

# ARCHIVED REPORT

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## E-10 MC2A - Archived 5/2008

### Outlook

- The E-10 effort combines a commercial 767-400ER airframe with an advanced radar and battle management system. The radar would also equip the Global Hawk UAV
- The E-10 MC2A has been threatened with cancellation throughout its development. In 2006, the U.S. Air Force finally canceled the program
- It is unlikely that the program will be resurrected in the short-term, but it is possible that it will be restarted at a later date. The E-8 JSTARS airframe and radar are aging, and may need to be replaced in the future
- This report will be archived in 2008. Any developments with its radar will be tracked in a Forecast International report titled, "MP-RTIP"

### Orientation

**Description.** The E-10 Multi-Sensor Command & Control Aircraft (MC2A) stemmed from a U.S. Air Force program to develop the Multi-Platform Radar Technology Insertion Program (MP-RTIP), a replacement for the Joint STARS radar. Under the E-10 program, the Air Force intended to equip a militarized commercial airliner with the MP-RTIP radar and a Battle Management Command and Control (BMC2) mission suite.

#### Sponsor

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**Status.** Technology development effort.

**Application.** The E-10 MC2A was intended to supplement and eventually replace the E-8 Joint STARS aircraft. Some earlier plans also called for the MC2A to be equipped with an AWACS radar and SIGINT equipment to replace E-3s and Rivet Joints in USAF service.

**Price Range.** As the E-10 MC2A did not reach production stage, no unit price information is available. The U.S. Air Force has spent about \$1.67 billion on development of the radar and integration studies.

### Contractors

#### Prime

<b>Northrop Grumman AGS&amp;BM Systems</b>	<a href="http://www.is.northropgrumman.com">http://www.is.northropgrumman.com</a> , 2000 NASA Blvd, PO Box 9650, Melbourne, FL 32902-9650 United States, Tel: + 1 (407) 951-5447, Fax: + 1 (407) 951-6876, Prime
<b>Boeing</b>	<a href="http://www.boeing.com">http://www.boeing.com</a> , 100 N Riverside, Chicago, IL 60606 United States, Tel: + 1 (312) 544-2000, Fax: + 1 (312) 544-2082, Email: <a href="mailto:wwwmail.boeing2@boeing.com">wwwmail.boeing2@boeing.com</a> , Second Prime

## E-10 MC2A

<b>Raytheon Space &amp; Airborne Systems</b>	http://www.raytheon.com/businesses/rsas, 2000 E El Segundo Blvd, El Segundo, CA 90245 United States, Tel: + 1 (310) 647-1000, Fax: + 1 (310) 647-0734, Email: SAS_Comms_PA@raytheon.com, Co-producer
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## Technical Data

**Design Features.** The Multi-sensor Command and Control Aircraft (MC2A), designated the E-10A, was intended to meet the U.S. Air Force's need to integrate command and control intelligence, surveillance, and reconnaissance (C2ISR) and information warfare functions on a single platform. Integration of these functions will improve the effectiveness of military operations by supporting increased battlespace awareness, shortened decision cycles, and rapid decision-making.

The E-10A capability was planned to include the Multi-Platform Radar Technology Insertion Program (MP-RTIP) sensor and Battle Management Command and Control (BMC2) suite enabled by open-system architecture. The sensor would have supported a Ground Moving Target Indicator (GMTI) capability as well as limited air-to-air and cruise missile defense support. A Multi-Platform/Common Data Link (MP-CDL) will provide a connection to other airborne and ground platforms prosecuting the ground war.

Other planned capabilities included interfaces to the Space Radar, reception of data from and control of unmanned aerial vehicles, and combat operations functions. The initial effort included provisions for the growth of both hardware and software to permit incorporation of additional sensor configurations, as well as other BMC2 functionality. A second spiral was planned to expand E-10A support to air-to-air and cruise missile defense with the installation of additional sensors (e.g., IFF) and additional BMC2 functionality.

The MC2A evolved from the Block 40 upgrade to the Joint Surveillance Target Attack Radar System

(JSTARS) E-8C (a B-707), designated the RTIP. The Air Force restructured the RTIP as MP-RTIP and directed the program office to develop a scalable sensor for multiple platforms. An Analysis of Alternatives was conducted to determine whether to install the sensor on a B-707 or on a newer aircraft. Based on this analysis, the Air Force decided a B-767-400ER better suited planned capability and growth. After the aircraft was chosen, the Air Force decided to integrate the MP-RTIP onto the E-10A.

