

A one-of-a-kind aircraft and a critical mission keep the 93rd Air Control Wing at Robins AFB, Ga., a busy place.



Photography by Guy Aceto, Art Director, and Susan Kennedy

The View From the



High Ground

Two 93rd ACW E-8C Joint Surveillance Target Attack Radar System aircraft on the Robins tarmac await the day's mission. The Air Combat Command wing, created just four years ago, is a unique unit and is one of the most heavily tasked outfits in the US military. The first real-world test for Joint STARS came during Operation Desert Storm in 1991—six years before initial operational capability—when two E-8A developmental aircraft flew more than 150 missions. Joint STARS has been used in every subsequent contingency and in many major exercises.

Each of USAF's six E-8Cs was once a commercial Boeing 707. Northrop Grumman now refurbishes and enhances the aircraft and installs a multimode radar system and advanced communications.

The 26-foot-long canoe-shaped pod added under the forward fuselage carries the Joint STARS phased array radar antenna. The radar has a range of more than 155 miles and can cover some 386,000 square miles in a single eight-hour mission. The E-8C radar provides real-time targeting and battle management data in virtually any weather condition to 17 onboard mission workstations as well as to Army mobile ground station modules. While the E-8C flies outside a battle area, the radar system looks deep into enemy territory to locate, classify, and track ground targets for theater commanders or combat aircraft.



Staff photo by Guy Aceto

Photo by Susan Kennedy



Above, a production model E-8C takes off from the Georgia base on a routine training mission. Before any sortie, the mission crew meets en masse for initial planning. They then split into smaller cells to refine the day's operations. At left, mission crew members determine the requirements for an integrated training exercise that will place them near Ft. Hood, Texas. Below, flight crew members go over the routes they'll use for the trip out and back and during the exercise.



Above, it's early morning as the crew boards the E-8C at the start of a 10-hour sortie. The E-8C's normal range is 11 hours—20 with air refueling.



Staff photos by Guy Aceto



On this mission, the flight crew takes on fuel from aircraft of the 19th Air Refueling Group, also based at Robins. Above, Lt. Rob Southerland carefully maneuvers the E-8C behind the tanker. The refueling receptacle is slightly behind the cockpit. Each pilot on the flight will conduct the refueling "dance."



It takes much practice for both the E-8C flight crews and the KC-135R boom operators to make the process look as routine as it did to Air Force Magazine's art director, Guy Aceto, who was along for this Joint STARS mission.



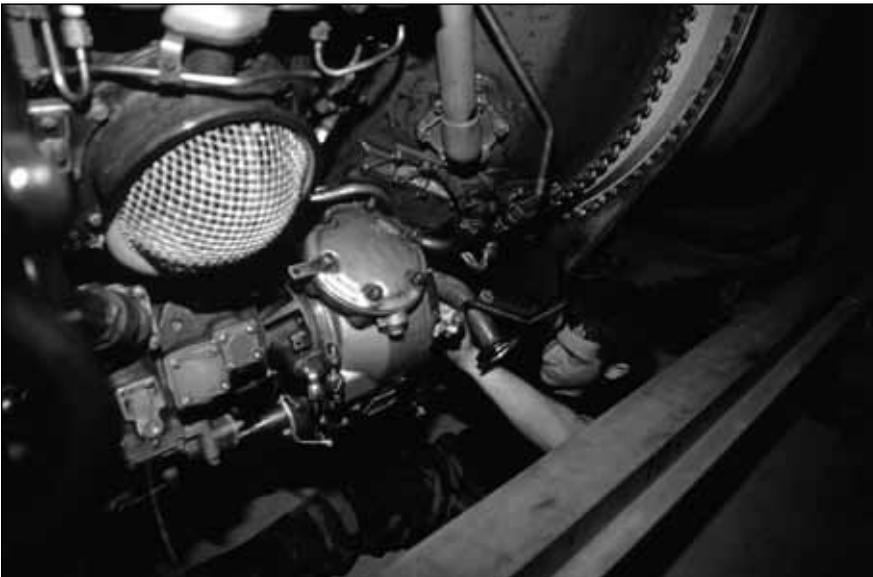
Air refueling permits Joint STARS aircraft to perform lengthy missions. For longer missions, the aircraft can accommodate up to 34 personnel. Besides the 17 mission workstations, there's a navigator workstation, several bunks, an open seating area, and a tiny galley with a food locker.

