

TESTED BY ORTEL CORPORATION
CONDUCTED MEASUREMENT INFORMATION

Test Equipment Used:

Signal Generator HP8648C, Hewlett Packard
Spectrum Analyzer HP8563E, Hewlett Packard
-RF cables (with SMA connectors), 7/16 to N connectors, N to SMA connectors, attenuation pad (for repeater output), and passive external combiner used for two tone testing.

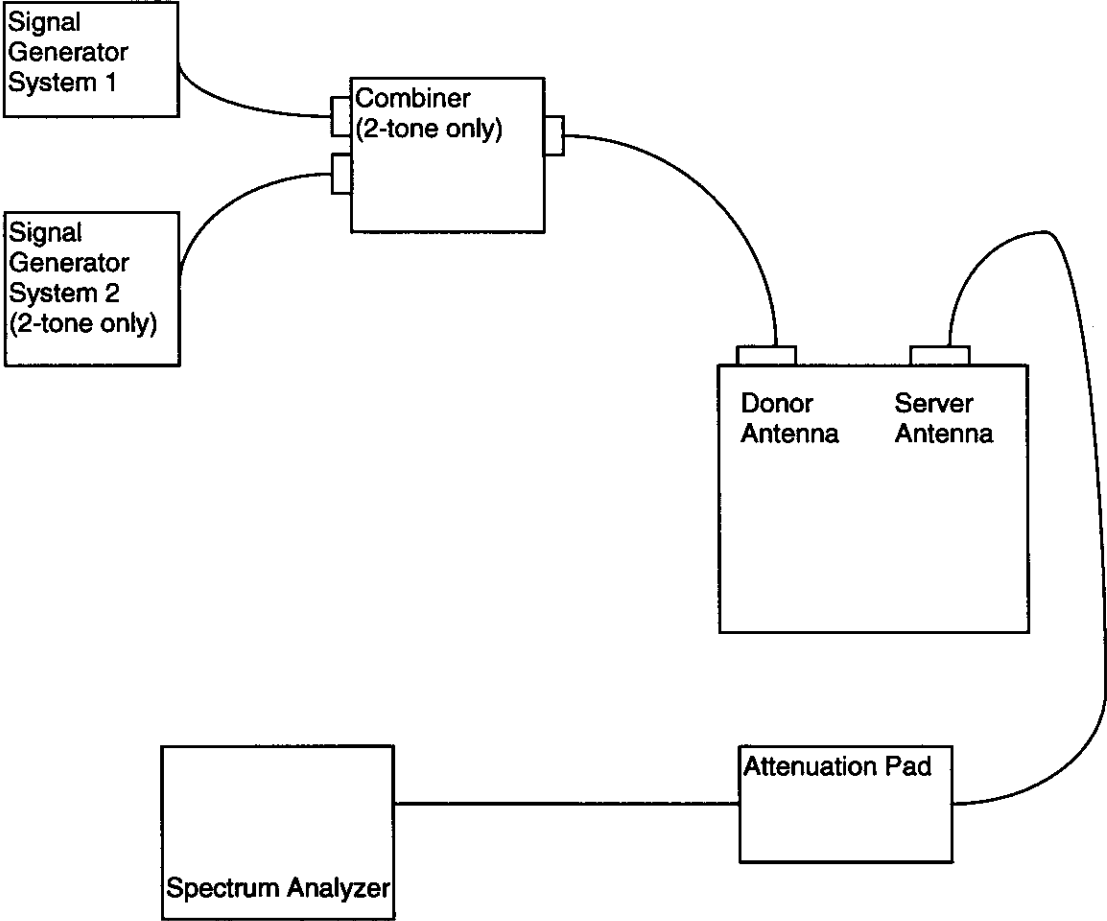
Tests performed for D-band

2.985, 2.989, 2.991, and 24.238 and In/Out

Test setup on next page.

CONDUCTED MEASUREMENT TEST SETUP

TESTED BY ORTEL CORPORATION



Downlink mode shown. For uplink, swap antenna connections at the repeater.
NOTE: All cables, connectors, and the attenuation pad are calibrated out at the

DL Low
D-band

DL Output
 $P_{in} = -54.2 \text{ dBm @ } 1945.2 \text{ MHz (ch.1)}$
CW source

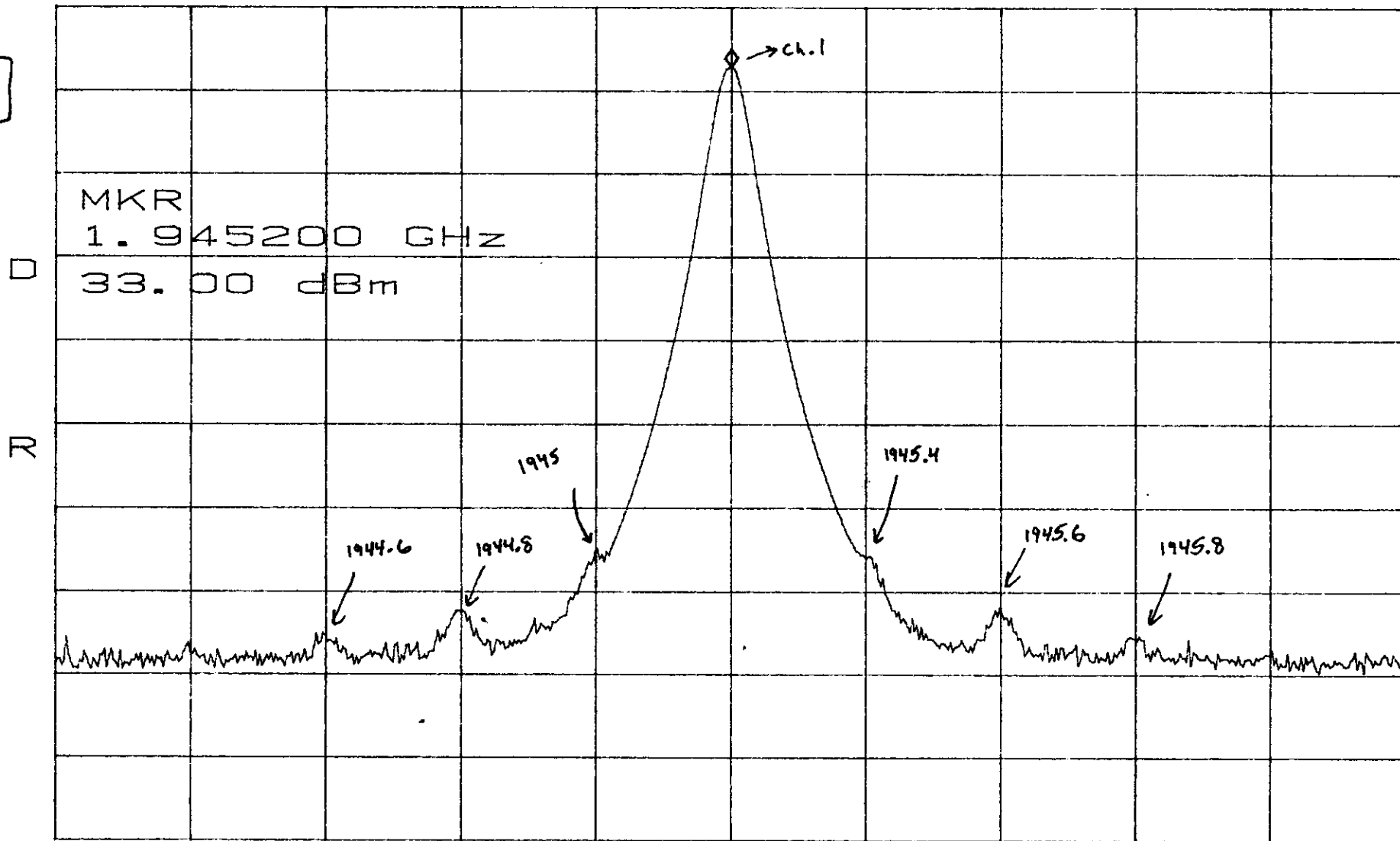
9/16/98
LB41901

ATTN 30dB
RL 40.0dBm

10dB/

MKR 33.00dBm
1.945200GHz

2.985



CENTER 1.945200GHz

SPAN 2.000MHz

RBW 30kHz

VBW 30kHz

SWP 50.0ms

DL Low
D-band

DL Output
 $P_{in} = -54.5 \text{ dBm} @ 1945.2 \text{ MHz} \text{ (Ch.1)}$

9/16/98
LB41901

ATTEN 30dB CW Source

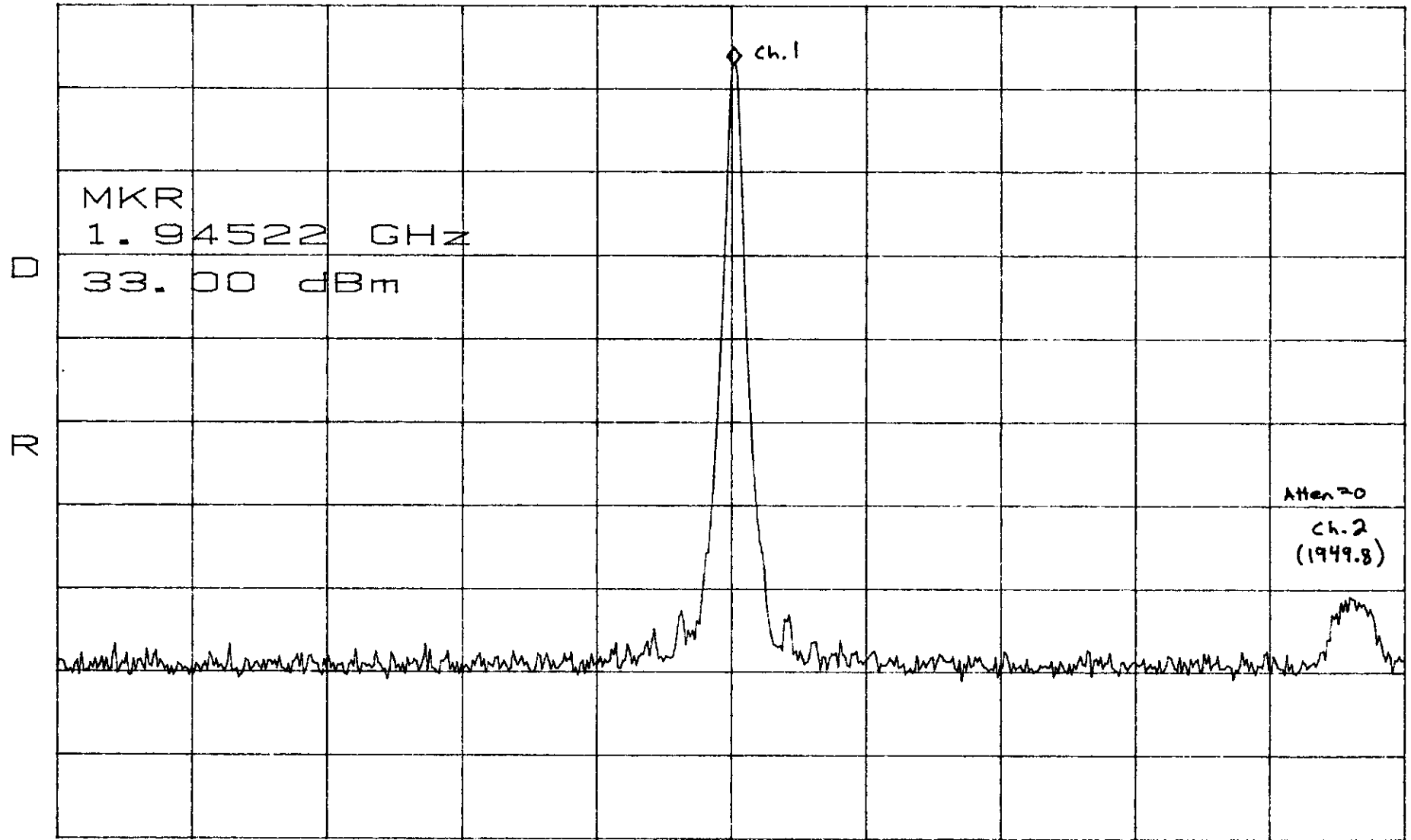
MKR 33.00dBm

RL 40.00dBm

10dB/

1.94522GHz

2.985



CENTER 1.94520GHz

SPAN 10.00MHz

*RBW 30kHz

VBW 30kHz

SWP 50.0ms

DL Mid
D-band

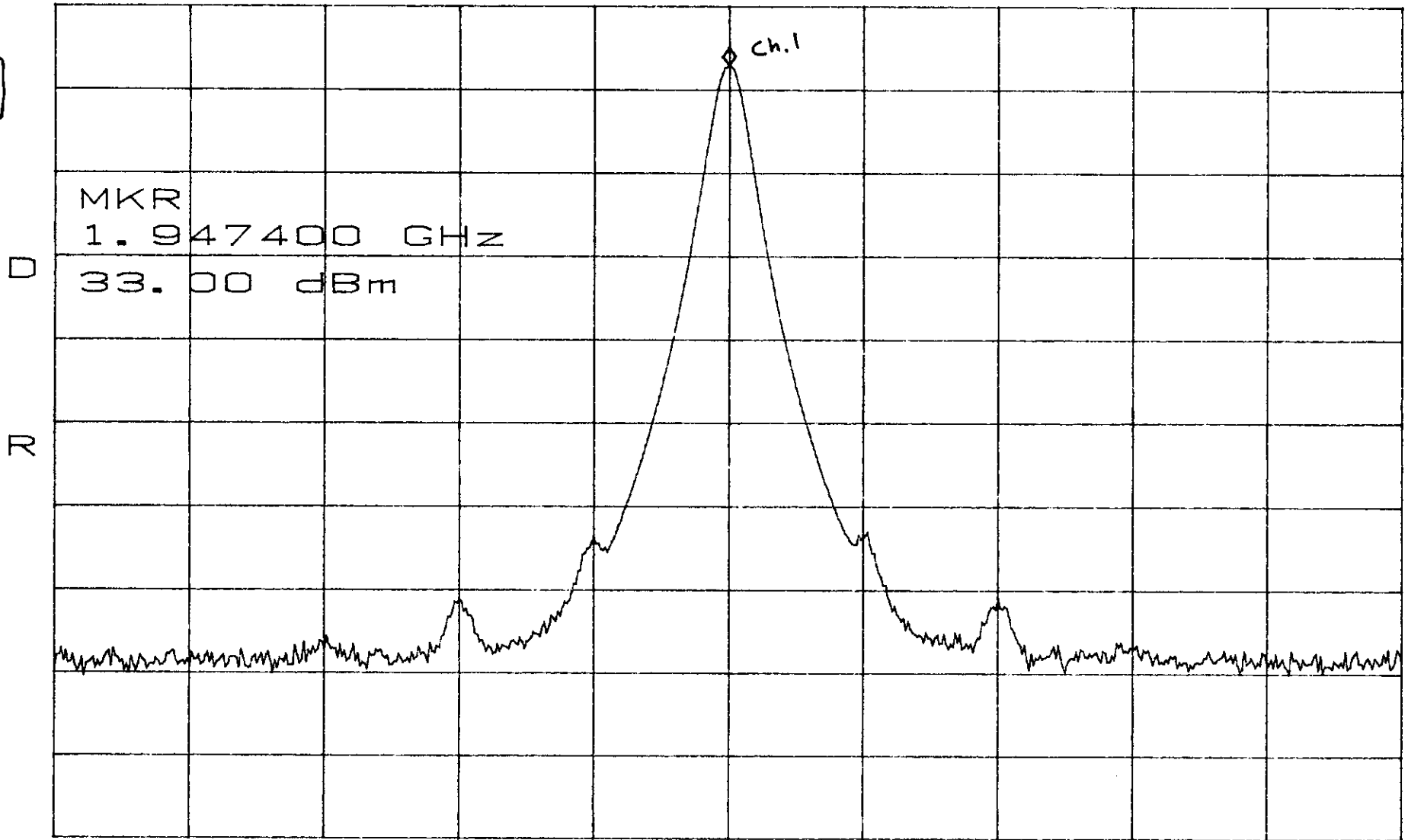
DL Output
 $P_{in} = -54.4 \text{ dBm @ } 1947.4 \text{ MHz (Ch.1)}$

9/16/98
LB41901

ATTEN 30dB CW source
RL 40.0dBm 10dB/

MKR 33.00dBm
1.947400GHz

2.985



CENTER 1.947400GHz

SPAN 2.000MHz

*RBW 30kHz

VBW 30kHz

SWP 50.0ms

DL Mid
D-band

DL Output
 $P_{in} = -54.4 \text{ dBm @ } 1947.4 \text{ MHz (ch.1)}$

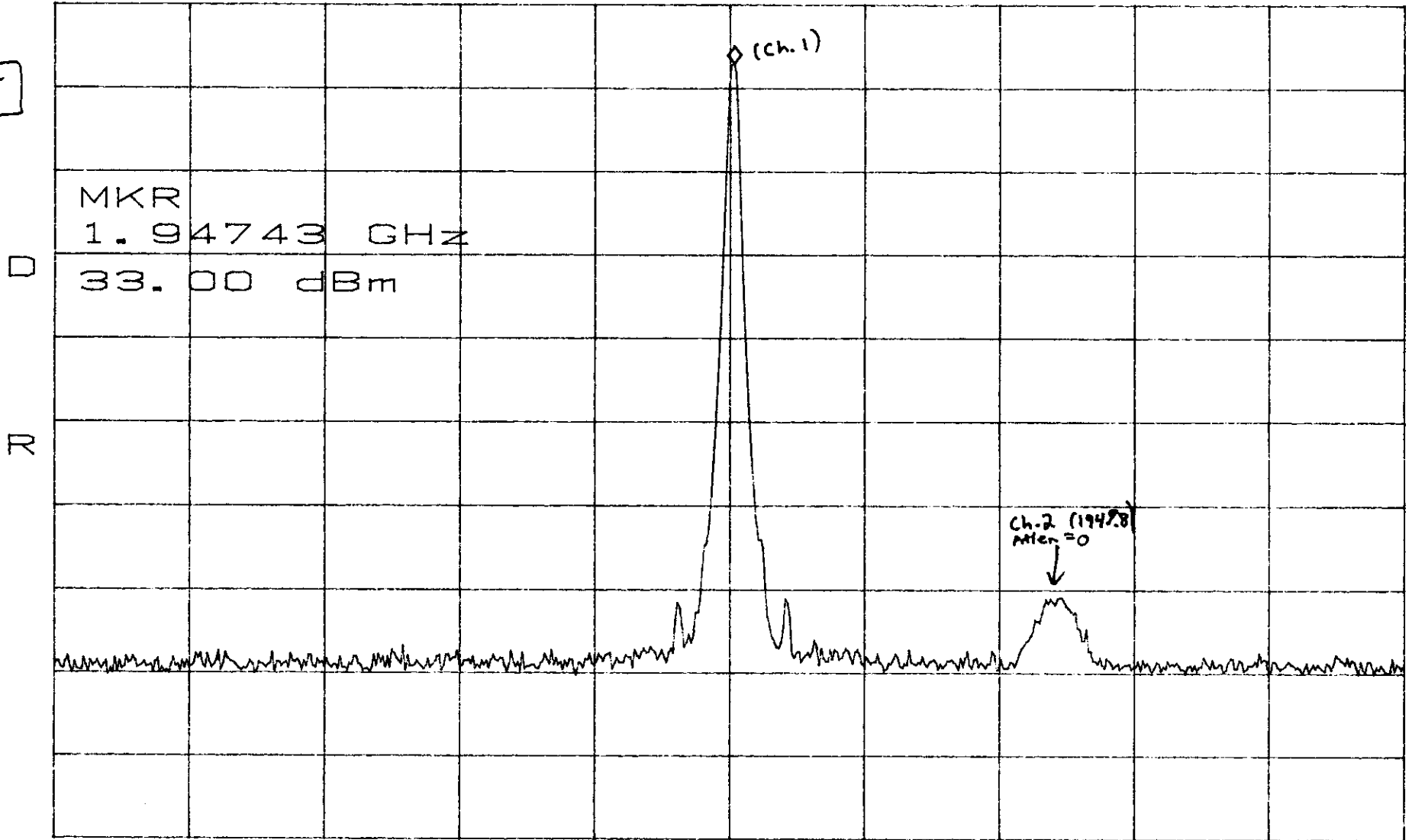
9/16/98
LB41901

ATTEN 30dB
RL 40.0dBm

CW-source
10dB/

MKR 33.00dBm
1.94743GHz

2.985



CENTER 1.94740GHz SPAN 10.00MHz
*RBW 30kHz VBW 30kHz SWP 50.0ms

DL High
D-band

DL Output
 $P_{in} = -54.4 \text{ dBm @ } 1949.8 \text{ MHz (ch.1)}$

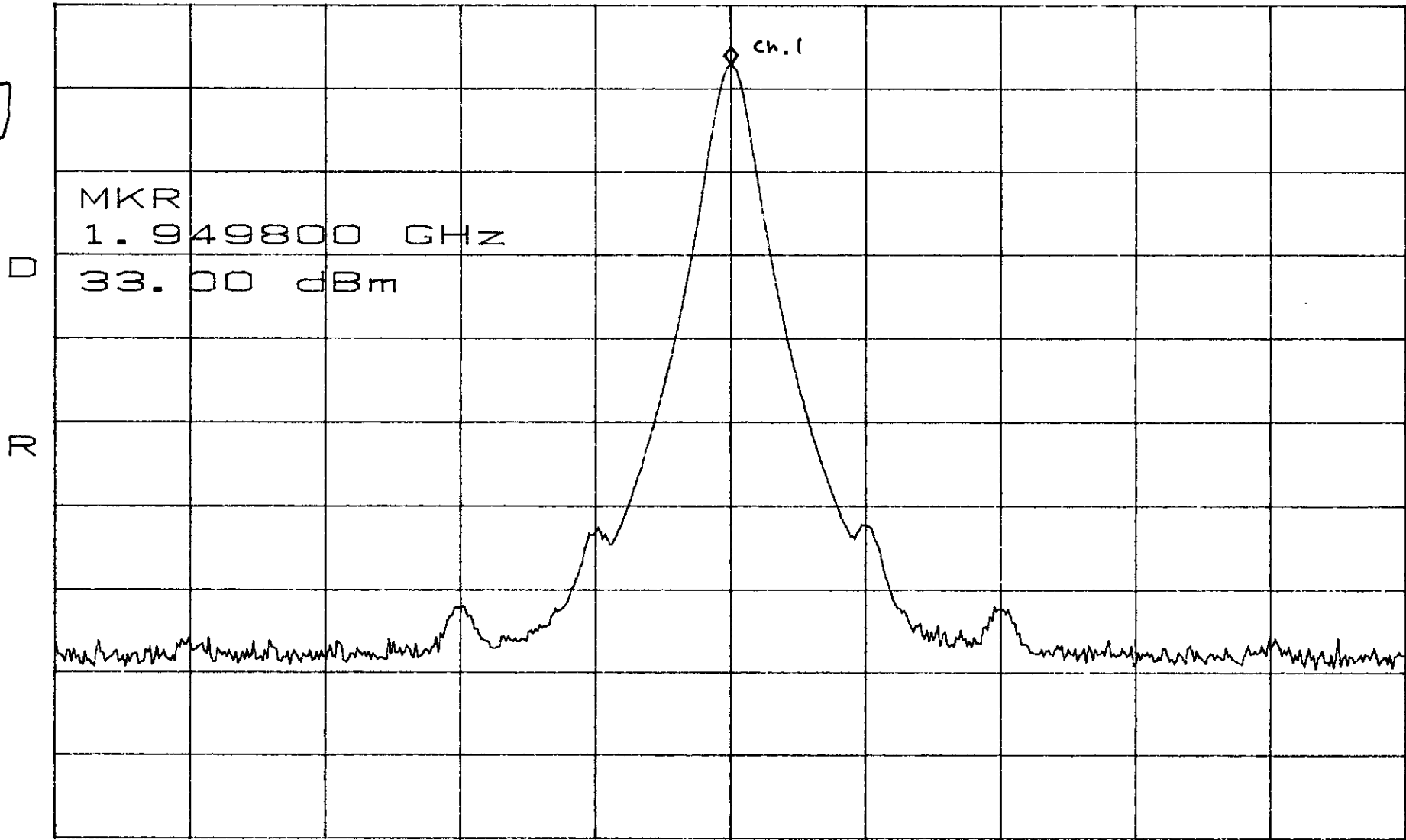
9/16/98
LB41901

ATTEN 30dB
RL 40.00dBm

CW source
10dB/

MKR 33.00dBm
1.949800GHz

2.985



CENTER 1.949800GHz

SPAN 2.000MHz

*RBW 30kHz

VBW 30kHz

SWP 50.0ms

DL High
D-band

DL Output
 $P_{in} = -54.4 \text{ dBm}$ @ 1949.8 MHz (Ch.1)

