MIPB

Military Intelligence Professional Bulletin

Battlefield

Visualization

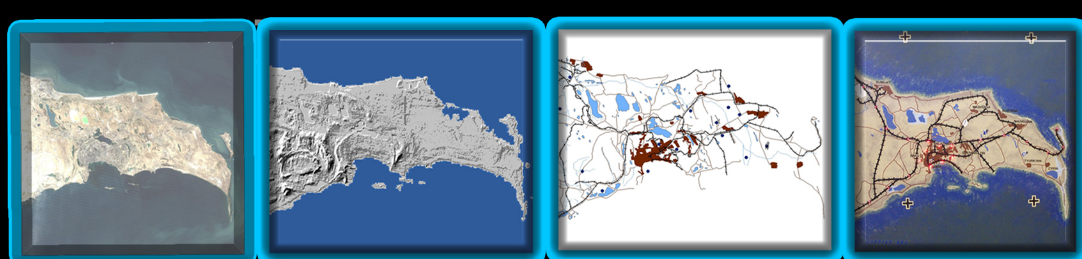
October-December
2002
PB 34-02-4

Presentation

Battlefield

Presentation

Visualization



Battlefield Visualization and Presentation

From the Editor

FM 3.0, **Operations**, states *that "the art of command lies in conscious and skillful exercise of command authority through visualization, decision making, and leadership. Using judgement acquired from experience, training, study, and creative thinking, commanders visualize the situation and make decisions. Effective battle command demands decisions that are both timely and more effective than those of the enemy. Success often depends on superior information that enables superior decisions."*

A commander's ability to see the terrain, his forces, and those of the enemy is perhaps the most critical element on any battlefield. For centuries, the commander performed his own visualization by monitoring the engagement from a carefully selected vantage point, usually a hill that offered excellent line of sight. From there, he could constantly monitor friendly and threat maneuver and their impact on his battle plan. We credit the most proficient of these with turning battlefield visualization into a science, the very best, to include such generals as Genghis Khan, Napoleon Bonaparte, and Robert E. Lee, were able to turn it into an art.

The increasing size of military forces as well as the introduction of new technology (such as observation balloons and radio) changed battlefield dynamics to the point that it severely taxed a commander's personal command and control. By the First World War, it was impossible for a division, let alone a corps or army commander, to view an entire battlefield. This in turn forced a greater reliance on maps, charts, and other graphic aids, as well as increasingly larger, specialized organizations of intelligence technicians and analysts. Today the speed and scope of modern combat and the mass of information available require new processes and systems to facilitate visualization.

Battlefield visualization products, in general, are visual or graphic portrayals (2D or 3D) of a designated geographical region, displaying topography, natural and manmade features, military symbology, and military graphics. The crucial dynamics of battlefield visualization include but are not limited to—

- ❑ Displays in our tactical operations centers (TOCs). Over time, we have employed various means to display what is today called the common operational picture (COP). The most modern systems display the COP on computer monitors and large, flat video panels although manually constructed mapboards and terrain models remain in widespread use.
- ❑ Heads-up or retinal displays for combat vehicles and helmets.
- ❑ Accurate sensors to collect information.
- ❑ Broad bandwidth networks to move data.
- ❑ Terrain and textual databases.
- ❑ Computer hardware and software to facilitate most battlefield visualization applications.
- ❑ Automatic target recognition (ATR) capability.

This issue of the ***Military Intelligence Professional Bulletin (MIPB)*** will address, to varying degrees, a number of systems and procedures that support the art of battlefield visualization. They include—

- ❑ The critical triad of the All-Source Analysis System (ASAS), Digital Topographic Support System (DTSS), and Integrated Meteorological System (IMETs).
- ❑ Unmanned aerial vehicles (UAVs).
- ❑ 3D visual simulation.
- ❑ Global Positioning System (GPS) tracking.
- ❑ Various optical sensors.
- ❑ COP.
- ❑ National Imagery and Mapping Agency (NIMA) digital map and imaging products.
- ❑ Geographic Information System (GIS).
- ❑ Digital templating.

Michael P. Ley

Michael P. Ley

MILITARY INTELLIGENCE

Professional Bulletin

ALWAYS OUT FRONT

PB 34-02-4
Volume 28 Number 4
October-December 2002

Purpose: The U.S. Army Intelligence Center and Fort Huachuca (USAIC&FH) publishes the ***Military Intelligence Professional Bulletin*** quarterly under provisions of **AR 25-30**. ***MIPB*** disseminates material designed to enhance individuals' knowledge of past, current, and emerging concepts, doctrine, material, training, and professional developments in the MI Corps.

Subscription form is on page 68.

FEATURES

DEPARTMENTS

By order of the Secretary of the Army:
Official:

JOEL B. HUDSON
Administrative Assistant to the Secretary of the Army
0224804

ERIC K. SHINSEKI
General, United States Army Chief of Staff

Always Out Front

by Brigadier General James A. Marks
Commander, U.S. Army Intelligence Center and Fort Huachuca

The current realities of asymmetric threats and the many complex operational environments have had a profound impact on U.S. Army doctrine. As reflected in **FM 3-0, Operations** (June 2001), the threat posed by the Soviet Army has been replaced by a diverse number of threats employing asymmetric means. This has caused a shift by Military Intelligence professionals in their focus, doctrine, and methodology in approaching these new threats.

As the horrific attacks of September 11 revealed, these new threats pose a significant threat to the United States. Today U.S. and allied forces face not only such well-organized and –equipped organizations as Al Qaeda, but also a collection of smaller groups in all corners of the world. Intelligence professionals facing this myriad of new and highly varied threats must develop a new set of skills and procedures to achieve the needed understanding. Determining how these threat forces are armed and organized, and when and where we must confront them, continues to confirm that the intelligence analyst is an absolutely vital element of the Global War on Terrorism.

Just where does the Intelligence professional fit in this war? In following the proven cycle of planning, preparation, execution, and continuous assessment (plan, prepare, execute, assess) we play a critical supporting role. However, without a doubt, some of your greatest contributions will occur under the element of *assess*. Within this element, we provide the commander and staff with the critical intelligence and visualization that allow their understanding of all aspects of the threat and battlespace. **FM 3-0** states that "*assessment precedes and guides every activity within the operations process and concludes each operation or phase of an operation. Assessment entails two distinct tasks: continuously monitoring the situation and the progress of the operation, and evaluating the operation against measures of effectiveness. Together the two tasks compare reality to expectations*."

This issue of the ***Military Intelligence Professional Bulletin*** focuses on one aspect of assessment, battlefield visualization. Battlefield visualization and its related element "*presentation*," have taken on increased importance in the high tech environment supporting the ongoing War on Terrorism. To attain the desired outcome, commanders must clearly understand the situation within their battlespace: What is the mission? What are the enemy's capabilities and likely courses of action? What are the characteristics of the environment? How much time is available? These and other questions require answers if the commander is to achieve the necessary situational awareness. As the command's Military Intelligence professionals, we make critical contributions to this visualization and understanding process. To achieve success, the Intelligence professional must address four critical areas:

- ❑ Acquiring information on the threat, weather, and terrain and facilitating the commander's understanding of the environment's advantages and disadvantages.
- ❑ Incorporating all aspects of this threat and environmental intelligence into a coherent picture that facilitates the commander's ability to achieve understanding. This may be our most significant challenge given the fluid nature of operations, the often vast space involved, and the sheer volume of information.
- ❑ Ensuring the maximization of the human aspects of our training and that our soldiers understand not only what they are to do but also the best methods in accomplishing it.

(Continued on page 4)

CSM Forum

by Command Sergeant Major Lawrence J. Haubrich
U.S. Army Military Intelligence Corps

Legacy Military Intelligence soldiers provide the guidance and shape the future of Military Intelligence. As senior leaders, the future of MI is in your hands. All of you have heard me say, "*we, the senior Military Intelligence leadership in our Army, are the Legacy Military Intelligence Soldiers*." We are responsible for shaping the future of MI training and the MI soldiers so they are successful in the Objective Force, providing intelligence to our respective formations. We do this so that our soldiers have complete training and are ready for the mission. As leaders, it is our responsibility to ensure the MI soldiers receive training to standard. The foundation of their training starts here at Fort Huachuca, Arizona, with institutional training.

After all training events, we go through the process known as the after-action review (AAR). The AAR is a structured review process that allows training participants to discover for themselves what happened, why it happened, and how they can do it better. The **Leader's Survey Program** is our AAR for the institutionalized training conducted by the U.S. Army Intelligence Center and Fort Huachuca (USAIC&FH). We need to complete the leader's survey request in order to correct deficiencies, sustain good training, and shape our soldiers to meet the intelligence requirements of the Objective Force. Completion of your survey provides the feedback our instructors, training developers, and evaluators need to produce quality training programs to ensure the MI soldiers' training is to standard and able to provide the needed intelligence in our Objective Force.

Before 11 September 2001, we collectively maintained an 80-percent response rate in the Leader's Survey Program (previously called the Supervisor's Survey Program). We were setting the standard for others to match. After September 11, the Quality Assurance Office (QAO) had some internal problems with servers and software due to security precautionary measures but we fixed that. Now, however, we are at a measly 15-percent response rate. This is not acceptable. We need to get the survey into the proper leaders' hands and make sure they complete and return them to USAIC&FH. The failure of our MI leadership to complete the surveys will result in maintaining the unacceptable "status quo" or having someone else's comments shape future MI soldiers. Will this help the future of MI? Will it give the MI soldiers in your formations the necessary tools to complete their missions?

We here at Fort Huachuca need you, the leadership, to be a part of the solution to shape and build a stronger MI Corps. We need a collective effort to ensure our young MI warriors meet the standard. Your feedback is important—it is necessary to shape the future of our Military Intelligence Corps.

The following is an outline of how these quality assurance surveys flow here at USAIC&FH.

- ❑ The soldiers complete the majority of their institutional training here at the "schoolhouse" and while here they complete pre- and post-course surveys.
- ❑ Approximately six months after graduation—four months for the Noncommissioned Officer Education System (NCOES)—the QAO uses the Army Training Requirements and Resource System (ATTRS) to determine graduates of the class and uses the World-Wide Locator (WWL) to locate the soldiers and points of contact (POC) lists of units to address and send E-mail Leader Survey Requests.
- ❑ The surveys then go to the unit POCs with a deadline of approximately two weeks from notice to completion.

(Continued on page 4)

Always Out Front

(Continued from page 2)

- Maximizing the use of information technologies to improve our ability to present this information and intelligence, with the objective of providing the commander with full situational understanding.

What I have outlined for you is something of a roadmap explaining not only where battlefield visualization fits within today's emerging doctrine, but also what Intelligence professionals must accomplish to obtain it. This issue of ***MIPB*** and its many articles will address the mechanics of achieving battlefield visualization and how we are transforming it into a dynamic force multiplier for the Objective Force. These articles address processes (our innovative employment of intelligence fusion), organizations (the ground component commander's combined analysis control center (GCC-CACC) and the DISE), products (the latest versions and uses of terrain models), and technology (UAVs, ASAS, IMETS, DTSS, web-based visualization technology, Vizier, and JISR). Combined, these processes, organizations, products, and technological advancements feed the common operational picture (COP) and in so doing, provide the key to achieving battlefield visualization and situational understanding.

As the United States and her allies continue to engage a number of threats to our way of life, we the professionals of the U.S. Army's Military Intelligence Corps, should be proud that we are leading the effort through our hard work to facilitate battlefield visualization and situational understanding. When challenged with the task to provide this extremely complex element to our combatant commanders, you can confidently turn and tell your boss...

"I GOT IT!"

CSM Forum

(Continued from page 3)

- The unit POCs forward the requests to the soldiers' leaders or supervisors. The leaders then access the survey via the Internet and the provided address. The survey is automatically returned via E-mail to the QAO and populates the Quality Assurance Operating System (QAOS) database which then automatically compiles the results.
- The QAO evaluators then check the results. They re-request surveys not received with another deadline of approximately two weeks.
- The QAO evaluators review and analyze the results for trends and findings, and prepare a report that goes to the USAIC&FH Command Group. The Command Group then distributes the report to the respective battalion commanders and command sergeants major (CSMs) who further distribute it to trainers, course managers, and training developers for use in adding, modifying, or deleting training based on the leader input.

I thank you all, the Legacy Military Intelligence soldiers, in advance for your continued support in training our great MI personnel. As always, let's take care of each other and our families. You train hard, you die hard; you train easy, you die easy. Peace needs protection.

"ALWAYS OUT FRONT!"

Commanders' Safety Course Online—Mandatory for New Commanders

The new Commanders' Safety Course that helps to turn commanders and other unit leaders into their own safety officers is up and running on the Internet. The course, equivalent to 30 classroom hours, gives commanders and first sergeants the tools and knowledge to manage their own safety programs.

The course will be mandatory for all commanders through brigade. Officers selected for brigade and battalion command will complete the course in conjunction with their precommand courses. Captains must take the course as self-development training before company command. Other leaders, soldiers, and employees can also take the course for self-development. Future commanders do not have to wait for notification of their selection to command to enroll in the course. All soldiers and employees can also enroll now.

The URL for the website is https://www.aimsrdl.atsc.army.mil/secured/accp_top.htm. You will need a user ID and password but the system will issue those after enrollment. Officers selected for command will be issued a user ID and password when they receive notification from ATRRS (Army Training Requirements and Resources System).

Battlespace Visualization and the All-Source Analysis System (ASAS)

by Lieutenant Colonel James V. Fink and Mrs. Edwina E. Kelly

For though the rise of industry has enormously enhanced the power which states can deploy against each other in war, and the improvement of weapons has almost infinitely extended the range of a general's reach….Men can only stand so much…so what needs to be established for our purposes is not the factor to which mechanization of battle has multiplied the cost of waging war to the states involved but the degree to which it has increased the strain thrown on the human participants.

—John Keegan, The Face of Battle, 1976[1]

When military historian John Keegan wrote these words more than 25 years ago, it was in the wake of the 1973 Yom Kippur War. The mechanization age was peaking and the speed and power exhibited on that modern battlefield were indicative of the progressive evolution of warfare during the century. Keegan could not have suspected that within a relatively short period, the advent of the information age would dictate yet another shift in the conduct of warfare. Not only would the means of directing and massing firepower have exponentially increased, but also the strain on today's leaders to comprehend the "battlespace" quickly would likewise increase. Ray Kurzweil challenged decision making in the digital age when he admonished:

> *We don't have time, therefore, to think many new thoughts when we are pressed to make a decision. The human brain relies on precomputing its analyses and storing the information for future reference. We then use our pattern-recognition capability to recognize a situation as comparable to one we have thought about and draw upon previously considered conclusions. We are unable to think about matters that we have not thought through many times before.[2]*

The Army is indeed attempting to come to grips with the need to provide our commanders with the tools that they require to visualize and react rapidly to the battlespace. **FM 6-0**, **Command and Control**, defines commander's visualization (formerly known as battlefield visualization) as:

> *the process of achieving a clear understanding of the force's current state with relation to the enemy and environment (situational understanding based upon the common operational picture), developing a desired end state which represents mission accomplishment (commander's intent), and determining the sequence of activity that moves the force from its current state to the end state (commander's intent and concept of the operation).[3]*

In this article, we want to look at the integral part the All-Source Analysis System (ASAS) Remote Workstation (RWS) plays in facilitating this visualization process and to examine briefly how integration of weather and terrain analysis significantly enhances the process.

Migrating Down the Digital Path

Prior to the dawn of computer technology and the emergence of the Army Battle Command System (ABCS), Army intelligence officers and staffs produced intelligence manually. The Intelligence cycle began when the soldiers performed intelligence preparation of the battlefield (IPB) using a hardcopy 1:50,000-scale map. On completion of IPB, intelligence sections developed hardcopy intelligence products such as the event matrix and template, reconnaissance and surveillance overlay, high-value target list, etc. Moreover, processing messages was a manual process—receiving hardcopy text, posting the message to the situation map, conducting analysis, and writing an intelligence summary.

Aside from the fact that intelligence teams had to produce nearly every product "by hand," the days before automation had other hugely limiting factors. How many maps would you need to bring if your unit was conducting an extensive screening mission? How could you dynamically update situation and targeting templates and overlays? How many hardcopy messages could you save before you reached "enough"?

The ASAS RWS—fielded to the Army in support of G2s and S2s for more than ten years—has made great strides in adding flexibility to supporting intelligence missions worldwide by automating the intelligence "business." This workstation consists of intelligence analytical software applications and tools that focus on the intelligence processes within Army corps, divisions, and brigades. Two versions are currently in use or under study. Version 4, or "V4 series," is Block II within the RWS development cycle, and is the current fielded version. Version 6, the latest series software, and also part of the software Block II, is currently under development by the ASAS Program Manager and under evaluation by the Stryker Brigade Combat Teams (SBCTs) at Fort Hood, Texas. Version 6 greatly advances interoperability among the other battlefield functional areas within the ABCS community.

Today's ASAS RWS continues to deliver a valuable and ever-improving suite of analyst-support tools to the Army's tactical intelligence soldiers. Within the ABCS environment, the ASAS RWS handles 23 separate messages, is programmable to process threat alerts, uses digital maps, provides formats for intelligence products, and provides a means to visualize the enemy portion of the common operational picture (COP).

The concept of the COP is an important one. The displays and other systems supporting acquisition of the COP have proven again and again to be crucial aids in avoiding information overload. Leaders see familiar threat patterns, which allow them to act rapidly upon expected or unexpected changes or outcomes. Commanders, who inherently tend to compose a view of the battlespace within their "mind's eye," can now validate or correct that view by measuring their previous perceptions against a detailed threat analysis. The ASAS-RWS provides an integrated visual representation of a combination of "Red" forces, nonaligned and neutral elements, and the environment. The job of the S2 is to understand the synergy of these combined factors, assess the potential impact on the friendly commander's mission, and convey that insight to the commander.

It is no coincidence that ASAS, to date, has focused a great deal of effort on having a system capable of evaluating the threat. The ASAS RWS Block I, sometimes called the "collateral workstation," remains operational and focuses primarily on processing and correlating threat entities. While the V4 and V6 versions have enhanced threat analysis capabilities, the ability of the ASAS RWS to facilitate visualization has broadened to include a more robust suite of weather and terrain products.

Integration of Weather and Terrain Products

The Intelligence battlefield operating system (BOS) has responsibility for integrating weather, terrain, and enemy information. The ASAS RWS is the Intelligence processing system that provides this integration. ASAS RWS integrates weather products from the Integrated Meteorological System (IMETS) and terrain products from Digital Topographic Support System (DTSS). Figure 1 graphically depicts ASAS integration of imagery, weather effects, terrain effects, and the moving target indicator (MTI) feed from the Joint Surveillance Target Attack Radar System (Joint STARS) Common Ground Station (CGS).

Editor's note: please also see the articles on pages 9 and 12, respectively, for more on IMETS and DTSS.

The level of interoperability between ASAS, IMETS, and DTSS varies based on whether they use non-ABCS-compatible or ABCS-compatible software versions. Figure 2 depicts the configuration of ASAS, IMETS, and DTSS as arrayed across the battlespace.

ASAS RWS Block I and IMETS primarily exchange information through United States Message Text Format (USMTF) messages; however, ASAS RWS II (ABCS Version 6.X) may access IMETS data various ways.

- ❑ The ASAS RWS has direct access to IMETS built into its graphical user interface (GUI) and can access the weather intelligence maintained in the IMETS database. To facilitate the IMETS-ASAS data exchange, the ASAS operator uses a "weather tab" on the ASAS GUI. The ASAS operator can use this tab to request

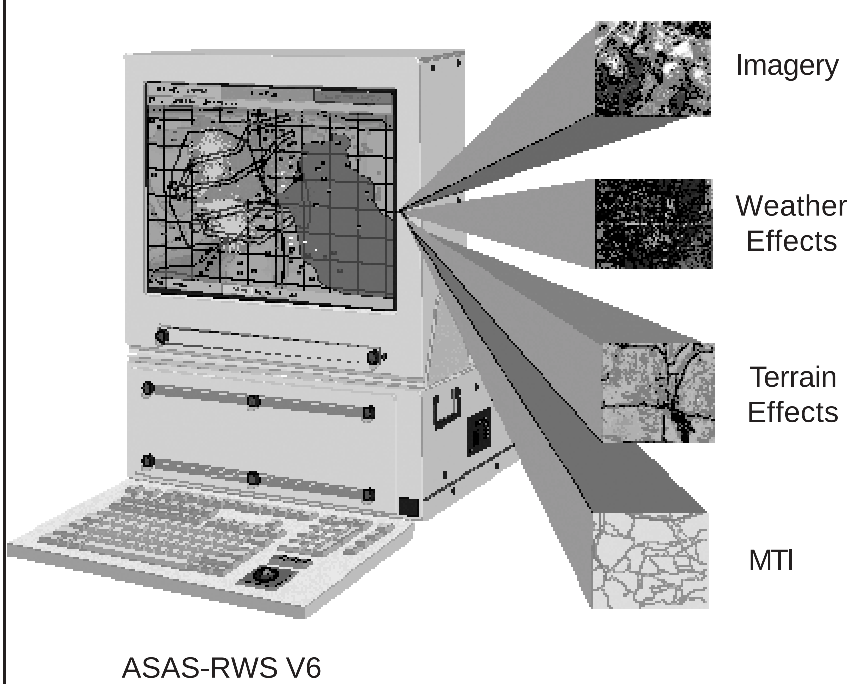
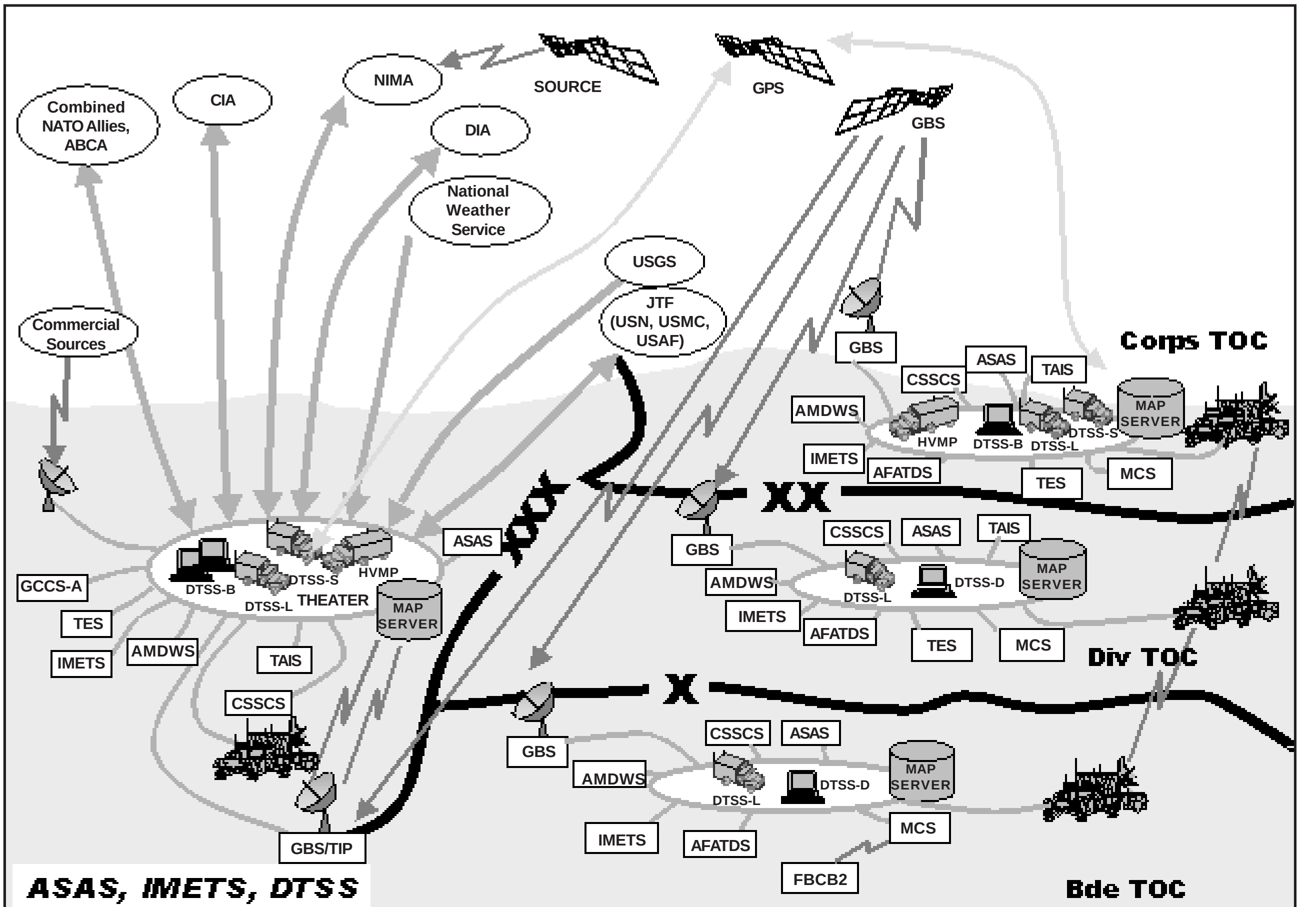


Figure 1. ASAS-RWS Version 6 Integration.



Key:

AFATDS – Advanced Field Artillery Tactical Data System
AMDWS – Air and Missile Defense Workstation
CIA – Central Intelligence Agency
CSSCS – Combat Service Support Control System
DIA – Defense Intelligence Agency
FBCB2 – Force XXI Battle Command Brigade and Below
GBS – Global Broadcast System
GBS/TIP – Global Broadcast System/Tactical Injection Point
GCCS-A – Global Command and Control System-Army
GPS – Global Positioning System
HVMP – High-volume map production
JTF – Joint task force
MCS – Maneuver Control Station
NATO – North Atlantic Treaty Organization
NIMA – National Imagery and Mapping Agency
TAIS – Tactical Airspace Integration System
TES – Tactical Exploitation System
TOC – Tactical operations center
USAF – U.S. Air Force
USGS – U.S. Geological Survey
USMC – U.S. Marine Corps
USN – U.S. Navy

Figure 2. ASAS, IMETS, and DTSS Configurations.

an overlay of winds on the ASAS COP (see Figure 1).

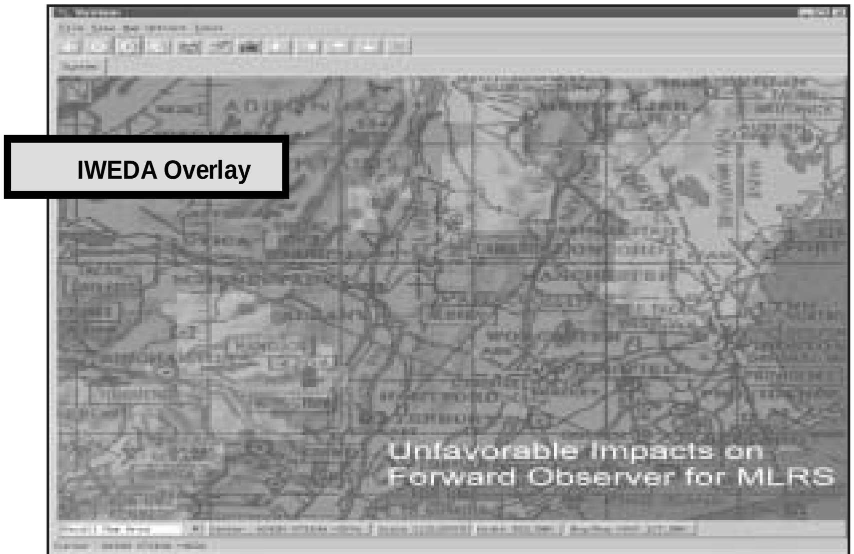
- The ASAS operator might request a terrain map from the DTSS and the precipitation forecast from the IMETS database (see Figure 2).
- The IMETS provides COP overlays produced by client applications, such as the Integrated Weather Effects Decision Aid (IWEDA), or statically built by the IMETS weather team. The ASAS operator may query IMETS' IWEDA to assist in the prediction of when and where a given weapon system will be effective, marginally effective, or not effective, based on the weather. (See Figure 3 for an example of an IMETS IWEDA overlay.)
- ASAS may receive data from IMETS through USMTF messages.
- ASAS may pull IMETS weather products posted to the IMETS weather homepage on the tactical operations center (TOC) local area network (LAN).

ASAS RWS Block II and DTSS can exchange data along lines similar to those of ASAS and IMETs through a client application (DTSS Overlay Provider or DOP) and USMTF messages. ASAS RWS Block II can pull DTSS products from the DOP; however, ASAS RWS I V2.5.1 does not have this capability. Both ASAS RWS I and II can exchange information via USMTF messages with DTSS. ASAS RWS I V2.5.1 also supports opening and viewing large computer graphics metafile (CGM) formatted files from DTSS and supports compressed arc digitized raster graphics (CADRG) maps.

Near Term

In the near term, the following activities will likely influence and enhance ASAS, IMETS, and DTSS interoperability:

- Interoperability will improve as a result of the recently awarded National Imagery and Mapping Agency (NIMA) Commercial/Joint Mapping Toolkit (C/JMTK) contract for the development and life cycle support of the equipment. The two corporations involved are the developers of digital mapping and terrain visualization products currently incorporated into DTSS; having the same developers for ABCS C/JMTK as for DTSS, should greatly enhance the digital mapping and terrain products and interoperability between DTSS and all ABCS facets.
- An integrated product team (IPT) formed by the U.S. Army Communications-Electronics Command (CECOM) will assess IMETS V6.2.0.8, RWS Block II V4.3.5 and 4.5.1, and ASAS-Light interoperability during the 4th quarter of fiscal year 2002 for the Program Director, IMETS.
- Joint consideration of incorporating Joint Terrain Analysis Tools (JTAT) application segments into ASAS to enhance and improve digital IPB interoperability with DTSS as well as Global Command and Control System Integrated Imagery and Intelligence (GCCS-I3) and Air Force systems.
- Army development of the Distributed Common Ground System-Army (DCGS-A) will impact on all the Army Intelligence systems.



Key:
MLRS - Multiple launch rocket system

Figure 3. IMETS IWEDA Overlay.

Long Term

In the longer term, ASAS shall incorporate intelligence products into a geo-rectified database environment that can combine with terrain analysis, map imagery, or other geospatial information system products. This will occur in two- or three-dimensional display and gives the intelligence analyst the ability to view and portray situations based upon time, topography, location, enemy situation, or any combination.

Final Thoughts

Battlespace visualization has become a critical capability in the information age. Bombarded by information, combatant commanders need a reliable, coherent picture that preserves familiar patterns, yet effectively presents decision-centric insight. As the analysis system for the Intelligence BOS, ASAS has the vital mission of facilitating visualization and will continue to provide the combatant commander with an ever-improving integrated picture depicting the effects of weather and terrain as well as the enemy situation.

Endnotes

1. Keegan, John, **The Face of Battle** (New York, NY: Viking Press, 1976), page 299.

2. Kurzweil, Ray, **The Age of Spiritual Machines** (New York, NY: Penguin Books, 1999), page 77.

3. **FM 6-0**, **Command and Control** (Washington, D.C.: Department of the Army, August 2000).

Lieutenant Colonel Vic Fink is the Deputy TRADOC (U.S. Army Training and Doctrine Command) System Manager-All-Source Analysis System (TSM ASAS). You may contact LTC Fink via E-mail at Finkj@hua.army.mil and telephonically at (520) 533-5145 or DSN 821-5145.

Genie Kelly is an Assistant TSM in the Futures Directorate Integration Center, U.S. Army Intelligence Center at Fort Huachuca, Arizona. In her current position, Mrs. Kelley documents ASAS user interface requirements with other ABCS systems. Readers may contact her via E-mail at edwina.kelly@hua.army.mil and by telephone at (520) 533-3526 or DSN 821-3526.

Battlespace Visualization and the Integrated Meteorological System (IMETS)

by Major Patrick M. Hayes, USAF, and Master Sergeant William J. Simcox, USAF

The earliest known collection of weather information provided by the U.S. Armed Forces was during the Lewis and Clark expedition of 1804-1806. President Thomas Jefferson directed Captain Merriwether Lewis to record the weather conditions along their journey west.[1] During the War of 1812, the U.S. Army Surgeon General directed Army medical personnel to make daily records of local weather conditions. The Army Signal Corps assumed weather observation duties in the late 1800s, with the most important application of weather intelligence being ballistics calculations used by field artillery units. With the birth of civil and military aviation in the early 1900s, the focus of weather intelligence shifted from ballistics studies to aviation support. World Wars I and II saw numerous examples of military battles and campaigns where the outcome relied heavily on the correct interpretation and use of weather intelligence. Perhaps the most famous U.S. military forecast was one that revealed a brief period of favorable weather on 6 June 1944 that allowed the Allies to cross the English Channel and the subsequent D-Day invasion of France.

Visualization of the Battlespace

While General Dwight David Eisenhower did not possess today's battlefield visualization tools, he had maps, some imagery, and various types of charts. Maps of the terrain, obstacles, and fortifications along coastal France were painstakingly constructed, sometimes with the aid of clandestine surveys of the beachhead conducted in the months leading up to the operation. Imagery, produced during the previous few hours by special photo-reconnaissance aircraft, often supplemented and helped verify the information portrayed on the maps. They produced weather charts twice daily, showing both the current and forecast weather conditions across England, the Channel, and Western Europe. They annotated these weather charts with areas of high seas, poor visibility, low cloud-cover, turbulence, and high winds. These maps, annotated charts, and the imagery were the precursors to the battlespace environmental visualization tools used by today's warfighters.

Today we display weather intelligence graphically with other intelligence information as part of the common operational picture (COP).[2] The tool used to process and display weather intelligence is the Integrated Meteorological System (IMETS). The IMETS processes weather data, runs weather forecast models, and displays the weather forecast information on the COP. Figure 1 includes

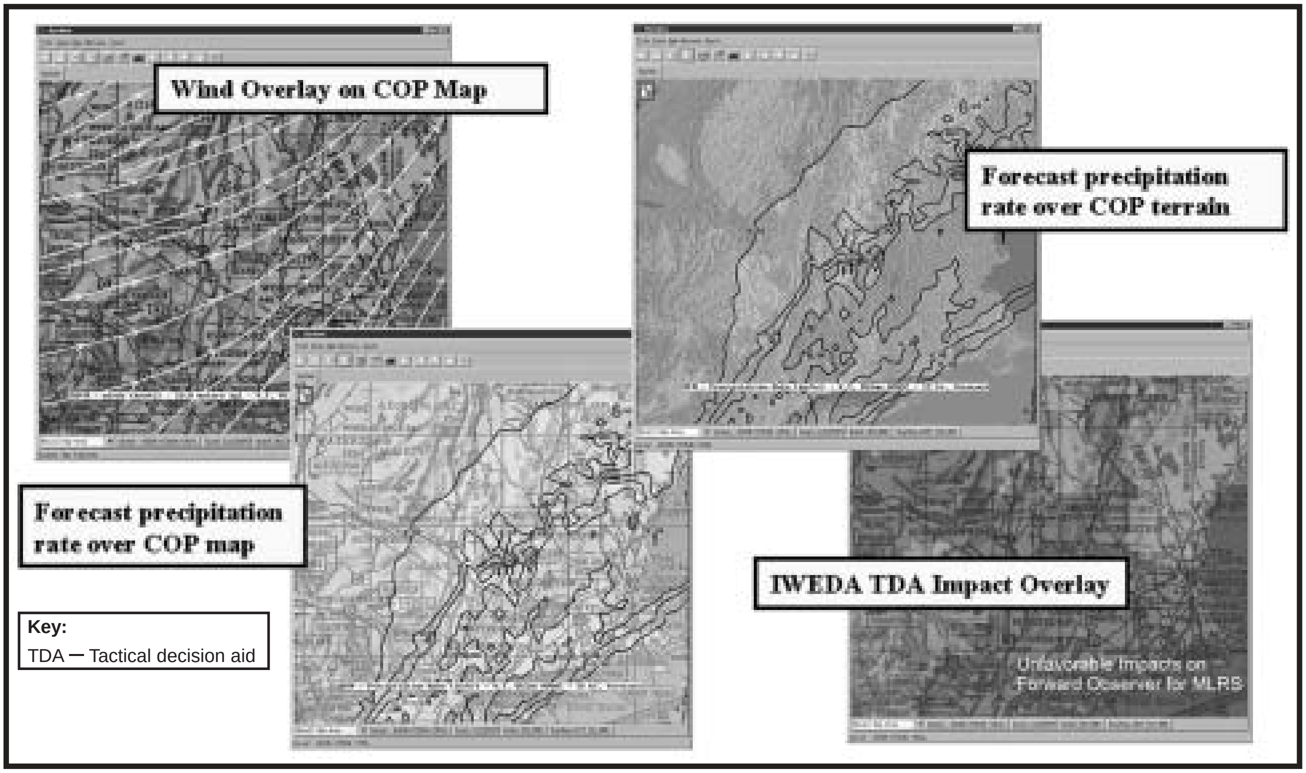


Figure 1. Weather and Impact Display on the COP Via the IMETS Weather Contours Overlay Provider.

