



# MV-22 resumes flying, exceeds expectations

By Gidge Dady  
NAVAIR V-22 Public Affairs

The MV-22 Osprey took to the skies above Naval Air Systems Command, Patuxent River, Md., May 29, for the first time after being grounded for more than 17 months following an operational pause.

The first MV-22 test aircraft to resume flying has improvements in its hydraulic and flight control software systems that make it practically a brand new aircraft and the most capable Osprey yet, according to V-22 program officials.

“The long awaited return to flight was a success. The Osprey not only performed what today’s test plan called for, but exceeded our wildest expectations,” said Col. Dan Schultz, V-22 program manager.

The original flight plan called for the aircraft to take off, hover and land. After successfully completing several vertical takeoffs, landings and hovering maneuvers over the runway, the pilots conducted rearward and sideward flights to check the aircraft’s maneuverability in helicopter mode. The pilots gradually increased maneuver speeds up and down the runway, went into landing pattern circuits and began conversion work. Later in the afternoon, the Osprey’s encore performance included a full conversion to airplane



Vernon Pugh photo

The V-22 Osprey exceeded all expectations during its first flight since being grounded in December 2000. Aircraft No. 10 (above) successfully converted to airplane mode while in the air for more than two hours.

mode at level flight speeds of 250 knots. The Osprey logged nearly two and one half hours of flight time and returned in full-up flight status.

Tom Macdonald and Bill Leonard, senior Bell Boeing V-22 Integrated Test Team pilots, who have a combined total of 13,000 flight hours in both fixed and rotary wing aircraft

and more than 500 hours each in the MV-22, took the aircraft through a series of maneuvers to evaluate its handling and performance. Part of this series included converting out from helicopter to airplane mode to take standard vibration measurements to check out

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AP photos



AP photos





## PM Perspective: V-22 returns to the air with flair

By Mike Tkach  
Vice President, Program Director  
V-22 Program Office, Pax River, Md.

When the Osprey returned to flight status on May 29, there were congratulatory cheers among the several hundred Bell, Boeing and government workers who were on hand to witness this milestone.

While we were confident the aircraft was going to fly, it was still very exciting to be a part of such an important event in the life of this program. Those of us on Team Osprey

Duncan Smith photo



Osprey pilots Tom Macdonald and Bill Leonard gently raise the aircraft from the flight ramp at NAS Patuxent River, Md. The flight marks the beginning of a rigorous, event-driven flight test program.

have always maintained our strong conviction in the Osprey and its remarkable tiltrotor technology.

A basic out of ground effect hover would have sufficed as a satisfactory return to flight milestone, but the test pilots, Tom Macdonald and Bill Leonard, were even more ambitious. Their planned flight test card, coupled with aircraft performance that exceeded even our highest expectations, enabled them to fly the airplane in every flight regime. In short, the Osprey performed magnificently.

There are many resolute people who have proven their mettle recently on the V-22 program. The flight clearance team and maintainers from the Marine Corps, DynCorp, Rolls Royce and Bell Boeing are at the top of the long list. Team Osprey and all of the suppliers to the V-22 program have also remained steadfast in their commitment to our program.

I know everyone associated with the V-22 is justifiably proud of his or her contributions in the return to flight effort.

The national press reaction to our return to flight status has been very positive. Those of us who know the Osprey the best know its extraordinary capabilities. Our job is to prove it to the rest of the world. Thanks to the many truly superb people who work in the V-22 program, I know we can.

## Gov't, contractor team to improve IETMs

By Steve Calvano  
Site Manager, Team New River

A diverse team of dedicated aviation technicians is working together towards a common goal—providing V-22 Osprey maintainers with the finest technical manuals available.

Interactive Electronic Technical Manuals (IETMs)—an important part of V-22 logistics and training—have been the subject of intense scrutiny since the Panel to Review the V-22 Program (i.e. Blue Ribbon Panel) identified IETM accuracy as a contributor to decreased aircraft availability. In response to the panel's findings, V-22 program officials have issued a challenge to improve the IETMs as part of the overall program transformation.

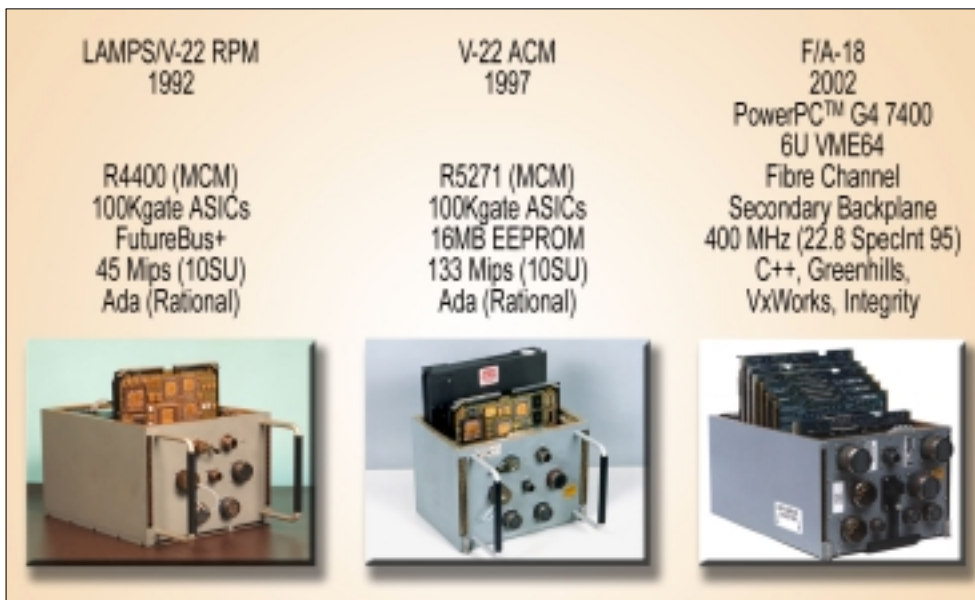
That challenge is being met by a fully integrated team operating out of the Osprey Support Center, Marine Corps Air Station, New River, N.C. Personnel from the Naval Aviation Technical Engineering Center, the Fleet Support Team (FST), VMMT-204, Bell Boeing and the Osprey Support Center have been working together to develop, implement and execute a series of process improvements that will help resolve data accuracy concerns and restore customer confidence in IETMs.

"This is no small task," said Col. Dan Schultz, V-22 program manager. "This is the first time anyone has ever performed verification on an IETM, and hopefully the results of this effort will address the concerns raised by the Blue Ribbon Panel."

The IETM verification process has been divided into two phases. The first phase will address seven priority systems identified by FST engineering as most critical. Although not a prerequisite, the team expects to complete them prior to the V-22 training squadron's (VMMT-204) return to flight. The second phase will verify all remaining tasks.

In order to successfully complete phase one, the New River Verification Team has identified a 450-task per month goal. Each month, the team—working with its Bell Boeing counterpart—produces a schedule that identifies required maintenance tasks. It is then up to eight "on-aircraft verification" teams to complete them. The teams—overseen by Bell Boeing Technical Manual Quality Assurance personnel—consist of technical writers, en-

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Bell Boeing and General Dynamics Advanced Information Systems have upgraded the V-22's Advanced Mission Computer over the years with new power supplies and lighter, more effective processors.

# GDAIS to deliver 100<sup>th</sup> V-22 Advanced Mission Computer

*Editor's Note: The following is the first in a series of monthly articles that feature Team Osprey members and their contributions to the program. For more information about Team Osprey, contact Bob Torgerson, V-22 Business Development (610-591-4509).*

By Anne Miller  
GDAIS Communications

General Dynamics Advanced Information Systems (GDAIS) will ship the 100<sup>th</sup> V-22 Advanced Mission Computer (AMC) in mid-July. The first 99 V-22 AMCs were delivered on or ahead of schedule, and GDAIS expects to continue this success rate with the July delivery.

The AMC is a critical subsystem within the V-22's avionics system. It contains high-performance mission data processing capability and interfaces to multiple external subsystems. Incorporating the AMC let Boeing transition to the Ada programming language for the V-22's mission processor. In addition to its weight and reliability benefits, the AMC provides significant processing and memory growth capability for future applications.

GDAIS has supplied the V-22's mission computer since the aircraft's full-scale development began in the late 1980s. In 1993, the company, at that time part of Ceridian Corporation's Computing Devices International, received an EMD contract to develop the AMC using the R4400 MIPS processor.

An upgrade, begun in 1997, eliminated out-of-production parts, incorporated a new power supply, reduced the total weight by shortening the chassis, and upgraded the processor to the RM5271. Computers built to this design were first delivered in 2000 during Lot 3 production and continue to meet the V-22's needs for highly reliable mission computing.

## The Challenges Ahead

The Navy and Bell Boeing have already weathered the challenge of sustaining and supporting the Osprey team during the review, reassessment, restructure, redesign and re-engagement of the last two years. GDAIS faces additional challenges in maintaining and increasing production efficiency and managing the evolution of component parts.

AMC technology is in its fifth year and is considered mature. GDAIS anticipates that several current AMC components will no longer be available and expects to work closely with Bell Boeing to determine lifetime buys of current parts or new part insertions. When the time comes, GDAIS stands ready to ease the transition to more powerful, cutting

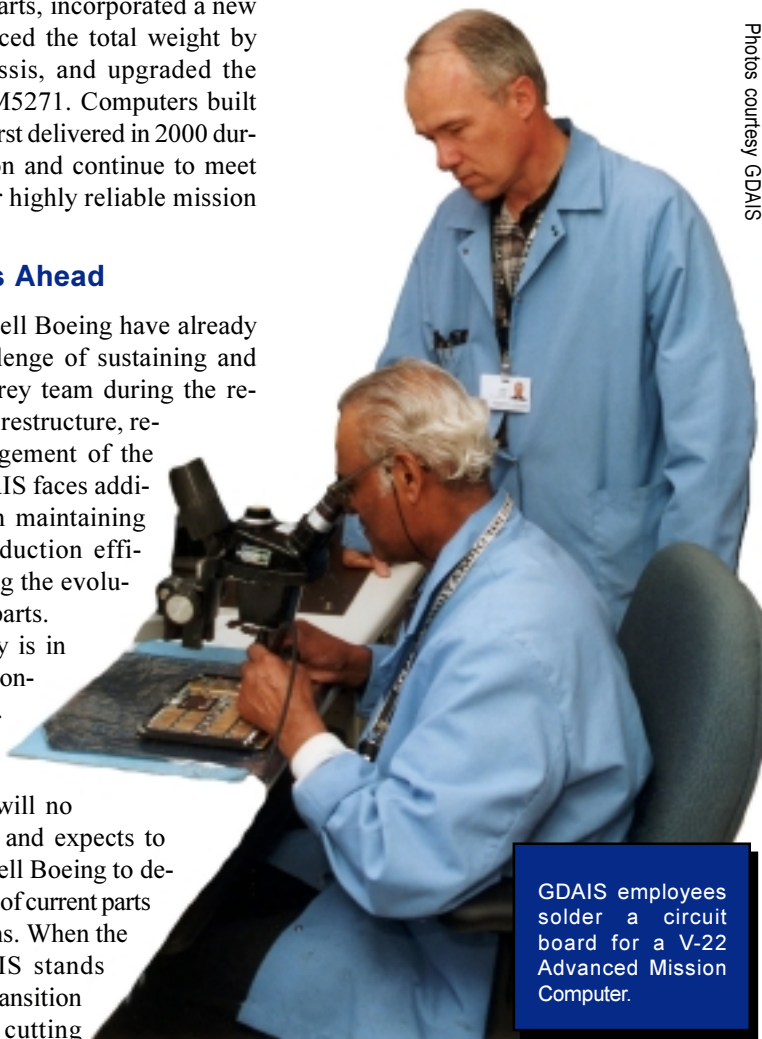
edge processors using open systems architecture. GDAIS is investigating transition paths that will sustain and support the legacy V-22 software while simplifying future technology upgrades.

GDAIS sees the V-22 Osprey as a revolutionary jump in aviation technology. While GDAIS looks forward to Navy, Marine and Air Force acceptance of this aircraft for full operational use, the company feels this is just the beginning. To realize the full potential of V-22 technology, GDAIS believes its role will extend far beyond that of an avionics equipment supplier and will include contributions that improve the V-22's capabilities while reducing overall system cost and weight.

Randy Sutter, who inherited the V-22 program from Jay Sorlie, has managed the program for GDAIS since February. He is a 20-year Air Force veteran who comes to GDAIS after 10 years with the NATO AWACS Program Management Agency (NAPMA) in Brunssum, the Netherlands.

