

## **CERTIFICATE OF COMPLIANCE** **FCC PART 22 CERTIFICATION**

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**Applicant:**

**WIDE TELECOM INC.**  
3551 Voyager St., Suite 103  
Torrance, CA 90503  
Attn: Matt Park, Sales Manager  
Tel. 310-921-9737  
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**FCC Classification:**

**Licensed Non-Broadcast Transmitter Held to Ear (TNE)**

**FCC Rule Part(s):**

**§22(H), §22.901(d), §2**

**FCC ID:**

**NPWWSH-200**

**Model(s):**

**WSH-200**

**Equipment Type:**

**Dual-Mode AMPS/CDMA Cellular Phone**

**Tx Frequency Range:**

**824.04 - 848.97 MHz (AMPS)**

**824.70 - 848.31 MHz (CDMA)**

**Rx Frequency Range:**

**869.04 - 893.97 MHz (AMPS)**

**869.70 - 893.31 MHz (CDMA)**

**Max. RF Output Power:**

**0.502 Watts ERP (AMPS)**

**0.280 Watts ERP (CDMA)**

**Frequency Tolerance:**

**2.5 PPM**

**Emission Designator(s):**

**40K0F8W, 40K0F1D, 1M25F9W**

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Celltech Research Inc. certifies that no party to this application has been denied FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 853(a).



**Shawn McMillen**  
**General Manager**  
**Celltech Research Inc.**



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## **MEASUREMENT REPORT - FCC PART 22**

### **1.1 SCOPE**

Measurement and determination of electromagnetic emissions (EME) from radio frequency devices for compliance with the technical rules and regulations of the Federal Communications Commission.

#### ***§2.1033(a) General Information***

##### **APPLICANT:**

**WIDE TELECOM INC.  
3551 Voyager St., Suite 103  
Torrance, CA 90503  
Attn: Matt Park, Sales Manager**

<b>FCC ID</b>	<b>NPWWSH-200</b>
<b>Model(s)</b>	<b>WSH-200</b>
<b>EUT Type</b>	<b>Dual-Mode AMPS/CDMA Cellular Phone</b>
<b>Classification</b>	<b>Licensed Non-Broadcast Transmitter Held to Ear (TNE)</b>
<b>Rule Part(s)</b>	<b>§22(H), §22.901(d), §2</b>
<b>Max. RF Output Power</b>	<b>0.502 Watts ERP (AMPS) 0.280 Watts ERP (CDMA)</b>
<b>Tx Freq. Range</b>	<b>824.04 - 848.97 MHz (AMPS) 824.70 - 848.31 MHz (CDMA)</b>
<b>Rx Freq. Range</b>	<b>869.04 - 893.97 MHz (AMPS) 869.70 - 893.31 MHz (CDMA)</b>
<b>Emission Designator(s)</b>	<b>40K0F8W, 40K0F1D, 1M25F9W</b>
<b>Modulation(s)</b>	<b>AMPS / CDMA</b>
<b>Battery Type(s)</b>	<b>3.6V Li-Hydrogen Standard Battery</b>

## **2.1 MEASUREMENT PROCEDURES**

### **2.2 TRANSMITTER AUDIO FREQUENCY RESPONSE - §2.1047(a)**

The frequency response of the audio modulating circuit over the frequency range 100 – 5000 Hz is measured. The audio signal generator is connected to the audio input circuit/microphone of the EUT. The audio signal input is adjusted to obtain 50% modulation at 1kHz and this point is taken as the 0dB reference. With the input held constant and below the limit at all frequencies, the audio signal generator is varied from 100 to 50 kHz.

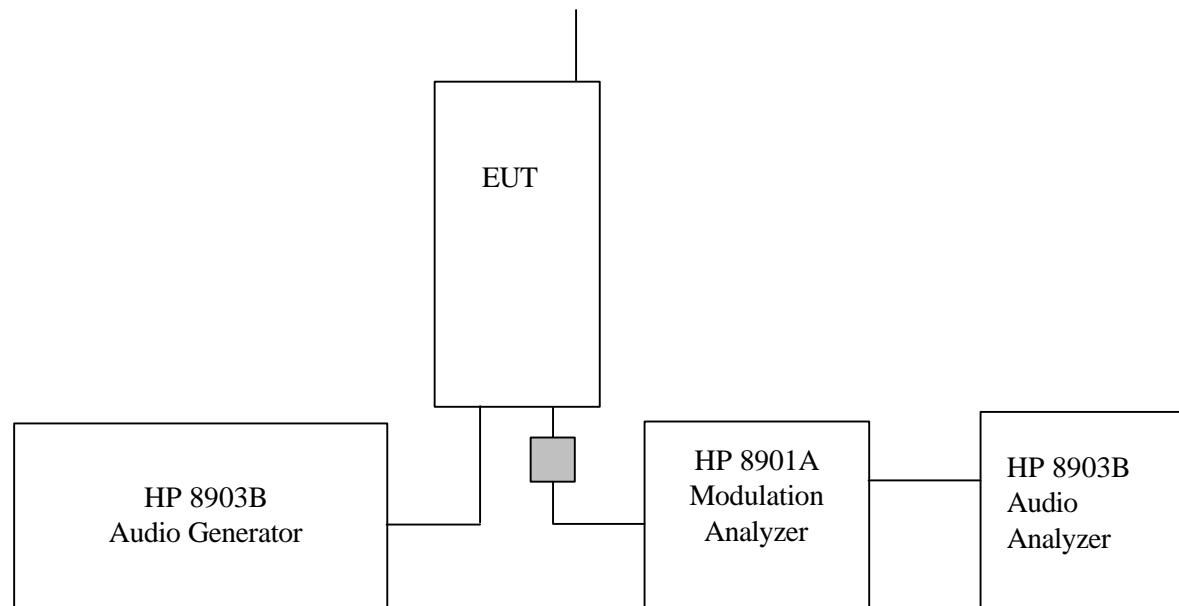
### **2.3 AUDIO LOW PASS FILTER FREQUENCY RESPONSE - §22.915(d)**

The response in dB relative to 1kHz is measured using the HP8901 Modulation Analyzer. For the frequency response of the audio low-pass filter, the audio input is connected at the input to the modulation limiter and the modulated stage. The audio output is connected at the output of the modulated stage.

### **2.4 MODULATION LIMITING - §2.1047(b) & §22.915(b)**

The audio signal generator is connected to the audio input circuit/microphone of the EUT. The modulation response is measured for each of the three modulating frequencies (300Hz, 1000 Hz, and 3000Hz), and the input voltage is varied from 30% modulation ( $\pm 3.6\text{kHz}$  deviation) to at least 20dB higher than the saturation point. Measurements of modulation and test plots are attached. Measurements were performed for ST, SAT, and wide-band data modulations.

Note: ST, SAT, & Wide-Band data were internally generated by the EUT.



Transmitter Audio Frequency & Tone Modulation Test Setup

### **2.5 OCCUPIED BANDWIDTH - §2.1049(c)**

The antenna output terminal of the EUT was connected to the input of a  $50\Omega$  spectrum analyzer through a matched 30dB attenuator. The radio transmitter was operating at maximum output power with and without internal data modulation. 100% of the in-band modulation is below the specified mask per §22.917.

Specified Limits:

- (a) On any frequency removed from the assigned carrier frequency by more than 20kHz, up to and including 45kHz, the sideband is at least 26dB below the carrier.
- (b) On any frequency removed from the assigned carrier frequency by more than 45kHz, up to and including 90kHz, the sideband is at least 45dB below the carrier.
- (c) On any frequency removed from the assigned carrier frequency by more than 90kHz, up to the first multiple of the carrier frequency, the sideband is at least  $60\text{dB}$  below the carrier of  $40 + \log_{10} (\text{mean power output in Watts})$  dB, whichever is the smaller attenuation.

### **2.6 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL - §2.1051**

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from 10MHz to 20GHz. The transmitter is modulated with a 2500Hz tone at a level of 16dB greater than that required to provide 50% modulation. The antenna output terminal of the EUT was connected to the input of a  $50\Omega$  spectrum analyzer through a matched 30dB attenuator and coaxial cable. The transmitter was operating at maximum power with internal data modulation.

### **2.7 RADIATED SPURIOUS AND HARMONIC EMISSIONS - §2.1053**

Radiated and harmonic emissions above 1 GHz were measured at our 3-meter outdoor site. The EUT is placed on the turntable and loaded with the integral antenna. A receiving antenna located 3 meters from the turntable receives any signal radiated from the transmitter and its operating accessories. The receiving antenna is varied from 1 to 4 meters and the polarization is varied (horizontal and vertical) to determine the worst-case emission level.

## ***2.8 FREQUENCY STABILITY/TEMPERATURE VARIATION - §2.1055***

The frequency stability of the transmitter is measured by:

- a) Temperature: The temperature is varied from -30°C to +60°C using an environmental chamber.
- b) Primary Supply Voltage: The primary supply voltage is varied from 85% to 115% of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied. The EUT is tested down to the battery endpoint.

*Specification – The minimum frequency stability shall be +/- 0.00025% at any time during normal operation.*

Time Period and Procedure:

1. The carrier frequency of the transmitter and the individual oscillators is measured at room temperature (25°C to 27°C to provide a reference).
2. The equipment is subjected to an overnight “soak” at -30°C without any power applied.
3. After the overnight “soak” at -30°C (usually 14-16 hours), the equipment is turned on in a “standby” condition for one minute before applying power to the transmitter. Measurement of the carrier frequency of the transmitter and the individual oscillators is made within a three-minute interval after applying power to the transmitter.
4. Frequency measurements were made at 10°C intervals up to +60°C, then back to room temperature. A minimum period of one and one half-hour is provided to allow stabilization of the equipment at each temperature level.

### **3.1 TEST DATA**

#### ***3.2 MODULATION LIMITING - §2.1047(b) & §22.915(b)***

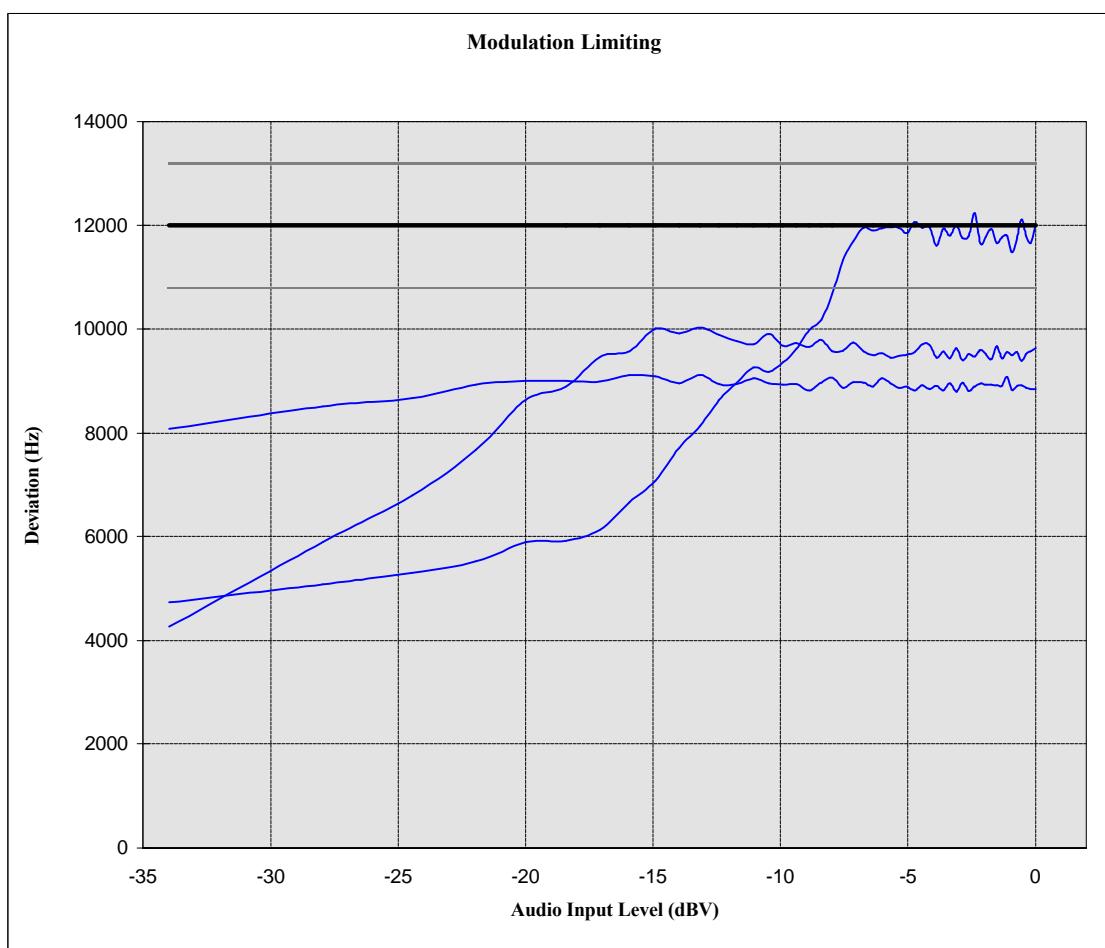
Test Date: 12/21/00

EUT: WIDE TELECOM Dual-Mode AMPS/CDMA Cellular Phone

Model: WSH-200

FCC ID: NPWWSH-200

REFERENCE: 1 kHz = 0 dB



**3.3 FREQUENCY RESPONSE OF AUDIO LOW PASS FILTER - §22.915(d)**

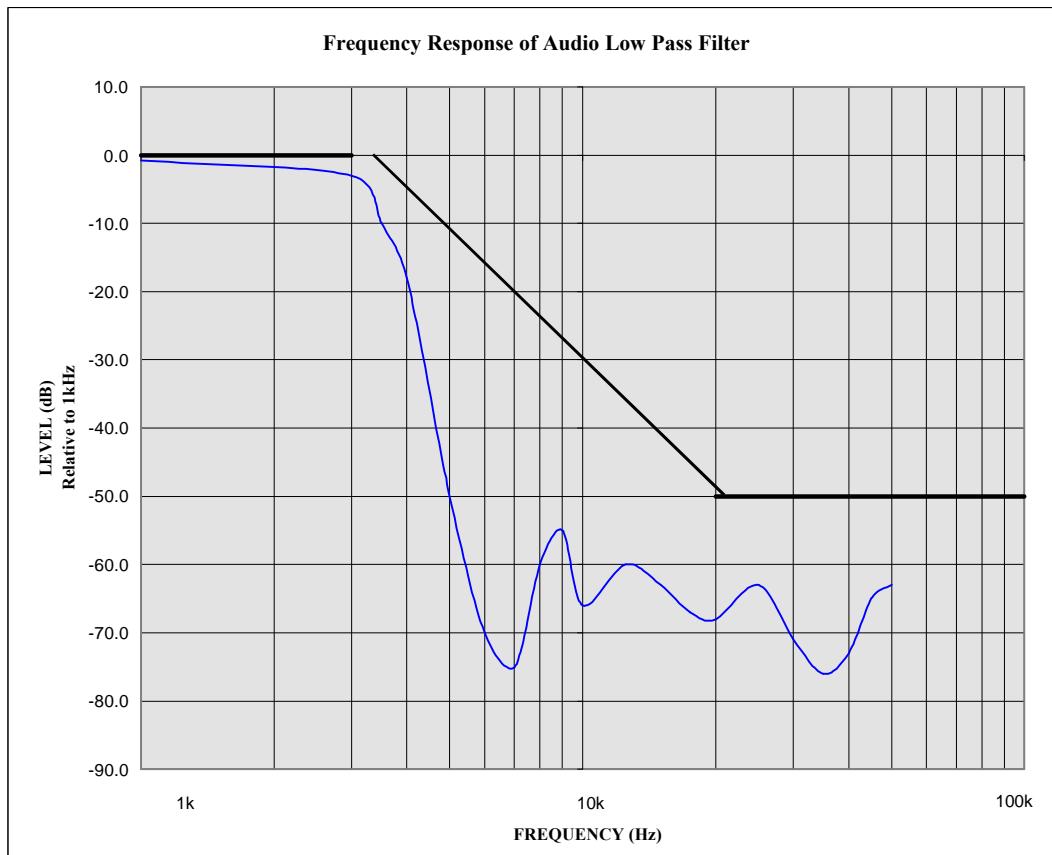
Test Date: 12/21/00

EUT: WIDE TELECOM Dual-Mode AMPS/CDMA Cellular Phone

Model: WSH-200

FCC ID: NPWWSH-200

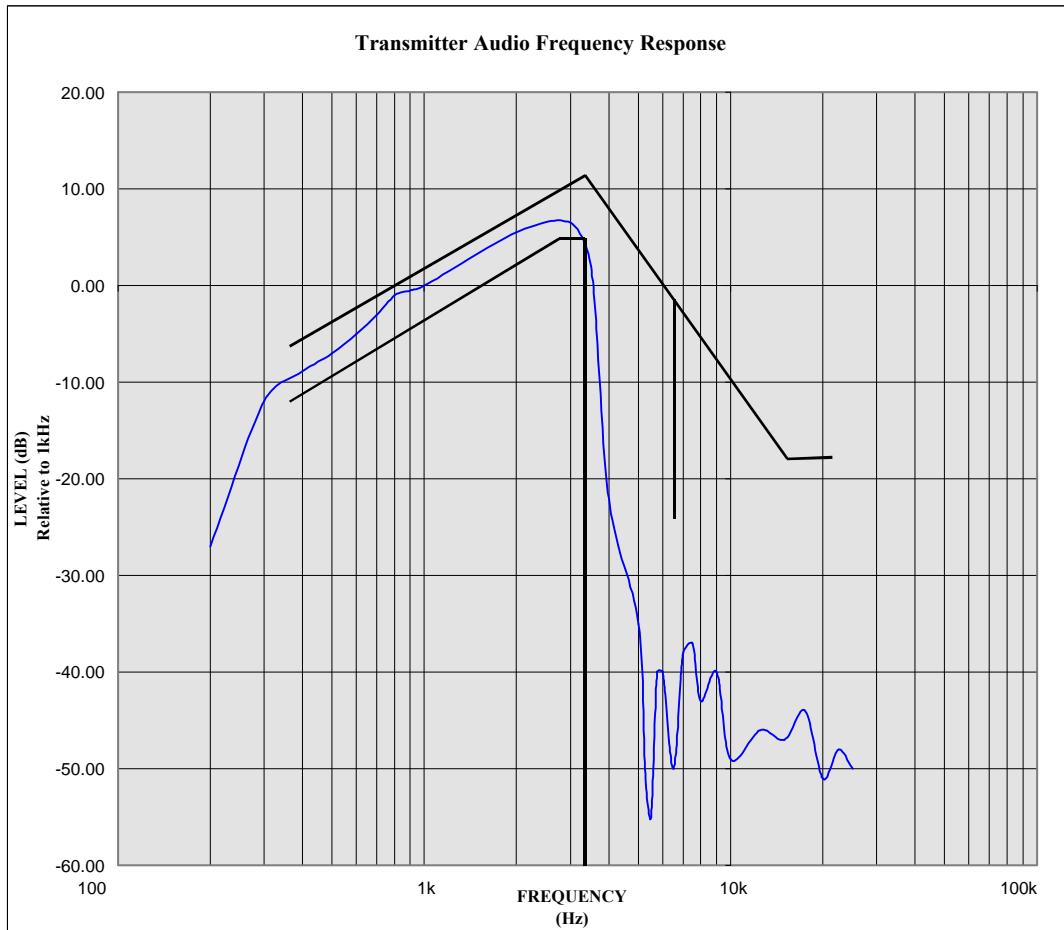
REFERENCE: 1 kHz = 0 dB



**3.4 TRANSMITTER AUDIO FREQUENCY RESPONSE - §2.1047(a)**

Test Date: 12/21/00  
EUT: WIDE TELECOM Dual-Mode AMPS/CDMA Cellular Phone  
Model: WSH-200  
FCC ID: NPWWSH-200

