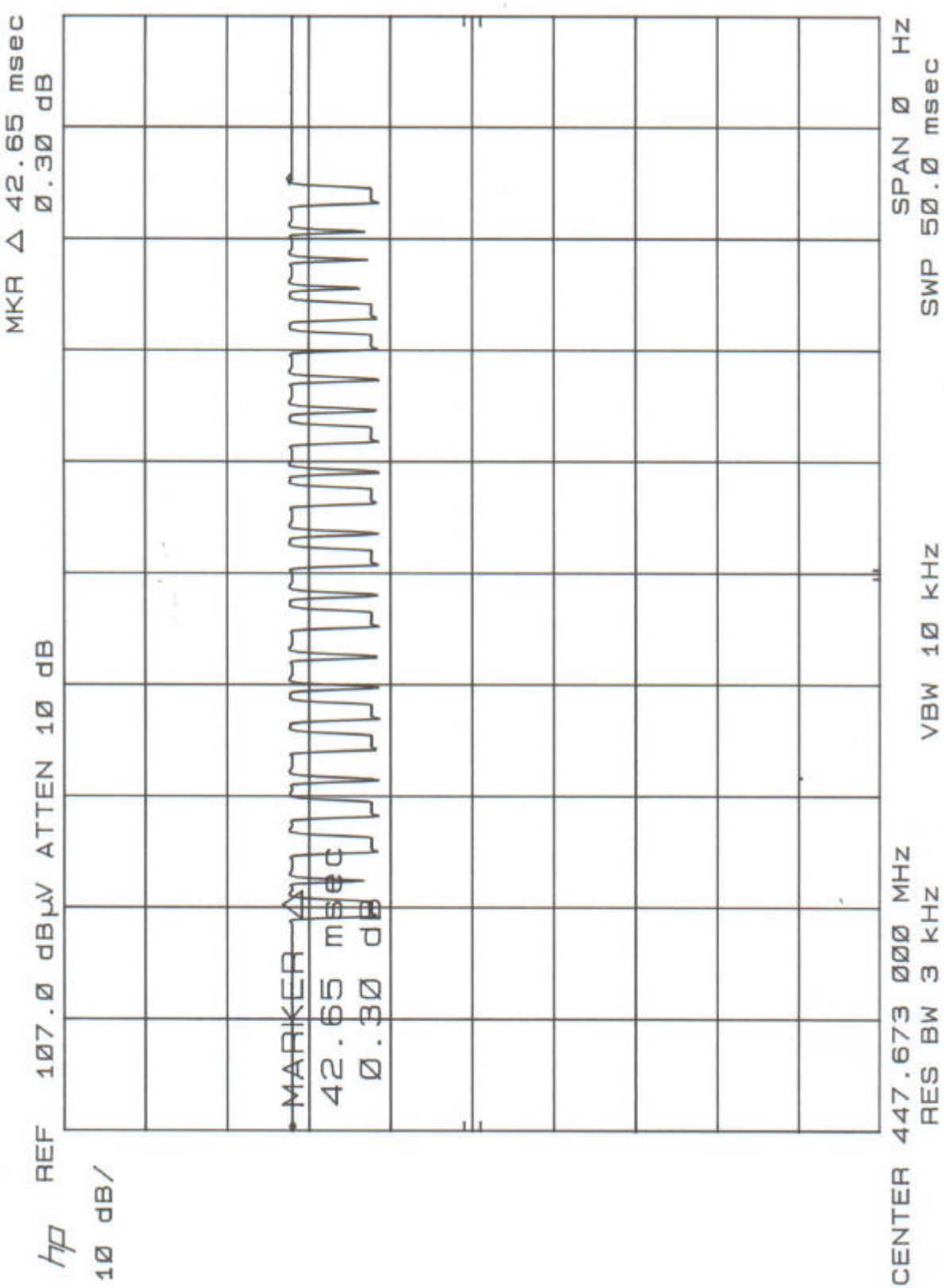
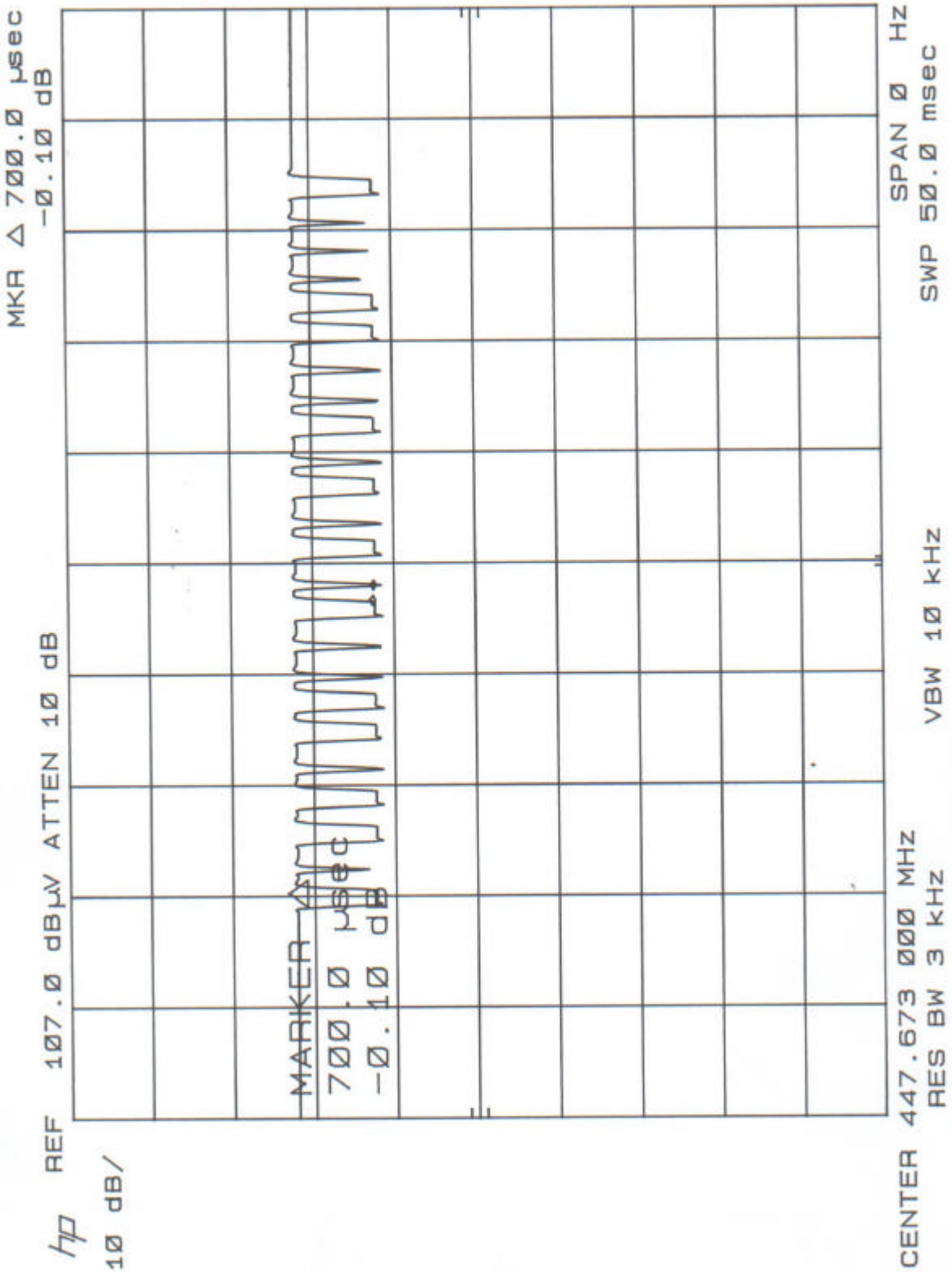
No Automatic Pulse Mode
Pulse Train = 42.65msec



No Automatic Pulse Mode
Minimum Pulse Width (Individual) = 700usec



## 3.1.7 Occupied Bandwidth

The transmitter's occupied bandwidth at (447 MHz) was measured with respect to the 20dB down point of the center frequency. Part 15.231 (c) stipulates that emissions shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 and shall be attenuated by at least 20 dB below the level of the fundamental or to the general radiated emission limits in Part 15.209, whichever is the lesser attenuation. Part 15.209 (a) specifies that the emissions from an intentional radiator shall not exceed the field strength levels in the 216 to 960 MHz band of 200 uV/m (46 dBuV/m).

