# FCC
# TYPE ACCEPTANCE

## TEST/MEASUREMENT REPORT

Product Name: 150 Power Amp

Model: LOK900

Applicant/Manufacturer: EAGLE WIRELESS INTERNATIONAL, INC.
101 Courageous Drive
League City, Texas 77573

Tested By Request of: Eagle Wireless International, Inc.

Testing Laboratory:
Wayne Langston, Inc.
P.O. Box 1377, League City, Texas 77574-1377
Tel: 281-337-6785; Fax: 281-337-7217; email: langstoninc@msn.com

Test Results:

I certify that I am the technically qualified person responsible for preparation of the technical information contained in this application, and that it is complete and accurate to the best of my knowledge.

Tested By: Wayne Langston
Wayne P. Langston

Date: 07-01-99

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**2.1033(a)** A completed FCC Form 731 is included with this application.

**2.1033(1)** Applicant/Vendor/Manufacturer:
Eagle Wireless International
101 Courageous Drive
League City, Texas 77573

**2.1033(2)** This equipment is identified as the Eagle RF Power Amplifier (FCC ID: LOK900-PA-5)

**2.1033(3)** Installation manual is not available to the user.

**2.1033(4)** The type of emission is F1D, F3D, and F3E, digital 1.2 KHz.

**2.1033(5)** The frequency range of the amplifier is 851-869 MHz and the range of the exciter is controlled to within the allowable FCC limits

Per 90.209 Bandwidth
Channel Spacing is 25 KHz
Bandwidth: 20 KHz

Emission B : (with audio filter)
B for audio filter
G without audio filter

**2.10333(6)** The output power levels is 150 watts (51.8 dBm) per tone. This amplifier has an output power range of 150 Watts. The output power is factory set at the maximum level of 150 Watts. Although the unit is intended to be operated at its maximum output power of 150 Watts. It does include a safety feature which will allow the user to lower the output power during extreme conditions in order to protect the unit. This function is intended to be used as a safety device only. The description for varying the output power is listed in the manual

**2.1033(7))** The maximum rated power of 150 watts (+ 51.8 dBm).

**2.1033(8)** The DC hookup voltage is +27 volts with a range of +26 volts to +28 volts. The total current draw for the entire unit is approximately 16 amps. The maximum current draw for the power amplifier is 15 amps. The maximum current draw for the power amplifier is 15 amps. Each of the 2 FET finals draws approximately seven amps with a drain to sourcevoltage of 27 volts. The function of the special IC's and components are as follows:

a). The Pre-Amp is capable of a variable RF output with voltage variations.

b). Each final is capable of approximately 90 Watts.

c). The isolator provides protection against a mismatched load.

d). the low pass filter reduces the harmonics to meet the FCC limits.

**2.983(d)(9)** All tune-up procedures are made at the factory. There are no power adjustments made during the installation of the equipment.

**2.1033(10)** Complete circuit diagram is attached to this application.

**2.1033(11)** Exhibit 1 is a label drawing. Its placements are shown in Exhibit 2.

**2.1033(12)** Photographs are included in the exhibit section.

**2.1033(13)** N/A

**2.1033(14)** The data required by Paragraph 2.1046 through 2.1057 are included with this report.

## 3, MEASUREMENT REQUIREMENTS (Paragraphs 2.985 et.seq)

This section contains the results of measurements taken to demonstrate compliance with the preconditions defined in the Commission's Rules, Part 90, Subpart I, for transmitters used in the Business Radio Service. Data are presented in tabular and/or graphical form.

Measurement procedures are described within the text of each reported test. All bandwidth measurements were made using ± 4.5 KHz deviation for data and 3.5 KHz deviation for audio.

**2.1046** Power Output

The amplifier's RF output power was measured using a Boonton Model 42B Micro watt meter. External attenuation was added to prevent overloading the equipment. The input of the micro watt meter presented a resistive load of 50 ohms to the amplifier which precisely matched the transmitter's output characteristics. The meter measured an output power of 51.8 dBm (150 Watts) at 851 MHz. This level is in compliance with the manufacturer's specified maximum rated power of 150 Watts. This power is also in compliance with Paragraph 90.205/90.635 which specifies a maximum effective radiated power of 500 Watts Suburban, 1000 Watts for Urban areas for transmitters operating in the 851-869 range PER 90.635. Figures 1, 2, and 3 describe the output power unmodulated.

RF Power Output:

| | |
|---|---|
| Input Exciter | Figure 1 |
| Output 150 Watt | Figure 2 |
| Output 10 Watt | Figure 3 |

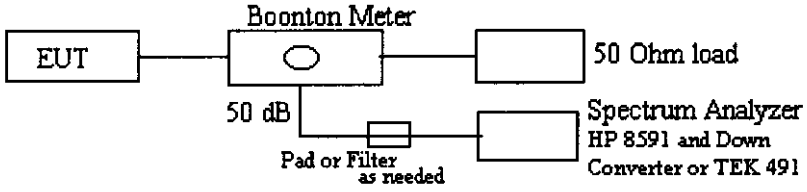
**2.1047** Noted.

**2.1049** Occupied Bandwidth

The transmitters that were used for testing do comply with the limit requirements for the occupied bandwidth. Figures 4 through 39 clearly show that the amplifier has no affect on the modulated carrier. The following is a matrix of these figures.

| | | | | | |
|---|---|---|---|---|---|
| Data | 851..00175 | | Exciter | 10 Watt | 150 Watt |
| | Input | 100 Hz | Figure 4 | Figure 5 | Figure 6 |
| | 5V pp | 600 | Figure 7 | Figure 8 | Figure 9 |
| | | 1.2 K | Figure 10 | Figure 11 | Figure 12 |
| Data | 860..00175 | | Exciter | 10 Watt | 150 Watt |
| | Input | 100 Hz | Figure 13 | Figure 16 | Figure 19 |
| | | 600 | Figure 14 | Figure 17 | Figure 20 |
| | | 1.2 K | Figure 15 | Figure 18 | Figure 21 |
| | | | Exciter | 10 Watt | 150 Watt |
| | 866 | 100 Hz | Figure 22 | Figure 25 | Figure 28 |
| | | 600 | Figure 23 | Figure 26 | Figure 29 |
| | | 1.2 K | Figure 24 | Figure 27 | Figure 30 |
| Audio | | | Exciter | 10 Watt | 150 Watt |
| | 851- | 100 Hz | Figure 31 | Figure 34 | Figure 37 |
| | | 1.0 K | Figure 32 | Figure 35 | Figure 38 |
| | | 5.0 K | Figure 33 | Figure 36 | Figure 39 |

Test Setup




**2.1051** Conducted Disturbance Emission

Disturbance emissions at the antenna terminals were measured using the test configuration illustrated below. External attenuation was added as necessary to prevent overloading the spectrum analyzer. The transmitter used for testing was modulated with a 1.2 kHz square wave with a peak-to-peak voltage of 5 Volts, as described in the occupied bandwidth section of this report, which was found to produce worst case emissions. The emission spectrum was examined up to the tenth harmonic of the carrier. Every emission not recorded was more than 20 dB below the limit. The emission limitation specified in Paragraph 22.359 is expressed as 43 + 10 log (PT) or 64.76 db with

carrier at + 51.8 dbm. The EUT was tested at its output power of 150 Watts. For a 150 Watt amplifier, this equals 64.76 dB below the unmodulated carrier or –12.96 dbm (94 dbuv). The data shown in the Table demonstrate compliance with this specification.

Test Setup

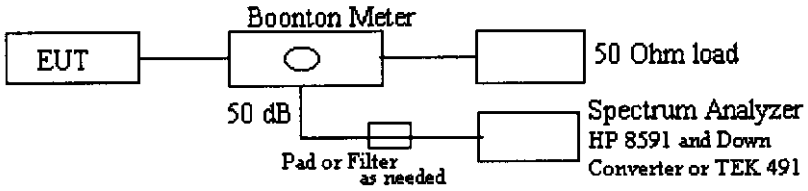



Table 1

Power Level: 51.8 dbm or 150 Watts

Frequency: 851.00 MHz

Carrier at: 51.8 dbm

| Frequency (MHz) | Emission Level (dBc) | Limit for (dBc) | Comments |
|---|---|---|---|
| 304.9 | -89.3 | -12.97 | |
| 609.9 | -89.7 | -12.97 | |
| 762.8 | -87.3 | -12.97 | |
| 1208.8 | -80.3 | -12.97 | |
| 1702.50 | -80.0 | -12.97 | |
| 3404 | -87.0 | -12.97 | |

Emission Levels preceded by a "<" indicate frequencies which were found to be below the spectrum analyzer's noise as indicated.

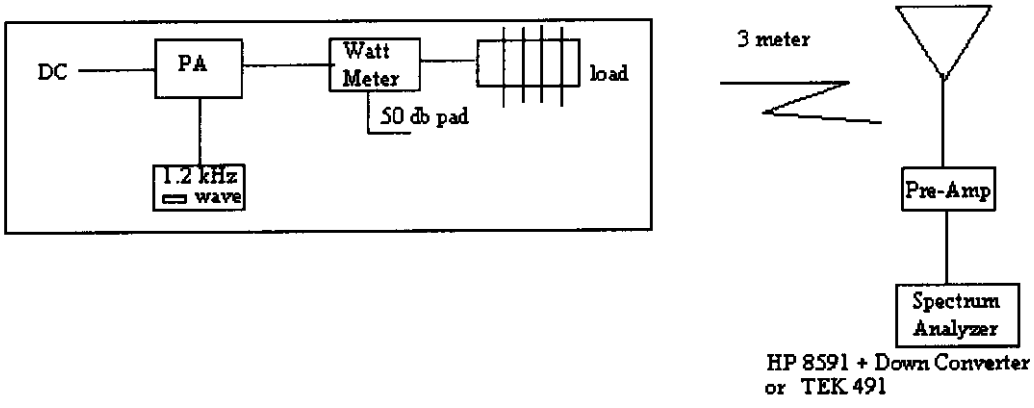
**2.1053** Field Strength of Spurious Radiated

Field strength measurements of radiated spurious emissions were made on a three-meter range maintained by Wayne Langston, Incorporated, at the League City, Texas facility. Complete description and measurement data have been placed on file with the

Commission. The equipment was scanned for radiated emissions in a Chamber prior to open-field testing.

The amplifier was place on a rotating wooden test stand approximately one meter in height. The amplifier's output was terminated with a 50 ohm dummy load. The emission spectrum was examined up to 10 Gig using a TEK 491/HP 8591 Spectrum Analyzer/ down converter and WLI log periodic antenna. A Mini Circuits broadband amplifier was used to provide approximately 20 dB gain when necessary. At each frequency, the device was rotated through 360 degrees, and the antenna was raised and lowered from one to four meters. Measurements were made using both vertically and horizontally polarized antennas. In each case, only the maximum radiation measured was recorded for this report. All emissions not reported were more than 20 dB below the specified limit. The reference level for spurious radiation's was taken at an ideal dipole excited by the rated output power according to the following relationship.

Calculation @ 3 meter measurement



For Carrier at 51.8 dbm for voltage at 3 meters and

$$E_{v/m} = \frac{\sqrt{(49.2)(150)}}{3}$$

$$E_{v/m} = 28.6356$$

$$E_{dB} = 42 \text{ dbm}$$

$$= 149 \text{ dbuv}$$

For Limits per 90.209

All emission must be 43 plus 10 log (150) or 80 decibel whichever is lesser.

For a 150 Watt Amplifier

43 plus 10 Log (150)

= 43 plus 21.7

= 64.7 db

If the carrier is at 42 dbm at 3 meter then the limit would be 42 dbm – 64.7 db, or

-22 dbm or 85 dbuv.

Note: level = measured value + mixer/pad loss – preamp gain all other emissions were

greeater than 20 db under the limit

1.2 KHz Data Transmission
@ 851 Mhz carrier.

| Frequency MHz | Level (dB) | $A_f / C_l$ | Total | Limit | Margin |
|---|---|---|---|---|---|
| 851 | Carrier | Carrier | | | |
| 1702 | -79 V | 38 | -41 | -22 dbm | 19 |
| 2553 | -85 V | 41 | -44 | -22 dbm | 22 |
| * 3404 | -90 H/V | 43 | -47 | -22 dbm | 25 |
| * 4345.2 | -91 H/V | 48 | -43 | -22 dbm | 21 |
| * 6808.3 | -90 H/V | 56 | -34 | -22 dbm | 12 |

* at MIN floor of Spectrum Analyzer/mixer combination

@ 866 MHz carrier

| Frequency MHz | Level (dB) | $A_f / C_l$ | Total | Limit | Margin |
|---|---|---|---|---|---|
| 866 | Carrier | Carrier | | | |
| 1732 | -83 | -38 | -45 | -22 | 23 |
| 3464 | -89 | 43 | -46 | -22 | 24 |
| * 4330 | -91 | 48 | -43 | -22 | 21 |

@ 869 MHz carrier

| Frequency MHz | Level (dB) | $A_f / C_l$ | Total | Limit | Margin |
|---|---|---|---|---|---|
| 869 | Carrier | Carrier | | -22 | |
| 1738 | -78 V | 38 | -40 | -22 | 18 |
| 3476 | -80 | 43 | -37 | -22 | 15 |
| * 6952 | -90 V | 56 | -34 | -22 | 12 |

# Appendix A

## Measurement Uncertainty

**MEASUREMENT UNCERTAINTY**

Normal distribution was assigned to uncertainties derived from multiple contributions. The standard uncertainty of a contribution to uncertainty with assumed normal distribution is found by dividing the uncertainty by the coverage factor k, appropriate to the stated level of confidence. Strictly speaking for a level of confidence of 95%, k = 1.96, we used k = 2.

Rectangular distribution means that there is equal probability of the true value lying anywhere between the prescribed limits. A rectangular distribution was assigned where a manufacturer's specification limits are used as the uncertainty.

**Radiated Emissions**

Measurement of vertically polarized radiated field strength over the frequency range 30 MHz to 1 GHz on an open area test site at 3m and 10m includes following uncertainty:

| Contribution | Probability Distribution | Uncertainty (dB) |
|---|---|---|
| Antenna factor calibration | Normal (k=2) | ±1.0 |
| Cable loss calibration | Normal (k=2) | ±0.2 |
| Receiver specification | Rectangular | ±1.0 |
| Antenna directivity | Rectangular | ±0.1 |
| Antenna factor variation with height | Rectangular | ±2.0 |

| | | |
|---|---|---|
| Antenna factor frequency interpolation | Rectangular | ±0.1 |
| Measurement distance variation | Rectangular | ±0.2 |
| Site Imperfections | Rectangular | ±1.5 |

Combined standard uncertainty $u_c(y)$ is

$$U_c(Y) = \pm\sqrt{\left(\frac{1.0}{2}\right)^2 + \left(\frac{0.2}{2}\right)^2 + \frac{1.0^2 + 0.1^2 + 2.0^2 + 0.2^2 + 1.5^2}{3}} = \pm 1.6\ \text{dB}$$

It is probable that $u_c(y) / s(q_k) > 3$, where $s(q_k)$ is estimated standard deviation from a sample of n readings

$$s(q_k) = \sqrt{\frac{1}{(n-1)} \sum_{k=1}^{n} (q_k - \bar{q})^2}$$

unless the repeatability of the EUT is particularly poor, and a coverage factor of k = 2 will ensure that the level of confidence will be approximately 95%, therefore:

$$U = 2\ u_c(y) = 2 \times \pm 1.6\ \text{dB} = \pm 3.2\ \text{dB}$$

Notes:

1.1 Uncertainties for the antenna and cable were estimated, based on a normal probability distribution with k = 2.

1.2 The receiver uncertainty was obtained from the manufacturer's specification for which a rectangular distribution was assumed.

1.3 The antenna factor uncertainty does not take account of

antenna directivity.

1.4 The antenna factor vary with height and since the height was not always the same in use as when the antenna was calibrated an additional uncertainty is added.

1.5 The uncertainty in the measurement distance is relatively small but have some effect on the received signal strength. The increase in measurement distance as the antenna height is increased is an inevitable consequence of the test method and is therefore not considered to be a contribution to uncertainty.

1.6 Site imperfections are difficult to quantify but may Include the following contributions:

- unwanted reflections from adjacent objects.
- ground plane imperfections: reflection coefficient, flatness and edge effects.
- losses or reflections from "transparent" cabins for the EUT or site coverings.
- earth currents in antenna cables (mainly effects Biconnical antennas).

The specified limits for the difference between measured site attenuation and the theoretical value (±4 dB) were not included in total since the measurement of site attenuation includes uncertainty contributions already allowed for in this budget, such as antenna factor.

**Conducted Emissions**

Measurement of conducted emissions over the frequency range 9 kHz to 30 MHz includes following uncertainty:

| Contribution | Probability Distribution | Uncertainty (dB) |
|---|---|---|
| Receiver specification | Rectangular | ±1.5 |
| LISN coupling specification | Rectangular | ±1.5 |
| Cable and input attenuator calibration | Normal (k=2) | ±0.5 |

Combined standard uncertainty $u_c(y)$ is

$$U_c(Y) = \pm\sqrt{\frac{1.5^2 + 1.5^2}{3} + \left(\frac{0.5}{2}\right)^2} = \pm 1.2 \text{ dB}$$

As with radiated field strength uncertainty, it is probable That $u_c(y) / s(q_k) > 3$ and a coverage factor of k=2 will suffice, therefore:

$$U = 2\ u_c(y) = 2 \times \pm 1.2 \text{ dB} = \pm 2.4 \text{ dB}$$

# Appendix B

## Terminal Interference Measurement Data

WAYNE LANGSTON, INC.