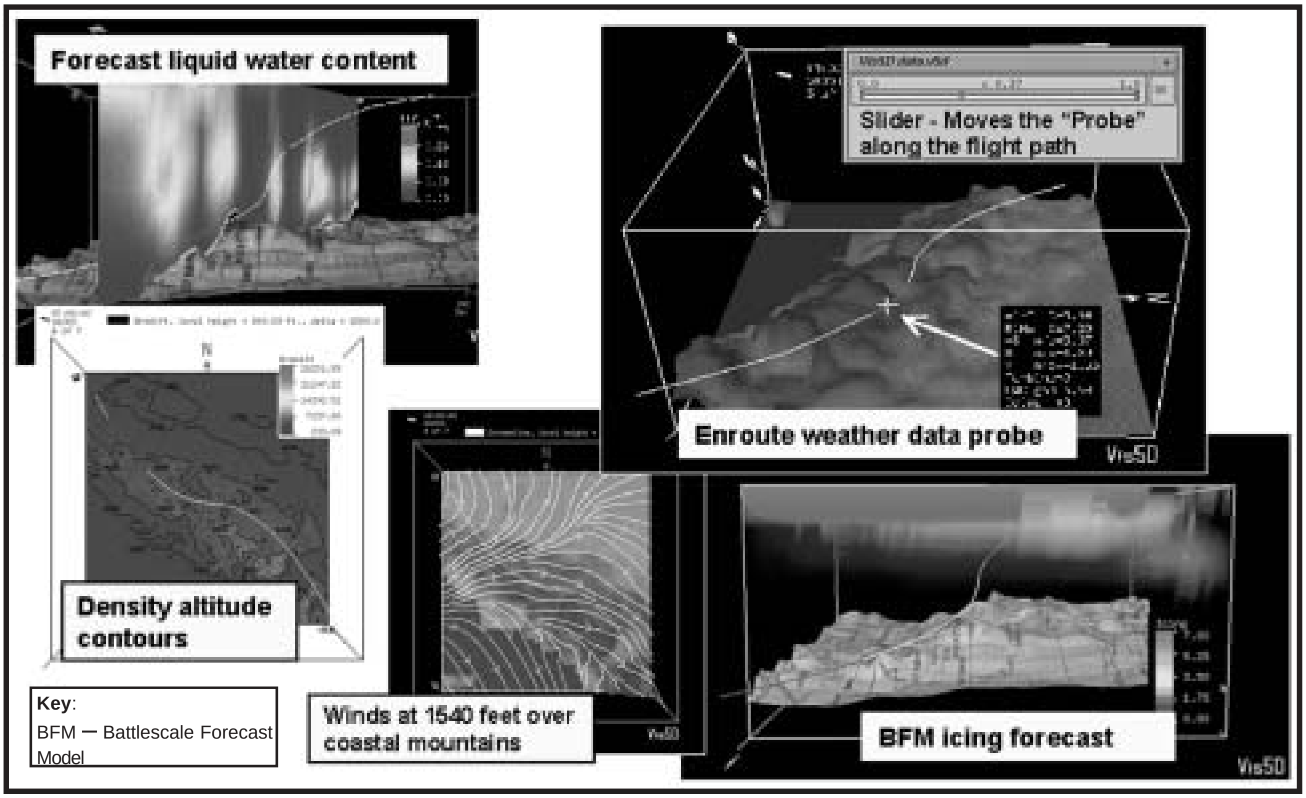


Figure 2. Five-Dimensional Forecasts Along a Mission Route.

an overlay display of forecast winds on a COP map. In this example, the commander and various battlefield functional areas (BFAs) can employ the IMETS to visualize the wind environment over the battlespace, and can see areas of light and strong winds, as well as the wind direction. This would be extremely helpful for the Chemical BFA.

IMETS can also display weather forecast information over a COP terrain chart as Figure 1 shows. The visualization in the upper left of forecast precipitation amounts uses the terrain map of the same region. This example would help the Engineer BFA predict the trafficability of roads and the "stage-height" of rivers (ability to cross) throughout this area.

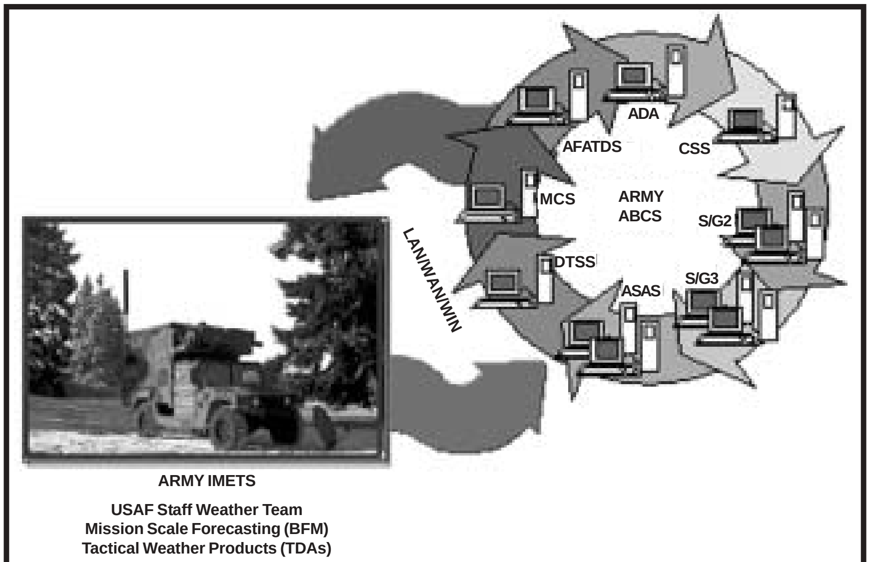
Another of IMETS' visualization tools is the Integrated Weather Effects Decision Aid (IWEDA). IWEDA tactical decision aid (TDA) uses weather forecast information and weapon-system sensitivities to predict when and where the employment of a given weapon system will be effective, marginally effective or not effective, based on the weather. The IMETS IWEDA display on Figure 1 shows favorable and unfavorable weather conditions (light areas) for employment of a multiple launch rocket system (MLRS) on the COP map for the artillery forward observer. The Division Artillery (DIVARTY) BFA would use this information with other intelligence to choose the optimum location to site the MLRS observer. The IMETS VIS5D displays five dimensional forecasts along ground and air mission routes (see Figure 2).

Integration

The feature of IMETS that enables the Air Force Combat Weather Team (CWT) as a true force multiplier is the system's integration with the Army Battle Command System (ABCS). All ABCS systems fielded at the Version 6.X level have direct access to IMETS built into their graphical user interfaces (GUIs). Each ABCS client system is able to access the "weather" intelligence maintained in the Gridded Meteorological Database (GMDB) on the IMETS. For example, the All-Source Analysis System (ASAS) operator can use the "weather" tab on the ASAS GUI to request an overlay of winds on the ASAS COP, (depicted in Figure 1). In another example, the ASAS operator might request a terrain map from the Digital Topographic Support System (DTSS) and the precipitation forecast from the IMETS GMDB, resulting in the COP shown in Figure 1. Figure 3 depicts a typical employment of the IMETS as an integral part of the ABCS system.

System Status

The IMETS currently fielded is in two configurations. They are the vehicle-mounted configuration (VMC), IMETS-Heavy, and the laptop version, the IMETS-Light. Figure 4 portrays the IMETS-VMC configuration; corps and division CWTs have fielded the VMC IMETS. The IMETS-Light is the most common version; the Army is fielding IMETS-Light to aviation brigades, brigade combat teams, and to Ranger and other Special Operations Forces elements. Both configurations have identical intelligence processing capabilities.



Key:
ADA — Air defense artillery
AFATDS — Advanced Field Artillery Tactical Data System
BFM — Battlescale Forecast Model
CSS — Combat Service Support
LAN — Local area network
MCS — Maneuver Control System
S/G2 — S2 and G2
S/G3 — S3 and G3
TDAs — Tactical decision aids
WAN — Wide area network
WIN — Warfighter Information Network

Figure 3. ABCS Receives Weather Information from IMETS.

The IMETS-Light has recently passed the Milestone C review and its production and fielding have official authorization. Both configurations of IMETS operate with ABCS Version 6.X-compliant software.

Final Thoughts

Team IMETS [3] has worked more than ten years to produce a system that provides badly needed weather information to Army commanders and staff. The IMETS has evolved alongside the Army's other intelligence processing systems. Today IMETS is the premier provider of value-added weather intelligence; there is no more accurate, reliable, faster, better-integrated system for processing and communicating environmental information to the warfighter.

Endnotes

1. Thwaites, Reuben G., Editor., **Original Journals of the Lewis and Clark Expedition**. Volume 1 (New York: Dodd, Mead, 1905).

2. The common operational picture (COP), is a graphical depiction of the synthesis of:

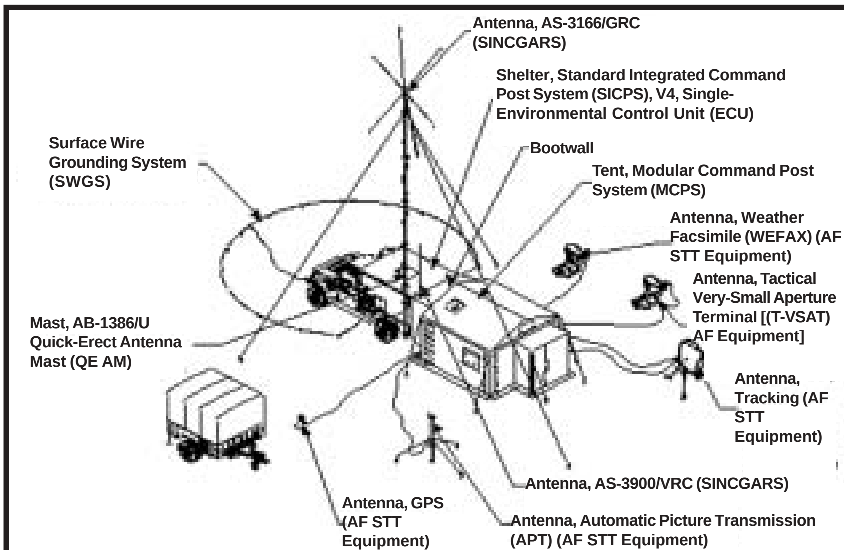
- Terrain.
- Weather.
- Current, projected, and planned disposition of friendly, enemy, and coalition forces plus noncombatant populations.
- Location and timing of significant events as they occur.
- Probable courses of action.

The spatial and temporal scale of the COP is appropriate for whatever echelon is composing the COP.

3. Team IMETS consists of U.S. Air Force airmen, noncommissioned officers (NCOs), and officers who employ the IMETS, the soldiers who maintain and support IMETS, personnel from the offices of the Program Manager-Intelligence Effects, TRADOC (the U.S. Army Training and Doctrine Command) System Manager-IMETS, IMETS New Equipment Training Team and New Systems Training Office, U.S. Army Communications-Electronics Command (CECOM) Software Engineering Center, and the Program Director of the IMETS program.

Major Pat Hayes is the Staff Weather Officer (SWO) for the Director of Combat Developments, U.S. Army Intelligence Center at Fort Huachuca, Arizona. His previous assignments include tours as the SWO for the 82d Airborne Division, XVIII Airborne Corps, and the 7th Special Forces Group. He earned a Master of Science degree in Meteorology from Texas A&M University. Readers can contact MAJ Hayes via E-mail at Patrick.Hayes@hua.army.mil and by telephone at (520) 538-6472 or DSN 879-6472.

Master Sergeant Bill Simcox is the Staff Weather NCO (SWNCO) for the Director of Combat Developments, U.S. Army Intelligence Center at Fort Huachuca. His previous assignments include tours as the SWNCO for the 101st Airborne Division (Air Assault) at Fort Campbell, Kentucky. He earned a Bachelors degree in Business Management from the University of Phoenix. Readers can contact MSG Simcox via E-mail at William.Simcox@hua.army.mil and telephonically at (520) 538-6493 or DSN 879-6493.



Key:
AF — Air Force
GPS — Global Positioning System
SINGARS — Single-Channel Ground and Airborne Radio System
STT — Small tactical terminal

Figure 4. IMETS-VMC.

DTSS Puts the "Visual" in Battlespace Visualization

Photograph courtesy of the U.S. Army.

DTSS-Light.

by Major Carl G. Herrmann

Every combatant commander in the Army keeps a keen eye out for tools that provide real-time (RT) situational awareness. The Army Battle Command System (ABCS) and related media provide a near-real-time (NRT) or RT appreciation for what is happening with related forces, friendly or enemy, how the commander arrayed those forces, and what is the interaction with the terrain (read that as battlespace). Commanders must have accurate, updated maps (preferably digital) of the area of operation (AO). They must know where natural and man-made obstacles are, how they affect current or future operations, and how weather effects interact with the terrain. There are a number of subordinate systems within ABCS that provide the maneuver commander not only the required data, but also the tools to analyze that data in terms of enemy, friendly, and terrain impacts. This article addresses the modern ABCS tools that the commander will use to visualize the battle through software and staff analysis products.

DTSS Capabilities

The foundation for all of the ABCS systems is the Engineers' Digital Topographical Support System (DTSS). DTSS imports digital terrain databases from every available source to create digital maps that frame the common operational picture (COP) for other systems to overlay. Depending on the level of detail or digital terrain elevation data (DTED) required and the source (National Imagery and Mapping Agency, Defense Intelligence Agency, and local and satellite images), the digital maps can include a variety of data. They may provide an informational database containing three-dimensional pictures and video, vegetation (by type and density), hydrology, existing bridges, drainage, roads by classification, slope, cross-country mobility by type of vehicle, and soil type as well as other tools and overlays. Commanders can use these

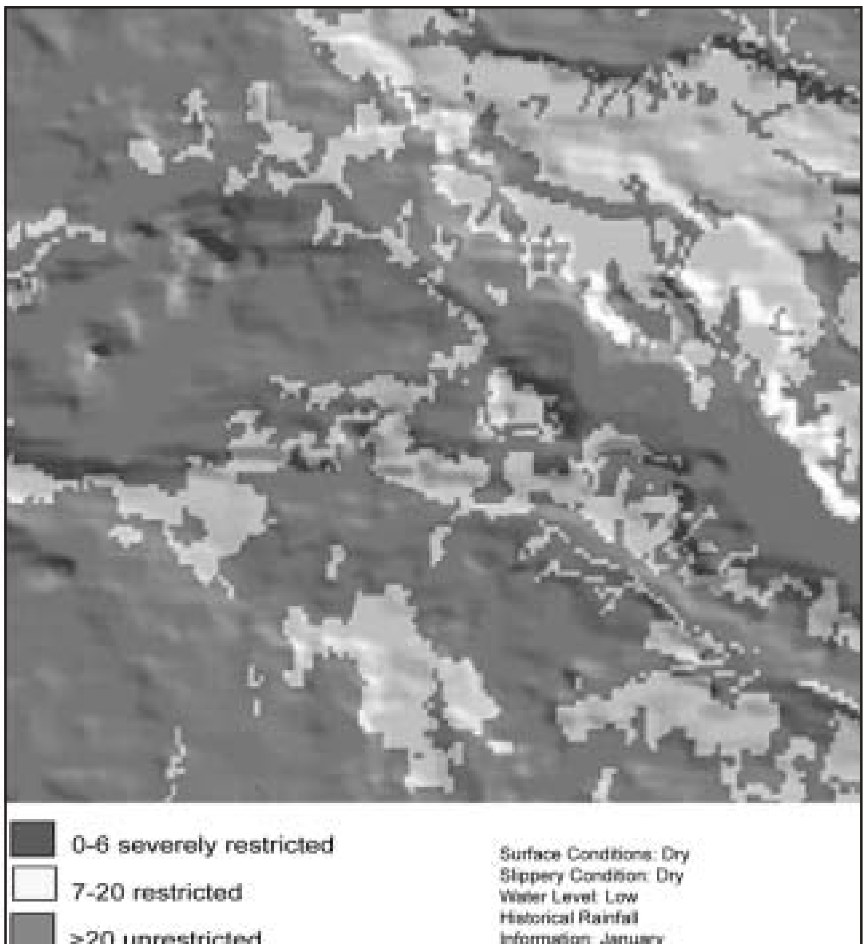


Figure 1. Cross-Country Mobility Overlay.

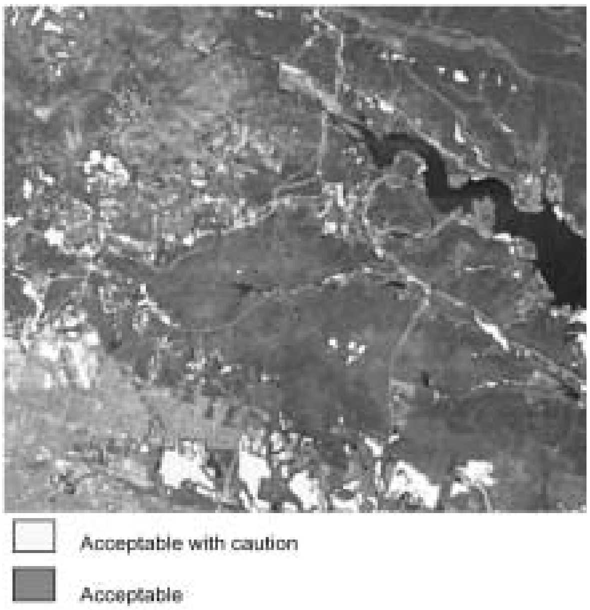


Figure 2. Mobility Corridors Overlay.

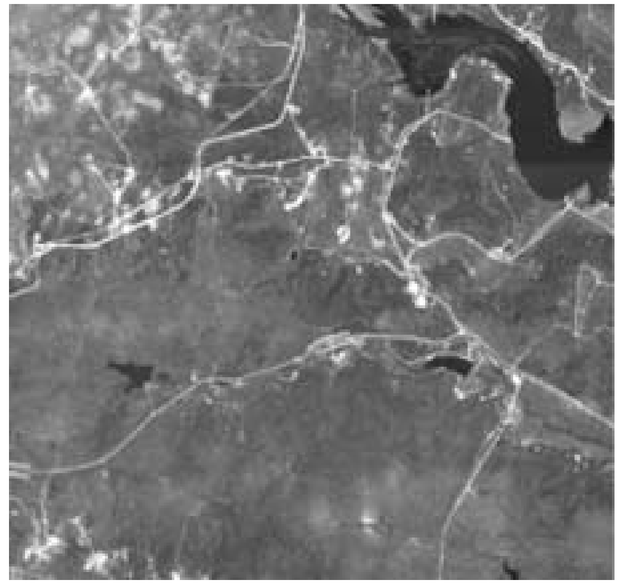


Figure 3. Linear Obstacles Overlay (LOO).

data products as overlays to facilitate answering questions and deciding how to shape the battlespace. However, DTSS by itself cannot produce certain trafficability analyses without input from the Integrated Meteorological System (IMETS). DTSS imports current and predictive data from IMETS to estimate the impact of weather on terrain (road conditions, low areas, possible troop locations, avenues of approach, and visibility from specific elevations in the air or on the ground). The prerequisite is that the higher levels of detail are available from the source element; only then can this type of interactive processes work accurately.

The All-Source Analysis System (ASAS) is another ABCS component interoperable with DTSS. DTSS supports ASAS by providing maps that intelligence analysts overlay with the enemy situation (templated, analyzed, or raw data). Use of the same map by all users ensures that everyone is literally on one "sheet of music": an eight-digit grid coordinate will show the same terrain every time to everyone.

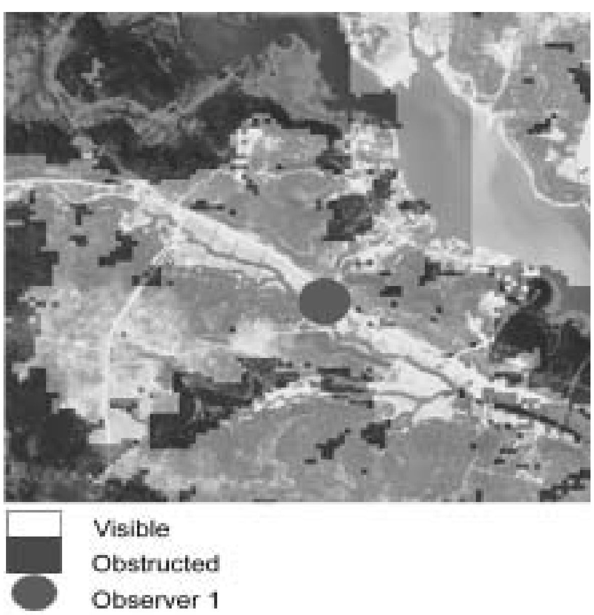


Figure 4. Line-of-Sight Analysis.

Figure 5. Masked Area Plot.

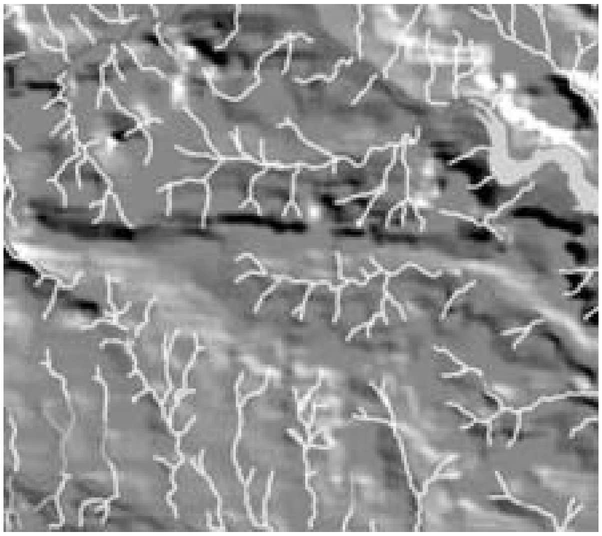


Figure 6. Hydrology Analysis Overlay.

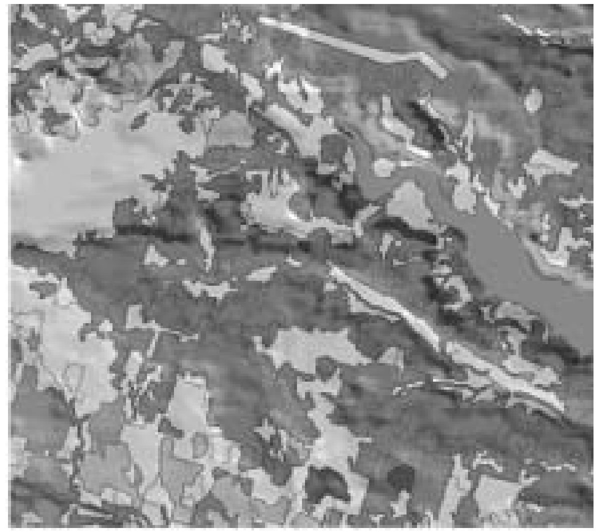


Figure 7. Vegetation Analysis.

DTSS Products and Dissemination

The Intelligence Community uses DTSS to produce separate terrain analysis products in order to assist them with the intelligence preparation of the battlespace (IPB) process. Some of these terrain products include:

- Cross-Country Mobility Overlay (CCMO). This overlay predicts trafficability under either wet or dry conditions based on IMETS data (see Figure 1).
- Mobility Corridors Overlay (MCO). This overlay shows usable avenues of approach based trafficability by wheeled or tracked vehicles and, if required, by type of wheeled or tracked vehicle (see Figure 2).
- Linear Obstacles Overlay (LOO). This overlay displays natural obstacles not normally identifiable on maps such as embankments, road cuts, pipelines, bluffs, walls, fences, and hedgerows (see Figure 3).
- Line-of-Sight Analysis (LOS) Overlay. This overlay helps to confirm or deny friendly observation posts (OPs), battle positions (BPs), or areas available from which to observe named areas of interest (NAIs) or targeted areas of information (TAIs). The LOS overlay assists in predicting what the enemy observer sees (given visibility conditions from IMETS) of known enemy OPs or possible OPs or BPs (see Figure 4). This overlay is a very useful tool for the maneuver commander.
- Masked Area Plot (MAP). The map (see Figure 5) is a converse of Figure 4. This overlay shows what a person cannot see given a specific position, optics, and height. This could be useful for suggesting scout directions of attack or infiltration routes.

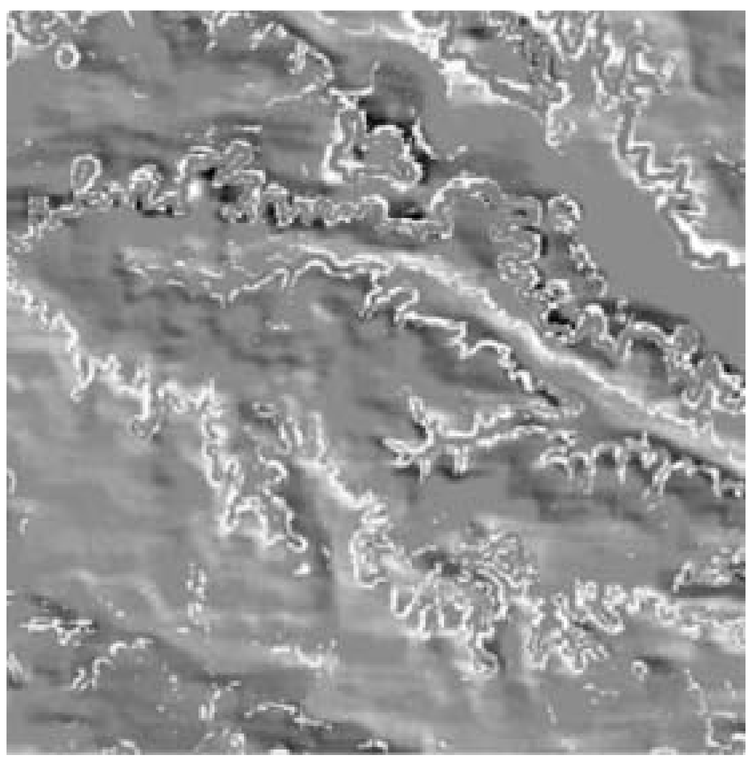


Figure 8. Artillery Slope Map.

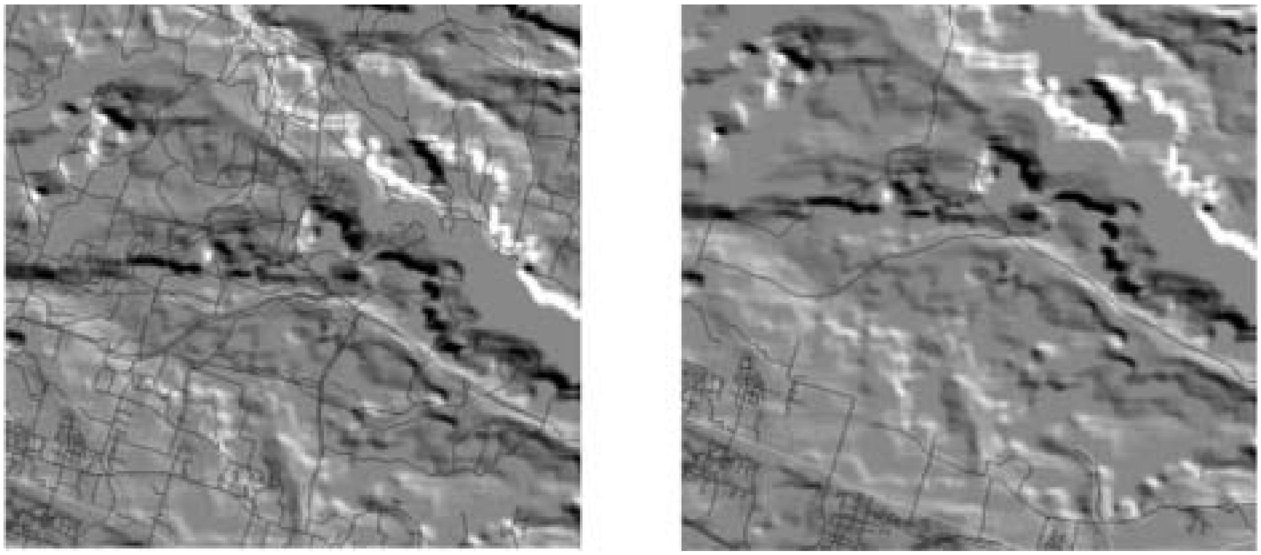


Figure 9. Transportation and LOC Overlay.

- Hydrology Analysis Overlay (HAO). This overlay (see Figure 6) identifies and classifies waterways and (depending on source detail) existing bridges and gap crossings. It may identify rivers, streams, canals, aqueducts, common open waterways, etc.
- Vegetation Analysis (VA). This analysis is a subset of LOS and the Masked Area Plot (Figures 4 and 5) that displays the types and density of vegetation (see Figure 7).
- Artillery Slope Map (ASM). This overlay (see Figure 8) graphically displays possible artillery firing points based solely on the ground slope; it is less likely that artillery units (friendly or enemy) would plan to position themselves in a location that has more than a 7-degree slope. The ASM overlay will also facilitate determining suitable or unsuitable helicopter landing zones.
- Transportation and LOC Overlay. The transportation overlay (see Figure 9 left side above) contains much more detail than the LOC overlay (right side) since it includes secondary roads and fording sites.

The brigade analysis and control team (ACT) requests these products from their supporting terrain team equipped with a DTSS. The ACT then imports the products into their ASAS as overlays on which to employ software applications such as a data fusion server (DFS) to template units or events. Not only is the DTSS capable of producing the standard types of products mentioned in this article, it is an analytical system that can answer any question concerning the impacts of terrain with the proper data and operator training. Experience has shown that we generate the very best, most used products to answer specific questions concerning terrain impacts. If an intelligence analyst submits a list of questions or requirements and the terrain team builds a product that answers those questions, it is a more useful product than if the team tries to guess which of the standard products they may need.

DTSS, along with the MCS-Engineer (MCS-Eng), will also help create the combined obstacle overlay and modified combined obstacle overlay (COO/MCOO). The Army will field the MCS-Eng in fiscal year 2004 (FY04). MCS-Eng will become an integral part the MCS system to provide data to ASAS. The MCS-Eng database will provide detailed information about friendly obstacles and known enemy-emplaced obstacles. Although the information will be a database, the results are graphic with “hooks” for additional detail. These “hooks” are pathways through which to delve into more detailed information concerning the item the user clicked. They are much like hyperlinks found on web pages.

Once an IPB analysis is ready for staffing or distribution, the analyst can save the IPB, with all of its overlays, as an operational overlay, which becomes part of the common operational picture (COP). If the supported unit is not digital, the DTSS produces color images of the overlay, or any other product, for limited hardcopy distribution. For large volume distributions, the terrain team requests support from a high-volume map production (HVMP) system set capable of printing up to 2500 maps in 24 hours (this type of printing is less crucial in a digital or ABCS-equipped unit).

In an ABCS-equipped unit, other systems will use the digital imagery provided by DTSS:

- MCS uses a direct link to the Joint Mapping Tool Kit (JMTK) to upload as well as update the COP.
- Force XXI Battle Command Brigade and Below (FBCB2) uses a Mission Data Loader (MDL) to upload the maps provided by DTSS individually.
- Additional systems that can interoperate with DTSS include the Global Command and Control System-Army (GCCS-A), Advanced Field Artillery Tactical Data System (AFATDS), and the Combat Service Support Control System (CSSCS).

The result is that all commanders look at the same map and COP displaying friendly forces and positions updated through FBCB2 and by the same enemy picture analyzed by the Intelligence Community and updated by ASAS. Together they use these integrated decision aides to visualize the battlespace to ensure survivability and mission accomplishment.

Outlook

There continues to be a need for a DTSS-like system capable of delivering digital maps to the other systems. While the ABCS is not an Objective Force system, there are plans to inject an improved capability under the Future Combat System (FCS) concept. ABCS planners have considered the need to fuse the capabilities of the IMETS, ASAS, and DTSS in a single "box" at the brigade and division levels. In the plan, the proponent schools and U.S. Army Training and Doctrine Command (TRADOC) System Managers (TSMs) would retain proponency of the functional areas while a single developer would integrate the software segments.

Another program oriented toward the Objective Force is the Army Imagery and Geospatial Information and Services (AIGIS). While this program is currently only a concept, it has direct implications for the future interaction among the terrain analysis teams and the Intelligence Community as well as with the all battlefield functional areas (BFAs). The AIGIS concept states that it is an *"integrated and comprehensive model to revolutionize the methodology for tasking, collection, processing, exploiting, and disseminating imagery intelligence, and geospatial information and associated services in support of Army objective forces."* Importantly, this concept describes the relationship that should exist between the information seekers and the analysts (combining the terrain and intelligence analysts in one cell).

For now, however, we have access to a system and a group of highly skilled operators who are able to furnish products including the COP and analysis to the combatant commander and the staff. We just need to know what to ask in enough time to get the job done.

I wish to thank the U.S. Army Maneuver Support Center (MANSCEN) Directorate of Combat Developments (DCD) staff, the ASAS TSM, and the TRADOC Program Integration Office-Terrain Data (TPIO-TD) for their assistance with this article. The digital Images are from ***TC 5-230 (Draft), Topo Smart Book****, September 2002.*

Editor's Note: Some of these graphics are hard to read in two tones. The graphics will be in full color when this article appears on our web site in early 2003.

Major Carl Herrmann currently works in the U.S. Army Maneuver Support Center's Engineer Division, Directorate of Combat Developments. He holds a Bachelor of Arts degree in Psychology from California State University, Fresno, and a Master of Business Administration degree from Indiana University of Pennsylvania. Readers may contact the author via E-mail at herrmannc @wood.army.mil and telephonically at (573) 596-0131 extension 3-7333 or DSN 676-7333.

Join the INTELST Information-Sharing Forum

The INTELST provides an information-sharing forum to discuss current and future intelligence doctrine, and to share and request ideas as well as tactics, techniques, and procedures (TTP) among intelligence professionals at all levels. Discussions on the INTELST have covered a very wide range of topics.

The INTELST is more than two years old, and has hundreds of members all over the world at all levels of command and rank. The INTELST membership includes intelligence professionals from across the spectrum of the military and civilian worlds. The INTELST (List server acronym for "Intel List") is an E-mail address to which you send a message that the server will automatically distribute—without edit or human intervention—to everyone on the list. After you sign up, you will receive a welcome message with instructions on how to use the INTELST and the INTELST "Rules of Engagement." The INTELST uses the Nonclassified Internet Protocol Router Network so all content of the messages must remain unclassified. Additionally, the INTELST is a closed list, and only those who have subscribed may post or receive notes sent to the list, or view the archived messages.

If you are interested in joining the INTELST, please send an E-mail to Lieutenant Colonel Rich Holden at "Rich.Holden@leavenworth.army.mil" or call him at (913) 684-9826 or DSN 552-9826. LTC Holden also requests that you pass this message on to other intelligence professionals who may be interested in joining.

