Army Enterprise Strategy

THE VISION

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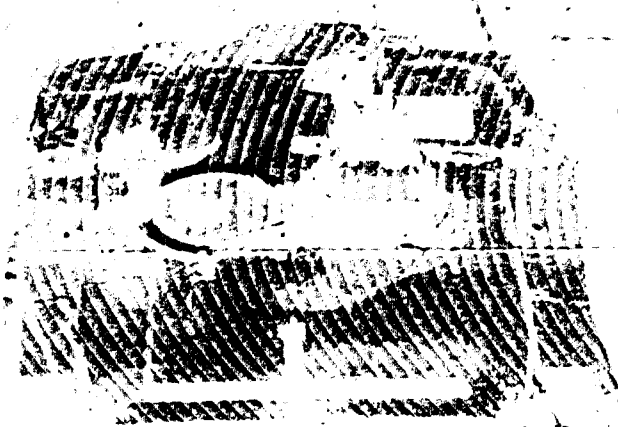


Enterprise

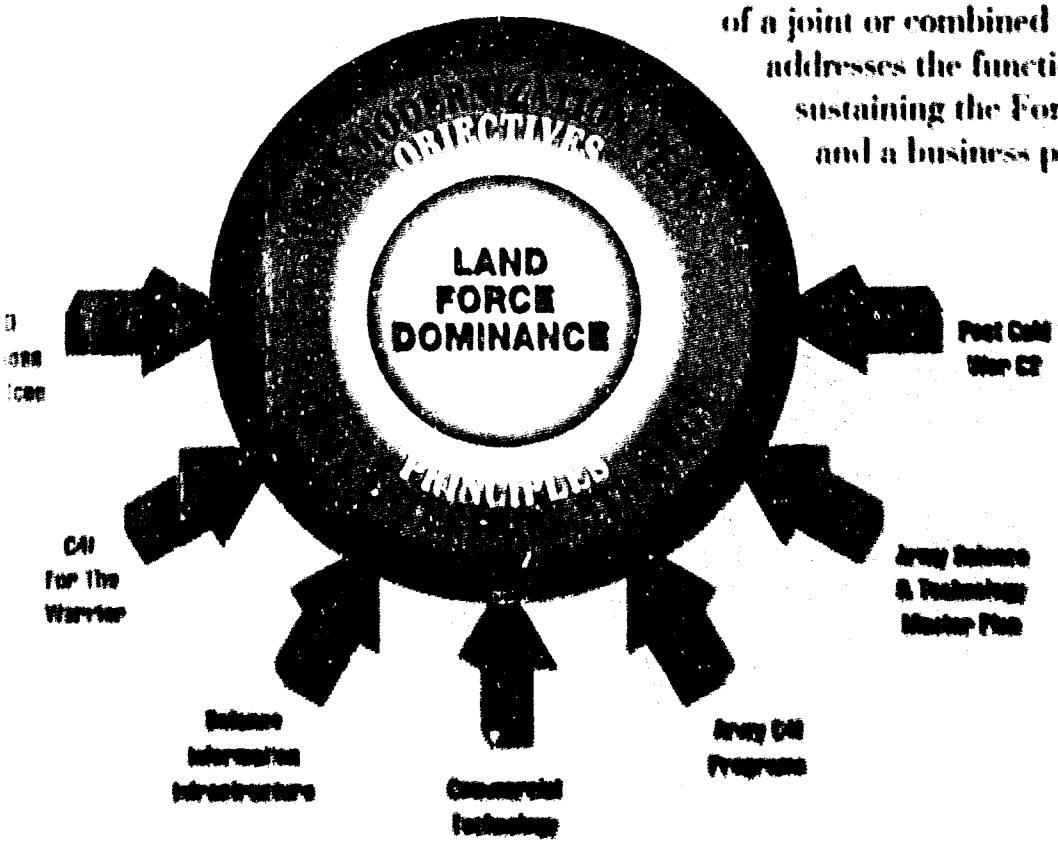
The Army Enterprise Strategy

The Army Enterprise Strategy is the single, unified vision for the Army C4I community. It serves as the enabler for Land Force Dominance as defined by the five objectives of the Army Modernization Plan.

Integrating both current Army doctrine and modernization plans for the evolution of information systems, the Enterprise Strategy is what the Army must do to "Win the Battlefield Information War."

This document, The Vision, is the first of two publications which compose the Army's Enterprise Strategy. It explains the ten principles that assure that the Warfighter will have information superiority over any opponent. The second document, The Implementation Plan, will present the steps the Army must take to fulfill the Vision.

The Enterprise Strategy focuses on the information needs of the Army as a whole. It addresses the Army's requirements to organize, train and equip the force. It also addresses the Army's requirements as a component of a joint or combined force. Finally, it addresses the functional requirements for sustaining the Force from both a tactical and a business perspective.



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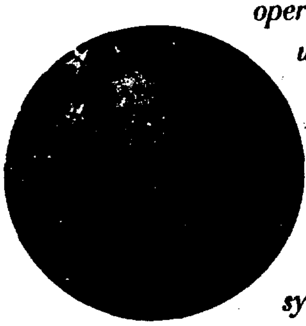
Foreword From the Chief of Staff

Rather than a single, focused threat, America's 21st Century Army faces a broad range of challenges. Today, we are changing in fundamental ways to accommodate an unpredictable new world. Moreover, we are searching for force multipliers as we work to maintain our warfighting edge.

Just as we capitalized on our strong base of heavy manufacturing to gain victory in World War II, we will rely on America's dynamic new base of available technologies to tailor our fighting force to tomorrow's battlefield. Specifically, we are exploiting advances in information technology to raise our readiness to respond to unstable situations throughout the world. The combat, combat support, and business operations of the Army Enterprise are interdependent and will be coordinated as we master the challenges of our quickly changing missions in support of Joint warfighting requirements.



This capstone document outlines the strategy and the principles by which we will exploit current and future information technologies, adopting new systems and using executive decision making as a means to advance the capability of the Total Army Force. The advanced capabilities envisioned by this document will enable the Army to project and sustain the force, protect the force, win the battlefield information war, conduct precision strikes throughout the battlefield, and dominate the maneuver battle.

The Army Enterprise Strategy is founded upon the well-established doctrinal foundations of Army Operations FM 100-5, which we have updated and expanded to fit the requirements of the 21st Century. The goal of this strategy is to support the Warfighter in combat and in garrison. As we know, the challenges of joint interoperability are great. The Enterprise Strategy is the framework by which we will meet and conquer these challenges. It is a vision for present and future information support for our Total Army.

Gordon R. Sullivan

General, United States Army

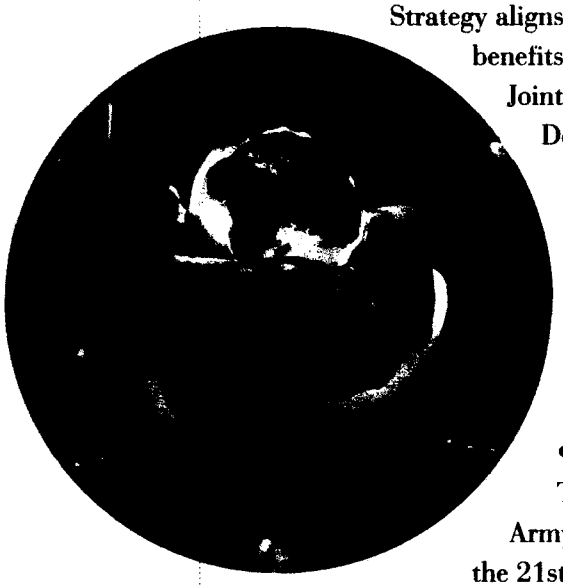
Chief of Staff

Introducing The Vision

This document is the vision statement of the Army Enterprise Strategy. This first section sets the stage for the detailed discussion that follows. It states The Purpose of the Enterprise Strategy, describes The Threat the Strategy must meet, and explains how the strategy focuses on Winning the Battlefield Information War to counter the threat. The second section is the heart of The Vision. It explains the ten Enterprise Strategy Principles, which make up the C4I solution. The final section, Azimuth for Change, sets the course for the follow-up document, The Implementation Plan.

THE PURPOSE

The purpose of the Army Enterprise Strategy is to support US Army Warfighters into the 21st Century.



Composed of a vision statement and an implementation plan, the Enterprise Strategy aligns and focuses existing Joint and Army efforts to maximize benefits to the Warfighter. It synchronizes Army programs with the Joint Staff's C4I for the Warrior concept, business practices, and Defense Information Infrastructure.

The Strategy will:

- unify the C4I community toward a common goal
- establish a structure to guide the system development process
- develop economic, functional, and technical guidelines and criteria to aid resource managers in making C4I system assessments
- provide a broad systems perspective across DoD

Together the vision and implementation plan define the Army Enterprise Strategy to support Army Warfighters into the 21st Century.

THE THREAT

Following the relative stability of the Cold War years, today's Warfighter faces less well-defined threats. The breakup of the Warsaw Pact, together with rising nationalism, ideological and religious fervor, and economic competition all contribute to global instability. Today's threats range from drug trafficking and terrorism... to conventional military operations... to nuclear and chemical confrontation.

The situation is unclear. There is no single major adversary. Instead, we face a host of potentially dangerous adversaries. They may become active threats at any time, separately or simultaneously. And every potential adversary poses a unique challenge, because each possesses a different level of sophistication in weaponry and

When our vital interests are challenged, or the will and conscience of the international community is defied, we will act—with peaceful diplomacy whenever possible, with force when necessary.

President

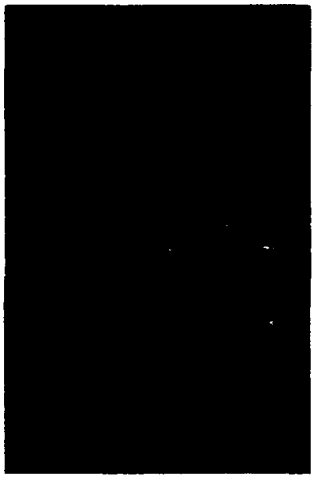
William J. Clinton

Force projection operations will greatly tax battle command. The deployment phase of an operation may result in the physical separation of units in space and time. Soldiers may arrive by air while their equipment arrives by sea at a separate location, particularly if the deployment is unopposed. The enemy may attack unexpectedly before deployment is complete. This may cause some commanders to fight without their entire complement of forces present. These considerations require an extra level of security for tactical units during deployment and initial operations while tactical commanders build combat power and prepare for future operations.

FM 100-5

Operations

command and control (C2) capability.



Operation Jayhawk Thunder from the Gulf War (see page 6) illustrates the need for flexible, coordinated responses to any situation. in this case. Army operations against a large-scale conventional threat employing Soviet weaponry and C2.

This example shows how *interoperating* systems in the Army and the Air Force provided the Corps Commander with a powerful and versatile means of deep fighting. Mission tasking, firing approval, targeting data, and airspace coordination were passed from both ground and air control coordination sites to the firing battery well inside of two hours.

