

ADN

AIR DEFENSE ARTILLERY

SEPT.-OCT. 1992



JOHN DEAN
PAUL CORN
JONES WELLS



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Cover art by John Paul Jones

Maj. Gen. John H. Little
Commandant, USAADASCH

Blair Case
Chief, ADA Publications Division

Lisa B. Henry
Editor-in-Chief

Hubert L. Koker
Editor

Kathleen Coats
Assistant Editor

John Paul Jones
Contributing Illustrator

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Image/Southwest

Terry J. Lewis
Publisher

John M. Case
Production Manager

Mellie Harding
Graphics Design

Lisa Lowe
Subscription Manager

Glynn Leach
Advertising Representative

A Date With Destiny

Heeding history's lessons

A wise man said, "He who ignores the lessons of history is doomed to repeat its errors and to suffer the consequences."

At this historical moment, as the peoples of the former U.S.S.R. cast off the shackles of totalitarianism and organize themselves into separate states, the political leadership of the United States is clamoring to drop the burden of maintaining a strong military force. Several reduction goals have already been set. Military manpower will be reduced from 25 to 50 percent within the next five years. And, unless a threat to U.S. security develops unexpectedly — an unlikely occurrence — the decline in U.S. military resources will continue.



Let those of us, then, who will once again be called upon to be the "first to fire," look to history for guidance.

Let's go to 1939 when Captain Mellnik of the Coast Artillery arrived at Corregidor and assumed command of Battery D, 91st Philippine Scout Regiment. The United States had been at peace for 21 years. Battery D manned two 14-inch disappearing rifles, eight 12-inch mortars, four 75mm cannons and eight 50-caliber antiaircraft machine guns. Battery D had 100 men. Scout soldiers almost always reenlisted. This was fortunate, because economics made training on today's scale not only impossible, but unthinkable. Frugality and materiel preservation were our way of life.

Since the U.S. Congress had enacted a law that would grant independence to the Philippine Commonwealth in 1946,

Washington saw little reason to upgrade the military defense of the distant islands. But this gave us little cause for concern. From our remote position on the world globe we saw little if any threat to our security.

Europe appeared calm. In Germany, Adolph Hitler, at the head of the Nazi Party, was urging the German public to resist the economic restrictions of the Versailles Peace Treaty. France, Britain and the United States, however, "pooh-pooed" the Hitler threat. In fact, Prime Minister Chamberlain of the United Kingdom went to Munich, consulted with Hitler, and reported to his people that his negotiations brought "peace in our time."

In the Far East, Japan's Prime Minister Tojo was looting Chinese resources from an incompetent Chiang Kai Shek. The free-wheeling Japanese military had taken over and installed a puppet government in Manchuria and was proceeding to occupy Chinese coastal cities en route to French Indochina and Malaya.

We felt confident and secure on Corregidor. The European countries appeared to be maneuvering to improve their markets and power positions and, while we wished them well, we hoped that *our* government would avoid becoming a participant in the European squabble as had happened in 1917.

We also felt quite confident that Japan would not willingly commit national suicide by attacking the United States. There remained then, only the local threat posed by the hundreds of fishing

INTERCEPT POINT



Brig. Gen. (Ret.) Stephen Mellnik is a former ADA School commandant and an ADA institution. His daring escape from a prisoner of war camp following the fall of Corregidor gave America a hero to celebrate during the war's darkest hour. Today, he often accepts invitations to Fort Bliss to provide sage counsel and inspire new generations of ADA soldiers.

Asked General Mellnik to author "Intercept Point" to dramatize "Corregidor and the 60th Coast Artillery," this issue's WWII 50th Anniversary article. You will see, however, that in writing of the past, he addresses challenges we face today.

It may comfort you to know that General Mellnik has often conveyed his deep admiration for today's soldiers, comparing them favorably to the legendary soldiers who defended Corregidor. Certainly, it comforts me to know that a soldier of his experience and expertise shares my confidence in soldiers who, when history calls, will be

First to Fire!

— Maj. Gen. John H. Little
Chief of Air Defense Artillery

vessels that surrounded Corregidor each night. To guard against a possible incursion of criminal elements against Corregidor, we strengthened our beach defense forces and instituted more frequent beach defense alert exercises.

Though the periods in early 1939 and 1992 show certain similarities, they differ in many important respects:

· The U.S. economy was sluggish in both periods. During the 1930s, President Franklin D. Roosevelt's New Deal was beginning to pull the nation out of the Great Depression, but the revenue poured into social programs left little funds for the military. Today, a lingering recession, social upheaval in our inner cities and demands for a "peace dividend" threaten to siphon off defense dollars in ever-increasing amounts. The fundamental difference between now and then is that the Army of the 1930s was a poorly equipped skeleton force, while today's superbly equipped Army is the world's most powerful military machine. The challenge, then, was to build an effective fighting force under conditions of extreme adversity; today, the challenge is to maintain the combat edge we now enjoy.

· In 1939 there appeared to be no power or combination of powers that could invade the United States with any hope of success. This may seem a strange assertion to generations of readers born after the war, but on the eve of World War II, conventional wisdom rated the French army superior to the German army and vastly underrated the martial qualities of the Japanese soldier and the audacity of his leaders. Today, despite the collapse of the Soviet Union, U.S. military and political leaders are aware that the world remains a dangerous place. The number of countries possessing or working hard to possess intercontinental ballistic missiles and nuclear warheads increases steadily, thereby placing our nation at risk. In briefing congressional committees, Secretary of Defense Dick Cheney and Chairman of the Joint Chiefs of Staff Gen. Colin Powell make

frequent references to the disasters that followed past force reductions. "This is something that we've never done very well in the past," said Cheney. "This time, we've got to get it right," added Powell. However, it remains to be seen whether or not today's political leaders will heed the lessons of history or once again sacrifice national security to political expediency.

· In 1939, U.S. intelligence on foreign countries was a farce. We were lulled by an inbred sense of national superiority into a false sense of security and complacency. Now, however, the United States has superb technical and analytical sources of information available to its civilian and military leadership. We must safeguard the intelligence apparatus and keep it operating at full capacity to prevent history from creeping up on us as it did five decades ago.

· The weak military force of the United States had little influence on government policy in 1939. However, the stimulus of the Pearl Harbor disaster coupled with German and Japanese threats to the United States forced all elements of U.S. society to unite. The resulting effort awakened the United States to a sense of its own power and formed a government structure capable of unified action. Although the United States was late in recognizing that the Soviet Union was its enemy and not its ally, it nevertheless took determined steps to stop the menace.

The Marshall Plan gave the free countries of Western Europe time to rebuild their war-torn economies. The United States used military force in Greece to stop a Soviet-sponsored invasion of that country. U.S. guidance and support permitted Japan to rebuild its war-ravaged economy, and U.S. forces stopped the North Koreans in South Korea. The long, drawn-out debacle in Vietnam was due to U.S. political leadership trying to fight the war from Washington, D.C. When Iraq invaded Kuwait and refused to leave in spite of United Nations' warnings, U.S. world leadership in both the political

and military fields came to the fore. The resulting short war produced minimum coalition casualties and demonstrated to the U.S. public, the U.S. political establishment and the world that the high quality of U.S. military leadership, weapons and training methods had produced a fighting machine of extraordinary power.

