

MANPRINT



Quarterly

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"MANPRINT: THE EXPANDING CHALLENGE"

The 1994 MANPRINT Practitioners Conference

9 - 11 August 1994

Westpark Hotel

Rosslyn, VA

Featured Speakers

Mrs. Colleen A. Preston*

Deputy Under Secretary of Defense Acquisition Reform

Lieutenant General Peter A. Kind

Director of Information Systems for Command,
Control, Communications and Computers

Lieutenant General William H. Forster

Military Deputy to the Assistant Secretary of the Army
Research, Development and Acquisition

Major General Wallace C. Arnold

Acting Deputy Chief of Staff for Personnel

Major General Jay M. Garner

Assistant Deputy Chief of Staff for Operations and Plans
Force Development

Brigadier General Orlin L. Mullen

Program Manager, Comanche

Dr. Harold R. Booher

Director for Manpower and Personnel Integration

Mr. Vito J. DeMonte

Directorate Executive, Army Research Laboratory
Sensors, Signatures, Signal and Information Processing

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Directorate Executive, Army Research Laboratory
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MANPRINT AND DUAL USE TECHNOLOGY

Dr. Thomas Killion
AMSRL-HR-M

The Army has for many years been an active proponent in the transfer of the results of taxpayer-supported R&D efforts to industry and academia. The recent National Security Strategy and consequent Defense and Army military strategies have increased the emphasis on investment in technologies with rapid spin-off to commercial industries. Partnerships are being encouraged between industry and the government in R&D as never before.

Implementing this interest in spin-off of military technologies is an increasing emphasis on the application of commercially available technologies to meet military needs, or spin-on. The evolving Defense Acquisition Strategy places a high priority on limiting the application of military-unique standards and specifications in acquisitions. The intent is to more rapidly take advantage of state-of-the-art technologies and systems. Despite their "off-the-shelf" character, such technologies and systems still require MANPRINT analyses to optimize their integration into combat systems and environments.

What role does MANPRINT, along with its methodologies and technologies, have to play in the dual use arena? Addressing this question requires a consideration of at least six categories of interest. The six categories are derived from a combination of the two directions in which technology can flow, i.e., spin-off and spin-on, and three areas of MANPRINT focus: (1) MANPRINT methods, tools, and data; (2) the products to which MANPRINT is applied; and (3) processes, both organizational and physical, which generate such products. Table 1 summarizes these concepts and provides some examples.

Under The Army Study Program (TASP), DAPE has received funding to initiate a contract to investigate dual use opportunities and needs for MANPRINT. The contractor will flesh out the framework presented in Table 1 and then focus on the application of MANPRINT

tools/methods to the transportation industry. The National Automotive Center (NAC), which was established by the Tank-Automotive Research, Development and Engineering Center (TARDEC) in Warren, MI, in late 1992, will provide the primary vehicle for interface with industry.

Expected products from the study include:

Clear definition of MANPRINT dual use issues and identification of areas for research/enhancement.

Identification of commercial industries and processes that would benefit from transfer of MANPRINT methodologies and technologies.

An initial Cooperative R&D Agreement (CRDA) for the transfer of MANPRINT technologies/methodologies with the U.S. automotive industry, coordinated through the NAC.

Recommendations for follow-on CRDAs with other commercial sectors.

Renewed emphasis on the MANPRINT process/program and its interrelationships with industry.

For MANPRINT Practitioners, this study will provide insights into opportunities for application of their methods and tools in the non-DoD environment, as well as identifying commercial tools, methods and data which may increase their efficiency and productivity.