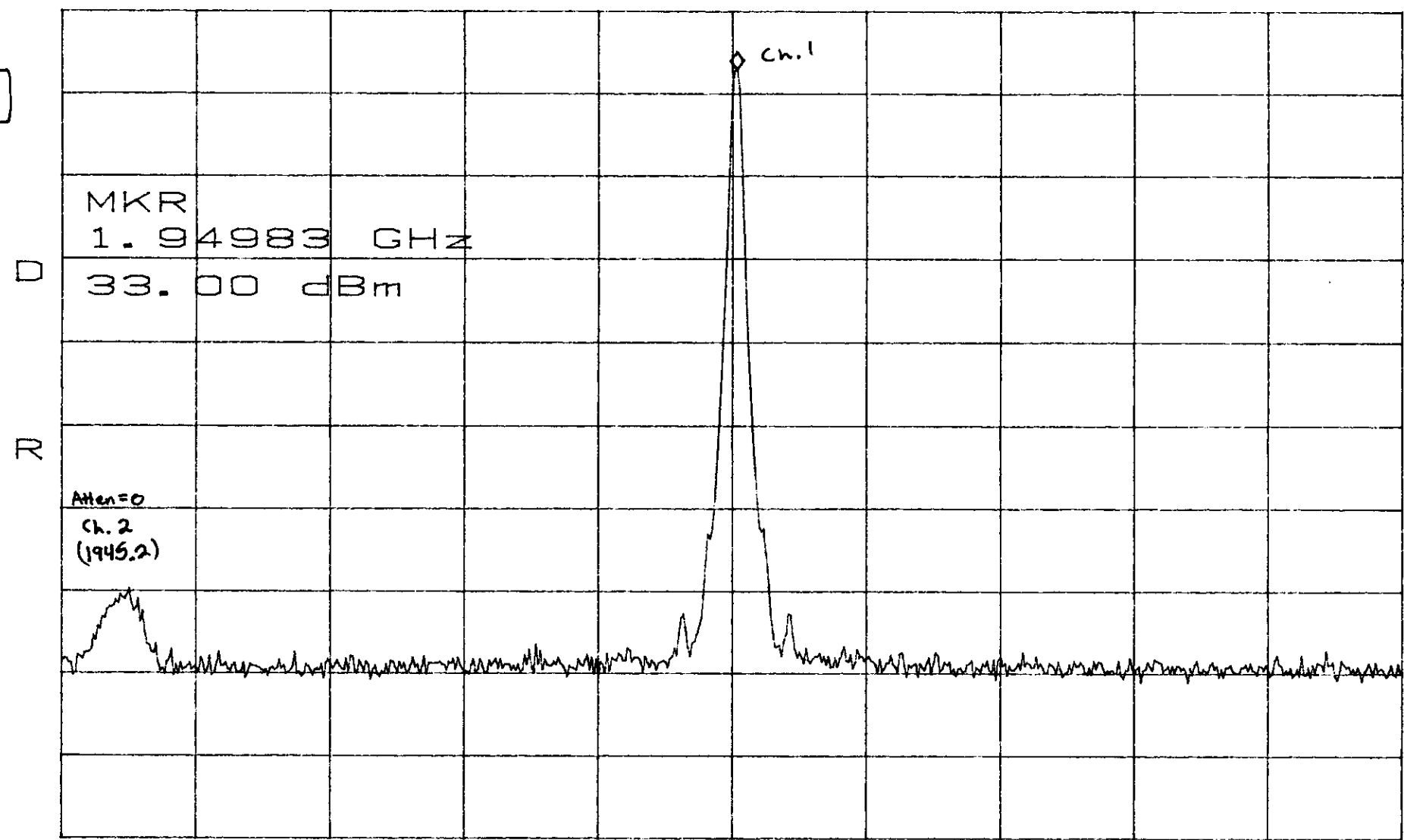
9/16/98
LB41901

ATTEN 30dB
RL 40.0dBm

CW Source
10dB/

MKR 33.00dBm
1.94983GHz

2.985



CENTER 1.94980GHz

SPAN 10.00MHz

*RBW 30kHz

VBW 30kHz

SWP 50.0ms

UL Low
D-band

UL Output

9/17/98

LB41901

ATTEN 30dB

$P_{in} = -51.9 \text{ dBm @ } 1865.2 \text{ MHz (ch.1)}$

CW Source

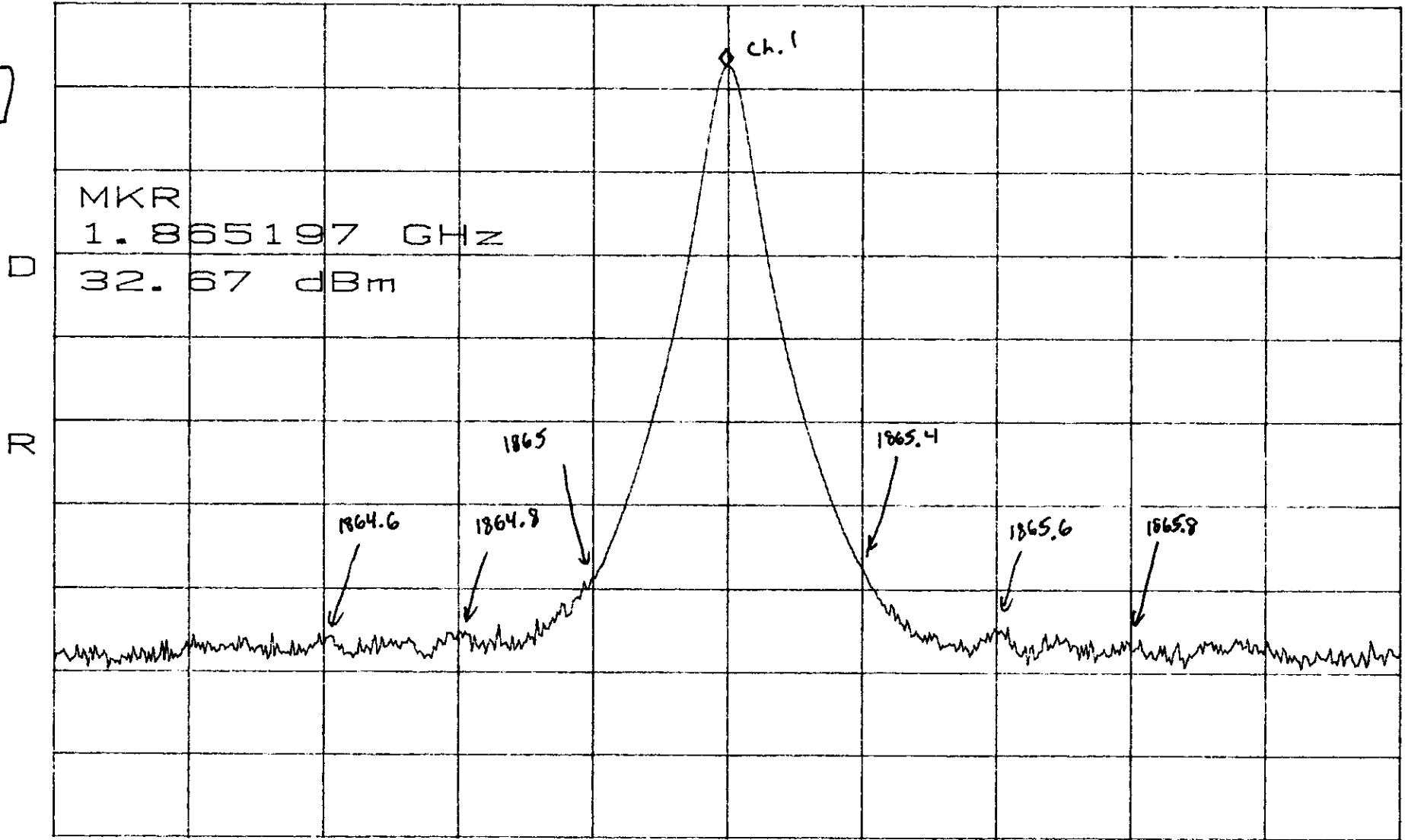
MKR 32.67dBm

RL 40.0dBm

10dB/BP0/

1.865197GHz

2.985



CENTER 1.865200GHz

SPAN 2.000MHz

*RBW 30kHz

VBW 30kHz

SWP 50.0ms

UL Low
D-band

UL output
 $P_{in} = -51.9 \text{ dBm} @ 1865.2 \text{ MHz (ch.1)}$

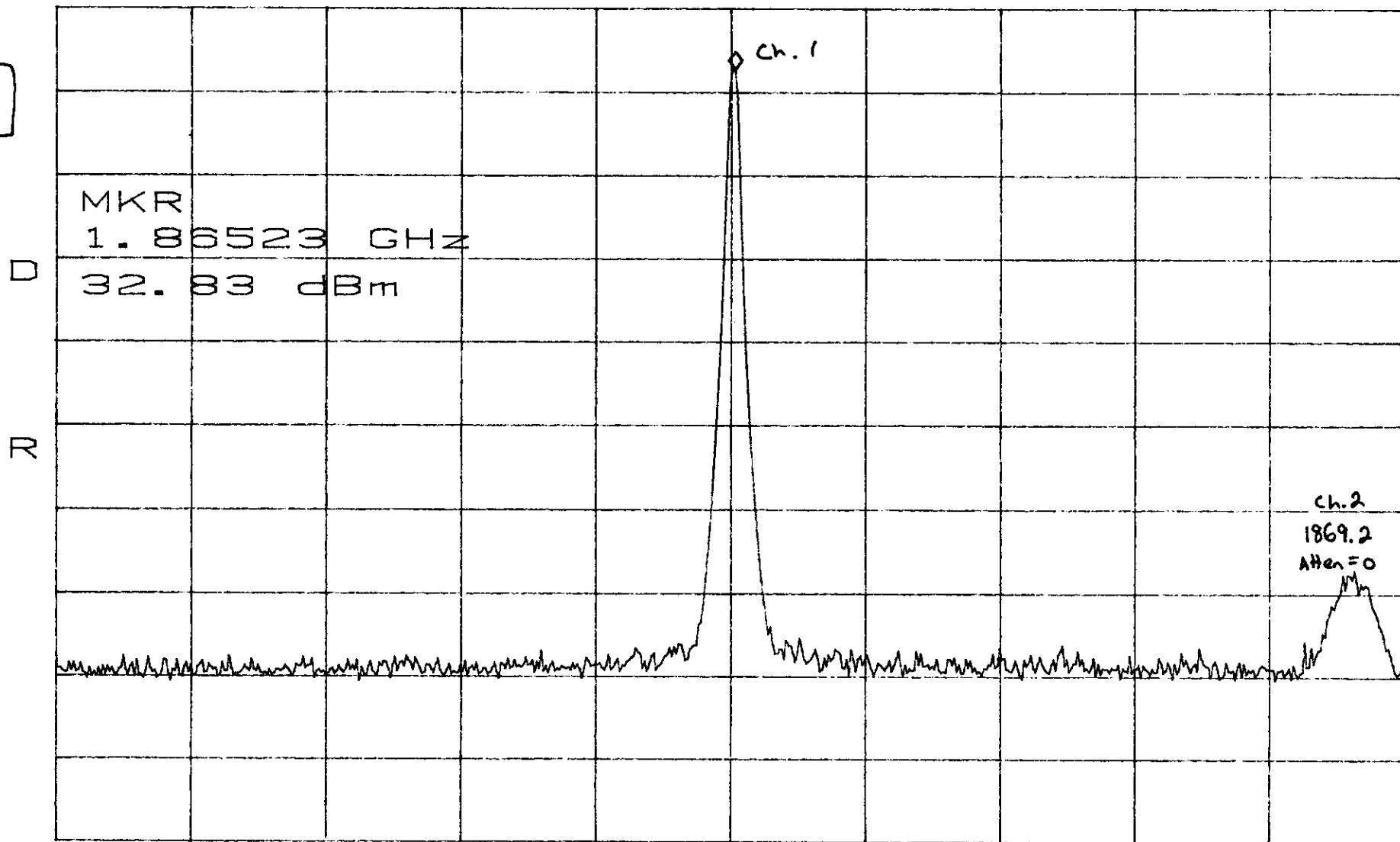
9/17/98
LB41901

ATTEN 30dB
RL 40.0dBm

cw source
10dB/

MKR 32.83dBm
1.86523GHz

2.985



CENTER 1.86520GHz SPAN 10.00MHz
*RBW 30kHz VBW 30kHz SWP 50.0ms

UL Mid
D-band

UL output
 $P_{in} = -52.6 \text{ dBm} @ 1867.4 \text{ MHz} \text{ (ch.1)}$

9/17/98

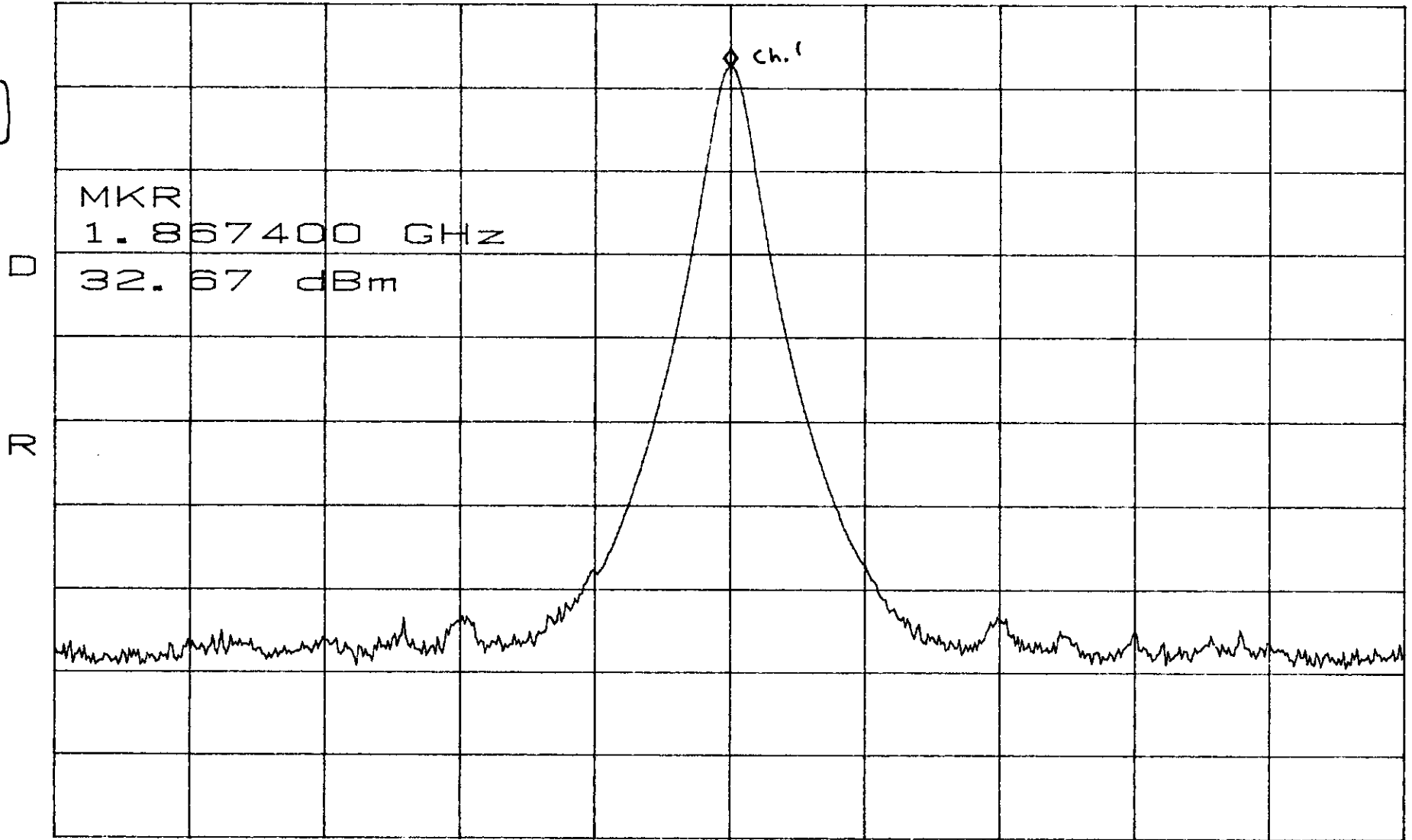
LB41901

ATTEN 30dB
RL 40.0dBm

cw source
10dB/

MKR 32.67dBm
1.867400GHz

2.985



CENTER 1.867400GHz

SPAN 2.000MHz

*RBW 30kHz

VBW 30kHz

SWP 50.0ms

UL Mid
D-band

UL Output
 $P_{in} = -52.6 \text{ dBm} @ 1867.4 \text{ MHz (Ch.1)}$

ATTEN 30dB

CW source

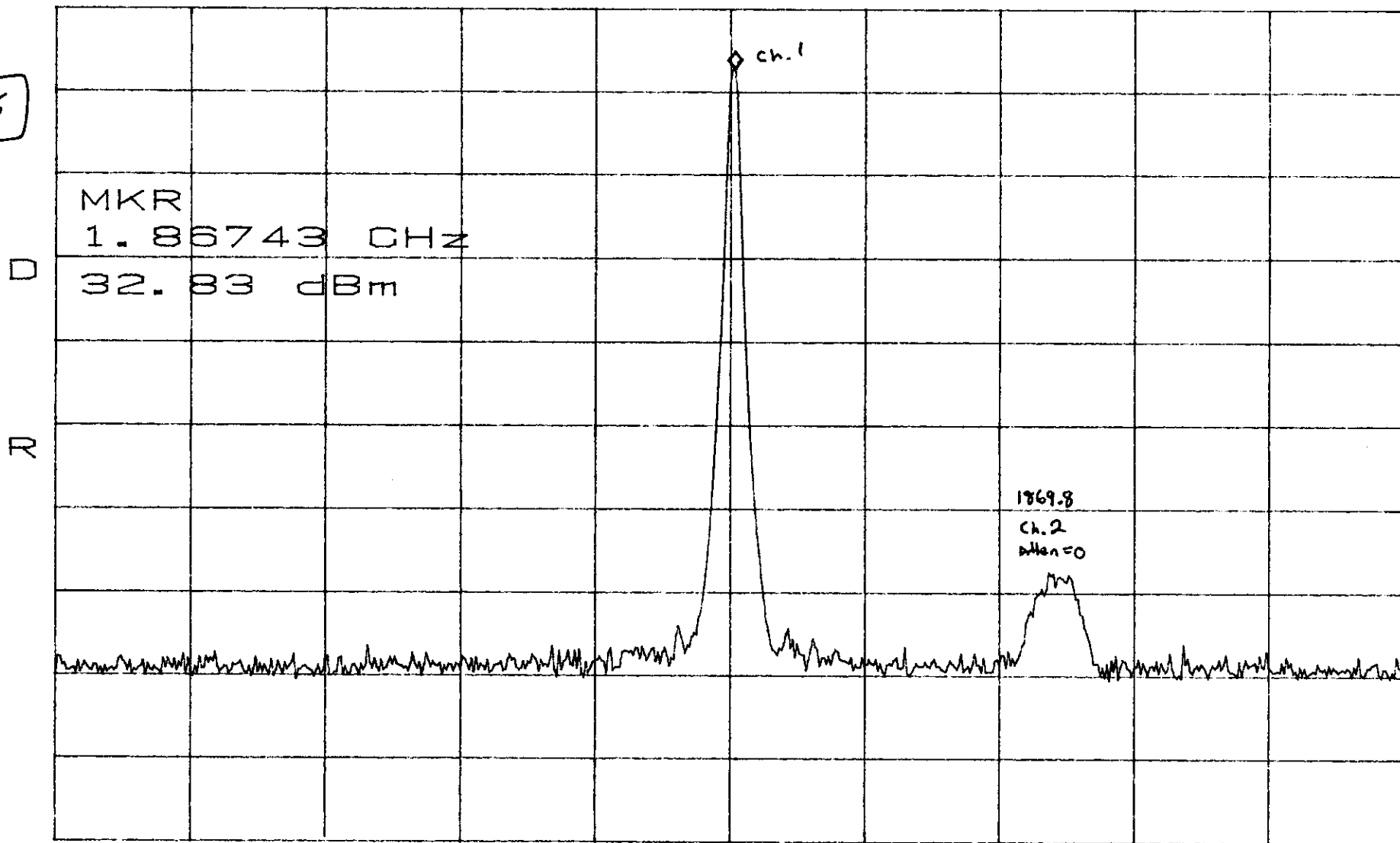
MKR 32.83dBm

RL 40.0dBm

10dB/

1.86743GHz

2.985



MKR
1.86743 CHz
32.83 dBm

1869.8
Ch.2
atten=0

CENTER 1.86740GHz

SPAN 10.00MHz

*RBW 30kHz

VBW 30kHz

SWP 50.0ms

UL High
D-band

UL Output
 $P_{in} = -53.0\text{dBm}$ @ 1869.8 MHz (ch.1)

