MANPRINT BULLETIN

Vol. V No. 4 March/April 1991

FOOTPRINT Update

FOOTPRINT is an interactive method of rapidly generating Manpower, Personnel, and Training reports on the operator and maintainer MOS of personnel associated with the Army's equipment. FOOTPRINT was discussed in a two-part story in the March/April and May/June 1988 issues of the *MANPRINT Bulletin*. A follow-up story on how to request a FOOTPRINT on the Decision Support System (DSS) appeared in the May/June 1990 issue.

FOOTPRINT availability has progressed from requesting printouts and batch reports (Version 1.0) to self-generating display screens via the Headquarters, Department of the Army (HQDA) or the Training and Doctrine Command (TRADOC) Decision Support System (DSS). The FOOTPRINT 2.0 still has the capability to print batch reports and also allows a new on-line screen display tailored to meet the user's needs. The Director of Office Information Management (DOIM) at each installation will assist new users of the DSS system in obtaining user IDs and passwords for the TRADOC or DADSS systems. Once you have obtained a password, it is easy to generate reports via the HQDA or TRADOC DSS system. The FOOTPRINT system is entered from the PROFS menu by typing "Footprt" at the command line of the first screen. After this, simply follow the user-friendly screen prompts for the selection of data that you want. FOOTPRINT reports are grouped into three functional categories: Manpower, Personnel, and Training. The initial manpower and personnel screens are complete and we project the training screens will be completed by March 1991. In addition, the U.S. Army Personnel Integration Command (USAPIC) has developed a user's guide which will soon be available for distribution.

FOOTPRINT 2.0 was developed through the cooperative efforts of the Combat and Training Developments Directorates at Headquarters TRADOC, both the HQDA and TRADOC Decision Support System Personnel and, of course the HQDA MANPRINT Office and USAPIC. While FOOTPRINT was originally designed to provide a baseline MOS description for use in developing a target audience

Continued on page 2

INSIDE THIS ISSUE:

FOOTPRINT (continued from page 1)

description as part of the materiel acquisition process, it has many other managerial uses. During FY 90, 2,652 FOOTPRINT reports were produced for a wide variety of users.

The HQDA Decision Support System staff will ensure FOOTPRINT is maintained and that the data is current. In addition, the Training and Performance Data Center (TPDC) is conducting research to see if Officer, Warrant Officer and Reserve Component data can also be included.

For more information, contact Harold Robinett, USAPIC, ATNC-NMF, 200 Stovall St, Alexandria, VA 22332-1345; AV 221-2092 or COM (703) 325-2092

MANPRINT NOTES

From the MANPRINT Program Office

■ **MANPRINT in Source Selection Clarification.** Paragraph 5-3b, AR 602-2, taken from AAE Memorandum #89-2, indicated that MANPRINT criteria apply to all major areas of source selection evaluation (e.g., cost, technical approach, management). The question arose how to do this for an area with no MANPRINT attributes? For improved clarity, DAPE-MR Message, subject Source Selection Evaluation Criteria, 20217Z DEC 90, proposed a revision: "MANPRINT shall be a separate major area of the same visibility as technical, management, and cost, and shall be evaluated throughout all other major areas which contain MANPRINT attributes." Comments on this change should be directed to HQDA , DAPE-MR (LTC Glen Hewitt), Washington, DC 20310-0300.

■ **Combat Service Support Control System (CSSCS) ASARC Meeting.** The Army Systems Acquisition Review Council approved the transition of the CSSCS program into the full scale development phase on 18 Dec 90. Although starting late, the PM and TSM have done a commendable job of incorporating MANPRINT into the program. Major MANPRINT issues (impact on maintainer MOS 29J and user-computer interface [UCI]) and other MANPRINT concerns were briefed by the proponent, Combined Arms Support Command (CASCOM)—formerly Log Cen. AAE requested that contractor performance be briefed at all future ASAR meetings. Contract award is scheduled for Jan 91.

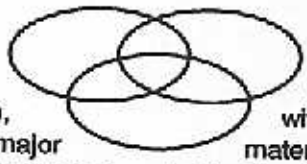
■ **DSS in the MATRIS Data Base.** The Manpower and Training Research Information System (MATRIS) has completed entering the records that comprise the Directory of Design Support Methods into their data base. The Directory has been developed through the Department of Defense Human Factors Technical Group and produced by the MANPRINT Directorate. Including these records in the MATRIS data base will allow the references to design support methods to "drop" (i.e., be accessed and reported) with related R&D retrievals. A limited number of copies of the Directory are available through MATRIS until it is available through the Defense Technical Information Center AD-system.

