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TacFLIR

Outlook

- FLIR has patented a new seal design for TacFLIR, one that is virtually impervious to salt water, sand, and dust
- Last published contract was disclosed in 2005; lack of information may be due to customer non-disclosure agreements or competition
- It is believed that TacFLIR is in production; TacFLIR is still featured on FLIR Systems' Web site

Orientation

Description. TacFLIR is a multisensor thermal imaging system designed for use on land vehicles.

Sponsor. According to FLIR management, the TacFLIR is currently in a test phase with a U.S. Army agency.

Status. Introduced in October 2005, TacFLIR II and TacFLIR III units are in production.

Total Produced. It is estimated that 12 TacFLIR systems have been produced.

Application. FLIR Systems Inc is primarily marketing TacFLIR for unmanned ground vehicles in long-range reconnaissance and improvised explosive device and mine detection roles, and as a vehicle viewer or as part of a weapon system.

Price Range. According to FLIR Systems management, the TacFLIR II system costs \$225,000 to \$275,000. The TacFLIR III system is priced at \$325,000 to \$400,000.

Contractors

Prime

FLIR Systems Inc, Boston Office	http://www.flir.com , 25 Esquire Rd, North Billerica, MA 01862 United States, Tel: + 1 (978) 901-8000, Fax: + 1 (978) 901-8885, Prime
VisionCom	http://www.visioncom.co.il , 8 Hanafar St, Industrial Zone B, Neve Ne'eman, 45240 Hod Hasharon, Israel, Tel: + 972 9 7756922, Fax: + 972 9 7756890, Dealer/Distributor

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Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 22 Commerce Road, Newtown, CT 06470, USA; rich.pettibone@forecast1.com

TacFLIR

Technical Data

	<u>Metric</u>	<u>U.S.</u>
Dimensions		
<u>Stabilized Gimbal Assembly</u>	22.9 x 34.3 cm	9 x 13.5 in
<u>Weight</u>	12.7 kg	28 lb
<u>Control Electronics Unit</u>		
<u>Weight</u>	25.1 x 15.2 x 26.9 cm	9.9 x 6.0 x 10.6 in
	6.9 kg	15 lb
Characteristics		
<u>Stabilized Gimbal Assembly</u>		
<u>Field of Regard</u>	360° AZ, 360° EL Continuous	
<u>Slew Rate</u>	II- 0° to 65°/sec III-0° to 140°/sec	
<u>Thermal Imager</u>		
<u>Wavelength</u>	3.4-5.1 µm	
<u>Image Resolution</u>	320 h x 240 v	
<u>FOV (Wide)</u>	21.7° x 16.4°	
<u>FOV (Wide w/1.8x opt extender)</u>	12.2° x 9.2°	
<u>FOV (Medium)</u>	Continuous Zoom	
<u>FOV (Narrow)</u>	2.2° x 1.7°	
<u>FOV (Narrow w/1.8x opt extender)</u>	1.2° x 0.9°	
<u>Daylight CCD TV</u>		
<u>FOV (Wide)</u>	48° x 36°	
<u>FOV (Narrow)</u>	2.7° x 2.2°	
<u>FOV (Narrow w/E-zoom)</u>	1.2° x 1.0°	
<u>Resolution</u>	NTSC: > 470 TV Lines PAL: > 460 TV Lines	
<u>Sensitivity</u>	0.7 LX @ F1.4	
<u>Zoom ratio</u>	18x Optical (over 2x digital)	
<u>Laser Pointer (Optional)</u>		
<u>Beam Divergence</u>	830 nm	
<u>Output power</u>	0.6 mrad 30 MW	
<u>Laser Rangefinder (Option on III only)</u>		
<u>Maximum Range</u>	1.54 µm, Erbium-glass 20 km	12.4 mi
<u>Control Electronics Unit</u>		
<u>Communication Interface</u>	RS 232/422	

Design Features. The TacFLIR thermal imaging system consists of a stabilized gimbale assembly (SGA), a hand control unit, and an electronics unit. The SGA swings 360° in both azimuth and elevation. The TacFLIR has two NVIS-compatible options for the hand control unit: a standard ergonomic hand unit, which is sealed and suitable for tactical operations, and a laptop control unit, which is suitable for a workstation or controlled environment.

