

**Appendix:**  
**Thermal Infrared Vendor Listings**  
**November 2014 Update**  
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*This list of vendors does not constitute an official evaluation, conclusion, recommendation, endorsement, or approval by the Forest Service of any product or service to the exclusion of others that may be suitable.*

## Type 1 Systems Contact Information

**Company Name** **USDA-FS National Infrared Operations**  
Mailing Address 3833 S. Development Ave., Boise, ID 83705  
Primary Contact Tom Mellin  
Telephone 505.842.3845  
Fax 505.842.3215  
Email Address tmellin@fs.fed.us  
Website nirops.fs.fed.us  
Emergency Contact  
General Sensor Description Phoenix Dual Channel Line Scanner

COST (2014): Aircraft: \$1,100 –1,710 per hour + crew per diem. An IR interpreter needs to be assigned at a cost of roughly \$500 per day.

REMARKS: The National Infrared Operations group has been flying IR mapping and detection missions since 1966. The group operates several dual-channel thermal line scanners that have been upgraded throughout the years. Its latest version, Phoenix, outputs georeferenced imagery products in GeoTiff format. Trained IR interpreters create GIS products for the incident(s). Aircell ATG (air-to-ground) Internet systems are used to disseminate imagery to the interpreters during the mission.

**Company Name** **Range and Bearing**  
Mailing Address 2200 Rimland Road, Suite 220, Bellingham, WA 98226  
Primary Contact Doug Campbell  
Telephone 855-451-4295  
Fax  
Email Address info@rangeandbearing.com  
Website www.rangeandbearing.com  
Emergency Contact  
General Sensor Description Pervasive Stare HDR

COST: Contact Range and Bearing

REMARKS: The sensor system consists of a LWIR sensor and a step-stare imager with a 110° FOV and a nominal swath width of 12 miles. Other imagers such as MWIR, SWIR, and VIS can be utilized by the system. Collected imagery is ortho-corrected and mosaicked during the mission. Output products are disseminated using an Aircell ATG (air-to-ground) Internet system. Imagery products are output in several digital file formats, including Geo-Tiff, JPEG2000, NITF, and KML/KMZ. Derived vector products (point, polygon) can also be disseminated during a mission

**Company Name** **VeriMap Plus Inc.**  
Mailing Address 5520 2nd Street S.W., Calgary, AB, Canada  
Primary Contact David Stonehouse  
Telephone 403.606.0412  
Fax  
Email Address David\_s@verimap.com  
Website www.verimap.com  
Emergency Contact 24/7 403.606.0412  
General Sensor Description Misitubishi IR-M700

COST (2012): Ferry: \$650 per hour. Standby: \$4,520 per day. Acquisition: \$2,395.

REMARKS: VeriMARC utilizes sensor system consisting of a MWIR sensor and a step-stare imager with a selectable 40° - 90° FOV. Collected imagery is ortho-rectified and mosaicked during the mission for delivery on landing. VeriMARC planned system upgrades to increase the production rate to 1,000,000 acres per hour and allow for dissemination of vector files (point) during the mission using an Iridium satellite phone system.

## Type 2 Systems Contact Information

<b>Company Name</b>	<b>Fuhr Flying Service</b>
Mailing Address	500 Airport Drive, Redwood Falls, MN 56283
Primary Contact	David Fuhr
Telephone	507.644.5419
Fax	
Email Address	dfuhr@airbornedatasystems.com
Website	www.airbornedatasystems.com
Emergency Contact	David Fuhr, 507.984.5419
General Sensor Description	Spectra-View SV-5-6MS-2T MS Camera System

COST (2012): Daily: \$7,000 per hour with 4 hour per day minimum; \$5000 per day for processing crew plus per diem

REMARKS: The camera system collects Blue, Green, Red and NIR imagery plus 3-5  $\mu\text{m}$  and 8-12  $\mu\text{m}$  thermal IR imagery. Collected imagery is geo-referenced on the aircraft using position and attitude data from the DGPS/INS system. Terrain correction is accomplished using 10-meter NED data. Imagery is output in several formats including Geo-Tiff, JPEG2000, and KMZ. Imagery is uploaded to the company servers after the mission. No imagery mosaics are produced.