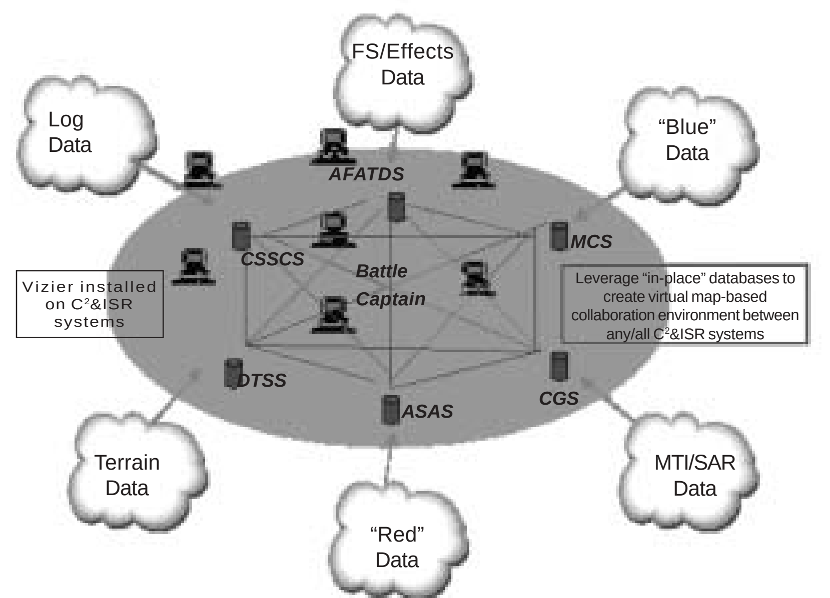
Moving Beyond Message-Based Dissemination—Vizier and JISR

by Sergeant First Class Eric M. Nielsen

Battlefield visualization is a vast topic that includes many facets. In collecting and sharing information to facilitate the commander's visualization, the Army faces challenges in the compilation and dissemination of information on friendly and enemy forces and the visual display of this information. The Battle Command Battle Lab at Fort Huachuca, Arizona, is developing two approaches to enable us to move beyond message-based systems: Vizier and the Joint Intelligence, Surveillance, and Reconnaissance (JISR) Project. Vizier exists now and JISR is currently in development.

What Is Battlefield Visualization?

The commanders' vision (or battlefield visualization) is a facet of battle command. When they receive a mission, commanders consider the battlespace and conduct mission analysis to develop their initial vision, which they continually confirm and modify. Commanders express the vision in concise guidance with sufficient detail to focus planning and preparation. Assisted by the staff, they visualize the operation, describe it in terms of intent and guidance, and direct the actions of subordinates within that intent. The commanders will draw on a number of factors to refine the initial vision including METT-TC (mission, enemy, terrain and weather, troops and support available, time available, and civil considerations), operational design, staff estimates, input from other commanders, and their own knowledge, experience, and judgment. They also draw on the principles of war and the tenets of operations.[1]



Key:
AFATDS – Advanced Field Artillery Tactical Data System
ASAS – All-Source Analysis System
CGS – Common Ground Station
CSSCS – Combat Service Support Control System
C^2 – Command and control
DTSS – Digital Topographic Support System
FS – Fire support
ISR – Intelligence, surveillance, and reconnaissance
Log – Logistics
MCS – Maneuver Control System
MTI – Moving target indicator
SAR – Synthetic aperture radar

Figure 1. Vizier Conceptual Architecture.

Existing Problems

One of the current challenges to achieving battlefield visualization is in compiling and disseminating near-real-time (NRT) information on both friendly and enemy forces. While adequate communications paths will continue to be a problem, this article will not specifically address them. Instead, we will begin by addressing some of the problems associated with the multitude of stovepipe systems that acquire and process the enemy and friendly situations. Products that facilitate visualization of enemy and friendly situations are not just icons of units, equipment and facilities, but also include the necessary operational and intelligence graphics to complete the picture. Furthermore, access to the underlying data behind various icons and graphics is necessary to enhance analysis. Various systems across the Services are responsible for the visual display of this information in a manner that allows commanders to assess the current situation rapidly and make timely decisions required to achieve their goals, but these systems have thus far failed to live up to user expectations.

At the present, the most prevalent method of passing information required to facilitate battlefield visualization is creating, passing, and processing formatted messages. Attempts to establish a standard message format acceptable to the joint Services is still ongoing and has not yet achieved the necessary level of interoperability required to meet the commanders' needs for true battlefield visualization.

Fielded systems use formats that include United States Message Text Format (USMTF), the Navy's Over-the-Horizon Gold (OTH-Gold) message format, or variable message format (VMF). Within these various message formats, the systems may also have different versions of the format, as they continuously review message sets, revise data, and update. To pass information rapidly, systems must have the ability to use and process the same message formats. In a perfect world, all systems would use a single standard message format. If all systems adopted a single message format, however, the message format rules would still be subject to error, based on the interpretation of the rules by developers. Additionally, the information contained within the prescribed message formats may not include all the relevant information necessary to meet the commander's specific needs. In this case, the information may be available within a system, but the message format does not allow for the information to be part of the disseminated message.

A good illustration of this problem is the USMTF S309 Enemy Interoperability message. This message is the primary means of passing the enemy situational information from intelligence systems to maneuver operations systems. The S309 currently will only send unit-level information in the message. In a situation that requires individual equipment locations and facility locations to give an accurate current enemy situational picture, this message does not fit the informational requirements of the commander.

Moving Beyond Message-Based Systems

Correcting a problem of this nature would require a new version of this particular message, thereby adding fields for the relevant information. The various system developers would then have to modify the system software to accommodate the new fields; after they complete the software changes, all systems in the inventory would require patches or reloading of the software with the new changes. This is a costly and time-consuming process. The scope of this problem becomes overwhelming when combined with the number of various message formats in use. The disadvantages of using formatted messages as the primary means of passing relevant information is evident.

Time delays are also inevitable with message-based systems because analysts must visually display the information received to check it for accuracy and to fuse it with other information. Analysts accomplish much of this action manually. After fusion takes place, analysts disseminate an updated common operational picture (COP) of the battlespace. This process can create long delays in passing relevant information to the commander.

So how do we compile timely relevant information and graphics and allow the commander to view this information as the staff is fusing and updating it? How do we then apply this process across the Services? How can we accomplish this without building and fielding additional systems to an already automation-overloaded tactical operations center (TOC)?

The Battle Command Battle Laboratory at Fort Huachuca (BCBL-H) is currently pursuing two approaches to the problem of acquiring timely enemy and friendly information and the associated graphics, and visually displaying the information for the commander. The programs under review use peer-to-peer or web-based "thin-client"[2] technologies.

Vizier Software Application

Peer-to-peer computing is the sharing of resources (such as harddrives and processing cycles) among computers and other "intelligent" devices. Vizier, one of the programs sponsored by BCBL-H, uses peer-to-peer technology in a purely software-based approach to battlefield visualization that requires no additional hardware, and only a relatively small software footprint (harddrive space).

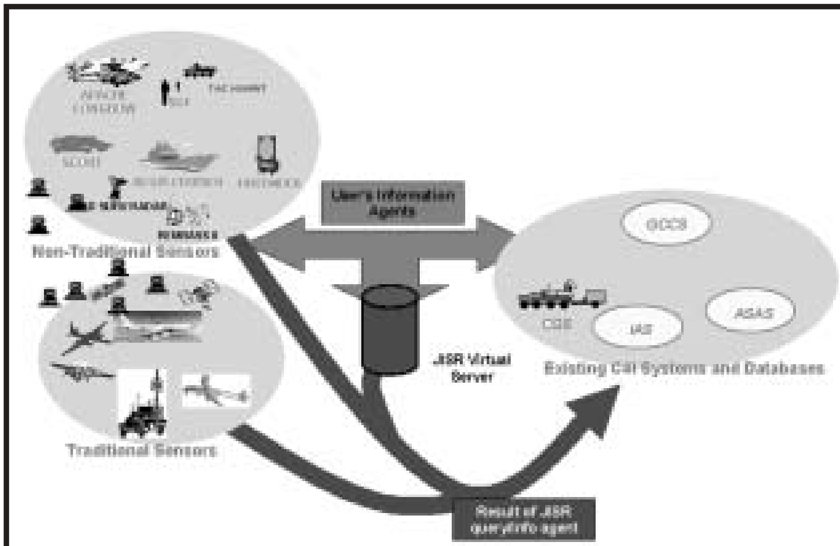
Vizier is a platform-independent software application that creates two-dimensional (2D) map-based visualizations in the form of map overlays. In effect, it is similar to the Map Collaborative Overlay application found in the current version of the All-Source Analysis System (ASAS) Remote Workstation (RWS) Block II, but system managers can install it on any system that supports Java (such as UNIX®, LINUX®, Solaris™, Windows®). Vizier allows users to create customized, content-rich overlays from multiple data-sources that contain the result of analysis, not just the result of a database query. See Figure 1 for a conceptual diagram of a Vizier-based architecture.

Unlike client-server applications, Vizier can operate independently of any other systems. It does not need a server, although it can use information contained on them. The Vizier map and table viewer can access and visualize data sources (usually databases on a network). The users do not need prior knowledge of this data to access and view it using Vizier software; they just require an authorized database user account (usually set up by the database administrator). If the data contains geographically-referenced information, Vizier provides an easy-to-use wizard for registering tables plotted on the Vizier map display.

Presentation of information is an integral part of battlefield visualization. At first, this may seem like a frivolous and unnecessary capability, but any soldier who has ever tried to find a military standard (**MilStd 25-25b**[3]) symbol for a cocaine lab, car bombing, or mass protest demonstration will immediately recognize the need for better information presentation tools. For better or worse, the U.S. Army seems to have a de facto information presentation standard: Microsoft® PowerPoint™. Soldiers continue to use this application for the simple reason that it allows them to make information intuitive and easily understood. Vizier features a variety of PowerPoint™-like tools that allow users to customize the way information appears on the screen. In the event that there is no **MilStd 25-25b** symbol for a data item that a soldier is trying to portray, Vizier provides the ability to use images, clip art, or user-defined drawings or symbols for visualization.

One realizes the full power of the Vizier application when it is in use across an entire network of different intelligence, surveillance, and reconnaissance (ISR) systems. The soldiers operating each of the systems create overlays from the data contained in their respective systems. They can then "share" these overlays so that any other soldier with Vizier installed on this system can "subscribe" to them. In effect, Vizier software creates interoperability between systems visually, if not actually. In this example, a battle captain could subscribe to the overlays produced by the variety of ISR systems with the TOC. The software posts any changes to a shared overlay for all subscribed overlays, alleviating the need for a soldier or battle captain to "refresh" the data, since it happens automatically. Furthermore, battle captains could select only those shared overlays that they wish to view, allowing the creation of a customized, content-rich, **relevant** COP.

Vizier also provides a monitoring tool capable of monitoring many things, such as database connectivity across the network, connectivity to other nodes on the network, and the status of other units' COPs. All of the Vizier tools provide a "Save as HTML" feature so that analysts can publish maps, tables, reports, messages, and more, on a Vizier-based web site.



Key:
Aegis – Aegis U.S. Navy phased-array radar-based combat system
C^2I – Command, control, and intelligence
GCCS – Global Command and Control System
GRD – Ground
HUMINT – Human intelligence
IAS – Intelligence Analysis System
REMBASS II – Remotely Monitored Battlefield Sensor System II
SOF – Special Operations Forces
SURV – Surveillance
TAC – Tactical

Figure 2. JISR Conceptual Architecture.

JISR Software Application

"Thin-client," or web-based technology is the ability to access an application or data using a web browser. It does not require installation of additional software, other than a web browser, to use the application. The Joint Intelligence, Surveillance, and Reconnaissance (JISR) Project is an example of thin-client, web-based technology.

The JISR Project is an advanced concept and technology demonstration (ACTD) program that uses a web-based architecture on existing C^2 and ISR workstations, within existing and future communications architectures. It provides NRT access to information that resides in the various fielded Department of Defense (DOD) systems. The intent is to provide early-entry forces and their supporting headquarters with significantly improved situational awareness by means of more effective and timely access, integration, and the visualization of relevant multiService, multiechelon systems without increasing the automation footprint within the TOC. See Figure 2 for a conceptual diagram of a JISR-based architecture.

An advantage of the thin-client, web-based technology approach is that it allows "disadvantaged" users access to information in a timely manner. Disadvantaged users are those who do not have systems that will allow them to receive the current situation via the formatted message mode (such as USMTF). These disadvantaged users may include military police, rear-area security elements, and various combat service support (CSS) elements. Currently, many of these users receive updates to the present situation via textual E-mails and PowerPoint™ slides; these groups may occasionally be able to access the current situation information from a web site. Neither of these options provides timely, updated information, nor do they fully cover these organizations' information requirements. They must request the additional information required manually, often via E-mail, and the response may require manual processing of information. With JISR, a disadvantaged user can access up-to-date information with nothing more than a web browser connected to the SIPRNET.

JISR allows users to define information requirements and "pull" data from various DOD source systems that satisfy those requirements; the application displays the resulting information in a 2D-visualization tool. After the initial query, the JISR application will continue to query source systems for updated information based on user-defined preferences. In the objective software application, the information pull will include the ability to obtain existing operational graphics and graphical intelligence products and will allow users to add to these products or create their own graphics based on the commander's needs. The visual display will include the ability to share a picture with other JISR clients in a dynamic role. This will allow the commander to view the current situation while new information updates it and as the operator fuses the picture. The application will also allow for a two-way share, or collaboration, on the map. This is similar to "white boarding," with the exception that the capability is resident in the map application and does not require the operator to import his product into a third-party software package to accommodate collaboration.

The JISR ACTD will migrate the application from its own server to one, or more, of the existing ISR systems as a software module. When complete, there will be no increase in the TOC footprint, nor will system administrators be required to load software applications on all systems with operators that require the JISR application.

New Challenges

Either of these two approaches to battlefield visualization promise to alleviate the problems identified with the existing message-based system. At the same time, they present several new challenges, some of which are technical in nature, while establishment or modification of tactics, techniques, and procedures (TTP) can address others.

As we move toward greater dependence on our automated networks, the need for bandwidth will increase exponentially. Both Vizier and JISR will make significant additional demands on our tactical bandwidth. On the other hand, continuing to use the existing methods of E-mailing text and graphic products vertically and horizontally between echelons will only make matters worse, since these methods tie up more bandwidth than either Vizier or JISR.

Multilevel security remains a daunting issue. Both Vizier (now) and JISR (in the future) possess functionality that enables users to share products dynamically. As long as all systems with access to these two respective systems operate within the same classification domain on a closed network, the risk is minimal. However, if either of these applications deploy in a multilayered security environment, we will need to modify the existing message-based guard technology not configured to allow or support collaboration across security domains.

Finally, as the amount of accessible information continues to increase, the potential for obtaining misleading, incomplete, or incorrect information increases dramatically. The institution of rigorous and comprehensive TTP mandating which system is the provider of authoritative information for a given battlefield functional area can resolve a significant part of this problem. For example, TTP should mandate that the ISR system maintained by a G2 operations section represents **the** authoritative red COP. If an organization fails to institute this level of rigor in its TTP, there is a great potential for multiple versions of a COP within the same organization, the results of which could be catastrophic.

Final Thoughts

Despite of these challenges, the current message-based approach to battlefield visualization does not serve the commanders' needs. A different approach, one that leverages the constantly advancing state-of-the-art information technology is required. The Huachuca Battle Command Battle Lab continues working on the identification, development, and testing of these technologies to enhance the warfighter's ability to see first, understand first, and finish decisively.

Endnotes

1. Department of the Army, **FM 3-0, Operations** (Washington, D.C.: Department of the Army, 14 June 2001).

2. "Thin clients" are applications or hardware devices that one can connect to a server-computer to download a representation of the server's graphical user interface. The connection normally uses some proprietary protocol rather than HTTP (hypertext transfer protocol), the worldwide web protocol. When running a thin client, the user of a desktop display terminal is able to view and interact with applications running on the remote server. The server receives and processes the user's mouse and key actions and transmits display updates back from the server to the display terminal. With thin clients, a server deploys, manages, and executes applications entirely in itself, making for platform-independent access to virtually any application.

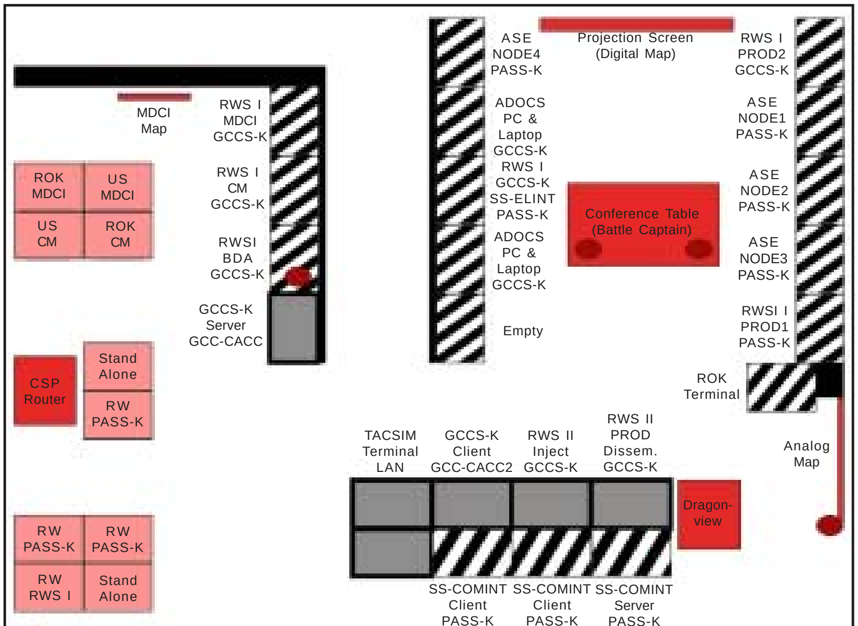
3. **Military Standard (MilStd) 25-25b**, **Department of Defense Interface Standard**: **Common Warfighting Symbology** (Washington, D.C.: Department of Defense, 30 January 1999).

Sergeant First Class Eric Nielsen is an Experimentation Noncommissioned Officer (NCO) assigned to the Battle Command Battle Lab-Huachuca. He is focusing on development and experimentation of advanced intelligence processing and visualization software. Readers may contact SFC Nielsen via E-mail at nielsene@hua.army.mil or telephonically at (520) 533-4674 or DSN 821-4674.

GCC-CACC—Improving Battlefield Visualization for Ground Component Warfighters in Korea

by Sergeant First Class Fernando Ortega and Staff Sergeant Erika K. Strong

According to the U.S. Army Training and Doctrine Command's **TRADOC PAM 525-70** (**Battlefield Visualization**), battlefield visualization is continuous and first and foremost requires "*commanders to develop a clear and concise understanding of the current state with relation to the enemy and environment.*" For without this first aspect, a commander cannot "*clearly discern a desired end state or envision a sequence of actions that will cause his force to arrive at the desired end state.*" Although this concept got a lot of attention when portrayed doctrinally in the 1990s, it is certainly not a new one. The requirement to "visualize the battlefield" has existed as long as warfare itself. For example, Sun Tzu articulated the concept in his writings.



- Peripheral systems
- New positions requiring new LAN drops
- Exercise positions
- Real-world positions
- STU (Secure Telephone Unit)

Key:
ADOCS – Automated Deep Operations Coordination System
ASE – All-Source Enclave
CM – Collection management
CSP – Communications support processor
LAN – Local area network
MDCI – Multidiscipline counterintelligence
PASS-K – PACOM ADP Server Site-Korea
PC – Personal computer
PROD; PROD1; PROD2 – Production; Production 1; Production 2
SS COMINT – ASAS-Single-Source Communications Intelligence
SS ELINT – ASAS-Single-Source Electronic Intelligence
TACSIM – Tactical simulation

Figure 1. GCC-CACC Floor Plan.

"Know the enemy, know yourself; your victory will never be endangered. Know the ground, know the weather; your victory will then be total."

In 2001, the 501st Military Intelligence Brigade began an initiative to increase battlefield visualization for the combat commander on the Korean Peninsula and to standardize the common operational picture (COP) for the warfighter. The Brigade's Ground Component Command- Combined Analysis Control Center's (GCC-CACC) digitization and modernization project incorporated "Dragonview," a state-of-the-art display system, as the centerpiece in increasing the commander's battlefield visualization.

GCC-CACC Mission and Location

The mission of the 501st MI Brigade's GCC-CACC is to provide the Ground Component Command (GCC) and Combined Forces Command (CFC) warfighters all-source predictive intelligence in support of situation and target development as well as intelligence exploitation. The GCC-CACC is within the Field Station-Korea complex located at the Zoeckler Station, a subinstallation of Camp Humphreys, Korea. The Field Station is also home to the 527th MI Battalion and elements of the 3d MI Battalion, both subordinate units of the 501st MI Brigade.

Evolution of the GCC-CACC

Formed in 1995, the Ground Component Command-Analysis and Control Element (GCC-ACE) has grown exponentially with the integration of each intelligence discipline. In 1997, the 501st MI Brigade's Technical Control and Analysis Element (TCAE) merged with the GCC-ACE. When our Republic of Korea (ROK) intelligence counterparts joined the team, thus creating a combined environment, the ACE became the GCC-CACC. This integration provided an improved intelligence capability, mobile satellite communications (SATCOM) capabilities via TROJAN SPIRIT (TROJAN Special-Purpose Integrated Remote Intelligence Terminal), and critical communications pipelines using very-small aperture terminal (VSAT) to the ROK Army intelligence signals intelligence (SIGINT) elements throughout the Peninsula.

As the GCC-CACC continued to evolve, other sections contributed significantly to the intelligence information structure. The GCC-CACC Ground Imagery Analysis Section (GIAS) added the Joint Services Workstation (JSWS) and the Common Ground Station (CGS); these systems have contributed a very robust, joint imagery and moving target indicator (MTI) capability to the GCC-CACC. In addition to GCC-CACC's organic intelligence processing systems, the 3d MI Battalion provides direct-feed capabilities from both the Guardrail Common Sensor and the Airborne Reconnaissance Low (ARL) (imagery intelligence). More recently, we integrated reporting from the Brigade's measurement and signature intelligence (MASINT) elements into the CACC, and an initiative is underway to automate the intelligence reporting and analysis provided by the Brigade's counterintelligence and human intelligence battalion, the 524th MI Battalion, to GCC consumers around the Peninsula.

As the number of intelligence information processors, systems and intelligence disciplines within the GCC-CACC has grown, so too has the communications architecture. In 2000, the addition of the Secure Internet Protocol Router Network (SIPRNET) provided much needed connectivity to information sources at the Secret Collateral level as well as dissemination capabilities for consumers in the United States. The GCC-CACC currently operates on multiple wide-area networks (WANs) at multiple classification levels. They provide a means of dissemination to virtually any consumer in the world as well as enabling analysts to access multiple theater- and national-level databases.

Our Challenges With Advanced Automation

By 2001, the GCC-CACC had an immense intelligence processing capability as well as a robust communications architecture to support virtually any mission on the Peninsula. More importantly, the GCC-CACC had the capability to facilitate comprehensive battlefield visualization for the warfighter. However, the abundance of incoming information and the various communications pipes presented the GCC-CACC with some unique challenges.

First the GCC-CACC had to resolve problems related to the quality control of the COP based on its current architecture. The most important responsibility of the GCC-CACC is furnishing the enemy ground situation for the Peninsula's COP, a vital tool in supporting the decision-making process of the Commander, United States Forces, Korea (USFK). Quality control is paramount to ensuring an accurate, timely and comprehensive view of the enemy situation, an effort hampered by the dispersion of the number and size of intelligence systems and processors within the CACC. With the All-Source Analysis System–All-Source (ASAS-AS) situation machine, COP production machine, and the Global Command and Control System-Korea (GCCS-K) machine separated by space and classification requirements, it was essential to pull these critical pieces of the COP together to ensure accurate and timely quality control. (These three machines are where the analysts generate the picture, an ASAS Remote Workstation that feeds the COP via the GCCS-K, and where warfighters can view the final picture.)

While GCC-CACC analysts had the ability to organize most of the incoming information and focus on commanders' priorities using a number of correlation systems, the challenge was in getting all of this information from many sources at many classification levels to one analyst workstation to ease the analysis, processing, and dissemination. Additionally, this data required exporting to an easily accessible media form so that the

U.S. Army photographs.

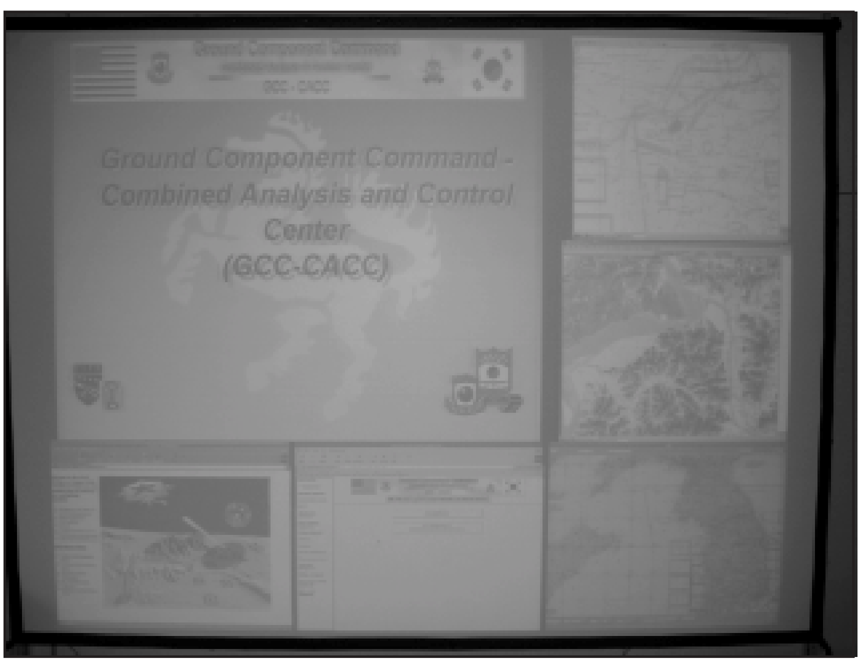


Figure 2. Closeup of Dragonview Monitor.

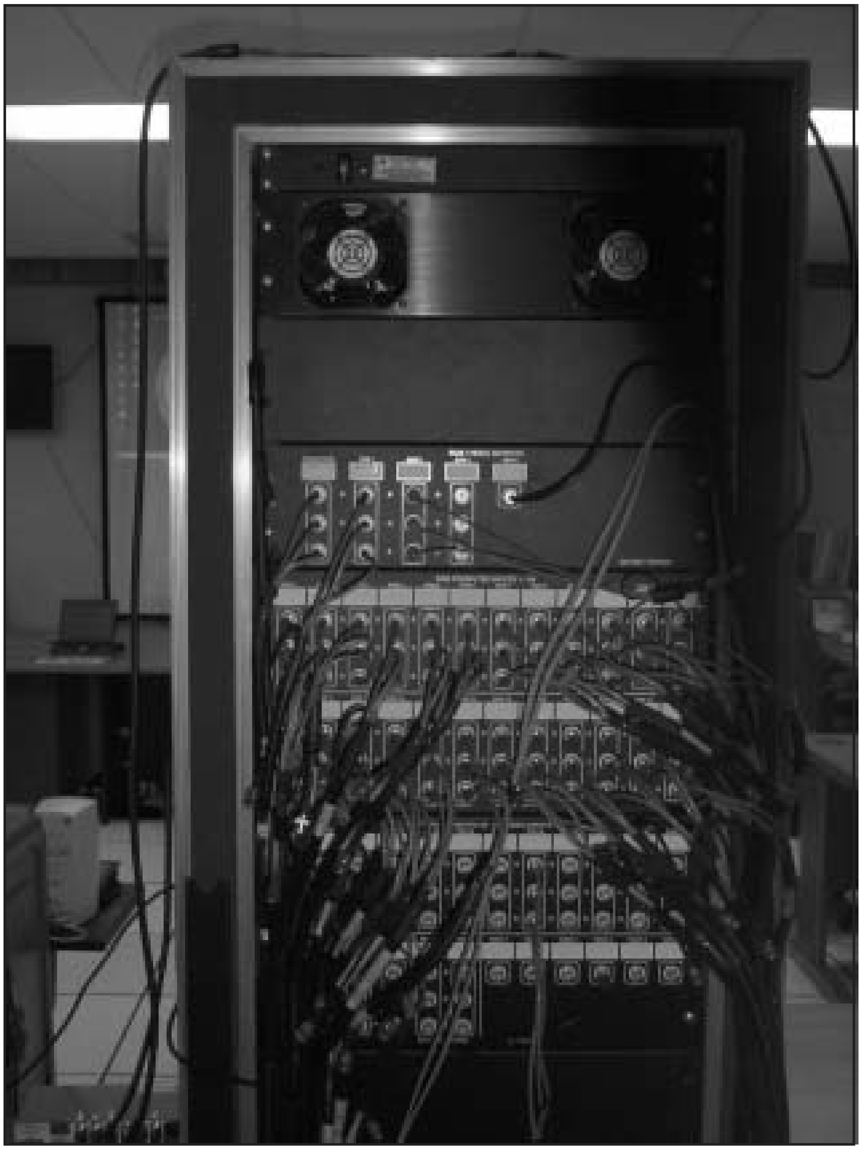


Figure 3. Input to the Dragonview Display System.

battle captain could view it without having to go to different buildings or areas.

The physical layout of the GCC-CACC and the size of the equipment presented another challenge. Although the bulk of the GCC-CACC area is within the field station's U.S.-ROK building, other elements are at a separate building, or outside the buildings in self-contained shelters. This environment fostered segregation of sections and hampered coordination, cross-cueing, cross talk, and production. For the CACC to achieve optimal situation development, target-development, and collection exploitation, it needed technology to port all of the CACC's many inputs into one area, thus allowing it to assimilate, evaluate, and disseminate perishable information quickly and to improve situational awareness.

GCC-CACC Transformation

In the first quarter of fiscal year 2001, the GCC-CACC, together with other elements of the 532d MI Battalion (parent unit of the GCC-CACC) and the 501st MI Brigade, engineered a plan to overcome these challenges as well as to facilitate increased battlefield visualization for the GCC-CACC and warfighter. The plan resulted in a major digitization and modernization project to transform the GCC-CACC into a digitized, efficient intelligence fusion and production center. To start, the planners would have to completely restructure the GCC-CACC information architecture and floor plan, modernize and upgrade existing systems to economize space, and install a state-of-the-art Superview 500 display system known as "Dragonview."

Several changes were made with regard to information architecture. The first of these was the introduction of a trusted workstation (TWS), which allowed analysts to access and share information from multiple sources at different security levels, providing the means to get information from several classification levels to the ASAS-AS for correlation and to analyst workstations for processing and dissemination. We also reprogrammed the communications support processors (CSPs)—servicing the bulk of transmission and receipt of GCC-CACC message traffic—to route traffic based on changes to the information architecture.

The GCC-CACC restructured the floor plan (see Figure 1) to deliver maximum situational awareness to the battle captain and GCC-CACC analysts and technicians.

- ❑ We surrounded the battle captain station (or "pit") with situation, targeting support, and production machines.
- ❑ We restructured and even moved individual sections in some instances to supply added situational awareness as well as to aid in the economy of space.
- ❑ We upgraded intelligence systems hardware (in terms of speed and memory) to accommodate future software upgrades.

Additionally, to combat the high demand for GCCS-K systems, the GCC-CACC purchased another system and is in the process of adding at least one more. To further deal with economy of space, the CACC replaced all monitors with flat-panel monitors expanding much needed analyst workspace.

GCC-CACC's Dragonview

Of all of the ideas, however, the most dynamic change to the GCC-CACC was addition of "Dragonview," a battlefield visualization system that ensured that those needing the information to facilitate immediate situational awareness could view it from intelligence systems spread throughout the field station. The system, developed for the Brigade in a partnership with a small company in Texas, provided customized display for the GCC-CACC.

Modeled after a similar mobile version at the III Corps ACE, the Dragonview display system enables the GCC-CACC to display multiple system feeds simultaneously in a single 10-foot wide by 8-foot high viewing area (see Figure 2). A compact computer video interface connects each system's central processing unit (CPU) and monitor. This small box has an HD-15 serial input for the computer and output for the monitor; it also has a second output for an RGB[1] cable to move only the video signal (no data) to the Dragonview system. This was especially important since the GCC-CACC battle command area (the Dragonview's location) has input sources operating at three different security levels. Even with the sources' variety of hardware manufacturers, the CACC successfully made all hardware connections using combinations of cables and adapters.

The Dragonview accepts up to 42 RGB inputs from different workstations and 6 video inputs (see Figure 3). We process and convert these inputs through the Dragonview for display on the projection screen. The battle captain uses a touch panel (see Figure 4) to determine which systems to display at various times and can choose from displays showing 1, 4, 6, or 10 inputs at a time. In addition to the RGB output to the projector, the Dragonview has one additional video output and three RGB outputs that add the capability to display a common intelligence picture remotely in distant locations, such as the 501st MI Brigade tactical operations center (TOC).

GCC-CACC, with Dragonview at its center, has significantly increased its situational awareness as well as battlefield visualization capabilities in support of the warfighter. In March 2002, USFK tested the display system during a major Peninsula-wide exercise, RSO&I (reception, staging, onward movement, and integration) 02, and it proved to be a major success throughout the GCC-CACC. Battle captains were no longer tied to individual 15" monitors, nor did they have to traverse the GCC-CACC floor to view other screens and mapboards in their efforts to achieve battlefield awareness. Instead, they now had the ability to customize their displays by manipulating the Dragonview touch panel, enabling them to visualize the battlefield quickly. Intelligence technicians and senior analysts had a dynamic set of tools to improve significantly production and accuracy in their dis-

Key:
ARL – Airborne Reconaissance Low
ASAS-SS – All-Source Analysis System-Single Source
BDA – Battle damage assessment
CGS – Common Ground Station
GCCS-K – Global Command and Control System-Korea
PREIVEW – Preview
PROJ – Projector
RWS – Remote workstation
RGB – Red-green-blue audio/visual connection
VCR – Video casette recorder
VID – Video

Figure 4. The Dragonview touch pad allows the Battle Captain in the pit to choose which systems to project.

semination efforts. Monitors from systems that resided outside the battle command area such as the CGS (MTI) quickly appeared for comparison on screens from other intelligence sources. Lastly, the Dragonview improved the GCC-CACC's briefing capability. Situation briefs became much more synchronized, visual, detailed, and accurate using the display system. The system even streamlined shift-change briefs by allowing analysts to brief their own areas of responsibility to a larger audience. Most importantly, the GCC-CACC conducted a thorough quality-control of the Peninsula's COP in a fraction of the time previously required. In turn, the GCC-CACC sent COP updates that were timely and accurate and thus delivering a significantly more valuable decision-making tool to the Commander, USFK.

Conclusion

The GCC-CACC has significantly improved situational awareness and battlefield visualization capabilities; however, there are still challenges to face. With the high transition rate of soldiers—unique to the Korean Peninsula—and the continued technological advances in automation systems, training is paramount. Comprehensive training programs and mobile training teams (MTT) are the focus for the GCC-CACC in providing seasoned analyst continuity within the Combined Analysis Control Center. The ASAS Master Analyst Program (AMAP) is crucial to coordinating systems and analysis training and the GCC-CACC has made every effort to ensure the continuity of ASAS Master Analysts. In an effort to keep the analyst in the loop, the GCC-CACC must continue to assist their intellectual development. A critical consideration is that advanced automation is only a tool and that analysts are the individuals on whom we rely to synthesize vast amounts of information and to perform complex tasks in support of the warfighter. With this in mind, the GCC-CACC senior noncommissioned officers are revising the current GCC-CACC training program. The new "analyst certification program" will focus on training analysts to operate in a seamless environment and developing cross-cuing skills and an understanding of where their intelligence disciplines fit while constructing a detailed picture of the battlefield. Automation training will be comprehensive and focused on analyst applications (using the machine as a tool) rather than machine functions or "buttonology."

To further enhance the digitization project, we will install a public address system. The system will link the GCC-CACC, the 501st MI Brigade TOC, and the 527th MI Battalion with audio to compliment their Dragonview visual feeds.

