

ARCHIVED REPORT

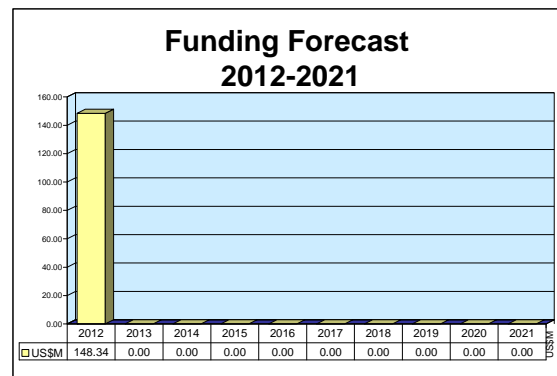
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FBCB2-BFT

Outlook

- FI projects that the U.S. Army will spend approximately \$148 million on procurement for the FBCB2 program in FY12
- According to a U.S. Army FY13 procurement budget document, the FBCB2 program will end in FY12
- Barring further activity, this report will be archived in September 2013



Orientation

Description. The Force XXI Battle Command Brigade and Below (FBCB2)-Blue Force Tracking (BFT) is the primary digital command and control system of the U.S. Army at brigade level and below. It consists of computer hardware and software integrated into a variety of tactical vehicles in various configurations. This system distributes situational awareness (SA) data and passes command and control messages within and between brigades, with feeds all the way to the Pentagon.

Note: *The FBCB2-BFT system is composed of multiple systems. As such, this report discusses the FBCB2-BFT system as a whole, rather than the individual systems that comprise it. That said, the focus of this report is on the FBCB2-BFT program that conducts procurement activities for the FBCB2-BFT system.*

Sponsor

U.S. Army
 Communications-Electronics Command (CECOM)
 Fort Monmouth, NJ 07703-5211
 USA
 Tel: + 1 (732) 532-2974
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 Web site: <http://www.cecom.army.mil/>

Status. The FBCB2-BFT program is currently conducting procurement activities.

Application. The FBCB2 provides soldiers and leaders in combat units and support units with on-the-move situational awareness and command and control information, as well as the means to communicate with the top of the command chain.

Contractors

Prime

Northrop Grumman Information Systems

<http://www.is.northropgrumman.com>, 7575 Colshire Dr, McLean, VA 22102 United States, Tel: + 1 (703) 556-1000, Prime (FBCB2 Program)

Comprehensive information on Contractors can be found in Forecast International's "International Contractors" series. For a detailed description, go to www.forecastinternational.com (see Products & Samples/Governments & Industries) or call + 1 (203) 426-0800.

Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 22 Commerce Road, Newtown,

FBCB2-BFT

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Technical Data

	<u>Metric</u>	<u>U.S.</u>
Dimensions		
<u>RVS-330 (V4+)</u>		
Processor Unit	12.95 x 32.26 x 25.9 cm	5.1 x 12.7 x 10.2 in
Display Unit	5.99 x 33.27 x 22.86 cm	2.36 x 13.1 x 9.0 in
Keyboard Unit	2.5 x 29.21 x 18.42 cm	1.0 x 11.5 x 7.25 in
<u>MT-2011 MST</u>		
	10.1 x 20.32 x 20.32 cm	4 x 8 x 8 in
Weight		
<u>RVS-330 (V4+)</u>		
12.1-inch Display	12.2 kg	26.9 lb
10.4-inch Display	11.6 kg	25.5 lb
<u>MT-2011 MST</u>		
	1.36 kg	3 lb
Characteristics		
<u>RVS-330 (V4+)</u>		
Processor	1.2-GHz Intel Pentium M	
Memory	512 MB SDRAM, up to 2 GB SDRAM	
Hard Drive	40 GB (removable)	
Display	High-resolution, active matrix TFT color display with touch screen	
Keyboard	USB 88-key elastomer in QWERTY configuration	
Pointing Device	Fully sealed, with right and left pick buttons	
Operating System	Compliant with Linux, Microsoft NT v 4.0, Solaris	
Power	28V DC vehicle power per MIL-STD-1275B	
<u>MT-2011 MST</u>		
Weight	1.36 kg	3 lb
Size	20.3 x 20.3 x 10.2 cm	8 x 8 x 4 in
Transmit Power	< 5 W	
Tx/Rx Frequency	L-band (Tx: 1,610.0 to 1,660.5 MHz; Rx: 1,525.0 to 1,559.0 MHz)	
Modulation	Direct sequence spread spectrum	
Interface Port	RS-422	
Power	10-32 Vdc @ 1 amp	

Design Features. The Force XXI Battle Command Brigade and Below-Blue Force Tracking is a digital battle command information system that provides information to combat and combat support units "on the move." It depends on a communications infrastructure called the Lower Tactical Internet, made up of EPLRS and SINCGARS radios. The FBCB2-BFT connects to an L-band satcom transceiver for over-the-horizon, on-the-move tracking.