? DID YOU KNOW?

◆ *Abstracts in Human-Computer Interaction*, a quarterly journal, was started in July 1990. Categories covered include documentation, training, programmer productivity, screen design, safety and health issues, and end-user productivity. Volume I, which retrospectively highlights 1988 and 1989 literature, contains about 2400 document abstracts. Over 50 percent of these were sponsored by institutions outside the United States. The price of Volume 1 is $290 U.S.A.

◆ *Keyguide to Information Sources in Artificial Intelligence/Expert Systems*, a 277 page sourcebook, has been published. Part I defines the scope, history, and present organization of AI and surveys the structure and use of AI literature and information sources. Part II is an annotated bibliography of major AI/ES information sources. Part III includes an international directory of key organizations. The price is $70. For additional information, contact: Ergosyst Associates, Inc., 123 W. Eighth Street, Suite 210, Lawrence, KS 66044-2605; telephone (913) 842-7334.

U.S. Army Personnel Integration Command: The Army's MPT Integrator



The MANPRINT community has grown significantly over the past several years. During this growth period, the U.S. Army Personnel Integration Command (USAPIC), formerly known as SSC-NCR, has been a major participant in the effort to institutionalize MANPRINT throughout the Army. USAPIC focuses on the first three domains of MANPRINT: manpower, personnel, and training (MPT).

In 1984, USAPIC was the proponent for the first major MPT front-end analysis using the Hardware vs. Manpower (HARDMAN) Comparability Methodology. This methodology was adapted from a paper and pencil methodology originally developed by the U.S. Navy. The U.S. Army Research Institute for Behavioral and Social Sciences (ARI) computerized the methodology, which became known as HARDMAN I and, later, HARDMAN II.

In HARDMAN analysis, a notional system is developed using real components and actual data. Estimates of the proposed system's effect on manpower, personnel, and training are made while the system is still on the drawing board; if the design of the system creates heavy demands on Army MPT resources, design changes can be made early in the acquisition process (when the cost of redesign is substantially lower); or a decision can be made to pay the high cost in MPT resources. HARDMAN I and II have been applied to 25 separate major weapon systems.

To assist the ARMY with its MANPRINT mission, USAPIC published the System MANPRINT Management Plan (SMMP) Procedural Guide. This guide provides a detailed description of how to prepare a SMMP for a new system (or an improvement to a present system).

USAPIC developed and is the proponent for the Early Comparability Analysis (ECA) methodology. ECA assesses MPT and, to a lesser degree, human factors through a "lessons learned" approach, emphasizing qualitative soldier issues. The ECA Procedural Guide provides the user with a detailed description of how to perform this analysis.

In September 1987, the MANPRINT Risk Assessment Guide was published to assist in the identification and evaluation of the MANPRINT risks associated with the development of an emerging materiel system. Since the guide's initial publication, this helpful tool has been automated and is available on disk.

USAPIC has been the proponent for MANPRINT training since 1987. The MANPRINT Staff Officer Course (MSOC), currently conducted through the U.S. Army Logistics Management Center at Ft. Lee, Virginia, is a two-week course for action officers involved in the MANPRINT effort. The MANPRINT Senior Training Course (MSTC), a one-week course designed for senior-level executives and managers, is conducted on-site alternately at TRADOC and AMC installations. These courses are available to military, civilian, and industry participants. More than 3200 people have received MANPRINT training to date.

Another recently available MANPRINT tool is FOOTPRINT. FOOTPRINT is an interactive method of generating MPT information through a series of reports on operator and maintainer Military Occupational Specialties (MOS) associated with the Army's equipment. It provides data for a baseline MOS description which is used in developing a target audience description and is a significant product of the MANPRINT process . The FOOTPRINT concept was developed in 1986 under USAPIC sponsorship. In 1988, USAPIC led the effort to automate FOOTPRINT reports and make them available through the HQDA and TRADOC Decision Support Systems. USAPIC's current aim is to make FOOTPRINT data available as a relational data base allowing standard reports to be produced which can be tailored to individual needs.

