

Appendix B

Laboratory Measurements

Measured Test Data

A sample LC-800HP (Level 5) was tested as required by 47 CFR 2.1001, and 2.985 through 2.997 inclusive, in accordance with §2.999. The system was configured as follows:

- B-Block,
- Reverse link Diversity,
- 1:3 Distribution,
- AC power

2.985 RF Power Output

Requirement

For the power levels expected, the objective is to operate at power levels such that all spurious signals including intermodulation distortion tones are attenuated below the mean power of the carrier to a levels less than -13 dBm.

Test Method

Two scenarios were tested to establish CDMA power output power capability: Single mode CDMA, and Dual mode CDMA/AMPS.

For the dual mode test, one randomly chosen phase set was used. Half the power was put into the CDMA carrier, and the other half delegated to six equal-power CW carriers.

Test Equipment

The following equipment was utilized:

1. HP E2507B Multi-format Communications Signal Simulator (MCSS), Model 60
2. HP 8563A Spectrum Analyzer
3. HP 437B Power Meter, with HP8481A sensor
4. Trilithic HFP530/10 Attenuator, 10 dB 'N'
5. Narda 766-30 Attenuator, 30 dB 'N'

Test Results

See figures SC-1 and MC-1.

Conclusion:

The LC800HP continues to meet FCC intermodulation requirements for composite power levels not exceeding 25 Watts average.

9/9/98 H.N.

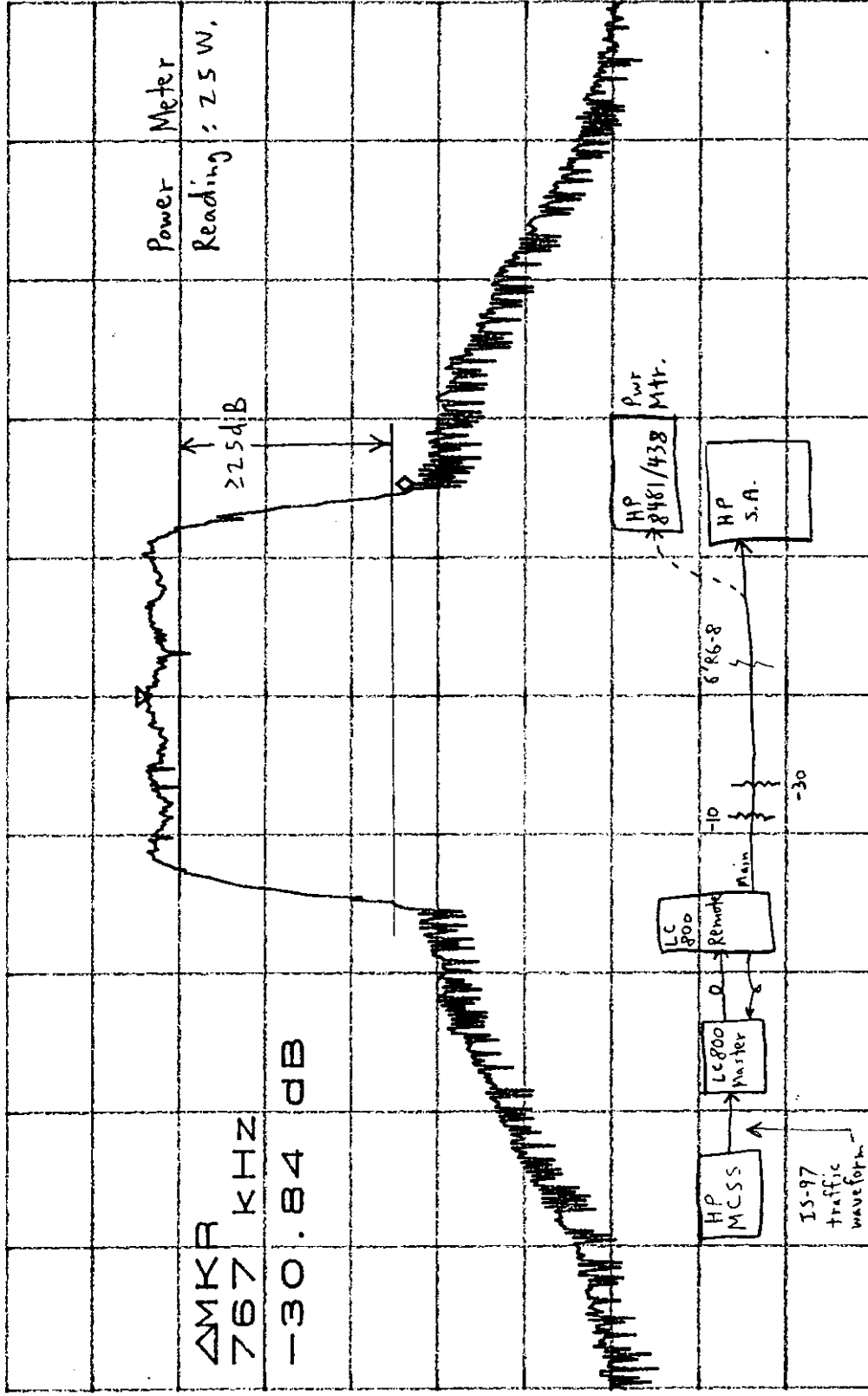
9/14/98 B.H. Annotations

FWD

$$p/o = +44 \text{ dBm} = 25 \text{ W}$$

ATTEN 20dB
RL 44.0dBm

$\Delta \text{MKR} -30.84 \text{ dB}$
767 kHz



$$\frac{10}{30} \leftarrow R$$

$$\frac{1.4}{41.4 \text{ dB}}$$

Power Meter
Reading: 25 W.

HP
8481/438
Mtr.

HP
S.A.

LC
800

Remote

Main

-10

-30

6.86-8

IS-97 traffic waveform

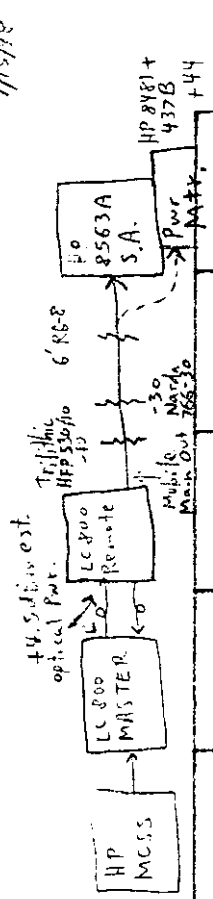
HP MCSS

LC800 Master

CENTER 881.000MHZ
RBW 30KHZ *VBW 300HZ
SPAN 5.000MHZ
SWP 1.4sec

Fig. SC-1: SINGLE-CARRIER CDMA PERF.

