measure emission amplitude exceeded the specification limit at that specific frequency.

**4 CONDUCTED EMISSION EQUIPMENT/DATA**

See following page(s).

**Emissions Test Conditions: CONDUCTED EMISSIONS, FCC Part 15, Paragraph 15.247(a)(i); (a)(1); (b)(2) (20 dB Bandwidth, Power Output, and Conducted Spurious**

**The *RADIATED EMISSIONS* measurements were performed at the following test location :**

- **Test not applicable**

■ - SR-3, Shielded Room, 12' x 20' x 8', Metal Chamber

**Test Equipment Used :**

Spectrum Analyzer, Hewlett Packard, Model HP8566B, P/N 744, Cal Date 09/01

Spectrum Analyzer, Hewlett Packard, Model HP8594E, P/N 430, Cal Date 05/01

Attenuator, 10 dB, Hewlett Packard, Model HP8491B, Cal: verified

Attenuator, Variable, Hewlett Packard, Model HP8494B, Cal: verified

Cable, Micropore, Model AA-190, P/N 729, Cal: verified

Remarks: \_\_\_\_\_

CLIENT: SCS  
NOTE(S):

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247(a)(1)(i)

1. Average time of occupancy (Verified not on greater than 0.4 sec. In any 10 second time period.)
2. Hop spacing
3. Hopping frequencies

MKE  $\Delta$  310.0 msec

-5.40 dB

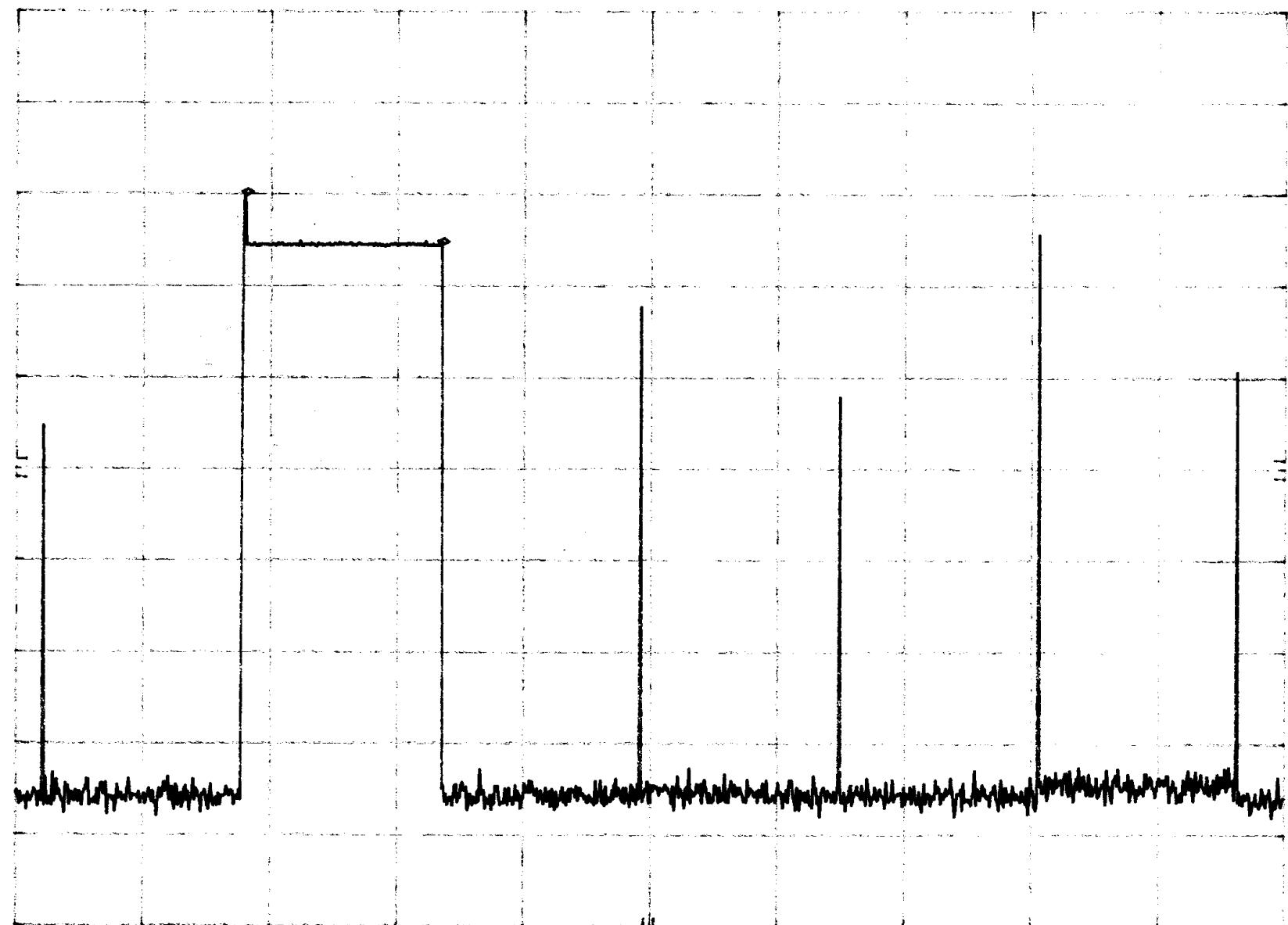
hp REF 48.0 dBm ATTEN 40 dB

10 dB

POS PK

## OFFSET

18.0  
dB



CENTER 915.000 000 MHz  
RES BW 30 kHz

VBW 30 kHz

SPAN 0 Hz  
SWP 2.00 sec 16

CLIENT: SCS  
NOTE(S):

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247(a)(i)

1. Average time of occupancy (Verified not on greater than 0.4 sec. In any 10 second time period.
2. Hopping channel spacing 500 kHz.
3. Hopping frequencies