Today, despite the turmoil in the Balkans and other trouble spots, the Cold War consensus that produced the superb Operation Desert Storm force seems in danger of melting away with the vanished Soviet threat.

Will we learn from history, or will we repeat it?

Department of Defense officials and senior Army leaders are doing their level best to prevent a repetition of past debacles in which the dismantling of our military force invited renewed aggression, but typical readers of this article — the battery commanders, the platoon and squad leaders — can do little more to influence national decision making than Captain Mellnik could have done in 1939, had he been granted a vision of what lay ahead. However, while decisions regarding force structure and weapons procurement are being made at higher levels, there is a lot you can do to ensure that the Army maintains its qualitative edge by continuing to produce the finest trained and best motivated soldiers in the world.

Bear in mind that you are part of a military machine led by highly intelligent and capable leaders who may be forced by economic, political or other factors to trim military assets in a fashion with which you may not agree. Have faith in your leadership and in their devotion to your interests and those of your country. As you carry out your duties in the years ahead, be mindful of the need to prepare yourselves physically, mentally and professionally for the day when history may call you, as it did me a few generations ago, to keep a date with destiny.

— Stephen M. Mellnik
Brigadier General, Retired

ADA DIGEST

MISSILE DEFENSE



MISSILE DEFENSE MILESTONE APPROACHES

ADA defines operational requirements

The U.S. Army Air Defense Artillery School, with help from the Army Space Command and the U.S. Army Training and Doctrine Command's Program Integration Office-Space, is preparing a National Missile Defense (NMD) operational requirements document for presentation to the Defense Acquisition Board in August. The document, an important acquisition and procurement milestone, will spell out requirements for the NMD ground-based interceptors, ground surveillance tracking station and ground-based radar.

The Missile Defense Act of 1991 requires the Department of Defense to begin initial deployment of a

ground-based missile defense no later than 1996. Congress directed DoD to prepare ground-based interceptors for deployment to one site near Grand Forks, N.D. The United States hopes to negotiate treaty arrangements with Russia to allow possible expansion to multiple sites.

But some leading defense officials have publicly questioned the feasibility of the early deployment date. Pentagon spokesman Bob Hall told reporters that the schedule "is very, very tight, in fact, it's not achievable." And a Pentagon program analyst, David Chu, has recommended delaying deployment by up to six years.

U.S. Army Air Defense Artillery School planners rate the strategic ballistic missile threat as less urgent than the closely related tactical ballistic missile threat, but expect NMD to become an essential Army mission. Since only a relatively few NMD sites could provide adequate coverage against limited or accidental strikes, the new mission, sometimes described as tailor-made for Army National Guard air defense units, is expected to have little impact on ADA force structure.

The Army constructed a Safeguard anti-ballistic missile site near Grand Forks in the early 1970s. The Safeguard system relied on two missiles, the Spartan and Sprint, equipped with nuclear warheads, to intercept and destroy incoming intercontinental ballistic missiles (ICBMs). Originally, there were to have been as many as two dozen Safeguard sites; however, the Safeguard program was terminated and the Grand Forks site was abandoned when the 1972 Anti-ballistic Missile Treaty sharply restricted anti-ballistic missile deployment. It was thought the small number of interceptors allowed by the treaty would do little good against a massive ICBM attack. The new generation of ground-based interceptors will not be armed with nuclear warheads. Defense contractors expecting to vie for the NMD contract displayed "hit-to-kill" anti-ballistic missile technology at the ADA Commanders Conference in June.

The Department of Defense has already solicited bids for site contracts near Nekoma, N.D. Nekoma is a tiny township that lies adjacent to the abandoned Safeguard anti-ballistic missile site.

FIRST FEMALE ADA CSM TAKES CHARGE

Kate Niedzielski is not your typical idea of the all knowing, weather beaten, combat hardened father figure of a command sergeant major. CSM Kathleen W. Niedzielski, who assumed the position of command sergeant major of the 1st Battalion, 6th Air Defense Artillery Regiment, in a change-of-position ceremony on June 16, 1992, has earned the distinction of becoming ADA's first female command sergeant major. It was the culmination of a long list of firsts for the 19-year Army veteran.

"I've been told that I pioneered enlisted women in ADA," said Niedzielski. "I was the first enlisted female to receive any kind of air defense training at Fort Bliss. I remember when I first arrived at Fort Bliss, I was given a whole two-story building, along with the keys, all to myself. They didn't have anywhere else to put me and it was several months before the next female student arrived to attend any ADA course."

Army Orders Rangefinders

The Army has awarded Texas Instruments of Dallas, Texas, a \$51 million contract for 350 laser rangefinders for the Avenger air defense system. The Dallas-based company is scheduled to deliver the first laser rangefinders during the first quarter of FY93.



When Niedzielski was chosen to attend the U.S. Army Sergeants Major Academy in June 1990, she knew that her dedication, sacrifices, hard work and perseverance had paid off. "I've always enjoyed my career in the Army, but I think a woman has to work harder to get the recognition she deserves," she said.

When asked why and when she chose to make the Army a career, Niedzielski replied, "I had just completed two years of college, my family had moved to St. Louis and I didn't care for it much. A friend had joined up and said she really liked it, so I decided to join too.

"I enjoyed it right from the beginning, and before I knew it 10 years had gone by. Without even realizing it, I had made an investment in a career — the Army. I like it, and I like the challenges of being in charge."

Niedzielski, a strong-minded New York native and mother of two, has been recognized by her superiors and peers as one of the Army's top NCOs. She has worked hard to attain the ulti-

mate position of command sergeant major and hopes to set an example for other female soldiers to follow.

"I hope by breaking this ground and setting the best example I can, it will become easier for women to be assigned to leadership positions.