**Operational Characteristics.** Formerly a Pre-Planned Product Improvement to JSTARS, MP-RTIP will deliver a significantly enhanced wide-area surveillance capability to the warfighter. It has a WAS platform to provide a near real-time, horizontally integrated view of the air and surface battlespace. To achieve this goal, advanced sensors, network-centric warfare systems and high-speed wideband communications will be incorporated on the platform. The MC2A will be the "hub" of the MC2 constellation's network-centric systems architecture. The E-10A will offer constant battlespace awareness.

The system will be capable of being cued by other reconnaissance, surveillance, and target acquisition systems, and be able to respond rapidly to worldwide contingencies. MC2A will greatly improve the commander's ability to detect, locate, classify, track, and monitor moving targets, and to provide target information to assigned aerospace and ground weapons systems.



The E-10 may have been based on the Boeing 767

Source: Boeing

## Program Review

### ***Result of Restructured RTIP***

In the early 2000s, the U.S. Air Force restructured its upgrade plans for the Joint Surveillance Target Attack Radar System (JSTARS). Previously, the upgrade program had fallen under the Radar Technology Insertion Program, which would upgrade the radars currently equipping the E-8 JSTARS aircraft. The restructuring was dubbed the Multi-Purpose Radar Technology Insertion Program (MP-RTIP). The MP-RTIP would be able to equip a variety of aircraft, including UAVs.

In addition, the USAF decided to procure a new widebody commercial aircraft to carry the new ground surveillance radar. The Air Force announced the plan to pursue the new aircraft in February 2001. Planners in the Air Force wanted the aircraft eventually to replace E-3 AWACS and RC-135 Rivet Joint SIGINT aircraft as well as the E-8 JSTARS aircraft. They also wanted the new aircraft to be the same model as whatever aircraft won the KC-X aerial refueling tanker competition.

Plans called for the E-10 to have an air moving target indicator (AMTI) capability for cruise missile defense, a

Ground Moving Target Indicator (GMTI) capability, and Battle Management, Command and Control (BMC2) capabilities. It would have interfaced with multiservice ground/air/space-based sensors and intelligence and communications assets to shorten the decision cycle for combat operations.

E-10A Increment 1 was to deliver the core capability to perform the AMTI and GMTI missions, including data processing. Future spirals within E-10A Increment 1 were envisioned to incorporate sensor fusion, advanced battle management functions, UAV control, space-based radar integration, and laser communications.

### ***High Price Tag a Threat to E-10***

The aircraft eventually was dubbed the E-10 Multi-Sensor Command & Control Aircraft (MC2A). A testbed MC2A, based on the Boeing 767-400 airliner, first flew in April 2002. Even as the program made progress, its price tag constantly caused problems. In October 2002, Congress cut the Air Force's planned budget for the MC2A program by half. In October 2003, the Air Force itself threatened to cancel the program if it was forced to purchase its planned KC-X aircraft rather than lease them.

## E-10 MC2A

## Significant News

**USAF Cuts E-10 MC2A Program** – The U.S. Air Force has canceled the E-10 MC2A program for FY08. The program, which was expected to cost about \$7.3 billion through 2013, will still develop the radar for Global Hawk UAVs, but will not develop the new E-10, or develop a radar to replace the JSTARS radar on E-8 aircraft. The Air Force will use existing systems to upgrade its E-8 JSTARS aircraft. Funds for the program had been continually reduced from 2003-2005. In FY08, they are finally completely gone. Some experts believe the new aircraft could still be developed but may not reach operational capability until 2019. (Reuters, 10/06)

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## Funding

Funding for the E-10 aircraft for FY08 has been canceled. There is still some funding for the MP-RTIP radar. Forecast International will record MP-RTIP funding in a report with that title.

## Contracts/Orders &amp; Options

(Contracts over \$5 million.)