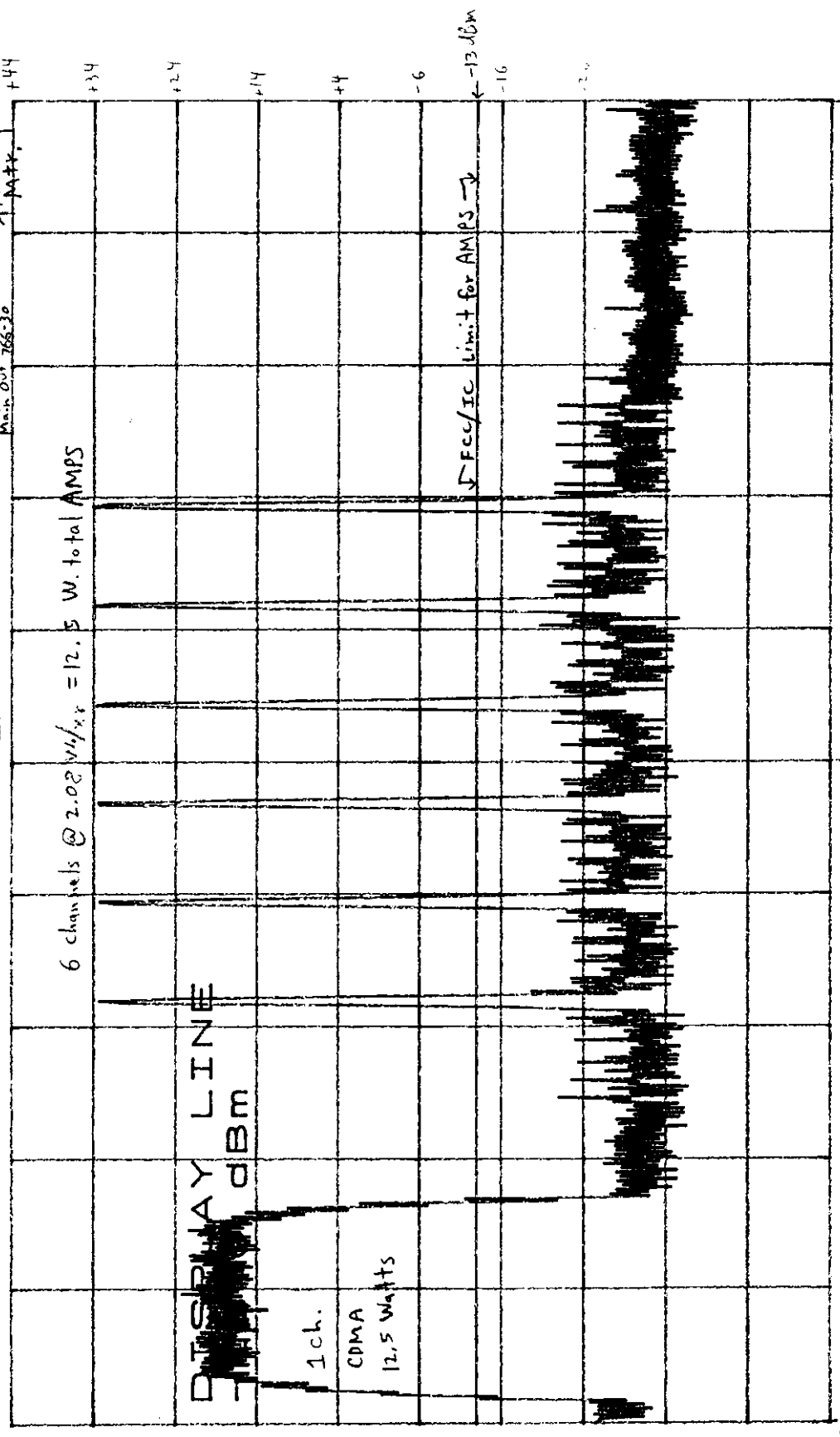
EGH
9/15/82



2.5 W. TOTAL CARRIER + AMPS

ATTEN 20dB
RL 44.0dBm

10dB/



CENTER 885.00MHZ SPAN 10.00MHZ
*RBW 10KHZ *VBW 300HZ SWP 8.4sec

FIG. MC-1: MULTIPLE-CARRIER PERF.

Paragraph 2.987 Modulation Characteristics

Paragraph 2.989 Occupied Bandwidth

Requirements

The LC800HP does not create any modulation of its own, only amplification of input signals occurs.

For a CDMA input, changes to Modulation Characteristics or Occupied Bandwidth are not expected, and have not been observed.

Paragraph 2.991 Spurious Emissions at the Antenna Terminals

Requirements

Under §2.991, the radio frequency power generated within the equipment and appearing on a spurious frequency shall be checked at the output terminals. The frequency range of the measurement is to include harmonics. The spurious signal attenuation shall be at least $43 + 10\log(\text{output power})$, dB. The limit is -13 dBm.

For a CDMA input, changes to conducted Spurious Emissions are not expected, and have not been observed.

Paragraph 2.993: Field Strength of Spurious Emissions

Requirements

The LC800 is to be measured for spurious emissions to a frequency of at least 10 times the rated output frequency. All spurious and harmonic signals are to be less than -13 dBm.

For a CDMA input, changes to radiated Field Strength are not expected, and have not been observed.

Paragraph 2.995 Frequency Stability

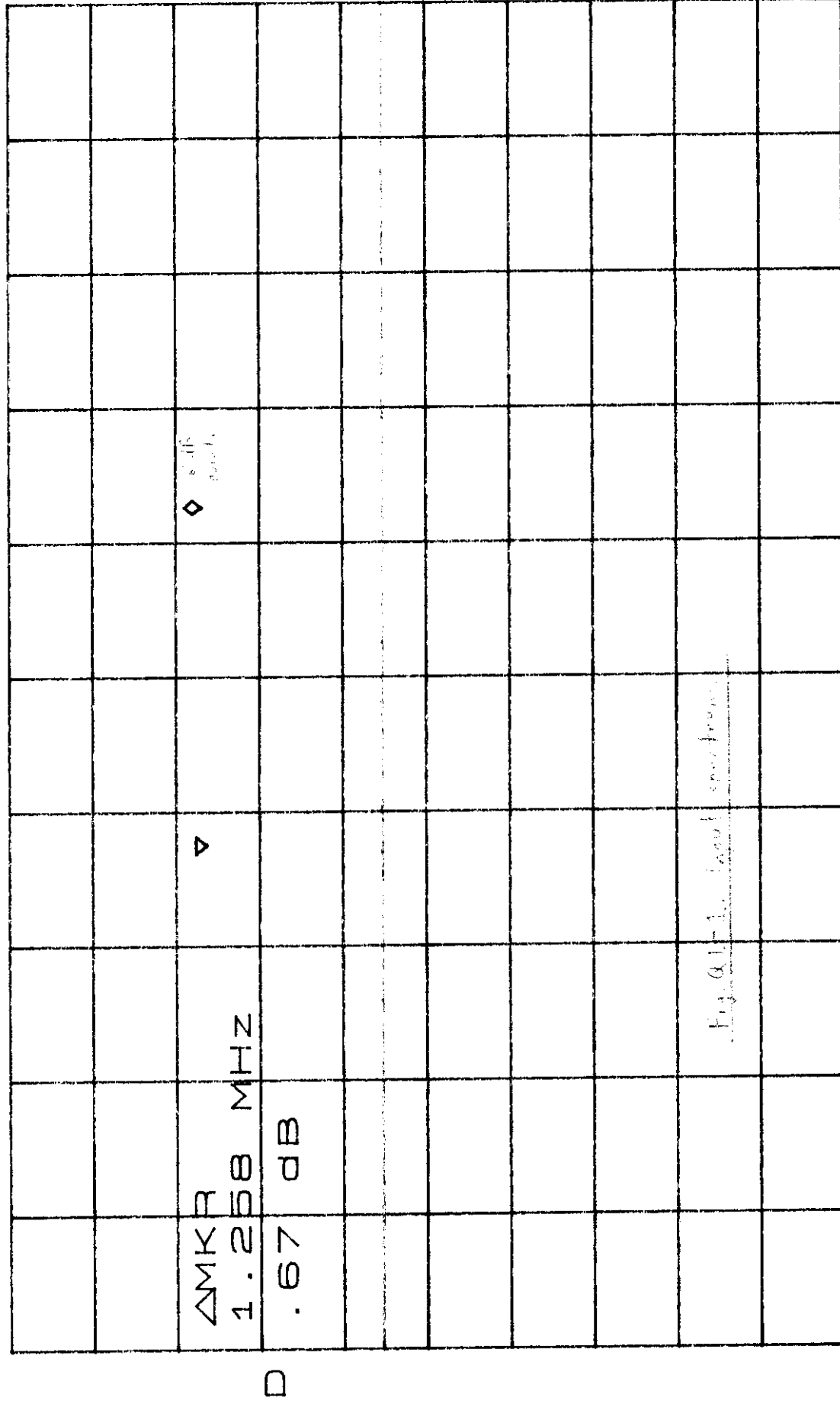
Requirements

The output frequency of the LC800HP is to be measured vs. primary power supply voltage and variations in temperature. The primary power supply voltage is varied over -15% to +20% of nominal. The temperature is to be varied from -30 degree C to +50 deg. C.

For a CDMA input, changes to Frequency Stability are not expected, and have not been observed.

6709.