MR > 500 kHz

□ . □ □ **dB**

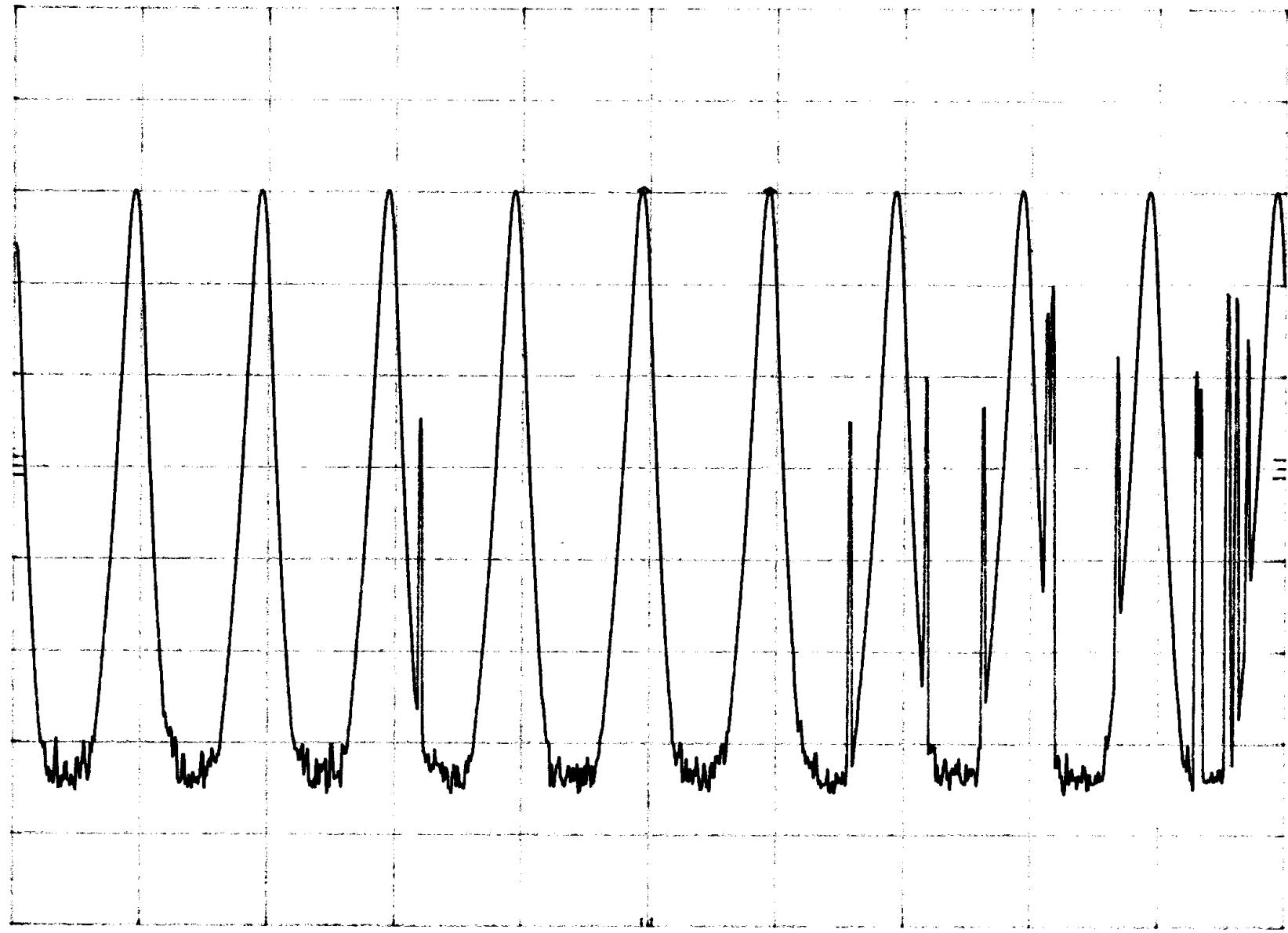
hp REF 48.0 dBm ATTEN 40 dB

10 dB

POS PK

## OFFSET

18.0  
dB



CENTER 915.00 MHz

RES BW 30 kHz

VB 30 KTN

SPAN 5.00 MHz

SWP 20.0 msec 17

CLIENT: SCS

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247(a)(i)

NOTE(S):

1. Average time of occupancy (Verified not on greater than 0.4 sec. In any 10 second time period.)
2. Hop spacing
3. 50 hopping frequencies

MKR  $\Delta$  24.60 MHz

-0.20 dB

HP REF 40.0 dBm ATTEN 40 dB

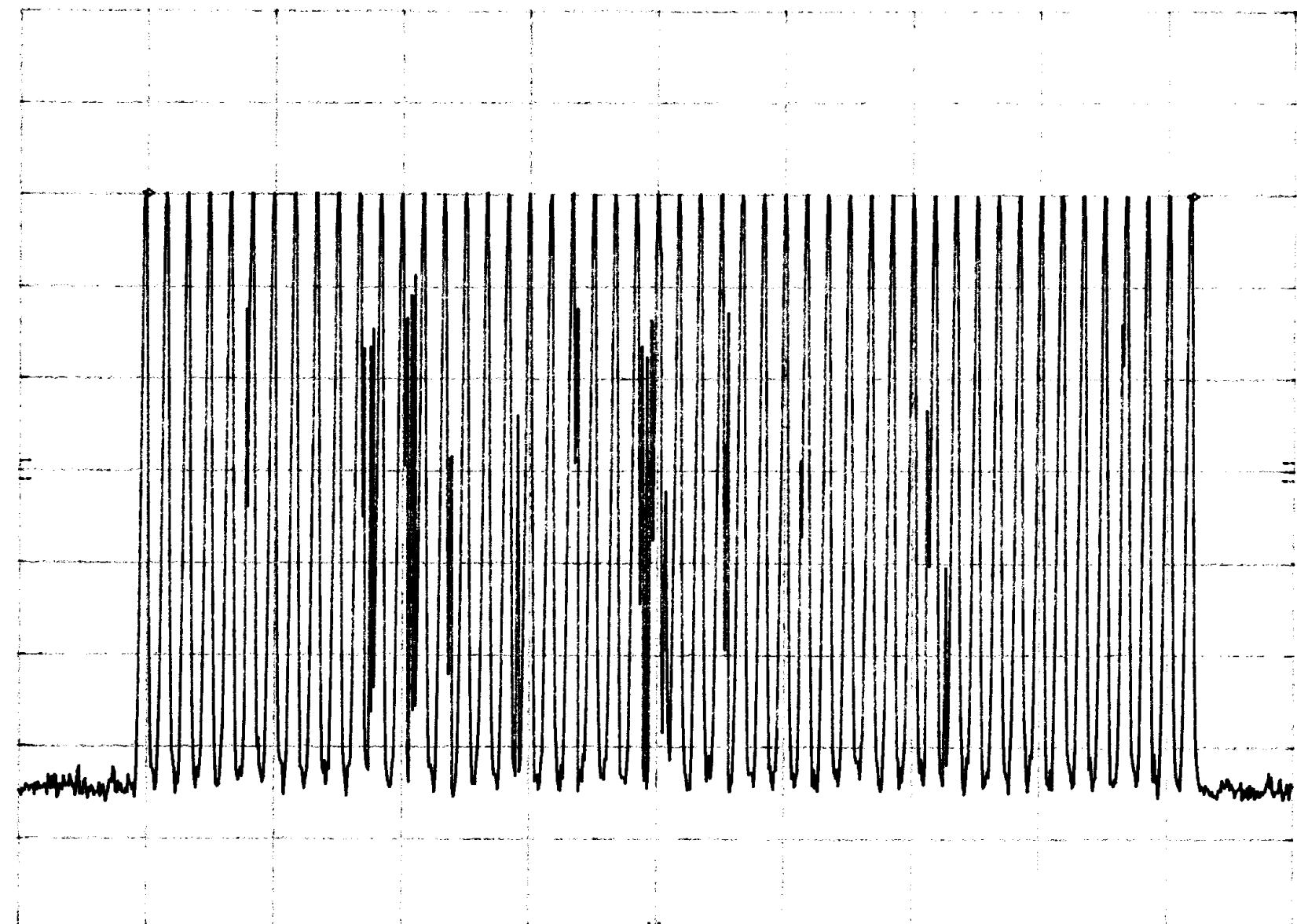
10 dB/

POS PK

OFFSET

10.0

dB



START 900.0 MHz

RES BW 30 kHz

VBW 30 kHz

STOP 930.0 MHz

SWP 90.0 msec /18

CLIENT: SCS

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247(a)(1); (b)(2)

NOTE(S):

1. 20 dB bandwidth
2. Power output

14:09:55 OCT 16, 2000

REF 38.0 dBm AT 30 dB

SMPL OCCUPIED BW (99.50%)

LOG OBW: 37.00 kHz

10  $\Delta$ Fc: -0.5 kHz

dB/ Pwr: 28.5 dBm

CSP 500.0 kHz

OFFSET

18.0

dB

VA SB

SC FC

CORR

CENTER 902.9740 MHz

#RES BW 10 kHz

SPAN 200.0 kHz

SWP 30.0 msec

#VBW 100 kHz

19

CLIENT: SCS

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247(a)(1); (b)(2)

NOTE(S):

1. 20 dB bandwidth
2. Power output

11: 16: 44 OCT 16, 2000

REF 38.0 dBm

AT 30 dB

SMPL

OCCUPIED BW (99.50%)