FBCB2-BFT is a self-forming, wireless network of computers, terrestrial radios, satcom systems, routers, ground stations, and robust software. It can accept and process information from a wide range of sensors, such as infrared sensors; laser rangefinders; and nuclear, biological, and chemical (NBC) detectors. Features

include danger alert systems, navigation aids, and equipment status indicators.

The systems can be installed on a variety of vehicles (40 in the Army alone). These include light and heavy armored vehicles, HMMWVs, reconnaissance vehicles, tracked and wheeled command vehicles, self-propelled howitzers, logistics vehicles, and aviation platforms. The network is scalable for use at all echelons, including theater, coalition, and joint-level centers.

There are a variety of ways to filter the situational awareness features by type of unit (friendly/enemy, armor, infantry, etc.). The C² field is fully configurable and can automatically set default parameters for message addressing, acknowledgments, etc.

FBCB2-BFT

The main elements of the FBCB2-BFT system are the Appliqué hardware and the application software.

FBCB2-BFT Hardware. The Appliqué system began as an experimental battlefield digitization computer system, comprising four basic versions of hardware: a V1 computer, a V2 computer, a V3 computer, and a V4+ computer.

Appliqué V1 Computers. The Appliqué V1 computer was the R&D commercial laptop version.

Appliqué V2 Computers. The Appliqué V2 computer was the R&D ruggedized 90-MHz Pentium processor; it weighed about 36.5 pounds.

Appliqué V3 Computers. The Appliqué V3 computer was an upgraded, militarized computer.

RVS-330 V4+ Computers. The Appliqué V4+ computer is the most recent ruggedized version. The RVS-330 V4+ Rugged Vehicle System (Appliqué) component of FBCB2-BFT is the core of the U.S. Army's digitization of the battlefield. It was selected for the later low-rate initial production (LRIP) units and full-scale FBCB2-BFT procurement.

The system's MT-2011 Mobile Satellite Transceiver is used with a near-real-time packet data network operating over multiple satellites worldwide. The network is fully encrypted, and the transceiver uses spread spectrum and short-burst transmissions to provide security, low probability of interception/detection, and bandwidth conservation.

Operational Characteristics. This system provides maneuver forces with a comprehensive and easily understood picture of the battlefield, forming an efficient digital command and control network for commanders at all echelons. The system pinpoints locations, informing soldiers of their own location as well as the locations of enemy and friendly forces and identifying the locations of threats and obstacles. It also displays command operational orders and becomes the C² network used to execute the plan. FBCB2-BFT makes it possible to plan and execute dynamic changes in a combat force, which is an essential capability in today's fast-changing combat environment.

Another significant system attribute is its "position reporting frequency," which can be set based on the speed of movement. This feature reduces clutter on system screens because slower vehicles cover less ground per unit of time, as opposed to aircraft, which can cover significant distances in a minute. There is also a feature that fades icons with time so users get a feel for the reliability of the information. Blue "current," pale blue "stale," and gray "old" icons appear based on how long ago the unit reported information. Typical time values are 20 min = stale, 40 min = old, 8 hr = purge.

Position information on enemy units is input manually. The recommended fade setting for red (hostile/enemy) icons is 5 min = stale, 10 min = old, 1 hr = purge. Red information is automatically broadcast system-wide to each FBCB2-BFT system in the network. Fading information should trigger a new location update report. Discussions are ongoing on ways to improve the graphic display of information, taking advantage of the fact that humans are visual-based decision-makers.

Manually created position reports can be substituted for automatically generated information. These can be used for units that are not equipped with FBCB2-BFT systems or for a system that is failing to report.

"Other situational awareness" (Geo-referenced SA) is reported on all screens and provides an audible and banner warning based on the platform's proximity to the hazard. The location of refugees and non-combatants can also be displayed.

The system can also be used for the digital distribution of fragmental orders (FRAGOs) and C² messages to forces in the field. Scalable maps and imagery overlays facilitate navigation, line-of-sight planning, and target location for front-line units.

The map background provides a combination of joint operations graphic (JOG), compressed ARC digitized raster graphics (CADRG), and imagery map backgrounds. Own-platform location based on GPS information is updated constantly relative to the map. The user can control map centering, scrolling, zoom, and magnification.



FBCB2 Appliqué

Source: U.S. DoD

Program Review

In August 1997, the U.S. Army approved the FBCB2 for engineering and manufacturing development (EMD) after milestones I and II were successfully completed. In August 1998, the U.S. Army ran a limited user test on the equipment that was then available. The results of this test were reportedly an improvement over the results that followed the first Task Force XXI-AWE of 1997.

