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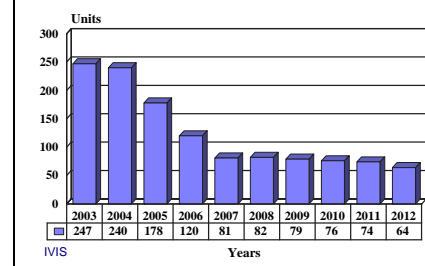
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## Intervehicular Information System (IVIS) - Archived 9/2004

### Outlook

- Forecast International projects defense departments to purchase some 1,241 Intervehicular Information Systems over the next decade
- Expect the US Army's FBCB<sup>2</sup> digital battle command information system to affect the future of the Intervehicular Information System

10 Year Unit Production Forecast  
2003 - 2012



### Orientation

**Description.** The Intervehicular Information System is a digital battlefield command and control network link for the United States Army.

#### Sponsor

US Army Communications & Electronics Command  
Ft. Monmouth, New Jersey (NJ)

US Army Tank-Automotive Command  
Warren, Michigan (MI)

#### Contractors

General Dynamics - Land Systems Division  
38500 Mound Road  
Sterling Heights, Michigan (MI) 48310-3200  
Tel: +1 810 825 4000  
Fax: +1 810 825 4013  
Web site: <http://www.gdls.com>

**Status.** In service and production.

**Total Produced.** Approximately 1,667 systems had been produced through the year 2002.

**Application.** To provide command and control for the M1A2 Abrams tank.

**Price Range.** Cannot be determined.

### Technical Data

**Design Features.** IVIS is designed to interface with other command and control (C<sup>2</sup>) networks via gateways that can be implemented to provide communication between IVIS and existing/planned Army C<sup>2</sup> systems. IVIS also reports continuous allied locations so that the position of each user is automatically updated and reported to other users. Accurate target location is accomplished by interfacing with a laser rangefinder. A processor and

display provide accurate target locations for inclusion in plans, reports, and overlays. Navigation is enhanced by means of waypoints set by the commander. IVIS, in turn, supplies the driver with accurate position and steering information in a graphic format.

The Intervehicular Information System includes a Commander's Tactical Display. The display is a thin

film electroluminescent display that presents a current menu layer, warnings and cautions, date and time group, vehicle heading, eight-digit grid coordinate, and

highlight area for incoming messages and display of IVIS messages, as well as legends for menu/option select buttons.

## Variants/Upgrades

**Bradley Prototype.** The IVIS system, while designed for the M1A2 Abrams tank, was tested in a few M3 Bradleys. These versions had better integration

capabilities with the M1A2s, allowing a much better understanding of intelligence and C<sup>2</sup> than previous Bradley versions.

## Program Review

**Background.** In late 1992 and early 1993, the US Army received 77 new-build M1A2 tanks as part of the tank's initial low-rate initial production program. All tanks were equipped with the Intervehicular Information System (IVIS).

In March 1993, the US Army conducted an exercise at Fort Knox, Kentucky, to demonstrate the command and control capabilities of the IVIS. Six IVIS-equipped Bradley tanks were used in the exercise. Results from the March demonstration raised questions about the adequacy of IVIS' communications link. The March tests revealed that the data protocols (codes used to control data message formats) did not match up between the helicopters and the ground vehicles. As a result, only 18 to 20 vehicles could successfully link together.

The March demonstration also showed that the FBCB<sup>2</sup>, a software application designed to link IVIS-equipped and non-IVIS-equipped vehicles, was not fully developed and therefore unable to reach full operation.

In late 1996, the US Army conducted a thorough examination of the IVIS. This examination showed that the IVIS system was unsatisfactory in its current state, and not ideally suited for real-world standards. Specifically, the Army found IVIS' startup procedures to be too cumbersome, with too many steps to perform. Moreover, the system's message routing process was too slow, as were the graphics the system displayed.

In spite of these sub-par results, the US Army awarded General Dynamics Land Systems Division a contract in

1996 to convert 580 to 600 M1A1 tanks to the M1A2 series and install the IVIS on the converted tanks.

**Recent Developments.** In January 2001, General Dynamics received a contract from Greece to produce 246 M1A2 Abrams tanks equipped with the IVIS for the Hellenic Army. Forecast International expects General Dynamics to manufacture the tanks between 2003 and 2008.

In March 2001, the US Army Tank-Automotive & Armaments Command awarded General Dynamics a contract to produce 307 M1A2 Abrams Upgrade Tanks carrying the Intervehicular Information System. Look for General Dynamics to complete the work under the contract by the end of 2004.

On September 20, 2001, General Dynamics signed another contract with the US Army Tank-Automotive & Armaments Command to retrofit 14 M1A2 Abrams upgrade tanks with the IVIS. Expect General Dynamics to complete work under the agreement by the end of October 2003.