LOG

OBW: 36.50 kHz

10

ΔFc: 0.7 kHz

dB/

Pwr: 28.3 dBm

OFFSET

18.0

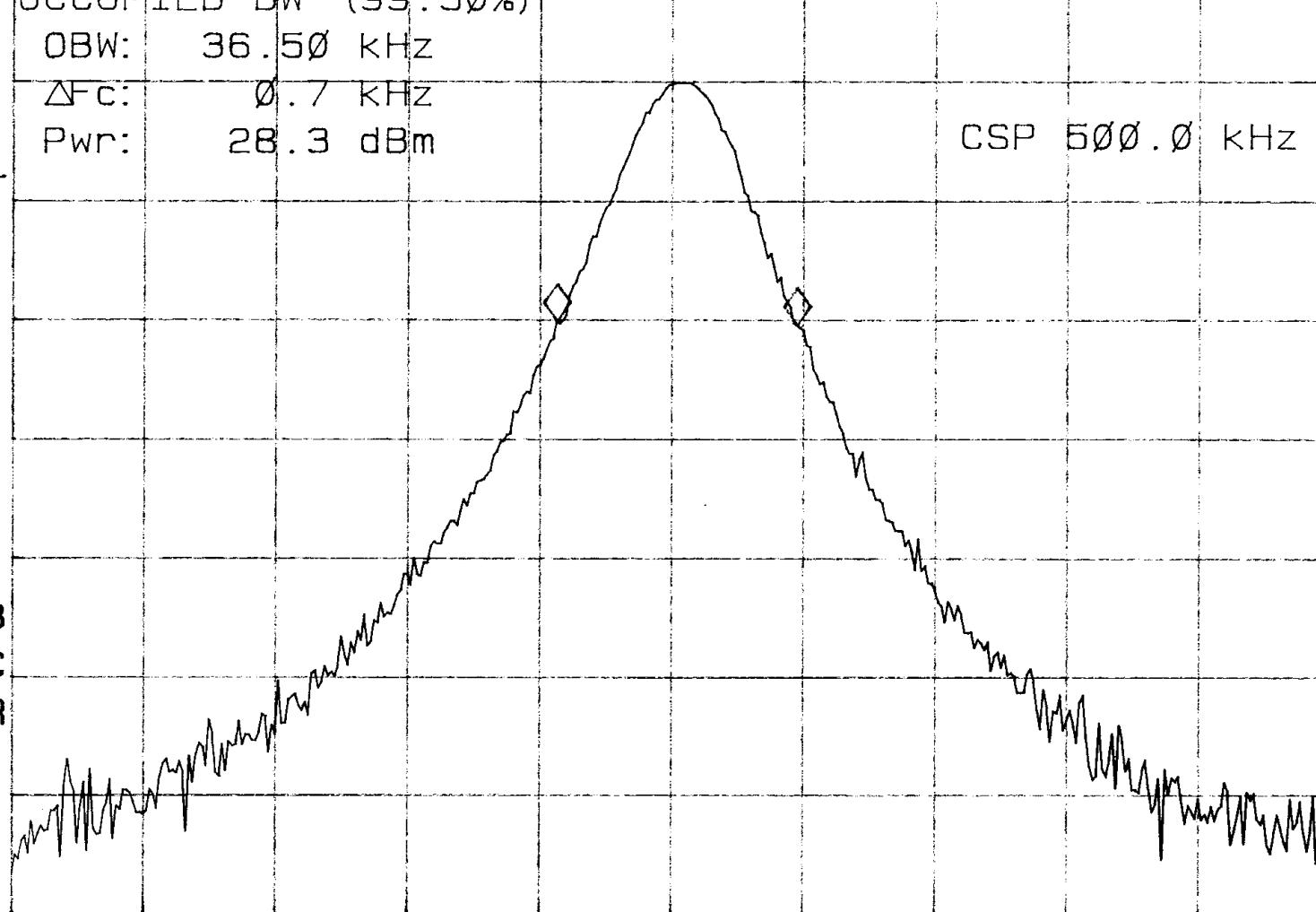
dB

CSP 500.0 kHz

VA SB

SC FC

CORR



CENTER 914.9725 MHz

SPAN 200.0 kHz 20

#RES BW 10 kHz

#VBW 100 kHz

SWP 30.0 msec

CLIENT: SCS

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247(a)(1); (b)(2)

NOTE(S):

1. 20 dB bandwidth
2. Power output

11:20:12 OCT 16, 2000

REF 38.0 dBm AT 30 dB

SMPL OCCUPIED BW (99.50%)

LOG OBW: 36.50 kHz

10  $\Delta$ FC: -0.7 kHz

dB/ Pwr: 28.0 dBm

OFFSET

18.0

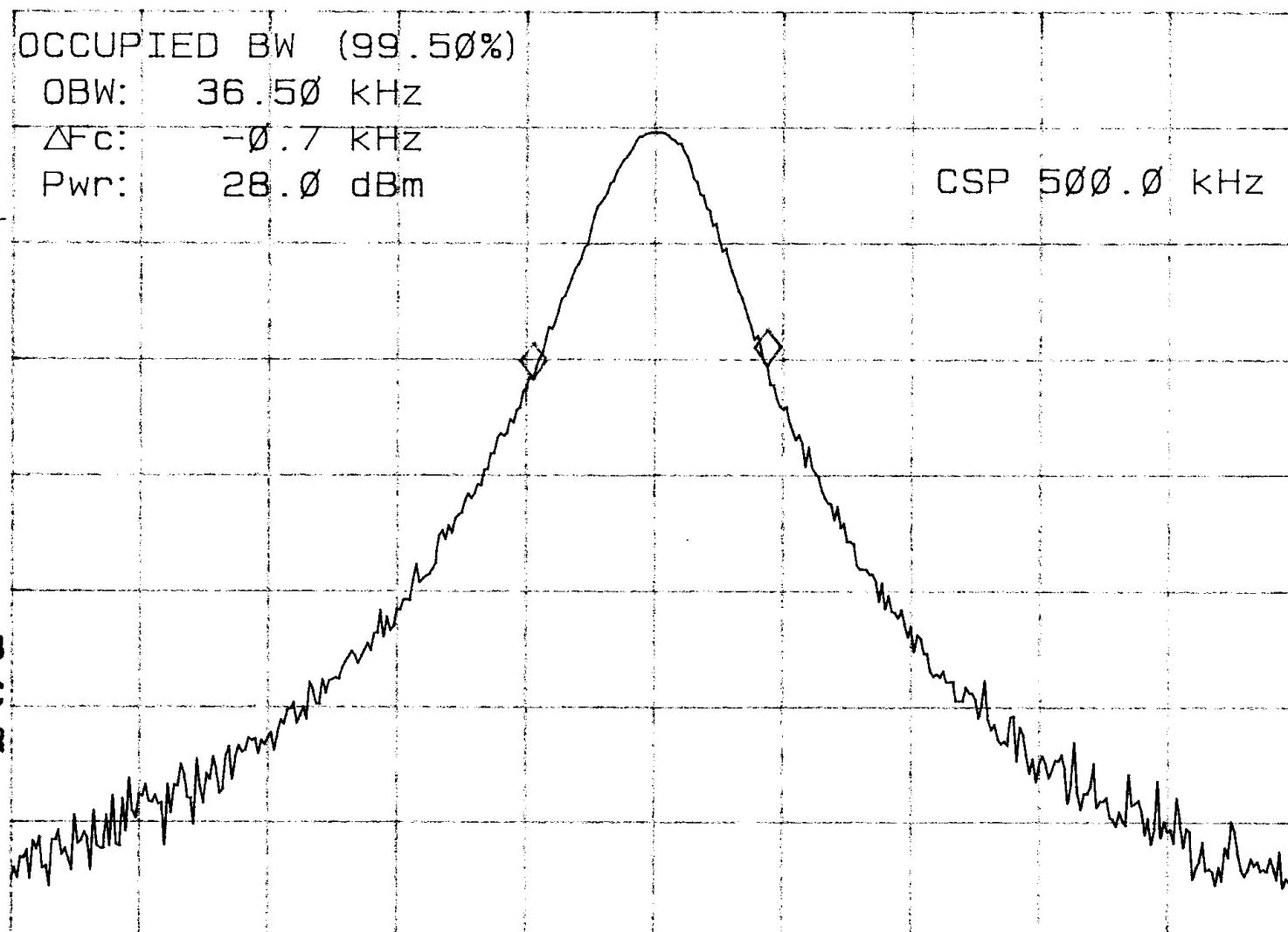
dB

CSP 500.0 kHz

VA SB

SC FC

CORR



CENTER 927.4735 MHz

SPAN 200.0 kHz 21

#RES BW 10 kHz

#VBW 100 kHz

SWP 30.0 msec

CLIENT: SCS  
NOTE(S):

DATE: 10/16/00  
High, 927.5 MHz

SPECIFICATION: FCC Part 15, Para. 15.247( c)(1)