USAPIC continues to contribute to the MANPRINT effort by assessing the manpower and personnel implications of materiel requirements and program documents; participating in MANPRINT Joint Working Groups (MJWG), TRADOC Materiel

(Continued on page 5)

Quantitative Method for Relating Helicopter Crew Task Performance and Mission Success

William B. Askren
Universal Energy Systems, Inc.

Joseph E. Boyett
Management & Engineering, Inc.

Editor's Note: This research was sponsored by the Army Research Institute Aviation R&D Activity, Fort Rucker, AL, under contract. Any opinions or conclusions expressed in this article are those of the authors, and do not necessarily reflect the views of the Army.

Current measures of aviation weapon system effectiveness are based on figures of merit, such as probability of kill (Pk) and probability of survival (Ps). While readily understood at the mission level, these measures cannot be decomposed to human performance at the task level. Consequently, the effects of aviator performance variations brought on by such factors as changes in equipment design, changes in training, and changes in tactics cannot be measured. The need, therefore, is for a quantitative method that links aviator performance at the task level to the various measures of system performance at the mission level. This paper describes an effort to devlop such a quantitative method.

The approach taken was first to develop a theoretical modeling concept that links aviator task performance to mission success probabilities. The second phase was to provide a proof-of-concept test of the modeling concept using information and data generated by subject matter experts (SMEs) for the AH-64 helicopter deployed in a combat scenario.

First Phase: Theoretical Modeling Concept

The modeling concept was based on three considerations: (1) a helicopter workload hierarchy reported by Szabo, 1986; (2) general probability and hierarchy modeling theory; and (3) the helicopter crew measurement concepts presented by Perez and Simons, 1987.

1. Szabo defined 653 cockpit tasks associated with AH-64 helicopter combat operations. She combined the 653 tasks, such as adjust altitude and check weapon path, into 153 unique helicopter system functions, such as acquire target and unmask aircraft. Szabo also combined the functions into 49 mission segments, such as nap of earth flight and battle position, and the segments into seven unique AH-64 mission phases, such as enroute and target servicing.

2. Using general probability and hierarchy model theory, conceptual models were developed that link pilot task performance to mission success. The task model presented below is representative of the conceptual model development work:

$$P = \beta_{0ijk} + \beta_{1ijk}M_{1ijk} + \beta_{2ijk}M_{2ijk} + \ldots + \beta_{mijk}M_{mijk} + e \quad (1)$$

where

P is the probability of successfully meeting a mission goal (navigation, target kill, enemy threat, ground hazard),
β_{0ijk} is the intercept of the model,
β_{1ijk} is the marginal contribution of measure one of task i, function j, segment k to task performance,
M_{1ijk} is measure one of task i, function j, segment k, and e is the residual or unexplained portion of the model.

3. Perez and Simons defined a number of measures of mission performance, such as course deviation, speed deviation, time error, steering error, and time on target. These mission measures were used to help define the parameters of cockpit task performance.

Second Phase: Proof of Concept Test

The test of the modeling concept was performed by attempting to construct quantitative equations, based on the conceptual models, that link pilot task perfor-

mance to helicopter mission success. The development of these equations required a large data base. Therefore, the proof-of-concept test was performed in three steps.

1. Collect SME Data. Two experienced helicopter pilots estimated the link between the performance of AH-64 helicopter cockpit tasks and the mission success scores of Probability of Target Kill, Probability of Successful Navigation, Probability of Surviving an Enemy Threat, and the Probability of Surviving a Ground Hazard. Three kinds of data were estimated by the SMEs. The first was the relationship between time to perform cockpit tasks and the various probabilities of mission success.

The second type of data were the relationships between "hard" measures for each task, i.e., degrees of heading, feet above terrain, knots of speed, meters from target, and the probabilities of mission success. The third type of data were the relationships between performance of "subjective" tasks, e.g., check flight instruments, check weapon path, observe tracking gates of the auto target tracker, and the probabilities of mission success.

2. Generate Pseudo Data Base. However, much more data than that provided by the two SMEs was needed to devlop the quantitative equations. The second step, therefore, used the limited amount of SME estimated data as the basis for the generation of a large quantity of data, termed pseudo data. A random number process created 100 pseudo observations for each task. In total, the pseudo data set contained 34,400 values.