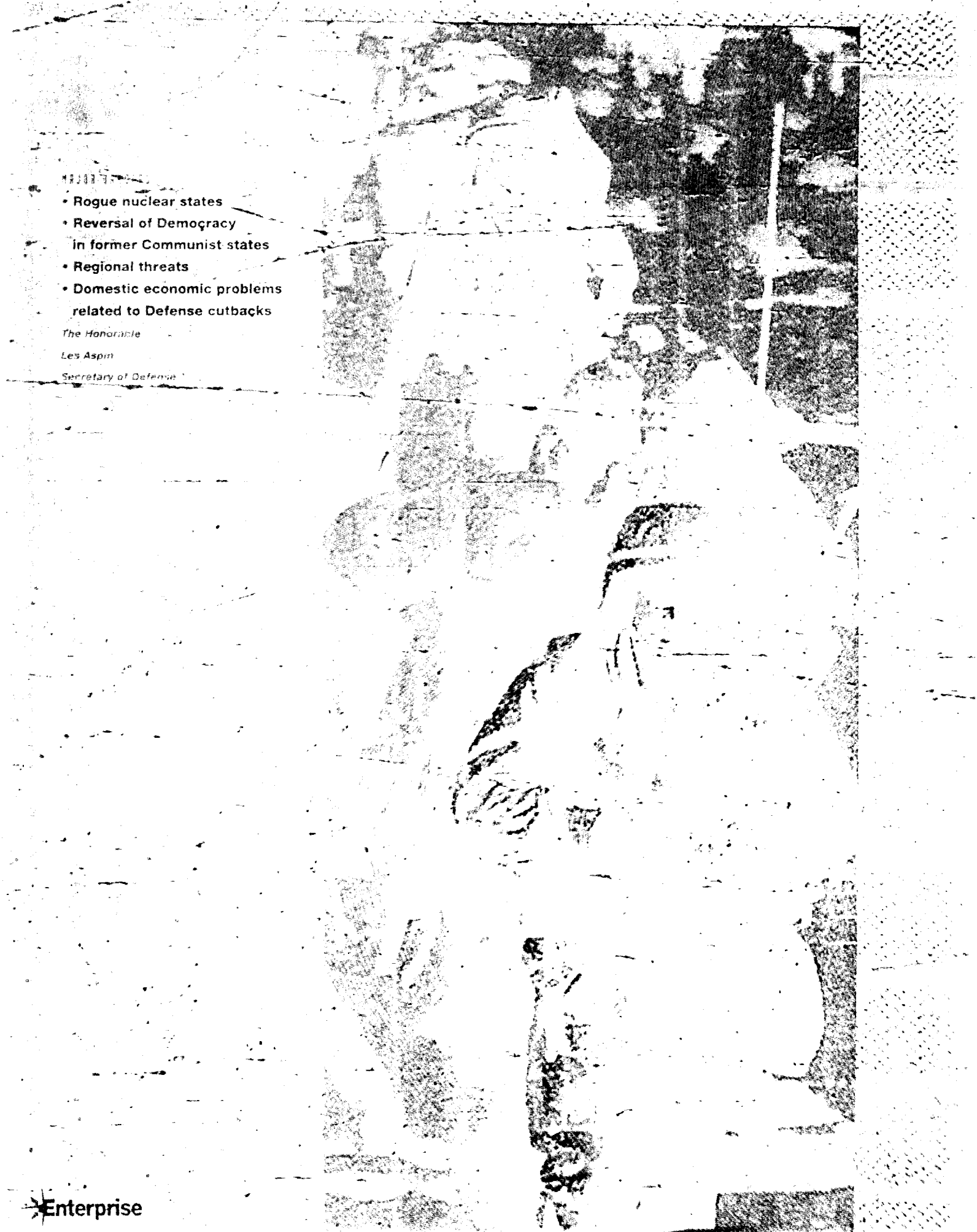
But while Jayhawk Thunder is a success story, two-hour responses won't be good enough for future engagements with fleeting targets. Too much time was lost in establishing communications. We cannot always count on Army artillery officers on AWACS taking the initiative. And we certainly cannot count on targets remaining in place for two hours. Future adversaries will exploit enhancements to their C2 capabilities to interrupt the type of information supremacy which the coalition forces enjoyed during the Gulf War. *Factors like these show the changing nature* of the threats we face and the new directions our C4I capabilities must take.

THE FOCUS

Countering tomorrow's threats requires Winning the Battlefield Information War. This requirement causes the Army to address both the offensive and defensive components of the Information War. As a result, the Army Enterprise Strategy focuses on identifying, supplying, and implementing the sophisticated information and other C4I technologies needed to support the Army Warfighter.

The Information Age has already had a dramatic impact on the way we fight. To support the Warfighter, the Army has adapted advanced information technologies, making them as intrinsic to warfighting as any weapon.

Today's combat power comes from the simultaneous application of complementary weapons capabilities. Rapid deployment . . . mobility . . . maneuvering to gain positional advantage and achieve surprise . . . real-time targeting for standoff engagements . . . all of these capabilities reflect modern warfare doctrine. And each one depends on modern information tools, which will be even more critical to warfighting in the future. By tak-



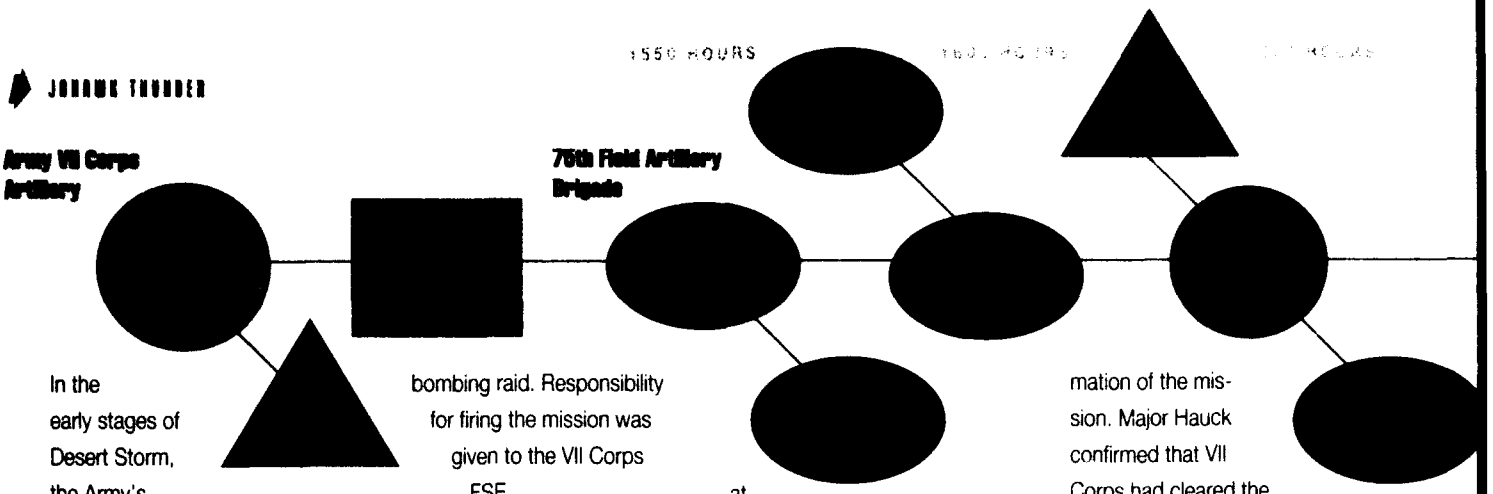
- Rogue nuclear states
- Reversal of Democracy in former Communist states
- Regional threats
- Domestic economic problems related to Defense cutbacks

The Honorable

Les Aspin

Secretary of Defense

Enterprise



In the early stages of Desert Storm, the Army's VII Corps Artillery command post received intelligence reports on an Iraqi SA-2 Surface to Air missile site southwest of Basra. At the time, it wasn't considered a high payoff target. But during the ground offensive, when B-52 strikes were planned for the "highway of death," the SA-2 site posed a real threat to friendly aircraft and operations of the 1st Armored Division.

On 26 February 1991, the VII Corps G2 passed this information to the VII Corps Fire Support Element (FSE). Other sources of intelligence information verified that the SA-2 site was active and posed a lethal threat against a planned B-52 bombing raid. Responsibility for firing the mission was given to the VII Corps FSE.

Repeated attempts to communicate with the 75th Field Artillery Brigade failed due to the distance between the Brigade and the Corps tactical operations center. All day on 26 February, units of the Brigade were fighting and moving fast as they reinforced the fire of the 1st Armored Division Artillery and provided general support to VII Corps. Unable to contact the 75th FA Brigade, the VII Corps FSE sent a message to an Air Force EC-130E Airborne Command and Control Center, code named Alley Cat, asking it to relay the fire mission to the 75th FA Brigade. Alley Cat successfully contacted the Brigade at 1550.

Corps Artillery intelligence continued to verify the location and activity at the Iraqi site. A target grid was passed to the JSTARS Ground Station Module requesting verification that the target was still functional. Flying in Alley Cat, Major Gerald Hauck, the Army ground liaison officer, contacted the command element of the 75th FA Brigade. He issued a warning order for the fire mission on the SA-2 site, but did not establish a launch window. Since the Brigade was moving and did not have communications with Corps Artillery, the Commander, Colonel Jerry Laws, asked Alley Cat for confirmation of the mission. Major Hauck confirmed that VII Corps had cleared the mission and that he was working on airspace clearance with the AWACS.

75th FA Brigade assigned the mission to A Battery, 6th Battalion, 27th Regiment. The commander, Captain Jeff Lieb, ordered an MLRS launcher to download rockets and upload missiles for an immediate Army Tactical Missile System (ATACMS) mission.

At this point Staff Sergeant Brault, the section chief, broke his MLRS launcher away from the Battery convoy and set up a firing point 75 to 100 meters away. Four ATACMS pods were delivered by the ammunition platoon. Two missiles were

ing advantage of opportunities in information technology, we will enhance the Army's warfighting ability and its contribution to national security.

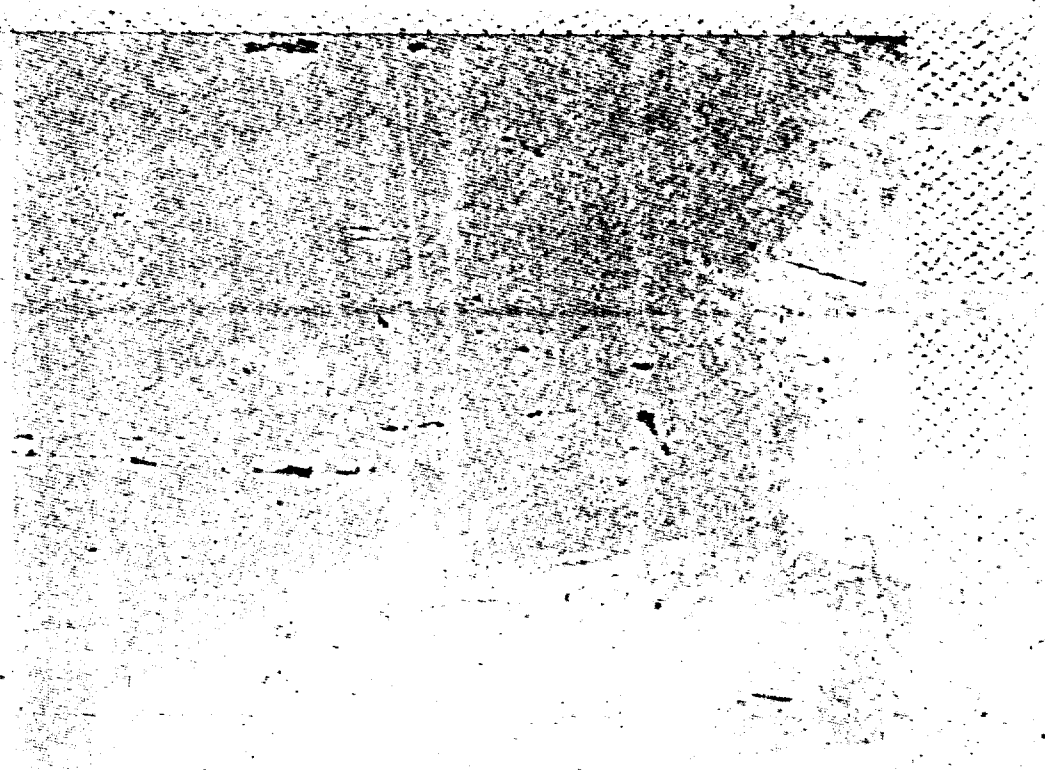
To be effective, the Warfighter now requires a broad range of coordinated support elements. Timely, accurate information is critical to success. Tools must be easy to use, lightweight, reliable, interoperable, small, and inexpensive.

But this is just the start. Winning the Battlefield Information War demands proper timing based on highly integrated command and control joining land, sea, air, and space resources. Fixed and mobile, manned and unmanned equipment are all involved. Management is crucial for the control, synchronization,

The Army does not fight alone. It integrates its efforts in unified operations with its sister services, with other national agencies, and often with allied and coalition forces. By doing so, the Army's operational capabilities are enhanced, victory comes quicker, and friendly casualties are reduced.

FM 100-5

Operations



The world in which we live has changed. No one could have predicted the events of the past several years: the fall of the Berlin Wall, operations Just Cause, Desert Shield, and Desert Storm, the dissolution of the Soviet Union. What's next? No one knows. We are relatively safe in predicting, however, that the strategic environment in the next decade will be dynamic, uncertain, and unstable. In response, we have structured our Army accordingly.