10dB / 1.258MHz



NOON. 12.45

*VBW 100HN

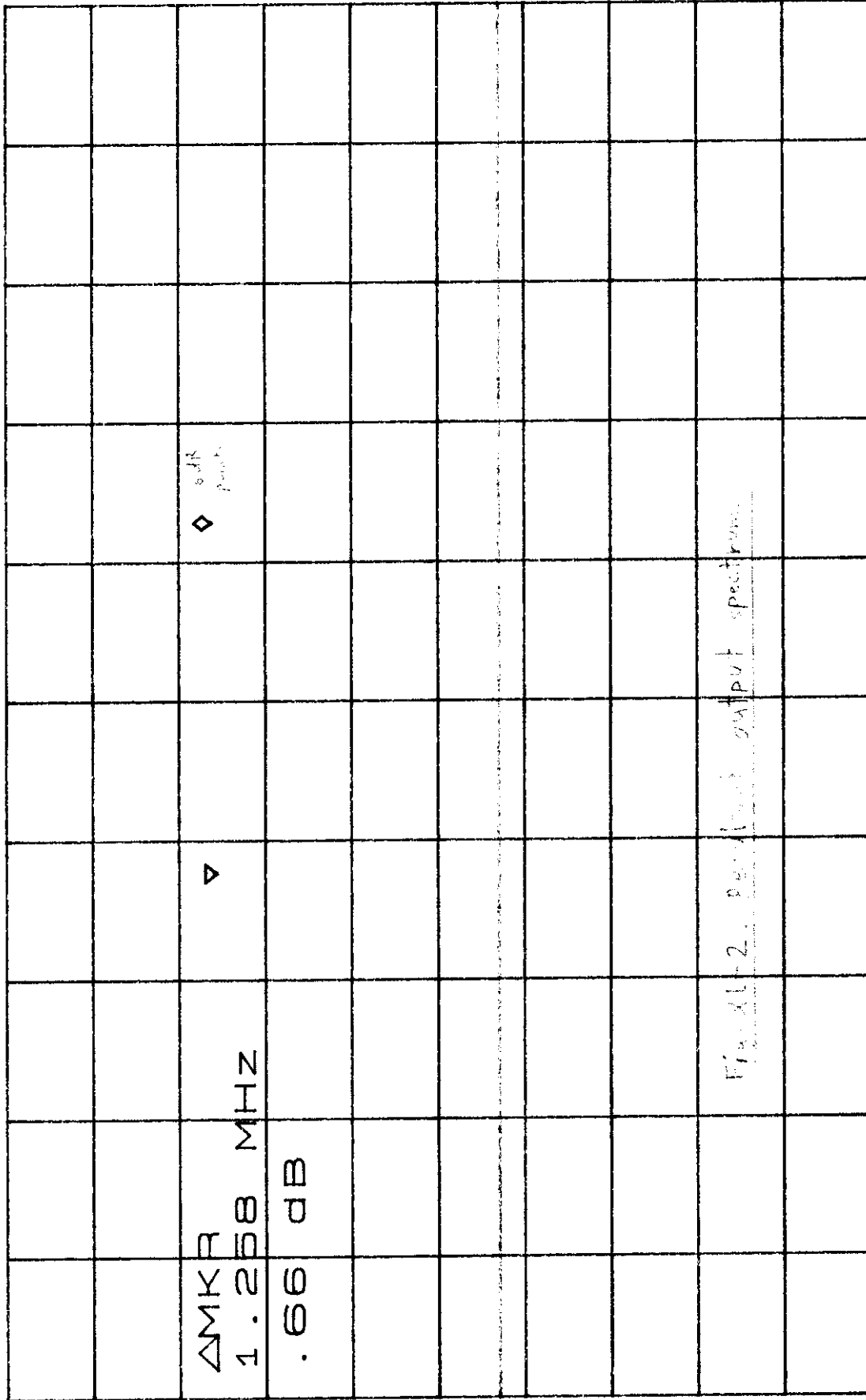
U
S
S
O
N
O
S
S



*ATTEN 20dB
 RL 44.0dBm

ΔMKR .66dB
 1.258MHz

10dB/



D

R

4.7.1
 1.2.1

CENTER 880.000MHz

SPAN 5.000MHz

*RBW 30kHz

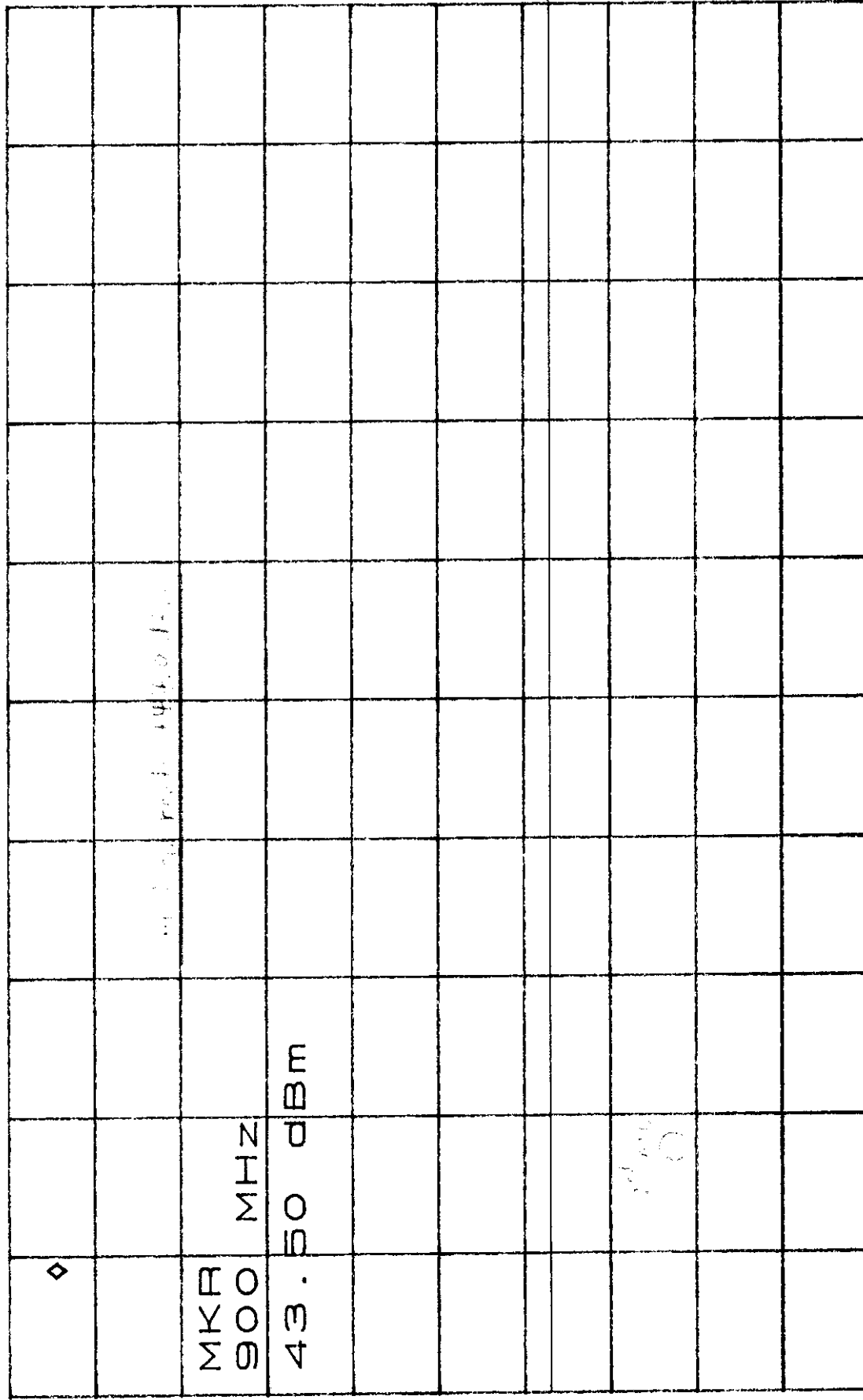
*VBW 100Hz

SWP 4.20sec



NYR 43.50BBE

10dB / 900MHz



START OHN

STOP 10.00GHN

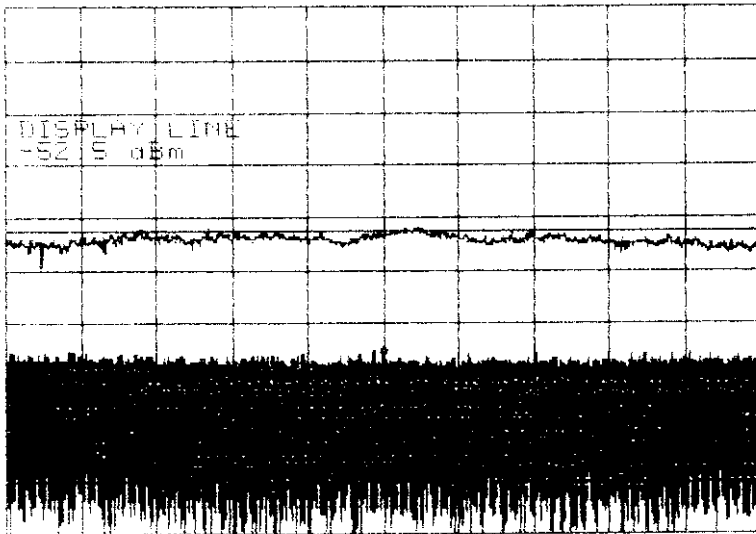
V B W 1 0 Y H N

SWP 25050600



Freq. Band		Calculation method, based on path loss										Substitution method				
Figure number	Freq. range	Freq. for calc. of path loss (geometric mean freq.) MHz	Base power level into dipole, dBm	Dist. DUT to Rx antenna, m	Free Space path loss, dBi	Measurement Antenna	Rx antenna gain, dBi	Transmission line, antenna to receiver measurement	Cable loss (Spec Analyzer Ref Level offset), dB	Max. Allowed Rx level, dBm (Display line setting)	Base power level into dipole, dBm	Gain of antenna substitution antenna, dBd	Cable loss driving substitution antenna, dB	Tx Power into substitution antenna, dBm (sweeper out Level)		
Q2-2	8 to 10 GHz	8900	-13	1	51.5	Electro-Metrics Horn, Double-ridged, RGA-60	12	6' RG-142	4	-52.5	-13	4	0	-17		
Q2-3	5.5 to 8 GHz	6600	-13	1	49.4	Electro-Metrics Horn, Double-ridged, RGA-60	10.9	6' RG-142	3.5	-51.5	-13	4	0	-17		
Q2-4	4 to 5.5 GHz	4700	-13	1	47.3	Electro-Metrics Horn, Double-ridged, RGA-60	10.5	6' RG-142	3	-49.8	-13	4	0	-17		
Q2-5	3 to 4 GHz	3500	-13	1	44.5	Electro-Metrics Horn, Double-ridged, RGA-60	9.4	6' RG-142	2.5	-48.1	-13	6	0	-19		
Q2-6	1 to 3 GHz	1700	-13	1	38.5	Electro-Metrics Horn, Double-ridged, RGA-60	7.5	6' RG-142	2	-44.0	-13	7	0	-20		
Q2-7	0.5 to 1.0 GHz	700	-13	1	31.5	Watkins-Johnson Log-periodic	5	6' RG-142	1	-39.5	-13	0	0	-13		
Q2-8	250 to 500 MHz	350	-13	3	34	Discone, with low-freq. extension whip, Diamond D-130	4	5' RG-58	1	-43.0	-13	0	2	-11		
Q2-9	60 to 250 MHz	110	-13	3	38.5	Discone, with low-freq. extension whip, Diamond D-130	2	5' RG-58	0.5	-49.5	-13	0	1	-12		
Q2-10	25 to 60 MHz	39	-13	3	24	Discone, with low-freq. extension whip, Diamond D-130	-5	5' RG-58	0	-42.0	-13	-2	1	-10		