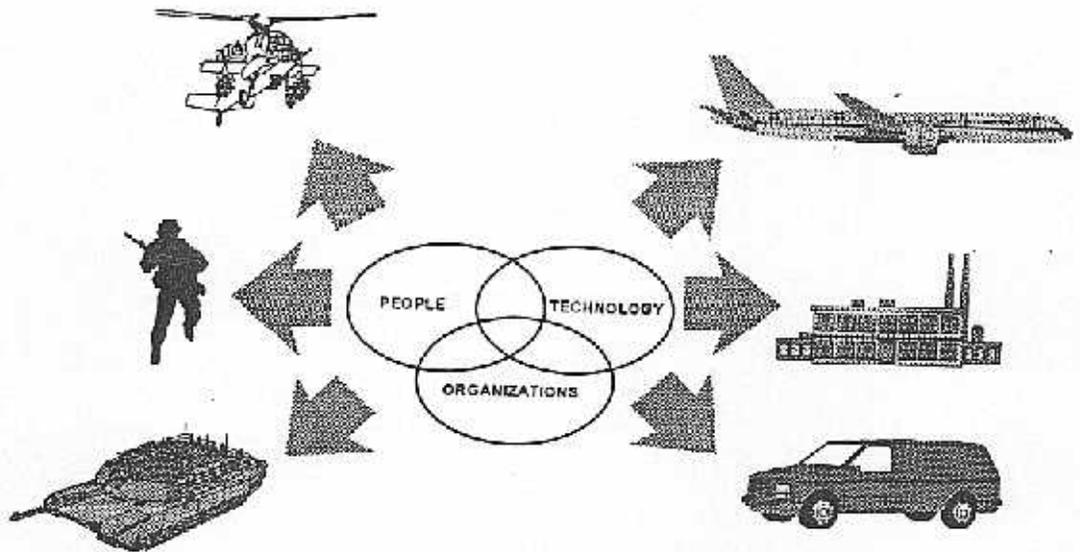


Table 1
Direction of Technology Transfer

Area of Interest	Spin-Off Military » Commercial	Spin-On Commercial » Military
Methods/Tools/Data	Concept: - Apply/adapt existing MANPRINT tools/methods/data for commercial system design Examples: - HARDMAN III - JACK	Concept: - Incorporate commercial design tools/data into MANPRINT "toolbox" Examples: - CAD/CAE tools - Data on special populations
Products	Concept: - Adapt/utilize military products for civilian application	Concept: - Adapt/utilize commercial products for military application
Processes	Concept: - Apply MANPRINT design tools to civilian processes (organizational/physical) Example: - Apply MPT analyses to manufacturing process design	Concept: - Apply/adapt commercial design tools/data to military processes Example: - Apply civilian organizational analysis tools to increase military organizational efficiency

Team Integration in the Early MANPRINT Process

by Mr. Matt DeGarmo, Fu Associates, Ltd.

Team integration is an essential component of MANPRINT. Its importance, while stressed throughout the entire acquisition life-cycle is especially critical during the early stages of a system's development when the requirements documents—those that will define the human/machine balance of a system—are being developed. Often, though, initial attempts at team integration are impeded or dismantled by individual and organizational barriers. Design objectives developed early by certain team members are modified, superseded or ignored by others later in the design process. All too frequently, the result is a system design process that incorporates fragmented elements of narrow interests rather than synthesizing these interests into a coherent and balanced team product.

The rationale for this behavior is clear: people and organizations develop values consistent with their responsibilities and interests. Safety engineers concern themselves with safety issues and trainers with training issues. While this is an obvious and natural tendency, it is not always a desirable one—especially if these narrow interests act as blinders to hinder team integration in the design process.

In the traditional approach to design engineering, this undesirable tendency is reinforced by the vertical structure in which it operates. Team members are organized along a hierarchy of specialized, independent disciplines. It is a highly fragmented approach where information is collected, processed, and passed down from one specialist to another with little opportunity for feedback. In this environment, people are motivated by narrow (individual, group and organizational) achievements, rather than collective (team) achievements. This engenders in the team a territorial mind set that stifles communication and inhibits cooperation. Because of this, the value of design contributions is not always known, respected, or shared. In the early phases of a system's development, this lack of communication can restrict design perspectives and lead to the development of inadequate initial requirements.

A better approach—one that best supports the unique demands of MANPRINT—is the integrated approach. This approach, inherent in modern management concepts such as Concurrent Engineering and Total Quality Management, differs from the traditional approach primarily in its emphasis on communication. While the same specialized areas of responsibility exist, the flow of communication between these areas is greatly enhanced by allowing individual disciplines to communicate horizontally (across disciplines) as well as vertically. For example, logisticians can speak directly with human factors engineers, and human factors engineers with trainers. By expanding the flow of communication, each team member is made aware of other team member concerns. This knowledge of other experts' concerns produces accountability, both to the individual and to the team, and promotes an enhanced design perspective.