General
Gordon R. Sullivan

THE PRINCIPLES OF THE ARMY ENTERPRISE

What you saw in the jungle and cities of Panama and in the desert of Iraq was a window on the future of warfare. We essentially told the Panama Defense Forces and the Republican guard, "I know where you are and where you are not. I know where I am, and I'm coming after you, day and night, in all weather. And I will not let up until I take you down." That's what we did. Took 'em down.

General

Gordon R. Sullivan

and integration of these vast numbers of diverse warfighting elements in the field.

According to the philosophy of C4I for the Warrior, this won't happen without inter-service cooperation. When crisis strikes, Army Warfighters join their counterparts in the other services in a joint, coordinated operation to meet a common enemy, a common challenge, a common goal.

Instant global communications will play a major part in this. Commanders can now synchronize high-tempo operations anywhere in the world. With this ability has come new challenges and new opportunities. The commander's job has always been to bring order out of chaos. Now it must be done more quickly, while on the move, and with practiced insight in a new environment.

C4I is also a crucial factor in our ability to project military forces throughout the world at any time. The Army of the Information Age will depend on intelligent systems to support power projection operations. Because these operations must cover distances on a global scale, proper management and control of C4I resources are critical. The Gulf War clearly showed that intelligent command and control systems are necessary for complex AirLand operations, integrated both in time and in battlespace. Combat operations (many at night) involved swift maneuvers, standoff engagements, precision targeting, and precise attacks.

In the current environment of downsizing and general reduction of resources, it is imperative that we use current and emerging technology to make the Warfighter more efficient.

As we go about tackling the difficult individual tasks ahead of us, we will not lose sight of our first duty—the maintenance of sound, ready, effective forces.

The Honorable

Les Aspin

Secretary of Defense

"Alley Cat"
relays the authorization
to fire on SA 2 site

Target
Destroyed

Focus on the Warfighter

Provide the Warfighter systems that meet validated needs.

Ensure Joint Interoperability

Provide the Warfighter C4I systems that interoperate in Joint and Combined operations.

Capitalize on Space-Based Assets

Provide the Warfighter assured access to mission-essential military and commercial space-based systems that support the Force Projection Army across the entire operational continuum.

Digitize the Battlefield

Provide the Warfighter an integrated digital information network that supports warfighting systems and assures C2 decision-cycle superiority.

Modernize Power Projection Platforms

Provide the Warfighter a modern power projection platform to support peacetime operations, training, mobilization, force projection, split-base operations, and redeployment.

Optimize the Information Technology Environment

Provide the Warfighter more efficient information support for combat and peacetime operations.

Implement Multi-level Security

Provide the Warfighter the ability to access and exchange information at needed levels of classification using a single C4I system.

Ensure Spectrum Supremacy

Provide the Warfighter electromagnetic spectrum supremacy in order to maximize the benefits of maneuver and tempo in conjunction with firepower.

Acquire Integrated Systems Using Commercial Technology

Provide the Warfighter synchronized C4I capabilities that leverage commercial technology.

Exploit Modeling and Simulation

Provide the Warfighter, with cost effective training, testing, and rapid prototyping through state of the art modeling and simulation.

Focus on the Warfighter

Provide the Warfighter systems that meet validated needs.

The Army's role in the National Military Strategy is to provide Warfighters to support any mission in any location around the world. This is why the first principle of the Army's Enterprise Strategy is to focus information systems support on the Warfighter.

The Warfighter's needs must be carefully understood and addressed to ensure that all communications and information requirements are met in a compact, portable, rapidly deployed package. Packing the optimum information processing capacity into the smallest possible package will enhance the Warfighter's ability to fulfill the primary mission in combat and in humanitarian operations.

The key to supplying the Warfighter with information systems that minimize interference with the primary mission is the acquisition strategy known as horizontal technology integration. This strategy integrates common technology into different systems to enable them to fight together effectively as a force.

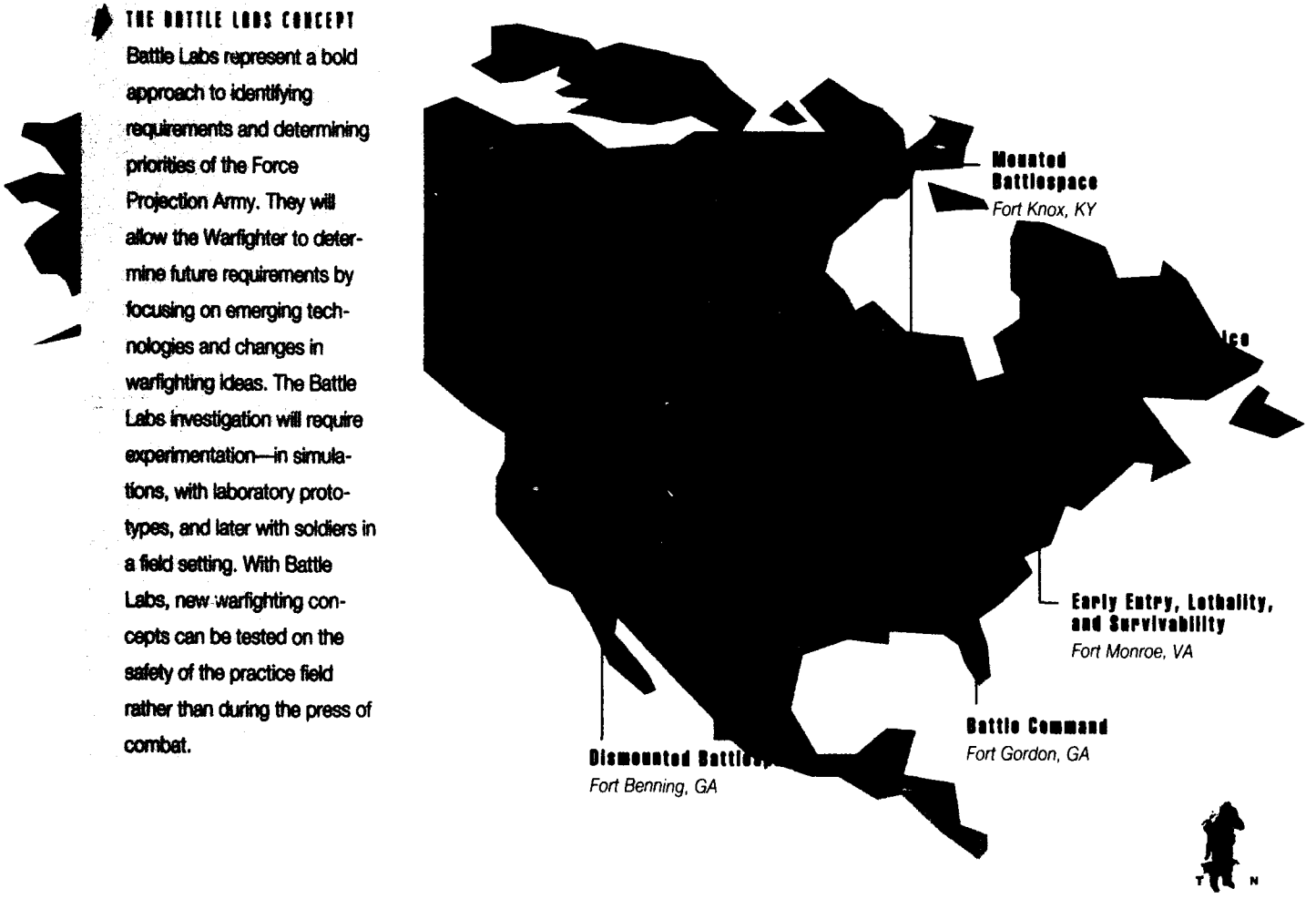
Meeting the Warfighter's needs presents five challenges.

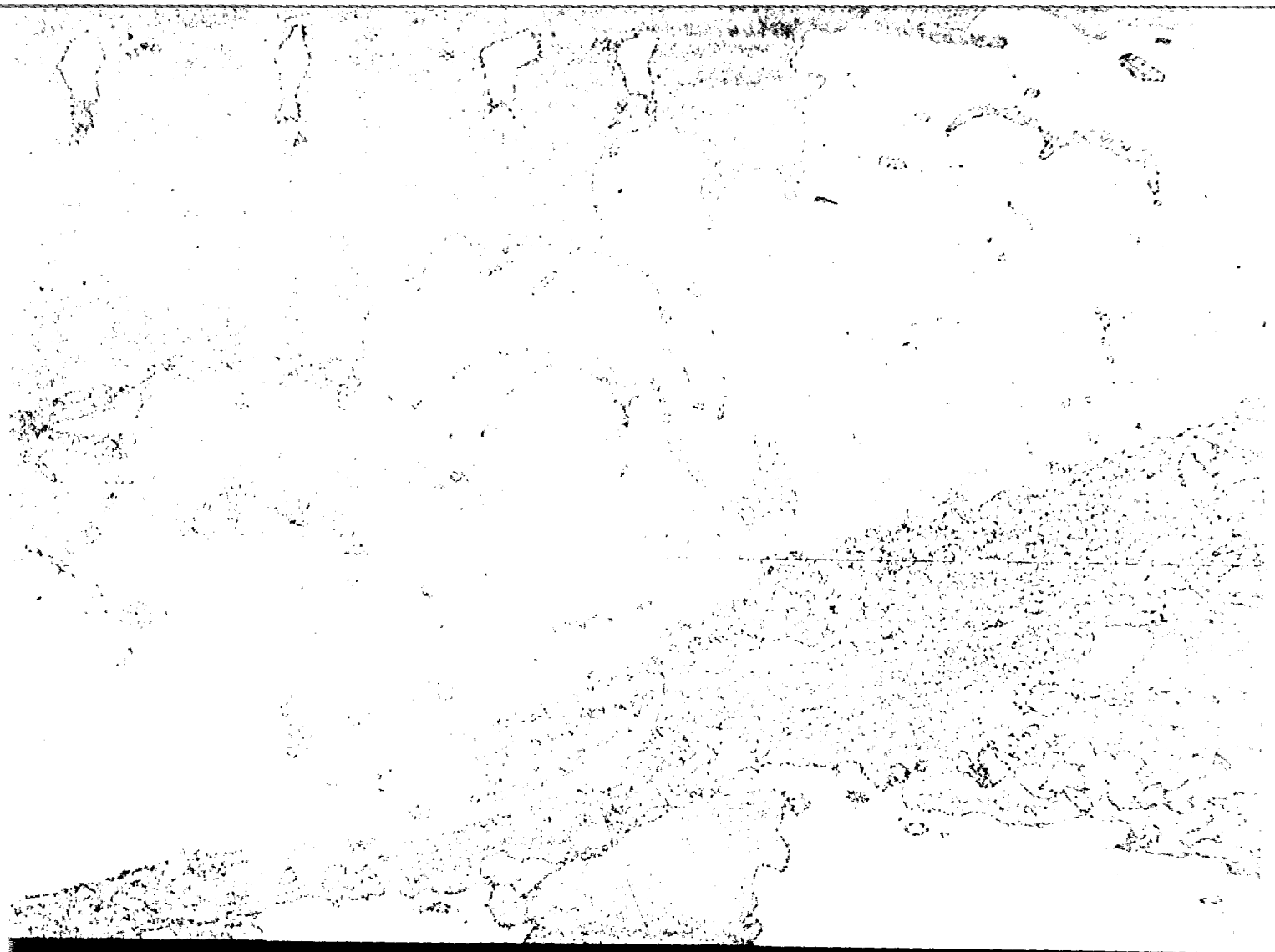
CHALLENGE ONE: ***Provide a responsive requirements process that reflects Warfighter needs.***

The most promising initiatives for improving the requirements process are

THE BATTLE LABS CONCEPT

Battle Labs represent a bold approach to identifying requirements and determining priorities of the Force Projection Army. They will allow the Warfighter to determine future requirements by focusing on emerging technologies and changes in warfighting ideas. The Battle Labs investigation will require experimentation—in simulations, with laboratory prototypes, and later with soldiers in a field setting. With Battle Labs, new warfighting concepts can be tested on the safety of the practice field rather than during the press of combat.