REFERENCE: 1 kHz = 0 dB



**3.5 EFFECTIVE RADIATED POWER OUTPUT - §2.1046**

**AMPS MODE**

Frequency Tuned	EUT Conducted Power	Max. Field Strength of EUT (antenna extended) (dBm)		Dipole Gain	Dipole Forward Conducted Power	ERP of EUT	
(MHz)	(dBm)	V	H	(dBd)	(dBm)	(dBm)	(Watts)
824.04	27.0	- 11.64	- 8.14	- 1.44	28.11	26.67	0.465
836.49	27.0	- 11.82	- 8.40	- 1.34	28.35	27.01	0.502
848.97	27.0	- 11.86	- 8.26	- 1.24	28.24	27.00	0.501

Notes:

1. ERP Measurements by Substitution Method:

The EUT was placed on a turntable 3-meters from the receive antenna. The field of maximum intensity was found by rotating the EUT approximately 360 degrees and changing the height of the receive antenna from 1 to 4 meters. The field strength was recorded from a calibrated spectrum analyzer for each channel being tested. A half-wave dipole was substituted in place of the EUT. The dipole was fed through a directional coupler and the power at the coupler port was monitored. A signal generator and power amplifier controlled the dipole, and the input level of the dipole was adjusted to the same field strength level as the EUT. The feed point for the dipole was then connected to a calibrated power meter and the power adjusted to read the same as the coupler port previously recorded, this is to account for any mismatch in impedance, which may occur at the dipole antenna. The conducted power at the antenna feed point was recorded. The forward power for the dipole was then determined and the ERP level was determined by adding the forward dipole power and the dipole gain in dB. For readings above 1GHz the above method is repeated using standard gain horn antennas.

2. ERP measurements were performed using the standard battery, which is the only battery option for this phone.

**CDMA MODE**

Frequency Tuned (MHz)	EUT Conducted Power (dBm)	Max. Field Strength of EUT (antenna extended) (dBm)		Dipole Gain (dBD)	Dipole Forward Conducted Power (dBm)	ERP of EUT Dipole Gain + Dipole Forward Conducted Power (dBm) (Watts)	
824.70	24.0	V 13.74	H - 10.28	- 1.44	25.57	24.13	0.259
835.89	24.0	V 14.28	H - 10.80	- 1.34	25.81	24.47	0.280
848.31	24.0	V 14.00	H - 10.40	- 1.24	25.70	24.46	0.279

Notes:

1. ERP Measurements by Substitution Method:

The EUT was placed on a turntable 3-meters from the receive antenna. The field of maximum intensity was found by rotating the EUT approximately 360 degrees and changing the height of the receive antenna from 1 to 4 meters. The spectrum analyzer was set to measure channel power for CDMA mode. The field strength was recorded from a calibrated spectrum analyzer for each channel being tested. A half-wave dipole was substituted in place of the EUT. The dipole was fed through a directional coupler and the power at the coupler port was monitored. A signal generator and power amplifier controlled the dipole, and the input level of the dipole was adjusted to the same field strength level as the EUT. The feed point for the dipole was then connected to a calibrated power meter and the power adjusted to read the same as the coupler port previously recorded, this is to account for any mismatch in impedance, which may occur at the dipole antenna. The conducted power at the antenna feed point was recorded. The forward power for the dipole was then determined and the ERP level was determined by adding the forward dipole power and the dipole gain in dB. For readings above 1GHz the above method is repeated using standard gain horn antennas.

2. ERP measurements were performed using the standard battery, which is the only battery option for this phone.

**3.6 FIELD STRENGTH OF SPURIOUS RADIATION - §2.1053**

Operating Frequency: 824.04 MHz  
 Channel: 991 (Low)  
 Measured Conducted Power: 27.0 dBm  
 Modulation: ST (Signaling Tone)  
 Distance: 3 meters  
 Limit:  $43 + 10 \log_{10} (W) = 40.31 \text{ dBc}$

**AMPS MODE**

Frequency (MHz)	Field Strength of Spurious Radiation (dBm)	Horn Forward Cond. Pwr. (dBm)	Standard-Gain Horn Antenna Gain (dBi)	POL (H/V)	EIRP (dBm)	ERP (dBm)	dBc
1648.08	≤ - 71.79	- 44.01	6.6	H	- 35.27	- 37.41	64.08
2472.12	≤ - 83.13	- 53.33	7.8	H	- 43.39	- 45.53	72.20
3296.16	≤ - 91.92	- 65.34	7.75	H	- 55.45	- 57.59	84.26
4120.20	≤ - 105.01	- 75.99	7.6	H	- 66.25	- 68.39	95.06
4944.24	≤ - 107.43	- 81.07	8.5	H	- 70.43	- 72.57	99.24
5768.28	≤ - 105.35	- 74.47	8.8	H	- 63.53	- 65.67	92.34
6592.32	≤ - 103.53	- 64.17	9.6	H	- 52.43	- 54.57	81.24
7416.36	≤ - 105.37	- 67.23	9.0	H	- 56.09	- 58.23	84.90
8240.40	≤ - 106.21	- 70.23	9.3	H	- 58.79	- 60.93	87.60

Radiated Measurements by Substitution Method:

The EUT was placed on a turntable 3-meters from the receive antenna. The field of maximum intensity was found by rotating the EUT approximately 360 degrees and changing the height of the receive antenna from 1 to 4 meters.

The field strength was recorded from a calibrated spectrum analyzer for each channel being tested. A standard gain horn antenna was substituted in place of the EUT. The antenna was fed through a directional coupler and the power at the coupler port was monitored. A signal generator and power amplifier controlled the antenna, and the input level of the antenna was adjusted to the same field strength level as the EUT. The feed point for the antenna was then connected to a calibrated power meter and the power adjusted to read the same as the coupler port previously recorded, this is to account for any mismatch in impedance, which may occur at the horn antenna. The conducted power at the antenna feed point was recorded. The forward power for the antenna was then determined and the EIRP level was determined by adding the forward power and the antenna gain in dB.

**AMPS MODE**

Operating Frequency: 836.49 MHz  
 Channel: 383 (Mid)  
 Measured Conducted Power: 27.0 dBm  
 Modulation: ST (Signaling Tone)  
 Distance: 3 meters  
 Limit:  $43 + 10 \log_{10} (W) = 40.31 \text{ dBc}$

Frequency (MHz)	Field Strength of Spurious Radiation (dBm)	Horn Forward Cond. Pwr. (dBm)	Standard-Gain Horn Antenna Gain (dBi)	POL (H/V)	EIRP (dBm)	ERP (dBm)	dBc
1672.98	$\leq - 75.81$	- 48.03	6.6	H	- 39.29	- 41.43	68.44
2509.47	$\leq - 84.26$	- 54.46	7.8	H	- 44.52	- 46.66	73.67
3345.96	$\leq - 96.80$	- 70.22	7.75	H	- 60.33	- 62.47	89.48
4182.45	$\leq - 102.70$	- 73.68	7.6	H	- 63.94	- 66.08	93.09
5018.94	$\leq - 104.04$	- 77.68	8.5	H	67.04	- 69.18	96.19
5855.43	$\leq - 105.53$	- 74.65	8.8	H	- 63.71	- 65.85	92.86
6691.92	$\leq - 105.64$	- 66.28	9.6	H	- 54.54	- 56.68	83.69
7528.41	$\leq - 103.08$	- 64.13	9.0	H	- 52.99	- 55.13	82.14
8364.90	$\leq - 106.36$	- 70.38	9.3	H	- 58.94	- 61.08	88.09

Radiated Measurements by Substitution Method:

The EUT was placed on a turntable 3-meters from the receive antenna. The field of maximum intensity was found by rotating the EUT approximately 360 degrees and changing the height of the receive antenna from 1 to 4 meters. The field strength was recorded from a calibrated spectrum analyzer for each channel being tested. A standard gain horn antenna was substituted in place of the EUT. The antenna was fed through a directional coupler and the power at the coupler port was monitored. A signal generator and power amplifier controlled the antenna, and the input level of the antenna was adjusted to the same field strength level as the EUT. The feed point for the antenna was then connected to a calibrated power meter and the power adjusted to read the same as the coupler port previously recorded, this is to account for any mismatch in impedance, which may occur at the horn antenna. The conducted power at the antenna feed point was recorded. The forward power for the antenna was then determined and the EIRP level was determined by adding the forward power and the antenna gain in dB.

**AMPS MODE**

Operating Frequency: 848.97 MHz  
 Channel: 799 (High)  
 Measured Conducted Power: 27.0 dBm  
 Modulation: ST (Signaling Tone)  
 Distance: 3 meters  
 Limit:  $43 + 10 \log_{10} (W) = 40.31 \text{ dBc}$

Frequency (MHz)	Field Strength of Spurious Radiation (dBm)	Horn Forward Cond. Pwr. (dBm)	Standard-Gain Horn Antenna Gain (dBi)	POL (H/V)	EIRP (dBm)	ERP (dBm)	dBc
1697.94	$\leq - 73.10$	- 45.32	6.6	H	- 36.58	- 38.72	65.72
2546.91	$\leq - 84.87$	- 55.07	7.8	H	- 45.13	- 47.27	74.27
3395.88	$\leq - 91.72$	- 65.14	7.75	H	- 55.25	- 57.39	84.39
4244.85	$\leq - 104.95$	- 75.93	7.6	H	- 66.19	- 68.33	95.33
5093.82	$\leq - 103.40$	- 77.04	8.5	H	- 66.40	- 68.54	95.54
5942.79	$\leq - 105.17$	- 74.29	8.8	H	- 63.35	- 65.49	92.49
6791.76	$\leq - 105.87$	- 66.51	9.6	H	- 54.77	- 56.91	83.91
7640.73	$\leq - 104.83$	- 66.69	9.0	H	- 55.55	- 57.69	84.69
8489.70	$\leq - 103.11$	- 67.13	9.3	H	- 55.69	- 57.83	84.83

Radiated Measurements by Substitution Method: construed

The EUT was placed on a turntable 3-meters from the receive antenna. The field of maximum intensity was found by rotating the EUT approximately 360 degrees and changing the height of the receive antenna from 1 to 4 meters. The field strength was recorded from a calibrated spectrum analyzer for each channel being tested. A standard gain horn antenna was substituted in place of the EUT. The antenna was fed through a directional coupler and the power at the coupler port was monitored. A signal generator and power amplifier controlled the antenna, and the input level of the antenna was adjusted to the same field strength level as the EUT. The feed point for the antenna was then connected to a calibrated power meter and the power adjusted to read the same as the coupler port previously recorded, this is to account for any mismatch in impedance, which may occur at the horn antenna. The conducted power at the antenna feed point was recorded. The forward power for the antenna was then determined and the EIRP level was determined by adding the forward power and the antenna gain in dB.

**CDMA MODE**

Operating Frequency: 824.70 MHz  
 Channel: 1013 (Low)  
 Measured Conducted Power: 24.0 dBm  
 Modulation: CDMA (Internal)  
 Distance: 3 meters  
 Limit:  $43 + 10 \log_{10} (W) = 37.48 \text{ dBc}$

Frequency (MHz)	Field Strength of Spurious Radiation (dBm)	Horn Forward Cond. Pwr. (dBm)	Standard-Gain Horn Antenna Gain (dBi)	POL (H/V)	EIRP (dBm)	ERP (dBm)	dBc
1649.40	$\leq - 76.11$	- 48.33	6.6	H	- 39.59	- 41.73	65.86
2474.10	$\leq - 84.16$	- 54.36	7.8	H	- 44.42	- 46.56	70.69
3298.80	$\leq - 96.13$	- 69.55	7.75	H	- 59.66	- 61.80	85.93
4123.50	$\leq - 102.06$	- 73.04	7.6	H	- 63.30	- 65.44	41.31
4948.20	$\leq - 106.67$	- 80.31	8.5	H	- 69.67	- 71.81	95.94
5772.90	$\leq - 105.39$	- 74.51	8.8	H	- 63.57	- 65.71	89.84
6597.60	$\leq - 103.14$	- 63.78	9.6	H	- 52.04	- 54.18	78.31
7422.30	$\leq - 104.08$	- 65.94	9.0	H	- 54.80	- 56.94	81.07
8247.00	$\leq - 103.68$	- 67.70	9.3	H	- 56.26	- 58.40	82.53

Radiated Measurements by Substitution Method:

The EUT was placed on a turntable 3-meters from the receive antenna. The field of maximum intensity was found by rotating the EUT approximately 360 degrees and changing the height of the receive antenna from 1 to 4 meters.

The field strength was recorded from a calibrated spectrum analyzer for each channel being tested. A standard gain horn antenna was substituted in place of the EUT. The antenna was fed through a directional coupler and the power at the coupler port was monitored. A signal generator and power amplifier controlled the antenna, and the input level of the antenna was adjusted to the same field strength level as the EUT. The feed point for the antenna was then connected to a calibrated power meter and the power adjusted to read the same as the coupler port previously recorded, this is to account for any mismatch in impedance, which may occur at the horn antenna. The conducted power at the antenna feed point was recorded. The forward power for the antenna was then determined and the EIRP level was determined by adding the forward power and the antenna gain in dB.

**CDMA MODE**

Operating Frequency: 835.89 MHz  
Channel: 363 (Mid)  
Measured Conducted Power: 24.0 dBm  
Modulation: CDMA (Internal)  
Distance: 3 meters  
Limit:  $43 + 10 \log_{10} (W) = 37.48 \text{ dBc}$

Frequency (MHz)	Field Strength of Spurious Radiation (dBm)	Horn Forward Cond. Pwr. (dBm)	Standard-Gain Horn Antenna Gain (dBi)	POL (H/V)	EIRP (dBm)	ERP (dBm)	dBc
1671.78	$\leq -74.31$	- 46.52	6.6	H	- 37.78	- 39.92	64.39
2507.67	$\leq -79.26$	- 49.46	7.8	H	- 39.52	- 41.66	66.13
3343.56	$\leq -95.70$	- 69.12	7.75	H	- 59.23	- 61.37	85.84
4179.45	$\leq -102.04$	- 73.02	7.6	H	- 63.28	- 65.42	89.89
5015.34	$\leq -106.77$	- 80.41	8.5	H	- 69.77	- 71.91	96.38
5851.23	$\leq -103.92$	- 73.08	8.8	H	- 62.14	- 64.28	88.75
6687.12	$\leq -106.32$	- 66.96	9.6	H	- 55.22	- 57.36	81.83
7523.01	$\leq -100.78$	- 62.64	9.0	H	- 51.50	- 53.64	78.11
8358.90	$\leq -104.60$	- 68.62	9.3	H	- 57.18	- 59.32	83.79

Radiated Measurements by Substitution Method:

The EUT was placed on a turntable 3-meters from the receive antenna. The field of maximum intensity was found by rotating the EUT approximately 360 degrees and changing the height of the receive antenna from 1 to 4 meters.

The field strength was recorded from a calibrated spectrum analyzer for each channel being tested. A standard gain horn antenna was substituted in place of the EUT. The antenna was fed through a directional coupler and the power at the coupler port was monitored. A signal generator and power amplifier controlled the antenna, and the input level of the antenna was adjusted to the same field strength level as the EUT. The feed point for the antenna was then connected to a calibrated power meter and the power adjusted to read the same as the coupler port previously recorded, this is to account for any mismatch in impedance, which may occur at the horn antenna. The conducted power at the antenna feed point was recorded. The forward power for the antenna was then determined and the EIRP level was determined by adding the forward power and the antenna gain in dB.

**CDMA MODE**

Operating Frequency: 848.31 MHz  
 Channel: 777 (High)  
 Measured Conducted Power: 24.0 dBm  
 Modulation: CDMA (Internal)  
 Distance: 3 meters  
 Limit:  $43 + 10 \log_{10} (W) = 37.48 \text{ dBc}$

Frequency (MHz)	Field Strength of Spurious Radiation (dBm)	Horn Forward Cond. Pwr. (dBm)	Standard-Gain Horn Antenna Gain (dBi)	POL (H/V)	EIRP (dBm)	ERP (dBm)	dBc
1697.40	$\leq - 75.38$	- 47.60	6.6	H	- 38.86	- 41.00	65.46
2546.10	$\leq - 82.82$	- 53.02	7.8	H	- 43.08	- 45.22	69.68
3394.80	$\leq - 93.83$	- 67.25	7.75	H	- 57.36	- 59.50	83.96
4243.50	$\leq - 104.30$	- 75.28	7.6	H	- 65.54	- 67.68	92.14
5092.20	$\leq - 108.67$	- 82.31	8.5	H	- 71.67	- 73.81	98.27
5940.90	$\leq - 107.33$	- 76.25	8.8	H	- 65.31	- 67.45	91.91
6789.60	$\leq - 102.06$	- 62.70	9.6	H	- 50.96	- 53.10	77.56
7638.30	$\leq - 102.94$	- 64.80	9.0	H	- 53.66	- 55.80	80.26
8487.00	$\leq - 105.98$	- 70.00	9.3	H	- 58.56	- 60.70	85.16

Radiated Measurements by Substitution Method:

The EUT was placed on a turntable 3-meters from the receive antenna. The field of maximum intensity was found by rotating the EUT approximately 360 degrees and changing the height of the receive antenna from 1 to 4 meters. The field strength was recorded from a calibrated spectrum analyzer for each channel being tested. A standard gain horn antenna was substituted in place of the EUT. The antenna was fed through a directional coupler and the power at the coupler port was monitored. A signal generator and power amplifier controlled the antenna, and the input level of the antenna was adjusted to the same field strength level as the EUT. The feed point for the antenna was then connected to a calibrated power meter and the power adjusted to read the same as the coupler port previously recorded, this is to account for any mismatch in impedance, which may occur at the horn antenna. The conducted power at the antenna feed point was recorded. The forward power for the antenna was then determined and the EIRP level was determined by adding the forward power and the antenna gain in dB.