Being knowledgeable, however, is only part of the equation. Integrating and balancing team member concerns requires a process of trade-offs. To do this, each member needs to understand the relative importance of their contribution to the total system—human and technical. This understanding can only be achieved through the type of communication found in an integrated team environment.

Changing to an integrated perspective takes work. High level support and strong leadership are essential to making change a reality. Without them, no amount of effort will be successful. In addition, team members must be willing, flexible, and committed to the endeavor. Even before these events occur, team members must be convinced that the process is worthwhile, that the effort they expended on changing will pay off later in the development process.

Looking at examples where integrated teamwork has succeeded will help convince team members of its importance. Consider the Corps Surface-to-Air-Missile (SAM) system. Early in the pre concept phase, the Corps SAM team was committed to an integrated approach. Under the leadership of a supportive project manager, the

Corps SAM team sought to involve the collective experience of the entire team into the concept development phase of the acquisition process. This effort created a challenge for the team because it required changing habitual approaches and confining perspectives common in earlier acquisitions.

The Combat Developer (CBTDEV) and the Materiel Developer (MATDEV) were two principal organizations in the Corps SAM team that exemplified this challenge. These organizations were crucial players in the development of initial studies and requirements documents. Yet, despite their mutual goals, each organization was driven by their own set of responsibilities: the CBTDEV-as the agency responsible for formulating the doctrine, concepts, organization, materiel requirements, and objectives of a proposed system-represented the user community; and the MATDEV-as the agency responsible for R&D and production-was principally concerned with cost, performance, and schedule.

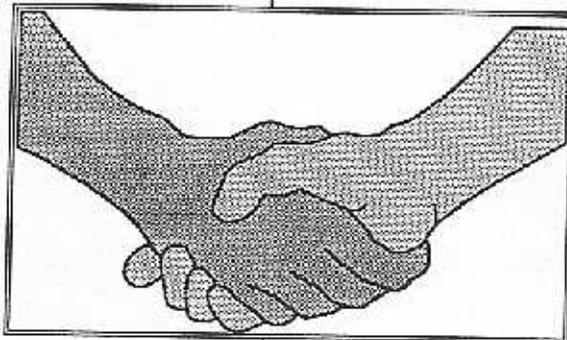
Changing the perception that these organizations operated autonomously was an important, early barrier to overcome in achieving integration. The Corps SAM team's project manager was instrumental in bringing leaders of both organizations together and in giving them the necessary resources to make change a reality. By demonstrating his commitment to team integration, he succeeded in persuading leaders from the CBTDEV and MATDEV to collaborate early on a wide range of tasks. In retrospect, many team members attributed the success of their integrated effort to the constructive dialogue established early between the project manager and the leaders of these organizations.

Qualifications of the CBTDEV and MATDEV leaders were important in facilitating change. Each possessed a strong knowledge and broad understanding of the role of MANPRINT and of the importance of integrated team work. These qualities were essential in understanding the individual and collective motivations of the team. Acknowledging and working to balance the

diversity of interests was vital in realizing team's full potential.

The project manager and the leaders from CBTDEV and MATDEV succeeded in fostering atmosphere of cooperation. Because of t effort, communication among team members, t respective organizations, and contractors beca open and productive.

Information was freely shared and iss discussed. Education also played an import



role in facilitating integration process. example, all team memb received formal MANPR training. Equipped with philosophy, training, i integration techniques MANPRINT, it was ea: for these individuals articulate their concerns ; ensure that t contributions would

clearly understood in the context of the syster development.

The Corps SAM team's integrated eff culminated in the development of strc MANPRINT requirements being written into initial Request For Proposal and Operatio Requirements Document. The quality of th early documents reflected the interests of both CBTDEV and MATDEV and presented a m comprehensive package than produced in past. By addressing important issues early in acquisition process, the Corps SAM te established the foundation for a human-centeri cost-effective system.

For MANPRINT, the importance of early te: integration cannot be understated. MANPRIN success relies on the ability of team members communicate effectively. By applying integrated approach early in the MANPRI process, system development teams can ensi that requirements are developed which optim available human, technological, and econon resources. In the end, the principal benefit integrated teamwork is revealed in the balance all team member contributions: a balance tl translates into maximum performance over system's life-cycle.

