# Joint Mission Planning System – Maritime (JMPS-M)

Executive Summary

- The Navy Joint Mission Planning System – Maritime (JMPS-M) Program Manager is modifying Framework 1.2 to integrate new mission planning features. The Navy plans to re-host its existing Mission Planning Environments (MPEs) to the new Framework 1.4 once it becomes available.
- The Navy and Marine Corps JMPS-M MPEs for host platforms have demonstrated improved results during developmental and operational tests.
- The Program Manager is continuing to develop JMPS-Expeditionary (JMPS-E) as a force-level planning tool to support amphibious operations.

System

- JMPS-M is a Windows XP, PC-based common solution for aircraft mission planning. It is a system of common and host-platform-unique mission planning applications for Navy and Marine Corps aircraft.
- A JMPS-M Mission Planning Environment (MPE) is a set of developed applications built from a framework, common components, and Unique Planning Components (UPCs). The basis of an MPE is the Framework. The Navy currently uses Framework 1.2 for its MPEs. Software developers add other common components (e.g., GPS-guided weapons) and federated applications that support multiple users to the framework. Developers add a UPC for the specific aircraft type (e.g., F/A-18E/F) to the framework and common components to complete the MPE.
- Depending on the aircraft model, a JMPS-M MPE might operate on stand-alone, locally networked, or domain controlled Windows XP computers, or a mixture of all three operating environments.
- JMPS-M Framework 1.4, an enhancement of the currently-used Framework 1.2, is under development with the Air Force to enable JMPS-M users to collaborate on mission planning, even when they are operating from different locations. Framework 1.4 is not currently used by the Navy for any MPEs.
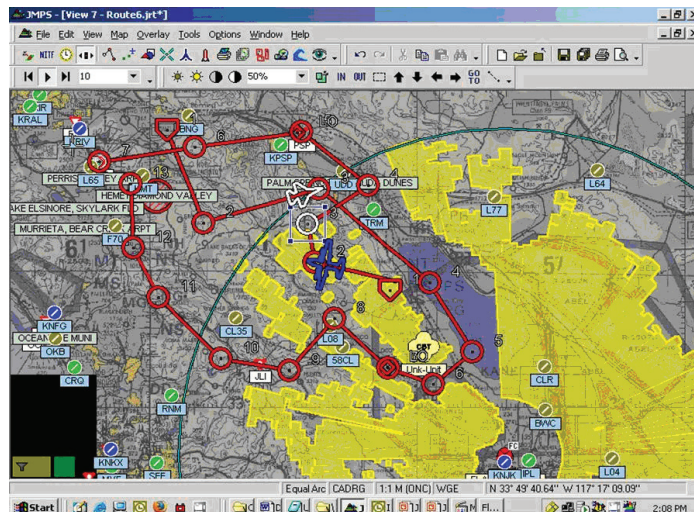
- Although portions of the JMPS-M software are being codeveloped among DoD components, JMPS-M is not a joint program.
- JMPS-E, a related but separate component from JMPS-M, is a force-level planning tool to support amphibious operations.

Mission

- Aircrew use JMPS-M MPEs to plan all phases of their missions. They then save required aircraft, navigation, threat, and weapons data on a data transfer device that they load into their aircraft before flight. They can also use the JMPS-M information to support post-flight mission analysis.
- Amphibious planners will use JMPS-E to plan the movement of personnel, equipment, and logistics support between the amphibious fleet and the shore.

