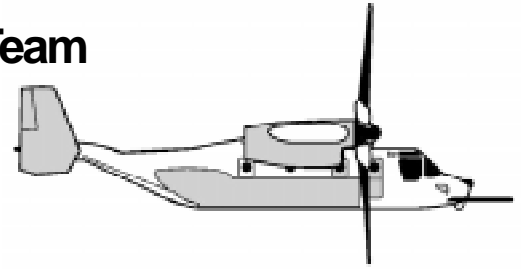


# OSPREY FACTS



## CMC lauds V-22 at Farnborough Air Show

The Marines led the charge in Britain when an overflow crowd gathered in the Team Osprey chalet, opening day of Farnborough 2000, the largest international aerospace event of the year, held July 24-29.

Of the more than 60 people in attendance for the scheduled press conference, 32 news reporters joined Bell Boeing and many suppliers when Gen. James L. Jones, USMC Commandant was introduced and spoke for about 30 minutes about the V-22. Some of this time was spent answering reporters' questions following the general's and Bell Boeing's opening remarks.

"We are truly excited about the V-22," said Jones, after reiterating the Corps' commitment to the new airplane despite its absence at the show. After outlining how the Operational Evaluation schedule precluded their getting an airplane to the air show, he also announced OPEVAL is complete and that the aircraft exceeded all of its threshold targets.

"It will expand the expeditionary envelope

of the Marine Corps and take our capabilities to a new level," said Jones. "It will allow our troops to deploy from further afield, deeper, more quickly and more safely than ever before."

Lt. Gen. Fred McCorkle, deputy chief of staff for aviation, also spoke to the press who joined him in the chalet for a formal luncheon after the press conference. John Murphey, Pat Finneran, Mike Tkach and others from Bell and Boeing also attended the lunch. McCorkle provided a prepared letter (below) for journalists, helping to explain the V-22's schedule conflict and absence at the



Gen. James Jones, USMC Commandant, addresses international reporters.



**A MESSAGE FROM THE DEPUTY COMMANDANT FOR AVIATION**

As you are no doubt aware, the V-22 aircraft is not participating in this year's Farnborough Air Show. The Marine Corps' decision to keep the aircraft in the United States was driven by the necessity to complete our MV-22 Operational Evaluation (OPEVAL). Given the limited number of assets currently fielded, priority was given to the Multi-service Operational Test Team to fully support their completion of OPEVAL in order to move expeditiously towards a full rate production decision this fall.

The accident investigation is complete and has fully vindicated the MV-22 design. Further, the United States Marine Corps remains steadfast in its support of the MV-22 Osprey tilt-rotor aircraft and continues to garner solid political support. Political leadership remains committed because the MV-22 provides the United States with an affordable balance of flexibility, responsiveness, and survivability that is required for 21<sup>st</sup> Century military operations.

*Fred McCorkle*

FRED MCCORKLE  
Lieutenant General, U.S. Marine Corps

event.

Many news interviews were conducted concurrently while heavy visitor activity continued at the chalet throughout the trade and press days of the air show.

Several Marines frequented the chalet to meet with visitors, present briefings and answer reporters'

questions through the week. This formed the basis of the Marine Corps' support of Bell Boeing international marketing initiatives, launched at Farnborough.

"Our belief in the future of tiltrotor technology is total; it will form the backbone of our airborne missions," said Jones.

Marketing and public relations materials were distributed to many potential customers and news journalists during the trade show days. These include the V-22 fact booklet, backgrounder fact sheets, photos, pins, posters, a CD and Flight International magazine engineering poster/drawing.

# Cost Reduction Affordability

## Team meets to reduce V-22 costs

By Mike Kimbell  
Fort Worth, Texas

The next major V-22 production decision milestone (MS III) is scheduled for November 2000. This milestone will address the V-22 program's readiness to proceed with full rate production.

In anticipation of the production decision milestone, the government and Bell-Boeing want to ensure that the V-22 is produced and delivered at the lowest price possible leading to an executable program within the government's planned budgets. To this end, a Bell-Boeing-government Cost Reduction Affordability Team (CRAfT) was established in January 2000 to provide a mechanism for collecting and implementing Cost Reduction Initiatives (CRI) using a methodology similar to the successful cost reduction efforts on the Air Force C-17 and F-22 programs.

