



MANPRINT Quarterly

April 2001



Director's Corner

This will be my last set of comments as the Acting Director for MANPRINT.

I have been honored to serve as Acting Director for our Army's MANPRINT program since October 1998. I have decided that after close to 30 years working for our Army in a variety of capacities and positions and having turned 60 this past January it is time for me to move on to other challenges.

My wife Patricia and I have recently purchased a 100 year old Victorian house in the small village of Belhaven North Carolina (just off the intra-coastal waterway) that we plan on operating as a Bed and Breakfast.

My plans also call for me to do some writing on topics that I have wanted to address over the years (including the role of MANPRINT in the systems design and acquisition process) but have been unable to complete due to my position as a U.S. Army employee.

I fully expect that the new Director for Personnel Technologies (MANPRINT along with Soldier Oriented Research and Development) will have been announced and be on-the-job by my retirement currently planned for late August.

I want to take this opportunity to personally thank each member of the MANPRINT community (civilian and uniformed) for your support, your dedication and your unfailing willingness to help identify and resolve MANPRINT issues early on.

As we move down the road of Army transformation the role of MANPRINT will take on ever-greater importance. MANPRINT is presently identified as one of the major elements that the Office of the Deputy Chief of Staff for Personnel recognizes as being within its area of responsibility under Line of Operation #3: Manning the force.

The CSA and the VCSA are asking personnel from the acquisition community (ASA (ALT) and AMC) what their plans are to ensure that MANPRINT is made an integral part of Army transformation and the design of the Future Combat Systems which will constitute that force.

So long as these conditions prevail I believe that MANPRINT will continue to be a distinctive and essential program for the Army (as well as for DoD).

My assignment here in the ODCPSER and as the Acting Director PERTEC has been the high point of my career. Thanks to each of you for making my last job in our Army both challenging and enjoyable.

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Dr. Bob Holz
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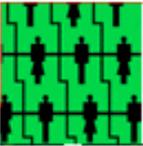
MANPRINT Domain Chiefs Meeting Minutes 23 January 2001

Mike Mathewson, Maximum Technology Corporation

Preface



The MANPRINT Domain Chiefs meetings are convened as required and are a chance for the PERTEC office and representatives of all seven of the MANPRINT Domains to share information.



The first MANPRINT Domain Chiefs meeting for 2001 was held on 23 January. The Chiefs and representatives from the seven MANPRINT Domains met in the Personnel Technologies (PERTEC) Director's Office. The purpose of this meeting was to provide advance information for the MANPRINT Board of Advisors (MBA) Workgroup session scheduled for the following day, Wednesday, 24 January 2001. The meeting allowed the Chiefs and the PERTEC staff to meet and discuss old and new business.



Dr. Robert Holz, Acting Director for PERTEC, opened the session and provided information per the Agenda to the assembled group. LTC Steve Zappalla (PERTEC) served as the meeting facilitator and although many issues were discussed, there were two main areas of concern. They included the revised DoD 5000.2-R and the quality of soldiers versus the needs of the Future Combat Systems (FCS). The full minutes of the MANPRINT Domain Chiefs Meeting are posted on the MANPRINT Website <http://www.manprint.army.mil>.

Revised DoD 5000.2-R



Pertaining to the DoD 5000.2-R, the participants discussed the impact of the revised DoD 5000.2-R on the MANPRINT community. Ms. Pam Bartlett (OSD P&R) stated that the revised DoD 5000.2-R would require the Program /Project Managers (PM) to address all Human Systems Integration (HSI) (DoD) Domains. Therefore, DoD 5000.2-R should improve the visibility and emphasize the need for PMs to address sustainability and MANPRINT issues within their acquisition programs. There is still an issue with Soldier Survivability for non-Acquisition Categories (ACAT) I & II systems. Limited funding only allowed HRED to examine three non-ACAT I & II systems during FY 2000.



The changes within DoD 5000.2-R will require revisions of lesson plans for the DoD colleges and universities (DSMC & DAU). Dr. Holz stated that the MANPRINT Board of Advisors has the power to ensure that MANPRINT/HSI is included in the DSMC and DAU curriculum.



When signed, the DoD 5000.2-R will be posted on the Defense Acquisition Deskbook Website at <http://web2.deskbook.osd.mil/>. The signed DoD 5000.2-R (Interim) is currently posted on the above Website.



Soldier Quality Versus the Future Combat Systems

In addressing the second issue, Mr. D.J. Imbs (PERSCOM) pointed out that there have not been any improvements in the quality of current enlistees for Category (CAT) 1 through 4. This is troubling: with the Future Combat Systems, the junior soldier (E-1/E-3) will need to process the knowledge currently located at the Non-Commissioned Officer level. This will

become an even greater factor as we develop Human/Robotic interface. Dr. Ed Smootz (ARL-HRED) expressed concern over the loss of "corporate knowledge" due in large part to the current economic conditions. To maintain operational knowledge, certain MOSs may require a six-year enlistment.

In addressing the quality of education, the Manpower, Personnel & Training (MPT) office in PERSCOM is developing a web-based tool that may be used to help the MANPRINT community with this issue. There is also a program that will issue soldiers laptop computers to access the Internet in the form of college courses online and web-based simulations for both training and testing of job skills. In a related statement, Ms. Holly Russell (ASA-MRA) explained that recruiting was being aimed at the Spanish speaking population. These newly recruited soldiers would attend an English language skills program before continuing with their MOS training.

The final issue surrounding the Future Combat Systems was the 74B System Administrator. MAJ Hale (TRADOC) indicated that TRADOC is being supplanted by FORSCOM as the trainer for the digital soldier. Local commands are identifying computer-literate soldiers and are then using this borrowed military manpower to meet the needs of the command. MAJ Hale referenced the training being conducted at Fort Hood and Fort Drum by their Central Training Support Facilities. These are not MOS producing schools; therefore, the training is lost to the Army when the soldier changes duty station.

LTC Zappalla took these and the other issues from the Chiefs meeting and presented them to the MANPRINT Board of Advisors Workgroup that met the following day. The date for the next MANPRINT Domain Chiefs Meeting was not announced.

Farewell

LTC Steve Zappalla assigned to the Personnel Technologies Directorate since November 1999 has been reassigned to the Operations Division, Directorate of Plans, Research and Operations in ODCSPER. We would like to take this opportunity to thank him for his outstanding contributions to the MANPRINT program and wish him well in his new assignment.

On 20 April 2001 MAJ Andy Stass will go on terminal leave and subsequently retire after 20 years of service in the U.S. Army. MAJ Stass joined the ODCSPER staff, PERTEC, in May 1999. He brought to this demanding assignment a broad range of knowledge gained from his previous assignments. We want to take this opportunity to thank him for his dedicated efforts on behalf of the MANPRINT program and to wish him well in all of his future endeavors.

Welcome

Major Joseph C. Jones joined the Personnel Technologies Directorate on 28 March. He will be working the Soldier Oriented Research and Development (SOR) mission. He joins us from the Strategic Human Resources Management Office within ODCSPER where he spent over 20 months as a strategic planner/analyst. In this capacity, he spent the last 10 months working Army and Personnel Transformation issues as the ODCSPER's primary representative to the Army Transformation Office. Prior to arriving in ODCSPER July 1999, he spent four years teaching leadership and sociology electives at the United States Military Academy at West Point. Joe and his family, wife LaSonia and daughter LaTisha, in seventh grade, live in Silver Spring, Maryland. His son Carlton is a sophomore at Texas A&M University, Kingsville, Texas. Joe can be reached at Commercial (703) 695-9215; DSN 225-9215; or email: joseph.jones@hqda.army.mil.

MANPRINT Application Analysis Verification & Validation (V&V)

**Joseph S. Chambers, Director,
Simulation Directorate,
United States Army Space &
Missile Defense Command**



**And
Carol G. Swinford, Program Manager,
Verification & Validation,
Maximum Technology Corporation**

Huntsville, Alabama

The following article is a continuation of the article, *MANPRINT Application Analysis*, which was published in the *MANPRINT Quarterly*, February 2001. This article detailed SMDC's, and particularly, the SDD's, involvement in the management and research of modeling and simulation (M&S) resources for SMDC and the applicability of MANPRINT Domains to these processes. The present article will detail SMDC's and SDD's role in the performance of Verification and Validation (V&V) activities, including both the Independent Verification and Validation (IV&V) of tactical, embedded software and the Verification, Validation, and Accreditation (VV&A) of M&S utilized in the training, exercises, acquisition processes, etc.

As the U.S. Army SMDC and particularly the SDD, serves as the Army's proponent for Space and National Missile Defense (NMD) and as the Army's integrator for Theater Missile Defense (TMD), SMDC must ensure that all tactical, embedded systems and all M&S, utilized in training, exercises, and acquisition programs have undergone a rigorous V&V process.

The Department of Defense (DoD) M&S Master Plan, DoD 5000.59-P, states that "V&V of models, simulations, and data are essential to gain the confidence of user organizations that M&S outcomes are representative of the real world, that they are reasonably correct, and that the models and simulations are acceptable for a specific purpose. V&V should be performed during the development of M&S and as part of M&S life-cycle management. Users must also properly accredit or certify each model, simulation, or data set as a prerequisite to its employment for each specific application." Figure 1, from the Department of the Army Pamphlet (DA Pam) 5-11 and the DoD Models and Simulation Office (DMSO) DoD VV&A Recommended Practices Guide, describes the process that must be conducted for M&S to be utilized in the training, exercises, and acquisition processes.

Data utilized in development, V&V, and utilization of the M&S, as well as tactical, embedded systems, must also be V&V'd.

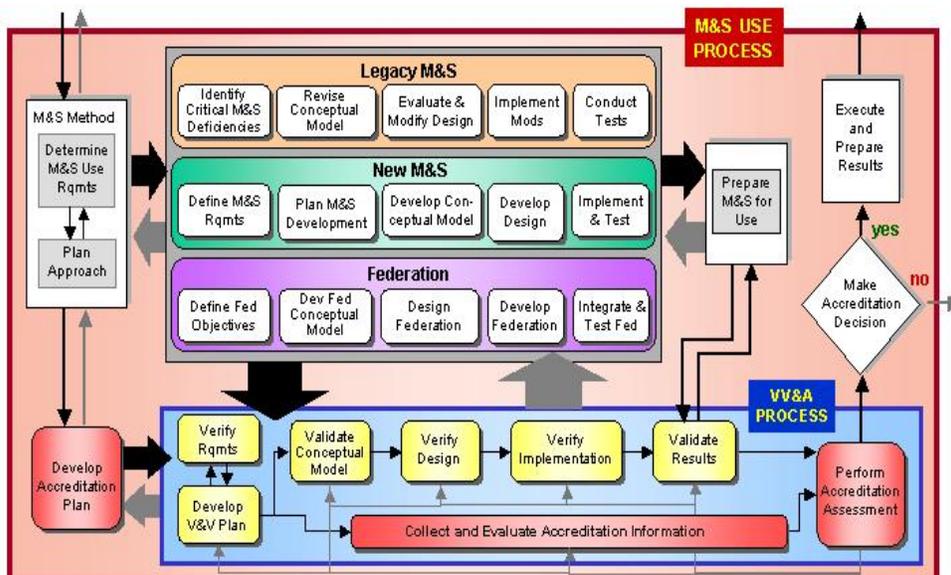


Figure 1 - Army M&S Life Cycle Incorporating VV&A

If invalid input data is utilized for the M&S or tactical system, the output will be invalid. This situation, especially in the case where M&S are utilized for training and exercise purposes, can prove to be fatal to the U.S. warfighters. Figure 2, from DA Pam 5-11 and DMSO DoD VV&A Recommended Practices Guide, describes the process of data verification, validation, and accreditation. The shaded rectangles represent the V&V activities that are required to accredit data utilized during the M&S life-cycle, while the white rectangles represent the M&S V&V activities which occur concurrently with the data V&V.

The Training and Doctrine Command (TRADOC) in TRADOC Pamphlet 71-13, April 29, 1996, "provides guidance to TRADOC organizations tasked, as proponents or evaluators, with the responsibility for independent evaluation of materiel systems, operational concepts, training devices, or force structure." This includes V&V of all software and/or hardware that is utilized by the Army for training, exercises, acquisition programs, and materiel systems.

This V&V process includes both IV&V of tactical, embedded systems and VV&A of M&S that are used in the training, exercises, and/or acquisition processes of the Army. Both of these processes are extremely important in ensuring that the United States warfighters are equipped with systems that operate as intended. The steps in achieving this goal are basically the same, whether IV&V or VV&A are being performed.

To achieve these V&V requirements to the highest degree, the following activities must be performed at the minimum:

1. **Requirements Verification:** Identify key requirements from specification. Ensure software requirements are complete, consistent, and correct. Verify requirements have been prepared in accordance with applicable standards. Evaluate progress of software development.
2. **Design Verification:** Conduct reviews of development products, such as design specifications, models, source code. Evaluate traceability of design to requirements. Perform analysis of development products for consistency, completeness and correctness. Evaluate development processes' conformance to appropriate software development practices and quality development practices. Provide independent evaluation of software development progress.
3. **Code Verification:** Conduct reviews of source code products for each build increment and provide evaluation of product adherence to design specifications. Analyze source code for consistency, completeness, and correctness. Review implementation processes for conformance to capability CMM key process area standards. Document risk areas identified during the implementation analysis in a risk assessment report.

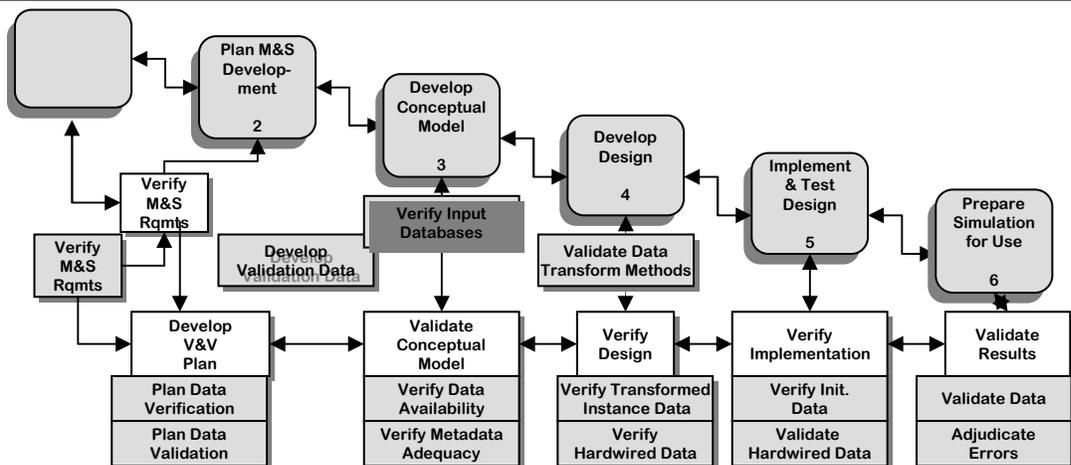


Figure 2. Data VV&A Activities in the M&S VV&A Process

4. **Validation:** Review software test plans and test results for traceability to requirements and development processes and for consistency with specific operational scenario constraints. Develop and conduct functional validation tests. Perform analysis of functional validation tests.

Figure 3 describes the inputs, V&V activities, and outputs that are required to ensure that a system will operate as intended. All of these V&V activities must be conducted to ensure that US warfighters are not sent into situations with systems that have not been adequately verified and validated.

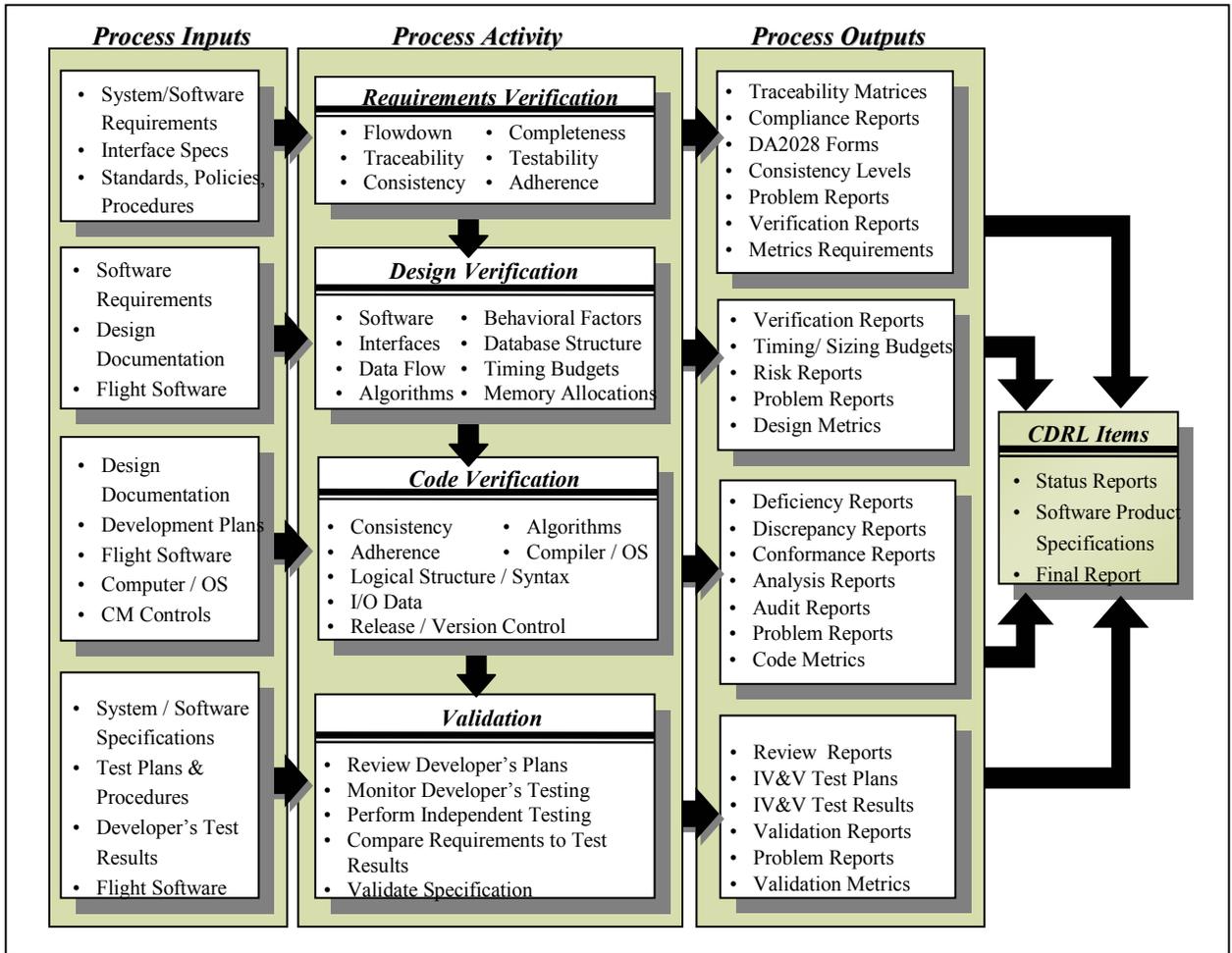


Figure 3 - V&V Process

Experience within the SMDC and SDD community has indicated that the main reason that V&V activities are either totally eliminated in programs or at the least, done in a rather haphazard fashion, is the cost that has been associated with these activities. In the past, in an effort to keep independence in the assessment process, programs have had to fund a totally different staff and, in a lot of cases, have actually purchased duplicate sets of hardware and software tools.

In an effort to alleviate this extreme cost issue as a reason for the elimination or haphazard performance V&V activities, the SDD has initiated the development of the Central Accreditation and Test Capability (CATC). The CATC is a centralized, standardized laboratory environment for the performance of V&V activities. The CATC consists of standardized software toolsets designed for performing activities associated with the V&V process.

The CATC is also staffed with highly trained V&V professionals who are available to the programs to execute the V&V process. The cost to a particular program is essentially any special test equipment that they deem necessary for their particular V&V program and funding for the man-level of effort required to perform the V&V activities associated with their program. This eliminates the need for programs to seek out qualified individuals or having to expend additional funding for the training of individuals. It also eliminates the need to purchase hardware and software tools for performing the V&V activities. In a simplistic view, the hardware, software, and personnel are readily available. It is the belief of the SDD and the SMDC that as Army programs become more familiar with the CATC environment, V&V will become less of a cumbersome, expensive undertaking.

Summary

This paper has summarized the Army and particularly the SMDC and SDD roles in the areas of V&V processes. M&S continue to grow in their importance of providing support to the U.S. warfighter and the Army, SMDC, and SDD are adamant in providing cost-effective, efficient V&V processes for these M&S. The Army, SMDC, and SDD recognize the requirements and importance for V&V activities, both in the realm of M&S and tactical, embedded systems. As a result of these requirements, the SDD has implemented the CATC, as a cost-effective, centralized environment for the performance of V&V activities which must be performed in all DoD programs. These V&V activities are imperative in providing the U.S. warfighters with tools that are sufficient.

Meetings of Interest

DoD HFE TAG Meeting 46

14-17 May 2001

Colorado Springs, CO

POC: Ms. Sheryl Costing

703-925-9791



The Thirteenth Annual International Acquisition/Procurement Seminar- Atlantic (IAPS-A)

25-29 June 2001

Sponsored by the International Defense Educational Arrangement (IDEA)

Mannheim, Germany

For further information call: 703-805-5196

The Interservice/Industry Training, Simulation & Education Conference

26-29 November 2001

Orlando, FL

See: <http://www.iitsec.org>

Pentagon Unveils New “non-lethal” Weapon

*Energy Beam could be used for riot control
peacekeeping missions*

Preface

This article is reprinted from the Huntsville Times Newspaper, dated March 2, 2001. Associated Press Military Writer Robert Burns wrote the article. It is presented here to provide an update on the development of non-lethal weapons. As the Army continues to be deployed for humanitarian and other missions short of war, our soldiers and leaders need non-lethal offensive and defensive options. Peaceful missions can be comprised by the presence of offensive weapons and yet we can't leave our soldiers undefended. This is the intended role of non-lethal weapons. Through the application of MANPRINT, these weapons can be developed to ensure that they are, in fact, NON-LETHAL to both the soldier and adversary.

WASHINGTON – The Pentagon on Thursday unveiled a new “non-lethal” weapon designed to drive off an adversary with an energy beam that inflicts pain without causing lasting harm. Figure 1 shows a computer rendering of the proposed Vehicle Mounted Active Denial System Prototype.

The weapon could be used for riot control and peacekeeping missions when deadly force is not necessary, officials said.

The weapon, called “active denial technology,” was developed by Air Force research laboratories in New Mexico and Texas as part of a multi-service program run by the Marine Corps.

“This revolutionary force-protection technology gives U.S. service members an alternative to using deadly force,” said Marine Corps Col. George P. Fenton, director of the program at Quantico, Va.

The weapon is designed to stop people by firing millimeter wave electromagnetic energy in a beam that quickly heats up the surface of the victim's skin. Within seconds the person feels pain that officials said is similar to touching a hot light bulb.



Figure 1. Computer Rendering of Proposed Vehicle Mounted Active Denial System Prototype

“It’s the kind of pain you would feel if you were being burned,” said Rich Garcia, a spokesman for the Air Force Research Laboratory at Kirtland Air Force Base, N.M. “It’s just not intense enough to cause any damage.”

The Pentagon has made a strong push to develop “non-lethal” weapons in the aftermath of a humanitarian mission in Somalia in 1992-93 that put soldiers in the line of fire in urban areas where civilians were present.

A prototype of the weapon will be tested on goats and humans at Kirtland in the next few months, Garcia said.

“When it penetrates in, it activates the pain sensors, and you feel a lot of pain,” Garcia said. “But there’s no damage. It truly is a non-lethal device.”

The Marine Corps said \$40 million was spent developing the weapon during the past decade.

The Marine Corps plans to mount the microwave weapon on top of Humvees, the Jeep-like vehicles used by both the Marines and the Army. Later it might be used on aircraft and ships, officials said.

The weapon could be fielded by 2009, officials said. William Arkin, senior military adviser to Human Rights Watch, questioned whether a pain weapon would be safe to use against civilians in combat situations.

FY 2001 MANPRINT Training Schedule



MANPRINT ACTION OFFICER COURSE (MAOC)

<u>CLASS</u>	<u>START DATE</u>	<u>END DATE</u>	<u>LOCATION</u>
2001-703	01 May 2001	10 May 2001	Alexandria, VA
2001-704	11 Sep 2001	20 Sep 2001	Fort Belvoir, VA



MANPRINT TAILORED TRAINING (APPLICATIONS COURSE)



<u>CLASS</u>	<u>START DATE</u>	<u>END DATE</u>	<u>LOCATION</u>
2001-708	17 Apr 2001	19 Apr 2001	Dover, NJ
2001-704	22 May 2001	24 May 2001	Fort Knox, KY
2001-001	12 Jun 2001	14 Jun 2001	ALMC, Fort Lee, VA
2001-707	19 Jun 2001	21 Jun 2001	Rock Island, IL
2001-705	21 Aug 2001	23 Aug 2001	Warren, MI

(POC: Mr. Len Girling, COM (804) 765-4361, DSN 539-4361)

MANPRINT INFORMATION

Articles, comments, and suggestions are welcomed. Submit to: MANPRINT Quarterly, HQDA (DAPE-MR), 300 Army Pentagon, Washington, DC 20310-0300; DSN 223-8840, COM (703) 693-8840, FAX (703) 697-1283, E-mail: margaret.simmons@hqda.army.mil

MANPRINT Web Site: <http://www.manprint.army.mil>

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SYSTEM SAFETY: Col. Kim Welliver or Mr. Jim Patton, Office of the Chief of Staff, Army Safety Office, ATTN: DACS-SF, Crystal Plaza 5, Rm 980, 2100 S. Clark Street, Arlington, VA 22202, COM (703) 601-2405, Email: kim.welliver@hqda.army.mil, pattojt@hqda.army.mil.

HEALTH HAZARDS: Mr. Bob Gross or Maj. Carl Hover, U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM), ATTN: MCHB-TS-OHH, Aberdeen Proving Ground, MD 21010-5422, DSN 584-2925, COM (410) 436-2925, FAX: 436-1016, E-mail: robert.gross@apg.amedd.army.mil or carlhover@apg.amedd.army.mil.

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Bob Holz

Acting Director for Personnel Technologies

The MANPRINT Quarterly is an official bulletin of the Office of the Deputy Chief of Staff for Personnel (ODCSPER), Department of the Army. The Manpower and Personnel Integration (MANPRINT) program (AR 602-2) is a comprehensive management and technical initiative to enhance human performance and reliability during weapons system and equipment design, development and production. MANPRINT encompasses the seven domains of personnel capabilities, manpower, training, human factors engineering, system safety, health hazards and soldier survivability. The focus of MANPRINT is to integrate technology, people and force structure to meet mission objectives under all environmental conditions at the lowest possible life-cycle cost. Information contained in this bulletin covers policies, procedures, and other items of interest concerning the MANPRINT Program. Statements and opinions expressed are not necessarily those of the Department of the Army. This bulletin is prepared quarterly under contract for the Personnel Technologies Directorate, Office of the Deputy Chief of Staff for Personnel under the provisions of AR 25-30 as a functional bulletin.

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