Major Contractor

Framework: BAE Systems – San Diego, California

Activity

JMPS-M

Framework 1.2

- The Navy conducted the following developmental tests on JMPS-M platform MPEs in order to assess risks to successful operational test results:
  - Marine Helicopter MPE version 2.1 at Naval Air Station (NAS) Point Mugu, California
  - C-2A/E-2C MPE version 2.0 (used for cockpit mission planning) at NAS Point Mugu, California
  - E-2C MPE version 3.0 at NAS Point Mugu, California
  - CVIC (Carrier Intelligence Center) MPE version 1.0 at NAS Fallon, Nevada
  - VH-3/VH-60 MPE version 1.0 at NAS Point Mugu, California
  - FA-18/EA-18 MPE version 2.3.0 at NAS Point Mugu, California
  - MV-22 MPE version 1.2.0 at NAS Point Mugu, California

- AV-8B MPE version 3.0.0 at NAS Point Mugu, California
- EA-6B MPE version 6.0 at NAS Point Mugu, California
- DOT&E monitored these developmental tests in order to assess risks to successful operational testing.
- Commander, Operational Test and Evaluation Force (COTF) conducted the following operational tests on JMPS-M platform MPEs:
  - Marine Helicopter MPE version 2.0 at Marine Corps Air Station (MCAS) Miramar, California, and MCAS Camp Pendleton, California, in January and February 2010
  - VH-3/VH-60 version 1.0 at Marine Corps Base, Quantico, Virginia, in June through October 2010
  - EA-6B MPE version 5.0 at NAS Point Mugu, California, in June 2010
  - DOT&E monitored these operational tests to assess operational effectiveness and suitability.
- All operational testing was conducted in accordance with DOT&E-approved Test and Evaluation Master Plans (TEMPs) and test plans.

Framework 1.4
- The Navy JMPS-M Program Manager, PMA-281, is continuing development with the Air Force on a new JMPS Framework 1.4, which will replace Framework 1.2. The Navy successfully completed preliminary design review of Framework 1.4 software.

JMPS-E
- PMA-281 conducted (and COTF monitored) enhanced developmental testing of the JMPS-E version 1.0.2.3 at the Expeditionary Warfare Training Group Pacific, Coronado Island, California.
- DOT&E approved the COTF JMPS-E Test Concept for IOT&E.

Assessment
JMPS-M
Framework 1.2
- Marine Helicopter
  - Marine Helicopter MPE version 2.0 completed operational testing on UH-1N, CH-46E, and CH-53D/E aircraft. COTF deferred operational testing of the MPE for AH-1W aircraft due to lack of test resources. The MPE experienced three Operational Mission Failures (OMFs) during 214.3 hours of testing, generating a Mean Time Between Operational Mission Failure (MTBOMF) of 71.4 hours. This compares with an MTBOMF requirement of 30 hours.
  - Marine Helicopter JMPS MPE version 2.1 developmental testing indicated that the MPE has potential to mature as a true attack helicopter mission planning tool, but it is not ready for operational test or fleet release. Deficiencies identified included inaccurate

and difficult fuel planning and difficulty in printing required forms for use by aircrew in the cockpit.
- C-2A/E-2C
  - C-2A/E-2C JMPS MPE version 2.0 operational testing showed the MPE does not provide C-2A and E-2C planners with intuitive procedures for printing take-off and landing data, and the MPE needs to better plan loitering time during missions. The MPE experienced no OMFs during 149 hours of testing, resulting in a MTBOMF of up to 149 hours. This compares with an MTBOMF requirement of 30 hours.
  - E-2C version 3.0 tactical support MPE initial test results showed that not all required flight data successfully transferred to the aircraft. The Navy issued a subsequent software upgrade that resolved this issue before the MPE was released to the fleet. The MPE experienced no OMFs during 293 hours of testing, which equates to a MTBOMF of up to 293 hours. This compares with an MTBOMF requirement of 30 hours.
- CVIC
  - CVIC MPE version 1.0 operational test results showed the MPE experienced no OMFs over 311 hours of operation, which equates to a MTBOMF of up to 311 hours, as compared with the requirement of 30 hours.
- VH-3/VH-60
  - DOT&E is still assessing VH-3/VH-60 MPE version 1.0. Developmental testing revealed few problems other than the MPE incorrectly calculated the fuel burn for hovering flight. Operational testing of the MPE commenced in June 2010 and concluded in October 2010 with analysis of test results ongoing.
- F-18/EA-18
  - The F-18/EA-18 MPE version 2.3.1 will enter operational testing in 1QFY11 without Joint Stand-Off Weapon – C1 (JSOW-C1). Developmental testing indicates that the JSOW-C1 planning component is poorly documented, unintuitive, inflexible, and difficult to use. The planners were unable to download their Global Positioning System (GPS) and JSOW-C1 mission planning information to removable media for transfer and uploading to the aircraft platform. JSOW C-1 testing will occur in 2QFY11 or later.
- MV-22
  - MV-22 JMPS MPE version 1.2 is undergoing developmental testing. During the February 2010 user event, the MPE provided basic functionality, but the developers need to improve system stability and reduce the number of workarounds needed to operate the MPE. The users had difficulty completing their mission planning within the one-hour requirement. In some cases, the users were unable to download their mission data to removable media for transfer to the aircraft. The MPE lacks aerial delivery planning functionality and