As technological advances continue at quantum rates, the GCC-CACC will persist in its efforts to harness new capabilities providing enhanced tools for the analyst and improved battlefield visualization to the warfighter. The GCC-CACC vision for the future is a "virtual intelligence architecture" that will link analysts and intelligence consumers electronically. Within the GCC-CACC, in the not so distant future, virtual overlays will replace or enhance the current Dragonview capability. Virtual whiteboards will link analysts and the battle captain in a collaborative environment. VTC capabilities will be the norm for linking the GCC-CACC with its Deployable Intelligence Support Element (DISE), ROK Army intelligence counterparts, and other intelligence consumers.

Endnote

1. RGB stands for "Red, Green, Blue," a common type of connection used in audio-video feeds.

Sergeant First Class Fernando Ortega currently serves as the 532d Military Intelligence Battalion S3 NCO in Charge (NCOIC). In addition to his S3 duties, he serves as the Battalion Systems NCO and the Senior ASAS Master Analyst for the 501st MI Brigade. He is a graduate of the ASAS Master Analyst Course and the U.S. Army Sergeants Major Academy Battle Staff NCO Course. In addition to having served as the GCC-CACC ASAS Master Analyst, he taught the Signals Intelligence Analyst (98C) Individual Entry Training (IET) Course and has served in a variety of tactical and strategic MI assignments. Readers may contact SFC Ortega via E-mail at ortegaf@seoul-501mi.korea.army.mil and telephonically at DSN 315-723-4784.

Staff Sergeant Erika Strong (recently changed from Olson) has been at the 532d MI Battalion in Korea since June 2001. She has served as the ASAS Master Analyst for the Ground Component Command-Combined Analysis and Control Center (GCC-CACC) since her graduation from the ASAS Master Analyst Course in December 2001. Before her assignment to Korea, SSG Strong spent just over four years in the 2d Armor Brigade, 4th Infantry Division (Mechanized) at Fort Hood, Texas. She was with the unit through their transition from analog operations to digital warfighting culminating in the Force XXI Division Capstone Exercise in spring 2001. SSG Strong's next assignment will take her back to Fort Hood in December 2002. Readers may reach her via E-mail olsonek@humphreys1-501mi.korea.army.mil and telephonically at DSN 315-753-3349.

Share Your Photographs

MIPB requests that our readers send photographs of MI operations, equipment in use, and exercises; we will use them to enhance your articles. All photographs should be copyright free. Please send a brief description of the action in the photograph, identify the people and equipment, and include the photographer's full name and rank, unit, and mailing address if available. The photos can be color or black-and-white, and they should be clear and in focus. Digital photos should be 300 dots-per-inch or better resolution. Provide a return mailing address and we will return the photos if so requested. Thank you!

The JIVA Knowledge Discovery Toolkit

by Michael D. Shaffer

***AR 381-10, U.S. Army Intelligence Activities**, establishes the responsibility for intelligence activities concerning U.S. persons, includes guidance on the conduct of intrusive intelligence collection techniques, and provides reporting procedures for certain federal crimes. This regulation applies to the Active Army, the U.S. Army National Guard, and the U.S. Army Reserve as well as to Army intelligence components and non-intelligence components conducting intelligence activities. The following article adheres to Intelligence Oversight policy.*

During the past year, the Joint Intelligence Virtual Architecture (JIVA) office has accelerated its efforts to provide new information technologies (IT) for the all-source intelligence analyst. We have presented three initiatives.

- Creation of a global enterprise-level hardware infrastructure able to facilitate intelligence analysis anywhere in the world. This infrastructure consists of a DIAC Secure Internet Protocol Router Network (SIPRNET) node as well as Joint Worldwide Intelligence Communications System (JWICS) regional support centers at the Defense Intelligence Analysis Center (DIAC), United States Space Command (USSPACECOM), U.S. European Command (EUCOM), and the Joint Intelligence Center, Pacific (JICPAC).
- Initiation of the development of a flexible web-based enterprise software architecture that can provide a tailored electronic desktop to each analyst through the JIVA enterprise portal.
- The third initiative, recently started, was to begin design and creation of a virtual knowledge base (VKB) that will integrate with the JIVA portal to facilitate seamless access to all data, regardless of its format or location. In addition to these efforts, the recent counterterrorism (CT) funding plus-up from Congress has provided us with the opportunity to pursue concurrently what we are now calling the "Knowledge Discovery (KD) Toolkit."

Information Overload

The information explosion driven by the ubiquitous Internet (and to a similar extent, INTELINK) affords us the ability to gain access to virtually unlimited sources of data. Unfortunately, this "sea" of information is so vast, unorganized, and often nonauthoritative that it literally overwhelms to the point of distraction. For the all-source intelligence analysts, their information glut is compounded by an intelligence IT environment that—

- Still emphasizes manual rather than automatic extraction of relevant data from both classified and unclassified sources.
- Has a search and discovery process exclusively based on what we **know** versus what **might be.**
- Limits flexibility in modifying a previously created information hierarchy when assessments change or the analysts receive new information.
- Provides a largely manual product-generation process further degraded by the inability to visualize significant relationships between data elements as the amount of data grows.
- Lacks the ability to facilitate the rapid assessment and time-critical reporting of streaming media (video and audio) and sensor data.
- Does not permit scaling so that the full capabilities of thousands of defense intelligence analysts can focus on creating a common picture or view.
- Lacks tracking ability over time.

Mission of the KD Toolkit

The KD Toolkit should be able to make headway immediately in addressing these problems for the Department of Defense intelligence CT analyst. However, if proven successful, its use will likely extend beyond CT to the general MI analyst population through its deployment on the JIVA enterprise site.

Traditional intelligence problems, such as assessing the military forces, capabilities, and intentions of foreign nations, generally involve analyzing data in both structured and unstructured databases and known hierarchies. However, the asymmetric threat problem, specifically the terrorism threat, involves assimilating a great deal of disparate data from the Central Intelligence Agency (CIA), National Security Agency (NSA), State Department, Federal Bureau of Investigation (FBI) and Immigration and Naturalization Service (INS). This process involves the assessment and integration of Intelligence Community (IC) real-time message feeds, mail systems, and other means of information input, as well as open-source HTML and XML (hypertext and extensible markup languages) documents and free-text data. In addition, the CT analyst must frequently think "outside the box" in terms of established Western standards of analysis making the ability to conduct "what-if" drills paramount. Additional analytical imperatives are the ability to establish relationships between data points and to test operational assumptions. Furthermore, because of the volume and inconsistency of raw data, the analyst must also be able to apply proven analytical methodologies along with the application of advanced IT tools.

This KD Toolkit should provide the CT analyst with an end-to-end highly integrated solution that hides its inherent complexity behind a simple user interface and the tools in use should be transparent to the analyst. Another primary goal is to support a variety of different analytic processes and analyst experience-levels by providing navigation options to exercise various components of the Toolkit. Envisioned is an interface using wizards to enable the analysts to delve as deeply as needed into the data based on how much time they have.

Development of the KD Toolkit

The objective Toolkit will consist of four major components:

- **Advanced Data Mining** to **ingest and process data** by facilitating natural language query and categorization of unstructured, semistructured, and structured text, audio, and video in all foreign languages.
- **Data Visualization** to **translate data into information** by identifying for further investigation patterns, relationships, linkages, and abnormalities regarding people, places and things.
- **Generation and Validation of Hypotheses** to **create knowledge from information** by analyzing discovered information and turning it into knowledge by asking questions of the system and receiving answers.
- **Structured Output** to **produce the analysis** by building timelines, showing linkages and supporting the creation of an auditable and defensible intelligence analysis that includes video, audio, and imagery overlaid on maps as necessary.

To create a KD Toolkit solution to the problems discussed in this article, JIVA issued a "sources sought" announcement to attract the best minds and technical solutions available in academia, government laboratories, and industry. A team of recognized experts from National Ground Intelligence Center (NGIC), National Air Intelligence Center (NAIC), Sandia Labs, Defense Intelligence Agency (DIA), and U.S. Pacific Command (PACOM) evaluated the 58 submitted responses, and recommended pursuing proposals from two companies. These selections emphasized—

- Availability of component technology this summer rather than future promise.
- Browser compatibility and simplicity of use instead of functionality and capability.
- Framework flexibility for future technology insertion.

The KD Toolkit project will occur in two phases. The first phase is to create two competing operational prototypes targeting open-source data of known CT value. These prototypes will be available in July 2002 and anyone anywhere with an Internet connection and a browser can evaluate them. By approximately 30 September, the Army will select the winning prototype and move it into the sensitive compartmented information (SCI) environment in the late fall. Because the KD Toolkit is completely browser-based without any client load, intelligence professionals from all over the world will be able to call JIVA and obtain an account for a "test drive."

Final Thoughts

JIVA remains committed to pursuing its primary mission objective aggressively to acquire and field new information technologies and tools rapidly that will improve the quality, responsiveness, and timeliness of intelligence collection, analysis, production, and support for warfighters, policymakers, and the defense acquisition community. The KD Toolkit acquisition initiative represents a major step in continuing to meet our critical mission challenges.

Mike Shaffer is the Principal Technology Engineer for the Joint Intelligence Virtual Architecture at the Defense Intelligence Agency, Washington, D.C. Mr. Shaffer is a former Naval Intelligence Officer and holds Electrical Engineering Bachelor and Master of Science degrees from George Washington University. Readers may contact the author via E-mail at dishamd@dia.ic.gov or mdshaffer@hotmail.com and telephonically at (202) 231-2189.

MI Corps Hall of Fame Nominations

The Military Intelligence Corps accepts nominations throughout the year for the MI Hall of Fame (HOF). Commissioned officers, warrant officers, enlisted soldiers, or civilians who have served in a U.S. Army intelligence unit or in an intelligence position with the U.S. Army are eligible for nomination. A nominee must have made a significant contribution to MI that reflects favorably on the MI Corps.

The Office of the Chief, Military Intelligence, provides information on nomination procedures. If you wish to nominate someone, contact the OCMI at U.S. Army Intelligence Center and Fort Huachuca, ATTN: ATZS-MI, Fort Huachuca, AZ 85613-6000, call commercial (520) 533-1173 or DSN 821-1173, or via E-mail at OCMI@hua.army.mil.

NGIC Uses Web-Based Visualization Technology to Inform Soldiers of Minefield Locations in Afghanistan

by Charles E. Hutson, Brendan F. Kelly, Harry L. Messimer, and Sergeant Brady D. Genz, USAR

Within weeks after the 11 September 2001 attacks, the U.S. Central Command (CENTCOM) asked the U.S. Army National Ground Intelligence Center (NGIC) to provide accurate geolocations of landmines in the Afghanistan theater for the purposes of operational planning. With the possibility of deploying U.S. ground troops at any time, the rapid identification of landmine locations was critical.

Within weeks of receiving the tasking, NGIC established a dynamic web-based mapping service through which they disseminated minefield locations to the Intelligence Community (IC) using geographic information system (GIS) technology. By the time the U.S. troops deployed, this information was available at both Secret and compartmented levels, providing ground commanders with the most current and reliable data and graphics depicting the geographic location of minefields.

NGIC is a major subordinate command of the U.S. Army Intelligence and Security Command (INSCOM). Located in Charlottesville, Virginia, NGIC is the Department of Defense's primary producer of ground intelligence. NGIC provides valuable information to tactical, operational, and national-level customers on ground forces and ground systems. As part of this service, NGIC has provided the IC with vast quantities of information about landmine systems, minelaying equipment, and countermine systems. However, providing accurate geolocations of landmines presented NGIC with a new challenge.

GIS Technology

In the past, commanders relied heavily on paper maps or static digital displays to obtain geospatial information. The major limitation of this process is that one static map product cannot meet the differing needs of the soldiers in the field. Every printed map or softcopy product distributed represented a compromise between the needs of differing users, none of whom received an ideal product. Now, with the advent of a web-based GIS, a simple web browser allows the user to visualize and query multiple data-layers. With this new tool, soldiers and analysts alike now have the ability to create customized maps and to provide dynamic web hyperlinks to related web sites.

The web-based GIS technology selected by NGIC is ArcIMS (Arc Internet Map Server), a commercially available GIS web tool. NGIC's ArcIMS web site has resulted in rapid dissemination of GIS minefield data to military operational planners supporting Operation ENDURING FREEDOM.

Simply put, a GIS is a computer-based mapping tool capable of assembling, storing, manipulating, displaying, and disseminating geographically referenced information. The layers of information one combines depend on the user's need, such as finding the most suitable helicopter landing zone, analyzing the terrain for cross-country movement, viewing a country's ground order of battle for operational planning or, in this particular case, determining the geolocations of minefields.

A functional GIS operation requires hardware, software, data, people, training, and sound methods to analyze the results generated by the GIS. A higher level of confidence is given to a GIS product if the analysis used the most detailed and accurate data available. Therefore, the data is by far the most important cog in the GIS wheel (see Figure 1).

GIS data comprises two types, geospatial data and attribute data. "Geospatial data" refers to a particular spot or location on the earth (e.g., the coordinates of a particular site or area). Coupled closely with this data is the attribute data. "Attribute data" is generally information associated with the spatial data. Consider the example of a reported minefield: the minefield's actual ground location is the spatial information while additional data such as the types of landmines, their blast radius, their layout pattern, and their emplaced

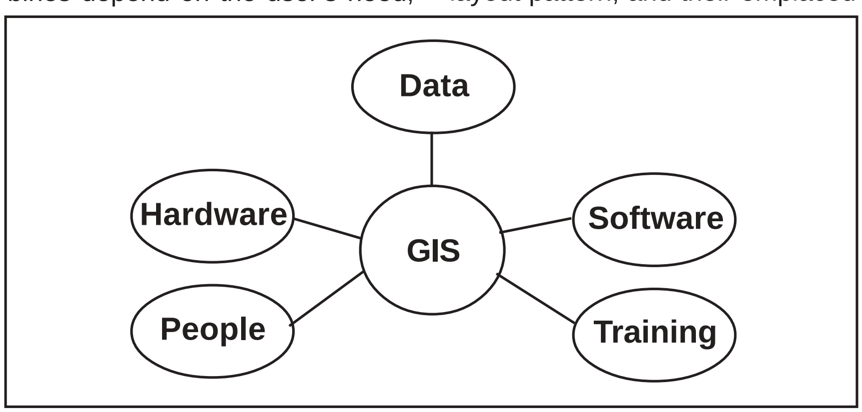


Figure 1. The Components of a GIS Operation.

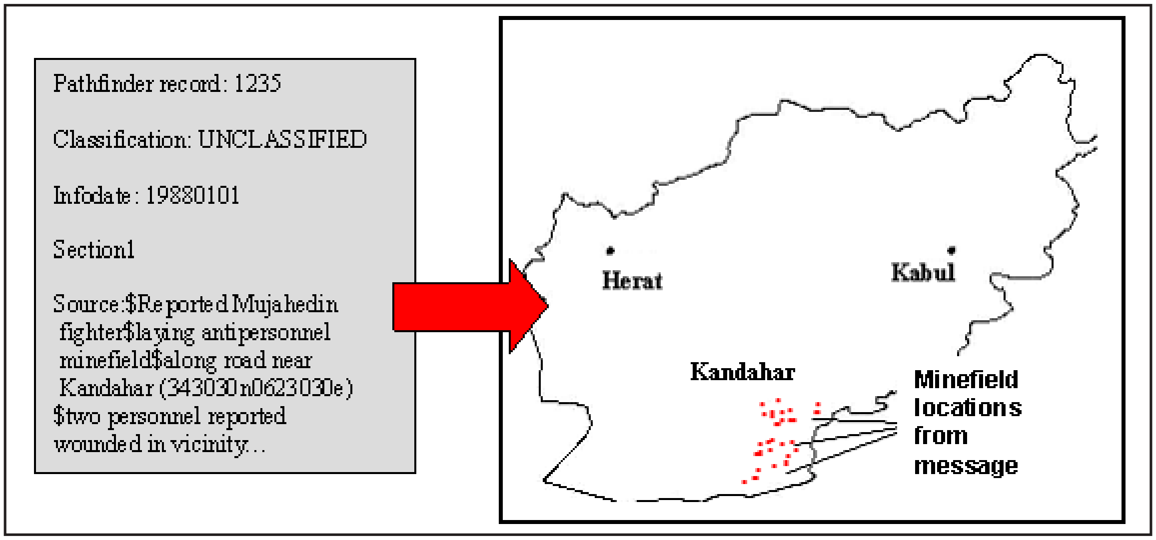


Figure 2. Message Traffic Used to Create Geospatial Layer.

time or date comprise the attribute data. It is the combination of these two data types that enables GIS to be such an effective decision-support tool.

Data Collection

In October 2001, NGIC obtained Soviet hardcopy maps depicting minefields in Afghanistan. Based on the originating sources and dates of the maps, they believed that the map data was current and accurate; however, in order to make use of this data, it was necessary to digitize and re-project the data from a Soviet map projection into a more user-friendly system using world geographic coordinates. Working with the Central Intelligence Agency (CIA) Map Library and employing specialized commercial image-processing software (ERDAS Imagine), NGIC digitized, re-projected and posted 81 original Soviet maps on NGIC's classified web sites within three days. They then translated maps' minefield locations into layers within ArcIMS.

In a quest for still more data, NGIC decided to review intelligence message traffic over the last 12 years to determine if there were any minefield incidents reported in Afghanistan that they had also tagged with geographic locations. Pathfinder, a mature message-traffic query tool currently employed by the IC, enabled NGIC to extract hundreds of additional mine incidents. Once they had captured the textual data, GIS tools automatically converted them to yet another minefield geospatial layer (see Figure 2).

Data Dissemination

As we previously discussed, GIS accomplishes data dissemination using the web-based GIS tool, ArcIMS (see Figure 3). The user has the option of viewing one or several layers of geospatial information by simply selecting them on the layer list. Map navigation tools allow users to pan and zoom to their areas of interest easily. Information tools are also available to link geospatial data portrayed in the map display to its respective tabular attribute data.

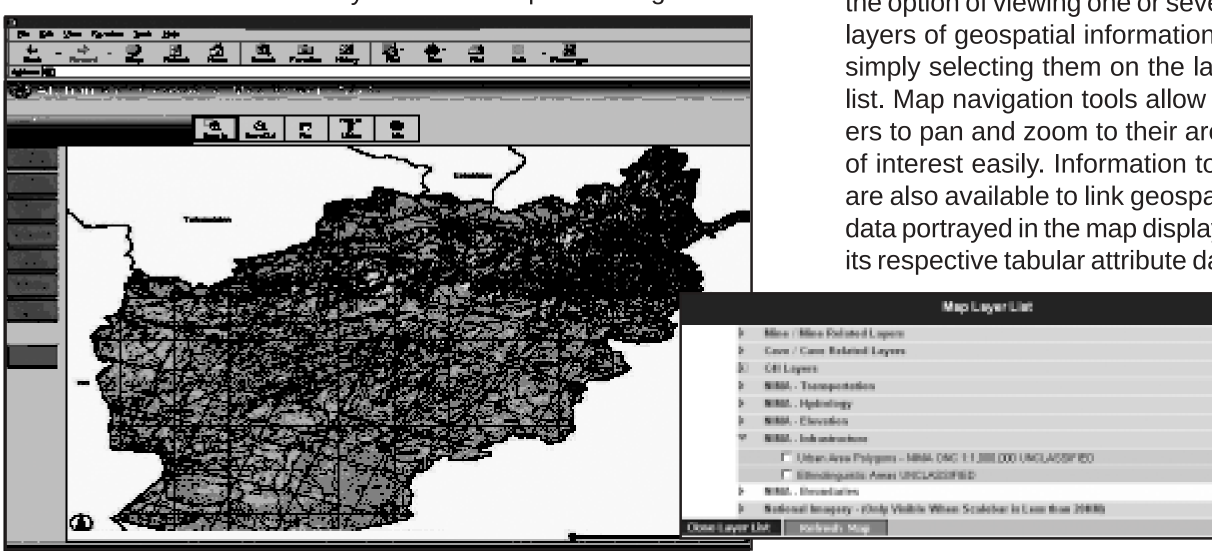


Figure 3. ArcIMS Interface as Employed on the NGIC Website.

Since this application resides in a web environment, it is possible to provide hyperlinks to other relevant web documents, such as imagery products, 3D "fly-throughs," and site drawings or diagrams as well. In response to numerous requests for the mine data available on the various country sites, NGIC added the capability for users to download GIS files directly into their computers.

To further support the warfighter, NGIC's GIS Team loaded all of the National Imagery and Mapping Agency's standard maps and CIB 5 (Controlled Imagery Base five-meter resolution) imagery, so that they may serve as reference layers in the ArcIMS. With this addition, users now have the ability to overlay minefield information on high-quality image based maps.

NGIC's ArcIMS Supports Ground Troops

On its ArcIMS site, NGIC posted the known minefield locations throughout Afghanistan. Although numerous Department of Defense and IC customers have accessed this data, the 26th Marine Expeditionary Unit (MEU) was one of NGIC's most significant ArcIMS users, especially when they first deployed to the Kandahar Airfield in December 2001. As soldiers first landed in this unfamiliar territory, minefields depicted on NGIC's ArcIMS site in and around the Kandahar Airfield proved to be timely and invaluable. Once the coalition secured the airfield and the mine-clearing operations were underway, the 26th MEU returned their updated GIS data from the field for posting on NGIC's ArcIMS site. Figure 4 shows an example of this data in ArcIMS depicting cleared minefield areas near the airfield.

Final Thoughts

Since the beginning of Operation ENDURING FREEDOM, NGIC has posted more than a dozen other geospatial map servers for crucial regions around the world. Although this article only addresses minefield locations, readers can access other intelligence layers through NGIC's ArcIMS site (e.g., infrastructure, geology, telecommunications, and links to other associated intelligence products). Since 11 September 2001, the Afghanistan geospatial map server has become the most accessed web-based product on NGIC's crisis support web page. NGIC will continue to provide expanded and updated geospatial information to assist our nation's forces as they carry out their missions.

Figure 4. Cleared Minefields Near the Kandahar Airfield.

We wish to acknowledge other organizations in the IC that contributed significantly to the success of this mission. The services and support of the following organizations were most valuable: Central Intelligence Agency Map Library, Defense Intelligence Agency Geospatial Analysis Division (OSJ-3), and the mobilized soldiers from the 422d, 3427th, 3428th, 3431st, and 3436th U.S. Army Reserve MI Detachments.

Charles Hutson currently serves as the GIS Program Manager at NGIC. He and his coauthors work in the Advanced Intelligence Projects Office. He has both Bachelors and Masters degrees in Civil Engineering, and he is certified as a professional Engineer. Mr. Hutson has served at NGIC for 17 years providing imagery and geospatial support. Readers may contact Mr. Hutson via E-mail at frhutce@ngic.army.mil and by telephone at (434) 980-7309 or DSN 521-7309.

Brendan Kelly currently serves as a GIS Analyst at NGIC. He holds a Bachelors degree and a Masters degree in Geography, and has been working in the GIS field for more than 10 years. He served at the Defense Intelligence Agency (DIA) for five years and recently joined NGIC to provide geospatial support. Readers can contact him via E-mail at frkelbf@ngic.army.mil and by telephone at (434) 980-7225 or DSN 521-7225.

H. Lee Messimer is a Computer Specialist and a GIS Analyst at NGIC. He earned a Bachelors degree in Liberal Studies and a Masters degree in Intercultural Studies. He has 18 years of experience in the Intelligence Community. Readers may contact him via E-mail at frmeshl@ngic.army.mil and by telephone at (434) 980-7962 or DSN 521-7962.

Sergeant Brady Genz, U.S. Army Reserve, is an Intelligence Analyst (military occupational specialty 96B) who has mobilized with assignment to NGIC's GIS Team. He is a software engineer for the University of Illinois at Urbana-Champaign. He holds a Bachelors degree in Computer Science and Mathematics, and is nearing completion of a Masters degree in Software Engineering. Readers can reach him via E-mail at frgenbd@ngic.army.mil.

Datums and Grids–What You Don't Know Can Kill You

by Major Richard J. Manning, USAR

Using a standard military map, a forward observer calls in grid coordinates for a fire mission. The field artillery battery receives the mission and the fire control crews initialize their state-of-the-art ballistic computer in accordance with the operations order (OPORD). The rounds impact 200 meters short of the target.

The problem was neither an inaccurate map nor a software problem in the ballistic computer. Rather the problem was human error.

Misuse of Datums and Grids

The misuse of datums and grids is a problem in our modern military. Many soldiers and leaders do not understand and are often mystified about how to employ datums[1] and grids properly. In the vignette above, the forward observer used coordinates generated from a current map with the North American Datum 1927 (NAD-27) while the fire control battery initialized their computers using the military standard World Geodetic System 1984 (WGS-84) datum. The basic problem is that datums are like different languages—without a translator they are incompatible with one another, in this case providing a different physical view of the earth for what appear to be identical grid coordinates.

Datum. As used here, "datum" is the base reference for an X, Y coordinate system. Because the earth is not a perfect sphere, we developed mathematical models for the accuracy of coordinates in specific geographic areas. Known as "local datums," they use an irregular ellipsoid model to obtain a "best fit" of the earth's surface for a particular region. Inconsistencies with local datums led to the development of the single worldwide system called WGS-84. This is the good news. The bad news is that it will be many years before all U.S. maps convert to this world geodetic system. As a result, multiple datums are normal on the battlefield and the military must exercise them in training.

Accuracy. The Department of Defense (DOD) requires the highest accuracy for precision navigation and delivery of long-range missiles and other guided munitions. **WGS-84 is the DOD global datum and the military mapping standard for all future products**. The National Imagery and Mapping Agency (NIMA) and Global Positioning System (GPS) use the WGS-84 datum as their standard. Datum information appears on NIMA map sheets in bold letters on the face or in the legend. OPORDs must clearly articulate which datum(s) are in use for an exercise or contingency. In Korea, the only datum permitted in the support of military operations is WGS-84, which prevents mixing with the local datum, significant positioning errors, and possible accidents. To ensure usage of WGS-84 products, users should destroy older map stock and put operational safeguards in place to prevent accidental use. Comparing a local datum to WGS-84 introduces significant error. Figure 1 compares four of the most common local datums with the WGS-84.

Difference Between NAD-83 and WGS-84

The difference between the two is insignificant for most applications because the shift is less than a meter and well within an acceptable error rate. Current NIMA military maps identify both NAD-83 and WGS-84 as the synonymous horizontally accurate datum for maps. With the proliferation of GPS and precision munitions, accurate use of maps and datums is more critical than ever. Leaders must challenge their soldiers to gain a basic understanding of datums and to

Photographs courtesy of the Fort Sill *Cannoneer*.

Modern weapons systems require proper datums to allow artillery elements to accurately deliver their ordnance.

Datum	Location	Average Shift
ED-50	Europe	175 meters
Tokyo	Korea	755 meters
NAD-27	U.S.	208 meters
NAD-83	U.S.	<1 meter

Figure 1. Comparison of Common Datum Systems.

train on their proper use. Tools and training aids are available to assist your unit to train safety and succeed on the battlefield. Figure 2 suggests some sources of additional information.

Leadership at all levels must be capable of extracting relevant OPORD information to execute mission planning.

Endnote:

1. In general writing, we use "data" as both singular and plural (the meaning changes based on whether data appears with a singular or plural verb form); "datum" is rarely used. However, this article uses "datum" in the specialized meaning employed in surveying and latitude and longitude as used by the Department of Defense and the National Imagery and Mapping Agency.

Major Rich Manning, USAR, is the S1 of the 460th Chemical Brigade at North Little Rock, Arkansas. His civilian occupation is Geospatial Analyst with the National Imagery and Mapping Agency (NIMA) at the U.S. Army Training and Doctrine Command (TRADOC) Terrain Visualization Center at Fort Leonard Wood, Missouri. Readers may contact the author via E-mail at manningr@wood.army.mil.

Soldiers must learn and practice basic map reading skills.

1. Datum Conversion Software: Geographic Translation Version 2.0 (GEOTRANS 2.0) is an easy to use Windows® (95 and NT) and UNIX software used to convert local datums to WGS-84 format. GEOTRANS 2.0 is the DOD-approved datum transformation and coordinate conversion program. Readers may download GEOTRANS 2.0 at the following website http://164.214.2.59/GandG/geotrans/geotrans.html.

2. Grid and Datum Manual: This NIMA reference manual provides information on grids and datums applied to DOD maps and charts. You may download it at http://164.214.2.59/GandG/tm83581/toc.htm.

3. GPS Tutorial: This is a basic, nontechnical course of instruction on CD-ROM (compact disc read-only memory) intended for Army GPS users. It contains an emulator for students to become familiar with the PLUGGER interface. The NSN is 7644014454559 and the NIMA Reference Number is GPS XXTUTORCD. Please see the website at http://www.wood.army.mil/TVC/FactSheets/gpsfctsht.htm.

Figure 2. Sources of Additional Information.

Have You Moved? Duplicate Issues?

Please notify ***MIPB*** of your address change or duplicate issues received. You may send an E-mail message to misty.simpkin@hua.army.mil with a subject: "Address Change." You can also call (520) 538-1009/0979 or DSN 879-1009/0979 or write us at Commander, USAIC&FH, ATTN: ATZS-FDR-CB (MIPB), Fort Huachuca, AZ 85613-6000.

Terrain Models as Battlefield Visualization Training Tools

by Captain David C. Stempien

Among the earliest tools associated with military terrain visualization was the terrain model. Although walking over (ground truth) or directly observing the terrain from a vantage point remains the best method for understanding the terrain, this approach is often impractical given the size of the area or the presence of a threat force. Other approaches such as line drawings, maps, and digitized displays have been or are in use. The second best approach, however, is the use of a terrain model which offers the advantage of providing a three-dimensional (3D) view of the target area's natural and man-made features.

The Need for Terrain Models

The use of terrain models is traceable to ancient times, probably beginning with simple drawings in the sand highlighted by the use of rocks and pieces of wood to represent people and terrain features. Roman and Chinese documents cite more detailed terrain models of fortified cities and in the late 16th century, Pope Clement VII employed a cork model of Florence to help plan his successful siege of that city. Then in the 17th century, King Louis XIV of France had terrain models created to depict accurately the state of the nation's fortified cities as well as those of potential enemies. Use of these models allowed his evaluation of the cities' defenses without having to travel to inspect them. So intricate were the models made for King Louis XIV, now considered works of art, many are on display at museums.

The French employed terrain models in support of military operations. One example is a terrain model of the city of Ath in Flanders that the French military engineer, Sebastien Le Prestre de Vauban, ordered before his attack on that city. Study of the model significantly contributed to the city's surrender after only a two-week siege.

Even so, detailed 3D terrain models were rare until the l940s because of the difficulty in their manufacture. This changed during World War II when lightweight materials and new techniques allowed their rapid production. Terrain models figured in the outcome of several critical operations during that war to include the Japanese attack on Pearl Harbor and the Allies' landings on Normandy's beaches.

Today, the U.S. Army intelligence analysts and engineers employ terrain models in a variety of sizes and means to support many types of missions. Continued improvements in material and process as well as the use of computer-imaging, -measuring, and -cutting systems have provided a quantum improvement in the accuracy and detail of the 3D terrain models in use today. Uses for terrain models include but are not limited to—

- Training (many types).
- Predictive analysis (threat courses of action (COAs)).
- Assisting the combatant commander in planning his own COA.
- Support to stability operations and support operations.
- Major engineering projects.

The underlying terrain to some extent restricts any action, either friendly or threat. Thus, understanding the implications of both natural and man-made features can be critical to the mission's success or failure.

As with any endeavor, one needs an element of skill to design and construct any but the most rudimentary terrain models. While there is no formalized military training in their design and construction, the Army recognizes their importance, and their development often receives the highest priority. For those who have never before developed a terrain model, the task can seem daunting. Unfortunately, because they are resource-intensive, learning to design and construct a terrain model does not usually occur during advanced in-

Photographs courtsey of Tom Daley.

Contract helper Tim Durfey and volunteer Gary Briles shave the Styrofoam.

dividual training (AIT), but rather on-the-job with a soldier's unit. This effort is not lightly undertaken because the design and construction of terrain models are both time- and resource-sensitive. The result, however, may be more useful than that provided by any other visualization tool since they present an all-aspect, 3D view of the subject terrain. Finally, the level of detail employed in these terrain models varies considerably due to focus, time, assets, and mission. This article looks at two aspects of terrain models, their use in training, and an example of a larger-than-usual terrain model that the U.S. Army Intelligence Center and Fort Huachuca (USAIC&FH) recently completed.

Requirements

Only the smallest or least sophisticated 3D terrain models require little more preparation than placing rocks or drawing lines in the sand. Those terrain models that support battalion and larger operations usually require the collection of a great deal of background information, maps, and imagery. This is even more critical when the terrain model must also depict threat forces. Figure 1 reflects some but not all of the elements required to design a terrain model that supports a division-level operation.

Caspian Sea Model

Because of their cost in both time and resources, terrain models used at USAIC&FH are usually for an exercise or series of exercises and normally used over a long period. As a training tool, terrain models must support a variety of scenarios and terrain features and they allow instructors a great deal of flexibility. Recent changes in the contemporary operational environment (COE) caused USAIC&FH to modify some of its training to address the new COE. One response was the development of a large 3D terrain model that would support at least one major exercise but could also support other exercises and the school's training mission.

The area chosen for the terrain model borders the Caspian Sea in Southwestern Asia. This area has diverse topography that consists of the Caspian Sea, its coastline, a port city, flat plains, long narrow valleys, highlands, and mountain ranges. The diverse nature of the terrain facilitates the training of intelligence analysts by providing many types of scenarios and environments. With instruction and use of the terrain model, the students can learn how an adversary may block an area, how to prevent such an effort, how weather and terrain may affect the operation, determine the importance of mobility corridors, and much more.

Building the Model

The Caspian Sea model is larger than most and represents an area of 61,440 square miles. Physically, it measures 24 by 28 feet and provides a scale of one inch to one mile. This 432 square-foot terrain model, made of metal, plywood, and Styrofoam™, can support the weight of people walking on it. Supporting its construction were a professional exhibits model-maker from the Intelligence Center's Visual Information Division, a carto-

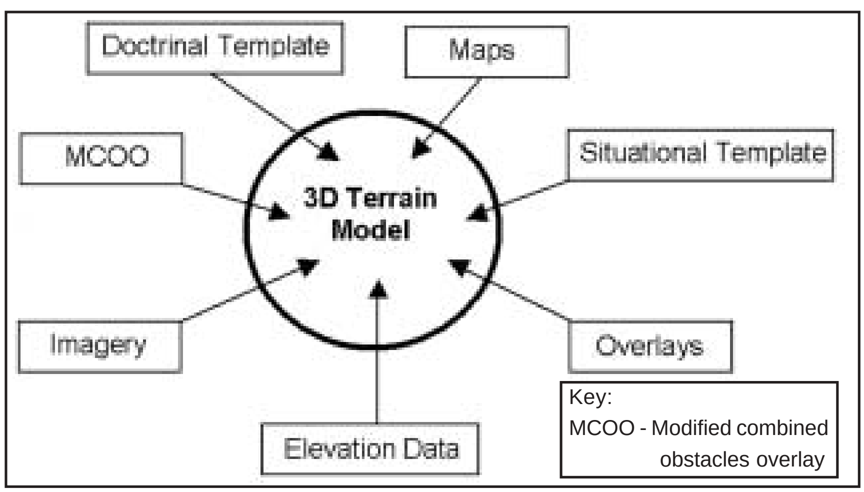


Figure 1. Considerations in Developing a 3D Terrain Model.

Exhibits model-maker Ruben Zuniga shaping the Styrofoam.

graphic and imagery specialist from the National Imagery and Mapping Agency (NIMA), as well as three volunteers.

Using an overhead projector, the builders projected the transparencies of NIMA imagery of the region on sheets of Styrofoam, then cut out the lower levels to match the terrain. Another sheet of Styrofoam represented the next terrain level. They repeated this process several times to construct the mountains and valleys. The builders then shaved the Styrofoam to create the nooks and crannies reflecting the contour lines of the map data the overhead projector displayed. The tallest mountain, with a vertical measurement of 14 inches, represents a 16,000-foot-high mountain peak.