3. Develop Quantitative Equations. To demonstrate proof-of-concept of the hierarchical modeling process, the research needed to show that the conceptual models, such as equation 1, can be used to construct equations that predict the relationship between task performance and mission success probabilities. The research produced 236 such equations, for example:

$$\hat{P}640 = 1.111 - .151\ (\text{TIME}) - .019\ (\text{DEGREES}) \quad (2)$$

The equation demonstrates that time to perform the task and degrees off flight path affect the probability of successfully hitting a target. The coefficient for time is negative (-.151) which shows that the probability of success decreases as time increases. The coefficient for degrees also has a negative influence (-.019) on success. Each degree increase in deviation from the desired path causes the probability of success to decrease by about 2 percent (.019).

The results of this research demonstrate that a quantitative link between pilot cockpit task performance and system mission success can be achieved. There are four potential uses of the results of this research effort. First, the effects of changes in crew task performance on the probability of combat success can be estimated. Second, the modeling process can be used top-down to predict from desired levels of combat success to the levels of crew performance that are required to achieve the desired combat success goals. Third, the modeling process can aid training programs by highlighting which tasks contribute most to mission success. And fourth, this modeling process can be extended to other system types, for example, tank systems, and thus allow the prediction of tank combat success from tank crew performance.

For more information, contact . . .
William B. Askren, Universal Energy Systems, Inc.
4401 Dayton Xenia Rd, Dayton, OH 45432-1894
COM (513) 426-6900

USAPIC (continued from page 3)

Evaluation Committees (TMEC), and other forums and by maintaining a MANPRINT Analysis Contract for contractual applications of MANPRINT methodologies. Upon request, USAPIC also conducts independent MPT assessments of materiel systems for the MANPRINT Office of the Deputy Chief of Staff for Personnel. These assessments provide detailed information on the manpower, personnel, and training impact of new systems before each milestone decision review.

Since the inception of MANPRINT, USAPIC has supported the Army by developing and providing guidance, training, and tools necessary to accomplish many of the tasks associated with the MANPRINT mission. As MANPRINT further evolves, USAPIC will continue to facilitate the incorporation of new and improved MANPRINT initiatives into the materiel acquisition process. Responsiveness has been and will be the hallmark of USAPIC's involvement in MANPRINT.

For more information, contact . . .
Diana Lueker, USAPIC, ATNC-NMF-B
200 Stovall Street, Alexandria, Va 22332-1345
AV 221-2096 or COM (703) 325-2096

MANPRINT Is Alive and Well at Oshkosh Truck Corporation

George W. Krause
Sam Pearlman
Oshkosh Truck Corporation

Now that MANPRINT has been around for a few years, one might ask how well is it doing? For an answer from one source, let's see how MANPRINT has been handled by Oshkosh Truck Corporation, Oshkosh, Wisconsin.

In January 1990, Oshkosh Truck Corporation (OTC) was, through competitive bidding, selected by the United States Army Tank-Automotive Command (TACOM) to develop and produce the Heavy Equipment Transporter (HET) M1070 Tractor Truck. In operation, the HET Tractor will be married up with the M1000 Semitrailer being produced by Southwest Trailer Company to form the Heavy Equipment Transporter System (HETS). The main purpose of HETS is primarily to provide on-road transport for the ABRAMS M1 tank in support of the US Army and Marine Corps in the field.

As we all know, the elements or domains that constitute the foundation of MANPRINT are not new to the materiel acquisition process. What is new, however, is the gathering of these domains of personnel, manpower, training, safety, health hazard, and human factors engineering under a single integrating umbrella. MANPRINT provides visibility and awareness of the requirement for early on and continuous man-machine interface during the materiel acquisition process at the highest level of command. Thus the program can be more easily managed and more importantly gets early command attention.

To reinforce their HET Team, OTC selected JAYCOR from Vienna Virginia, as their Software Support Contractor to develop and coordinate the MANPRINT Program. Working closely with the OTC MANPRINT Manager, the JAYCOR MANPRINT Coordinator had the freedom to cross OTC departmental lines to expedite recommended improvements.