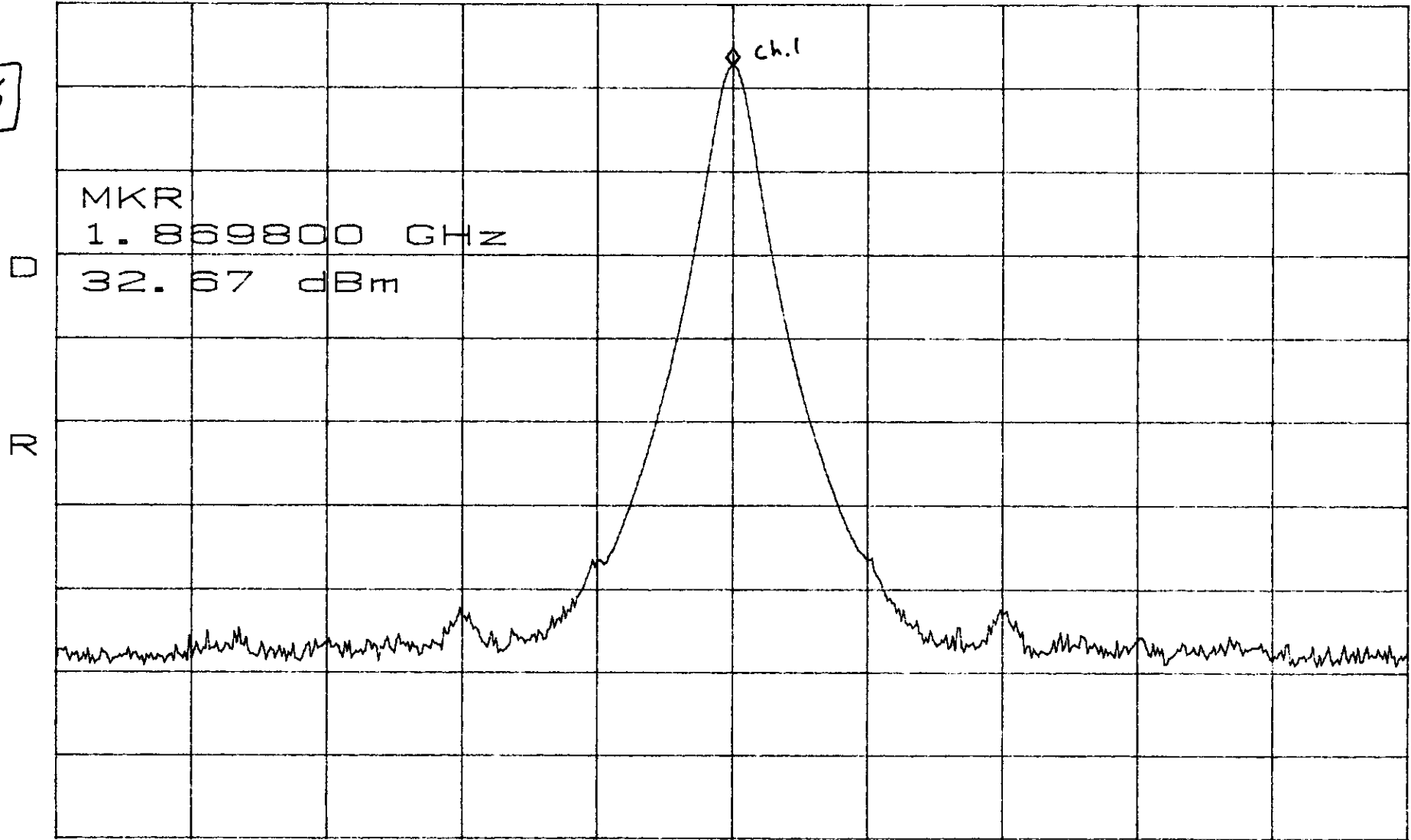
9/17/98
LB41901

ATTN 30dB
BPOB
RL 40.0dBm

CW Source
10dB/

MKR 32.67dBm
1.869800GHz

2.985



CENTER 1.869800GHz

SPAN 2.000MHz

*RBW 30kHz

VBW 30kHz

SWP 50.0ms

UL High
D-band

UL output
 $P_{in} = -53.0 \text{ dBm} @ 1869.8 \text{ MHz (ch.1)}$

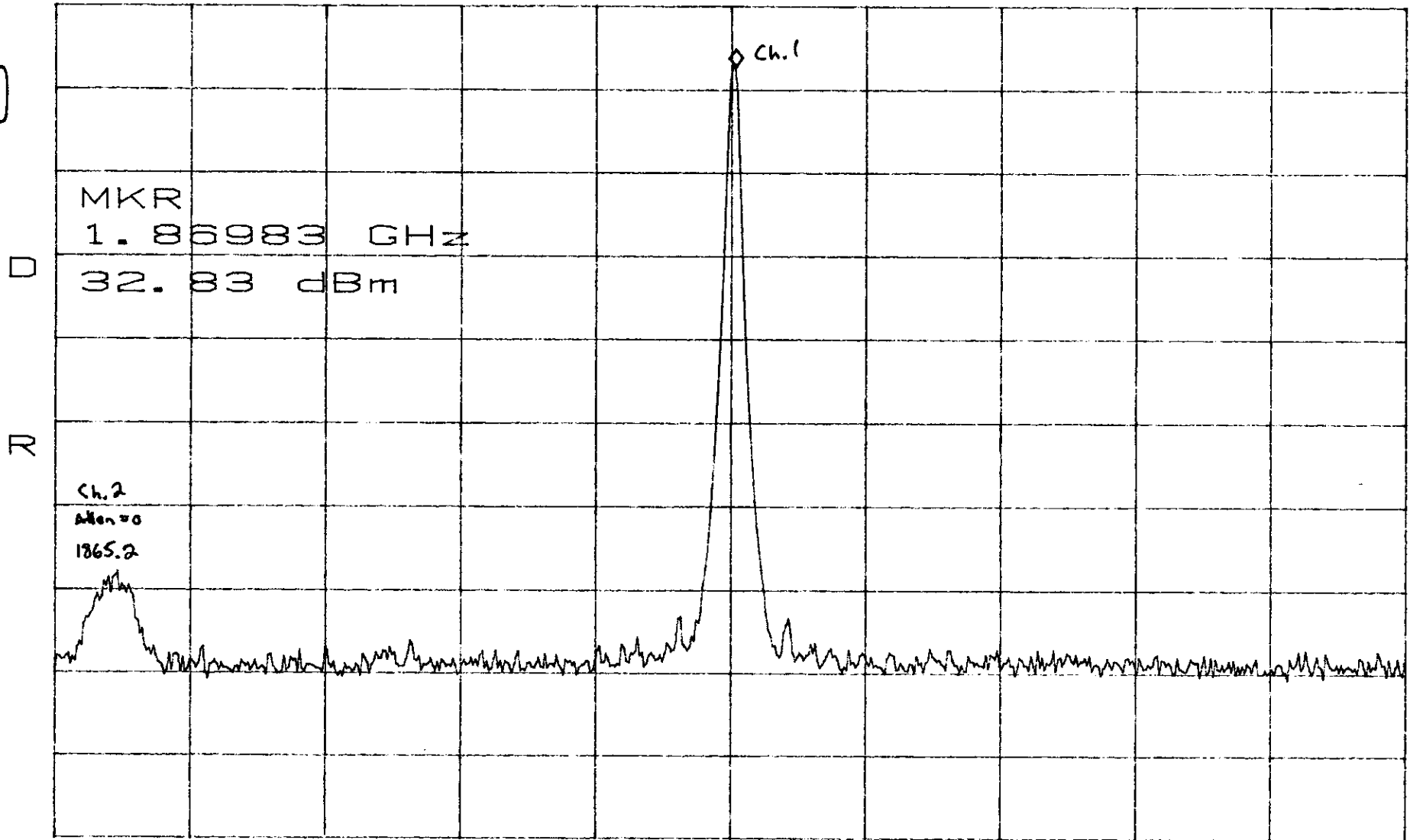
9/17/98
LB41901

ATTEN 30dB
RL 40.0dBm

CW Source
10dB/

MKR 32.83dBm
1.86983GHz

2.985



CENTER 1.86980GHz

SPAN 10.00MHz

*RBW 30kHz

VBW 30kHz

SWP 50.0ms

DL Low
D-band

Occupied BW
CW Source

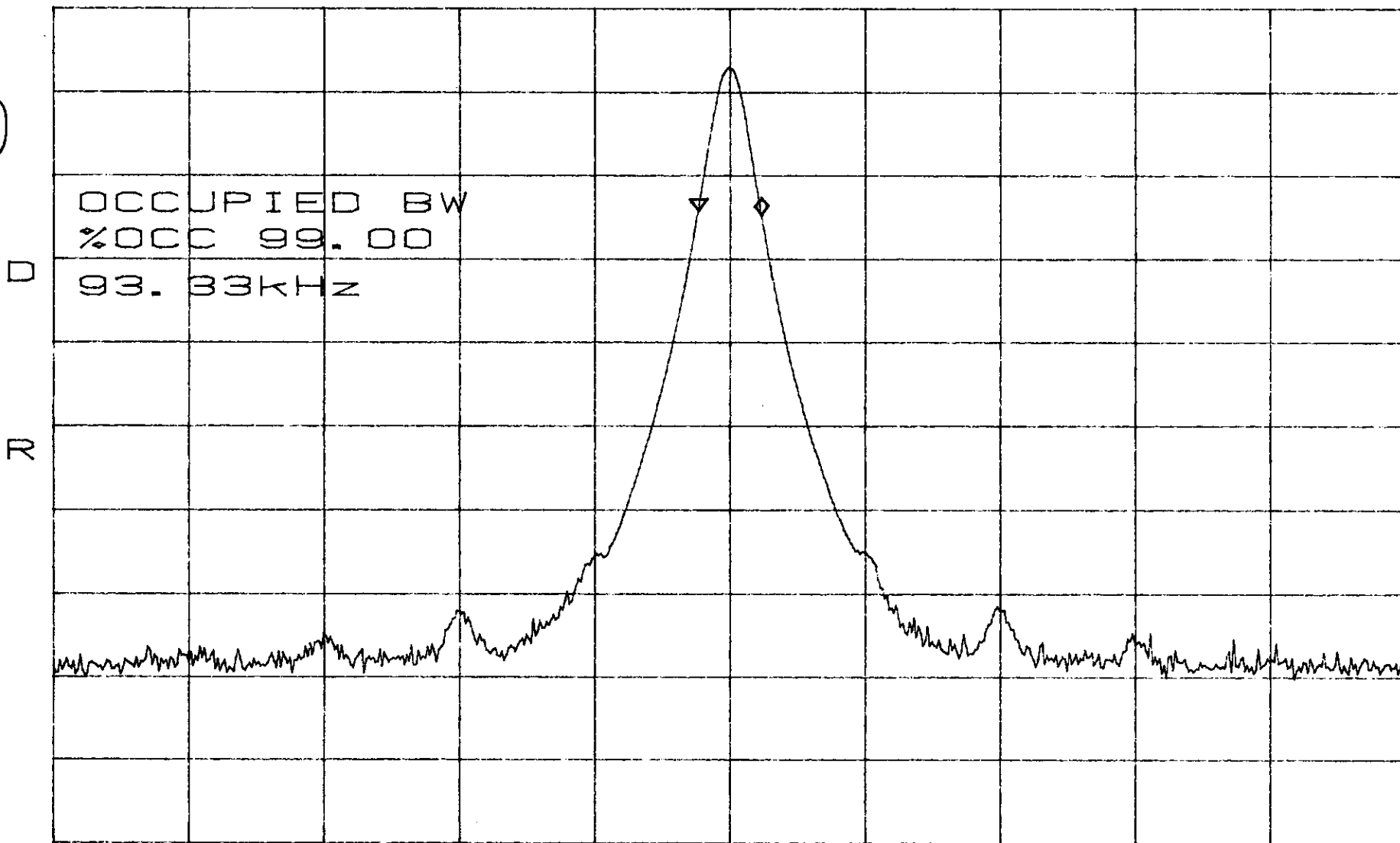
9/17/98
LB41901

ATTEN 30dB
BPO3
RL 40.0dBm

1dB/

ΔMKR -.50dB
93kHz

2.989



CENTER 1.945200GHz

SPAN 2.000MHz

*RBW 30kHz

VBW 30kHz

SWP 50.0ms

DL Mid
D-band

Occupied BW
CW Source

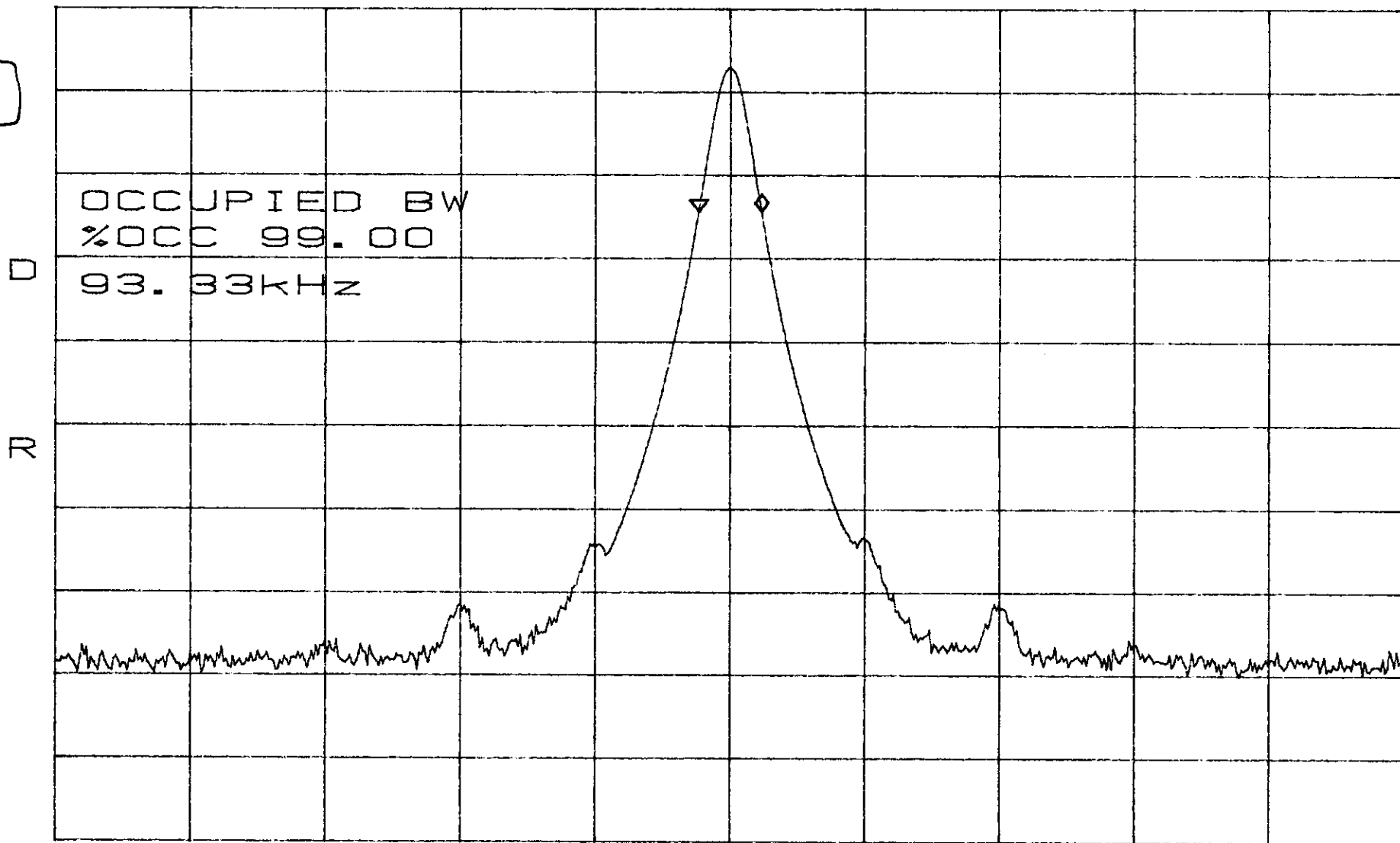
9/17/98
LB41901

ATTEN 30dB
BPO3
RL 40.0dBm

10dB/

ΔMKR 0dB
BPO
93kHz

2.989



CENTER 1.947400GHz SPAN 2.000MHz
*RBW 30kHz VBW 30kHz SWP 50.0ms

DL High
D-band

Occupied BW

9/17/98

CV Source

LB41901

ATTEN 30dB

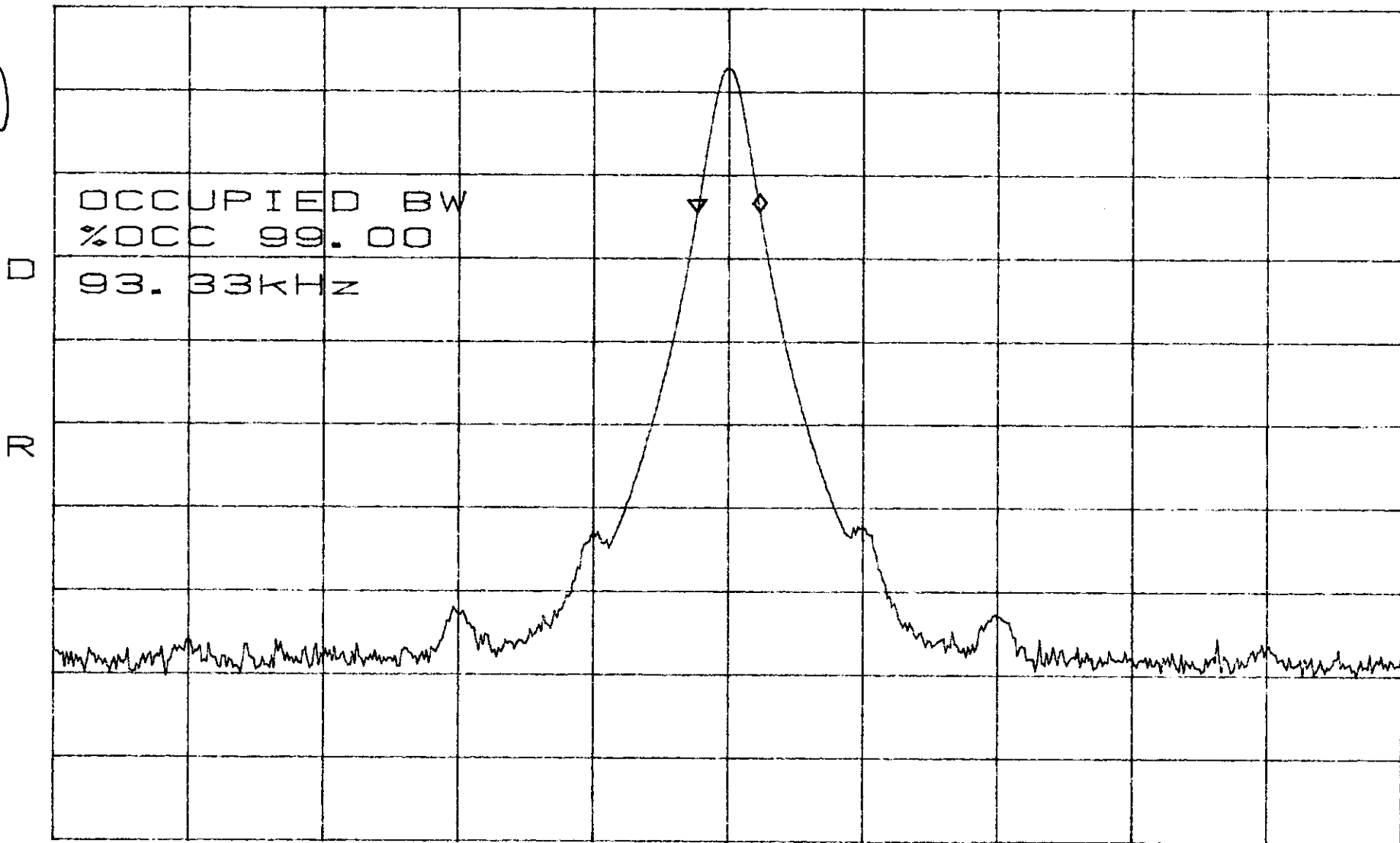
ΔMKR 0dB

RL 40.0dBm

10dB/

93kHz

2.989



CENTER 1.949800GHz

SPAN 2.000MHz

*RBW 30kHz

VBW 30kHz

SWP 50.0ms

VL Low
D-band

Occupied BW
CW source

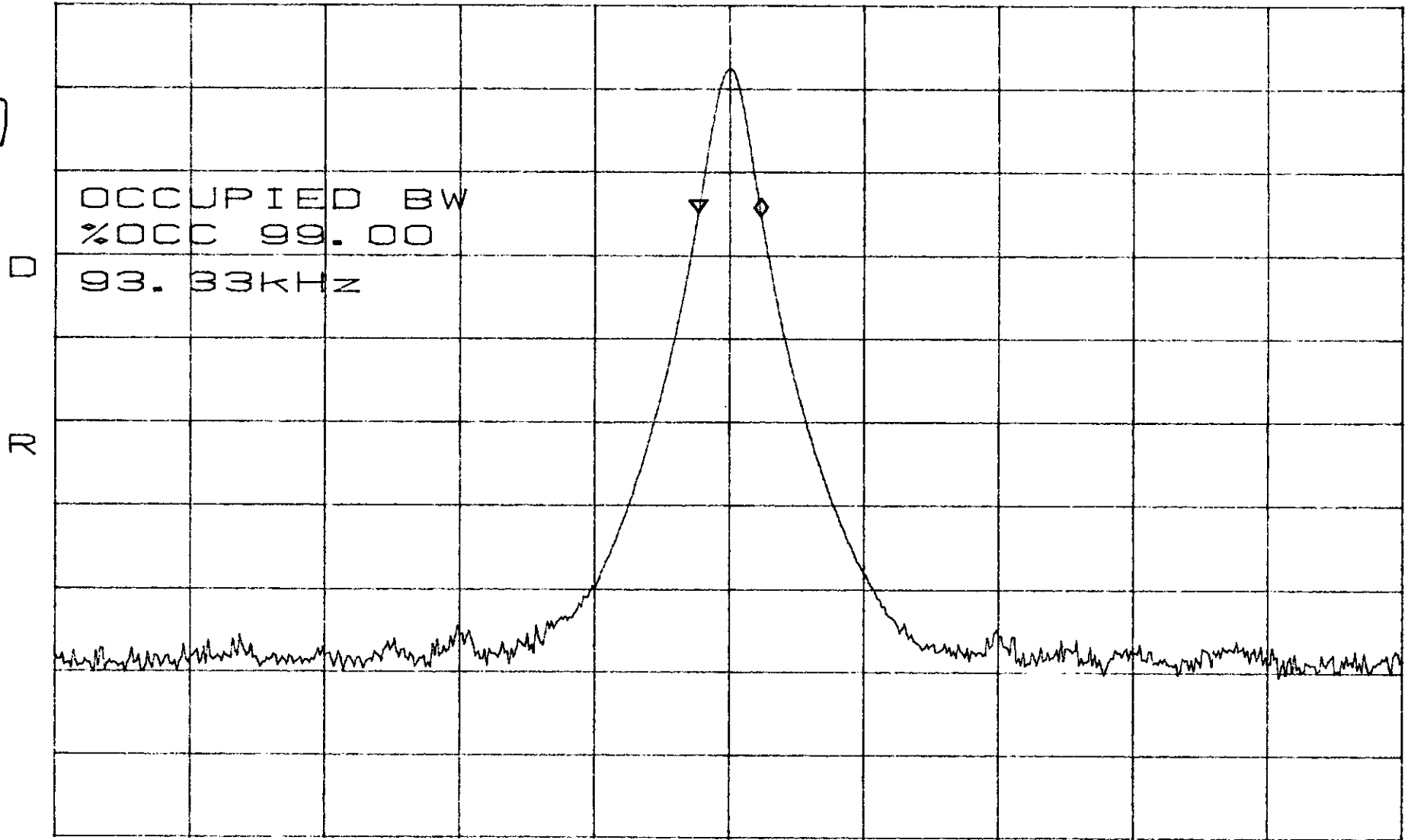
9/17/98
LB41901

ATTEN 30dB
BPO3
RL 40.0dBm

1dB/

ΔMKR - .50dB
93kHz

2.989



CENTER 1.865200GHz

SPAN 2.000MHz

*RBW 30kHz

VBW 30kHz

SWP 50.0ms

UL Mid
D-band

Occupied BW
CW source

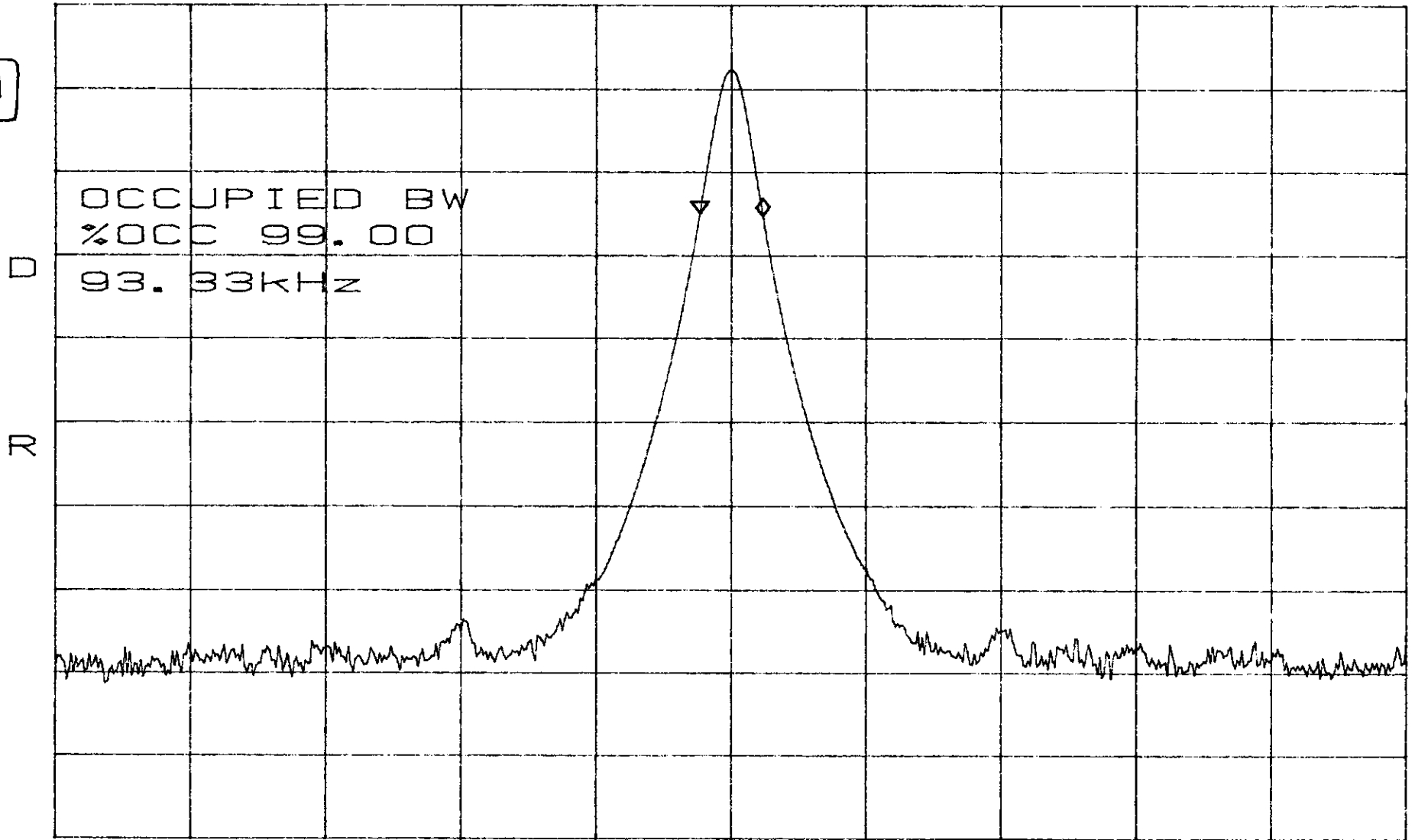
9/17/98
LB41901

ATTEN 30dB
RL 40.0dBm

10dB/BP01

Δ MKR -.34dB
93kHz

2.989



CENTER 1.867400GHz

SPAN 2.000MHz

*RBW 30kHz

VBW 30kHz

SWP 50.0ms

UL High
D-band

Occupied BW

9/17/98
LB41901

ATTEN 30dB

CW Source

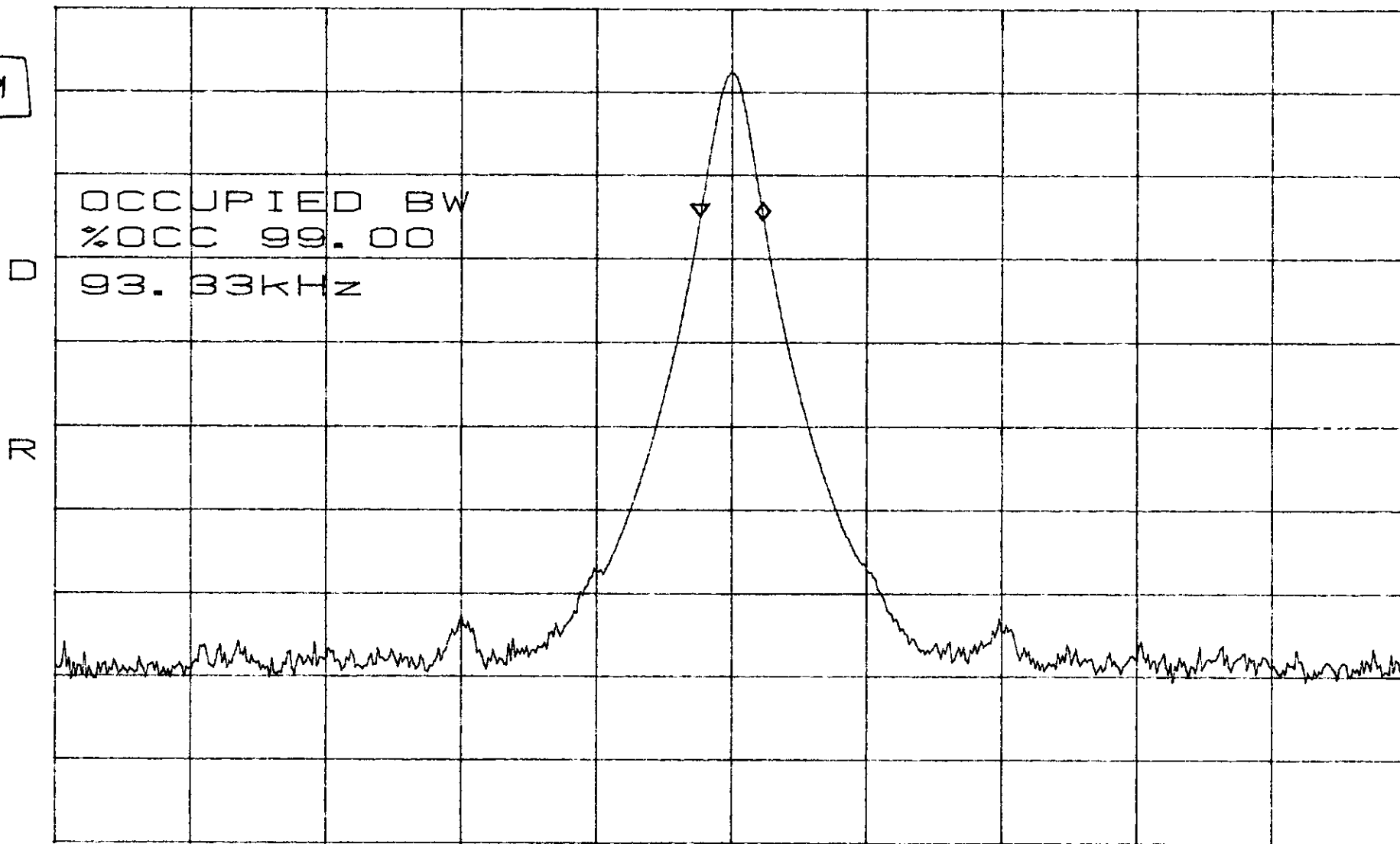
Δ MKR - .50dB

RL 40.0dBm

10dB/BPO1

93kHz

2.989



CENTER 1.869800GHz

SPAN 2.000MHz

*RBW 30kHz

VBW 30kHz

SWP 50.0ms

DL Low
D-band

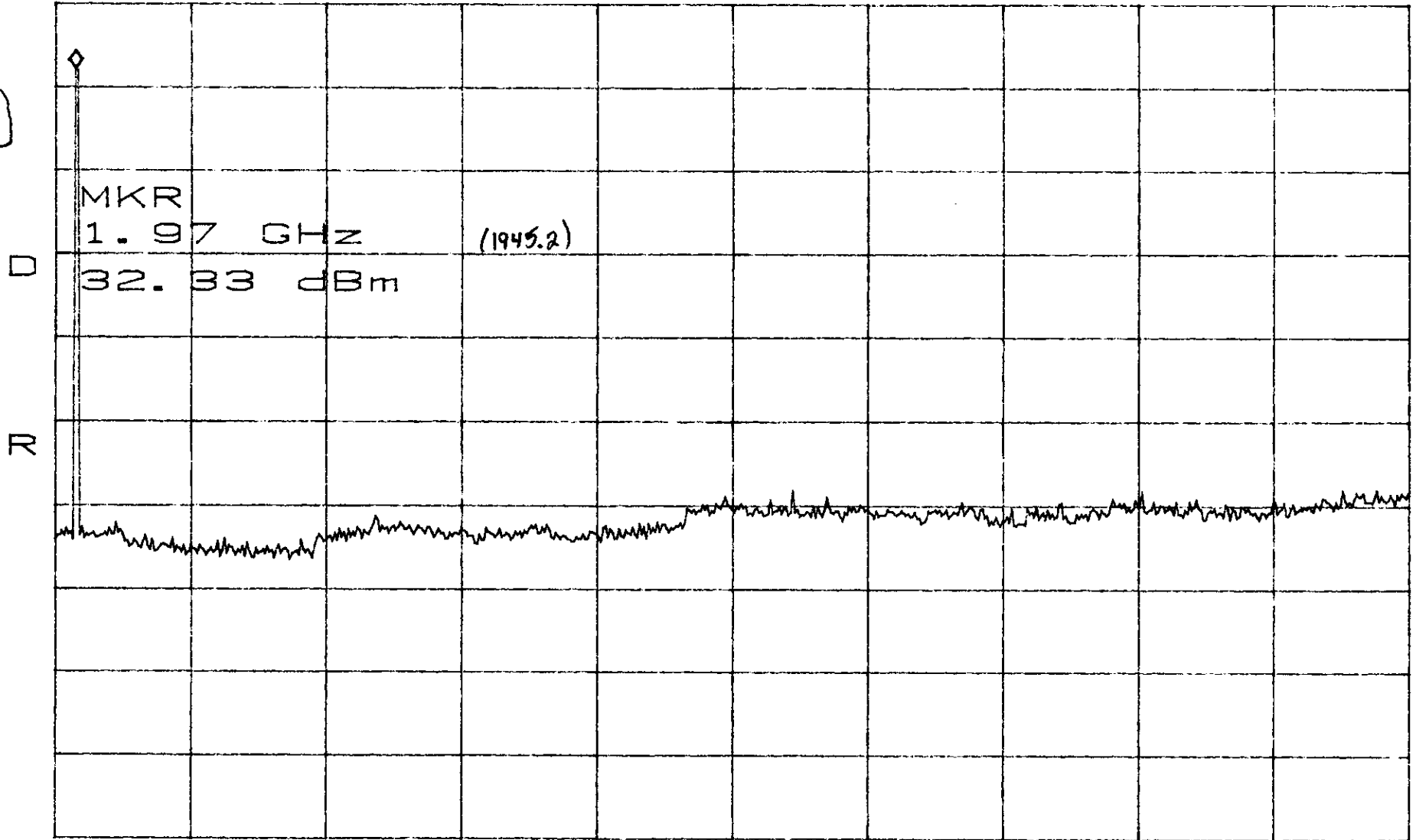