"The AMC meets all technical requirements and exceeds the V-22 Osprey's current needs,"

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Photos courtesy GDAIS

GDAIS employees solder a circuit board for a V-22 Advanced Mission Computer.

# Osprey

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the tracking and balance of the individual blades of the two proprotors. This “test card” for the first flight series follows the Osprey’s methodical and event driven approach to safely return the aircraft to flight testing.

“Along with everyone else on the V-22 test team, we are excited about being back in the flight test business. We are proud of the extensive safety and reliability enhancements to the Osprey’s design, which was made possible by the concerted efforts of many people throughout the NAVAIR, Bell Boeing, Rolls Royce and supporting contractor teams,” asserted Macdonald.

Leonard shares the excitement of being back in the air and moving forward with flight testing. “I’m dedicated to the concept and believe tiltrotor technology will be as important to aviation as the advent of the jet engine,” he explained. “This aircraft has potential that we in the aviation community have yet to understand let alone exploit. I’ve been actively engaged in military and civilian aviation for over 35 years, flown well over 100 different aircraft and truly believe that this technology, if exploited properly, will impact both civil and military aviation to an incredible degree.”

In preparation for today’s flight, several days of aircraft ground runs and a systems checkout were conducted so both pilots

would have further opportunity to re-acquaint themselves with the V-22 cockpit prior to the actual flight.

“To ensure that no stone has been left unturned in our pursuit of safety and excellence, the entire process was structured and viewed by the V-22 Integrated Test Team as a true first flight, almost as if the aircraft had never flown before and was making its maiden flight,” said Macdonald.

As part of the training for this flight, Macdonald and Leonard had a dress rehearsal simulation at the Manned Flight Simulator, which allowed them to practice the first flight following the actual test cards and procedures developed for it with the telemetry room engineering team directing the flight and monitoring the progress and instrumentation in the control room.

This flight marks the beginning of an 18-month developmental flight test plan that will validate the engineering and design changes made to the aircraft and continue with developmental testing that will further test such areas as vortex ring state boundaries, dynamic shipboard compatibility, formation flying, and low speed hovering and landing conditions.

Other areas to be tested include the aircraft’s icing, cargo handling and radar warning systems. A total of 1,800 flight test hours are scheduled over this period of time using seven MV-22 aircraft.



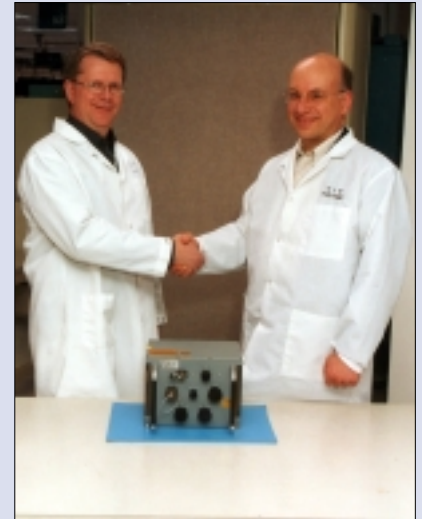
AP photo

The May 29 flight marks the beginning of an 18-month development flight test plan that will validate the engineering and design changes made to the aircraft and continue its developmental testing.

# GDAIS

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he said. “The GDAIS manufacturing team continues to produce the computers on schedule while maintaining the highest levels of quality workmanship. Our near-term focus involves handling the ongoing roll of component parts and continuing our efforts to further reduce costs. We are eager to share our ideas on ways to boost processing power, reduce weight and save costs. The V-22 Osprey is an important program for GDAIS and we are committed to grow along with Bell Boeing’s Osprey team.”



(From left) Jay Sorlie and Randy Sutter

# IETMs

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engineers and fleet maintenance Marines from VMMT-204. Three aircraft have been reserved for the verification process.

On-aircraft verification requires fleet Marines to conduct actual maintenance tasks, while engineers monitor for accuracy and technical writers capture the changes (part number, procedures, graphics, etc.) noted during the maintenance task.

Following the on-aircraft verification, the team meets weekly to openly review all of the verification comments with subject matter experts. Approved comments are then forwarded to Bell Boeing for incorporation into the IETMs.

To date, the verification team has exceeded its 450-task per month goal and is well on its way to verifying IETM accuracy and quality.