### 3.7 FREQUENCY STABILITY - § 2.1055

Operating Frequency: 836,490,000 Hz

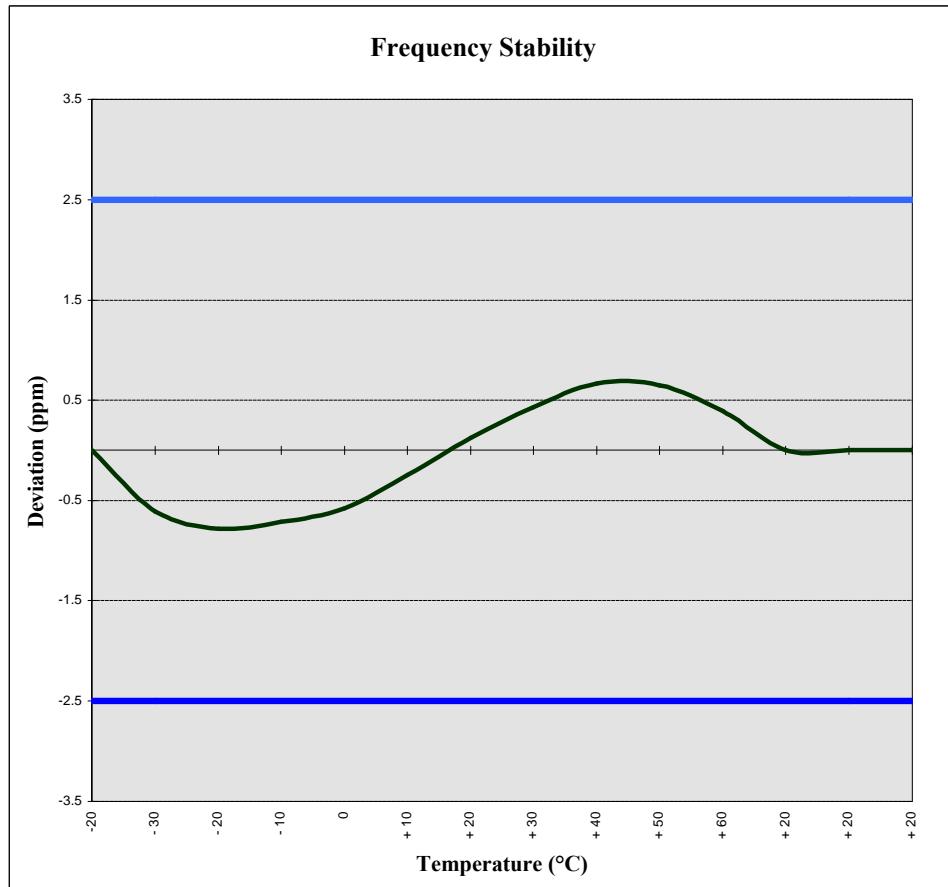
Channel: 383

Reference Voltage: 3.6 VDC

Deviation Limit: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQ. (Hz)	Deviation (%)
100 %	3.60	+ 20 (Ref)	836490000	0.00000000
100 %		- 30	836490508	-0.00000061
100 %		- 20	836490653	-0.00000078
100 %		- 10	836490598	-0.00000071
100 %		0	836490482	-0.00000058
100 %		+ 10	836490208	-0.00000025
100 %		+ 20	836489897	0.00000012
100 %		+ 30	836489639	0.00000043
100 %		+ 40	836489443	0.00000067
100 %		+ 50	836489456	0.00000065
100 %		+ 60	836489672	0.00000039
85 %	3.06	+ 20	836490000	0.00000000
115 %	4.14	+ 20	836490000	0.00000000
BATT. ENDPOINT	2.88	+ 20	836490000	0.00000000

***FREQUENCY STABILITY - § 2.1055***



#### 4.1 TEST EQUIPMENT

<u>Type</u>	<u>Model</u>	<u>Calib. Date</u>	<u>Serial No.</u>
Signal Generator	HP 8648D (9kHz-4.0GHz)	Nov 1999	3847A00611
Gigatronics Power Meter	8652A	Oct 1999	1835272
Gigatronics Power Sensor (2)	80701A (0.05-18GHz)	Oct 1999	1833535, 1833542
Amplifier Research Power Amp.	5S1G4 (5W, 800MHz-4.2GHz)	N/A	26235
Microwave System Amplifier	HP 83017A (0.5-26.5GHz)	N/A	3123A00587
Network Analyzer	HP 8753E (30kHz-3GHz)	Nov 1999	US38433013
Audio Analyzer	HP 8903B	March 1999	3729A18691
Modulation Analyzer	HP 8901A	March 1999	3749A07154
Frequency Counter	HP 53181A (3GHz)	May 1999	3736A05175
DC Power Supply	HP E3611A	N/A	KR83015294
Multi-Device Controller	EMCO 2090	N/A	9912-1484
Mini Mast	EMCO 2075	N/A	0001-2277
Turntable	EMCO 2080-1.2/1.5	N/A	0002-1002
Double Ridged Horn Antenna	ETS 3115 (1-18GHz)	Oct. 2000	6267
Double Ridged Horn Antenna	ETS 3115 (1-18GHz)	Oct. 2000	6276
Horn Antenna	Chase BBHA 9120-A (0.7-4.8GHz)	Sept 1998	9120A-239
Horn Antenna	Chase BBHA 9120-A (0.7-4.8GHz)	Sept 1998	9120A-240
Roberts Dipoles	Compliance Design (2 sets) 3121C	June 2000	
Spectrum Analyzer	HP 8594E	March 2000	3543A02721
Spectrum Analyzer	HP E4408B	Nov 1999	US39240170
Shielded Screen Room	Lindgren R.F. 18W-2/2-0	N/A	16297
Environmental Chamber	ESPEC ECT-2 (Temperature/Humidity)	Feb 2000	0510154-B

### **5.1 CONCLUSION**

The data collected shows that the WIDE TELECOM INC. Model: WSH-200 Dual-Mode AMPS/CDMA Cellular Phone FCC ID: NPWWSH-200 complies with all the requirements of Parts 2 and 22 of the FCC rules.

