

Researchers at the University of Michigan Institute of Science and Technology have developed a powerful new aerial scanner which can now be used to focus on such problems as water pollution, wildlife movement, and glacial changes.

This scanner, which acts as an eyeball sensitive to ultra-violet, visible, and infrared radiation, has a combination of three qualities which distinguish it from previous remote sensors.

It is sensitive to 18 channels of radiation, while the eye is thought of as having only three color channels. It has quantitative calibration, and its outputs are electrical signals in a format which allows automatic computer processing of the spectral information from each scene point.

ALTHOUGH MANY aerial scanning devices are now in use, according to Marvin R. Holter, head of the ISTR's Infrared and Optical Sensor Laboratory (IROSL), "this is the most advanced scanner now available for nonmilitary uses. The challenge is to utilize efficiently for scientific purposes the vast amount of information available from the scanner."

IROSL researchers, under the direction of Donald Lowe, are exploring the potential of the 18-channel device with biologists, geologists, geographers, geophysicists, ecologists, and agriculturalists.

Among the possible suggested uses, which would be faster, more thorough, and conceivably less expensive than the ground sampling techniques now used, are:

- crop census taking
- plant disease detection
- plant productivity studies
- aerial soil surveys
- water pollution detection and mapping
- landform and rock type identification and mapping
- mapping of geothermal activities
- wildlife detection and census
- determining a heat budget of glaciers and identification and mapping of Great Lakes and sea ice.

INSTALLED in an airplane, the device produces a continual strip map picture of the ground passed over. The picture is produced by rapidly scanning individual "lines" and the image has the appearance of a television picture.

The scanner, more than three years in development and refinement, got a big test last fall when an IROSL group under the direction of Philip Hasell conducted an aerial survey around Pt. Barrow, on Alaska's Arctic coast.

The scanner gathered thousands of feet of imagery which are just beginning to be analyzed. The images are exceptionally clear and reveal information about the "arctic heat sink," ice packs and ice islands, and the contours of parts of the Arctic coast.

The data could not have been gathered with any other device in the format needed for electronic multispectral processing.

Last summer, while en route to this Arctic survey, the team conducted a survey of Yellowstone National Park. Data from this survey indicated some of the effects of ground temperature on vegetation.

A SURVEY OF Tennessee Valley Authority waters to determine the distribution pattern of warm water injected into the Tennessee River by generators for plants was also conducted by an IROSL group last summer.

E. J. Korvette

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