Integration will begin with concept development. Concept development will be supported by comprehensive interoperability requirements and standards. Cooperative designs and trade-offs among functional areas will reduce duplication of hardware and software and eliminate stovepipe systems. Multifunctional equipment, shared data bases, and distributed processing are examples of technologies available to support this concept. Adherence to technical, procedural, and operational standards, coupled with adequate testing and coordination will assure interoperability.

Equipping the Warfighter with the most advanced technology is not enough. More important is how the Army integrates new technologies into the force. TRADOC will focus on doctrinal integration. Functional proponents will work together to identify opportunities for cross-system integration. Developers will cooperate to design integrated systems that exploit commercial technology. The Army will find ways to overcome the slowness of requirements generation and acquisition processes.

The strategy is attainable and will keep pace with rapid advances in technology. It ensures that Army Warfighters are equipped with superior technology.

LOUISIANA MANEUVERS (LAM)

OBJECTIVES: The LAM will:

A. Explore and assess emerging policy options related to our ability to man, equip, organize, train, and sustain the force and generate tailored Total Army Force packages to support the national military strategy.

B. Participate in joint and combined operations to support warfighting CINCs in a structural way to learn, and use to:

1. Adjust our doctrine, organizations, training, materiel, leader development and soldiers.

2. Confirm our sea, air, and land strategic mobility, and other requirements.

C. Evaluate new weapons systems, equipment, and organizations through the use of simulations in a "fly before you buy" commitment to full-fledged R & D.

From the Letter of Instruction for Louisiana Maneuvers, General Gordon R. Sullivan to BG Tommy R. Franks

CHALLENGE THREE: ***Provide more deployable information systems.*** Deployability affects not only the Warfighter on the front line, but the Warfighting commanders who must allocate lift as they direct the overall operation.

The fast-moving Warfighter of the 21st Century requires systems that minimize the need for separate power sources. The Warfighter cannot afford the luxury of vehicles used solely to carry communications equipment or large computers that require hours to bring on line or prepare for road march. The combat load of the soldier argues against bulky communications equipment.

The Enterprise Strategy envisions information systems that will not be allowed to impede the Warfighter's ability to perform the combat mission. They will operate efficiently on the move and over extended distances when control of the force is most difficult. Also, the Enterprise Strategy will help leaders ensure that tactical and strategic deployability considerations are met, and that C4I capabilities are modular and tailorable to the mission at hand.

CHALLENGE FOUR: ***Provide capable and reliable systems.*** Those who implement the Enterprise Strategy will consult the Warfighter to formulate systems solutions to issues of capability and reliability. The Warfighter's role is to help define the elements of information needed to do the job at each echelon. The Enterprise Strategy will deliver a system to provide that information—and just that information. A system will be used only if it is reliable in terms of timeliness of information and ease and speed of maintenance. Only the Warfighter can set the criteria that determines reliability.

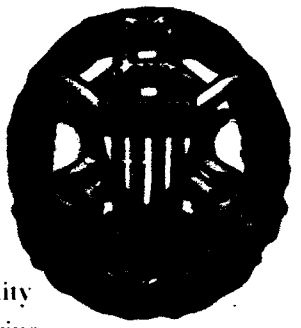
CHALLENGE FIVE: ***Provide systems that function in both garrison and tactical environments.*** A major problem for the Warfighter is maintaining user skill on complex tactical systems. The Enterprise Strategy will provide systems that behave in garrison exactly as when deployed tactically. This is good economically, because limited funds cannot support separate systems with overlapping function. It is good functionally, because it allows for split-base operations when part of the force deploys while the other part stays in garrison. And it is good operationally, because skills that the Warfighter develops in garrison will be second nature in the tactical setting.

Ensure Joint Interoperability

Provide the Warfighter C4I systems that interoperate in Joint and Combined operations.

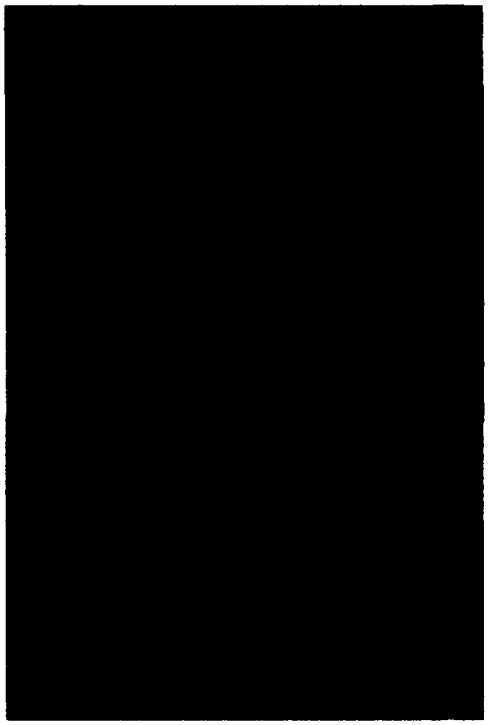
The concept of teamwork in warfare is not new. In modern warfare, however, the increasing complexity of multiple force operations *is new*. These operations demand improved information systems, with seamless interfaces, to process, plan, order, and coordinate the maneuver of forces and weapons systems horizontally and vertically throughout the battlespace.

The fighting force that destroyed the Iraqi defenses reaffirmed the long-standing tenet that victories are gained by close and effective integration of joint ground, sea, and air operations. The need for interoperability among Services and nations is accepted. However, *there is little chance of realizing* the required degree of interoperability unless system standards are identified, rigorously defined, and mandated for use.



Interoperability encompasses doctrine, procedures, and training—as well as systems and equipment. Simply put, interoperability is the overall ability of Warfighter systems to exchange voice, data, and imagery information effectively, in near or real-time, as dictated by the operational situation.

Achieving interoperability will require adherence to industry standards for engineering, communication protocols, and data elements. Standards define a common environment in which *new systems can be introduced at* reduced risk. They help maintain inter-



operability with existing systems as equipment is modernized.

Traditionally, standards have been slow to develop, lagging a generation behind the swift advance of technology. The challenge is knowing when to take the lead through cooperation with industry to develop new standards that exploit emerging technologies, and when to allow competing technologies to mature before establishing a new standard.

The Army is developing a Data Model that will reflect the Warfighter's information requirements. Existing data models will be integrated, and data elements will be standardized against this model for Army-wide use. The Data Model will define interface requirements, functional overlaps, and data architectures across the Army. Moreover, it will comply with the DoD Enterprise Model.

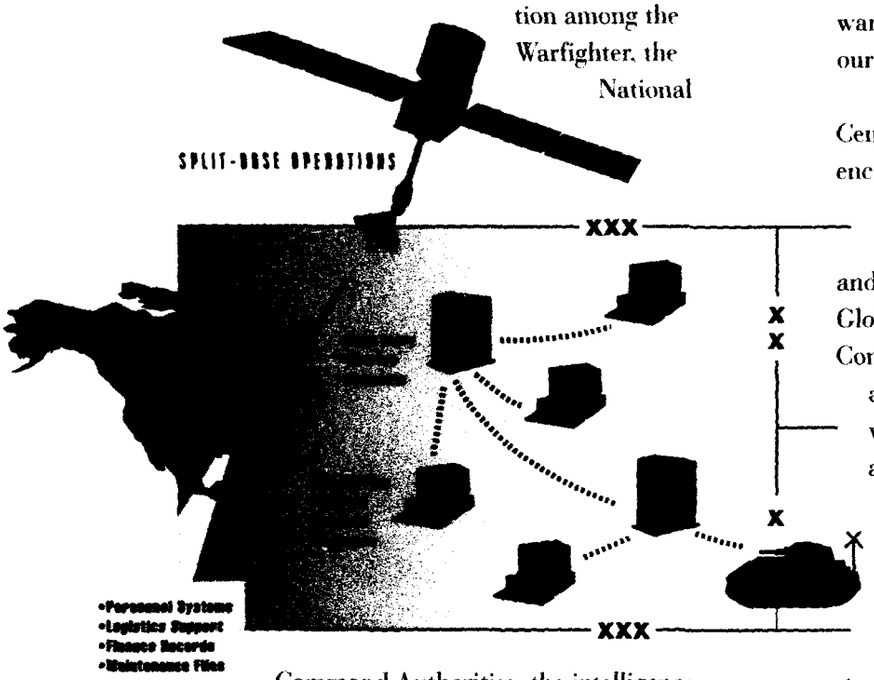
Interoperability provides the Warfighter with access to the global grid for exchange of vital C2 information. Joint interoperability ensures scalability of the information exchange as the mission and command relationships change. Through all phases of a joint operation, interoperability improves the Warfighter's ability to transfer information at low and high data rates.

Capitalize on Space-Based Assets

Provide the Warfighter assured access to mission essential military and commercial space-based systems that support the Force Projection Army across the entire operational continuum.

Increased use of space-based assets makes it possible to provide global surveillance and communication while enhancing strategic deployment and tactical operations. Adequate satellite communications facilities are essential to force projection operations.

At the strategic level, satellite support is required to exchange information among the Warfighter, the National Command Authorities, the intelligence community, and other functions supported by the Defense Information Infrastructure. The increased use of satellites for split-base operations is also crucial. This allows a reduction in the size of combat service support elements traditionally deployed forward into the area of operations. CONUS-based installations will provide continuous information, materiel, and maintenance support to deployed forces.



At the tactical level, satellites support deployments to remote areas of the world where virtually no established communications infrastructure exists. Within minutes of arrival in the Area of Operations, the Warfighter will be linked by satellite to regional and CONUS-based power projection platforms and intelligence centers. Protection of satellites from electronic warfare will ensure unimpeded C2 of our forces.

Army operations of the 21st Century will have widely dispersed enclaves, separated by distances beyond the range of terrestrial systems. Satellites connect these enclaves and, through capabilities such as the Global Positioning System, enable Commanders to move forces rapidly and reliably across the battlefield with improved targeting precision and situational awareness.

In addition, satellite communications are integral to a growing number of Army weapon systems. They will support procedures that make the sensor more responsive to the shooter. Satellites will also service information systems critical to personnel, medical, and logistic support.

Ensuring adequate satellite capacity is a major challenge in this area. As forces deploy from CONUS-based power projection platforms, there will

THE GLOBAL POSITIONING SYSTEM (GPS) IN DESERT STORM

On the 3rd day of the Desert Storm offensive, an air cavalry troop commander was given the coordinates of a desired impact point and asked to assess the targeting accuracy of antitank and antipersonnel artillery. With a GPS receiver carried on the dash of his Kiowa helicopter, the pilot asked his copilot to compare the impact location with their current position. When his copilot said they were at the impact location, he turned immediately and could "...see, feel, and hear the rounds hit the spot where a moment earlier I was hovering—my aircraft was shaking from the shock waves and I had all the power pulled in trying to get away—I did it without a scratch, just frayed nerves!"

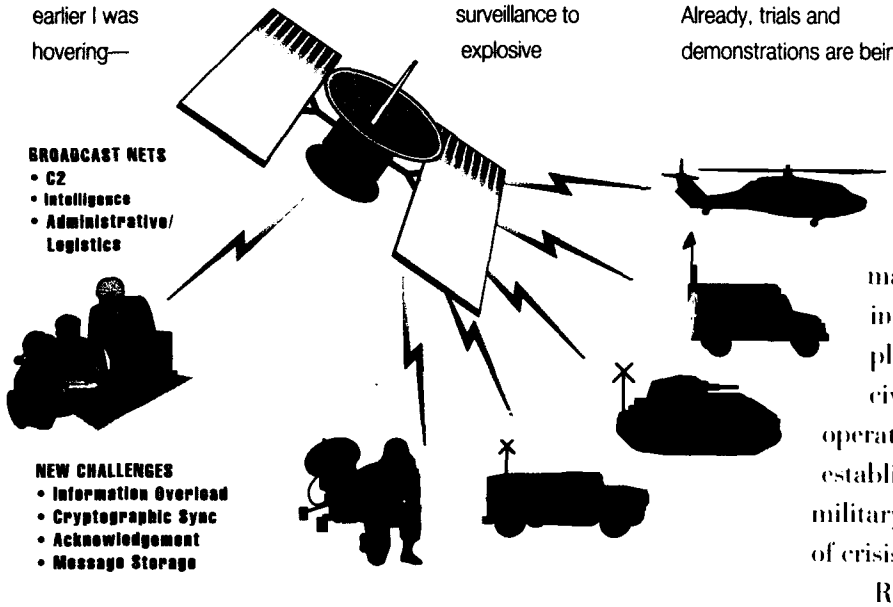
To continue quoting from the pilot: "I'm damn sure [GPS] saved my life, copilot, and aircraft. My next plan is to start saving to purchase my own, so I will not be caught dead without one."