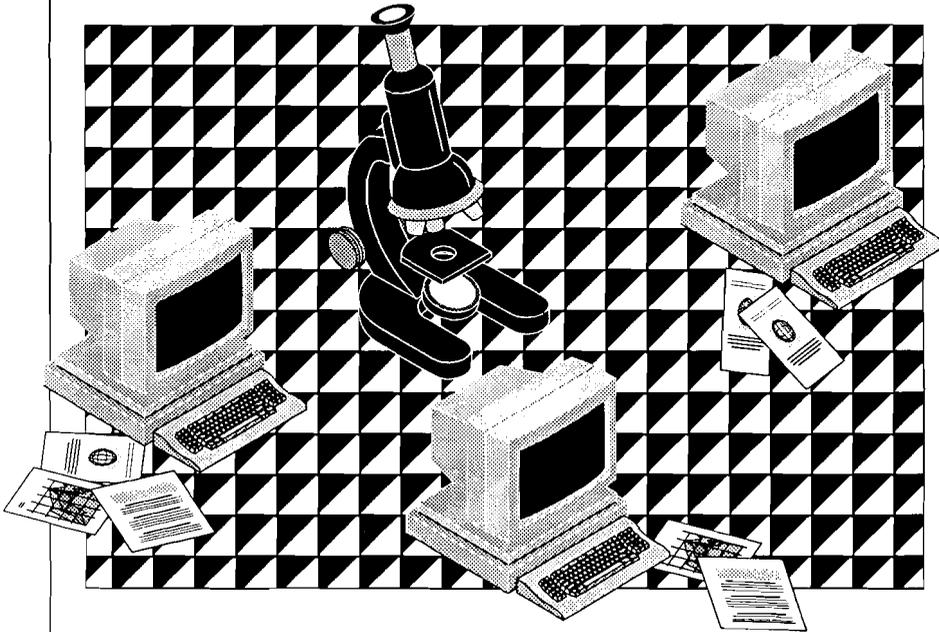
"When I first enlisted in 1973, I never thought these opportunities would be open to me, but I wasn't going to allow being a female to stop me from going as far as I could in the Army," Niedzielski recalls. "I think this is a testament to how far both the Army and I have progressed."

According to Niedzielski, the keys to climbing the Army's ladder of success are knowledge, drive and ambition. Set your priorities (attend required courses as soon as you are eligible), volunteer for special duty assignments (such as drill and instructor positions), accept all responsibilities given you and show initiative. "Strive to be all you can be!" Niedzielski chants like a television pitch man, but she means it.

— Kathleen Coats

Women in Combat

President George Bush has named nine men and six women, including eight active or retired military officers, to the Commission on the Assignment of Women in Combat. The commission is scheduled to issue its final recommendations on what roles women should play in combat in November.



AIR DEFENSE LAB

A cheap, simple, quick way of rating concepts, ideas, materiel or software that can improve ADA firepower

The newly established Air Defense Lab at Fort Bliss will conduct concept evaluations of materiel, doctrine, training and organization solutions that may be proposed within or outside TRADOC. The goal of the Air Defense Lab is to provide a very flexible, easily accessed process that minimizes bureaucratic red tape. These tests, experiments and evaluations will serve a host of purposes. The Air Defense Lab may produce proposals similar in form to TRADOC concept evaluation proposals or force development tests and evaluations, or it may simply provide better insight into contractor provided materiel. Since most of the materiel ideas processed by the Air Defense

Lab will be pre-milestone activities or concepts that will feed into the materiel change process, the lab will not compete with the formal testing process.

The lab will use existing testing, experimenting and simulation facilities and activities already located at or near Fort Bliss, working synergistically with these ongoing activities to accomplish TRADOC tests, experiments and evaluations.

"I do not envision any significant amount of totally new work but rather the refocusing of existing activities to encompass the activities of the Air Defense Lab," said Chief of ADA Maj. Gen. John H. Little. "An example might be the use of JADO-JEZ

activities to examine new identification techniques on a non-interference basis.

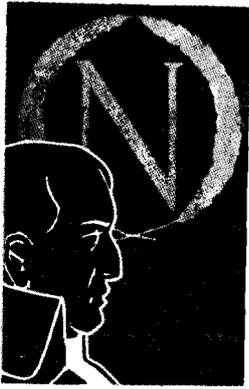
"The recent work we have done in developing the Bradley Stinger Fighting Vehicle is an excellent example of the type of work to be done by the lab," Little continued. "We used informal test activities to develop the missile brackets, refine the crew drill procedures, test the load plans and even test the system for safety in the storage and transportation of the Stinger missiles."

The Air Defense Lab will be organized and operate much like a TRADOC System Management Office with a broad charter to coordinate and plan test activities. The Air Defense Lab will consist of a management team that will link together and coordinate the use, planning, funding, test plans and reports, test activities and simulations for a wide range of facilities and activities.

The Air Defense Lab management team will aggressively search out test and experiment opportunities and match them with appropriate requirements. Any Fort Bliss activity, ADA units worldwide, a commander in chief or an Army major command can nominate a test or experiment. The lab director and his staff will review test proposals and make recommendations to the commanding general as to the appropriateness of the test and the capability of Fort Bliss to support it.

"There will be no bureaucratic inertia to delay our ability to get at new ideas quickly," said Little. "Abbreviated test plans and reports will allow us to accomplish our goals and capture the results of our efforts. In short, the Air Defense Lab is a cheap, simple, quick way of looking at concepts, ideas and materiel that might improve our combat power."

(Digest continued on page 18)



The moment of greatest peril is the moment of victory.

— Napoleon



I know my fellow countrymen, and I know that no matter what general resolutions they come to in advance, no matter what the lack of preparation, they would go to war on the drop of a hat if the national honor or the national interest was seriously jeopardized. The way to prevent that possibility, therefore, is to keep ourselves, our whole military system, the Army and Navy as part of the whole military system, in such a condition that there won't be any temptation on the part of anyone else to go to war with us. You can't do that unless you make our people wake up to the real meaning of our past history.

— Theodore Roosevelt
1912

The Legitimacy Struggle

by Capt. Bryon E. Greenwald

Drawdowns are nothing new to the U.S. Army. In fact, the current reduction from a force of approximately 780,000 in 1987 to about 535,000 by 1995 appears mild when compared to the cutbacks that discharged millions of soldiers from the service following World War I and World War II.

The difference between earlier reductions and the current cutback is that through careful management the Army is attempting to avoid recreating the hollow force that emerged from every previous drawdown in our nation's history. For the Chief of Staff of the Army, Gen. Gordon Sullivan, this means "no more Task Force Smiths," or not returning to an Army similar in character to the untrained and ill-equipped force that initially failed so miserably in Korea only five years after winning World War II. For air defenders whose predecessors — antiaircraft artillerymen — participated in that war, a number of salient lessons abound regarding the Army's precipitous decline in training and readiness. In light of current branch difficulties, however, air defenders should focus some attention on another period of equal importance: the "interwar" period between World War I and World War II.

The current challenges confronting the branch harken back to the struggle for legitimacy faced by antiaircraft artillerymen following World War I. Like today, the interwar period (1919-1941) was one in which no credible threat existed to support continued spending on weapons and manpower. Similarly, isolationist (America First) tendencies rose while defense spending declined. Widespread economic hardship (the Great Depression) silenced even the most stalwart military supporters. These factors resulted in a military, particularly an antiaircraft artillery, force structure ill-prepared for the exigencies of a future war.