MKR 190.7 MHz  
-11.10 dBm

hp REF 48.0 dBm ATTEN 40 dB

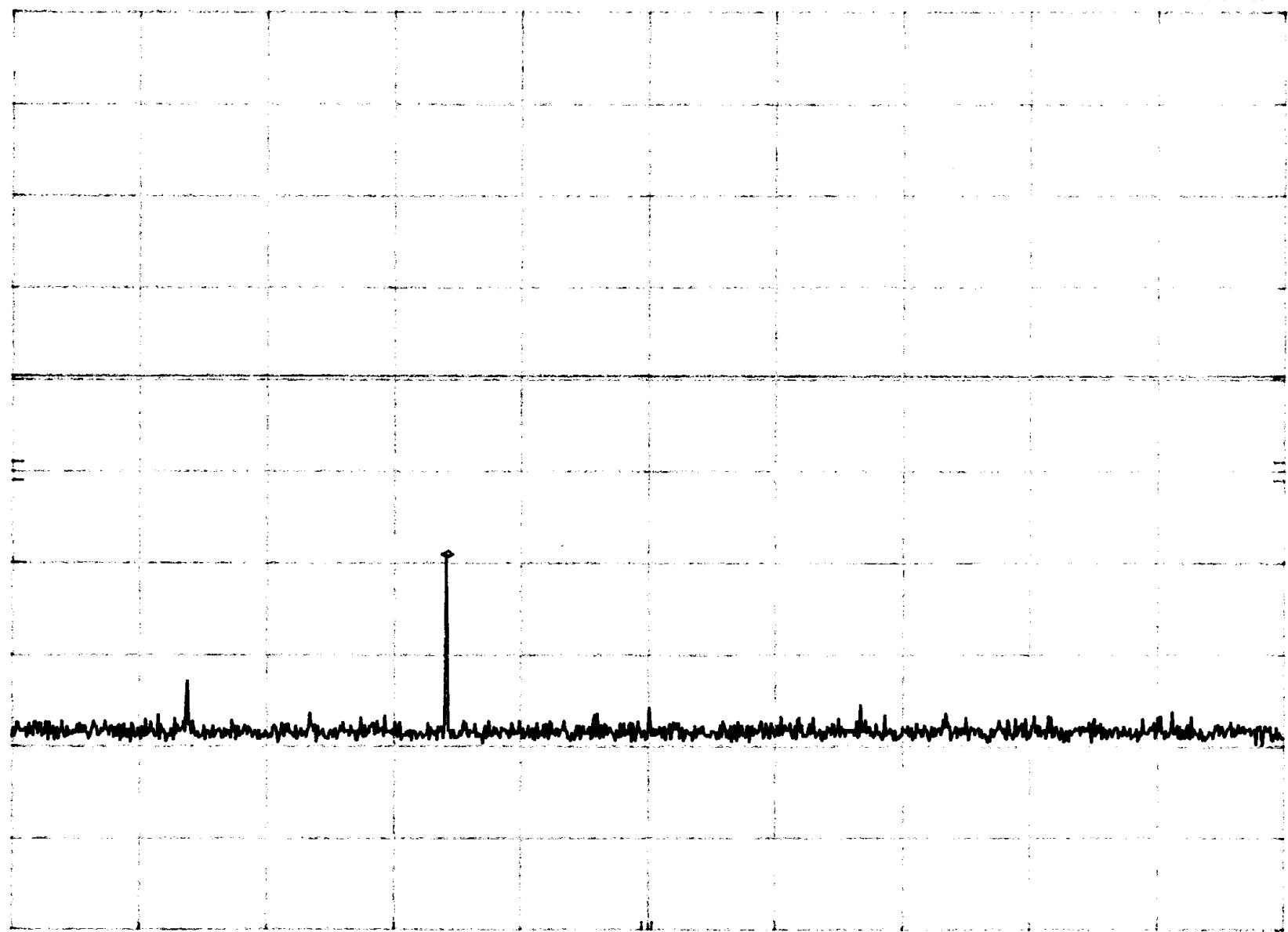
10 dB/

POS PK

OFFSET

18.0  
dB

DL  
8.4  
dBm



START 30 MHz  
RES BW 100 kHz

VBW 100 kHz

STOP 500 MHz  
SWP 141 msec 22

CLIENT: SCS  
NOTE(S): High

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247( c)(1)

MKR 736.5 MHz  
-4.60 dBm

40 REF 48.0 dBm ATTEN 40 dB

10 dB/

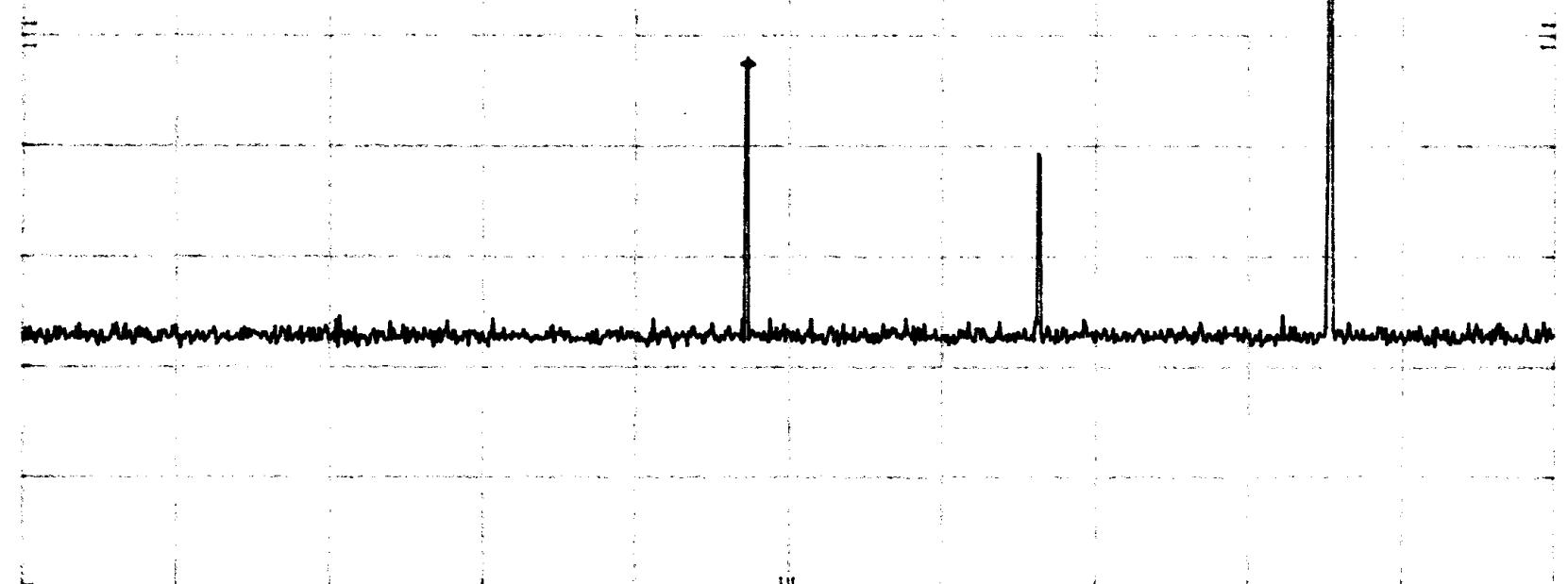
POS PK

OFFSET

18.0  
dB

MARKER

DL 736.5 MHz  
8.4 -4.60 dBm  
dBm



START 500 MHz

RES BW 100 kHz

VBW 100 kHz

STOP 1.000 GHz  
SWP 150 msec 23

CLIENT: SCS  
NOTE(S): High

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247( c)(1)

MKR 927.56 MHz  
27.30 dBm

HD REF 48.0 dBm ATTEN 40 dB

10 dB/

POS PK

OFFSET

18.0  
dB

DL  
8.4  
dBm

START 895.0 MHz

RES BW 100 kHz

VBW 100 kHz

STOP 935.0 MHz

SWP 20.0 msec 24

CLIENT: SCS  
NOTE(S): High

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247( c)(1)