This story gives only one example of the many uses of GPS during Operation Desert Storm. The breadth of GPS uses is vast, ranging from in-flight refueling to artillery gun laying. Indeed, GPS applications span the range of military missions from surveillance to explosive ordinance demolition.

The pivotal role GPS played in Operation Desert Storm is all the more remarkable considering that limited operational military use of GPS only began with Operation Desert Storm. GPS was judged two years away from full military operational status during preparations for Desert Storm. When declared fully operational, GPS will become the DoD's primary radio-navigation system for all military operations, including land, air, and sea missions.

Meanwhile, the Army is exploiting the lessons learned in the Gulf War and looking at many new GPS applications. Already, trials and demonstrations are being conducted in such areas as autonomous vehicles, tactical C3, multiple-target tracking, and battlefield surveillance projectiles.

Integrated into tactical C3 systems, for example, GPS offers the Warfighter precise positioning information to allow precision maneuvering and synchronization of forces in time and space. This will provide an essential combat edge on future battlefields. At the same time, since more than 40% of Army tactical messages are of the "where are you" type, GPS offers significant reductions in network loading of combat communications.



be a surge in access requirements that military satellites may not be able to meet. This means our forces may increasingly rely on commercial satellites, which raises important questions about interoperability and security, rights of usage, and laws of space.

Initiatives are already under way to address surge requirements, make military terminal systems interoperable with commercial platforms, and increase the use of civilian systems suited to military operations. These initiatives will establish procedures for allowing the military to use such systems in times of crisis.

Reliance on satellite communications will be balanced by other available technologies. Satellites are one component of the seamless Enterprise network. Military satellite communications will be capable of sustaining the growth and technological advances needed to maintain the vitality of Warfighter requirements.

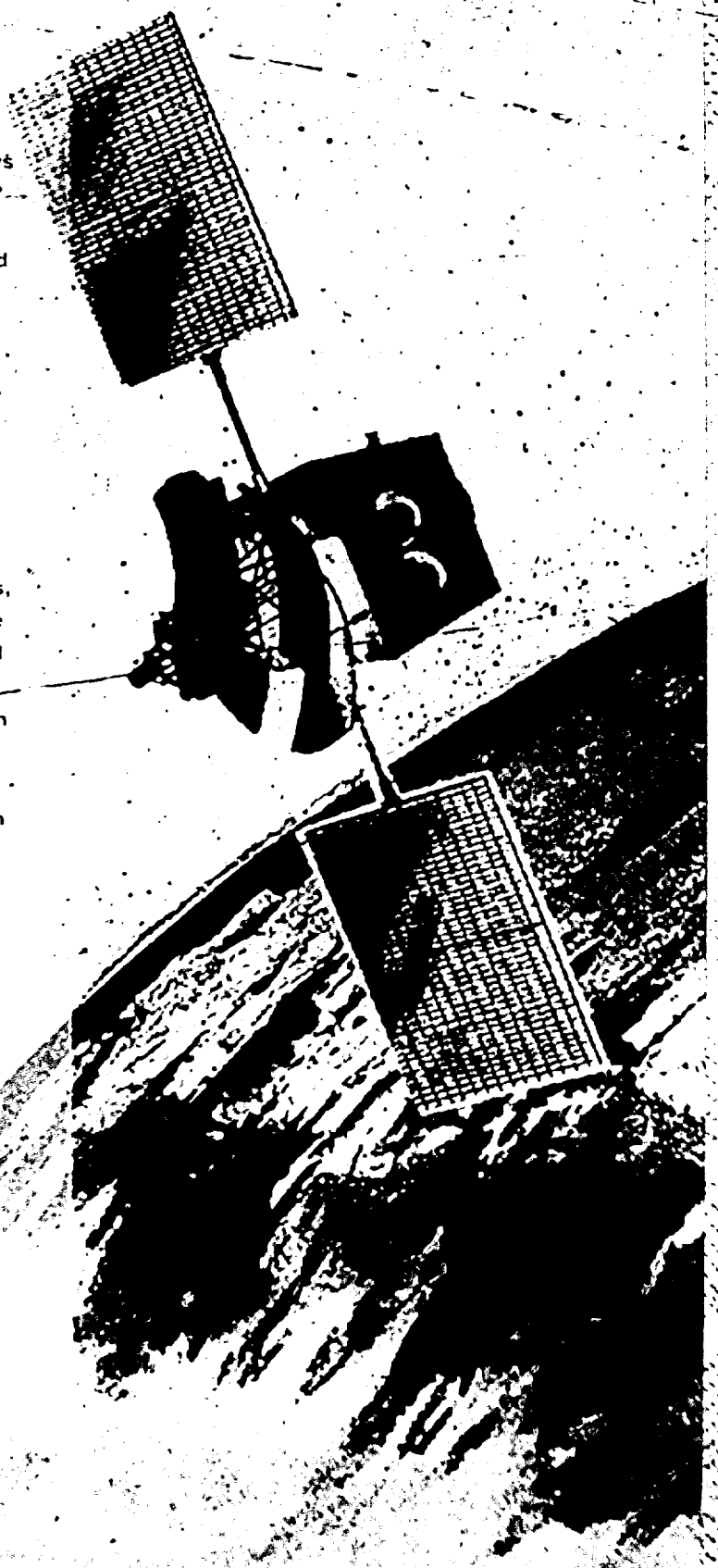
SPACE OPERATIONS —

Space-based capabilities are critical to rapid force projection operations. Normally Army units will be offset from an area of operations and will rely on space-based systems to gain intelligence and to track deployment and early employment. Intelligence, early-warning communication, navigation, and data processing are all enhanced by uninterrupted space operations. The resulting efficiencies have dramatic effect on ground combat operations. For example, precise knowledge of the location of friendly units allows for rapid decision-making, quick adjustments of fire, and greater protection of the force. When married with precise knowledge of enemy locations, this capability allows us to dominate on the battlefield.

In an age of high technology, when potential enemies are armed with sophisticated, user-friendly weapons systems, US dominance in space is critical to protection of the force. Advanced conventional munitions, cruise and ballistic missiles, high-energy systems, and a variety of weapons of mass destruction threaten to harm concentrations of friendly forces. Dispersion is one defense against such threats, but dispersion may not always be possible. Space systems properly integrated with ground operations can mitigate the danger.

Uninterrupted, space-relay communications enhance the speed with which we can process information. These communications facilitate high-tempo operations, normally an advantage in ground combat, and allow for mobile, deployable information processing headquarters. Having fewer of these headquarters on the move increases agility. The proper integration of space systems with ground forces means greater versatility.

FM 100-5
Operations



Digitize the Battlefield

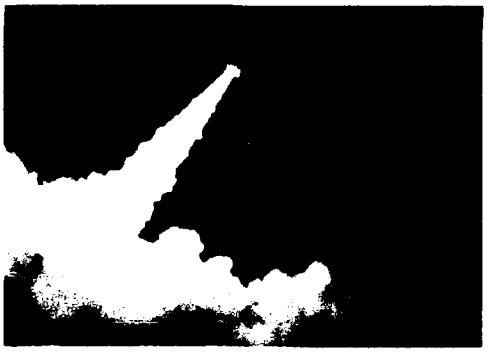
Provide the Warfighter an integrated digital information network that supports warfighting systems and assures C2 decision-cycle superiority.

The digitized battlefield extends from the highest echelon command post forward to the main battle tank at the tip of the spear. It affects how command posts function internally and how they work in concert with other command posts. Similarly, it affects the way weapons systems function and the way they interoperate with other weapons systems.

Achieving digitization requires the implementation of rigorous standards for communications and data representation. The advantages of this effort include:

- joint interoperability
- a common picture of the battlefield
- situational awareness
- improved compatibility across battlefield operating systems
- the opportunity for sharing system components

With a common picture of the battlefield, commanders and staff will all have the same information at the same time. Orders and graphical overlays will be sent electronically to subordinate units and echelons. Control measures, such as checkpoints and unit boundaries, will be modified in real-time and the new picture relayed to all friendly units. Near real-time battle damage assessment will be possible. Commanders will also use this common picture for simulations to play out tactical alternatives. The net gain in command and control will offer dramatic and decisive advantages in the tactical fight.



Situational awareness is the graphic and instantaneous knowledge of your own location and the relative locations of friendly and enemy forces in your area. For lower echelons down to the combat crew, situational awareness is essential for survival and combat effectiveness. That's why equipment will be designed and upgraded to support the efficient sharing of digitized information over digital transport systems across combat and combat support systems. For example, the common data bus installed in the Army's newest tanks and helicopters supports the graphic display of situational awareness information. One major benefit is that situational awareness reduces fratricide through the use of battlefield combat identification systems.

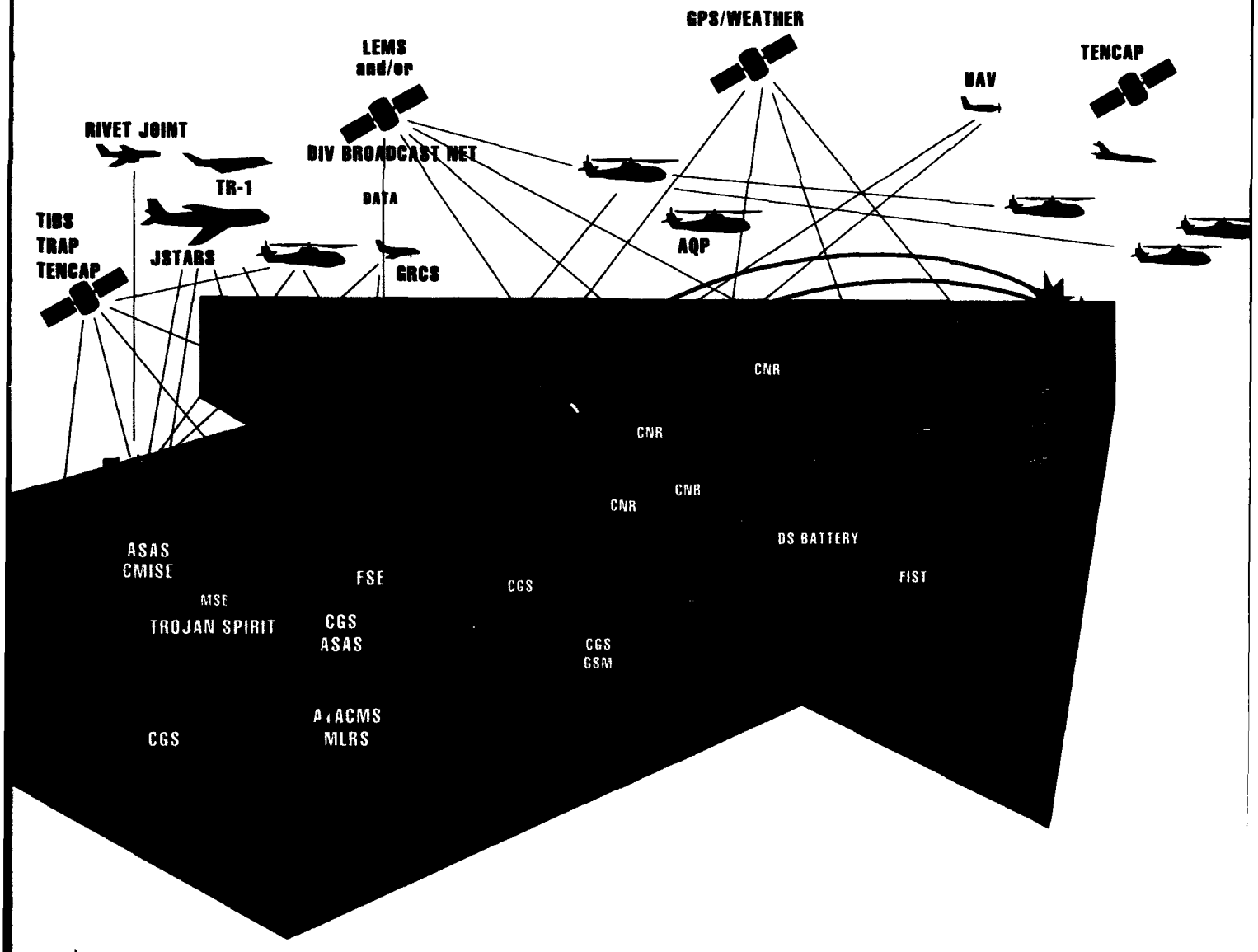
Another benefit of digitization is the sharing of components within and across weapons systems platforms. For example, a common display device within a tank could show engine temperature, ammunition inventory, and image intelligence. A self-propelled howitzer or a command and control vehicle could use the same display device.

