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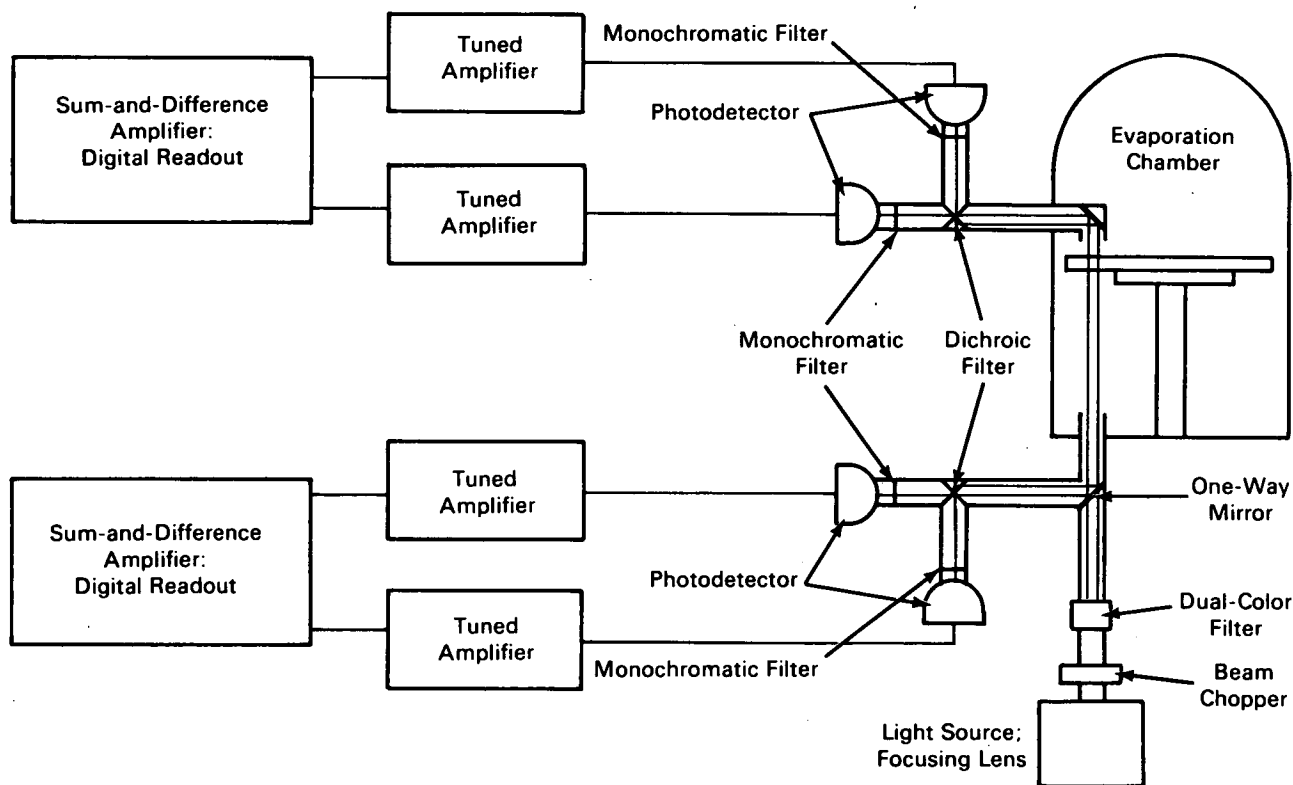
Brief 70-10658

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## Dual-Wavelength System Monitors Deposition of Films: A Concept



An improved dual-wavelength system (see fig.) monitors the fabrication of high-quality optical filters and other highly precise film deposition operations. Single-wavelength monitoring systems lack the required degree of accuracy. Dual wavelength systems were designed to generate the output signal of an element that would change rapidly at the point when the deposition process should change or stop.

A problem of earlier dual-wavelength systems was that multiple paths were needed for filtering and re-

combining the light beams for the various colors. Many of the components required critical optical alignment, and there was little assurance that both colors were monitoring the same area of the sample.

The new system eliminates these defects, and has the following advantages: (1) A stable light source is not necessary; minor variations are cancelled using a ratio test. This test between signals permits the determination of any point along the monitor curve. Exact  $1/4-\lambda$  positions can be noted from the difference

(continued overleaf)

signal, but extremely accurate filters are not needed. (2) Both transmitted and reflected light can be measured. (3) Incorporated filters must be measured exactly for peak transmission but need not be manufactured for a predetermined wavelength. (4) All monitoring light travels the same path simultaneously. (5) The requirements for the optical components are not restrictive.

The concept should be of interest to semiconductor products manufacturers and manufacturers of pigments used in spectrum-selective dyes for the pharmaceutical and chemical industries.

**Notes:**

1. This innovation is in the conceptual stage only; at the time of this publication no model or prototype exists.
2. No further documentation is available. Specific questions, however, may be directed to:  
Technology Utilization Officer  
Marshall Space Flight Center  
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**Patent status:**

Inquiries about obtaining rights for the commercial use of this invention may be made to:

Patent Counsel  
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