ATTEN 10dB MKR -76.50dBm
 RL -10.0dBm 10dB/ 9.000GHz



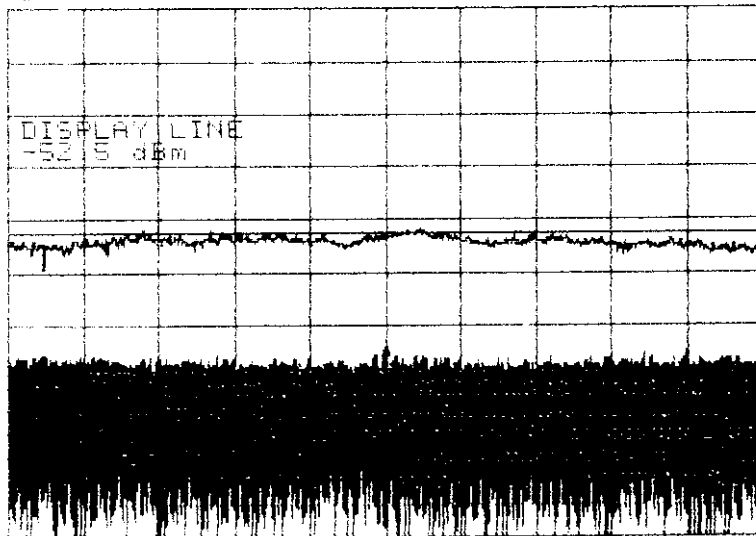
START 8.000GHz STOP 10.000GHz
 *RBW 30kHz VBW 30kHz SWP 5.60sec

Direct line correction
 times 100 dB,
 noise floor not particularly
 plus 10 dB noise gain.

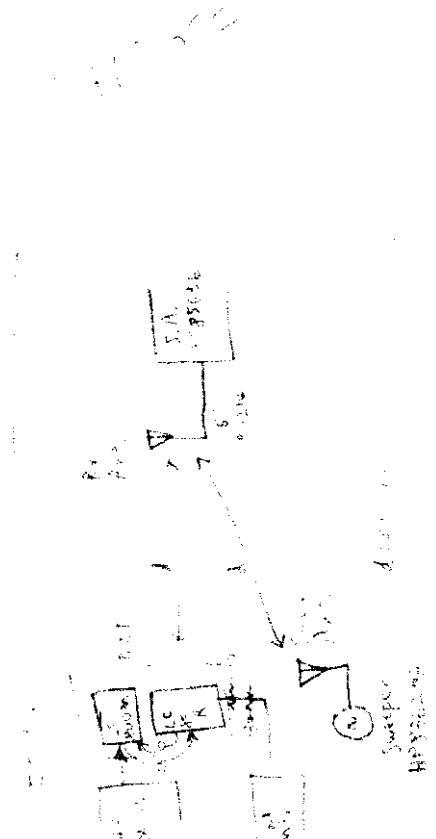
Measured level
 from the
 subtraction strength.

Measurement
 of the DAT.

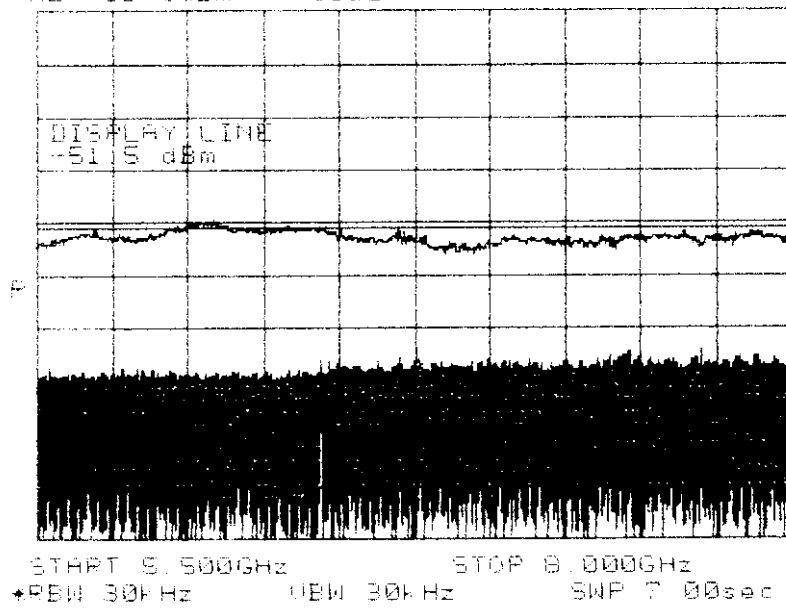
ATTEN 10dB MKR -76.33dBm
 RL -10.0dBm 10dB/ 9.000GHz



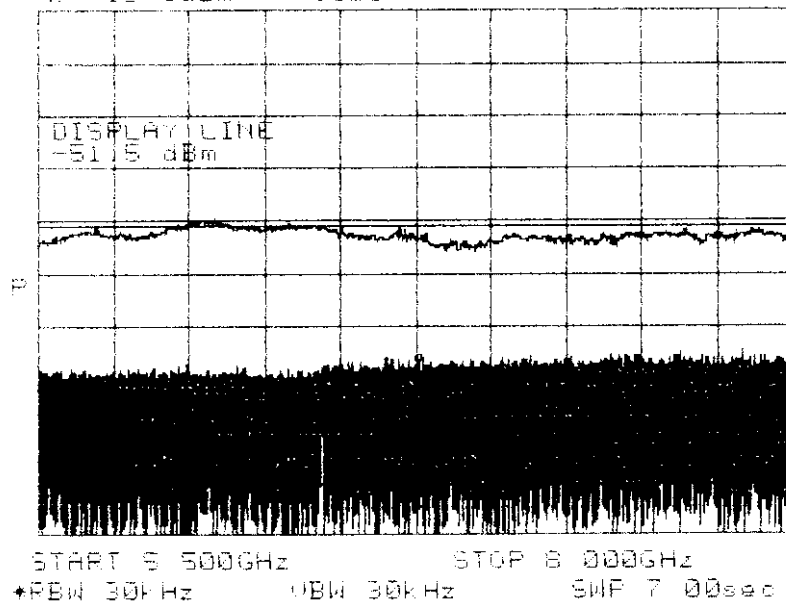
START 8.000GHz STOP 10.000GHz
 *RBW 30kHz VBW 30kHz SWP 5.60sec



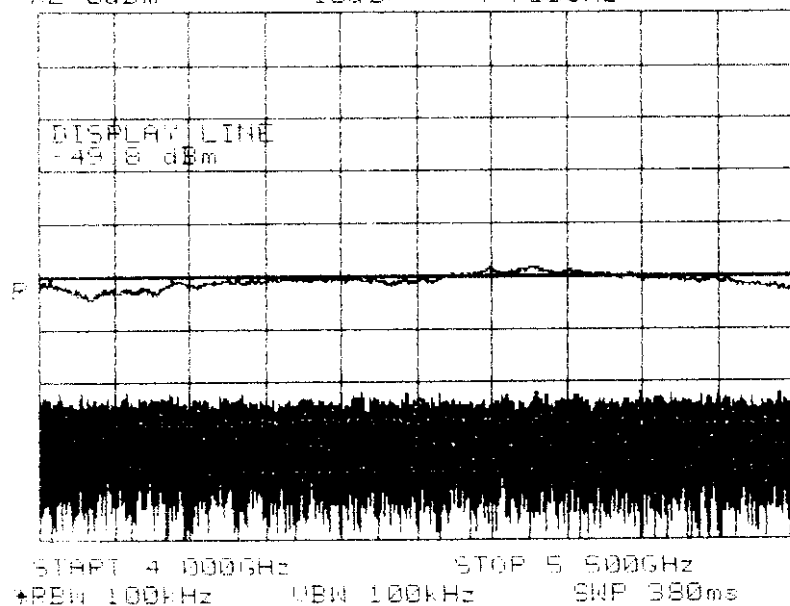
ATTEN 10dB MKR -78.50dBm
RL -10.5dBm 10dB/ 6.758GHz