The interwar years were especially painful for air defenders. Born of battle in France in 1917, antiaircraft artillery emerged as an organized and effective element of the U.S. Army by the end of the war. Although small and poorly equipped, the Antiaircraft Service of the American Expeditionary Forces (AEF) downed 58 enemy airplanes using Hotchkiss machine guns and modified French 75mm artillery pieces. After the war, Secretary of War Newton D. Baker commented that there "naturally grew up a system of antiaircraft defense . . . to either drive off or destroy bomb-carrying enemy planes." Unfortunately, in the ensuing two decades, the continued development of that antiaircraft system languished and a dichotomy emerged between the evolution of military aviation and the antiaircraft system designed to defend against it. While, for the most part, military aviation flourished with the help of the civilian aviation industry, antiaircraft artillery — one of the many branches of the military without direct civilian application — floundered.

The immediate wartime result of this dichotomy became painfully apparent. Perhaps no one understood this better than General of the Army George C. Marshall. Commenting in his 1945 "Biennial Report of the Chief of Staff," Marshall stated that antiaircraft weapons were one of the types of weapons that had been grossly neglected in peacetime because they had no commercial counterpart. He continued, ". . . the highly efficient antiaircraft of today did not materialize until long after the fighting began. The consequent cost in time, life and money of this failure to spend the necessary sums on such activity in peacetime has been appalling."

Implicitly, Marshall understood what apparently others did not: even in times of peace, the nation must vigorously pursue defense readiness. Moreover, the underlying

Air Defense Past and Present

principle he offered is timeless: *military organizations must keep pace with technology or risk being hopelessly outclassed when the next call to arms is sounded.* From his vantage point in the War Department, Marshall witnessed the impact that the lack of anti-aircraft artillery equipment had on military operations. To a great extent, the War Department completed equipment standardization, production and fielding too late to support early combat operations. At the beginning of the war, what the Army needed (but did not have at places such as Kasserine Pass) was fully equipped anti-aircraft units to protect troops and lines of communication from hostile air attack. If all else remained indiscernible to Congress and defense planners in 1945, explicit in Marshall's comments was the call for an adequate level of peacetime defense spending. Since that normally translates into an increase in defense budget authorizations, it is something that tends to run counter to most popular sentiments regardless of era.

Throwing money at the problem, however, is only part of the solution. Organizational theory regarding the creation and management of large organizations emphasizes that money only becomes a usable resource when it is linked to an effective framework for development and expansion. Money alone cannot create a viable organization. Expansion cannot proceed without the early creation of a strong conceptual foundation and a plan for growth.

The development of anti-aircraft artillery in the U.S. Army from 1919 to 1941 adhered to these tenets of organizational growth. Like most governmental and military organizations, the Coast Artillery (anti-aircraft artillery's parent organization) muddled through the fiscally lean interwar years clinging to its tenuous institutional existence. Over time, the Coast Artillery abandoned its antiquated and costly seacoast ar-

tillery mission and focused on the emerging task of defending against hostile air attack. The Coast Artillery enhanced its anti-aircraft doctrine, revamped its proposed organizational structure and adapted its available weapons technology to meet the changing air threat. In the end, through the untiring efforts of forward looking officers within the corps, the Coast Artillery Corps provided the Army with an expandable framework upon which to build its wartime anti-aircraft force. Unfortunately, War Department production planning did not achieve a commensurate level of success, leaving America with a wholly inadequate anti-aircraft force structure on the eve of World War II.

The 1920s — A Foundation for Growth

The American Anti-aircraft Artillery Service that fought in World War I was never very large, and with rapid postwar demobilization, most of the men and equipment quickly disappeared. Aside from a couple of French guns, the majority of the equipment was sold for scrap before the AEF set sail for America. The men were predominantly reservists who rapidly melted back into civilian life. Of the few regulars who remained, most found themselves posted to coast defense batteries around the country.

As these and other elements of the AEF returned from Europe, military planners and elected officials in the United States settled down to redefine America's postwar military structure. If questions concerning the structure of the postwar force still existed as Congress began hearings on the matter, growing popular sentiment against foreign intervention and increased military spending ensured that the size of the force would remain small. While Congress exercised its legislative duty to "raise and support" the Army, eventually reducing it to 280,000 with the National Defense Act of 1920, the military services worked to mitigate the ef-



Caught with a mere semblance of an army in 1917, our available forces had to be increased by a hundredfold with no trained men to fill our ranks and with resource still further unready. We were placed in a most discouraging dilemma. Our officials scarcely knew which way to turn. There was no plan to meet the problem and confusion reigned supreme. After a waste of six months, masses of men were herded together in a few quickly and expensively constructed cantonments where they were sorted into units and their training conducted under the greatest difficulty. A year and more passed before any one of our units took its place beside the Allies. This is no criticism of anyone; it was inevitable under the circumstances. The same thing will occur again unless we plan otherwise.

— Gen. John J. Pershing

The next American lot of AA guns were even worse than the first. At first thought, one might think that they were better because they were mounted on trucks and a hand device for computing deflections had been invented. There was great difficulty in traversing them, and they were too rough a gun for the cannoneers to "ride" during fire. At each shot, the gun would leave the ground a few inches.

— 1st Lt. Burgo D. Gill

In the Coast Artillery today we find two schools of thought in regard to our line of development. There are those that believe that the seacoast artillery phase should receive paramount consideration — others that feel that antiaircraft artillery should have major consideration. Just what percent of the personnel in the corps is on each side of this question cannot be estimated, but that there is a division there is no doubt.

— Maj. Sanderford Jarman
1930

Drawdown in Perspective

WW I		WW II		KOREA		VIETNAM		CURRENT	
1918	2.4M	1945	8.27M	1953	1.5M	1968	1.57M	1987	780K
1920	204K	1950	593K	1957	997K	1974	783K	1995	535K
	(-92%)		(-93%)		(-35%)		(-50%)		(-31%)

facts of the inevitable reductions on their respective branches.

For Maj. Gen. Frank W. Coe, the new chief of the Coast Artillery Corps, protecting the interest of the corps was not a static, defensive battle that relied on justifying the branch's position and parrying the thrusts of congressional budget knives. Conversely, Coe intended to take the war to the enemy and expand the responsibility of the Coast Artillery, absorbing men, material and political power along the way. In 1920, Coe argued unsuccessfully for the reintegration of the Artillery and the Coast Artillery Corps and, in the process, almost caused the Coast Artillery to lose its institutional identity. The AEF Superior Board that heard Coe's case recommended to the War Department that coast defense become a Navy responsibility and that the Army incorporate the heavy, mobile coast artillery guns into the Artillery branch. Thus, instead of expanding the scope of his responsibilities, Coe almost caused the disintegration of his corps. In the end, the War Department had no desire to relinquish control of its assets to the Navy and dropped the matter. Having survived this challenge to its institutional existence, the Coast Artillery Corps discarded its seacoast roots to embrace the antiaircraft mission as a way to retain its independence as a combat arm. Over the next two decades, changes in doctrine and technology enabled the Coast Artillery — more precisely, the antiaircraft artillery — to merge as an accepted member of the family of combat arms.

