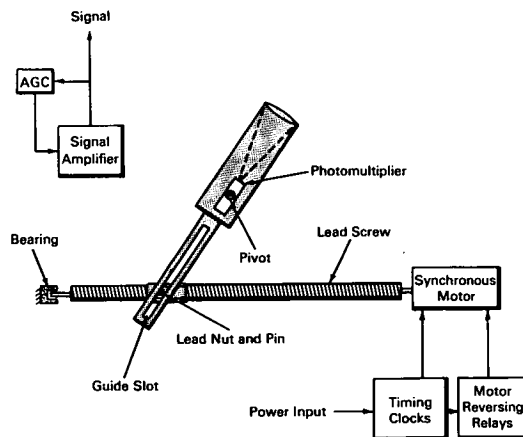
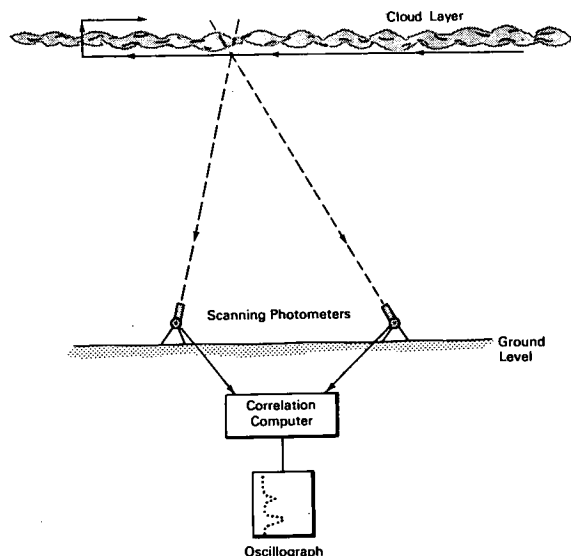


# NASA TECH BRIEF



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## Scanning Photometer System Automatically Determines Atmospheric Layer Height



### The problem:

To determine the height of nonuniform luminous layers above the earth, such as clouds or airglow. Present systems use a vertical beam of modulated light whose reflection is seen by a telescope and photocell located a discrete distance from the light source. Separate calculations are required to determine the height of the reflection and scanning is not automatic.

### The solution:

A pair of photometers, placed a given distance apart, that scan the luminous layers in a synchronous manner. Photometer outputs are correlated by a simple analog correlation computer to automatically give luminous layer height.

### How it's done:

The photometers are placed a distance apart determined by the height of the layers to be investigated and are mechanically driven so that the point of intersection of their fields of view moves in a horizontal line. After completing one scan, they move to a higher level and scan again. Scanning is repeated up to the maximum desired height.

As shown in the right-hand figure, each photometer is caused to move about its pivot by motion of the lead nut along the lead screw and motion of the pin in the guide slot. The photometers are driven by identical synchronous motors so that the intersection of their fields of view moves in a horizontal line at con-

(continued overleaf)

stant speed. At the end of each scan the motors are reversed.

To raise the scan height, either the left motor is run for a short period to pivot its photometer to the left, or the right motor to pivot its photometer to the right. To lower the scan height, either motor is run for a short period to bring its photometer's field of view directed more towards the other instrument.

**Notes:**

1. This system could be used to determine visibility ceilings at airports.

2. Inquiries concerning this innovation may be directed to:

Technology Utilization Officer  
Manned Spacecraft Center  
Houston, Texas, 77058  
Reference: B66-10170

**Patent status:**

No patent action is contemplated by NASA.

Source: Milo Wolff  
of Massachusetts Institute of Technology  
under contract to  
Manned Spacecraft Center  
(MSC-245)