Reorganization of DIA and Defense Intelligence Activities

by Lieutenant General James R. Clapper, Jr., USAF
Director, Defense Intelligence Agency

Lieutenant General James R. Clapper, Jr., was appointed the 10th Director of the Defense Intelligence Agency on 18 November 1991, some twenty-eight years after graduating from the University of Maryland and earning his commission in the US Air Force in 1963.

After service in Vietnam he served in various assignments with the Air Force Security Service and the National Security Agency during the next twenty years. In 1985 he was selected as Assistant Chief of Staff for Intelligence, US Combined Forces Command, Korea, and subsequently served in a similar intelligence leadership capacity at Headquarters Pacific Command, Strategic Air Command, and Headquarters US Air Force.

"Gentlemen, we have no more money; now we must think."

— Ernest Rutherford, British physicist and Nobel Prize winner, 1871-1937.

Rutherford used those words in the early 1990's while addressing a poorly-funded British Government committee assigned the task of determining the feasibility of splitting the atom. Little did Baron Rutherford of Nelson know at the time, but his insightful declaration would, in many ways, define the principal challenge the U.S. defense intelligence community faces today, almost a century later.

... the Soviet paradigm has disappeared... The nation's security policy is undergoing evolutionary change under pressure of drastic military budget reductions...

Admittedly, defense intelligence is far from bankrupt. But there is no question, the nation's military intelligence community faces a daunting array of challenges requiring imaginative thinking and solutions. Community members, to their credit, are approaching these challenges mindful of the central reality of life in intelligence in the 1990's—everything we do, we do in an environment characterized by escalating consumer needs and generally declining resources.

This article characterizes both the challenge for defense intelligence, and the severely constrained resource environment in which the community is forced to operate. It also explains adjustments made or planned for community organizations and operating systems—adjustments designed to enhance military intelligence's ability to deal effectively with today's diverse threat environment.

Recalling Baron Rutherford's words, the defense intelligence community has not only begun to think; indeed, it has also begun to act in the mutual best interest of its members, the community in general, and for that matter, the nation at large.

The Post-Cold War Security Environment

In the four decades immediately following World War II, defense intelligence committed most of its time, money, and resources to responding to the threat of hostilities originating in the former Soviet Union.

As a result, large, capable, Service component and departmental intelligence organizations were created—all squarely focused on and consumed by issues related to the Soviet threat. The community's primary concerns became anticipating, monitoring, deterring, and containing Soviet aggression, and a diligent effort was made to develop appropriate

capabilities to carry out these missions. Actually, the former Soviet Union was a simple intelligence problem, but it was one that required incredibly complex capabilities to manage.

Now the Soviet paradigm has disappeared. It evaporated when the Communist system, the Soviet Union and its client states all collapsed from within. Nonetheless, this former Soviet/Warsaw Pact threat continues to influence U.S. military thinking, planning, and activity. Together with several other key factors, it is helping define the post-Cold War security environment and has already played a major role in determining military intelligence requirements through the end of this decade.

...the Defense Intelligence Agency will lose nearly 1,000 billets by Fiscal Year 1997...

Another of these key factors influencing the American military today—one closely related to the collapse of the Soviet Union—is the significant degradation of the global nuclear threat. That's the good news. The bad news is that this same decline has facilitated a new array of potential conflicts which frustrate expectations for a new era of peace and security.

The United States now faces an international security environment marked by diverse regional crises and contingencies, many of which are being inflamed by nationalism, ethnicity, ideology, and resource scarcity.

The nation's security policy is also undergoing evolutionary change. Following the President's articulation of the national security strategy, Secretary of Defense Les Aspin recently outlined four major impediments to achieving that strategy's goals; nuclear weapons and other weapons of mass destruction, regional disputes; threats to democracy and reform, and economic issues.

A third factor increasingly influencing the roles and missions of the American military is the increasing use of multilateral organizations, such as the United Nations (UN), to resolve regional crises. Current levels of international support for UN peacekeeping efforts are unprecedented. For example, during 1990, the UN employed some 10,000 peacekeeping forces at an annual cost of approximately $819 million. Within three years, those numbers had grown almost exponentially—to more than 80,000 peacekeepers supported by an annual budget of nearly $3.6 billion.

The development—and refinement—of joint warfighting concepts has also had a significant impact on the conduct of military operations—almost as significant an impact as that made by recent technological advances. While advanced technology holds the potential to change and improve—among other things, our communications capabilities and ability to process and store data—it also has the potential to vastly complicate military operations.

A final factor influencing the U.S. military is the widespread pressure to reduce defense spending. And while we might prefer otherwise, the defense intelligence community has not been able to isolate itself from budget cuts and personnel reductions. For example, the Defense Intelligence Agency (DIA) will lose nearly 1,000 billets by Fiscal Year 1997. Throughout the General Defense Intelligence Program (GDIP), which funds most of the military intelligence resources that support joint forces and the defense acquisition community, cuts will approach 5,000 billets by FY 1997.

Projected reductions of this magnitude in the Department of Defense (DoD) have precipitated a shift in the Department's focus—from maintaining a large force in being, to establishing a capability for rapid reconstitution to deter or counter the ascendance of a rival global power. For DoD to make this shift workable, it is relying heavily on military intelligence to identify and monitor emerging threats. Such a policy places a premium on timely and accurate forecasting.

Taken together these factors define a new context for the U.S. military—one in which much of the burden of meeting the gaps certain to arise between requirements and resources falls squarely on military intelligence's ability to analyze the present and somehow "divine" the future.

The Role of Intelligence

Fortunately, despite several years of dramatic change in the international military balance, the fundamental mission of military intelligence has remained unchanged. It is still to provide unique insight to the

operating forces, reduce uncertainty for decision makers, and project future threat environments for the systems acquisition community. As a result, the defense intelligence community has been able to concentrate lately on finding increasingly innovative ways of supporting its customers, and of providing this support more rapidly and efficiently.

Most recently, military intelligence has shifted greater attention to transforming its traditional peacetime organizations and activities into ones that more closely resemble those the community will set up and energize when it goes to war.

In all of these efforts, defense intelligence is clearly focused on the customer, of which there are three primary ones: the military operators, defense policymakers, and the force planning and modernization communities. (Chart #1)
Each requires intelligence to focus on different issues, from slightly different perspectives, and at different times. The military commander, for instance, needs comprehensive intelligence data concerning his specific battlefield in order to effectively influence warfighting decisions. Since these decisions are made in minutes—not hours or days-supporting intelligence must meet stringent time constraints.

Simultaneously, there is a need for assessments of the potential consequences and likely effects of U.S. military actions that look weeks, and sometimes months, into the future. Conversely, intelligence analysis that supports defense policymaking is required to merge reliable day-to-day reporting of global events with assessments of potential crises and conflicts in the future.

In the current international environment, defense policy depends for its effectiveness on intelligence judgments of future regional trends and the actions of governments and groups capable of affecting U.S. national interests.

Finally, military force planners rely on the military intelligence community to depict the future environment for military forces so they can develop the doctrine, strategy, and tactics that will ensure U.S. armed forces maintain an advantage against any conceivable adversary. Accurate, long-term projections of the threat environment and the probable characteristics and capabilities of weapons systems and equipment are absolutely essential to the U.S. military's equipment modernization and weapons acquisition decision process.

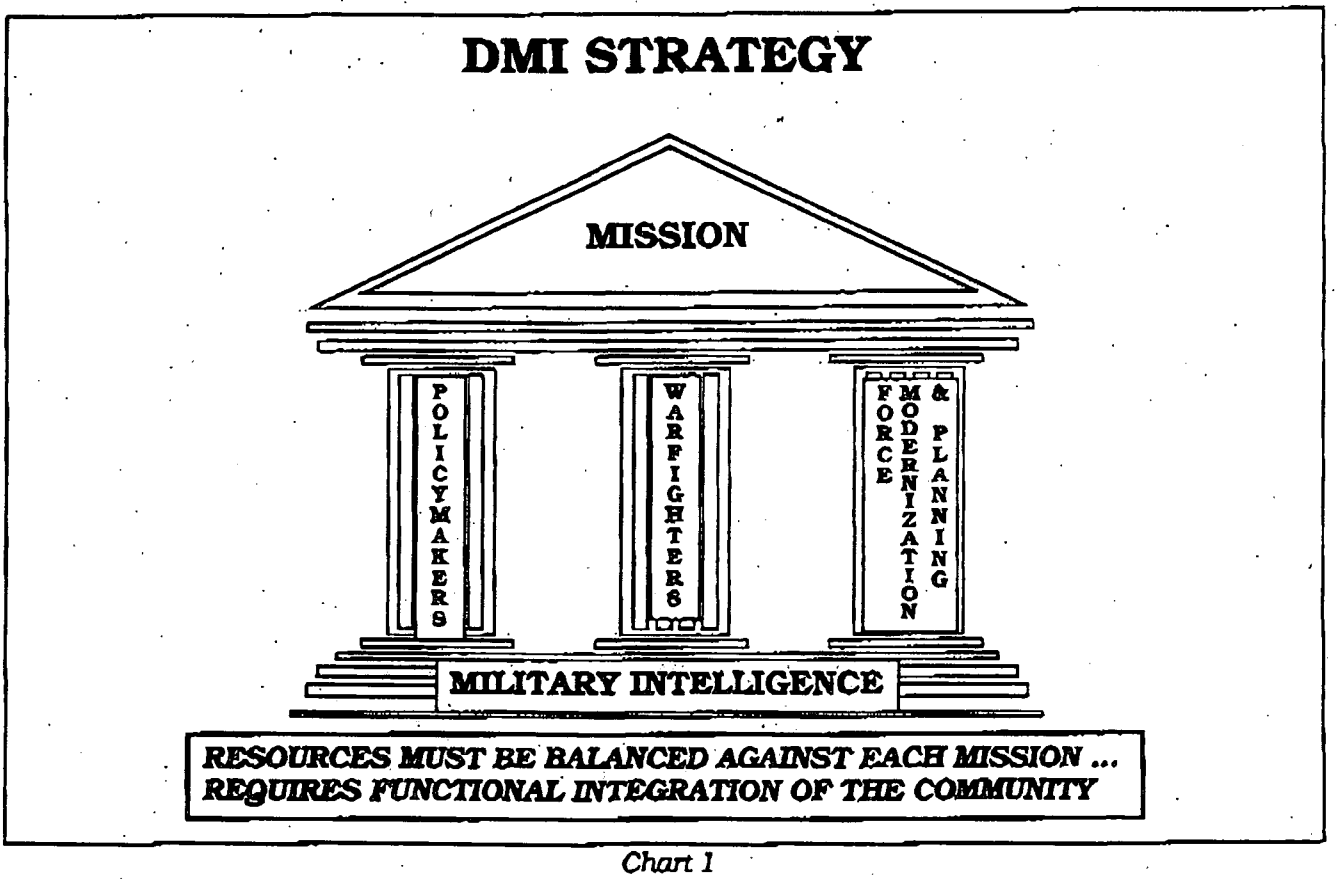

Chart 1

In fact, as the future grows murkier and U.S. military activities expand—into greater involvement, for example, in peacekeeping and humanitarian relief operations—and the resources for weapons procurement decline, the demand for more in-depth and timely intelligence forecasts increases dramatically.

These three distinct consumer groups are demanding military intelligence do several important things:

- Organize, manage, and optimize its dwindling resource base to provide intelligence that identifies crises around the world;

- Provide encyclopedic data on the battlefield environment and the forces of allies and adversaries;

- Monitor the emergence of regional threats to U.S. interests and advise on how to minimize these threats; and

- Forecast the nature and capabilities of potential threats 15 to 20 years into the future.

Restructuring the Community

While intelligence collection and production priorities have undergone fundamental changes over the last five years, shifts of intelligence personnel and activities also have occurred. Internal realignments were the first order of business, followed by more far-reaching reorganizations within DIA and the military Services.

This evolution of military intelligence has rightly stopped short of complete consolidation. There are, after all, diverse needs that DoD, the Services and the combatant commands must consider, along with the substantial infrastructure involved. What has not stopped is the search for ways of improving the effectiveness and efficiency of all remaining intelligence assets. This is military intelligence's focus today—the substantial challenge of functionally integrating the activities of organizations throughout the defense intelligence community. I've accepted this challenge and am addressing it primarily in my ex-officio role as Director of Military Intelligence (DMI). To assist me, I have engaged the military intelligence leadership and am empowering its membership in every way possible to ensure success.

Presently, that leadership is focused on embedding a joint mentality in all operations while continuing the search for innovative ways of structuring peacetime elements and activities to smooth the eventual transition to a wartime footing. In addition, the military intelligence community is leveraging advances in automation and communications to enhance the quality of the product it supplies to customers. I believe the leadership is now working more collegially than ever before to solve common problems and improve the management of community activities.

Most importantly, the leadership is attuned to its responsibility to identify as early as possible the community's most critical missions and those essential functions that support these missions. It has also embarked on a rational, community-wide restructuring program that should ensure all essential intelligence capabilities are preserved, even during this period of across-the-board drawdowns. We learned a host of valuable lessons about the kind of intelligence customers require—and how rapidly they need it—during Operations DESERT SHIELD and DESERT STORM, as well as other, subsequent crises and contingencies.

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One key element in the military intelligence community's crisis management structure as it exists today is a direct outgrowth of the Pentagon-based, national-level Joint Intelligence Center (JIC) formed during the Persian Gulf War to handle the overwhelming volume of requests from field elements for intelligence data. After proving its value during the war, DIA institutionalized the functions of this **National Military Joint Intelligence Center (NMJIC)** by formally establishing it as a crisis-oriented, multi-service, multi-agency clearinghouse and tasking center for intelligence. Today, the NMJIC is the nerve center of timely intelligence support to the national-level contingency effort.

Here, analysts and associated personnel continuously monitor international trouble spots, overseeing the formation of either specialized intelligence working groups or task forces to monitor events more intensively. As part of its inherent surge capability, the NMJIC can enlist DIA's extensive analytic expertise through activation of the Agency's Operations Intelligence Crisis Center (**OICC**) in the Defense Intelligence Analysis Center (**DIAC**) at Bolling Air Force Base. Further NMJIC expansion is possible through the augmentation of desk elements staffed full-time by representatives from agencies outside DIA, such as the National Security Agency (NSA), the Central Intelligence Agency (CIA), and the intelligence arms of the Services.

...the NMJIC is the nerve center of timely intelligence support to national contingency efforts. Systems like JWICS and JDISS allow almost instantaneous support to operating forces...

The consolidation of theater intelligence assets into JICs at the major combatant commands complemented and reinforced this arrangement in the Pentagon. Through these field intelligence nodes, analysts at all levels supply detailed assessments regarding priority targets. Interest within them is a full-time capability to monitor events throughout a Command area.