One early and important change was the creation of an antiaircraft section in the corps' professional journal, the *Journal of the United States Artillery* (later renamed the *Coast Artillery Journal*, which evolved

into the *Antiaircraft Journal* and eventually became *ADA* magazine). This section discussed antiaircraft weapons, techniques and tactics, providing the entire corps with information on the newest part of the Coast Artillery. The *Journal* articles eventually led to an *Antiaircraft Bulletin* published by the Office of the Chief of Coast Artillery from 1922 to 1929. The monthly bulletin covered a myriad of antiaircraft subjects and, more importantly, enhanced the level of institutional knowledge within the corps regarding antiaircraft artillery and supplied antiaircraft units with an initial set of doctrinal guidelines. In the 1930s, the Coast Artillery continued to refine its doctrinal direction and technical instruction. From 1930 to 1940, the Coast Artillery published four separate antiaircraft manuals. Each improved upon the success of the last, and together they formed a comprehensive collection of information for antiaircraft artillerymen. Through the *Coast Artillery Journal* and the branch field manuals, antiaircraft officers could focus their study and discussion of relevant technical, tactical and combined arms issues. This discourse enhanced the professional socialization of Coast Artillery officers and formed the foundation of common understanding within the branch and the antiaircraft artillery.

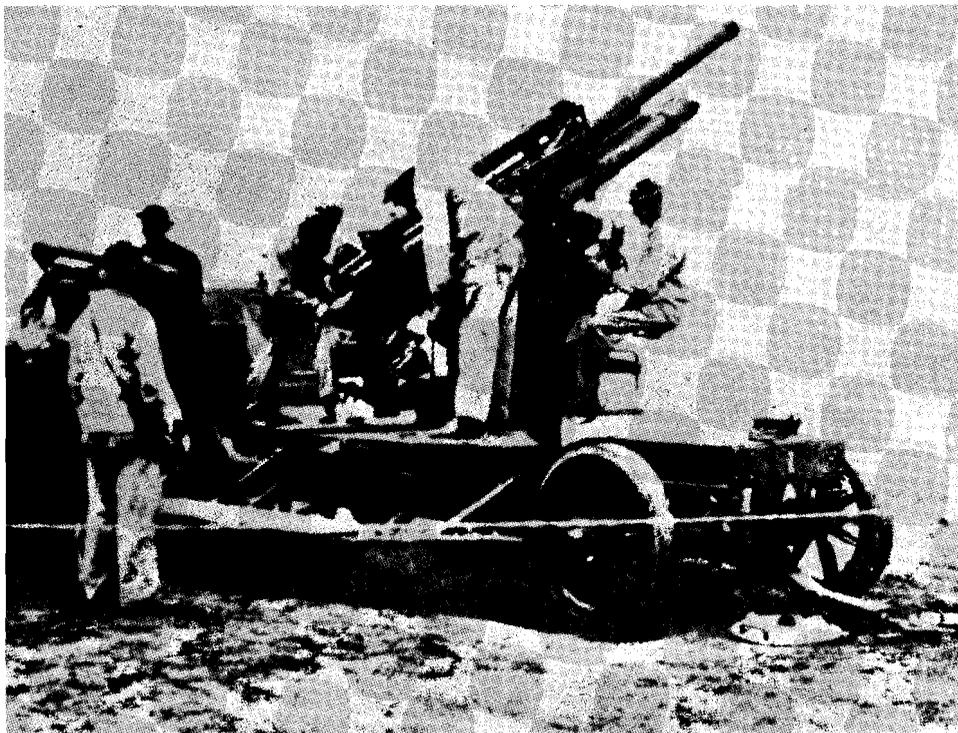
From an organizational perspective, antiaircraft artillery also evolved over time. In 1920, a special committee chaired by Chief of Staff Peyton C. March studied the organization of the Army. The committee recommended that an antiaircraft regiment be assigned to each corps and that each field army have an antiaircraft brigade composed of three regiments. The antiaircraft regiment that emerged from these proceedings consisted of 1,514 men, who were split into two

650-man battalions and a headquarters. The antiaircraft artillery three-inch gun battalion had three batteries of four guns each and one battery of 12 searchlights. The machine gun battalion had four batteries of three platoons each, each platoon armed with four .50-caliber machine guns.

Planning for this organization was one thing. Arming it with functioning equipment, however, was quite another. Inextricably linked to the acceptance of the antiaircraft artillery as a combat arm was the development of effective antiaircraft weapons. From its earliest beginnings, the antiaircraft artillery suffered from a lack of equipment and limited funds with which to pursue improvements. Despite these handicaps, the Coast Artillery Corps continued to develop its antiaircraft weapons, but full-scale procurement fell victim to isolationist tendencies, intellectual malaise concerning defense matters and the Great Depression. Only in the late 1930s, when rearmament became a national priority, did the supply of antiaircraft equipment increase.

The few antiaircraft artillery guns owned by the Coast Artillery during World War I

The Model 1918 three-inch gun fired in all directions and ranged out to 25,000 feet.



had been dispatched to coastal fortifications around the United States to counter the possibility of an air attack. By 1920, however, these guns were woefully obsolete. The French model 75mm gun possessed an extremely limited range and was incapable of rotating 360 degrees or depressing its barrel below +31 degrees. This prevented crews from engaging targets on the horizon or targets that had passed to the rear of the position. The trailer-mounted three-inch gun (M-1918) fired in all directions and ranged out to 25,000 feet, but was unstable during firing. The fixed-mount three-inch gun (M-1917), although the best of the three guns, lacked an automatic breechblock that permitted the rapid firing necessary to engage aircraft.

Part of the problem Coe faced in increasing the size and capability of his arsenal occurred because effective antiaircraft artillery fire depended not on the development of one good gun, but on the creation of a "system" composed of different weapons and subsystems. In addition to three-inch antiaircraft artillery guns, the system included .50-caliber machine guns, 60-inch Cadillac searchlights, sound locators, acoustic amplifiers and various fire control directors and



When planes attacked us in France, we hid and prayed, now we shoot back with an ever increasing effect. There is an old saying in the Army that no pursuit is so hot as that of an unresisting foe. When the foe fights back, ardor slackens. Have you ever noticed the fervent manner in which a terrier chases a cat until she turns, and then how often he remembers that he has an immediate engagement elsewhere?

— Maj. George S. Patton Jr.
1930

It is a pity that we should have become so oblivious to the bitter lessons of the World War as to allow our defense to dwindle until, if another war should be forced upon us, we should, as usual, be unprepared for effective action. In that event we should find that our so called "economies" have in reality been a hideously extravagant waste of money and lives.

— Secretary of War
1936 Annual Report

Thinking small in terms of anti-aircraft defense for many years has resulted in almost no defense. It is not too late to think big and repair the delays of the past. Any further delay may be too late. Money and personnel will be supplied generously when true need is demonstrated. And it is up to the Army to demonstrate that need.