does not provide an ashore interface to the Navy Marine Corps Intranet.

- AV-8B
  - DOT&E is still assessing the AV-8B MPE version 3.0. This version provides sufficient functionality and improved stability compared with previous versions, but it is not intuitive and requires extensive user training. Users were not able to plan Military Training Route missions within the 60-minute threshold requirement and it is doubtful whether users will be capable of meeting the requirement without more automated help in creating planning map overlays. Planners were able to download their mission data to removable media for transfer to the aircraft, but the hardware adapter required to do this is not suitable for use in an operational environment.
- EA-6B
  - EA-6B MPE version 5.0 operational testing revealed that the MPE Platform and Configuration Editors allowed improper user input into the configuration and fuel calculations, resulting in erroneous flight planning. A correction to this error is forthcoming in software version 5.0.1 scheduled for 1QFY11 release. The planning process was not intuitive to the users and the embedded mission checklist is insufficient to guide users through the planning process.
  - DOT&E is still assessing EA-6B MPE version 6.0. Developmental testing indicates that the MPE will meet user needs but it will require extensive user training, especially for planners unfamiliar with previous versions of JMPS. The MPE experienced numerous software crashes during the first test event. During this event, transfer of mission plans to removable media for transfer to the aircraft was not attempted.

JMPS-E
- Due to a new test concept, the Navy must update and resubmit the JMPS-E TEMP annex to obtain approval for the start of operational test. A coherent JMPS-E Acquisition Strategy, approved by the Milestone Decision Authority, is required to properly develop follow-on increments of JMPS-E.

- DOT&E is still assessing JMPS-E. During developmental user testing, Amphibious Squadron users found JMPS-E useful in creating and adjusting plans quickly, but JMPS-E did not provide Tactical Air Control Squadron personnel with the information they needed to perform their planning tasks. Detailed aviation data were not available in JMPS-E and Tactical Air Control Squadron users had to use JMPS-M or other tools to create their plans. Developmental testing revealed significant information assurance issues that need correction.

Recommendations
- Status of Previous Recommendations. The Navy has satisfactorily improved the JMPS-M MPE software stability, as recommended in FY09. The Navy has made progress on the remaining five FY09 recommendations for JMPS-M and JMPS-E, valid for FY10. They are reiterated below.
- FY10 Recommendations. The Navy should complete all remaining FY09 recommendations for JMPS-M and JMPS-E.
  JMPS-M
  1. The Navy should continue to ensure that successful transfer of mission planning data to powered host platform computers occurs during developmental test prior to entrance into operational test.
  2. The Navy should update the various host platform MPE Flight Performance Module applications to meet aircrew planning and accuracy expectations for fuel and endurance calculations.
  JMPS-E
  1. The Navy should conduct the necessary information assurance vulnerability certifications, obtain the necessary authorizations to directly connect, and then test JMPS-E interactions with external data network interfaces.
  2. The Navy should produce an approved JMPS-E Acquisition Strategy for follow-on increments before development efforts continue.
  3. The Navy must submit a TEMP Annex for JMPS-E prior to commencing operational testing.