

INTERACTIVE TECHNOLOGIES INCORPORATED
DESCRIPTION OF MEASUREMENT FACILITIES

Measurements were performed at TUV Testing Services Open Test Site. A full description of the measurement facilities are kept on file by the FCC. TUV's acceptance and approval is dated as June 5th, 1996 in a letter received from the FCC.

TUV PRODUCT TESTING SERVICE
19035 WILD MOUNTAIN ROAD
TAYLORS FALLS, MN. 55084-1758

INTERACTIVE TECHNOLOGIES INCORPORATED

LABORATORY MEASUREMENTS

PART B

PREFACE

This device is a security transmitter. The device was placed on a .8 meter high platform, three meters from the receiving antenna. Peak emissions were found by varying the antenna height from one to four meters and rotating the device 360 degrees. Emissions were taken with both vertical and horizontal polarization's.

TEST NOTES

- 1) Bandwidth measurements were made in the peak mode, using a Hewlett Packard Spectrum Analyzer Model Number (70000).
- 2) Duty Cycle Correction Factors = $20 \log (t/T)$ Where t = Maximum time during any .1 second interval. T = .1 second
- 3) All emissions from 25 MHz were measured to the tenth harmonic were measured with an Hewlett Packard model 8566B Spectrum Analyzer.
- 4) Emissions below 1000MHz were measured with a 100 kHz bandwidth. Emissions above 1000MHz were measured with a 1MHz bandwidth.
- 5) Forbidden bands measurements were made at 1 meter distance.
- 6) Noise floor measurements. See AMBIENT LEVEL IN THE FORBIDDEN BANDS.

INTERACTIVE TECHNOLOGIES INCORPORATED

BANDWIDTH MEASUREMENT

15.205 (d) Bandwidth (see Test Notes). (.25% of Fundamental)

Spectrum Analyzer used: HP 70000

Spectrum analyzer skirt bandwidth (-20 dBm) 1KHz

FREQUENCY (MHz)	MEASURED BANDWIDTH @ -20dBm (KHz)	*ESTIMATED SIGNAL BANDWIDTH (KHz)	FCC BANDWIDTH LIMIT (KHz)
319.5	41	40	792