9/23/98
LB41901

cw

*ATTEN 30dB
RL 40.0dBm

MKR 32.33dBm
1.97GHz

2.991



START 1.60GHz

STOP 26.50GHz

*RBW 1.0MHz

*VBW 1.0MHz

SWP 500ms

DL Mid
2-band

9/23/98
LB41901

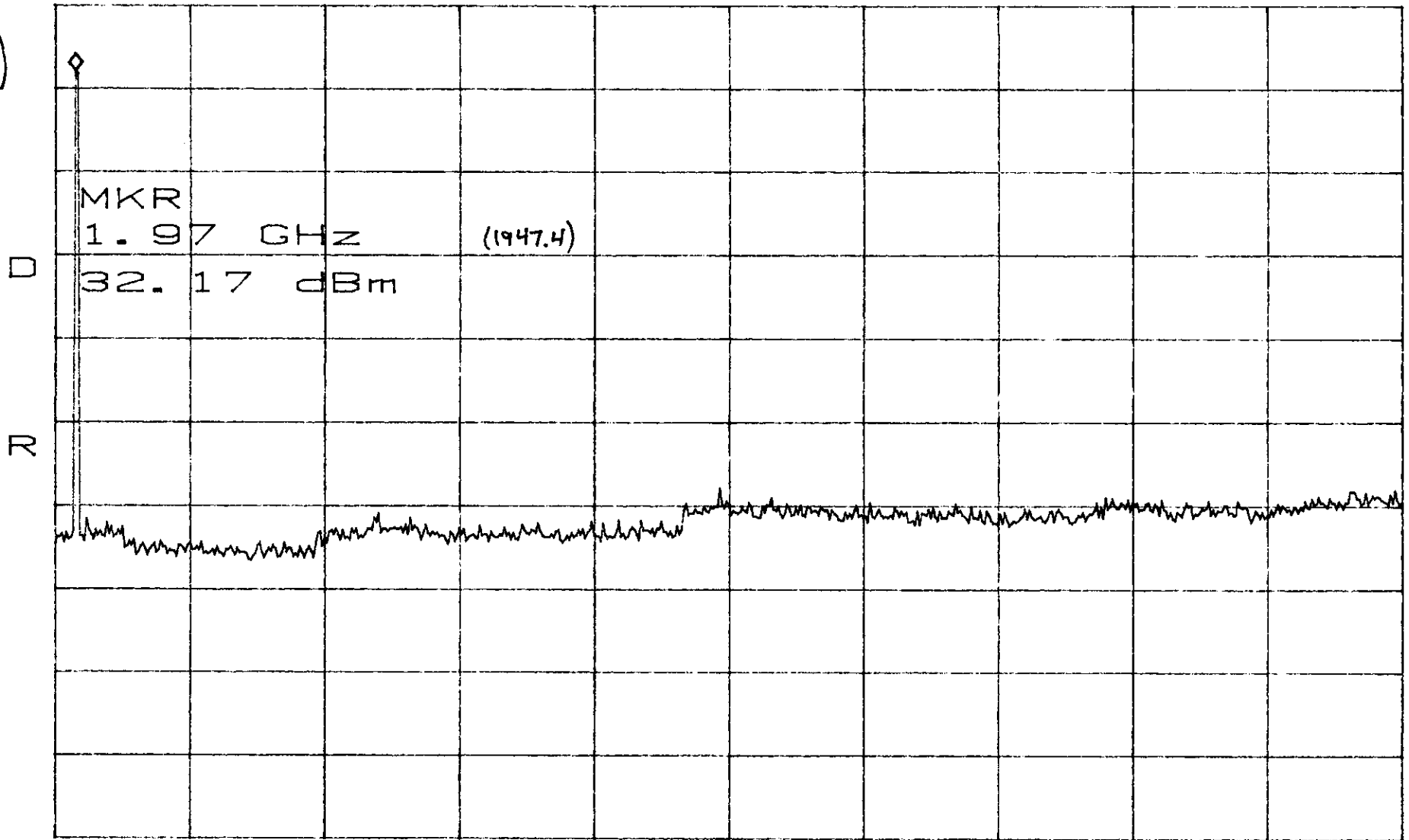
cu

*ATTEN 30dB
RL 40.0dBm

10dB/

MKR 32.17dBm
1.97GHz

2.991



START 1.60GHz

STOP 26.50GHz

*RBW 1.0MHz

*VBW 1.0MHz

SWP 500ms

DL High

D-band

9/23/98

LB41901

*ATTEN 30dB

cw

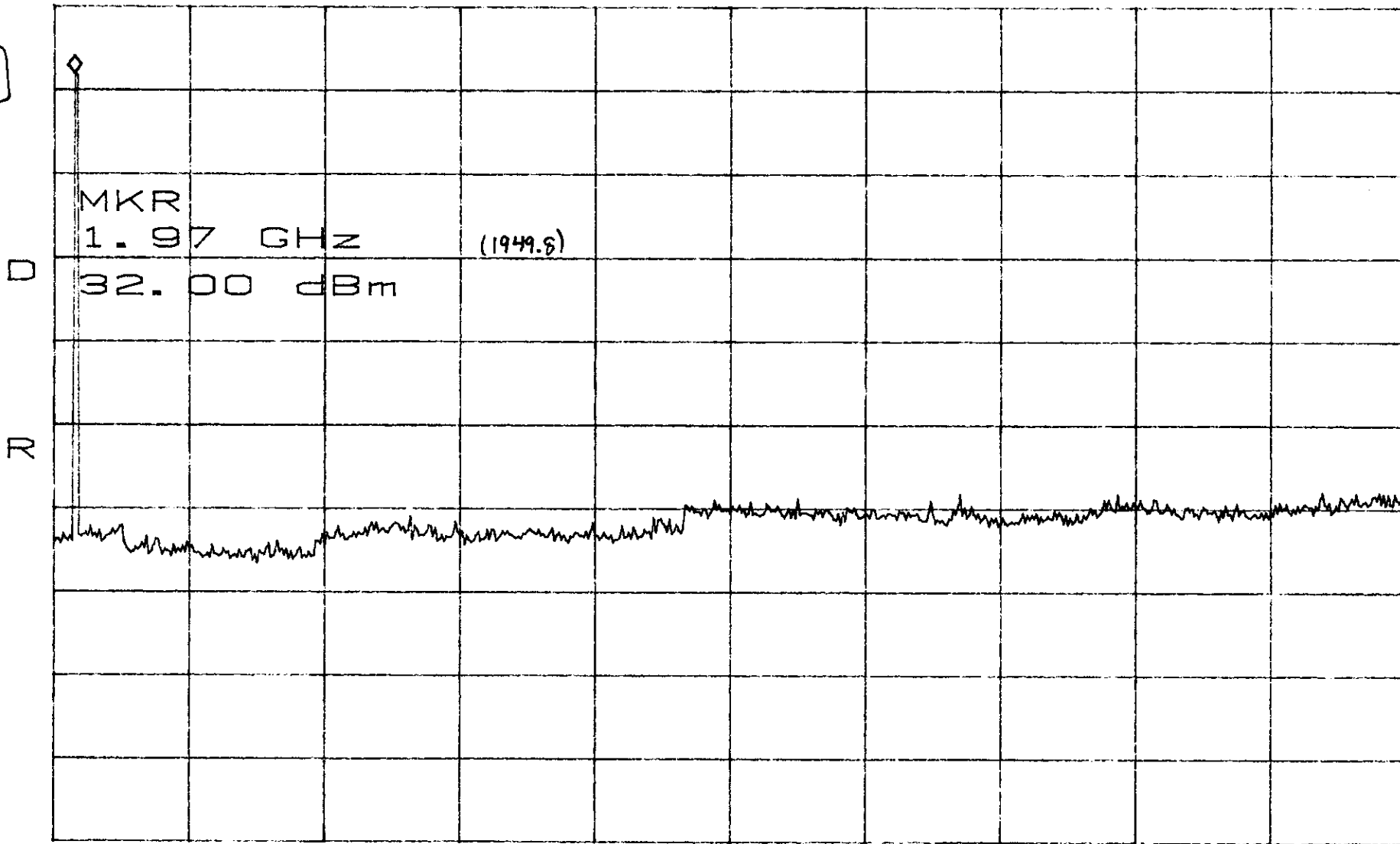
MKR 32.00dBm

RL 40.0dBm

10dB/

1.97GHz

2.991



START 1.60GHz

STOP 26.50GHz

*RBW 1.0MHz

*VBW 1.0MHz

SWP 500ms

UL Low
D-band

cw

9/23/98

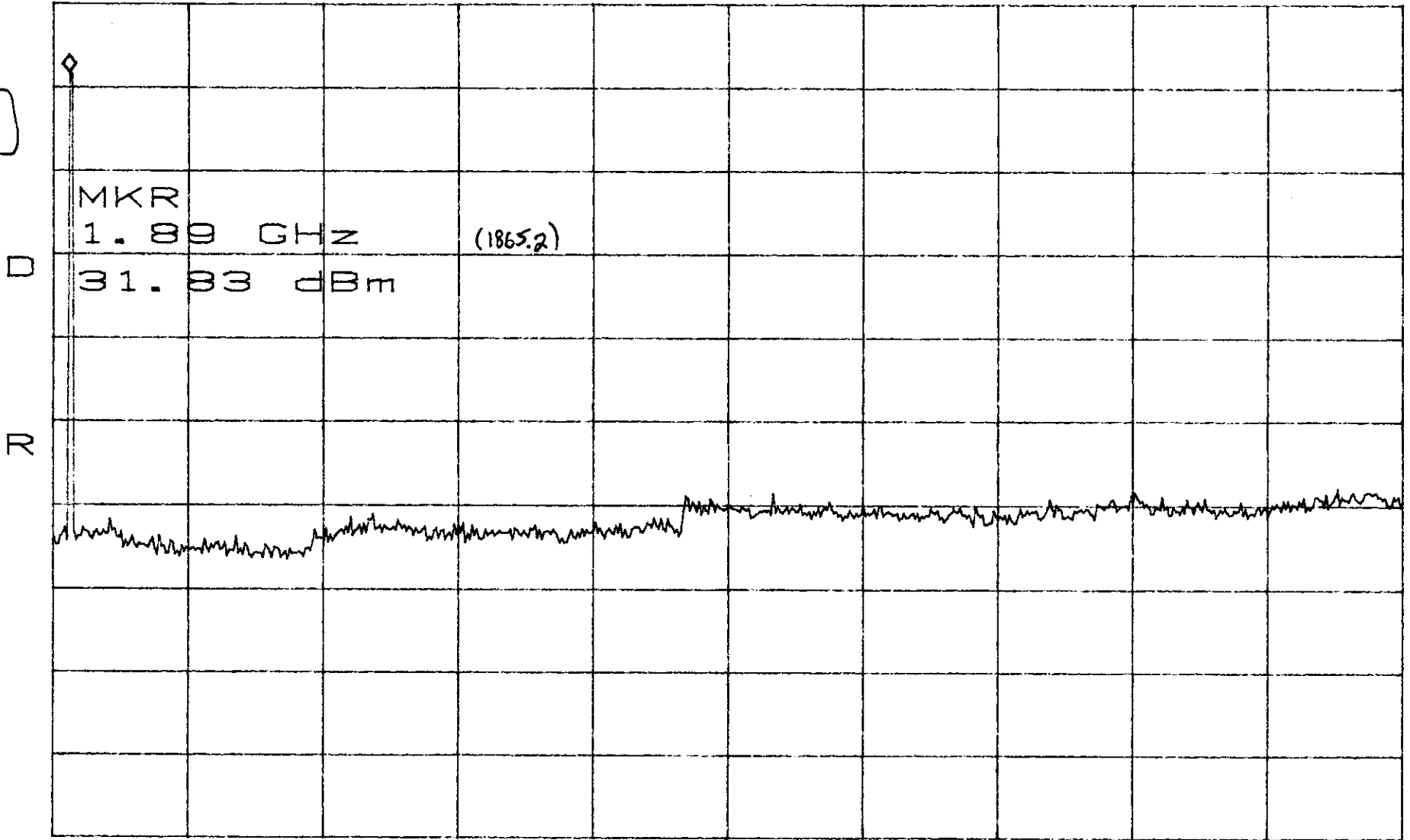
LB41901

*ATTEN 30dB
RL 40.0dBm

MKR 31.83dBm
1.89GHz

10dB/

2.991



START 1.60GHz

STOP 26.50GHz

*RBW 1.0MHz

*VBW 1.0MHz

SWP 500ms

9/23/98

LB41901

UL Mid
D-band

cw

*ATTEN 30dB

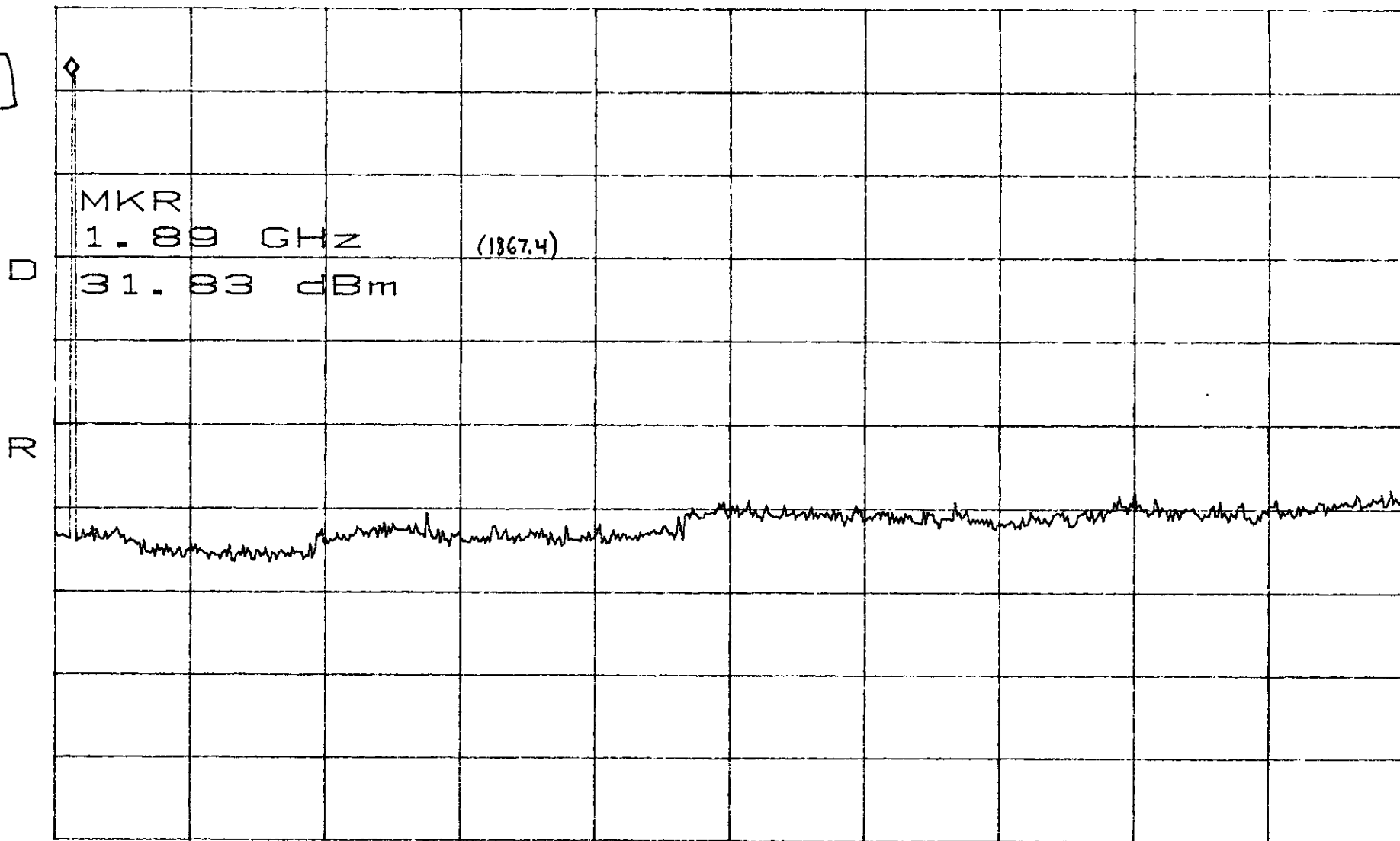
MKR 31.83dBm

RL 40.0dBm

10dB/

1.89GHz

2.991



START 1.60GHz

STOP 26.50GHz

*RBW 1.0MHz

*VBW 1.0MHz

SWP 500ms

UL High
0-band

9/23/98
LB41901

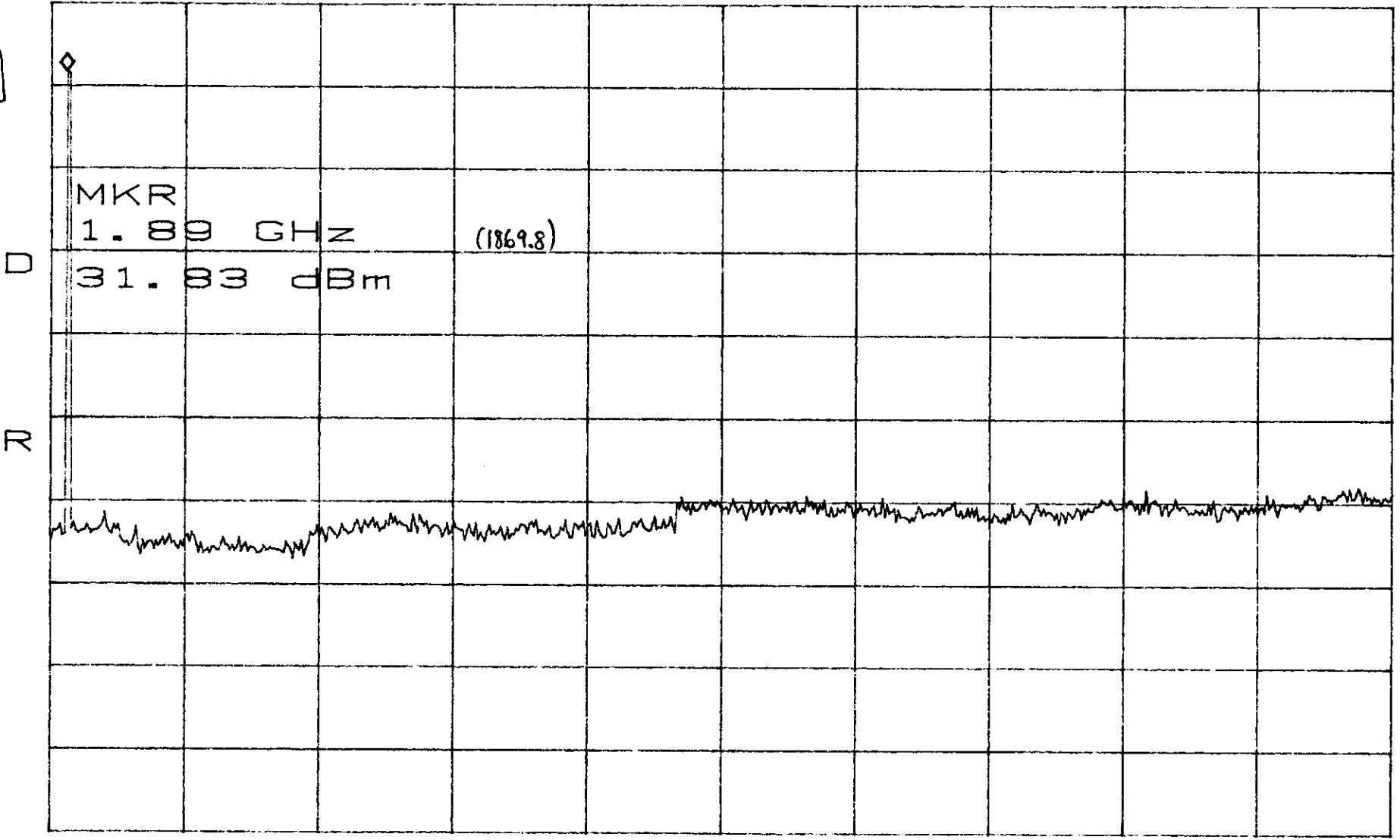
cw

*ATTEN 30dB
RL 40.0dBm

10dB/

MKR 31.83dBm
1.89GHz

2.991



START 1.60GHz STOP 26.50GHz
*RBW 1.0MHz *VBW 1.0MHz SWP 500ms

DL Low
D-band

Output
cw

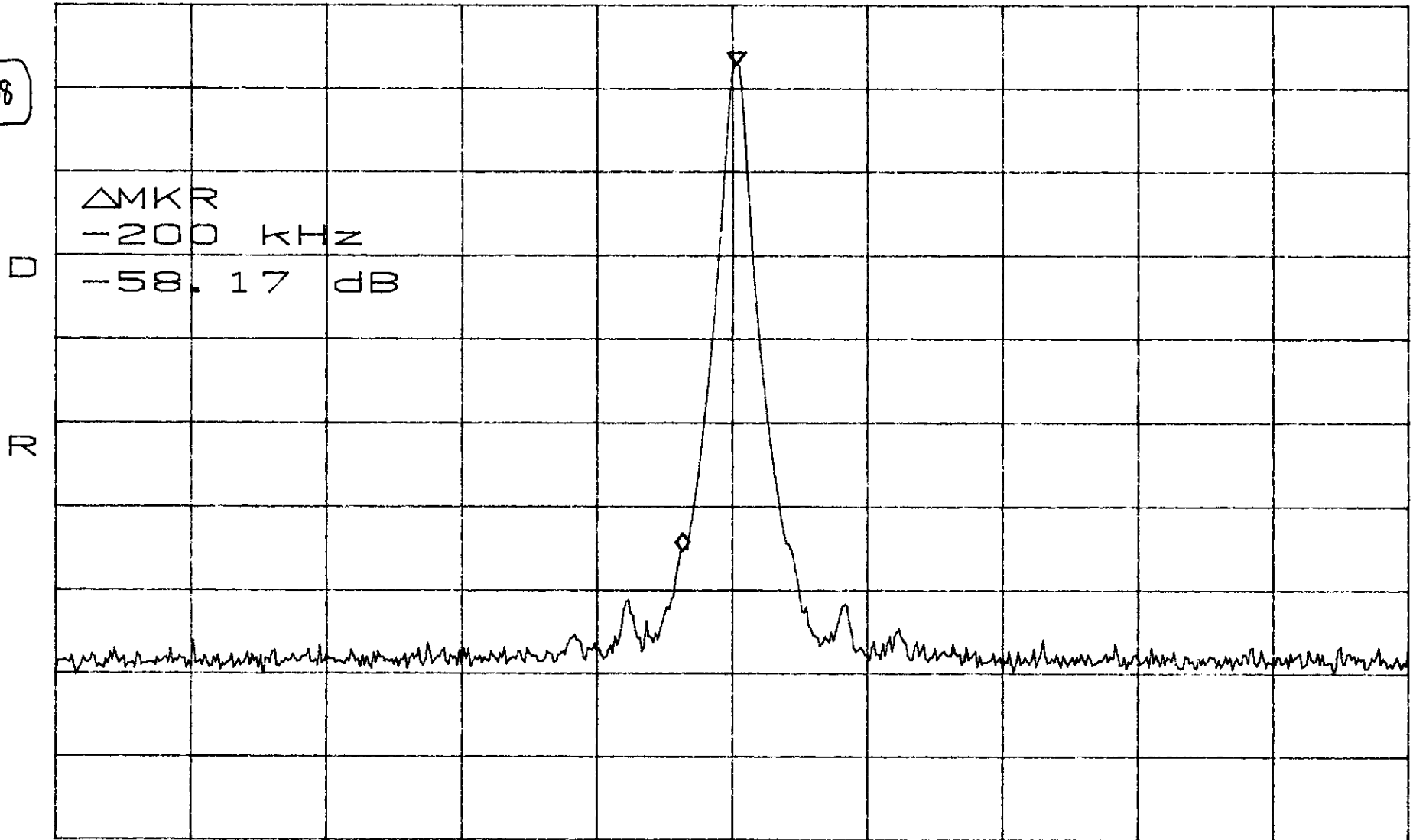
9/23/98
LB41901

ATTEN 30dB
BPO 0.0dBm

10dB/

Δ MKR -58.17dB
-200kHz

24.238



CENTER 1.945200GHz

SPAN 5.000MHz

*RBW 30kHz

*VBW 30kHz

SWP 50.0ms

DL Low

D-band

Input

9/25/98

LB41901

ATTEN 10dB

CW-source

MKR -55.00dBm

RL 0dBm

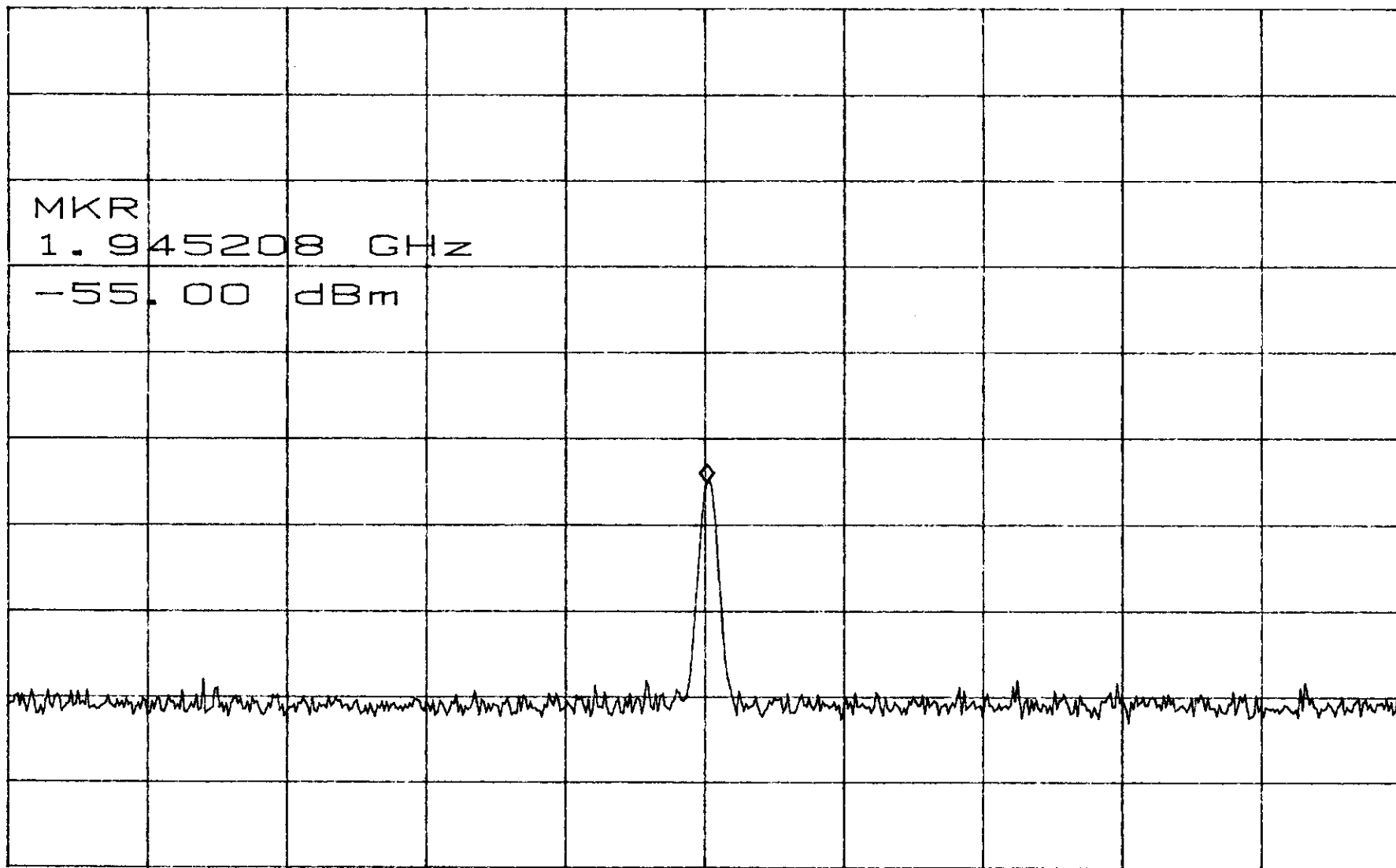
10dB/

1.945208GHz

24.238

MKR
1.945208 GHz

D
-55.00 dBm



CENTER 1.945200GHz

SPAN 5.000MHz

*RBW 30kHz

*VBW 30kHz

SWP 50.0ms

DL Low
D-band

Output
cw

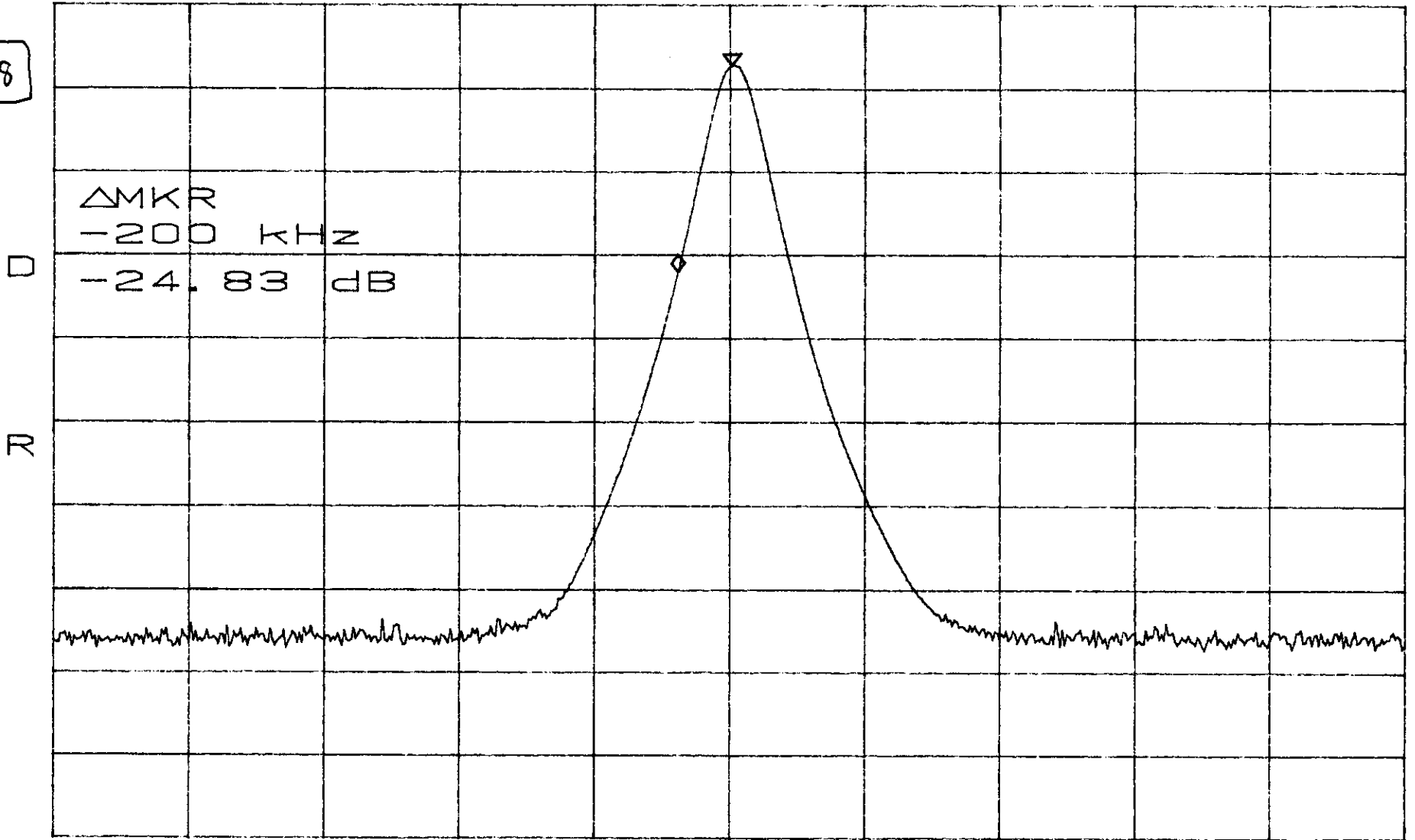
9/23/98
LB41901

ATTEN 30dB
RL 40.0dBm

10dB/

Δ MKR -24.83dB
-200kHz

24.238



CENTER 1.945200GHz

SPAN 5.000MHz

*RBW 100kHz

*VBW 30kHz

SWP 50.0ms

DL Low
D-band

Output
cw

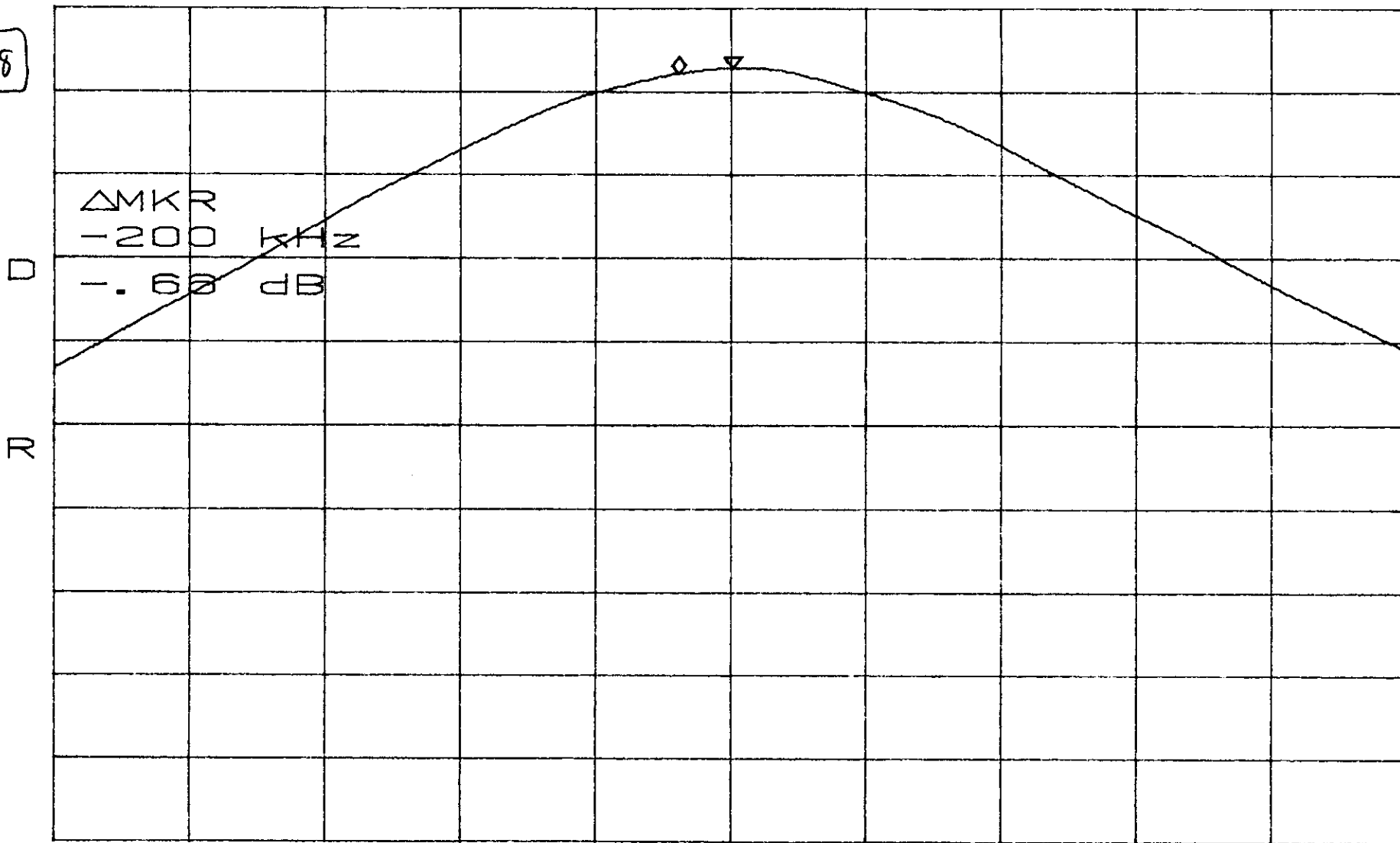