ANNOUNCING FY 95 MANPRINT TRAINING SCHEDULE

The **MANPRINT FOR MANAGERS COURSE (MFMC)** is designed to provide training to mid-level managers in my organizations with **MANPRINT** missions and functions in order to facilitate the accomplishment of **MANPRINT** program goals. The course provides highly interactive instruction on **MANPRINT** and its background, philosophy, purpose and domains in two days. DoD contractor personnel are welcome.

MANPRINT FOR MANAGERS COURSES

<u>ASS</u>	<u>DATES</u>	<u>LOCATION</u>
-701	04-05 OCT 94	NATICK LABS, MA
-702	15-16 NOV 94	FORT GORDON, GA
-703	29-30 NOV 94	FORT MONROE, VA
-704	10-11 JAN 95	FORT BRAGG, NC
-705	14-15 FEB 95	FORT HOOD, TX
-706	25-27 APR 95	FORT SILL, OK
-707	16-17 MAY 95	FORT BLISS, TX
-708	20-21 JUN 95	FORT MONMOUTH, NJ
-709	22-23 AUG 95	ROCK ISLAND ARSENAL, IL
-710	19-20 SEP 95	FORT LEONARD WOOD, MO

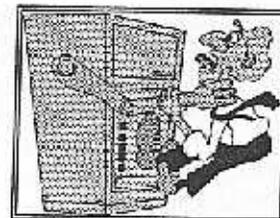
MANPRINT WORKSHOP

MANPRINT WORKSHOPS are tailored courses from 1 to 5 days in length with a focus on customer needs. These courses are given by special request.

701	24 JAN - 27 JAN	FORT RUCKER, AL
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MANPRINT and Automated Information Systems (AIS)

See **MANPRINTing of Major Automated Information Systems Review Council (MAISRC)** systems courses will be offered for FY 95. These courses are primarily designed for those DoD and contractor personnel who are responsible for the acquisition of Army MAISRC level Systems. This course will focus on how **MANPRINT** applies throughout the life cycle of these systems and how the **MANPRINT** process can influence hardware/software design and development.



702	28 FEB - 03 MAR	FORT BELVOIR, VA
701	13 MAR - 16 MAR	FORT LEE, VA
704	26 SEP - 29 SEP	FORT HUACHUCA, AZ

MANPRINT ACTION OFFICER COURSES

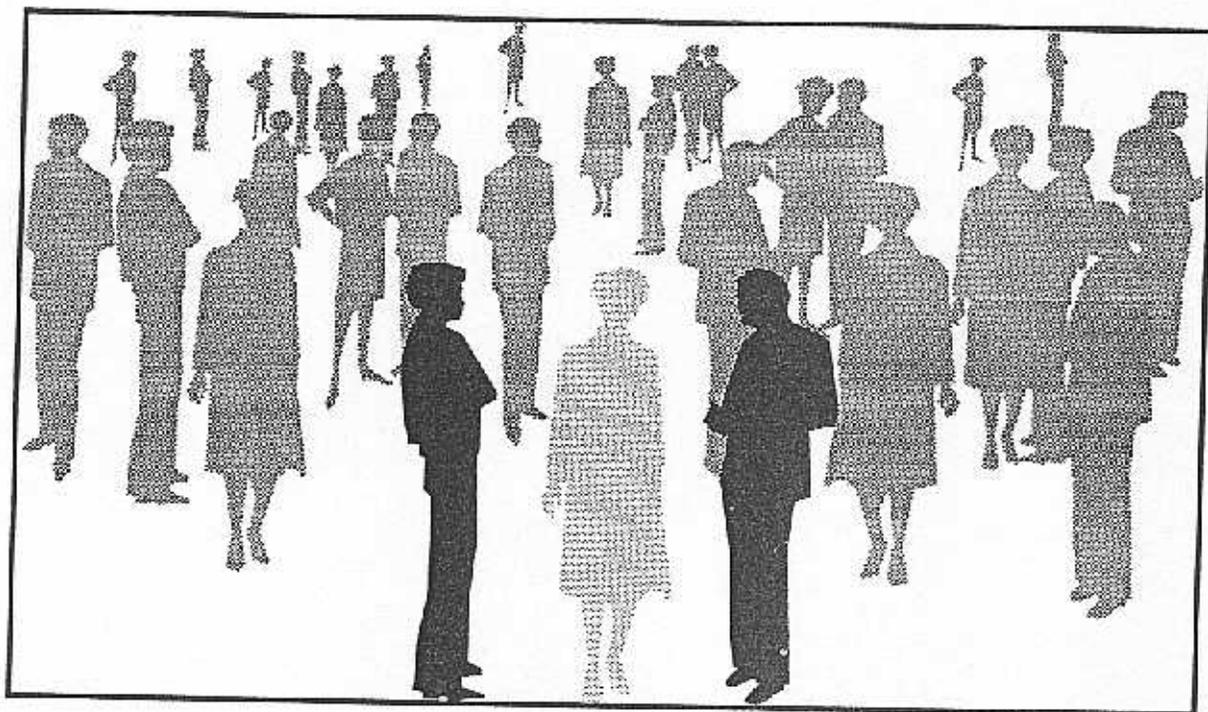
The FY 95 **MANPRINT** training schedule was approved at the annual **MANPRINT** Training Steering Committee Meeting in May 1994. Those wishing to attend should contact their installation training office as soon as possible.