ARMY COMPONENT COMMANDERS

Combat service support information is another

vital component of the Warfighter's battlefield picture. Logistics data will enter the system at the lowest level possible, the point closest to the consumer. Once entered, there's no need for re-entry or manual processing. This lets us take a modern approach to the business processes that sustain the force, from resupply of food, fuel, and ammunition to tracking soldiers and equipment to the battlefield. Processing digitized logistics information sent from CONUS-based force projection platforms electronically connected to the operational area will improve combat service support and strategic mobility.

The digitized battlefield puts an expanded arsenal of capabilities at the Warfighter's disposal: battlespace synchronization, joint precision strike operations, a near real-time common battlefield picture, point of engagement identification, and situational awareness at the lowest levels. Together, these capabilities will ensure that the Warfighter "owns the night" and wins the Battlefield Information War.



Enterprise

Modernize Power Projection Platforms

Provide the Warfighter a modern power projection platform to support peacetime operations, mobilization, force projection, split-base operations, and redeployment.

The ability to project forces is critical to the success of executing the National Military Strategy. That's why an enhanced sustaining base is essential to the Army Enterprise Strategy. Modernizing the sustaining base telecommunications infrastructure supports the C4I for the Warrior concept and DoD business systems as well.

Many of the information management functions performed by units deployed in the rear area of the large theater of operations designated for the Cold War are now in a CONUS-based network. By upgrading the installation infrastructure as part of the global grid, CONUS installations and support centers become the rear area. This has been termed "split-base operations."

Information technology makes split-base operations possible. But while split-base operations reduce the need to transport bulky non-combat related computer systems and their operating personnel, they require greater access to communications. The Warfighter will benefit from a seamless operating environment that provides user-friendly access to information from the home base or deployed site.

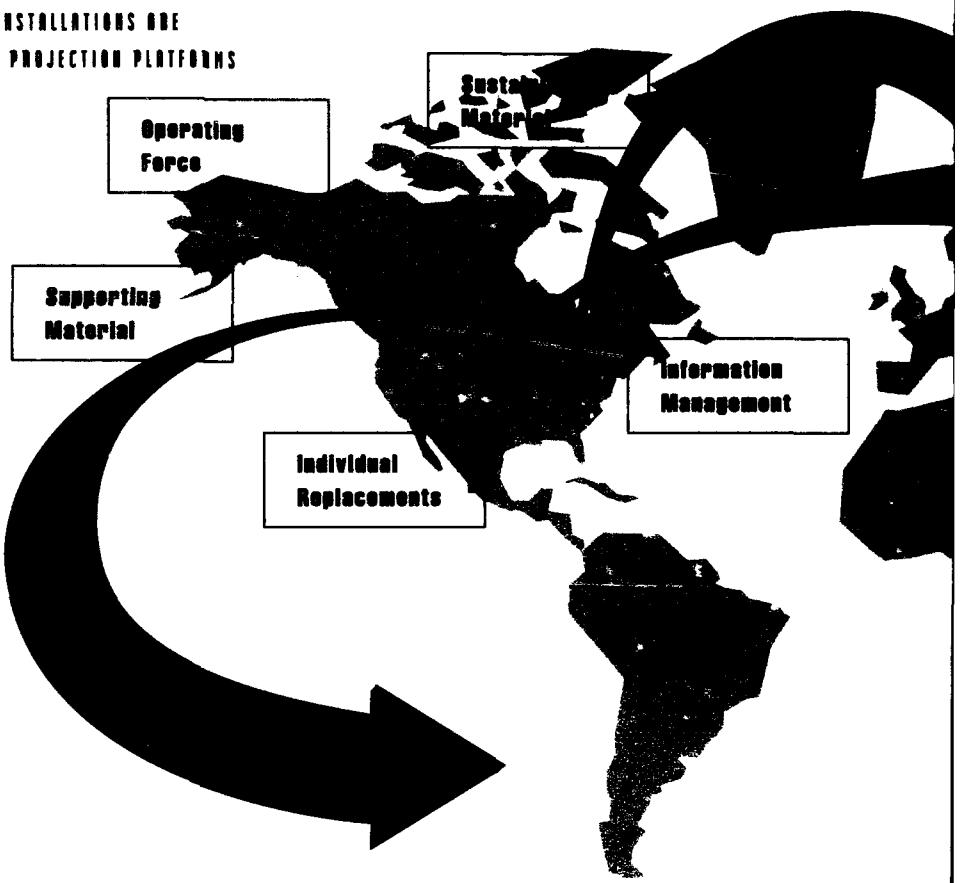
SPLIT-BASE OPERATIONS

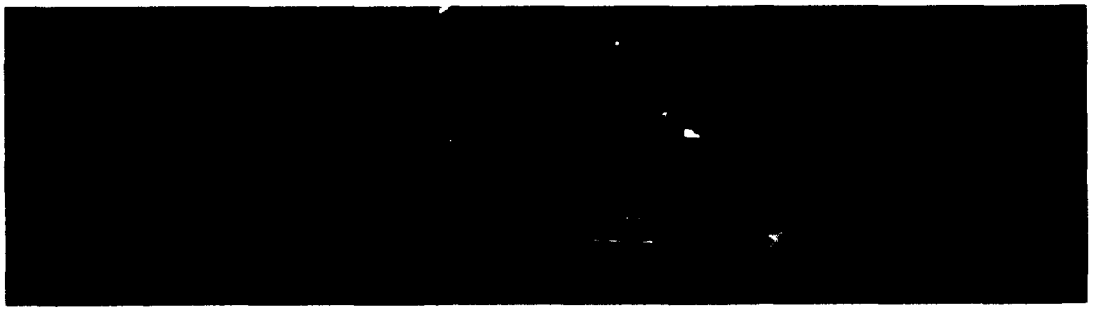
The full integration of supply and transportation functions into a vertical distribution system is critical. Enhanced, assured communications allow some logistics management functions to be accomplished from CONUS or from another theater, deploying only those functions necessary. This is called split-based operations. In these operations, the industrial base in the United States (or a base in another theater) receives requirements and sends forward necessary support. Split-based operations reduce the burden on the deployment flow and prevent unnecessary stockage in theater.

FM 100-5

Operations

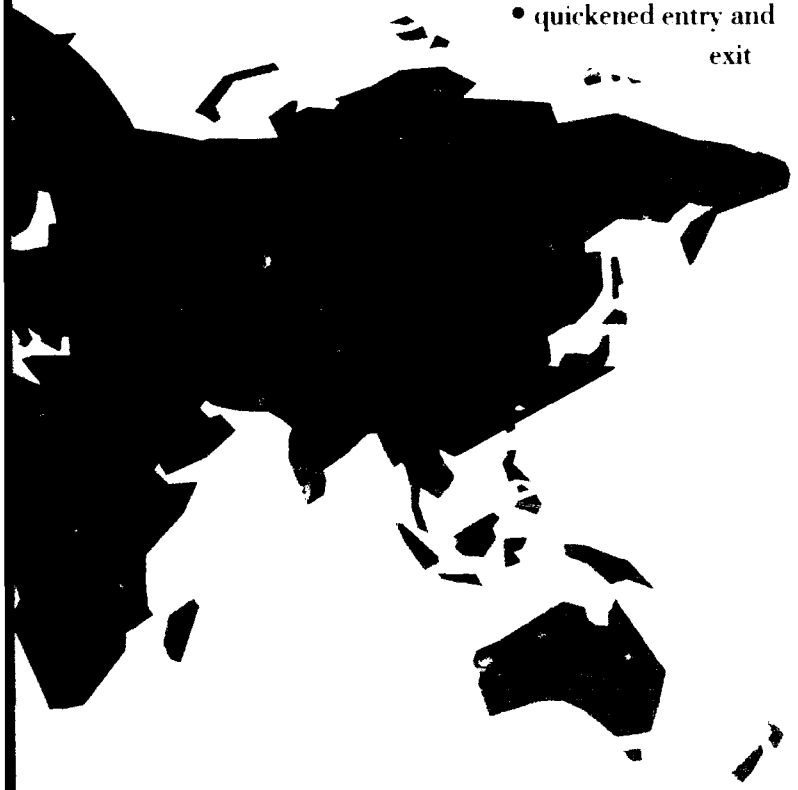
ARMY INSTALLATIONS ARE POWER PROJECTION PLATFORMS





The advantages in expanding the capability of power projection platforms include:

- reduced demand for strategic transport
- uninterrupted and sustained combat service support
- continued availability of proven peacetime services by CONUS-based depot and support activities
- reduced exposure of troops and equipment in theater
- quickened entry and exit



CONUS installations will support essential pre-deployment rehearsals and training activities that use models and distributed simulators to create synthetic environments. However, to incorporate this technology into the Army at every echelon requires improvements in the telecommunications infrastructure. Distributed simulation requires connectivity among geographically dispersed installations, with sufficient communications capacity to pass near real-time video and data.

Improving the telecommunications infrastructure is a fundamental prerequisite to supporting distributed simulation. Moreover, these improvements in CONUS will provide the same connectivity and communications capacity, under "split-base operations," to the deployed Warfighter.

Optimize the Information Technology Environment

Provide the Warfighter with more efficient information support for combat and peacetime operations.

The Warfighter needs modular, interoperable, portable information systems that transcend traditional Service and CINC boundaries. Smart management of the infrastructure is the key to assuring:

- standard, interoperable communications networks
- standard graphic interfaces that minimize training and support cost
- systems with integrated, user-friendly capabilities

Future information systems will be planned, developed, and managed as integrated and interoperable elements to support the basic mission of Army,

Joint, and Combined Forces.

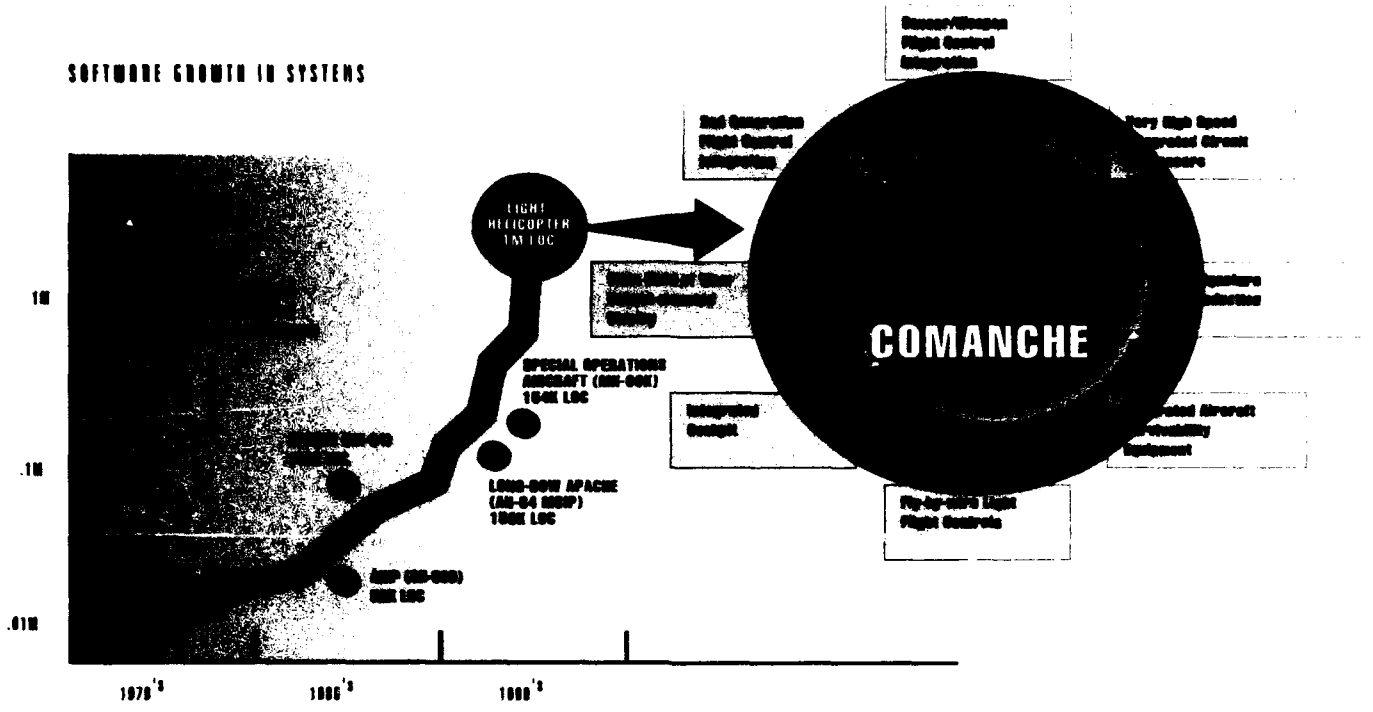
Building modular systems that consist of existing, commercially available equipment will reduce acquisition costs and increase compatibility. Existing information systems, streamlined and simplified, will provide the additional capabilities required to support a smaller, more diversified force—

in an environment where force deployments are increasingly unpredictable.