The Joint Worldwide Intelligence Communications System (**JWICS**) gives the community the capability to provide these JICs with the fused intelligence required for theater battle management. A companion system to JWICS, the Joint Deployable Intelligence Support System (**JDISS**), allows the JIC to pass this fused intelligence further along the chain of command to subordinate tactical units.

The JWICS—a Sensitive Compartmented Information (SCI)-secure, high-capacity, multi-media, communications system—features a diversity of capabilities, from secure video and audio for video telecasting and teleconferencing, to collaborative electronic publishing and the electronic distribution of finished intelligence, reference imagery, maps, and geodetic materials. Presently, JWICS carries DIA's daily, classified intelligence updates over the Defense Intelligence Network (**DIN**), a system some have dubbed the "classified CNN."

The JDISS is a deployable system that serves as an interface between the national and theater intelligence centers and the subordinate tactical commands, one that extends the reach of the national-level intelligence community down to the tactical level, and vice versa.

Since its baptism under fire during Operation SOUTHERN WATCH (allied effort to prevent Iraq from conducting air operations against that country's Shia minority in the south), JWICS has become an essential cog in the wheel of intelligence support. During SOUTHERN WATCH-related strike operations in Iraq, the system provided exceptional mission planning support and some of the best battle damage assessment ever. JWICS continues to contribute significantly to U.S. and allied efforts in the Balkans, Somalia, and elsewhere. The possibilities—for analyst-to-analyst and national-to-the-tactical-level communications—are endless.

Systems like JWICS and JDISS enable us to treat intelligence as an integrated whole. Moreover, they enhance defense intelligence's ability to produce intelligence support products and provide them almost instantaneously to operating forces at virtually any location for immediate application on the battlefield.

In addition to developing and perfecting these high-technology solutions to intelligence problems, the military intelligence community is working hard to further improve its corresponding organizational structure and processes.

The DIA Reorganization

Within DIA, we recently completed the most profound reorganization in the Agency's 32-year history by creating a "new-look" agency built on the traditional intelligence pillars of collection, production and infrastructure. Moreover, we designed this structure to serve as an institutional model for closer functional integration of all military intelligence activities.

As part of the DIA reorganization, we sought to drive authority down the management chain to the lowest level, and shifted the Agency's previous analytic orientation from a regional to a functional basis.

The restructuring also cut supervisors by 169, or approximately 30 percent, and reduced burdensome layering across the Agency. DIA's high-grade structure is being reduced as well—DIA's Senior Executive Service (SES) corps will shrink by 17.5 percent, GG-15's, by 20 percent; and GG-14's, by 17 percent. In addition, of significance, 45 percent of DIA's SES members shifted to new jobs during the restructuring.

The Agency is feeling the effects of recent Service-related reductions as well, and stands to lose approximately 25 percent of its uniformed force. The restructuring, however, will enable DIA to lessen the impact of these cuts. To overcome them, we've instituted a more-efficient, functional approach to analysis and will be dependent on the Service production organizations and the JICs for substantial military intelligence production.

Five of DIA's previous nine directorate-size elements, plus several other subordinate offices, were merged to create three major centers: the National Military Intelligence Collection Center (**NMICC**), the Production Center (**NMIPC**) and the Systems Center (**NMISC**). (Chart #2) Besides their internal roles, these centers functionally manage intelligence efforts throughout the entire military intelligence community. They perform the following critical functions:

- COLLECTION CENTER:

— Manages all-source intelligence collection for DoD;

— Acquires and applies collection resources to satisfy current and future DoD requirements;

— Manages the Defense Department's Human Resource Intelligence (HUMINT) and Measurement and Signature Intelligence (MASINT) programs; and

— Controls the Defense Attaché System (DAS), with military attaches stationed in some 100 countries around the world.

- PRODUCTION CENTER:

— Produces, or manages the production of military intelligence to satisfy the needs of DoD and non-DoD agencies;

— Among other tasks, produces all-source, finished intelligence concerning trans-national military threats, regional defense, combat support issues, the weaponry, doctrine and combat capabilities of foreign militaries, foreign military-related medical advances, and foreign nuclear, chemical and biological weapons developments;

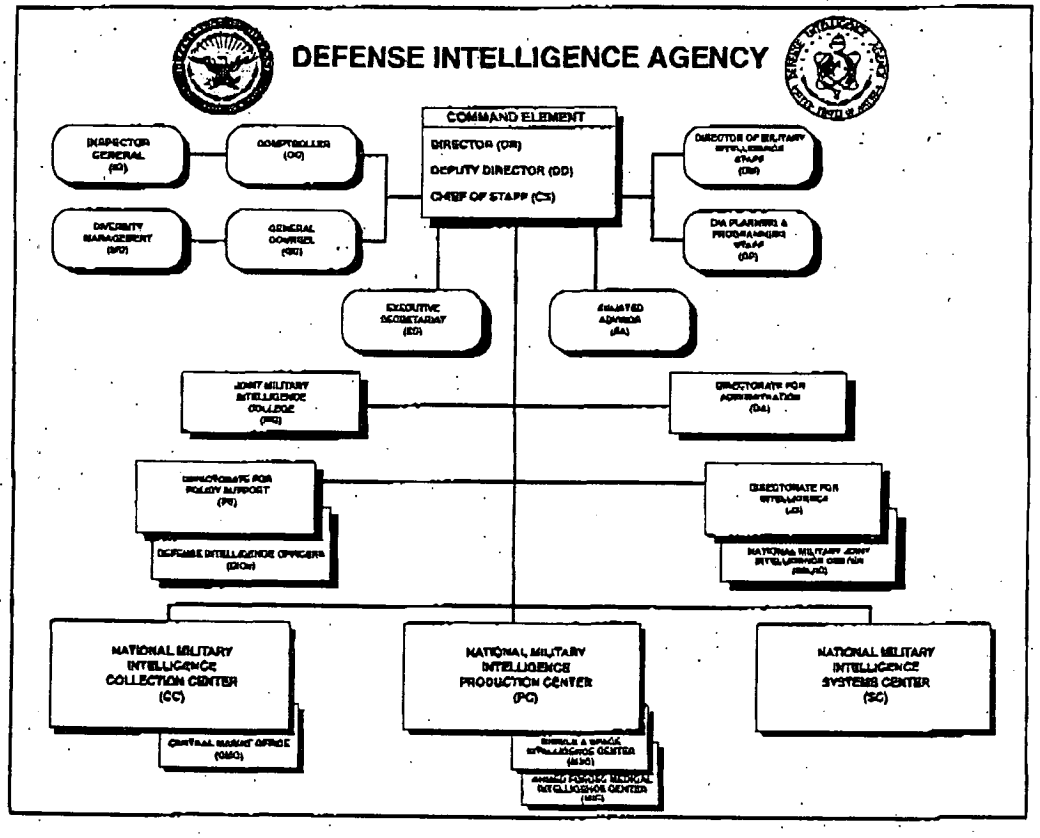

Chart 2

— The Missile and Space Intelligence Center in Huntsville, Alabama, and the Armed Forces Medical Intelligence Center at Fort Detrick, Maryland, are now part of DIA, and within DIA, are part of this Center.

- SYSTEMS CENTER:

— Serves as the computer and automated data processing (ADP) nerve center for DIA;

— Provides information services and related support to DIA and other agencies in the national Intelligence Community, including ADP support, communications engineering and maintenance, information systems security, imagery and photo processing, and the publication and dissemination of intelligence reference products.

Integration Through the MIB

The Military Intelligence Board (**MIB**)—in effect, the military intelligence community's corporate board of directors—has been invaluable during these restructuring efforts.

The DIA Director serves as MIB chairman and sets the agenda for this body composed of the Service intelligence chiefs, the JCS/J2, the Deputy Assistant Secretary of Defense for Intelligence from the office of the Assistant Secretary of Defense for Command, Control, Communications and Intelligence (**ASD/C3I**), the Director for Operations at NSA, and other principal DoD intelligence officials.

The MIB, which played a critical role in fostering greater cooperations within the military intelligence community during the Persian Gulf War, now meets weekly. It is the principal forum through which senior community leaders oversee program development, review integrated programs and budgets, resolve programmatic issues of mutual concern, and deal with substantive intelligence matters.

As Director of Military Intelligence, I envision empowering the Service intelligence chiefs as Deputy Directors of Military Intelligence and authorizing them to assist in managing military intelligence as an integrated community.

All of these recent reorganization initiatives are aimed at improving the flow of intelligence to the community's customers, particularly the warfighting commands. Under this new military intelligence construct (see Chart #3), data will no longer bypass the unified commands in reaching specific field

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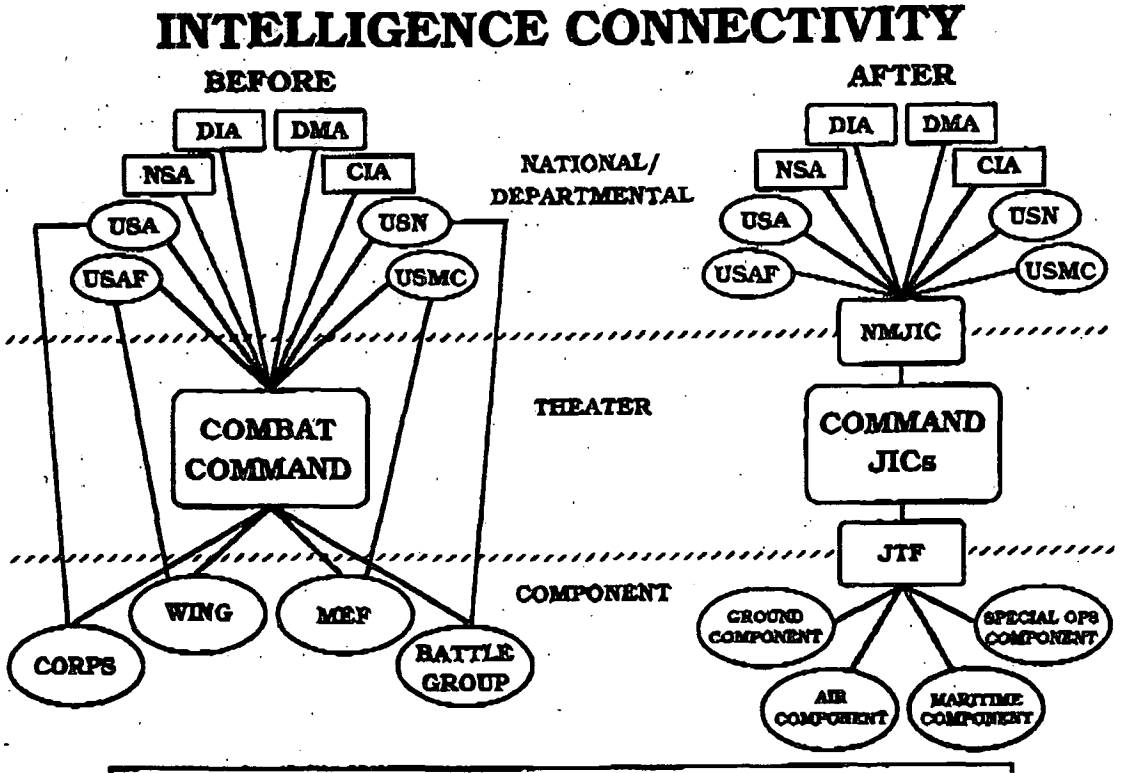

Chart 3

elements. Data funneled through the NMJIC will instead flow through the unified command JICs to deployed Joint Task Forces (JTF). As part of the emerging joint command concept, these JTFs will have as subordinate elements not Army, Marine Corps, Air Force and Navy components, but generic ground, air, maritime, and Special Operations components.

In conclusion, many of these new military intelligence support concepts involve the exploration of uncharted waters. No question, matching the community's support mechanisms and revamped organizations with the joint structures now being developed, and then fitting in military intelligence's high-tech, performance-enhancing "doo-dads," presents a significant challenge. But it's one we must meet, and in reality, differs little from other recent challenges with which we've dealt successfully.

Our approach has been to return to the basics of intelligence and fundamentally change our ways for the better, while still remaining flexible and open-minded. Baron Rutherford's message was to think and, implicitly, to develop "innovation-rich" alternatives in a "resource-poor" environment.

We're doing that, and I'm encouraged by the many beneficial changes we've put in place already throughout military intelligence. I'm also extremely optimistic about this vibrant community's future prospects; it will be even more relevant, vital, and needed as it helps chart new courses in this uncertain new world.

THE NEWLY REVIVED NATIONAL IMAGERY AND MAPPING AGENCY: GEOSPATIAL IMAGERY & INTELLIGENCE IN 2002 AND BEYOND

by James R. Clapper, Jr.
Lieutenant General, USAF (Retired), Director, NIMA

James R. Clapper, Jr., is the first civilian Director of the National Imagery and Mapping Agency (NIMA). He retired as a Lieutenant General from the US Air Force in 1995 after a 32-year career. Prior to NIMA he was VP and Director of Intelligence Programs at SRA International. Director Clapper's last military assignment was as Director of the Defense Intelligence Agency (DIA).

CREATION

The National Imagery and Mapping Agency (NIMA) stood up as the newest member of the Intelligence Community on 1 October, 1996. By a coincidence of time and place, I was Director of the Defense Intelligence Agency and participated in discussions on the future of imagery, discussions that led to the creation of NIMA. Initially, it was not at all certain that there was a need for a linkage between mapping and imagery, that the two technologies could sensibly be merged. It did not take long to demonstrate that the creation of this new intelligence agency was not only a good idea, it was likely overdue. I knew that NIMA could play a huge role because of the variety of products and services that its predecessors have traditionally delivered.

Just as the Central Intelligence Agency and the National Security Agency were responses to Soviet Communism, the birth of NIMA may be said to anticipate the needs of the new century, and the accelerating – and asymmetrical -- engagements in the world that has developed following the Cold War.

At the start, eight organizations came together to create the new organization. By far the largest of these was the Defense Mapping Agency (DMA), a de facto intelligence agency in its own right, and with a remarkable lineage dating to its service as the Army Map Service and comparable institutions in the Navy and Air Force. Also in the mix were the Central Imagery Office, the Defense Dissemination Program Office, and the National Photographic Interpretation Center in their entirety; and imagery exploitation, dissemination and processing elements of the Defense Intelligence Agency, the National Reconnaissance Office, Defense Airborne Reconnaissance Office, and the Central Intelligence Agency. The Latin motto in our logo is inclusive of all of our principal disciplines. The translation is Timely-Accurate-Precise, core terms in our three primary occupations of imagery analysis, mapping and targeting.

