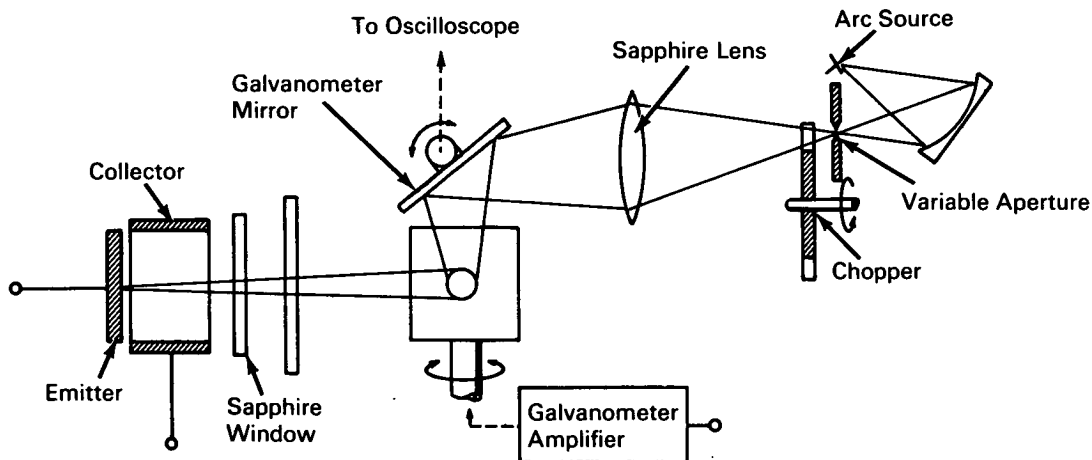


# NASA TECH BRIEF



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## Photoelectric Scanner Makes Detailed Work Function Maps of Metal Surface



**The problem:**

To develop a scanning device that will make detailed work function maps of a metal surface in equilibrium with cesium vapor, and be capable of use over a range of surface temperatures.

**The solution:**

A photoelectric scanning device that maps the work function of a metal surface by scanning it with a light spot and measuring the resulting photocurrent.

**How it's done:**

In the photoelectric scanning device the position of the light spot is synchronized with that of an oscilloscope beam spot whose intensity is modulated by the photocurrent. The pattern on the oscilloscope, as the light spot scans the emitter surface, results in bright spots corresponding to low work function and dark spots to high work function areas. The scanner is also capable of measuring the surface work function directly by fixing the light spot on a selected portion of the emitter and measuring the work function by standard photoelectric techniques.

The photoelectric scanning device consists of the following four subsystems: optical; electronic scanning; photocurrent detection and amplification; and test cell and emitter assembly. The optical subsystem is illustrated.

**Note:**

Inquiries concerning this innovation may be directed to:

Technology Utilization Officer  
 Jet Propulsion Laboratory  
 4800 Oak Grove Drive  
 Pasadena, California 91103  
 Reference: B66-10440

**Patent status:**

No patent action is contemplated by NASA.

Source: Ned S. Rasor  
 of Thermo Electron Engineering Corp.  
 under contract to  
 Jet Propulsion Laboratory  
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Category 01