Model: LOK900
Date: 07-01-99

FCC ID: LOK900-PA-5
Appendix B
Test Manifest Page
WLI Project: 981530

| TEST: Check One | Test Type: Check One | End Results: Check One |
|---|---|---|
| FCC (Part 15) [ ] | Radiated [ ] | Pass [ ] |
| EN550 22/Cispr 22 [ ] | Conducted [X] | Fails [ ] |
| Immunity: IEC 801- [ ] | Both [ ] | |
| Other (please define): | | |

EUT Model #/Name: LOK900
EUT Description: Refer to Manufacturer's User/Operations Manual

| EUT Support Equipment: | Serial # | Model # | FCC ID # |
|---|---|---|---|
| | | | |

Software: Client provided (if any)
EUT Classification: Class "A" [ ]; Class "B" [ ]

| Test Equipment/Model # | | Serial # | Cal. Date |
|---|---|---|---|
| [ ] AH Systems/SAS-200/S12 | 303 | | Traceable to NIST |
| [ ] Compliance Design/Lisn | | | Traceable to NIST |
| [ ] Rhode & Schwarz | 879691/09 | | Daily |
| [x] Hewlett Packard 8591E | 3501A03599 | | Traceable to NIST |
| [ ] Hewlett Packard 8640B | 1532A03642 | | Traceable to NIST |
| [ ] Roberts Tuned Dipoles Std. | N/A | | Per ANSI Ref. Std. |
| [x] Rhode & Schwarz | HL023 | | Traceable to NIST |
| [ ] Rhode & Schwarz/ESH3 | 872318/03 | | Traceable to NIST |
| [ ] Polard/ESH3-Z2 | N/A | | Traceable to NIST |
| [ ] Polard/HFH2-Z2 | N/A | | Traceable to NIST |
| [ ] Electro-Metrics/ESA-100 | 307 | | Traceable to NIST |
| [x] Electro-Metrics Biconical | BIA 3432 | | Traceable to NIST |
| [ ] TEM Chamber/None | none | | Per IEC 801-3 |
| [ ] Mini-Circuits Power Amp/None | 100102 | | Traceable to NIST |
| [ ] Mini-Circuits/AFL-1000LN | 10093 | | Traceable to NIST |
| [ ] Mini-Circuits/CAT-3(3dB,500Ohm Pad) | None | | Traceable to NIST |
| [ ] HP Oscilloscope/54600A | 3134A04619 | | Traceable to NIST |
| [ ] Mini-Circuits 50 dB Pad/NTRM 50 | 10018 | | None Required |
| [ ] Schaffner NSG433 | | | Traceable to NIST |
| [ ] Schaffner NSG1046 | | | Traceable to NIST |

Miscellaneous Support Equipment

| Equipment/Model | Serial | FCC ID |
|---|---|---|
| [ ] Dell 320 SLi PC | 1Y10Y | EZK320SLi |
| [ ] Epson LX 800 Printer | 011216166 | BKM5VEP70RA |
| [ ] IBM Thinkpad | None | AN02618M481 |

WAYNE LANGSTON, INC.

Model: LOK900
Date: 07-01-99

FCC ID: LOK900-PA-5
Appendix B
Test Results Page
WLI Project: 981530

Test Performed: Conducted Emissions: CISPR/FCC

| Frequency (MHz) | Line: 0 Amplitude (dBμV) QP | AV | Line: 1 Amplitude ( dBμV) QP | AV | Comments |
|---|---|---|---|---|---|
| .19 | 44.8 | 42.9 | | | |
| .25 | 40.2 | 43.0 | 51.4 | 48 | |
| .34 | 44.4 | 41.9 | | | |
| .36 | 36.4 | 35.2 | 48.5 | 44. | |
| .41 | 35.0 | 33.2 | | | |
| .47 | 34.3 | 33.1 | | | |
| .487 | 40.7 | 35.0 | | | |
| .62 | 34.8 | 30.9 | 42.0 | 30.1 | |
| .68 | 35.8 | 31.1 | 39.3 | 34.1 | |
| .714 | 74.5 | 29.4 | 38.3 | 26.1 | |
| .94 | 36.3 | 34.1 | | | |
| 1.00 | 37.6 | 34.7 | | | |
| 1.01 | 41.9 | 34.3 | 50.0 | 48.3 | |
| 1.17 | 39.1 | | | | |
| 1.28 | 37.6 | 33.4 | 41. | 40.3 | |
| 1.4 | 39.0 | 33.4 | 39.9 | 31.4 | |
| .16 | | | 52.1 | | |

# Appendix C

## Radiated Interference Measurement Data

# WAYNE LANGSTON, INC.

Model: LOK900
Date: 07-01-99

FCC ID: LOK900-PA-5
Appendix C
Test Manifest Page
WLI Project: 981530

| TEST: Check One | Test Type: Check One | End Results: Check One |
|---|---|---|
| FCC (Part 15) [ ] | Radiated [x] | Pass [ ] |
| EN550 22/Cispr 22 [ ] | Conducted [ ] | Fails [ ] |
| Immunity: IEC 801- [ ] | Both [ ] | |
| Other (please define): | | |

EUT Model #/Name: LOK900
EUT Description: Refer to Manufacturer's User/Operations Manual
EUT Support Equipment: Serial # Model # FCC ID #

Software: Client provided (if any)
EUT Classification: Class "A" [ ]; Class "B" [ ]

| Test Equipment/Model # | | Serial # | Cal. Date |
|---|---|---|---|
| [ ] AH Systems/SAS-200/S12 | 303 | | Traceable to NIST |
| [ ] Compliance Design/Lisn | | | Traceable to NIST |
| [ ] Rhode & Schwarz | 879691/09 | | Daily |
| [x] Hewlett Packard 8591E | 3501A03599 | | Traceable to NIST |
| [ ] Hewlett Packard 8640B | 1532A03642 | | Traceable to NIST |
| [ ] Roberts Tuned Dipoles Std. | N/A | | Per ANSI Ref. Std. |
| [x] Rhode & Schwarz | HL023 | | Traceable to NIST |
| [ ] Rhode & Schwarz/ESH3 | 872318/03 | | Traceable to NIST |
| [ ] Polard/ESH3-Z2 | N/A | | Traceable to NIST |
| [ ] Polard/HFH2-Z2 | N/A | | Traceable to NIST |
| [ ] Electro-Metrics/ESA-100 | 307 | | Traceable to NIST |
| [x] Electro-Metrics Biconical | BIA 3432 | | Traceable to NIST |
| [ ] TEM Chamber/None | none | | Per IEC 801-3 |
| [ ] Mini-Circuits Power Amp/None | 100102 | | Traceable to NIST |
| [ ] Mini-Circuits/AFL-1000LN | 10093 | | Traceable to NIST |
| [ ] Mini-Circuits/CAT-3(3dB,500Ohm Pad) | None | | Traceable to NIST |
| [ ] HP Oscilloscope/54600A | 3134A04619 | | Traceable to NIST |
| [ ] Mini-Circuits 50 dB Pad/NTRM 50 | 10018 | | None Required |
| [ ] Schaffner NSG433 | | | Traceable to NIST |
| [ ] Schaffner NSG1046 | | | Traceable to NIST |

Miscellaneous Support Equipment

| Equipment/Model | Serial | FCC ID |
|---|---|---|
| [ ] Dell 320 SLi PC | 1Y10Y | EZK320SLi |
| [ ] Epson LX 800 Printer | 011216166 | BKM5VEP70RA |
| [ ] IBM Thinkpad | None | AN02618M481 |

WAYNE LANGSTON, INC.

Model: LOK900
Date: 07-01-99

FCC ID: LOK900-PA-5
Appendix C
Test Results Page
WLI Project: 981530

## TEST RESULTS

| Freq. (MHz) | Level (dB) | $A_f/C_L$ (dB) | $H_A$(M) Hor/Ver | Rotation □° | Results (dB) | Comments |
|---|---|---|---|---|---|---|
| 32.0 | 10.0 | 15.7 | 1.5V | 190 | 20.7 | |
| 34.0 | 8.6 | 14.0 | 1.5V | 180 | 22.6 | |
| 36.0 | 13.7 | 14.0 | 1.5V | | 27.7 | |
| 38.0 | 15.0 | 14.0 | 1.5V | 200 | 29.0 | |
| 40.0 | 17.0 | 14.0 | 1.5V | 180 | 26.0 | |
| 42.0 | 7.8 | 14.0 | 1.5V | 190 | 21.8 | |
| 44.0 | 2.4 | 14.0 | 1.5V | 190 | 16.4 | |
| 46.0 | 5.4 | 14.0 | 1.5V | 180 | 19.4 | |
| 50.0 | 5.6 | 13.3 | 1.5V | 200 | 18.9 | |
| 54.0 | 18.0 | 13.3 | 2.0V | 180 | 28.3 | |
| 61.2 | 14.6 | 12.0 | 2.0V | 80 | 26.6 | |
| 62.0 | 16.3 | 12.0 | 2.0V | 90 | 28.3 | |
| 64.0 | 17.5 | 12.0 | 2.0V | 180 | 19.5 | |
| 66.0 | 23.4 | 12.0 | 2.0V | 180 | 35.4 | |
| 68.0 | 15.7 | 12.0 | 2.0V | 180 | 27.7 | |
| 70.0 | 15.5 | 10.3 | 1.5V | 120 | 25.8 | |
| 44.0 | 10.9 | 14.0 | 1.0H | 95 | 24.9 | |
| 46.0 | 2.3 | 14.0 | 1.0H | 100 | 16.3 | |
| 58.0 | 16.1 | 13.3 | 2.0H | 95 | 29.4 | |
| 60.0 | 10.2 | 12.0 | 2.0H | 90 | 22.2 | |
| 62.0 | 11.3 | 12.0 | 2.0H | 120 | 23.3 | |
| 64.0 | 6.9 | 12.0 | 2.0H | 120 | 18.9 | |
| 66.0 | 9.2 | 12.0 | 2.0H | 120 | 21.2 | |
| 68.0 | 10.1 | 120 | 2.0H | 120 | 22.4 | |
| 851 | Coax leak | | 1.0V | Base frequency | | |
| | Coax leak | | 2.0H | 120 | | |
| 2530 | 28 | 48 | 1.5V | 180 | 76 | Or –31 dbm |
| 51.06 | 23 | 54 | 1.5V | 180 | 77 | Or –30 dbm |

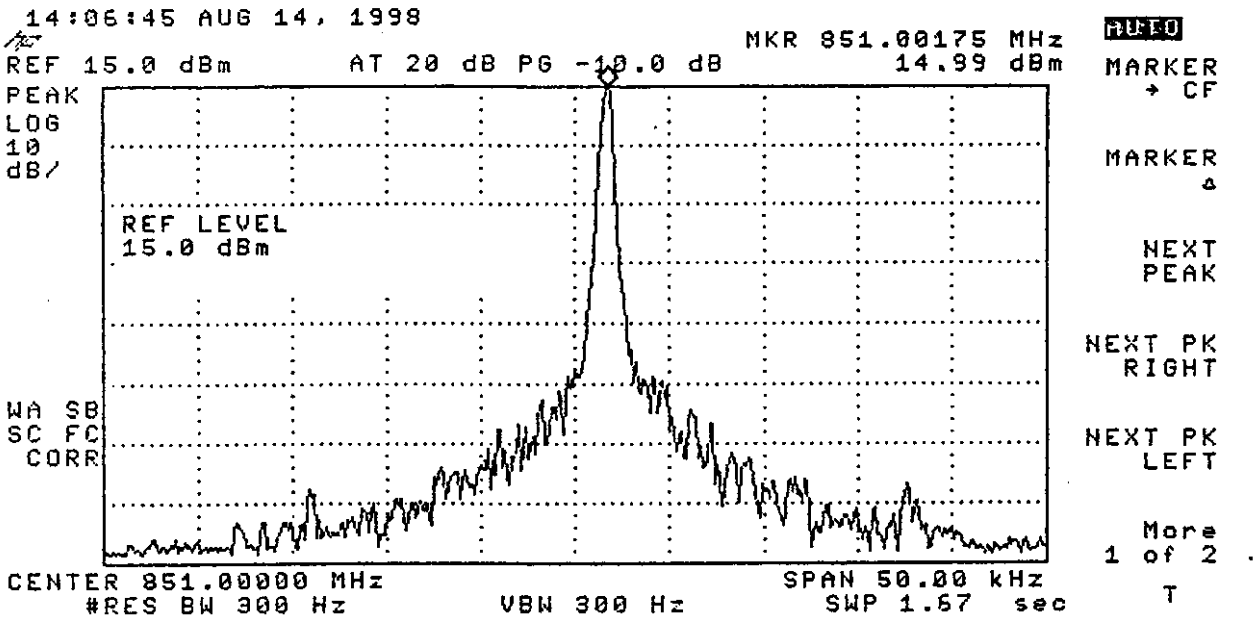

14:06:45 AUG 14, 1998
MKR 851.00175 MHz
REF 15.0 dBm
AT 20 dB PG -10.0 dB
14.99 dBm
PEAK
LOG
10
dB/
REF LEVEL
15.0 dBm
WA SB
SC FC
CORR
CENTER 851.00000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 50.00 kHz
SWP 1.57 sec
AUTO
MARKER
→ CF
MARKER
Δ
NEXT
PEAK
NEXT PK
RIGHT
NEXT PK
LEFT
More
1 of 2
T

Figure 1

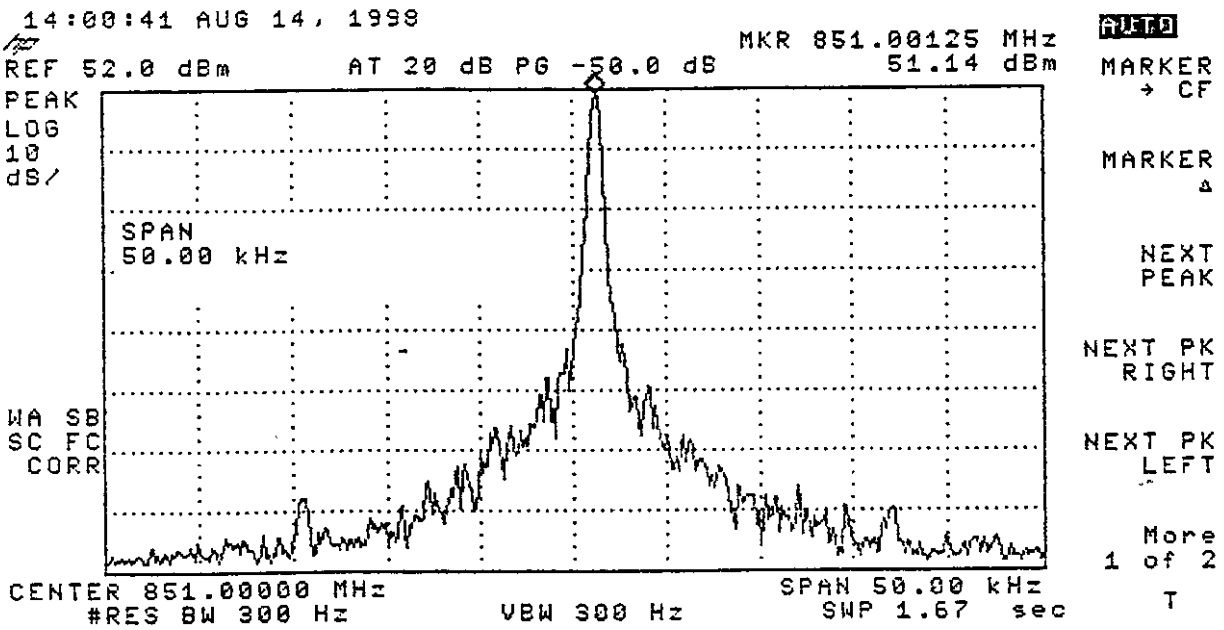

14:00:41 AUG 14, 1998
MKR 851.00125 MHz
REF 52.0 dBm
AT 20 dB PG -50.0 dB
51.14 dBm
AUTO
PEAK
LOG
10
dB/
SPAN
50.00 kHz
MARKER
→ CF
MARKER
Δ
NEXT
PEAK
NEXT PK
RIGHT
NEXT PK
LEFT
More
1 of 2
WA SB
SC FC
CORR
CENTER 851.00000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 50.00 kHz
SWP 1.67 sec