* Estimated Bandwidth = Measured bandwidth minus analyzer bandwidth

INTERACTIVE TECHNOLOGIES INCORPORATED

BANDWIDTH MEASUREMENT

13:54:32 JUN 15, 1998

RL 0.00 dBm

MR #1 FRQ 319.506 1 MHz

ATTEN 10 dB
10.00 dB/DIV

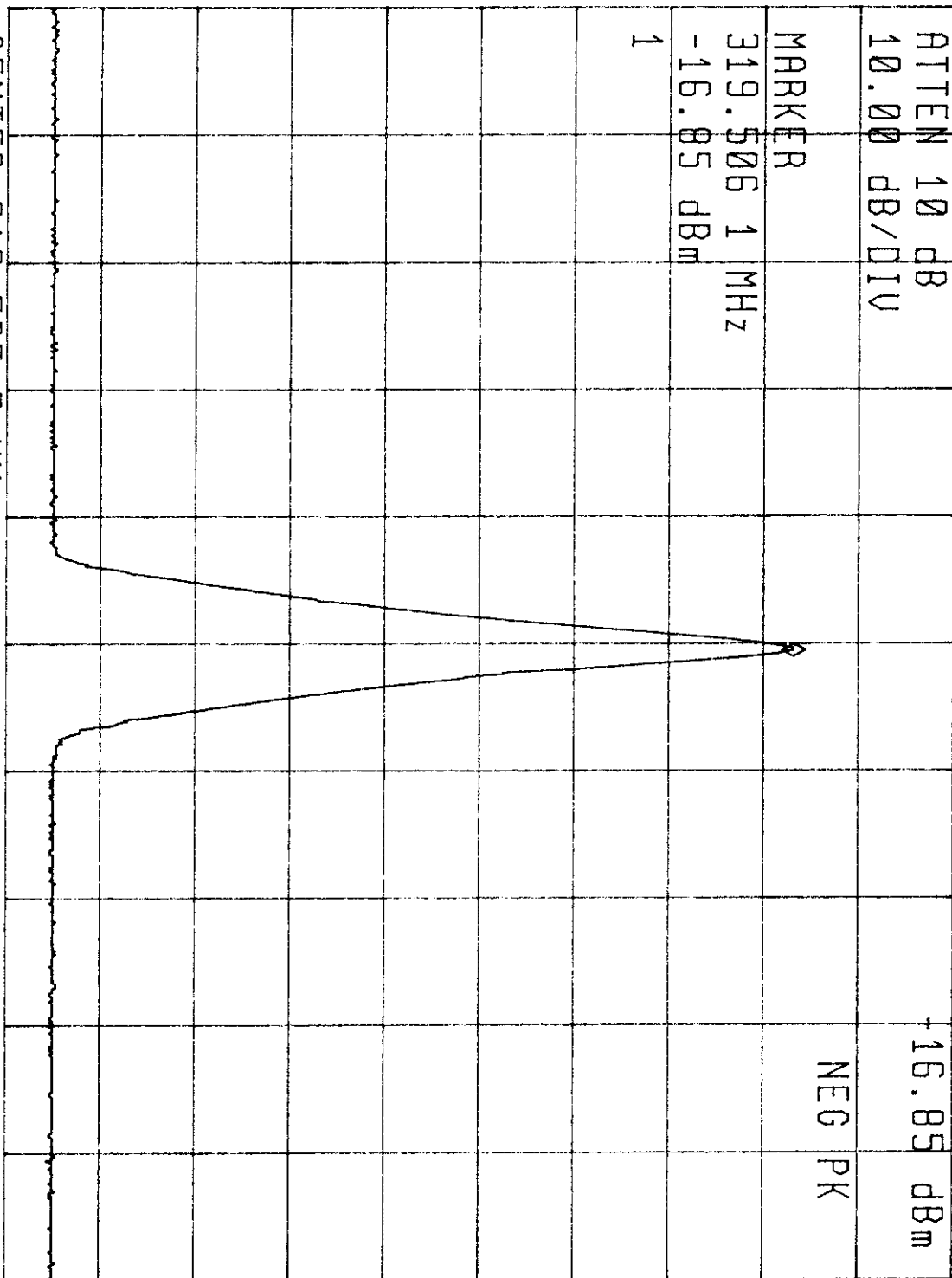
+16.85 dBm

MARKER

NEG PK

319.506 1 MHz
-16.85 dBm

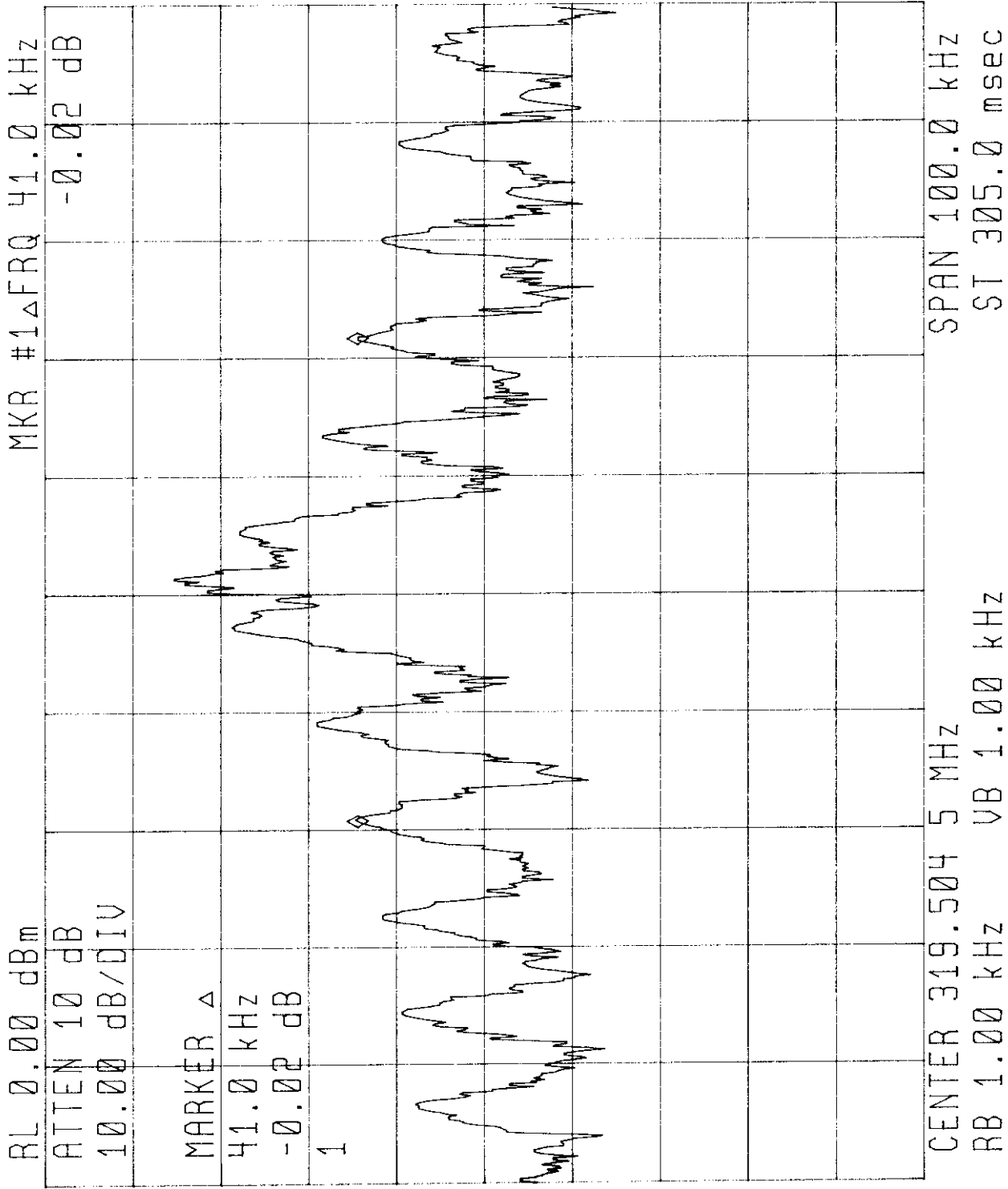
1



CENTER 319.505 5 MHz
RB 1.00 kHz VB 1.00 kHz

SPAN 100.0 kHz
ST 305.0 msec

13:32:17 JUN 15, 1998



INTERACTIVE TECHNOLOGIES INCORPORATED

BANDWIDTH MEASUREMENT

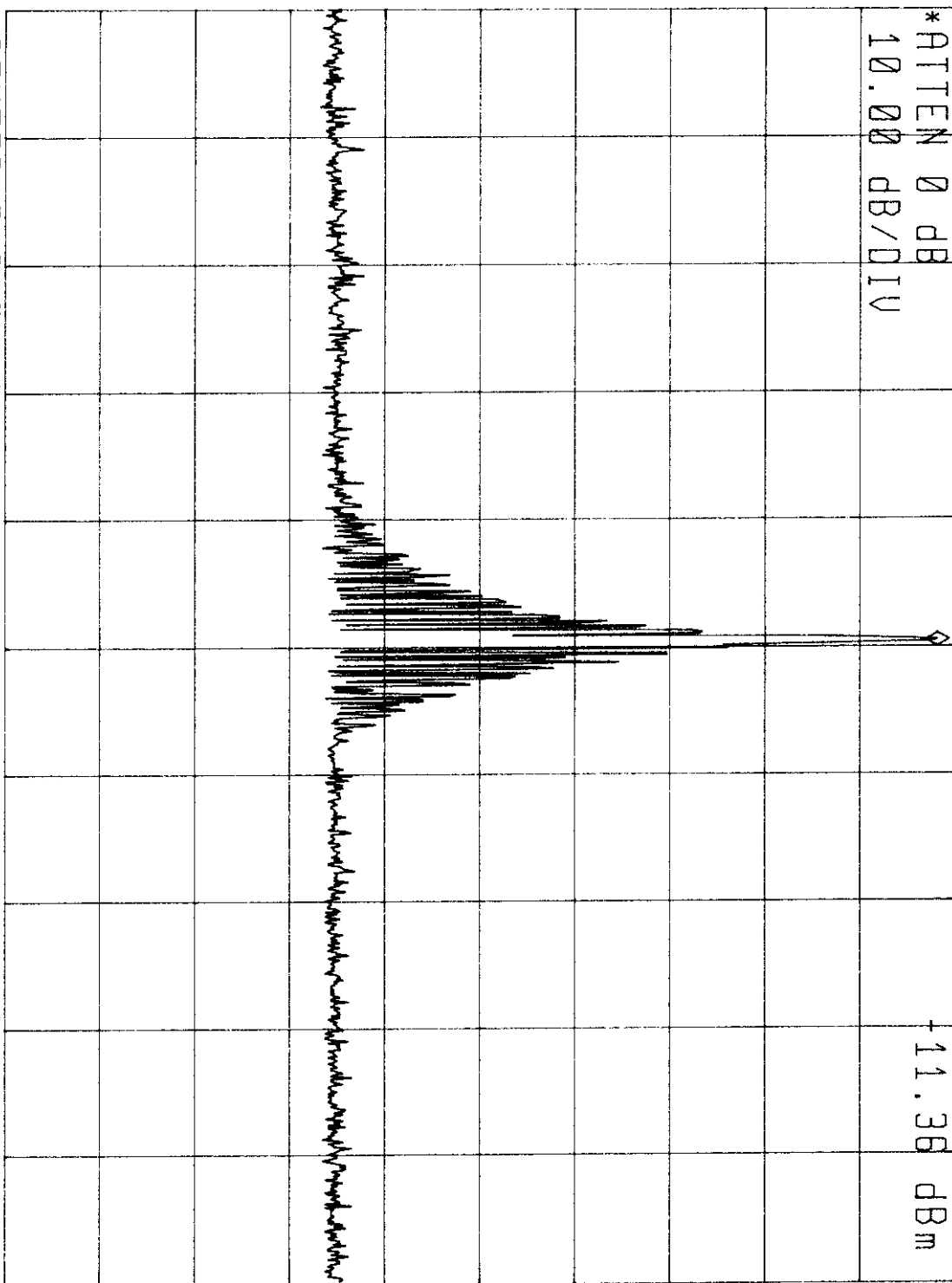
13:35:21 JUN 15, 1998

RL -10.00 dBm

MKR #1 FRQ 318.8 MHz

*ATTEN 0 dB
10.00 dB/DIV

+11.36 dBm



INTERACTIVE TECHNOLOGIES INCORPORATED

DUTY CYCLE CALCULATION

The Learnmode format transmission time varies from 19.8 milliseconds to 28.8 milliseconds. The maximum on time is 9.76 milliseconds. The interval between packets is 100 milliseconds. The maximum transmitted packets per each activation is 24, therefore the maximum transmission length is 23×100 milliseconds + 28.8 milliseconds or 2.328 seconds as per FCC Rules Part 15, Paragraph 15.231 (d). This device is not supervised.

The calculation for the “ Duty Cycle Correction Factor “ is as follows:

Three bit sequence defines the start of the packet. following the start sequence, all bits are either zero's or ones, with zero's being 244 microseconds high, 244 microseconds low and ones being 244 microseconds high, 488 microseconds low. High time for every bit is 244 microseconds. Total high time for 40 bit pattern is 9.76 milliseconds. Transmitting a packet every 100 milliseconds gives the maximum FCC Duty Cycle Correction Factor of 10% for our transmitter power allowance.