9/23/98
LB41901

ATTEN 30dB
RL 40.0dBm

10dB/

Δ MKR -.66dB
-200kHz

24.238



CENTER 1.945200GHz

SPAN 5.000MHz

*RBW 1.0MHz

*VBW 1.0MHz

SWP 50.0ms

DL Low
D-band

Output
cw

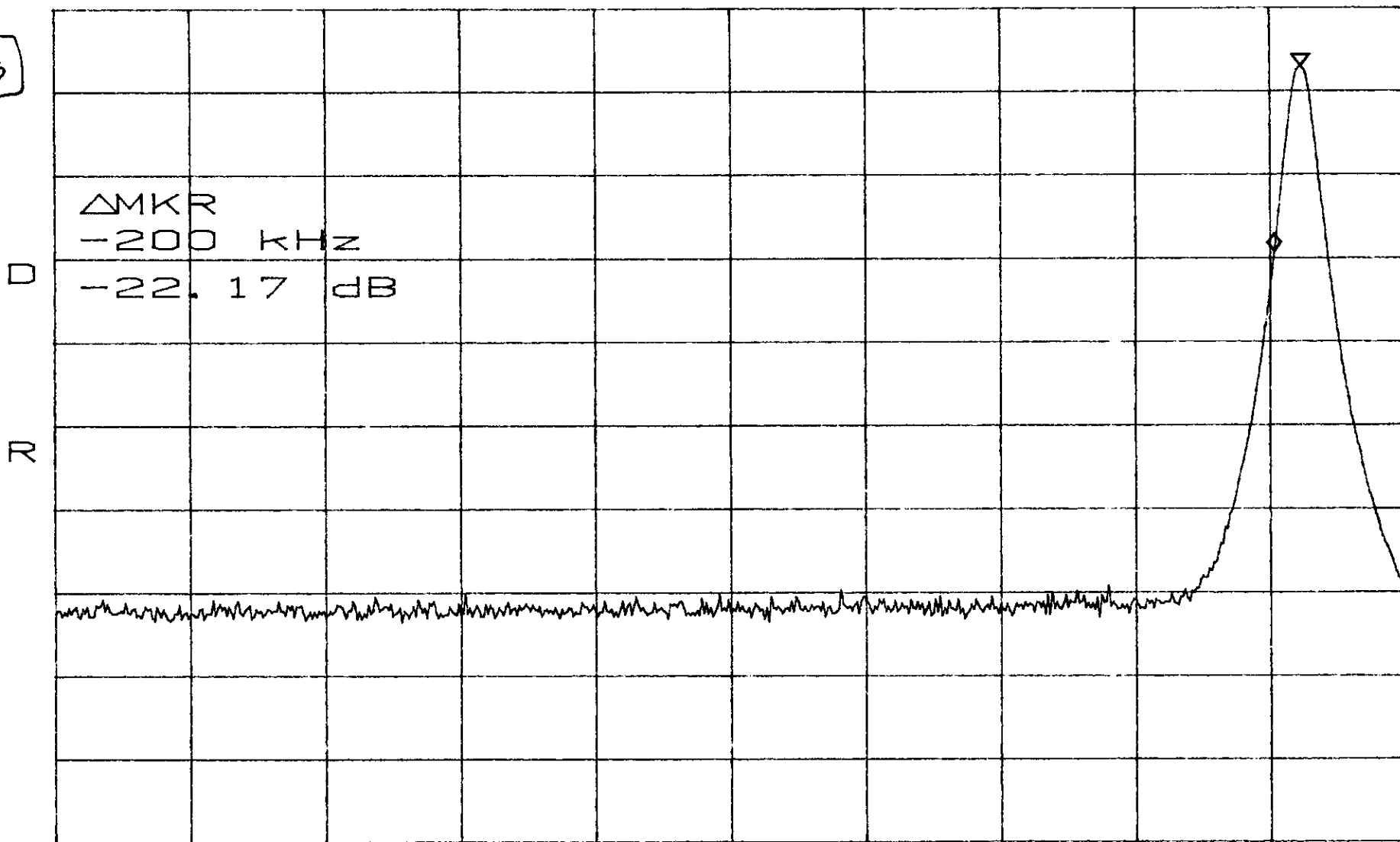
9/23/98
LB41901

ATTEN 30dB
RL 40.0dBm

10dB/
BP01

Δ MKR -22.17dB
-200kHz

24.238



CENTER 1.94100GHz SPAN 10.00MHz
*RBW 100kHz *VBW 1.0MHz SWP 50.0ms

DL Low
D-band

Output
cw-source

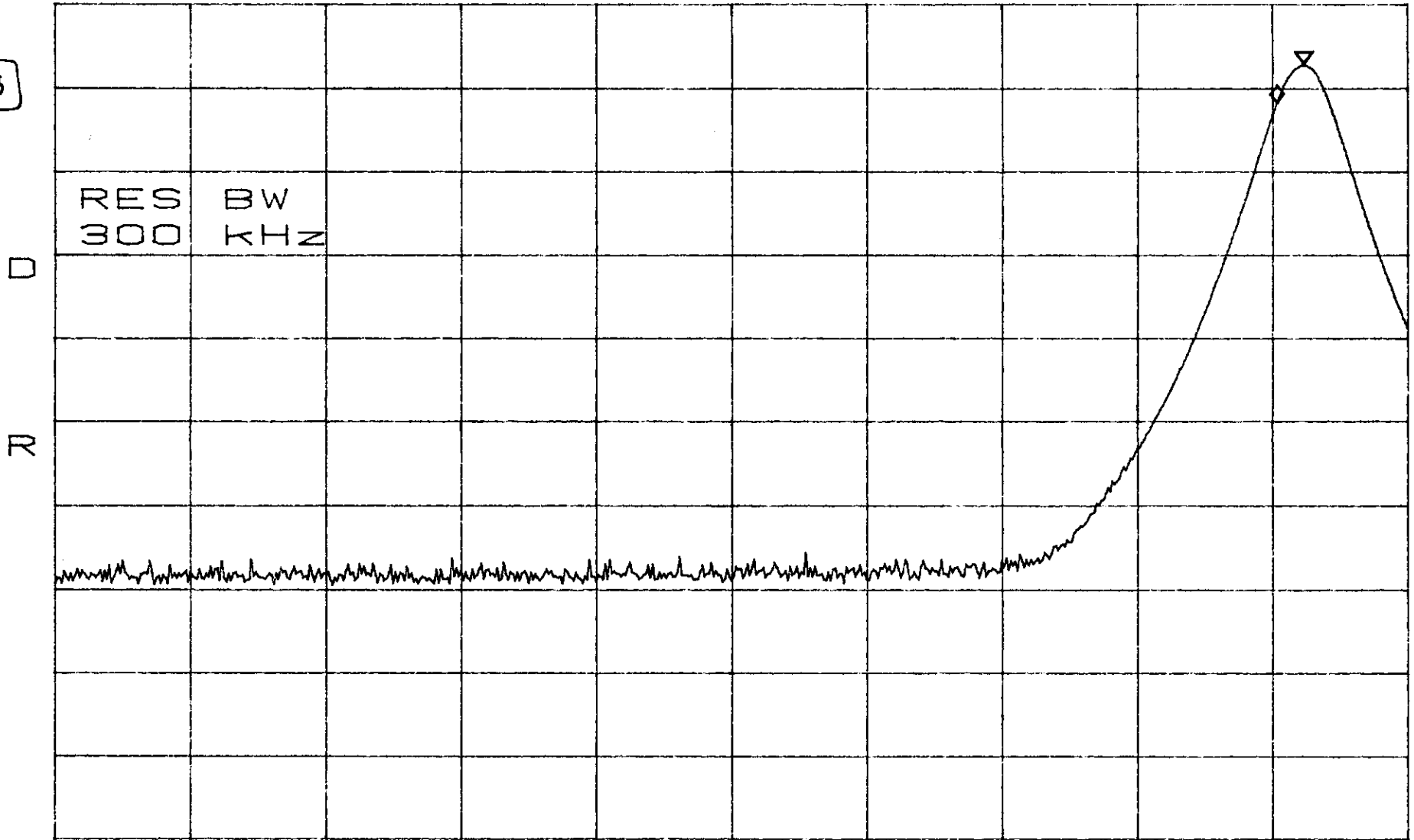
9/23/98
LB41907

ATTEN 30dB
RL 40.0dBm

10dB/

Δ MKR -4.67dB
-200kHz

24.238



CENTER 1.94100GHz

SPAN 10.00MHz

*RBW 300kHz

*VBW 1.0MHz

SWP 50.0ms

DL High
D-band

DL Output
cw source

9/23/98
LB41901

ATTEN 30dB

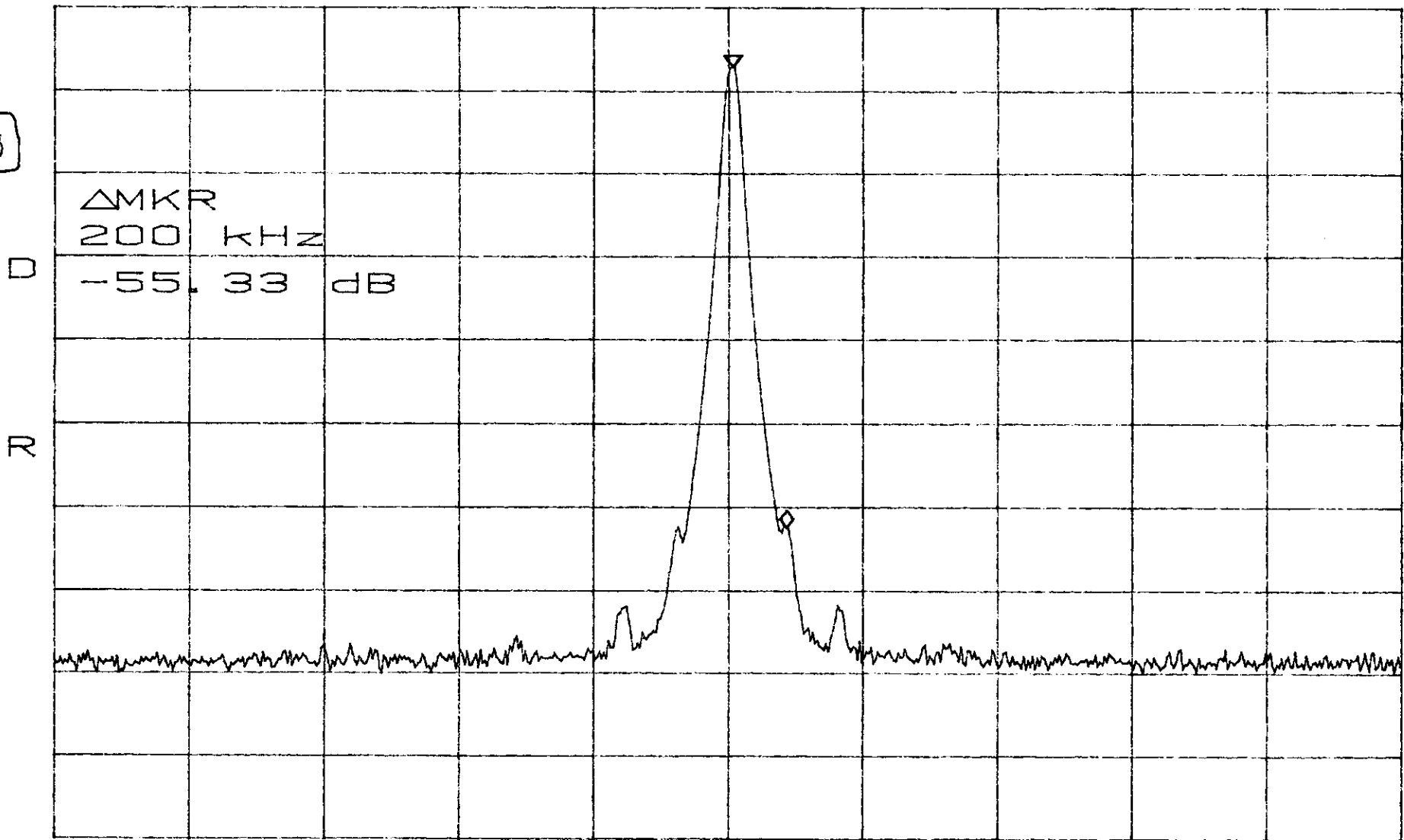
Δ MKR -55.33dB

RL 40.0dBm

10dB/

200kHz

24.238



CENTER 1.949800GHz

SPAN 5.000MHz

*RBW 30kHz

*VBW 30kHz

SWP 50.0ms

DL High
D-band

~~Output~~ Input
CW source

9/23/98
LB41901

ATTEN 10dB

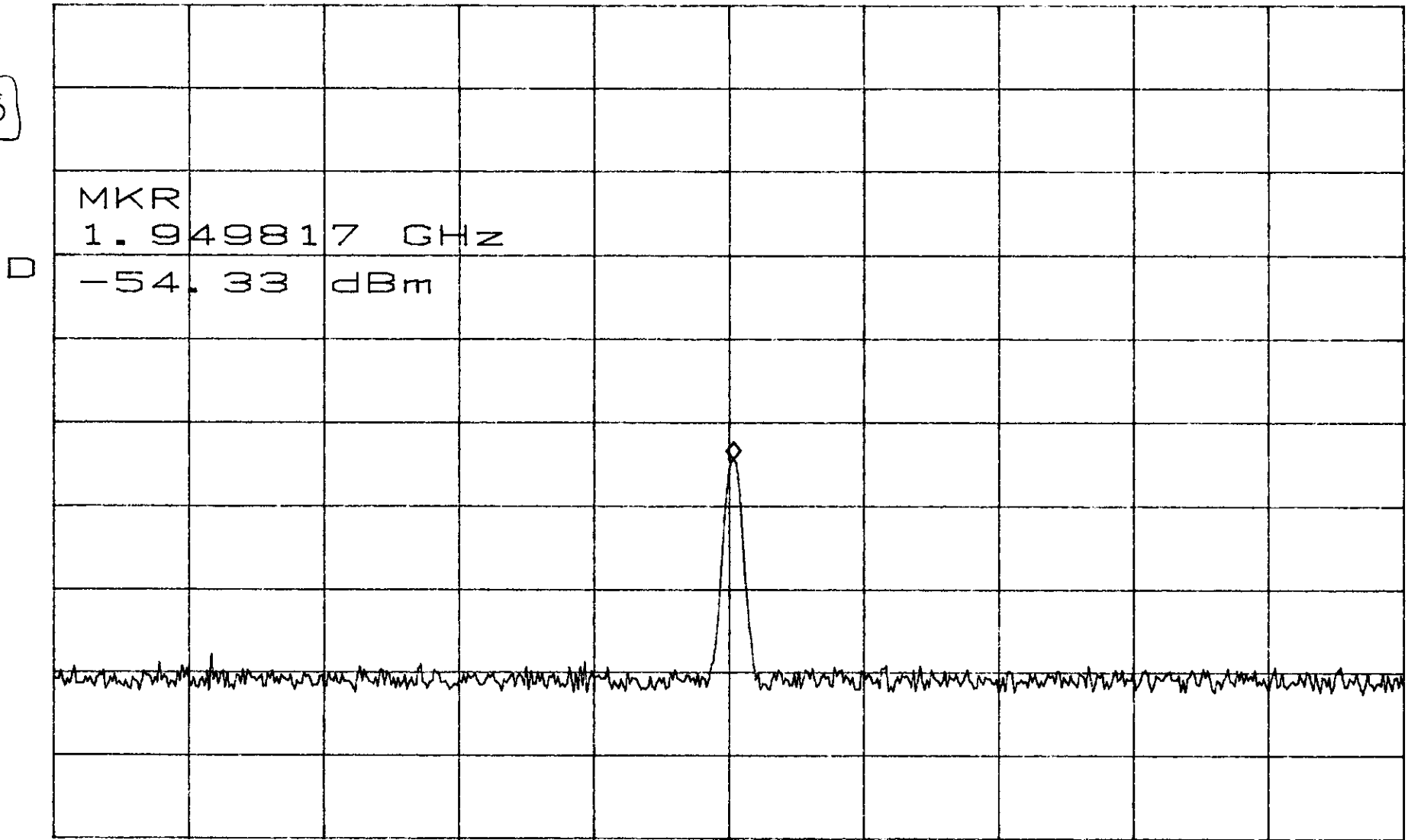
MKR -54.33dBm

RL 0dBm

10dB/

1.949817GHz

24.238



MKR
1.949817 GHz
-54.33 dBm

CENTER 1.949800GHz SPAN 5.000MHz
*RBW 30kHz *VBW 30kHz SWP 50.0ms

DL High
D-band

Output
cw

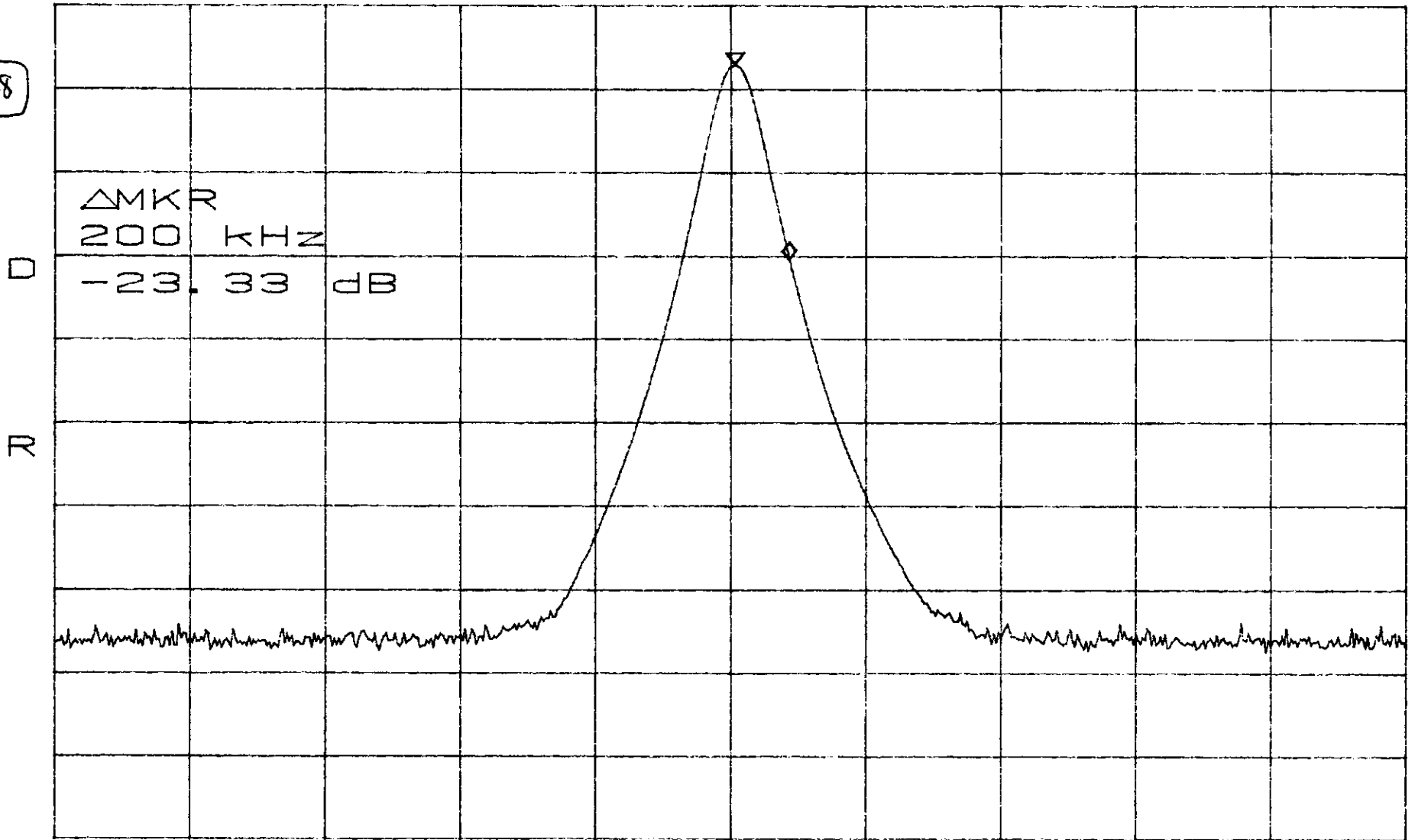
9/23/98
LB41901

ATTN 30dB
RL 40.0dBm

10dB/

Δ MKR -23.33dB
200kHz

24.238



CENTER 1.949800GHz

SPAN 5.000MHz

*RBW 100kHz

*VBW 30kHz

SWP 50.0ms

DL High
D-band

Output
cw

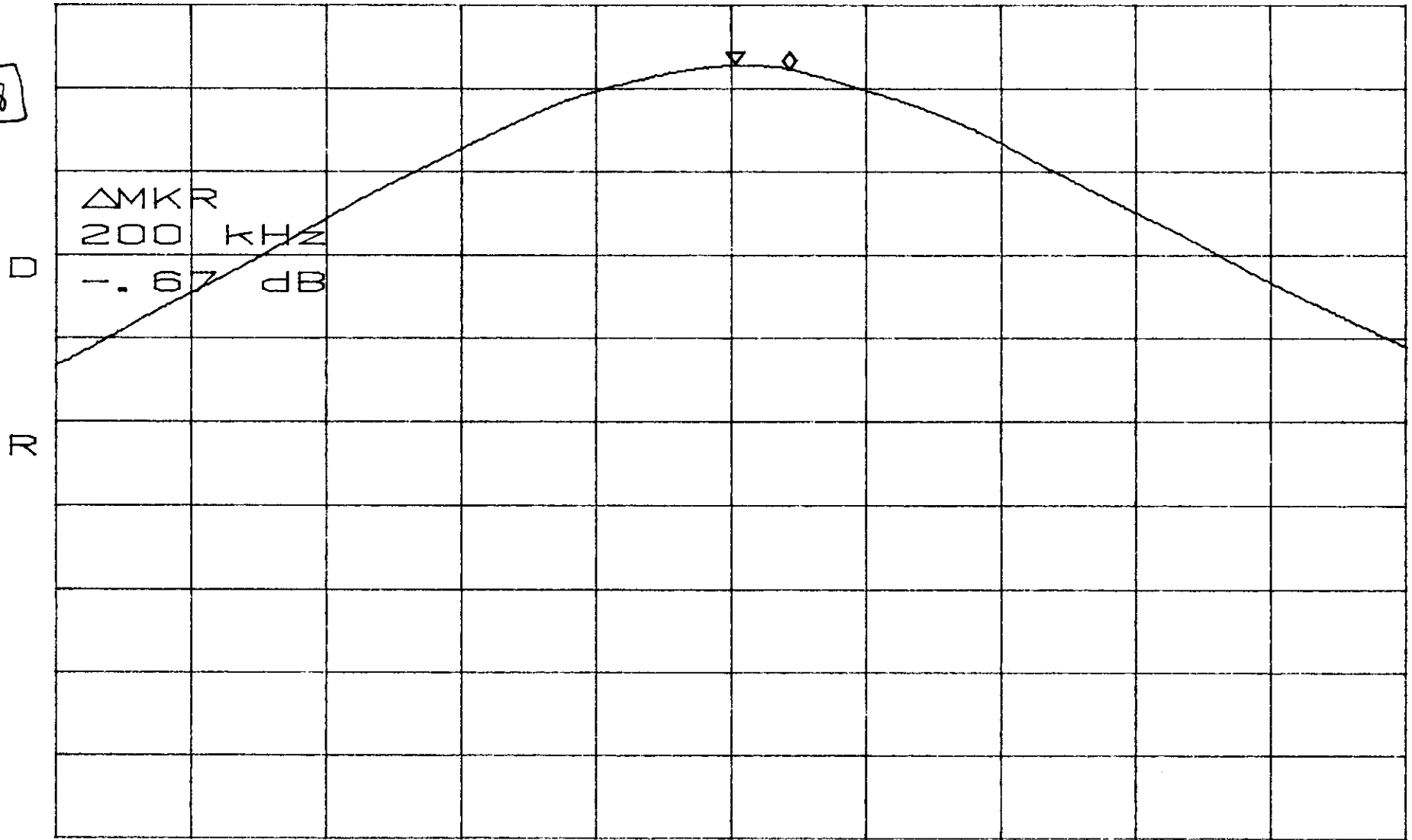
9/23/98
L841901

ATTEN 30dB
RL 40.0dBm

10dB/BPO1

ΔMKR -.67dB
200kHz

24.238



CENTER 1.949800GHz

SPAN 5.000MHz

*RBW 1.0MHz

*VBW 1.0MHz

SWP 50.0ms

DL High
D-band

Output
cw

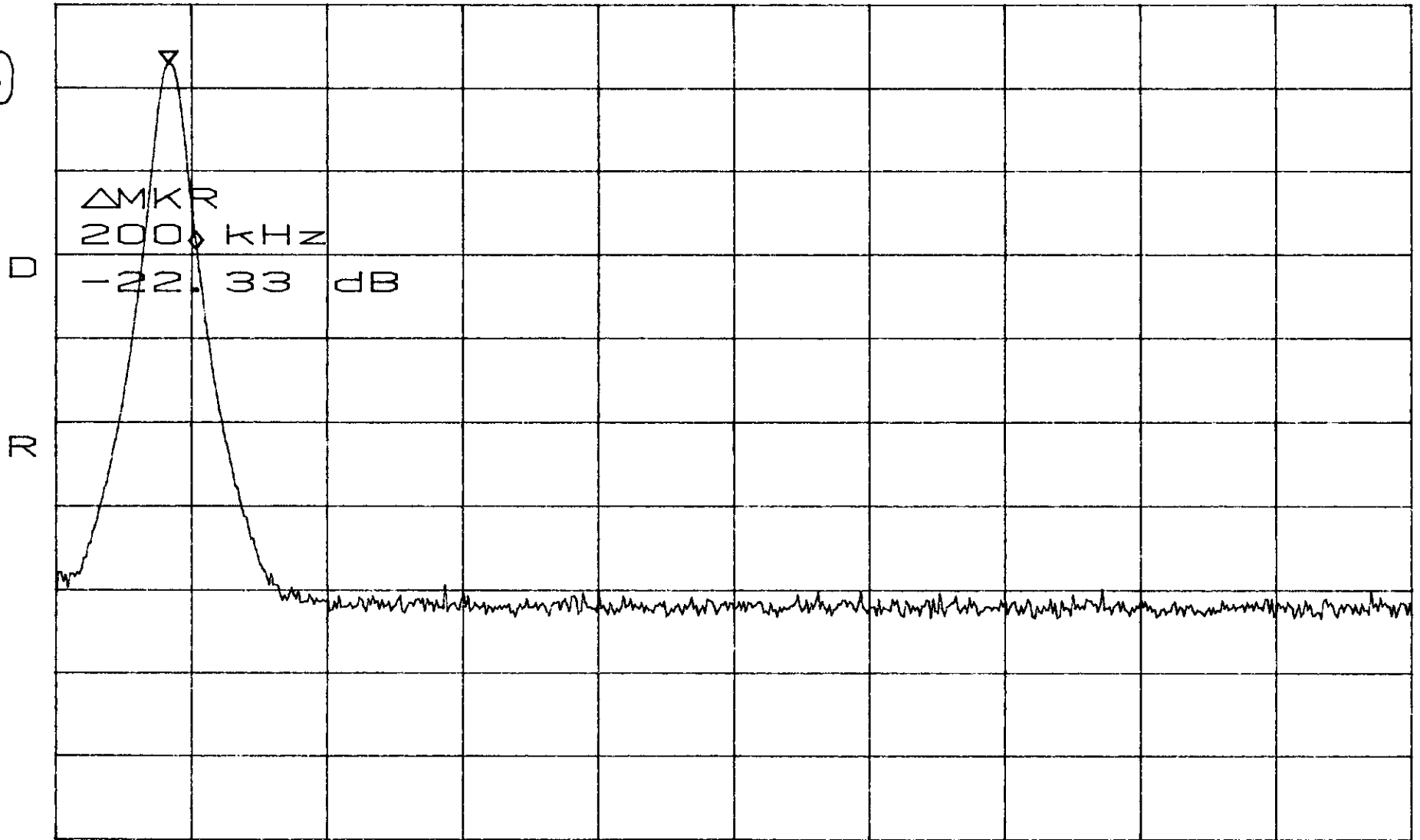
9/23/98
LB41901

ATTEN 30dB
RL 40.0dBm

10dB/

Δ MKR -22.33dB
200kHz

24.238



CENTER 1.95400GHz

SPAN 10.00MHz

*RBW 100kHz

*VBW 1.0MHz

SWP 50.0ms

DL High
D-band

Output

9/23/98

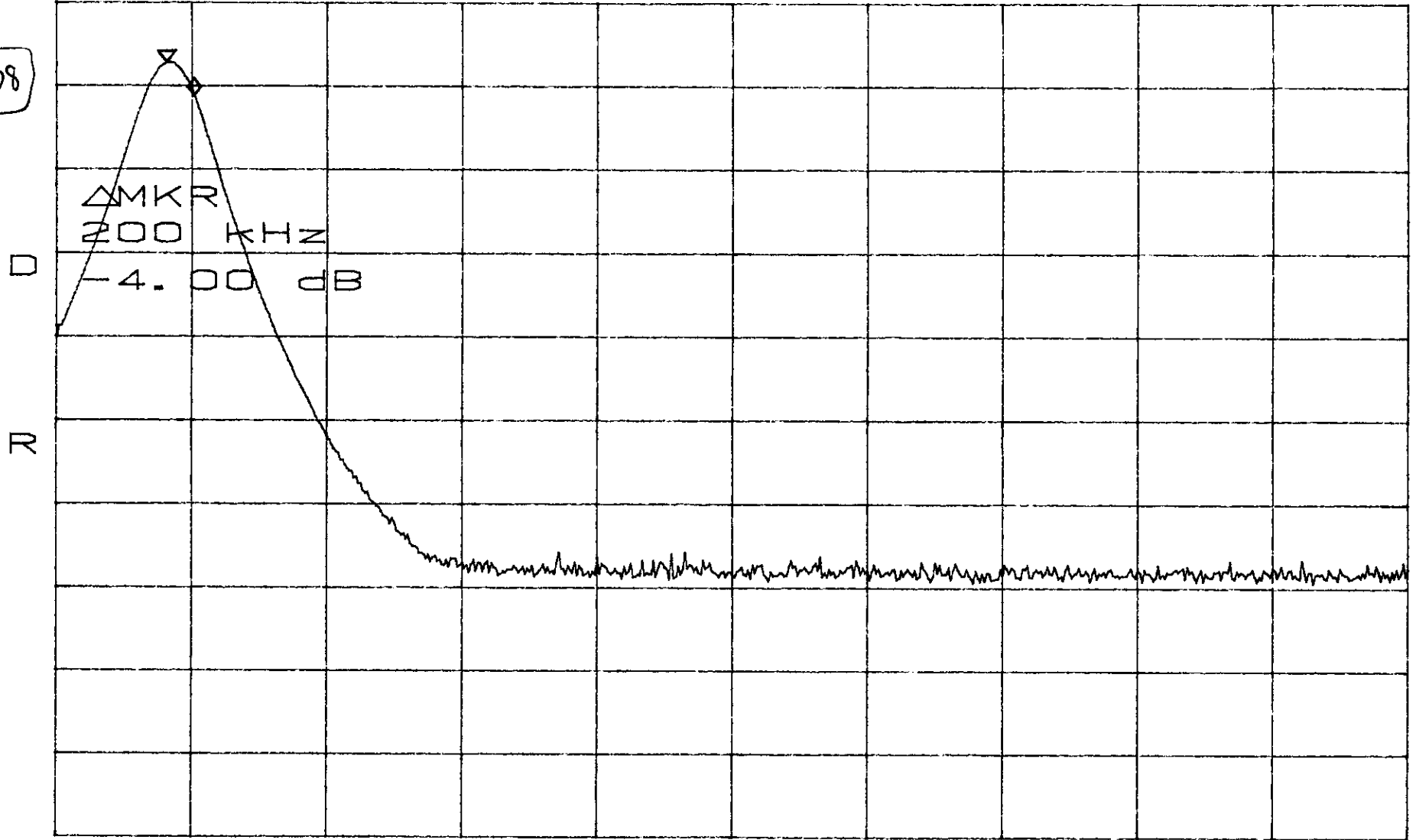
LB41901

ATTN 30dB
RL 40.0dBm

cw
10dB/

Δ MKR -4.00dB
200kHz

24.238