MKR 1.022 GHz  
-25.80 dBm

HP REF 48.0 dBm ATTEN 40 dB

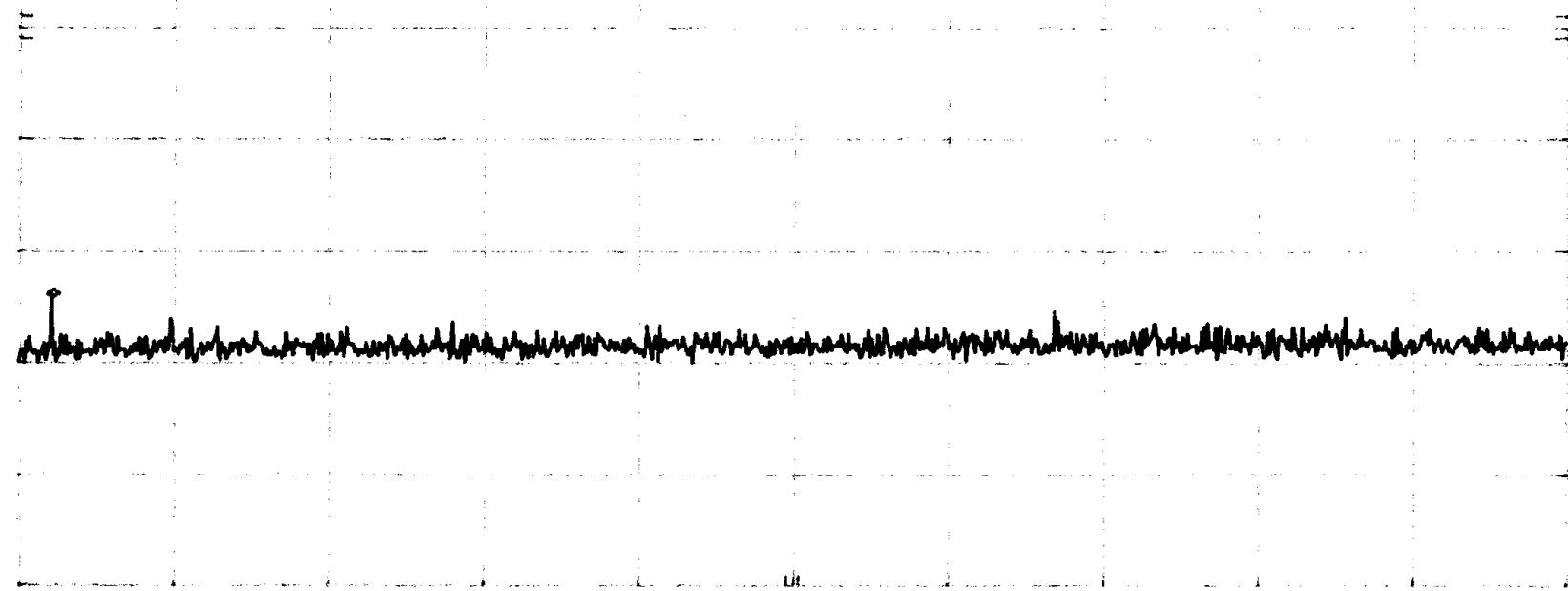
10 dB/

POS PK

OFFSET

18.0  
dB

DL  
8.4  
dBm



START 1.00 GHz

RES BW 100 kHz

VBW 100 kHz

STOP 2.00 GHz

SWP 300 msec 25

CLIENT: SCS  
NOTE(S): High

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247( c)(1)

HP REF 48.0 dBm ATTEN 40 dB

10 dB/

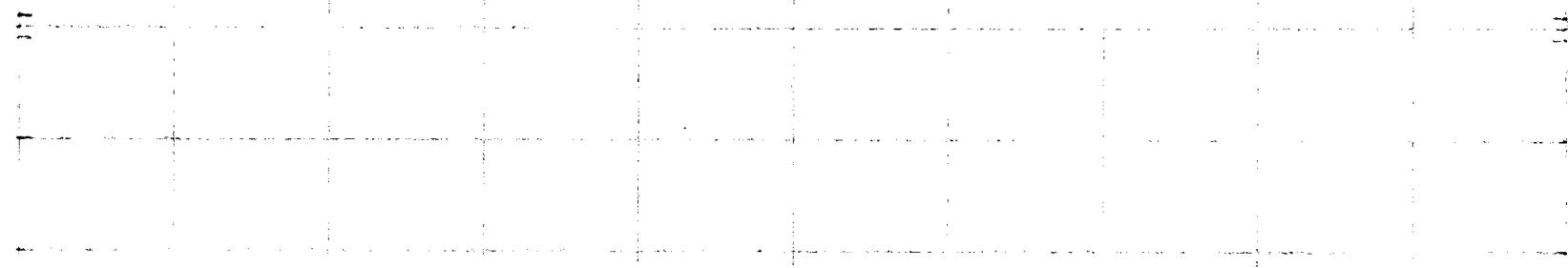
POS PK

OFFSET

18.0  
dB

DL  
8.4  
dBm

MKR 2.480 GHz  
-28.10 dBm



START 2.00 GHz

RES BW 100 kHz

VBW 100 kHz

STOP 5.00 GHz

SWP 900 msec 26

CLIENT: SCS  
NOTE(S):

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247(c)(1)

REF 48.0 dBm ATTEM 40 dB

10 dB/

POS PK

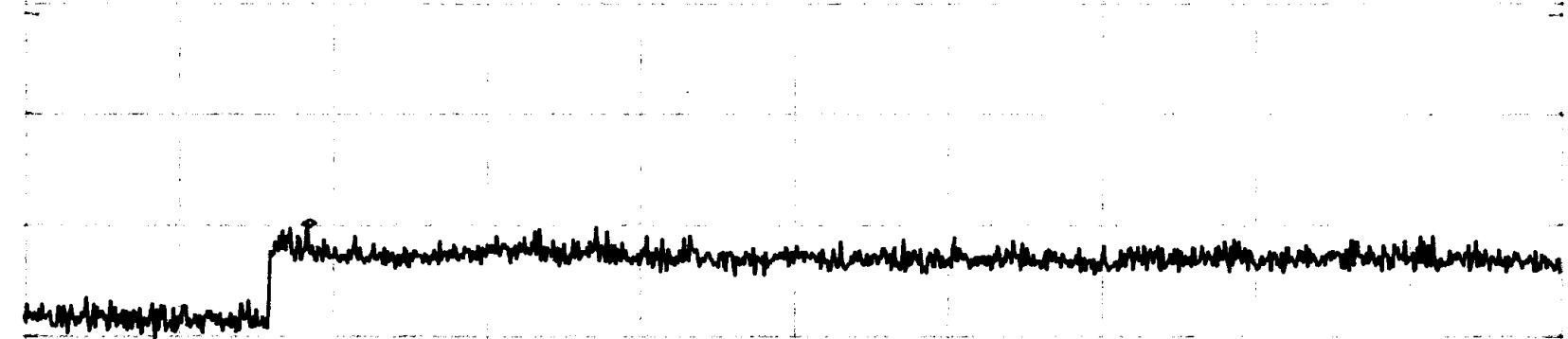
OFFSET

18.0  
dB

DL  
8.4  
dBm

MKR 5.925 GHz

-21.90 dBm



START 5.00 GHz

RES BW 100 kHz

VBW 100 kHz

STOP 10.00 GHz

SWP 1.50 sec 21

CLIENT: SCS  
NOTE(S):

DATE: 10/16/00  
Medium, 915 MHz

SPECIFICATION: FCC Part 15, Para. 15.247(c)(1)

MKR 221.8 MHz  
-27.80 dBm

HP REF 48.0 dBm ATTEN 40 dB

10 dB/

POS PK

OFFSET

18.0  
dB

DL  
8.4  
dBm

■ ■

■ ■

START 30 MHz

RES BW 100 kHz

VBW 100 kHz

STOP 500 MHz

SWP 141 msec 28

CLIENT: SCS  
NOTE(S):

DATE: 10/16/00

Medium

SPECIFICATION: FCC Part 15, Para. 15.247(c)(1)