— Maj. Thomas R. Phillips
1940

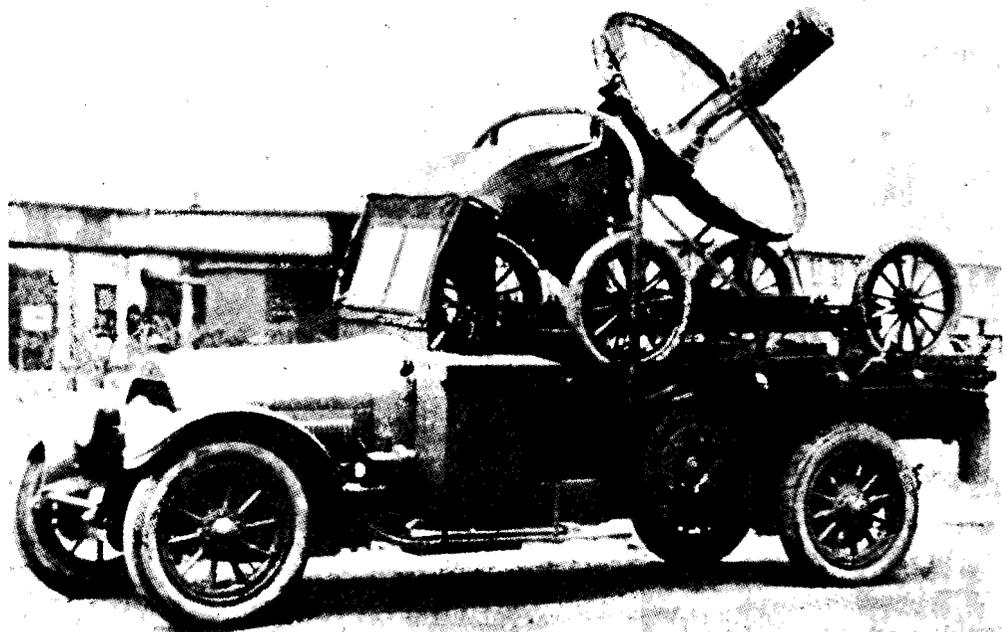
computers. Similar in orientation to today's forward area air defense system, each of these items worked together to enable crewmen to engage an airplane with accuracy. As a result of its recent emergence as an element of warfare, anti-aircraft artillery suffered from the immaturity of the overall system as well as from the lack of development of each weapon and subsystem.

Confronted with a parsimonious Congress, Coe had trouble explaining the need for funds to develop each part of this system. To a great extent, Congress became confused over the need for the various projects and failed to appropriate adequate funds for further development. In a situation akin to that facing the branch today, the lack of a credible enemy compounded this confusion and added to Coe's difficulty in obtaining money. Frustrated by this situation, Coe issued an office memorandum to members of the corps explaining the serious deficiencies that existed in anti-aircraft equipment. The memo highlighted the need for "every officer conversing with members of Congress . . . to present a clear picture of the shortages and how it [was] proposed to remedy [them]" — a strategy similar to present-day Chief of Air Defense Artillery Maj. Gen. John H. Little's effort to persuade ADA soldiers to "speak with one voice."

Part of Coe's proposed remedy was the development of a new three-inch gun (M-1923E) that retained all of the better qualities of earlier models, but also included an automatic breechblock to increase the rate of fire. Concerned that Congress might become confused with too much anti-aircraft information, Coe emphasized that every officer should argue for the new three-inch gun. Coe's gambit achieved limited success. The M-1923E (experimental) gun emerged from the testing process in 1925 as the M-1925, better known as the M-3 three-inch mobile or the M-4 three-inch fixed gun. The first M-1925 reached the field in 1928 and the model remained the standard until early in World War II.

In light of the dearth of appropriations for anti-aircraft development, Coe's concern over congressional confusion seemed fitting. Since the end of World War I, Congress had appropriated a meager amount of money for the development of anti-aircraft artillery, while providing the Air Service with millions for aircraft research work. From 1919 to 1924, Congress gave the Coast Artillery \$42,250 for anti-aircraft development, while the Air Service received \$3 million just for 1924. Even the Ordnance Department, with

This 60-inch Cadillac searchlight was part of the 1920s system of systems approach to air defense.



its overall responsibility for weapons development, paled in comparison to the Air Service. From 1921 to 1924, the Coast Artillery and the Ordnance Department received a total of \$1,952,881 for antiaircraft artillery development. During the same period, Congress allocated \$15.8 million, or more than eight times as much, for the development of airplanes.

By the end of the decade, the design of the antiaircraft system was almost complete, but the fiscal limits imposed by Congress and reinforced by the effects of the Depression constrained the actual procurement of antiaircraft equipment. With respect to the "system" design, the Coast Artillery Corps adopted the three-inch gun, the .50-caliber machine gun, the MV-1 distant-controlled searchlight and the antiaircraft gun fire control director as standard equipment. The only major piece of equipment still considered unsatisfactory was the sound locator.

The sound locator, employed in tandem with the searchlight, formed the weakest link in the system. It contained four 14-foot horns, mounted in a cross configuration so two of the horns (top and bottom) measured the angular height of the airplane, while the other two horns (left and right) indicated its azimuth.

An acoustic corrector located behind the horns added wind, sound lag and parallax corrections to the airplane's apparent position and produced a true location. The sound locator measured angular velocity by following the sound automatically. The locator sent this data to the comparator via an AC self-synchronous transmitter. The comparator superimposed pointers for both the searchlight and sound locator to check for parallax errors. A distant electric control allowed the operator to traverse or elevate the searchlight electrically from a remote position up to 200 feet away, a feature that greatly improved crew safety in wartime. The sound locator picked up targets out to 20,000 yards, but could only indicate directions accurately from 5,000 to 12,000 yards. Beyond 12,000 yards, the sound generated by the aircraft was too random to pinpoint. Inside 5,000 yards, the airplane's angular velocity exceeded the locator's speed and ability to correct for sound lag. The Army never totally perfected the sound locator, and discon-

tinued its use with the advent of radar in the early 1940s.

With the exception of sound location, the Coast Artillery overcame the technological hurdles that retarded the development of a complete system in the 1920s. As the Army closed out the decade, however, fiscal limitations prevented the fielding of an effective force. Even prior to the Depression, conditions had deteriorated to the point that the Coast Artillery could claim only six active antiaircraft regiments, most at reduced strength. In March 1929, Maj. Gen. Andrew Hero, Coe's successor as chief of Coast Artillery, complained to the War Department that there were only 28 searchlights, 80 .50-caliber machine guns and one four-gun battery of modern three-inch antiaircraft guns available to defend the United States from air attack. With the October stock market crash, Hero's concerns fell on deaf ears. Economic hardships combined with earlier isolationist and antiwar sentiments to remove all hope of modernizing the nation's antiaircraft artillery force.