Figure 2

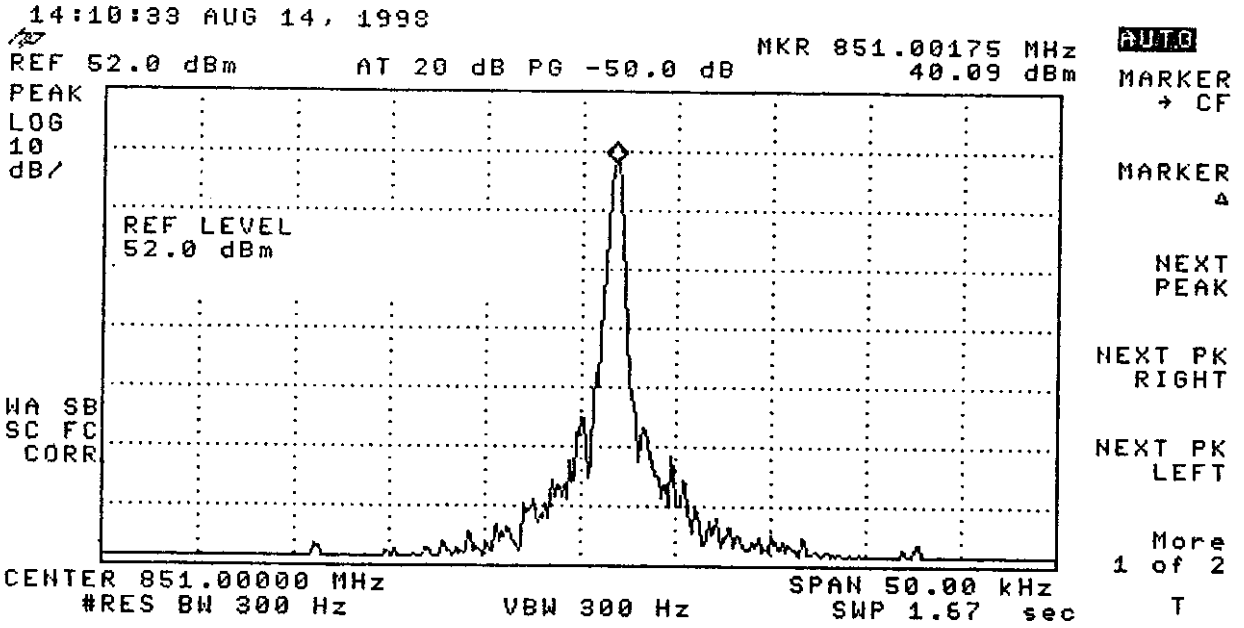

14:10:33 AUG 14, 1998
REF 52.0 dBm
AT 20 dB PG -50.0 dB
MKR 851.00175 MHz
40.09 dBm
AUTO
PEAK
LOG
10
dB/
REF LEVEL
52.0 dBm
MARKER
→ CF
MARKER
Δ
NEXT
PEAK
NEXT PK
RIGHT
NEXT PK
LEFT
More
1 of 2
WA SB
SC FC
CORR
CENTER 851.00000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 50.00 kHz
SWP 1.67 sec
T

Figure 3

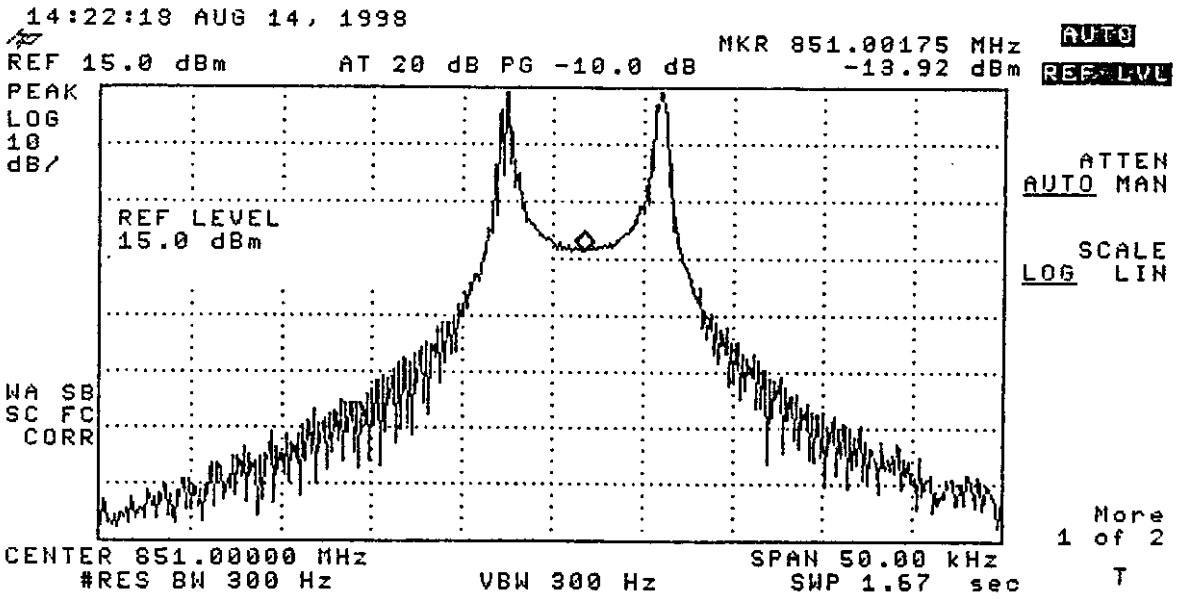

14:22:18 AUG 14, 1998
REF 15.0 dBm
AT 20 dB PG -10.0 dB
MKR 851.00175 MHz
-13.92 dBm
AUTO
REF LVL
PEAK
LOG
10
dB/
REF LEVEL
15.0 dBm
ATTEN
AUTO MAN
SCALE
LOG LIN
WA SB
SC FC
CORR
More
1 of 2
CENTER 851.00000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 50.00 kHz
SWP 1.67 sec

Figure 4

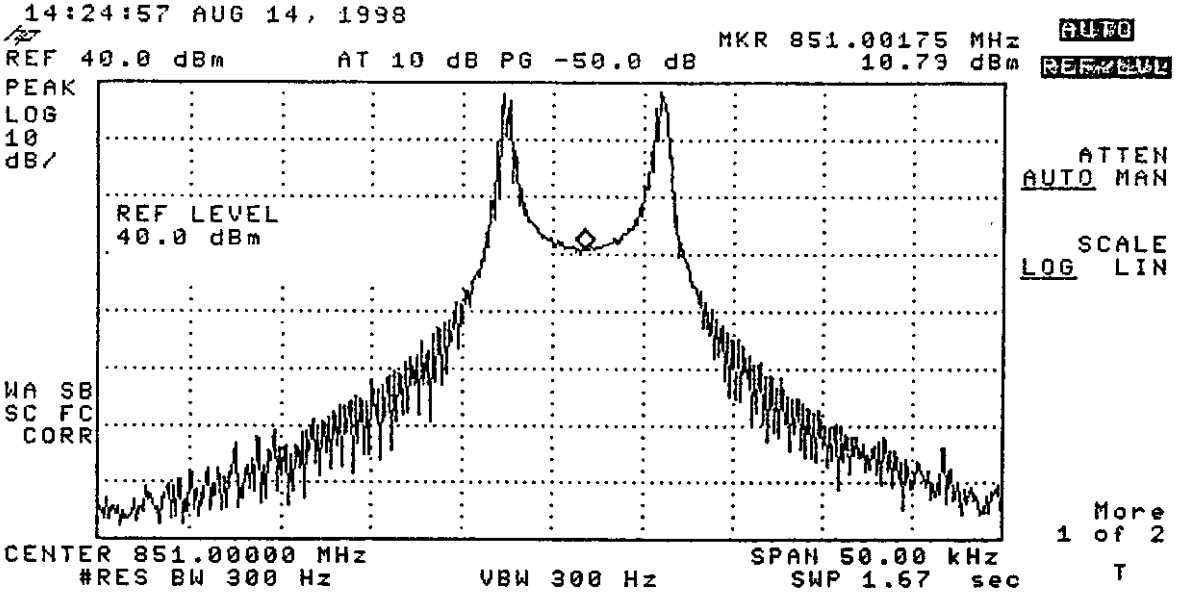

14:24:57 AUG 14, 1998
MKR 851.00175 MHz
REF 40.0 dBm
AT 10 dB PG -50.0 dB
10.79 dBm
PEAK
LOG
10
dB/
REF LEVEL
40.0 dBm
ATTEN
AUTO MAN
SCALE
LOG LIN
WA SB
SC FC
CORR
More
1 of 2
CENTER 851.00000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 50.00 kHz
SWP 1.67 sec

Figure 5

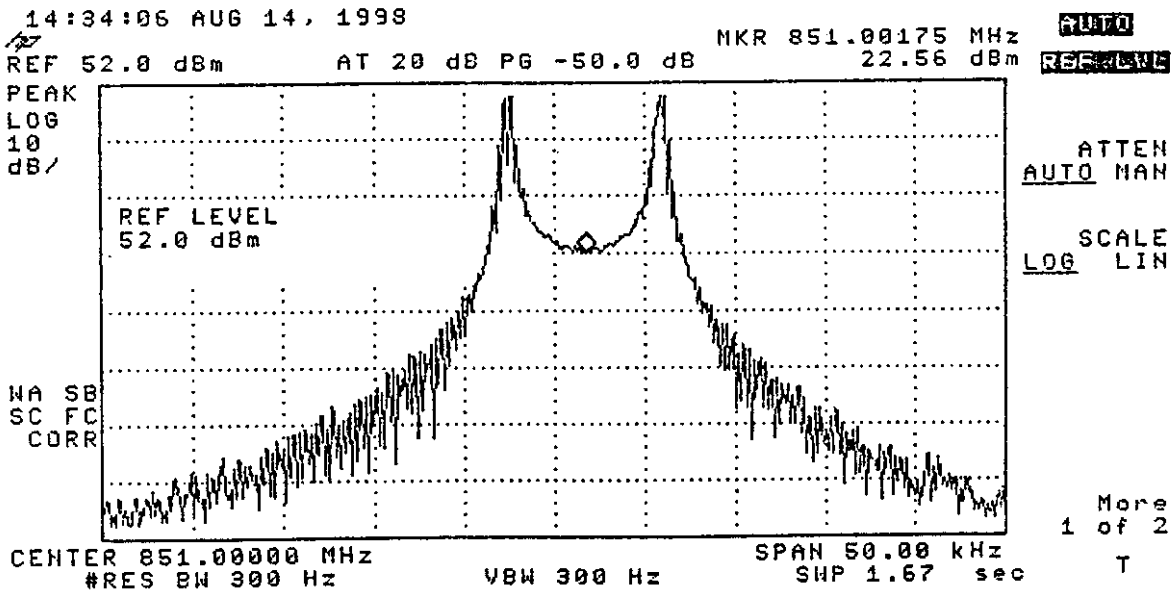

14:34:06 AUG 14, 1998
MKR 851.00175 MHz
22.56 dBm
AUTO
REF 52.0 dBm
AT 20 dB PG -50.0 dB
REF LVL
PEAK
LOG
10
dB/
REF LEVEL
52.0 dBm
ATTEN
AUTO MAN
SCALE
LOG LIN
NA SB
SC FC
CORR
More
1 of 2
CENTER 851.00000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 50.00 kHz
SWP 1.67 sec

Figure 6

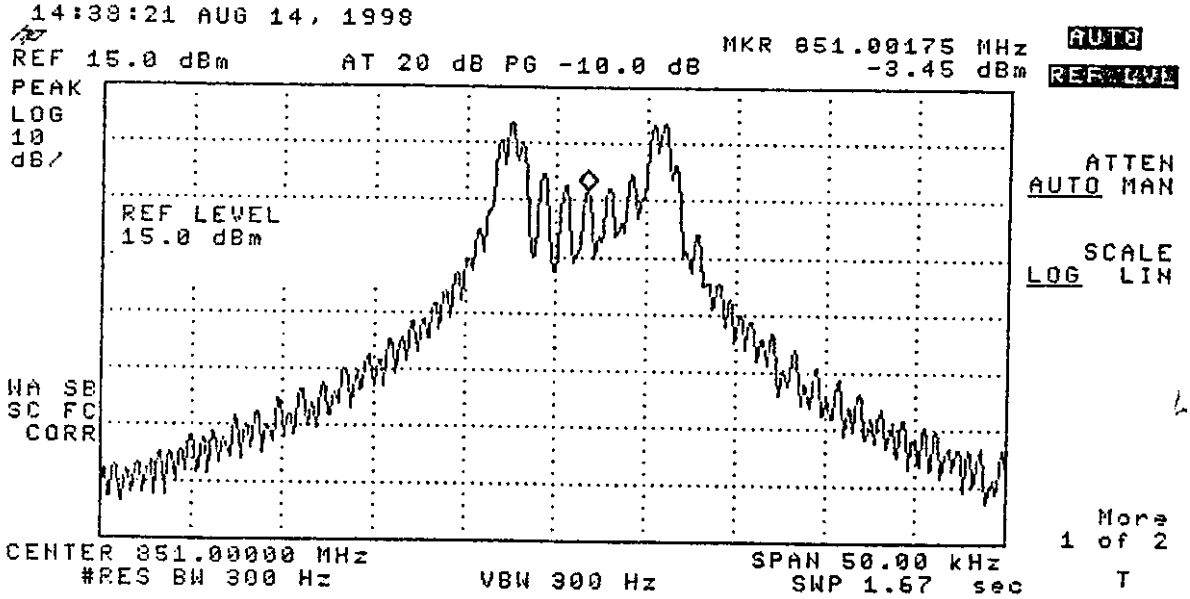

14:38:21 AUG 14, 1998
REF 15.0 dBm
AT 20 dB PG -10.0 dB
MKR 851.00175 MHz
-3.45 dBm
AUTO
REF LVL
PEAK
LOG
10
dB/
REF LEVEL
15.0 dBm
ATTEN
AUTO MAN
SCALE
LOG LIN
MA SB
SC FC
CORR
More
1 of 2
CENTER 851.00000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 50.00 kHz
SWP 1.67 sec
T

Figure 7

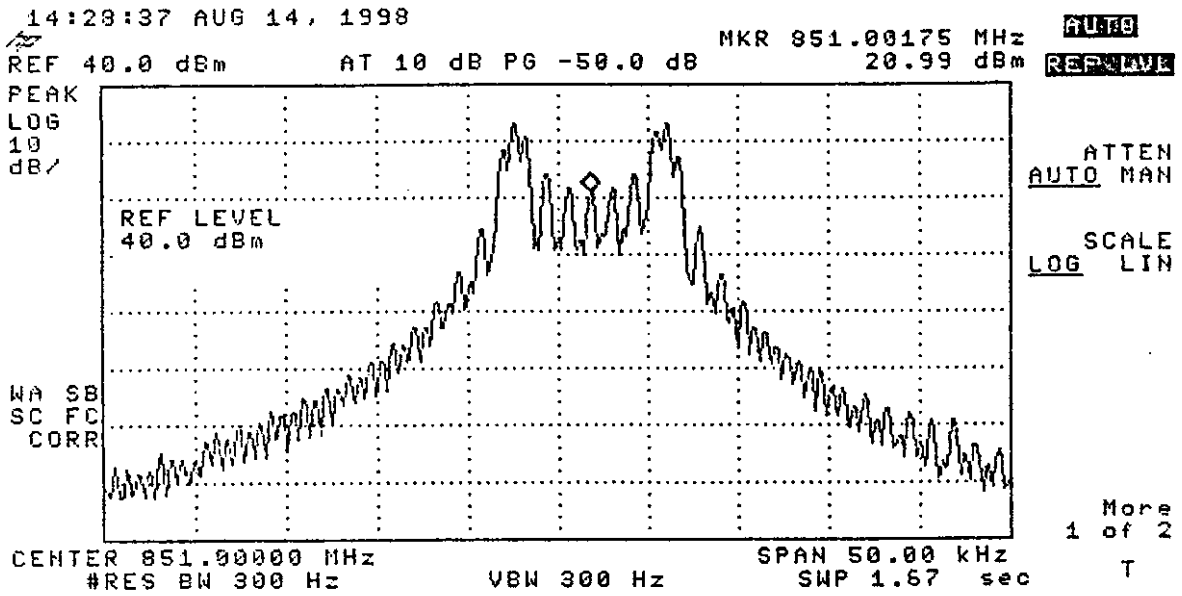

14:28:37 AUG 14, 1998
MKR 851.00175 MHz
REF 40.0 dBm
AT 10 dB PG -50.0 dB
20.99 dBm
AUTO
REF LVL
PEAK
LOG
10
dB/
REF LEVEL
40.0 dBm
ATTEN
AUTO MAN
SCALE
LOG LIN
WA SB
SC FC
CORR
More
1 of 2
CENTER 851.00000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 50.00 kHz
SWP 1.67 sec