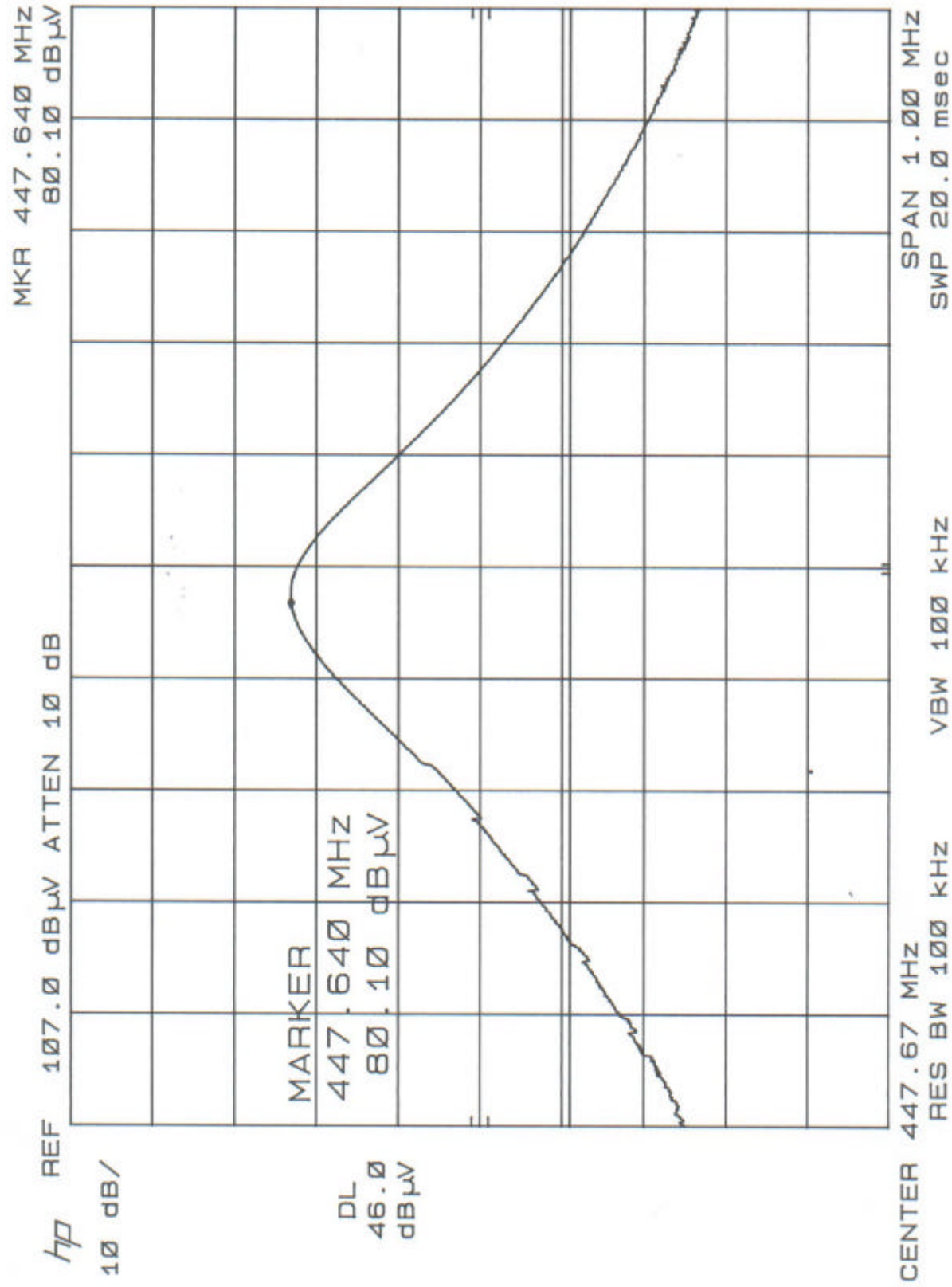
When transmitting at 447.64 MHz, emissions measured at the 0.25% bandwidth of 447.64 MHz (band edge) were 45.1 dBuV/m (< 46 dBuV/m).

Lower band edge calculated as 446.5209 MHz
Lower 20dB down point is 447.440 MHz (Between 446.521 and 448.759 MHz)
Transmitting signal fall below 37dBuV/m at 447.375 MHz (<46 dBuV/m)

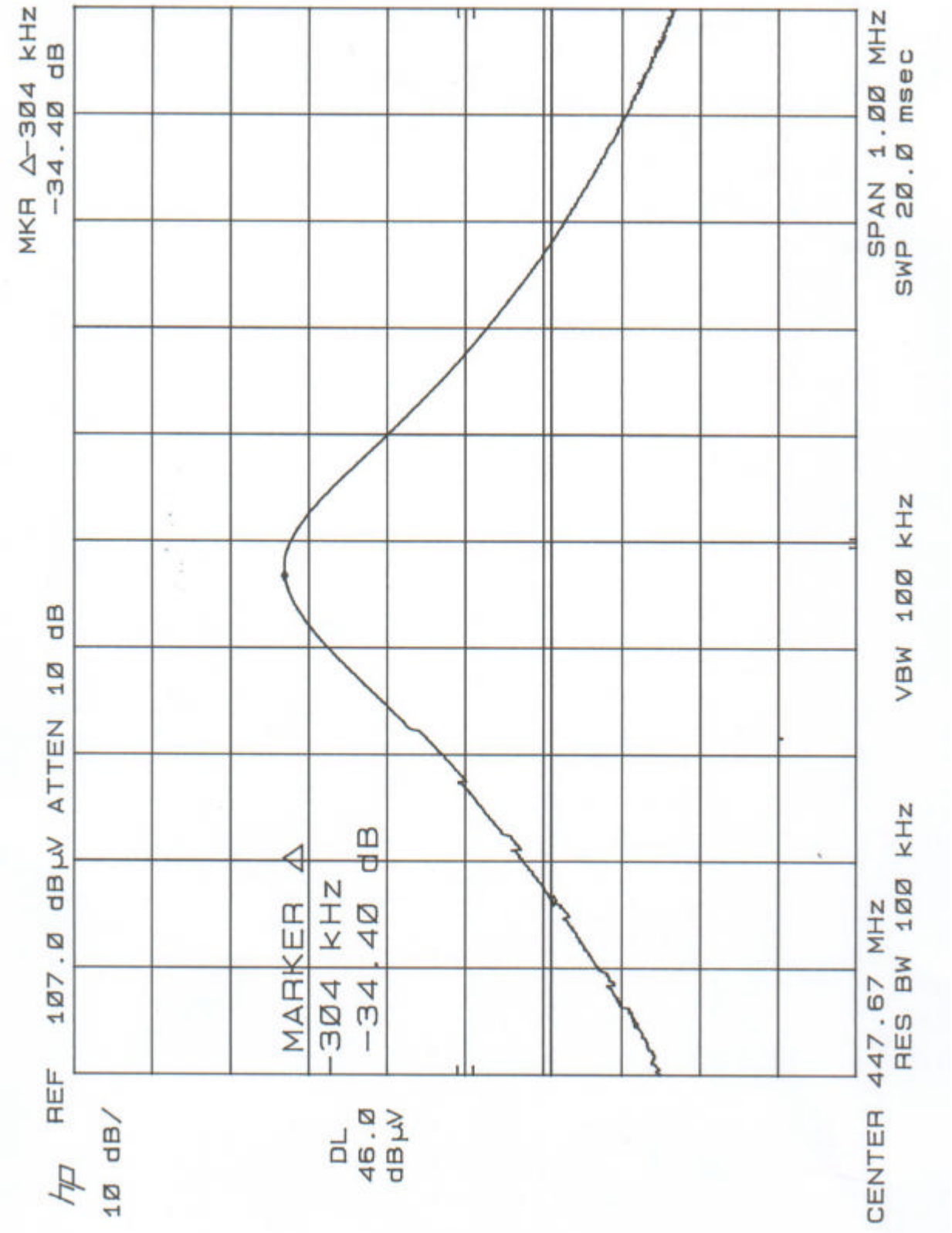
Upper band edge calculated as 448.7591 MHz
Upper 20dB down point is 447.84 MHz (Between 446.521 and 448.759 MHz)
Transmitting signal falls below 37dBuV/m at 447.924 MHz (<46 dBuV/m)

Plots showing the occupied bandwidth are provided on pages 28 thru 39.

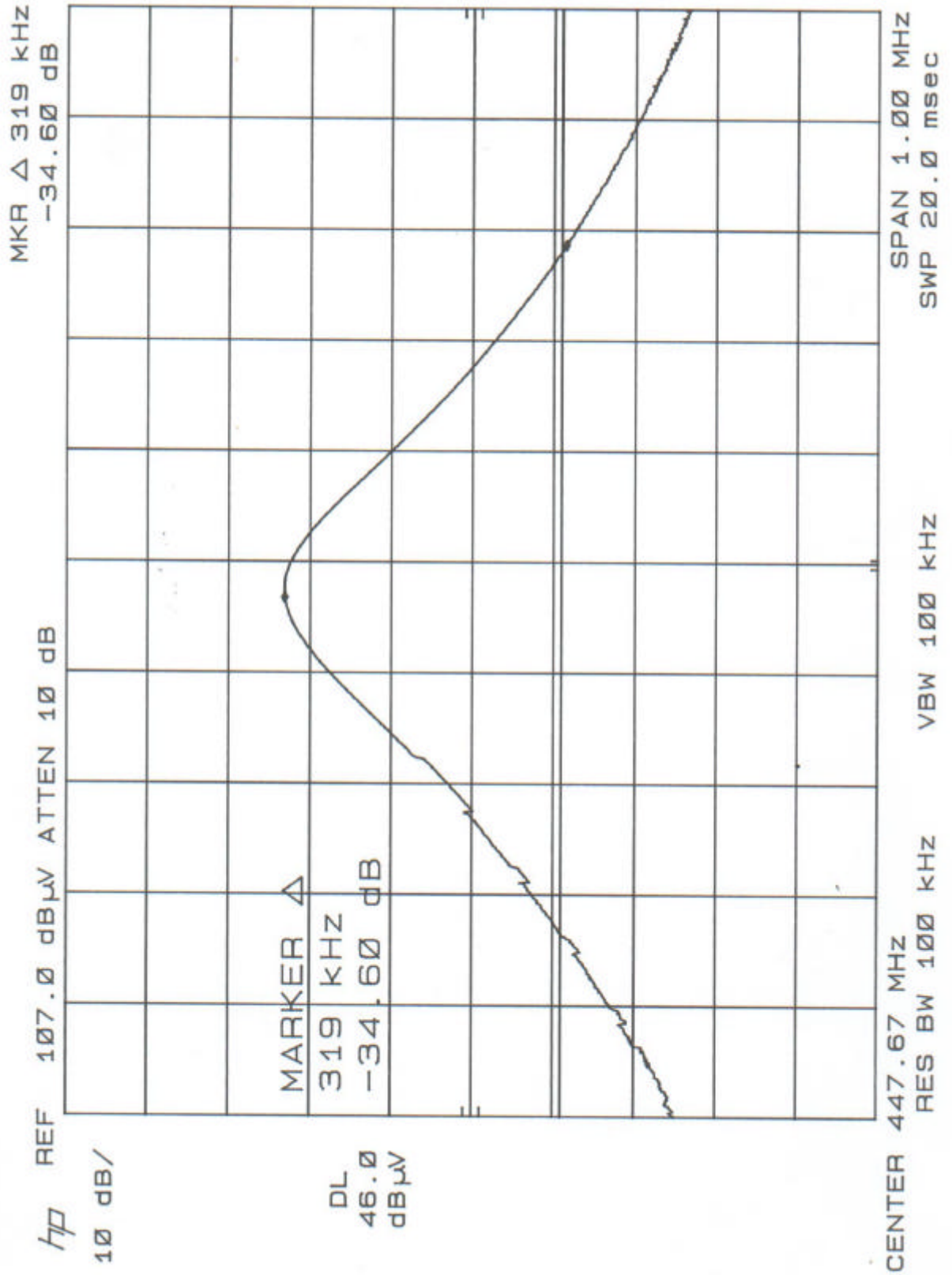
Occupied Bandwidth
Antenna Vertical / EUT Vertical