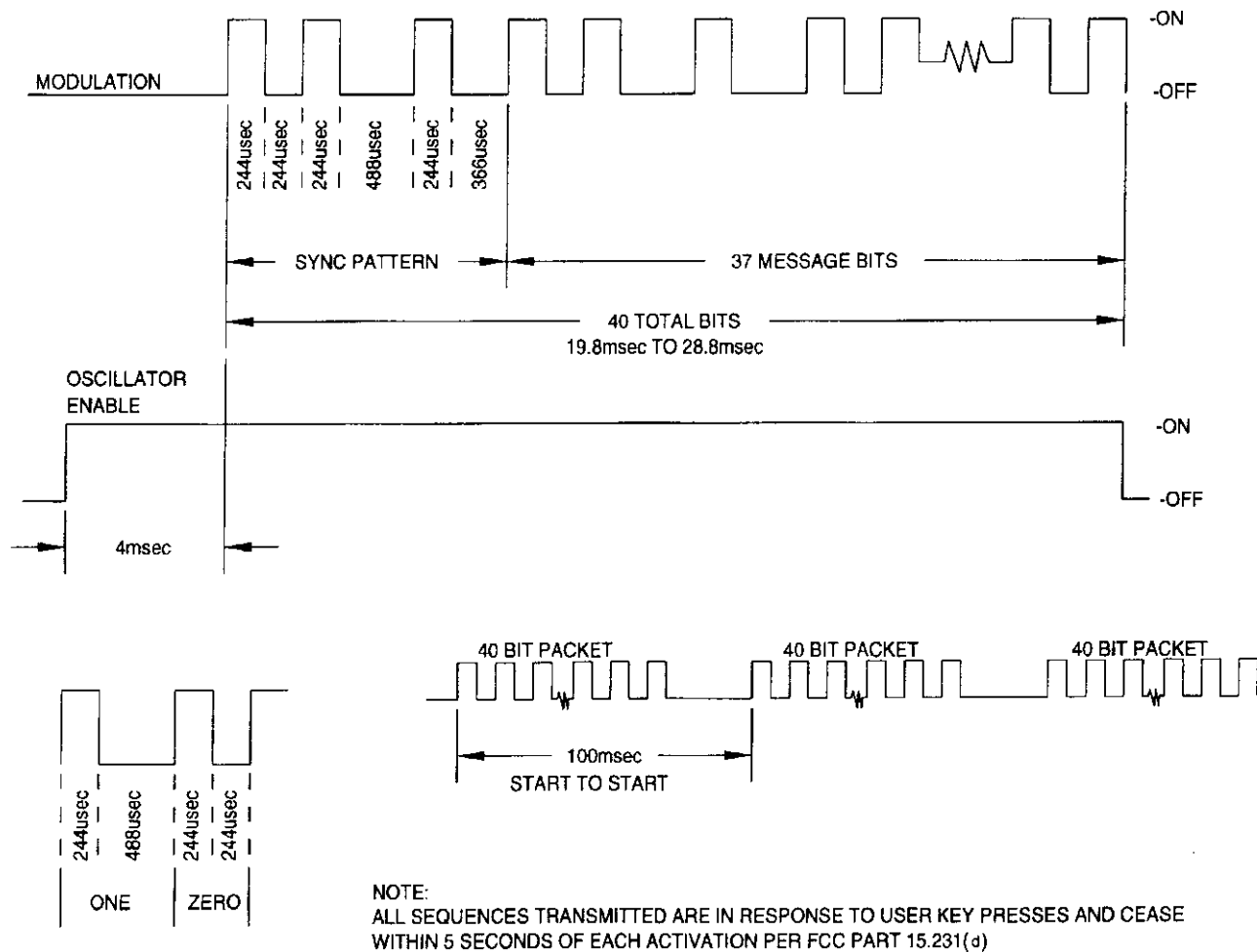
28.8 milliseconds Total Time

9.76 milliseconds Total On Time

$9.76 \text{ milliseconds TOTAL ON TIME} / 100 \text{ milliseconds} = .0976 \text{ (LOG) } \times 20 = -20.21\text{dB}$