## TEST PLOTS

---

11:08:42 JAN 03, 2001

WSH-200 VOICE

REF 27.0 dBm

AT 10 dB

PEAK

LOG

10

dB/

OFFST

31.0

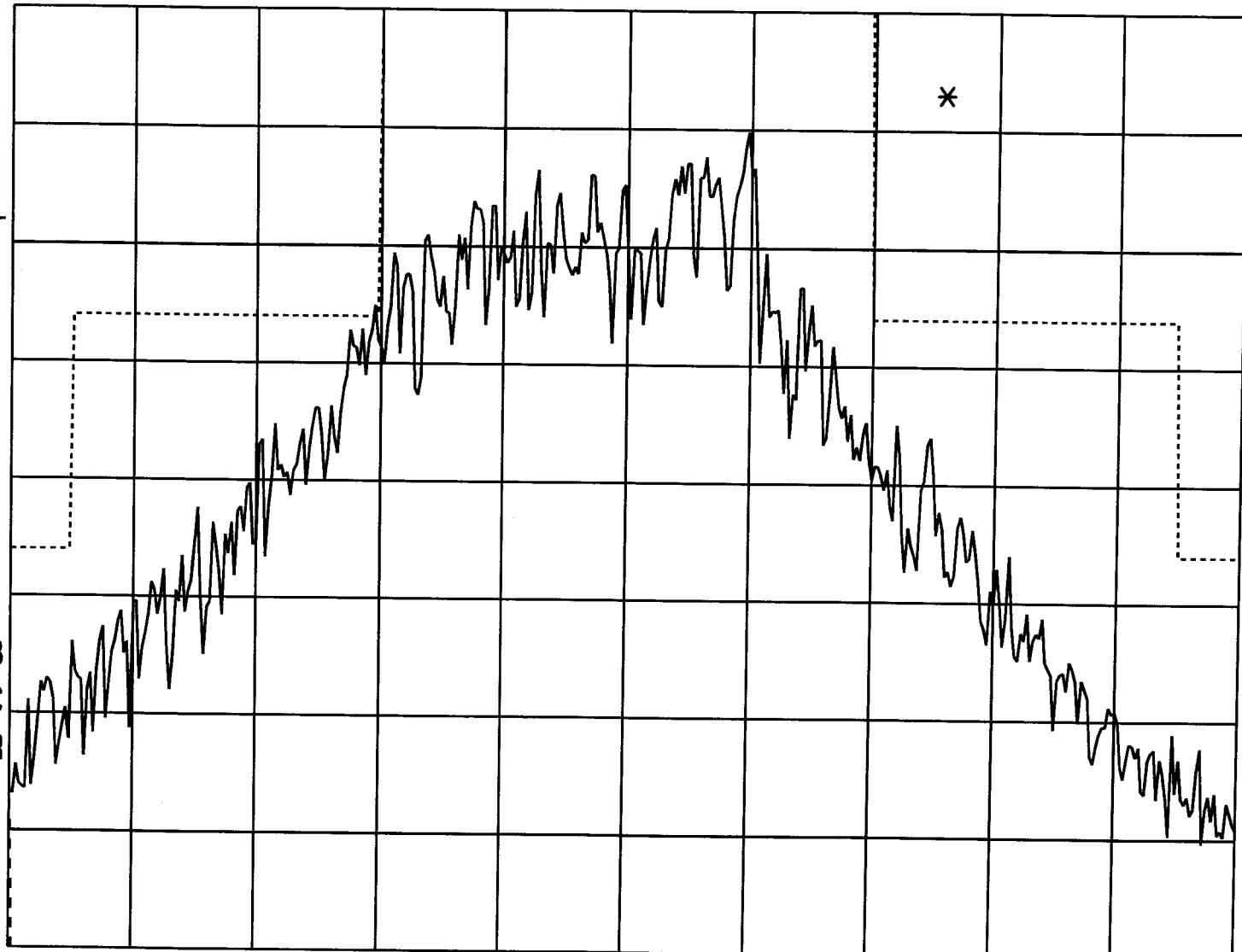
dB

\*

WA SB

SC FC

CORR



CENTER 836.4900 MHz

#RES BW 300 Hz

SPAN 100.0 kHz

#VBW 300 Hz

SWP 3.33 sec

08:49:08 JAN 03, 2001

WSH-200 SAT

REF 27.0 dBm

AT 10 dB

PEAK

LOG

10

dB/

OFFST

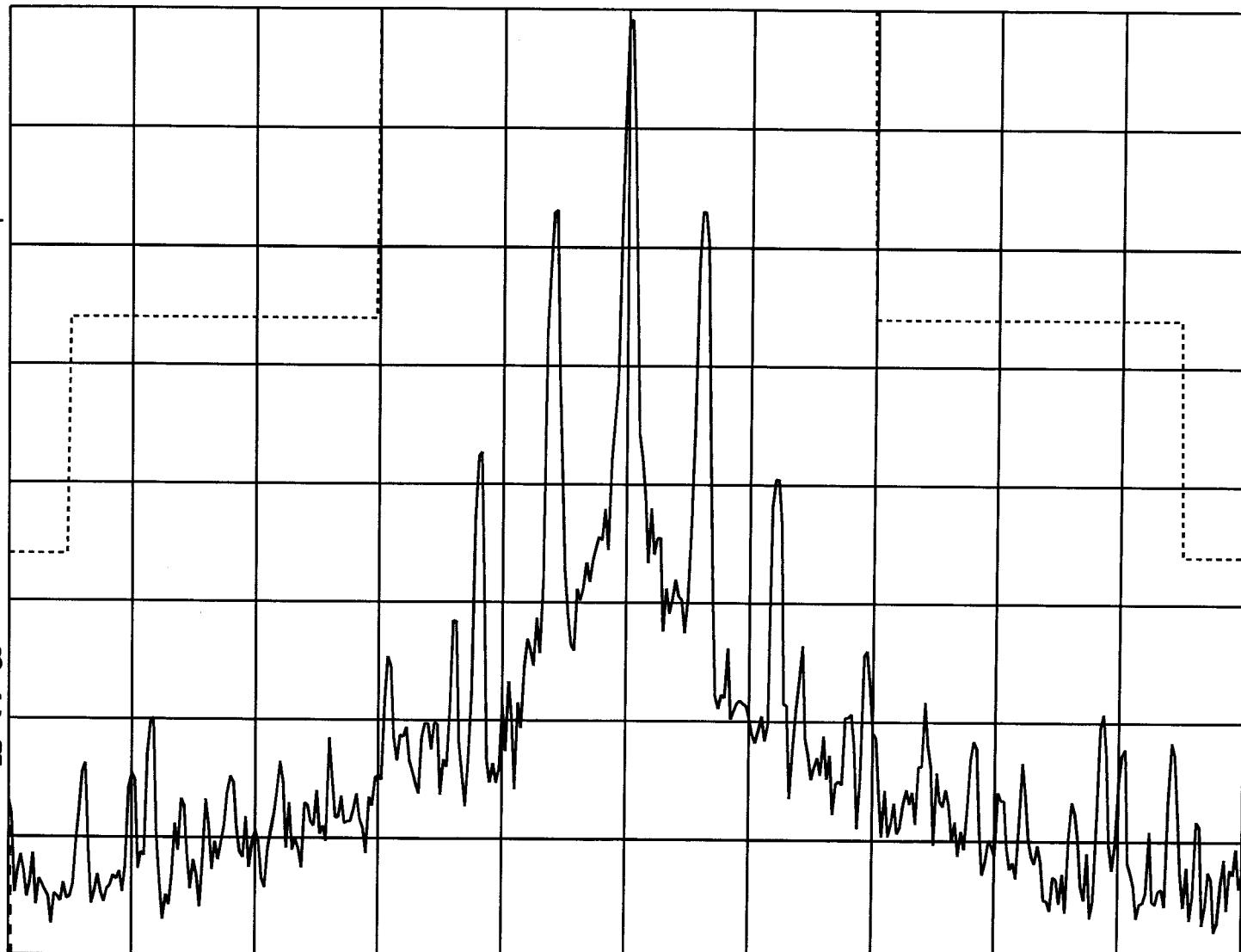
31.0

dB

WA SB

SC FC

CORR



CENTER 836.4900 MHz

#RES BW 300 Hz

#VBW 300 Hz

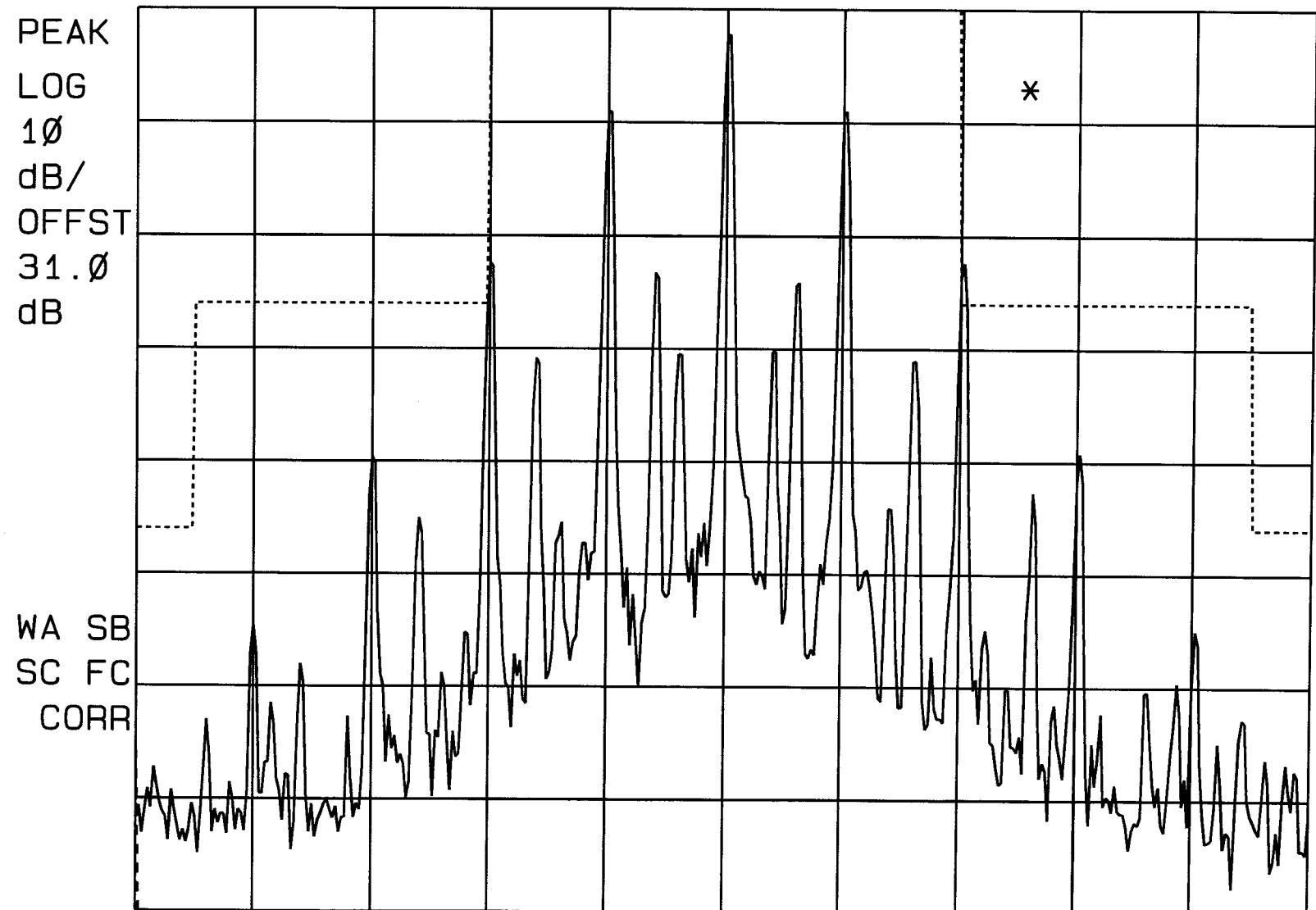
SPAN 100.0 kHz

SWP 3.33 sec

08:49:48 JAN 03, 2001

WSH-200 SAT + ST

REF 27.0 dBm AT 10 dB



CENTER 836.4900 MHz

#RES BW 300 Hz

#VBW 300 Hz

SPAN 100.0 kHz

SWP 3.33 sec

08:39:34 JAN 03, 2001

WSH-200 ST

REF 27.0 dBm

AT 10 dB

PEAK

LOG

10

dB/

OFFST

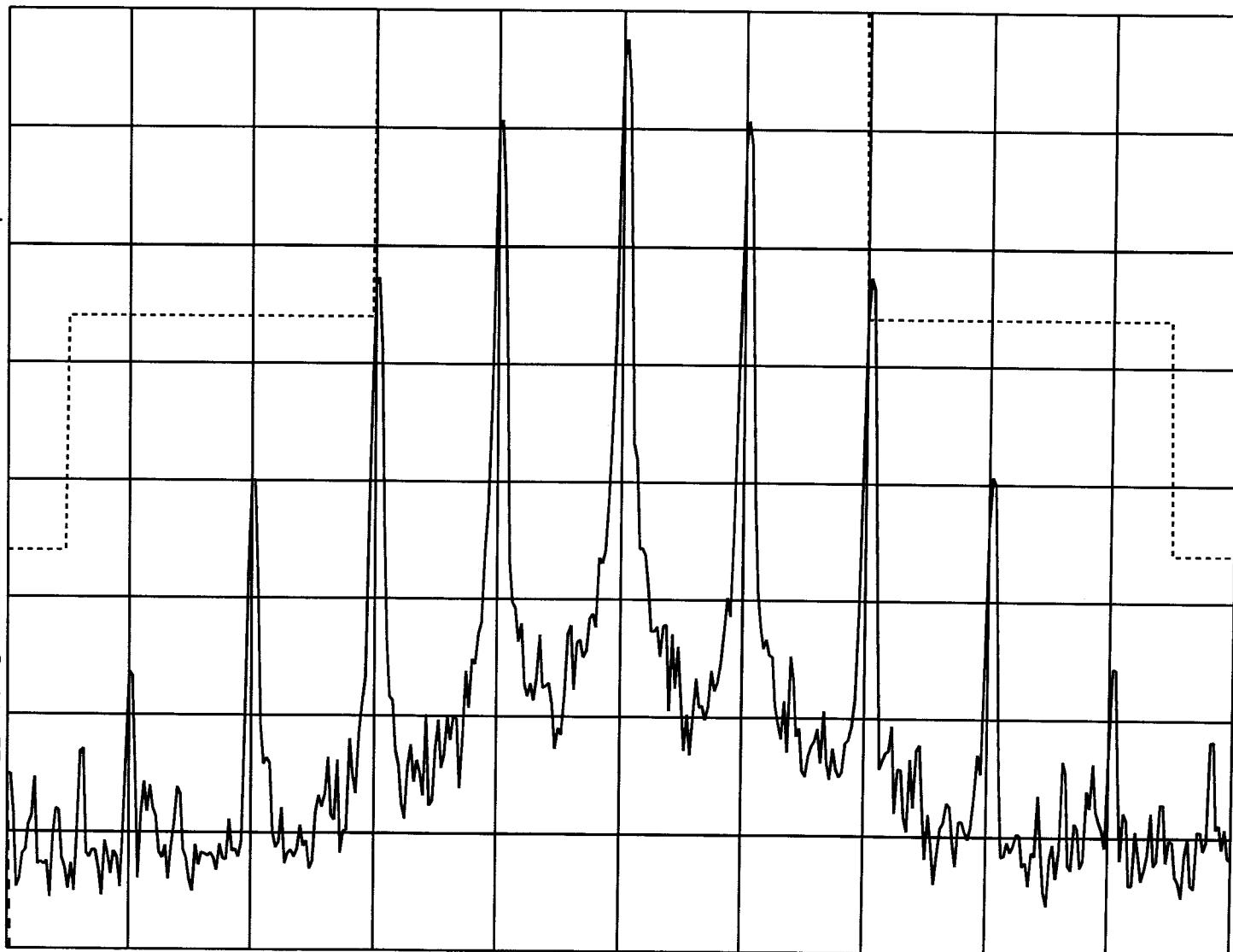
31.0

dB

WA SB

SC FC

CORR



CENTER 836.4900 MHz

#RES BW 300 Hz

#VBW 300 Hz

SPAN 100.0 kHz

SWP 3.33 sec

08:41:11 JAN 03, 2001

WSH-200 DATA

REF 27.0 dBm

AT 10 dB

PEAK

LOG

10

dB/

OFFST

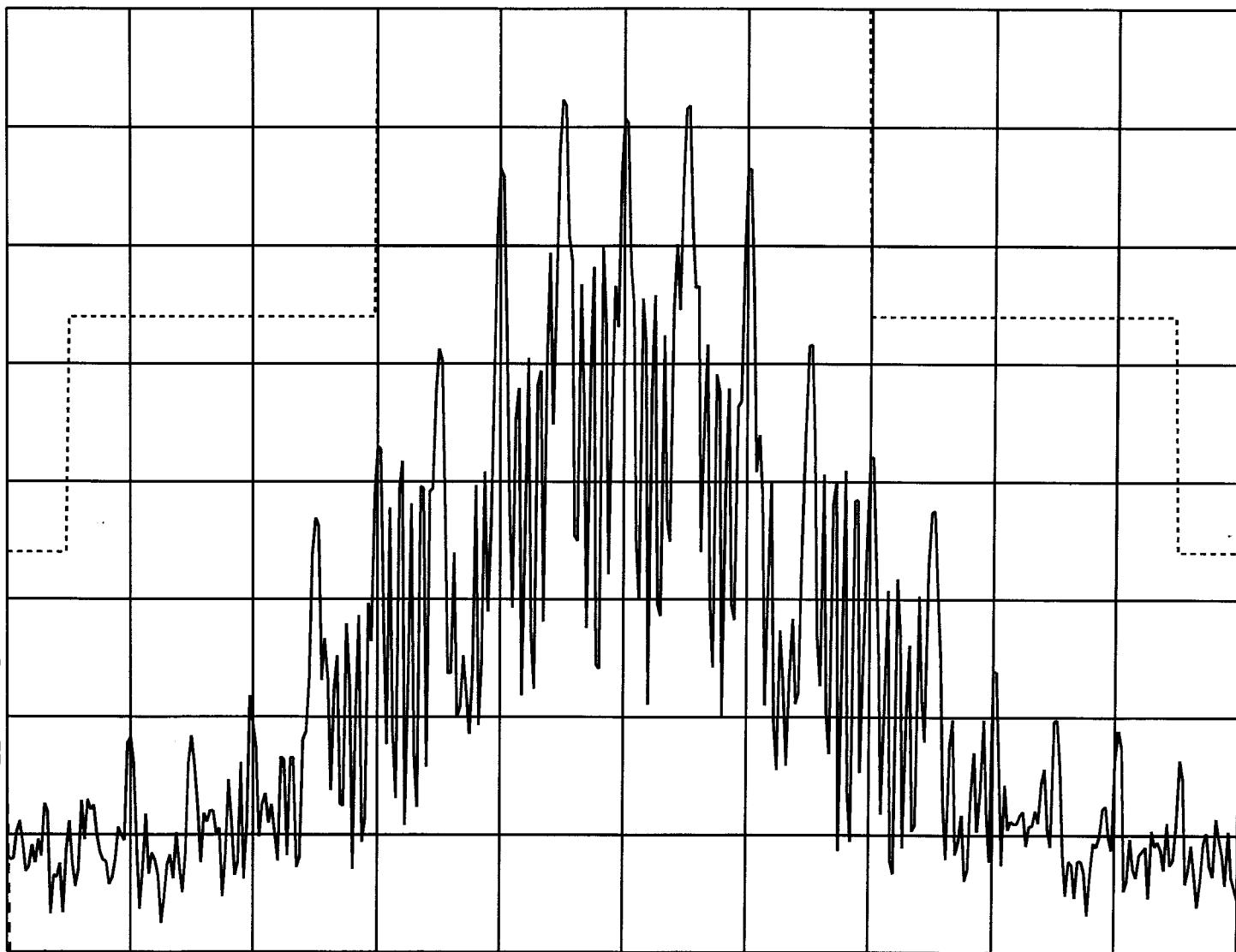
31.0

dB

WA SB

SC FC

CORR



CENTER 836.4900 MHz

#RES BW 300 Hz

#VBW 300 Hz

SPAN 100.0 kHz

SWP 3.33 sec

08:36:24 JAN 03, 2001

WSH-200 UN MOD CARRIER

REF 27.0 dBm AT 10 dB

PEAK

LOG

10

dB/

OFFST

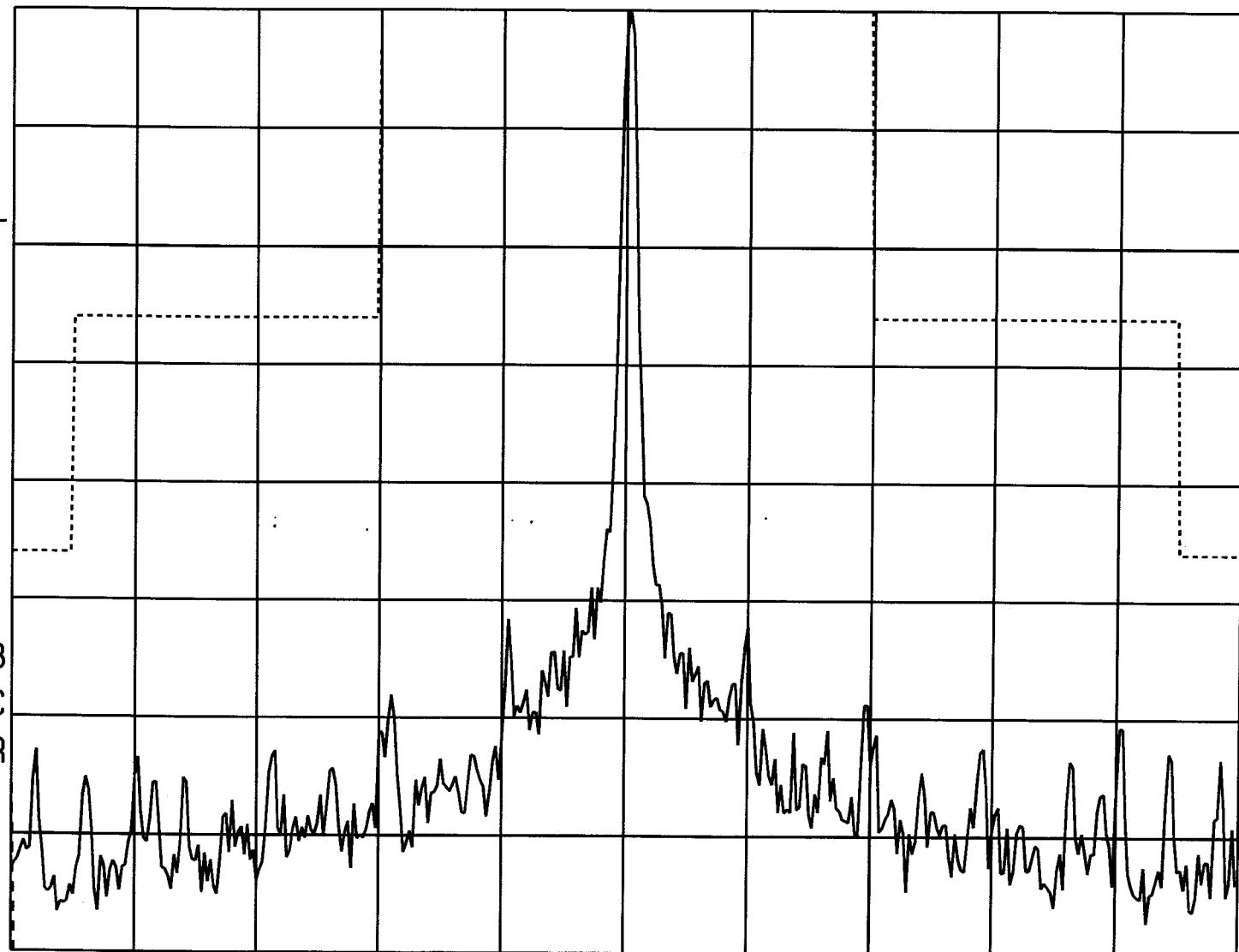
31.0

dB

WA SB

SC FC

CORR



CENTER 836.4900 MHz

#RES BW 300 Hz

#VBW 300 Hz

SPAN 100.0 kHz

SWP 3.33 sec

10:32:38 JAN 03, 2001

WSH-200 SAT + DTMF

REF 27.0 dBm

AT 10 dB

PEAK

LOG

10

dB/

OFFSET

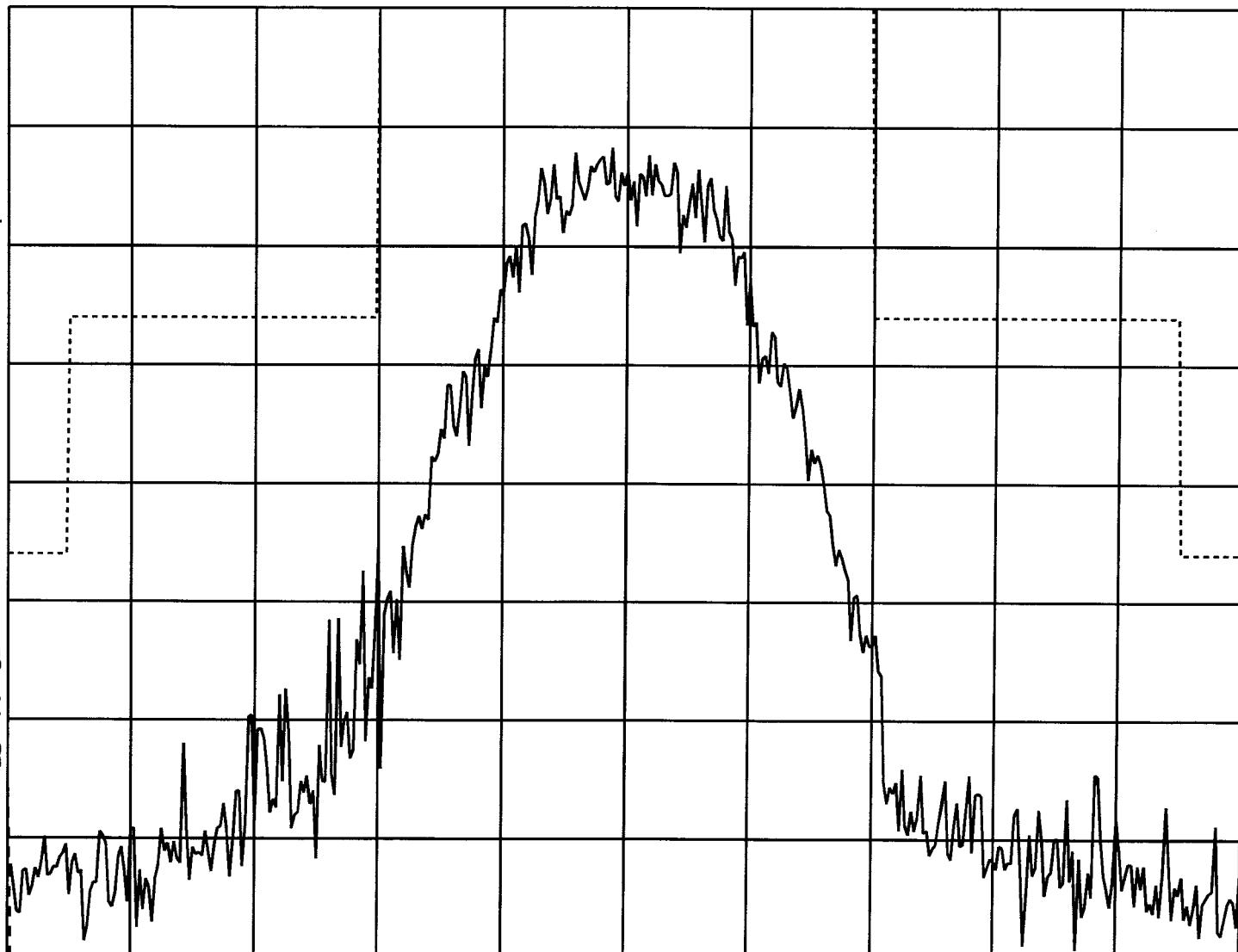
31.0

dB

WA SB

SC FC

CORR



CENTER 836.4900 MHz

#RES BW 300 Hz