The proponent for **MANPRINT** training is the Deputy Chief of Staff for Plans, Force Integration and Analysis (DCS/PLANS), U.S. Total Army Personnel Command. The training is conducted by the U.S. Army Logistics Management College, Fort Lee, VA. In addition to being presented at the proponents location, the new version of the **MANPRINT** Action Officer Course is only eight (8) days long.

The purpose of the MANPRINT Action Officer Course (MAOC) is to train officers, warrant officers, noncommissioned officers, and civilian personnel responsible for integrating MANPRINT considerations into the system development and acquisition process. An officer skill identifier 6S is awarded to CPTs, MAJs, and LTCs upon successful completion of the course. DoD contractor personnel are welcome.

MANPRINT ACTION OFFICER COURSE SCHEDULE - FY 95

95-701	18 OCT - 27 OCT 94	FORT SAM HOUSTON, TX
95-001	24 OCT - 03 NOV 94	FORT LEE, VA
95-702	06 DEC - 15 DEC 94	FORT GORDON, GA
95-703	31 JAN - 09 FEB 95	FORT BRAGG, NC
95-704	04 APR - 13 APR 95	FORT SILL, OK
95-705	06 JUN - 15 JUN 95	FORT HOOD, TX
95-706	01 AUG - 10 AUG 95	FORT LEONARD WOOD, MO
95-002	14 AUG - 24 AUG 95	FORT LEE, VA



DON'T YOU BE THE ONE LEFT OUT.

**COME JOIN US AT THE MANPRINT PRACTITIONERS CONFERENCE
9-11 AUGUST**

DETAILS ON PAGE 9

WE HOPE TO SEE YOU THERE, AND HAVE THE OPPORTUNITY TO PUT NAMES AND FACES TOGETHER

QUICK AND DIRTY ANALYTICAL TECHNIQUES FOR MANPRINT!

By Mr. John E. Hodges

ANALYSIS SHOP

ACCURATE!

FAST!

CHEAP!

NOTE: YOU MAY ONLY HAVE TWO (2) OF THE ABOVE.

How many of you have seen the above quote? Probably many of you. It's all too true. I have received numerous requests (and you may have also) to produce an analytical product and have it meet all three requirements, when it can only meet two.

The same is true with MANPRINT Analyses. Since I've been working MANPRINT (beginning in May of 1986) there has been a continuing search for a "quick and dirty" MANPRINT Analysis Tool. Guess what? No one has found one yet and I don't think they ever will.

However, there are many fine analytical techniques that can be used to provide analysis of one or more MANPRINT domains. They take effort, time and subject matter expertise, but these analyses can make a significant contribution toward the "MANPRINTing" of a system.

Wonder — How do we start? One good way is the eight step Operations Research Systems Analysis (ORSA) outline process. I have modified it a little and added a ninth step, to meet MANPRINT needs.

Define the problem. What MANPRINT Domains are involved? Have you received some senior level guidance?

Determine the objectives. Do you need to determine the target Audience? Are there some lessons learned from predecessor systems (includes manual processes)?

Identify assumptions. This is a good one. Assumptions are not wishes. These are items that are accepted as facts. If they are not true, the whole process is invalid.

Formulate alternatives. More than one tool or automated technique may be applied. Take an initial look at how much and what kind of data has to be collected. That will drive your decision on which tool to use.