The E-8Cs are packed with avionics, radios, and computers. They even come with onboard stores of spare equipment for in-flight maintenance, should it be needed. Joint STARS uses both secure digital data links and voice communications to distribute and exchange information.

Keeping all this equipment in running order is partially the task of the 93rd's avionics shop. At right, SrA. Larry Williams checks out a radio from one of the E-8Cs.



Photo by Susan Kennedy



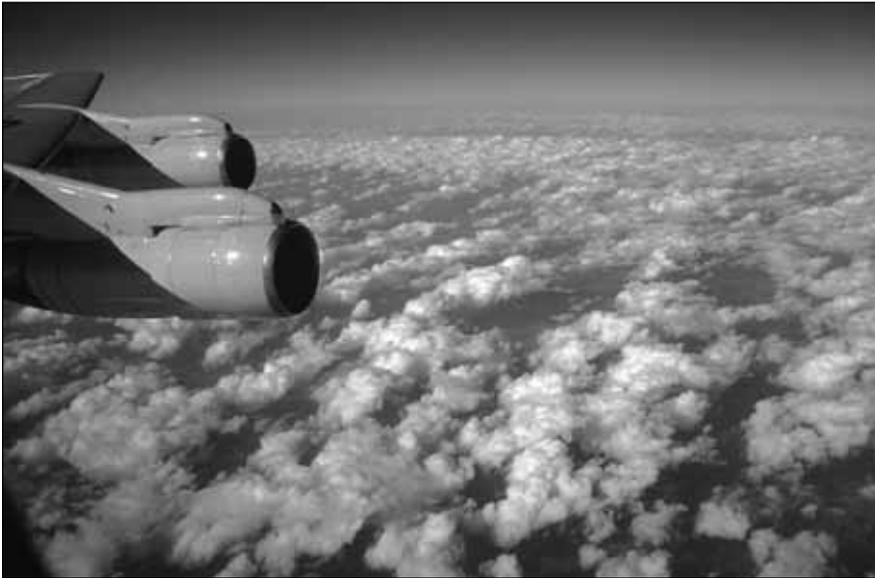
Above and at left, A1C David Tackett works on one of the aircraft's four Pratt & Whitney JT3D-3B turbojet engines. The engines each have 18,000 pounds thrust. The maximum airspeed is Mach .84, and the ceiling is 42,000 feet.

At right, TSgt. Douglas Winfrey checks an aircraft wheel hub for tiny stress fractures.

A newly developed nondestructive test uses a chemical coating that becomes fluorescent under ultraviolet light. Regular maintenance is critical and helped the wing exceed expectations during wartime surge tests conducted in 1998 and 1999.