#VBW 300 Hz

SPAN 100.0 kHz

SWP 3.33 sec

11:05:35 JAN 03, 2001

HP WSH-200 DTMF

REF 27.0 dBm

AT 10 dB

PEAK

LOG

10

dB/

OFFST

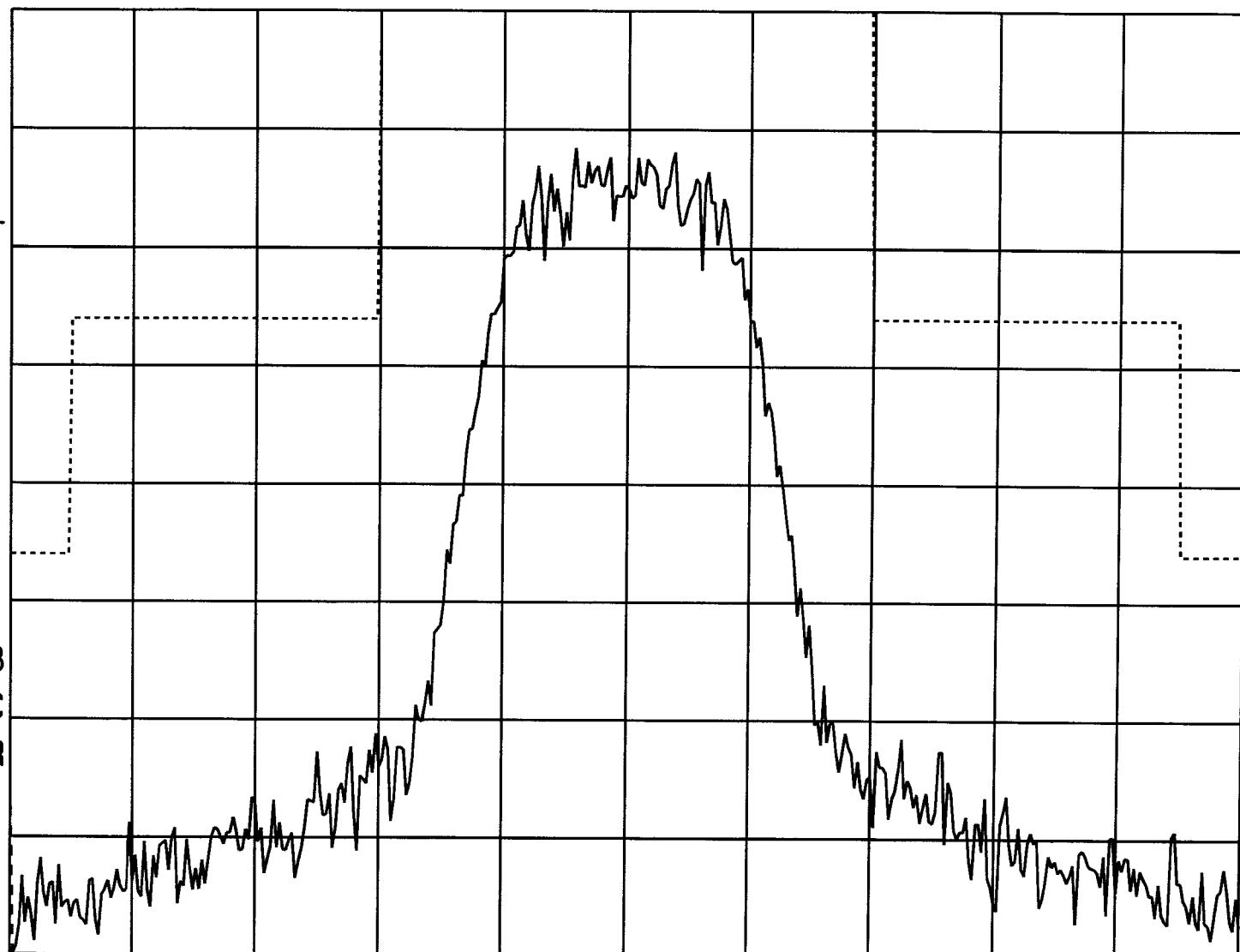
31.0

dB

WA SB

SC FC

CORR



CENTER 836.4900 MHz

#RES BW 300 Hz

#VBW 300 Hz

SPAN 100.0 kHz

SWP 3.33 sec

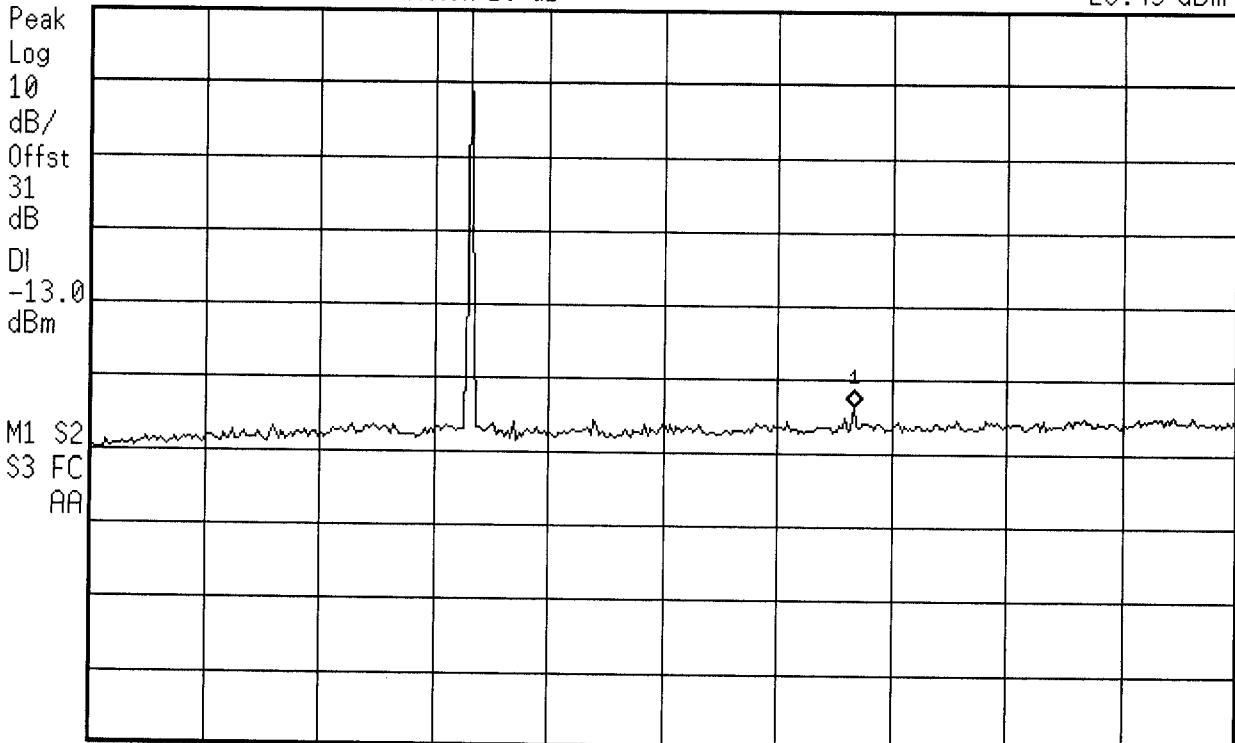
hp 15:02:19 Dec 21, 2000

WSH-200 COND SPURS CH 991

Ref 27 dBm

Atten 10 dB

Mkr1 1.672 GHz  
-26.43 dBm



Start 10 MHz

#Res BW 1 MHz

VBW 1 MHz

Stop 2.5 GHz

Sweep 6.225 ms

hp 15:03:22 Dec 21, 2000

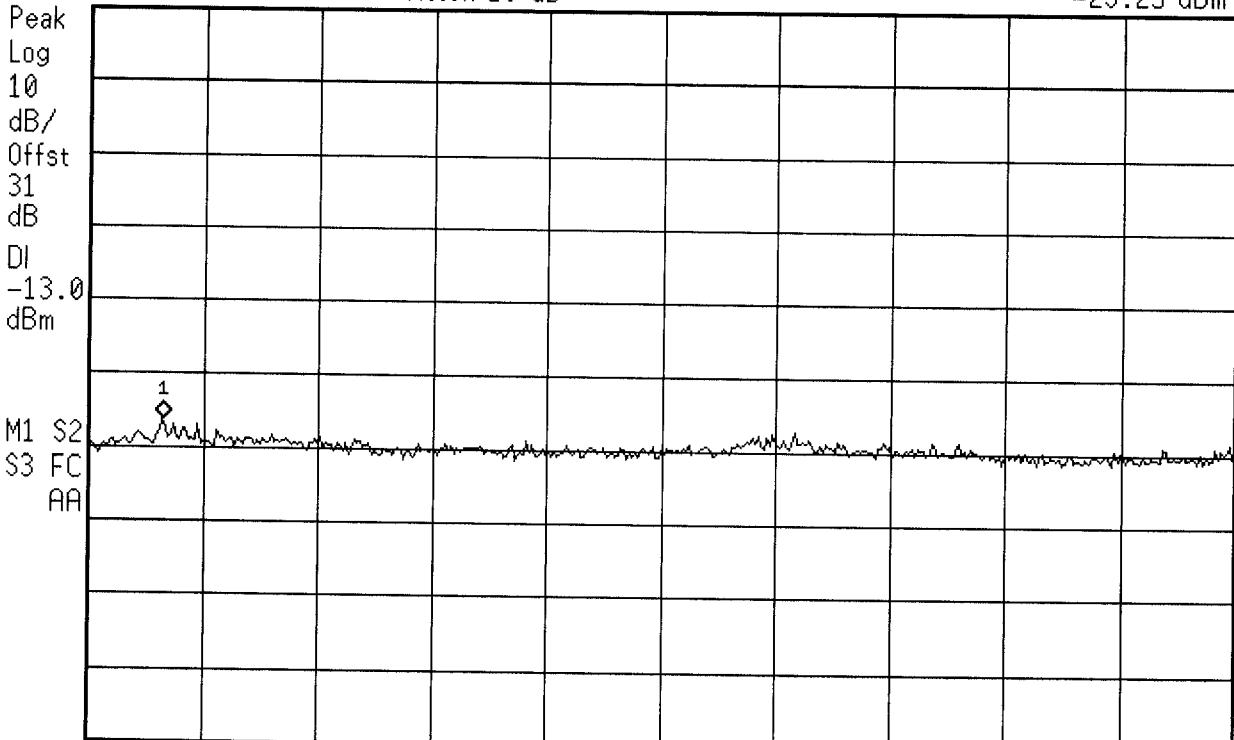
WSH-200 COND SPURS CH 991

Ref 27 dBm

Atten 10 dB

Mkr1 2.988 GHz

-29.25 dBm



Start 2.5 GHz  
#Res BW 1 MHz

VBW 1 MHz

Stop 10 GHz  
Sweep 18.75 ms

hp 15:08:22 Dec 21, 2000

WSH-200 COND SPURS CH 991

Ref 27 dBm

Atten 10 dB

Mkr1 13.23 GHz

-28.76 dBm

Peak

Log

10

dB/

Offst

31

dB

DI

-13.0

dBm

M1 S2

S3 FC

AA

Start 10 GHz

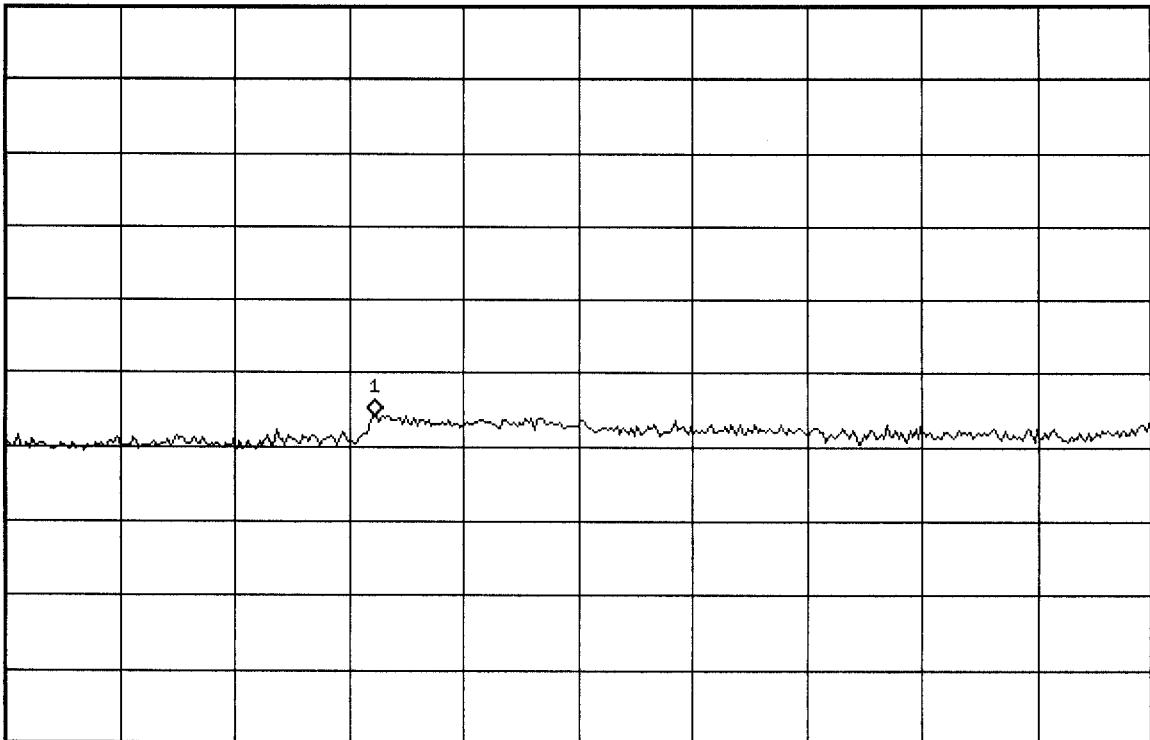
#Res BW 1 MHz

VBW 1 MHz

Stop 20 GHz

Sweep 100 ms

1



[hp] 15:06:10 Dec 21, 2000

WSH-200 COND SPURS CH 383

Ref 27 dBm

Atten 10 dB

Mkr1 2.376 GHz

-27.54 dBm

Peak

Log

10

dB/

Offst

31

dB

DI

-13.0

dBm

M1 S2

S3 FC

AA

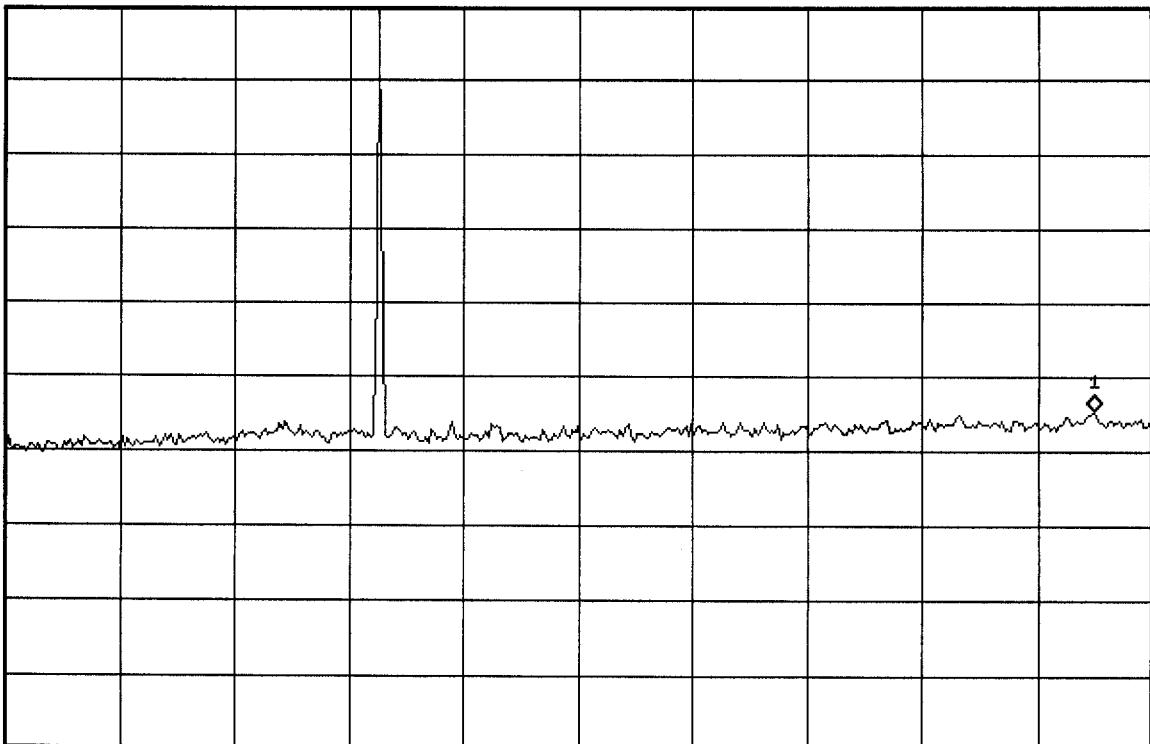
Start 10 MHz

#Res BW 1 MHz

VBW 1 MHz

Stop 2.5 GHz

Sweep 6.225 ms



[hp] 15:06:51 Dec 21, 2000

WSH-200 COND SPURS CH 383

Ref 27 dBm

Atten 10 dB

Mkr1 2.988 GHz

-29.92 dBm

Peak

Log

10

dB/

Offst

31

dB

DI

-13.0

dBm

M1 S2

S3 FC

AA

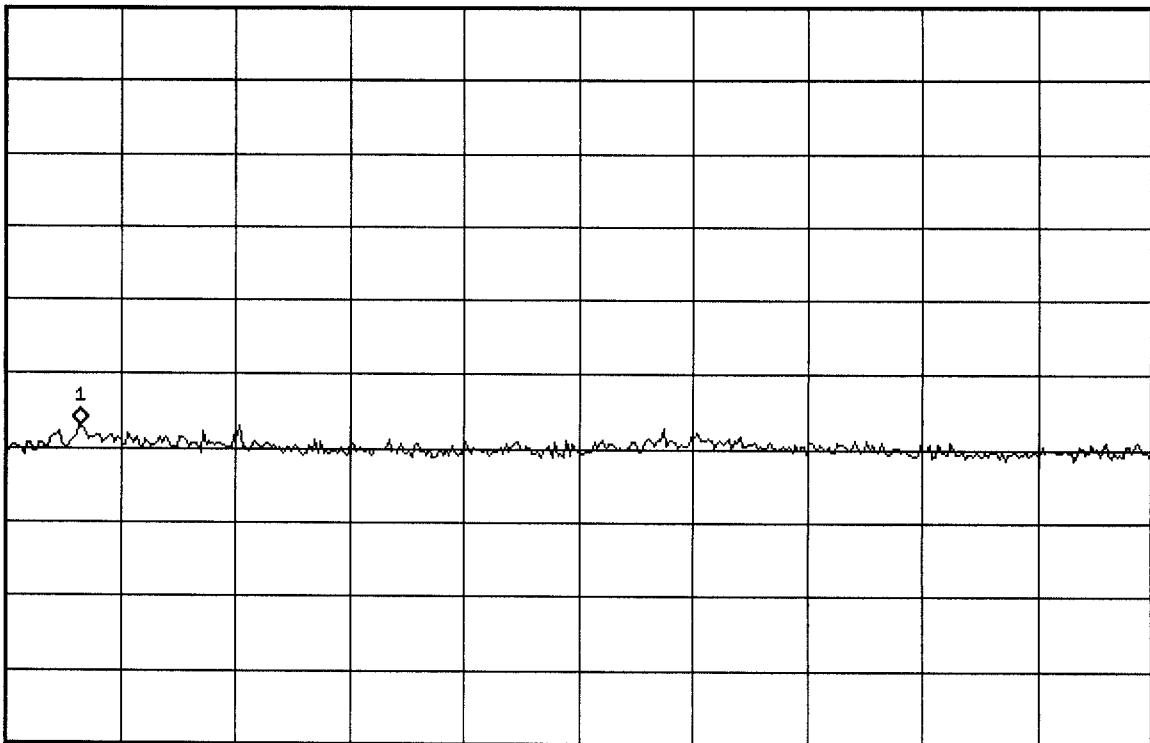
Start 2.5 GHz

#Res BW 1 MHz

VBW 1 MHz

Stop 10 GHz

Sweep 18.75 ms



hp 15:07:12 Dec 21, 2000

WSH-200 COND SPURS CH 383