Despite its inability to expand the antiaircraft force, the Coast Artillery Corps accomplished a great deal in the decade following World War I. Emerging from the ashes of the war, the corps secured bureaucratic ownership of the antiaircraft artillery, established the foundation for a coherent warfighting doctrine and designed a theoretically effective antiaircraft system for defending against air attacks. Although the Coast Artillery failed to translate this progress into the development of a sizeable force structure, its failure only reflected the large environment in which it operated. Superimposed upon the evolution of antiaircraft artillery was a decade of declining defense spending that retarded most force development, with the possible exception of the Air Corps.

The 1930s — Expansion and Acceptance

Throughout the 1930s, the Coast Artillery Corps built on the achievements of the previous decade, expanding its antiaircraft tactical organization and gaining increased acceptance of antiaircraft artillery within the War Department. The first significant organizational change occurred in 1933 when the Corps changed the composition of the antiaircraft gun battalion.

We are the only nation in the world that waits til we get into a war before we start getting ready for it. We were mighty glad to listen to General Pershing's advice during the war when we trusted the lives of millions of our boys to him. I don't see why they can't listen to him now. Pacifists say that "if you are ready for war, you will have one." I bet you there has not been a man insulted Jack Dempsey since he has been champion.

— Will Rogers



As the necessity of national defense is sacrificed in the name of economy, the United States presents a tempting spectacle. It is a spectacle which may ultimately lead to the alignment of the nations which may lead to another world war, and that war would find a score of nations ready for the sack of America.

— Gen. Douglas MacArthur
1936



The Army used to have all the time in the world and no money; now we've got all the money and no time.

— Gen. George C. Marshall
1942

Concerned over the vulnerability of anti-aircraft gun batteries to low-flying attack aviation, Coast Artillery planners assigned each battery a platoon of .50-caliber machine guns for self-defense. These machine guns protected the three-inch gun crewmen from strafing attacks by enemy aircraft seeking to open a path for incoming high-altitude bombers. Using machine guns not only enhanced the mix of weapons employed in the defense, it also provided security for anti-aircraft gun batteries during road movement and emplacement. Combined with the 48 machine guns in the anti-aircraft machine gun battalion, the additional weapons raised the regimental total to 60 machine guns.

The second and perhaps most sagacious change in anti-aircraft doctrine and organization came as the result of efforts to integrate the new 37mm anti-aircraft gun into the existing force structure. The 37mm gun had undergone extensive testing in the latter half of the decade and would eventually enter production in early 1940. Designed as an intermediate automatic weapon to supplement the fire of the .50-caliber machine gun, the 37mm gun had an effective (tracer) range of 10,500 feet. Mounted on a highly mobile trailer, crews could emplace the weapon within a minute and have the fire control system operational in less than five minutes. The gun fired a 1.25-pound high-explosive, point-detonating shell at a sustained rate of over 60 rounds per minute. Each 37mm gun battery consisted of eight guns divided into four platoons of two guns each.

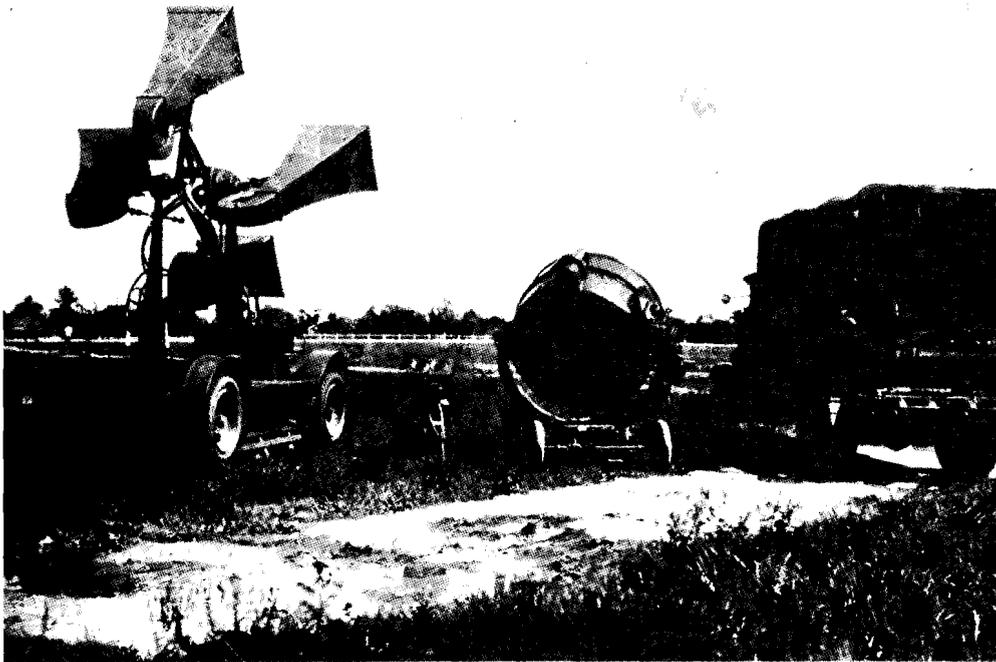
Hoping to capitalize on the capabilities of the 37mm gun, Coast Artillery planners used it to form the basis for several new anti-aircraft artillery organizations. The first new organization created in the wake of the 37mm gun's development was the "automatic weapons" battalion. This battalion combined three 37mm gun batteries with one .50-caliber machine gun battery and replaced the earlier four-battery .50-caliber machine gun battalion organization. This new automatic weapons battalion joined the three-inch gun battalion to form the standard mobile anti-aircraft regiment.

The second organization developed around the new gun was the "separate" 37mm gun battalion. This separate battalion differed from the automatic weapons battal-

ion in that it consisted of four 37mm gun batteries. The Coast Artillery created these and other separate battalions to reinforce the existing fires of corps and army anti-aircraft artillery units. In infantry or cavalry divisions, which by regulation possessed no organic anti-aircraft artillery, separate battalions reinforced the small arms fire of the ground troops.

In reality, planners formed two different 37mm gun organizations from this structure: the mobile and semimobile separate battalions. In both cases the four-battery composition remained the same. The only difference occurred in the units' ability to transport themselves from one place to another. Mobile units, which possessed the vehicles to transport themselves, existed for use in fluid overseas situations where planners anticipated frequent changes of position. Conversely, planners designed semimobile units for use in more stabilized locations where frequent moves were unlikely. As a result, semimobile units did not possess the ability to move without outside assistance. To change location, these units relied on vehicles from the battalion motor pool to shuttle men and equipment between positions. With an eye toward the possible manpower and equipment demands of an expandable Army, planners designed the semimobile units to maximize firepower while minimizing the need for personnel and vehicles.

Combined, these advances in technology and changes in organization signaled the maturation of interwar anti-aircraft artillery doctrine. Doctrinal maturity, however, did not guarantee the full development of an anti-aircraft artillery force structure. As the decade opened, Gen. Douglas MacArthur, the new Army chief of staff, sat atop an Army that had deteriorated beyond any reasonable comparison with the doctrine it espoused. Although by 1931 the Army had reached a 10-year manpower peak, the 140,516-man force was only half of that authorized by the National Defense Act of 1920. To make matters worse, most of the equipment in use was obsolete, World War I vintage materiel. To rectify this situation, MacArthur recommended an immediate procurement program that included \$33 million for anti-aircraft artillery equipment.