5. *Evaluate the Alternatives.* What practical limitations do you have (dollars and time)? Should the analysis effort be contracted out? Remember if you contract out, it may save you time, but you are paying for a service. Based on all the considerations, what is the optimum tool for this problem?

6. *Collect the data.* Data collection is one of the most intensive (and expensive) efforts in running analyses. That is why they aren't cheap or fast. Who has the data? How do I get it?

7. *Do the analysis (or run the model).* By the way, does the tool or model require a number of iterations? If so, run it the right number of times.

8. *Evaluate the results.* Does it make sense? Did something get left out? What does it really say? Have the assumptions changed?

9. *Integrate the results.* Remember the most important word in Manpower and Personnel Integration is "... Integration". Integrate the results into the System MANPRINT Management Plan (SMMP). Share the information with others and take action based upon it.

If you use these steps they will help you to size your analytical need, decide on the best analysis tool to use and execute an effective analysis.

In addition to the traditional Functional Economic Analysis (FEA), Early Comparability Analysis (ECA), FOOTPRINT Data Base and HARDMAN II/ HARDMAN III methodologies, there are some other validated tools you can use. The Manpower and Training Research Information System (MATRIS) of the Defense Technical Information Center has a complete listing of the analytical tools available for MANPRINT. The listing includes a description of the tool, the tool's objective, responsible organization, whether it is ready for use and a POC. There is a nominal charge for MATRIS listings and database output products (effective 1 Oct 94).

DEFENSE Technical Information Center
MATRIS Office, DTIC-AM
53355 Cole Road
San Diego, CA 92152-7213

Mr. Hodges is Chief of the Automated Information Systems Section, Information Systems Branch, MANPRINT Division, PERSCOM. He joined the Manning Integration Directorate (MANPRINT Division's predecessor) in May of 1986.

The 1994 MANPRINT Practitioner's Conference
"MANPRINT: THE EXPANDING CHALLENGE"

9 - 11 August 1994

Westpark Hotel, Rosslyn, VA

AGENDA

AM

PM

Day 1 Theme: "The State of MANPRINT"

The Importance of MANPRINT

MANPRINT Update

MANPRINT and Dual Use Technology

Small Group Workshops (2 sessions)
(see PreRegistration Form below to select)

Workshop Summaries:

How to Address/Assess SSv - A practical application workshop designed to disseminate ODCSPER policy, SLAD procedures and policies, and other information related to Soldier Survivability.

MANPRINT in Training Devices - A workshop designed to help the MANPRINT practitioner determine MANPRINT requirements for training devices.

Joint/Tri-Service Integration - A workshop designed to help the MANPRINT practitioner determine MANPRINT requirements for Joint Programs.

MANPRINT in Acquisition Documents - A generalized workshop/discussion of how MANPRINT requirements/constraints are reflected in program documentation.

Automated Tools - A hands-on workshop demonstrating some of the automated tools available.

Day 2 Theme: "MANPRINT: A Contributing Partner to
Acquisition Success"

MANPRINT in AIS

Comanche

AFAS

DoD Acquisition Reform

MANPRINT Domain Updates

MANPRINT Practitioner Feedback

Day 3 Theme: "MANPRINT'S Impact on Warfighting"

Battlefield Digitization

The MANPRINT Challenge in Acquisition

PreRegistration Form

MANPRINT Practitioner's Conference '94

9-11 August 1994 Westpark Hotel, Rosslyn, VA

NAME _____

OFFICE/MAILING
ADDRESS: _____

PROFS USER ID (COMPLETE): _____

DAYTIME PHONE NUMBER (DSN IF AVAILABLE) _____

Registration Fee of \$25.00 payable at registration, receipts will be issued upon payment

Detach at line, or photocopy, fill out and mail or fax to: ODCSPER, ATTN: DAPE-MR, 300 Army Pentagon, Washington, DC 20310-0300

Phone: Commercial (703)695-9213/14/15/16 DSN 225-XXXX FAX (703)697-1283.

I would like to preregister for the following workshops: (register for one each session)

Day 1 Session 1

____ How to Address/Assess SSv

____ Automated Tools

____ Joint/Tri-Service Integration

____ MANPRINT in Training Devices

Day 1 Session 2

____ How to Address/Assess SSv

____ Automated Tools

____ MANPRINT in Acquisition Documents

____ MANPRINT in Training Devices