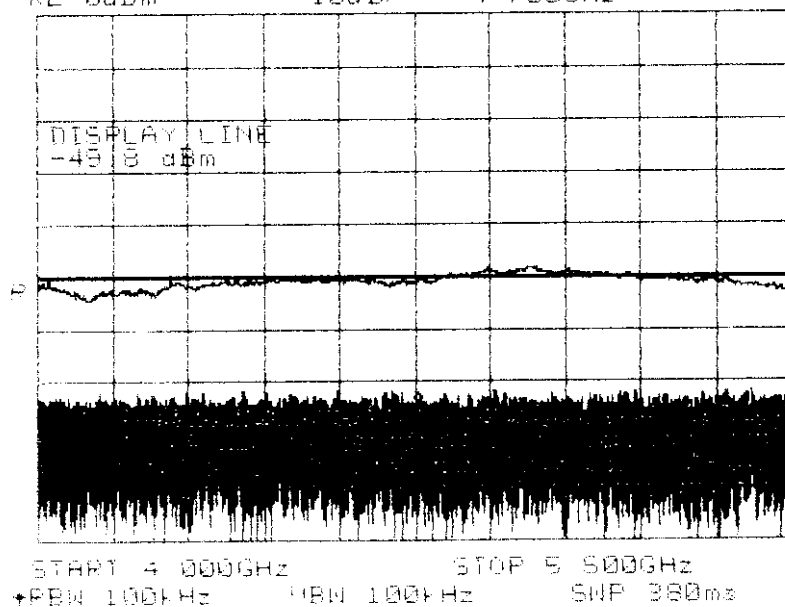
ATTEN 10dB MKR -77.67dBm
RL -10.5dBm 10dB/ 6.758GHz



ATTEN 10dB MKR -75.00dBm
RL 0dBm 10dB/ 4.755GHz

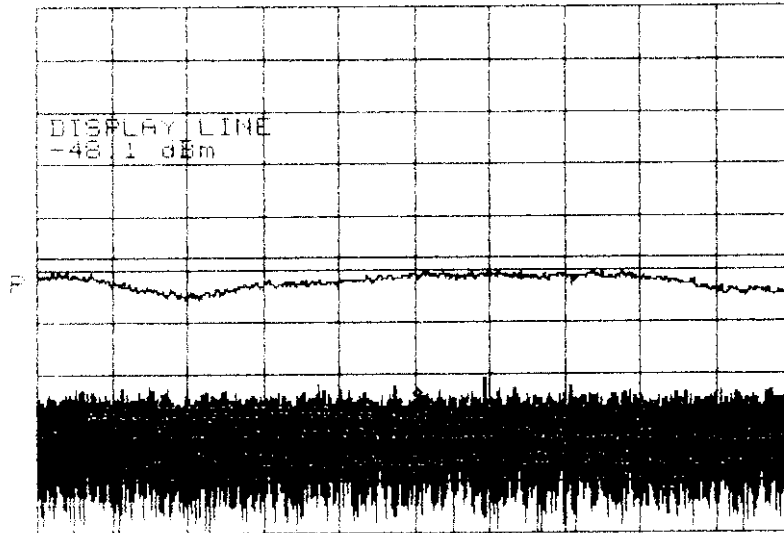


ATTEN 10dB MKR -74.17dBm
RL 0dBm 10dB/ 4.755GHz



F. 0-1

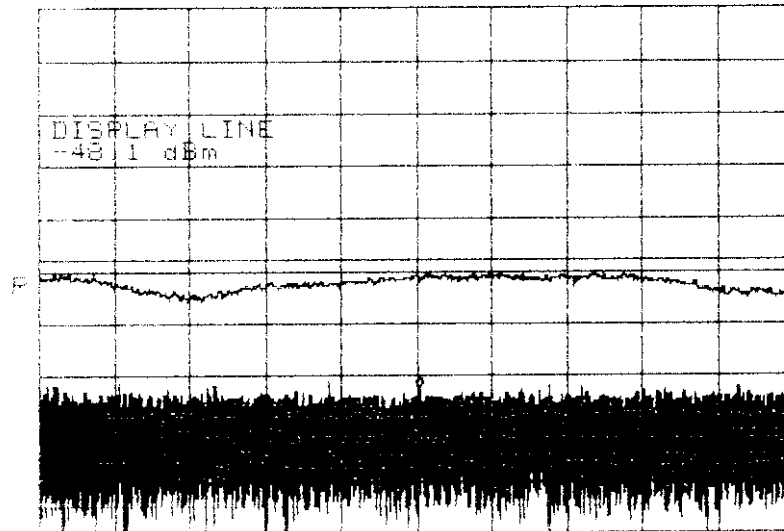
ATTEN 10dB MKR -74 50dBm
RL 0dBm 10dB 3 500GHz