Figure 8

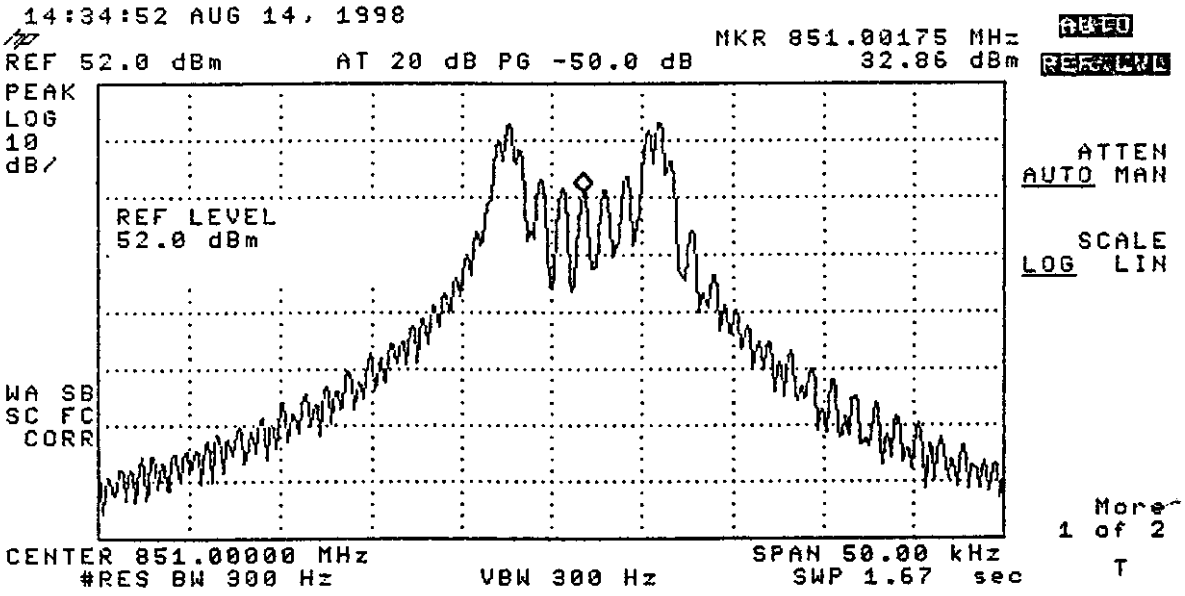

14:34:52 AUG 14, 1998
MKR 851.00175 MHz
REF 52.0 dBm
AT 20 dB PG -50.0 dB
32.86 dBm
PEAK
LOG
10
dB/
REF LEVEL
52.0 dBm
ATTEN
AUTO MAN
SCALE
LOG LIN
WA SB
SC FC
CORR
More
1 of 2
CENTER 851.00000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 50.00 kHz
SWP 1.67 sec

Figure 9

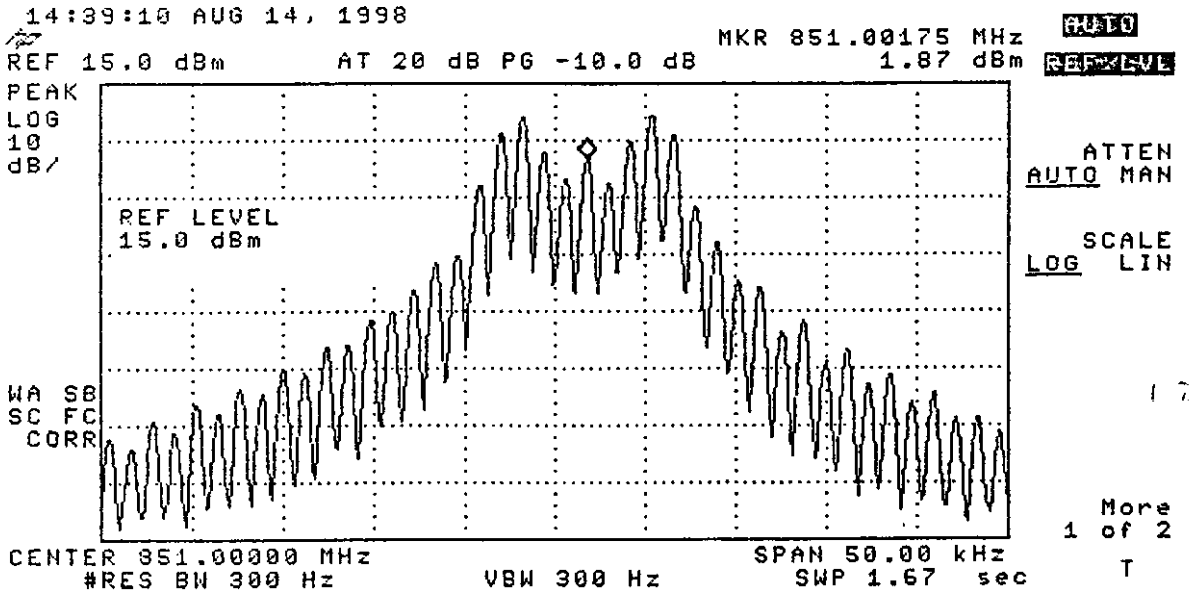

14:39:10 AUG 14, 1998
MKR 851.00175 MHz
REF 15.0 dBm
AT 20 dB PG -10.0 dB
1.87 dBm
AUTO
REF LVL
PEAK
LOG
10
dB/
REF LEVEL
15.0 dBm
ATTEN
AUTO MAN
SCALE
LOG LIN
WA SB
SC FC
CORR
More
1 of 2
CENTER 851.00000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 50.00 kHz
SWP 1.67 sec

Figure 10

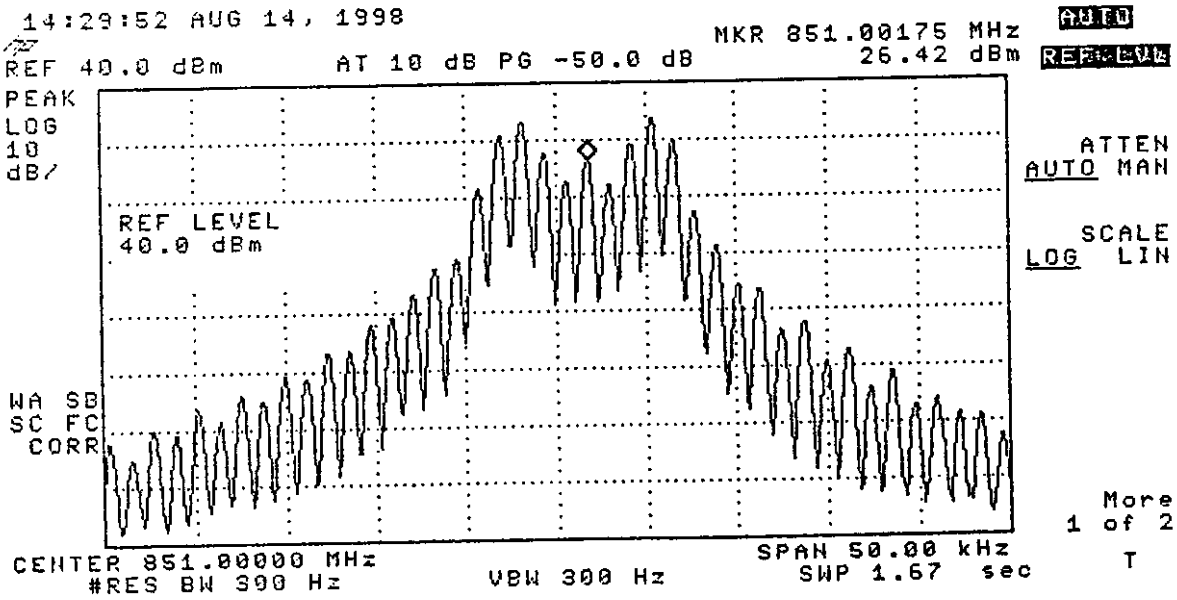

14:29:52 AUG 14, 1998
MKR 851.00175 MHz
26.42 dBm
AUTO
REF 40.0 dBm
AT 10 dB PG -50.0 dB
PEAK
LOG
10
dB/
REF LEVEL
40.0 dBm
ATTEN
AUTO MAN
SCALE
LOG LIN
WA SB
SC FC
CORR
More
1 of 2
CENTER 851.00000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 50.00 kHz
SWP 1.67 sec

Figure 11

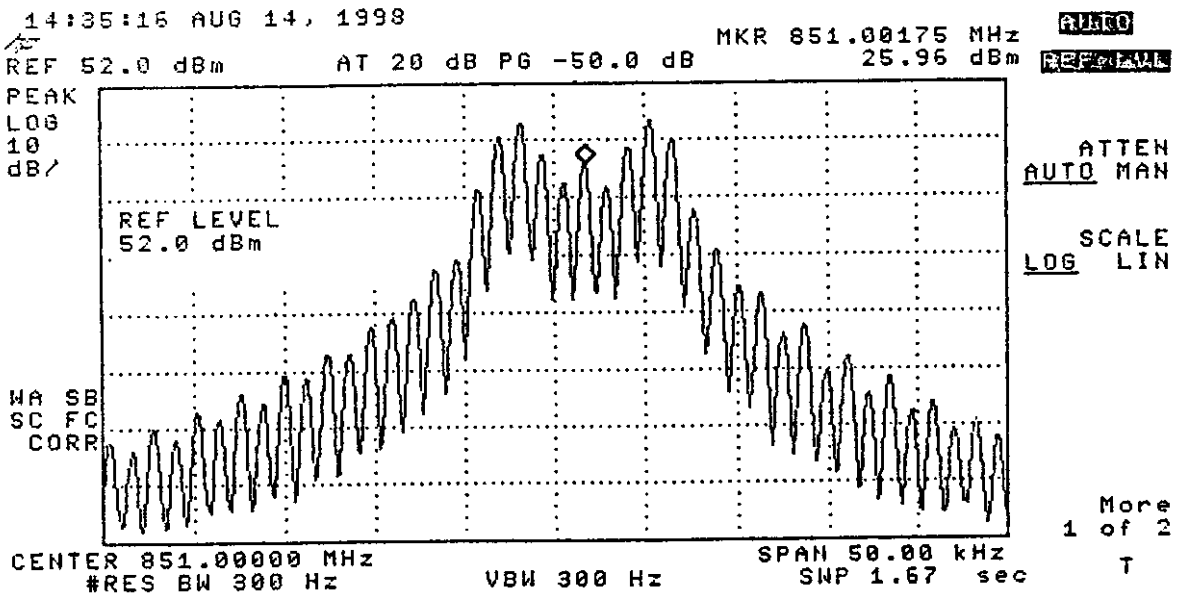

14:35:16 AUG 14, 1998
MKR 851.00175 MHz
REF 52.0 dBm
AT 20 dB PG -50.0 dB
25.96 dBm
PEAK
LOG
10
dB/
REF LEVEL
52.0 dBm
ATTEN
AUTO MAN
SCALE
LOG LIN
WA SB
SC FC
CORR
More
1 of 2
CENTER 851.00000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 50.00 kHz
SWP 1.67 sec

Figure 12

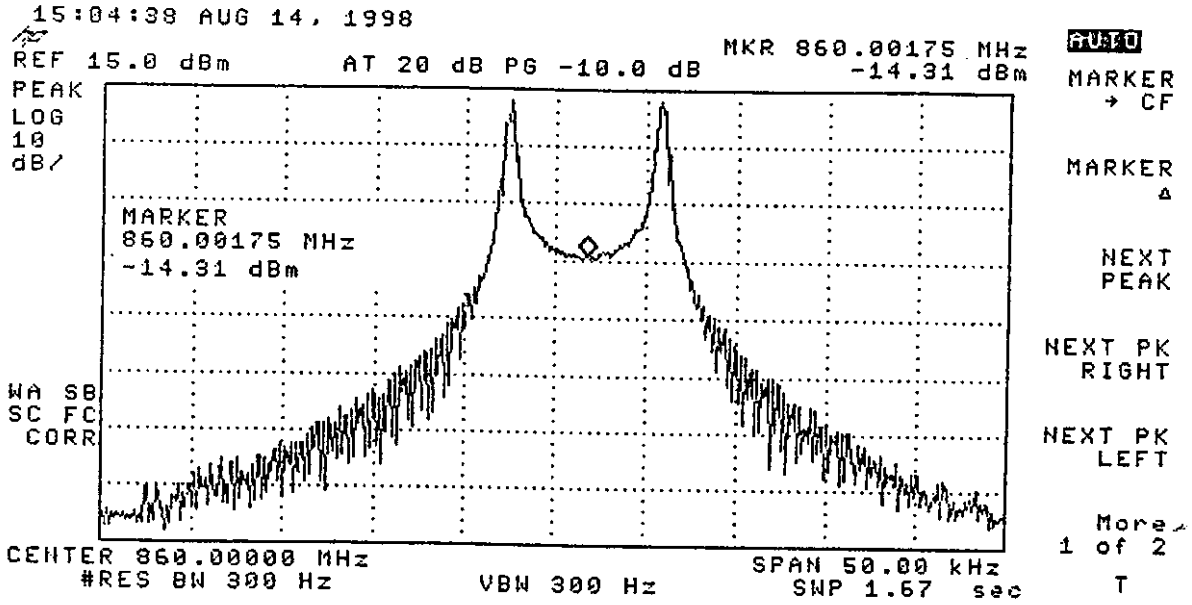

15:04:38 AUG 14, 1998
REF 15.0 dBm
AT 20 dB PG -10.0 dB
MKR 860.00175 MHz
-14.31 dBm
PEAK
LOG
10
dB/
MARKER
860.00175 MHz
-14.31 dBm
WA SB
SC FC
CORR
CENTER 860.00000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 50.00 kHz
SWP 1.67 sec
AUTO
MARKER
→ CF
MARKER
Δ
NEXT
PEAK
NEXT PK
RIGHT
NEXT PK
LEFT
More
1 of 2
T

Figure 13

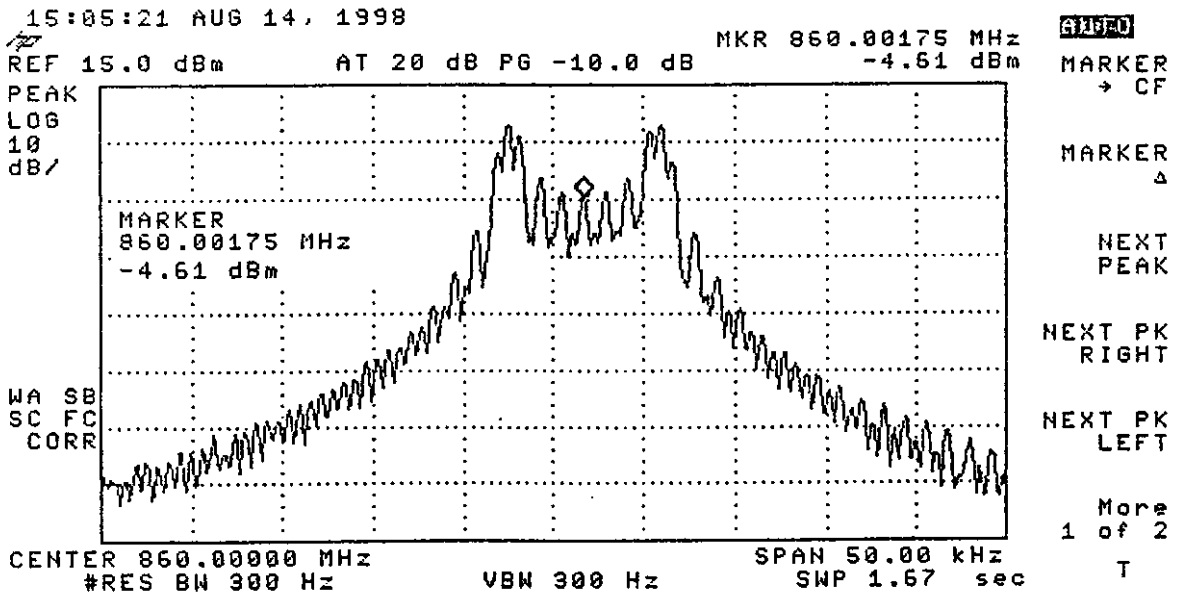

15:05:21 AUG 14, 1998
MKR 860.00175 MHz
REF 15.0 dBm
AT 20 dB PG -10.0 dB
-4.61 dBm
PEAK
LOG
10
dB/
MARKER
860.00175 MHz
-4.61 dBm
WA SB
SC FC
CORR
CENTER 860.00000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 50.00 kHz
SWP 1.67 sec
MARKER
→ CF
MARKER
Δ
NEXT
PEAK
NEXT PK
RIGHT
NEXT PK
LEFT
More
1 of 2
T