We are also a Department of Defense (DoD) Combat Support Agency. Our mission supports national security objectives by providing geospatial intelligence in all its forms, and from whatever source—imagery, imagery intelligence, and cartographic data and information—to ensure the knowledge foundation for planning, decision, and action. We use the relatively unfamiliar word geospatial because it is a better description of 21st century imagery collection and mapping methods, manufacturing, and related information gathering.

Those whom we serve—the White House, Congress, policy community, military commanders, law enforcement officials, and civil leaders—require reliable information with a geospatial foundation as the common denominator. This information must be timely, accurate, current,

detailed, easily accessible, and, in relative terms, affordable.

OPERATION

The attacks of September 11, 2001 profoundly changed the United States and our perception of what we now soberly understand is our "national security." Our immediate response to the crisis accelerated the enormous changes already underway in the Agency. We can now "see" with ever-clearer precision the vectors we must pursue—and now recognize that we must do so ever more aggressively.

Our superb team of government and contractor people are uniquely postured to foster integration of intelligence because the data bases for which we serve as steward provide the visualization and analytical framework to enable informed, timely decision-making. For us, this means capitalizing on all forms of what we have traditionally categorized as imagery, imagery intelligence, and geospatial data and information, which we now call Geospatial Intelligence. The new term signals our new vision: Know the Earth...Show the Way.

Our work force is heavily populated by experts in fields such as cartography and photogrammetry, imagery analysis, geospatial analysis, the physical sciences, computer and telecommunication engineering—and geodesy. Our work includes coordinating imagery collection, processing, exploitation and dissemination requirements among Defense components, throughout the Intelligence Community, the National Security Council, and a litany of customers from other federal agencies and departments. Our headquarters is in Bethesda, Maryland, with major facilities in Washington, D.C.; Reston, Virginia; Fort Belvoir, Virginia; and St. Louis, Missouri. In addition, our detachments and teams operate worldwide, most especially including major military commands. We are a global enterprise, by any measure.

Our tasks encompass products and information used to support international diplomacy, the individual military departments and warfighters, civil emergencies, treaty negotiations, and monitoring national counter-narcotics and counter-terrorism activities, peacekeeping operations, and humanitarian relief efforts. Since 9/11, we added homeland security to our list of tasks. The blend of geospatial and imagery products result in an amazing variety of services. One of our legacy organizations, DMA, featured in the inter-entity boundary negotiations with the former Yugoslavia, during the Peace Accords process in Dayton, Ohio, in 1995.

NIMA assisted Ecuador and Peru to settle a boundary dispute that had percolated between the two countries for about half a century. In Europe, when the Elbe River floods resulted in great loss of property we helped the Polish government delineate the stricken area, to aid in damage assessment and restoration efforts. Similar visualization support of a region hard-hit by natural disaster was provided to Japan after the Kyoto earthquakes; following large oil spills off the Galapagos Islands; catastrophic mud slides from hurricane damage in Central America, and monitoring the spread of forest fires in Borneo, for environmental concerns. In these samples, the product blended imagery with mapping techniques to create a highly accurate visualization of the affected areas.

In support of strike operations we gave our pilots based at Aviano, Italy, the means to pre-fly each mission in exacting terrain-visualized detail, right to their designated targets in the Balkans. This was a first in combat aviation history. We supported Operation Desert Fox and Operation Allied Cause with substantial quantities of imagery products for Allied air crews. And we share in no small measure in the successes of recent anti-terrorist operations in Afghanistan.

NIMA's blend of geospatial and imagery products result in an amazing variety of services, from support of war operations to diplomacy, and from counter-terrorism to humanitarian relief efforts...

For sailors, our Digital Nautical Chart most certainly ranks among the most innovative developments in safe navigation at sea since a Chinese mariner magnetized a needle to produce the first, rough compass countless years ago. For the protection of VIPs, our support includes products for the Presidential Inauguration and the Pope's visit to St. Louis, Missouri. We also assisted with assessing the catastrophic damage to Lower Manhattan after the collapse of the twin towers of the World Trade Center.

We helped with security for the Winter Olympics in Salt Lake City, Utah. A cadre of our analysts equipped with a tailor-made geographic information system (GIS) that integrates near real-time imagery, deployed in late January to aid decision-makers in the Olympics Intelligence Center. High-end workstations were also used to provide support, reflecting an escalation of the demand for the kind of information we provide. Under the auspices of the Homeland Security Customer Support Division, our

Olympics Support Team deployed as members of the first National Intelligence Support Team to operate in the continental United States. The request for our participation came through the FBI, the lead federal agency at the Olympics.

NIMA Olympics team members work with the Norfolk, Virginia-based Joint Forces Command, the Department of Transportation, the National Forest Service, and state and local law enforcement authorities, among others. Their primary mission is to support counter- terrorism.

NIMA recently realigned its organizational structure to enhance its ability to achieve a set of strategic goals...

One of the most historic projects undertaken by NIMA was a partnership with NASA, to measure the Earth – the Shuttle Radar Topography Mission (SRTM), flown aboard the Space Shuttle Endeavor February 11-22, 2000. The mission payload used modified versions of the same instruments that comprised the Space Shuttle Imaging Radar-C/X-Band Synthetic Aperture Radar that flew twice on Endeavor in 1994.

Digital elevation-model data, sampled at an interval of one measurement every 30 meters (98 feet), are now available to selected science investigators, with 90-meter (295-foot) sample imagery available to the general public. Initial processing by the Jet Propulsion Laboratory, Pasadena, California, and distribution of validated U.S. digital topographic data, will continue on a regular basis, with completion expected this spring. At that point, the product comes to us for 'finishing'.

The mission collected 3-D measurements of Earth's land surface using radar interferometry, which compares two radar images taken at slightly different locations to obtain elevation or surface-change information. To collect the data, engineers added a 60-meter (197-foot) mast, installed additional C-band and X-band antennas, and improved tracking and navigation devices.

When completed later this year, more than 12 terabytes of data encompassing nearly one trillion measurements will have been processed, representing 80 percent of Earth's land mass between 60 degrees north and 56 degrees south of the equator. The areas mapped are home to approximately 95 percent of the world's population. As a 'gee-whiz' statistic, the number of terabytes of collected SRTM measurements is roughly equal to all the information stored in the Library of Congress.

The mission literally captured a snapshot of the Earth's surface at the beginning of the 21st century that will be of tremendous value for years to come. The data will provide our customers a revolutionary leap forward in imaging information. The maps produced from the mission will be among the most valuable, universally beneficial data ever produced by a science mission. National and local government organizations, scientists, commercial enterprises and civilians alike will find the data useful for applications as diverse as earthquake studies, flood control, transportation and urban planning, enhanced ground-collision warning systems for aircraft and better placement of cell phone towers.

The SRTM supports NASA's Earth Science Enterprise, Washington, a long-term research and technology program designed to examine Earth's land, oceans, atmosphere, ice and life as a total integrated system.

From our beginning as a new Agency we focused on our customers. At the risk of hyperbole, we are the world's most formidable provider of geospatial intelligence – the analysis and visual representation of security-related activities on the Earth. We strive mightily to ensure that decision-makers and warfighters are able to visualize the world in near-real time by enabling them to understand and use a mix of geospatial intelligence to accomplish their mission.

TRANSFORMATION

Our hallmark theme is transformation. We have undergone considerable change in our short existence.

Most recently, NIMA aligned its organizational structure to better support our mission, vision, core values, and intent and defined a set of strategic goals. Our central, underlying organizing principle—prompted by the 9/11 crisis, and rapidly implemented early in its midst—is designed to foster this transformation. It acknowledges our three major mission imperatives, which we will execute simultaneously:

First and foremost, we must now and always respond to analysis and production demands—in what we recognize is a perpetual state of crisis. We call this the "NOW," which means meeting current obligations to our demanding, myriad client base.

The "NEXT" is management of a series of complex and costly acquisitions. We must champion and complete a set of major investments in order to move us to the next level of the National System for Geospatial Intelligence (NSGI). This may seem like an obvious thing to do, but I remember when it was not so simple. One of the early questions in NIMA's formation was "What's your investment strategy for 2010?" And our then-deputy promptly answered, "Our investment strategy is that everyone gets paid this week."

And the "AFTER NEXT," by which we mean to try to anticipate the future. Our trajectory is designed to strengthen the organizational structure and take it well into the 21st century. We must forge the "AFTER NEXT" environment by constantly driving future technical trends and applying them to operational needs, inserting technology rapidly, and providing relevant Geospatial Intelligence, services, and solutions.

"NOW" responds to analysis and production demands. Our customers' interests include protecting national security, combating the threat of terrorism, implementing national policy, responding to natural disasters, and countering illegal drug trafficking. To be successful, they require Geospatial Intelligence tailored to meet highly specific needs, delivered faster and cheaper, in an easily understood format. We will meet these needs by continually adapting analysis and production, our business practices, and our technology. Our global foundation databases, Earth-referenced and time-stamped, support this aim through an evolving state of national security. The databases include land-based, aeronautical, and hydrographic navigation information.

NIMA's goal is to provide timely, relevant, accurate, predictive and actionable geospatial intelligence...

We customize for each client. By combining an understanding of global issues with in-depth knowledge of customer missions, analysts will correlate tailored Geospatial Intelligence to provide the foundation for planning, decision, and action. Other intelligence information will be overlaid, as necessary.

We manage this data-rich environment by creating a digital information network. We will populate our databases and exploit all available Earth-derived, space-based, and airborne data, including "exotic" forms of spectral imagery. These data will incorporate appropriate standards to ensure interoperability. Additionally, we will certify the lineage, integrity, and quality of the information and facilitate direct customer access. The information will be readily shared through a common, digital, geospatially referenced framework and analyzed by professionals.

The investments of the "NEXT" level of the National System for Geospatial Intelligence (NSGI) provides the knowledge foundation for planning, decision, and action. To make it work, we intend to migrate to an all-digital environment. The transformation includes seamless libraries, collaborative exploitation, automated generation of information, a robust communications infrastructure, and community collection and information management in a multi-intelligence environment that supports the intelligence cycle.

Further, we will ensure NSGI information interoperability in a collaborative, multi-source environment. Interoperability is key. Defining, implementing, and managing the NSGI architecture is the first step. We will lead in defining the interfaces and standards to speed discovery, retrieval, and exploitation of information. Standards adopted in concert with the Department of Defense and the Intelligence Community will be universally applicable.

"NEXT" also includes improvements in acquisition, contract management, and systems engineering processes. Transition to an all-digital, interoperable environment requires smart, disciplined processes.

"AFTER NEXT" strives to invent the future, not react to it. In order to remain relevant to customer needs we are defining a path that culminates in long-term solutions to worldwide issues, while also attempting to guide strategic direction for an unknown, threat environment. We must try to forecast changes to the operating environment, and realign investments accordingly.

To that end, we promote a vigorous Research and Development (R&D) program by directing seven percent of our total budget to this end. We are also forming strategic partnerships with our Intelligence Community counterparts, with the purpose of leading the design of integrated, national and commercial space-based and airborne imagery architectures.

The temporal dimensions of "NOW," "NEXT," and "AFTER NEXT"—are intentionally instituted to facilitate our transformation. It is simple, timeless, and agile, and it governs our organizational structure, program and financial approach, the conduct of our mission, and how we manage our workforce. It applies to us as a corporate

enterprise as well the broader National System for Geospatial Intelligence (NSGI) it leads as Functional Manager.

ORGANIZATION

Finally, the 'dry-as-dust' but pivotal organizational structure. Simply, we sharpen and trim. There are three line organizations:

(1) the Analysis and Production Directorate that brings information-gathering branches together, provides geospatial intelligence, products and services to all our customers, and supports global issues and homeland security. This organization represents the "NOW."

(2) The Acquisition Directorate, with its focus on acquisitions of systems and technology. This represents the "NEXT" and

(3), the InnoVision Directorate, the "AFTER NEXT" – where future forecasting is the aim, where we attempt to describe needs in the years to come, and where we establish plans to align resources, provide technology and process solutions.

Five directorates, termed "enablers," provide Agency-wide support: Financial Management; Human Resources; Information Services; Security and Installation Operations; and the Training and Doctrine. The helm is vested in a lean Executive Committee which consists of my deputy, an Executive Director, a Technical Director and myself. I focus externally. The deputy attends to the day-to-day running of the Agency, and also serves as the Chief Operating Officer and Director of National Support. The Executive Director – who is also the Director of Military Support – implements policy, and programmatic and operational decisions. The Technical Director is the senior advisor for commercial outreach and outsourcing strategy.

SUMMATION

Our goals focus on the heart of our customers' needs—timely, relevant, accurate, predictive, and actionable Geospatial Intelligence. We continue to energetically chart the course for information and decision superiority. The Nation depends on us for it. Customers demand it of us. Our tradition of excellence assures it.

EDITOR'S NOTE

Eric Berryman, Ph.D., member of the NIMA Public Affairs Staff, drafted this article. Dr. Berryman will join the American Intelligence Journal as an Associate Editor.

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Desert War Was Crucible For Intelligence

Stovepipe systems are being capped, and interoperability gains added attention.

By MGen. James R. Clapper Jr., USAF

Desert Storm not only proved to be a dramatically decisive military operation, but it also served as a crucible for systems that collect, analyze, fuse and disseminate intelligence. The successes and pitfalls of the war in Southwest Asia will shape the way the U.S. Air Force does business for years to come.

Successful Air Force operations depend on the knowledge of enemy force capabilities, dispositions, intentions and operations as well as the battlefield environment. This requirement is the basis of the primary Air Force intelligence mission, which will provide information and intelligence on foreign military and military related capabilities, intentions and operations. The mission also will support commanders and staff, those responsible for developing and implementing national security policy and structuring and employing military forces.

The methods and capabilities for providing intelligence to users significantly have improved during the last 20 years, and senior Air Force officials believe this trend will continue.

Stovepipe Systems

In the past, intelligence organizations have been characterized by a proliferation of stovepipe collection, processing and analysis organizations. Stovepipe is a term given to vertical organizations that collect, process, analyze and disseminate one category of intelligence without integrating other types of intelligence into the final product.

Another characteristic of the past has been the proliferation of command-unique intelligence organizations and systems. For example, a variety of secondary imagery systems are scattered throughout theater commands that are not interoperable. As a result, the intelligence community has difficulty providing an integrated all-source product tailored to users' needs.

