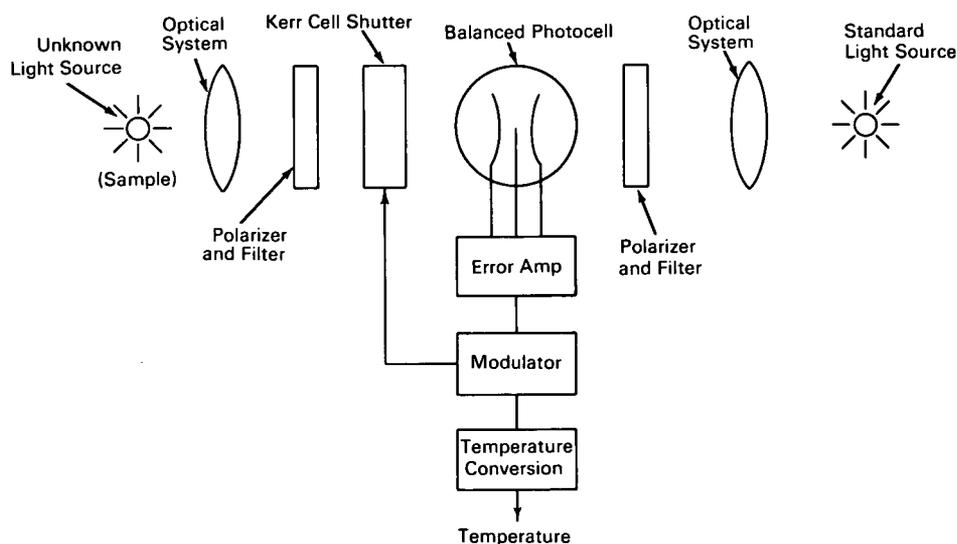


NASA TECH BRIEF



NASA Tech Briefs are issued by the Technology Utilization Division to summarize specific technical innovations derived from the space program. Copies are available to the public from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia, 22151.

Nulling Pyrometer Uses Kerr Cell Shutter for Fast Response



The problem: For measuring very rapid temperature changes in a sample, conventional pyrometers using mechanical shutters do not respond rapidly enough.

The solution: A pyrometer system that uses a Kerr cell in place of a mechanical shutter plus the addition of polarizers to the filters.

How it's done: A commercially available photocell consisting of a matched pair of elements in a single envelope forms the sensing element in the system. The output of the two elements is fed to an error amplifier which generates a signal proportional to the difference in intensity between the sample and the standard source. This error signal is used to modulate the Kerr cell shutter to adjust the amount of light reaching the photocell from the sample. The amount of modulation required to match the sample and the standard is

proportional to the temperature of the sample and a conversion stage supplies a direct temperature readout.

Notes:

1. This system is capable of very rapid response as the Kerr cell is operable as a shutter up to 10^9 cycles per second.
2. Inquiries concerning this innovation may be directed to:

NASA Space Nuclear Propulsion Office
Technology Utilization Branch
U.S. Atomic Energy Commission Bldg.
Germantown, Maryland
Reference: B65-10050

Patent status: NASA encourages commercial use of this innovation. No patent action is contemplated.

Source: Westinghouse Electric Corporation
under contract to NASA Space Nuclear
Propulsion Office (NU-0010)
Category No. 01