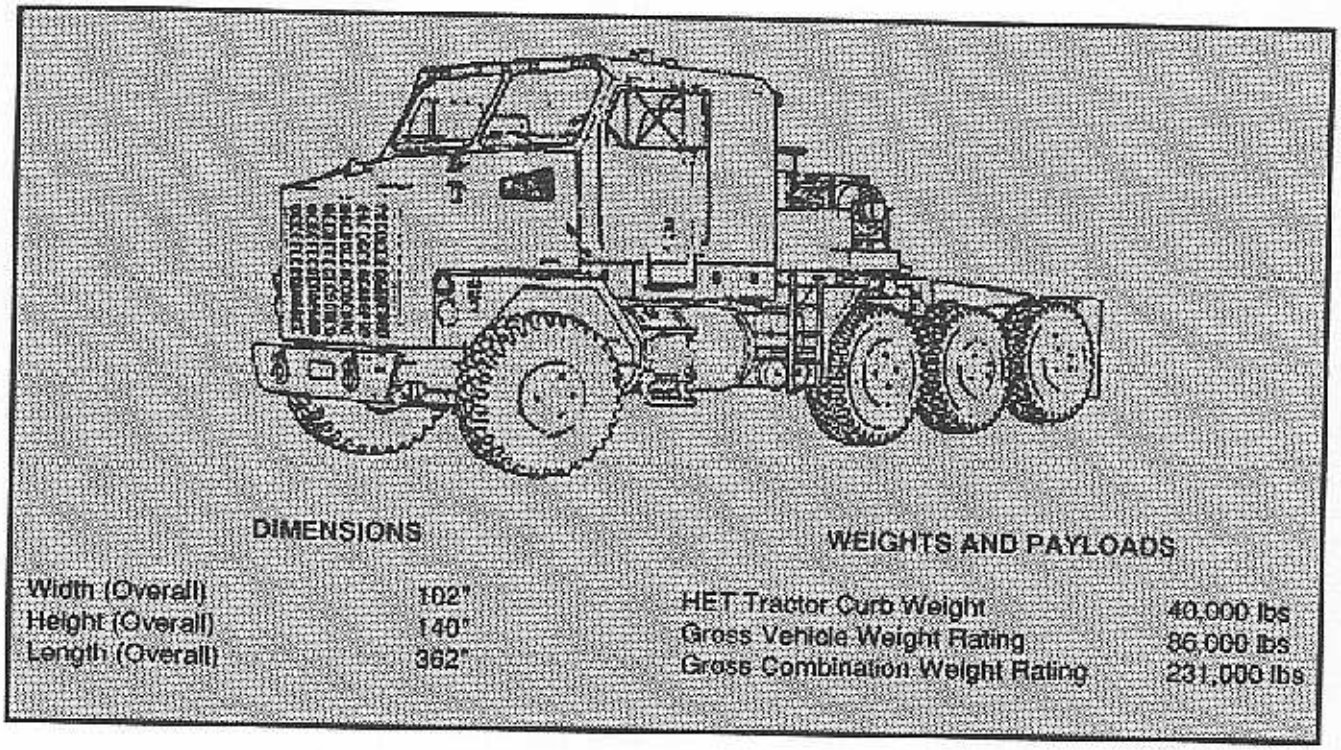
OTC's MANPRINT approach stresses total involvement by every member of the HET Team. This includes the indoctrination of the design engineers, reliability and maintainability engineers, producibility and manufacturing representatives, test and development personnel. It also includes the entire logistics support team, consisting of logistics analysts, provisioners, technical writers and illustrators.

This total involvement effort focused on the ultimate users, the U.S. military operators and maintainers. The first and foremost lesson to be learned was that everyone must have a thorough understanding and a constant awareness of who the ultimate users are: their training, skills and years of experience, as well as their physical capabilities and limitations to accomplish the tasks required to operate and maintain the HET Tractor in the expected mission environment.

The MANPRINT Coordinator, acting as the eyes and ears of the Chief Design Engineer, was constantly on the lookout for problem areas adversely affecting the operator or maintainer. Once identified, these problems were rapidly analyzed and solutions expedited.

An excellent example of the free interchange of problems and proposed solutions resulted in reducing the installation time of the vehicle starter. It began with a starter replacement problem, as expressed in a few choice words for the designer by an experienced mechanic, on a similar vehicle on which he had been working. Design changes resulted in the time required to physically install the starter for the HET being reduced from over one hour to about 15 minutes. Free and informal exchanges of ideas, problems and potential solutions among the team members were the quickest way to focus on the problem. Engineering solutions were developed, staffed very rapidly and application made with minimum delay.

