

FCC ID: AEK981049R

## **I. INTRODUCTION**

This measurement report is submitted in support of an Application for Certification in accordance with Part 2, Subpart J and Part 15, Subpart B (effective 6/23/89) of the Federal Communications Commission's Rules and Regulations.

The equipment under test (EUT) is a ***superregenerative*** receiver which decodes commands from a separate handheld transmitter. This receiver operates at a fixed frequency within the band from 49.82 to 49.90 MHz and is powered by one 6.0 volt battery. The EUT is identified as the PYTHON Receiver (FCC ID:AEK981049R). Operation under the transition provisions of Paragraph 15.37 is not requested for this device. The measurements contained in this report demonstrate compliance with the limitations in effect since 6/23/89.

## **II. INFORMATION REQUIRED FOR CERTIFICATION**

### Paragraph(s)

2.1033(a) This application for certification is filed on FCC Form 731 with all questions answered. An application fee of \$350 is attached.

2.1033(b)(1) The full name and mailing address of the manufacturer of the device and applicant for certification is:

Taiyo Kogyo Co., Ltd.  
No. 1-23-17, Higashiyotsugi  
Katsushika-ku, Tokyo  
Japan

**FCC ID: AEK981049R**

- (2) The FCC Identifier of the device is AEK981049R.
- (3) A copy of the installation and operating instructions to be furnished to the user, or a draft copy of such instructions, is included in the exhibits section of this application.
- (4) This device is a superregenerative receiver powered by one 6.0 volt battery. It is designed to operate on a fixed frequency in the band 49.82 to 49.90 MHz.
- (5) A block diagram of the device is included in the exhibits section of this application. Schematics are also provided in the exhibits section of this application. No IFs are involved.
- (6) A report of measurements is included with this report.
- (7) Photographs of this device showing its general appearance, the FCC Label and its placement are included in the exhibits section of this application.
- (8) This equipment is a stand-alone unit. No peripherals or accessories are involved.
- (9) Certification under the transition provisions of Paragraph 15.37 is not being requested for this device.
- (10) N/A.

### **III. GENERAL TEST CONDITIONS AND PROCEDURES**

Measurement procedures were used as outlined in MP-1, as specified in Part 15.31, except as noted herein. The open field tests were performed on a three-meter range maintained by Carl T. Jones Corporation at the Springfield facility. Complete description and measurement data for the site have been placed on file with the Commission. Carl T. Jones Corporation is listed by the FCC as a facility available to do measurement work for others on a contract basis. Prior to open-field testing, the equipment was placed in a shielded enclosure and scanned at a distance of 1 meter to determine its emission characteristics.

#### **IV. RADIATED EMISSION MEASUREMENTS**

The receiver was assembled on a rotatable wooden test stand approximately one meter in height. The receiver's antenna was fully extended. Because of the superregenerative nature of the receiver, an unmodulated rf signal was transmitted to it during testing in order to insure proper functionality. The emission spectrum was examined from 30 MHz to 1000 MHz using a Hewlett-Packard 8568B spectrum analyzer and Compliance Design "Roberts" tuned dipole antennas.

At each emission frequency, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to determine the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarizations. The spectrum analyzer's 6 dB bandwidth was set to 100 kHz. The analyzer was operated in the CISPR quasi-peak detection mode for measurements of all emissions less than 1000 MHz. No post-detector video filters were used. The EUT was investigated in three orthogonal planes. There were no detectable emissions observed during the EUT's initial scan. Test Results: THE EUT complied with the FCC Limits.

**Note: *SEE ENCLOSED INITIAL FREQUENCY SCAN SPECTRAL PLOTS.*** Seven spectral plots are included. The spectral plots are:

1. Ambient - CW carrier on, EUT Off (RBW = 10kHz)
2. CW carrier on, EUT on (RBW = 10kHz)
3. Ambient - CW carrier on, EUT off (RBW = 300Hz).
4. CW carrier on, EUT on (RBW = 300Hz)
5. Spectrum at  $2 f_o$ , CW carrier on, EUT on (RBW = 100kHz)
6. Spectrum at  $3 f_o$ , CW carrier on, EUT on (RBW = 100kHz)
7. Spectrum through  $10 f_o$ , CW carrier on, EUT on (RBW = 100kHz)

The actual field intensity in decibels above one microvolt per meter (dB $\mu$ V/m) is determined by algebraically adding the measured level in dB $\mu$ V, the antenna factor (dB), and the cable loss (dB) at the appropriate frequency.

$$FI_a \text{ (dB}\mu\text{V/m)} = FI_m \text{ (dB}\mu\text{V)} + AF \text{ (dB)} + CL \text{ (dB)}$$

$FI_a$  = Actual Field Intensity

$FI_m$  = Measured Field Intensity

AF = Antenna Factor

CL = Cable Loss

As a sample calculation, assume a particular device emits a signal with a frequency of 49.96 MHz. The received signal level is measured as 4.0 dB $\mu$ V. The total attenuation factor (antenna factor plus cable loss) for 49.96 MHz is 4.7 dB. The actual radiated field is calculated as follows:

$$4 \text{ dB}\mu\text{V} + 4.6 = 8.6 \text{ dB}\mu\text{V/m}$$

In no case did the radiated emissions exceed the limits specified in Paragraph 15.109(a) of the Commission's Rules.