The final step was to paint and wire the model. The builders carefully chose colors that would define the terrain by differentiating the land, sea, and mountains and added the outlines of the region's cities, towns, and villages, as well as railroad tracks, airfields, and roads. Finally, they wired the model with lights to highlight the roadways, railroads, power stations, and other significant features on the terrain model.

Projected Employment

Among first to make use of this large training aid was the U.S. Army Training and Doctrine Command (TRADOC) System Manager (TSM) for Unmanned Aerial Vehicles and Aerial Common Sensor (UAV/ACS). TSM UAV/ACS employed the terrain board to support its Extended Range/Multi-Purpose (ER/MP) Tactical UAV Map Exercise (MAPEX) held 19-23 August 2002. The MAPEX included use of the Caspian Sea scenario in a series of five vignettes, with the intent to "play" ER/MP TUAV support to forces on the ground and to see what support the UAV did and should provide. Additionally, the MAPEX was to identify what sensor capabilities are essential, and what operational tempo (OPTEMPO) is necessary to keep the warfighter apprised of actions within the battlespace. The terrain board proved to be an invaluable tool, helping to visualize how, where, and when the UAV support helped the ground commander and his troops see first, understand first, act first, and finish decisively. Completion of the MAPEX left the terrain board free for use as a training tool; however, it also stands ready for use in future exercises.

Captain David Stempien received his commission from Norwich University, Military College of Vermont. He is an imagery intelligence- and signals intelligence-trained officer currently serving as the Assistant Battalion S3 for the 304th Military Intelligence Battalion at Fort Huachuca, Arizona. His previous assignments include Deputy S2 and Reconnaissance, Surveillance, Target Acquisition Chief for the 3d Armored Cavalry Regiment at Fort Carson, Colorado, and Collection Manager, Multinational Division-North in Bosnia-Herzegovina for Stabilization Force 7 (SFOR-7). *Readers can contact him via E-mail at david.stempien@hua.army.mil and by telephone at (520) 533-6509 or DSN 821-6509.*

Generating One-Meter Terrain Data for Tactical Simulations

Figure 1. PVNT 3D View Screen Capture of a Perspective View.

by Wolfgang Baer, Ph.D.

In order to enhance a soldier's effectiveness on the battlefield, simulation systems depicting operational scenarios require the accurate calculation of concealment, cover, and detection parameters. Measurement and analysis of tactical battlefield features requires the generation of metrically accurate terrain-elevation databases at higher resolution than the standard 90- and 30-meter data available from the National Imagery and Mapping Agency (NIMA). However, the generation and exploitation of higher-resolution terrain data can be slow and expensive and potentially a significant obstacle in conducting tactical terrain analysis. This article describes a low-cost system designed to address the generation and usage of 1-meter-resolution terrain in large-area tactical battlefield simulations.

The system, under development at the Naval Postgraduate School (NPS) in Monterrey, California, greatly enhances the cost effectiveness of high-resolution terrain data by employing low-cost personal computer (PC)-based software. The software, known as PVNT (or perspective view nascent technologies), can generate the terrain data and use it to create perspective views (Figures 1 and 2) and to perform line-of-sight (LOS) as well as weapons-effectiveness analysis.

Figure 1 shows a perspective view of two helicopters flying over Fort Hunter Ligget, California. Study of the terrain reveals trails and bushes. These features are on the order of one meter and their placing is accurate within approximately two meters. The images, generated under joy-stick control, are at better than 30 frames-per-second on a high-end PC.

PVNT operates on standard PCs running Windows® NT, 98, and 2000. NPS designed it to address the real-time generation of accurate battlefield views at any time of day and under all weather conditions. Its users include the Aviation and Missile Research, Development and Engineering Center (AMRDEC) in Huntsville, Alabama, which used the

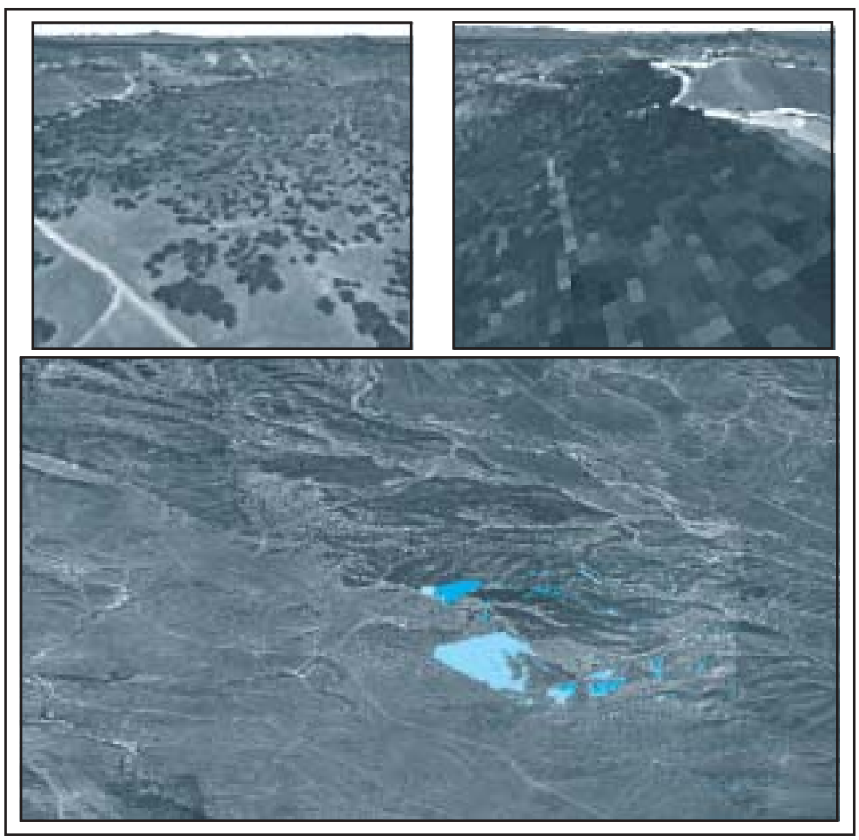


Figure 2. Multiple Windows from a Screen Capture of PVNT Images and Map.

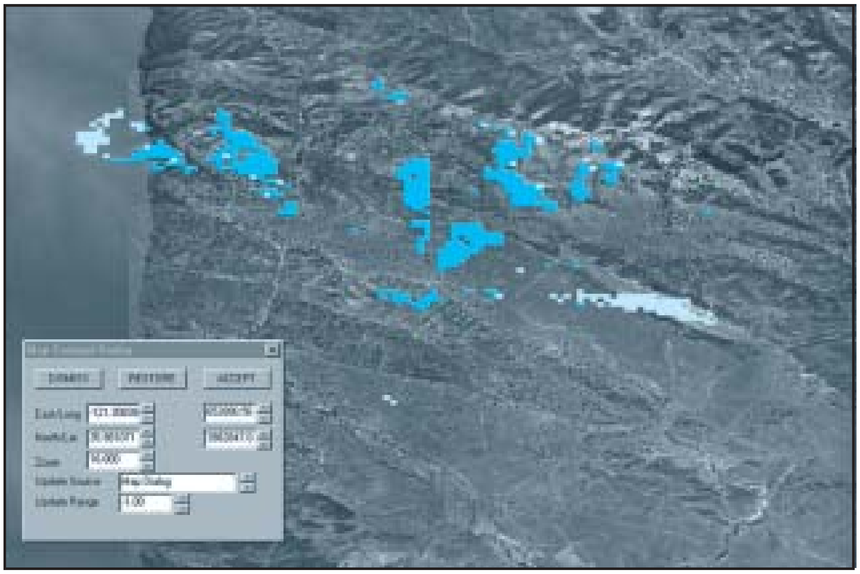


Figure 3. PVNT Screen Capture Showing the Route for Stony Valley and the Corresponding Fire Opportunities Map for Route Node 0.

program to perform a weapons effectiveness comparison between a TOW (tube-launched, optically tracked, wire-guided missile system) 2B and a TOW FF (fire and forget).

Figure 2 shows a screen capture of PVNT windows used for LOS analysis. NPS generated two perspective views and displayed them in the upper windows. At the center bottom, a map view shows as light blue and medium blue the area under observation in each of the viewer windows. Both the perspective views and ground visibility cones move in real time under joy-stick control.

The user selected target routes of interest in a one-meter terrain dataset, and the system calculated hit probabilities for each route point from all possible attack positions within a four-kilometer radius. Figure 3 is a PVNT screen capture showing the result for a single route point. The light blue indicates those ground areas from which TOW 2B and TOW FF weapons can attack the single route point. The medium blue indicates those ground areas that only the TOW FF can attack. The additional successful attack area for the TOW FF provides a measure of greater weapon effectiveness. The basis of the software used LOS calculations is detailed knowledge of the terrain elevation. We can only achieve a meaningful result in this comparison using terrain data with one-meter or better resolution.

PVNT imports standard NIMA digital terrain evaluation data (DTED) and has local update tools that allow new information, gathered by local sensors and from data reports, to improve and enhance the information in the terrain database. It is unique in that most scene-visualization programs store the terrain surface as a polygon database, whereas PVNT uses raster formats (pixels), which are more appropriate for scientific scene visualization. Therefore, PVNT is more suitable for handling remotely sensed data and for integration with tactical battlefield sensor systems.

The software also has extensive feature-modeling and database editing capabilities. The left side of Figure 4 shows an image of trees and bushes in a sample terrain. The program measures the size and shape of identified features and executes a three-dimensional (3D) modeling program to fit the best tree outline to the measured feature. It categorizes the resulting objects by height as either trees (light blue) or lower vegetation (medium blue).

PVNT is a software package that addresses both the data-generation and data-exploitation issues. It allows the insertion of 3D models for a large variety of features that the user might encounter on the terrain. PVNT provides support for producing metrically accurate representations of the

(Continued on page 42)

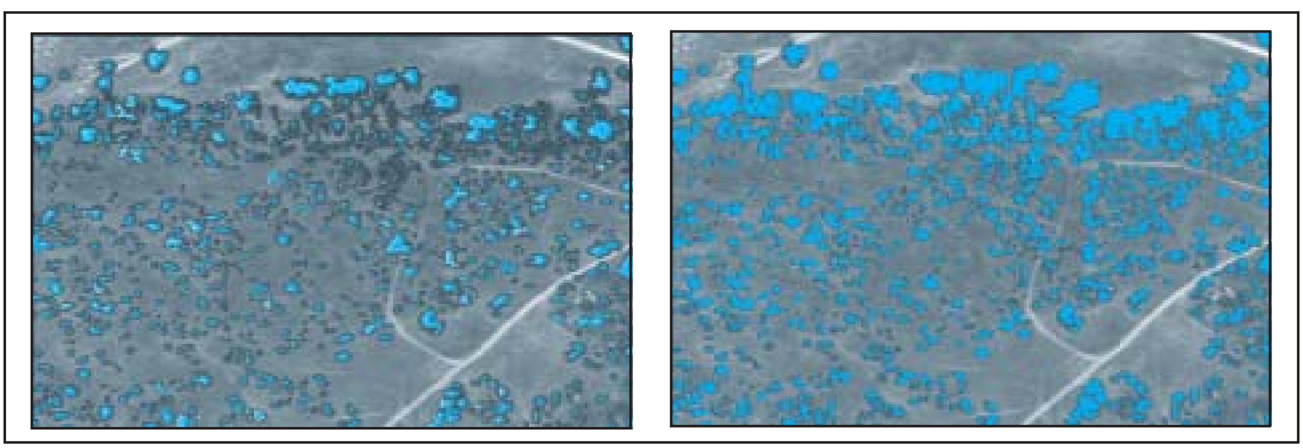


Figure 4. Example of Terrain Feature Identification and Modeling in PVNT.

The 101st Airborne Division (Air Assault) Deployable Intelligence Support Element (DISE) in Operation ENDURING FREEDOM

by Major Drew Moores

The Afghanistan…campaign is not over, but analysts and senior military officials are hailing it as the first conflict in which intelligence was the primary U.S. weapon. Key factors in their assessment were persistence (the ability to maintain round-the-clock surveillance), integration at the tactical and operational levels of intelligence from many sources, and the ability to control data collection.

—David A. Fulghum, "Intel Emerging as Key Weapon in Afghanistan," Aviation Week and Space Technology, 11 March 2002

The Commander of the 101st Airborne Division (Air Assault) had a brigade combat team (BCT) deployed in support of Operation ENDURING FREEDOM. They had to cover an area of interest (see Figure 1) that is half the size of Texas with a series of combat and stability and support operations missions to accomplish and a command and control relationship that was not exactly standard.

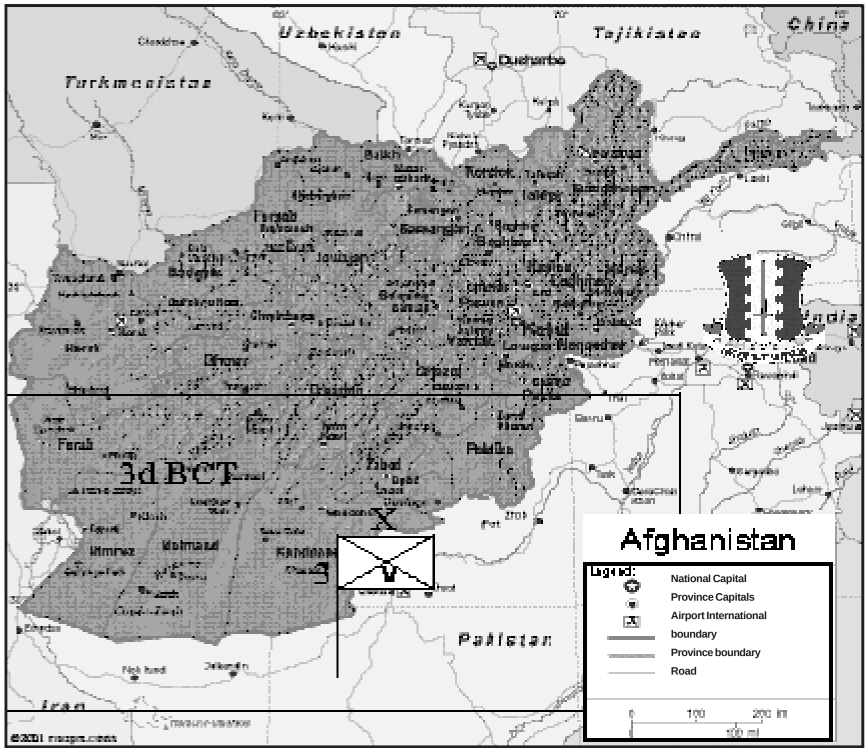
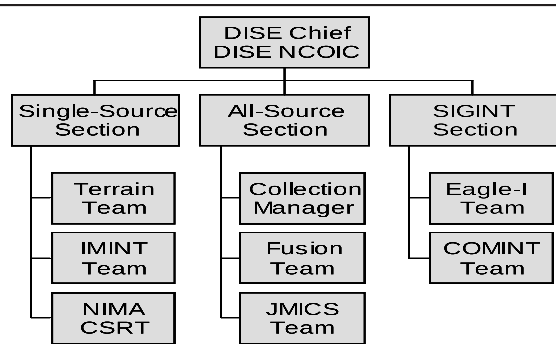


Figure 1. The 3d BCT Area of Interest Was Southern Afghanistan and Western Pakistan.

The Commander dispatched a deployable intelligence support element (DISE) (see Figure 2) to augment the BCT's organic intelligence capabilities. The DISE joined the Division's 3d Brigade—the famed "Rakkasans" of the 187th Infantry Regiment—at Kandahar Airfield on 1 February 2002. It consisted of 16 soldiers and 3 civilian contractors from the U.S. Army Communications Electronics-Command (CECOM) and the U.S. Army Space Program Office (ASPO).

The DISE had the mission and organic systems shown in Figure 3. It joined other intelligence assets already deployed including a four-man National Imagery and Mapping Agency (NIMA) Customer Support Response Team (CSRT) and three individual augmentees from the Division Analysis and Control Element (ACE) who reinforced the Brigade's Analysis and Control Team (ACT).

Other intelligence units would link up with the DISE at Kandahar. An electronic warfare (EW) section from Canada joined the 3d BCT later that month. It combined with 3d BCT's direct support (DS) military intelligence (MI) company assets to form



Note: The National Imagery and Mapping Agency Customer Support Response Team was already at Kandahar when the DISE arrived. The JWICS Mobile Integrated Communications System joined the DISE in early March.

Key:
COMINT – Communications intelligence
CSRT – Customer Support Response Team
IMINT – Imagery intelligence
JMICS – JWICS Mobile Intelligence Communications System
JWICS – Joint Worldwide Intelligence Communications System
NCOIC – Noncommissioned officer in charge
NIMA – National Imagery and Mapping Agency
SIGINT – Signals intelligence

Figure 2. DISE Organization.

Mission

The 101st DISE provides direct intelligence support to 3d BCT, and to tenant and adjacent units at Kandahar Airport.

Key:
ELINT – Electronic intelligence
TROJAN SPIRIT II – TROJAN Special-Purpose Integrated Remote Intelligence Terminal II
Topo – Topographic

Systems

- Digital Topo Support System (DTSS)
- Quick-Reaction System (NIMA)
- Integrated Intelligence System (I2S)
  - All-Source Analysis System (ASAS)
  - Remote Workstations (RWSs)
- Eagle-I (ELINT)
- TROJAN SPIRIT II
- JWICS Mobile Integrated Communications System (JMICS)

Figure 3. The DISE's Mission and Systems.

an EW cell with its sole focus on force protection (FP) for Kandahar Airfield (KAF). A JWICS (Joint Worldwide Intelligence Communications System) Mobile Intelligence Communications System (JMICS) from XVIII Airborne Corps' 525th MI Brigade arrived on 2 March 2002. The JMICS provided support to the 3d BCT with sensitive compartmented information (SCI) video teleconference (VTC) and other capabilities.

Support to Combat Operations

The DISE fully participated in Operation ANACONDA, the largest ground offensive to date in the Global War on Terrorism. Here the 101st DISE played a significant role in situation development and support to targeting. The DISE also assisted the Brigade S2 in his intelligence preparation of the battlespace (IPB) effort. Analyzed imagery and communications intelligence (COMINT) were the mainstays of this effort, to include the fused products.

Support to Tenant Units

Engineers, special forces, civil affairs, and theater-level MI battalions all have one thing in common—they require high-quality maps and geospatial products (see Figure 4) to operate efficiently in a foreign land. This is especially true in a location like Afghanistan, where those who deployed early had to rely on Soviet-era maps with differing and sometimes incompatible data. Kandahar was not only the base camp for the Rakkasans, but it was also home to several other U.S. and at least eight foreign military units. The 101st DISE also supported these units with special mission-focused intelligence products that the NIMA CSRT, imagery intelligence (IMINT), and terrain teams provided.

- Imagery analysis
- Photomaps
- Gridded reference graphics
- Mosaics
- Perspective views
- 3D anaglyphs
- Operational fly-throughs
- LOS analysis
- Lines-of-communication analysis
- Map enlargement

Figure 4. Geospatial Products.

Lessons (Re)Learned

Systems are rifles; data makes bullets. The value-added a DISE provides to the warfighter are its mission-relevant products developed from information not accessible by organic assets. The DISE deployed with a robust suite of systems that provided the 3d BCT Commander with access to theater- and national-level intelligence systems and products. Despite this tremendous capability, without trained soldiers knowledgeable of air assault and light infantry operations and the unit's current mission, that data would remain "information," and not relevant tactical intelligence, that is "rounds on target." I also believe the analysts need to accompany the unit and commander in the area of operations (AO) and live under the same conditions as the soldiers they support. Doing so provides them with the same situational awareness and sense of urgency that the other soldiers experience.

Trained Personnel + Systems + Connectivity = Capabilities. Warfighting is about capabilities, and the Intelligence battlefield operating system (BOS) is no different. What is different about the Intelligence BOS is its critical requirement for connectivity to higher echelons, as

DISE
- Support brigade S2 with all tactical MI tasks (except BDA)
- Link to corps and above assets/sources
- Support tenant units on KAF

Brigade S2
- No change to standard responsibilities

DS MI Company
- Tactical SIGINT support focused on FP
- Counterintelligence support
- JSTARS CGS support
- Supports DISE with standard company functions

Key:
BDA – Battle damage assessment
CGS – Common Ground Station
JSTARS – Joint Surveillance Target Attack Radar System (Joint STARS)

Figure 5. Responsibilities of the 101st Airborne Division's Intelligence Elements.

opposed, for example, to a deployed forces' mobility, countermobility, and survivability capability, which is most likely inherent in its colocated engineer unit(s). Experienced MI soldiers, armed with the hardware, software, and connectivity to reach back to theater and national assets, provide the commander and his staff with the terrain, imagery, and signals intelligence (SIGINT) information needed to make a difference on the objective.

Lanes-in-the-Road. While "competing analysis" is good for strategic intelligence problems where time is available, at the tactical level where time is precious, the Intelligence BOS must focus on what is relevant, with a "deliverable" as the end state. The Brigade Commander, S2, Company Commander, and DISE Chief established these "lanes in the road." Establishing "lanes" is important (see Figures 5 and 6).

- Provide indications and warnings (I&W)
- Perform IPB
- Perform situation development
- Perform target development and support to targeting
- Support FP
- Perform battlefield damage assessment

Figure 6. Tactical MI Tasks.

Contractors on the Battlefield (COB). Contractor support is an effective force multiplier and can be an invaluable tool for supporting deployed forces. Contractors have always accompanied our military overseas. However, the increase in contingency operations and technology that mandates their use in today's FP Army is unprecedented (see Figure 7).[1]

The DISE in direct support to Task Force Rakkasan had 20 pieces of hardware using 3 or 4 different operating systems (UNIX® Solaris 2.6 and 2.51, Windows®, and Open VMS 7.1-2) and ten software packages. Keeping these systems running was not a task for amateurs, especially when the information the systems provided support decisions with lives hanging in the balance. The DISE deployed with three civilian contractors (officially called Tactical Automation Support Field Software Engineers) who were instrumental in making the DISE a successful venture; while DISE soldiers are trained operators of these systems and software, they have neither the technical training nor experience to troubleshoot major problems. Additionally, they do not possess the skills necessary to resolve connectivity or compatibility problems between the different systems required to function together. Finally, the contractors, many of whom are veterans themselves, provide on-the-spot training to operators, increasing their individual capabilities and greatly improving intelligence support to the warfighter. Figure 7 shows a list of tasks the contractors performed on this mission.

Conclusion

The Screaming Eagle DISE validated its capabilities during Operation ENDURING FREEDOM by proving its value-added to a maneuver commander during combat and stability and support operations. National-level data combined with mission-focused soldiers produced relevant tactical intelligence that supported targeting and situational awareness. A flexible, adaptable unit, the DISE was ready and able to integrate with elements from other intelligence organizations and thus increase its capabilities by an order of magnitude. Backed up with some critical skill sets from a few contractors, the DISE was able to assist the commander in "seeing the enemy and the battlespace" in a manner that past commanders could scarcely have imagined. The knowledge and experience gained from this operation will help prepare all military intelligence soldiers of the 101st for their next "rendezvous with destiny."

Endnote

1. **FM 100-21**, **Contractors on the Battlefield**, 26 March 2000, Chapter 1.

Major Drew Moores was the DISE Chief for this mission. He has served in a variety of intelligence positions at all echelons, and is a graduate of the Postgraduate Intelligence Program (PGIP) and the Command and General Staff Course (CGSC). He is currently the Deputy G2, 101st Airborne Division (AA). Readers can reach the author at (270) 798-4802 or via E-mail at mooresd@campbell.army.mil.

- Assist users with Solaris administration of national systems.
- Create high-side web pages on the Single-Source ASAS system and low-side web pages on the Remote Workstation (RWS) Block I.
- Create a query support package (QSP) on the Single Source. QSP is a program that allows the user to perform queries on the single-source databases and plot them to Oilstock.
- Create custom scripts for plotting, with predefined queries, to Oilstock.
- Perform network and LAN administration.
- Assist with TROJAN SPIRIT II troubleshooting.
- Perform administration of non-ASAS Windows® systems because of lack of C^4I support.
- Assist in troubleshooting of generator and power problems.
- Provide guidance to Canadian counterparts on the administration of their systems, primarily UNIX and Oilstock administration and configuration.
- Provide assistance to counterparts and unit personnel within the 10th Mountain Division (Light).
- Assist with hardware troubleshooting of the DTSS and RWS Block II systems.
- Provide high-side and low-side E-mail capabilities and assist users in setting up E-mail client software.
- Fill sandbags as the need arises.

Key: C^4I – Command, control, communications, computers, and intelligence
LAN – Local area network

Figure 7. Tactical Contractor Tasks.

The UAV Exploitation Team, 297th MI Battalion

by Warrant Officer One Sam Hairston

The Unmanned Aerial Vehicle (UAV) Exploitation Team (UET) is one of the Army's premiere intelligence assets. A part of the 297th Military Intelligence Battalion, the UET is the only Army asset with the primary mission of exploiting UAV imagery. The team's ability to provide accurate real-time intelligence and situational awareness greatly enhances commanders' decisions on the battlefield. In performing its mission, the team works with the U.S. Air Force which operates the RQ-1 Predator UAV.

The Predator UAV is a medium-altitude theater intelligence asset, used for reconnaissance, surveillance, and target acquisition. It can deploy to high-risk areas, minimizing battle hazards to soldiers' lives. Examples of its use include locations where we have not fully suppressed enemy air defenses, mountainous terrain, open ocean environments, and areas contaminated by biological or chemical hazards. The system can loiter for extensive periods thus enabling accurate intelligence collection.

Exploitation rests on the shoulders of highly trained soldiers who provide the analytical effort. The team comprises ten imagery analysts, a noncommissioned officer in charge (NCOIC) (Staff Sergeant or above), a liaison team, and an imagery warrant officer (WO1 through CW3). The warrant officer serves as the mission manager and the NCOIC is the team leader. The analysts, the NCOIC, and the warrant officer are geographically separated from the UAV launch location. They usually co-locate with the corps G2 or the joint analysis and control element. At the launch location, the pilot-operators control the Predator's travel according to preplanned flight paths; the UET liaison team, comprised of two soldiers, is also at the launch site. They assist in articulating sensor control, enabling additional dwell times or revisits to particular areas of interest.

Their specialized equipment, referred to as a Multimedia Analysis and Archive System (MAAS), enables their exploiting full-motion video focused on named areas of interest (NAIs). There are two screening stations, two capture stations, two information stations, two analyst stations, and two research stations. The Army uses the screening stations to evaluate targets assigned to NAIs that would likely answer a commander's concerns. As implied, the capture station allows analysts to encapsulate pictures they convert into graphical intelligence products. Used in concert with the analyst stations, the information and research stations provide additional research capabilities for in-depth analysis. In addition, there are two plasma screens, four video cassette recorders, and two 12'' television sets. All of this provides the ability to maintain 24-hour production.

With such equipment, the UET can provide intelligence quickly and accurately to the consumer. The team produces an imagery interpretation report (IIR), secondary imagery dissemination product, and a video clip to the commander. This multi-layered method of intelligence reporting provides complete answers to information gaps. These products are also available to ground units and the intelligence community via a web page. In addition to this method, the team takes additional steps to ensure that their analysis is beyond doubt.

The UET cross-references initial phased exploitation with other intelligence systems within the Battalion. They compare the imagery with electronics, signals, and other imagery intelligence (IMINT) from the Tactical Exploitation System (TES), measurement and signature intelligence, and Common Ground Station. Once the team has compared and verified the intelligence, it provides additional reports. These steps for ensuring accuracy give the UET the quality reputation it possesses today.

The UET has proven that it is an intelligence multiplier in crisis and war. The team's capability became a preference of operational and battlefield commanders during Operation ENDURING FREEDOM. Its intelligence supported U.S. Army, coalition, and allied forces as well as our other Services and special agencies. Furthermore, the UET provided critical support to Operation DESERT SPRING and is still a crucial asset in Operation SOUTHERN WATCH.

Because of its demonstrated capability, the UET will continue to be a cornerstone of the 297th MI Battalion's IMINT services. Changes in communications architecture and technology upgrades may soon allow the team to conduct real-time exploitation of combat imagery from their home station, rather than from an operational theater; the changes will be seamless to commanders and other customers. Intelligence will still be timely, accurate and reliable, while the UET will benefit by reducing the frequent deployments of soldiers and eliminating battle hazards. When it comes to real-time battlefield visualization, the UET will remain the intelligence system of choice for the land component commander.

I wish to thank Captain Dexter Daniel, Commander, Company B, 297th MI Battalion, for his many contributions to this article.

Warrant Officer One Sam Hairston is currently assigned to B Company, 297th MI Battalion, Fort Gordon, Georgia. He began his Army service as a Tracked Vehicle Repairer with the 2d Armored Division and a member of the Commanding General's Combined Army Tank Team. He served in Operations DESERT SHIELD and DESERT STORM, then his next assignment was to the Headquarters, Military Support Company-Combat System Test Activity where he tested and provided feedback for new Army equipment. His first MI assignment was as an Imagery Analyst using the Forward Area Support Terminal (FAST) with the 104th MI Battalion. His follow-on assignments included Platoon Sergeant and Senior Imagery Analyst with the Opposing Forces (OPFOR) at the National Training Center in the 11th Armored Cavalry Regiment; Imagery Operations Analyst and Platoon Sergeant at the 205th MI Battalion; and Imagery Manager for the Southeast Asia theater with the Joint Intelligence Center, Pacific (JICPAC). Mr. Hairston is a graduate of the Warrant Officer Candidate and Basic Courses. Readers may contact the author via E-mail at shairst@mi513. gordon.army.mil and telephonically at (706) 791-8510 or DSN 780-8510.

Generating One-Meter Terrain Data

(Continued from page 37)

battlespace. It is therefore optimal for use in an operational environment where the live and virtual-reality worlds will come together. Development of faster and more automated PVNT terrain-creation code is an ongoing research effort at NPS, as are collaborative efforts that allow code sharing and the development of a user group.

Wolfgang Baer, Ph.D., currently holds an Associate Research Professor position at the Naval Postgraduate School (NPS) in Monterrey, California, where he teaches courses in networks and network programming. The author will provide sample copies of executables and sample one-meter terrain data. You can contact Dr. Baer via E-mail at baer@nps.navy.mil and telephonically at (831) 656-2209.

Updated FDIC Web Sites on the Way at Fort Huachuca

The Futures Development Integration Center at the U.S. Army Intelligence Center is breathing new life into its elements' web sites by bringing all of the sites under a centralized umbrella. A new FDIC web enabler will maintain continuity and improve the sites' appearance.

The web enabler developed a centralized appearance for the FDIC sites while migrating the content of the previous sites to this new look. Each office will have a unique URL that better suits each specific element. All the FDIC URL's follow the form of http://<**www** or **directorate** or **secure**> such as forcedesign.future.hua.army.mil and each URL is its own site, while still maintaining the overall look and feel for the FDIC.

Current Open FDIC Sites

www	Central launching point	**abio**	Army Broadcast Intelligence Office
bcbl	Battle Command Battle Lab-Huachuca	**car**	Concepts, Architectures & Requirements
dcd	Directorate of Combat Developments	**doctrine**	Doctrine Division
forcedesign	Force Design Division	**jstars**	Joint Surveillance Target Attack Radar System
kaps	Knowledge and Program Services	**nsto**	New Systems Training Office
tencap	Tactical Exploitation of National	**tsmasas**	TSM All-Source Analysis System
tsmprophet	TRADOC System Manager (TSM),	**tsmuav**	TSM Unmanned Aerial Vehicle Capabilities
weather	Army Weather Support Team Prophet		

Current Secure FDIC Sites (password control software)

secure	secure site with doctrine and web enabler sites (uses Army Knowledge On-Line login/password)
doctrine	(on the https://secure.futures.hua.army.mil site)
weather	(on the https://secure.futures.hua.army.mil site)

Site Under Development (will be active shortly)

MIPB	http://futures.hua.army.mil/mipb/ or http://mipb.futures.hua.army.mil (older site available at http://huachuca-usaic.army.mil/mipb/mipbhome/welcome.htm)

Intelligence Fusion in Force Protection

by Lieutenant Colonel Darryl E. Ward

The attacks on 11 September 2001 have placed greater emphasis on the role of intelligence and its application to force protection (FP). In the attacks' aftermath, military installations across the world increased their force protection conditions (FPCONs). During this time, we came to grips with the questions of *"how well do we know what the threat posture is at our own installations and the surrounding communities* and *are we equipped to know?"* The answer to the initial question was not very well and resulted in a baseline FPCON Charlie for all installations. The second question is a little harder to answer and requires a detailed look by commanders and their installation staffs. How can installation commanders, particularly those who do not have organic intelligence, improve their situational awareness? How can they build this capability within their organizations? These are questions addressed in this article.

The author recently completed a tour as the Intelligence Observer/Trainer (O/T) on the Battle Command Training Program's (BCTP) Antiterrorism and Force Protection (AT/FP) Team during its 6-month, 15-installation tour. Several lessons learned emerged concerning how we—

- Obtain information from intelligence assets, law enforcement agencies (LEAs), and other resources.
- Fuse that information.
- Provide the relevant information to the commander to improve his situational awareness and to enable him to make better informed decisions regarding FP measures.

Why is Intelligence Vital to Force Protection?

Before we discuss intelligence fusion, we should review intelligence's role in FP. **FM 34-1**, **Intelligence and Electronic Warfare Operations**, states that FP is one of the six primary intelligence tasks. The role (i.e., duties, responsibilities, and functions) of intelligence support to installation operations is no different than its role in division or corps rear area operations—the differences that do exist concern available assets and methods of application. Commanders use the Intelligence battlefield operating system (BOS) to facilitate FP through—

- Assessment of friendly vulnerabilities.
- Assessment of the threat's ability to exploit those vulnerabilities.
- Identification of the threat's perception of friendly centers of gravity and how the threat will attack or influence those COGs.
- Identification of potential countermeasures to deny the threat access to friendly critical areas.
- Conduct of appropriate risk assessments.

In accomplishing the above, the commander must make plans to—

- Perform operations security (OPSEC), counterreconnaissance, and other security measures.
- Locate the threat accurately through intelligence preparation of the battlespace (IPB) and situation development.
- Contribute to threat avoidance once risk identification is complete.
- Provide for health services and logistical support.
- Institute troop safety measures.

Functions of Intelligence Fusion

Through intelligence fusion, we also accomplish other primary functions, to include:

U.S. Army photo

At an entry checkpoint, a sergeant with the 40th Military Police Detachment inspects a driver's identification card, while a private with the 6th Battalion, 27th Field Artillery, armed with an M-16A2, provides security. The soldiers are part of the larger FP groups performing various security missions at each of the gates at Fort Sill , Oklahoma.

- Enhancing information-sharing between the installation and community.
- Processing relevant information into usable (actionable) intelligence and predictive analysis.
- Providing the commander with a means for decision making.

While there is currently no field manual addressing intelligence fusion, this doctrine will be part of the future rewrite of **FM 2-33.3**, **Intelligence Synchronization**.

Regulatory Guidance

For fusion to be effective, there must be an appropriate personnel structure, physical organization, and connectivity both internally and externally. Additionally, throughout all phases of the FP planning and execution process, certain restrictions apply.

Intelligence Oversight. **Executive Order 12333**, **United States Intelligence Activities**, and the supporting **Department of Defense (DOD) Directive 540.1-R**, **Procedures Governing Activities of DOD Intelligence Components That Affect United States Persons**, and **AR 381-10**, **U.S. Army Intelligence Activities**, set stringent rules on the use of military intelligence (MI) assets on domestic activities. These guidelines govern the collection of information against non-DOD individuals and organizations. As a rule, this generally applies to all Army MI activities inside the United States. Two misunderstandings often arise from these guidelines: that MI cannot collect information and that MI cannot store that data.

Photo by SGT Sharron Stewart, Fort Huachuca.

A Fort Huachuca dog handler with the 18th Military Police Detachment, and a Belgian tervuren, inspect a truck and trailer at the East Gate of Fort Huachuca, Arizona.

