



**FHTET**  
Forest Health Technology Enterprise Team

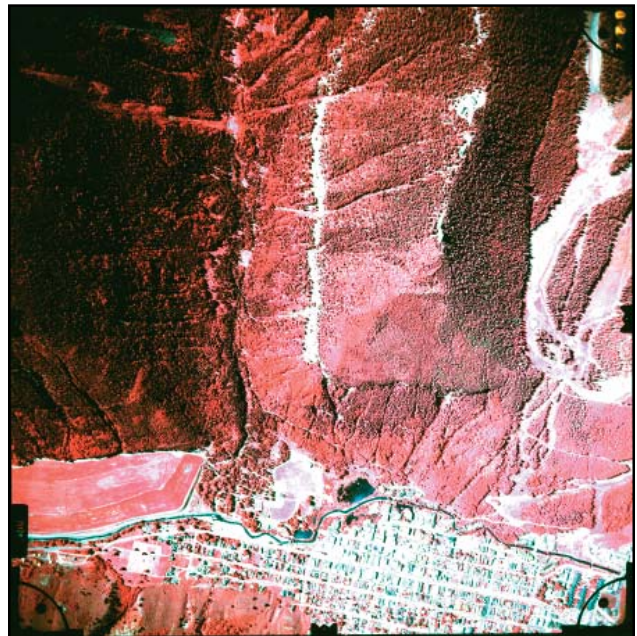
## REMOTE SENSING IMAGERY ACQUISITION SERVICES

PROVIDING TECHNOLOGY FOR FOREST HEALTH PROTECTION

The Forest Health Technology Enterprise Team - Fort Collins, Colorado (FHTET-FC) provides remote sensing and image analysis expertise and services in the detection, monitoring, and evaluation of forest health-related concerns. Services are provided on a cost-reimbursable basis to USDA Forest Service units, other federal agencies, and state entities.

### Aerial Imagery Acquisition

Aerial imagery acquisition is designed to provide high quality imagery to support forest health analysis and monitoring. FHTET-FC operates a Beechcraft King Air 100A aircraft, which is equipped with a 20-inch optical window camera port for use with a large-format film camera (9x9). A service ceiling of 23,000 feet above mean sea level allows for the collection of photography up to 1:30,000 scale. GPS is utilized for flight line navigation. Additionally, an automated position and orientation unit allows for near-realtime automated geo-referencing of acquired digital imagery. Services include mission planning, preparation of flight maps, acquisition of imagery, purchasing and processing of film, index map(s) of imagery coverage, and delivery of end products (film, photos, digital images) to the end-user.



Scanned infra-red aerial photograph:  
Telluride, Colorado.

### Equipment

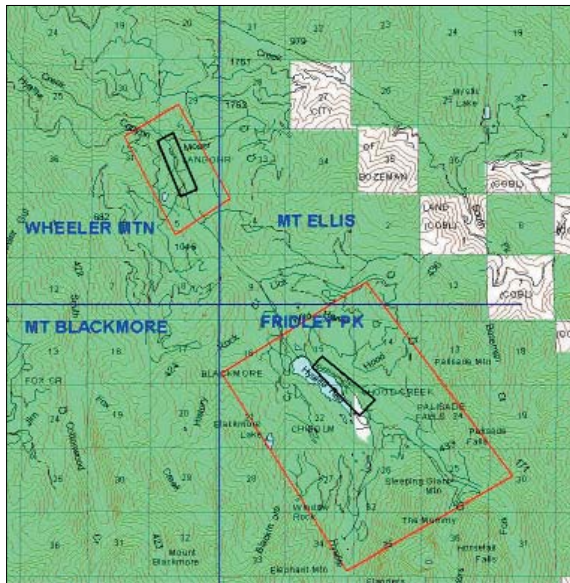
**Aerial Photography** – FHTET maintains two mapping camera systems: a Zeiss RMK A 21/23 mapping camera (9x9 inch film format) with an 8.25-inch focal length lens and a Zeiss RMK A 15/23 mapping camera with a 6-inch focal length lens. Collected photos can be scanned for digital applications. Aerial photography is best suited to mapping activities such as larger block coverage or sample blocks.

**Positioning and Orientation System** - The Applinix POS AV 310 system is a combination of a high-speed GPS unit, 3-axis gyroscope, and accelerometer. The system is mounted onto the camera system and the collected measurements are processed to achieve a position and orientation solution that can be utilized by image processing software to accurately geo-reference the imagery collected during the mission.

**Digital Color Infrared Camera** - A Kodak Proback 645 camera produces 16-megapixel color infrared images. These images are post-processed in 24-bit TIFF format, which can be orthorectified using the Applanix data using a technique known as “automated aerial triangulation”. The types of imagery coverage that can be acquired are: block area (wall-to-wall coverage), sample points/ground plots, and sample strips/transects. However, due to the small footprint, such imagery is recommended for small project areas.

**Epson 1640 XL Medium format scanner** – This scanner will scan 9x9 photos and transparencies (negatives/positives) at resolutions up to 1600 dpi. Though not photogrammetric quality, the resultant image is usable for most vegetation mapping needs.

### Mission Cost Estimates and Procedures

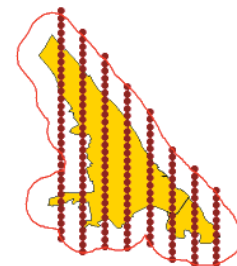


A mission request drawn on a map.

Due to the specific needs of individual missions, it is difficult to provide cost figures by line-mile, square-mile: costs vary greatly by scale/ground sample, imagery type, size and configuration of the project area, ferry time, and other factors.

The best planning procedure involves providing a map outline of the area(s) to be imaged and mission specifications. Electronic ArcView shapefiles are preferred; however, paper maps can be sent by either mail or facsimile. If mission specifications are unknown, the team can provide consultation on mission designs.

A cost estimate will be prepared and sent to the customer. As a federal unit, all costs associated with the imagery acquisition are



Planned flight lines over an area of interest.

chargeable to the benefiting function (charged-as-worked), just as any savings are passed on to the benefiting function. Once the customer agrees on cost and mission parameters, funds are transferred via an In-Service Agreement (ISA FS-6500-46). As much as possible, requests will be handled on a “first-come, first-served” basis.

### Delivery Timeframe

As with most imagery acquisition projects, the delivery timeframe is dictated by weather conditions. Scheduling of services is balanced by customer needs and prevailing weather conditions. Once imagery is collected, film is sent overnight for processing. Scanning and printing are dependent upon third-party schedules. Small projects can be completed in 1 to 2 weeks after actual imagery acquisition.

#### For more information contact:

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