CENTER 1.95400GHz SPAN 10.00MHz
*RBW 300kHz *VBW 1.0MHz SWP 50.0ms

UL Low
D-band

UL Output
CW Source

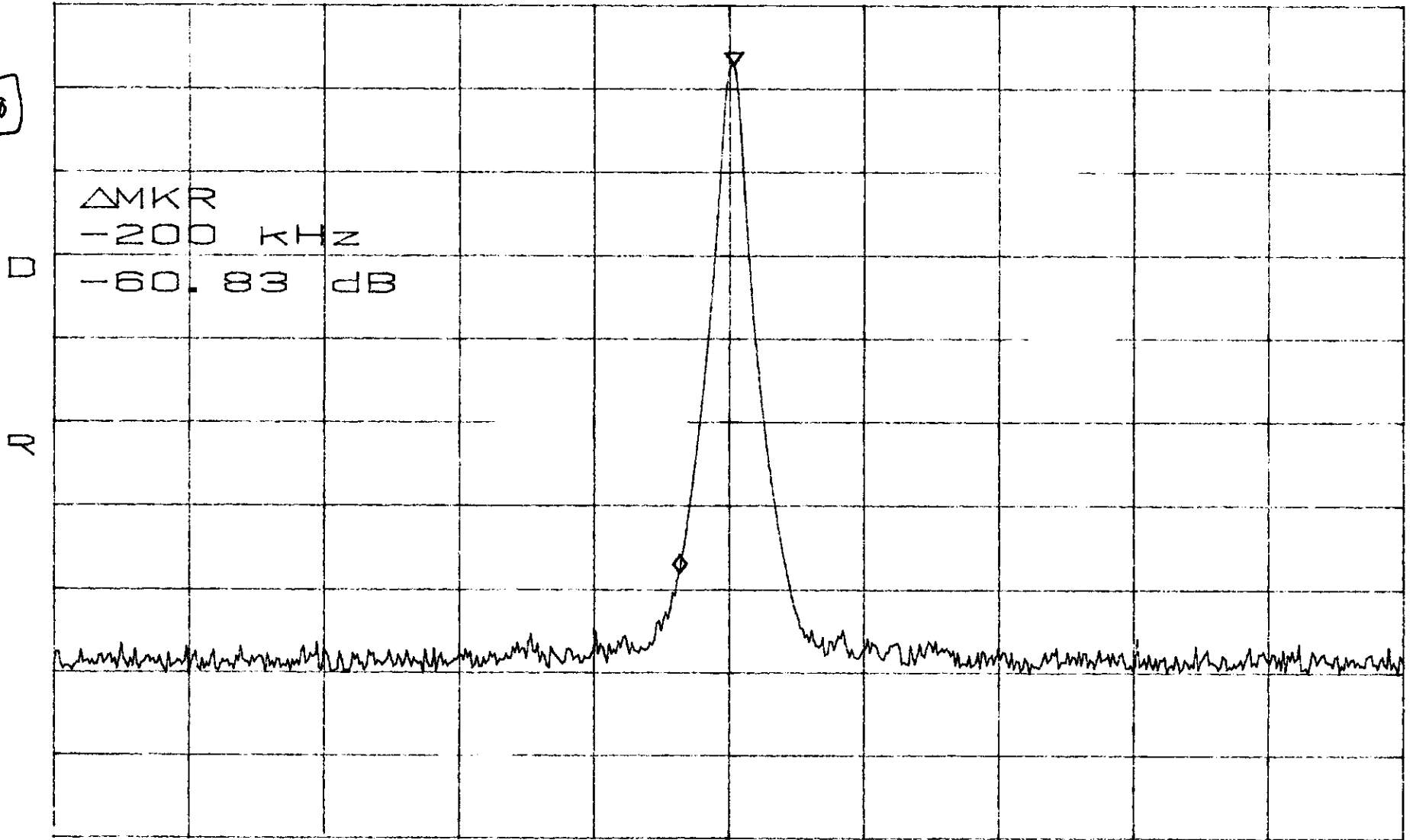
9/17/98
LB41901

ATTEN 30dB
RL 40.0dBm

10dB/BPO

Δ MKR -60.83dB
-200kHz

24.238



CENTER 1.865200GHz

SPAN 5.000MHz

*RBW 30kHz

VBW 30kHz

SWP 50.0ms

UL Low
D-band

UL Input
cw source

9/17/98
LB41901

ATTEN 10dB

MKR -51.17dBm

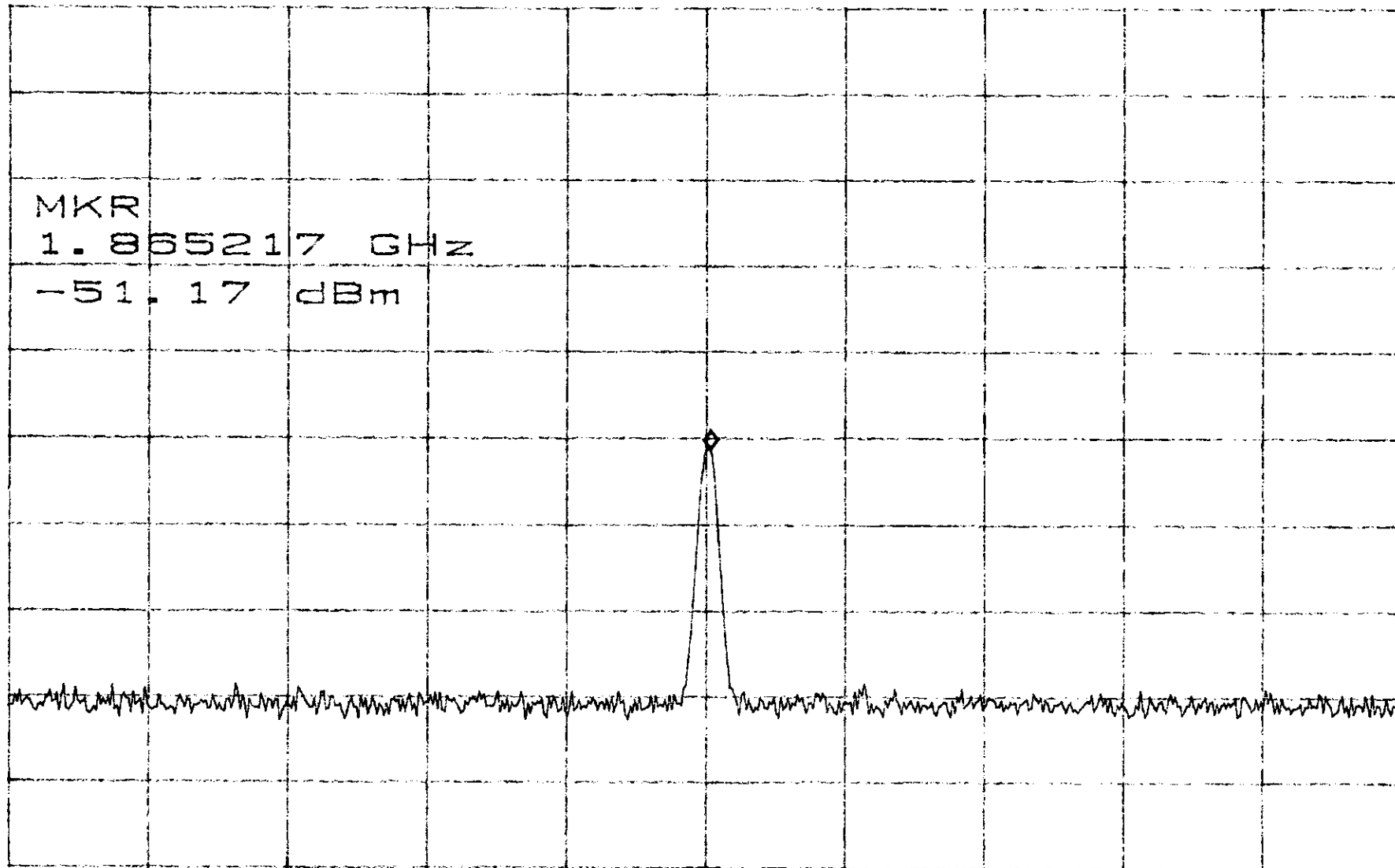
RL 0dBm

10dB/BPO1

1.865217GHz

24.238

MKR
1.865217 GHz
-51.17 dBm



CENTER 1.865200GHz

SPAN 5.000MHz

*RBW 30kHz

VBW 30kHz

SWP 50.0ms

UL Low
D-band

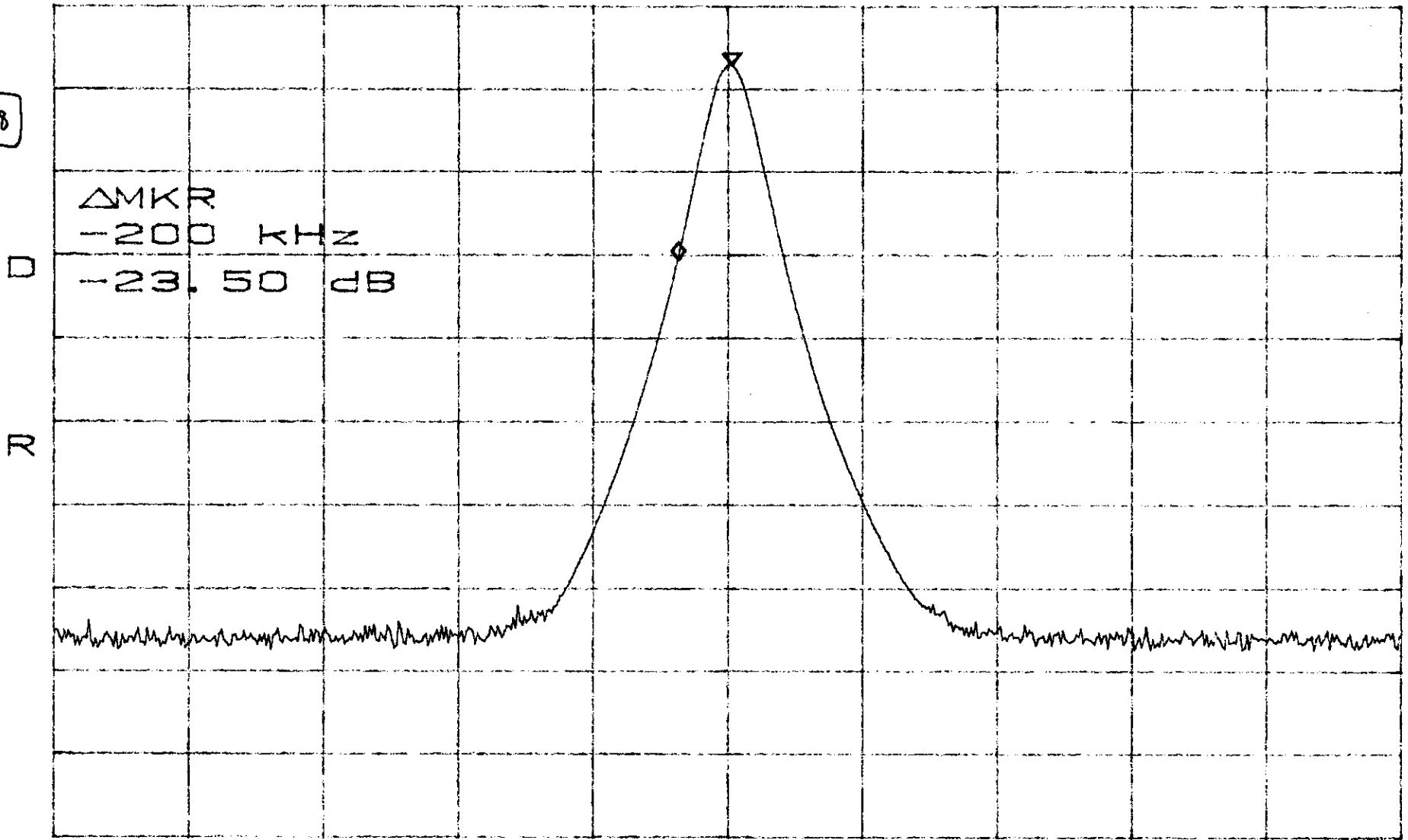
Output
CW Source

9/17/98
LB41901

ATTEN 30dB
RL 40.0dBm

Δ MKR -23.50dB
-200kHz

24.238



CENTER 1.865200GHz

SPAN 5.000MHz

*RBW 100kHz

*VBW 30kHz

SWP 50.0ms

UL Low
D-band

Output
CW source

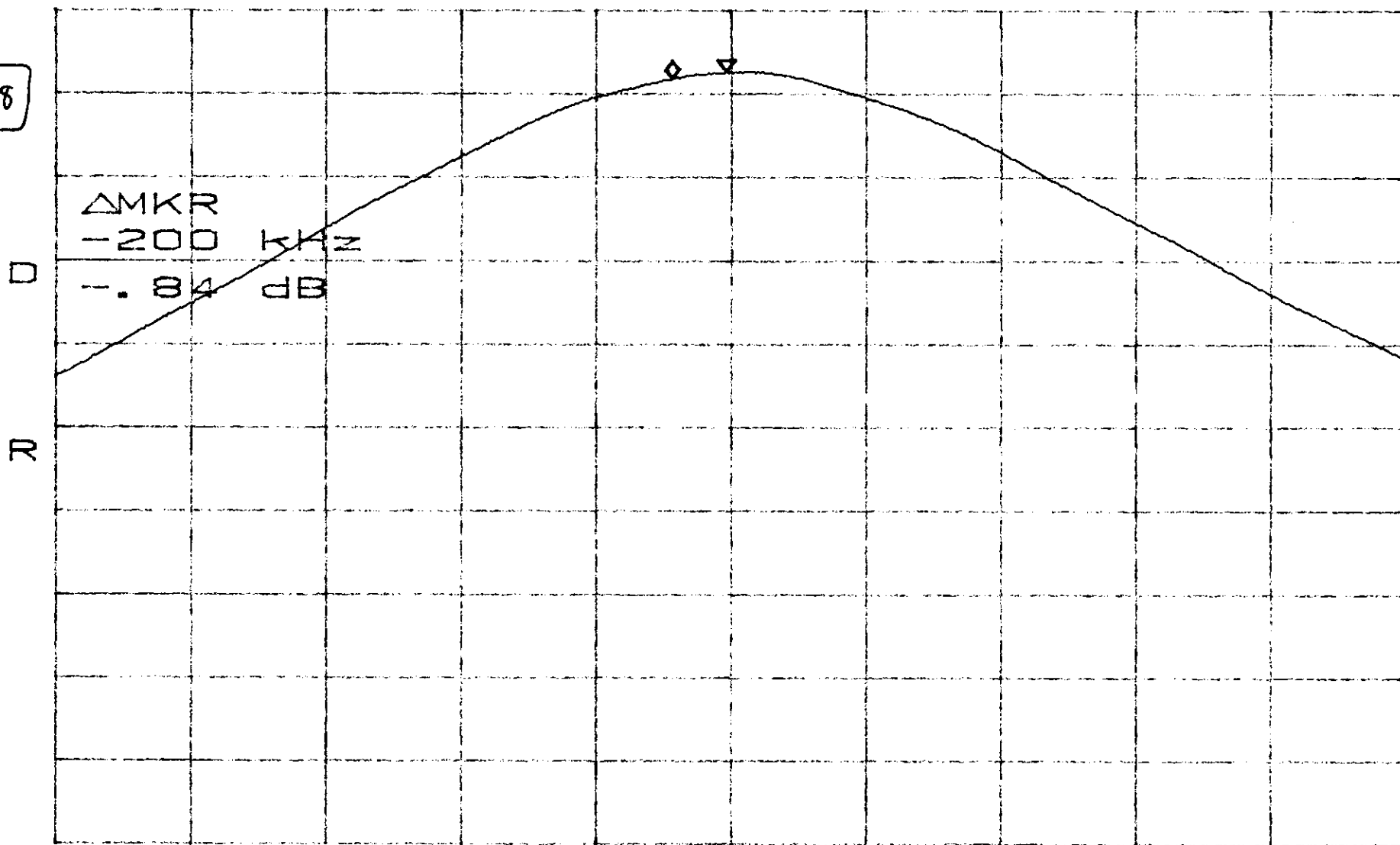
9/17/98
LB41901

ATTEN 30dB
BPOE
RL 40.0dB

10dB/

Δ MKR -.84dB
-200kHz

24.238



CENTER 1.865200GHz

SPAN 5.000MHz

*RBW 1.0MHz

*VBW 1.0MHz

SWP 50.0ms

UL Low
D-band

Output
cw source

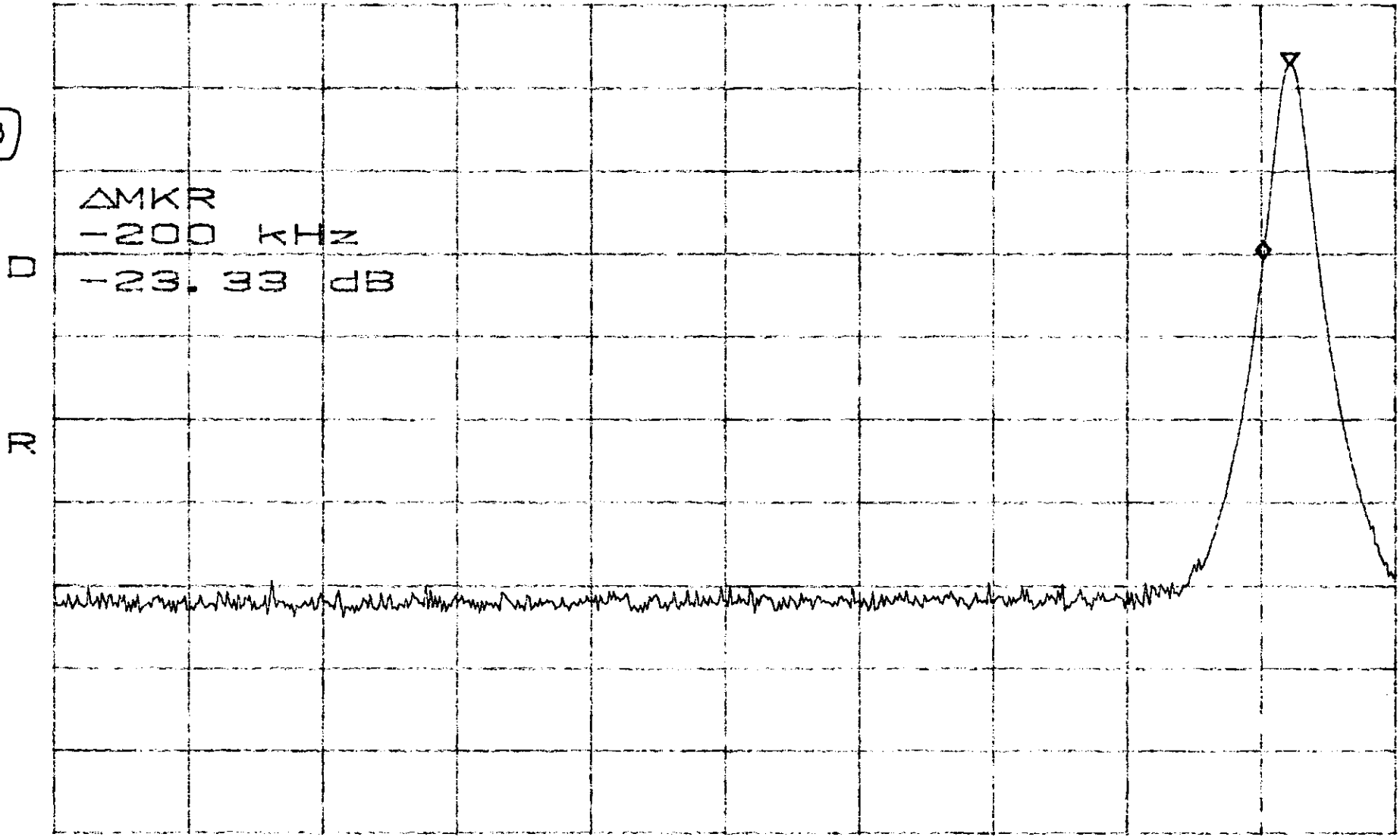
9/17/98
LB41901

ATTEN 30dB
BPO 0.0
RL 40.0dBm

1dB/BPO

ΔMKR -23.33dB
-200kHz

24.239



CENTER 1.86100GHz

SPAN 10.00MHz

*RBW 100kHz

*VBW 1.0MHz

SWP 50.0ms

UL Low
D-band

Output
cw-source

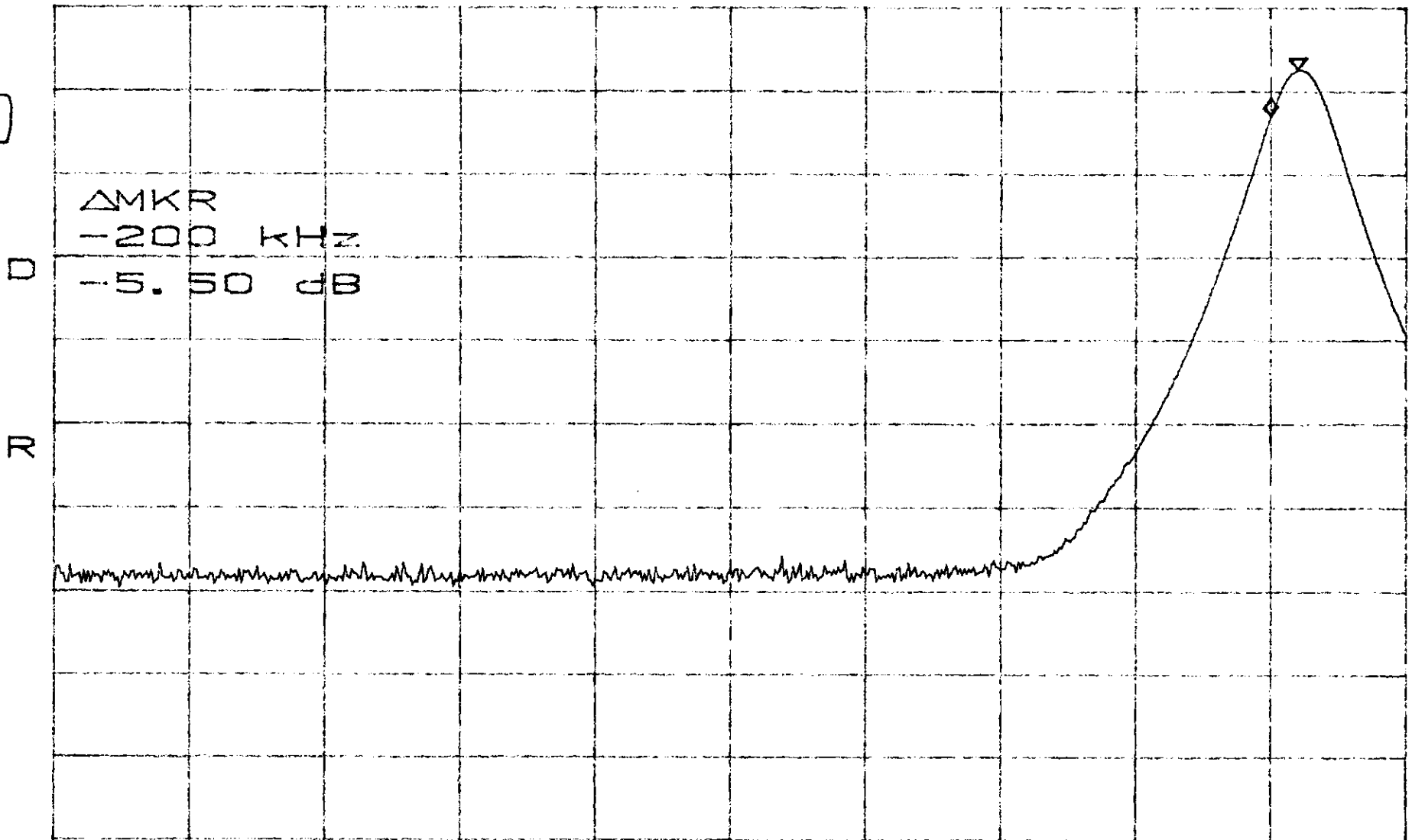
9/17/98
LB41901

ATTEN 30dB
RL 40.0dBm

1dB/

Δ MKR --5.50dB
-200kHz

24.238



CENTER 1.86100GHz

SPAN 10.00MHz

*RBW 300kHz

*VBW 1.0MHz

SWP 50.0ms

UL High
D-band

UL Output
cw source

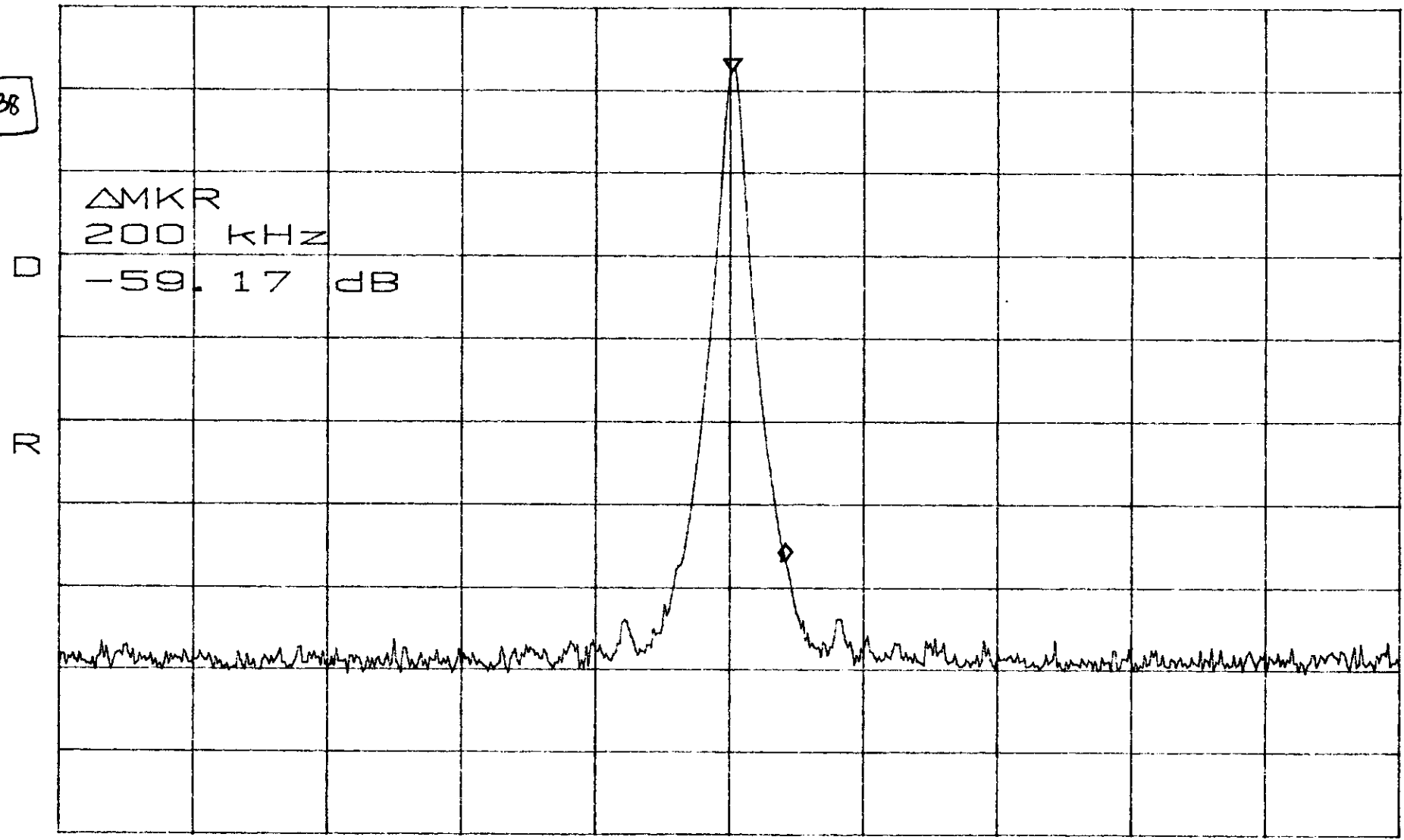
9/23/98
LB41901

ATTEN 30dB
RL 40.0dBm

10dB/
200kHz

Δ MKR -59.17dB
200kHz

24.238



CENTER 1.869800GHz
RBW 30kHz

VBW 30kHz

SPAN 5.000MHz
SWP 50.0ms

UL High
D-band

UL Input
CW Source

9/23/98
LB41901

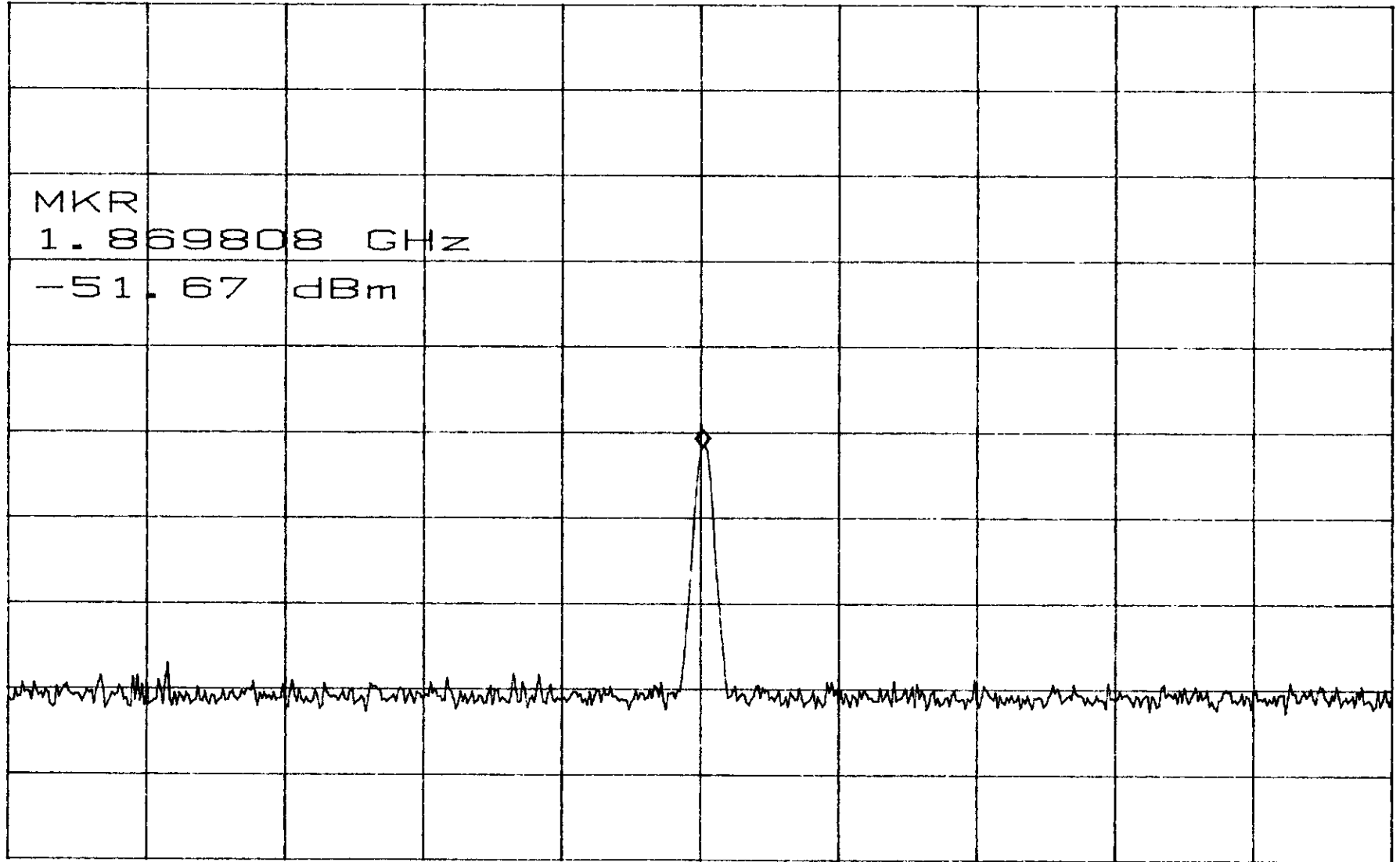
ATTEN 10dB
RL 0dBm

10dB/
/BPO1

MKR -51.67dBm
1.869808GHz

24.238

MKR
1.869808 GHz
-51.67 dBm



CENTER 1.869800GHz

SPAN 5.000MHz