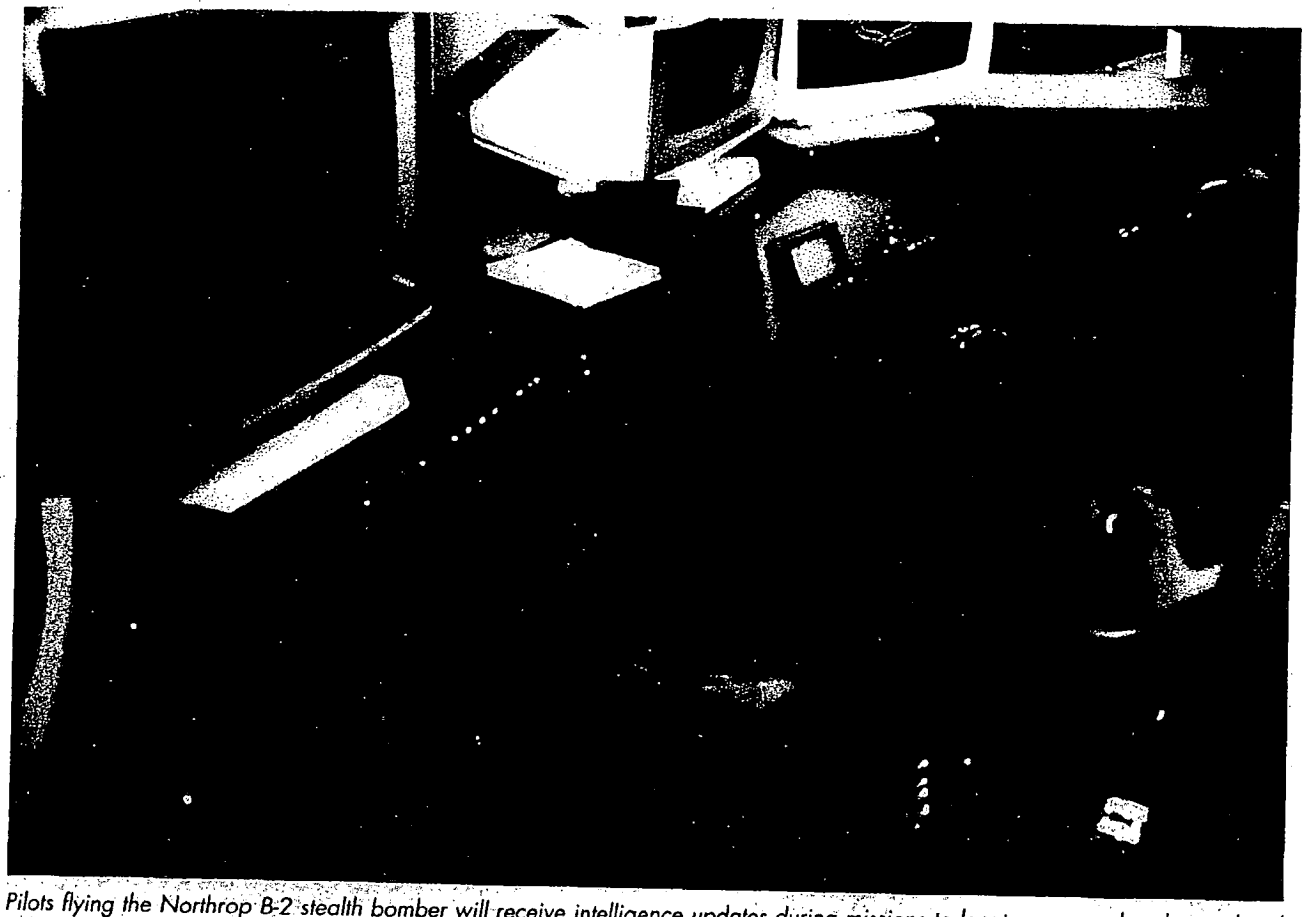
Another limitation to timely dissemination of intelligence is the lack of robust communication networks to a wide range of consumers from the national to the tactical level. The Air Force's ability to provide intelligence support to the operators has, for the most part, been a manual process. For years, wing and squadron intelligence organizations have been plotting order of battle updates on maps with grease pencils.

When operations Desert Shield and Desert Storm began, many intelligence systems, in various states of development, were thrust onto center stage. Air Force intelligence personnel at Central Command Air Force (CENTAF) in Saudi Arabia were forced to bring together a number of different systems into an architecture that would provide the operators with a timely, fused product. In order to do this, a variety of collection assets were employed from the national to the theater level. Once the information was collected, some of it was processed and analyzed at intelligence centers in the United States, and some of it was done in-theater at the joint intelligence center and component command intelligence organizations.

Intelligence Systems

Two developmental unit-level systems called upon to do this force-level job were Constant Source and Sentinel Byte (*SIGNAL*, September 1990, page 46). Constant Source provided near real-time multisource signals intelligence, while Sentinel Byte provided a reference source for air and missile orders of battle. Together, they supplied tactical air situation updates. Customers included Air Force, Marine and Navy flying units, as well as special operations units and Army Patriot missile batteries.

The dissemination of intelligence



PHOTOGRAPHY BY JACK W. SYKES

Pilots flying the Northrop B-2 stealth bomber will receive intelligence updates during missions to locate command and control and mobile missile targets. A simulated mission is being conducted in this B-2 cockpit mock-up.

information was accomplished primarily in two ways. One method was via an in-theater backbone tri-service tactical communications (TRI-TAC) network, using the secure telephone unit (STU)-III and the KY-68 for encryption. This was how the Sentinel Byte at force-level passed order of battle data to the Sentinel Bytes at unit-level.

The second method was by broadcasting intelligence updates to wings and squadrons directly from the collector or its associated ground processing facility. Constant Source and tactical information broadcast service were two systems used to receive these broadcasts.

At the unit level, the Air Force used Sentinel Byte to receive the order of battle data base from its force level counterpart, to pull together other pieces of the intelligence picture and to provide the mission planners with both a graphic depiction of the threat and the data necessary to support automated mission planning. Operators used the tactical digital facsimile to send and receive imagery—originating stateside and in-theater—for pre-mission planning and post-mission analysis.

Overall, the Air Force was able to provide timely, quality intelligence support to the flying units prosecuting the war. As with all functional areas, however, a number of lessons learned exist that will color the way the Air Force intelligence does business in the future. The Air Force did not have a well integrated architecture for intelligence operations throughout its Desert Storm units. Some of these intelligence units used one kind of hardware to process and disseminate intelligence, while others used something different.

Some units were familiar with using computer-based data, while others still primarily used hard copy reports. It is no surprise, then, that many of the units had trouble coordinating and passing data efficiently. An overall concept of operations and associated systems architecture will help ensure a common baseline of intelligence systems that meet the interoperability, timeliness and information requirements of combat operations.

One area where the Air Force suffered from an overabundance of different systems was imagery dissemination. More than a dozen secondary imagery systems supported headquarters U.S. Central Command and its components during the conflict. Very few of these were compatible because they were not equipped with the national imagery transmission format or common communications protocols. The resulting hodgepodge of systems injected time delays into distribution of time-critical imagery and imagery derived intelligence. Air Force intelligence needs to ensure standardization of secondary imagery transmission systems not only for the Air Force but also for all services.

Tactical Reconnaissance

Tactical reconnaissance demonstrated it had an important role to play in the combat planning cycle. The tempo of future operations is expected to dictate more timely receipt of tactical reconnaissance data. Film processing techniques used by the RF-4C cannot meet this need, so the follow-on tactical reconnaissance system is being developed to take advantage of today's technology.

Another lesson learned is that the CENTAF intelligence staff had difficulty sending and receiving intelligence data essential to development of the air situation assessment and targets. This was primarily because of the limited enemy situation correlation element, a system designed to

receive and fuse large amounts of raw data into a coherent picture of the battlefield. This and other experiences demonstrated that the air component intelligence staff must have direct access to secure intratheater data communications capable of supporting simultaneous transmission of order of battle, threat and target data from the component command's intelligence nodes to all units.

At the unit level, dial-up, point-to-point communications equipment was not totally satisfactory for the job because of time delays in moving information. Twice daily during the war, intelligence personnel electronically transmitted data files sequentially to each of the 30-plus units in-theater. This process, which took four hours under ideal conditions, must be improved for future operations. Communications will continue to be a priority for Air Force intelligence.

When Air Force intelligence was assessing the capabilities of enemy units during hostilities, the reports tended to reflect the amount of equipment destroyed without assessing the impact on enemy combat effectiveness. A commander is vitally interested in the current combat effectiveness of the enemy force, which is more than a simple count of equipment damaged or destroyed. This process will be improved by ensuring development of standardized methodologies and automation tools that assess battle damage against desired objectives of the commander. This shortcoming is not new and becomes apparent after every major conflict. It is an area that is not amenable to peacetime training.

Pushing And Pulling

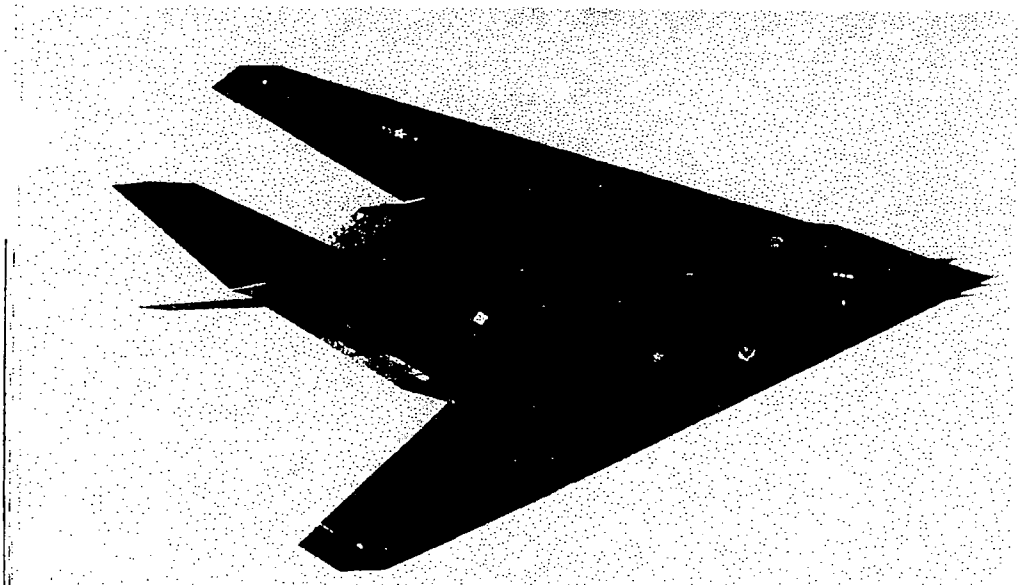
During Desert Storm the flow of intelligence largely followed the traditional "push" system. This means tactical flying units primarily received intelligence data when the air component headquarters pushed information downstream that it believed the units needed. Air Force intelligence now is in the process of changing this system. This is not only because of the experiences of Desert Storm but also because of the changing threat, budgetary constraints and advances in communications and information systems technology. There also is an increasing appetite for greater amounts of detailed intelligence—smart weapons and in-flight cockpit updates.

Air Force intelligence is creating a "pull" system for the flow of future Air Force theater intelligence to supplement the "push" system. The dissemination of collected, processed and analyzed data will be more widespread and timely. More onboard collector processing and broadcast systems will send the data out to consumers in near real time from both collector and all-source organizations.

When data needs to be analyzed, Air Force intelligence will use all-source intelligence organizations composed of experienced analytical and targeting personnel who are directly connected to units being supported. They will use standard automated systems that are integrated with command and control as well as mission planning and rehearsal systems. Intelligence personnel then will have the capability to access theater and/or national imagery and textual data from a variety of intelligence centers.

Deployable Assets

Deployable communications and automated data processing systems also will be key elements for force-level intelligence organizations. This robust capability will permit Air Force intelligence to execute operations anywhere in the world. The



The Lockheed F-117A stealth fighter made successful use of intelligence during the Gulf War to pummel Iraqi targets with devastating surprise.

objective is for intelligence to be a key part of an integrated command and control system, supported by communications and focused on the effective and efficient application of air power.

One of the programs that will help Air Force intelligence achieve this objective is the tactical Air Force linked operations/intelligence centers Europe capability, or TAFLC. Despite the connotation of having the word "Europe" in the title, this program includes Pacific Air Forces operating locations as well those responsible for operating in and around the European theater. TAFLC is based on the tactical forces' need to exploit time-sensitive, high-volume, multisensor information rapidly. As collection means and communications improve, the ability to process the raw data manually is falling behind the requirement for an effective operational response.

While the commander never will operate on a basis of absolute certainty, more timely analyzed data will reduce the uncertainty to more tolerable levels. The objective of the TAFLC program is to field a baseline capability to provide intelligence and operations personnel with the precise location of an opposing force structure and graphic display of the ground situation through correlation and aggregation of all-source intelligence.

Common View

Additionally, the program will be interoperable with the Army's all-source analysis system, thus supporting Air Force intelligence's goal of providing systems that give a common view of the battlefield. TAFLC also will supply users with a common capability consistent with Air Force plans for upgrades in the intelligence data handling system (IDHS).

The data handling system is composed of processing systems used to analyze, process and disseminate vast amounts of intelligence coming into national, theater, component and unit organizations. At the national level, the system processes data used to perform strategic warning, develop the single integrated operational plan and construct data bases used by the Defense Intelligence Agency. At the theater or component level, the system provides intelligence used for indications and warning, situation and threat assessments, target development and weapons selection as well as reprogramming of electronic warfare assets. At the unit level, this system provides targeting information, threat alerts and current air defense situations. It will continue to evolve because of advances in technology and increasing demands for more effective information processing.

Air Force intelligence will head into the future with five concepts. Customers will have "one button to press" to get the information they need. All-source intelligence organizations will provide tailored organic support to the force level and below. intelligence units will have a demand or "pull" system that will filter data. Air Force intelligence will operate standard and deployable systems. Finally, Air Force intelligence will be able to deliver near real-time intelligence to mission planners as well as directly into the cockpit.

These strategies mean that Air Force intelligence must be flexible and have the capability to provide more timely and effective support to the operators as they organize and plan to execute the Air Force's concept of "global reach, global power."

Air Force intelligence must support a commander responsible for planning and execution, a commander who may be working with mission orders that assign objectives to a unit rather than to specific targets and one whose assets will be highly trained and rapidly deployable. As a result, Air Force planners believe that intelligence and operations will work together to meet the requirements of a new national military strategy by improving rapid force projection.

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MGen. James R. Clapper Jr., USAF, is director, Defense Intelligence Agency and former assistant chief of staff, intelligence, headquarters U.S. Air Force. He is a member of AFCEA's Washington, D.C., Chapter.

Defense Intelligence Agency (Joseph M. Juarez)

National Military Joint Intelligence Center.

Challenging Joint Military Intelligence

By JAMES R. CLAPPER, JR.