The U.S. Army approved the FBCB2 program for LRIP in November 1999. Two months later, TRW (now Northrop Grumman) was awarded a contract worth \$41 million plus options. This contract provided for the acquisition of FBCB2 systems to meet the U.S. Army's requirement for the first digitized division.

In November 2002, the U.S. Army delivered 216 FBCB2-BFT systems to Camp Doha in Kuwait. As war with Iraq commenced in 2003, the DoD postponed its Initial Operational Test and Evaluation (IOT&E) of the FBCB2 system, which was scheduled for the spring of 2003.

The Army continued to advance FBCB2 design in 2008 and 2009, as well as purchase new systems. Acceptance tests for FBCB2 Joint Capabilities Release began in November 2008.

In February 2009, the Army increased the ceiling of a contract awarded to Northrop Grumman by \$574 million. The additional funds will include capability for new in-line encryption devices and wires, cables, and other hardware to integrate the system onto vehicles.

In January 2010, the U.S. Army awarded Northrop Grumman a contract for FBCB2 support services and update work (see **Contracts/Orders & Options**). The contract is valued at more than \$8 million.

According to a United States Army FY13 procurement budget document (dated February 2012), the FBCB2 program ends in FY12. The program has no FY13 funding.

FBCB2-BFT

Funding

U.S. FUNDING

	FY11	FY11	FY12	FY12	FY13	FY13
	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>
Procurement (U.S. Army) Force XXI Battle Command Brigade & Below (FBCB2) (W61900)	-	178.56	-	148.34	-	0.00

	FY14	FY14	FY15	FY15	FY16	FY16	FY17	FY17
	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>
Procurement (U.S. Army) Force XXI Battle Command Brigade & Below (FBCB2) (W61900)	-	0.0	-	0.0	-	0.0	-	0.0

All \$ are in millions.

Source: U.S. Department of the Army FY13 procurement budget document

Contracts/Orders & Options

Contractor	Award (\$ millions)	Date/Description
Northrop Grumman	8.04	Jan 2010 – The U.S. Army awarded Northrop Grumman a cost-plus-fixed-fee contract for support services for the FBCB2, Integrated System Command / Tactical Internet Management System, and for Blue Force tracking data product and automated toll development/update. Work was scheduled to be completed Dec 4, 2010. CECOM Acquisition Center, Fort Monmouth, NJ, is the contracting activity (W91QUZ-07-D-0005).

Timetable

Month	Year	Major Development
Mar	1998	Initial Operational Requirements Document (ORD) for FBCB2-BFT
Jan	1999	V3.0 software completed and delivered
Jun	1999	V3.1 software completed and delivered
Sep	2000	Army concludes system needs further development before being declared operationally suitable; LRIP contract
Apr	2001	Army tests performance of FBCB2-BFT system; officials give it high marks
Nov	2002	U.S. Army delivers 216 FBCB2-BFT systems to its camp in Doha, Kuwait
Mar	2003	DRS Technologies receives a contract from Northrop Grumman to provide Appliqué computer systems and display units for the FBCB2-BFT program
4Q	FY04	Award of follow-on contract, full-rate production decision review, full-rate production contract award
2Q	FY05	Full-rate production contract award
Jun	2006	\$396 million contract awarded to DRS Technologies for rugged Appliqué computer
1Q	FY07	FBCB2-BFT follow-on test and evaluation
Nov	2008	Acceptance tests of FBCB2 Joint Capabilities Release
Feb	2009	Ceiling of contract awarded to Northrop Grumman for FBCB2 install kits and other hardware increased by \$574 million
Jan	2010	The U.S. Army awards Northrop Grumman a contract for FBCB2 support services and update work
	FY12	FBCB2 program scheduled to end

Worldwide Distribution/Inventories

The FBCB2-BFT system is a **United States Army** program.

Forecast Rationale

The FBCB2-BFT is the primary digital command and control (C2) system of the U.S. Army at brigade level and below. The FBCB2-BFT consists of computer hardware and software integrated into a variety of tactical vehicles in various configurations. The FBCB2-BFT is a system of systems.

Forecast International projects that the United States Army will spend approximately \$148 million on procurement for the FBCB2 program in FY12.

According to a United States Army FY13 procurement budget document (dated February 2012), the FBCB2 program ends in FY12. The same budget document indicates that the program has no FY13 funding.

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Ten-Year Outlook

ESTIMATED CALENDAR YEAR PROCUREMENT FUNDING (in millions \$)												
Designation or Program	High Confidence					Good Confidence			Speculative			Total
	Thru 2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
Northrop Grumman Information Systems (Prime)												
FBCB2-BFT Military <> United States <> Army												
	2,756.76	148.34	.00	.00	.00	.00	.00	.00	.00	.00	.00	148.34
Total	2,756.76	148.34	.00	.00	.00	.00	.00	.00	.00	.00	.00	148.34