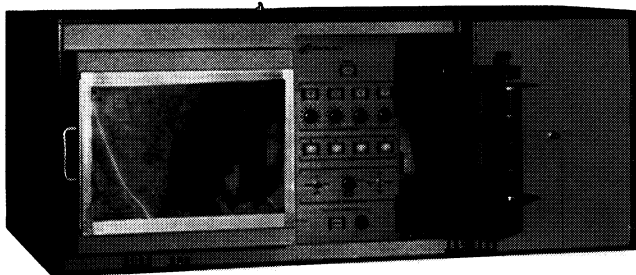
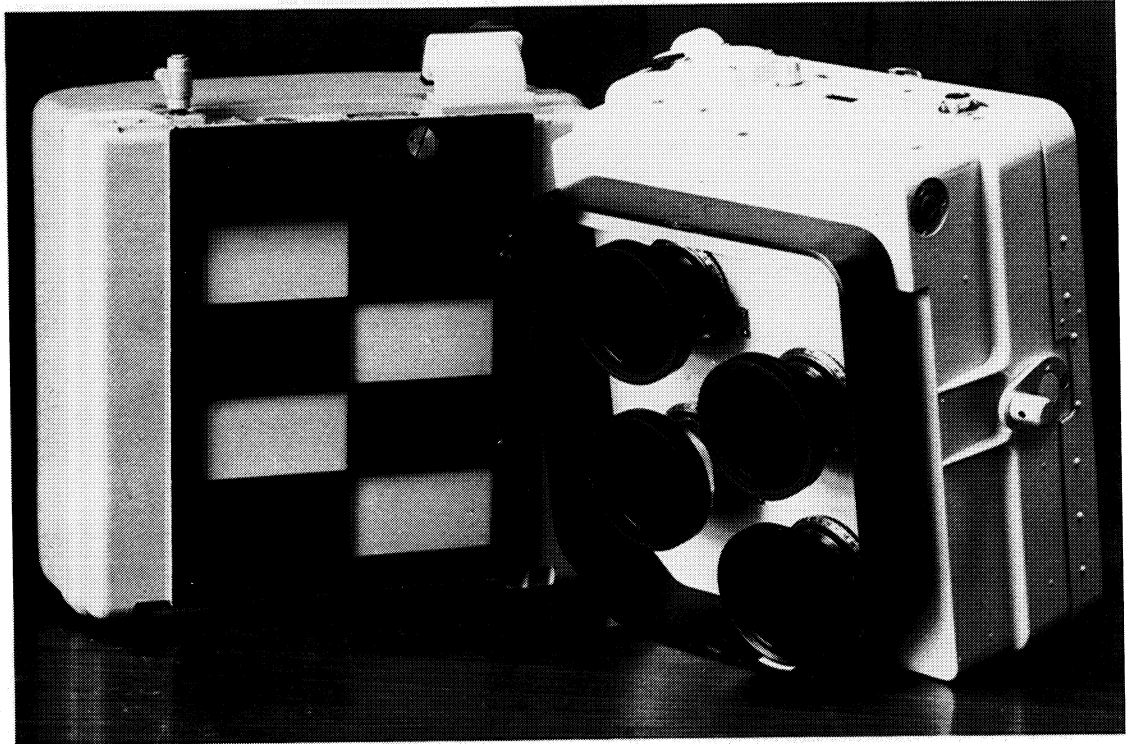


Multispectral Photography

Shown below is an advanced aerial camera capable of detecting subtle differences in Earth conditions not detectable by conventional aerial photography. Called the Model 11 Multispectral Camera, it was developed by Spectral Data Corporation, Hauppauge, New York. The camera provides optimum enhancement of a scene by recording spectral signatures of ground objects only in narrow, preselected bands of the electromagnetic spectrum. Its photos have application in such areas as agriculture, forestry, water pollution investigations, soil analysis, geologic exploration, water depth studies and camouflage detection.



Before an aerial survey begins, technicians first determine the spectral characteristics that distinguish the target object or condition. For example, a certain species of plant life exhibits a different signature from its surrounding environment because of its unique physiological properties. The difference is measured and plotted, enabling selection of the "information bands" of the spectrum which best contrast the target's signature with its background. Each of the camera's four lenses is fitted with a special filter and the lens/filter combinations are adjusted according to the target's spectral properties. The target scene is then simultaneously photographed in four separate spectral bands.

In the next step, Spectral Data employs a multispectral viewer—such as the company's Model 75 (opposite page below)—to create a color image from the black-and-white positives taken by the camera. With this optical image analysis unit, all four bands are superimposed in accurate registration and illuminated with combinations of blue, green, red and white light. The best color combination for displaying the target object is selected and printed.

An example of the end product is shown at right, an image made during a forest management study of how effective remote sensing systems can be in early detection of tree stress caused by Dutch elm disease. In the image, the reddish-brown trees are healthy; green trees are diseased but the damage cannot yet be detected visually; the blue trees show visually detectable signs of the disease. The Spectral Data system showed the best visual discrimination between healthy and diseased trees. In many cases, the imagery revealed indications of stress before it was visible to ground surveyors; further comparisons showed that multispectral photography could also be employed as a predictive tool.

Another example is an image (below) of an agricultural area which included opium poppy fields. Remote sensing of poppy growth is extremely useful in enforcing narcotics laws and controlling drug traffic; Spectral Data has successfully employed multispectral photography for this purpose internationally. This image shows a variety of crops in different colors; the gold or beige tones indicate opium poppy fields. In center photo (arrow) is an illicit poppy field (gold) which was cultivated in the middle of a rye field (red) for camouflage purposes at ground level.

Spectral Data produces several types of remote sensing equipment, including systems for plotting, interpreting and viewing data from aerial surveys or from Landsat satellites. The company also provides aerial survey, image processing and analysis, and a number of other remote sensing services.