Since its establishment, the Bell-Boeing team has identified some 437 CRIs. Budgetary estimates along with an implementation strategy have been prepared for the most promising of these ideas with anticipated turn-on during August-November of 2000. The intent of the CRAfT is to make cost reduction an on-going effort for the duration of the V-22 program.

Objectives of the CRAfT are as follows:

- Analyze the V-22 program with special emphasis on Lots 4-11 production, to determine cost drivers and time-phased cost reduction goals.

- Recommend management actions to ensure successful program execution within current government budgets.

- Identify program CRIs to reduce the V-22 unit price to achieve a program cost objective of \$41M per aircraft in FY86

base year dollars for Lots 5 and beyond.

- Facilitate the development of a joint cost model which results in annual V-22 cost estimates based on joint government/contractor agreed-to factors, assumptions, and CRIs.

### *Supplier Conference*

A part of the CRAfT review process focused on that portion of the aircraft that is procured from the multitude of V-22 suppliers. As with primes, Bell and Boeing, many subcontractors have a vested interest in the continued viability of the program. On May 9 and 10, Bell, Boeing and NAVAIR conducted a supplier conference with a representative number of subcontractors. The purpose of the meeting was to explain the affordability issue and to solicit cost reduction ideas from the representatives. Col. Nolan Schmidt, V-22 Program Manager, explained the current affordability issue faced by NAVAIR. John Murphey, President of Bell Helicopter Textron, and Al Haggerty, Vice President of Engineering for Boeing Aerospace and Missiles. Both explained the efforts at the prime contractor level to reduce costs and solicited support from the attendees. They asked all of the V-22 suppliers for any ideas on how to reduce the cost of the aircraft. The general theme was that there are "no dumb ideas" and all ideas would be evaluated. A great number of ideas have been put forth by suppliers, and Bell Boeing technical and admin staffs are hard at work evaluating the input. Once evaluation is complete, decisions will be made as to how to expand the scope of the CRAfT effort to the entire supplier base. Pending that initiative, any firm or individual who has an idea that could reduce cost while maintaining the capabilities of the aircraft is encouraged to submit those ideas through their appropriate procurement focal at Bell or Boeing.

## Customers: We have great faith in Osprey reliability

When senior U.S. military officers and Boeing officials insisted on being the first passengers transported aboard a V-22 Osprey after a crash that killed 19 U.S. Marines, how much risk did they take?

No more than if they had flown in any other well-proved military aircraft, say the participants. General James Jones, commandant of the U.S. Marine Corps, was so committed to and confident in the safety of the aircraft that he took along his wife, Diane.

Boeing Senior Vice President for Navy and Marine Corps programs Patrick Finneran says he actually looked forward to riding on the aircraft.

"I was thrilled when General Jones called and invited me to join him aboard the V-22," he said. "The flight was a great experience. The Osprey is clearly an exceptional aircraft that fills a vital role in the defense of our nation."

Later, Gen. Jones said that he was making good on a pledge to be able to tell the families of the accident victims that the April 8 tragedy was "not related to any design flaws." The Marine review of the accident ruled out any structural flaws.

The U.S. Marine data showed that in the last seconds of its flight over Tucson, Ariz., the rotorcraft was in a high rate of descent at a relatively low forward airspeed. These characteristics can lead to a phenomenon known as "power settling," which can result in a loss of lift in all rotor systems, (not unique to tiltrotors).

The V-22 tiltrotor, with its triple-redundant fly-by-wire flight controls, is considered by the Marines to be much safer as well as more capable than the Vietnam-era CH-46 and CH-53D helicopters that it will replace. It flies twice as fast and three to five times further than conventional helicopters. During operational evaluation flights, the aircraft had safely flown more than 40 troop-lift missions and carried more than 700 troops.



Marine Corps photo

VMMT-204's production MV-22Bs are parked on the ramp at MCAS New River, N.C. near Jacksonville.

# USAF CV-22 debuts at Bell as first variant

By Gidge Dady  
NAVAIR V-22 Public Affairs

ARLINGTON, Texas (July 25, 2000) – The first CV-22 Osprey, the newest addition to the Special Operations Command aviation arsenal and hailed by military officials as “the first step in delivering a revolutionary capability to the Air Force Special Operations Command,” was unveiled July 25 at ceremonies held at the Bell Helicopter Textron facility in Arlington, Texas.