<b>Company Name</b>	<b>Icaros Inc</b>
Mailing Address	1445 Research Blvd., Ste. 150, Rockville, MD, 20850
Primary Contact	Arik Nir
Telephone	571.275.9903
Fax	301.220.4345
Email Address	arik@icaros.us
Website	www.icaros.us
Emergency Contact	Arik Nir, 571.275.9903
General Sensor Description	Icaros IDM600 (IDM603T, IDM603R2T, IDM603RNT)

COST(2012): Daily, \$5,500 per hour with 2 hour per day minimum, plus mobilization costs

REMARKS: : Daytime acquisition pay load is two thermal sensors co-located with a RGB sensor. Imagery is orthorectified post-flight using aircraft GPS and IMU data. Nighttime acquisition payload is three thermal sensors. Sensor payload can be mounted using passenger seat chair rails with passenger door removed on a light plane platform. Products delivered as GeoTiff format imagery

<b>Company Name</b>	<b>GeoVantage Inc.</b>
Mailing Address	3 Centennial Drive, Suite 350, Peabody, MA 01960
Primary Contact	Matthew Herring
Telephone	781-856-4775
Fax	
Email Address	matt@geovantage.com
Website	www.GeoVantage.com
Emergency Contact	
General Sensor Description	GeoVantage Multispectral + Thermal Sensor

COST: Contact GeoVantage Inc.

REMARKS: : The sensor system includes a 4-band (B, G, R, and NIR) camera module and a two camera LWIR module with a 24° FOV enclosed in a STC'd pod that can be mounted externally on a fixed-wing or rotary-wing aircraft using a GeoVantage mount. The pod also contains the GPS and IMU units. Imagery ortho-correction and mosaicking are performed after the mission. Products can be output in several digital file formats, including GeoTiff.

## Type 3a Systems Contact Information

**Company Name** Fireball International Services Corp.  
Mailing Address 1240 Fairfield Ave., Reno, NV 89509  
Primary Contact Tim Ball  
Telephone 755.848.4462  
Fax 775.328.0694  
Email Address info@fireballit.com  
Website www.fireballit.com  
Emergency Contact 24/7 775.848.4462  
General Sensor Description Wescam 12-DS90 (gimbal mount);

COST (2012): IR/Mapping Service: \$5,655 per day. Jet Ranger w/ Wescam: \$3,000 per day.

REMARKS: Fireball's IR and visible imagery is geo-referenced and ortho-rectified. IR overlays detailing hot spots and GPS coordinates for use by mop-up crews are also available. Video recordings (both IR and TV) of the flights are available. Digital data can be delivered through Fireball's FTP site or through Google Earth, depending on line-of-site communications. Fixed mount systems are available through Guardian (Van Nuys, CA) and Redding Air Services (Redding, CA)

**Company Name** Patriot Technologies Group, LLC  
Mailing Address 21022 Auberry Road, Clovis, CA 93619  
Primary Contact Steven McShea  
Telephone 559.213.2415  
Fax 703.229.4194  
Email Address Steven.mcshea@ptgllc.com  
Website www.ptgllc.com  
Emergency Contact  
General Sensor Description L-3Com Wescam M12i EO/IR Camera System (gimbal mount);

COST (2012): \$3,200/day plus \$500/flight hour ( 3 hr. min.); Includes fully equipped aircraft, fuel, pilot & systems operator. Real-time video and ArcGIS format shapefile down link available at a cost of \$1,300/day.

REMARKS: Patriot Technologies Group Multi-Mission Aircraft is a quick response, fixed wing asset that provides accurate ArcGIS files of the fire perimeter and hot spots. Files can be delivered in real-time or upon landing. In addition, the MMA is also equipped to provide real-time mid-wave IR and EO video or images via line-of-sight downlink to a hand-held receiver. The receiver can be used for portable situational awareness or can support large screen display and video streaming at an ICP via the Internet. PTG is a Service Disabled Veteran Owned Small Business.

**Company Name** Aspen Helicopters/Veteran's Emergency Technical Services  
Mailing Address 2899 West 5th Street, Oxnard, CA 93030-6503  
Primary Contact Dispatcher  
Telephone 805.985.5416  
Fax 805.985.7327  
Email Address dispatch@aspenhelo.com  
Website www.aspenhelo.com  
Emergency Contact 24/7 805.985.5416  
General Sensor Description: FLIR High Definition P660 Infrared Camera

COST (2014): \$3,950.00 -\$4,775 per day, all inclusive.

