

## **What is it?**

Manpower Personnel Integration (MANPRINT) is the Army's program to ensure that Soldier performance is the central consideration in system design, development, and acquisition. It is the technical process of integrating the interdependent elements of human factors engineering, manpower availability, personnel skills and abilities, training design, system safety, health hazards, and survivability. The MANPRINT program has three primary objectives: 1) optimize both the quantity and quality of the personnel needed for systems; 2) design systems that are easily useable by Soldiers, safe to operate, cause no unnecessary health problems, and maximize Soldier survivability; and 3) ensure acceptable trade-offs are made among performance, design, and Soldier capabilities and limits. This ensures that Soldier readiness is not compromised by equipment that is difficult to use or maintain.

## **What has the Army done?**

In FY 11, the Army responded to Office of Secretary of Defense for Acquisition, Technology, and Logistics (OSD AT&L) leaders "to conduct and provide comprehensive reviews and assessments of MANPRINT efforts within the department." The Army continues to have the most successful program of all the Services. For example, there are currently over 100 Acquisition Category (ACAT) I and II (complex, high dollar) systems in the Army inventory, of which about 70 percent are actively covered by MANPRINT analytic efforts. This year's accomplishments included:

- Joint Tactical Radio System (JTRS) Handheld, Man-portable, Small Form-Fit (HMS) Manpack Radio:
  - Persistent MANPRINT analysis and Warfighter feedback from multiple user assessments drove design decisions and identified missing system requirements
  - Reverse engineered the Apple® iPod® user interface and applied lessons learned to Manpack radio design
  - Human-Machine Interface (HMI) keypad redesigned to reduce complexity, enhance menu navigation, and improve access to mission critical radio functionality
  - Guided Soldiers to achieve streamlined menu flows and prioritized menu item placement to meet mission needs
- Warfighter Information Network – Tactical (WIN-T): Current effort includes engagement with the Program Managers and Engineers to make the user and maintainer task demands less complex, thereby increasing user-friendliness and significantly reducing training requirements.
- Blackhawk: Changes to air crew seating including dual-axis seat adjustment now accommodates 40 percent more Soldiers.
- Nett Warrior: Supporting a high-visibility, fast-moving acquisition program involving three competing vendors who are prototyping Soldier-worn, computer based systems with situational awareness, voice communication, and messaging capabilities to the ground Soldier in tactical settings
- Tactical Firefighting Truck: Applied human factors and biomechanical principles to develop a rear fold-out step for safer ingress and egress; both the rear roof and crew cab access ladders had rungs that were smooth metal tubing and too close to the vehicle to make positive boot contact
- Ground Tactical Vehicles Maintenance Concept: Streamlined number of tasks to be performed barehanded as much as possible has resulted in fewer tools (10 tools) to track, less time to perform maintenance.
- Apache Longbow: Eighty MANPRINT problems, issues, and concerns were identified and resolved so that a \$2.7 million MANPRINT investment resulted in \$286 million cost avoidance in operations and support.
- Handheld GPS Receiver Operator Performance: An evaluation with dismounted soldiers using the Defense Advanced GPS Receiver (DAGR) in the field revealed the presence of a fratricide issue: 38 percent of the Soldiers (6 out of 16) incorrectly reported their present position rather than the target's during a simulated Call for Fire Scenario; MANPRINT recommended using a pop-up warning message, which was incorporated; in the retest, none of the Soldiers incorrectly reported their present position.

- Stryker: An added platform for the loader on the Mortar Carrier B enables the loader to "drop" mortar rounds more safely and reduce physical stress; increased room in the commander's station allows a larger portion of the Soldier population to fit into the crew station; redesigned gunner position now accommodates the body configuration of approximately 95 percent of Soldiers.

These and many other significant contributions to aviation, maneuver, weapons, and logistics programs have resulted in enhanced system performance, significant cost savings, cost avoidance, and increased personnel survivability.

### **What continued efforts does the Army have planned for the future?**

The MANPRINT program is now taking the lead to forge new alliances with the testing and evaluation, rapid equipping, and early concept development communities, as well as the other Services to expand MANPRINT analysis and application. The Army MANPRINT office leads the Joint Human Systems Integration (HSI – MANPRINT equivalent in OSD, other services) Working Group to ensure full coordination of effort and leveraging of technology and analytic methods. In addition, MANPRINT training courses are being proliferated to system developer groups, analysis practitioner forums, and acquisition managers, including a standard block of instruction at Defense Acquisition University (DAU System Engineering CLE 062).

### **Why is this important to the Army?**

Tomorrow's operations will include continuous deployments in complex environments where Soldiers will have new equipment, technology, and doctrine. The Army's combat effectiveness and readiness depend on equipping our Soldiers with equipment that meets their needs and allows them to accomplish their assigned missions rapidly, accurately, and efficiently. In a word: "Fit the equipment to the soldier, not the soldier to the equipment".