Summary

Military intelligence was shaped over four decades by the Soviet threat, emerging weapons systems, and increasing defense budgets. A sea change began with the demise of the old Soviet empire, the crisis in the Persian Gulf, and growing involvement in U.N. peace operations and humanitarian efforts. The Defense Intelligence Agency (DIA) is adjusting to successor threats, including regional instability, low-intensity conflict, terrorism, counter-narcotics, nuclear proliferation, and chemical and biological weapons—all within a joint environment. DIA must adapt its collection/production/dissemination cycle to a quickened operational pace and fewer resources. With technology now allowing intelligence to be treated as an integrated whole, the restructuring of DIA, and a focus on unified commands, the military intelligence community has gone back to basics while retaining the flexibility needed to underpin support of joint warfighting into the next century.

Few questioned the roles of the military establishment in the early years of our Nation: the Army dominated the land while the Navy concentrated on the sea. Some mix of missions occurred following World War I as the military potential of flight was seriously considered. But during World War II, with the designation of theaters of operation, an interesting phenomenon arose—a commander in chief (CINC) from one service often led thousands of personnel from others.

The impetus for joint command stemming from World War II extended to the creation of the Joint Chiefs of Staff (JCS). The National Security Act of 1947 not only institutionalized JCS but hastened the formation of a separate Air Force and, eventually, the Department of Defense. At a 1948 meeting in Key West, the chiefs carved out the broad, individual functional areas that remain intact to this day. Jointness came of age with the Goldwater-Nichols Act which requires the Chairman to adjust service functions as appropriate to "achieve maximum effectiveness of the Armed Forces." This provided a fillip to joint task forces (JTFs)—a hybrid military element with components from two or more services. JTFs were the composite contingency force of choice.

the fundamental elements of the mission of military intelligence have not changed

F–117 Stealth Fighter attacking Iraqi facility.

In the 1993 *Report on the Roles, Missions, and Functions of the Armed Forces of the United States*, the Chairman recommended extending JTFs to peacetime. Moreover, JTFs are the predominant means of executing military operations, relying upon service components for specific capabilities. Accordingly, Army and Marine Corps elements comprise joint ground components of JTFs, while Marine and Navy elements make up joint maritime components. Each of the services logically contributes to the joint air and special operations components of JTFs.

Lieutenant General James R. Clapper, Jr., USAF, is Director of the Defense Intelligence Agency. In addition to positions with the National Security Agency and the Air Force Security Service, he has held key intelligence assignments with the U.S. Combined Forces Command, Korea; Pacific Command; and Strategic Air Command.

Intelligence Keeps Pace

Throughout this evolution, intelligence has pressed to keep pace. The imperative to do so was heightened by the lessons learned from Operations Desert Shield/Desert Storm and subsequent contingency operations. In fact, in the last few years the intelligence community has concentrated on finding more innovative ways of supporting joint warfighting and providing this support more rapidly and efficiently. Lately defense intelligence has also begun to shift attention to transforming peacetime organizations and activities to more closely approximate how the intelligence community would fight during wartime.

The fundamental elements of the mission of military intelligence—to provide unique insight to operating forces, reduce uncertainty for decisionmakers, and project future threat environments for the systems acquisition community—have not changed. What has changed very dramatically in several recent cases is the international military balance. By the late 1980s defense intelligence had evolved over a period of nearly forty years in response to the threat posed by the Soviet Union; the proliferation of multiple, complex weapons systems and intelligence associated with their design and employment; and a corresponding increase in the size of the defense budget. During these four decades a dynamic Soviet threat and U.S. response to it spawned large, capable service component and departmental intelligence organizations focused on intelligence problems related to this threat.

The intelligence community was primarily concerned with adequate capabilities to support the mission of anticipating, monitoring, deterring, and containing Soviet aggression or advantage. Significantly, systematic intelligence interest in other countries or regions, unless somehow tied to Soviet issues, was marginal at best. The former Soviet Union was in many respects a very simple intelligence problem, but it was one that required remarkably sophisticated capabilities to manage. For example, during the height of the Cold War, Strategic Air Command headquarters employed some 1,500 intelligence professionals, bolstered by unmatched civilian depth and expertise within the Defense Intelligence Agency (DIA) to evaluate

the Soviet nuclear arsenal. Similarly, the Navy needed a robust anti-submarine warfare program to monitor the design and operation of the Soviet submarines capable of surprise attack. And the Army required thousands of intelligence personnel scattered across Europe as a critical force multiplier to help NATO keep tabs on a numerically superior Soviet armored force.

But then came the great collapse. In the span of a few short years, the world witnessed:

- the demise of communism in the Soviet Union and Eastern Europe
- the dissolution of the Warsaw Pact
- the crumbling of the Soviet empire and emergence of newly independent states
- the end of the Cold War with a diminished military challenge to the West
- war in the Middle East and subsequent heavy American involvement in U.N.-sponsored peace operations and humanitarian assistance in Iraq, Somalia, and the Balkans.

Realigned and Refocused

Intelligence unquestionably helped win the Cold War by offsetting the imbalance between NATO and the Warsaw Pact. Yet by the time that paradigm no longer applied, and before the West even had a chance to celebrate its victory, defense intelligence moved on to more pressing matters. Primary among them was modifying—in some cases creating from scratch—a structure that would enhance the ability of the military intelligence community to address the challenges of a different, emerging, global military environment.

intelligence requirements to support battlefield operations have become simply mind-boggling

There are some who claim intelligence never met a threat it did not like. A truer dictum is that intelligence only reluctantly gives up threats it knows best. Today's threats are different from yesterday's and in many respects considerably less predictable. These uncertain threats—regional, low-intensity conflict, terrorism, nuclear proliferation, and chemical and biological weapons—have emerged as defense intelligence's new priorities. Equally important is supporting the expanding involvement of military forces in efforts to alleviate global stress points, whether they involve the use of force or the provision of assistance.

The intelligence community is still responsible for providing the best possible intelligence on regional force capabilities, plans, dispositions, and objectives. It also retains the requirement to understand the conflict environment, whether the mission is containing aggression, keeping the peace, or feeding the starving. In each case, military intelligence must provide information on the means of access to an operational area, plus data on the terrain, climate, and the cultural context in which the Armed Forces will operate.

We should not be deluded, for even with these course adjustments for defense intelligence the task of providing support for force application is neither easier nor simpler than it was during the Cold War. In fact it is probably more difficult. For example, the development of precision-guided "smart" weapons has placed an untold strain on intelligence resources. Operation Desert Storm offered critical lessons regarding intelligence support to sophisticated weapons. Among the most critical was that such systems are voracious consumers of intelligence. For instance, in the past the identification of a specific targeted building sufficed. Today precision delivery capabilities require further identification—down to a particular room in that targeted building. This increase in the level of targeting detail demands exacting geo-positional data, near-real time imagery, and fused all-source intelligence.

Even more, intelligence requirements to support battlefield operations have become simply mind-boggling, from collecting and correlating battlefield activities to developing target packages based on precision analysis, and from assessing battle damage to relaying assessments in near-real time to the operational commander. As a result, intelligence simply must situate itself within the operational cycle rather than outside it. In other words, the intelligence collection, production, and dissemination cycle must be compressed so that it fits within the operational cycle for targeting to support strike and restrike operations. Also, as force modernization and acquisition programs are focused on fewer systems, comprehensive assessments of projected conflict environments become critically important. In developing these assessments intelligence must forecast both the nature and focus of military conflict in the next

twenty years with sufficient precision to define requirements for advanced weapons systems and force structure.

So defense intelligence faces a broad spectrum of global geopolitical changes that requires supporting new and increasingly complex missions. The military intelligence community is at the same time attempting to manage the transition from its Cold War posture to one appropriate for the new world disorder. This would be a herculean challenge in and of itself. But in addition defense intelligence is embarking on this transition in a period marked by a reduction in resources which far outstrips the annual increases required to build capabilities in the first place. The fiscal reality for intelligence is simple, yet stark—its budget levels will soon approximate those for 1982.

Loading Intelligence equipment on aircraft.

In the Defense Intelligence Agency (DIA), for instance, actions are already under way that will eliminate nearly 1,000 billets by FY97. Throughout the General Defense Intelligence Program (GDIP), for which the DIA Director serves as manager and which funds most military intelligence resources supporting joint forces and defense acquisition, projected cuts will approach 5,000 billets by FY97. Along with these reductions will go many of the capabilities developed in another era to address another problem entirely. The magnitude of programmed cuts—and some advocate even larger reductions—will leave intelligence with little flexibility to devote resources to developing new capabilities to counter future threats.

With the dual challenge of more missions and fewer resources, the military intelligence community views increased jointness as a potential solution. Specifically, the military intelligence leadership is focusing on embedding joint culture in all operations and is continually searching for innovative ways to align peacetime structures and activities to ease the transition to war. Defense intelligence is leveraging advances in automation, communications, and interactive video not only to survive in this new world, but to improve its ability to provide a high-quality product to its customers.

In my *ex-officio* role as Director of Military Intelligence, I have engaged and empowered military intelligence leadership to fight this battle better. These leaders are working together more than ever before to solve the community's most troublesome problems and manage its activities coherently and communally. They have developed a planning approach that permits identification of critical missions and supporting intelligence functions required to meet them, and established a methodology to rationally restructure the community during this period of downsizing so that no essential capabilities are sacrificed along the way.

The Joint Environment

DIA began this process by institutionalizing the functions of the Pentagon-based, national-level Joint Intelligence Center (JIC) which proved so valuable during the Gulf War. Established in the aftermath of that conflict, the National Military Joint Intelligence Center (NMJIC) is a crisis-oriented, multi-service, multi-agency intelligence clearinghouse and tasking center which forms the heart of timely intelligence support to national-level contingency operations. Assigned analysts and indications and warning personnel monitor world trouble spots and guide formation of intelligence working groups to monitor events more closely as situations intensify. These working groups can be expanded into intelligence task forces. DIA can also activate an Operational Intelligence Crisis Center in the Defense Intelligence Analysis Center (DIAC) at Bolling Air Force Base, a move that allows NMJIC personnel to have rapid access to DIA's extensive analytic expertise.

After the Gulf War the current intelligence functions of all service intelligence organizations were the first elements to be consolidated in NMJIC. Later agencies such as the National Security Agency and Central Intelligence Agency also provided full-time representatives to NMJIC. These elements can be augmented easily and rapidly in

Naval Historical Center (Jacobs)

Building relief map of Rabaul, New Britain, circa 1943.

U-2R/TR-1 reconnaissance aircraft.

large-scale crises that demand greater participation by community elements. Depending upon the nature of the crisis, NMJIC can also accommodate intelligence support from other national-level agencies and departments, such as the Federal Bureau of Investigation and Department of State.

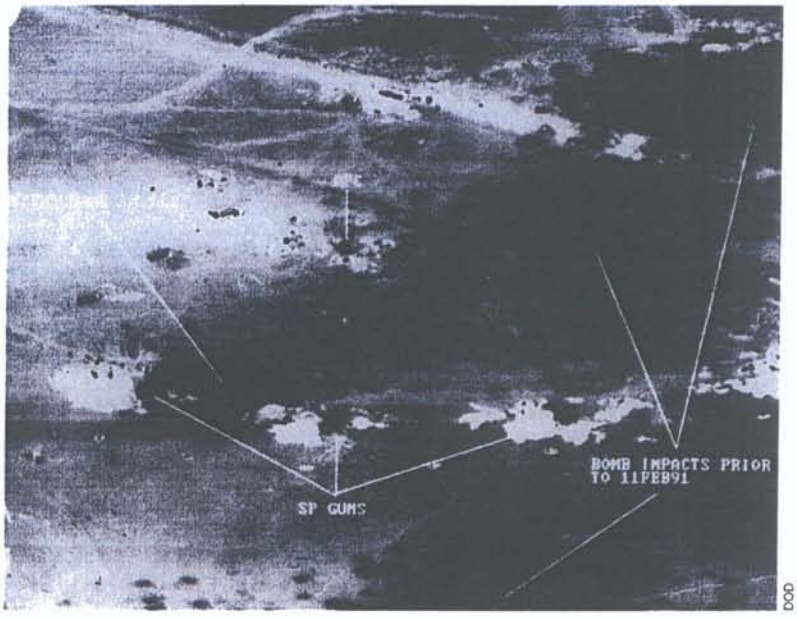
mechanisms have been established to share intelligence with crisis centers supporting the United Nations

With a staff arrayed both functionally (for example, terrorism or narcotics trafficking) and regionally (on areas such as the Middle East or Africa), NMJIC hosts various intelligence working groups and task forces formed to address contingencies around the world. During actual crises, NMJIC serves as a clearinghouse for all requests for national-level intelligence information. Field elements forward intelligence requirements to NMJIC where they are either satisfied immediately using existing resources or farmed out to other agencies, such as service intelligence organizations, for more detailed study. All responses back to field elements are routed through NMJIC.

Interface mechanisms have also been established that allow NMJIC to share appropriately sanitized intelligence information with crisis centers supporting the United Nations and countries that have formed coalitions with the United States.

In addition to permanently establishing NMJIC following the Gulf War, DIA spearheaded an effort to consolidate theater intelligence assets into centers at major combatant commands. These JICs have become primary nodes for intelligence support to CINCs. Through them, the analytic community provides detailed intelligence analysis against priority targets. Within them defense intelligence has established a capability for the daily monitoring of events throughout each CINC's area of responsibility. JICs perform similar functions for CINCs as NMJIC does for elements in Washington. In commands with worldwide missions JICs concentrate on tailoring and applying intelligence for local use that is developed primarily at national level. In commands with specific regional responsibilities, JICs possess full-up production capabilities as well as collection assets to develop intelligence concerning their areas of interest. This information is frequently enhanced by intelligence provided from the national level.

Critical to the success of these JICs is the ability to process fused intelligence from



Effects of airstrikes shown in imagery from U–2R/TR–1.

multiple sources for theater battle management, and then transmit it further down the warfighting chain to tactical level. Accordingly, the defense intelligence leadership is promoting uniform standards for military intelligence information and communications systems which link the national, theater, and tactical levels. The foundation of this process is the Joint Worldwide Intelligence Communications System (JWICS) and the Joint Deployable Intelligence Support System (JDISS).

JWICS is a sensitive compartmented information (SCI)-secure, high-capacity, multimedia communications system that offers the military intelligence community a wide range of capabilities, including a secure video and audio service for both video telecasting and teleconferencing. The system also provides conventional network services for collaborative electronic publishing, the electronic distribution of finished intelligence, and tools to accommodate the transfer of reference imagery, maps, and geodetic materials, as well as other high-end graphics products. DIA is using JWICS to broadcast its innovative, daily, national-level, classified intelligence updates. Officially designated the Defense Intelligence Network, the system is commonly called "classified CNN."