Army DCS G2. On 6 November 2001, the Department of the Army (DA) Deputy Chief of Staff G2 released a memo[1] that further clarifies certain aspects of **AR 381-10**. The memo states that MI can always receive information and that MI is not prohibited per se from collecting on U.S. persons. It further states that MI is authorized to collect on U.S. persons in limited circumstances where the information is essential to the accomplishment of DOD missions to include the protection of DOD functions and property. However, those persons associated with committing acts against these DOD missions must have a significant connection with a foreign power, organization, or person. MI can also store information if it meets the two criteria stated above. If it does not meet the criteria, then we can only pass this information to appropriate agencies.

Staff Judge Advocate. In addition to the legal applications regarding what MI can and cannot do, an installation staff member also plays a critical role in fusion's functions, the Staff Judge Advocate (SJA). The SJA provides a filter for both criminal and terrorist information coming into the fusion cell, and can make recommendations pertaining to the disposition of information coming into the fusion cell and what information MI can collect. This does not say MI has carte blanche authority to collect and store it. The 6 November DCS G2 memorandum simply alleviates some ambiguity in the regulations. The Federal Bureau of Investigation (FBI) has the lead in fighting foreign and domestic terrorism inside the United States. Once the criteria have been met, the local 902d MI Group detachment must receive permission from the Department of the Army Case Control Office, via the U.S. Army Intelligence and Security Command (INSCOM), before conducting a for-

Photo by SGT Tim Volkert, Fort Huachuca

Specialist Rozyczk simulates the process of evaluating a casualty.

mal investigation (as opposed to initial reporting).

Information-Sharing

Normally, the provost marshal's office (PMO) will conduct liaison with local, state, and federal LEAs. The supporting 902d MI Group element conducts liaison with appropriate intelligence agencies. Both the PMO and the local 902d element provide their input to the installation operations center (IOC) for fusion and analysis. Additionally, installations should routinely establish a forum with agencies "outside the gate" for the purpose of providing an FP information exchange. At these meetings, the installation's FP representative will provide the outside agencies with a list of the types of information the commander requires. Essentially, installation FP representatives must articulate requirements based on the commander's priority intelligence requirements (PIR), and present these information requirements in such a manner that everyone understands them. In this forum, by sharing knowledge concerning known general and specific threats, the FP forum can develop potential indicators and warnings (I&W) for various threat courses of action (COAs). I&W development is another of the six primary intelligence tasks, and drives the initiation of the collection plan.

The best collection plans are those with well-thought-out supporting specific information requirements (SIR or IR) and detailed specific orders to subordinates for information collection. The vast majority of information collectors requiring these SIR in this environment are civilians. It is important to remember that civilians often misinterpret military terminology so the better we transfer our requirements in "nonmilitary language" to these outside agencies, the better will be the information we will receive.

From the above discussion, it is clear that success hinges upon effective liaison and well-established relationships. While most installations have already established a good rapport with civilian LEAs and intelligence agencies, they often overlook non-LEAs.

Non-LEAs (such as regional hospitals, realtors, apartment managers, fire departments, the media, labor unions, airports, and local Internet providers) can potentially provide information that is of value to the fusion team. However, too often commanders and staff planners leave these agencies out of the collection plan. Similar capabilities are resident on the installation; for increased effectiveness, planners must include the medical department activity (MEDDAC), directorate of housing, directorate of public safety (DPS) (Fire), public affairs office, directorate of contracting, directorate of information management (DOIM), and so forth in the collection plan. Ensure they know the SIR. Such agencies can "reach out" to community civilian counterparts and, while they are not active collectors, they may encounter vital information. As such, they are valuable and often overlooked resources.

Information-sharing is not a one-way street. The agencies listed above not only pull information but can also push it out to the community. Situational awareness shared between the installation commander and a local mayor should be relatively the same. We share information, especially law-enforcement sensitive or classified information, through established memorandums of agreement and nondisclosure agreements. To pass classified information between installation leadership and civilian leadership, the Department of the Army Deputy Chief of Staff G2 (formerly the Deputy Chief of Staff for Intelligence or DCSINT) has approved the limited issuance of security clearances that allow the passing of Homeland Defense-related classified information. Sharing information between the installation and civilian agencies leads to the second major function of intelligence fusion, processing.

Processing Information Into Intelligence

The IOC fusion cell sifts through raw criminal, domestic, and international terrorist information, analyzes and compares that information against the SIR, and processes it into usable intelligence that either partially or completely satisfies the commander's PIR. The end state of processing information is predictive analysis that enables the commander to make informed decisions regarding FP measures or other appropriate actions.

Successful IOC fusion cells employ doctrinal intelligence tools such as link diagrams, pattern analysis, and event charts to assist their analysis. These tools allow participants to visualize the information coming into the fusion cell better. In contrast, those IOC cells that did not construct these tools lost track of information and, therefore, could not determine a threat COA.

The fusion cell also conducts IPB of the installation; the IPB process lays a foundation for the installation's AT/FP plan. While the fusion cell takes the lead on conducting IPB, it is important to note that IPB is a **total installation staff function**. For instance, the DOIM conducts IPB on the threat's capabilities to interrupt the installation's local area network (LAN); DPS identifies hazardous chemical-storage areas; MEDDAC analyzes potential effects of diseases on the community, etc. The aggregate of the staffs' IPB efforts identifies gaps in intelligence concerning the threat and generates PIR for the collection plan. For installations, a thorough IPB product is vital to the vulnerability assessment (VA). The VA identifies the high-risk targets (HRTs) based upon ease of access, symbolic value, and the nature of the threat. IPB assesses HRTs based upon their vulnerability to attack from chemical, biological, radiological, nuclear material, and high-yield explosives (CBRNE), and cyberspace. Once assessed, the fusion cell prioritizes the HRTs and includes them in the AT/FP plan. Nearly all installations that we assessed conducted IPB to some degree; however, the participation level by members of the installation staff other than the IOC was often nonexistent.

Decision Making

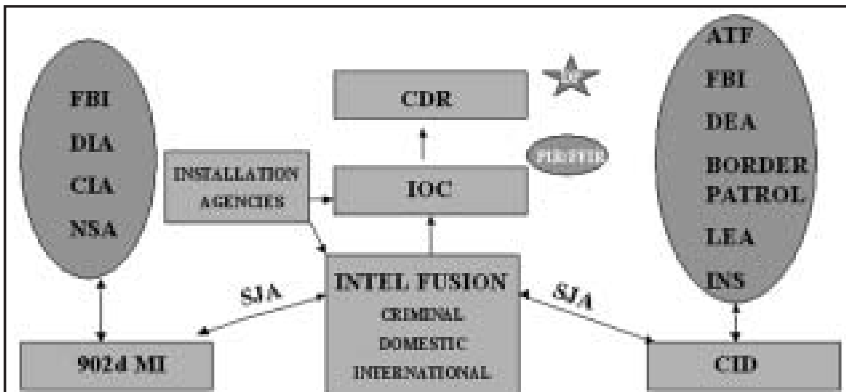
We derive the third function of intelligence fusion from the previous two. The IOC fusion cell receives information, processes it into intelligence that facilitates answering a PIR, and allows the commander to make an informed FP decision. Intelligence-based decisions (e.g., alerting first responders, increasing physical security measures) may mitigate or deter threat actions. One decision-making tool is the decision support matrix (DSM). DSMs were evident in the majority of IOCs visited, as well as supporting PIR. Those fusion cells that lacked a DSM, had no posted collection plan, etc., were seriously later in satisfying PIR because of the reduced focus of the collection effort. As a direct result, the staff made **reactive** decisions based on what the threat had already done; there was no predictive analysis, no successful interdiction, and limited effectiveness in response and mitigation resulting from the failure to plan and collect throughly.

Intelligence Fusion Architecture

Fusion Team. The "fusion cell" generally comprises intelligence analysts (area of concentration and military occupational specialty 35D/350B/96B), counterintelligence (CI) agents (AOC and MOS 35E/351B/97B[2]), normally from the supporting 902d MI detachment), and military law enforcement personnel (PMO, the supporting Criminal Investigation Division Resident Office). The BCTP AT/FP Team found that fusion cells limited to these members seemed to fare better because the senior intelligence officer (G2) can focus their collection efforts and analysis. Certainly, those non-intelligence and non-LEA entities mentioned earlier are involved in the IPB process, and provide vital information. They also continue to provide input to the fusion cell, but do not physically collocate with it.

At least one installation formed a threat working group (TWG) that consisted of the fusion cell and installation directorates. The TWG formed when the fusion cell received certain I&W data that met a PIR, which in turn pointed to a specific, potential threat COA. The TWG's meetings provided a very effective information dissemination means and ensured the incorporation of all information into a single, consolidated product before going to the directorate of plans, training, and mobilization (DPTM) or G3 for a decision recommendation.

Many installations used the term, title, and function of "G2" rather loosely. Depending upon the military facility, the installations sometimes defined this person as the system security officer, personnel security manager, senior intelligence officer, DPTM, or provost marshal (PM). Those G2s that had a clearly defined intelligence role were not a subordi-



Key:

ATF — Bureau of Alcohol, Tobacco, and Firearms
CDR — Commander
CIA — Central Intelligence Agency
DEA — Drug Enforcement Administration
DIA — Defense Intelligence Agency
DP — Decision point
FFIR — Friendly forces information requirements
INS — U.S. Immigration and Naturalization Service
Intel — Intelligence
NSA — National Security Agency

Figure 1. Intelligence Fusion Architecture.

nate element of a directorate but worked directly for the installation chief of staff and "owned" the installation security functions of personnel security, information security, physical security, etc.

The 902d MI Group's local detachment, PM, and CID play an integral part in the fusion cell. While they do not work for the G2, as stated earlier they do conduct liaison appropriate to their lanes with the community and other agencies. They are the primary means for bringing information into the cell; they also bring limited analytical capabilities. This is especially important to installations that do not (yet) have an organic intelligence capability.

Editor's note: The U.S. Army Training and Doctrine Command plans to provide all TRADOC installations with an organic, defined, functional analytical capability.

Fusion Cell Location. The physical location of the fusion cell has a huge impact on overall installation operations. Currently, various installations have both extremes, some with the IOC and fusion cell in the same room, and other installations have them separated by as much as a 30-minute drive. The relationship between the fusion cell and the IOC is comparable to that of the analysis and control element (ACE) and the division tactical operations center (DTOC) since the ACE's relationship with the DTOC is to provide timely intelligence. The same is true between the fusion cell and the IOC. Locating the fusion cell in the same building (but not the same room) allows rapid dissemination of information, and also allows the G2 (and other crucial installation leaders) to move quickly between locations. When fusion cells were within the IOC, they often quickly became engulfed in the other IOC processes, competed for space, and thus were ineffective. Fusion cells geographically separated from the IOC had a vast deficit in situational awareness, and lost their direct contact with the G2.

Connectivity. The communications plan between the IOC and fusion cell corresponded with the distance between the elements. Installations that had them in the same building relied primarily on face-to-face communications while those with separated elements relied on the telephone or E-mail. In an emergency, reliance on digital communications or even telephone lines is unacceptable. In the event of a cyberattack accompanying another threat attack, the LAN may go down. Planning should assume a thinking, adaptive, and creative threat. Most IOCs and fusion cells have the Secure Internet Protocol Router Network (SIPRNET), which provides additional communications if primary communications are disrupted, as well as a means to pass collateral Secret intelligence. Having a frequency modulation (FM) capability also provides a backup; however, we did not notice this arrangement in any fusion cell during any exercise. The bottom line is that for the geographical location of the IOC and fusion cell, the closer they are (preferably the same building but not necessarily a shared room), the better the communication.

Figure 1 illustrates the criminal and terrorist information coming in from law enforcement and intelligence channels (the ovals are not all-inclusive). The fusion cell processes information against the commander's PIR and submits it to the IOC for decisions regarding FP measures and conditions. Some of this information may require an SJA military oversight review.

Conclusion

Through the exercises executed at 15 different installations, the tactics, techniques, and procedures (TTP) listed above worked, to varying degrees, for each fusion cell. Fusion cell's functions—information-sharing, processing, and decision making—are similar to those of an ACE. Not every installation has organic intelligence personnel assigned; however, every installation does have a limited resident analytical capability within its tenant agencies such as the 902d MI Group detachment or CID. The PMO also has a resident analytical capability. Further, the Army has noted this deficiency and action is underway to address it properly.

Although MI has limitations on what it can collect and store, G2s should thoroughly review both **AR 381-10** and the Army G2's 6 November 2001 memo.[3] Intelligence is not just for the commander and the installation is only a part of a larger community. Efforts have been made to share Homeland Defense information with community leaders to improve both their and our situational awareness. Situational awareness is also a challenge between the IOC and fusion cell, and becomes more difficult the further these two elements physically separate. Much work is left to be done regarding intelligence fusion. The Homeland Security Director, Mr. Tom Ridge, will likely include regional intelligence centers that support installations. Ultimately, the fusion cell's success depends on the personnel, equipment, and working spaces the installation commander is willing to dedicate to it.

Endnotes

1. An extract of this memorandum appeared in the ***Military Intelligence Professional Bulletin*** January-March 2002 issue, on page 34.

2. The intelligence analysis AOC and MOS are 35D (All-Source Intelligence Officer), 350B (All-Source Intelligence Technician), and 96B (Intelligence Analyst). The AOC and MOS for CI are 35E (CI Officer), 35IB (CI Technician), and 97B (CI Agent).

3. See also Michael Varhola's article on page 34 of the January-March 2002 issue of ***MIPB*** and Regan Smith's on page 5 in our July-September 2002 issue.

Lieutenant Colonel Darryl Ward recently completed a six-month tasking as the Intelligence O/T for BCTP's AT/FP Team. He is currently the Deputy Commanding Officer (DCO) for the 112th MI Brigade. His previous assignments include Observer/Controller at the Jungle Operations Training Center, Light Infantry Brigade S2, MI Battalion XO, and 111th MI Brigade DCO. Interested readers can contact him via E-mail at wardd@hua.army.mil and telephonically at (520) 533-3055 or DSN 821-3055.

Enduring Freedom

The FARC and Other Terrorist Groups in Colombia and South America: Are We Moving Closer to the Next Phase in the War on Terror?

by Warrant Officer One James D. Higday

The views expressed in this article are those of the author and do not represent the official policy or position of the U.S. Army Intelligence Center and Fort Huachuca, U.S. Army, Department of Defense or the U.S. Government.

As U.S. and Allied forces eliminate Al Qaeda terrorists in the mountains of Afghanistan and assist the Philippine Government in eliminating the Abu Sayyaf Group in the Philippines, one must wonder where the focus of the next assault in the Global War on Terrorism will be. One primary candidate lies closer to the U.S. border and is a country that is already the focus of much U.S. attention regarding its role in the War on Drugs. This article addresses the current situation in Colombia and the impact of its three largest and most capable terrorist organizations.[1]

- ❑ National Liberation Army (*Ejército de Liberación Nacional* or ELN).
- ❑ Popular Liberation Army (*Ejército Popular de Liberación* or EPL).
- ❑ Revolutionary Armed Forces of Colombia (*Fuerzas Armadas Revolucionarias de Colombia* or FARC).

La Violencia

Ten years ago, the Colombian guerrillas numbered just a few thousand members who spent most of their time hiding from government forces in the country's mountains or jungles. Today, there are more than 17,000—who are well-armed and -equipped and have gained much experience in their operations against Colombia's military. Three major terrorist groups in Colombia have, in the last ten years, extended their influence from the rural to urban areas. Over time, they have grown more powerful and today they control Colombia's southeast Caqueta region, an area the size of Switzerland. They conduct bombings, murder, kidnapping, extortion, and hijackings primarily in Caqueta, but also at other locations. The Colombians generally call their operations "*La Violencia*," focusing on the violence of their efforts. In the past five years, these groups have also engaged in both guerrilla and conventional operations against the Colombian military, its political institutions and personalities, and a variety of economic targets.

The groups have also extended their operations into neighboring Venezuela. In March 1999, the FARC kidnapped three U.S. Indian-rights activists in Colombia and then executed them in Venezuelan territory. Both Colombian citizens and foreign nationals are often the targets of FARC kidnapping; the demands for ransom are a popular revenue producer that FARC Commander Raul Reyes calls a "*peace tax*." Funds from these ransoms bring in much-needed capital to finance their operations. In addition, the FARC has well-documented ties to narcotics traffickers, principally through the provision of armed protection.

FARC is not the only guerrilla group to use kidnapping to raise funds. The smaller but no less murderous ELN is holding at least 50 hostages, including 36 people seized while they were attending mass in an affluent suburb of Cali. The original church kidnapping involved 143 hostages, but the ELN has released all but 36. Monsignor Isaias Duarte, Archbishop of Cali, excommunicated the guerrillas from the Roman Catholic Church because of the kidnappings. Colombian authorities also believe the ELN is responsible for a Venezuelan commercial airliner that disappeared with 16 people aboard. The third Colombian terrorist group, the EPL, has also conducted some of these operations.

U.S. State Department Warning

The U.S. State Department warns that there is a greater risk of being kidnapped in Colombia than in any other country in the world, with more than 3,000 people abducted every year—and those are just the official figures. Far worse things have happened to backpackers who have braved the country's interior provinces. Violence by narcotraffickers and paramilitary groups has created a culture of fear that has catalyzed criminal elements throughout the country. This is a dangerous time to visit any part of Colombia, though street-wise visitors can still enjoy the major cities without putting themselves in too much danger. Should you be visiting Colombia, pay close attention to your embassy's travel warnings and to local news both before and during your stay.

The ELN

Founded in 1964 by Fabio Vásquez Castaño, the ELN adopted a doctrine for insurrection inspired by the Cuban Revolution. During the mid-1960s, ELN activities centered on the department of Santander and included the temporary seizure of small towns and villages where they freed prisoners and robbed banks. Additionally, wherever possible they made anti-government speeches in an effort to gain recruits. ELN gained international notoriety in 1966 when it recruited Father Camilo Torres, a socially prominent and well-educated Roman Catholic priest. Father Torres joined the ELN following his unsuccessful efforts to organize a political opposition to the National Front government. Only four months after taking up arms, Father Torres was killed in a confrontation with an army patrol.

Although ELN was considered the most effective of the country's guerrilla organizations, the Colombian Army's counterinsurgency campaign decimated the ELN in the early 1970s. By 1973, the armed forces claimed that they had "*virtually destroyed*" the ELN. The claim was premature since the military had severed the ELN's ties to its urban support network but otherwise left the organization intact. By the mid-1970s, the guerrillas had recouped their strength and by 1976 were again conducting kidnappings, bank robberies, and assassinations, including the killing of the Inspector General of the Army, General José Ramón Rincón Quioñes.

The ELN was the only major guerrilla organization that did not sign the 1984 cease-fire agreement. Their refusal, along with their kidnapping of then Colombian President Betancur's brother in an attempt to sabotage the peace talks, reportedly earned the organization a rebuke from Cuban leader Fidel Castro Ruz. Possibly as a result of Castro's support for the peace talks, three ELN fronts reached a temporary cease-fire agreement with the government.

In the late 1980s, the ELN's size was thought to be 500 with its theater of operations extending to vast stretches of Colombia's eastern plains and portions of the departments of Norte de Santander, Santander, Bolívar, Cauca, and Antioquia, and the intendancy of Arauca. The ELN has continued its policy of kidnapping, robbery, and assassination but expanded its efforts by attacking petroleum installations, pipelines, and exploratory drilling sites, mostly owned or operated by foreign companies. They intended these attacks not only to disrupt the national economy, but also to draw attention to the exploitation of Colombia's natural resources.

The EPL

The EPL was the only major group in Colombia espousing a Maoist political ideology and as such, it endorsed the concept of a prolonged popular war. After breaking with the Soviet-line Communist Party of Colombia (PCC) in July 1965, the EPL organized in early 1968 led by pro-Chinese communists who formed the Communist Party of Colombia-Marxist-Leninist (*Partido Comunista de Colombia-Marxista-Leninista* or PCC-ML). The EPL served as the armed branch of the PCC-ML but unlike the PCC, the PCC-ML did not enjoy legal status in 1988.

The EPL conducted its first military operations in the late 1960s in the department of Córdoba, on the Caribbean coast. Internal dissension and the deaths of some of its important leaders during the 1970s weakened the EPL's operational capabilities. In 1979, this dissension led to formation of the Pedro León Arboleda Movement, a splinter group named for an EPL leader slain in 1975. This group remained active as an independent organization in the 1980s.

Despite its Maoist orientation, the EPL chose to participate in the 1984 cease-fire but refused to sign a peace agreement. Following the reported killing of its leader, Ernesto Rojas, in 1985, the organization broke the cease-fire. By 1987, estimates were that the EPL included some 350 guerrillas organized into four fronts. Its principal area of operations was in rural regions of the departments of Antioquia, Córdoba, and Risaralda but the organization also maintained urban support networks in major cities.

According to a Colombian military analyst, profits from the drug trade now comprise 48 percent of FARC's income

The FARC

By far the largest and most powerful of the three Colombian groups, Manuel Marulanda Vélez founded the FARC in 1966. Known by the nickname "Sure Shot" (*Tirofijo*), Marulanda and other members of the Central Committee of the PCC were instrumental in establishing an organization that embraced the PCC's Soviet-style Marxist-Leninist ideological orientation. The PCC reportedly also supplied the arms and financial assistance that proved critical during the early years of the FARC's existence. The early membership of the FARC consisted of communist ideologues as well as noncommunist peasants, many of whom had been active during *la violencia*.

The height of the FARC's early phase of operations came shortly after its founding, between 1966 and 1968. During this period, they recruited as many as 500 armed militants as well as several thousand peasants. FARC operations included raids on military posts and facilities that allowed the collection of needed weapons, ammunition, military uniforms, and even telecommunications equipment. Nonetheless, an effective military counterinsurgency campaign and the opening of diplomatic relations between Colombia and the Soviet Union in 1968 reportedly combined to weaken the organization. By the early 1970s, the FARC appeared incapable of mounting sustained operations.

Nevertheless, like the country's other guerrilla organizations, the FARC enjoyed a resurgence during the late 1970s and 1980s. The organization turned to kidnappings to finance its operations, as well as to gain publicity for its objectives. By 1978, the FARC conducted operations on five fronts and by September 1980, many regarded it as the strongest of the nation's guerrilla groups. Although the FARC attempted to carry out joint military operations with at least one other guerrilla group, the effort failed, reportedly because of ideological differences. In 1987, estimates placed the organization's membership at 6,000 militants, who were active on at least twenty-seven fronts. In early 1988, one report maintained that as many as forty FARC guerrilla fronts were active throughout the country. Areas of the country considered FARC strongholds included portions of the departments of Huila, Caquetá, Tolima, Cauca, Boyacá, Santander, Antioquia, Valle del Cauca, Meta, Cundinamarca, and the intendancy of Arauca.

FARC and the Drug Trade

Adding significantly to the dangers faced by the antinarcotic forces in Colombia is the protection offered by the FARC (and to some extent by the ELN) to the nation's coca farmers and drug traffickers. It is clear that drug profits have fueled the FARC's explosive growth during the past decade and that Colombia provides most of the cocaine and heroin sold on U.S. streets. According to Alfredo Rangel, a Colombian military analyst, profits from the drug trade now comprise 48 percent of FARC's income, amounting to nearly $180 million annually; other analysts say the figure runs higher.

Until 1982, rebel leaders considered the cultivation of drug crops counterrevolutionary and prohibited them in many areas under their control. However, as the crops became more lucrative, the FARC began levying a 10-percent tax on fields of coca and opium poppies, the raw materials for cocaine and heroin, and collecting fees for every narcotics flight leaving rebel-controlled zones. The FARC and ELN also charge a fee for protecting precursor chemicals and coca leaf, and for cocaine hydrochloride (HCl) moving through their regions. There are also indications that the two groups have assisted the narcotraffickers by storing and transporting cocaine and marijuana within Colombia. Finally, there is information that FARC units may be engaged in localized opiate trafficking. To date there is little to indicate the insurgent groups are trafficking in cocaine themselves, either by producing cocaine HCl and selling it to Mexican syndicates or by establishing their own networks in the United States.

FARC's participation in the drug traffic, however, is primarily one of protecting the coca farmers and drug traffickers operating in areas under their control. After the breakup of the Medellin and Cali drug cartels in the early 1990s, the FARC's involvement in the narcotics trade grew. The so-called "mini-cartels" that sprang up often turned to the rebels for protection. Anne Patterson, U.S. Ambassador to Colombia, stated that:

> *The FARC is into narcotrafficking in a big way....There is no question that the FARC is involved in the internal transportation and production of drugs. As for exportation, we are not sure, but we think so.*

This protection is not merely lip service. The FARC (and at times the ELN) has demonstrated on numerous occasions that they are willing to engage government forces in the defense of the coca farmers and drug traffickers. In 1997, they fought hard to protect the huge HCl conversion complex seized by government forces and they have reportedly fought hard elsewhere. CNP (Colombia National Police) helicopters and planes used in drug-eradication efforts continually receive ground fire when conducting counterdrug operations and several CNP officers have been killed conducting antinarcotics operations in guerrilla-controlled territory.

In a roundabout way, the FARC has achieved one of its initial goals, control over the peasantry. While the foundation of all of these groups was originally on ideological beliefs, the profits from the multibillion dollar drug trade have sparked their interest in selling their services to drug traffickers at the expense of pursuing that ideology. In the pursuit of protective efforts, their strength has increased to the point that within their zones of operation, they have consolidated their control over the peasantry.

FARC and Venezuela

The FARC is primarily interested in gaining political control over Colombia and employing terror as its means of accomplishing this goal. The organization's alleged connections to Venezuelan President Hugo Chávez FrRaz should, however, have raised the concerns of the United States. In August 2000, President Chávez was the first democratically elected Venezuelan President to visit Iraq and Saddam Hussein since the 1991 Gulf War. While in Baghdad, he dined with Hussein, toured the city in one of his chauffeured limousines, and denounced the United States for intervening in Venezuela's sovereign affairs. After a brief stopover in Jakarta, Indonesia, where Chávez called for an end to United Nations (U.N.) sanctions against Iraq, he flew on to Tripoli, Libya, for a weekend meeting with Libyan strongman Colonel Mu'ammar Gadhafi. President Chávez used the occasion to take another jab at the United States by calling Washington's 1986 bombing of Tripoli and the port city of Benghazi a "criminal act."

Regarding this subject, the Central Intelligence Agency (CIA) is following a number of startling leads provided by a FARC defector. The defector, who had worked as a bodyguard for the Venezuelan President on his visits to Colombia, provided information that indicates a direct link between FARC and Venezuelan President Hugo Chávez. The defector, as part of a FARC plan to assassinate the then Colombian presidential candidate, hard-liner Álvaro Uribe Vélez, decided to abandon the FARC urban militia after having infiltrated Mr. Uribe's campaign. Mr. Uribe is considered a danger to the FARC due to his tough stance against terrorism and his opposition to the present peace process.

After military leaders blamed him for the deaths of at least 13 people in violent antigovernment protests in the capital in April 2002, a bloodless military coup removed Venezuelan President Chavez from office for two days. President Chavez pledged to make necessary changes after completing a dramatic return to power two days later. The United States called on President Chavez to recognize that his people had sent him a "clear message" to change. Uncertainty remains about the country's vital oil industry where a strike that was at the heart of the takeover by business leader Pedro Carmona cut production nearly in half. In his strongest conciliatory gesture, President Chavez announced the resignations of the board of directors he had appointed to the state-owned oil monopoly.

The United Kingdom welcomed President Chavez's return to power, saying that any change of government should be through democratic means. President Chavez's allies Iraq and Cuba were jubilant and Brazil said it supported his reinstatement. Chavez, who led a bloody 1992 failed coup attempt, has enjoyed wide support from Venezuela's poor, many of whom believe he has addressed issues facing them. He took office in 1999 after a sweeping to election victory, promising constitutional reform, an end to corruption, and the redistribution of oil wealth. President Chavez faces challenges in the upcoming election.

Another former critical FARC operative in Bogotá, Diego Fernando Serna Alzate, apparently turned in a list of high-level Venezuelan Government officials who have repeatedly visited the FARC distension zone around San Vicente del Caguan. Mr. Serna had also participated in the plan to assassinate then Colombian presidential candidate Uribe. If his information is true, this would seem to verify information from the Defense Attaché Service that "ex-soldiers" from Venezuela are present in the FARC distension zone.

FARC and Panama

The Colombian terrorists also pose a security concern for Panama and the United States. The FARC and narcotraffickers affiliated with the FARC use the Panamanian Darien jungle along the Colombian border as a safe haven. From this haven on 29 December 1999, hundreds of the communist rebels rained machine-gun fire and homemade missiles on a Colombian naval base on Colombia's border with Panama, killing at least 45 Marines, one policeman, and a civilian. Some 600 FARC guerrillas launched an attack on the Pacific coast town of Jurado. Jurado, lying in Choco province some 15 miles (25 kilometers) (or 20 minutes by speedboat) from Panama, serves as a staging area on the drug and arms smuggling route used by narcotraffickers, guerrillas, and ultra-right paramilitary fighters. In early 1999, General Charles Wilhelm, then head of the U.S. Army Southern Command, warned that Panamanian Defense Forces would be powerless to stop rebel incursions into Panama once U.S. forces pulled out of the Canal Zone.

Rebel Violence Continues After Colombia's Election

A right-winger who has pledged to reconquer the half of the country under the control of left-wing guerrillas and other paramilitaries won Colombia's May 2002 presidential election. Alvaro Uribe won a landslide victory on an independent ticket, securing more than 53 percent of the vote and avoiding the need for a runoff election. It was the first time in the country's history that a candidate won an outright victory in the first round of voting.

Election officials said polling went smoothly at most stations, but there were some isolated incidents, mainly in the rebel-dominated south of the country. Left-wing guerrillas from Colombia's major rebel group—the FARC—rigged some vehicles with explosives in an attempt to intimidate voters and one woman died in a rebel attack on an electoral office in the northwest of the country. The National Registrar's Office in Bogota said the FARC caused difficulties in fewer than 10 of 1,000 municipalities.

Several explosions rocked downtown Bogota, just before Colombian President Uribe took office on 7 August 2002. The salvo of leftist rebel mortar shells in Bogota killed at least 20 civilians. In his victory speech in the capital, Mr. Uribe said he was prepared to talk peace with illegal armed groups of left and right, but they had to lay down their weapons. His landslide victory is an overwhelming endorsement for his plans to increase military spending and broaden the 38-year-old civil war, according to the British Broadcasting Corporation's Peter Greste in Bogota.

On 12 August 2002, Colombia's new President declared a state of emergency to fight what the government described as a "regime of terror" following a surge of war violence. Uribe also decreed an emergency tax to allow the government raise $778.5 million to fund a military build-up. The Colombian Government announced the immediately effective crisis measures after a daylong cabinet meeting called to discuss an escalation of violence that has left 100 dead since Uribe took office.

Unchecked, the FARC can be a major destabilizing force within Latin America, Northern South America, and possibly in the Caribbean

Conclusion

All indicators predict a potentially dangerous situation developing in Colombia and Venezuela and along Colombia's border with Panama. The FARC has made it clear that its ultimate objective is complete control over Colombia and that it will do whatever is required to achieve that goal. In business now for forty years, and despite its support of drug trafficking, the FARC does not seem to be in any hurry to abandon this objective.

The connection between the FARC and the current Venezuelan administration as well as the Venezuelan administration's ties to Iraq, Libya, and Cuba are nothing less than disturbing. FARC control over Colombia would provide a severe escalation in drug sales with the impacts felt around the world. Like most terrorist organizations, the FARC does not know when to stop and their lust for power will grow with more success. Unchecked, the FARC can be a major destabilizing force within Latin America, Northern South America, and possibly in the Caribbean. FARC control or influence in Venezuela could lead to disruptions in the flow of oil, forcing the United States to depend more on Middle Eastern oil. Finally, the FARC leadership has stated that they intend to double their present size to 30,000 troops. Given their growing strength, the War on Drugs, as we are currently running it, will not stop the FARC. Just how much will the U.S. Government tolerate and how soon will it address this threat?

Endnote

1. The difference between Colombia's ELN, EPL, and FARC and the Al Qaeda and other Islamic Fundamentalist groups are that the Colombian organizations are not radical religious organizations. Instead, they are interested in power, money, and the eventual control of Colombia with some degree of political influence over Venezuela. It is in the best interests of the United States to keep a keen eye on the ELN, EPL, and FARC and the governments of Colombia and Venezuela. Though it is doubtful the three terrorist organizations will work together to bring down the Colombian Government, their combined force may be sufficient to destabilize the area for generations to come.

Warrant Officer One Jim Higday is an All-Source Intelligence Technician with the 356th MI Company (Reserve Component) (RC). He had assignments with the 505th MI Group (RC), 651st MI Company (RC), 337th MI Battalion (RC), and has also served with the former Sixth Army Counter-Drug Task Force, and the Third U.S. Army G2's Counterterrorism Crisis Action Team (two tours). WO1 Higday holds a Bachelor of Arts degree in Business Administration from National University. He can be reached via E-mail at wo1jdh@mindspring.com.

CIA Support to Enduring Freedom

The views expressed in this article are those of the author and do not reflect the official policy or position of the U.S. Army Intelligence Center and Fort Huachuca, U.S. Army, Department of Defense, or the U.S. Government.

by Anthony R. Williams

In just over eleven months, the United States organized an international coalition to pursue the Al Qaeda terrorist organization on a worldwide basis, destroyed Taliban military forces in Afghanistan, and drove them from power. These efforts turned the surviving members of Al Qaeda and the Taliban into fugitives, while at the same time U.S. and allied forces organized a temporary government in Kabul, one that is helping to shape a more stable government and preclude any possible return of such radical rule.

The successes to date are due to the judicious and coordinated use of the full range of U.S. national power and the instruments provided by the U.S. citizenry for the application of that power. One of these instruments, the Central Intelligence Agency (CIA), has played a vital role in this struggle. On 26 September 2001, in a speech to CIA personnel, President George W. Bush cited the vital role intelligence would play in the coming struggle and noted this would be a war requiring the best intelligence. Since that time, the President, the Secretary of Defense, and the Commander of the U.S. Central Command (CENTCOM) have each cited intelligence as an essential element in U.S. successes.

Since its establishment in 1947, the CIA has been a crucial player in every U.S. conflict. None, however, demanded a greater breadth and depth of CIA involvement than Operation ENDURING FREEDOM. The U.S Pacific Command (PACOM), and U.S. Southern Command (SOUTHCOM) to support the permanent DCI representatives stationed there.

The CIA's Counter-Terrorist Center has dramatically increased in strength since the start of Operation ENDURING FREEDOM. These officers are not only providing support to U.S. operations in Afghanistan, but to U.S. military, diplomatic, and law enforcement missions worldwide in the struggle against terrorism. As part of the CIA effort to support Operation ENDURING FREEDOM, scores of retired CIA officers have returned to temporary full- and part-time duty. CIA analytical, operations, and support personnel from throughout the Agency have volunteered for temporary duty assignments in counterterrorist and military support activities at considerable personal inconvenience and risk.

CIA's ability to deliver the current level of support to our armed forces is due in large part to efforts undertaken throughout the Agency during the past decade. The CIA has been engaged for several years on the ground in Afghanistan and elsewhere in an effort to apprehend Osama bin Laden and his associates, and to disrupt and destroy the Al Qaeda terrorist organization. That effort has resulted in an extensive network of agents in Afghanistan and elsewhere, and a cadre of CIA officers experienced in the region ready to support Operation ENDURING FREEDOM from the outset.

As a result of the after-action reviews of U.S. military operations during the 1990s, the CIA reorganized its support to the U.S. Armed Forces under the leadership of the Associate DCI for Military Support. The CIA regularly assigns DCI representatives to all the U.S. unified commands and war colleges in order to incorporate CIA support into U.S. military doctrine. CIA liaison teams join U.S. joint task forces as necessary. These representatives and additional personnel from the Office of Military Affairs have been regular participants in U.S. military exercises worldwide, thus developing the skill and experience necessary to meet the challenges imposed by Operation ENDURING FREEDOM.

Anthony Williams serves as a Representative of the Director of Central Intelligence (DCI) at the U.S. Army War College at Carlisle Barracks, Pennsylvania. Readers may contact him by telephone at (717) 245-3299 or Fax (717) 245-3530.