START 3 000GHz STOP 4 000GHz
+RBW 100kHz VBW 100kHz SWP 250ms

10751

ATTEN 10dB MKR -72 38dBm
RL 0dBm 10dB 3 500GHz

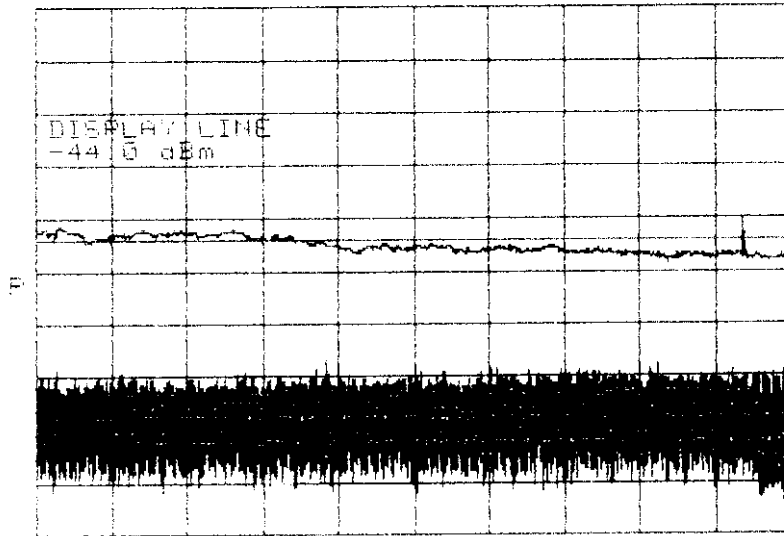


START 3 000GHz STOP 4 000GHz
+RBW 100kHz VBW 100kHz SWP 250ms

10752

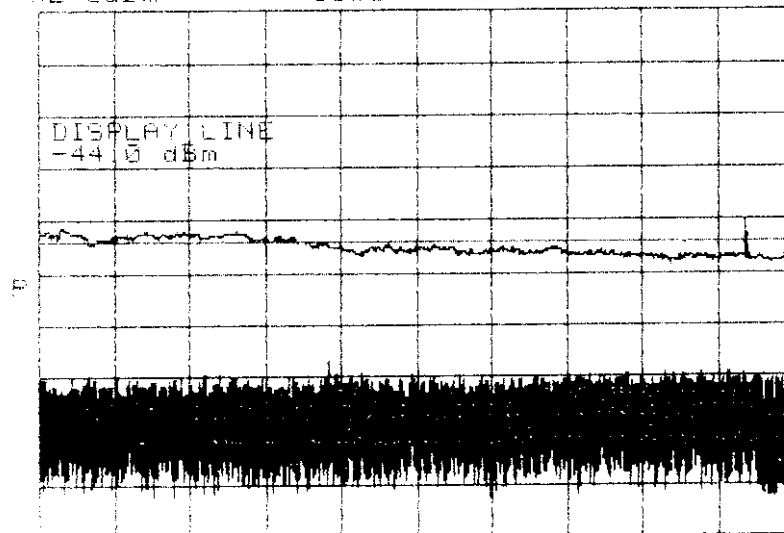
Fig. 12.1

ATTEN 10dB MKR -87.00dBm
RL 0dBm 10dB 2.600GHz



CENTER 2.000GHz SPAN 2.000GHz
+RBW 300kHz VBW 300kHz SWP 56.0ms

ATTEN 10dB MKR -86.50dBm
RL 0dBm 10dB 2.600GHz



CENTER 2.000GHz SPAN 2.000GHz
+RBW 300kHz VBW 300kHz SWP 56.0ms

F. 2 6

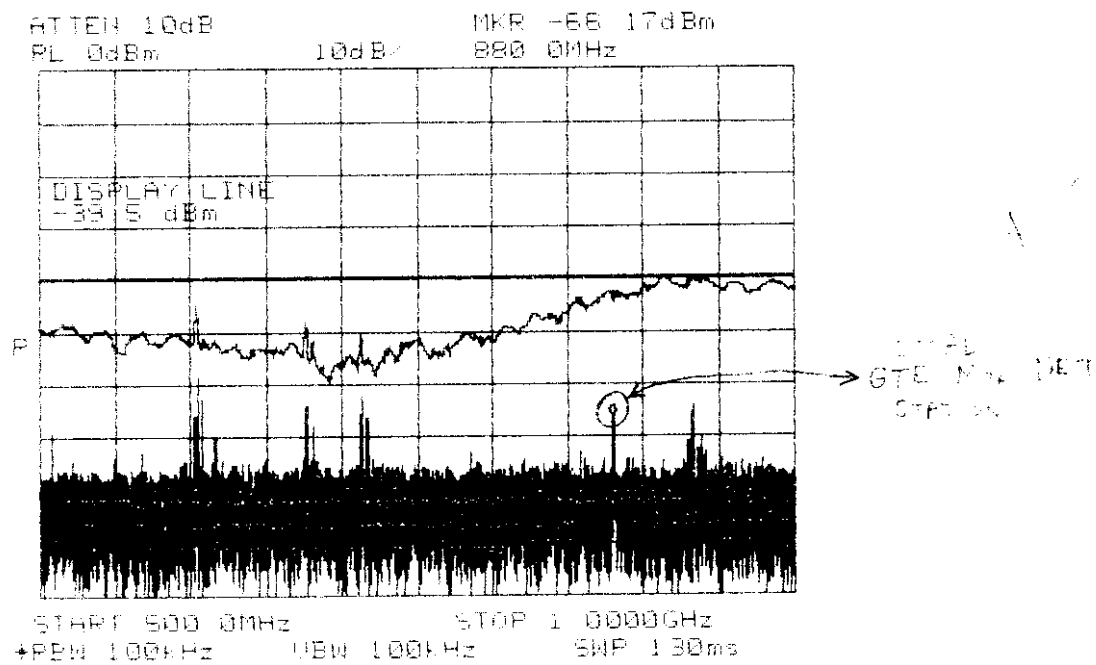
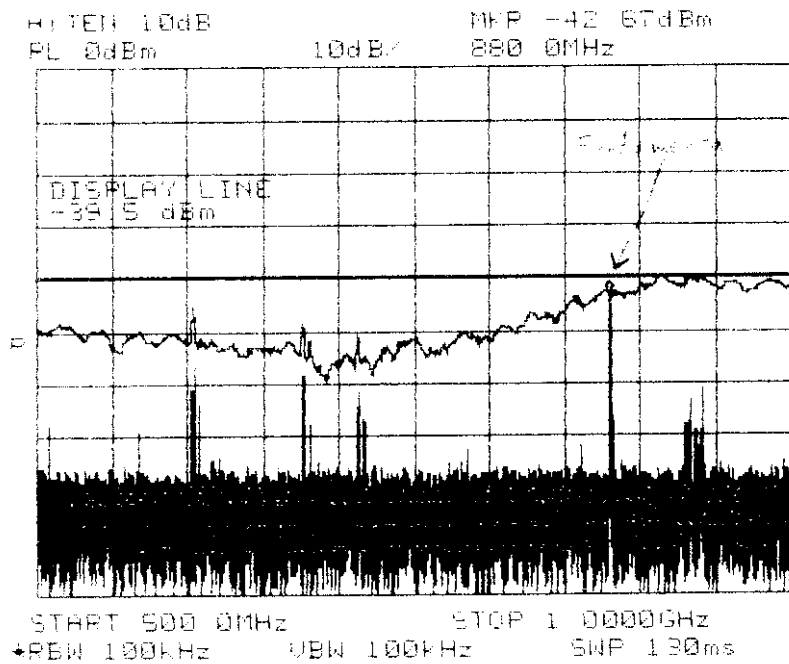
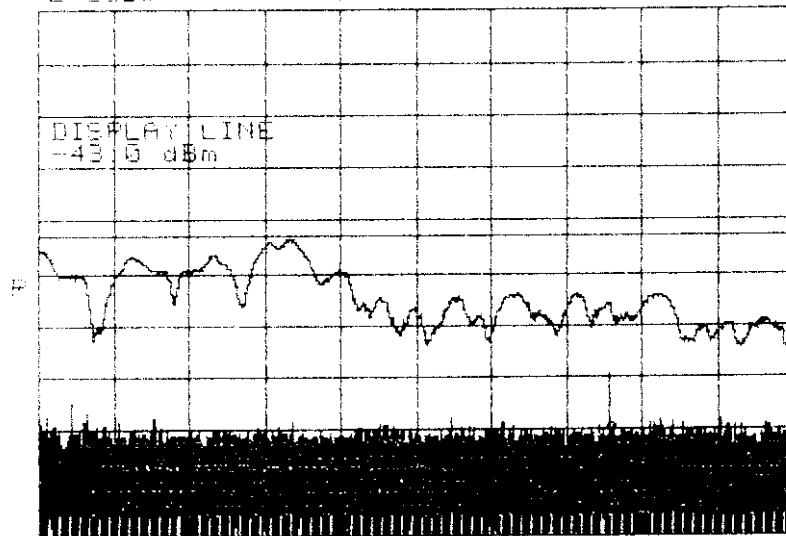


Fig. 2-17

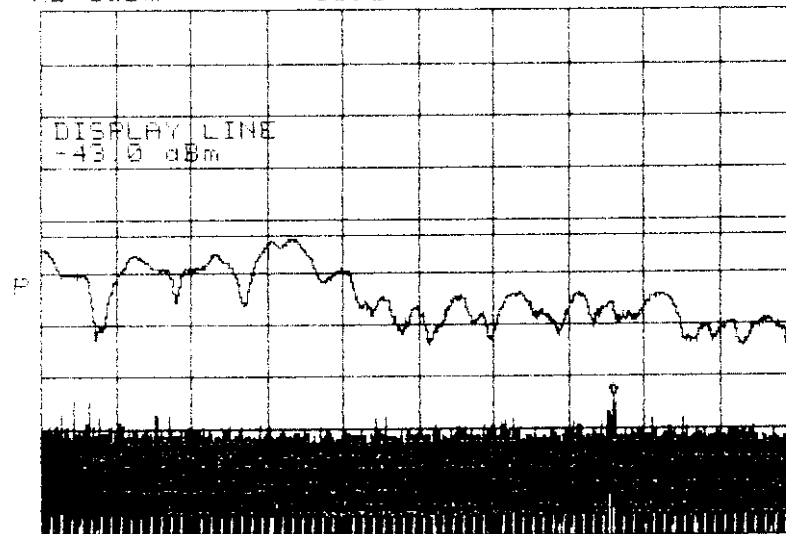
ATTEN 10dB MKR -80 50dBm
RL 0dBm 10dB 440.0MHz



START 250.0MHz STOP 500.0MHz
*RBW 30kHz VBW 30kHz SWP 700ms

Handwritten note: 440.0 MHz

ATTEN 10dB MKR -73 50dBm
RL 0dBm 10dB 440.0MHz

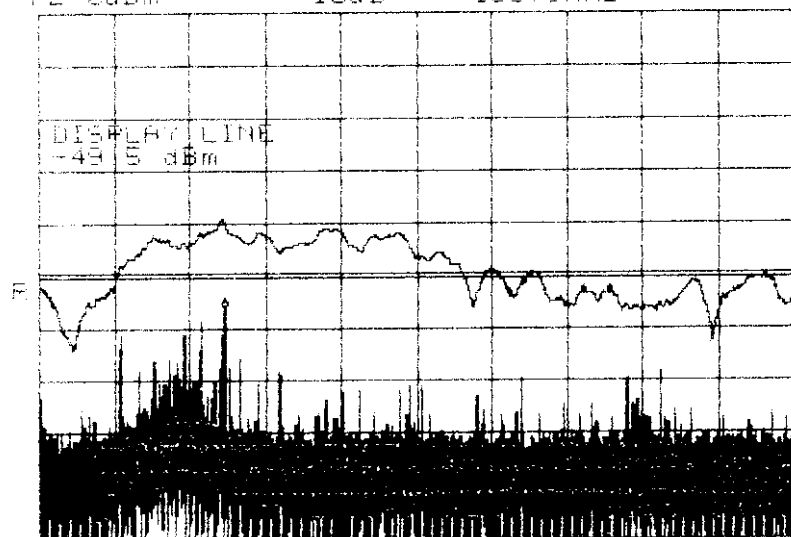


START 250.0MHz STOP 500.0MHz
*RBW 30kHz VBW 30kHz SWP 700ms

Handwritten note: 440.0 MHz

Handwritten note: 440.0 MHz

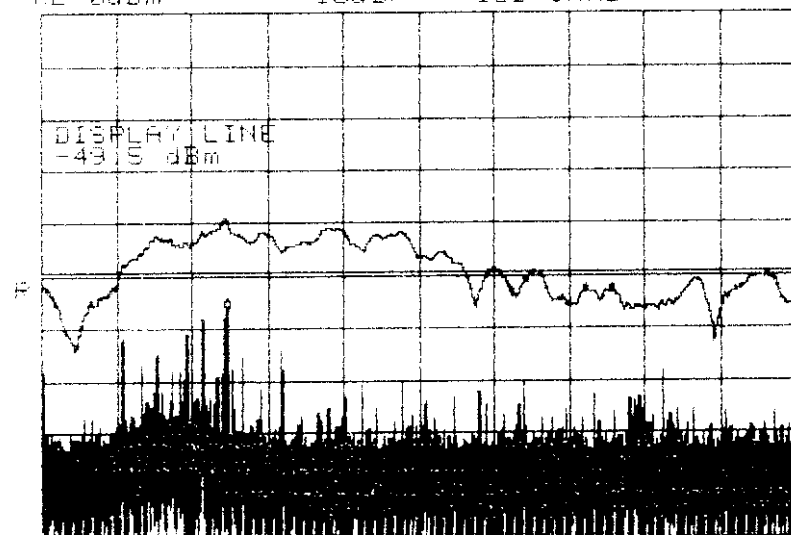
ATTEN 10dB MKR -56.00dBm
PL 0dBm 10dB 106.9MHz