Ref 27 dBm

Atten 10 dB

Mkr1 13.33 GHz

-28 dBm

Peak

Log

10

dB/

Offst

31

dB

DI

-13.0

dBm

M1 S2

S3 FC

AA

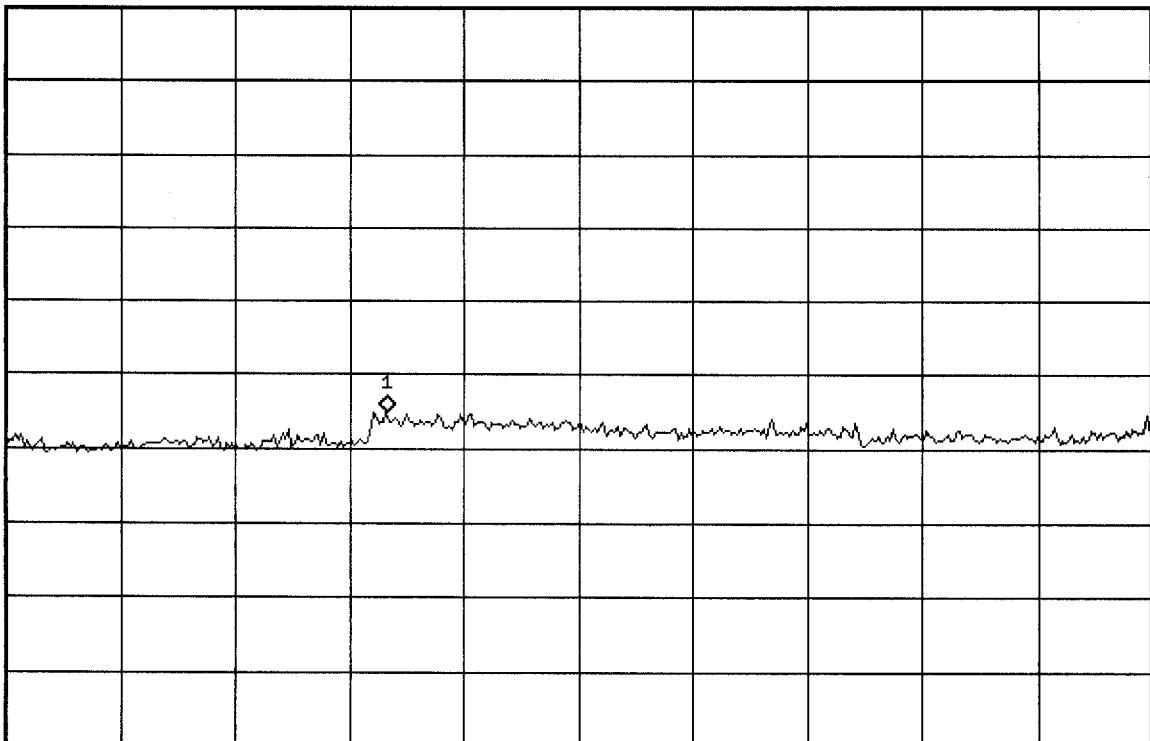
Start 10 GHz

#Res BW 1 MHz

VBW 1 MHz

Stop 20 GHz

Sweep 100 ms



hp 15:09:59 Dec 21, 2000

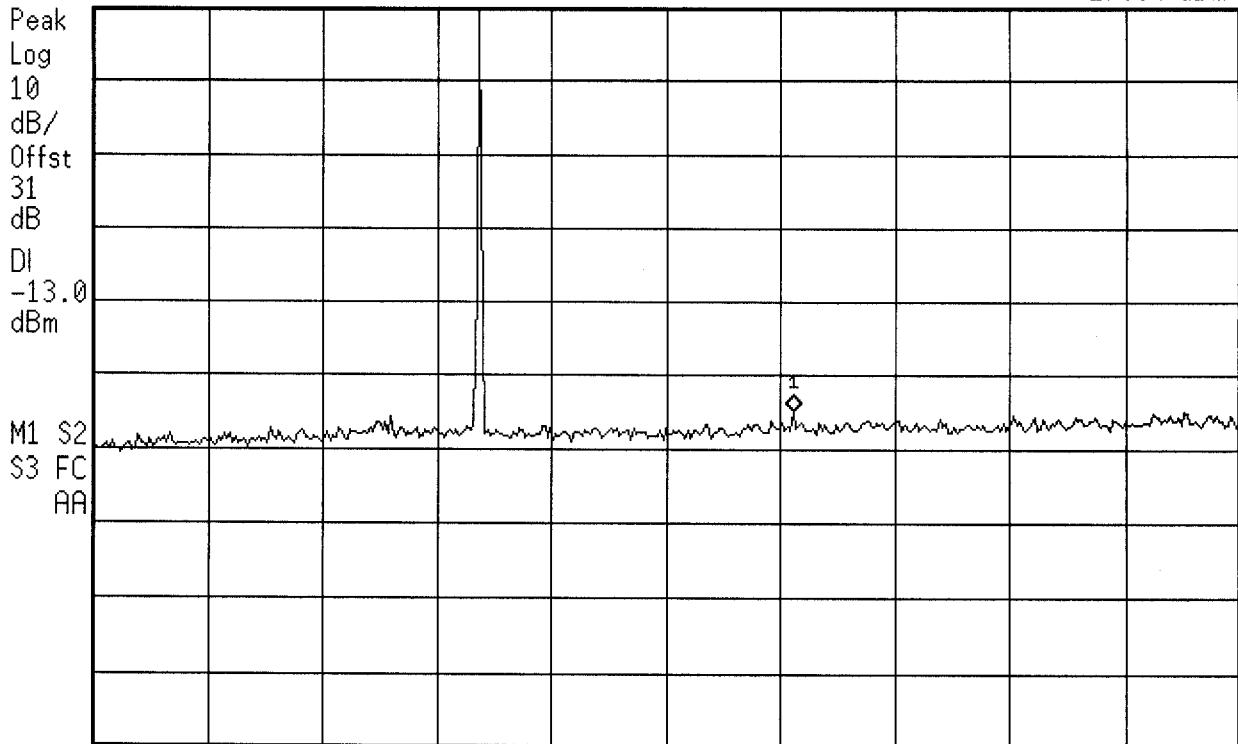
WSH-200 COND SPURS CH 799

Ref 27 dBm

Atten 10 dB

Mkr1 1.535 GHz

-27.94 dBm



Start 10 MHz

#Res BW 1 MHz

VBW 1 MHz

Stop 2.5 GHz

Sweep 6.225 ms

[hp] 15:10:18 Dec 21, 2000

WSH-200 COND SPURS CH 799

Ref 27 dBm

Atten 10 dB

Mkr1 2.556 GHz

-23.99 dBm

Peak

Log

10

dB/

0ffst

31

dB

DI

-13.0

dBm

1

0

M1 S2

S3 FC

AA

Start 2.5 GHz

#Res BW 1 MHz

VBW 1 MHz

Stop 10 GHz

Sweep 18.75 ms

[hp] 15:10:49 Dec 21, 2000

WSH-200 COND SPURS CH 799

Ref 27 dBm

Atten 10 dB

Mkr1 13.53 GHz

-28.44 dBm

Peak

Log

10

dB/

Offst

31

dB

DI

-13.0

dBm

M1 S2

S3 FC

AA

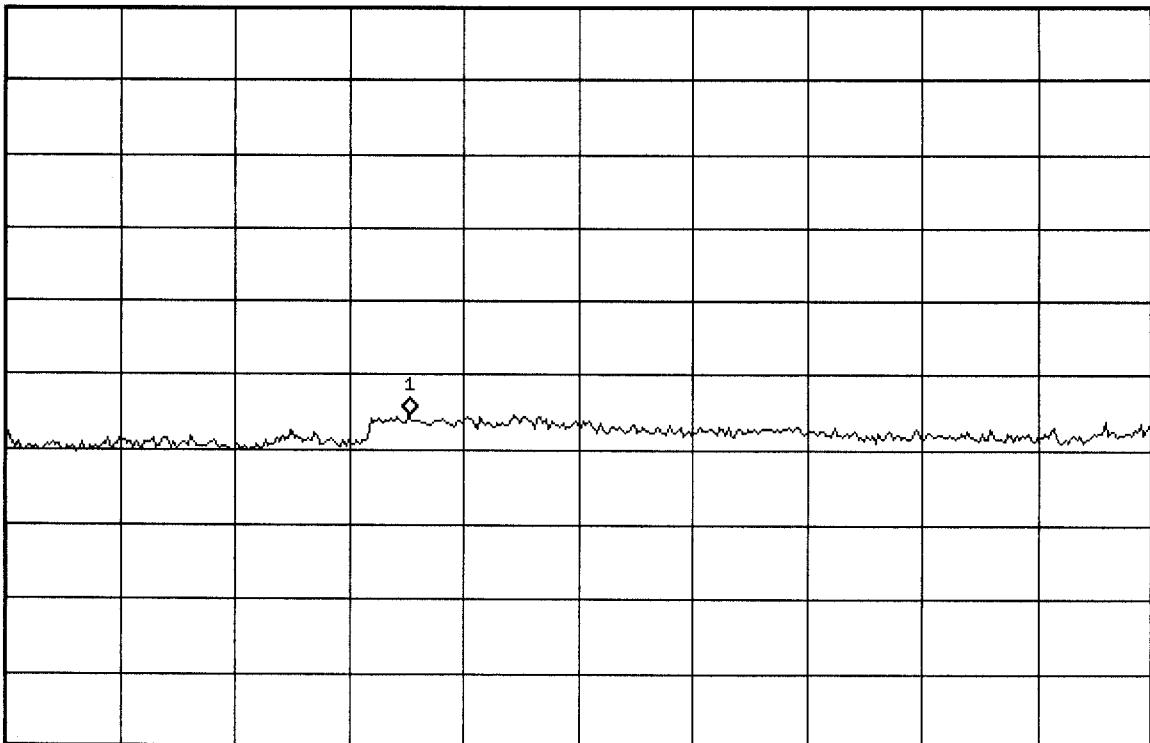
Start 10 GHz

#Res BW 1 MHz

VBW 1 MHz

Stop 20 GHz

Sweep 100 ms



 15:16:01 Dec 21, 2000

WSH-200 COND SPURS CH 1013

Ref 24 dBm

Atten 5 dB

Mkr1 2.046 GHz

-31.88 dBm

Peak

Log

10

± 5

607

31

31  
dB

64

1

-13.0

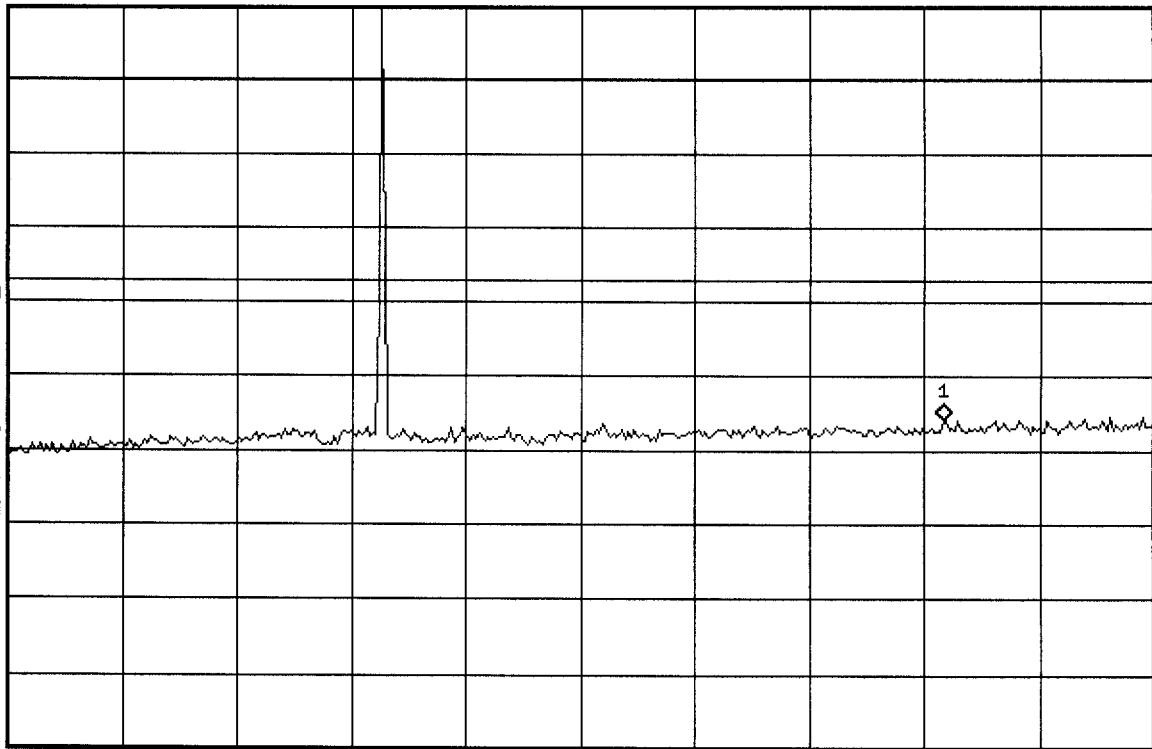
dBm

M1 S2

M1 32  
00 50

53 FL

AA



Start 10 MHz

#Res BW 1 MHz

VBW 1 MHz

Stop 2.5 GHz

Sweep 6,225 ms

[hp] 15:16:21 Dec 21, 2000

WSH-200 COND SPURS CH 1013

Ref 24 dBm

Atten 5 dB

Mkr1 3.100 GHz

-32.86 dBm

Peak

Log

10

dB/

Offst

31

dB

DI

-13.0

dBm

M1 S2

S3 FC

AA

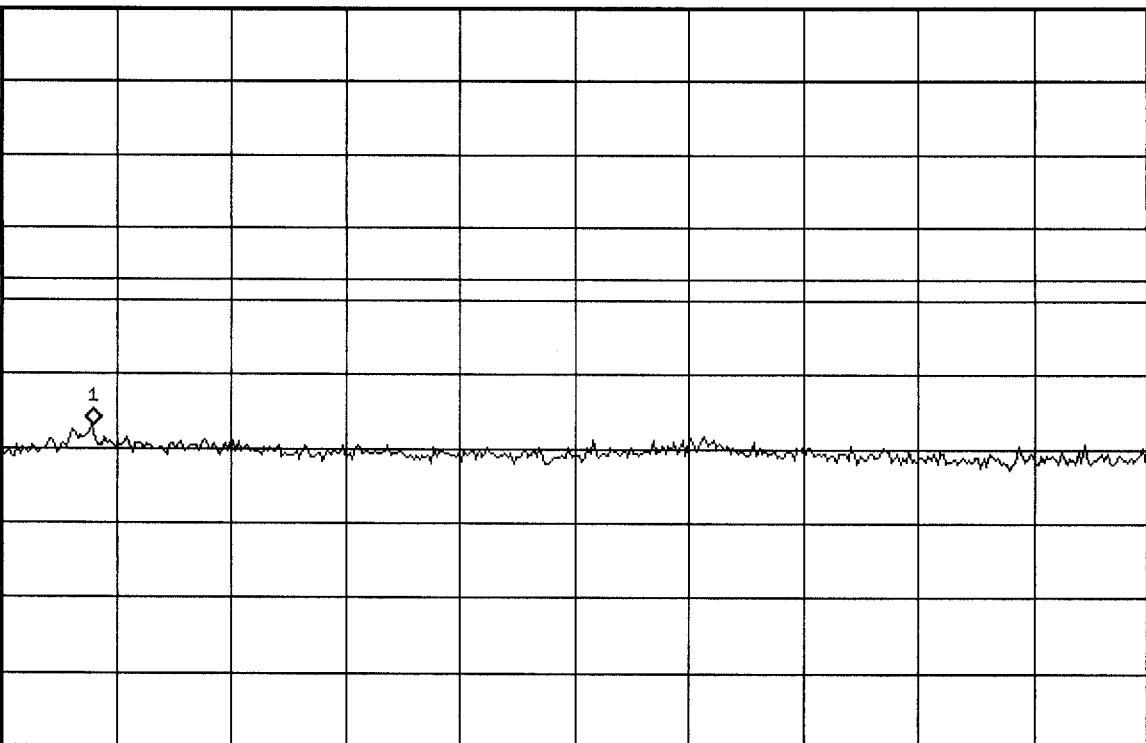
Start 2.5 GHz

#Res BW 1 MHz

VBW 1 MHz

Stop 10 GHz

Sweep 18.75 ms



hp 15:16:42 Dec 21, 2000