REMARKS: Aspen/V.E.T.S. uses a FLIR High Definition P660 infrared camera, mounted as a Side Looking Infrared System. Once a heat location is identified, imagery and GPS location data are acquired. Using the most current incident GIS data the new perimeter and hot spot locations are used to revise the GIS data. The V.E.T.S. infrared system is completely portable and can be use in any Type III aircraft assigned to the incident. VETS is a Service Disabled Veteran Owned Small Business.

**Company Name** **Avwatch Inc.**  
Mailing Address 3 Robinwood Circle, Forestdale, MA 02644  
Primary Contact Christopher Kluckhuhn  
Telephone 508-360-4398  
Fax  
Email Address clk@avwatch.us  
Website www.avwatch.us  
Emergency Contact  
General Sensor Description Multispectral Sensor Package With Dual Channel Thermal IR

COST: Contact Avwatch Inc.

REMARKS: The system includes dual channel thermal IR with other multispectral capability designed to operate at 3,000-5,000 feet AGL as either a gimbaled system or locked to acquire nadir imagery. The system outputs geo-referenced digital stills from the video that can be downlinked to the incident.

**Company Name** **Vision Air Research**  
Mailing Address 904 E. Washington St., Boise, ID 83712  
Primary Contact Susan Bernatas  
Telephone 208.841.9566  
Fax 208.345.0595  
  
Email Address info@visionairresearch.com  
Website www.visionairresearch.com  
Emergency Contact 24/7 208.841.9566  
General Sensor Description FLIR Thermovision 1000 PolyTech Kelvin 350 II

COST (2012): Availability \$2,072-2,968 daily, Flight: \$629-778 Sensor support: \$3,500 per day.

REMARKS: This system includes a SONY video camera and a Thermovision (an infrared radiometer). Output includes both color and infrared video in analog or digital videotape. The video includes an overlay of the GPS data. The Vision Air collects frame-by-frame data at up to one frame per second in an on-board computer. This computer has the capability to geo-rectify the data frame by frame. The geo-referenced mosaics can be incorporated into a GIS data product.

**Company Name** **HeloAir, Inc**  
Mailing Address 5721 Gulfstream Road, Richmond, VA 23250  
Primary Contact Whit Baldwin  
Telephone 804-226-3400  
Fax 804-226-3494  
Email Address  
Website www.heloair.com  
Emergency Contact  
General Sensor Description FLIR Systems Kelvin 350

COST: Contact HeloAir Inc.

REMARKS: This system includes a FLIR Systems 660 infrared system with a MegaPixel digital camera. Imagery is GPS tagged for post-flight geo-referencing. On contract with USFS Sawtooth NF, Hailey, ID for fire support services

## Type 3c Systems Contact Information

**Company Name** Fireball International Services Corp.  
Mailing Address 1240 Fairfield Ave., Reno, NV 89509  
Primary Contact Tim Ball  
Telephone 755.848.4462  
Fax 866.313.5036  
Email Address info@fireballit.com  
Website www.fireballit.com  
Emergency Contact 775.848.4462 available 24/7  
General Sensor Description FLIR microbolometer (Long-wave IR, portable, pointable);  
COST(2012): IR/Mapping Service: \$5,655 per day. Dual-use/Recon Helicopter provided by incident

REMARKS: This portable system can be flown on any helicopter so that this Type 3C offering enables an incident to make multiple use of their aircraft. This service is available through the Fireball EERA

**Company Name** Henderson Aviation  
Mailing Address 29484 Meadowview Road, Junction City, OR 97448  
Primary Contact John Henderson, Staci Stainbrook  
Telephone 541.688.4777  
Fax 541.688.4926  
Email Address info@hendersonaviationco.com  
Website www.hendersonaviationco.com  
Emergency Contact 541.688.4777 (24/7) or 541.954.5452, or 541.968.2057  
General Sensor Description Agema1000 Thermal Imager

COST (2012): \$1,500/day

REMARKS: Thermal system is configured with color video in a WESCAM 16 DS-A gyro-stabilized housing. Deliverables include color and thermal video, plus geo-referenced still imagery

**Company Name**  
Mailing Address  
Primary Contact  
Telephone  
Fax  
Email Address  
Website  
Emergency Contact  
General Sensor Description:

COST :

REMARKS: