

# ARCHIVED REPORT

For data and forecasts on current programs please visit

[www.forecastinternational.com](http://www.forecastinternational.com) or call +1 203.426.0800

## IEWCS

---

### Orientation

**Description.** Intelligence and Electronic Warfare Common Sensor, a standardized, interoperable, and interchangeable system for tactical signal interception, direction finding, and electronic countermeasures.

**Sponsor**

US Army

Communications & Electronics Command

Signals Warfare Directorate

Vint Hill Farms Station

Warrenton, VA

**Contractors**

Electrospace Incorporated

Richardson, TX

(Prime integrator)

AEL Corp

Lansdale, PA

(Components)

Condor Systems Inc

San Jose, CA

(ELINT system)

Loral Corp

Federal Systems Group

Owego, NY

(Processors)

Lockheed Sanders/AEL Joint Venture

Hudson, NH

(TACJAM-A)

Magnavox Corp

Fort Wayne, IN

(Communications subsystems)

Motorola Inc

Scottsdale, AZ

(Workstations)

FMC Corp

Santa Clara, CA

(Vehicles)

Quest/ERI inc

McLean, VA

(Support)

Vitro Corp

Rockville, MD

(Support)

**Status.** Engineering development.

**Total Produced.** Developmental units only to date.

**Application.** The IEWCS program is developing special tracked vehicles equipped for battlefield electronic warfare and capable of keeping up with today's fast-moving front-line units. GBCS-Light will support Airborne and Air Assault Divisions; GBCS-Heavy will support Armored and Mechanized Infantry Divisions.

**Price Range.** Estimated unit cost is undetermined at this time. It will integrate systems that currently exist or are under development.

## Technical Data

### Characteristics

Vehicular operation:	All terrain
Mission operation:	24 hours
Frequency range	
Intercept, locate:	HF, VHF, UHF, SHF, D, E, F, G, H, I, J, K
Jam:	
Setup time:	10 min
Teardown time:	3 min
Transport	
GBCS-H:	C-5
GBCS-L:	C-130, C-141

**Design Features.** This project provides for development and test of the following Intelligence and Electronic Warfare Common Sensor subsystems. It integrates Common Sensor subsystems into three Army Systems, for the development of platform unique items (i.e., antennas), and for the modification of standard Army vehicles to meet intelligence and electronic warfare requirements. The Army systems are:

TACJAM-A. TACJAM-A consists of state-of-the-art modular and scaleable Electronic Support Measures (ESM) and Electronic Counter Measures (ECM) subsystems designed for use on a variety of air and ground prime movers (tracked, wheeled and heliborne).

Ground Based Common Sensor-Light (GBCS-L). The GBCS-L provides the Commanders of Light, Airborne, and Air Assault Divisions with an organic capability to listen to, locate for hard-kill targeting or order-of-battle resolution, or render ineffective through jamming opposition command and control and fire control nets and counter/mortar, counter/ battery ground surveillance radar emissions.

The system is specifically designed to ensure transportability, prime mover maintainability, and over terrain mobility equal to or greater than supported units, while at the same time exploiting or eliminating - at the supported Commander's discretion - the latest, most modern types of hostile modulations and transmission techniques at the key time and place on the battlefield. GBCS-L is configured on High Mobility Multipurpose Wheeled Vehicle (HMMWV).

Ground Based Common Sensor-Heavy (GBCS-H). The GBCS-H provides the Commanders of Armored and Mechanized Infantry Divisions and Armored Cavalry Regiments (ACR) the same capability as the above

GBCS-L. The GBCS-H, however, is the Army's only on-the-move, on-the-ground, all weather, all terrain, self-contained, fully integrated, 24-hour-a-day signals intelligence and electronic warfare asset. The GBCS-H is configured on a derivative of the Bradley Fighting Vehicle, the Electronic Fighting Vehicle System (EFVS) which is being developed in concert with the Command and Control Vehicle (C2V).

The GBCS will leverage technology to provide a single system to perform the missions of four field IEW systems - TRAILBLAZER, TEAMMATE, TACJAM, and TEAMPACK. The GBCS will share common components architecture, and software with Advanced QUICKFIX; the two systems will be totally interoperable.

Advanced QUICKFIX (AQF). The AQF provides for a materiel change to the existing heliborne QUICKFIX communications intercept, collection, processing, direction finding, and jamming system and will be deployed to Army Divisions and ACR. Configured in a BLACKHAWK Helicopter (EH-60A), it provides the moving platform necessary to invoke Differential Doppler technology to provide for location accuracies sufficient for "steel on target" requirements, as well as for extension of Line of Sight (LOS) for greater range and coverage of signals intercept and C2 jamming targets. The incorporation of an advanced suite of self-protection equipment enables Advanced QUICKFIX to overfly enemy territory and thus provide for electronic overwatch of the commander's entire area of interest.

Mobile Electronic Warfare Support System (MEWSS). The United States Marine Corps is utilizing the same subsystems as the GBCS and configuring them in a Light Armored Vehicle as a part of the MEWSS improvement program.

This project is joint with the National Security Agency's Tactical Cryptologic Program (TCP), Program Element 030885G, which provides a portion of the funds required for the development of the precision location subsystem and system integration of GBCS-L and GBCS-H.

**Operational Characteristics.** The signals intercept and emitter location systems will search, intercept, locate, identify, and provide electronic countermeasures against enemy communications and non-communications emitters

beyond the Forward Line of Troops. The ground-based element will provide a single system capable of performing the missions of four currently fielded IEW systems: TRAILBLAZER, TEAMMATE, TACJAM, and TEAMPACK.

Situation development information will be transmitted to the Technical Control and Analysis Element (TCAE) of the All Source Analysis System (ASAS) and targeting information will be transmitted through the TACFIRE system to their respective users.

## Variants/Upgrades

**GBCS-L** GBCS-Light will support Airborne and Air Assault Divisions and be mounted on an M1097 HMMWV.

**GBCS-H** GBCS-Heavy will support Armored and Mechanized Infantry Divisions and will be mounted in an

**Electronic Fighting Vehicle System (EFVS) using an MLRS M993 chassis.**

## Program Review

**Background.** The US Army has been fielding a variety of battlefield electronic warfare systems to support front-line units. Four in particular, TRAILBLAZER, TEAMMATE, TACJAM and TEAMPACK, have been carrying the brunt of the workload. Having four different systems proved awkward. They were not totally interoperable, logistics support was inefficient, and they were not totally compatible with key airborne assets. As a result, the Army decided to develop the Integrated Electronic Warfare Common Sensor for its armored and mechanized infantry divisions and its the airborne and air assault divisions.

Planners had been studying the needs of the front-line units and developing a plan for creating a family of interoperable, standardized systems which could search, intercept, locate, identify, and provide electronic countermeasures against enemy communications and non-communications emitters. Work progressed on several fronts.

In 1989 the Army awarded a contract to an AEL/Lockheed Sanders team, an engineering development contract for TACJAM-A, the upgraded ground jamming system to replace the MLQ-34. Because of the variety of considerations in planning TACJAM-A and developing funding sources for all the work under consideration, there were some delays in awarding developmental contracts for all the work.

In FY91, the Army awarded a contract for Engineering and Manufacturing Development (EMD) for IEWCS, the GBCS-L, GBCS-H and Advanced QUICKFIX). Planners updated their TACJAM-A Electronic Countermeasures (ECM) subsystem development and awarded an option on

the PM Bradley multiyear contract to procure an EFVS for GBCS-H.

FY92 accomplishments were the awarding a contract for fabrication of TACJAM-A ESM E&MD subsystems and TACJAM-A ECM E&MD subsystems. Contractors also delivered a TACJAM-A ESM prototype subsystem in place, the first EFVS to the IEWCS integration contractor, and the Army exercised an option for two additional EFVS for GBCS-H and continue E&MD. Engineers also delivered the first GBCS-L prototype platform to the EWCS integration contractor and conducted Preliminary Design Review (PDR) for IEWCS. Program personnel also delivered one EH 60A platform to IEWCS Contractor and initiated risk reduction effort to eliminate mutual interference among SHORTSTOPs.

FY93 accomplishments saw the delivery of three GBCS-L platforms for integration. This took place in the Third Quarter. Engineers completed TACJAM-A ESM subsystems and delivered for integration in the Third Quarter at a cost of \$7.9 million. The Program Office conducted a Critical Design Review for TACJAM-A ECM E&MD and slow completion of EMD. (4Q - \$8.5 million)

Plans for FY94 were to resume the TACJAM-A ECM subsystem E&MD program (2Q94 - \$2,500), and continue the GBCS/AQF Integration effort. This was planned for the Fourth Quarter and funded at \$6.4 million. Program managers conducted a GBCS-L Special In-Process Review (SIPR) in the Third Quarter and began development and operational test (DT/OT) on GBCS-L/H and AQF in the Fourth Quarter. The Army also planned

to complete development of TACJAM-A ESM E&MD subsystems (3Q94 - \$2,080).

FY95 plans called for continued TACJAM-A ECM development, funded at \$22.6 million; and continued GBCS/AQF Integration effort, funded at \$21,638. Planners would conduct E&MD on Block II operational capabilities expansion for GBCS-L/GBCS-H and AQF which could not be accommodated in the baseline system due to funding constraints. This was planned for the Fourth Quarter.

Army Modernization Plan. In January 1993, the Army released its *Modernization Plan*, a 17-volume document which lays out the Army's plan for reshaping and re-equipping its forces for the future battlefield. Annex I highlighted the Army's plan for Intelligence and Electronic Warfare (IEW) and how it will support the Army's five modernization objectives and the Vision of LAND FORCE DOMINANCE. The IEW Annex outlined the details and rationale for the major programs that are key to achieving the Modernization Vision. These efforts will support:

- Winning the Information War
- Protecting the Force
- Conducting Precision Strikes
- Dominating the Maneuver Battle

Based on lessons learned in Operation Desert Storm, the Army found that its IEW force lacked versatility and balance. Processing and communications capabilities are inadequate, and deployability is limited. Sensor technology is 15 to 25 years old and does not have the needed frequency range, a precise targeting capability, and could not exploit many modern modulation techniques. The platforms are also very support/maintenance intensive and the number needed to support field forces can be a strain on available air and sea lift capacity.

In its plan, the Army noted that during the next decade military forces in many regions will increase their combat capability by acquiring increasingly sophisticated weapons and communications equipment. US forces must be prepared to face a broad array of systems and capabilities. As a result, the Army will have to upgrade older systems or add new, leading edge systems to its inventory.

The major improvements in EW/SIGINT capability are envisioned to be fielded during FY96 through FY99. The new systems will have an open architecture and modular design. Precision and capability will be significantly improved; as will mobility, deployability, balance, and supportability. Keys to this will be fielding the Guardrail Common Sensor, Advanced Quick Fix, and Ground Based Common Sensors, as well as TACJAM-A.

## Funding

	FY96		FY97		FY98		FY99	
	QTY	AMT	QTY	AMT	QTY	AMT	QTY	AMT
<u>RDT&amp;E (USA)</u>								
PE 0604270A								
DL12 Signals Warfare								
Development <sup>(a)</sup>	-	139.7	-	62.7	-	44.5	-	47.3
<u>RDT&amp;E</u>								
(USA estimate)	QTY	AMT	QTY	AMT	QTY	AMT	QTY	AMT
DL12	-	12.9	-	13.6	-	10.2	-	8.4

<sup>(a)</sup>Based on PE 0604270A, covers a variety of projects, including IEWCS.

	FY92		FY93		FY94		FY95	
	QTY	AMT	QTY	AMT	QTY	AMT	QTY	AMT
<u>Production (USA)<sup>(b)</sup></u>								
IEWCS	-	-	-	-	-	-	-	58.4
FY96	FY97							
	QTY	AMT	QTY	AMT				

Production

(USA estimate)

I EWCS - 46.9 - 46.6

<sup>(b)</sup>Based on FY96/97 Defense Budget request

All \$ are in millions.

**Analysis.** Army electronic combat efforts have been given priority in the development of equipment and tactics. Exercises and combat experience revealed the need for an aggressive approach to the increasingly sophisticated battlefield of the future. There is an emphasis on developing effective systems and protecting our own forces from the effects of enemy disruptive techniques.

The high-speed ground war in the Persian Gulf revealed the inadequacy of many systems. Many units could not keep up with the rapid advance of the Coalition forces. Tracked vehicles suffered breakdowns and had neither the mobility nor speed to keep up with the fast-moving combat forces. I EWCS platforms are being designed to be as mobile as the forces they will support.