MKR 447.640 MHz
80.10 dBµV
REF 107.0 dBµV ATTEN 10 dB
10 dB/
DL
46.0
dBµV
MARKER
447.640 MHz
80.10 dBµV
CENTER 447.67 MHz
RES BW 100 kHz
VBW 100 kHz
SPAN 1.00 MHz
SWP 20.0 msec

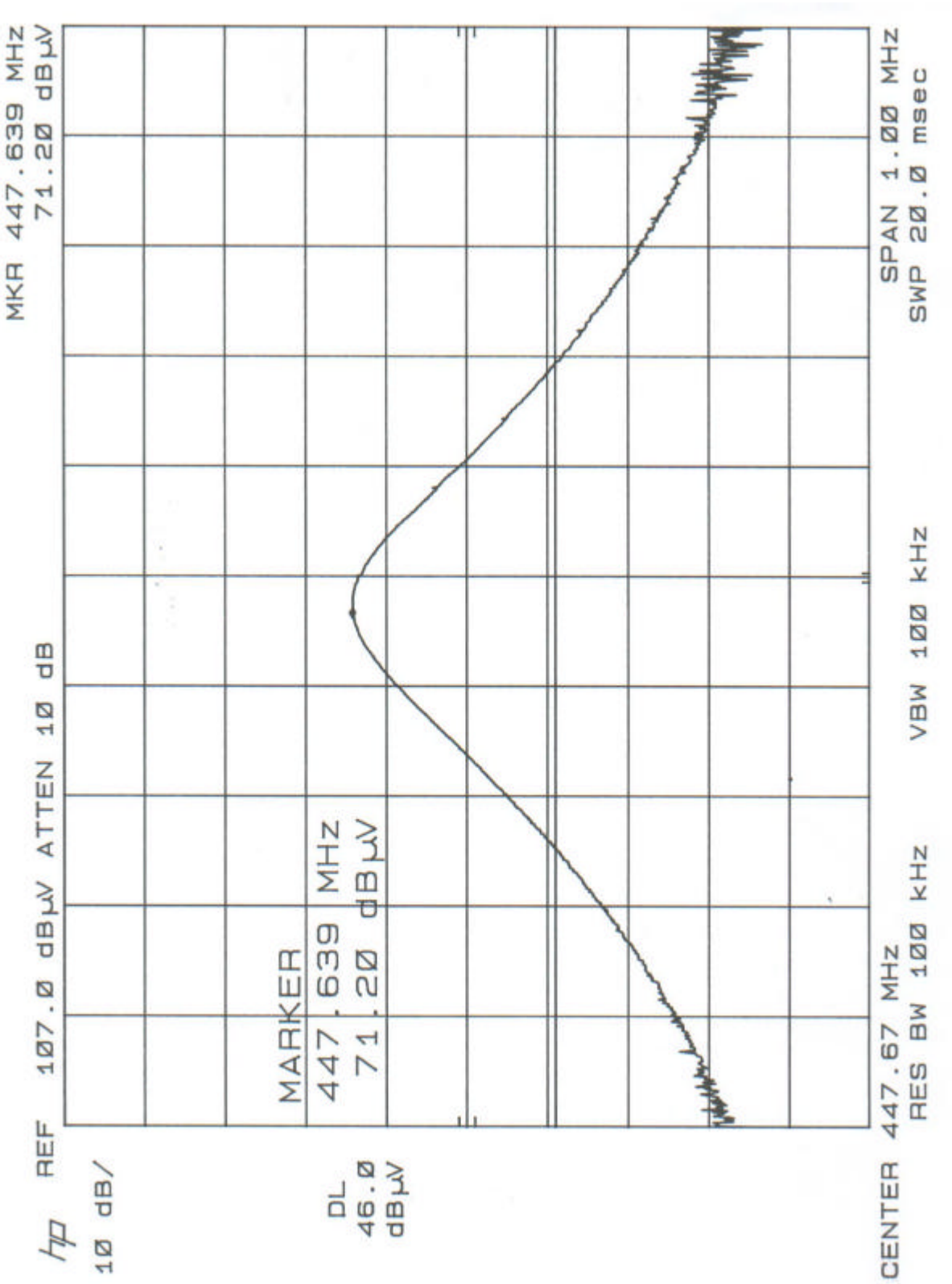
Occupied Bandwidth
Antenna Vertical / EUT Vertical



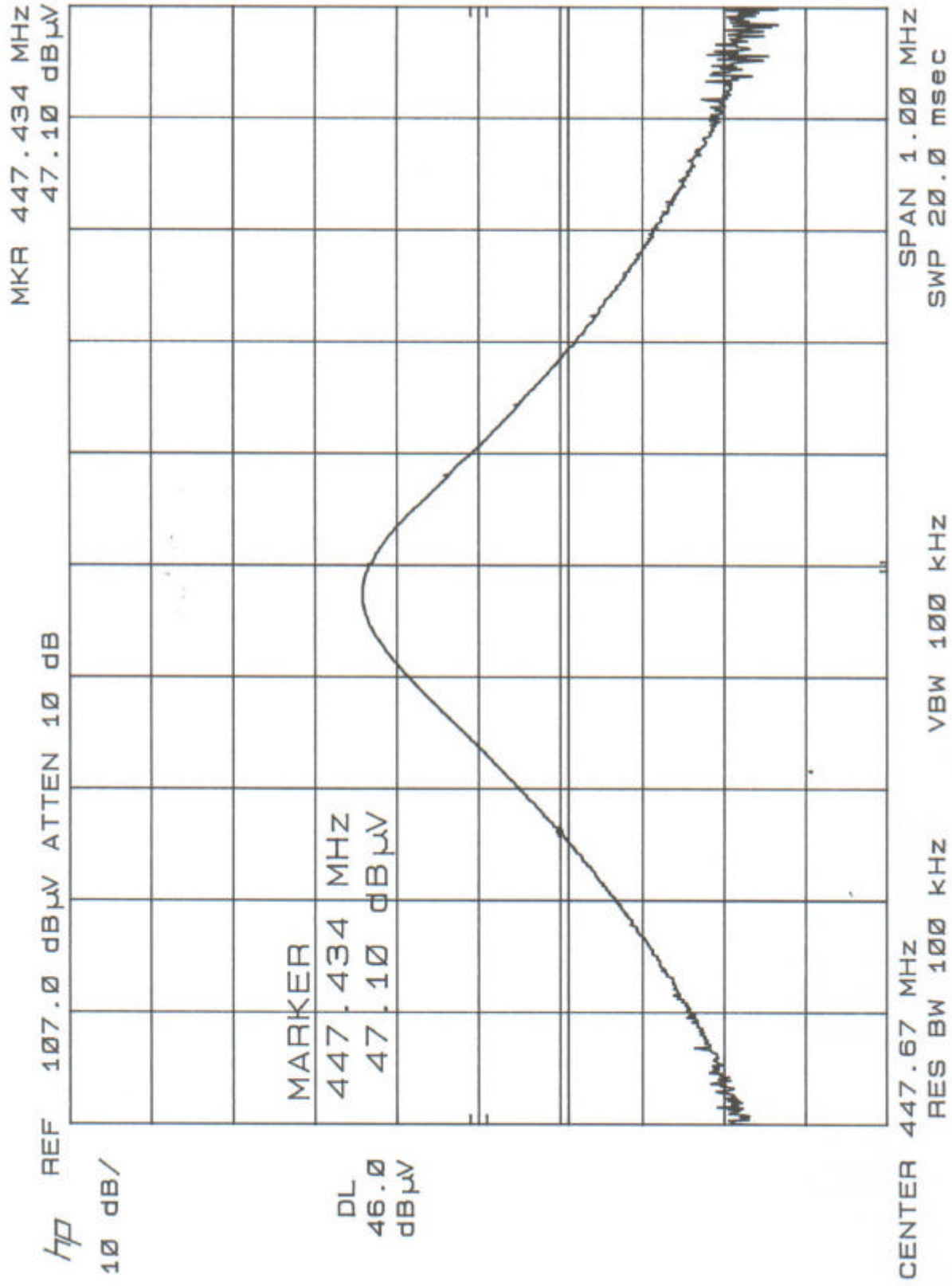
Occupied Bandwidth
Antenna Vertical / EUT Vertical