Professional Reader

Fleets of World War II,

by Richard Worth (Cambridge, MA: Da Capo Press, 2001), 375 pages, $39.00.

Fleets of World War II is a must for any military historical collection! Richard Worth, a freelance writer, naval wargamer, and naval historian, has consolidated information and photographs of the warships that participated in World War II. For this effort he chose a format that reduced the cost and need for multiple volumes to present his material.

Fleets of World War II opens with a brief description of the details of the *Washington Naval Treaty of 1922* and its implications on the major naval powers. It then continues with the status of each navy, from the smallest to the largest. The focus of the publication, however, is on the thousands of naval warships employed during the most destructive war in human history. Arranging the fleets by nationality, Mr. Worth follows the layout established by the better known Janes and Conways publications. Here he briefly describes the dimensions, speed, ordnance, and fire control of each class of warship as well as modifications made to them during the war.

Unlike those other publications, however, Mr. Worth provides additional explanation and description that reveals tantalizing bits of hard to find technical and historical data. As a reference guide to the warships employed by the naval powers during the period from 1939 to 1945, **Fleets of World War II** should be on every naval historian's Christmas wish list.

Michael P. Ley
Fort Huachuca, Arizona

Army Intelligence Master Plan

Thoughts on Battlespace Visualization

by Brad T. Andrew (U.S. Army, Retired)

Perhaps the greatest challenge of Army Transformation is disengaging ourselves from predilections born of past success. It is normal to "look" at new situations through the lens of our experience, education, and training. We can understand why cavalry soldiers fought to retain their horses when faced with the industrial revolution's onslaught but we also know the terrible price paid by the magnificent Polish cavalry against German armor. The Axis war machine in turn failed to grasp the significance of our first steps into the information revolution as radar and the Ultra system provided the Allies with "knowledge advantages" that enabled them to both **see first** and **understand first**.

The Army is basing its decision superiority concepts on the past fifty years of work developing the information technology (IT) and knowledge-management advantages that enable unsurpassed battlespace understanding, which in turn results in the commander's ability to make decisions better and faster than the enemy can respond. The Army Intelligence core competency *Present* is a component in the activity commonly referred to as "battlespace visualization." The goal of Army Intelligence is to promote the commander's instantaneous and intuitive understanding of the threat and environment within the common operational picture (COP). Looking forward to the Objective Force era and given the unrelenting scientific advances in neuroscience and computer engineering, a more appropriate context in which to explore *Present* may be within a shift to the concept of "battlespace perceptualization."

The term "visualization" understandably reflects both our visual nature and the sighted population's cultural dominance. We are familiar with the changes in our lives and our children's lives, based on IT's impact. Most of us are probably not as familiar with the impact of IT on the non-hearing and non-seeing members of our society, yet we can imagine a similar, perhaps an even more profound change in their lives. From the military standpoint, we have traditionally considered battlefield visualization the simple presentation of enemy and friendly forces arrayed on the battlefield in such a manner as to enhance the commander's situational understanding. While this concept may have served us well in the past, the varied and complex entities that comprise enemy, threat, and civilians on the battlefield in the contemporary operational environment (COE) force us to conduct a more detailed selection and depiction of critical elements as components of the commander's tailored, battlefield visualization picture. It therefore follows that we should broaden the scope of our *Present* efforts to include other areas in which humans receive and process data to reach understanding and make decisions. We must use **every** advantage available to us to enable the commander to understand the threat and environment more rapidly and better than the enemy. Since the term "visualization" inherently limits its expanded thought on the subject, "battlespace perceptualization" may offer the conceptual context for a broader examination in this critical area. This is not science fiction, it is today's science. We can only imagine tomorrow's.

High above the fight, commanders watching out their windows or on screens couldn't hear the gunfire and screaming of wounded men, or feel the impact of the explosions. From above, the convoy's progress seemed orderly. The visual image didn't always convey how desperate the situation really was.

—Mark Bowden, Black Hawk Down[1]

Endnote:

1. Bowden, Mark, **Black Hawk Down: A Story of Modern War** (New York, NY: Grove/Atlantic, Inc., February 1999).

Brad Andrew (Lieutenant Colonel, U.S. Army, Retired) is a Futures Analyst with the Army Intelligence Master Plan. His active duty assignments included Commander, 303d MI Battalion (Operations), 504th MI Brigade, Fort Hood, Texas; Deputy Director of Operations, 718th MI Group, Bad Aibling, Germany; J2, Joint Task Force-Bravo, Soto Cano, Honduras; and Force Integration Staff Officer, Headquarters, Department of the Army, Office of the Deputy Chief of Staff for Operations and Plans. He holds a Master of Military Arts and Science degree from the Command and General Staff College, Fort Leavenworth, Kansas, and a Bachelor of Science degree in Engineering from the U.S. Military Academy in West Point, New York. He is also a graduate of the National Security Agency Junior Officer Cryptologic Career Program and earned a Space Operations specialty. You may contact him via E-mail at Brad.Andrew@hqda.army.mil and telephonically at (703) 824-4136 or DSN 761-4785.

Doctrine Corner

Achieving Battlefield Visualization

by Chief Warrant Officer Two Timothy P. McGinty

The theme for this issue of the ***Military Intelligence Professional Bulletin*** is battlefield visualization. The articles define, discuss, and provide examples of what battlefield visualization is and how it applies to the troops and leaders. The issue introduces and discusses the tools that increase battlefield visualization, yet the question remains—how do I bring this all together for my commander?

Visualization Begins With Intent

Commanders initiate battlefield visualization through their intent and issuance of planning guidance initially to the staff and subsequently to subordinates when they issue orders. Commanders also give their intent and specific guidance to the various battlefield operating system (BOS) representatives to ensure that they integrate and synchronize their efforts with his overall plan. The commander's intent is a clear, concise statement of what the unit must do and the conditions it must meet to succeed with respect to the enemy, terrain, and the commanders' desired end state.[1] The intent consists of the end state, crucial tasks that the force as a whole must accomplish, and if desired, the expanded statement of purpose for the operation. It is essential for soldiers to know and understand thoroughly what the commander requires and expects from them to facilitate his achieving his battlefield visualization.

The 1st Cavalry Division's "Cav Big 8" (operations orders, graphics, precombat checks and inspections, rehearsals, security, reconnaissance and surveillance (R&S), time management, and risk assessment) is an example of a commander stating his intent and how the unit must meet his requirements. Major General McKiernan, then the Division Commander, designed the Big 8 as the way to accomplish all the Division's tasks. All soldiers applied these eight principles daily, regardless of rank or duty position.

Battlefield visualization is a continuous activity initiated by the commander, that the staff planners start. Their plans and orders initiate R&S collection, the collection results undergo analysis, and the intelligence goes to the commander who then makes tactical decisions or issues retasking. The resulting visualization is only as good as the staff's ability to provide products in a format that helps the commander's mental process. Some commanders prefer ordinary maps, others rely upon PowerPoint™ graphics or other visual depictions. The initial guidance provided by the commander starts the visualization process but it is the commander's rapport with and training of the staff that really makes it work. The resulting products, such as the map or display, inform the commander who "sees" the terrain and its effects on his and the enemy's combat operations. The commander visualizes more than key terrain, decisive terrain, and "go" and "no go" terrain; he "sees and feels" the effects of the terrain on the enemy's ability and his own ability to disperse, mass, observe, deploy, shoot, and protect the force. It allows him to envision where the enemy would be most vulnerable to the combined arms capabilities of his force and facilitates the commander's shaping the battlefield for his success and not that of his enemy.

Visualization as a Team

People often compare the military and military operations to sports teams and their games. Historically, the units and teams that enjoy success all have strong relationships of habitual training, support, and fighting as groups. The great sports teams go to training camps where they eat, train, and live together. Each team member understands his own role and the others' roles and responsibilities, capabilities, and limitations. Every player has a specific task and a purpose to achieve, and knows when he must accomplish his task to set the conditions for overall team success. The members continually repeat the plays in rain, in heat and in cold, in every condition in which they may execute them. Once achieved, the players have ingrained the synchronized plays more often resulting in victory.

The most essential aspect of training is to train at the frequency required to sustain the required skill sets under realistic conditions

Similar to a coach, the commander seeks to determine his opponent's capabilities and what he is currently doing. The force achieves battlefield visualization and dominance by realizing the full power of doctrine, organization, training, leaders, soldiers, and equipment capabilities within the unit. It is both an art form and a science, performed by trained professional soldiers, and we must regard and revere it as such. This ability is more than turning on a machine and waiting for results. Like the sports team, the commander and unit accomplish it through hard, realistic, and frequent training.

Training is Essential

A good starting point for achieving battlefield visualization is to know, understand, and continually follow the methods in **FM 25-101** (new number **FM 7-0**), **Training the Force**. Well-trained individuals comprise the well-trained team. Both the individual and unit training and evaluation are against established performance standards at every level, from a team to corps, including the staffs. Following each training event, the unit conducts an after-action review; individuals or a unit that fail to meet the established standards must retrain and execute until they meet the standards. The most essential aspect of training is to train at the frequency required to sustain the required skill sets under realistic conditions.

Training includes some type of certification program to ensure that the soldiers and leaders possess the knowledge, skill, and ability to perform their duties. Many units have on-the-job, apprenticeship, job qualification, reception, and other training programs that certify the individuals can perform their jobs. Soldiers require the time to train so that they are intimately aware of what their roles include, what tools they have available to accomplish their tasks, and how to make the tools work for them and their commanders. The certification program also gives the troops confidence in themselves, their units, and their leadership, making it easier to achieve the full potential of the units.

Take the opportunity to train against the contingency plans (CONPLANs) and operations plans (OPLANs) the unit supports. This requires close coordination with the corps, theater, combatant command, U.S. Army Intelligence and Security Command (INSCOM), and other crucial Service and national agencies. Allow these organizations to know you and your requirements. Learn what these organizations have to assist you, how to request tasking and support, and how you can also assist them in providing professional support by keeping them aware of your commander's intelligence requirements. Through training and coordinating with these higher echelon agencies, and knowing how to properly request additional support, you are better able to provide the right information at the right time to the commander to facilitate his achieving his battlefield visualization. The time spent establishing relationships before deployment will eventually save coordination time and effort during deployment.

By default, there exist several distracters to training. Each year units undergo an approximate 35- to 40-percent turnover of soldiers. Directed training from the Departments of Defense and the Army, from the major Army commands (MACOMs), corps, division, brigade, and battalion erode training time from the company commander's training calendar. The high operations tempo robs the commander of troops and training time, and the lack of funding steals resources. Even with all of these outside forces wreaking havoc on a training plan, the unit can achieve tough, realistic training. Use planned rotations to the combat training centers (CTCs) to create or update "Smartbooks," tactical operations center (TOC) boxes, and other products. Work with the supported staff to refine the staff process so that battlefield visualization is obtainable, and they have integrated and synchronized the plans for success.

Observer/controllers (O/Cs) continually stress that staffs can accomplish much of the planning process for the CTCs during garrison training. The commander must take every opportunity in garrison to practice the military decision-making process (MDMP) and all supporting staff processes. Brown-bag lunch meetings of the commander and staff members as well as regularly scheduled meetings with those staff sections normally associated with wartime (such as division or corps deep operations cells (DOCCs) or collection managers at the various echelons) foster the concepts of team-building and -maintaining. Take every opportunity presented to enhance the staff and subordinates' ability to facilitate the commander's situational understanding and battlefield visualization.

Final Thoughts

Often the commander who has the better picture of the terrain, his enemy, and his own forces determines the result of a battle. His ability to win the next fight will not depend on having the latest and greatest weapons systems, a sophisticated high-technology command and control system, nor the reach capabilities of the nation. Rather, success will depend on the trained soldiers, noncommissioned officers, warrant officers, and officers who provide him with the dominating visualization of the battlefield.

Any Comments?

The purpose of this article is to generate thought and feedback about battlefield visualization. The Doctrine Division welcomes any comments or subsequent articles describing successful tactics, techniques, and procedures (TTP) on facilitating the commander's battlefield visualization for use in the updates of the 2-series field manuals.

Endnote

1. U.S. Army, **FM 3-0**, **Operations**, 14 June 2001.

Chief Warrant Officer Two Tim McGinty is currently a Doctrine Writer at the U.S. Army Intelligence Center and Fort Huachuca. Readers can contact him via E-mail at timothy.mcginty@hua.army.mil and (520) 533-9970 or DSN 821-9970.

Proponent Notes

by Lieutenant Colonel Eric W. Fatzinger

A number of things have been happening during the summer to include Chief of Staff, U.S. Army (CSA) approval of the majority of recommendations presented in both the Army Development System XXI (ADSXXI) and Army Training and Leadership Development Panel (ATLDP) Warrant Officer Study. The MI Corps has had some selective relief from the continuing "stop loss." By the time you receive this copy of the ***Military Intelligence Professional Bulletin (MIPB)***, much more detailed information on the Army's exit strategy should be available. Check either the U.S. Total Army Personnel Command (PERSCOM) Online or Army Knowledge Online web page for the latest information. Another item of note is that because of a recent change to the fiscal year 2002 (FY 02) *Defense Authorization Act*, **Title 10**, **Armed Forces**, has changed to allow the Services to promote officers through October 2005 to the ranks of first lieutenant (1LT) and captain (CPT) after 18 months time in grade (TIG). Consequently, beginning in October 2002, Army Competitive Category (ACC) officers' "pin-on" time to CPT will decrease from 42 months to approximately 38 months time in service (TIS). This will gradually accelerate promotions next year and should be complete by August 2003.

Enlisted Actions

Career Map Guidance. Since this issue is about "visualizing," I thought it might be useful to share some thoughts with you about how MI soldiers can see and plan the road ahead for a successful career. One of the major responsibilities of the Office of the Chief, Military Intelligence (OCMI) Sergeant Major (SGM) is to oversee career development guidance for our MI soldiers. The career maps published for each of our military occupational specialties (MOSs) are one of the tools used for this purpose; surprisingly, many of our soldiers (young and old) are not aware that this guidance exists. Even more surprising is that many of our soldiers are often not knowledgeable of the types of programs, courses, and methods for obtaining training that are readily available. As MI moves into the future, skills will become more technical, courses more demanding, and promotions more competitive. With that reality in mind, it is essential for our future leaders and soldiers to stay a step ahead in the areas of leadership and professional development—your career map can help you do that.

Career maps contain several separate sections including institutional training, MOS-related courses, career management field (CMF)-related courses, additional skill identifier (ASI) courses, duty assignments, CMF-related special programs, and for some MOSs, language-related courses. They will serve as general roadmaps for you as you progress in your careers.

As the Proponent SGM, I encourage all leaders and soldiers to become familiar with their career maps and use them when developing their short- and long-term goals. Ultimately, the responsibility for career development lies in your hands. Read your career map, ask questions about what is available for you, step out of your comfort zone and look toward what you will truly need to be successful in today's and tomorrow's Army. Your MI career map is on the OCMI web page at http://138.27.35.34/ocmi/enlisted.html.

Upcoming NCO Boards. The 2002 SGM/Command Sergeant Major (CSM) Selection Board will meet in October 2002.

As always, if you have questions on career maps, courses, impact of assignments, any of the programs recommended, as well as any other enlisted actions, feel free to contact me. You can reach me via E-mail at walter.crossman@hua.army.mil and by telephone at (520) 533-1174 or DSN 821-1174.

Warrant Officer Actions

Counterintelligence (CI)Technician (351B) and Human Intelligence (HUMINT) Collection Technician (351E). Both of these career fields (CFs) are critically short of personnel. While there are a number of reasons for this shortage, the most significant factor continues to be the excessive force-structure requirements. Currently, 351B has a ratio of warrant officer (WO) slots to 97B (CI Agent) enlisted members slots of only 1:3. MOS 351E likewise has a ratio of only 1:4 to 97E (HUMINT Collector). This is counting all enlisted soldiers' slots, not just noncommissioned officer (NCO) positions. The bottom line is that neither of these MOSs can ever hope to achieve ideal ratios with their current force-structure ratios. Experience has taught us that to maintain a healthy WO cohort, a minimum ratio of WO to enlisted members of 1:8 is necessary and 1:10 is desirable. Quite simply, due to this force-structure imbalance, there are not enough NCOs in either of these two MOSs to fill existing WO slots while maintaining a strong NCO cadre.

Consequently, the Futures Development Integration Center (FDIC), U.S. Army Intelligence Center, is conducting a CI and HUMINT Integrated Concept Team (ICT) to address these two disciplines specifically, their mission in the Army, and to find ways to correct this force-structure imbalance. Once FDIC has completed its work and the Army has implemented the ICT's recommendations, it will likely take another three to five years for the CI and HUMINT WO force to get "healthy" again.

In the meantime, we continue to accept applications for 351E from 98G (Cryptologic Linguist) applicants on a "will train" basis in addition to 97E soldiers. The OCMI appreciates your help, cooperation, and patience in supporting these endeavors.

350U Tactical Unmanned Aerial Vehicle (TUAV) Operations Technician. This is the newest MOS in the Army; it is an exciting field with a bright future that is receiving lots of attention. We have now graduated our first 350U WOs and sent them to the field. While we currently have accessed enough 350U WOs to fill Army requirements through FY 03, we need to access additional 96U soldiers into the force now to fill the 350U requirements for FY 04. MI needs them immediately so that their training will be complete by the time their TUAV units stand up. Due to the limited number of 96U soldiers in the inventory and the high demand to increase those numbers rapidly, we are also accepting 350U applications from grounded junior aviation WOs on a "will train" basis. Any aviation WO accepted will attend the 7-week MI WOBC, the 23-week 96U Course, and the 6-week 350U Certification Course. We are only accepting experienced warrant officers one (WO1s) and junior chief warrant officers two (CW2s).

The point of contact (POC) for all warrant officer actions is Chief Warrant Officer of the MI Corps, Lon Castleton. You can reach him via E-mail at lon.castleton@hua.army.mil and telephonically at (520) 533-1183 or DSN 821-1183.

Officer Actions

Changes to Officer Professional Development. The Army last published **Department of Army (DA) Pamphlet (PAM) 600-3**, **Commissioned Officer Development and Career Management**, on 1 October 1998; it needs revision in response to changes made under the Officer Personnel Management System 3 (formerly OPMS XXI). To date OCMI has submitted a number of changes to the pamphlet in an attempt to capture the changing Army environment. Of special interest to most will be the clarification of what it takes to become Branch-qualified as an MI officer. Currently, **DA PAM 600-3** is very broad in its guidance and requires only that an MI officer serve in an appropriate intelligence officer position to be fully Branch-qualified. While true, that misses the point and the requirement for MI officers to seek both leadership and technical developmental assignments. The proposed changes should rectify that situation.

Branch Qualification for MI Captains. In addition to successfully completing the required schooling of the Military Intelligence Captains Career Course (MICCC) and the Military Intelligence Officer Transition Course (MIOTC) (for Branch-detail officers), the MI officer must meet two criteria. The candidate must have successfully commanded a company or detachment for at least 12 months, and have served at least 12 months as a battalion S2, assistant brigade S2, or intelligence staff officer at any echelon.

Branch Qualification for MI Majors. In addition to the Army-required schooling, the MI officers must have served as executive officers or S3s of any battalion or as division analysis and control element (ACE) chiefs for at least 12 months, and they must have served as brigade S2s or intelligence officers at any echelon for at least 18 months.

Intelligence support to warfighters is a demanding business and intelligence officers need to experience as much as they can to ensure continued professional growth. Ultimately, this is not about promotion statistics; rather it is about building the necessary warfighting competence within our officer corps. The changes simply codify what we have all known for years: successful intelligence professionals have always sought out and held both leadership and technical assignments to develop and maintain their professional proficiency.

Upcoming Officer Selection Boards. The Lieutenant Colonels CSA (Chief of Staff, Army) Command Board will meet tentatively 15 through 18 October 2002. The Captains Army Category Board will tentatively meet 5-15 November 2002, and the Brigadier General Army Board will tentatively meet 13-22 November 2002. Remember, it is essential that you have an up-to-date photo in your files and that your officer record brief reflects you accurately—**do not wait** until the last minute.

The POC for officers and civilians is Ms. Charlotte Borghardt. Readers can reach her through E-mail at charlotte.borghardt@hua.army.mil and by telephone at (520) 533-1188 or DSN 821-1188.

Lieutenant Colonel Eric Fatzinger is the Director, Office of the Chief, Military Intelligence (OCMI). Readers may contact him via E-mail at eric.fatzinger@hua.army.mil. Robert C. White, Jr. (Colonel, U.S. Army, Retired) is the Deputy OCMI. You can reach him via E-mail at robert.white@hua.army.mil. Readers may access the OCMI website through the Intelligence Center homepage at http://usaic.hua.army.mil and then linking to OCMI with the Training/MI Professionals button. You will be able to find information on issues ranging from enlisted career field overviews to officer, warrant officer, and civilian updates.

TSM Notes

Prophet Has Arrived

by Colonel Kevin Peterson

The U.S. Army unveiled Prophet, its newest electronic warfare (EW) system, as part of the Army's 227th Birthday Celebration in Washington, D.C., on 12 June 2002. Prophet is the first ground-based tactical electronic warfare support (ES) system fielded in twenty years and is a crucial step toward the Army's Transformation to the Objective Force. Prophet will be the unit of action's (UOA) principal signals intelligence (SIGINT), EW, and multidiscipline intelligence system. Prophet will provide the UOA with an enhanced capability for force protection, situational awareness, intelligence support, and EW.

The Prophet program is using a block-upgrade development approach to field the Prophet Block I dismounted and vehicle-mounted ES capability in September 2002. The Army will add electronic attack (EA), advanced signal detection, measurement and signature intelligence (MASINT), and eventually deployment and control of remote sensors through the Block II through Block V development upgrades. The Prophet system is necessary to counter the rapidly expanding inventory of communications equipment available to potential adversaries and to support the current Army Transformation mission, doctrine, priorities, and requirements.

The Prophet Block I production system completed its technical test

FY	1st Quarter			2nd Quarter			3rd Quarter			4th Quarter		
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
2001									Block I Production Contract Awarded			
2002									PG-6 (Lot 1-Production Systems) Delivered to GOV	System Evaluation		3/2 ID (3) (BCT 1) 1/25 ID (3) (BCT 2) Ft. Lewis, WA (T=6)
2003				1st CD (6) 4th ID (4) 3/4th ID (2) Ft. Hood, TX (T=12)		USAIC&FH TRADOC Fort Huachuca, AZ (5)	82d ABN Ft. Bragg, NC (6)	2d ID EUSA (4)		278th ACR TN-ARNG (4)	10th MTN (Light) Ft. Drum, NY (4)	
2004	172d SIB (BCT3) Ft. Richardson, AK	3d ACR FT. Carson, CO (4)		2d ACR (BCT 4) Ft. Polk, LA (4)	3d ID Ft, Stewart, GA (6)	1st AD USAREUR (6)	1st ID USAREUR (6)	101st AAD Ft. Campbell, KY (6)	45th ESB OK-ARNG (2)			
2005	2/25 ID (BCT 5) USARPAC (3)	3/25 ID USARPAC (2)										

Key:

AAD – Airborne assault division
ABN – Airborne
ACR – Armored cavalry regiment
AD – Armor division
ARNG – U.S. Army National Guard
BCT – Brigade combat team
CD – Cavalry division
ESB – Enhanced separate brigade
EUSA – Eighth U.S. Army (Korea)
FORSCOM – United States Forces Command
GOV – Government
ID – Infantry division
MTN – Mountain
OK ARNG – Oklahoma Army National Guard
SIB – Separate infantry brigade
TN ARNG – Tennessee Army National Guard
TRADOC – U.S. Army Training and Doctrine Command
USAIC&FH – U. S. Army Intelligence Center and Fort Huachuca
USA Korea – United States Army, Korea
USAREUR – U.S. Army, Europe
USARPAC – U.S. Army, Pacific

Legend: FORSCOM | USAREUR | USA Korea | ARNG | USARPAC

Figure 1. Prophet Fielding Schedule.

verification at Fort Huachuca, Arizona, in July 2002. The Army will field it to the two Striker Brigade Combat Teams located at Fort Lewis, Washington, in September. Prophet detects, demodulates, determines the signals angles of arrival, and exploits enemy signals of interest. Eighty-three Block I Prophets should be in the field by November 2004. Figure 1 depicts the Prophet fielding schedule.

The Block I system has an AN/PRD-13 (V2) 2 signal-intercept system mounted on a high-mobility multipurpose wheeled vehicle (HMMWV). It replaces the TRAILBLAZER (AN/TSQ-138), TEAMMATE (AN/TRQ-32 (V)), and manpack (AN/PRD-11, -12) legacy systems.

A preproduction version of Prophet (engineering manufactured design) has already deployed to undisclosed locations around the world in support of the Global War on Terrorism and Operation ENDURING FREEDOM. The Army has received very positive feedback on Prophet's performance. Units commented favorably on Prophet's flexibility, mobility, and reliability. The combatant commanders viewed Prophet's flexibility as a force multiplier in a very fluid and harsh operational scenario.

Colonel Kevin Peterson is the U.S. Army Training and Doctrine Command (TRADOC) System Manager-Prophet (TSM Prophet) at the U.S. Army Intelligence Center and Fort Huachuca (USAIC&FH). Readers may contact him via E-mail at kevin.peterson@hua.army.mil and telephonically at (520) 533-5579 and DSN 821-5579. You may also contact the Deputy TSM, Major Paul McDermitt via E-mail at paul.mcdermitt@hua.army.mil.

Prophet with dismounted soldiers.

Prophet on the move.

MI Corps Hall of Fame

The 15th annual Military Intelligence Corps Hall of Fame (HOF) ceremony was on 28 June 2002. During the ceremony, the Corps inducted five new members: Colonel (Retired) Richard E. Allenbaugh, Lieutenant General (Retired) Donald L. Kerrick, Chief Warrant Officer Five (Retired) Michael J. Maroney, Lieutenant General (Retired) Ira C. Owens, and Major (Retired) Walter J. Unrath. During the HOF celebration, the MI Corps and the 111th MI Brigade redesignated the Fort Huachuca academic complex as Prosser Village to honor the memory of Staff Sergeant Brian "Cody" Prosser.

Colonel Richard E. Allenbaugh (U.S. Army, Retired)

Richard Allenbaugh received his commission through the Army Reserve Officer Training Program (ROTC) at Ohio University as a Field Artillery Officer in 1970. He began service in the Military Intelligence Corps in 1973 upon his transfer from Artillery to the MI Branch. His first major contribution was organizing and commanding the Army's first opposing force (OPFOR) company, modeled after a Soviet motorized rifle company. He later deployed to Fort Irwin, California, where he became involved in testing the OPFOR unit training concept that was critical to the later success of the National Training Center (NTC) and the successive training of the Army's combat forces.

After graduation from the MI Officer Advanced Course, he served a tour as a ROTC Assistant Professor of Military Science at the University of Kentucky. While there, he initiated a new ROTC program at Kentucky State University and earned his Master of Business Administration degree.

He began the first of four assignments with the XVIII Airborne Corps at Fort Bragg, North Carolina, following his graduation from the Command and General Staff College. As the Corps G2 Training Officer, he expanded the Readiness Training (REDTRAIN) Program throughout the Corps, planned and designed the Signals Intelligence (SIGINT) Readiness Facility with links to the National Security Agency (NSA) and the Corps' deployed units, and expanded the language training facilities at Fort Bragg. He served as the Executive Officer (XO), 519th MI Battalion (Airborne), 525th MI Brigade, during Operation URGENT FURY. As the XO, he led the testing and evaluation of the high-frequency (HF) single-station location (SSL) and direction-finding (DF) concept for an MI tactical exploitation (TE) battalion. The Army procured the HF SSL DRAGON FIX system and assigned it to the 519th MI Battalion (TE) (ABN), which then deployed to Panama for Operation JUST CAUSE.

As the 525th MI Brigade S3, he task-organized and coordinated the deployment for the 224th MI Battalion (Aerial Exploitation [AE] Task Force (TF) deployment to Honduras for Quality Dragon, a five-year SIGINT mission. The 224th TF reduced its deployed footprint by removing an antenna suite from a Guardrail aircraft and modifying it to work independently while positioned on a mountaintop for line-of-site to the other aircraft. This reduced the mission requirement from three to two aircraft. In coordination with the NSA, they designed a truck with signal-relay equipment to transmit data from the deployed mission aircraft to a commercially leased satellite and then to the Guardrail ground facilities operating at Hunter Army Airfield, Georgia. At Hunter, personnel translated intercepted signals, prepared tactical SIGINT reports, relayed them to various locations, and returned the reports to customer embassies within minutes. The 525th MI Brigade led the way in split-based MI operations in 1983-1984.

Selected for Lieutenant Colonel below the zone before his 1986 short tour, he served in Yong-In, Korea, with the Third Republic of Korea (ROK) Army G2 staff, as the Senior U.S. Intelligence Officer on Combat Support Coordination Team 3. He led the Korean-U.S. combined intelligence team to incorporate the latest U.S. MI doctrine, and he revamped the Third ROK Army intelligence collection plan.

Upon selection for battalion command, he returned to Fort Bragg and the 519th MI Battalion (TE)(ABN). Among the Battalion's accomplishments in 1987-1989 under his command included revamping the annual training program to align with supported XVIII Airborne Corps divisions. During the Divisions' Annual Training Evaluation Exercise, the task-organized Battalion participated in the exercise and the evaluation. A Company (Interrogation) would receive soldiers for B Company (Counterintelligence) and for C Company (Electronic Warfare). A Company TF received training in air assault operations and aligned with the 101st Airborne Division (Air Assault), B Company (TF) with the 82d Airborne Division, C Company TF commander in support of division and separate brigade rotations to the Combat Training Centers (CTCs) at Fort Irwin and Fort Polk. The 519th employed new interrogation procedures with video teleconference (VTC) cameras in each interrogation room for rapid tactical interrogation reporting via digital message transmission devices. We published tactics, techniques, and procedures (TTP) manuals for interrogation, counterintelligence (CI), and EW operations based on the 519th's deployment postures. The Battalion shared these TTP manuals with the U.S. Army Intelligence Center and Fort Huachuca (USAIC&FH) and later published them for use by other Army MI units.

Colonel Allenbaugh deferred attendance at the Army War College for a year to become the 82d Airborne Division G2. From 1989-1990, he coordinated the receipt of several new MI systems in the Division, reorganized the Analysis and Control Element (ACE) to include the terrain analysis team, and worked as part of the division effort for expanded annual training evaluations with a dedicated OPFOR and intelligence preparation of the battlefield (IPB) procedures. He also expanded the Division-wide intelligence command post exercise (CPX) for both teaching and coordinating the brigade collection plans for each Division operations plan (OPLAN). He parachuted into combat for Operation JUST CAUSE in Panama in December 1989. The 82d was the U.S. Army Force (ARFOR) with the 2d Brigade, 7th Infantry Division (ID), and the 75th Ranger Regiment attached during various phases of the operation.

After graduation from the War College and one year's service as the Deputy G2, XVIII Airborne Corps, he assumed command of the 504th MI Brigade, III Corps, at Fort Hood, Texas, in 1992. The highlights of his two-year command tour include—

- Transition of Guardrail V to Improved Guardrail.
- Retirement of the OV-1D Mohawk aircraft.
- Creation of the 3d MI Battalion (AE) Mohawk Museum with the mounted OV-1D (tail number 007) in front of the new Battalion headquarters.
- Out-of-cycle and first MI corps brigade receipt and employment of the All-Source Analysis System (ASAS).
- Reorganization of the Brigade to permit rapid deployment support for III Corps units.
- Incorporation of the aligned MI Battalion (TE), U.S. Army Reserve (USAR).

Colonel Allenbaugh's next assignment was with the Army Staff as the Director of Plans, Programs, and Integration. He was instrumental in revamping the Army Intelligence Master Plan (AIMP), coordinating the Army Intelligence "lane" in the Louisiana Maneuvers Campaign Plan, and working with USAIC&FH, U.S. Army Intelligence and Security Command (INSCOM), U.S. Army National Guard (ARNG) and USAR on MI organizational changes from lessons learned during Operation DESERT STORM.

He served his final tour at Fort Bragg as the G2, XVIII Airborne Corps. COL Allenbaugh retired in 1997.

Lieutenant General Donald L. Kerrick (U.S. Army, Retired)

Donald Kerrick received his commission through Army ROTC as a Second Lieutenant, Military Intelligence, in the Regular Army, and as a graduate of the Army Aviation Qualification Program. In his first assignment, he received a detail to Armor Branch as the Executive Officer (XO) of a tank company at Fort Knox, Kentucky. In 1974, First Lieutenant Kerrick moved to Thailand, where he served as the Operations Officer and Deputy Commander of an aerial reconnaissance unit flying combat missions into Cambodia and Vietnam. He then became a Company Commander for the National Security Agency Field Station in Central Thailand.

From 1976 to 1979, Captain Kerrick commanded an intelligence unit in Berlin, providing direct support to tactical air and ground forces in the European theater, as well as interrogation of refugees and defectors and liaison with British and French intelligence agencies. Captain Kerrick then served as the U.S. Army Intelligence and Security Command (INSCOM) Safety and Standardization Officer from 1979 to 1982; during this assignment he worked on fielding and supporting advanced airborne intelligence systems in Panama, Korea, Turkey, and Germany.

Next, Major Kerrick commanded Korea's only Army electronic warfare (EW) company providing around-the-clock communications intelligence support to the Republic of Korea and U.S. Forces in the ROK. He then moved to the Army Staff, first as an Aviation EW Staff Officer and subsequently as the Assistant XO for the Army's Assistant Chief of Staff for Intelligence. This period included advanced work in development, acquisition, and testing of MI and Army operational equipment as well as advanced operational concepts including unmanned aerial vehicles (UAVs), remote technologies and operations, and doctrinal innovations.

In 1987, Lieutenant Colonel Kerrick became the Commander, 3d Military Intelligence Battalion (Aerial Exploitation [AE]) in the Republic of Korea. His Battalion field-tested the first UAV in Korea, participated directly in providing security for the 1988 Seoul Olympics, and conducted several operations with the South Korean intelligence services.

Following graduation from the National War College, Colonel Kerrick became the Special Assistant to the Commander, INSCOM. Personally selected and sent to Saudi Arabia, COL Kerrick became to become the Chief of the Third Army's Targeting, System, and Program Division for the Gulf War. He led the fielding of 25 intelligence and electronic warfare (IEW) systems to corps and divisions in a sixty-day period. In 1991, he became the Commander of the 701st MI Brigade and Field Station-Augsburg, in Germany. During a period of great turmoil in Europe, Colonel Kerrick led his brigade to win the prestigious Director of the National Security Agency's Travis Trophy as the cryptologic unit making the most significant contribution in signals intelligence (SIGNT) to the nation in 1991.

His next assignment was with the Joint Staff Directorate for Strategic Plans and Policy as the Chief, European Division. This led to his selection to the President's National Security Council (NSC) as Director for European Political and Security Affairs. He developed and supplied policy advice on foreign and national security policy to the National Security Advisor and the President.

Brigadier General Kerrick then became the Director of Operations and the Defense Attaché System for the Defense Intelligence Agency (DIA). In this position, he was also the Director of the Defense HUMINT (Human Intelligence) Service (DHS); Director, Central Measurement and Signature Intelligence (MASINT) Office; and Director, Defense Collection Management Directorate. In 1995, the President asked General Kerrick to leave DIA temporarily to serve as his personal representative on the U.S. team negotiating an end to the war in Bosnia-Herzegovina, resulting in the Dayton Accords. In January 1997, Brigadier General Kerrick became the NSC's Chief of Staff. He was responsible for developing, implementing, and reviewing U.S. foreign and national security policies around the world. He received his promotion to Major General during this period. In August 1999, Lieutenant General Kerrick became the Assistant to the Chairman of the Joint Chiefs of Staff. In this capacity, he was also the Military Advisor to the Secretary of State. In July 2000, the President asked Lieutenant General Kerrick to return to the White House to serve as his Deputy National Security Advisor, advising the President on all matters pertaining to national security and foreign policy.