Figure 14

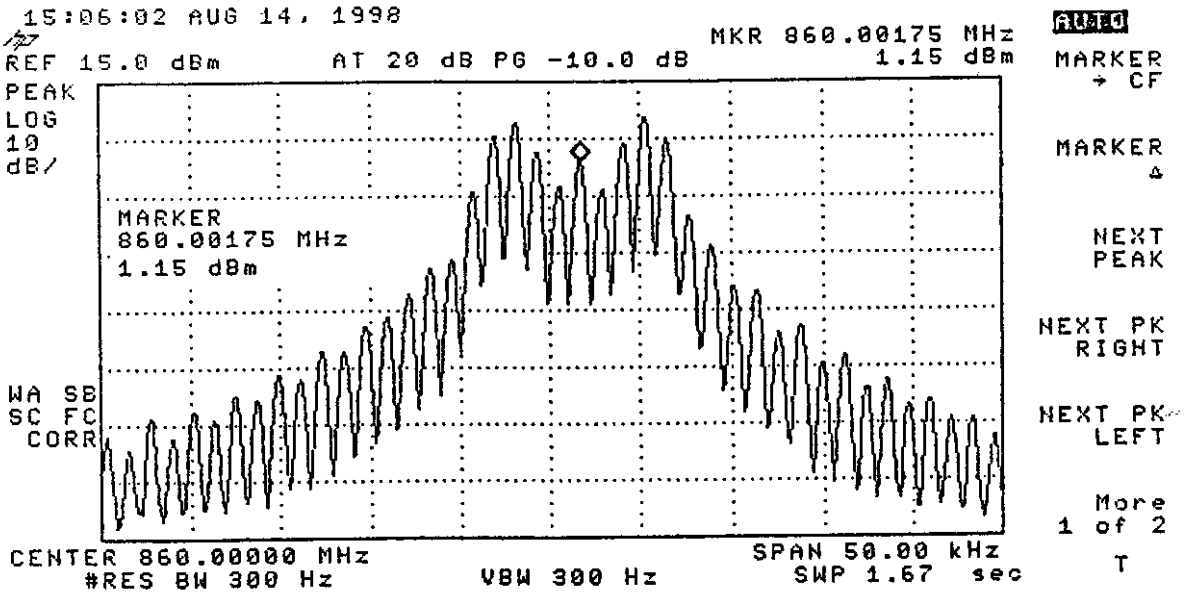

15:06:02 AUG 14, 1998
MKR 860.00175 MHz
REF 15.0 dBm
AT 20 dB PG -10.0 dB
1.15 dBm
AUTO
MARKER → CF
PEAK
LOG
10
dB/
MARKER
860.00175 MHz
1.15 dBm
MARKER Δ
NEXT PEAK
NEXT PK RIGHT
WA SB
SC FC
CORR
NEXT PK LEFT
More 1 of 2
CENTER 860.00000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 50.00 kHz
SWP 1.67 sec

Figure 15

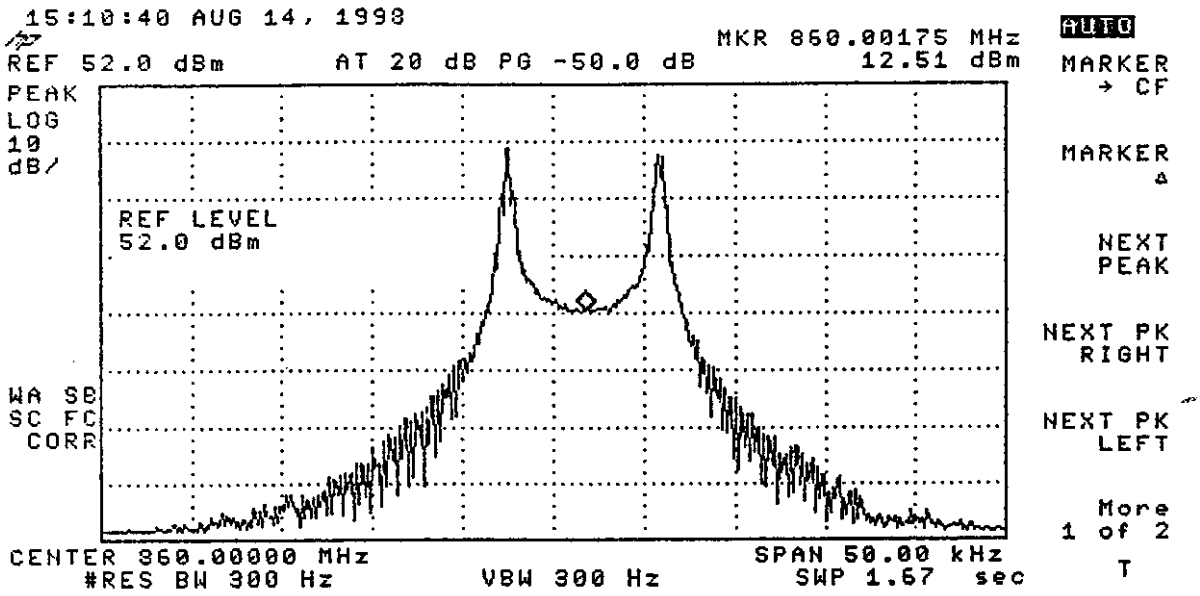

15:10:40 AUG 14, 1998
MKR 860.00175 MHz
REF 52.0 dBm
AT 20 dB PG -50.0 dB
12.51 dBm
AUTO
PEAK
LOG
10
dB/
REF LEVEL
52.0 dBm
MARKER
→ CF
MARKER
Δ
NEXT
PEAK
NEXT PK
RIGHT
NEXT PK
LEFT
More
1 of 2
WA SB
SC FC
CORR
CENTER 860.00000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 50.00 kHz
SWP 1.57 sec

Figure 16

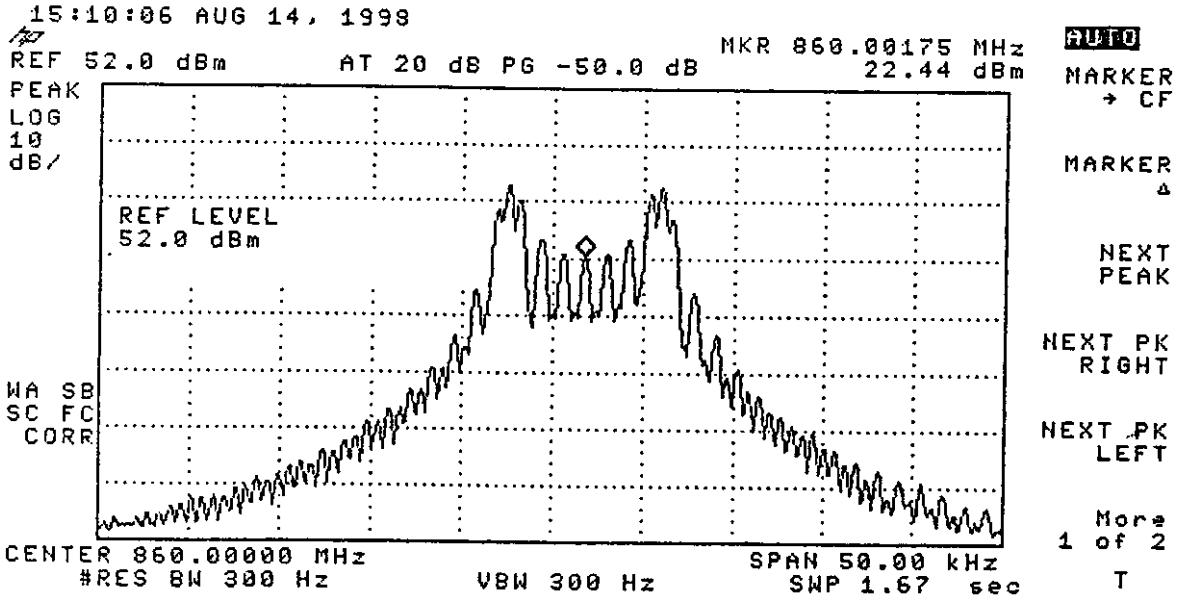

15:10:06 AUG 14, 1998
REF 52.0 dBm
AT 20 dB PG -50.0 dB
MKR 860.00175 MHz
22.44 dBm
AUTO
PEAK
LOG
10
dB/
REF LEVEL
52.0 dBm
WA SB
SC FC
CORR
MARKER
→ CF
MARKER
Δ
NEXT
PEAK
NEXT PK
RIGHT
NEXT PK
LEFT
More
1 of 2
CENTER 860.00000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 50.00 kHz
SWP 1.67 sec
T

Figure 17

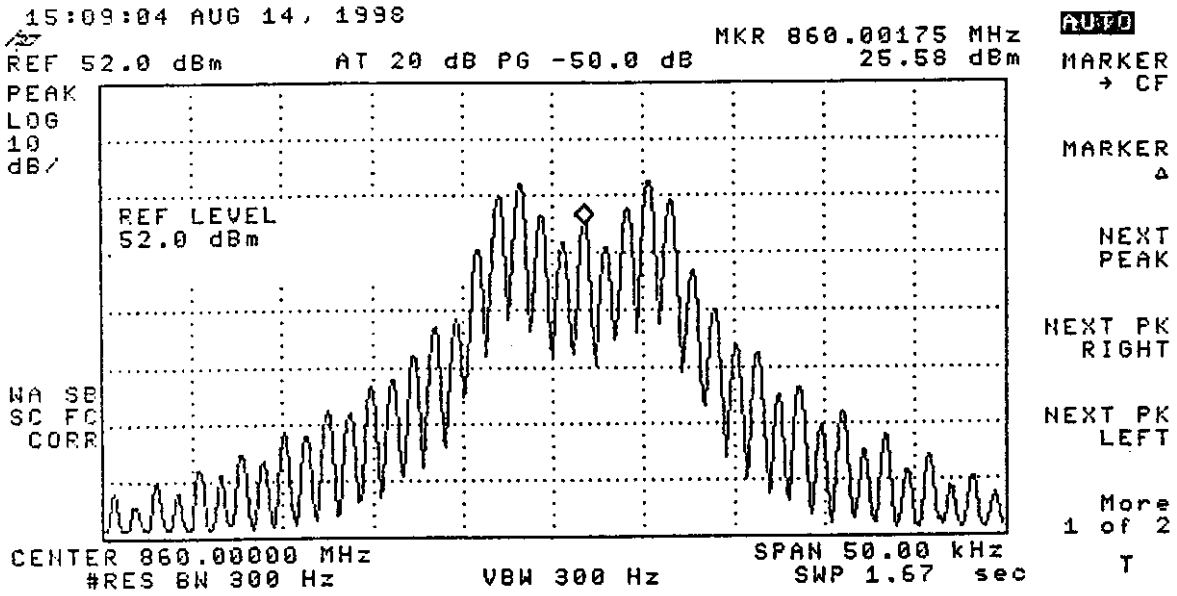

15:09:04 AUG 14, 1998
MKR 860.00175 MHz
REF 52.0 dBm
AT 20 dB PG -50.0 dB
25.58 dBm
AUTO
PEAK
LOG
10
dB/
REF LEVEL
52.0 dBm
MARKER
→ CF
MARKER
Δ
NEXT
PEAK
NEXT PK
RIGHT
NEXT PK
LEFT
More
1 of 2
NA SB
SC FC
CORR
CENTER 860.00000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 50.00 kHz
SWP 1.67 sec

Figure 18

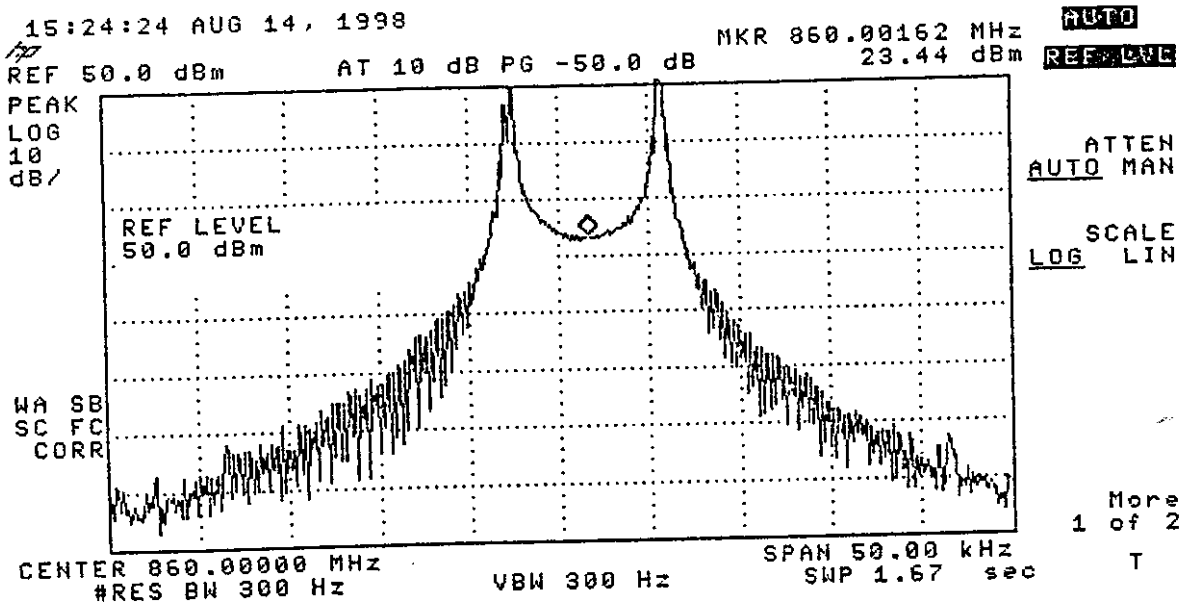

15:24:24 AUG 14, 1998
MKR 860.00162 MHz
23.44 dBm
AUTO
REF LVL
REF 50.0 dBm
AT 10 dB PG -50.0 dB
PEAK
LOG
10
dB/
REF LEVEL
50.0 dBm
ATTEN
AUTO MAN
SCALE
LOG LIN
WA SB
SC FC
CORR
More
1 of 2
CENTER 860.00000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 50.00 kHz
SWP 1.67 sec

Figure 19

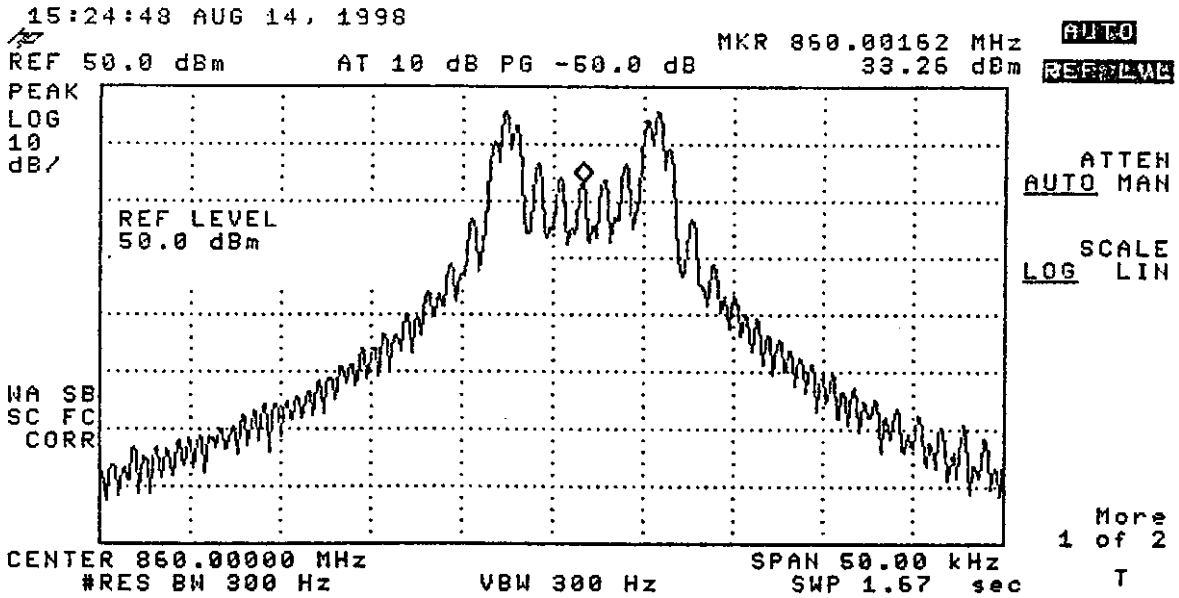

15:24:48 AUG 14, 1998
REF 50.0 dBm
AT 10 dB PG -50.0 dB
MKR 860.00162 MHz
33.26 dBm
AUTO
REF LVL
PEAK
LOG
10
dB/
REF LEVEL
50.0 dBm
ATTEN
AUTO MAN
SCALE
LOG LIN
WA SB
SC FC
CORR
More
1 of 2
CENTER 860.00000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 50.00 kHz
SWP 1.67 sec
T

Figure 20

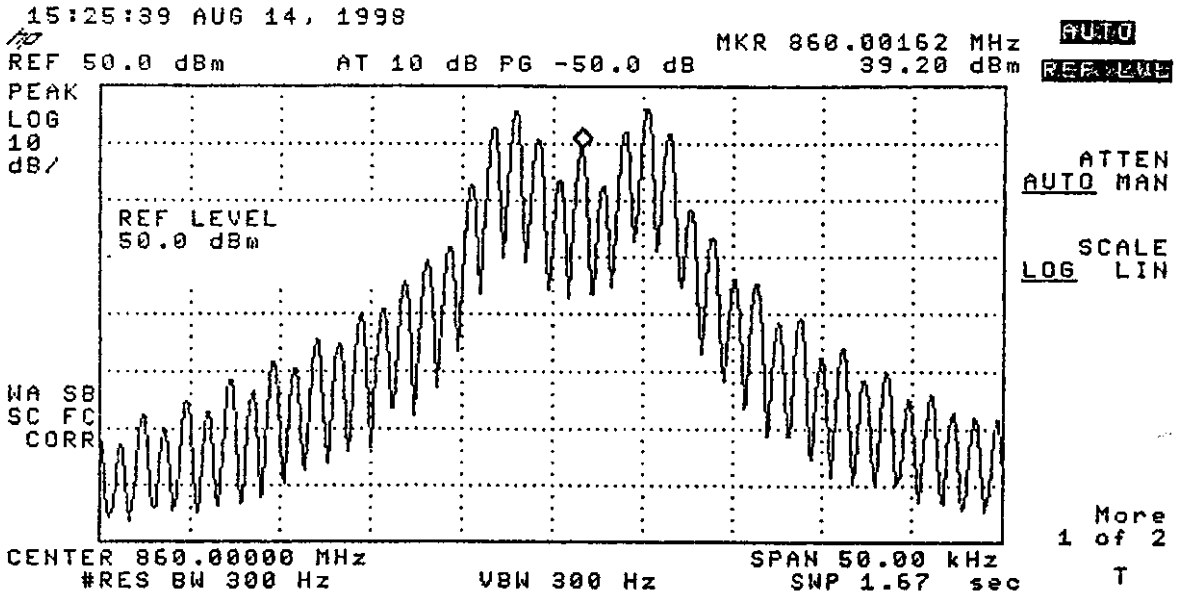

15:25:39 AUG 14, 1998
REF 50.0 dBm
AT 10 dB PG -50.0 dB
MKR 860.00162 MHz
39.20 dBm
AUTO
REF LVL
PEAK
LOG
10
dB/
REF LEVEL
50.0 dBm
ATTEN
AUTO MAN
SCALE
LOG LIN
WA SB
SC FC
CORR
More
1 of 2
CENTER 860.00000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 50.00 kHz
SWP 1.67 sec