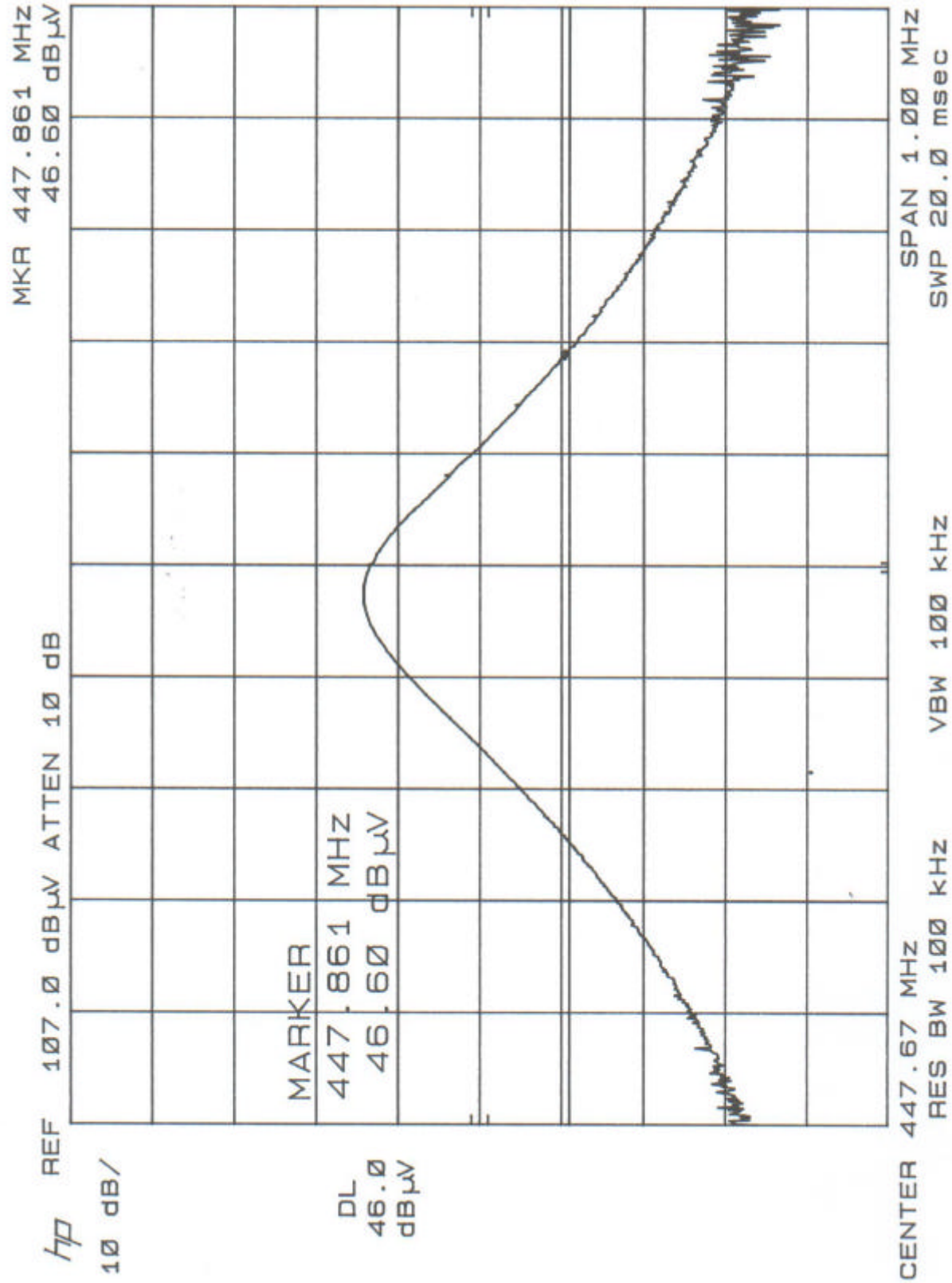
Occupied Bandwidth
Antenna Vertical / EUT Horizontal



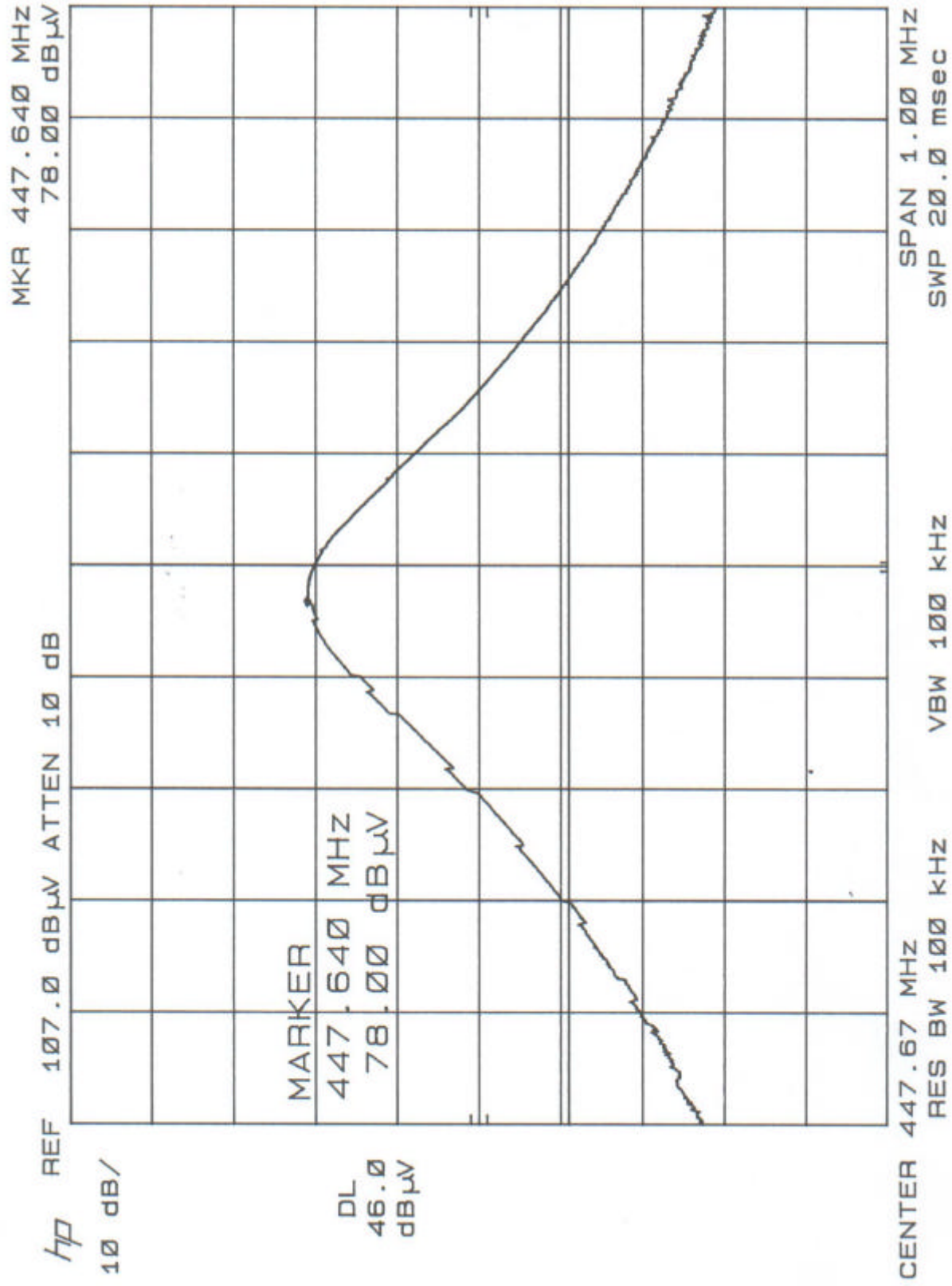
Occupied Bandwidth
Antenna Vertical / EUT Horizontal