#### **V. POWER LINE CONDUCTED EMISSIONS MEASUREMENTS**

Measurements of the power line conducted emissions were not performed since the EUT has no means for connection to the public utility power grid.

**TABLE 1  
FIELD STRENGTH  
RADIATED EMISSIONS DATA SHEET**

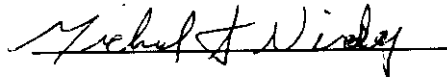
| EMISSION<br>FREQUENCY<br>(MHZ) | ANTENNA<br>POLARITY<br>(H,V) | EMISSION<br>LEVEL<br>(dBuV) | ANTENNA<br>FACTOR<br>AND<br>CABLE LOSS<br>(dB) | EMISSION<br>LEVEL<br>(dBuV/m) | FCC<br>LIMIT<br>(3 METERS)<br>(dBuV/m) |
|--------------------------------|------------------------------|-----------------------------|------------------------------------------------|-------------------------------|----------------------------------------|
| ~49.86                         | H&V                          | <4.0                        | 4.7                                            | <8.7                          | 40.0                                   |

**Limits specified in Quasi-Peak, data reported in Peak.**

**Note: The only detectable emissions are shown in the attached spectral plots. They were located around the CW carrier (~49.86 MHz) using 10 kHz RBW. These emissions were not detectable on the open-area-test-site to a level well below 20 dB below the limit.**

CLIENT: TAIYO KOGYO  
FCC ID: AEK981049R  
MODEL: PYTHON  
TEST DATE: 06/26/98  
TEST ENGINEER: MICHAEL A. NICOLAY

SIGNATURE:

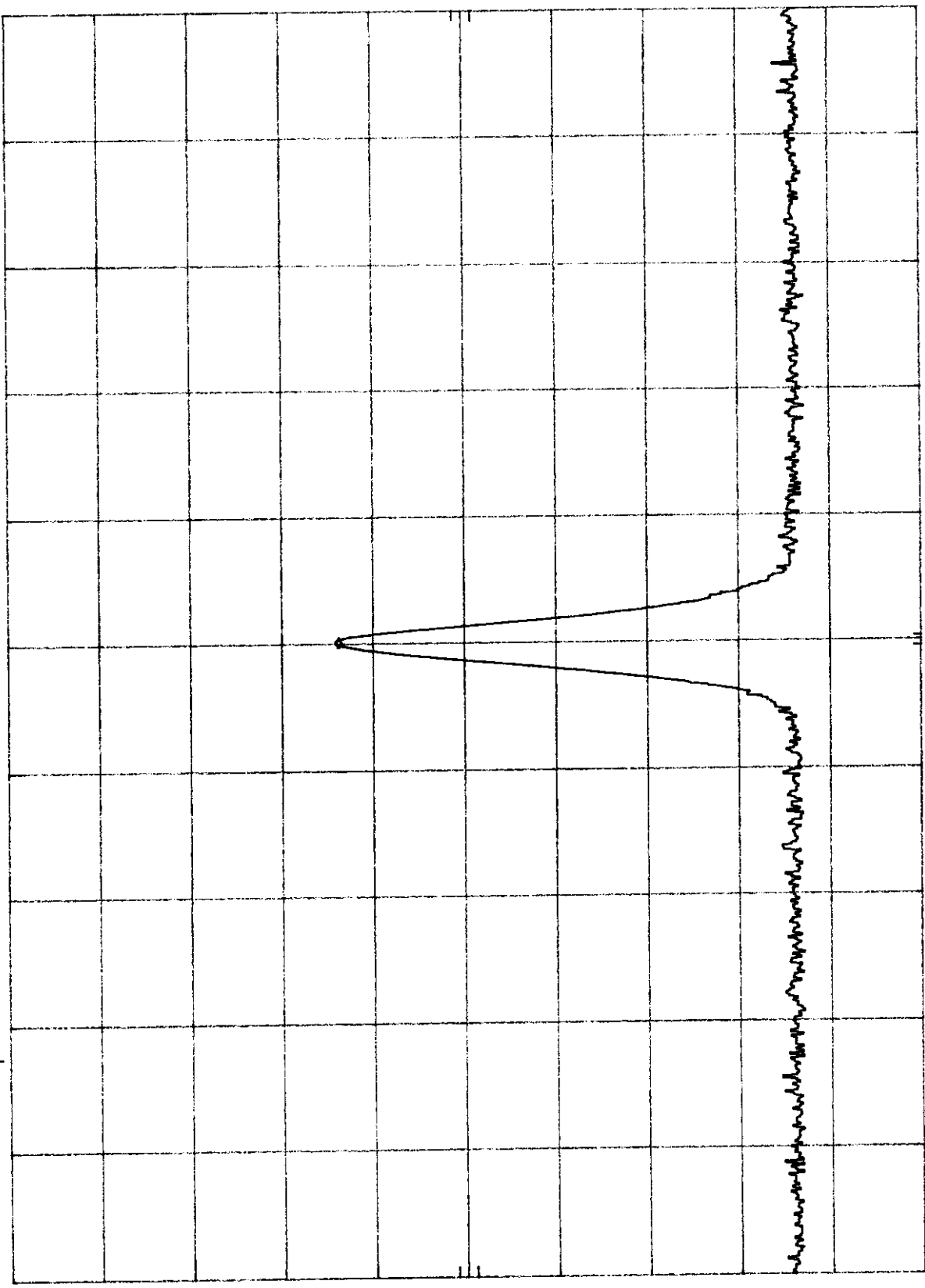


**Exhibit 5**  
**Spectral Plots**

h<sub>p</sub> CW CARRIER ON  
REF 107.0 dBμV  
10 dB/

ATTEN 10 dB

MKR 49.860 MHz  
70.80 dBμV



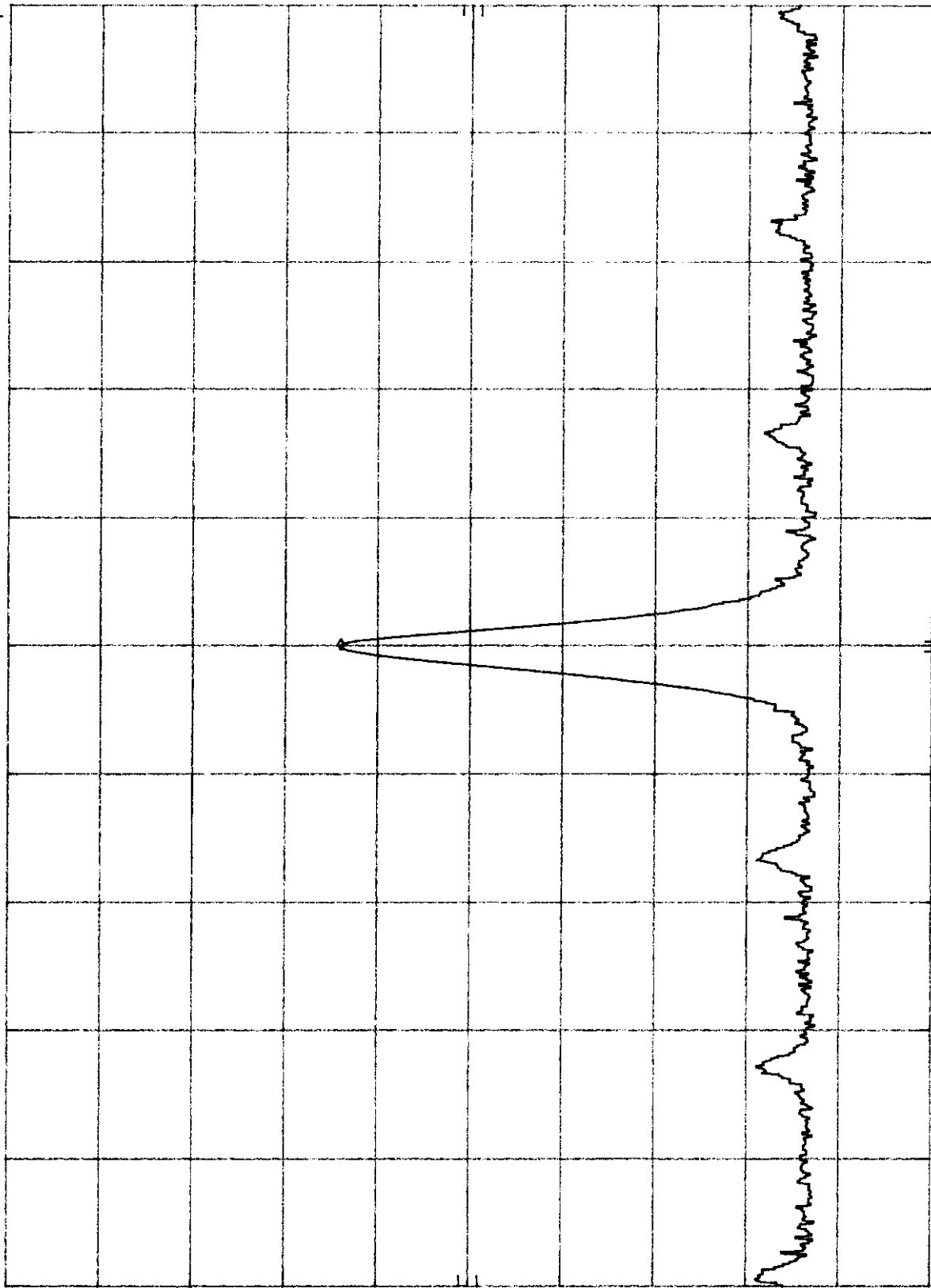
CENTER 49.860 MHz  
RES BW 10 KHz  
SPAN 1.000 MHz  
SWP 30 msec