RBW 30kHz

VBW 30kHz

SWP 50.0ms

UL High
D-band

UL Output
CW Source

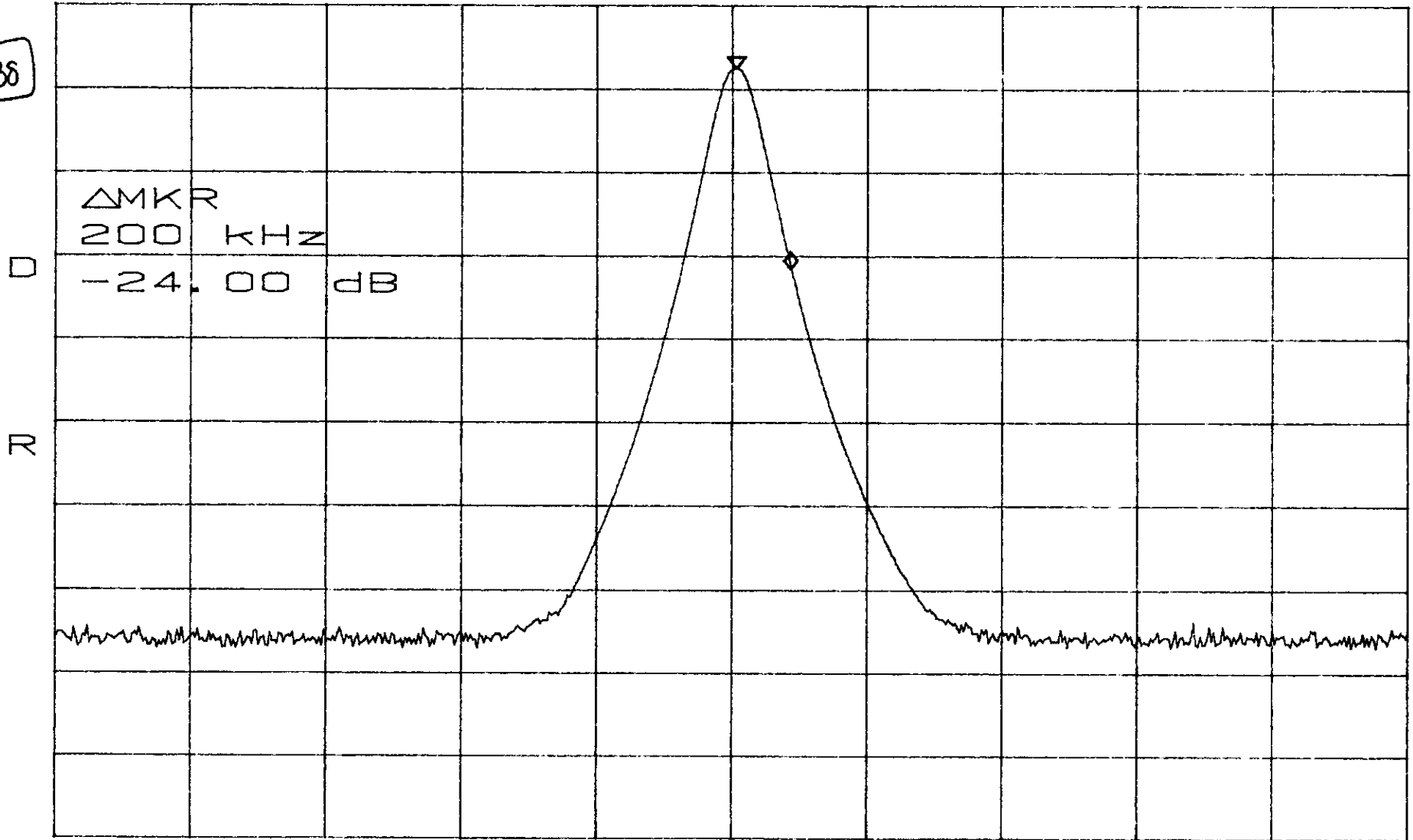
9/23/98
LB41901

ATTN 30dB
RL 40.0dBm

10dB/

Δ MKR -24.00dB
200kHz

24.235



CENTER 1.869800GHZ

SPAN 5.000MHZ

*RBW 100kHz

*VBW 30kHz

SWP 50.0ms

UL High
D-band

UL Output
cw source

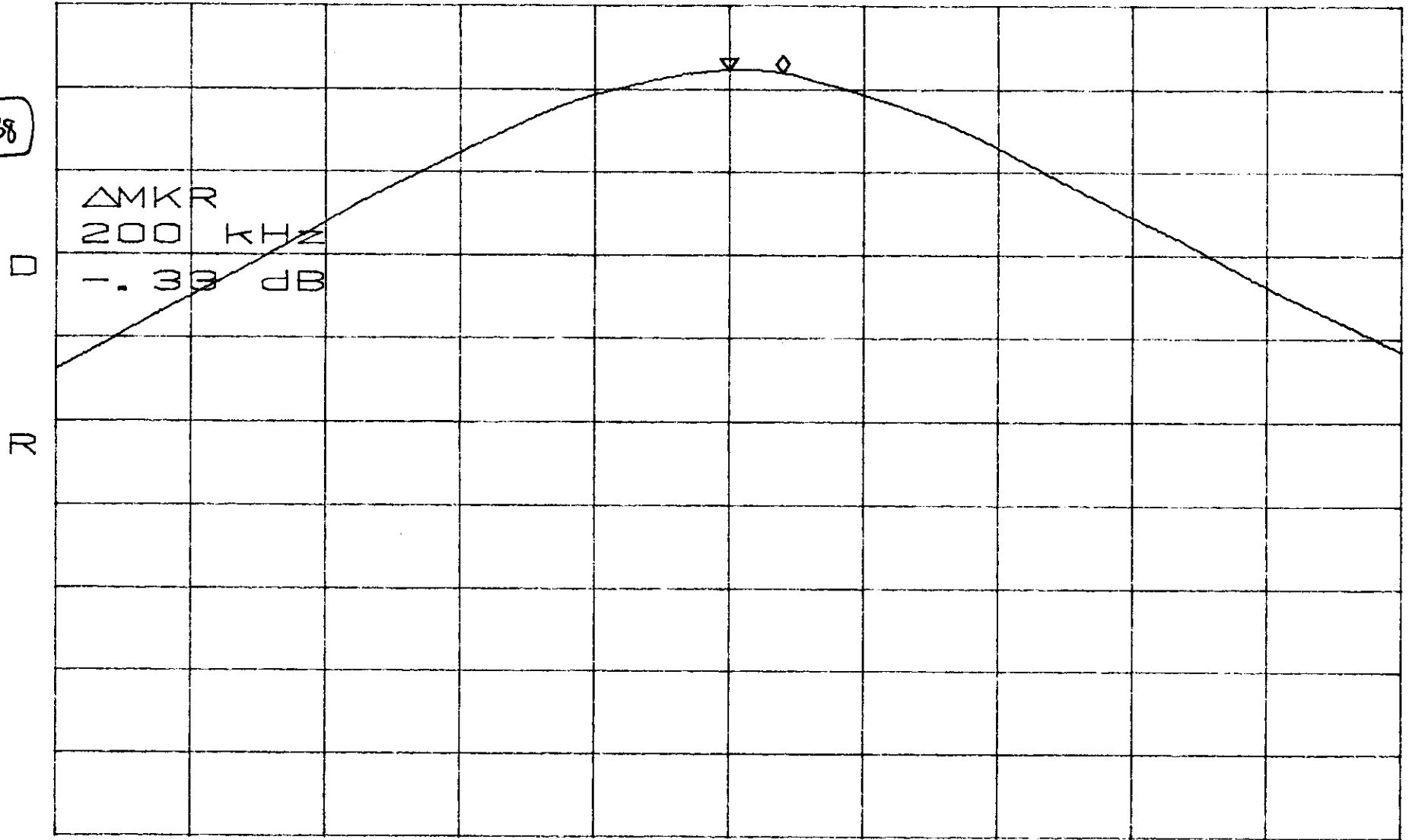
9/23/98
LB41901

ATTN 30dB
BPOB
RL 40.0dBm

10dB/

Δ MKR -.33dB
200kHz

24.238



CENTER 1.869800GHz SPAN 5.000MHz
*RBW 1.0MHz *VBW 1.0MHz SWP 50.0ms

UL High
D-band

UL output
CW - Source

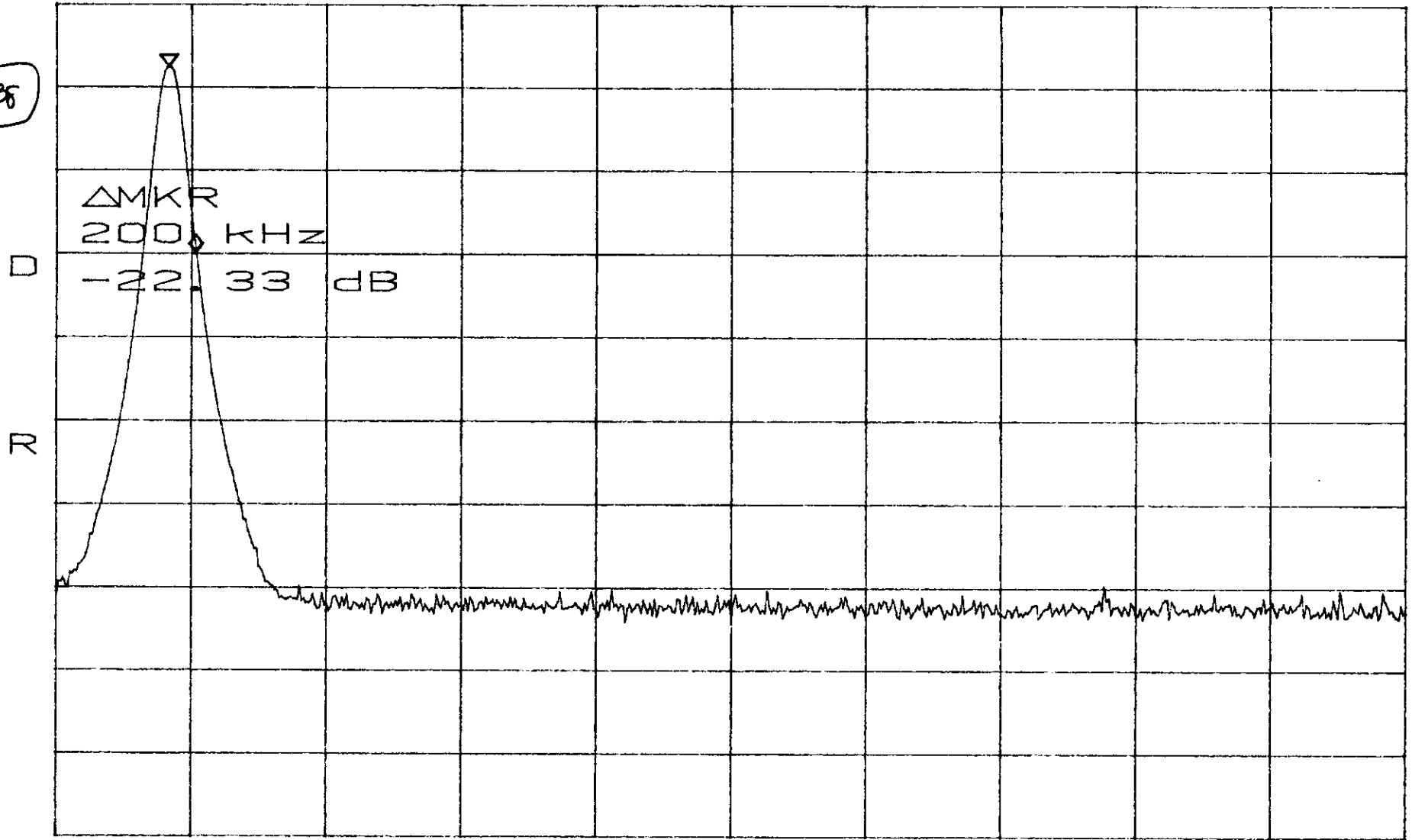
9/23/98
LB41901

ATTEN 30dB
RL 40.0dBm

10dB/BPOI

Δ MKR -22.33dB
200kHz

24.235



CENTER 1.87400GHz SPAN 10.00MHz
*RBW 100kHz *VBW 1.0MHz SWP 50.0ms

UL High
D-band

Output
CW-source

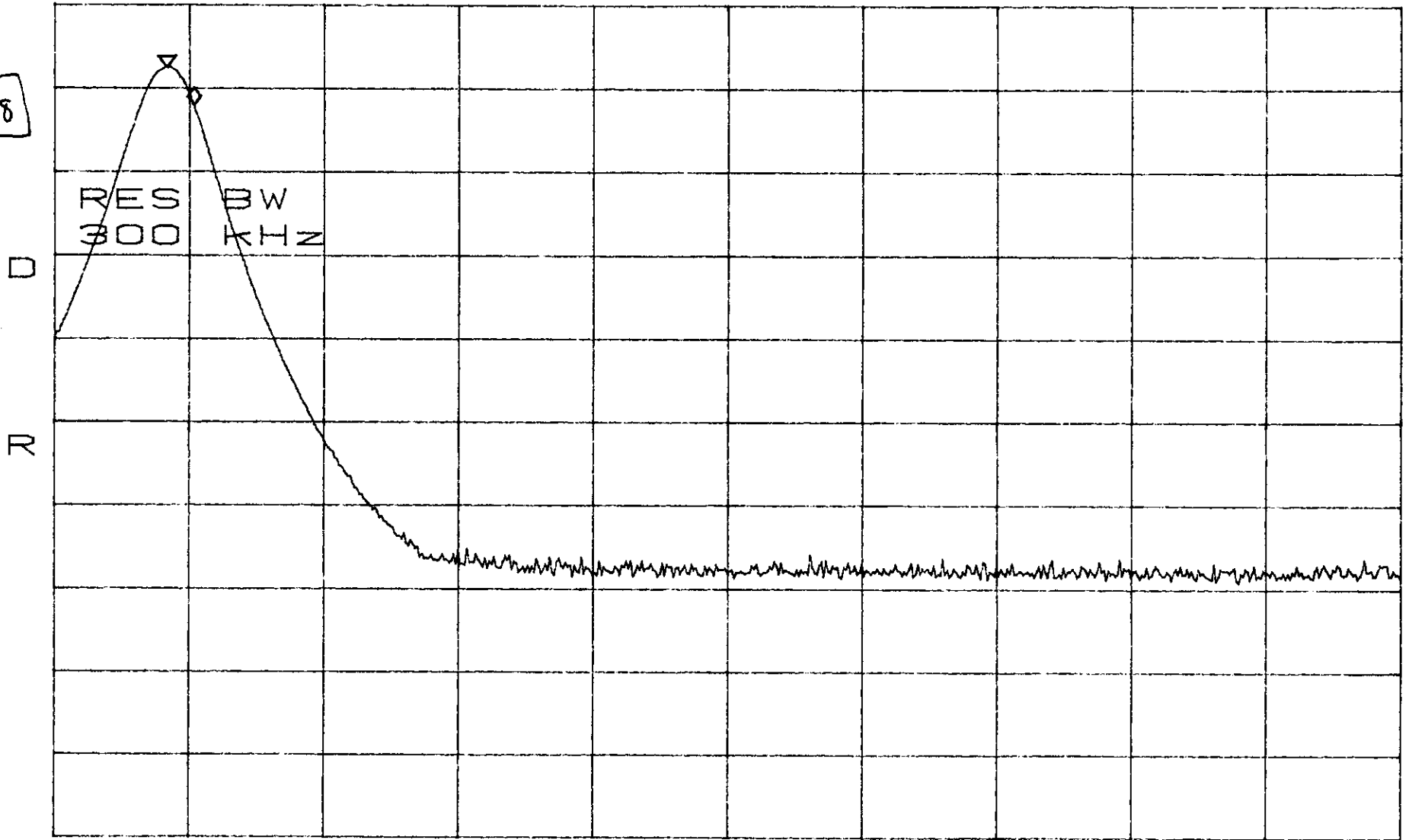
9/23/98
LB41901

ATTEN 30dB
RL 40.0dBm

10dB/

Δ MKR -4.50dB
200kHz

24.238



CENTER 1.87400GHz

SPAN 10.00MHz

*RBW 300kHz

*VBW 1.0MHz

SWP 50.0ms

DL Low
D-band

Input
CW-Source

9/17/98
LB41901

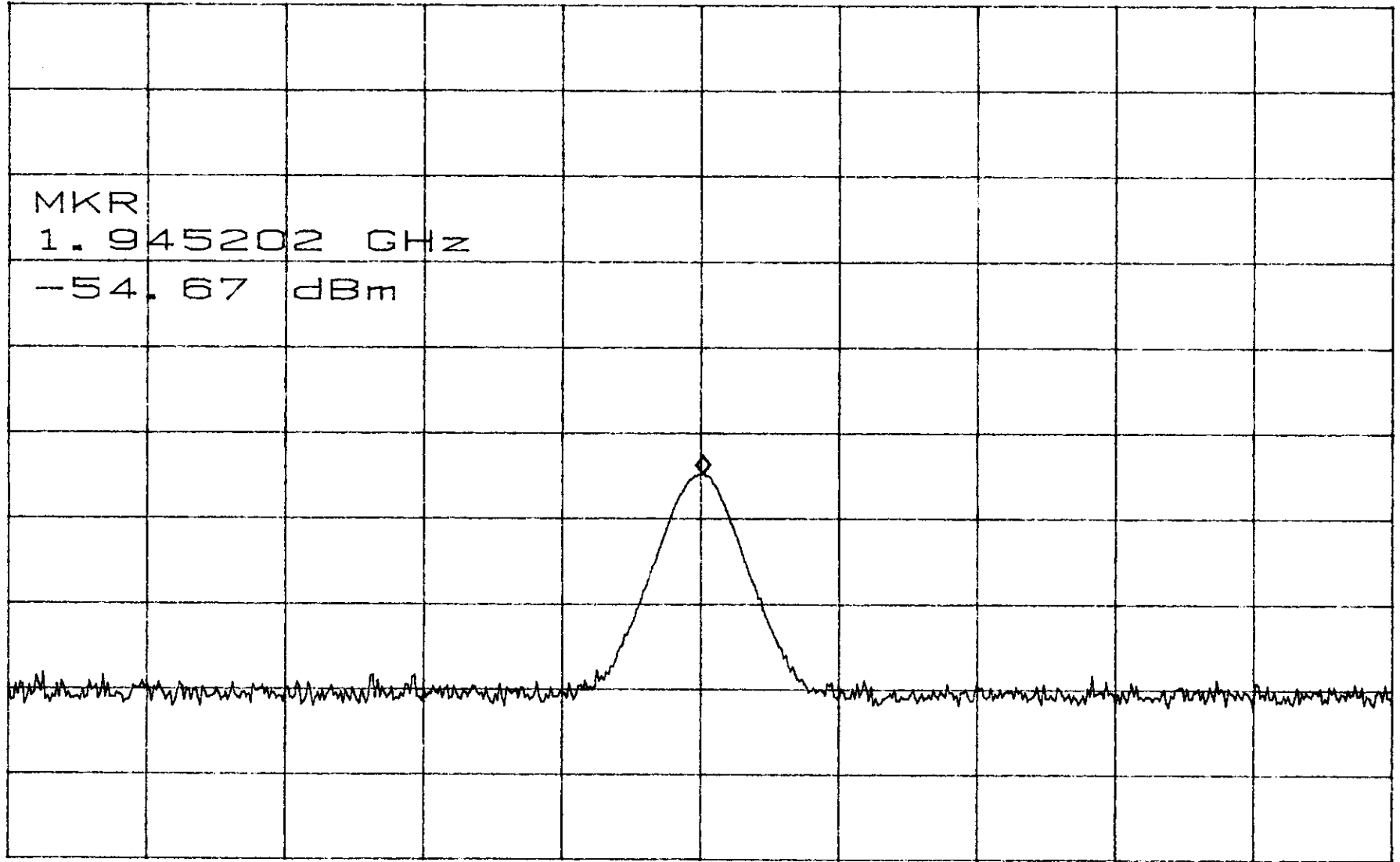
ATTEN 10dB
RL 0dBm

10dB/

MKR -54.67dBm
1.945202GHz

In/Out

MKR
1.945202 GHz
-54.67 dBm



CENTER 1.945200GHz SPAN 1.000MHz
*RBW 30kHz VBW 30kHz SWP 50.0ms

DL ~~Low~~ Low
D-band

Output
CW-source

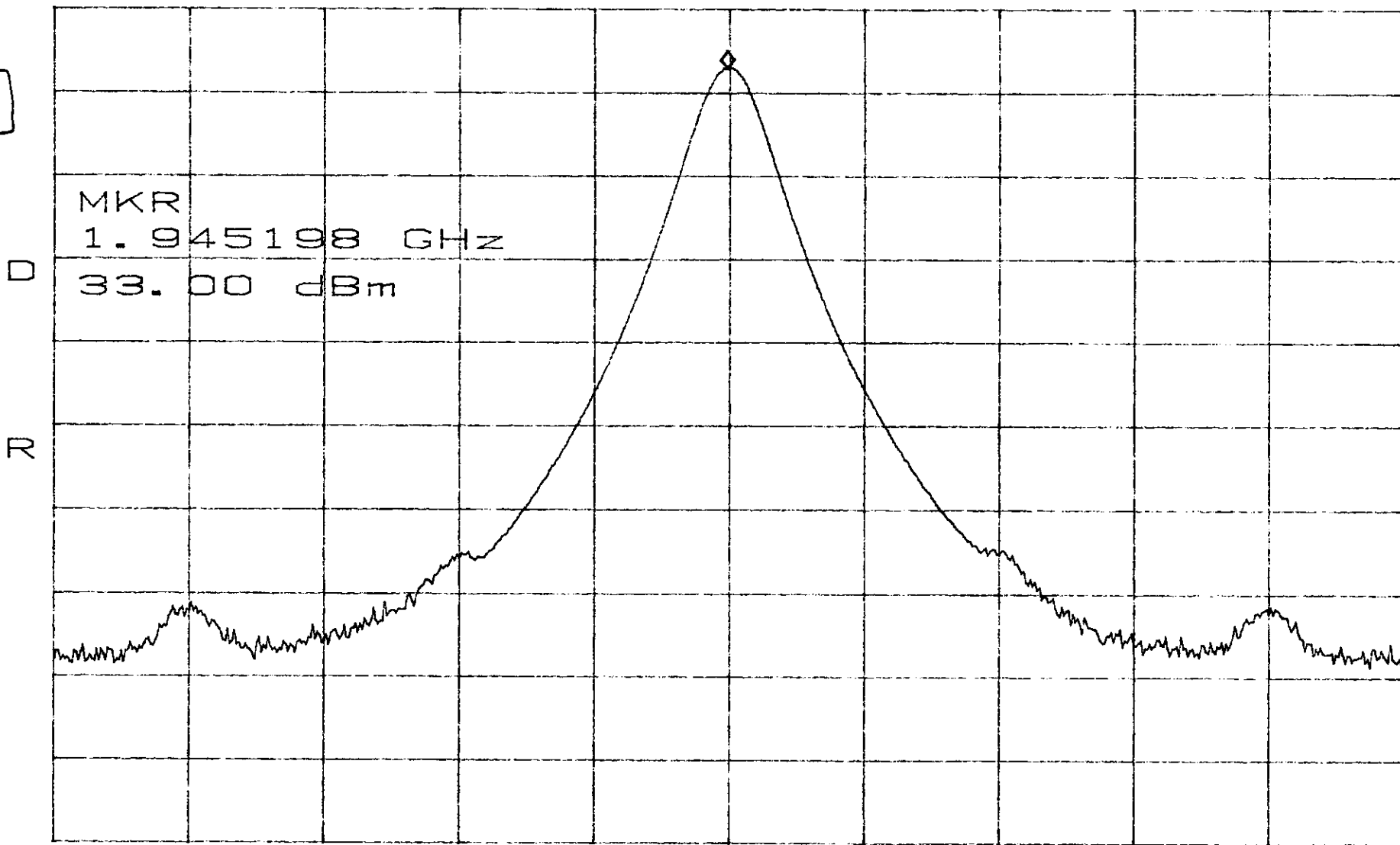
9/17/98
LB41901

ATTEN 30dB
RL 40.0dBm

10dB/

MKR 33.00dBm
1.945198GHz

In/Out



CENTER 1.945200GHz

SPAN 1.000MHz

*RBW 30kHz

VBW 30kHz

SWP 50.0ms

DL Mid
D-band

Input
cw source

9/17/98
LB41901

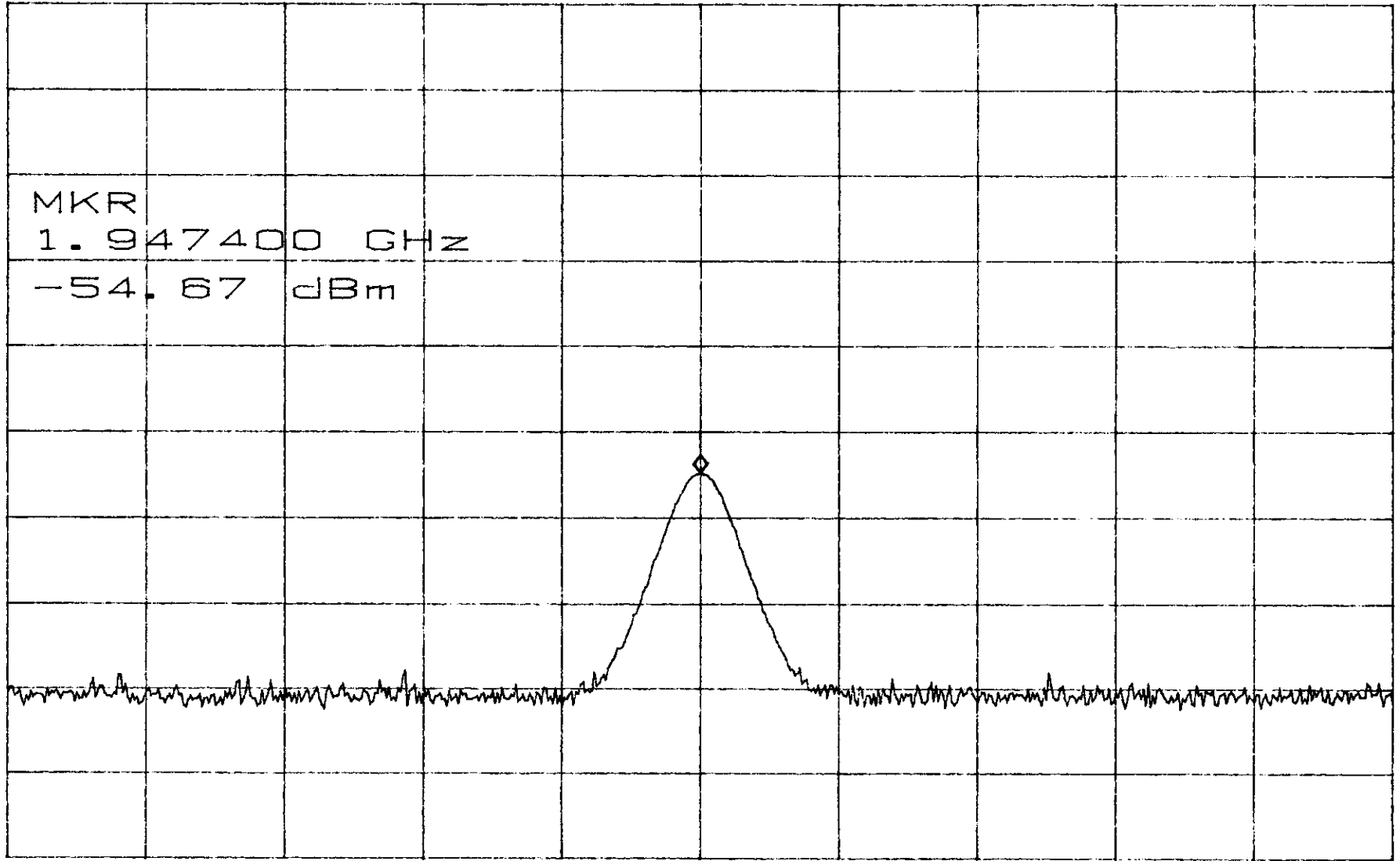
ATTEN 10dB
BPO 1
RL 0dBm

10dB/

MKR -54.67dBm
1.947400GHz

In/out

MKR
1.947400 GHz
-54.67 dBm



CENTER 1.947400GHz

SPAN 1.000MHz

*RBW 30kHz

VBW 30kHz

SWP 50.0ms

DL Mid
D-band

Output
CW Source

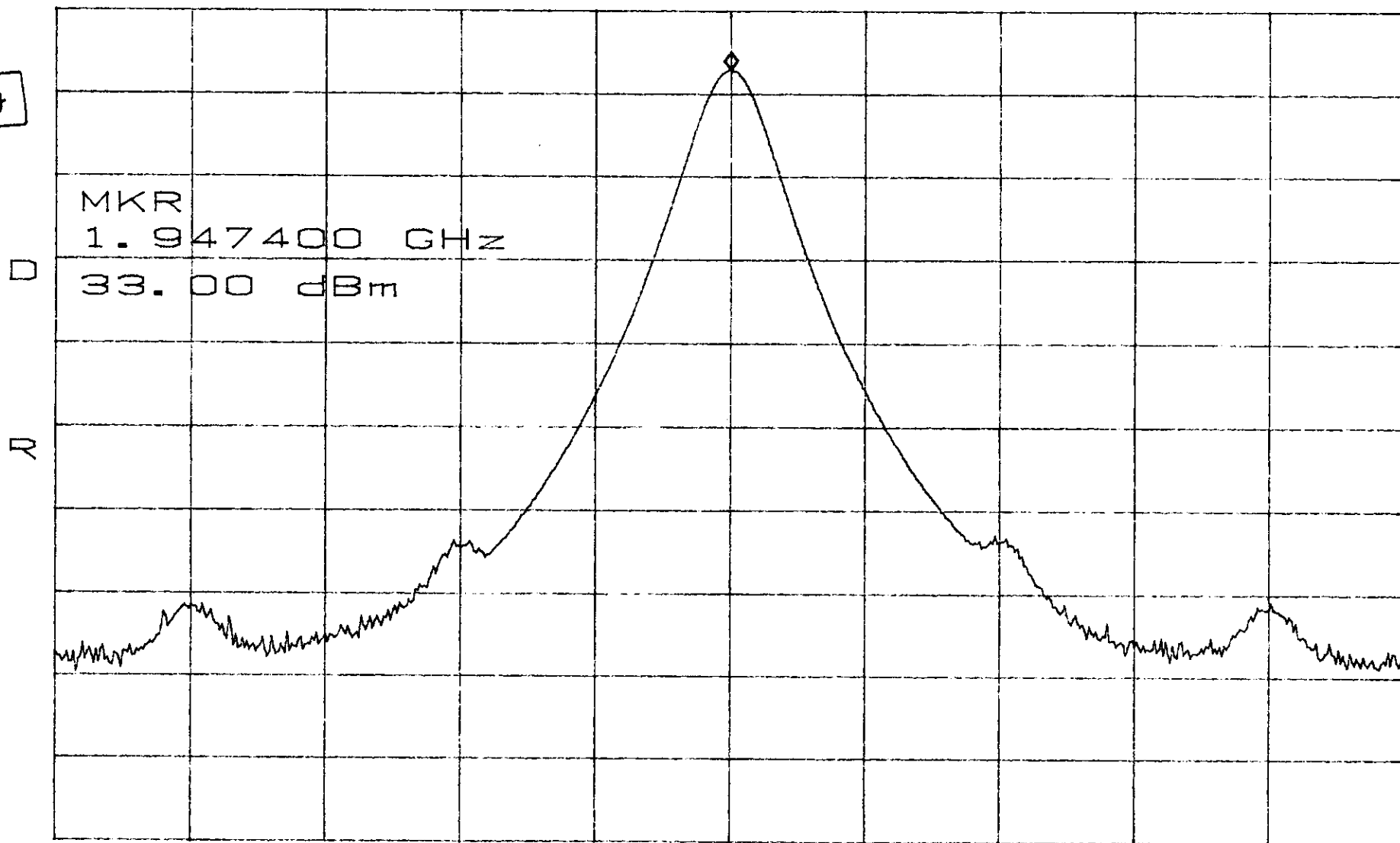
9/17/98
LB41901

ATTN 30dB
RL 40.0dBm

10dB/

MKR 33.00dBm
1.947400GHz

In/Out



MKR
1.947400 GHz
33.00 dBm

D
A

CENTER 1.947400GHz SPAN 1.000MHz