All information systems will use Army standard data elements. This will increase the accuracy and timeliness of the data, increasing interoperability during all operations.

The Army will continue to integrate new technologies, such as imaging systems, multimedia, and electronic data interchange, into battlefield systems. Commanders will have the required information when and how they need it, capable of operating seamlessly in Army, Joint, and Combined force operations. Policies and procedures will be in place to support the rapid insertion of new functional requirements and new, less costly technologies into existing systems.

The Army will reexamine basic business processes and streamline them to meet current and future mission requirements. Non-value added processes will be eliminated and information technology applied to the more efficient processes. Whenever possible, system development will exploit software reuse, integrated computer-aided software engineering tools, and business process redesign to reduce development costs and shorten acquisition and fielding time. To improve



information infrastructures, the Army will benchmark technology methods and operations against world-class operations in government and industry.

Our overall approach to information systems will address the requirements of the Warfighter and the economic imperative to provide modernized technology in this era of decreasing resources. Army systems will be modernized and leveraged, especially those in the C4I arena, so that they can be exported for other US and Allied use. Smart investments today in information technology will generate savings and maintain information superiority in the future.

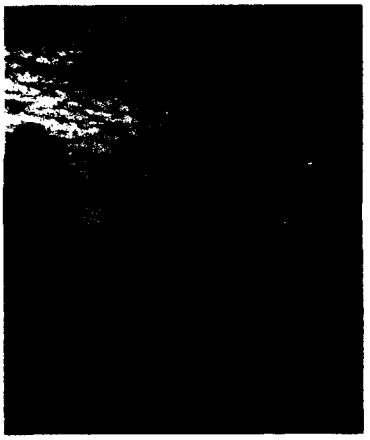
The Warfighter is the ultimate information customer. The rapid introduction of modern, low cost technologies will increase the Army's warfighting prowess.

Implement Multi-Level Security

Provide the Warfighter the ability to access and exchange information at needed levels of classification using a single C4I system.

The Warfighter has long faced the challenge of operating simultaneously at many different levels of security. Warfighting CINCs confirm this through exercises and operational planning efforts. Unfortunately, every strategy used to address this challenge has had significant drawbacks.

Requiring the highest level of trust throughout a system is not acceptable.



Mixed levels of trust have resulted in separate and redundant systems, which are often inefficient. Consolidating separate systems like these into one integrated network is a force multiplier for the Warfighter. It improves the Commander's decision cycle.

Only multi-level security (MLS) can make consolidation possible—along with the savings in development, procurement, and operations and maintenance costs associated with consolidation.

In addition, the Army's Power Projection strategy will require the use of commercial telecommunication and information processing systems and networks to provide a global grid. MLS will allow us to maximize the benefits provided by these "non-military" resources. It will also ensure that the safeguards limiting unauthorized access to commercial networks complement those that protect tactical networks.

In the future, Warfighters will have more time to concentrate on the mission at hand, since MLS will free them from the manual and cumbersome procedures associated with security enforcement. Also, MLS will provide the technology to give the Warfighter universal access to information processed on a single terminal device. MLS technology supports the establishment of a seamless information system architecture linking the deployed Warfighter to the power projection platform . . . to other components of the Joint Task Force . . . and to the global information system. Furthermore, MLS capabilities contribute to the common picture of the battlefield.

Many challenges must be overcome before emerging MLS technology goes into the field. These include:

- consolidating existing systems to achieve more efficient use
- requiring new systems to be interoperable with existing, single level security systems, including unclassified ones
- demonstrating that prospective systems can be trusted to operate securely and efficiently in tactical, strategic, and commercial packet switched networks with no special purpose hardware or software

Eliminating existing stovepipe systems, with their bulky components and awkward, manual keying devices, in favor of a single integrated MLS system will shift the focus to the needs of Warfighters and significantly enhance their capability to achieve Land Force Dominance.

Ensure Spectrum Supremacy

Provide the Warfighter electromagnetic spectrum supremacy in order to maximize the benefits of maneuver and tempo in conjunction with firepower.

The Gulf War demonstrates what can be accomplished when we control the electromagnetic spectrum. But at the same time, it highlights our extreme dependence on the spectrum.

The coalition was able to deny the enemy the ability to see the battlefield and the ability to effect C2 of its own dispersed forces, much of which was accomplished by the use, denial, and control of the frequency spectrum. The tangible outcome was decisive victory with a minimum of coalition casualties.

The Army of the 21st Century will be challenged to "Win the Battlefield Information War." In this regard, information warfare cannot be waged unless a military force can effectively and efficiently control the electromagnetic spectrum.

The Army's dependence on the spectrum increases with the rising sophistication and number of electronic battlefield systems. We rely on these systems to guide smart munitions, aim weapons, collect intelligence, conduct night operations, counter enemy C2, and perform numerous other operations. The engagement sequence is entirely a function of information flow through the electromagnetic spectrum. Unrestricted access to the spectrum is critical to the Warfighters' ability to see the battlefield through sensors, the commanders' ability to communicate their intent, and the Army's ability to engage the enemy beyond visual range,

and "to own the night."

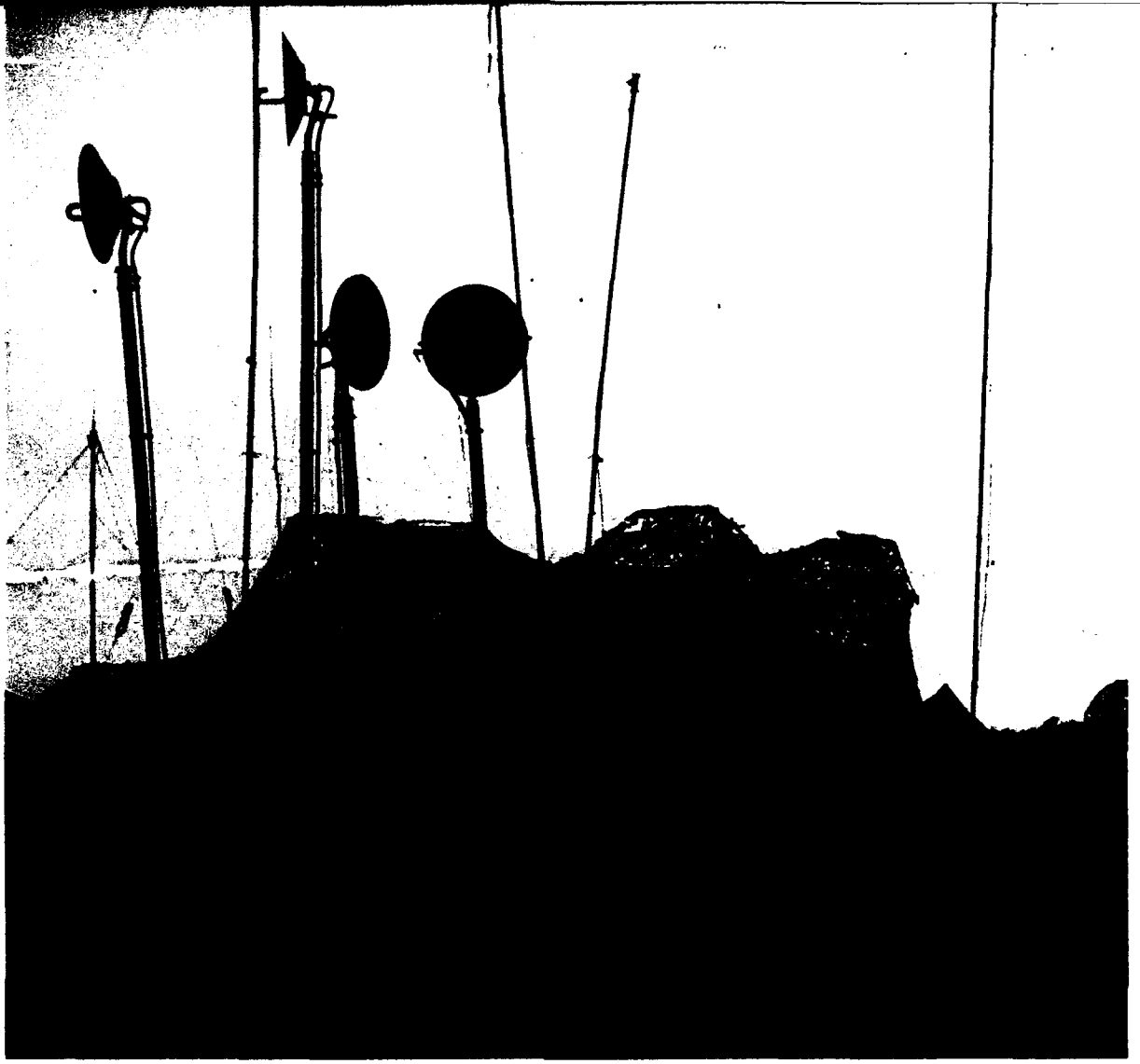
Communications, such as satellites and microwave radios, come immediately to mind when spectrum considerations are discussed. But our access to and dependence on a "friendly" spectrum now goes far beyond just communications equipment. Our weapons, intelligence, information, and navigation systems are fast becoming inextricably tied to unrestricted use of the spectrum. We know how to use the spectrum in benevolent environments.

We must now adopt a proactive and coordinated approach to provide and ensure that benevolent environ-

Few would argue that the military commander at any level of command who has a near perfect picture of both enemy and friendly battlefield dispositions, while his opponent lacks such a picture, has a nearly insurmountable advantage.

General (Ret.)

Glenn Otis



ment. That approach must be spectrum supremacy: the electromagnetic protection of the brains, ears, and eyes of our synchronized weapons systems.

Ensuring spectrum supremacy requires doctrinal and technological change as envisioned in the Army Enterprise Strategy. In future operations, a single focal point in the Joint Task Force will have authority over the spectrum. The technical means will be implemented to allow this authority to allocate and assign the spectrum just as any other scarce and critical resource is handled. The Services will increase technical planning and coordination efforts for communications and electronic warfare. Spectrum supremacy assets will include the weapons to deny the enemy exactly the capability we wish to reserve for ourselves.

We cannot count on uncontested ownership of the electromagnetic spectrum in future conflicts. It is a valuable and finite resource. Military and civilian groups compete for its use. Interestingly, it will not be sufficient to develop the weapons and tools to ensure spectrum supremacy over the enemy. The proactive participation in national, international, and allied policy formulation is equally important. This will assure the Warfighter uncontested access to the spectrum needed to carry out the National Strategy when the nation calls.

Acquire Integrated Systems Using Commercial Technology

Provide the Warfighter C4I capabilities that leverage commercial technology.