VBW 1 MHz

EUT ON/CW CARRIER ON  
REF 107.0 dBμV ATTEN 10 dB  
MKR 49.862 MHz  
71.00 dBμV

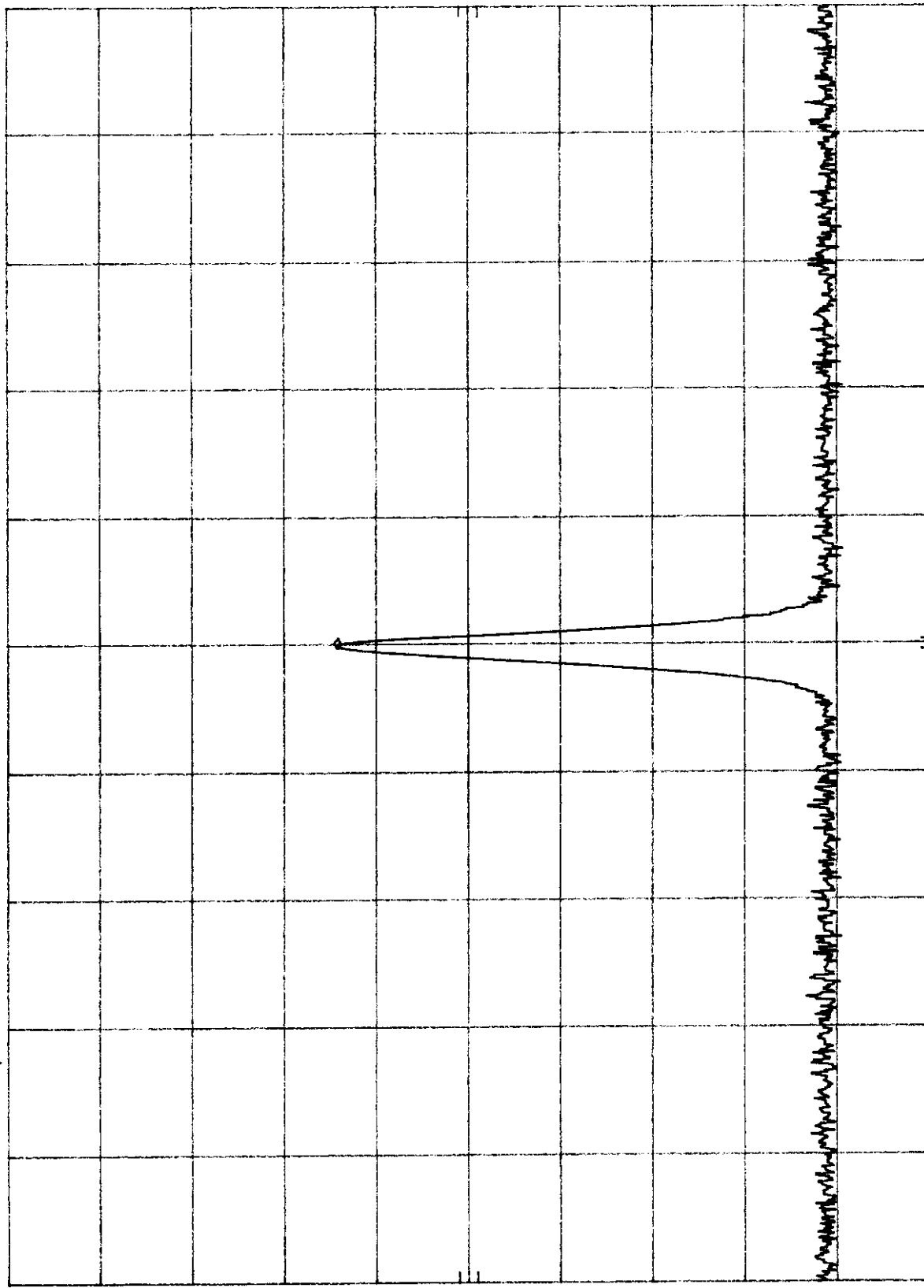
HP

10 dB/



CENTER 49.862 MHz  
RES BW 10 KHZ  
SPAN 1.000 MHz  
SWP 30 msec  
VBW 1 MHz

h<sub>p</sub> CW CARRIER ON MKR 49.86010 MHz  
REF 107.0 dBμV 71.20 dBμV  
ATTEN 10 dB