In January 2002, General Dynamics received a contract from the US Army Tank-Automotive & Armaments Command to upgrade 11 M1A2 Abrams tanks. Again, the tanks will be carrying the IVIS. Forecast International expects work under the contract to be completed by March 2004.

## Funding

Funding for the Intervehicular Information System no longer appears in any US Department of Defense program element. That said, it is possible that IVIS is part of the Combat Vehicle Improvement Program, Project D330 – Abrams Improvements.

## Recent Contracts

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<u>Contractor</u>	<u>Award (\$ millions)</u>	<u>Date/Description</u>
General Dynamics	Unknown	January 2001 – General Dynamics Land Systems received a contract from Greece to produce 246 M1A2 Abrams tanks for the Hellenic Army.
General Dynamics	741.1	March 2001 – General Dynamics Land Systems received a contract from the US Army Tank-Automotive & Armaments Command for the production of 307 M1A2 Abrams Upgrade Tanks. (DAAE07-01-G-N001)
General Dynamics	17.1	September 2001 – General Dynamics Land Systems received a contract for 14 retrofitted M1A2 Abrams upgrade tanks. Work is scheduled to be completed by October 31, 2003. The US Army Tank-Automotive & Armaments Command is the contracting agency. (DAAE07-01-G-N001)
General Dynamics	13.3	January 15, 2002 – General Dynamics Land Systems received a contract (DAAE07-01-G-N001) to upgrade 11 M1A2 Abrams tanks. Work will be finished by March 31, 2004. Tank-Automotive and Armaments Command is the contracting agency.

**Note:** Above contracts represent M1A1 to M1A2 configuration upgrade kits, of which IVIS is a subcomponent.

## Timetable

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<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1993	IVIS Phase 1 development completed
	1994	IVIS Phase 2 development completed; contract awarded for 206 M1A1s to be converted to M1A2s with IVIS
	1995	Upgraded Abrams begin to enter service
	1996	Final deliveries of the 206 M1A1 to M1A2 retrofit contract
	1997	Contract awarded for 600 M1A1s to be converted to M1A2s with IVIS
	1998	M1A2 fielding to US Army 1st Cavalry Div. completed
Jan	2001	General Dynamics receives contract from Greece to produce 246 M1A2 Abrams tanks for the Hellenic Army
Mar	2001	General Dynamics receives contract from the US Army for the production of 307 M1A2 Abrams Upgrade Tanks
	2002	General Dynamics receives a US Army contract to upgrade 11 M1A2 Abrams tanks
	2003	104 M1A2 Abrams Upgrade Tanks projected to be delivered to the US Army
	2003	Production of the M1A2 Abrams tanks for Greece projected to commence
	2004	109 M1A2 Abrams Upgrade Tanks projected to be delivered to the US Army

## Worldwide Distribution

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The **United States, Kuwait, Saudi Arabia, and Greece** all possess M1A2 tanks equipped with a command and control system that includes IVIS.

## Forecast Rationale

The Intervehicular Information System (IVIS) is a digital battlefield command and control network link manufactured by General Dynamics for installation on new-build M1A2 Abrams tanks and retrofit M1A1 tanks.

As indicated by the outlook chart below, Forecast International projects defense departments to purchase some 1,241 Intervehicular Information Systems over the next decade. Procurements of M1A2 Abrams tanks and retrofit M1A1 tanks are driving IVIS purchases.

The Intervehicular Information System provides allied and enemy tank location information to the M1A2 Abrams tank driver. IVIS automatically updates this location information and disseminates it to other allied tanks equipped with the system.

The US Army's FBCB<sup>2</sup> digital battle command information system will most certainly affect the future of the Intervehicular Information System. The FBCB<sup>2</sup>

provides soldiers and leaders with on-the-move situational awareness and command and control information, allowing them to view friendly and enemy forces on screen. Soldiers access information provided by the FBCB<sup>2</sup> via a touch-screen display fixed to the vehicle's dashboard. Commanders access the same information using movie-theater-sized screens. The US Army used the FBCB<sup>2</sup> for the first time in the war with Iraq.

## Ten-Year Outlook

### ESTIMATED CALENDAR YEAR PRODUCTION

Designation	Application	Thru 02	<u>High Confidence Level</u>				<u>Good Confidence Level</u>				<u>Speculative</u>			Total 03-12
			03	04	05	06	07	08	09	10	11	12		
IVIS	C2 (US ARMY)	984	116	109	47	39	40	41	40	38	39	32	541	
IVIS	C2 (VARIOUS)	150	131	131	131	81	41	41	39	38	35	32	700	
IVIS	Prior Prod'n:	533	0	0	0	0	0	0	0	0	0	0	0	
Total Production		1667	247	240	178	120	81	82	79	76	74	64	1241	