Figure 21

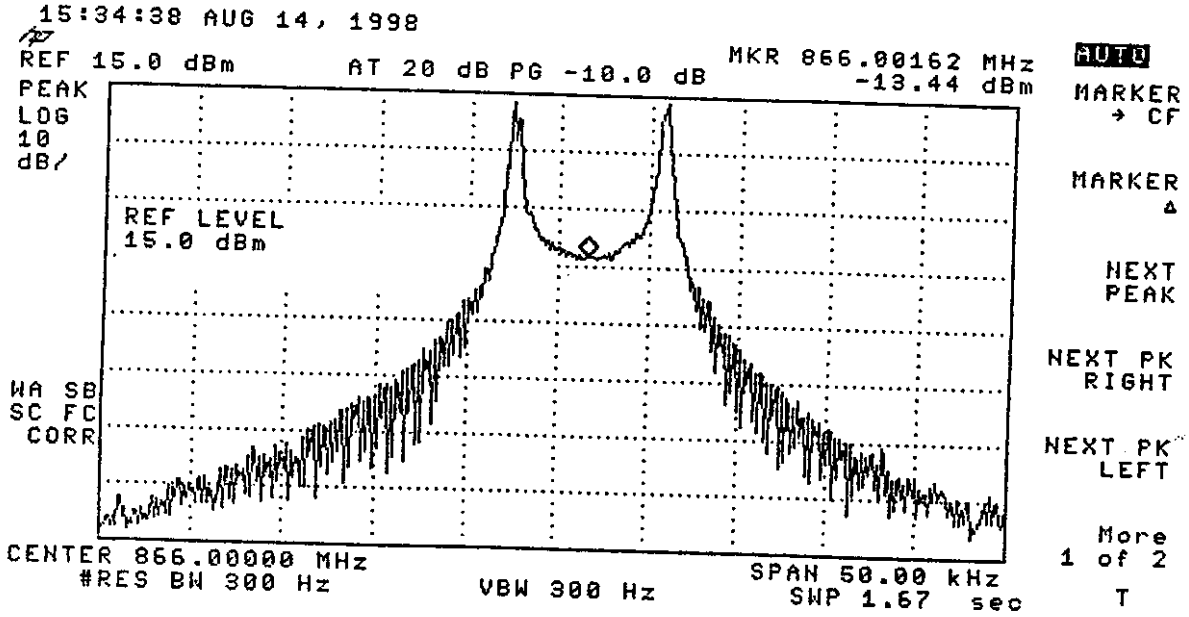

15:34:38 AUG 14, 1998
REF 15.0 dBm
AT 20 dB PG -10.0 dB
MKR 866.00162 MHz
-13.44 dBm
AUTO
PEAK
LOG
10
dB/
REF LEVEL
15.0 dBm
MARKER
→ CF
MARKER
Δ
NEXT
PEAK
NEXT PK
RIGHT
NEXT PK
LEFT
More
1 of 2
WA SB
SC FC
CORR
CENTER 866.00000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 50.00 kHz
SWP 1.67 sec
T

Figure 22

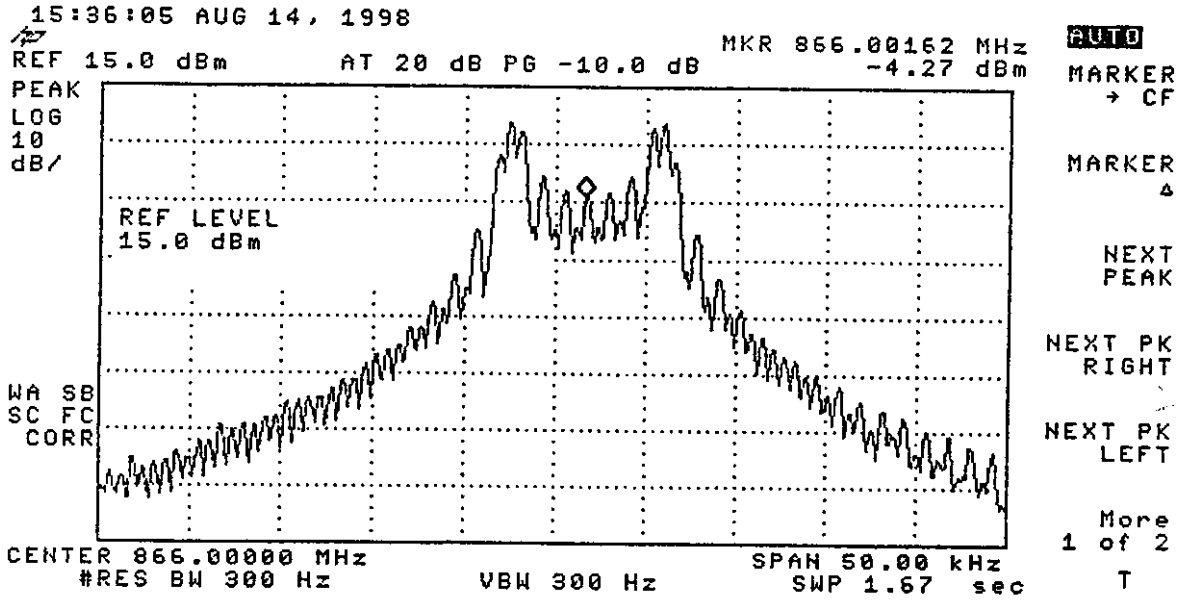

15:36:05 AUG 14, 1998
REF 15.0 dBm
AT 20 dB PG -10.0 dB
MKR 866.00162 MHz
-4.27 dBm
AUTO
PEAK
LOG
10
dB/
REF LEVEL
15.0 dBm
WA SB
SC FC
CORR
MARKER
→ CF
MARKER
Δ
NEXT
PEAK
NEXT PK
RIGHT
NEXT PK
LEFT
More
1 of 2
CENTER 866.00000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 50.00 kHz
SWP 1.67 sec

Figure 23

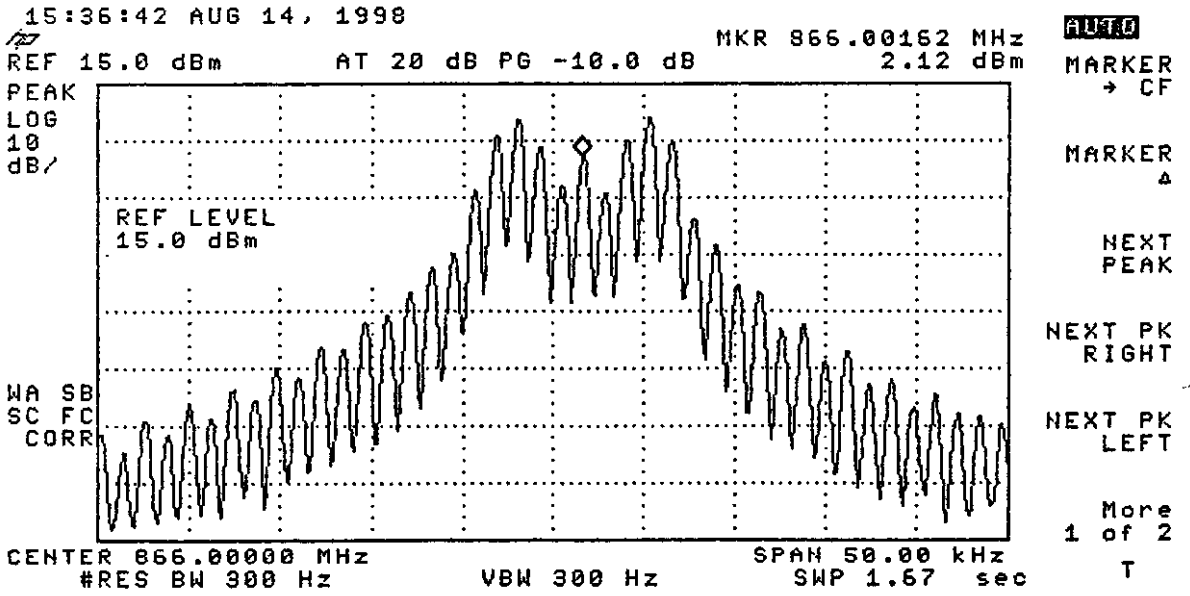

15:36:42 AUG 14, 1998
MKR 866.00162 MHz
REF 15.0 dBm
AT 20 dB PG -10.0 dB
2.12 dBm
AUTO
PEAK
LOG
10
dB/
REF LEVEL
15.0 dBm
MARKER
→ CF
MARKER
Δ
NEXT
PEAK
NEXT PK
RIGHT
NEXT PK
LEFT
More
1 of 2
WA SB
SC FC
CORR
CENTER 866.00000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 50.00 kHz
SWP 1.67 sec

Figure 24

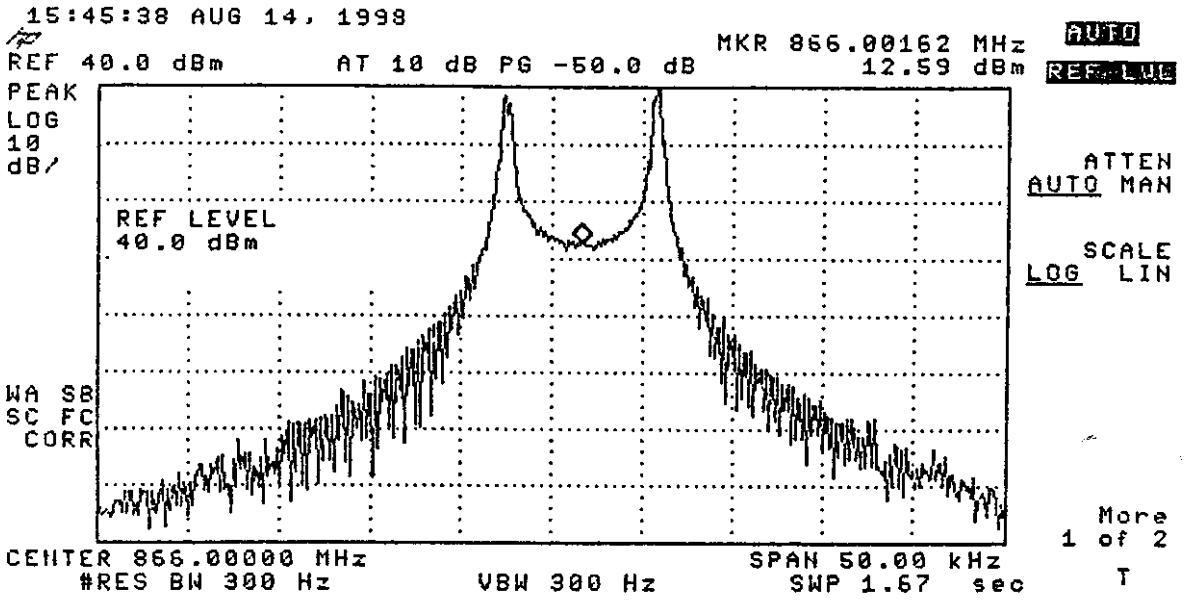

15:45:38 AUG 14, 1998
REF 40.0 dBm
AT 10 dB PG -50.0 dB
MKR 866.00162 MHz
12.59 dBm
AUTO
REF LVL
PEAK
LOG
10
dB/
REF LEVEL
40.0 dBm
ATTEN
AUTO MAN
SCALE
LOG LIN
WA SB
SC FC
CORR
More
1 of 2
CENTER 866.00000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 50.00 kHz
SWP 1.67 sec

Figure 25

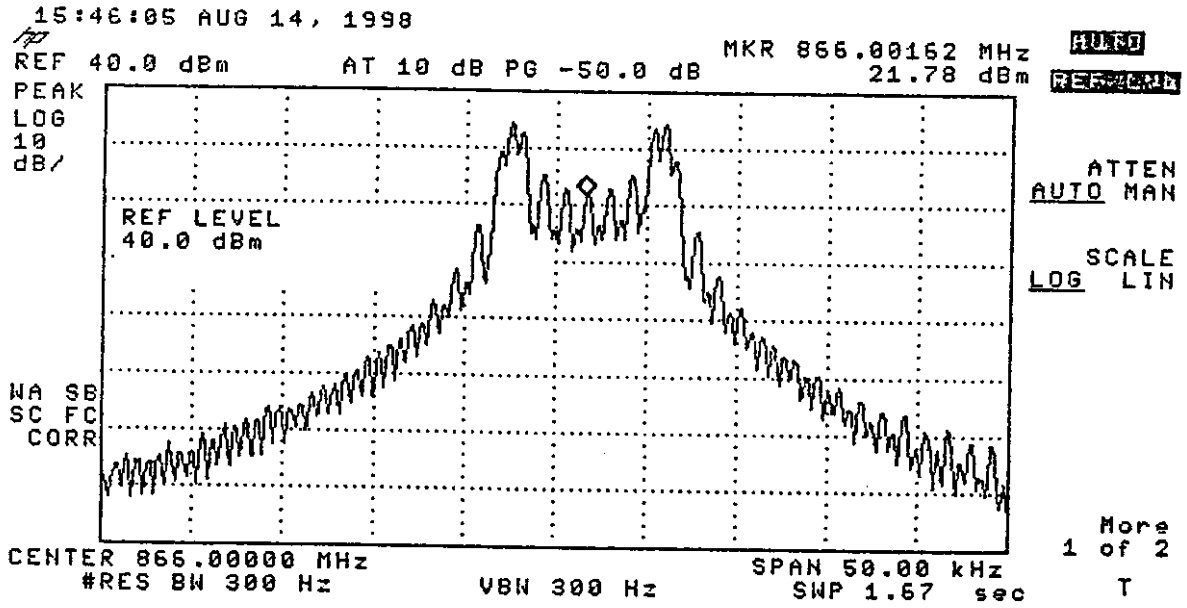

15:46:05 AUG 14, 1998
REF 40.0 dBm
AT 10 dB PG -50.0 dB
MKR 866.00162 MHz
21.78 dBm
PEAK
LOG
10
dB/
REF LEVEL
40.0 dBm
ATTEN
AUTO MAN
SCALE
LOG LIN
WA SB
SC FC
CORR
More
1 of 2
CENTER 866.00000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 50.00 kHz
SWP 1.67 sec

Figure 26

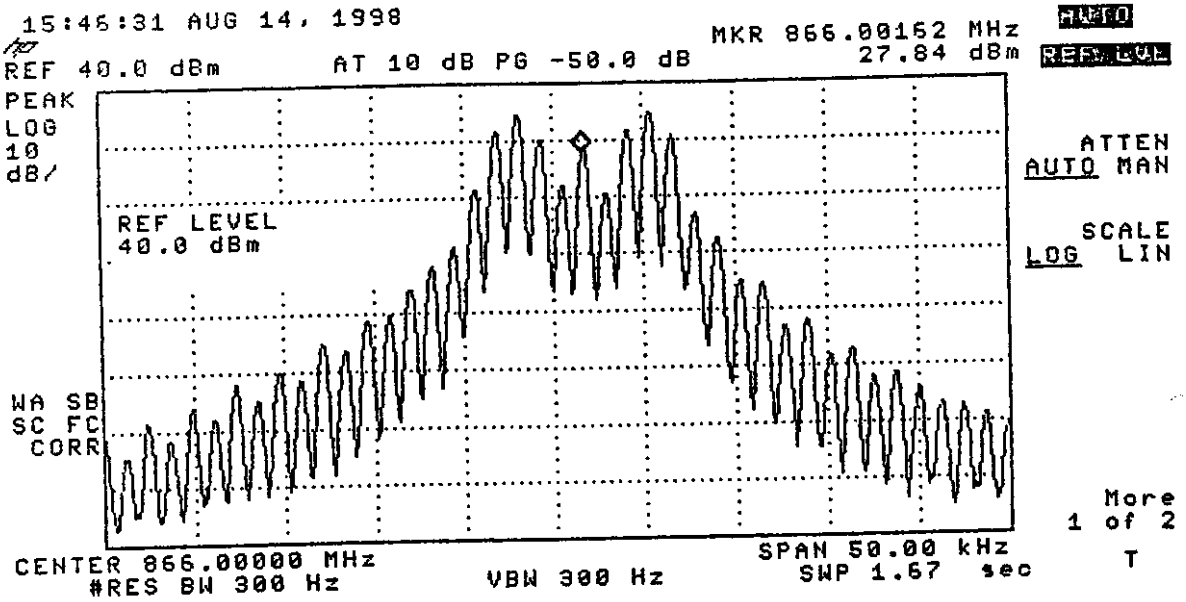

15:45:31 AUG 14, 1998
MKR 866.00162 MHz
27.84 dBm
REF 40.0 dBm
AT 10 dB PG -50.0 dB
PEAK
LOG
10
dB/
REF LEVEL
40.0 dBm
WA SB
SC FC
CORR
ATTEN
AUTO MAN
SCALE
LOG LIN
More
1 of 2
CENTER 866.00000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 50.00 kHz
SWP 1.67 sec