JDISS, on the other hand, is a deployable system that, when tied into JWICS, becomes the interface between the military intelligence community's national and theater intelligence centers and subordinate tactical commands. Essentially, it extends the national-level intelligence community's reach down to the lowest tactical level on the battlefield. JDISS offers such applications as word processing, electronic mail, mapping, graphics, electronic publishing, bulk transfer of data, and a capability for direct analyst-to-analyst conversation. JDISS users also have the potential to access other important data bases and applications throughout the system.

To illustrate how quickly advancing technology and operational requirements are pushing us let me cite a real-world JWICS example. Originally, JWICS was planned for introduction early in 1993. To validate the concept, intelligence planners intended to wire the system's components at DIA initially and test them via experimental links to the Navy's intelligence complex in Suitland, Maryland, and Atlantic Command compound in Norfolk, Virginia. But a complication emerged. While preparations were being made to install JWICS at Suitland and Norfolk, the United States launched Operation Southern Watch with the intention of prohibiting offensive Iraqi air operations against the Kurdish minority located south of 32 degrees North latitude. Having committed to this operation without even a fraction of the massive infrastructure available during Desert Storm, the defense intelligence community found itself confronting communications problems similar to those identified repeatedly in lessons learned reports following the Gulf War. Among them were how to disseminate imagery in near-real time, how to share data, and how to communicate effectively with the JTF commander in the region.

The community's solution was to gamble on technology and, instead of shipping JWICS to Suitland and Norfolk, it was sent to Riyadh, Saudi Arabia, where it worked exactly as planned. JWICS facilitated the establishment of a 24-hour electronic window through which NMJIC-based intelligence watch officers could literally reach into the JTF Joint Intelligence Center in Southwest Asia, and vice versa. This JWICS link to U.S. forces during subsequent strike operations in

DIA is currently overseeing the most significant restructuring of Human Resources Intelligence (HUMINT) in DOD history. Under this effort DIA is consolidating the HUMINT assets of all the services with its own to form Defense HUMINT Services (DHS), a new joint field operating activity subordinate to Director, DIA, in his capacity as DOD HUMINT manager. The activity was created last summer by then Deputy Secretary of Defense William J. Perry. DHS is subordinate to the National Military Intelligence Collection Center.

DHS was established to manage HUMINT given the constraints of diminishing resources while more rapidly and efficiently focusing assets on targets worldwide. The transfer of functions and resources is being accomplished in phases and is scheduled to be completed when the activity becomes fully operational in FY97. All the services are represented on a transition team which is focusing on structural and procedural changes in HUMINT during the formation of DHS.

Iraq provided exceptional mission planning support and the best battle damage assessment up to that time. Since then JWICS has become integral to all intelligence support efforts, including those for U.S. and allied forces in places such as the Balkans and Somalia.

This new architecture provides a revolutionary capability for secure communications. For example, some time ago I had discussions with intelligence personnel on *USS George Washington* operating at sea using the JWICS videolink in my Pentagon office. The possibilities of analyst-to-analyst, national-to-tactical-level communications are only beginning to be realized. Technology is providing the capability to treat intelligence as an integrated whole, another fundamental lesson of Desert Storm. Defense intelligence will soon be able to provide a variety of products to support operating forces at virtually any location for immediate application on the battlefield. The early success of secure communications systems demonstrates the validity of advanced computer technology to establish interactive intelligence connectivity between National Command Authorities, JICs at major warfighting commands, JTFs, and ultimately tactical forces.

Restructuring DIA

The community leadership has been working hard to develop a structure and accompanying processes to meet its new mission. Within DIA the restructuring efforts went back to basics, and in what was the most profound reorganization in the agency's 32-year history, we conceived at the top but built from the bottom a new organization based on the traditional intelligence constructs of collection, production, and infrastructure. Importantly, the new structure was designed to serve as the institutional base for coherently managing military intelligence. In the new DIA, five of its previous nine directorate-size elements, plus other subordinate offices, merged into three major centers—namely, the National Military Intelligence Collection Center (NMICC), the Production Center (NMIPC), and the Systems Center (NMISC)—each of which performs critical functions.

▼ *Collection Center.* Manages all-source intelligence collection, both acquiring and applying collection resources to satisfy current and future DOD requirements. The center also manages the defense community's entire spectrum of Human Resource Intelligence (HUMINT) programs, and the Measurement and Signature Intelligence program. Finally, NMICC controls the Defense Attaché System which has personnel posted in one hundred countries.

▼ *Production Center.* Produces or manages production of military intelligence for DOD and non-DOD agencies. For instance, the center produces all-source, finished intelligence concerning transnational military threats; regional defense; combat support issues; the weaponry, doctrine, and combat capabilities of foreign militaries; foreign military-related medical advances; and foreign nuclear, chemical, and biological weapons developments. Both the Missile and Space Intelligence Center at Huntsville, Alabama, and the Armed Forces Medical Intelligence Center at Fort Detrick, Maryland, are now part of this center within DIA.

▼ *Systems Center.* Computer/automated data processing (ADP) nerve center which provides information services and support to DIA and other agencies in the national intelligence community. These services include ADP support, communications, engineering and maintenance, information systems security, imagery and photo processing, and publication and dissemination of intelligence reference products.

Military Intelligence Board

Throughout this reorganization I have been aided immensely by the Military Intelligence Board (MIB) which is composed of the service intelligence chiefs; Director for Intelligence (J-2), Joint Staff; Deputy Assistant Secretary of Defense for Intelligence; Director of the Central Imagery Office; Associate Deputy Director for Operations at NSA; and other senior DOD officials. I chair MIB in my capacity as the Director of Military Intelligence (DMI), which is distinct from my role as the Director, DIA.

MIB proved its worth during the Gulf War when it played a critical role in fostering greater cooperation within the military intelligence community. Since that time MIB has met virtually every week and provided a forum for senior community leaders to oversee program development, review integrated programs and budgets, resolve programmatic issues of mutual concern, and deal with substantive intelligence matters.

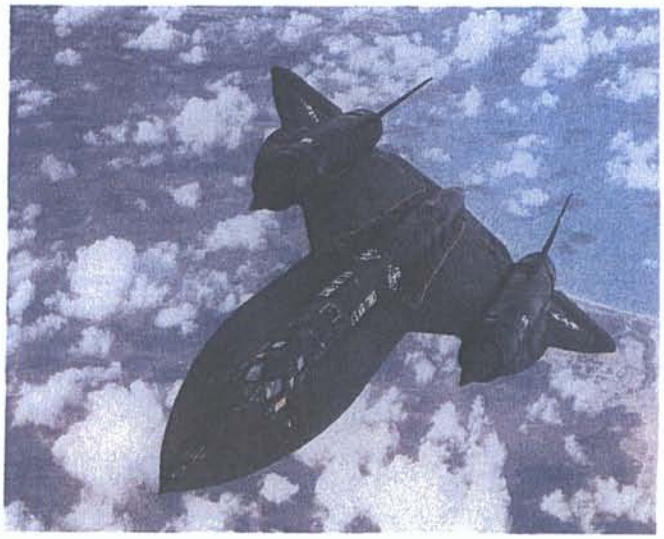
intelligence data no longer bypasses CINCs as it flows from national level to service elements

As this modus operandi matures, we envision empowering the service intelligence chiefs as Deputy Directors of Military Intelligence. In this way, they will acquire recognized responsibility and authority to assist in the management of military intelligence as an integrated community for their respective warfare areas.

These reorganization efforts, coupled with a rethinking of the way defense intelligence does business, meshes well with the new combat construct for regional contingencies that has emerged recently. At the top of what Pacific Command calls the theater "two-tiered warfighting model" is the unified command which monitors the regional military situation and provides direction as well as strategic and operational focus for forces in the theater. It also maintains combatant command over associated JTFs. Beneath the unified command are service components that provide forces and sustain logistics for the theater, and JTFs which coordinate activities of the combat forces and provide direction to tactical forces.

To reiterate, intelligence data no longer bypass CINCs as it flows from national level to service elements in the field. National-level intelligence activities are centralized in NMJIC where service and intelligence community representatives are consolidated. Data funneled via NMJIC flows in turn through unified command JICs and on to JTFs, which significantly have subordinate to them not individual Army, Navy, Marine Corps, and Air Force components, but land, sea, air, and special operations forces.

Achieving this level of jointness in peacetime has not been without its share of confusion. Likewise, overlaying this structure with a corresponding, complementary template for intelligence support—and then



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making it reality by applying appropriate high-technology and providing a solid organizational underpinning—has also presented a challenge. As we learned in restructuring DIA, the concept was simple, but the devil was in the details. But this was clearly a concept whose time had come. The challenges to joint military intelligence today are much different from those of the Cold War years. The community's responses have also been different. In short, we have returned to the basics of intelligence, and in doing so I believe we have fundamentally changed our ways for the better. Most importantly the organizational structures are sufficiently flexible to sustain military intelligence into the next century. To harken back to Baron Rutherford, we in defense intelligence have not only begun to think, we have begun to act as well. JFQ

are followed by analyses of the new tasks faced by defense intelligence from a Defense Department perspective by Captain Larry Seaquist, USN. Captain William Walls, USN and Major Lynwood Metts, USAF (US Pacific Command) and Ed Guam (US European Command) define their Command's responses to their intelligence challenges. The issue also deals with important substantive issues with essays on tactical intelligence by former Director of Central Intelligence William Colby and indications and warning by Russell Swenson.

Subsequent issues of the *DIJ* will deal with important substantive themes such as *Ethnic Conflict* (fall 1992), accompanied by important contributions from practitioners and academics. We strongly encourage contributions of scholarly articles for consideration.

Each issue will also include important articles on curriculum issues as well as book reviews and intelligence-related documents. Of major interest to the *community* is a section devoted to *Community Notes* to inform Community professionals of events in the Defense Intelligence Community.

The *DIJ* is an important and bold step for the Defense Intelligence College Foundation. It represents a major contribution to the Community in its efforts to define the profession of Defense Intelligence and directly supports the Defense Intelligence College's effort to assume a central role in the academic enterprise of defense intelligence. As co-editors, we remain responsible for the content of the *DIJ*. We gratefully acknowledge the strong backing received from the Foundation's Board of Directors whose support represents their collective personal commitment to a stronger and more professionalized Defense Intelligence Community. We also acknowledge the support of an outstanding Editorial Advisory Board which provides an important sounding board and ensures the professionalism of the Journal. The *DIJ* would not have succeeded without the willingness of our inaugural issue authors to provide us with important and provocative essays. Finally, we appreciate the efforts of a small staff of extraordinarily dedicated individuals who undertook this effort on their own time, without government support or financial gain.

We believe that the *DIJ* makes an important contribution to the debate confronting the United States in the decade ahead and we look forward to your support in making the *DIJ* a success.

Defense Intelligence Journal 1(1992),3-16

Defense Intelligence Reorganization and Challenges

Lt Gen James R. Clapper, Jr., USAF

The Defense Intelligence Agency (DIA) enters its fourth decade of service to the nation facing a daunting array of challenges from all quarters of the multipolar world that has emerged over the last three years. But it faces these challenges armed with a powerful, new mandate for action conferred upon DIA in tandem by the Secretary of Defense and the US Congress.

This mandate, contained in Secretary of Defense Dick Cheney's 1991 guidance on the reorganization of defense intelligence, and in the language of the National Defense Authorization Act for FY 92/93 signed by President Bush in December 1991, acknowledges DIA as the nation's preeminent producer of military intelligence. The Secretary's plan and the Congressional language also explicitly assign DIA a significantly expanded role in the management and oversight of key Department of Defense (DoD) intelligence activities.

With these actions, DIA has gained the authority to exercise fully its founding charter, which in October 1961 called for the new DIA "to obtain unity of effort among all components of the DoD in developing military intelligence and a strengthening of the overall capacity of the DoD for the collection, production, and dissemination of intelligence information." That charter further set for DIA the objectives "of obtaining a more efficient allocation of scarce intelligence resources, more effective management of all DoD intelligence activities, and the elimination of all duplicating facilities, organizations, and tasks."

The views contained in this article are those of the author and should not be interpreted as representing the official policy of the Defense Intelligence Agency or the US Government.

Although the words were written in 1961, DIA's charter is on-target today. The vision of that charter, more than ever, prescribes the structural and procedural changes that must be made to enable defense intelligence to meet the challenges of the 21st century.

The New World Order

Precipitating the sweeping reorganizations that defense intelligence in particular, and much of the DoD in general, is presently undergoing is the emergence of a "new world order."

There is no question today's world is fundamentally different from yesterday's. Three years ago, superpower rivalry or a bipolar balance of power characterized the world with the United States and the member countries of the North Atlantic Treaty Organization (NATO) arrayed across Western Europe in an often tense standoff against the Soviet Union and its Warsaw Pact allies. Today, following the demise of the Communist-controlled governments of Eastern Europe, the abandonment of the Warsaw Pact alliance, the collapse of the Soviet Union, and the rise of insurgency and instability, a multipolar world now exists.

As the decade of the 1980s drew to a close, the United States witnessed the precipitous decline of its long-standing, principal geopolitical adversary, and with it, more than 40 years of sustained, international Cold War tension. Richard J. Kerr, as Acting Director of the Central Intelligence Agency, described the impact of the multipolar world's creation on intelligence when he told a group of retired intelligence officers in October 1991: "Life was simpler when the Soviet threat was greater. We had an enemy that we understood. Now, US intelligence faces a country-by-country reassessment of American interests, a task complicated by the emergence of ethnic and indigenous strife in areas once gripped by East-West tension."

Now is not the time to dismantle, or to degrade measurably, our national intelligence apparatus. Senior policymakers recognize the criticality of intelligence. In 1955, six years before DIA's establishment, a commission headed by former President Herbert Hoover published a report on the country's defense posture that said: "In a troubled world where so many forces and ideologies work at cross purposes, the fate of the nation may well rest on accurate and complete intelligence data."

More than 35 years later, in November 1991, President George Bush said at the swearing-in ceremony for Robert Gates as Director of Central Intelligence (DCI): "Our world without the Cold War confrontation is a safer world, but it is no Garden of Eden, [and] intelligence remains our basic national instrument for anticipating danger, [be it] military, political [or] economic. Intelligence is and always will be our first line of defense."

New Challenges

Along this "first line of defense," intelligence will likely encounter challenges that differ substantially from those associated with the Cold War standoff. At DIA, we anticipate that international relations during the remainder of this century will be heavily influenced by transnational issues such as weapons proliferation, narcotics trafficking, terrorism, insurgency, economic insolvency, arms control and monitoring activities, as well as various manifestations of low-intensity conflict.