START 60.0MHz STOP 250.0MHz
*RBW 30kHz VBW 30kHz SWP 530ms

106.9

ATTEN 10dB MKR -56.33dBm
PL 0dBm 10dB 106.9MHz



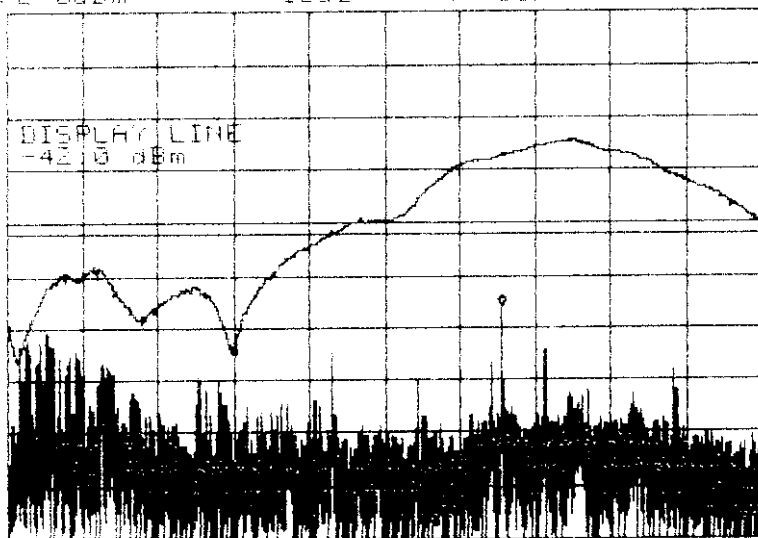
START 60.0MHz STOP 250.0MHz
*RBW 30kHz VBW 30kHz SWP 530ms

106.9

F. 1

ATTEN 10dB
PL 0dBm
10dB/

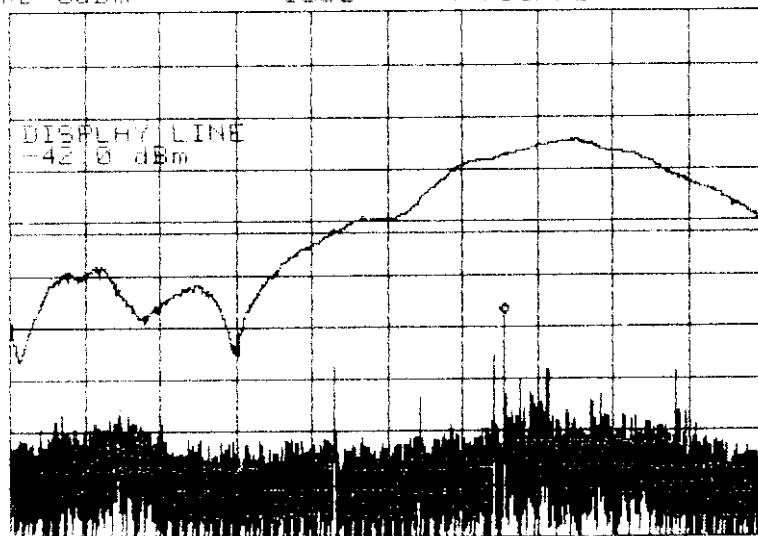
MKR -55.83dBm
47.98MHz



START 25.00MHz STOP 60.00MHz
+BW 30kHz VBW 30kHz SWP 98.0ms

ATTEN 10dB
PL 0dBm
10dB/

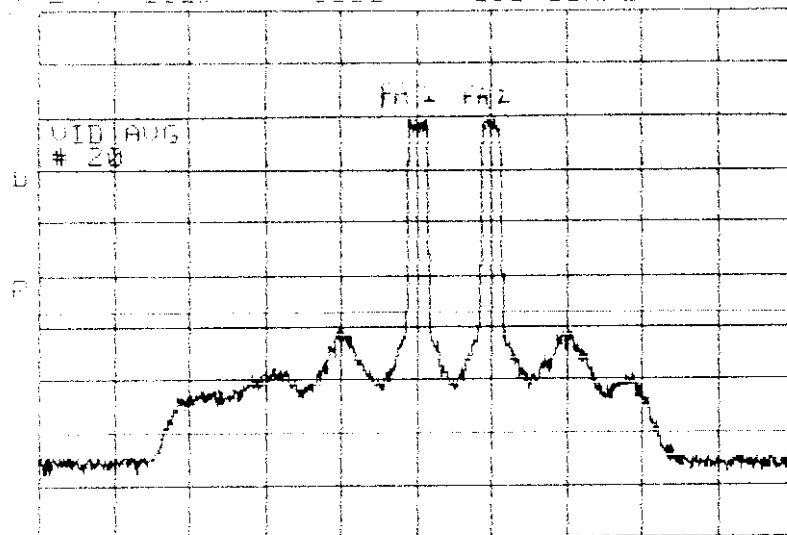
MKR -57.83dBm
47.98MHz



START 25.00MHz STOP 60.00MHz
+BW 30kHz VBW 30kHz SWP 98.0ms

Page 10

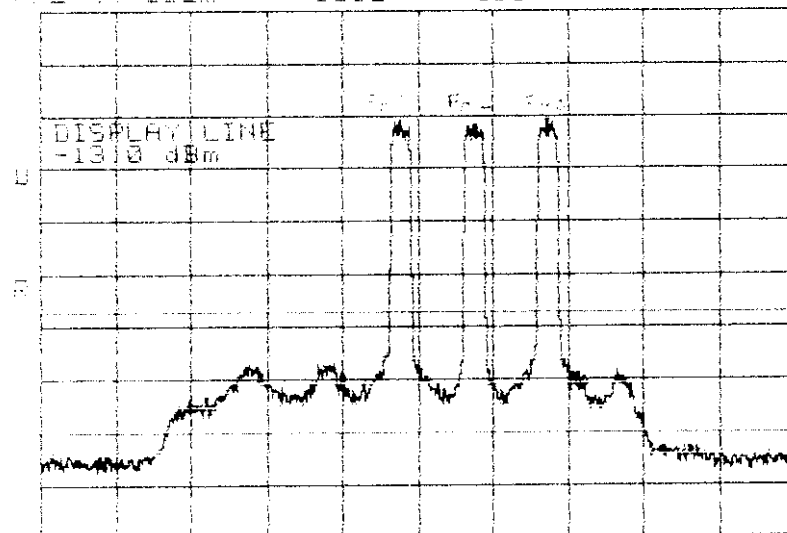
ATTEN 20dB 0AUG 20 MKR -23.00dBm
 PL 44 0dBm 10dB 882.58MHz



CENTER 882.48MHz SPAN 50.00MHz
 *RBW 30kHz URW 30kHz SWP 140ms

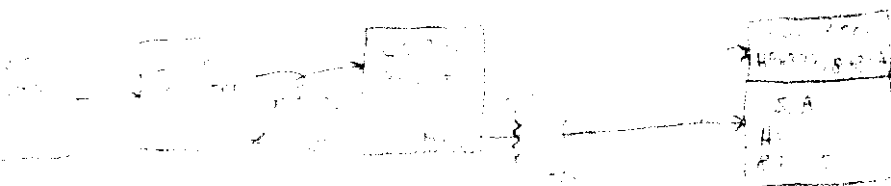
Fig. 1 - Spectrum of the signal

ATTEN 20dB 0AUG 20 MKR -27.67dBm
 PL 44 0dBm 10dB 882.58MHz



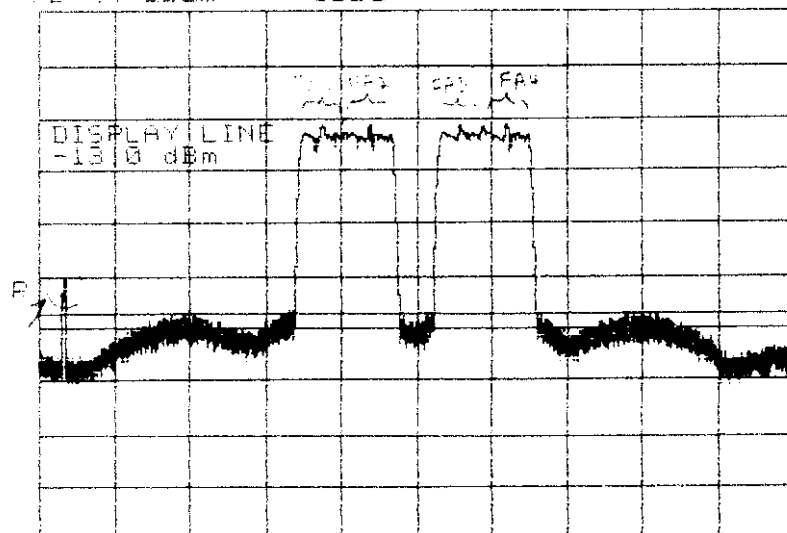
CENTER 882.48MHz SPAN 50.00MHz
 *RBW 30kHz URW 30kHz SWP 140ms