The TacFLIR is a rugged, gyro-stabilized multisensor system for use on land vehicles for long-range reconnaissance, mine detection, or as a vehicle viewer. It weighs less than 20 kilograms. The gyro-stabilization

feature compensates for vehicle movement and vibration, which is critical for long-range imaging. With its mid- or large-format midwave IR (3.4-5.1 microns), and up to 450 millimeters of continuous zoom, the system is able to detect beyond 10 kilometers in total darkness, through smoke, fog, and most battlefield obscurants. The daylight/lowlight TV with 40x zoom maximizes target acquisition during dawn-to-dusk surveillance missions. The multimode auto tracker allows the operator to lock onto targets and reduces operator fatigue. The TacFLIR II and III can be equipped with an optional 830-nm laser pointer. The laser pinpoints targets for observers using night vision equipment, while remaining invisible to others.

TacFLIR

The TacFLIR can communicate with a variety of command and control systems, Global Positioning System/Inertial Navigation System/Inertial Measurement Unit (GPS/INS/IMU) devices, radar,

moving map, and searchlight systems for improved mission effectiveness. TacFLIR is available in U.S. NTSC and European PAL video standard formats.



TacFLIR III

Source: FLIR Systems Inc

Variants/Upgrades

TacFLIR II. This is a scaled-down version of the TacFLIR III. It does not have the built-in test (BIT) or video outputs options.

TacFLIR III. The TacFLIR III features all of the TacFLIR II options plus BIT and video outputs. The BIT feature confirms operation of critical functions and performs fault isolation to simplify logistics. The digital and analog video outputs maximize compatibility

with platform monitors and recording devices. Digital capability optimizes video resolution and provides greater data transmission and manipulation flexibility. An optional precision target geo-positioning feature is also available on the TacFLIR III. This optional feature uses an eye-safe (1.54 m) laser rangefinder in conjunction with GPS/INS/IMU/DMC (digital magnetic compass) to calculate a target's latitude, longitude, elevation, range, and bearing.

Program Review

Background. A U.S. Provisional Patent Application filed in November 2003 described an electromechanical human that could replace soldiers or police officers in dangerous situations. The robotic human could be remotely controlled and include a targeting system for the recognition and handling of multiple enemy combatants. According to the patent application, the head comprised an imaging and targeting system, preferably a TacFLIR III multi-sensor system.

FLIR Systems announced in October 2005 the launch of a new product line to address the needs of tactical ground forces. FLIR stated that its new TacFLIR product line provides unmatched capability and situational awareness to aid in reconnaissance, surveillance and target acquisition (RSTA) and fire control missions. The TacFLIR is designed for use on both manned and unmanned platforms. It features robust environmental hardening combined with high-performance sensors, which make the TacFLIR an ideal

solution for demanding ground mobility applications. Integrated with optional multisensor payloads, the TacFLIR is uniformly capable during the day or in total darkness. "TacFLIR capitalizes on the best of FLIR's recent development efforts," said Rick Mannello, vice president of Land Systems. "Advanced capabilities developed during the execution of several major U.S. military programs, coupled with experience from having fielded over 250 similar systems for extreme military environments, have yielded a product that leads the industry." Also in 2005, FLIR Systems received a U.S. Army contract for a technology demonstration program for the TacFLIR.

In November 2005, TacFLIR made its international debut at the Dubai Air Show. VisionCom, a member of the Netcom Group of companies, is FLIR Systems' sole representative in Israel. The VisionCom Web site carries TacFLIR data sheets and information.