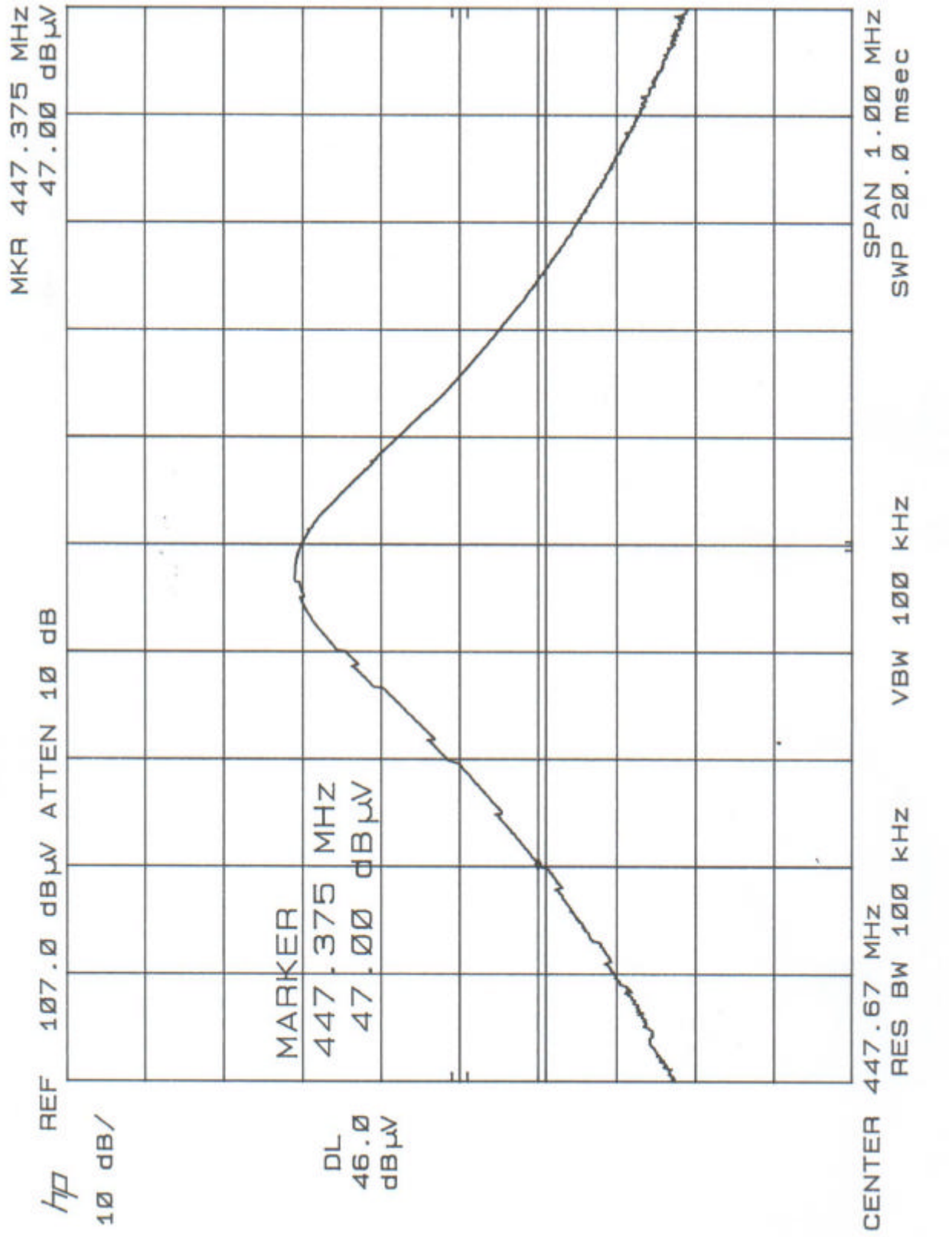
Occupied Bandwidth
Antenna Vertical / EUT Horizontal



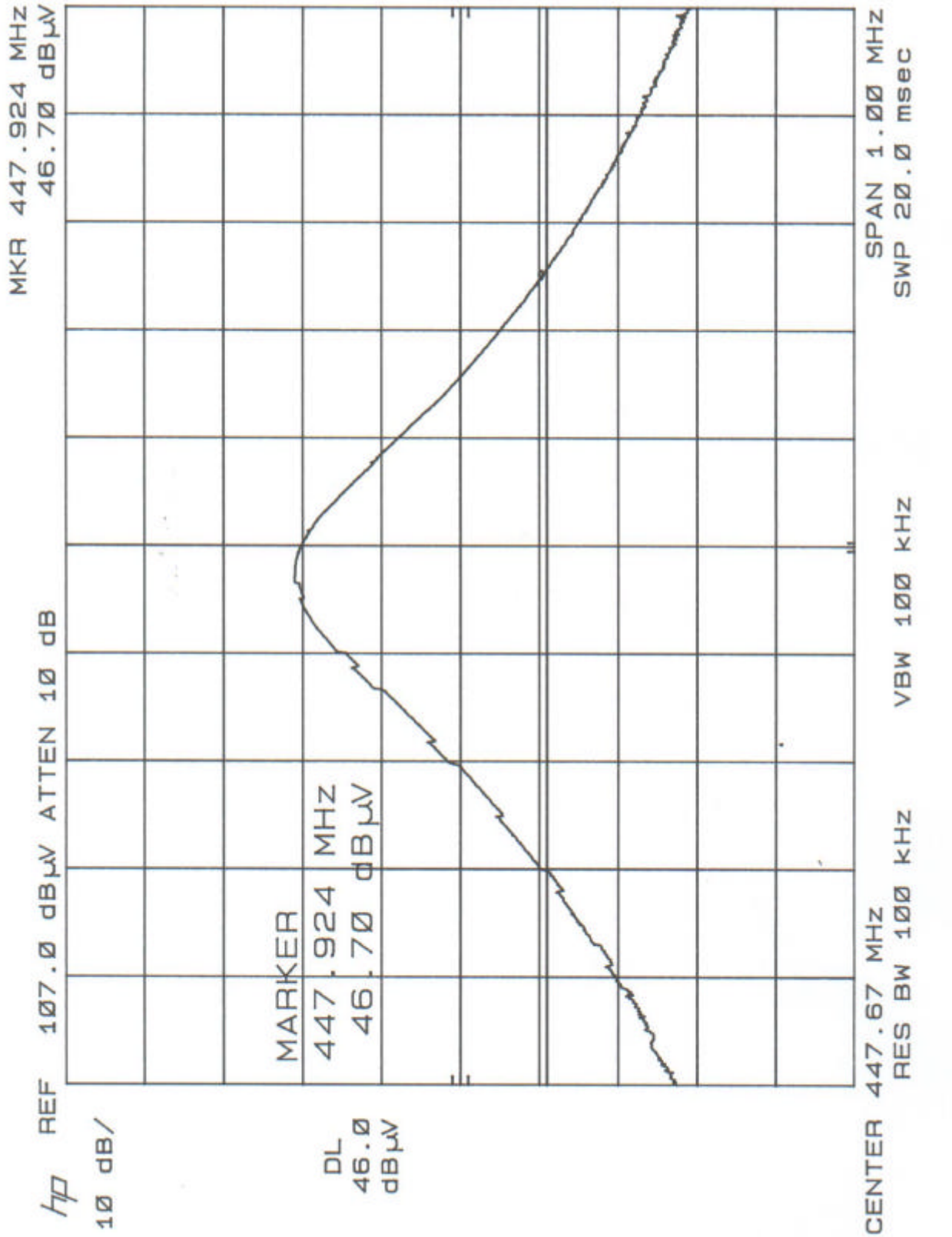
Occupied Bandwidth
Antenna Horizontal / EUT Horizontal



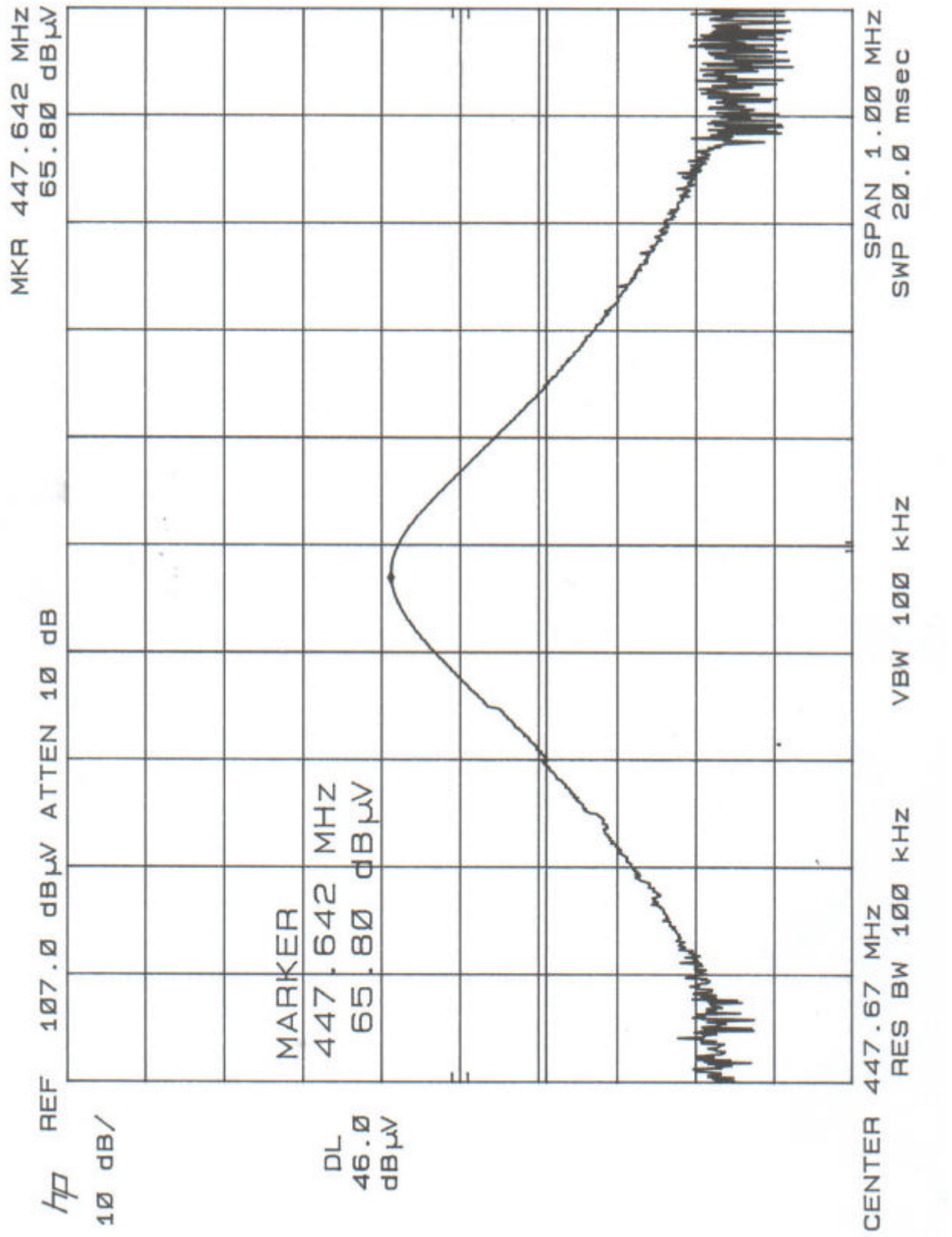
Occupied Bandwidth
Antenna Horizontal / EUT Horizontal