The continuous awareness by each member of the team brought forth many excellent and useful



DIMENSIONS		WEIGHTS AND PAYLOADS	
Width (Overall)	102"	HET Tractor Curb Weight	40,000 lbs
Height (Overall)	140"	Gross Vehicle Weight Rating	86,000 lbs
Length (Overall)	362"	Gross Combination Weight Rating	231,000 lbs

recommendations that were rapidly integrated into the developing design effort by the engineering staff. Everyone was a contributor and could be justly proud of their efforts to design and produce six prototype HET Tractors in less than nine months after contract award.

The greatest encouragement for continuous participation in the MANPRINT Program by each member of the HET Team members is the knowledge that they have contributed to the successful completion of a vehicle, suitably designed to be operated and maintained in a safe and efficient manner by U.S. military personnel.

MANPRINT helps to maintain awareness of the needs of the ultimate users during all phases of development and production of military hardware. These principles and techniques, practiced and honed on OTC's military procurements, have proven so fruitful that they will be applied to its commercial product development and production also. Additionally, this effort is in keeping with OTC's Total Quality Management commitment.

For more information contact George W. Krause and Sam Pearlman, Oshkosh Truck Corporation
P.O. Box 2566, 2307 Oregon Street,
Oshkosh, WI. 54903-2566
COM (414) 235-9150

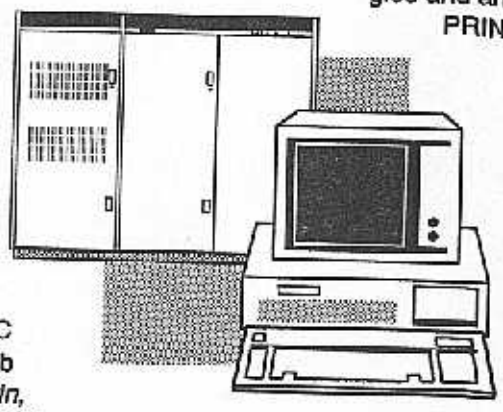
The U.K.'s *MANPRINT Mail*: Looking for a Few Good Articles

The U.K.'s *MANPRINT Mail* is looking for articles for publication in their newsletter. If you would like to submit an article, or simply wish to be added to their mailing list, contact Mrs. Liz Wheatley, Room 5154, DASD, Ministry of Defence, LONDON ENGLAND SW1A 2HB.

MANPRINT and Information Systems

Jim Dyser, MANPRINT Coordinator
U.S. Army Information Systems Command

Mr. Riviello's article, *IMA: MANPRINT's Forgotten Area* (Nov/Dec 1990), was on target when it was written; however, a lot is being done to correct the problem. The US Army Information Systems Command (USAISC) has written an excellent supplement to AR 602-2, and DISC4 is actively reviewing the 25 series publications to incorporate MANPRINT. A new Information System (IS) Acquisition Management Model, which is being developed with MANPRINT embedded, will also contain those necessary documents that will make the application of MANPRINT to IS successful. As LTC Gary Shaw pointed out in the Jan/Feb 1991 issue of the *MANPRINT Bulletin*, MANPRINT is also being embedded in the MAISRC process.



Although a lot has been accomplished, much still remains to be done. Greater use of front-end-analysis is needed to determine the training and force structure impacts of IS. Since a majority of IS are commericial off-the-shelf (COTS), MANPRINT must be successfully embedded in the market investigation process, as well as a true discriminator in the selection of non-development items (NDI). We also must bring industry aboard. The leading manufacturers of Information Systems must be convinced that the Army is serious about the MANPRINT concept, and that MANPRINT will be considered in the source selection of Information Systems.

To further what has been started, the Army may want to host a MANPRINT Information Systems seminar. Leading designers and developers of Information Systems and Army personnel can meet to address the issue of MANPRINT in Information Systems and the application of MANPRINT to software. We must also ensure that the designers and developers of Information Systems are aware of the Army's MANPRINT training programs and what the Army expects in the MANPRINT arena.