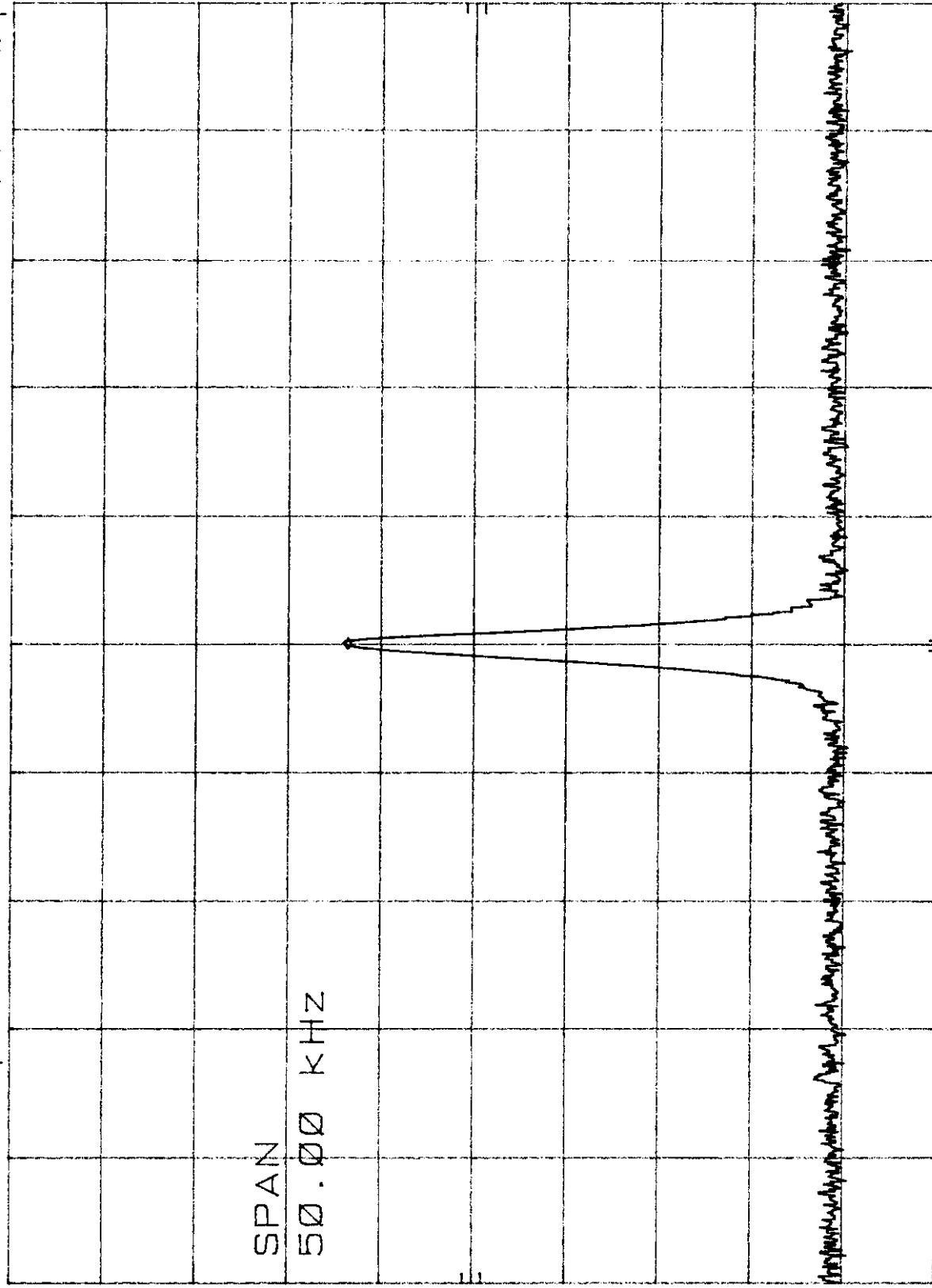


CENTER 49.86010 MHz  
RES BW 300 Hz  
SPAN 50.00 kHz  
SWP 1.0 sec  
VBW 1 MHz

MKR 49.86000 MHz  
70.60 dBμV

79

1088/



CENTER 49.86000 MHZ  
RES BW 300 HZ

VBW 1 MHz

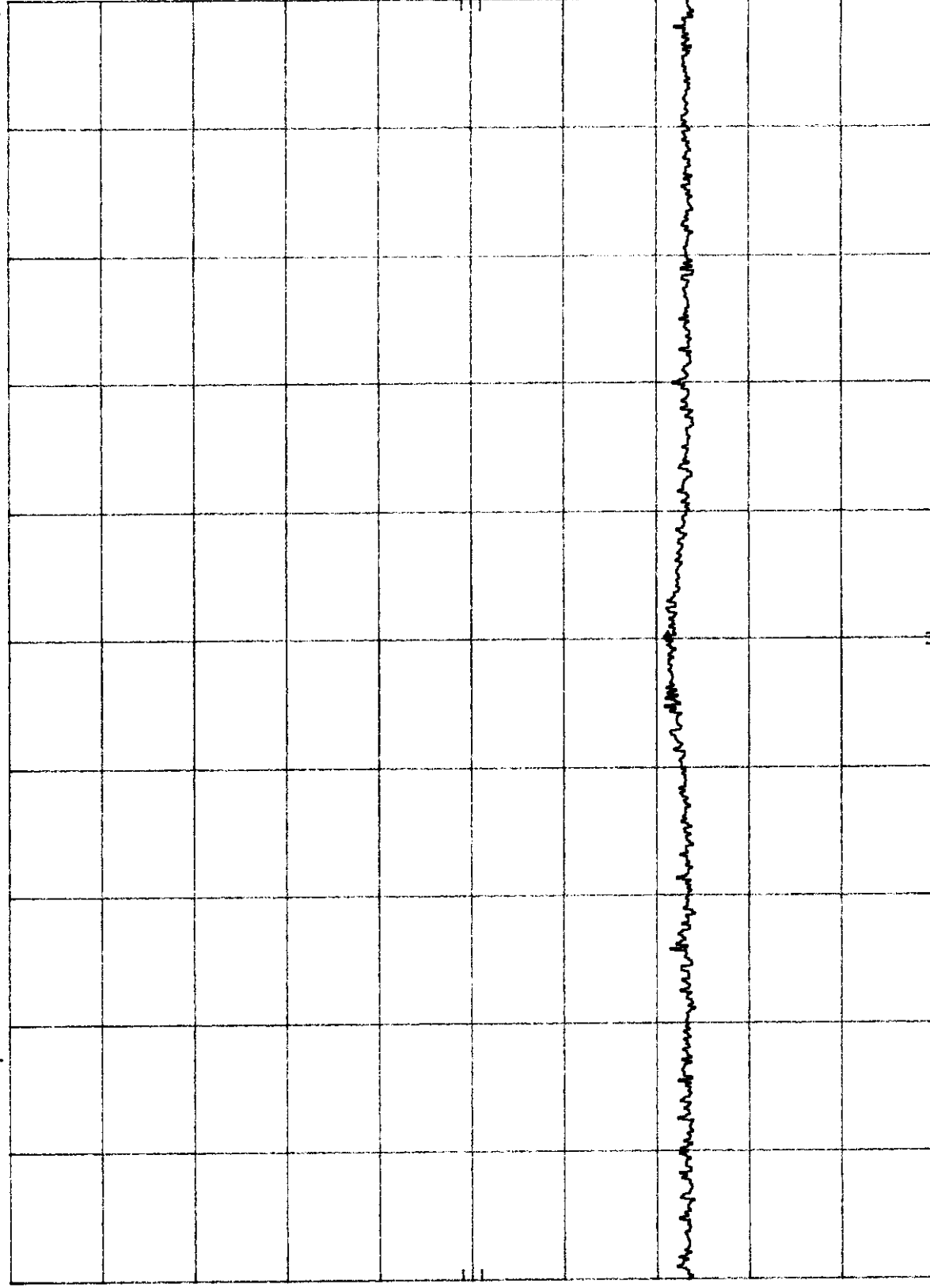
SPAN 50.00 KHZ  
SWP 1.0 sec

2f0 / CW CARRIER ON  
REF 107.0 dBμV ATTEN 10 dB

MKR 99.721 MHz  
35.80 dBμV

HP

10 dB/



CENTER 99.720 MHz

RES BW 100 kHz

VBW 1 MHz

SPAN 1.000 MHz

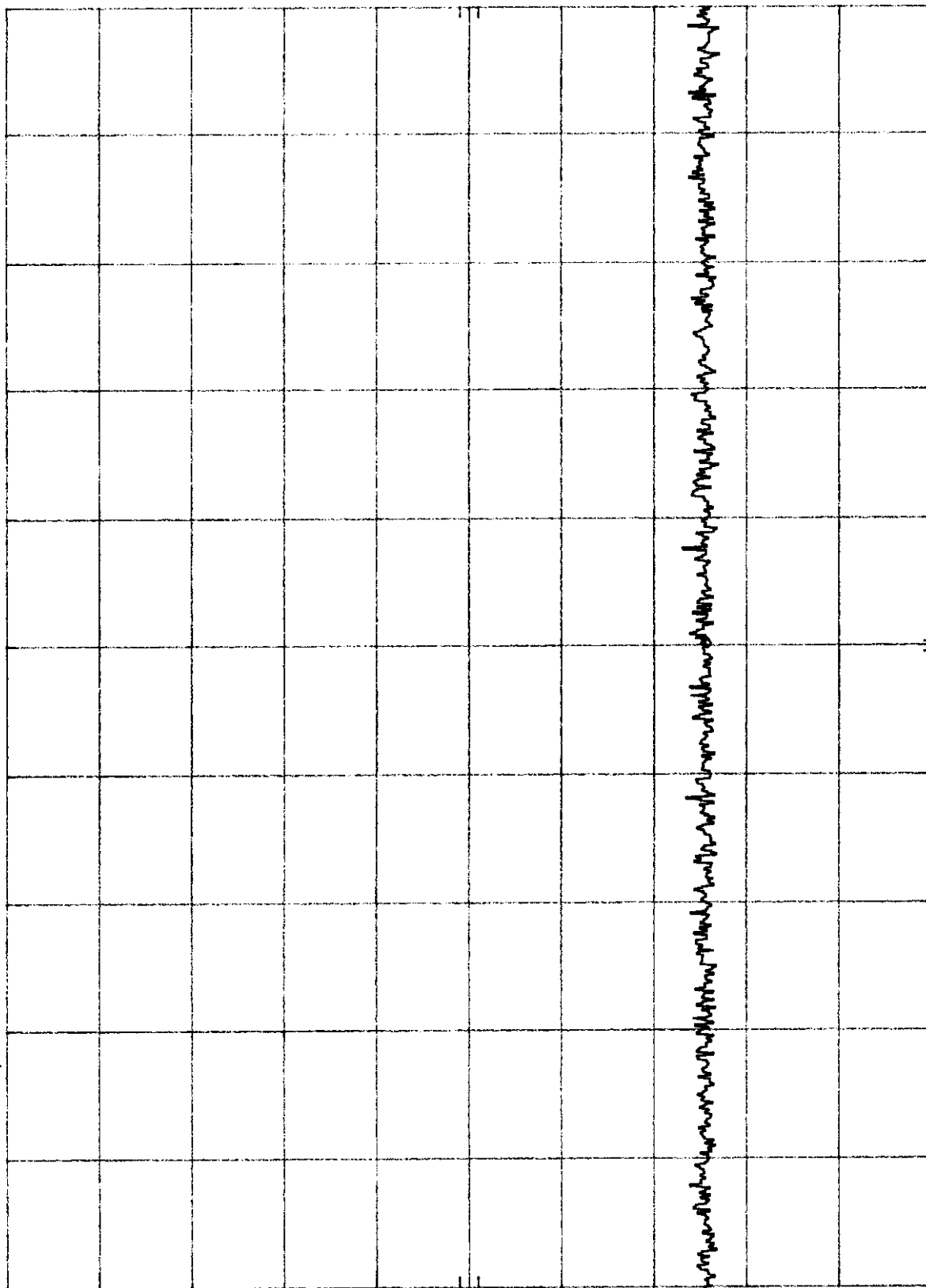
SWP 20 msec

3fo / CW CARRIER ON  
REF 107.0 dBμV ATTN 10 dB

MR 149.581 MHz  
31.20 dBμV

hp

10 dB/



CENTER 149.580 MHz  
RES BW 100 KHz

SPAN 1.000 MHz  
SWP 20 msec

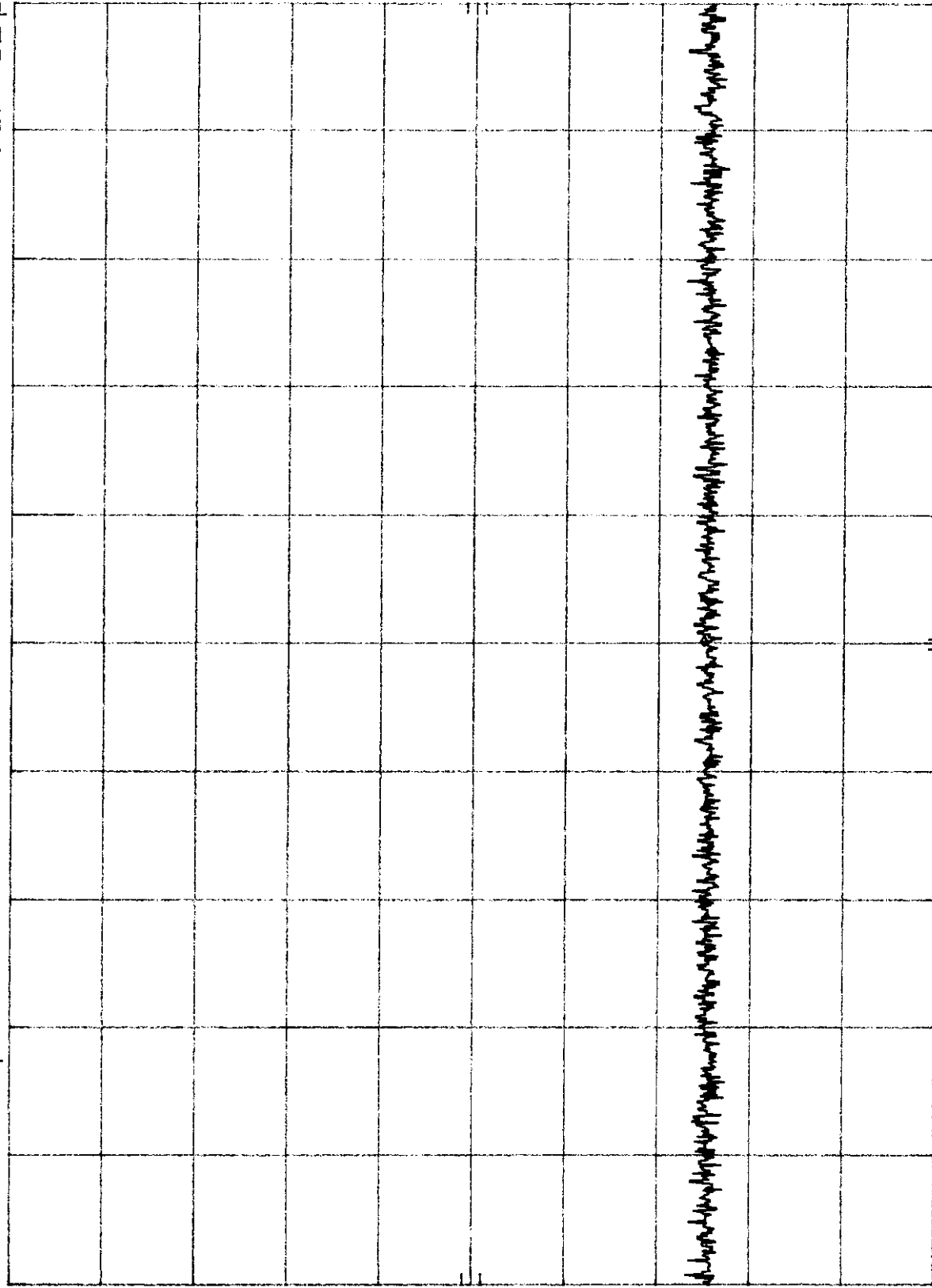
VBW 1 MHz

THROUGH 10fo / CW CARRIER ON  
REF 107.0 dBμV ATTEN 10 dB