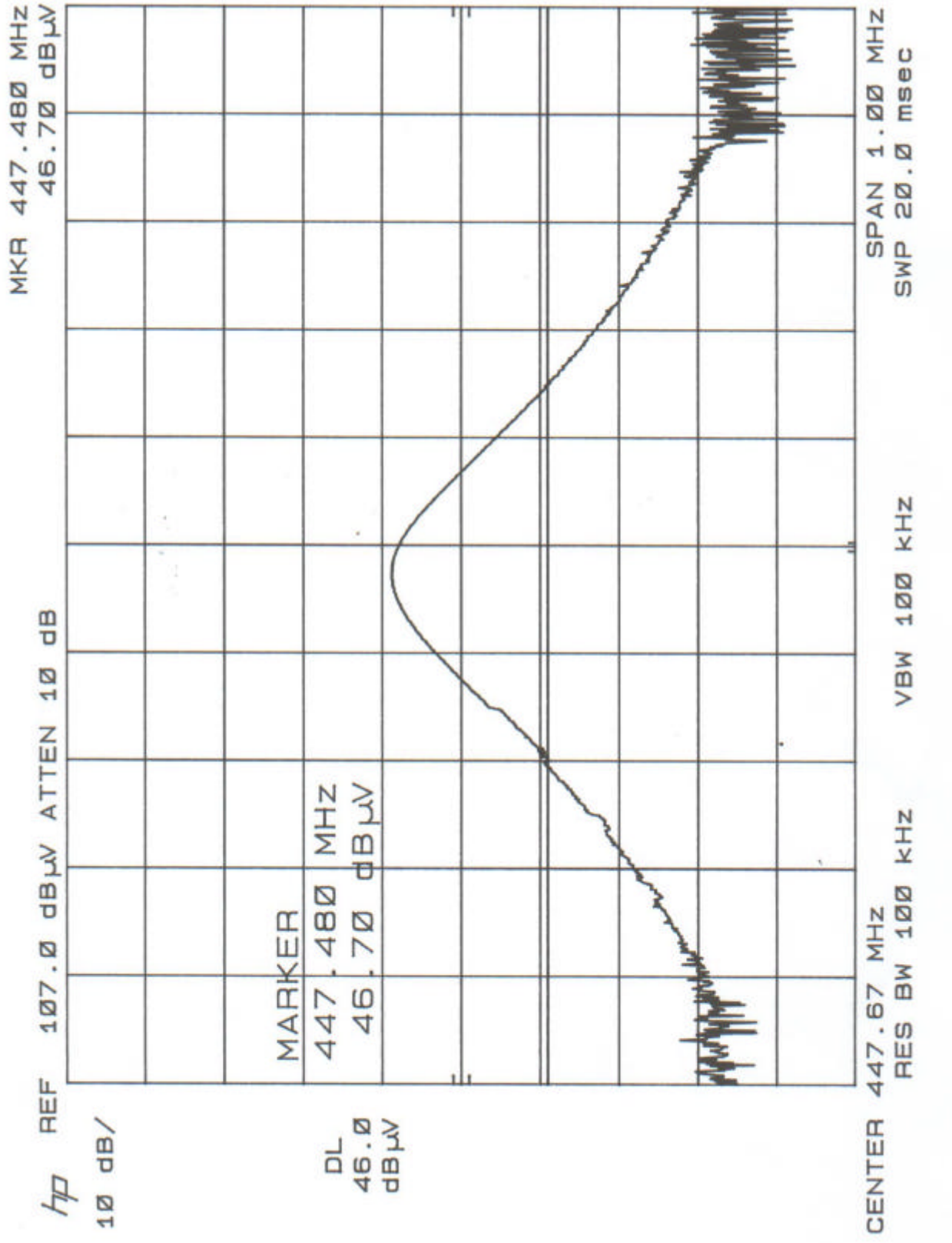
Occupied Bandwidth
Antenna Horizontal / EUT Horizontal



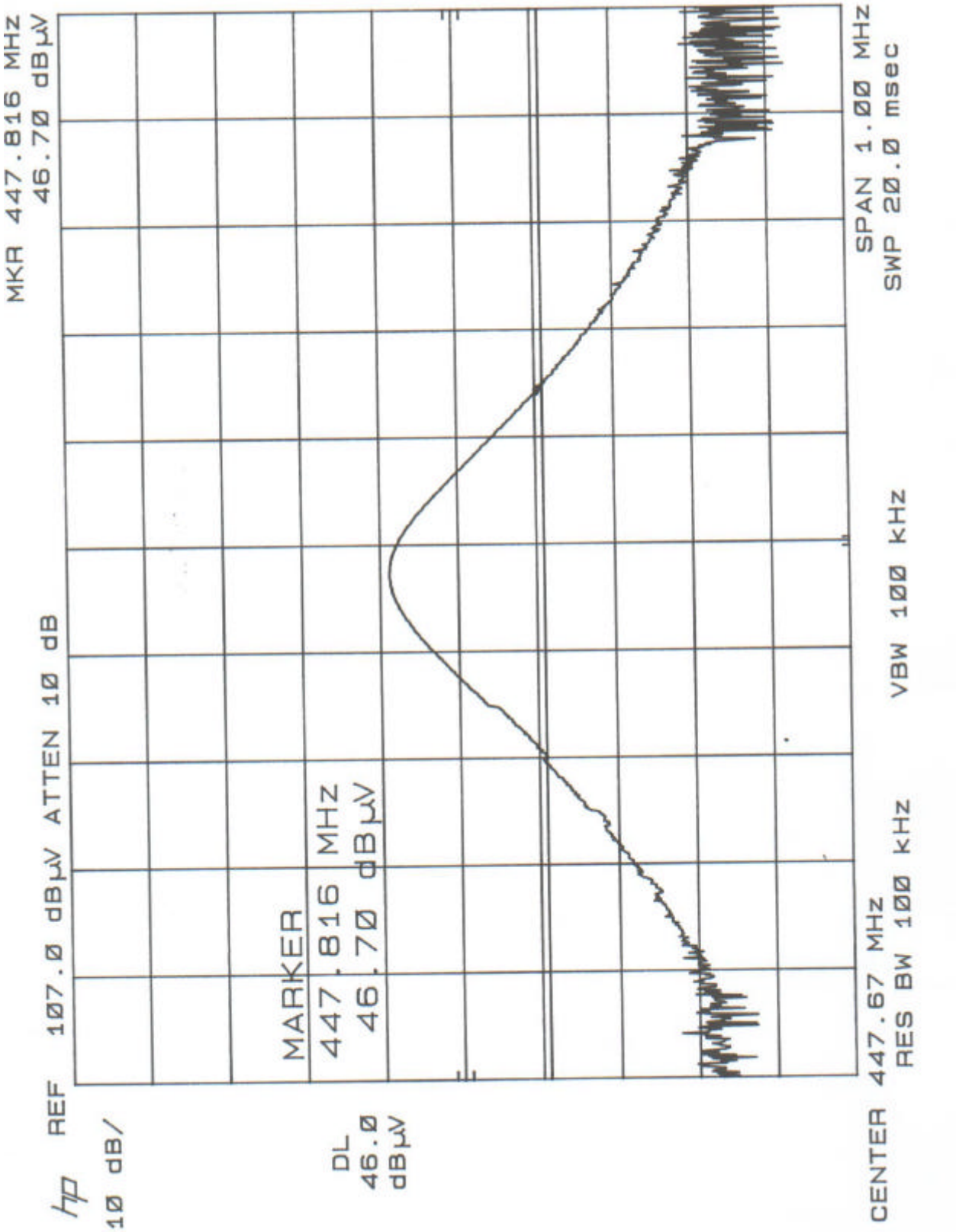
Occupied Bandwidth
Antenna Horizontal / EUT Vertical



Occupied Bandwidth
Antenna Horizontal / EUT Vertical

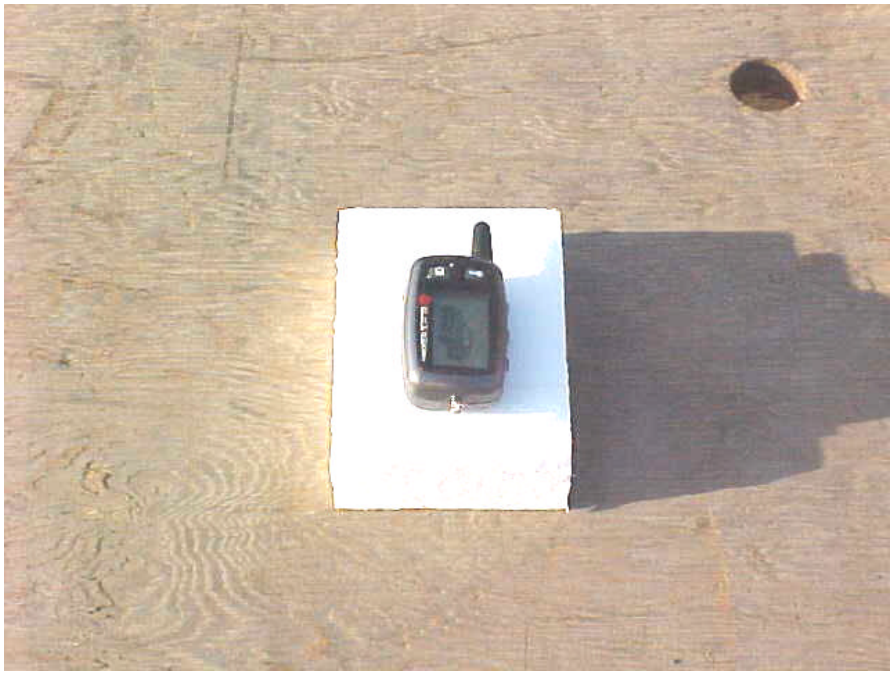


Occupied Bandwidth
Antenna Horizontal / EUT Vertical



## 3.1.8 Photographs of Radiated Test Setup – per 2.1033(b)(7)

**Radiated Emissions, Fundamental (and Harmonics)**



**Horizontal Polarization EUT in position 1**

**Vertical Polarization EUT in position 2**

**Radiated Emissions, Fundamental (and Harmonics)**

**30-200 Mhz (Biconical Antenna)**

**Radiated Emissions, Fundamental (and Harmonics)**

**200-1000 Mhz (Log Periodic Antenna)**

**Radiated Emissions, Fundamental (and Harmonics)**

**1000-18000 Mhz (DRG Horn Antenna)**

# 4. LABELING REQUIREMENTS - PER 2.1033(B)(7)

Label will be constructed of 0.02-inch plastic attached as shown on the equipment with permanent adhesive.