Chief Warrant Officer Five Michael J. Maroney (U.S. Army, Retired)

Michael Maroney enlisted in the Army in 1970 and attended Basic Training at Fort Dix, New Jersey. In 1971, Corporal Maroney graduated as a Special Agent from the Counterintelligence (CI) Course at Fort Holabird, Maryland, and then attended the Korean and German language courses at the Defense Language Institute in Anacostia, Virginia. Having a gift for languages, he graduated at the top of his German language class and then received a promotion to Sergeant.

He proceeded to his first operational assignment with the 165th MI Battalion in Frankfurt, Germany, where he performed countersubversion and counterespionage duties that involved sensitive source operations targeted against dissident groups opposed to the U.S. Government and the Vietnam War. He concluded his tour of duty as the primary liaison officer between the 165th MI Battalion and

the Frankfurt/Main Criminal Police, which was an extraordinary responsibility for such a young soldier. In 1974, SGT Maroney transferred to the U.S. Soviet Military Liaison Mission where he was highly successful in conducting compartmented, human intelligence (HUMINT) collection operations against our major adversary of that time—also an extraordinary accomplishment for a young soldier who had not yet received formal training in conducting these high-risk source operations. After promotion to staff sergeant, he returned to the United States where he graduated from the Military Operations Training Course that qualified him as a HUMINT Area Intelligence (AI) Specialist, also commonly referred to as a Case Officer.

SSG Maroney expanded his professional development in his next assignment as a Regional Desk Officer in the U.S. Army Intelligence and Security Command (INSCOM) Assistant Deputy Chief of Staff for Operations and Plans-HUMINT at Fort Meade, Maryland. While serving in this crucial staff position, he earned promotion to Warrant Officer

One (WO1) as an AI Technician and he guided the most sensitive, Army HUMINT collection operations conducted in the Far East. He was instrumental in helping to shape U.S. Army Pacific Command (PACOM) policy into operational guidance and he routinely briefed sensitive operational proposals at the Army, joint, and national levels.

CW3 Maroney earned a Master of Arts degree in Political Science and International Relations from the University of Rhode Island. Following graduate school, he served as a Case Officer in the Operations Company, U.S. Army Operational Group (USAOG) in the Fort Meade area and continued to perform the most sensitive, high-risk and aggressive, HUMINT source operations ever conducted by that organization. After his promotion to CW4, he transferred to the Army's premier Training Course under the U.S. Army Foreign Counterintelligence Activity (USAFCA) in the Fort Meade area where he served as a Principle Instructor in the area of foreign CI investigations and conducted an extensive review of several MI source operations compromised in Europe. He consequently developed an innovative strategy to help deter the collection efforts of hostile intelligence services that is still in use today.

In 1990, CW4 Maroney once again returned to Munich, Germany, where he served as Counterespionage Case Officer for Detachment 15 for two years. Handpicked to deploy back to Saudi Arabia not long after he arrived in Munich, he returned to support Operation DESERT SHIELD. While serving there, he established and managed the U.S. Central Command (CENTCOM) Offensive Counterintelligence Operations Program.

CW4 Maroney also established close liaison contacts with senior leaders in the Saudi Ministry of the Interior (MOI) who provided valuable CI/HUMINT force-protection intelligence information that satisfied CENTCOM priority requirements. CW4 Maroney was also an outstanding mentor to the young soldiers in the 513th MI Brigade who learned how to conduct low-level source operations under his expert guidance. CW4 Maroney briefly returned to Munich but they recalled him to Kuwait immediately following initiation of the DESERT STORM ground campaign. During the intense six-week period that followed, he supervised CFSO (CI/HUMINT force-protection source operations) and conducted liaison activities with the Kuwaiti MOI. During this critical phase of DESERT STORM, he collected vital intelligence information that senior U.S. Government officials used to influence Kuwaiti governmental policy on the return of refugees. His performance of duty under harsh and stressful conditions was exceptional and he truly deserved the award of the Bronze Star Medal for extraordinary performance during the Gulf War.

In 1992, CW4 Maroney transferred to another assignment with USAFCA in Berlin for two more years where he managed a highly trained team of counterespionage experts who focused their intelligence collection efforts against the most dangerous worldwide target countries. He graduated from the FBI National Academy in Quantico, Virginia, enroute to his final assignment at Fort Huachuca, Arizona.

CW4 Maroney earned a promotion to CW5 in 1995 and became Senior Military Instructor for the Collection Branch, Tactical (TAC) HUMINT Committee, 309th MI Battalion. During his last six years in the Army, CW5 Maroney made his greatest contributions to the MI Corps by updating and presenting CI/HUMINT training curriculums and, most importantly, sharing his vast knowledge and experience with hundreds of young soldiers he instructed and mentored. Also noteworthy during this fulfilling assignment was CW5 Maroney's direct support to the warfighters in Bosnia-Herzegovina. The Department of the Army Deputy Chief of Staff for Intelligence (DA DCSINT) directly tasked him to provide one-on-one HUMINT training to several flag officers that included the Commander in Chief (CINC) U.S. Army, Europe (USAREUR); the Commander, Stabilization Force (SFOR); and several Task Force (TF) Eagle commanding generals. He traveled to Bosnia on numerous occasions to train these senior leaders and he always made extra efforts to train all deployed TAC HUMINT Teams, who greatly benefited from his insights and expertise. Additionally, he traveled to the Joint Readiness Training Center (JRTC) at Fort Polk, Louisiana, for two complete training cycles to train the CI and HUMINT soldiers and the leaders of the 629th and 3d Infantry Divisions, who were rotating in to TF Eagle. The commanders of both infantry divisions lauded CW5 Maroney for his outstanding efforts in providing critical and timely CI and HUMINT training.

CW5 Maroney achieved an unparalleled record of success in conducting highly sensitive HUMINT and counterespionage source operations that helped shape U.S. Government policies and significantly contributed to the fall of the Berlin Wall and the collapse of the communist regimes in Eastern Europe. He retired in 2001.

Lieutenant General Ira C. Owens (U.S. Army Retired)

Ira Owens received his commission through Officer Candidate School (OCS). He served in the U.S. Army Security Agency (ASA) Headquarters in Arlington, Virginia, where he held a variety of security and electronic warfare (EW) staff officer positions.

From this assignment he moved to the Home of the Infantry and successfully completed Airborne and Ranger training. His first Special Operations Forces (SOF) assignment was as the

Operations Officer and subsequently the Commander of the 402d Security Operations Detachment, 10th Special Forces Group, Bad Tolz Germany.

From there he went to U.S. Strike Command (STRICOM) as an essential EW Planner for quick-reaction strike forces. Immediately after his STRICOM tour, he returned to Special Forces, this time as the Commander, 403d Special Operations Detachment, 5th Special Forces Group, in the Republic of Vietnam. Returning from Vietnam, he became the Executive Officer of the 301st Battalion (Airborne) at Fort Bragg, North Carolina.

Recognized as an outstanding officer with unique skills, he was one of a select few to attend the U.S. Marine Corps Command and Staff Course. In 1973, he returned to the Pacific Theater, this time personally selected to be the Commander of the U.S. Army Special Security Group, Cambodia. During this period of political turmoil in Asia, Ambassador John G. Dean singled him out for making "*an indispensable contribution to the implementation of our policy toward Cambodia*."

Selected to command the 313th ASA Battalion (Airborne), XVIII Airborne Corps, he returned to Fort Bragg. After a superb command tour, he became the Operations Officer, Office of the Assistant Chief of Staff G2, XVIII Airborne Corps and subsequently the Assistant Chief of Staff G2, 82d Airborne Division.

Armed with extensive field experience, he moved to the Pentagon to become a Force Integration Staff Officer with the Intelligence, Surveillance, Target Acquisition, and Electronic Warfare Directorate, Office of the Deputy Chief of Staff for Operations and Plans. After promotion to the rank of Colonel, he again found himself Pacific-bound, this time as the Commander, Field Station-Okinawa—the largest intelligence command in the Pacific. A return to Fort Bragg followed his tour in Okinawa; he distinguished himself as the J2 of the Joint Special Operations Command.

Returning to the Pentagon, Colonel Owens became the Executive to the Assistant Chief of Staff for Intelligence, U.S. Army. He later served as the Chief of Staff at the U.S. Army Intelligence and Security Command (INSCOM).

Following his promotion to General Officer, he became the Deputy Commander, INSCOM, followed by an appointment as the Army Assistant Deputy Director for Operations, at the National Security Agency. He left NSA to become the Assistant Deputy Chief of Staff for Intelligence; in November 1991, he became the twenty-seventh Senior Intelligence Officer of the United States.

At home in the strategic intelligence environment, LTG Ira Owens was instrumental in coordinating national agency support to the operating forces from the rescue operation in Grenada to Operations JUST CAUSE and DESERT STORM. As the Assistant Deputy Director of Operations for NSA, he garnered support for a variety of sensitive programs that included bringing the Regional SIGINT Operating Centers (RSOCs) on-line, establishing direct support operational teams for military operations, and employing highly specialized Army intelligence assets to satisfy the critical intelligence requirements in support of Executive Branch national security objectives. LTG Owens retired in 1995.

Major Walter J. Unrath (U.S. Army, Retired)

In 1939, at the age of 16, Walter Unrath joined the 258th Field Artillery Regiment and served in Hawaii. The Army honorably discharged him in fall 1939 and he reenlisted in the U.S. Army in 1940. His assignments progressed from Chief Clerk of Army Reserve Affairs to Instructor, Military Science and Tactics, at New York University. In 1942, he entered Officer Candidate School (OCS) and graduated in February 1943 as a Second Lieutenant. He was a combat commander in Europe until the end of World War II. While in Europe, he served in a temporary duty assignment with the U.S. Army Counterintelligence Corps (94/CIC Team) where he performed investigative and interrogation functions that led to the arrest of many, designated German war criminals (automatic arrestees).

He returned to the United States in the fall of 1945 for separation. Reenlisting in the U.S. Army as a Master Sergeant in February 1946, he served as Chief Clerk in the U.S. Army Reserve Office, New York, with responsibility for a section of 35 enlisted soldiers; the Army recalled him to active duty as an officer in summer 1946.

From 1946 to 1948, as a Special Agent for the U.S. Army CIC, his duties ranged from Field Investigator to Chief, Investigations and Operations, 108th CIC Detachment. At the Detachment, he managed a staff of 45 with responsibility for all CI investigations, services, and operations conducted by subordinate field units covering all of New England, New York, New Jersey, and Delaware. He directed and supervised—

- Investigations of personnel for security and loyalty.
- Investigations involving espionage, subversion, and disaffection suspects.
- Security surveys.
- Inspections of the First U.S. Army military and industrial installations' analysis of reports from other federal investigative organizations, and preparation, review, analysis, and evaluation of CI and investigative surveys, studies, and reports.

As a Regional Technical Specialist from 1948 through 1952, Major Unrath supervised military and CI field teams charged with CI and investigative coverage of a geographical area of West Germany with a population of approximately four million people. Responsible for the control, security, and deployment of all covert and overt indigenous sources of information and modus operandi used in covert operations, he also directed and participated in highly sensitive and specialized investigations and interrogations regarding subversion and espionage suspects and agents. He used special investigative technical equipment as necessary. He was also responsible for the overall security of all regional covert operations and for the assignment of specific regional target surveys and studies.

Major Unrath served as Assistant Operations Officer and controlled all the CI investigations and convert operations conducted within a specific regional area of jurisdiction. He reviewed, analyzed, and evaluated regional investigative and intelligence reports received from field installations as well as U.S. and allied intelligence and law enforcement agencies (LEAs). During this time, he prepared and implemented specific regional operational plans, directives, and policies.

As Chief, Technical Specialist Division, 66th CIC Group, he supervised a staff of 31. He served as Operational Supervisor of 12 subordinate regions of the United States Army, Europe (USAREUR), including the Bremen Enclave and the U.S. Sector of Berlin, and maintained operational staff responsibilities over the CIC units within the Communications Zone, France. In addition, he was responsible for—

- Overall control and security of covert and overt indigenous sources of information used by the Group in its operations within its prescribed area of responsibilities.
- Establishment of 66th CIC Group CI targets.
- Institution of necessary operational controls.

He instituted and maintained an original Group operational cost-accounting system involving vast sums of confidential funds, and was responsible for the direct operational control of those funds theater-wide. As a senior officer, he participated in and directed high-level and sensitive CI investigations as well as directing investigations and interrogation of selected espionage suspects and agents. He conducted command investigations of U.S. personnel and organizations suspected of violating regulatory directives and laws.

From 1952 to 1953, Major Unrath served as the Chief of Operations for the 902d MI Group. Reassigned as the Chief for the Technical Specialist Division, he conducted special high-level and critically sensitive investigations. During the remainder of the tour, he served as the Assistant Group S3 for Headquarters, 66th CIC Group. With a staff of more than 120 soldiers, he was responsible for the development, promulgation, and implementation of all Group operational plans, policies, and procedures concerning classified CI covert operations within USAREUR jurisdiction. Reviewing, analyzing, and evaluating investigative and intelligence reports from subordinate organizations, U.S. and allied intelligence agencies, and German intelligence and LEAs were some of the tasks he performed while in this position. He appeared before the Killian Committee (a Presidential Committee appointed by President Dwight D. Eisenhower) in July 1956 to provide informational testimony on all CI operations, plans, and policies in Europe for the 66th CIC Group and USAREUR.

From 1956 to 1958, Major Unrath held the position of Executive Officer, Headquarters, Region I, 108th CIC Group with supervisory responsibilities for four major operational branches. He was responsible for the overall operational effort and activity of the First U.S. Army CI and investigative mission within the geographical area of New York City, Long Island, and seven counties of New York State. He was also responsible for the preparation and implementation of all operational plans and directives; establishment of operational policy and direction; interpretation of existing federal security directives and statutes; and the initiation, conduct, direction, and control of all CI investigations and operations.

Major Walter Unrath retired from military service in August 1958 and from federal service in June 1974.

MIPB Web Site

MIPB's new web site should be available after 15 October 2002. The new address is http://mipb.futures.hua.army.mil.

Sly Fox

by Matthew J. Nunn

The All-Source Analysis System (ASAS) Master Analyst Branch (AMAB) is still training soilders. Currently, AMAB is part of the Functional Courses Division (FCD) of the 306th MI Batallion, 112th MI Brigade (Provisional). Even though AMAB has been through various personnel changes and reorganizations since its creation in 1997, the Branch is still dedicated to creating the best ASAS Master Analyst (additional skill identifier 1F) as possible.

The ASAS Master Analyst Branch's specific mission is to:

- ❑ Select and rigorously prepare the best Military Intelligence leaders for duty as ASAS Master Analysts.
- ❑ Conduct the ASAS Master Analyst Course (AMAC) and ASAS Instructor Certification Course (AICC).
- ❑ Develop pertinent training materials for conduct of AMAC and AICC, and support the Master Analysts in the field.
- ❑ Manage the Master Analyst tracking program.
- ❑ Provide on-call ASAS expertise to the U.S. Army Intelligence Center and Fort Huachuca (USAIC&FH).
- ❑ Advise the Commander, 112th MI Brigade (Provisional), on ASAS training policy.

To fulfill our mission, we continue to offer both the ASAS Master Analyst Course (3A-F7/232-ASI1F) and the ASAS Instructor Certification Course.

ASAS Master Analyst Course

The ASAS Master Analyst Course lasts 8 weeks and 4 days. Its purpose is to train selected military intelligence personnel (military occupational specialties (MOSs) 96B (Intelligence Analyst) and 98C (Signals Intelligence Analyst) to:

- ❑ Manage the ASAS configuration in the analysis and control element (ACE).
- ❑ Conduct the unit ASAS training program.
- ❑ Prepare ASAS tactics, techniques, and procedures (TTP).
- ❑ Troubleshoot the ASAS communications architecture.
- ❑ Troubleshoot the ASAS processing architecture.

The course develops advanced skills on analytical methods and processes, intelligence preparation of the battlespace (IPB) and the intelligence cycle, threat assessment, and ASAS integration into mission operations.

The responsibility of the ASAS Master Analyst includes being an **analyst** who can direct, plan, and supervise ASAS intelligence operations including IPB, collection synchronization, integration of automation into the unit's mission, and the intelligence communications-processing architecture. The Master Analyst is a **trainer** who can plan, supervise, and conduct unit ASAS sustainment training and evaluate unit and individual performance including the ASAS skills test. The Master Analyst is also a **troubleshooter** who can isolate and resolve software anomalies and hardware faults, and direct the performance of organizational maintenance of ASAS components.

The AMAC target audience is the staff sergeant (SSG) through master sergeant (MSG) in MOS 96B or 98C who is or will be serving in an ACE as the Master Analyst or ASAS Enclave Senior Analyst. We will also train Warrant Officers (WO1 through CW3) 350B (All-Source Intelligence Technician) or 352C (Traffic Analysis Technician) assigned to the ACE. We can train other MOSs and ranks on a limited, case-by-case basis. All AMAC nominees regardless of rank or MOS should be proficient on at least one ASAS system; we highly encourage proficiency however, on additional ASAS systems. Upon graduation from AMAC, a Master Analyst must have at least eight months retainability in the U.S. Army. Interested individuals may obtain additional information about student prerequisites and the nomination process by visiting the AMAB website at http://150.180.145.79.

ASAS Instructor Certification Course

Created in 1999 in response to Major General John D. Thomas, Jr.'s Digital Transformation Initiative, the three-week AICC is taught two or three times a year, depending on student load and other mission requirements. The primary goal is to enable USAIC&FH instructors to leverage ASAS in a training environment and certify instructors on the ASAS-Single Source, ASAS All-Source, or Remote Workstations. A secondary goal is to provide a basic to intermediate training opportunity for non-USAIC&FH units to meet their commanders' immediate ASAS training needs. AICC would also be good training for units that use ASAS, but do not use all components of the ASAS family, or are not organized around a traditional ACE.

AICC is recommended for units that need additional ASAS training (beyond skill level 10) for some of their ASAS analysts, but do not need the in-depth training or expense of sending an analyst to the ASAS Master Analyst Course.

AMAC Dates, FY 03
03-001 14 Oct-17 Dec 02
03-002 23 Feb-24 Apr 03
AICC Dates, FY 03
03-001 13 Jan-31 Jan 03
03-002 05 May-22 May 03

Figure 1. AMAC and AICC Dates for Fiscal Year 2003.

The course places emphasis on in-depth system skills, training, and troubleshooting that allows training to continue until field software engineer (FSE) support can arrive and provide a long-term fix. Although not designed as such, AICC serves as an excellent prerequisite for AMAC. The students also receive an introduction to Information Engineering and Communications Architecture, and they must prepare for and execute training for an ASAS workstation.

The AICC target audience is the specialist (SPC) through SSG who would be in a position to train or mentor others in the unit on ASAS use. Students already ASAS "smart" are fine, although we are prepared and capable of training personnel with little ASAS experience. The only requirement is that they be familiar with computers in general, and not biased against the use of automated systems. Junior noncommissioned officers (NCOs) would gain the most from AICC, although we will train senior NCOs and warrant officers.

Readers may obtain additional information about AMAC and AICC by visiting the AMAB website at http://150.180.145.79 or by contacting Matthew Nunn via E-mail or telephone (see below).

Matt Nunn is the Course Manager and an Instructor for the ASAS Master Analyst Branch. His career has included 13 years as a Signals Intelligence Analyst at multiple echelons and 5 years instructing AMAC and AICC. He also has 10 year's experience using and instructing about various ASAS systems. Readers may contact Mr. Nunn via E-mail at nunnm@hua.army.mil and telephonically at (520) 538-1184 or DSN 879-1184.

Glossary of Acronyms Used in the Feature Articles

2D – Two-dimensional
3D – Three-dimensional
ABCS – Army Battle Command System
ACE – Analysis and control element
ACS – Aerial Common Sensor
ACT – Analysis and control team
ACTD – Advanced concept technology demonstration
ADA – Air defense artillery
ADOCS – Automated Deep Operations Coordination System
ADP – Automated data processing
AFATDS – Advanced Field Artillery Tactical Data System
AIGIS – Army Imagery and Geospatial Information and Services
AIMP – Army Intelligence Master Plan
AIT – Advanced individual training
AMAP – ASAS Master Analyst Program
AMDWS – Air and Missile Defense Workstation
AMRDEC – Aviation and Missile Research, Development and Engineering Center
AO – Area of operation
AOC – Area of concentration
ArcIMS – Arc Internet Map Server
ARL – Airborne Reconnaissance Low
ASAS – All-Source Analysis System
ASAS-AS – All-Source Analysis System–All-Source
ASAS-SS – All-Source Analysis System–Single-Source
ASE – All-Source Enclave
ASM – Artillery slope map
ASPO – U.S. Army Space Program Office
AT – Antiterrorism
ATF – Bureau of Alcohol, Tobacco, and Firearms
AT/FP – Antiterrorism and force protection
BCBL-H – Battle Command Battle Laboratory-Huachuca
BCT – Brigade combat team
BCTP – Battle Command Training Program
BDA – Battle damage assessment
BDE – Brigade
BFA – Battlefield functional area
BFM – Battlescale Forecast Model
BOS – Battlefield operating system
BP – Battle position
C^2 – Command and control
C^2I – Command, control, and intelligence
C^4I – Command, control, communications, computers, and intelligence
CACC – Combined Analysis Control Center
CADRG – Compressed arc digitized raster graphics
CBRNE – Chemical, biological, radiological, nuclear material, and high-yield explosives
CCMO – Cross-country mobility overlay
CECOM – U.S. Army Communications-Electronics Command
CENTCOM – U.S. Central Command
CFC – Combined Forces Command
CGM – Computer graphics metafile
CGS – Common Ground Station
CI – Counterintelligence
CIA – Central Intelligence Agency
CIB 5 – Controlled Imagery Base five-meter resolution
C/JMTK – Commercial/Joint Mapping Tool Kit (NIMA)
CM – Collection management
CNP – Colombian National Police
COA – Course of action
COB – Civilians on the battlefield
COE – Contemporary operational environment
COGs – Centers of gravity
COMINT – Communications intelligence
COO/MCOO – Combined obstacle overlay/modified combined obstacle overlay
COP – Common operational picture
CSP – communications support processor
CSRT – Customer support response team (NIMA)
CSS – Combat service support
CSSCS – Combat Service Support Control System
CT – Counterterrorism
CWT – Combat Weather Team (U.S. Air Force)
DA – Department of the Army
DCD – Directorate of Combat Developments
DCGS – Distributed Common Ground System
DCGS-A – Distributed Common Ground System-Army
DCSINT – Deputy Chief of Staff, Intelligence
DEA – Drug Enforcement Administration
DFS – Data fusion server
DIA – Defense Intelligence Agency
DIAC – Defense Intelligence Analysis Center
DISE – Deployable intelligence support element
DIV – Division
DIVARTY – Division artillery
DOD – Department of Defense
DOIM – Directorate of information management
DOP – DTSS Overlay Provider
DOS – Department of State
DP – Decision point
DPS – Directorate of public safety
DPTM – Directorate of plans, training, and mobilization
DS – Direct support
DSM – Decision support matrix
DTED – Digital terrain elevation data
DTOC – Division tactical operations center
DTSS – Digital Topographic Support System
ELINT – Electronic intelligence

ELN – National Liberation Army (Ejército de Liberación Naciónal)
EPL – Popular Liberation Army (Ejército Popular de Liberación)
EUCOM – U.S. European Command
FARC – Revolutionary Armed Forces of Colombia (Fuerzas Armadas Revolucionarias de Colombia)
FBCB2 – Force XXI Battle Command Brigade and Below
FBI – Federal Bureau of Investigation
FCS – Future Combat System
FFIR – Friendly forces information requirements
FP – Force protection
FPCONs – Force protection conditions
FS – Fire support
GBS – Global Broadcast System
GBS/TIP – Global Broadcast System/Tactical Injection Point
GCC – Ground Component Command
GCC-ACE – Ground Component Command-Analysis and Control Element
GCC-CACC – Ground Component Command-Combined Analysis Control Center
GCCS – Global Command and Control System
GCCS-A – Global Command and Control System-Army
GCCS-I3 – Global Command and Control System-Integrated Imagery and Intelligence
GCCS-K – Global Command and Control System-Korea
GEOTRANS 2.0 – Geographic Translation Version 2.0
GIAS – Ground Imagery Analysis Section
GIS – Geographic information system
GMDB – Gridded Meteorological Database
GPS – Global Positioning System
GUI – Graphical user interface
HAO – Hydrology analysis overlay
HRTs – High-risk targets
HUMINT – Human intelligence
HTML – hypertext markup language
HVMP – High-volume map production
I^2S – Integrated Intelligence System
IAS – Intelligence Analysis System
IC – Intelligence Community (national level)
IMETS – Integrated Meteorological System
IMINT – Imagery intelligence
INS – Immigration and Naturalization Service
INSCOM – U.S. Army Intelligence and Security Command
IOC – Installation operations center
IPB – Intelligence preparation of the battlefield/battlespace
IPT – Integrated product team
IR – Information requirements
ISR – Intelligence, surveillance, and reconnaissance
IT – Information technology
I&W – Indications and warnings
IWEDA – Integrated Weather Effects Decision Aid
JICPAC – Joint Intelligence Center, Pacific
JISR – Joint Intelligence, Surveillance, Reconnaissance (Project)
JIVA – Joint Intelligence Virtual Architecture
JMICS – JWICS Mobile Integrated Communications System
JMTK – Joint Mapping Tool Kit
Joint STARS – Joint Surveillance Target Attack Radar System
JSWS – Joint Services Workstation
JTAT – Joint Terrain Analysis Tools
JTF – Joint task force
JWICS – Joint Worldwide Intelligence Communications System
KD – Knowledge Discovery
LAN – Local-area network
LEAs – Law enforcement agencies
LOS – Line of sight
MAAS – Mutimedia Analysis and Archive System
MANSCEN – U.S. Army Maneuver Support Center
MAP – Masked area plot
MAPEX – Map exercise
MASINT – Measurement and signature intelligence
MCO – Mobility corridors overlay
MCOO – Modified combined obstacle overlay
MCS – Maneuver Control System
MDCI – Multidiscipline counterintelligence
MDL – Mission data loader
MEU – Marine Expeditionary Unit
MI – Military intelligence
MLRS – Multiple Launch Rocket System
MOS – Military occupational specialty
MTI – Moving target indicator
MTT – Mobile training team
NAD-27 – North American Datum 1927 (grid coordinates system)
NAI – Named area of interest
NAIC – National Air Intelligence Center
NATO – North Atlantic Treaty Organization
NCO – Noncommissioned officer
NCOIC – Noncommissioned officer in charge
NGIC – National Ground Intelligence Center
NIMA – National Imagery and Mapping Agency
NPS – Naval Postgraduate School
NRT – Near-real time
NSA – National Security Agency
OP – Observation post
OPFOR – Opposing force
OPORD – Operations order
OPSEC – Operations security
OPTEMPO – Operational tempo
O/T – Observer/trainer
OTH – Over the horizon
PACOM – U.S. Pacific Command
PASS-K – PACOM ADP Server Site-Korea
PC – Personal computer
PCC – Communist Party of Colombia
PCC-ML – Communist Party of Colombia-Marxist-Leninist (Partido Comunista de

Colombia-
Marxista-Leninista)
PM – Program manager
PMO – Provost marshal office
PVNT – Perspective view nascent technologies
RC – Reserve Component
REMBASS II – Remotely Monitored Battlefield Sensor System II
RGB – Red-green-blue (audio/visual connection)
ROK – Republic of Korea
RS&OI – Reception, staging, onward movement, and integration
RT – Real time
RWS – Remote Workstation (ASAS)
SAR – Synthetic aperture radar
SATCOM – Satellite communications
SBCT – Stryker brigade combat team (formerly initial/interim brigade combat team or IBCT)
SCI – Sensitive compartmented information
SIGINT – Signals intelligence
SINCGARS – Single-Channel Ground and Airborne Radio System
SIPRNET – Secure Internet Protocol Router Network
SIR – Specific information requirements
SJA – Staff judge advocate
SOF – Special Operations Forces
SOUTHCOM – U.S. Southern Command
STT – Small tactical terminal
STU – Secure Telephone Unit
SWNCO – Staff weather NCO
SWO – Staff weather officer
TACSIM – Tactical simulation
TAI – Target area of interest
TAIS – Tactical Airspace Integration System
TCAE – Technical control and analysis element
TDA – Tactical decision aid
TES – Tactical Exploitation System
TF – Task force
TOC – Tactical operations center
TOW – Tube-launched, optically tracked, wire-guided missile system
TOW FF – Tube-launched, optically tracked, wire-guided missile system – fire and forget
TRADOC – U.S. Army Training and Doctrine Command
TROJAN SPIRIT – TROJAN Special-Purpose Integrated Remote Intelligence Terminal
TSM – TRADOC System Manager
TTP – Tactics, techniques, and procedures
T-VSAT – Tactical very-small aperture terminal
TWG – Threat working group
TWS – Trusted workstation
UAV – Unmanned aerial vehicle
UET – UAV Exploitation Team (under 297th MI Battalion)
U.N. – United Nations
USAF – U.S. Air Force
USAIC&FH – U.S. Army Intelligence Center and Fort Huachuca
USGS – U.S. Geological Survey
USFK – U.S. Forces, Korea
USMC – U.S. Marine Corps
USMTF – United States Message Text Format
USN – U.S. Navy
USSPACECOM – United States Space Command
VA – Vegetation analysis (DTSS); vulnerability assessment
VCR – Video cassette recorder
VKB – Virtual knowledge base
VMC – Vehicle-mounted configuration
VMF – Variable message format
VSAT – Very-small aperture terminal
VTC – Video teleconference
WAN – Wide-area network
WGS-84 – World Geodetic System 1984 (grid coordinates system)
WIN – Warfighter Information Network
XML – Extensible markup language

U.S. soldiers from the 3/505th infantry from Fort Bragg, North Carolina, arrive on the ground in Malikasay, Afghanistan, on a mission to seek out enemy forces and locate any weapons or ordnance caches in the area. Photograph by Sergeant Sean A. Terry, USA

Contact Information
and Submissions

This is your magazine and we need your support in writing articles for publication. When writing an article, select a topic relevant to the Military Intelligence community; it could be historical or about current operations and exercises, equipment, TTP, or training. Explain lessons learned or write an essay-type thought-provoking article. Short "quick tips" on better use of equipment, personnel, or methods of problem-solving and articles from "hot spots" are always welcome. Seek to add to the professional knowledge of the MI Corps. Propose changes, describe a new theory or dispute an existing one, explain how your unit has broken new ground, give helpful advice on a specific topic, or explain how a new piece of technology will change the way we operate.

Maintain the active voice as much as possible. Make your point. Avoid writing about internal organizational administration. If your topic is a new piece of technology, tell the readers why it is important, how it works better, and how it will affect them. Avoid lengthy descriptions of who approved the new system, quotations from senior leaders describing how good the system is, reports your organization filed regarding the system, etc.

The ***MIPB*** staff will edit the articles and put them in a style and format appropriate for the magazine. You can send articles, graphics and photographs via E-mail to **michael.ley@hua.army.mil** or mail (with a soft copy on disk) to Commander, U.S. Army Intelligence Center and Fort Huachuca, ATTN: ATZS-FDR-CB, Bldg 61730, Room 103, Fort Huachuca, AZ 85613-6000. (Please do not use special document templates and please attach the graphics separately.) We can accept articles in Microsoft Office 2000, Word 7.0, Word Perfect 6.0a, and ASCII; we need the graphics in Corel or PowerPoint (in order of preference). Please include with your article:

- ❑ A cover letter with your work and home E-mail addresses, work telephone number, and a comment stating your desire to have the article published.
- ❑ A release signed by your local security officer or SSO stating that your article is unclassified, nonsensitive, and releasable in the public domain. (***MIPB*** is available for sale by the Government Printing Office.)
- ❑ Pictures, graphics, and crests/logos with adequate descriptions. Submit clear "action" photos that illustrate your article with captions for the photos (the who, what, where, when, why, and how); the photographer credits; and include the author's name on photos. Please do not embed graphics.
- ❑ The full name and a short biography for each author. The biography should include the author's current duty position, related assignments, relevant civilian degrees, and any special qualifications. (Indicate whether we can print your telephone number and your E-mail address with the biography.)

We cannot guarantee we will publish all submitted articles. ***MIPB*** now employs a three-step process that ends with final approval from the Chief of Doctrine Division. We shall, however, send you a message acknowledging receipt of the article as well as keeping you posted on its status. Please inform us of any changes in contact information as it can take a year or more before some articles are published.

If you have any questions, please call (520) 538-0979/1005 or DSN 879-0979/1005.

Military Intelligence Professional Bulletin
2003 Issues
Upcoming Themes and Deadlines
for Article Submission

Issue	Theme	Deadline
Jan-Mar	MI Fundamentals (ISR Synchronization)	5 Oct 02
Apr-Jun	Force Protection	5 Jan 03
Jul-Sep	Information Operations	5 Apr 03
All Issues	War on Terrorism Operation ENDURING FREEDOM	

635th Military Intelligence Battalion

Oriental blue is the primary color associated with military intelligence units. Red denotes courage and sacrifice. The Indian scout personifies the spirit of the motto, "SEE, HEED, FATHOM," emphasizing the skills required to locate and assess enemy forces. The lightning bolt represents electronic warfare and signals intelligence and the globe symbolizes worldwide capabilities. The dogwood wreath is a reference to Missouri, the "Show Me State."

On 24 March 1997, the Army officially activated the Battalion as a unit within the Missouri Army National Guard (MO ARNG) with a WARTRACE alignment under the 35th Infantry Division (ID). Since receiving federal recognition, the 635th MI Battalion has remained in cadre battalion status as it has made preparations in anticipation of the order of the National Guard Bureau (NGB) to increase its authorized level of organization in September 2002, ending its cadre status.

The 635th MI Battalion is continuing to grow. The Battalion staff, HHOC, and subordinate units are beginning the NGB-directed shift from a cadre battalion to full strength. The battalion will begin to activate its line companies starting with Alpha Company, currently the 231st MI Company (Kentucky ARNG), and the Bravo and Charlie Companies' Analysis and Control Teams in September 2002. Bravo Company will expand to a full company in 2005 and Charlie Company in 2007. Strength in the unit is still high at more than 120 percent, but the search continues for soldiers in all occupational skills for emerging missions.

For the last year, the Battalion's focus has primarily centered on supporting its WARTRACE headquarters, the 35th ID. Some of the missions the 635th accomplished were in support of the 35th ID while it performed as the Corps Response Cell for the 34th ID's warfighter exercise and later as a Division Response Cell in the V Corps warfighter in Grafenwohr, Germany. In addition, the 35th ID will draw on the 635th MI Battalion in support of its train-up for its future deployment to Bosnia for SFOR-13, while those troops who do not deploy to Bosnia have a National Training Center augmentation rotation in June 2003.

The 635th has worked hard in the last year to expand its abilities to support missions for the MO ARNG, Homeland Defense, and airport security. The battalion's soldiers have increasingly made use of the Southwest Army Reserve Intelligence Support Center (ARISC) in San Antonio, Texas, and the Joint Reserve Intelligence Center (JRIC) at Fort Leavenworth, Kansas, to work real-world intelligence missions and exercise their MI skills. The Battalion's future plans include acquiring the All-Source Analysis System (ASAS) and a secure work area, which would increase the soldiers' ability to support the intelligence requirements of the Missouri National Guard and the 35th ID.

Employing the skills of some of its former combat arms soldiers, the battalion has fielded opposing forces (OPFOR) teams that aggress sister ARNG companies and battalions, reenforcing to those units the criticality of remaining tactically proficient in force protection, survivability, and rifle platoon tactics, techniques, and procedures (TTP). The unit's success has come due to the hard work and dedication of its soldiers and families and the constant support of the 35th ID Aviation Brigade and the Missouri Army National Guard.

See, Heed, Fathom!

Commander
U.S. Army Intelligence Center and Fort Huachuca
ATZS-FDR-CB (12)
Fort Huachuca, AZ 85613-6000

BULK RATE
U.S. POSTAGE & FEES PAID
NIAGARA FALLS, NY 14304
PERMIT NO. 300

Presentation

Presentation

Battlefield

Visualization

Battlefield

Visualization

Visualization

Battlefield

PIN: 080257-000