This is not to say intelligence interest in the former Soviet Union has disappeared, or that it will vanish soon. To the contrary, despite tremendous internal political and economic upheaval, the former USSR retains a robust strategic nuclear force. Defense intelligence cannot afford to lose sight of these strategic capabilities.

Mr. Gates, the new DCI, reaffirmed this in early December of last year when, in his first public address following his confirmation, he announced "an unprecedented effort to gather information from throughout the lands of the former Soviet Union to reassess the political, economic, social and military reality" of that region of the world. In addition, he revealed the Intelligence Community's intention to produce "an unprecedented ten national intelligence estimates on developments in what was the Soviet Union in an effort to help our policymakers understand what is happening there and what may happen, especially in coming months."

Mr. Gates also noted the determination of intelligence agencies to concentrate on "other challenges to peace, to international order and, thus, to us," emanating from "beyond the borders of Russia and the newly sovereign republics." He was referring, of course, to those transnational issues likely to arise at the low-intensity end of the spectrum of conflict.

The recent upsurge in narcotics trafficking and the subsequent heavy involvement of the military in countering it, and in assisting other agencies and other countries in countering it, demonstrate how enigmatic and highly dynamic such transnational issues can be. I expect we will be challenged more often, and perhaps more forcefully, in these areas.

That we must be better prepared is certain, because collection against these targets invariably poses new and different challenges for intelligence. In this low-intensity realm, targets are much more elusive and less vulnerable to normal collection means.

As a result, although unprecedented numbers of indicators of instability exist, understanding them requires intelligence analysts to engage in a form of intense, fine-grained analysis that is, by definition, anecdotal, longer-term, more difficult to accomplish, and extremely manpower-intensive. Moreover, with so many low-intensity threats arising in so many different locations (often simultaneously) collection priorities are not established easily. This difficulty in changing the traditional orientation of intelligence collection resources means that a majority will remain oriented toward targets in the mid- to high-intensity environment.

Nonetheless, requirements emanating from the low-intensity end of the spectrum continue a steady increase. This hamstrings intelligence collection managers who must assign an already stretched body of resources to cover a whole series of protracted instability problems not knowing when, if, or which of these hot spots will flare to a level sufficient to require the commitment of US and/or allied forces. Consequently, collection managers ensure coverage initially for clearly identified strategic priorities, while simultaneously preparing analysis for sudden surges of support necessary to confront whatever regional instability or crisis develops.

Operations DESERT SHIELD/DESERT STORM

Defense intelligence faced such a challenge during the summer of 1990. To DIA's credit, its analysts and collection managers recognized an increasing potential for conflict in the Persian Gulf region. In fact, sources had detected indications of possible hostile Iraqi moves in the region as early as the middle of 1989 and intensified coverage of the area.

As concern about Iraqi activities rose steadily through late April 1990, the US Central Command (CENTCOM) began drawing more and more heavily on defense intelligence to intensify its focus on potential Iraqi aggression. This defense intelligence-CENTCOM relationship, so critical to operations that would commence with DESERT SHIELD, was not pieced together haphazardly as Iraqi troops massed on Kuwait's borders. Rather, DIA's links with CENTCOM date back to the formative days when DIA became one of the first national-level agencies to assign a permanent representative to the Command. In 1985, a DIA-staffed, all-source intelligence branch also was created at CENTCOM. In November 1989, DIA published a Defense Intelligence Brief that outlined the Iraqi military threat to the Gulf States and specifically discussed an Iraqi invasion of Kuwait. CENTCOM later used this paper as the basis for its Command Post Exercise, INTERNAL LOOK 90, in which the CENTCOM staff war-gamed events that occurred.

The situation deteriorated rapidly in July 1990. On the 20th, at the JCS-J3's request, DIA produced its first Iraqi contingency targeting list, 12 days before the invasion, and the Joint Staff forwarded this list to CENTCOM. This target list subsequently became the nucleus of the CENTCOM-generated target list, and represented only one phase of DIA's intensive intelligence support to targeting. On July 22, DIA activated its Iraqi Regional Intelligence Working Group in the Pentagon. DIA's surge of support coincided roughly with the Working Group's formation. Integral to this surge was an expanded number of highly significant reports generated by DIA's Defense Attache System (DAS) and other human intelligence (HUMINT) collectors. By March 1991, more than 80 DAS stations around the globe had produced more than 11,000 reports on such critical, crisis-related topics as Iraq's efforts to obtain sensitive military technology and to circumvent the United Nations-imposed arms and economic embargoes.

Relying primarily on the earliest reporting from this network, DIA was able to issue a specific, unambiguous warning to DoD officials more than a week before Iraq's invasion of Kuwait that Saddam Hussein's forces had achieved the capability to invade *with no warning*. Several hours before the actual attack began on August 2, 1990, DIA issued a clear warning of imminent invasion.

On the evening of August 1, 1990, the Iraqi Regional Intelligence Working Group transitioned into the 24 hour-a-day

Iraqi Intelligence Task Force (ITF). Collocated with DIA's National Military Intelligence Center (NMIC), the ITF quickly became the focal point for all requests for national-level intelligence support and, during the crisis, acted on more than 5,200 such requests. It channeled back to requesters answers as simple as single-paragraph analyses, or as complex as detailed studies reproduced in hundreds of copies and delivered by special couriers. Some of these studies, for example, helped CENTCOM determine its most advantageous avenues of approach into Iraq and the location of Iraqi minefields and other obstacles.

At the same time, DIA greatly expanded its Operational Intelligence Crisis Center (OICC) in the Defense Intelligence Analysis Center (DIAC) at Bolling Air Force Base. The OICC operated 24 hours a day, was staffed by up to 80 people per shift, and ultimately answered nearly three-quarters of all requests for intelligence information sent to the ITF.

Throughout August, the requirement for national-level intelligence support grew significantly. As a result, on 2 September 1990, DIA took the unprecedented step of creating a Joint Intelligence Center (JIC) subordinate to the ITF. Composed of order-of-battle teams with manning from DIA, each of the services, and the National Security Agency (NSA), the JIC likewise operated around the clock in an all-source intelligence fusion effort of the likes never before attempted. The JIC fused signals and human intelligence, imagery, and data from all other sources to produce situational reports that focused on a narrow, 72-hour period: the present day, the day before, and the day after. Simultaneously, special JIC production elements concentrated on SCUD missile targeting, targeting against Iraqi command, control, and communications assets, and other unique operational requirements.

Moreover, to assist DoD components in validating and satisfying operational intelligence collection requirements, DIA activated a round-the-clock crisis collection management team, a move that presaged DIA's appointment as "executive agent" for imagery collection within the national Intelligence Community. This unprecedented level of tasking control over national assets, backed by DIA's strengthened relationship with CENTCOM, helped ensure crisis-related operational imagery requirements received priority coverage.

DIA also moved to improve intelligence-related communications with the theater. During the DESERT SHIELD buildup, DIA constituted and trained eight new National Military Intelligence Support Teams (NMISTs) to augment the three teams already in existence. Of the eleven, nine were eventually deployed to corps and component level in the Persian Gulf, and in a clear acknowledgment of their importance, NMISTs were included as part of the first contingent of US units to arrive in the region. These self-contained teams provided the first secure-voice link to the Gulf, as well as the capability to transmit rapidly and receive intelligence-related text, imagery data, and facsimile material. DESERT SHIELD/STORM NMISTs processed nearly 2,700 requests for information through the end of February 1991. By way of comparison, similar teams deployed in supporting roles during Operation JUST CAUSE in Panama in December 1989 processed 166 requests for information during that operation.

Through a series of innovative communications pathways, DIA also connected theater-based collection managers with the national-level network of imagery data bases, a link that provided direct, real-time access to national products and information.

In a related action, DIA designed, tested, and operated an all-source bomb damage assessment (BDA) system that employed a hotline between the national and theater levels. With this system, DIA provided rapid feedback to strike planners at CENTCOM and Central Air Forces (CENTAF) on previous bombing runs to assist in planning subsequent strikes. These all-source BDAs proved especially valuable in refining strategic targeting and in assessing the effect of the strategic air campaign.

By the end of 1990, a rudimentary, yet fairly efficient, imagery delivery capability had been established in theater. For the first time ever in a crisis setting, imagery was being made available on a near real-time basis. A joint imagery production complex also was set up that provided theater-controlled reconnaissance elements with hard-copy photographic reproduction support. Also collocated at this complex was a multiservice, multinational imagery interpretation facility that produced and disseminated over 50,000 photographic products during the crisis from over 1 million feet of film that passed through its associated photo lab.

However, DIA's ability to pinpoint target sites that were part of Iraq's chemical, biological, and nuclear weapons programs involved much more than imagery. In particular, the

comprehensive knowledge of these targets that DIA analysts developed over the years was primarily responsible for the timely, accurate assessments of them and DIA's strong capability to analyze damage to facilities.

An additional, highly successful effort came in the foreign materiel area where, prior to DESERT STORM, defense intelligence was able to acquire or gain access to many items of equipment similar to those sold to Iraq. Studying these items enabled US and coalition forces to modify weapons, tactics, and plans to maximize allied performance and increase Iraqi vulnerability.

Back in Washington, terrorism received special emphasis in DIA's expanded Terrorism Threat Analysis Section, which was augmented by two US Army Reserve Military Intelligence Detachments (MIDs). A Prisoner of War/Missing in Action (POW/MIA) Center also was created that tracked coalition personnel who were captured or declared missing as well as the team of journalists captured early in the war.

Yet even these many intelligence successes only touch the surface of the overall defense intelligence effort on behalf of the deployed forces. In DIA alone, over 2,000 personnel ultimately were committed full-time to the war effort, including nearly 100 actually deployed to the theater to provide CENTCOM with critically needed expertise in such areas as explosive ordnance disposal, land and sea mines, and SCUD missile performance characteristics, modifications, and vulnerabilities.

Throughout the period of DESERT SHIELD/DESERT STORM, reservists played a vital role in DIA. Over 50 Individual Mobilization Augmentees (IMAs) and three MIDs were mobilized, adding directly to DIA's manpower supporting the war effort. These reservists brought to bear a wide spectrum of intelligence expertise.

During the crisis and conflict, DIA elements also:

- Processed and disseminated over 500,000 customized photographs;
- Published over 41,000 operational support products;
- Devised and managed a special Defense Courier Service program that enabled delivery to the theater of hard-copy intelligence products in 96 hours or less, and that moved nearly 215 tons of this material during the crisis;
- Successfully deployed to a forward location, for the first time, elements of the specialized data transmission system known as DODIIS, or the DoD Intelligence Information System;

- Also for the first time during a conflict, provided to the theater daily updates numbering in the hundreds of thousands for order-of-battle and facilities data bases; and
- Deployed special teams to the theater to assist CENTCOM personnel in developing their communications architecture.

The Persian Gulf crisis indeed tested the mettle of DIA and the Defense Intelligence Community. Here, for the first time in decades, the United States faced a significant threat, over a broad area, with only a limited military infrastructure and minimal command, control, and communications assets in the region. The challenges were many, but we met them all.

Increased Responsibility for DIA

DIA's superb performance left lasting impressions where they mattered most. Within four months of the war's conclusion, DIA received its second DoD Joint Meritorious Unit award in the last five years for "the sustained, vital role" played during Operations DESERT SHIELD and DESERT STORM by DIA personnel who "contributed with great distinction to the coalition victory." Almost simultaneously, DIA received a National Intelligence Meritorious Unit Citation from the Director of Central Intelligence in recognition of "its extraordinary performance" in providing "consistently outstanding, dedicated intelligence to the National Command Authorities and field commanders throughout the crisis in the Middle East." These unit awards, of course, were in addition to hundreds of individual awards presented to DIA personnel both during and after the war.

In a mid-June 1991 ceremony during which he formally presented DIA with its Joint Meritorious Unit Award, General Colin L. Powell, Chairman of the Joint Chiefs of Staff, said: "Your effort, and that of your sister intelligence agencies in the Intelligence Community, will go into the history books . . . as representing a new level of expertise, a new level of professionalism and proficiency in the conduct of war."

Throughout the Defense Department and the Congress at this time, intelligence was recognized as a significant force multiplier that contributed greatly to the coalition victory in the war and the speed with which it was achieved. Yet even before the war concluded, Secretary Cheney had begun moving aggressively to reorganize defense intelligence to address the rapidly changing nature of the worldwide military threat, as well

as the certainty of increased DoD-wide budget austerity. As part of this reorganization, he directed the shifting of additional intelligence program management responsibilities to DIA.

This across-the-board restructuring of defense intelligence functions and assets in early 1991 envisioned a reconfiguration of DIA to emphasize DIA's intelligence management role, as well as "quality analysis, production and reporting of strategically important intelligence."

Secretary Cheney's reorganization guidance also gave DIA additional responsibilities for managing DoD-wide intelligence activities, principally in production, scientific and technical (S&T) intelligence, weapons acquisition support, imagery activities, and HUMINT. As part of its new responsibilities, DIA was directed to manage all defense intelligence production worldwide, to operate a centralized current intelligence reporting system, and to oversee the global indications and warning system. DIA also was asked to explore establishing a centralized system for the procurement of specialized supplies and equipment for defense intelligence, and to develop standards for defense intelligence automated data processing (ADP) and communications systems and activities.

As a first step toward implementing the Secretary's directive, DIA's leadership conducted a top-to-bottom review of its missions, functions, and structure. This review factored in the new tasks and responsibilities anticipated under a restructured defense intelligence apparatus. It led directly to the internal reorganization completed last October. This tailoring brought a series of changes that have clearly left DIA much better structured to meet the challenges of a rapidly changing world. DIA's internal reorganization accomplished the following: civilianized the Deputy Director's position; eliminated the Executive Director's slot; created a new, civilian Command Element position for a Chief of Staff; and reduced the number of directorates from eight to six.

As we finished the reorganization plan, we began shifting DIA assets into intelligence program management areas, all the while preserving DIA's traditional, primary focus on intelligence production. Presently, moves are under way to distribute increasing numbers of operational-level intelligence production tasks to the newly evolving Joint Intelligence Centers at the Unified and Specified (U&S) Commands. Tasks to be distributed include those associated with maintaining order-of-battle and related facility data bases, and performing capabilities

assessments of foreign military forces. Yet even as we increase oversight in this area, we continue to sharpen DIA's focus on the production of strategic-level assessments in support of national policy formulation and operational-level planning.

DIA also has begun to assume an enhanced role in managing production at the service-affiliated S&T centers and is strengthening its support to the weapons acquisition process. The future should see further increases in DIA's involvement in the review and validation of Service-generated Systems Threat Assessment Reports (STARS) for major weapons systems and the validation of data bases the services use to prepare these reports. Finally, in the HUMINT area, I will provide, in my role as the DoD HUMINT Program Manager, an enhanced level of planning, execution, and evaluation in this critical DoD mission area.