All information on the label will be etched or screened. All methods will exceed the expected lifetime of the equipment.

The label will be large enough to allow all information to be readily legible.

## 4.1 Additional Label Required

| |
|---|
| This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation. |

Shown above is a copy of the label with the Part 15.19 Compliance Statement, Location of required information is checked “below”.

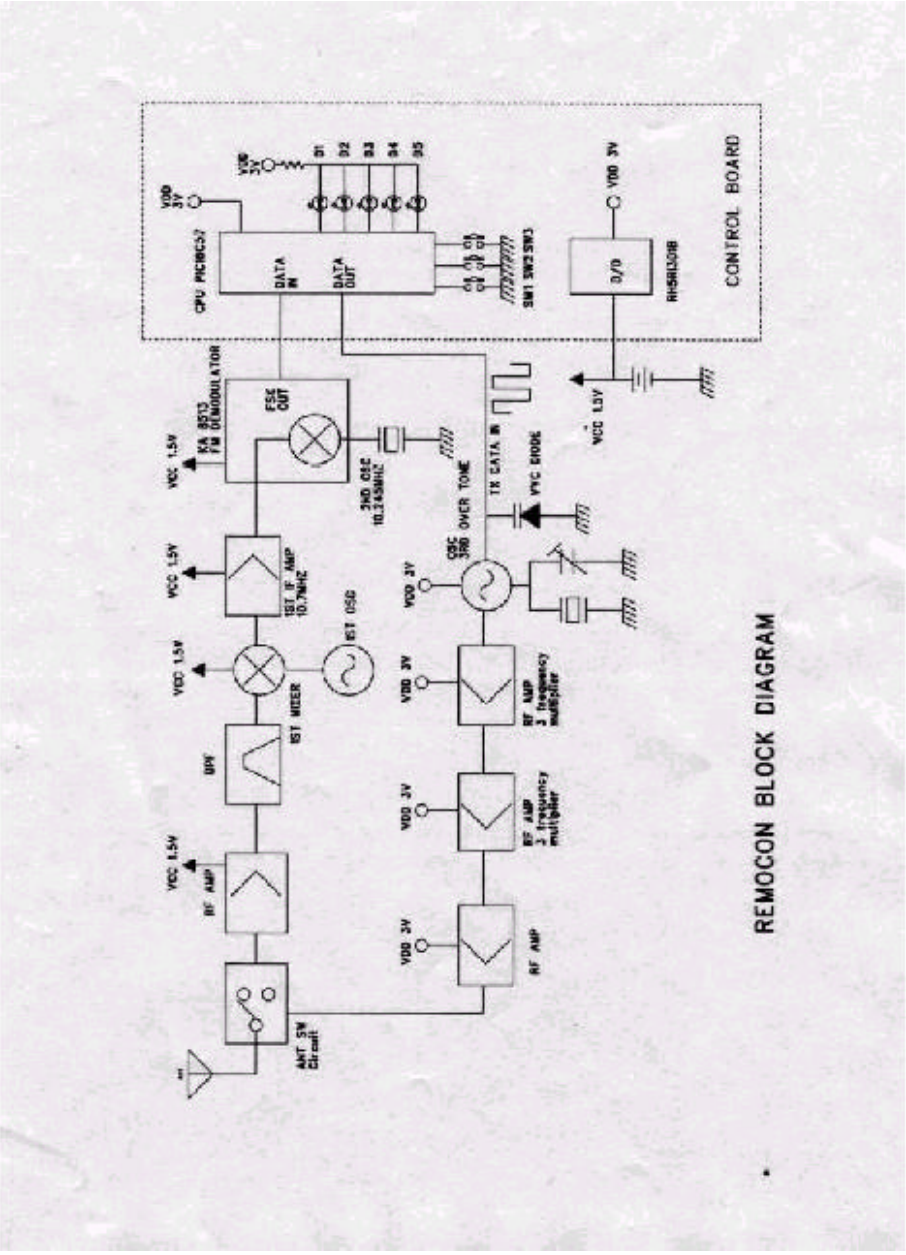
The label will be placed in a conspicuous location on the device.

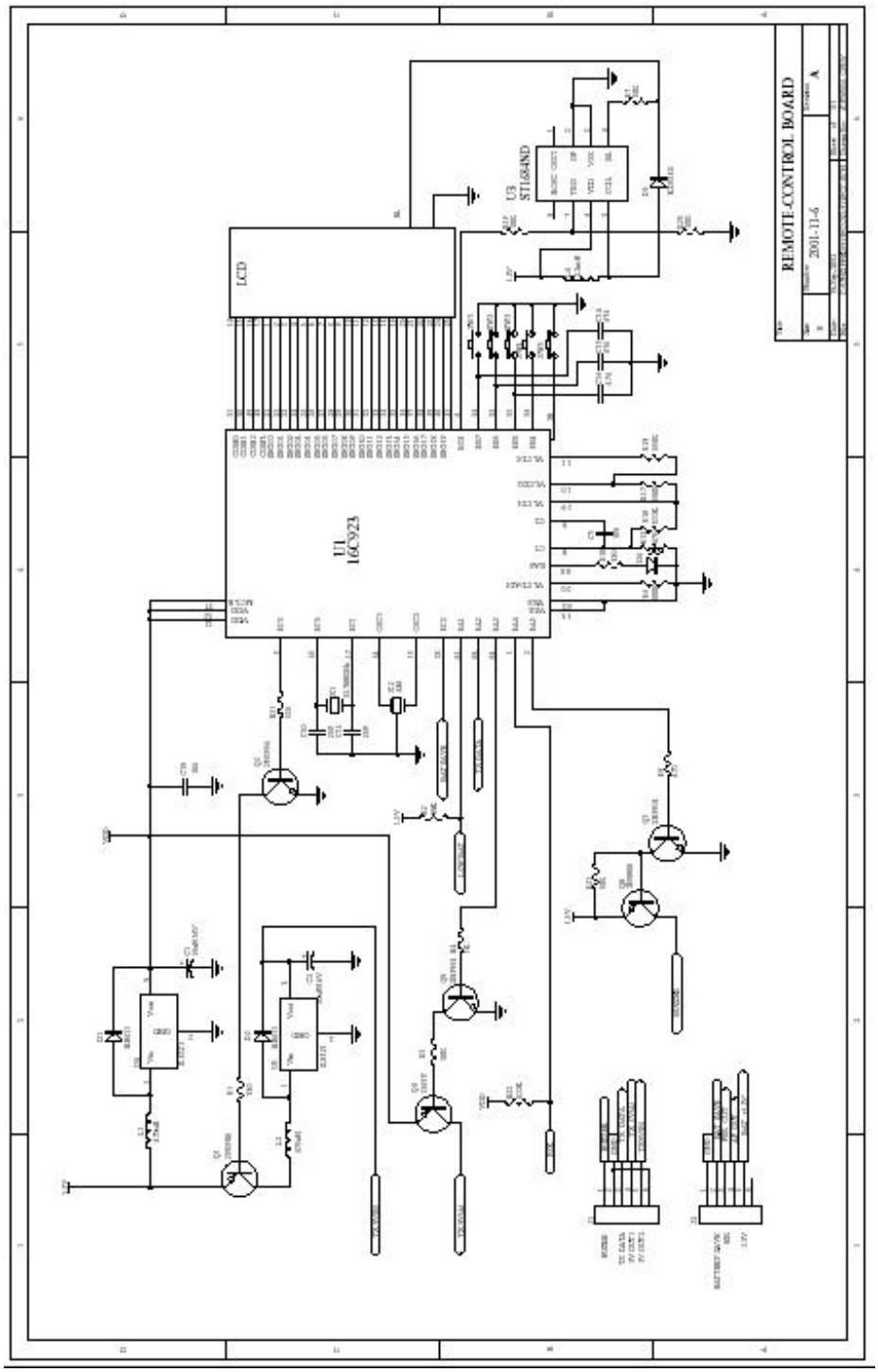
## 4.2 Photograph of Label Placement and Contents