Figure 27

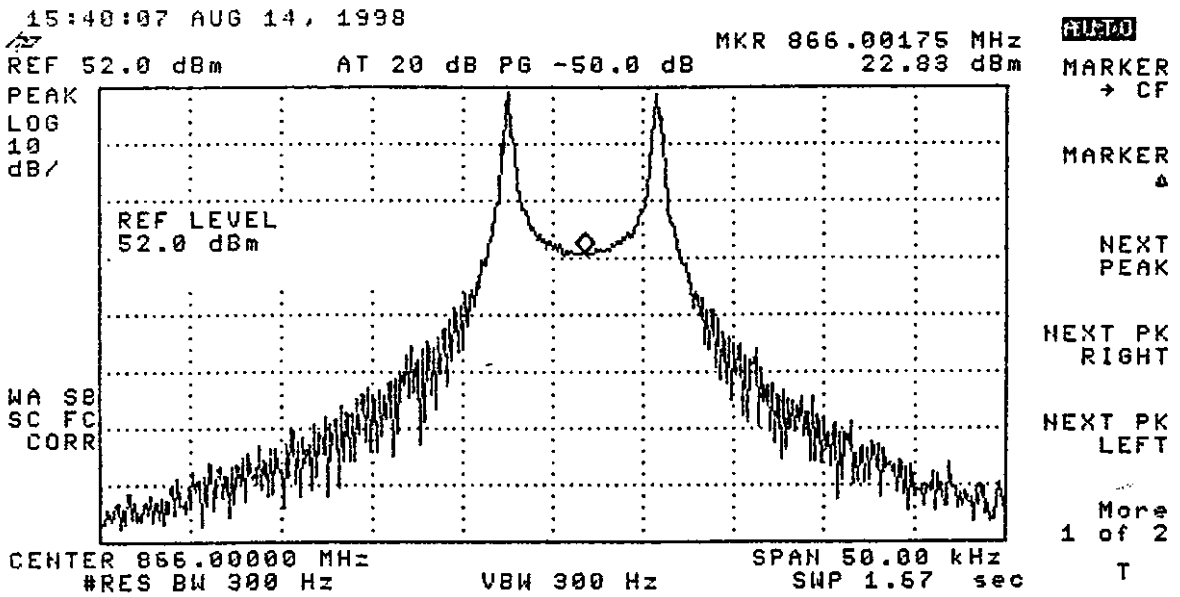

15:40:07 AUG 14, 1998
MKR 866.00175 MHz
REF 52.0 dBm
AT 20 dB PG -50.0 dB
22.83 dBm
AUTO
MARKER → CF
MARKER Δ
NEXT PEAK
NEXT PK RIGHT
NEXT PK LEFT
More 1 of 2
PEAK
LOG
10
dB/
REF LEVEL
52.0 dBm
WA SB
SC FC
CORR
CENTER 866.00000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 50.00 kHz
SWP 1.67 sec

Figure 28

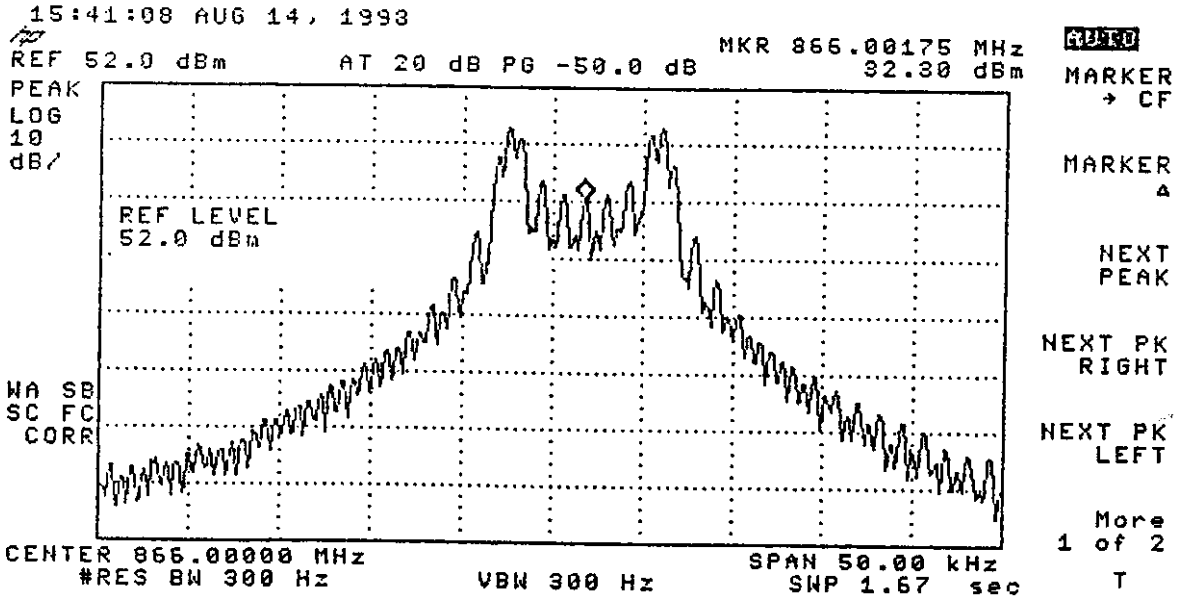

15:41:08 AUG 14, 1993
REF 52.0 dBm
AT 20 dB PG -50.0 dB
MKR 866.00175 MHz
32.30 dBm
PEAK
LOG
10
dB/
REF LEVEL
52.0 dBm
WA SB
SC FC
CORR
CENTER 866.00000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 50.00 kHz
SWP 1.67 sec
MARKER
→ CF
MARKER
Δ
NEXT
PEAK
NEXT PK
RIGHT
NEXT PK
LEFT
More
1 of 2
T

Figure 29

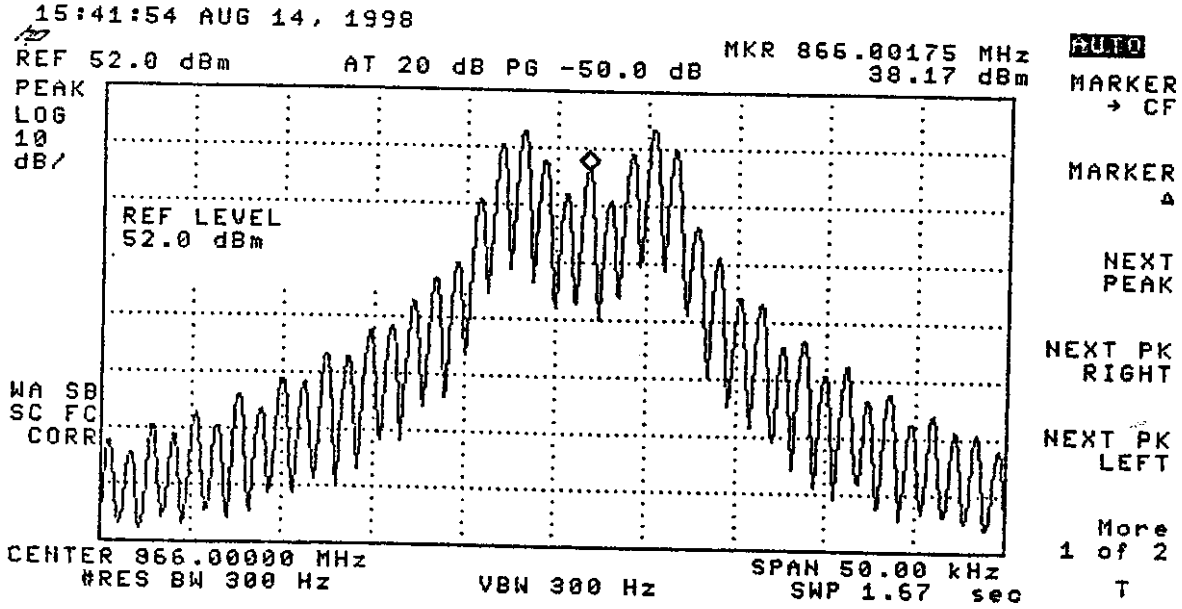

15:41:54 AUG 14, 1998
REF 52.0 dBm
AT 20 dB PG -50.0 dB
MKR 866.00175 MHz
38.17 dBm
AUTO
PEAK
LOG
10
dB/
REF LEVEL
52.0 dBm
MARKER
→ CF
MARKER
Δ
NEXT
PEAK
NEXT PK
RIGHT
NEXT PK
LEFT
More
1 of 2
WA SB
SC FC
CORR
CENTER 866.00000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 50.00 kHz
SWP 1.67 sec

Figure 30

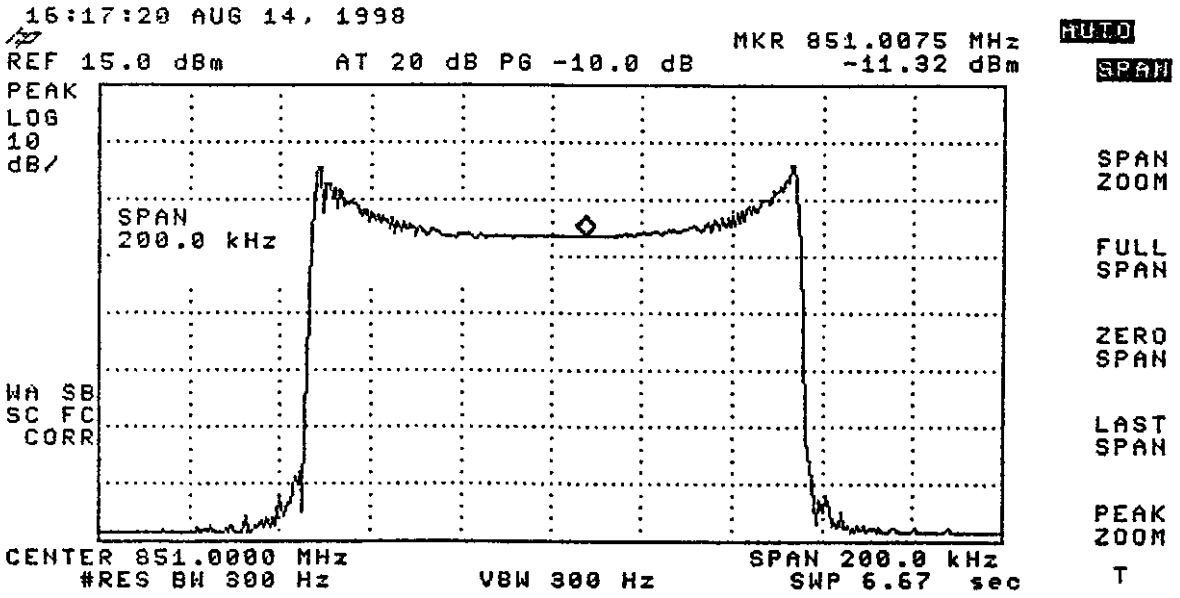

16:17:20 AUG 14, 1998
MKR 851.0075 MHz
REF 15.0 dBm
AT 20 dB PG -10.0 dB
-11.32 dBm
PEAK
LOG
10
dB/
SPAN
200.0 kHz
WA SB
SC FC
CORR
CENTER 851.0000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 200.0 kHz
SWP 6.67 sec
MKR
SPAN
SPAN ZOOM
FULL SPAN
ZERO SPAN
LAST SPAN
PEAK ZOOM
T

Figure 31

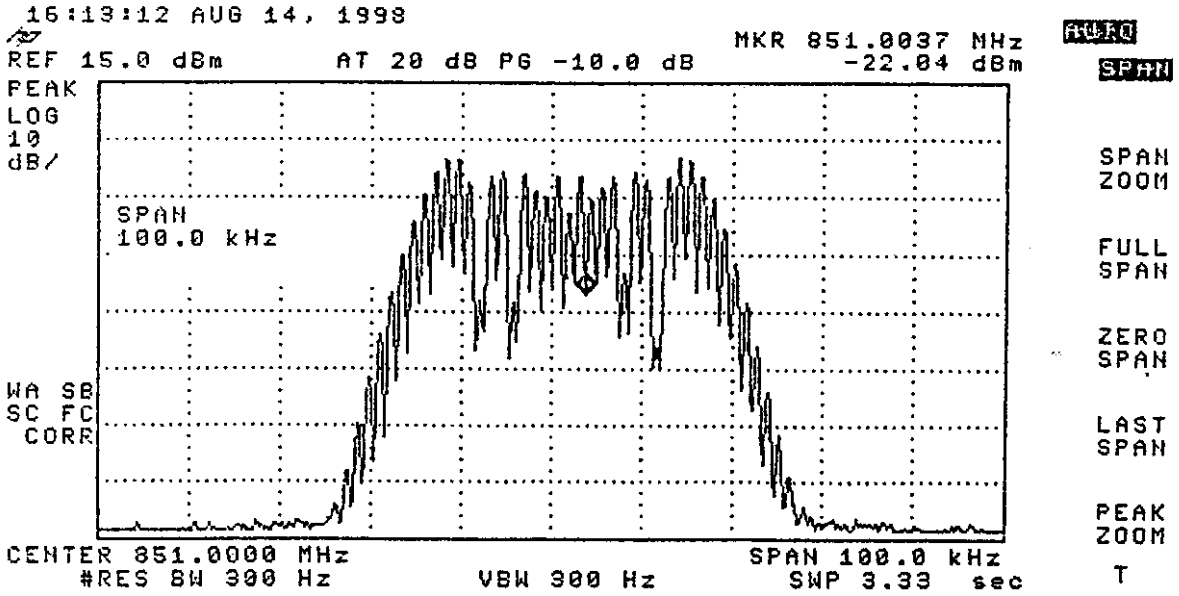

16:13:12 AUG 14, 1998
REF 15.0 dBm
AT 20 dB PG -10.0 dB
MKR 851.0037 MHz
-22.04 dBm
PEAK
LOG
10
dB/
SPAN
100.0 kHz
WA SB
SC FC
CORR
CENTER 851.0000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 100.0 kHz
SWP 3.33 sec
AUTO
SPAN
SPAN ZOOM
FULL SPAN
ZERO SPAN
LAST SPAN
PEAK ZOOM
T

Figure 32

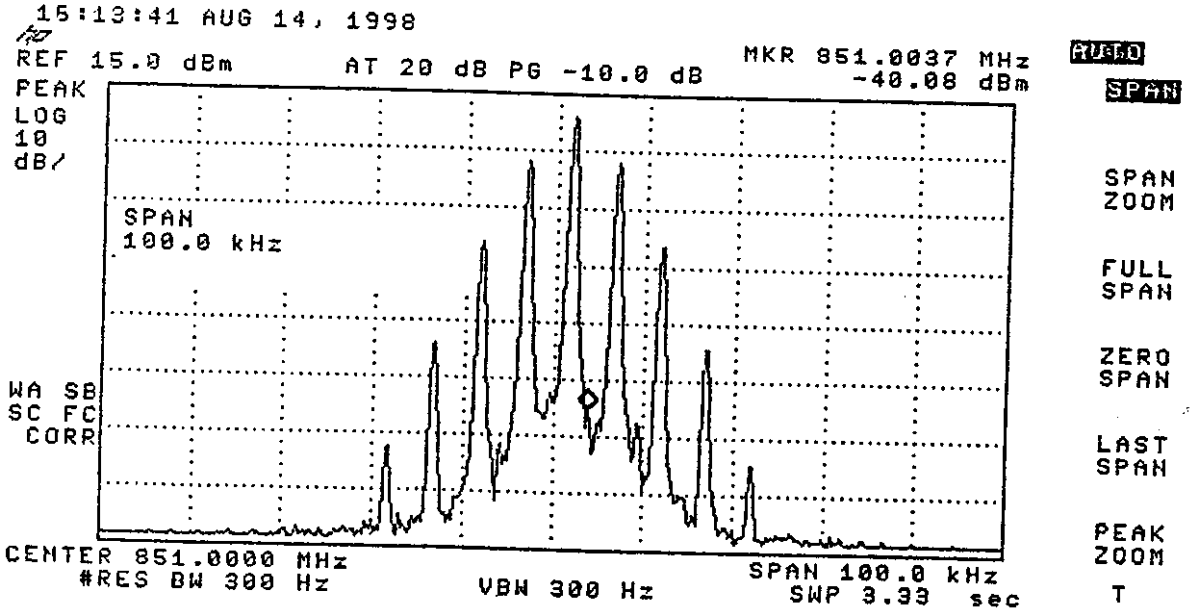

15:13:41 AUG 14, 1998
REF 15.0 dBm
AT 20 dB PG -10.0 dB
MKR 851.0037 MHz
-40.08 dBm
PEAK
LOG
10
dB/
SPAN
100.0 kHz
WA SB
SC FC
CORR
CENTER 851.0000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 100.0 kHz
SWP 3.33 sec
AUTO
SPAN
SPAN ZOOM
FULL SPAN
ZERO SPAN
LAST SPAN
PEAK ZOOM
T