“We in the Special Operations Forces (SOF) foresee a global environment that is dynamic, ever changing and full of unpleasant surprises,” said Lt. Gen. Norton Schwartz, USAF deputy commander in chief, US Special Operations Command, to members from the Air Force Special Operations Command, Air Force, Navy and Marine Corps communities, Bell and Boeing, who gathered to be a part of this significant event. “To deal effectively with security threats posed in this increasingly complex world, we must aggressively develop and leverage America’s technological prowess to enhance the human dimension of our already highly trained and capable special operators.”

“This tiltrotor represents just such a major material leap forward in leveraging our human resources,” said Schwartz. “Having the CV-22 means having a significant ad-

vantage over the maneuver capabilities of potential future adversaries. The CV-22 fills a long-standing United States Special Operations Command and Air Force requirement to conduct long range insertion and extraction missions in one period of darkness. We have always been able to insert but not, until now, to reliably extract at long range.” The tiltrotor aircraft “rolled out” at this event is representative of future CV-22 production models and will be used as a flight test vehicle during the CV-22’s engineering and manufacturing development (EMD) phase. This aircraft and one other were part of the original four EMD aircraft used for the multi-service developmental flight test program.

The process of converting the two MV-22s into CV-22s began last June at the Bell Textron facility where the aircraft were reconfigured with CV-22 production wiring and CV-22-unique systems such as a multi-mode radar for terrain following/terrain avoidance, auxiliary fuel tanks, and an integrated electronic warfare suite. Since both the Marine and Air Force variants share 80% commonality, only the equipment that is unique to the Special Operations missions will undergo testing. As such, the CV-22 will benefit from testing previously performed on the MV-22, which is now in production.

A team from the Air Force, Marine Corps, Bell Helicopter and Boeing began initial CV

flight testing earlier this year at the Bell facility. This September, the same team will take the Ospreys to Edwards Air Force Base, Calif., to continue these tests until the spring of 2002. At that time, the CV-22 is scheduled to begin its initial operational test and evaluation phase at Kirtland Air Force Base, N.M. During that phase, the aircraft will be further tested and evaluated in various scenarios to include a mock deployment to ensure that it meets operational requirements. The Air Force version of the Osprey will have a Suite of Integrated Radio Frequency Countermeasures (or SIRFC) which includes an active jammer. This equipment can geo-locate threats using its missile warning receivers, as well as incorporate real-time intelligence from a multi-mission advanced tactical terminal. This is accessible to the pilot on a digital map. Other CV items include a survivor locator system, additional radios and upgraded computers.

The Air Force is acquiring 50 CV-22 Ospreys to replace its fleet of MH-53J Pave Low helicopters used to insert and extract special operations forces covertly from hostile areas. Procurement of the first production CV-22s is scheduled to begin in 2001 with deliveries in 2003 and an initial operational capability expected in 2004. The first four production aircraft will go to the 58<sup>th</sup> Training Squadron at Kirtland where they will be used for CV-22 advanced aircrew training.

The CV-22 Osprey is a tiltrotor aircraft that combines the vertical takeoff, hover, and vertical landing qualities of a helicopter with the long-range, fuel efficiency and speed characteristics of a turboprop aircraft. It takes off vertically and, once airborne, the nacelles (engine and propeller group) on each wing can rotate into a forward position. The Osprey cruises at 275 knots, and has a range three times greater than the MH-53J. It is also much quieter, thereby avoiding enemy threats. “The CV-22 matches the latest in aviation technology with military utility,” said Marty Shubert, a contractor pilot who is part of the CV-22 test team.

After it enters Air Force service, Schwartz said it would carry numerous SOF operators on dangerous, critical missions throughout the world. “We are confident that the CV-22 will assume its appropriate place in our SOF and Air Force legacy...like the Huey, Hercules, the Pave Low and Pave Hawk before it.”



This completely remanufactured tiltrotor aircraft, EMD aircraft #9, that was rolled out at Bell, is representative of future CV-22 models and will be used as a flight test vehicle during the CV-22 Engineering and Manufacturing Development testing phase along with EMD aircraft #7, which was modified less than #9. (Bell Helicopter photo.)

# CV-22 Integrated Test Team formed

By Richard Peasley  
Chief, CV-22 Flight Test

The CV-22 Integrated Test Team (ITT) will conduct flight test operations on the first variant of the MV-22 aircraft at Edwards Air Force Base. The CV-22 is being developed for Air Force Special Operations Command (AFSOC) to replace both the MH-53 Pave Low Helicopter and some of the C-130 aircraft. The CV-22 Integrated Test Team is contractually defined and similarly structured to the existing MV-22 Integrated Test Team, currently conducting MV-22 flight tests at Patuxent River, Md. The V-22 development contract specified an ITT and required the establishment of a memorandum of agreement to document the organizational structure and command relationships. The primary signatories of this document are Naval Air Systems Command, the contractors Bell and Boeing, and several developmental and operational test organizations.

The two test aircraft are Engineering and Manufacturing Development (EMD) aircraft number 7, modified with the CV-22 fuel system and the Raytheon APQ-186 Multi-Mode Radar (MMR), and EMD aircraft 9, remanufactured to a production representative CV-22 (see story page 3). In addition to the fuel system, advanced mission computers, unique software and MMR, aircraft 9's configuration includes four new radios, MATT capability through the satellite communications, or SATCOM, ITT (a company in this reference) Avionics ALQ-211 Suite of Integrated Radio Frequency Countermeasures, ALE-47 and ALR-47 to support the CV-22 configuration.

Edwards AFB was selected as the development test site due to the available test facilities and terrain types. Specifically, the Benefield Anechoic Facility, the China Lake electronic warfare test ranges, and different terrain types such as flat, rolling, mountainous, foliated, barren, and land/sea interface, were required to support MMR development. During the test program, operations at Vandenberg AFB, Naval Air Station Point Mugu, and Nellis AFB are being planned to complete the test program requirements. The

418<sup>th</sup> Flight Test Squadron (FLTS) at Edwards AFB, which supports large aircraft testing such as C-17 and C-141 will be the host test organization. The CV-22 ITT has been integrated into the 418<sup>th</sup> FLTS facilities, procedures and processes. Bell and Boeing contractor personnel support will be provided from Boeing's High Desert Assembly and Integration and Test Group, also located at Edwards.

The CV-22 flight test program has started with aircraft 7 flying flight loads survey and initial MMR development on a daily basis, and aircraft 9 conducting the E3, EMC/EMV, system qualification tests. The CV test team is in place at Bell's Plant 6 near Fort Worth and the applicable operating procedures and processes are being tested and refined on a daily basis. The CV-22 Integrated Test Team is an exceptional example of a joint contractor and government effort to efficiently accomplish developmental testing and operational assessments concurrently. The jointness is evident from the test team management to the hangar floor effort. The director position is shared by a contractor and military representative. The other



A V-22 shown in Air Force Special Operations Command colors.

technical leadership positions also have government or military representatives to ensure total integration of the test team. To ensure a compatible test team, all personnel have definite responsibilities and duties to support the test effort. This is done to remove the perception that the government is only here to *check* on the contractor. Government personnel are essential to the program and share in management, and where appropriate, lead technical positions.

The operational participation will come from the Multi-service Operational Test Team (MOTT)

### V-22 EMD Flight Test Status as of August 21, 2000

A/C #	Total EMD Hours	Total EMD Flights
7	449	227
8	501	281
9	318	140
10	465	203
<b>Totals</b>	<b>1,734</b>	<b>851</b>

Total V-22 Flight Time with LRIP and FSD flights	3,728 hrs
Maximum Airspeed Attained	342 kt
Maximum Altitude Attained	25,000 ft
Max Take-Off Gross Weight	60,500 lb
Maximum Load Factor	3.9 Gs

that recently completed operational evaluations. These Air Force and Marine Corps participants will conduct two operational assessment periods, called OT-II F & G, concurrently during the developmental testing of the CV-22. The operational pilots and aircrew will fly on the developmental sorties and share the same data. All developmental test data is shared openly within the CV-22 ITT. The MOTT however, will produce its own assessment of the test results. This will provide one set of data, but two reports, making testing more efficient. To accomplish this, the MOTT has participated in developing test plans and concurred that the operational requirements are included.

In developing the team, the contractor and government worked together in developing a single set of flight test plans and operating procedures, covering both development testing (DT) and operational testing (OT), respectively. This effort ensured jointness in the test scope and operating ground rules. There are 84 separate procedures that cover all aspects of the flight test operations, maintenance, training and safety. These procedures are directed by contract requirements, government and Edwards AFB directives, and contractor processes and procedures. A single set of operating procedures is essential for an integrated test team made up of members from different organizations. These procedures also establish a standard for inspecting and maintaining oversight of the team's operations.