MRK 915.00 MHz  
27.40 dBm

hp REF 48.0 dBm ATTN 40 dB

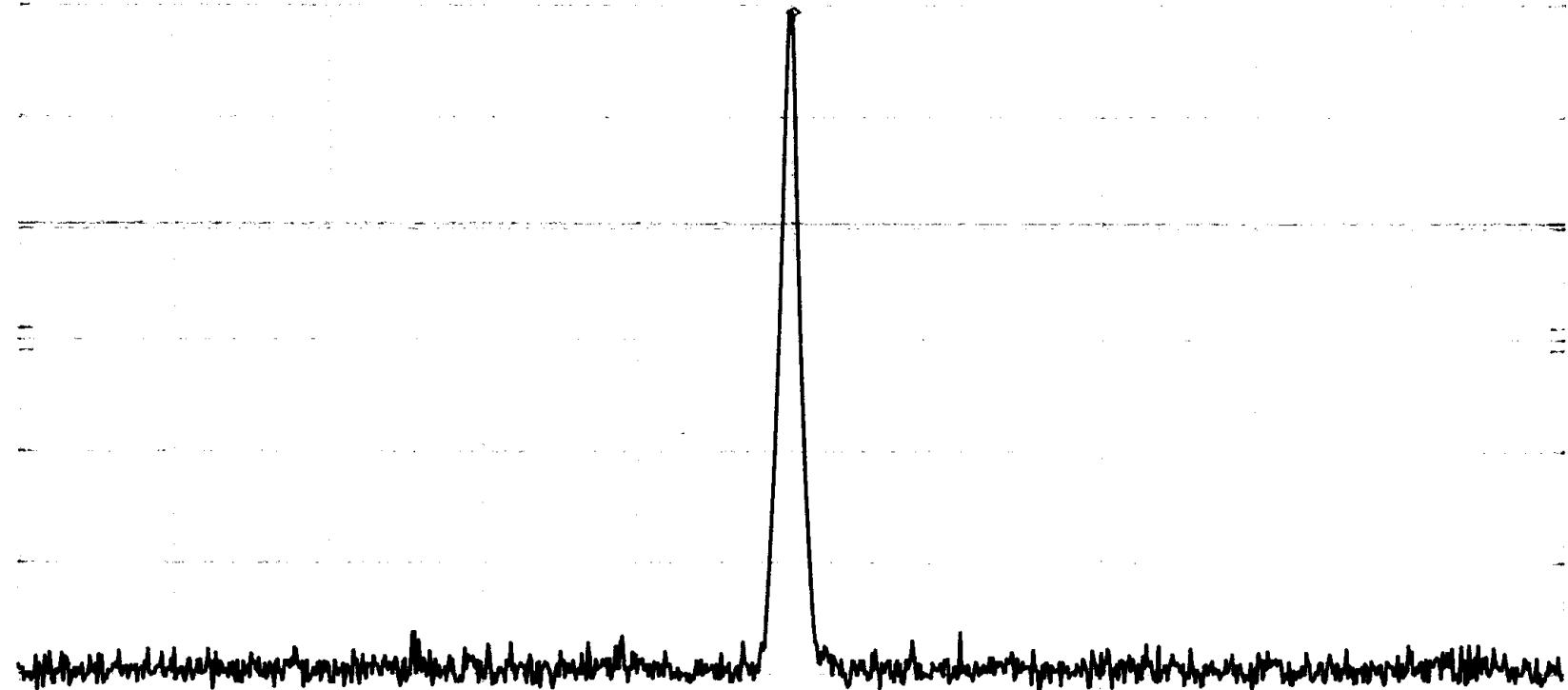
10 dB/

POS PK

OFFSET

18.0  
dB

DL.  
8.4  
dBm



START 895.0 MHz

RES BW 100 kHz

VBW 100 kHz

STOP 935.0 MHz  
SWP 20.0 msec 29

CLIENT: SCS  
NOTE(S):

DATE: 10/16/00

Medium

SPECIFICATION: FCC Part 15, Para. 15.247( c)(1)

REF 48.0 dBm ATTEM 40 dB

MKR 915.0 MHz

27.30 dBm

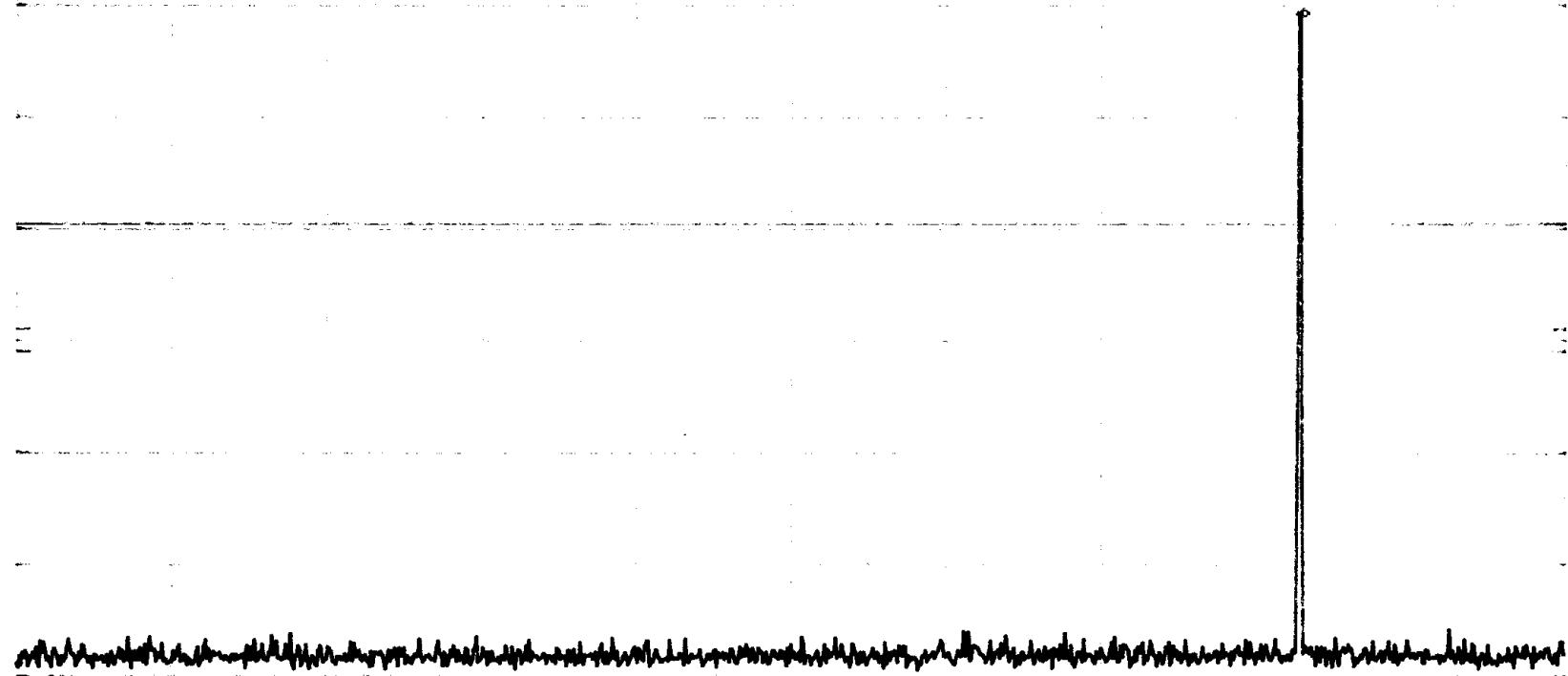
10 dB/

POS PK

OFFSET

18.0  
dB

DL  
8.4  
dBm



START 500 MHz

RES BW 100 KHz

VBW 100 KHz

STOP 1.000 GHz

SWP 150 msec 30

CLIENT: SCS  
NOTE(S):

DATE: 10/16/00

Medium

SPECIFICATION: FCC Part 15, Para. 15.247(c)(1)

MRK 4.876 GHz

-28.40 dBm

REF 48.0 dBm ATTN 40 dB

10 dB/

POS PK

OFFSET

18.0  
dB

DL  
8.4  
dBm

10 20 30 40 50 60 70 80 90 100

10 20 30 40 50 60 70 80 90 100

10 20 30 40 50 60 70 80 90 100

10 20 30 40 50 60 70 80 90 100

START 4.00 GHz

RES BW 100 kHz

VBW 100 kHz

STOP 2.00 GHz

SWP 300 msec 31

CLIENT: SCS  
NOTE(S):

DATE: 10/16/00

Medium

SPECIFICATION: FCC Part 15, Para. 15.247( c)(1)

REF 48.0 dBm ATTN 40 dB

MIN 4.724 GHz

-28.30 dBm

10 dB/

POS PK

OFFSET

18.0  
dB

DL  
8.4  
dBm

START 2.00 GHz

RES BW 100 kHz

VBW 100 kHz

STOP 5.00 GHz

SNP 900 msec 32

CLIENT: SCS  
NOTE(S):

DATE: 10/16/00

Medium

SPECIFICATION: FCC Part 15, Para. 15.247(c)(1)

MKR 8.420 GHz

-22.00 dBm

HP REF 48.0 dBm ATTEM 40 dB

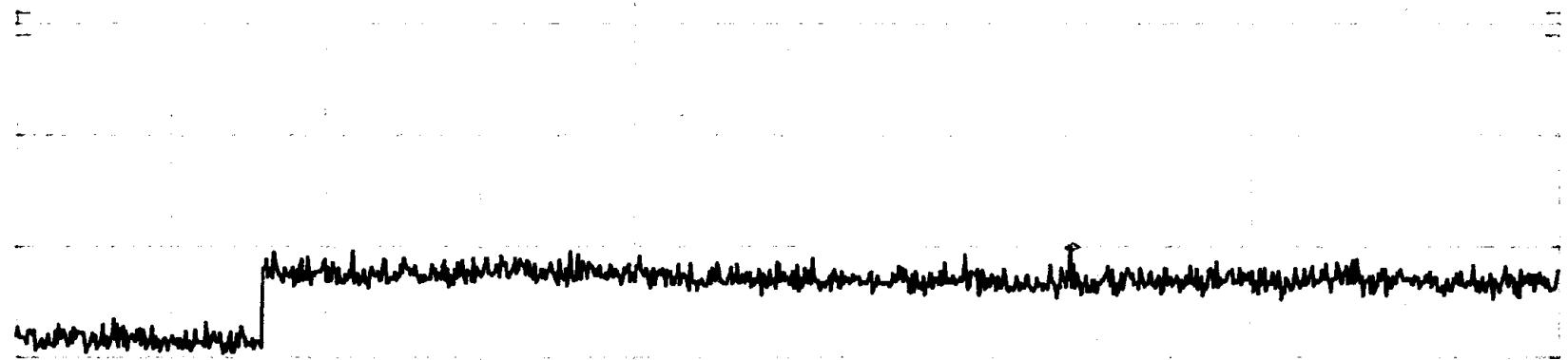
10 dB/

POS PK

OFFSET

18.0  
dB

DL  
8.4  
dBm



START 5.00 GHz

RES BW 100 KHz

VBW 100 KHz

STOP 10.00 GHz

SWP 1.50 sec 33

CLIENT: SCS  
NOTE(S): Low

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247(c)(1)