Figure 33

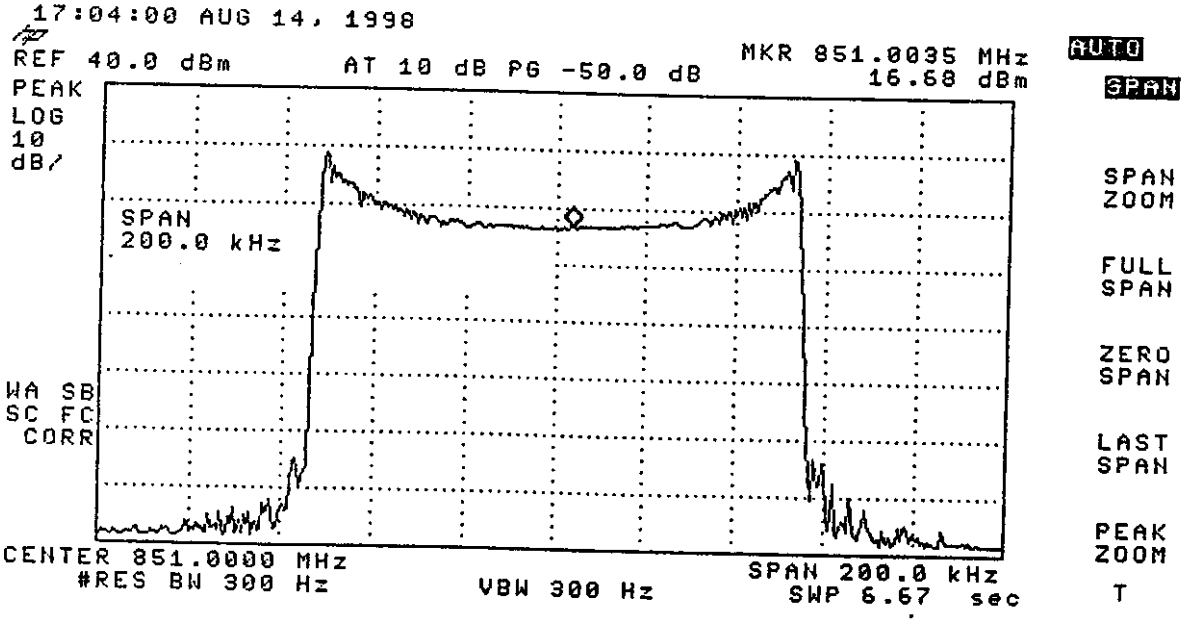

17:04:00 AUG 14, 1998
REF 40.0 dBm
AT 10 dB PG -50.0 dB
MKR 851.0035 MHz
16.68 dBm
PEAK
LOG
10
dB/
SPAN
200.0 kHz
WA SB
SC FC
CORR
CENTER 851.0000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 200.0 kHz
SWP 6.67 sec
AUTO
SPAN
SPAN ZOOM
FULL SPAN
ZERO SPAN
LAST SPAN
PEAK ZOOM
T

Figure 34

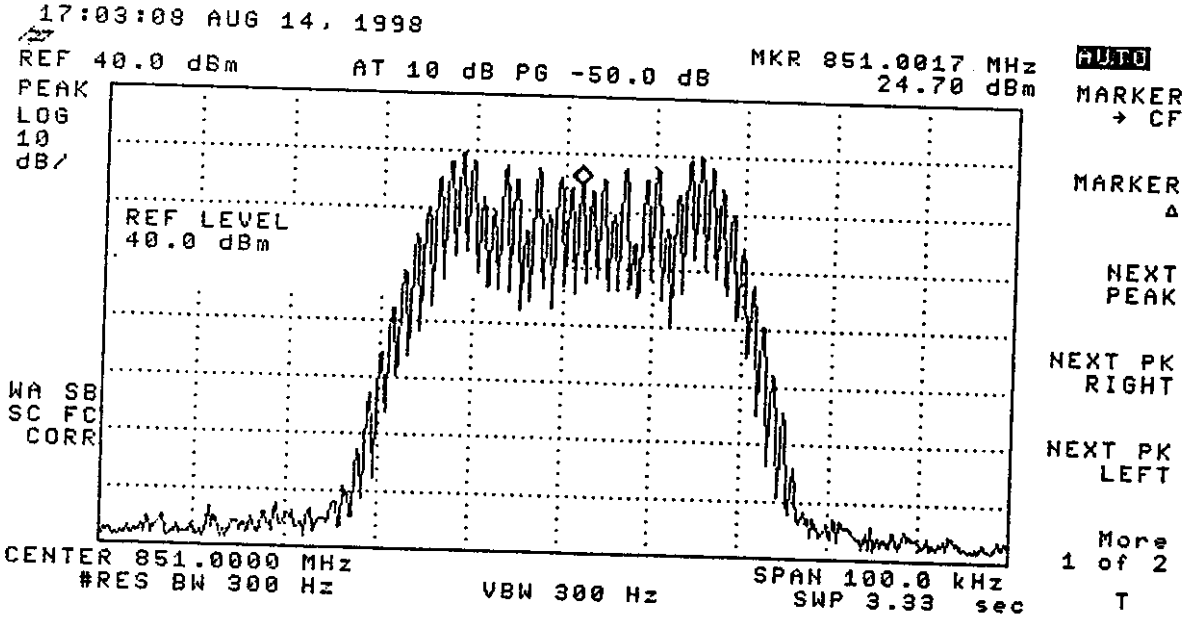

17:03:08 AUG 14, 1998
REF 40.0 dBm
AT 10 dB PG -50.0 dB
MKR 851.0017 MHz
24.70 dBm
AUTO
PEAK
LOG
10
dB/
REF LEVEL
40.0 dBm
MARKER
→ CF
MARKER
Δ
NEXT
PEAK
NEXT PK
RIGHT
NEXT PK
LEFT
More
1 of 2
WA SB
SC FC
CORR
CENTER 851.0000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 100.0 kHz
SWP 3.33 sec
T

Figure 35

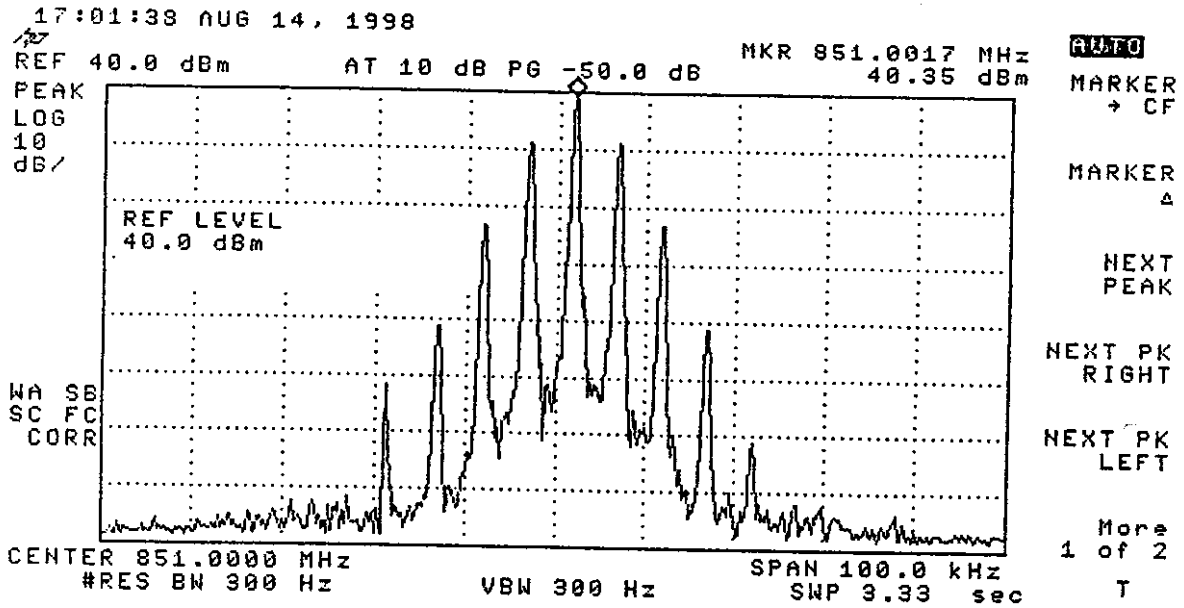

17:01:38 AUG 14, 1998
REF 40.0 dBm
AT 10 dB PG -50.0 dB
MKR 851.0017 MHz
40.35 dBm
AUTO
PEAK
LOG
10
dB/
REF LEVEL
40.0 dBm
MARKER
→ CF
MARKER
Δ
NEXT
PEAK
NEXT PK
RIGHT
NEXT PK
LEFT
More
1 of 2
WA SB
SC FC
CORR
CENTER 851.0000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 100.0 kHz
SWP 3.33 sec

Figure 36

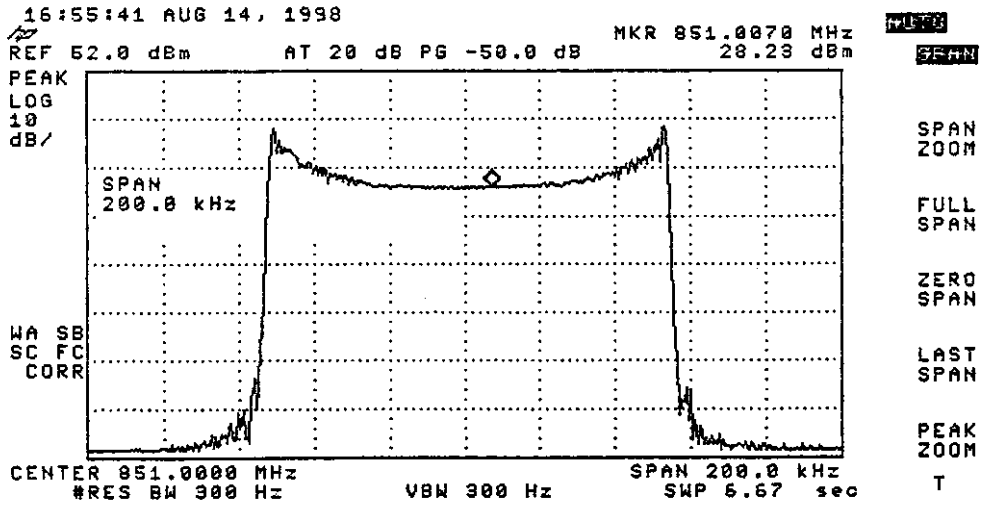

16:55:41 AUG 14, 1998
MKR 851.0070 MHz
REF 52.0 dBm
AT 20 dB PG -50.0 dB
28.23 dBm
PEAK
LOG
10
dB/
SPAN
200.0 kHz
WA SB
SC FC
CORR
SPAN
ZOOM
FULL
SPAN
ZERO
SPAN
LAST
SPAN
PEAK
ZOOM
T
CENTER 851.0000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 200.0 kHz
SWP 6.67 sec

Figure 37

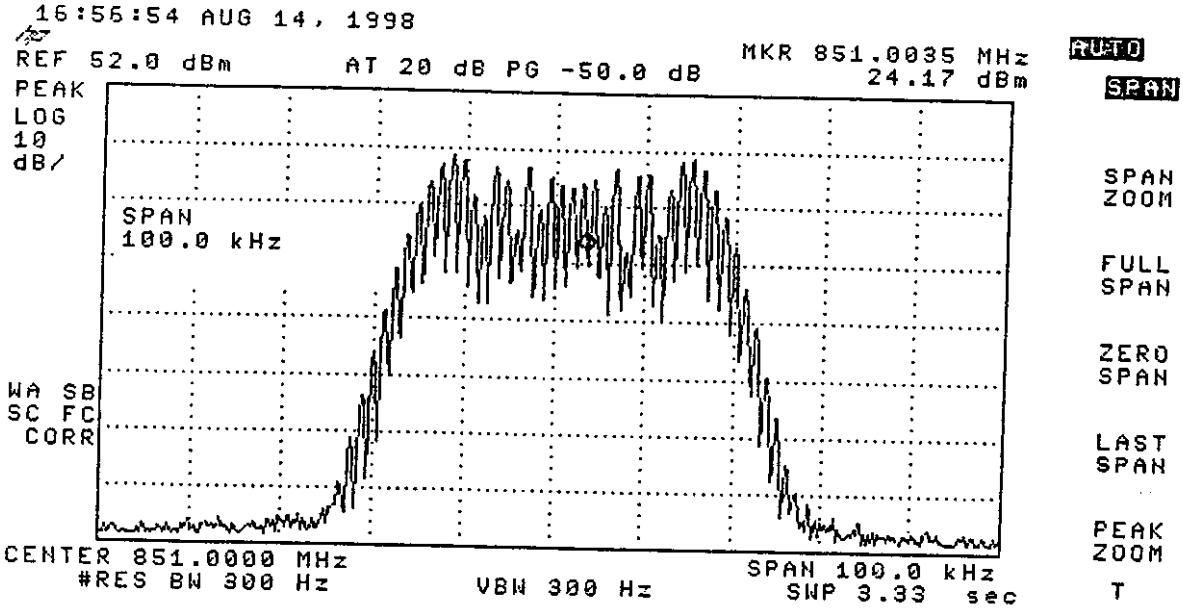

16:56:54 AUG 14, 1998
REF 52.0 dBm
AT 20 dB PG -50.0 dB
MKR 851.0035 MHz
24.17 dBm
PEAK
LOG
10
dB/
SPAN
100.0 kHz
WA SB
SC FC
CORR
CENTER 851.0000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 100.0 kHz
SWP 3.33 sec
AUTO
SPAN
SPAN ZOOM
FULL SPAN
ZERO SPAN
LAST SPAN
PEAK ZOOM
T

Figure 38

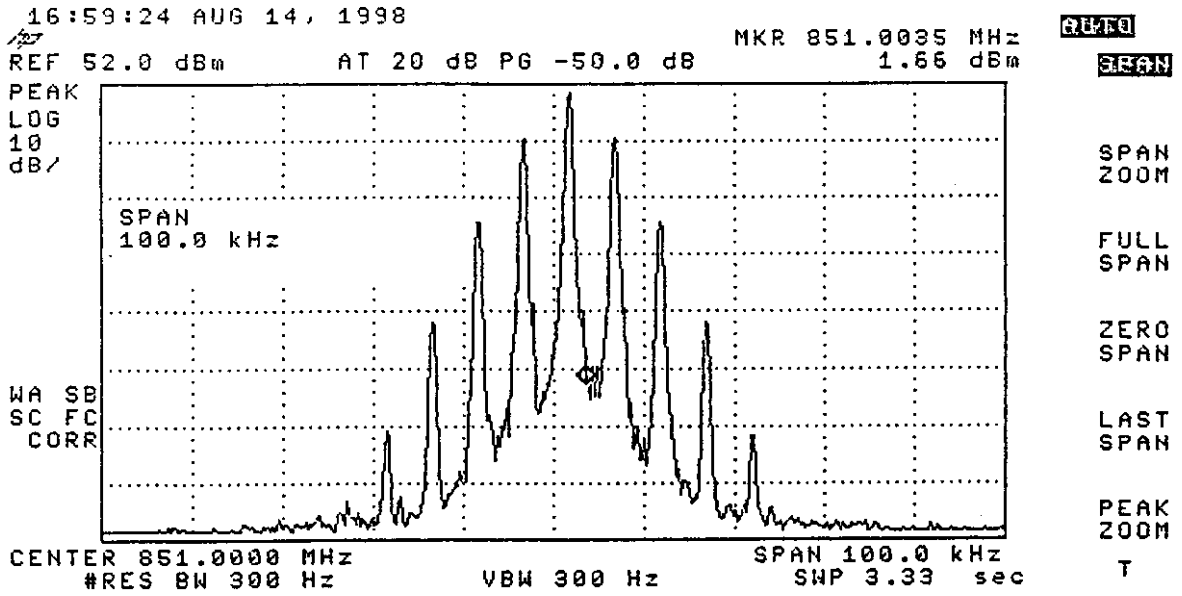

16:59:24 AUG 14, 1998
MKR 851.0035 MHz
REF 52.0 dBm
AT 20 dB PG -50.0 dB
1.66 dBm
PEAK
LOG
10
dB/
SPAN
100.0 kHz
WA SB
SC FC
CORR
CENTER 851.0000 MHz
#RES BW 300 Hz
VBW 300 Hz
SPAN 100.0 kHz
SWP 3.33 sec
AUTO
SPAN
SPAN ZOOM
FULL SPAN
ZERO SPAN
LAST SPAN
PEAK ZOOM
T

Figure 39