

Appendix:
Thermal Infrared Vendor Listings
March 2011 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 <http://nirops@fs.fed.us>
Emergency Contact 208.859.4475
General Sensor Description Phoenix Dual Channel Line Scanner

COST: Aircraft: \$920-1340 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 line scanners that have been upgraded throughout the years. Its latest version, Phoenix, is capable of producing georeferenced digital products in Geotiff format. Trained interpreters are able to help create GIS products for an incident. A data downlink system has been added to improve delivery of imagery to the IR interpreters.

Company Name USDA-FS PSRS, Riverside Fire Lab
Mailing Address 4955 Canyon Crest Dr., Riverside, CA 92507
Primary Contact Robert Lockwood
Telephone 951.680.1535
Fax 951.680.1501
Email Address rlockwood@fs.fed.us
Website www.fireimaging.com
Emergency Contact 24/7 909.315.0181
General Sensor Description Space Instrument FireMapper

COST: Aircraft: \$500 per hour. An image processor also needs to be assigned at a cost of roughly \$500 per day.

REMARKS: FireMapper is a research and development project funded by the National Fire Plan and managed by the USDA Forest Service, Region 5. It is dispatched by the South Zone Coordination Center. FireMapper imagery depicts color-coded surface temperatures, which are readily interpretable as fire intensity or activity, on a geo-registered, shaded, relief map. Major fire lines are also shown in 3D on a topographic relief view. Products are delivered in ArcGIS-compatible format and as Google Earth KML/KMZ files.

Company Name Argon ST
Mailing Address 300 Parkland Plaza, Ann Arbor MI, 48106
Primary Contact Fred Osterwisch
Telephone 734.769.5649 ext. 103 or 0
Fax 734.769.0429
Email Address fred.osterwisch@argonst.com
Website www.argonst.com
Emergency Contact 24/7 734.730.5263
General Sensor Description Real Time Mapping AA3607 AMS Multispectral Scanner

COST: Rate \$2,350 per hour The same rate applies for acquisition or ferry.

REMARKS: Argon ST operates a 16 band multispectral imager: which includes 3 to 5 and 8 to 12 thermal IR sensors. Argon's data system generates highly accurate georeferenced, ortho-rectified, ArcGIS compatible imagery of the fire and the terrain. Fire pixels are highlighted and target detection marks are inserted in the border. Imagery is generated within minutes of data acquisition and can be down linked in near real time to a UHF receiver within 30 miles of the aircraft, or hand delivered.

Company Name	VeriMap Plus Inc.
Mailing Address	5520 2nd Street S.W., Calgary, Alberta, Canada
Primary Contact	David Stonehouse
Telephone	403.228.1235 (CAN), 601.857.8197 (US)
Fax	
Email Address	David_s@verimap.com
Website	www.verimap.com
Emergency Contact	24/7 403.606.0412
General Sensor Description	Misitubishi IR-M700, Kodak CIR, Profile LIDAR

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

REMARKS: VeriMARC utilizes a multisensor system that consists of a thermal imager, a digital camera, and a LIDAR (light intensity detection and ranging). Horizontal accuracy is +/- 1 meter because the imagery is rectified to a digital elevation terrain model developed from the LIDAR returns. The imagery sets are fully ortho-rectified and tiled. Imagery can be processed on board the aircraft or onsite by the vendor. The false-color, post-burn analysis is a larger file size and takes an additional day for processing.

Type 2 Systems Contact Information

Company Name	Airborne Data Systems
Mailing Address	25338 290th St., Wabasso MN 56293
Primary Contact	David Fuhr
Telephone	507.644.5419
Fax	507.984.3150
Email Address	dfuhr@airbornedatasystems.com
Website	www.airbornedatasystems.com
Emergency Contact	David Fuhr, 507.984.5419
General Sensor Description	Airborne Data Systems Spectra-View

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

REMARKS: Airborne Data Systems provides two systems: A SV-5-6 Type 1 sensor: 4 bands, 0.4-1.0 um and 2 thermal bands, 3-5 and 8-14 um or, a SV-5-5 Type 2 sensor: 4 bands, 0.4-1.0 um and 1 thermal band, 3-5 um. All imagery can provide active fire, hot spot identification, pre-burn fuel loading, post fire burn assessment, forest health, moisture content, and 3D aerial mapping. Either system can operate day or night. All imagery is ortho-rectified using DGPS/INS and DEMs. Image processing can be done in flight. Imagery is delivered in geotiff format.

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: 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: \$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	Ram Systems LLC
Mailing Address	P.O. Box 993, Jefferson, OR 97352
Primary Contact	Jill Johnson
Telephone	541.327.1169, Cell: 503.551.4094
Fax	541.327.2910
Email Address	jill@ramsystemsllc.com
Website	www.ramsystemsllc.com
Emergency Contact	Jill Johnson, 541.327.1169, 503.551.4094
General Sensor Description	RAM Systems Radiometric Infrared

COST: \$5,000/day

REMARKS: RAM operates a Radiometric Airborne Mapping (RAM) system, in a dual imaging, gimbal mounted, company owned Bell Jet Ranger. The Jet Ranger is fully fire carded. The RAM system operates in 8-14 um (longwave-IR) and is geo-referenced. The system allows for input of atmospheric and ambient temperature, relative humidity, objective distance, and emissivity. This give the RAM system the capability to discriminate between burning wood, hot rocks, cars, etc. RAM records information to a tri-screen image that is encoded to heat sources plotted to maps. The GIS support trailer can create ap products from the IR data. Data can be down linked in real-time when requested.

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: 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.

Type 3c Systems Contact Information

Company Name **Calalaska Helicopters**
Mailing Address 3123 Liberator St., Santa Maria, CA 93455-1839
Primary Contact Barry Dallwig
Telephone 805.377.3387
Fax
Email Address flynbarry@msn.com
Website <http://www.calalaskahelicopters.com>
Emergency Contact 805.922.1199
General Sensor Description FLIR High Definition P640 Infrared Camera
COST: Flight time: Current USFS Hourly Rate, \$2492 Standby; Infrared Module: \$3950 per day

REMARKS: Calalaska uses a FLIR High Definition P640 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 current information is then returned to the Plans Unit for inclusion in the incident geodatabase. Operational infrared maps are created for the shift IAP documents. This IR system can be installed or removed in under 5 minutes, which not only gives the incident a committed IR ship but a multiuse aircraft

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: 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: FLIR Hand-held

COST: \$1,500/day

REMARKS:

Company Name	Veteran's Emergency Technical Services
Mailing Address	848 Ann Arbor Ave., Ventura, CA 93004
Primary Contact	Jim Kniss
Telephone	805.218.9646
Fax	805.647.8464
Email Address	jimkniss@sbcglobal.net
Website	http://www.VETSresponse.com
Emergency Contact	805.218.9646
General Sensor Description	FLIR High Definition P640 Infrared Camera

COST: \$3,950.00 per day, all inclusive.

REMARKS: V.E.T.S. uses a FLIR High Definition P640 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 current information is then returned to the Plans Unit for inclusion in the incident geodatabase. Operational infrared maps are created for the shift IAP documents. 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.