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Langley Research Center

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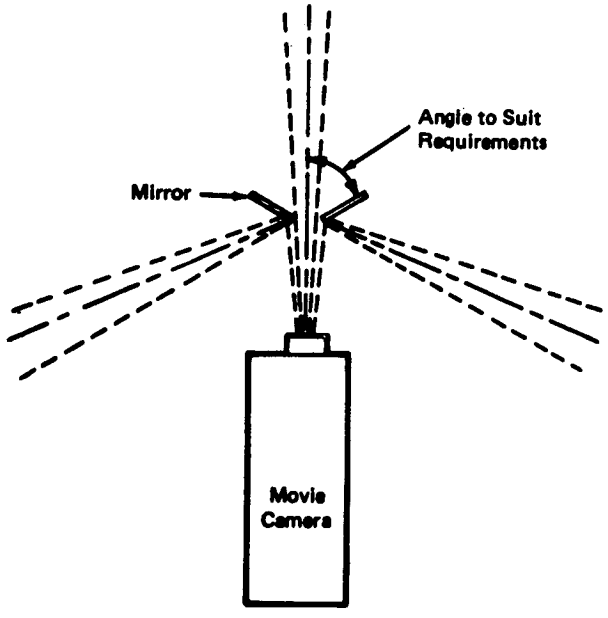
Optical Discriminator System

The optical discriminator system shown in the illustration includes a lightweight, inexpensive movie camera to record simultaneously the views from three different angles on the same filmstrip. A Langley Research Center model has been tested with this system mounted in the cabin area of a high-wing aircraft model, in a rearward-facing direction. Wingtip-mounted flow vanes were viewed through cabin windows and were reflected by the side mirrors to the camera lens. The tail area was seen through a pair of periscope-like mirrors.

The two first-surface mirrors used are ground to a beveled edge and are mounted in front of the movie camera lens with a narrow gap between them. Each mirror is tilted in such a manner as to reflect an image on one side of the filmstrip. The gap between the beveled edges of the mirrors permits the third image to be formed. As can be seen in the illustration, dimensions and angles are not critical and may be varied to meet individual requirements. The only limiting factor may be the desirability for the three viewing areas to receive similar light levels to allow best image discrimination.



Optical Discriminator System

This is essentially a noncritical system as it is adaptable to many applications requiring similar, but diverse, viewing areas. The mirrors are the most critical elements as it is necessary that they be good quality, first-surface mirrors which are ground to a sharp edge.

One specific application for the system is in light plane testing, where powered, small-scale, radio-controlled models are used in programs investigating stall/spin characteristics. For such testing, it is normally desirable to record in-flight data, measured at the model, of various separate areas. Specifically, flow vanes are used to illustrate angle/attack-yaw angles while pointers or direct viewing indicate positions of control surfaces. By strategic sizing and location of the side-looking mirrors, the aileron movement may be recorded on film simultaneously with the wingtip flow vanes.

Note:

No further documentation is available. Specific questions, however, may be directed to:

Technology Utilization Officer
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Hampton, Virginia 23665
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Patent status:

NASA has decided not to apply for a patent.

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