TacFLIR

Contracts/Orders & Options

<u>Contractor</u>	<u>Award (\$ millions)</u>	<u>Date/Description</u>
FLIR Systems	Not disclosed	2005 – U.S. Army contract for a technology demonstration program for an undisclosed number of TacFLIR systems.

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
Nov	2003	In U.S. Provisional Patent Application, TacFLIR described as the "head" of an electromechanical human
	2005	FLIR systems receives U.S. Army contract for a technology demonstration program
Oct	2005	TacFLIR product line launched in the marketplace
Nov	2005	TacFLIR makes its international debut at Dubai Air Show
Jun	2006	FLIR product deployed on TAGS UAV for testing purposes – unclear if it was TacFLIR or SeaFLIR
	2007	FLIR receives U.S. patent for new seal design

Worldwide Distribution/Inventories

The **U.S. Army** is the only known customer of the TacFLIR system.

Forecast Rationale

TAGS UGVs

In 2005, FLIR Systems received a U.S. Army contract to supply TacFLIR for a technology demonstration program. It is unclear whether this demonstration program is related to the Tactical Amphibious Ground Support (TAGS) unmanned ground vehicle (UGV).

According to an announcement made at Eurosatory 2006, TacFLIR was mounted on a TAGS UGV for system-level testing. TAGS UGV is part of the Family of Integrated Rapid Response Equipment (FIRRE) program, a layered multi-sensor system for use in force protection applications. Other sources indicate that a SeaFLIR unit was mounted on the UGV. The results of this system-level testing are unavailable.

Northrop Grumman's Remotec subsidiary will provide its TAGS vehicle as the main unmanned ground platform for the FIRRE program. The Remotec TAGS vehicle is about the size and weight of a compact car. Remotec's business development manager stated that TAGS vehicles support perimeter security and other surveillance requirements of U.S. forces in Iraq. He added that this represents the first-ever deployment of an autonomous, unmanned ground vehicle in a combat

zone. Use of the TAGS vehicles reduces manpower requirements, allowing troops to focus on other missions.

Systems that reduce the number of soldiers required in Iraq are in great demand. If FLIR Systems can win a production contract to supply TacFLIR for the FIRRE program, the outlook for FLIR will be good for the next several years.

New Impervious Seal Design

In the April 2007 issue of *Military & Aerospace Electronics*, FLIR Systems announced that it received a U.S. patent for a new seal design – one that is virtually impervious to salt water, sand, and dust. The new seal is being used on maritime and land gimbaled systems, including TacFLIR II/III. In the "Collaborative Point Paper on Border Surveillance Technology," published by NATIBO (North American Technology and Industrial Base Organization) in December 2007, TacFLIR II/III was included in a listing of approximately 100 other products under U.S. and Canadian Surveillance Systems Products and Technology.

TacFLIR

Reaching Out for International Sales

FLIR Systems has collaborated with distributors in order to boost sales. Israel's VisionCom, Poland's AGTES, and Singapore's Imrex display several FLIR products, including TacFLIR II/III, on their Web sites. It is unknown whether any sales have come from business deals with international suppliers.

No News

Although FLIR Systems has been striking up deals with distributors to increase sales, overall the company has been very silent about the product. There is no mention

of it in U.S. military procurement documents, Department of Defense Web sites, or industry publications. The FLIR Systems Web site does not have any press releases regarding TacFLIR. The last known contract was issued in 2005.

The reason for FLIR Systems' silence may be due to compliance with customer non-disclosure agreements or competition. However, since TacFLIR is displayed under Land System – Stabilized Multi-Sensor Products and Unmanned – Compact Systems on the company's Web site, it is believed to still be in production.

Ten-Year Outlook

The last published TacFLIR contract was disclosed in 2005 and has been completed; there has not been sufficient data to generate a **Ten-Year Outlook** chart. If new information is published in open source literature, a chart will be produced.

Barring further information, this report will be archived in May 2011.

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