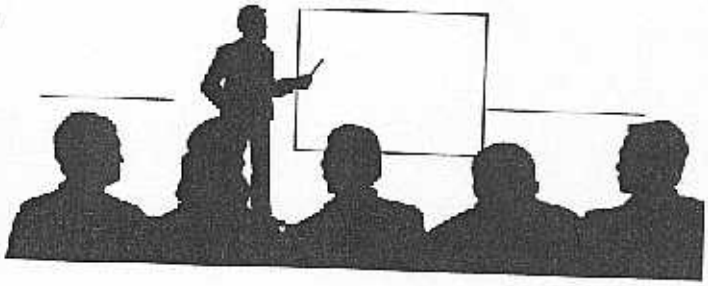
Upon initiation of the MANPRINT program , the Army Research Institute and the Human Engineering Laboratory expended considerable talent and energy in the development of various methodologies and analyses for addressing MANPRINT in the development and acquisition of hardware systems. Those considerable talents must now be turned towards Information Systems. We must marshal those same dedicated personnel and present this new challenge. If we are to succeed in having a MANPRINT program that addresses all Army systems, we must have the support of the total MANPRINT community. As Mr. Riviello pointed out, Information Management Systems touch all aspects of the soldier's life. We cannot accept the nay sayer's philosophy that one cannot apply MANPRINT to Information Systems or software; we must convince them of value added.

Those in the Information Mission Area may be behind the power curve, but we are addressing the issues. DISC4 is well aware of the issues and is actively pursuing solutions; however, it will not be easy. There are many unanswered questions on how to apply the MANPRINT concept to Information Systems and software development. There is also that age-old problem of changing mindsets and showing that MANPRINT is an investment in the future. With the drawdowns, cut backs, and austere budgets, the importance of the MANPRINT concepts grows daily. Whether it be an Information System or a crew-served weapon system, the application of MANPRINT cannot be overlooked. The stakes are simply too high.

For more information, contact Jim Dyser, MANPRINT Coordinator, USAISC, Attn: ASLO-LD-A, Fort Huachuca, AZ 85613-5000 DSN 879-6931,COM (602) 538-6931

DoD HFE Technical Group Conference Features MPTS Integration Sub-Group Meeting

Mr. Judah Katznelson
U.S. Army Research Institute



The MPTS Integration Sub-group #25 met in San Diego, California on 12 November 1990 during the DoD Human Factors Engineering Technical Group Conference. The meeting was attended by 32 people from government and industry. Sub-group attendance has grown from past meetings, and should continue to do so as more people gain an appreciation for the importance of integrating manpower, personnel, and training issues. The meeting featured the following six presentations:

✓ Charlie Holman of the Army Research Institute discussed "MANPRINT During Early User Test and Experimentation (EUTE)" and how MANPRINT's focus during EUTE is on human performance (time and error) as an integral part of and contributor to system performance.

✓ Jim Boismier of General Dynamics talked about the "Application of Process Control Techniques to Human Performance Assessment" and how the measures of task speed and accuracy can be treated with statistical process control techniques. One can specify upper and lower control limits relative to human performance requirements. When performance drifts out of control, corrective action can be based on improved training, system redesign, or revision to personnel selection criteria.

✓ Dan Gardner, representing the U.S. Air Force, presented an overview briefing on the Air Force's Integrated Manpower, Personnel, Comprehensive Training and Safety (IMPACTS) program. His briefing focused on the status of MIL-STD-881, which deals with how the military allocates cost in acquisition programs. The IMPACTS Office is seeking to modify the MIL-STD to include Human Systems Integration (HSI) in a major parts break-out. HSI is not currently factored in at all.

✓ Bill Wheeler of Battelle presented "Proof of Principle Demonstration of PC-based Automated Content Categorization for Command and Control." To successfully integrate MPTS into automated command and control systems, we need to understand the flow of information elements that commanders use to analyze their situations and make appropriate decisions. The demonstration was designed to determine the feasibility of using a PC and NDI software to categorize message traffic to achieve rapid and economical reduction of information.

✓ Barbara Sorensen of the Air Force, talked about the "U.S. Joint Services Systems Approach to Training and the Integrated Weapons Systems Data Base."

✓ John Courtright, of BDM International, discussed the U.S. Air Force Aircraft Mishap Prevention Program and the need for better tools to identify the complex nature of human contributions to mishaps. This program is developing the capability to apply information processes, techniques, and support tools to recognize and correct deficiencies in equipment design, training, and operational practices which contribute to mishaps.

As a final point of business, the sub-group nominated and elected Fred Oberman of the Naval Sea Systems Command as the new Chair of the MPTS Integration Sub-group. His two year term will begin with the May 1991 meeting.

For more information contact
Mr. Judah Katznelson, USARI, Attn: PERI-SM, 5001 Eisenhower Ave., Alexandria, VA 22333-5600, AV 284-8917, COM (703)-274-8917