

# MWR-100 Microwave Receiver Horn

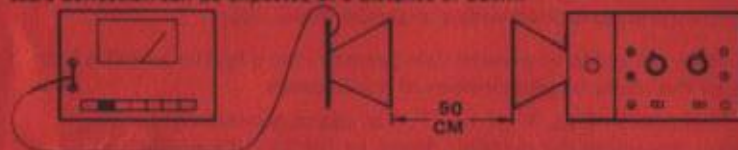


## Introduction

The MWR-100 Microwave Receiver Horn utilizes a very sensitive detector diode (1N833) which is attached to a horn and thus acts as a high gain receiver for the MWG-103. The unit is designed to operate in conjunction with the solid state Gunn diode of the MWG-103 Microwave Generator and will increase the maximum sensitivity of the received signal at distances greater than one meter.

## Operation

The MWR-100 is plugged directly into the SRM-100 Six Range Meter. The ground side of the double banana plug is marked and should be mated with the black binding post of the meter. On the 100µa range of the meter, full scale deflection can be expected at a distance of 50cm.



If greater sensitivity is desired, use the amplifier to multiply the generated signal. At a gain setting of 100 and at a distance of 100 cm full scale deflection can be expected on the 2 volt scale.

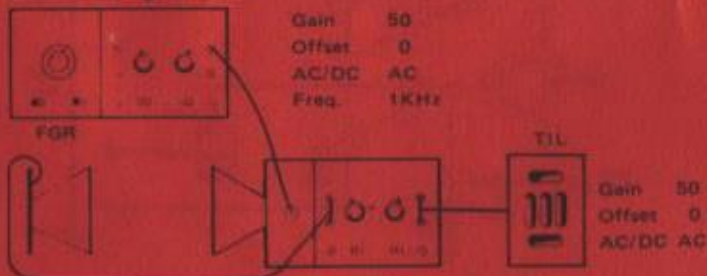


## Specifications

The sensitive microwave receiver diode is diode protected against signal overload when the receiver horn is placed directly in front of the Microwave Generator. It is also protected against an electrostatic charge by the use of a clear coating on the circuit board acting as an insulator and a capacitor to absorb the charge.

If the receiver diode becomes twisted on the circuit board then the sensitivity may decrease. If this should happen, move the leads of the diode until maximum sensitivity is attained.

The MWR-100 may also be used when the MWG-103 is amplitude modulated as shown in the figure.



# MWG-103 Solid State Microwave Generator





## Introduction

The microwave plug-in incorporates a solid state Gunn diode.

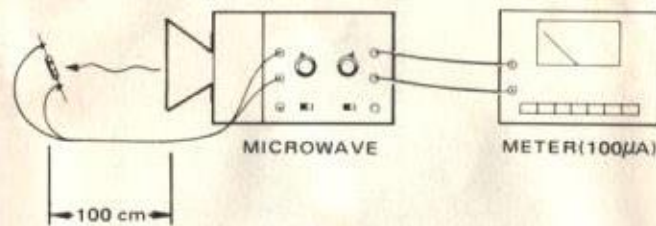
The unit has no warm-up time, requires no high voltage (12V max.) runs cool (40°C), and has a long life. The frequency of oscillation is designed to be 10 gigahertz (a wavelength of 3.0 cm.).

## Operation

The MWG-103 plugs into the connector on the left hand side of the APS-101, Amplifier Power Supply utilizing the 18vdc and the 6vdc reference to drive the Gunn diode. The Gunn diode is mounted in a flange which is placed in front of a shorted piece of waveguide.

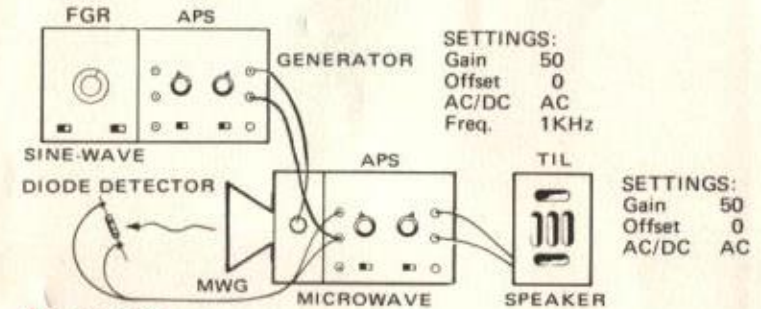
A sensitive glass covered diode probe is used to detect the microwave signal. This diode, a MA40204, (our MWD-103), is cut to approximately 1/2 wavelength for maximum detection. The MWD-103 will detect the microwave signal generated by earlier microwave models (MWG-100) (MWG-101) (MWG-102).

The signal detected by the diode may be read directly on a 100 $\mu$  amp meter, (SRM-100). At 5 cm. from the leading edge of the microwave horn a signal of 100 $\mu$ a can be expected. For greater sensitivity, use the amplifier to multiply the signal generated by the diode. At 100 cm. and using a gain setting of 50, full scale deflection on the 100 $\mu$ a range can be expected. At a gain setting of 100 and at a distance of 100 cm. .25 volts can be expected on the 2 volt scale. The setup would be as shown below:



SETTINGS:  
Gain 100  
Offset 0  
AC/DC DC

The unit is modulated by inserting a sine wave signal at the red jack on the MWG-103 front panel. Do not exceed 15V peak-to-peak at this input. The setup for modulation is as shown below:



## Accessories

- Double Slit Attachment - An aluminum clip, with two slits about 1/2 wavelength wide and approximately two wavelengths apart which fits over the horn on the microwave generator. This unit enables the performance of Young's interference experiment with microwaves. (Reference our FIL-100E on Measuring Microwave Wavelengths performed with our earlier MWG-100).
- Rake - A series of parallel bars pressed into a holder suitable for use in the study of polarization of microwaves.
- Reflectors - 2 ea. 4", 1 ea. 1". For use in generating standing waves, mounting the detector diode, or for Lloyd's mirror experiment.

## Specifications

RF Power Output : 25 mw minimum, 10.525 gigahertz  $\pm$  25 mhz  
Modulation Requirements: 1Vpp for maximum modulation

## Schematic MWG 103

