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# NASA TECH BRIEF



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## Detector Measures Power in 50 to 30,000 GHz Radiation Band

### The problem:

To develop a broadband power measuring detector for electromagnetic radiation in the 50 to 30,000 GHz (6 mm to 10 micron) band.

### The solution:

An assembly employing a matched pair of detectors which incorporate thin-film radiation absorbers.

### How it's done:

Each of the two detectors in the assembly consists of a thin-film radiation absorber mounted on a dielectric substrate in close thermal contact with a thermistor bolometer element. The detectors are matched electrically and thermally to compensate for ambient temperature variations when operated in a balanced Wheatstone bridge circuit. In tests on an experimental model, the detector assembly exhibited the following characteristics at 70 GHz:

Responsivity	240 volts/watt
Minimum detectable signal	$10^{-8}$ watt (approx. 1 sec)
Dynamic range	50 db ( $10^{-8}$ to $10^{-3}$ watt)
Output voltage	(Linear with respect to input power)

### Notes:

1. The detector is effective with either coherent or incoherent radiation.
2. Inquiries concerning this invention may be directed to:

Technology Utilization Officer  
 Electronics Research Center  
 575 Technology Square  
 Cambridge, Massachusetts 02139  
 Reference: B66-10581

### Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

Source: M. T. Wang and F. R. Arams  
 of Airborne Instruments Laboratory,  
 Cutler-Hammer, Inc.  
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