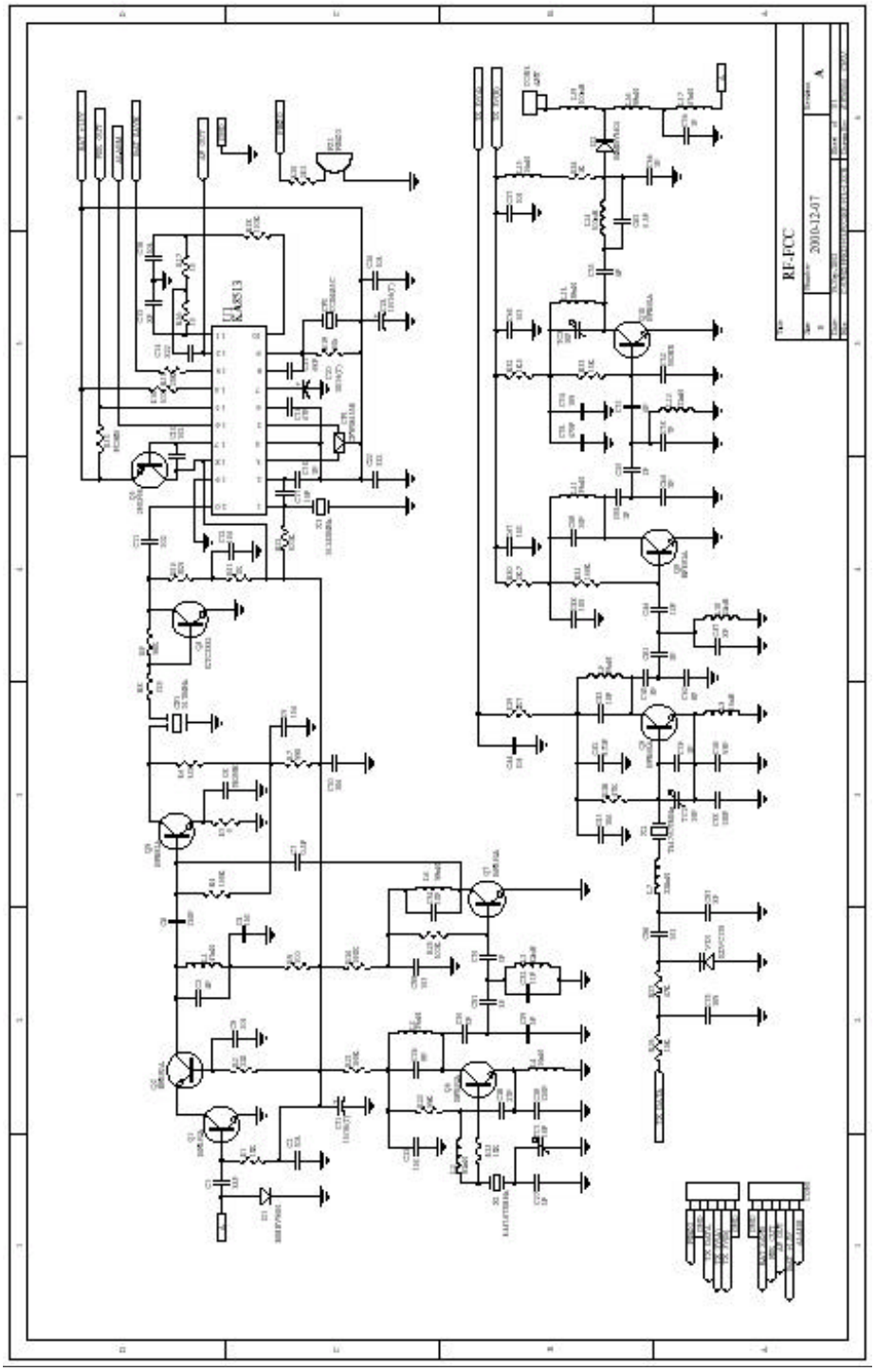
Because of the small size of this device the information in 4.1 may be placed in the documentation provided to the user. The FCC ID shall be placed upon the unit. This is in accordance with FCC Part 15.19 (a) (5).

FCC ID Label

## 5. SCHEMATIC DIAGRAMS




REMOTE-CONTROL BOARD
LCD
U1
16C923
U3
ST1684ND


RF-PCC
2010-12-07

# UNCERTAINTY TOLERANCE

DNB Engineering's Riverside Facility (3 and 10 meter Open Area Test Sites) are within acceptable uncertainty tolerances per ANSI C63.4 (1992) sections 5.4.6.1 and 5.4.6.2.

**ANSI C63.4 (1992)**

5.4.6.1 Site Attenuation. A measurement site shall be considered acceptable for radiated electromagnetic field measurements if the horizontal and vertical NSA derived from measurements, i.e., the "measured NSA," are within ?4 dB of the theoretical NSA (5.4.6.3) for an ideal site.

5.4.6.1 NSA Tolerance. The ?4 dB tolerance in 5.4.6.1 includes instrumentation calibration errors, measurement technique errors, and errors due to site anomalies. These errors are analyzed in ANSI C63.6-1988 [3], wherein it is shown that the performance of a well-built site contributes only 1 dB of the total allowable tolerance.

# INFORMATION PERTAINING TO EQUIPMENT MANUFACTURED AFTER COMPLIANCE TESTING

It is prudent that manufacturers have an established Quality Assurance program to spot check their products on a periodic basis, either based upon time or quantities produced. Obviously, a change in the engineering design should be sufficient justification for a re-test.

The Quality assurance test need not be formal Verification or Certification such as required during the initial production of the product. However, it should be sufficient in scope to assure that the EMI characteristics of the product have not changed to the degree that the product exceeds the FCC limits. If a new model of a product is produced, it must undergo full Verification or Certification testing and, in case of Certification, be filed with the FCC.

It is expected that the FCC will place greater emphasis and resources in spot checking commercially available products. If a product is found not to be compliant with the Limits specified in Part 15, Subpart B. the manufacturer will be subject to the appropriate penalties imposed by the Commission. The initial Certification or Verification is sufficient to justify initial production. The additional quality assurance testing performed is the manufacturer's responsibility to assure continued compliance.

# Appendix A


# FM 2-WAY TRANSMITTER

## Transmitter Operation

**1 - ARM/DISARM/PANIC Button** - To arm or disarm the system, press button 1. To activate the panic feature, press button 1 and hold for three seconds.

**2 - START Button** - To start the vehicle, press and hold button 2 for two seconds. To shut down the vehicle, press and hold button 2 for two seconds.

**3 - TRUNK Button** - To activate the trunk output, press and button 3 for two seconds.

**4 - AUXILIARY 2 Output** - To activate the **Aux. 2** output, press and hold button 4 for two seconds.

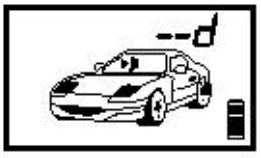
**5 - CONFIRMATION Button** - To check current status of the system, press buttons 2 & 3. The current status of the system will be displayed & illuminated on the transmitter.

## Transmitter Indications


**Arm** - The display will show icon and the animated icon to confirm arming. Lights will flash once.


**Shock Sensor** - The display will show Shock and flash the animated icon to indicate shock sensor triggering.


**Disarm** - The display will show and the animated to confirm disarming. Lights will flash twice.




**Door** - If a door is opened while the system is armed, the display will show --d .


**Trunk** - The display will show and flash this icon opening to confirm.

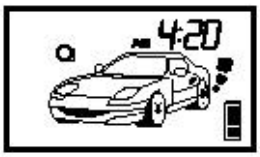

**Hood** - If the hood or trunk is opened while the system is armed, the icon will show and the lights will flash.


**Warn Away** - If the warning stage is triggered, the icon will flash.


**Panic** - The display will show PAN when the Arm/Disarm button is held to enter the Panic mode.

## Transmitter Indications Continued


**Start** -
The display will indicate the ignition is turned on and the engine is going to crank.

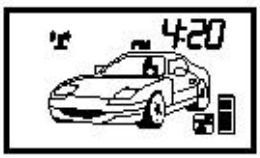



**Engine Run** -
When the engine starts and continues to run, the icon will be displayed, and the icon will remain displayed.


**Valet Mode** -
The display will show --U to confirm entering the Valet mode.

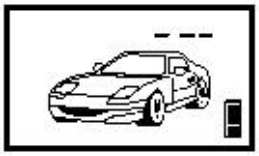

**Aux. 2 Output** -
The display will show 0-1 to confirm the Auxiliary 2 Output.


**Lock (Valet)** -
If the doors are locked with the transmitter in Valet mode, the display will show to confirm locking.



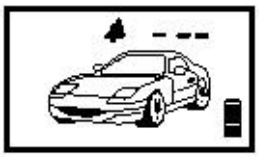

**Unlock (Valet)** -
If the doors are unlocked with the transmitter in Valet mode, the display will show the icon to confirm unlock.


**Low Battery** -
When the transmitter battery needs replacement, the display will flash the icon.



**Set Clock** -
Press and hold buttons 2 & 3 for 2 seconds. The transmitter will beep twice and the display will show ---. Change hour by pressing button 2; change minute by pressing button 3. Press button #5 (Confirm Status) to set. The transmitter will play a tune to indicate new time is set.

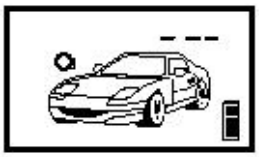
**Continue to hold buttons 2 & 3 to:**



**Set Alarm Clock** -
Press and hold buttons 2 & 3 until the transmitter beeps three times and the alarm clock icon ( ) appears. Confirm the same way as setting clock.

**Turning Off Alarm Clock** -
Press and hold buttons 2 & 3 until the transmitter beeps three times and the alarm clock icon appears. Press transmitter button 1. The icon will disappear and the alarm will be turned off.

**Continue to hold buttons 2 & 3 to:**



**Set Start Timer** -
Press and hold buttons 2 & 3 until the transmitter beeps four times and the fan icon ( ) appears. Set the start timer the same way as setting the clock. The fan icon will remain displayed when set.

**Turning Off Start Timer** -
Press and hold buttons 2 & 3 until the transmitter beeps four times and the alarm clock icon appears. Press transmitter button 1. The icon will disappear and the alarm will be turned off.