*RBW 30kHz VBW 30kHz SWP 50.0ms

DL High
D-band

Input

9/17/98
LB41901

ATTEN 10dB

CW source

MKR -54.33dBm

RL 0dBm

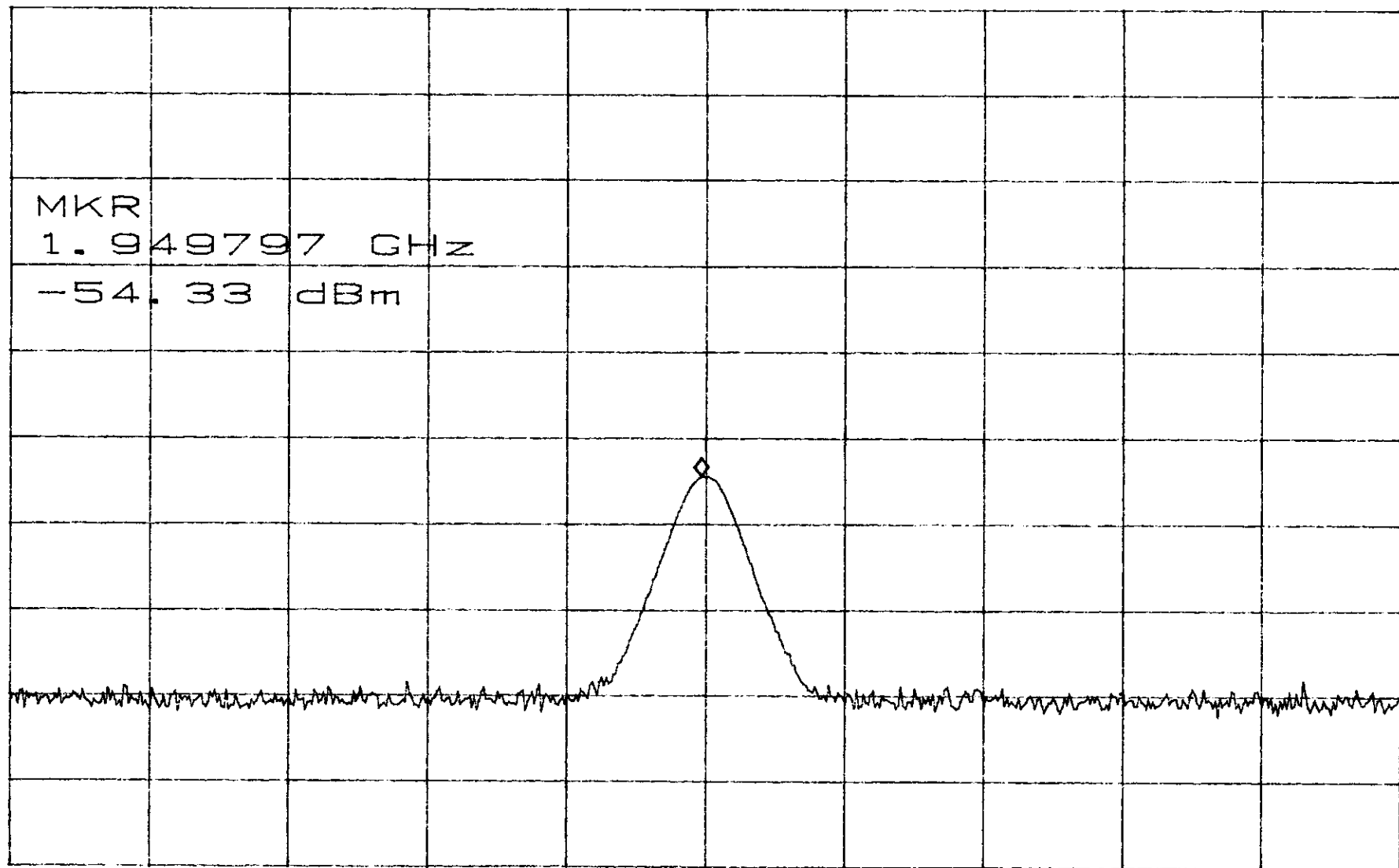
10dB/
/BP01

1.949797GHz

In/Out

D

MKR
1.949797 GHz
-54.33 dBm



CENTER 1.949800GHz

SPAN 1.000MHz

*RBW 30kHz

VBW 30kHz

SWP 50.0ms

DL High
D-band

Output
CW-source

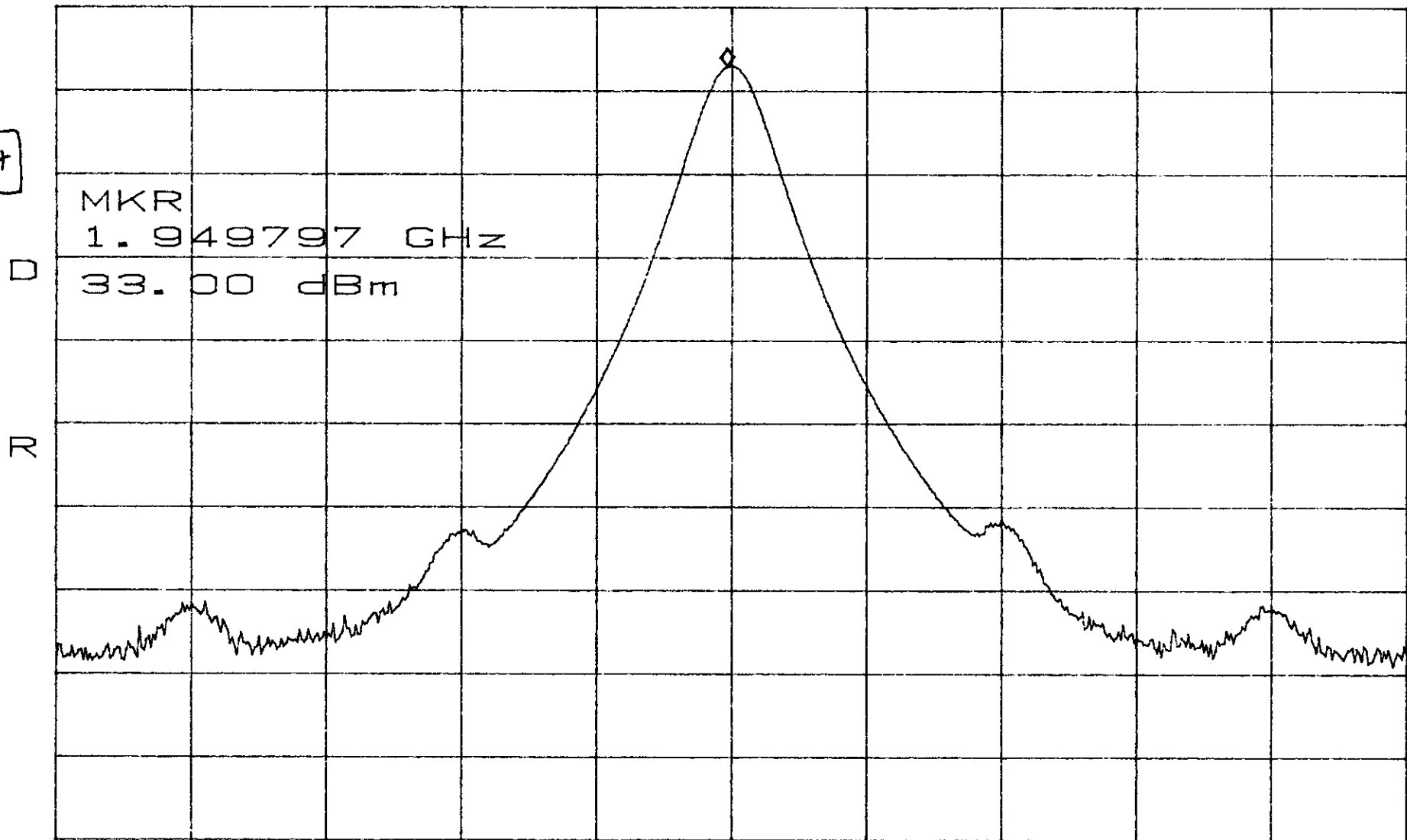
9/17/98
LB41901

ATTEN 30dB
RL 40.0dBm

10dB/

MKR 33.00dBm
1.949797GHz

In/Out



CENTER 1.949800GHz SPAN 1.000MHz
*RBW 30kHz VBW 30kHz SWP 50.0ms

UL Low
D-band

Input
cw Source

9/17/98
LB41901

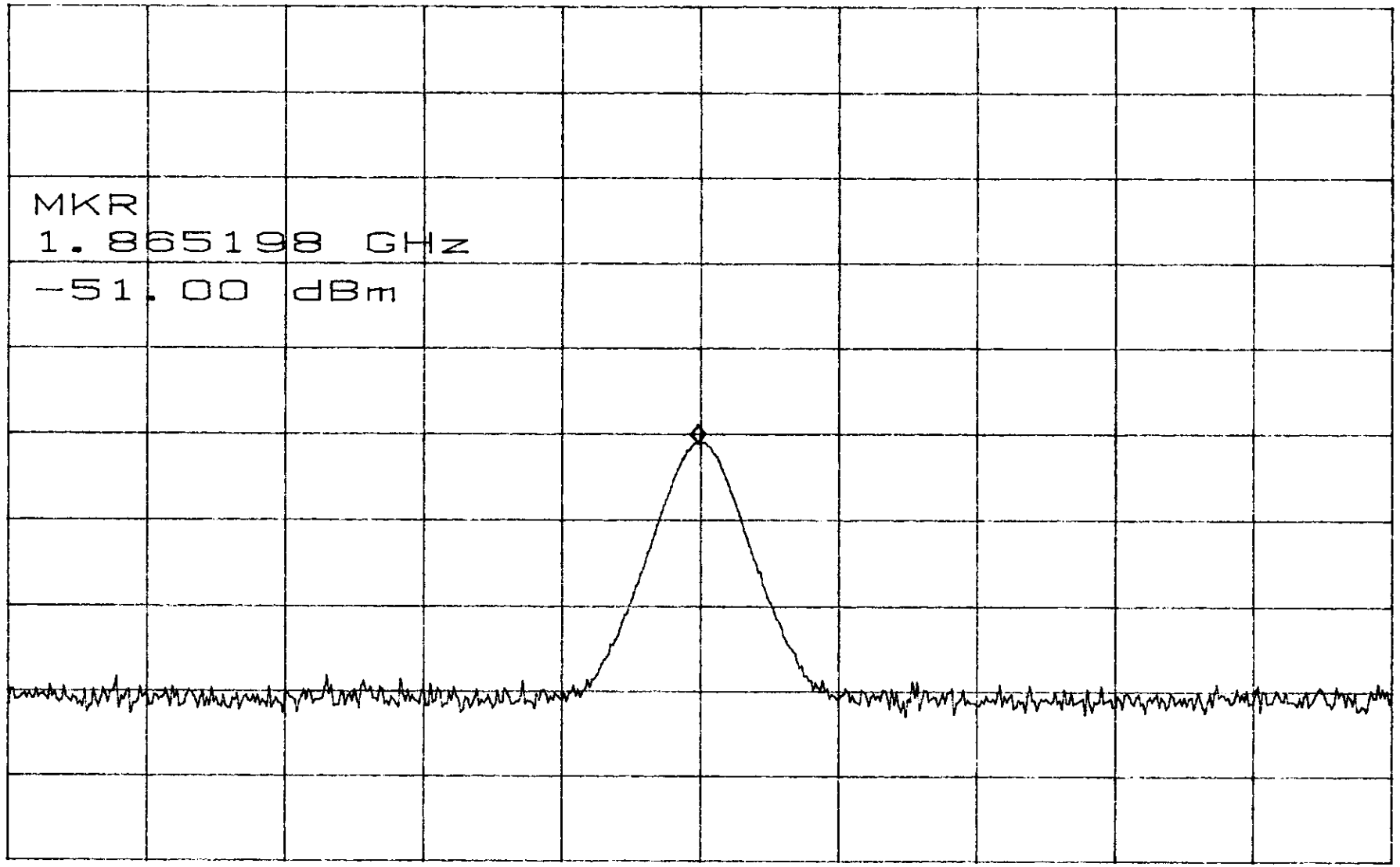
ATTEN 10dB
RL 0dBm

10dB/
/BP01

MKR -51.00dBm
1.865198GHz

In/Out

D



CENTER 1.865200GHz

SPAN 1.000MHz

*RBW 30kHz

VBW 30kHz

SWP 50.0ms

UL Low
D-band

Output
CW-Source

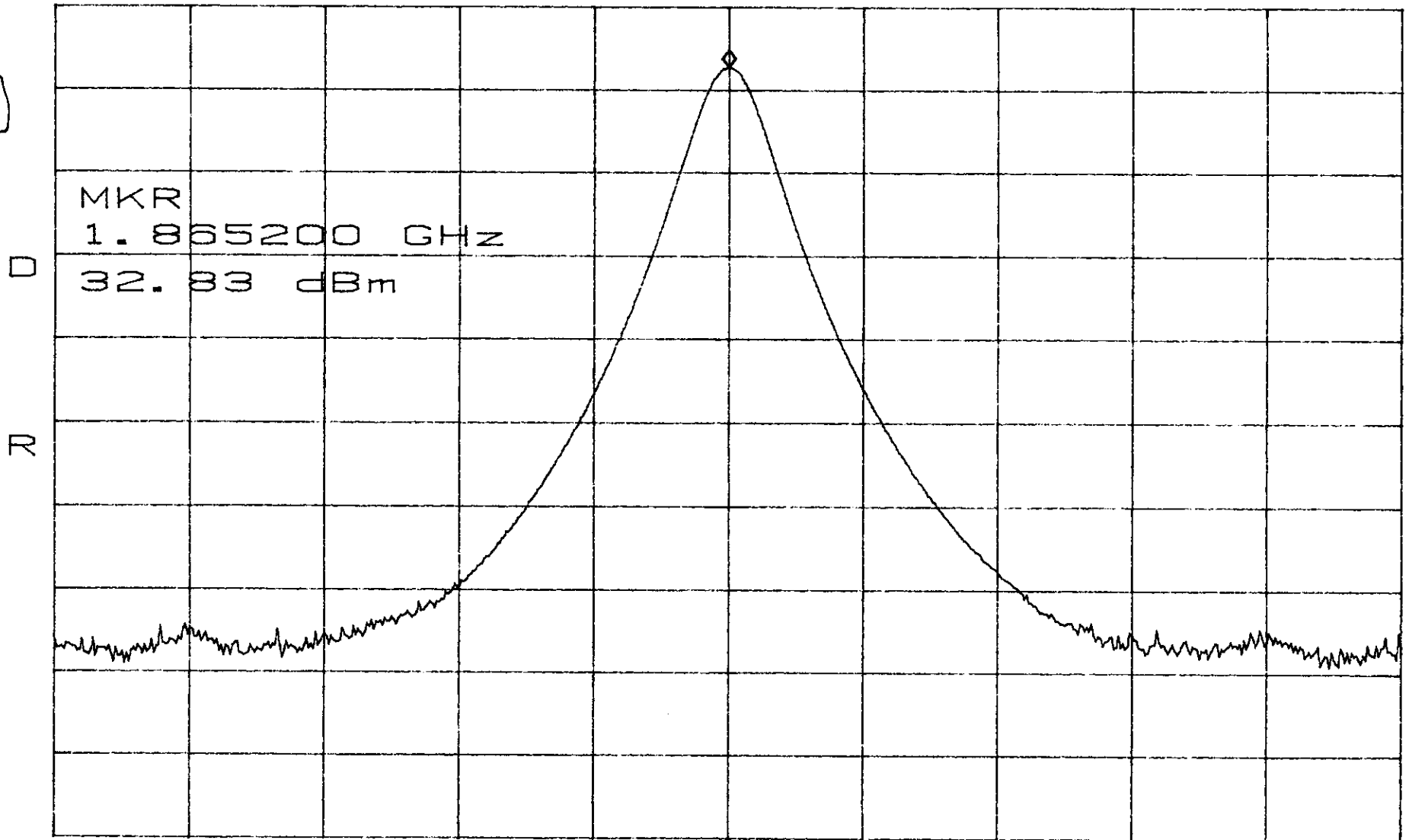
9/17/98
LB41901

ATTEN 30dB
RL 40.0dBm

10dB/BPO

MKR 32.83dBm
1.865200GHz

In/Out



CENTER 1.865200GHz

SPAN 1.000MHz

*RBW 30kHz

VBW 30kHz

SWP 50.0ms

UL Mid
D-band

Input
CW - source

9/17/98
LB41901

ATTEN 10dB

MKR -51.67dBm

RL 0dBm

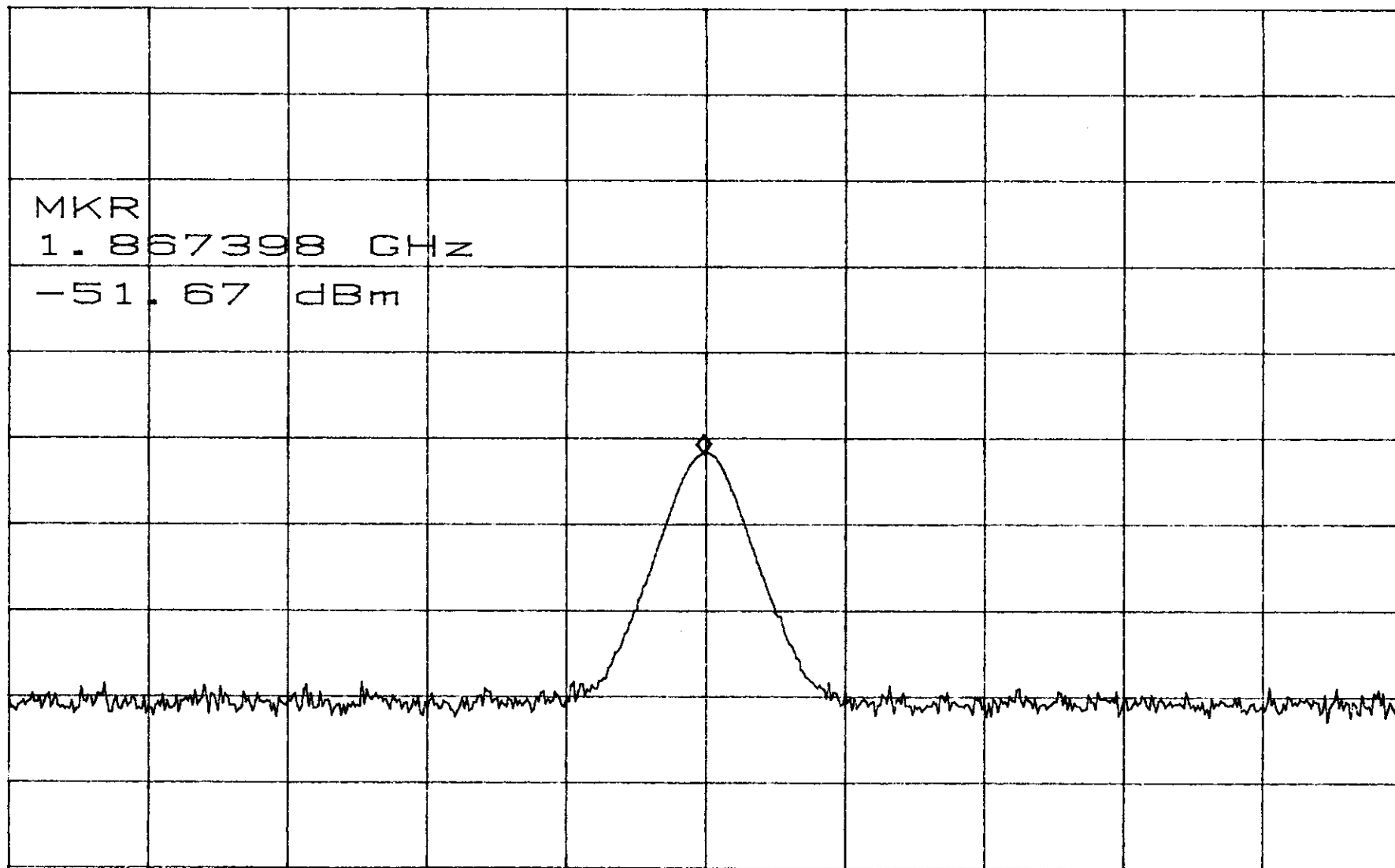
10dB/

1.867398GHz

In/out

D

MKR
1.867398 GHz
-51.67 dBm



CENTER 1.867400GHz

SPAN 1.000MHz

*RBW 30kHz

VBW 30kHz

SWP 50.0ms

UL Mid
D-band

Output

9/17/98
LB41901

ATTEN 30dB

cw - source

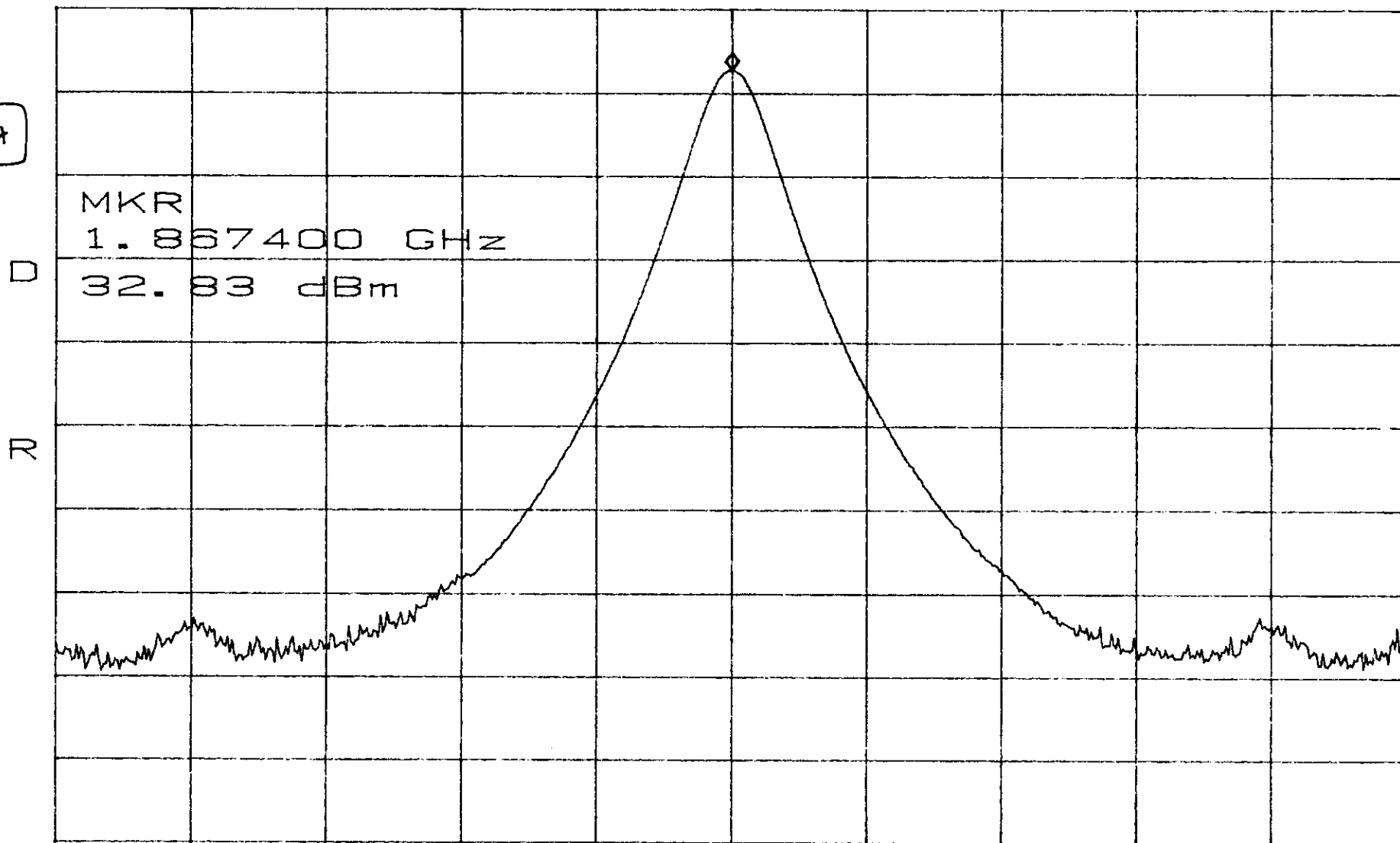
MKR 32.83dBm

RL 40.0dBm

10dB/
BP01

1.867400GHz

In/out



CENTER 1.867400GHz

SPAN 1.000MHz

*RBW 30kHz

VBW 30kHz

SWP 50.0ms

UL High
D-band

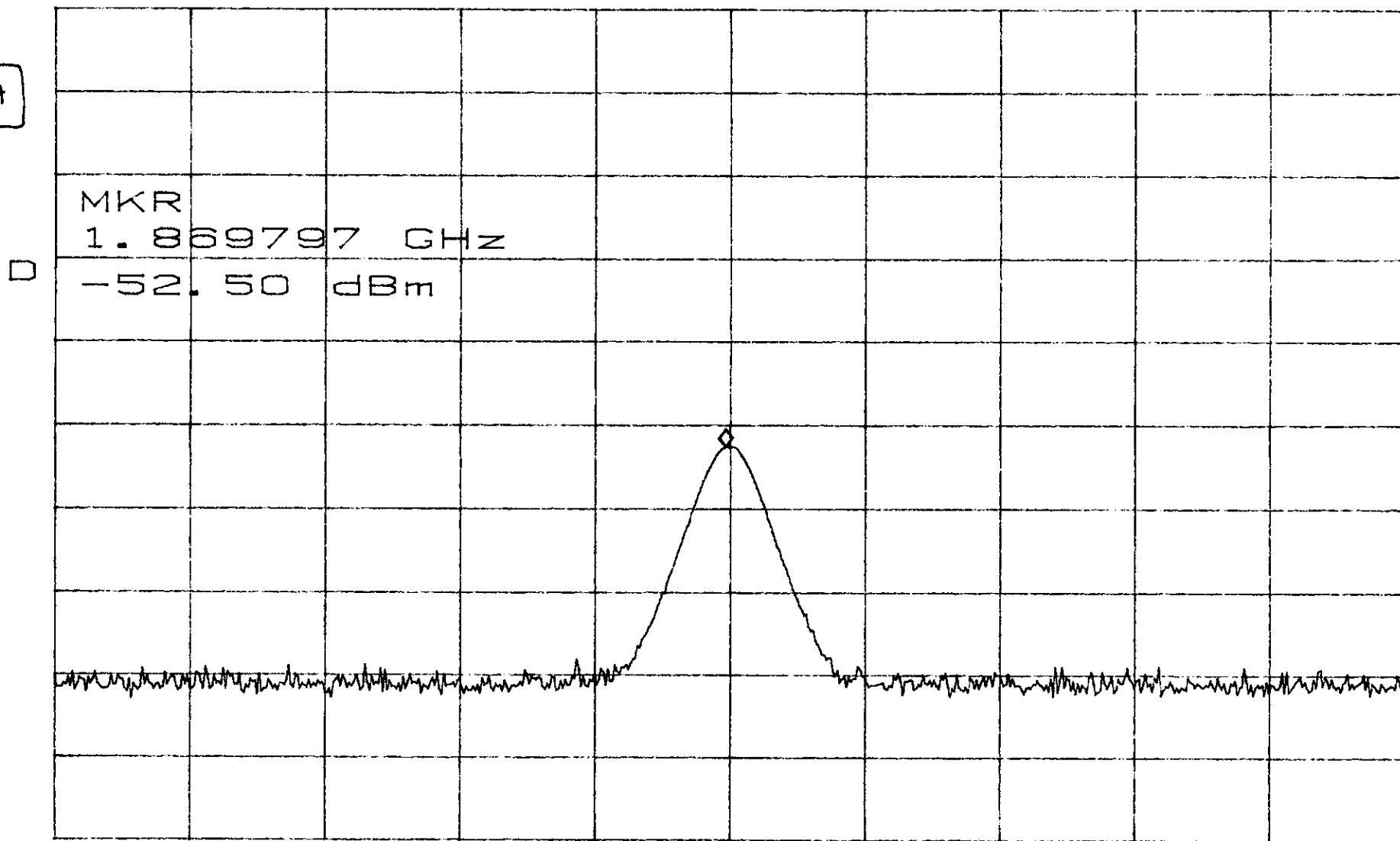
Input
CW-source

9/17/98
LB4101

ATTEN 10dB
BPO1
RL 0dBm

MKR -52.50dBm
1.869797GHz

In/out



CENTER 1.869800GHz

SPAN 1.000MHz

*RBW 30kHz

VBW 30kHz

SWP 50.0ms

UL High
D-band

Output
CW-source

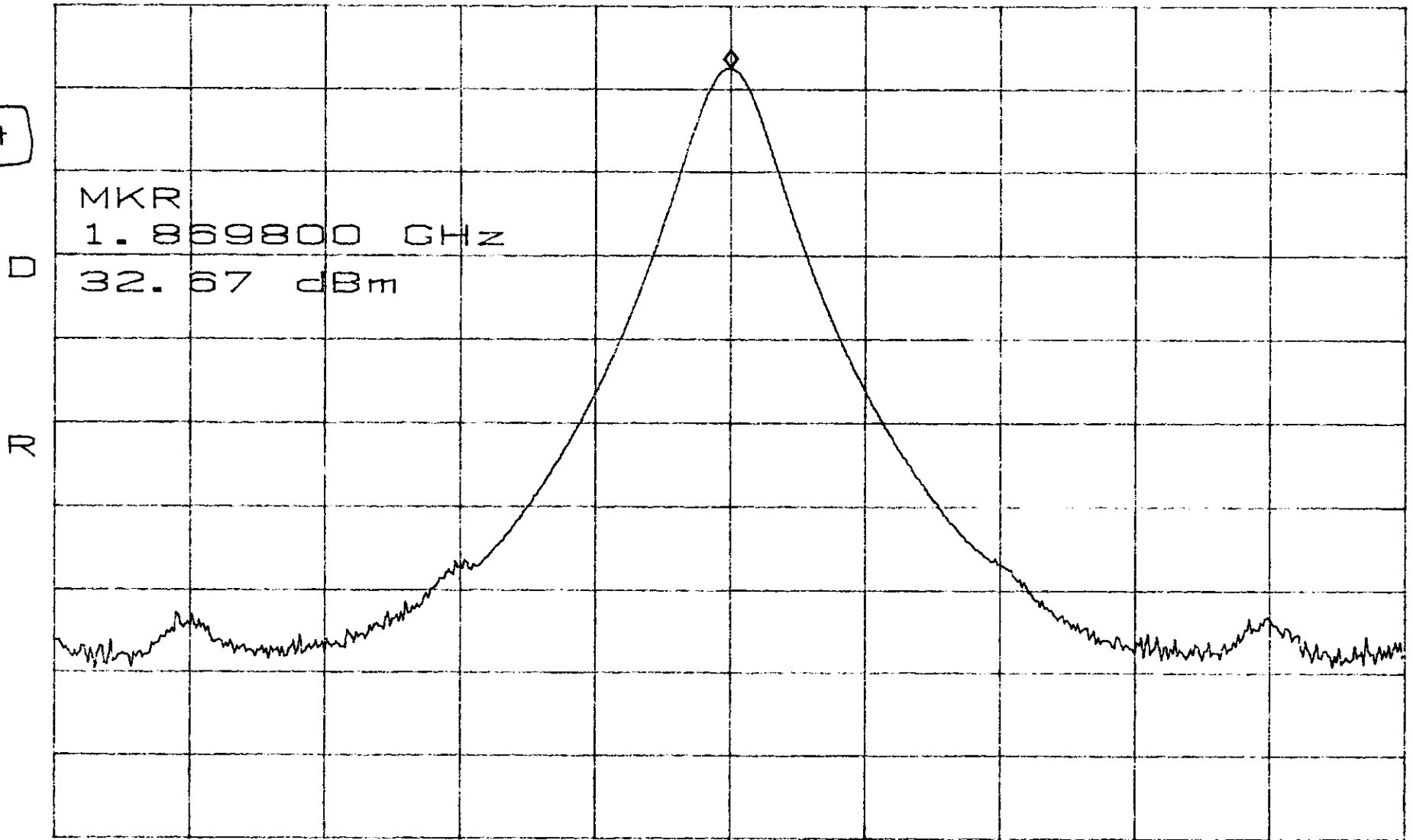
9/17/98
LB41901

ATTEN 30dB
RL 40.0dBm

10dB/

MKR 32.67dBm
1.869800GHz

In/out



CENTER 1.869800GHz

SPAN 1.000MHz

*RBW 30kHz

VBW 30kHz

SWP 50.0ms