<u>Contractor</u>	<u>Award (\$ millions)</u>	<u>Date/Description</u>
Northrop Grumman	9.6	Jun 2000 – Not-to-exceed mod to a CPIF contract to extend by three months the pre-EMD phase of the Radar Technology Insertion Program. Completed June 2000. (F19628-99-C-0011-P00016)
Northrop Grumman	6.7	Jul 2000 – Mod to a CPF contract to extend by two months the pre-EMD phase of the Radar Technology Insertion Program. Completed August 2000. (F19628-99-C-0011-P00018)
Northrop Grumman	6.4	Jul 2000 – Mod to a CPF contract to extend by two months the pre-EMD phase of the Radar Technology Insertion Program. Completed October 2000. (F19628-99-C-0011-P00019)
Northrop Grumman	153.9	Sep 2002 – CPAF mod for contractor support of the government's selection of the Boeing 767-400ER as wide-area surveillance platform and Balance Plus configuration of the Global Hawk. Contract also includes development of risk-reduction hardware and proof-of-design hardware. In addition, contract provides for acceleration of prime mission equipment for MC2A and Global Hawk development units. Completed March 2004. (F19628-00-C-0100, P00026)
Northrop Grumman	888.0	Apr 2004 – CPAF contract mod for MP-RTIP SDD. This includes the development of an MP-RTIP radar for the MC2A, as well as the delivery of two WAS demonstration units that are upgradeable to a full configuration baseline, and three MP-RTIP Global Hawk radars. Also includes ECP-004 mode, platform integration and test (ground and flight), and NATO AGS Center support. To be completed May 2010. (F19628-00-C-0100, P00050)
Northrop Grumman	170.5	Sep 2004 – CPAF contract mod for pre-system development and demonstration of E-10A battle management command and control system. Completed October 2005. (F19628-03-C-0014/P00014)
Northrop Grumman	62.0	Sep 2004 – CPAF contract mod for extension of pre-SDD phase. Completed December 2005. (F19628-03-C-0014/P00014)

## Timetable

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<u>Month</u>	<u>Year</u>	<u>Major Development</u>
1Q	FY01	MP-RTIP Phase 1 award
3Q	FY01	MP-RTIP Phase 1 definitized, Integrated Baseline Review
1Q	FY02	Radar Requirements Review
2Q	FY02	Radar Functional Review
1Q	FY03	Purchase of 767-400ER, sensor Initial Design Review
3Q	FY03	System Design Review initiated for aircraft and sensors
4Q	FY03	Incrementally funded purchase order placed for 767-400ER, BMC2 Competition contracts awarded (3 teams)
2Q	FY04	System Requirements Review
3Q	FY04	Downselect of BMC2 Contractors and sensor Final Design Review
4Q	FY04	Initial Design Review
3Q	FY05	Start of Global Hawk Development Unit 1 Build
4Q	FY05	Start of Final Design Review
4Q	FY05	Development of RF Aperture Unit (RFAU); start of Global Hawk Unit 2 build
Nov	2005	E-10A passes Critical Platform Review
	FY06	One 767-400ER/MP-RTIP testbed for modification
	FY07	One Global Hawk MP-RTIP for integration
Oct	2006	E-10 MC2A canceled

## Worldwide Distribution/Inventories

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This is currently a **U.S.**-only program. NATO and select allies will probably be included in the future.

## Forecast Rationale

### *E-10 Finally Canceled in 2006*

The E-10 MC2A has been threatened with cancellation throughout its development. In 2006, the U.S. Air Force finally canceled the program in order to save money for other programs as well as reduce its overall budget. In addition, the Air Force canceled the MP-RTIP radar that was to equip the E-10. However, it will still develop a radar to equip its Global Hawk UAVs.

It is unlikely that the E-10 program will be resurrected within the next couple of years. Some analysts believe that the Air Force is trying to force Congress's hand by canceling a program for a valuable piece of equipment in the hopes that Congress will then authorize funding for the program. This, however, is unlikely because of the new party in power along with the desire to reduce the budget.

While it is unlikely that the program will be resurrected in the short-term, it is possible that it will be restarted at a later date. The E-8 Joint STARS aircraft are getting older. The Air Force may be tempted just to upgrade the radar to increase the aircraft's capabilities, but the airframe itself is getting older as well. Eventually, maintenance costs will outweigh the costs of a completely new airframe. Currently, the KC-X is a top priority for the USAF. Once that program is underway, the service may begin to more seriously look at the E-10 program.

Any developments for the Multi-Platform Radar Technology Insert Program will be tracked in a separate report.

## Ten-Year Outlook

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This report will be archived in 2008. The E-10 MC2A has been canceled. Any developments with its radar will be tracked in a Forecast International report titled, "MP-RTIP."

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