



AIR COMBAT COMMAND

PEOPLE FIRST - MISSION ALWAYS

E-3 SENTRY

Current as of February 11, 2023



MISSION

The E-3 Sentry is an airborne warning and control system, or AWACS, aircraft with an integrated battle management command and control, or BMC2, surveillance, target detection, and tracking platform. The aircraft provides an accurate, real-time picture of the battlespace to the Joint Air Operations Center.

AWACS provides situational awareness of friendly, neutral and hostile activity, command and control of an area of responsibility, battle management of theater forces, all-altitude and all-weather surveillance of the battle space, and early warning of enemy actions during joint, allied, and coalition operations.

FEATURES

The E-3 Sentry is a modified Boeing 707/320 commercial airframe with a rotating radar dome. The dome is 30 feet (9.1 meters) in diameter, six feet (1.8 meters) thick, and is held 11 feet (3.33 meters) above the fuselage by two struts. It contains a radar subsystem that permits surveillance from the Earth's surface up into the stratosphere, over land or water. The radar has a range of more than 250 miles (375.5 kilometers). The radar combined with an identification friend or foe, or IFF, subsystem can look down to detect, identify and track enemy and friendly low-flying aircraft by eliminating ground clutter returns that confuse other radar systems.

Major subsystems in the E-3 are avionics, navigation, communications, sensors (radar and passive detection) and identification tools (IFF/SIF). The mission suite includes consoles that display computer-processed data in graphic and tabular format on video screens. Mission crew members perform surveillance, identification, weapons control, battle management, and communications functions.

The radar and computer subsystems on the E-3 Sentry can gather and present broad and detailed battlefield information. This includes position and tracking information on enemy aircraft and ships, and location and status of friendly aircraft and naval vessels. The information can be sent to major command and control centers in rear areas or aboard ships. In times of crisis, this data can also be forwarded to the president and secretary of defense.

In support of air-to-ground operations, the Sentry can provide direct information needed for interdiction, reconnaissance, airlift, and close-air support for friendly ground forces. It can also provide information for commanders of air operations to gain and maintain control of the air battle. As an air defense system, E-3s can detect, identify and track airborne enemy forces far from the boundaries of the United States or NATO countries. It can direct fighter-interceptor aircraft to these enemy targets. Experience has proven that the E-3 Sentry can respond quickly and effectively to a crisis and support worldwide military deployment operations.

AWACS may be employed alone or horizontally integrated in combination with other BMC2 and intelligence, surveillance, and reconnaissance elements of the Theater Air Control System. It supports decentralized execution of the air tasking order/airspace control order. The system provides the ability to find, fix, track, and target airborne or maritime threats and to detect, locate, and ID emitters. It has the ability to detect threats and control assets below and beyond the coverage of ground-based command and control and can exchange data with other command and control systems and shooters via datalinks.

With its mobility as an airborne warning and control system, the Sentry has a greater chance of surviving in warfare than a fixed, ground-based radar system. Among other things, the Sentry's flight path can quickly be changed according to mission and survival requirements. The E-3 can fly a mission profile approximately eight hours without refueling. Its range and on-station time can be increased through in-flight refueling and the use of an on-board crew rest area.

AIR COMBAT COMMAND PUBLIC AFFAIRS

115 Thompson St., Ste 121
Langley AFB, Va. 23665-1987

ACCPA.operations@us.af.mil
757-764-5007



Twitter: @USAF_ACC

Facebook: @ACCnCFB



Instagram: @aircombatcommand

Youtube: @ACCNEWSTV





AIR COMBAT COMMAND

PEOPLE FIRST - MISSION ALWAYS

BACKGROUND

Engineering, test, and evaluation began on the first E-3 Sentry in October 1975. In March 1977, the 552nd Airborne Warning and Control Wing (now 552nd Air Control Wing, Tinker Air Force Base, Oklahoma), received the first E-3s.

There are 31 aircraft in the U.S. inventory. Air Combat Command has 27 E-3s at Tinker. Pacific Air Forces has four E-3 Sentries at Kadena Air Base, Japan and Elmendorf Air Force Base, Alaska.