WSH-200 COND SPURS CH 1013

Ref 24 dBm

Atten 5 dB

Mkr1 13.75 GHz

-31.84 dBm

Peak

Log

10

dB/

Offst

31

dB

DI

-13.0

dBm

M1 S2

S3 FC

AA

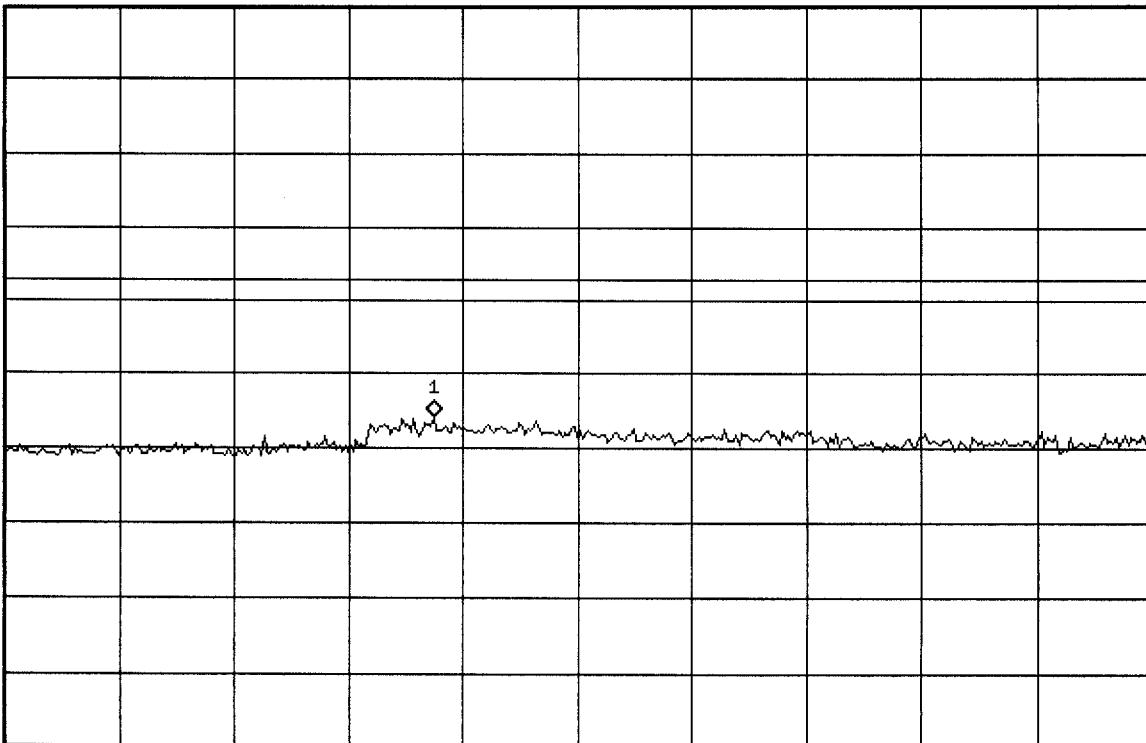
Start 10 GHz

#Res BW 1 MHz

VBW 1 MHz

Stop 20 GHz

Sweep 100 ms



**hp** 15:17:36 Dec 21, 2000

WSH-200 COND SPURS CH 363

Ref 24 dBm

Atten 5 dB

Mkr1 1.672 GHz

-27.42 dBm

Peak

Log

10

dB/

Offst

31

dB

DI

-13.0

dBm

M1 S2

S3 FC

AA

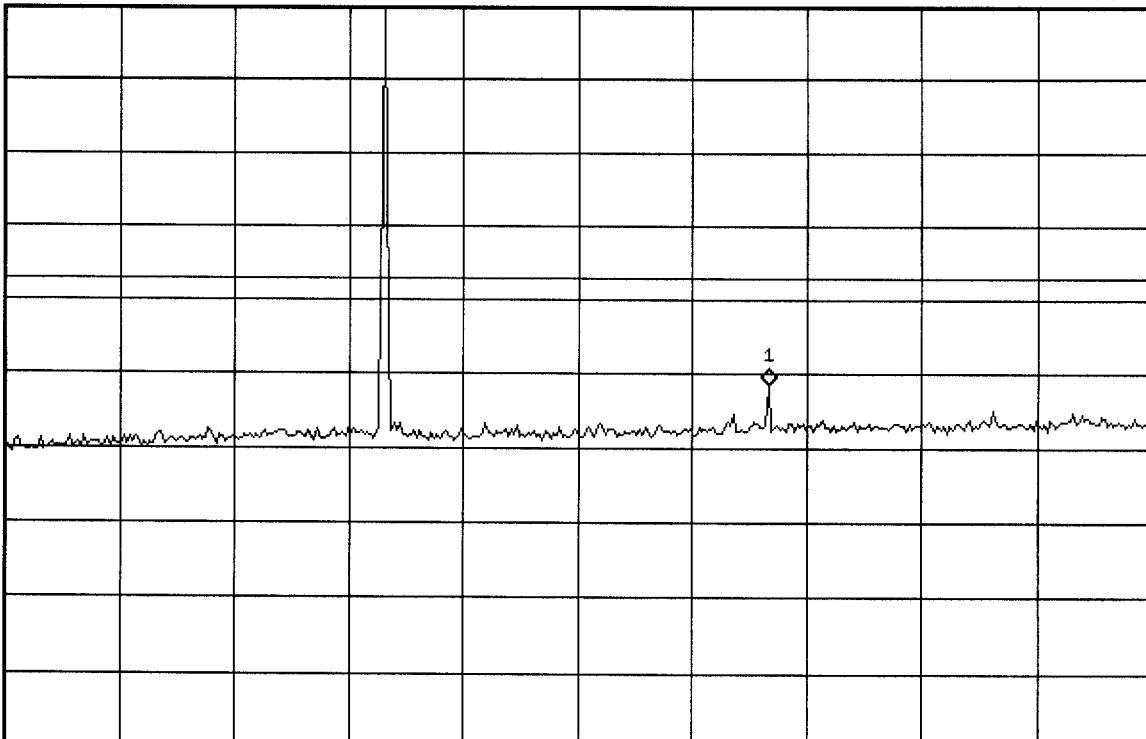
Start 10 MHz

#Res BW 1 MHz

VBW 1 MHz

Stop 2.5 GHz

Sweep 6.225 ms



**hp** 15:17:58 Dec 21, 2000

WSH-200 COND SPURS CH 363

Ref 24 dBm

Atten 5 dB

Mkr1 2.988 GHz

-33.6 dBm

Peak

Log

10

dB/

Offst

31

dB

DI

-13.0

dBm

M1 S2

1

S3 FC

AA

Start 2.5 GHz

#Res BW 1 MHz

VBW 1 MHz

Stop 10 GHz

Sweep 18.75 ms

**hp** 15:18:22 Dec 21, 2000

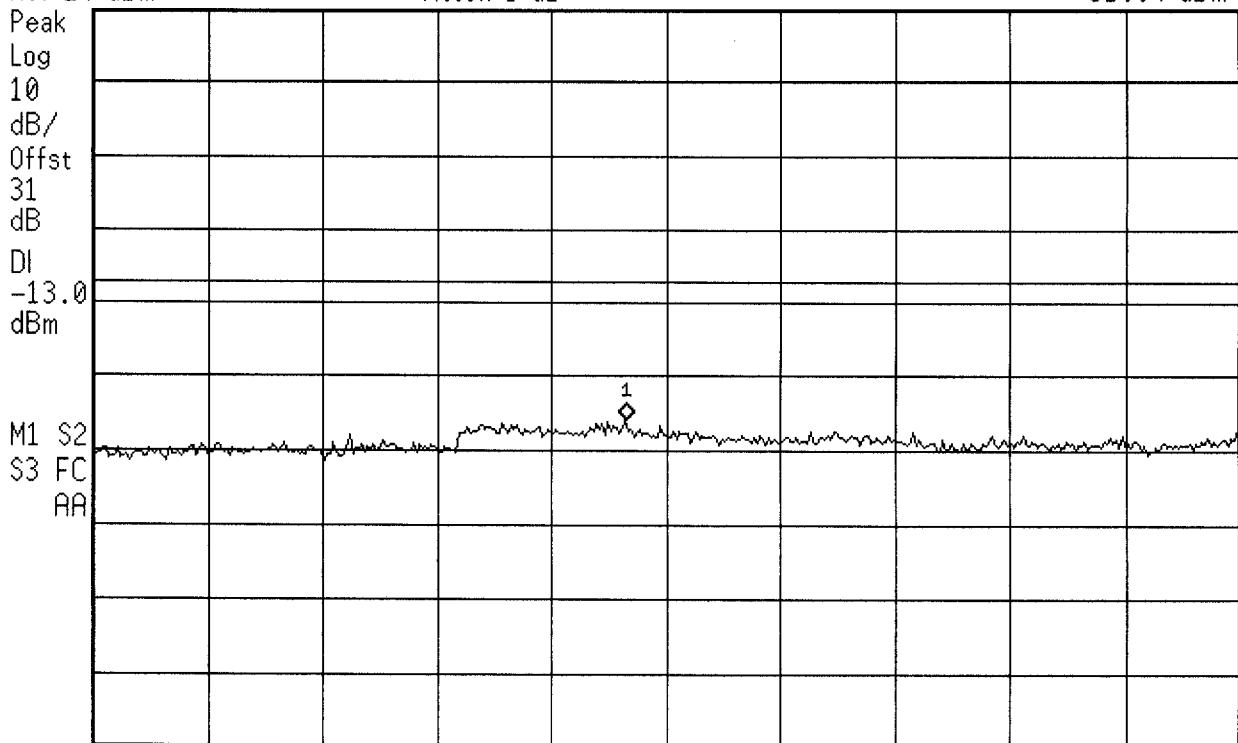
WSH-200 COND SPURS CH 363

Ref 24 dBm

Atten 5 dB

Mkr1 14.65 GHz

-31.94 dBm



Start 10 GHz  
#Res BW 1 MHz

VBW 1 MHz

Stop 20 GHz  
Sweep 100 ms

**[hp]** 15:19:02 Dec 21, 2000

WSH-200 COND SPURS CH 777

Ref 24 dBm

Atten 5 dB

Mkr1 2.114 GHz

-31.65 dBm

Peak

Log

10

dB/

0ffst

31

dB

DI

-13.0

dBm

M1 S2

S3 FC

AA

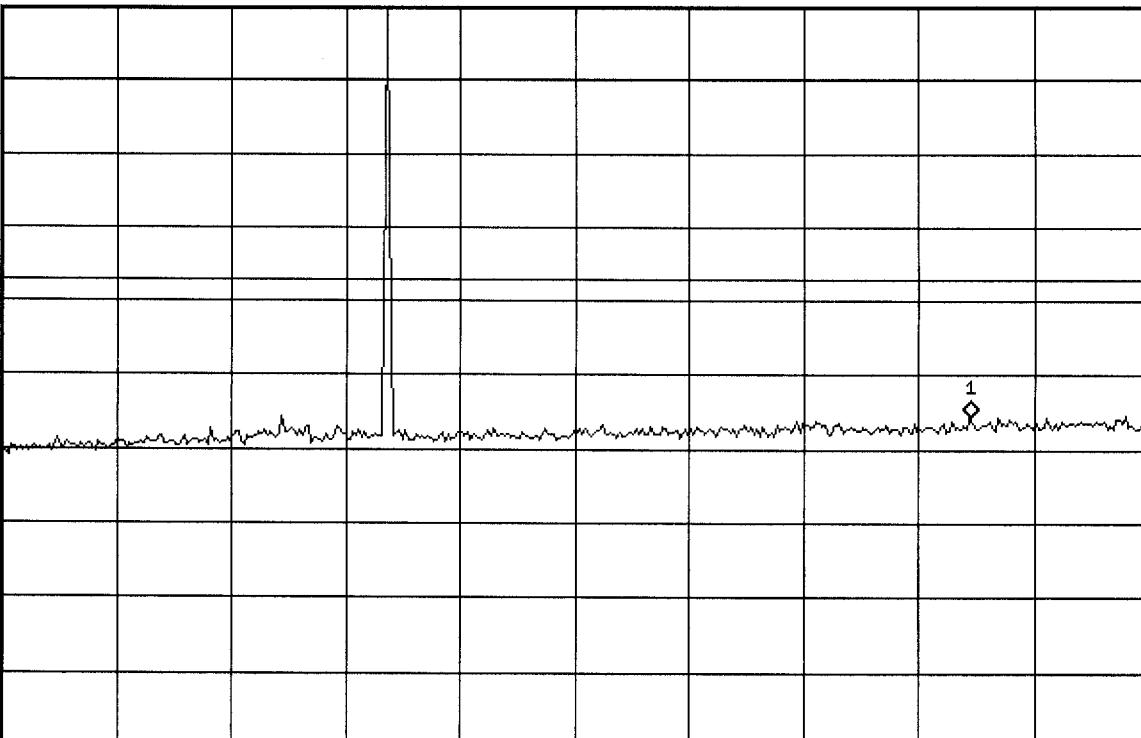
Start 10 MHz

#Res BW 1 MHz

VBW 1 MHz

Stop 2.5 GHz

Sweep 6.225 ms



hp 15:19:21 Dec 21, 2000

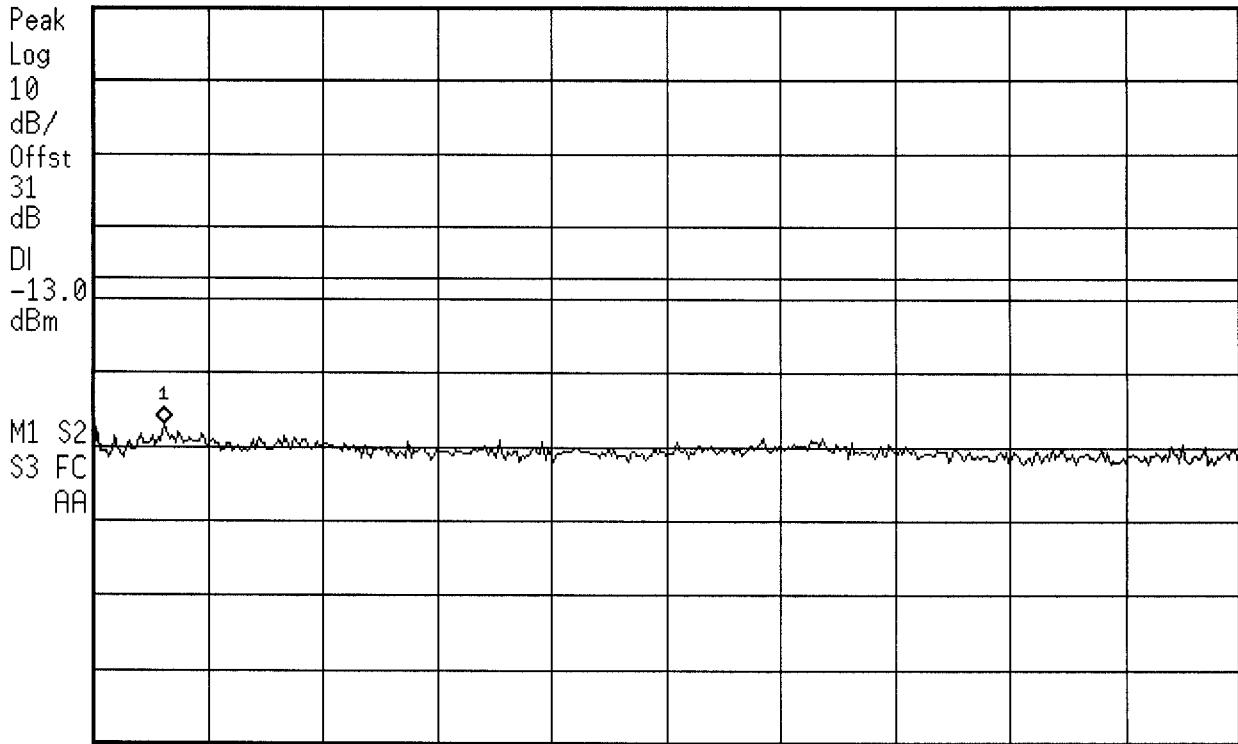
WSH-200 COND SPURS CH 777

Ref 24 dBm

Atten 5 dB

Mkr1 2.969 GHz

-33.01 dBm



Start 2.5 GHz  
#Res BW 1 MHz

VBW 1 MHz

Stop 10 GHz  
Sweep 18.75 ms

**hp** 15:19:40 Dec 21, 2000

WSH-200 COND SPURS CH 777

Ref 24 dBm

Atten 5 dB

Mkr1 14.45 GHz

-31.22 dBm