When the Army released its Modernization Plan in early 1993, it noted that over the next decade, military forces worldwide will be improving their combat capabilities. Acquisition of advanced weapons and communications equipment is increasing, and there will be an emphasis on quality, not just quantity.

Planners have the incentive to push the I EWCS program, and the Persian Gulf War encouraged support of funding requests, although budgets have had a constraining effect. The increased interconnectivity of available assets, and the ability to interface with other developing information systems coming to the battlefield, will be important to insuring that the Army has an electronic warfare capability suitable to future combat. Standardization will reduce the cost and complexity of logistics support; these are important considerations as defense budgets are reduced. The new Army strategy emphasizes smaller but technologically superior forces that are versatile, deployable, and lethal. I EWCS plays an important part of meeting these goals, by developing an advanced capability with less equipment.

I EWCS is an intelligent, but ambitious, approach to battlefield EW. Although standardized hardware is important to improving the overall system, software development can be a challenge. The broad frequency spectrum to be addressed will also make antenna and roof component development a challenge as well.

## Recent Contracts

(Contracts over \$5 million.)

<u>Contractor</u>	<u>Award (\$ millions)</u>	<u>Date/Description</u>
Electrospace	185.4	Sept 1991 - CPAF contract for the Intelligence and Electronic Warfare Common Sensor (I EWCS) program encompassing GBCS-H, GBCS-L, and AQF applications. Complete Sep 1996 (DAAB10-91-C-0202).

## Timetable

Sep	1989	Started TACJAM-A E&EMD ESM prototype
Sep	1990	Initiate Host Interface Unit (HIU) development
Feb	1991	Bid solicitations
Sep	1991	I EWCS integration contract award
Nov	1991	Delivered first EH-60A platform to EIWCS contractor (AQF)
Feb	1992	First EFVS delivered (GBCS-H)
Mar	1992	Exercised option for first ESM E&EMD prototype to I EWCS contractor

Apr	1992	Initial System Design Review
Jun	1992	Preliminary Design Review, selection of subsystem suppliers
Jul	1992	Delivered first GBCS-L prototype platform to IEWCS, completed EFVS tests
Oct	1992	Exercise option for GBCS-L/ONS
Nov	1992	Complete HIU development/tests, CDR
Sep	1992	Deliver 2nd ESM prototype in-place
Feb	1993	Deliver three GBCS-L platforms to IEWCS contractor
Mar	1993	Deliver 2nd ESM E&EMD prototype to IEWCS contractor
Jun	1993	Deliver TACJAM-A ESM E&EMD subsystems for integration
Jun	1994	Conduct special In-Process Review on GBCS-L
Sep	1994	Begin DT/OT on GBCS/AQF
Oct	1994	Award contracts for procurement of IEW Common Sensor subsystems for GBCS-L ONS
Mar	1995	Field RDT&E models f GBCS-L to XVII Airborne Corps
Jul	1995	Milestone III on GBCS and AQF, selection decision on GBCS/AQF integration contract award
Nov	1995	Award contract for GBCS/AQF system integration
Oct	1996	Initiate EMD Block I improvements

## Worldwide Distribution

This is a US-only program.

## Forecast Rationale

Although the overall procurement plan for IEWCS has not been finalized, the initial round of systems needed to equip forces through the end of the reporting period is estimated in the Ten-Year Outlook. There have been some industry queries for quotes supporting a procurement of up to 100 units. This is a case where tactical ambition and fiscal reality may be at odds.

The forecast numbers will be adjusted as force levels are established. A second procurement effort after the turn of the century is possible as reserve units are outfitted with the new equipment and limited FMS interest develops.

## Ten-Year Outlook

### ESTIMATED CALENDAR YEAR PRODUCTION

Designation	Application	thru 94	<u>High Confidence</u>				<u>Good Confidence</u>				<u>Speculative</u>				Total 95-04
			<u>Level</u>				<u>Level</u>								
			95	96	97	98	99	00	01	02	03	04			
I EWCS	BATTLEFIELD EW (AS ARMY)	3	2	5	15	20	20	15	5	5	0	0	87		