NOTE: 20dB is the maximum allowable DUTY CYCLE CORRECTION FACTOR

INTERACTIVE TECHNOLOGIES INCORPORATED



TRANSMITTER MODULATION & TIMING

INTERACTIVE TECHNOLOGIES INCORPORATED

SINGLE PACKET
100 MILLISECOND PLOT

11:09:01 JUN 22, 1998

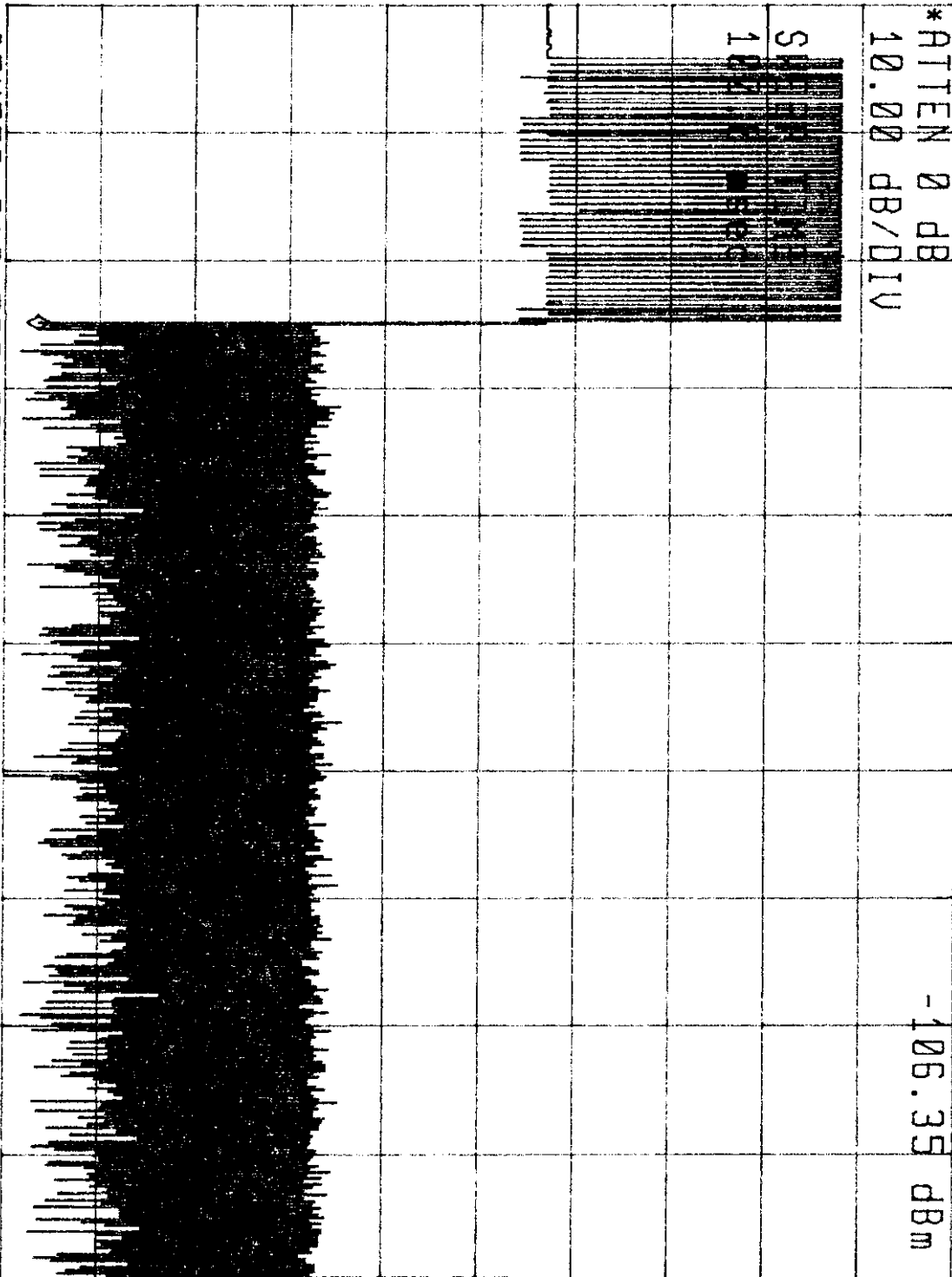
RL -10.00 dBm

MKR #1 SMT 25.00 msec

*ATTEN 0 dB
10.00 dB/DIV

-106.35 dBm

SPECTRUM
100 msec



CENTER 319.508 000 MHz
*RB 300 kHz VB 300 kHz

SPAN 0 Hz
*ST 100.0 msec

INTERACTIVE TECHNOLOGIES INCORPORATED

SINGLE PACKET

MAXIMUM ON TIME IS 9.76 MILLISECONDS

MAXIMUM POSSIBLE PACKET DURATION IS 28.8 MILLISECONDS