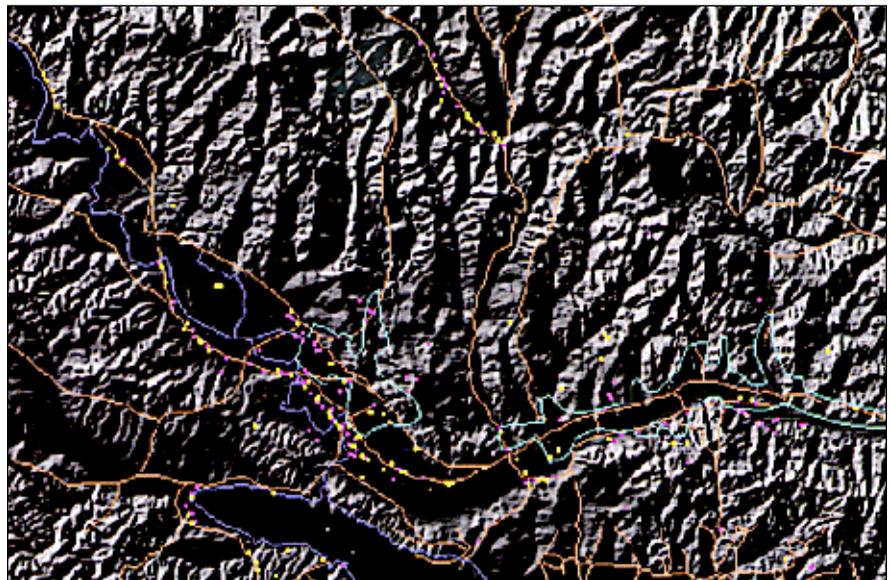
During Operation Allied Force, in which Air Force maintainers far outnumbered contractor representatives, the ground crews sustained a mission capable rate above the 85 percent goal.





The E-8C literally gives US forces the electronic high ground. The aircraft fly in figure-8 patterns once in an assigned orbit area. The system's key tool is its multi-mode radar. The fundamental operating modes detect, locate, and identify slow-moving ground or waterborne targets, helicopters and other low-flying vehicles, and rotating antennas. Using advanced signal processing, Joint STARS can differentiate between wheeled and tracked vehicles. The other modes produce a photographic-like image or map of selected geographic regions, giving precise locations of nonmoving targets, such as bridges, harbors, airports, buildings, or stopped vehicles. Using a combination of modes and a history display, onboard or ground operators can perform battle damage assessment.

Each operator station contains an advanced digital display processor that provides rapid display of maps, radar data, and multiple activity indicators and symbols via a high-resolution color graphics monitor. A typical image, as shown at right, displays moving vehicles in real time as dots of light. By watching the dots move across the terrain, operators can determine the direction and speed of movement.



During Allied Force, the typical eight-hour sortie became a "power mission" lasting 15–20 hours. Operators such as these at left provided intelligence and targeting information to the Combined Air Operations Center, located at Vicenza, Italy. In some cases they were cleared to direct strike aircraft missions against moving targets. The operators can swiftly update information, determining direction, speed, and patterns of ground vehicles or helicopters.



The airborne Joint STARS team includes both Air Force and Army mission operators. These operators and the flight crews normally log some 125 flying hours per month. During the Kosovo campaign, the average became 165 hours as the mission duration stretched up to 20 hours.

About 200 93rd ACW members—flight and mission crews, aircraft maintainers, and support personnel—deployed to the theater with two E-8Cs for Allied Force. The aircraft flew their patrols in tandem. Throughout the operation, the 93rd managed about a 96 percent mission effectiveness rate.

At right, crew members don oxygen masks during this training flight—practicing their in-flight emergency procedures for “fumes” coming from electrical equipment. With the number of computers, radios, and other equipment on this aircraft, it’s serious business.



At left, the crew member designated to check out the suspicious fumes gets a yellow walk-around oxygen bottle. Other crew members with oxygen bottles also do walk-arounds until the aircraft is thoroughly checked and they either find the problem or ensure there’s no danger.



The 93rd received its fifth and sixth production E-8Cs late last year—welcome additions and both ahead of schedule. The original Air Force plan called for 30 aircraft. That was scaled back to 19, then 13 in 1997 because of budget considerations. The number is now up to 15 in the new Pentagon budget.



Program officials at the Electronic Systems Center, Hanscom AFB, Mass., anticipate delivery of two more during this year. They are also working on a program to replace five of the E-8C computers with two more-capable units. The new computers, if testing this year is satisfactory, would first appear on production aircraft delivered in summer 2001. Other enhancements include a planned radar upgrade.



During Allied Force, key commanders stated that the Joint STARS package was invaluable, noted a wing official. He added that changes being made by the program office and the wing would improve it, as would time and experience. ■