MKR 342.5 MHz

-28.40 dBm

REF 48.0 dBm ATTN 40 dB

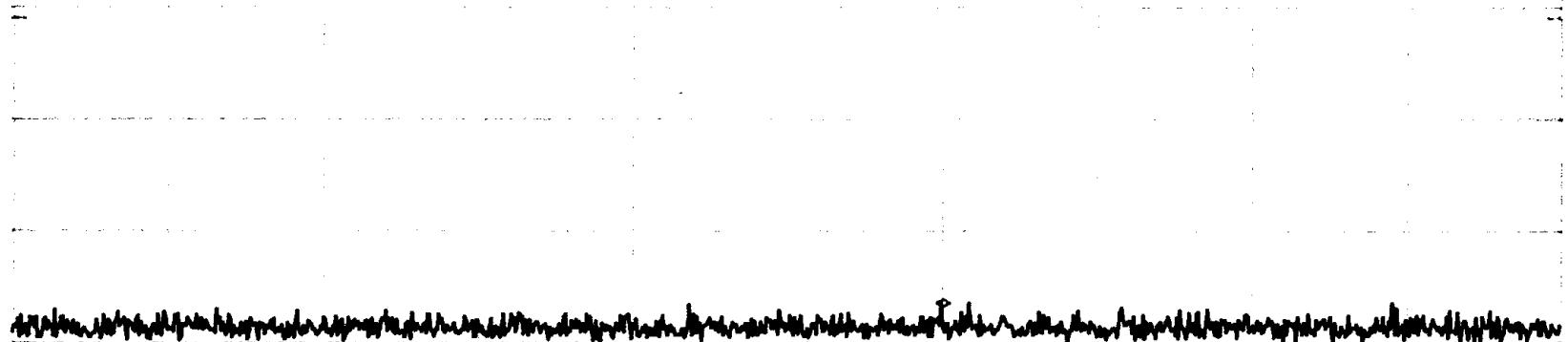
10 dB/

POS PK

OFFSET

18.0  
dB

DL  
8.4  
dBm



START 30 MHz

RES BW 100 kHz

VBW 100 kHz

STOP 500 MHz

SWP 141 msec 34

CLIENT: SCS  
NOTE(S): Low

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247(c)(1)

118.8 902.92 MHz  
27.50 dBm

REF 48.0 dBm ATTN 40 dB

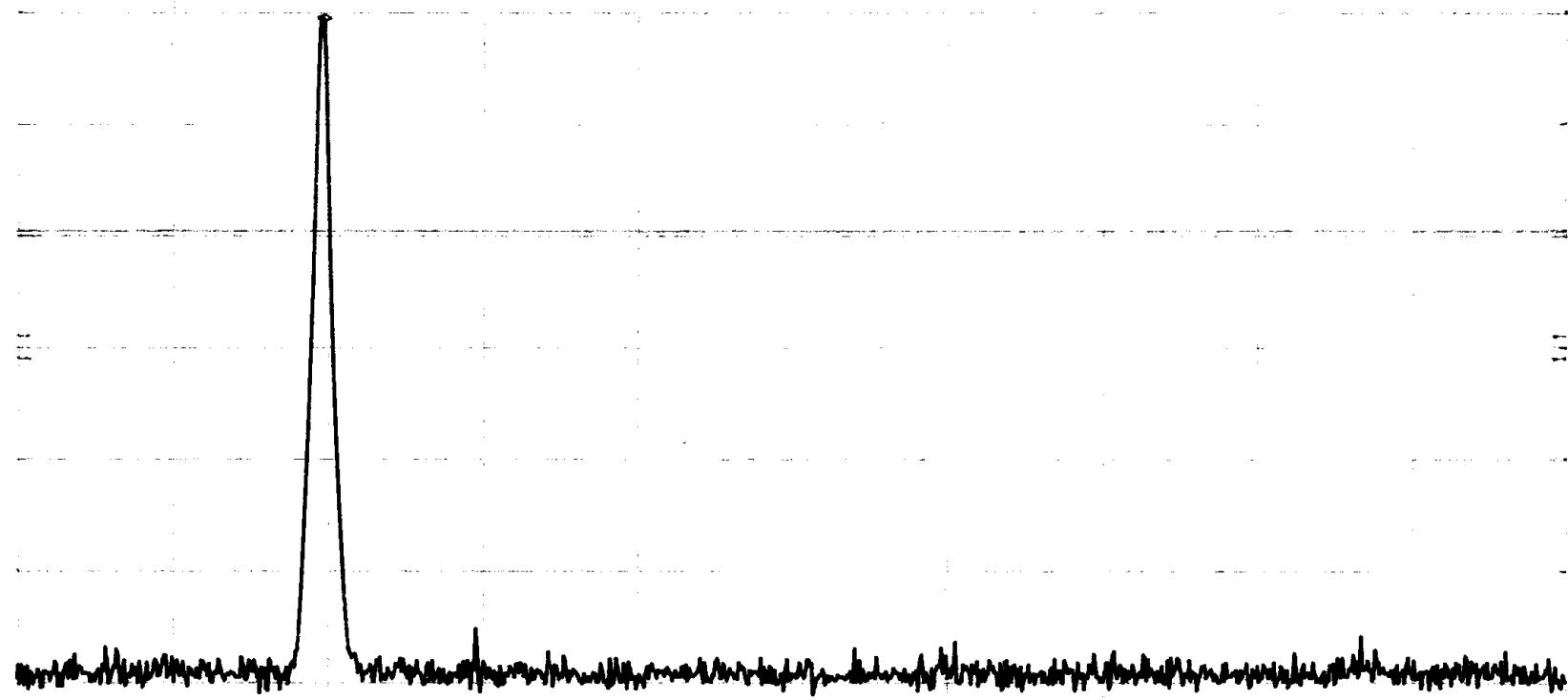
10 dB

POS PK

OFFSET

48.0  
dB

DL  
8.4  
dBm



START 895.0 MHz

RES BW 100 kHz

VBW 100 kHz

STOP 935.0 MHz

SWP 20.0 msec 35

CLIENT: SCS  
NOTE(S): Low

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247(c)(1)

REF 48.0 dBm ATTEN 40 dB

10 dB/

POS PK

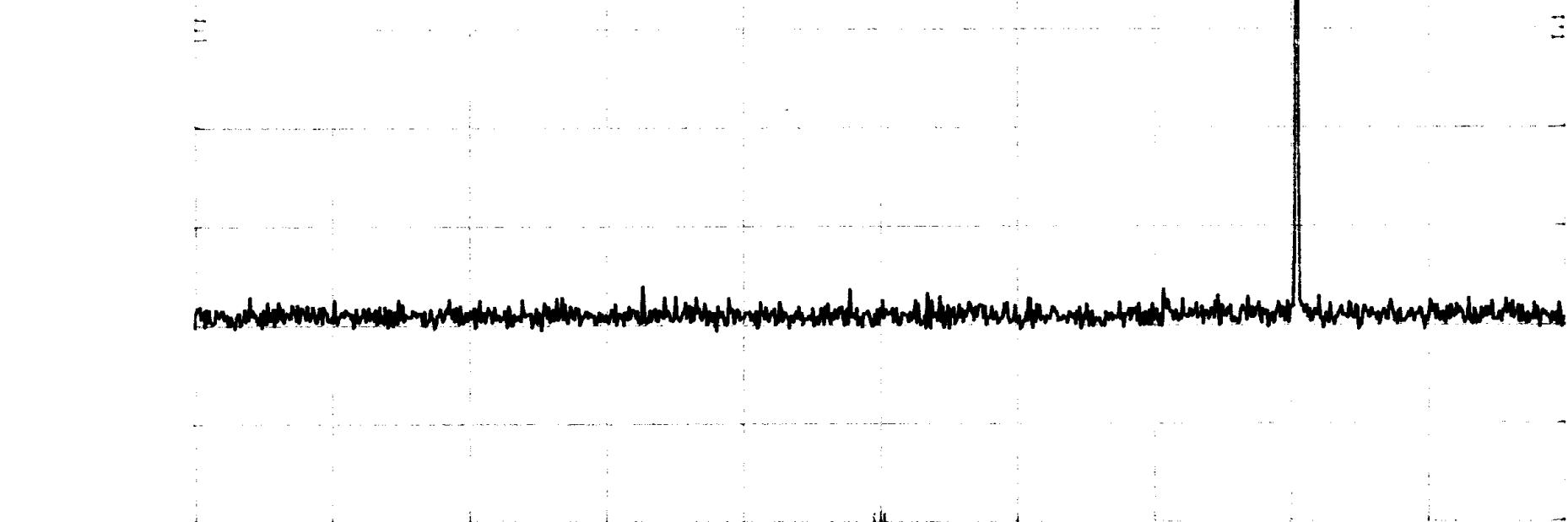
OFFSET

18.0  
dB

DL  
8.4  
dBm

MKR 903.0 MHz

27.40 dBm



START 500 MHz

RES BW 100 KHz

VBW 100 KHz

STOP 1.000 GHz

SWP 150 msec 36

CLIENT: SCS  
NOTE(S): Low

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247(c)(1)

