

Infrared sensors are generally more complex and expensive than photographic systems. A FLIR will cost about \$450,000 and an infrared linescanner can be expected to cost about \$500,000.

Radar

Radar systems can acquire imagery in almost any atmospheric conditions: haze, smoke, cloud cover, or even light rain and snow. In some areas, radar might be the only way to acquire imagery. Image acquisition might have to be completed during a specific period or it might have to be done on an urgent basis. In either case, cloud coverage could be a serious problem unless an imaging radar system is available. Furthermore, radar can be used during the night or day since it is an active sensor, providing its own illumination.

These systems produce continuous strips of imagery of the terrain adjacent to the flight path of the aircraft. A radar is mounted on the aircraft, pointing to the side. The antenna acts as a transmitter as well as a receiver of microwave energy pulses. It alternates between illuminating terrain adjacent to the flight path of the aircraft with pulses of microwave energy and recording the echoes which return. Returns reflected from targets at different ranges arrive back at the antenna at different times.

Modern airborne imaging radars are mostly synthetic aperture radars (SAR). SARs use the forward motion of the aircraft to create the effect of an antenna hundreds of metres long and thereby providing resolutions on the order of a few metres. A synthetic aperture radar is a complex sensor and also expensive: a SAR will cost from \$5 to \$6 million; \$8 to \$10 million with a ground-based data processing station. The data is recorded and processed digitally. Real time imagery may be produced on dry silver paper or the data can be downlinked to a ground receiving station.