Technology outpaces the acquisition cycle. To make the Enterprise Strategy succeed, the Army will use flexible and responsive ways to satisfy its needs. Initiatives will be undertaken to streamline the acquisition process. We will work with industry to influence the direction of R&D and standardization efforts, exploit commercial advances, and resort to Army-funded technology base improvements when necessary. Modeling and simulation together with end-user interaction experiments at Battle Labs will help speed introduction of "leap-ahead" technologies.

Army Warfighters will have technically superior weapons and support systems in the future. The keen commercial competition to produce these weapons and systems, particularly in areas such as computers and communications, will give the Army a strong incentive to re-address acquisition strategies. Commercial technology is improving at breakneck speed. Further, worldwide demand for advanced technology has led to low prices. Advanced technologies are affordable and available even to Third World countries. The Army will exploit these trends and aggressively employ dual-use technologies to the maximum extent possible. Our challenge is to pick key technologies that pay off quickly and economically.

Some warfighting technologies are unique and cannot be satisfied by commercial developments. The Army will continue to invest in selected research that promises long-term payoff. However, Army Science and Technology investments will be pursued within the scope of the Tri-Service Science and Technology Reliance Program. This program, a DoD initiative, allows the Army to contribute to and benefit from Sister Service efforts, while reducing potentially costly overlaps. The Army will also share its results with academia and industry through technology transfer programs.

Acquisition strategies will emphasize technology insertion and evolutionary advances over new starts. The entire acquisition cycle will adjust to this approach. New requirements will consider opportunities for evolution. They will not over-reach the limits of technology, thereby prolonging the acquisition process. Design approaches will emphasize modularity, open architectures, and existing technology to aid future upgrade or replacement. Production decisions and fielding plans will consider product cycle time. The Army will plan for orderly disposition of obsolete equipment as new technology becomes available.

A strategy of vertical integration by echelon and horizontal integration across functional areas requires a deliberate and planned design approach.

Integration will begin with concept development. Concept development will be supported by comprehensive interoperability requirements and standards. Cooperative designs and trade-offs among functional areas will reduce duplication of hardware and software and eliminate stovepipe systems. Multifunctional equipment, shared data bases, and distributed processing are examples of technologies available to support this concept. Adherence to technical, procedural, and operational standards, coupled with adequate testing and certification will assure interoperability.

Equipping the Warfighter with the most advanced technology is not enough. More important is how the Army integrates new technologies into the Force. TRADOC will focus on doctrinal integration. Functional proponents will work together to identify opportunities for cross-system integration. Developers will cooperate to design integrated systems that exploit commercial technology. The Army will find ways to overcome the slowness of requirements generation and acquisition processes.

This strategy is affordable and will keep pace with rapid advances in technology, assuring that Army Warfighters are equipped with superior technology.

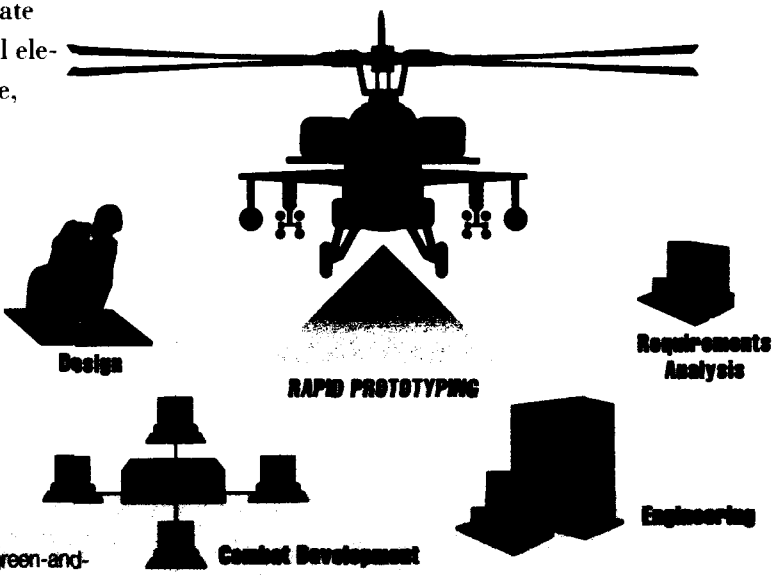
Exploit Modeling and Simulation

Provide the Warfighter with cost effective training, testing, and rapid prototyping through state-of-the-art modeling and simulation.

Modeling and simulation enhance Warfighters' readiness by allowing them to train realistically, analyze courses of action, and rehearse complex operations. Tomorrow's Warfighter will require access to distributed simulations that offer more detail and operate across the global grid to link all elements of the joint force—before, during, and after deployment.

Simulation provides cost effective crew training through such devices as the Close Combat Tactical Trainer. Warfighting crews perform as a team on equipment that looks, feels, and sounds like a combat vehicle—without expending fuel, ammunition, or spare parts. These crew trainers are incorporated into distributed simulations to analyze courses of action and rehearse complex operations within a realistic C2 network.

The Warfighter will employ the same modeling and simulation environ-



THE NEW WORLD OF MILITARY TECHNOLOGY

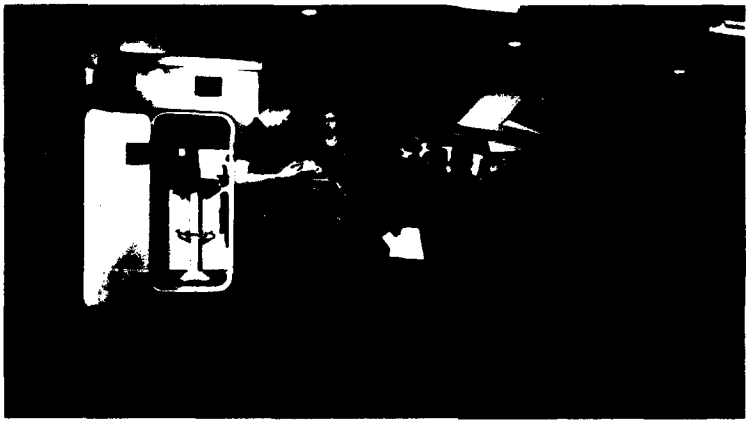
The First Company of the 12th Armored Cavalry Regiment prepared for virtual battle.

At the Combined Arms and Tactical Training Center (CATTC) in Fort Knox, Ky., the troops prepared to enter SIMNET—a virtual war delivered via network links. With the almost Disney-like mimicry of SIMNET operations, the warriors were briefed in an actual field command-post, with folding camp-stools, fly swatters, and stenciled jerry cans. The young tankers wore green-and-brown forest camouflage fatigues, black combat boots, and forage caps. Their command-post canvas tent was pitched inside the giant CATTC barn, right in the midst of silent rows of plastic tank simulators. . .

Today's engagement would take place in a digital desert replica of California's Mojave Desert, the bleak, much-mangled terrain that is the heavy-armor stomping ground of the US Army's National Training Center. Thanks to the Defense Advanced Projects Agency (DARPA), the Defense Mapping Agency, and the Army's Topographic Engineering Center, the US military's vast Mojave acreage had been replicated virtually. The virtual Mojave is now available for remote use even in distant Fort Knox (and in an increasing number of other simulation centers around the planet).

The NTC's Mojave was a very harsh terrain, a hell of a place to lose a cow or throw a tank track, and today it was worse yet, because it was swarming with the Opposing Forces.

The Threat were on their way in overwhelming numbers. Their assault force was four times larger than the beleaguered Americans, and they were blitzkrieging headlong in Soviet T-72 heavy tanks and mechanized transports. . .



ment in the acquisition process to design, develop, and test emerging technologies through rapid prototyping. Refining requirements through modeling and simulation will speed the acquisition of systems that have already demonstrated their potential to support the Warfighter.

The Distributed Simulation Internet, projected for the turn of the century is to be a creature of another order entirely from SIMNET. Ten thousand linked simulators! Entire literal armies online, Global real-time, broadband, fiber-optic, satellite-assisted, military simulation networking.

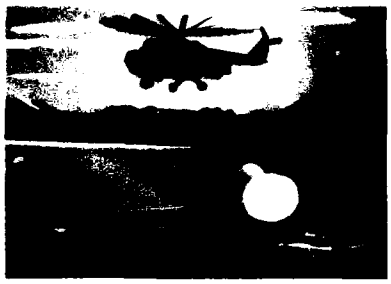
And not just connected, not just simulated. Seamless. "Seamless simulation" is probably the weirdest conceptual notion in the arsenal of military virtuality. The seams between reality and virtual reality will be repeatedly and deliberately blurred.

War is Virtual Hell

Bruce Stirling

Wired Magazine

December 1992

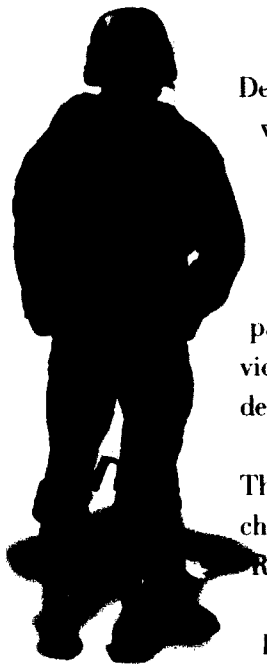


Integrating modeling and simulation into the Warfighter's planning process implies that standards will be applied to tactical and business systems. It is only through a common hierarchy of interconnectivity and data sharing that the seamless integration of modeling and simulation into the global grid can take place. Several technological challenges to achieving seamless integration remain:

- Warfighters must be able to use tactical equipment in the distributed simulation environment
- tactical equipment must function the same in tactical and simulated environments
- decisions required of the Warfighter must be the same in tactical and simulated environments

To resolve these challenges, the full potential of emerging technologies must be exploited to fully integrate modeling and simulation into the Warfighter's planning efforts.

Azimuth for Change: Implementing the Strategy



Today's world mandates unprecedented cooperation among all elements of the Defense establishment. Joint solutions and dual-use technology will be the norm. We will exploit readily available solutions to problems, developing new systems only in case of unique requirements. Using the principles of the Army Enterprise Strategy, old ways of doing business will be reviewed and new ways devised.

Warfighters cannot rely on others to state their requirements. They must influence the policies, the doctrine, and the systems specifications. They need to be part of the development and acquisition process. Simulation and modeling will provide the basis, and Battle Labs and Louisiana Maneuvers will provide the means for determining these requirements.

The Army faces increasingly tough choices as we compete for scarce resources. The Enterprise Principles describe a value-system to guide leaders in making these choices. Change will be accomplished using existing Army institutional processes. Rigorous methods will be used to effect change.

The Vision presented in this document must now make the transition to an Implementation Plan. This Plan will improve our understanding of existing and planned improvements, and it will focus Army Leadership on systemic changes with the highest payoff. Its short-term objectives will be:

- an independent assessment of existing systems
- development of an investment strategy for the future
- articulation of an action plan for reshaping Cold War Army information systems

All C4I and Combat Service Support systems will be examined and measures of effectiveness defined. Duplicate systems and those of marginal value will be marked for elimination. The decision process will balance development risk against the pace of change.

The long-term objective of the Implementation Plan is nothing short of the complete implementation of the Enterprise Vision and the C4I for the Warrior Concept.

The Enterprise Strategy gives the Army a disciplined process to field systems that satisfy the needs of the peacetime and warfighting United States Army.

The next step is to implement the strategy.

We must remain fixed on one standard—protect and defend the Constitution and the Republic. For combined arms leaders today, that standard means maintaining our Warfighting Edge. We can help do that by improving synchronization of the combined arms on the battlefield. The ability to deliver decisive victory the next time the nation calls depends on our fighting as a fully integrated combined arms team.

General

Gordon R. Sullivan

THE NATIONAL
SECURITY STRATEGY

Our strategy has shifted from a focus on a global threat to one of regional challenges and opportunities, from containment to a new regional defense strategy. The demise of the global threat of Communism leaves America and its allies with an unprecedented opportunity to preserve with greater ease a secure environment within which our democratic ideals can prosper. Where once a European-wide war, potentially leading to nuclear exchange was theoretically only weeks and yards away, today such a threat has receded and would take years to rekindle. With the end of the Cold War, there are no significant hostile alliances.

From the National Security Strategy of the United States
January 1993

The Army Enterprise Vision
20 July 1993

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SECRETARY OF THE ARMY

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