NATO has 14 E-3A's and support equipment. The first E-3 was delivered to NATO in January 1982. The United Kingdom has seven E-3s, France has four, and Saudi Arabia has five. Japan has four AWACS built on the Boeing 767 airframe.

As proven in operations Desert Storm, Allied Force, Enduring Freedom, Iraqi Freedom, and Odyssey Dawn/Unified Protector, the E-3 Sentry is the world's premier BMC2 aircraft. AWACS aircraft and crews were instrumental to the successful completion of operations Northern and Southern Watch, as well as having supported operations Inherent Resolve, and Spartan Shield. They provide radar surveillance and control in addition to providing senior leadership with time-critical information on the actions of enemy forces. The E-3 has also deployed to support humanitarian relief operations in the U.S. following Hurricanes Rita, Katrina, and Irma, coordinating rescue efforts between military and civilian authorities.

The data collection capability of the E-3 radar and computer subsystems allowed an entire air war to be recorded for the first time in the history of aerial warfare. In March 1996, the Air Force activated the 513th Air Control Group, an AWACS Reserve Associate Program unit that performs duties on active-duty aircraft.

During the spring of 1999, the first AWACS aircraft went through the Radar System Improvement Program. RSIP is a joint U.S./NATO development program that involved a major hardware and software intensive modification to the existing radar system. Installation of RSIP enhanced the operational capability of the E-3 radar electronic counter-measures and has improved the system's reliability, maintainability, and availability.

The AWACS modernization program, Block 40/45, is currently underway. Block 40/45 represents a revolutionary change for AWACS and worldwide Joint Command and Control, Battle Management, and Wide Area Surveillance. The Block 40/45 Mission Computer and Display upgrade replaced 1970 vintage mission computing and displays with a true open system and commercial off-the-shelf hardware and software, giving AWACS crews the modern computing tools needed to perform its mission. Fleet upgrades are estimated to be completed by 2024.

Diminishing Manufacturing Sources Replacement of Avionics for Global Operations and Navigation (DRAGON), CNS/ATM modification is a cooperative effort between the Air Force and NATO to upgrade the flight avionics suite of the E-3 weapons system. This upgrade ensures global access of the AWACS platform into the 2030s and beyond. The DRAGON system modification utilizes industry standard hardware and software interfaces to allow weapons system compliance with worldwide communication and navigation requirements. Fleet upgrades are estimated to be completed by 2027.

Characteristics

Primary function: airborne battle management, command and control

Contractor: Boeing Aerospace Co.

Power plant: four Pratt and Whitney TF33-PW-100A turbofan engines

Thrust: 20,500 pounds each engine at sea level

Rotodome: 30 feet in diameter (9.1 meters), 6 feet thick (1.8 meters), mounted 11 feet (3.33 meters) above fuselage

Wingspan: 145 feet, 9 inches (44.4 meters)

Length: 152 feet, 11 inches (46.6 meters)

Height: 41 feet, 9 inches (13 meters)

Weight: 205,000 pounds (zero fuel) (92,986 kilograms)

Maximum Takeoff Weight: 325,000 pounds (147,418 kilograms)

Fuel Capacity: 21,000 gallons (79,494 liters)

Speed: optimum cruise 360 mph (Mach 0.48)

Range: more than 5,000 nautical miles (9,250 kilometers)

Ceiling: Above 29,000 feet (8,788 meters)

Crew: flight crew of 3 or 4 plus mission crew of 13-19 specialists (crew size varies according to mission and model variant)

Unit Cost: \$270 million (fiscal 98 constant dollars)

Initial operating capability: April 1978

Inventory: Approximately 31 (total force)

AIR COMBAT COMMAND PUBLIC AFFAIRS

115 Thompson St., Ste 121
Langley AFB, Va. 23665-1987

ACCPA.operations@us.af.mil
757-764-5007



Twitter: @USAF_ACC

Facebook: @ACCConFB



Instagram: @aircombatcommand

Youtube: @ACCNEWSTV

