



## Distributed Real Time Infrared (DRTI) and Fire Imaging Technology

**Background:** Forest Service and Department of Interior Fire and Aviation Management utilize aerial, space and ground based fire imaging and technology to support wildland firefighting operations and decision making. Development of advanced technology and increased expectations by agency end users is out pacing limited programmatic capability. Within wildland fire management, decision support requirements for fire imaging and technology have been insufficiently documented.

**Key Points:** Additional fire imaging and technology capabilities have become available within the agency, the military and private industry. The use of this technology cannot be supported without demand, decision support requirements or operational objectives, which would support innovation, developing technology, and broader use of fire imaging and technology systems.

This collaboration is intended to improve decision support through increased incident awareness and assessment, and facilitate strategic and operational use of current aircraft, systems and technology, and future innovation.

This collaboration is being conducted under an agreement between the Forest Service, Department of Defense (DoD), and the Air National Guard (ANG).

### **Capabilities and Operations:**

#### Mapping

DRTI line/perimeter mapping is resolved through a detailed sequence of points recorded by the sensor operator through the sensor viewfinder. Actual lines or perimeters must be subsequently interpreted and drawn through GIS processes. Given this, line/perimeter mapping is not a DRTI strength.

#### Detection

Point/spot detection in concert with high-resolution photographs make DRTI an effective detection tool. The high altitude, high speed flight characteristics of the RC-26 aircraft provide the ability to fly detection missions over broad geographic areas. Wireless transfer of data from the aircraft facilitates transfer of information to ground units.

#### Tactical

DRTI is a packaged product which provides overhead infrared (IR) video to frontline operators and near-real time perimeter maps to both frontline operators and ICP planners. Video will be downlinked by an Air National Guard (ANG) RC-26 flying above other aircraft operating in the Fire Traffic Area. Video will be received and displayed at the incident by ANG Joint Terminal Attack Controllers (JTACs). Video can be displayed anywhere on the fire – operators are mobile. Video range limited to approximately 26 miles, but perimeter maps may be delivered anywhere. Video can be displayed next to a moving map which graphically depicts where the sensor is looking, allowing users to rapidly glean where the observed fire behavior is occurring.



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- The high-resolution IR camera is capable of seeing through smoke, though not through most clouds. The sensor operates comfortably at 10,000 feet above ground level, well above other fire aircraft.
- The sensor is capable of multiple levels of zoom, enabling users to assess an area or observe specific fire behavior such as torching.
- Aircraft have a 4.5 hour sortie duration, including travel time. 1-2 missions per day can be flown based on crew and aircraft availability.
- Six JTACs are included in the DRTI package. They can be assigned to different Divisions (or the ICP) on the same fire, or can be split among several fires in the same geographic area.
- DRTI can provide shape files for the fire perimeter in near real-time to both frontline supported commanders and ICP planners.

Fire Applications / Considerations:

- Perimeter Detection. Use downlinked data to update previous perimeter maps, providing near-real-time situational awareness to both tactical (front-line) and operational (ICP) users.
- Fire Behavior. Use data to assess fire behavior in areas not observed/observable by ground or air firefighters.
- Strategy Development. Use data to identify and assess vegetative, terrain and man-made features which may be used as part of an indirect containment strategy.
- Spot / Line Penetration Detection. Use the data to identify fire outside of existing or planned lines.

Observations will be conducted from the air and the ground. An agency wildland fire liaison has been assigned to the DRTI Group and will be coordinating observation assignments between the National Interagency Coordination Center, Geographic Area Coordination Centers, and local dispatch offices.

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