The Role of Congress

As Secretary Cheney's plan for the restructuring of defense intelligence was being implemented, Congress also was drafting legislation that would directly affect DIA by infusing it with considerably expanded responsibilities. In language from the Senate report on this year's National Defense Authorization Act, Congress said that, among other things, it wanted to "strengthen joint intelligence support to the combatant commands, ensure that intelligence priorities reflect[ed] the changed security environment, and improve the responsiveness and utility of national intelligence systems and organizations to the needs of the combatant commanders."

Acting on DIA's outstanding performance during Operations DESERT SHIELD and DESERT STORM, Congress included language in the Defense Authorization Act that reinforced DIA's role as a combat support agency and conferred upon it a clear charter for leadership in defense intelligence. Fulfilling this energetic Congressional mandate at the same time DIA is meeting the guidelines of the Secretary of Defense's reorganization directive has become the centerpiece of my agenda during my first year at DIA.

In many respects, this legislation represents a Goldwater-Nichols Act for intelligence. Principally, it restates DIA's charter to provide intelligence and intelligence support to the Secretary of Defense, the Chairman of the Joint Chiefs of Staff, the

commanders of the U&S combatant commands, and the Director of Central Intelligence. Unspoken, but no less important, is DIA's role as part of the national Intelligence Community to provide intelligence support to national decisionmakers and the members of Congress. Further, the legislation placed DIA under the "authority, direction and control" of the Secretary of Defense.

The legislation directed another important change, this one in the management of the General Defense Intelligence Program (GDIP). The GDIP is that portion of the larger National Foreign Intelligence Program (NFIP) dedicated primarily to providing intelligence for operating forces, except those associated with purely tactical intelligence units and forces. Specifically, Congress restored DIA managership of the GDIP. Further, Congress altered the GDIP's basic management structure. Under the legislation, DIA was directed to assign its functional managers additional roles and authorities to guarantee their substantial participation in the preparation, review, approval, and supervision of GDIP budgets and programs within their areas. What this means is that instead of building the GDIP along purely Service and Defense agency lines as happened in the past, programs will now be developed along functional lines. This will allow consideration of intelligence production, for example, from a total capabilities measure of effectiveness, and will infuse the program management effort with a joint perspective it did not have previously.

Other important aspects of this legislation confer upon DIA a larger role in S&T matters. Specifically, Congress directed that both the Armed Forces Medical Intelligence Center (AFMIC) and the Army's Missile and Space Intelligence Center (MSIC) be turned into field production activities of DIA by January 1, 1992. This was accomplished on schedule. We worked hard to ensure these actions occurred with as little disruption as possible to center customers and a minimum amount of internal upheaval for the centers' work forces; and we were successful. The legislation also recommended that the research and development and procurement funding for the remaining four S&T intelligence centers be transferred to DIA.

The legislation further enhanced management responsibility for imagery exploitation, analysis, and dissemination on behalf of the DoD. Congress, in drafting this section of the legislation, acknowledged DIA's existing responsibility for functional management of imagery within DoD. It asked, however, that DIA

sharpen its focus on personnel and training policies, and that it develop and enforce standards for imagery exploitation, analysis, and dissemination.

DIA also received the authority to consolidate Washington, D.C., area military intelligence centers into a JIC that DIA would manage in its capacity as the intelligence staff activity of the JCS Chairman. This JIC, which will operate during peacetime as well as crises, will be responsible for preparing current intelligence assessments, including those associated with indications and warning. This new JIC was formally established on March 1, 1992 when DIA's National Military Intelligence Center was retitled the National Military Joint Intelligence Center (NMJIC).

The Military Intelligence Board (MIB) is another very important part of the changes now under way. As the Director of DIA, I chair the MIB, which is composed of the service intelligence chiefs; the Director, NSA; and other invited officials. The MIB came into its own during DESERT SHIELD and DESERT STORM when it met much more regularly than it had in the past and became an active working group that orchestrated all types of intelligence support. An important addition to the MIB during the war was the JCS J6. The MIB was successful in attacking problems along the sometimes ill-defined seams of intelligence's national and tactical levels. This group will be strengthened even more in the months ahead to serve as the military intelligence Community's senior board of directors.

Meeting the Challenges

Handling these new responsibilities, while maintaining DIA's high production standards and volume, will require a renewed commitment from the total DIA work force. But DIA's personnel always have been, and remain, our most important resource, and their worth was evident during the war when they showed what can be accomplished through a totally dedicated effort. In this regard, I intend to focus heavily on preserving and fostering a DIA-wide personnel structure commensurate with the missions DIA has now been assigned. To do otherwise would seriously neglect the very element that has sustained DIA through its first three decades and will bring it further success in the future.

Today, DIA stands better prepared than at any time in its history to confront the challenges of this turbulent, changing world. Thanks to the foresight of Secretary Cheney and the US Congress, we will soon have all the tools necessary to meet any future challenge. We will place these tools in the hands of proud professionals who are both anxious to implement DIA's renewed intelligence charter, and who remain, in the words of its motto, "Committed to excellence in defense of the nation."

Defense Intelligence Journal 1(1992), 17-29

Rethinking US Intelligence

Senator David L. Boren

Overview of Bill S. 2198

On February 5, 1992, I introduced a bill, S. 2198, entitled the "Intelligence Reorganization Act of 1992," which proposes a dramatic restructuring of the US Intelligence Community. Chairman McCurdy of the House Permanent Select Committee on Intelligence introduced a companion bill.

Creation of a New Director of National Intelligence. Among other things, the bill would create a new Director of National Intelligence (DNI) to coordinate US intelligence activities, to serve as the President's principal intelligence adviser, and to provide operational supervision of the Central Intelligence Agency. In addition, the DNI would serve as a nonvoting participant in the National Security Council. Existing law does not provide any explicit role for the DCI.

The DNI's responsibilities for the Intelligence Community itself remain similar to those under the existing Executive Order, but with a few significant additions. For example, the bill would make the DNI expressly responsible for approving the acquisition of overhead reconnaissance systems to support both signals intelligence and imagery collection. The bill also would require the DNI to establish an independent office to evaluate the performance of the Intelligence Community, as well as require him to establish a permanent office to provide warning to policymakers and support in crises. Under this bill, the existing Intelligence Community Staff would be formally abolished and its functions assumed by the new deputy or otherwise be apportioned pursuant to the bill.

The bill also would considerably enhance the DNI's authorities with respect to the Intelligence Community,

ANALYSIS

Critical Security Dominates Information Warfare Moves

By LTGen. James R. Clapper, Jr., USAF, and LTC Eben H. Trevino, Jr., USAF

Information warfare evolved from the ability of computers and communications equipment to influence the outcome of any event or scenario. As these systems flourish and become more capable, reliance on them will increase proportionately. This reliance represents a powerful tool—and a potentially fatal vulnerability—to the war fighter.

While information warfare will play an increasingly important role in future conflicts, neither a national definition nor a strategy exists to capture the concept accurately. Most definitions characterize information warfare rather than define it.

A number of organizations in the Defense Department are working toward similar information warfare objectives. The overall effort, however, lacks cohesive organization. It needs a set of common, deconflicted and specifically defined objectives. The theory and practice of information warfare must be fused into a coherent and meaningful picture to avoid diversion.

One Defense Department directive states that information warfare applies to both the information being processed and the information systems performing this processing in support of military operations. This effort establishes the policy and assigns responsibilities regarding information warfare, but it does not define it.

The closest description of information warfare might be found in the definition of command and control warfare. A memorandum of policy from the Chairman of the Joint Chiefs of Staff describes command and control warfare as a joint war fighting strategy that integrates the concepts of operations security, deception, psychological operations, electronic warfare and the traditional combat role of physical destruction. Command and control warfare's objectives are achieved by influencing, degrading, denying or destroying an adversary's command and control capabilities. An equally important element of the concept is its defensive nature—the protection of command and control capabilities via operational security, deception operations and protection measures built into information systems.

Information warfare means different things to different people. For some, it is all about communications and the predominant and leading role held by those in communications-based military business areas. To others, it is about computers, networking and leadership. One participant at a recent conference on information warfare characterized it as an "intelligence-intensive business, where intelligence serves as the foundation." Others at the conference did not even mention the role of intelligence. The only thing everyone seems to agree on is that information warfare is very important. Dr. David Signori, deputy director, Defense Information Systems Agency, explains the concept by saying that information warfare exists at the convergence of intelligence, mission support activities and command and control.

While no definitive description or definition of information warfare exists, each of the services has its own definition; none are exactly alike; and all are similar, according to officials at the National Defense University's new School of Information Warfare and Strategy.

The university's program stresses that information warfare is the sum of many things: electronic warfare, psychological operations, deception, intelligence, reconnaissance and surveillance. Information warfare consists of understanding an adversary's information flow. The resulting knowledge enables effective force application against the enemy's information links to increase friction, uncertainty and disorder. Additionally, the resulting cognition enables the protection of U.S. information flow. Because of the critical dependency that war fighters have on this flow, it becomes a center of gravity that, if attacked, will hinder severely the war fighter's capability to execute combat operations. Information warfare is a deliberate war fighting methodology and strategy. It is an integrated employment methodology of missions and operations, not the least of which is intelligence and communications.

Coming to grips with the combination of technology and strategic thought requires doctrine, strategy, education, training and procedures. Leaders need a roadmap—an azimuth enabling all concerned to march toward a common objective. To build this roadmap, the United States needs a national definition, strategy and coordinating mechanism for information warfare; a Defense Department definition and strategy for information warfare; and theater-level strategies and coordinating mechanisms oriented to the various global regions.

A national information strategy is an important, but missing, piece of the information warfare puzzle. Such a plan would be of particular benefit to the military, especially in an operations-other-than-war environment. When the military must perform missions far beyond its traditional bounds, the U.S. government must have a clear purpose, as well as goals and objectives for its involvement.

Essential to a national information strategy is a national coordinating forum or mechanism to fuse the strategies of national power elements—military, political and economic. A forum would bring together organizations such as the departments of State, Defense and Treasury; the Central Intelligence Agency; and the U.S. Information Agency. This effort would facilitate the sharing of data and perceptions; the development and recommendations of a coherent policy and posture; and the synchronization of actions to support national interests and the U.S. military. The Defense Department's participation in such a forum would require that it also develop a doctrinally and procedurally defined information warfare strategy.

The enemy's observe-orient-decide-act loops are bounded by factors of time and friction. When the U.S. effort can increase the friction, it extends the time the adversary needs to observe, orient, decide and act. If this effort simultaneously reduces friction and time for the United States, the military effectively will outperform an adversary in combat and will prevail in an engagement, crisis or conflict. The success of this approach hinges on an effective Defense Department strategy to ensure that everyone is working toward the same goal in a complementary and unified manner.

Concurrent with a defense effort, the United States needs to develop theater-level strategies attuned to furthering national interests in various global regions. At this level, the Unified Commands' strategies would be developed within a theater-wide coordinating forum consisting of the command's joint staff members and the designated representatives to the command from other national-level U.S. government agencies. The theater command and its assigned representatives would have a combined, multinational, coordinating mechanism available to them. The combined coordinating mechanism would serve two additional purposes—to deter or diffuse potential conflicts and, in those instances where deterrence fails, to build a sound foundation for cohesive coalition action.

Leadership in the information war begins with the national command authority. For the military, the leaders in information warfare should not come from those involved in command, control, communications, computers nor intelligence. The roles of these professionals are important, and their individual efforts will be integrated and synchronized within a command's plans. But the J-3, the commander's principal war fighting staff director, should be the information warfare leader. This is the individual who is responsible for directing, planning and executing a course of action.

The role of intelligence is critical for an effective information campaign, and the foundation is not limited to the scientific and technical aspects of various intelligence analyses and systems. In many cases, intelligence must include biographic, cultural, sociological and economic factors—particularly in those operations-other-than-war scenarios where U.S. troops will be coming into direct daily contact with a foreign population. The actions and decisions of these troops could have an immediate effect on U.S. foreign policy objectives. The basis of daily activities must have a strong intelligence underpinning. Military personnel must be armed with knowledge.

Some facets of information warfare go beyond the battlefield. The public opinion component of information is of critical value to all involved. Everyone must recognize that, because of the well-developed media and the prominent voice of public opinion in U.S. life, an adversary's information campaign often will be targeted against the U.S. public, not against the military. Leaders collectively must respond to and interact with the public component in an honest, open and public forum. The public needs a balanced and fair presentation of U.S. activities and involvement around the world. Active engagement requires training and understanding as well as full government participation. Success or failure may not be determined on the battlefield, but on the front page of the morning newspaper.

The Gulf War demonstrated that the execution of information operations can determine a mission's success. Future wars will include information campaigns where an adversary's information flow specifically will be targeted and information dominance will be achieved. Because information warfare is applicable across the spectrum of conflict, it will affect operational planning, force deployment, the sustainment of fighting forces and force redeployment.

Many believe the war fighters' paradigm has shifted. But others contend that the military is still in the midst of this shift. A recent *Wall Street Journal* article by Thomas Ricks reports that Andrew Marshall of the Office of Net Assessment, Office of the Secretary of Defense, says the information age will spark a "military revolution," just as artillery did in the 15th century and industrial-age machinery did during the past 150 years. The next 30 years, he suggests, may see the beginning of the end of the industrial era of attrition warfare. What Marshall envisions is a far cry from operation Desert Storm, which he considers a late industrial-age conflict with only hints of the high-technology future.

Marshall warns that an early lead is no guarantee of remaining on top. It is precisely because of the fragility of the U.S. lead that decision makers must begin to address information warfare intellectually and practically.

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Virtual Reality Gaining Ground In Computing Market

By Herbert F. Schantz

The number of virtual reality applications for medicine, business and education is increasing, with many new systems predicted to be available by 1997. As systems and accessory prices decline, desktop computing power increases and the accuracy of computer-generated worlds improves, the uses of virtual reality will start to expand, industry experts predict.

Analysts estimate that elementary virtual reality systems will be available for home use this year; partial-immersion systems, by 1998; and full-immersion products, before 2005. Virtual reality software programs allow users to interact with three-dimensional, computer-generated environments. They will be more widely used by the end of the decade 2004. Analysts at NewMedia, Riverton, New Jersey, divide virtual reality systems into four categories, in ascending order of complexity: desktop, partial immersion, full immersion and environmental.

Partial-immersion systems use a monitor and other accessories, such as gloves and headgear, to enhance a user's sight, touch and hearing. Full-immersion applications use headgear, gloves and bodysuits to permit users to move through virtual space. They are becoming increasingly popular in video arcades today. The final category, environmental, permits users to move and interact with three-dimensional space with few, if any, physical constraints.

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