11:12:46 JUN 22, 1998

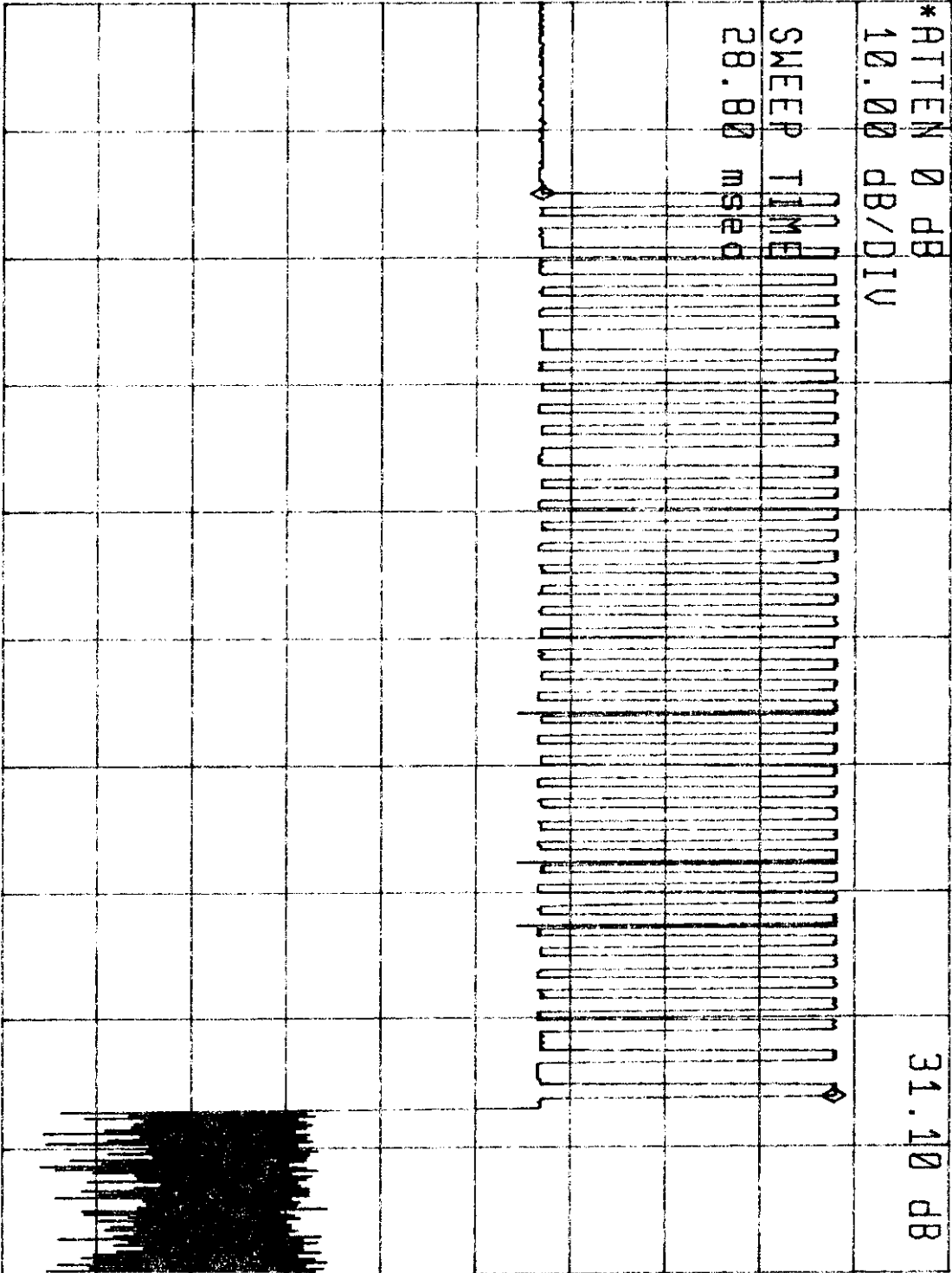
RL -10.00 dBm

MKR #1 Δ SMT 20.45 msec

*ATTEN 0 dB
10.00 dB/DIV

31.10 dB

SWEEP TIME
28.80 msec



CENTER 319.508 000 MHz

SPAN 0 Hz

*RB 300 kHz VB 300 kHz

*ST 28.80 msec

INTERACTIVE TECHNOLOGIES INCORPORATED

A COMPLETE TRANSMISSION OF EIGHT INDIVIDUAL ALARM ACKETS

1) **INTER MESSAGE TIME DELAY** - Measured from the leading edge of one message packet to a leading edge of the following message packet. This time is 100 milliseconds. The transmission duration will never exceed 2.328 seconds in accordance with 15.201 (d).