Fig. 2 - Spectrum of the signal



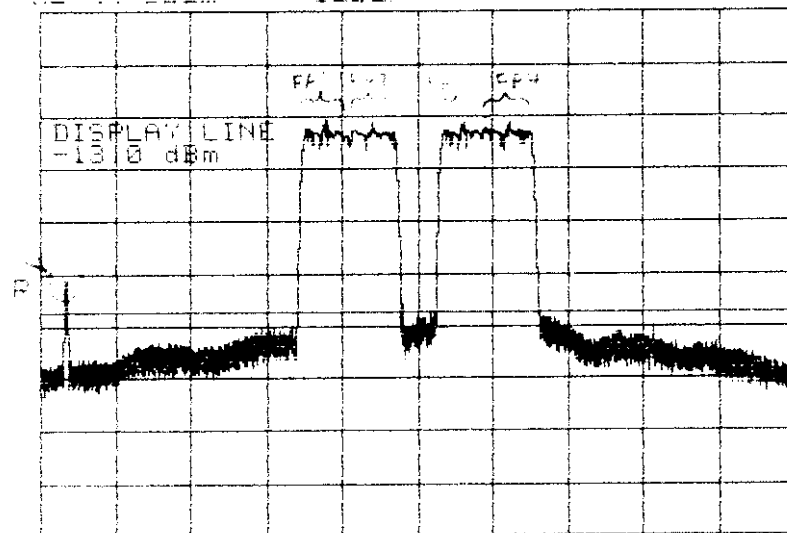
[illegible]

ATTEN 20dB
PL 44 0dBm 10dB/



CENTER 882.48MHz SPAN 20.00MHz
*RBW 30kHz *VBW 300Hz SWP 5.60sec

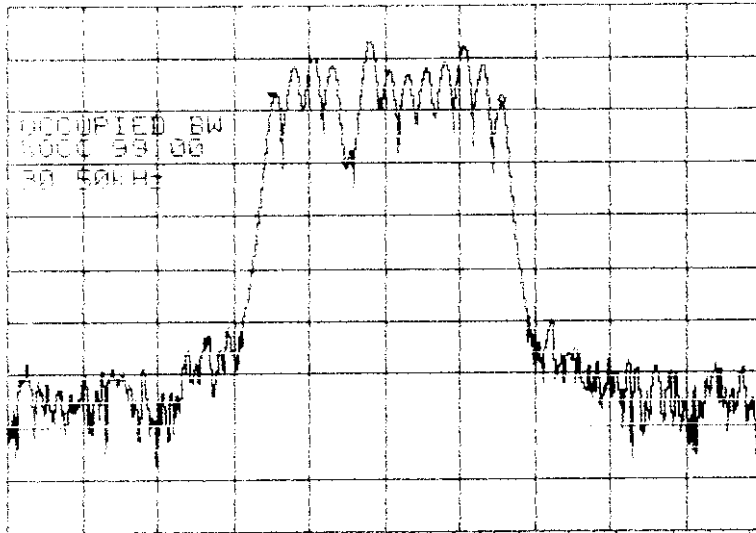
ATTEN 20dB
PL 44 0dBm 10dB/



CENTER 882.48MHz SPAN 20.00MHz
*RBW 30kHz *VBW 300Hz SWP 5.60sec

F. Q2-14 100 00MHz

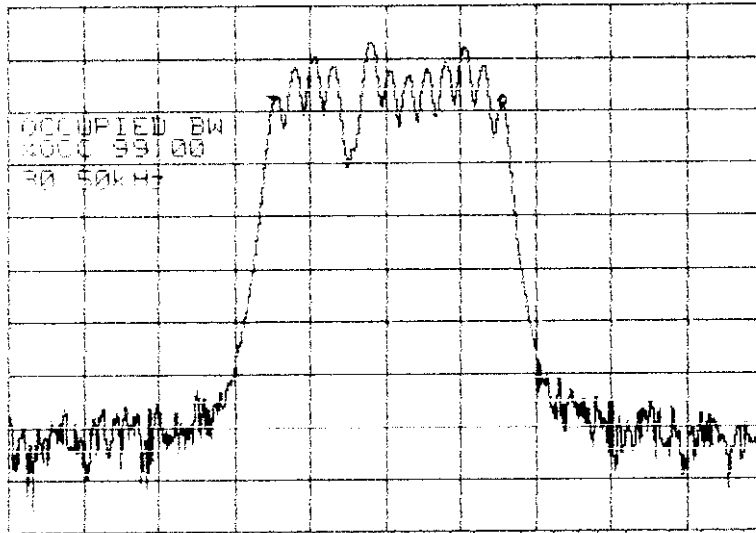
ATTEN 10dB ΔMKR -1 34dB
 PL 22.0dBm 10dB 20 5kHz



CENTER 880.0000MHz SPAN 100.0kHz
 RBW 1.0kHz VBW 1.0kHz SWP 250ms

A C

ATTEN 10dB ΔMKR -1 00dB
 PL -19.0dBm 10dB 20 5kHz



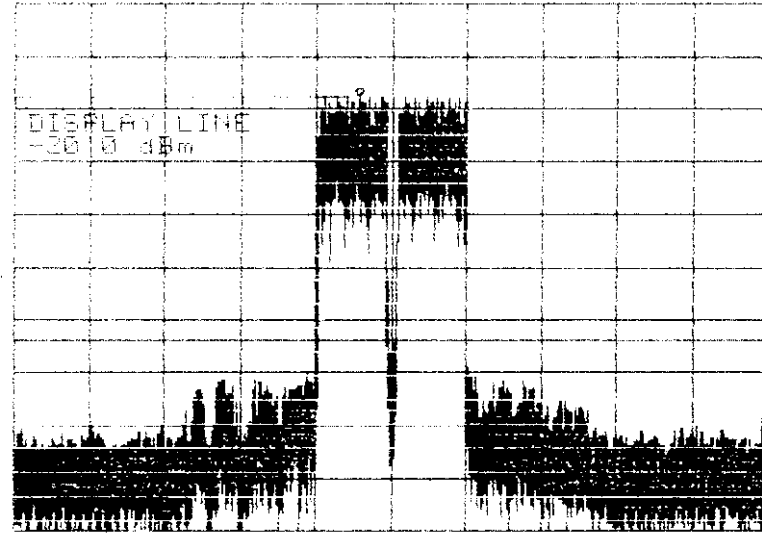
CENTER 880.0000MHz SPAN 100.0kHz
 RBW 1.0kHz VBW 1.0kHz SWP 250ms

A C

Figure 1: Spectrum plot of the signal at 880.0000MHz. The signal is labeled 'OCCUPIED BW 800.0000 20.0kHz'.

Case No. 7-10-6

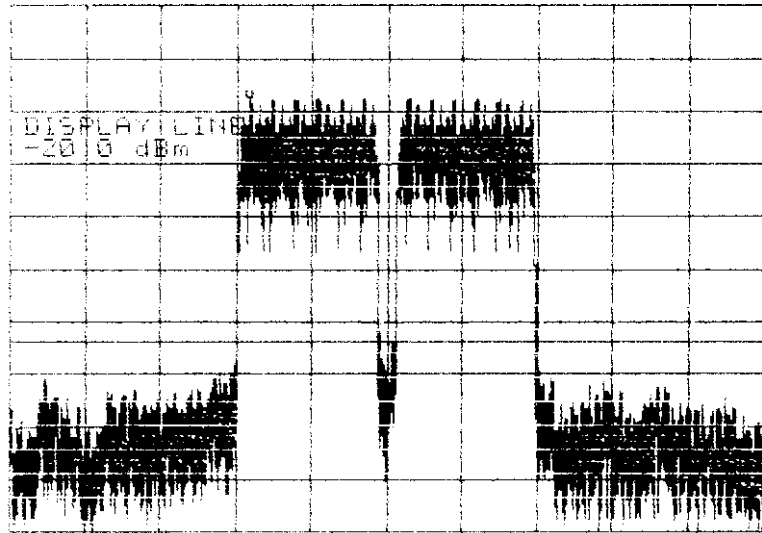
ATTEN 20dB MKR 26 33dBm
 RL 44 0dBm 10dB 880 095MHz



CENTER 880 182MHz SPAN 2.000MHz
 *PRW 1.0kHz RBW 1.0kHz SWP 5.00sec

① W 35-1 AND

ATTEN 20dB MKR 26 33dBm
 RL 44 0dBm 10dB 879 999MHz



CENTER 880 182MHz SPAN 1.000MHz
 *PRW 1.0kHz RBW 1.0kHz SWP 2.50sec

② 20-10

③ 20-10 10 0000 1000