

a light source. For this reason, thermal systems can be used during the day or night. Thermal infrared radiation does not penetrate cloud cover, so thermal systems must be used under clear sky conditions or, sometimes, thermal imagery can be acquired by flying underneath an evenly overcast sky.

Aerial thermal infrared reconnaissance can be done using thermal infrared linescanners (IRLS) or forward-looking infrared (FLIR) systems. The two kinds of sensors are intended for different missions. Table 2 contrasts selection criteria for the two sensors.

FLIRs produce thermal images in a framed format, similar to that of a video camera (Figure 12). FLIR systems which are designed for reconnaissance missions have a sensor head mounted beneath the aircraft (Figure 13) which is pointed toward targets of interest by an operator inside the aircraft using a video display with a set of controls. A FLIR such as the Honeywell system shown in Figure 13 will cost approximately \$450,000.¹

Infrared linescanners use a rotating mirror with optics to direct radiation from a small ground surface area to a detector or detector array. The mirror rotates perpendicular to the line of flight so that with each cycle, a strip of ground normal to the flight direction is covered (Figure 14). The forward motion of the aircraft causes successive scan lines to cover adjacent strips on the ground, creating a two-dimensional image such as the one shown in Figure 15. The data may be displayed in near-real time on a display screen or on dry silver paper for the use of the sensor operator during the overflight. However, the data will likely be recorded on magnetic tape, or a similar storage medium, and

¹ Jeff Tracey, Intera Technologies Ltd. Personal communication.