Peak

Log

10

dB/

Offst

31

dB

DI

-13.0

dBm

M1 S2

S3 FC

AA

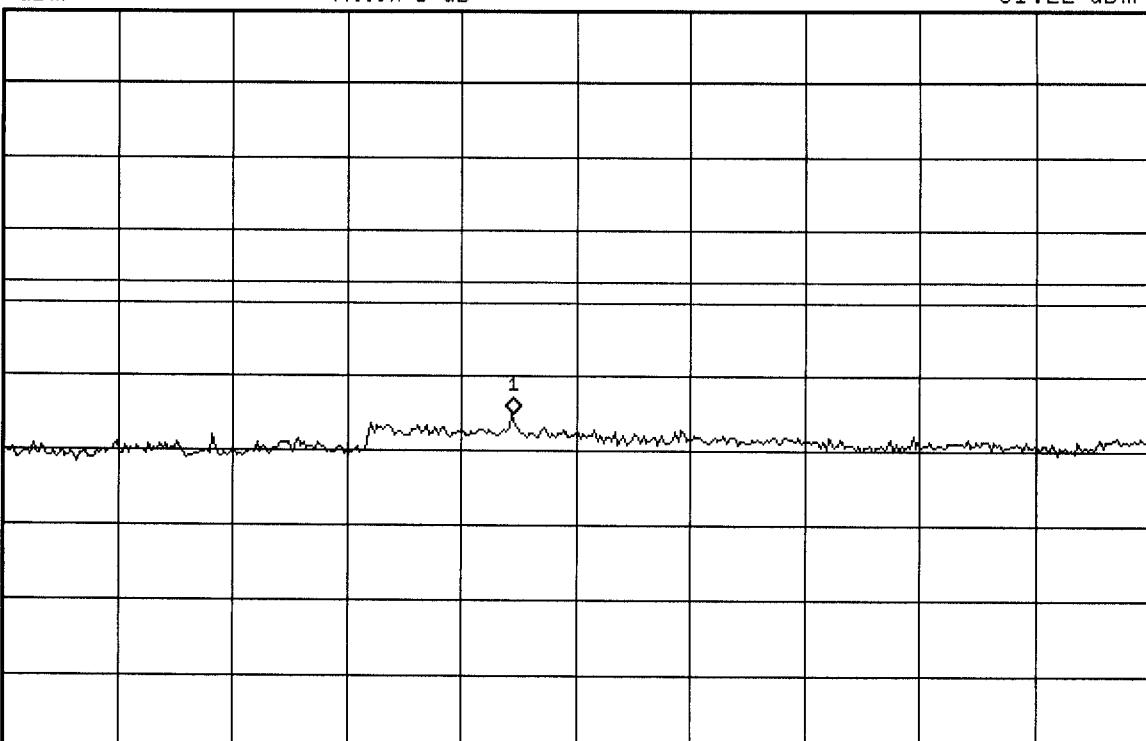
Start 10 GHz

#Res BW 1 MHz

VBW 1 MHz

Stop 20 GHz

Sweep 100 ms



hp 15:32:15 Dec 21, 2000

WSH-200 CDMA MODE BAND EDGE LOW CH

Ref 24 dBm

Atten 5 dB

Peak

Log

10

dB/

Offst

31

dB

DI

-13.0

dBm

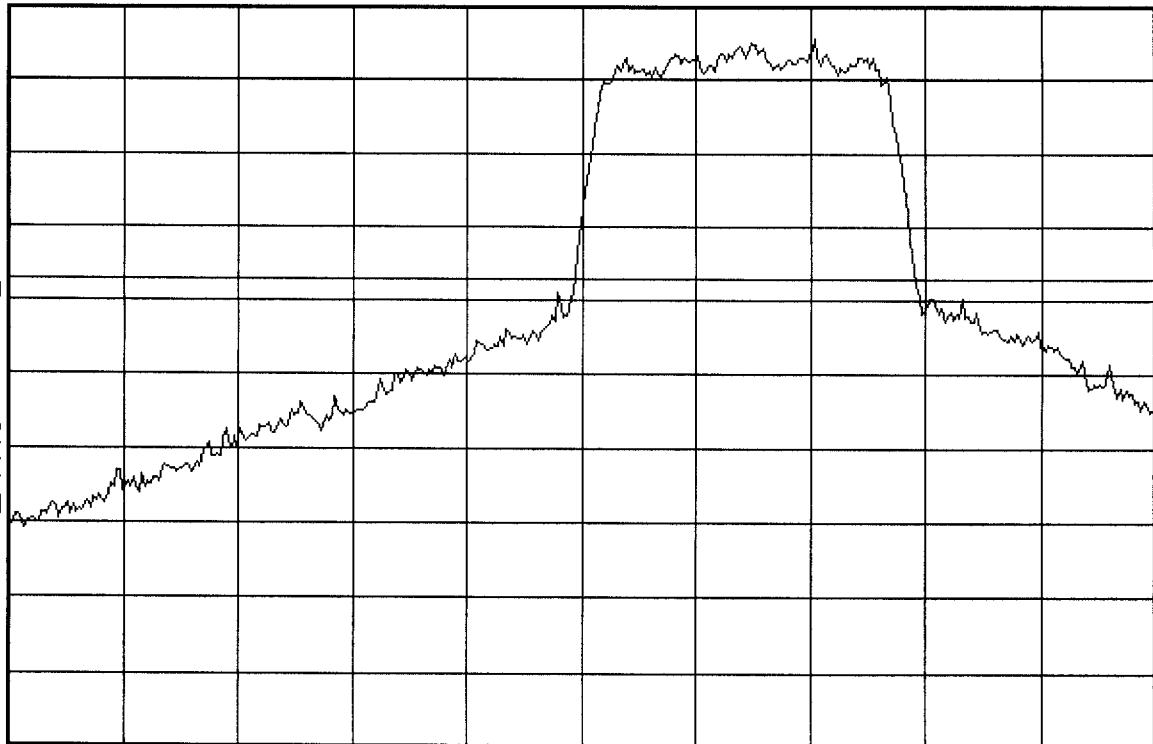
M1

S2

S3

FC

AA



Center 824 MHz  
#Res BW 30 kHz

VBW 30 kHz

Span 5 MHz

Sweep 13.89 ms

[hp] 15:31:06 Dec 21, 2000

WSH-200 CDMA MODE BAND EDGE HIGH CH

Ref 24 dBm

Atten 5 dB

Peak

Log

10

dB/

Offst

31

dB

DI

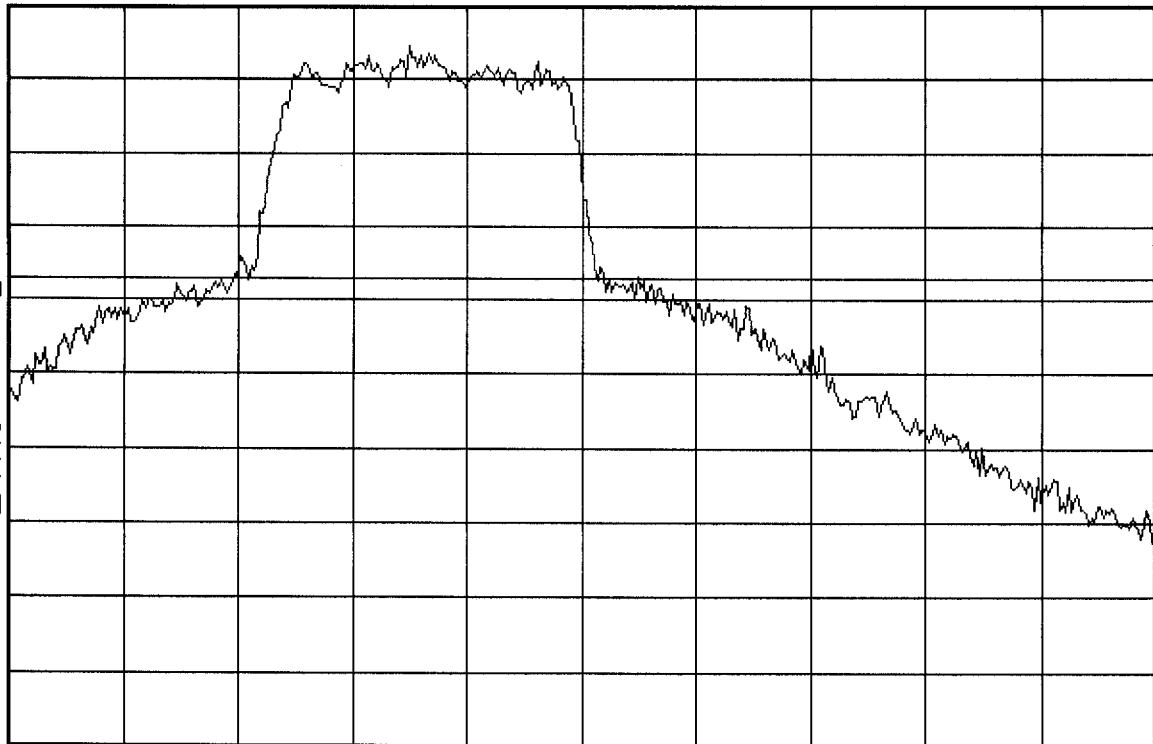
-13.0

dBm

M1 S2

S3 FC

AA



Center 849 MHz

#Res BW 30 kHz

VBW 30 kHz

Span 5 MHz

Sweep 13.89 ms

[hp] 15:29:16 Dec 21, 2000

WSH-200 CDMA MODE CH 777

Ref 24 dBm

Atten 5 dB

Peak

Log

10

dB/

0ffst

31

dB

DI

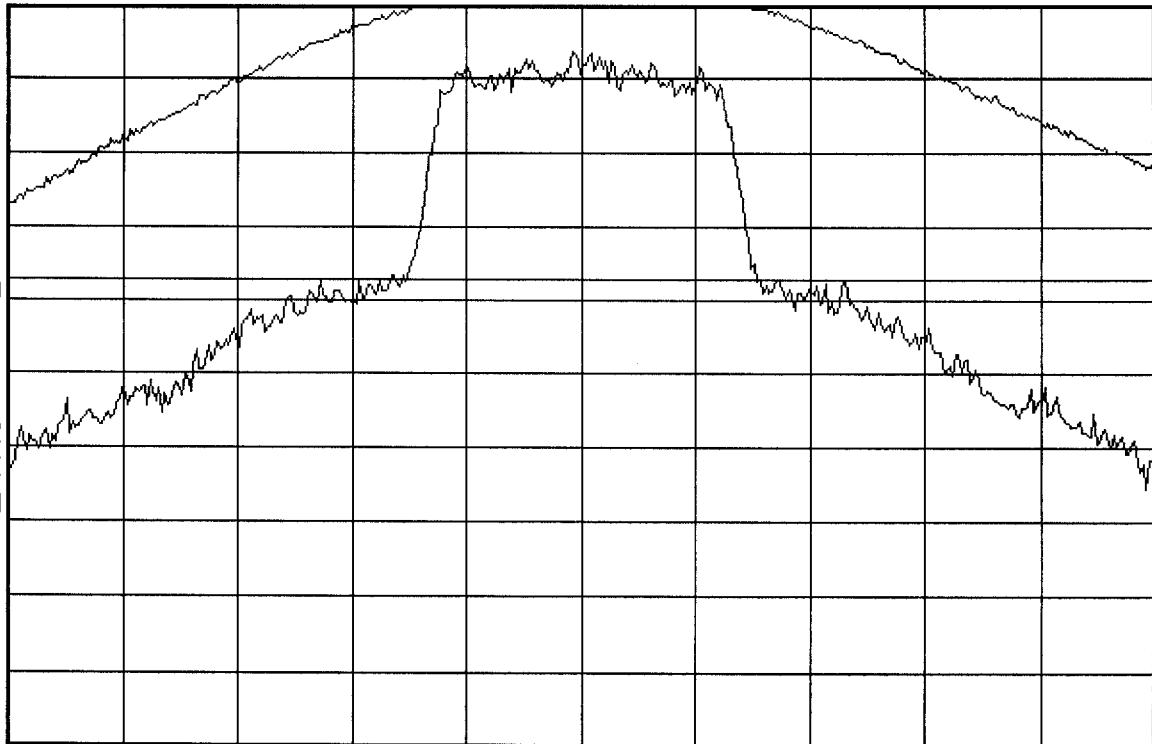
-13.0

dBm

M1 M2

S3 FC

AA



Center 848.3 MHz

#Res BW 30 kHz

VBW 30 kHz

Span 5 MHz

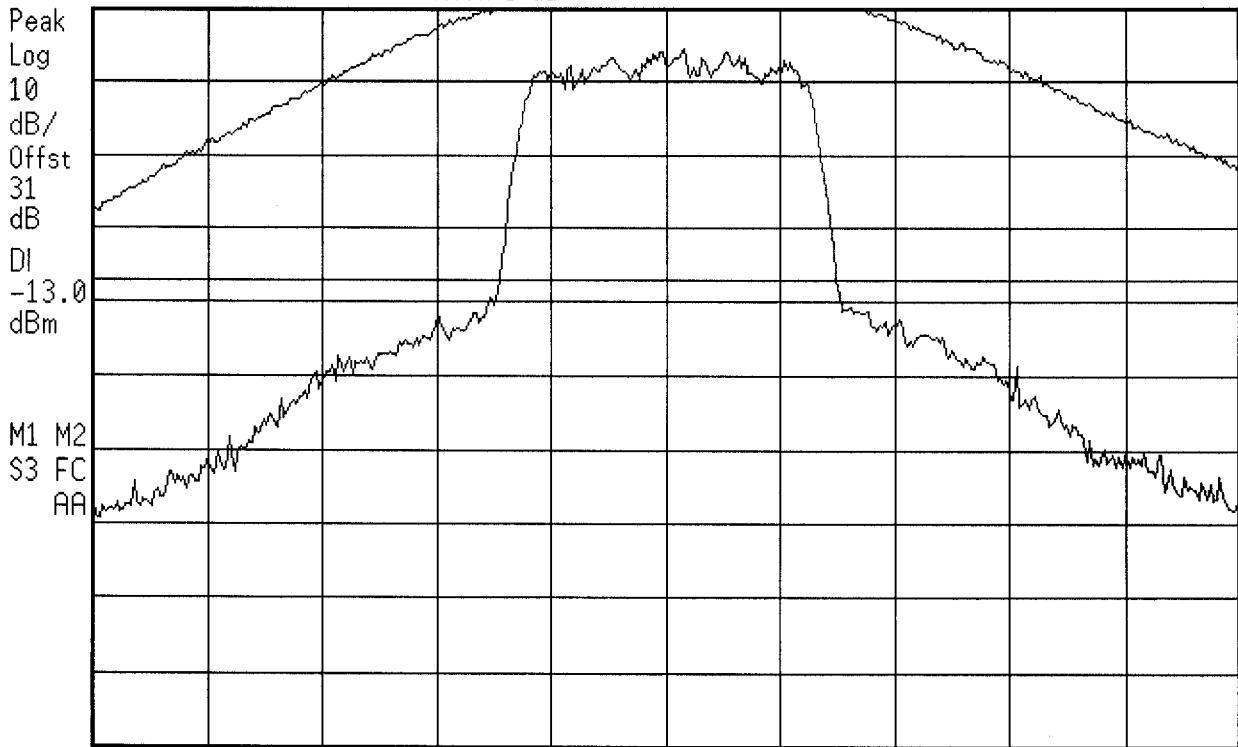
Sweep 13.89 ms

hp 15:27:18 Dec 21, 2000

WSH-200 CDMA MODE CH 363

Ref 24 dBm

Atten 5 dB

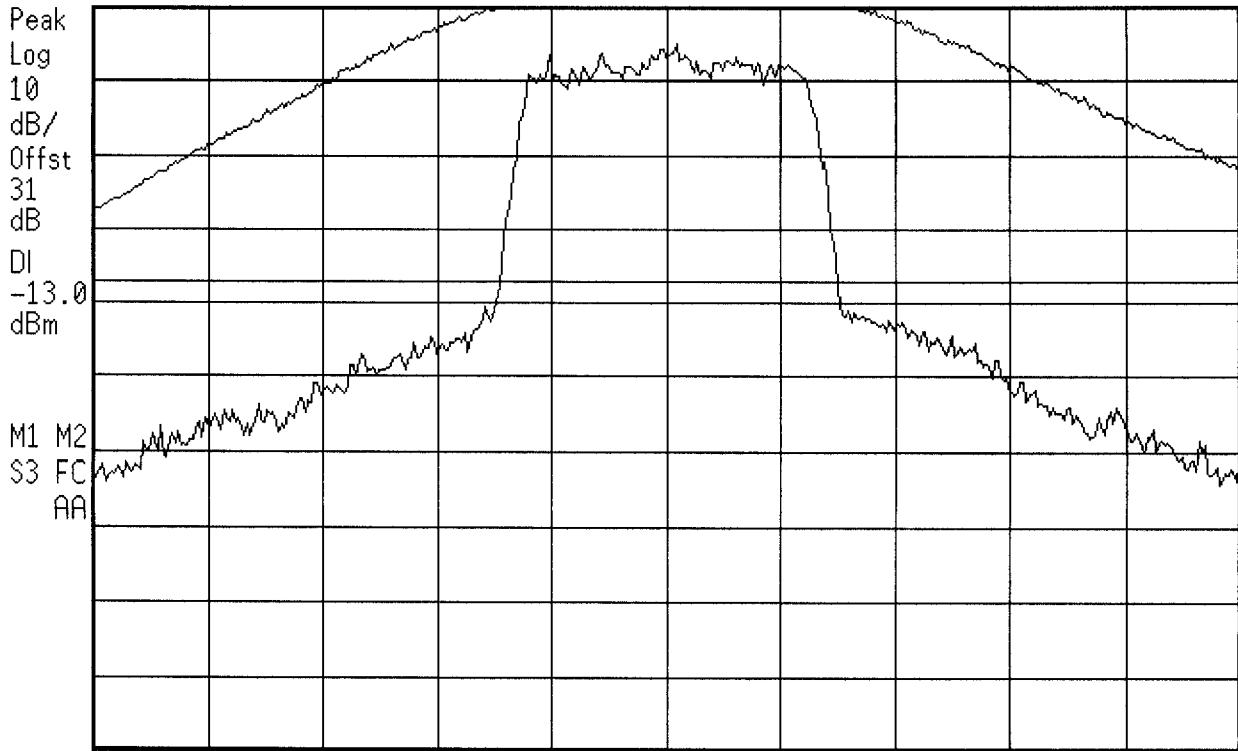


hp 15:25:10 Dec 21, 2000

WSH-200 CDMA MODE CH 1013

Ref 24 dBm

Atten 5 dB



Center 824.7 MHz

#Res BW 30 kHz

VBW 30 kHz

Span 5 MHz

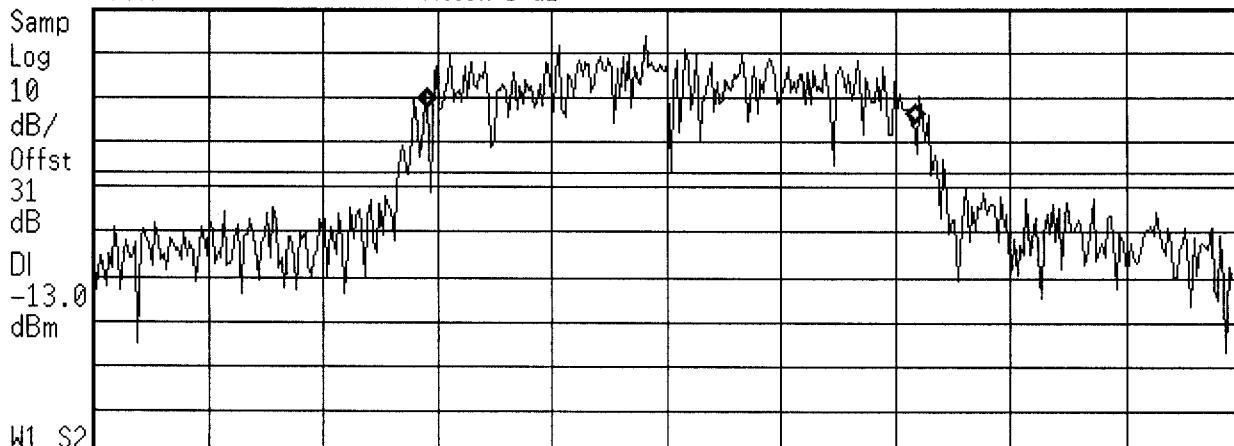
Sweep 13.89 ms

**hp** 15:45:11 Dec 21, 2000

WSH-200 CDMA MODE 99% BAND WIDTH

Ref 24 dBm

Atten 5 dB



Center 835.9 MHz

\*Res BW 30 kHz

\*VBW 300 kHz

Span 3 MHz

Sweep 9.167 ms

Occupied Bandwidth Results (measuring..)

Occupied Bandwidth

Occ BW % Pwr 99.00 %

1.277 MHz

Transmit Freq Error 10.58 kHz