MKR 325.4 MHz  
32.10 dBμV

HP

10 dB/



START 150.0 MHz

RES BW 100 KHz

VBW 1 MHz

STOP 500.0 MHz

SWP 100 msec

**EXHIBIT 6**  
**TEST EQUIPMENT USED FOR FCC COMPLIANCE TESTING**  
**BY CARL T. JONES CORPORATION**

| <u>MANUFACTURER</u> | <u>DEVICE</u>          | <u>MODEL NUMBER</u> | <u>QUANTITY</u>     |
|---------------------|------------------------|---------------------|---------------------|
| Hewlett Packard     | Spectrum Analyzer      | 8568B               | 1                   |
| Hewlett Packard     | Quasi-Peak Adapter     | 8565OA              | 1                   |
| Hewlett Packard     | Spectrum Analyzer      | 141 T               | 1                   |
| Hewlett Packard     | RF Section             | 8555A               | 1                   |
| Hewlett Packard     | RF Section             | 8553B               | 1                   |
| Hewlett Packard     | IF Section             | 8552A               | 1                   |
| Tektronix           | Spectrum Analyzer      | 7L13                | 1                   |
| Electro-Metrics     | Spectrum Analyzer      | ESA-1000            | 2                   |
| Hewlett Packard     | Frequency Counter      | 5245L               | 1                   |
| Hewlett Packard     | Frequency Converter    | 5253B               | 1                   |
| Hewlett Packard     | Pre-Amplifier          | 8447E               | 2                   |
| Hewlett Packard     | Signal Generator       | 8656B               | 2                   |
| Hewlett Packard     | Signal Generator       | 606B                | 1                   |
| Boonton Electronics | Signal Generator       | 102B                | 1                   |
| Boonton Electronics | Power Meter            | 42B                 | 1                   |
| Tektronix           | Oscilloscope           | 475                 | 1                   |
| Marconi Instruments | AM/FM Modulation Meter | TF2300              | 1                   |
| Compliance Design   | 20 MHz-1000 MHz        | AntennasRoberts     | <sup>tm</sup> 1 Set |
| Solar Electronics   | 50 Microhenry LISN     | 8028-50-TS-24-BNC   | 1                   |
| Solar Electronics   | 50 Microhenry LISN     | 8012-50-R-24-BNC    | 2                   |