REF 48.0 dBm ATTEM 40 dB

MKR 1.394 GHz  
-28.20 dBm

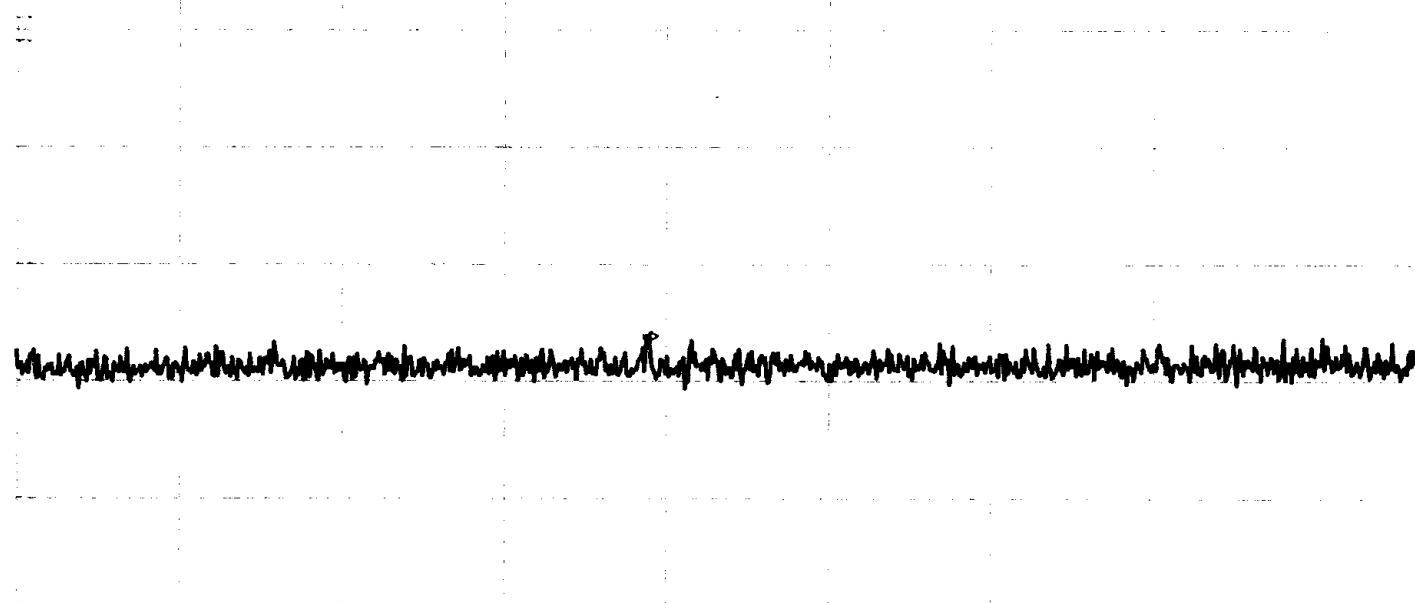
10 dB

POS PK

OFFSET

18.0  
dB

DL  
8.4  
dBm



START 1.00 GHz

RES BW 100 kHz

VBW 100 kHz

STOP 2.00 GHz

SWP 300 msec 31

CLIENT: SCS  
NOTE(S): Low

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247( c)(1)

REF 48.0 dBm ATTN 40 dB

MMR 2.597 GHz  
-27.710 dBm

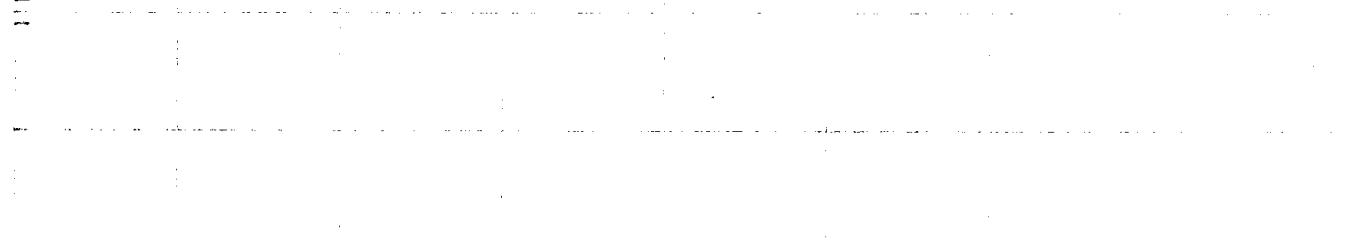
10 dB

POS PK

OFFSET

48.0  
dB

DL  
8.4  
dBm



START 2.00 GHz

RES BW 100 KHz

VBW 100 KHz

STOP 5.00 GHz

SWP 900 msec 38

CLIENT: SCS  
NOTE(S): Low

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247( c)(1)

REF -48.0 dBm ATTEN 40 dB

MR 5.9.0 GHz

-22.20 dBm

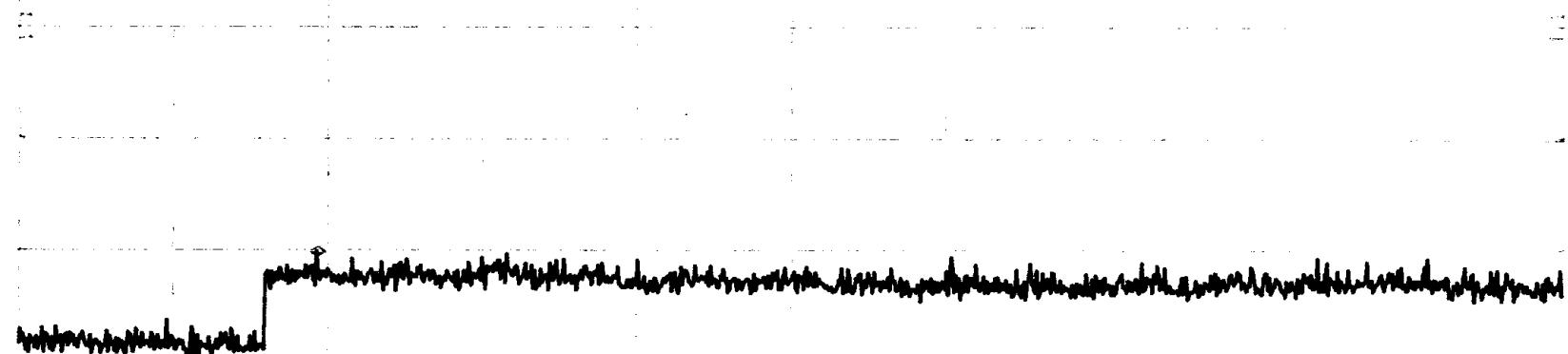
10 dB/

POS PK

OFFSET

18.0  
dB

DL  
8.4  
dBm



START 5.00 GHz

RES BW 100 kHz

VBW 100 kHz

STOP 10.00 GHz

SWP 1.50 sec

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**7 SIGNATURE PAGE**

**GENERAL REMARKS:**

**SUMMARY:**

All tests according to *FCC Part 15, Paragraphs 15.209(b); 15.247(a)(i); (a)(1); (b)(2)* were

- Performed
- **Not** Performed

The Equipment Under Test

- **Fulfills** the requirements of *FCC Part 15, Paragraphs 15.209(b); 15.247(a)(i); (a)(1); (b)(2)*.
- **Does not** fulfill the general approval requirements cited on page 1.

- TÜV PRODUCT SERVICE, INC. -

Responsible Engineer:



Jim Owen  
(EMC Engineer)