Sound locators formed the weakest link in the post-World War I air defense system.

Maj. Gen. John Gulick, the new chief of the Coast Artillery, welcomed MacArthur's efforts. In May 1933 his corps could muster only 122 three-inch guns, 98 .50-caliber machine guns and 46 searchlights to defend the United States, and by 1935 the situation had not improved. Of the four active regiments in the United States, none were at full strength. In fact, three of the four regiments possessed only one battery each of searchlights, guns and machine guns. On the whole, the Army needed an additional 400 three-inch guns and more than 2,000 .50-caliber machine guns. In an attempt to overcome these and other equipment shortages, MacArthur initiated a series of six-year programs to rebuild the military.

By June 1936, the War Department had achieved modest progress in meeting MacArthur's goals. Gen. Malin Craig, MacArthur's successor, reported that the Army had equipped one anti-aircraft regiment and would complete a second within a year. The real impetus behind anti-aircraft rearmament, however, came in 1937 when the War Department received reports from Spain and China regarding the effectiveness of modern anti-aircraft artillery weapons against air-

craft. In light of these reports, Craig elevated anti-aircraft artillery equipment to the top of the War Department's priority list.

As the wars in Spain and China continued, concern grew in the War Department over the Army's level of readiness. Craig complained in his 1938 report that "the regular army rank[ed] 18th among the standing armies of the world." More importantly, he argued that the United States "failed to keep pace with the development of defensive [anti-aircraft and antitank] weapons that had occurred since the World War." As a result, he left anti-aircraft weapons at the top of the War Department's priority list for a second straight year.

Unfortunately, it took more than an increase in priority and an infusion of money to produce enough anti-aircraft weapons to equip the recently expanded force structure. Despite the best efforts of Assistant Secretary of War Louis Johnson, the man charged to "arm the nation," procurement fell far behind schedule. As the deficit continued, anti-aircraft artillery topped the priority list again in 1939. In May 1940, the Army possessed only 448 modern three-inch anti-aircraft guns, 194 sound locators, 15 37mm guns, 1,014 .50-caliber machine guns and 285 searchlights for a planned force of more than 88 mobile and semimobile regiments.

There has been and probably will be continued controversy about anti-aircraft defense, in the forward area particularly. The question of whether we should equip each unit with certain means of anti-aircraft defense, guns, or whether we should have the unit fairly stripped down to the essentials and have a roving mass of anti-aircraft means. That is a tough question and has been from the beginning. It hasn't been resolved by the Tunisian campaign. There are a good many divergent opinions about that. There is the angle that if we have a given number of anti-aircraft guns scattered uniformly among the units — fixed in those units — we are guilty of what we call dispersion. If we disperse our strength we, generally speaking, are strong nowhere, we have some strength everywhere, but no great strength anywhere. If we disperse our present number of anti-aircraft guns in that way, everyone will feel the comfort of having some guns near him and watching over him, but he may not realize that the number of guns is inadequate to stop much of anything in the way of an air attack. That is a question that there is no exact answer for.

— Lt. Gen. Leslie J. McNair
1943

The Army has faced similar challenges before. In fact, after every major conflict in our history — all the way back to the Revolutionary War — pressures on the Army to decrease in size have also resulted in decreases in effectiveness. The result has been tragic defeats when the Army was not ready for the next war. The decline after World War I led to failure at Kasserine Pass. The loss of effectiveness after World War II led to the defeat of Task Force Smith in Korea in June of 1950. Today we again find ourselves in the wake of great success on the battlefield. We are at peak effectiveness. Victories in the Cold War, Panama and the Gulf War demonstrate that today's Army holds a warfighting edge — an effectiveness advantage — over our opponents. As in the past, we now face a changing environment and the mandate to decrease the size of the Army. This time, however, we must break the historical pattern. We must maintain our warfighting effectiveness as we reshape for the future. My theme as chief of staff is "No More Task Force Smiths."

— Gen. Gordon R. Sullivan
1991

The bulk of the rearmament problem resulted from the War Department's failure to maintain an expandable production base commensurate with its plans for an expandable army. In 1940, the Ordnance Department had four arsenals capable of producing only the small number of artillery and anti-aircraft artillery pieces required for a peacetime Army. Moreover, the civilian infrastructure necessary to assume control of weapons manufacturing was virtually nonexistent. As a result, when Johnson placed the huge orders to outfit the planned anti-aircraft force — a 400 percent increase in sound locators, a 210 percent increase in three-inch guns and carriages and a 140 percent increase in machine guns — the sudden upswing in demand overwhelmed the Ordnance Department's ability to react.

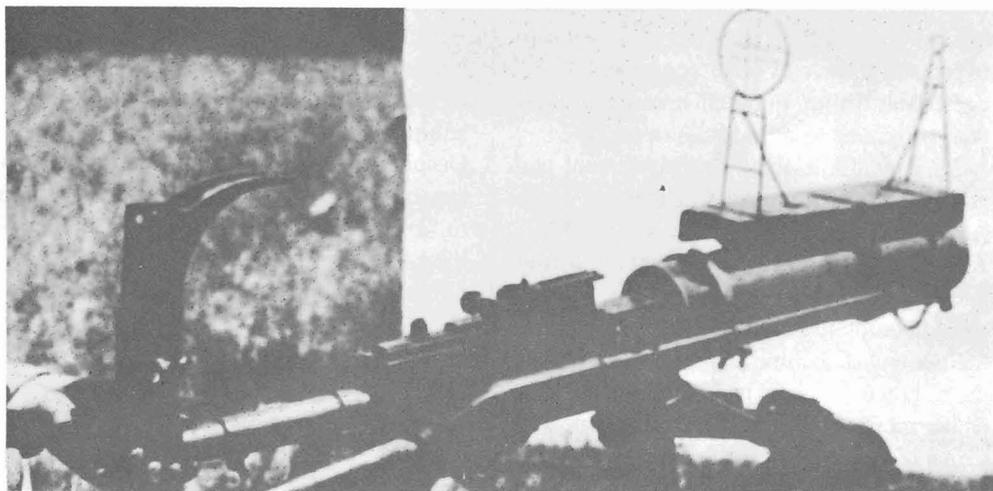
Thus as the decade ended and America stood poised to enter World War II, anti-aircraft artillery had emerged as an essential element of national defense. Despite the Coast Artillery's creation of a viable warfighting doctrine and a relatively effective system of anti-aircraft weapons, the size of the anti-aircraft force lagged dangerously behind War Department expectations. During the interwar period, the development of anti-aircraft artillery signaled a commitment on the part of Coast Artillery planners to maximize their resources and plan for future expansion. Unfortunately, larger political, social and economic forces minimized the success of this development and slowed the eventual expansion of the nation's anti-aircraft artillery force.

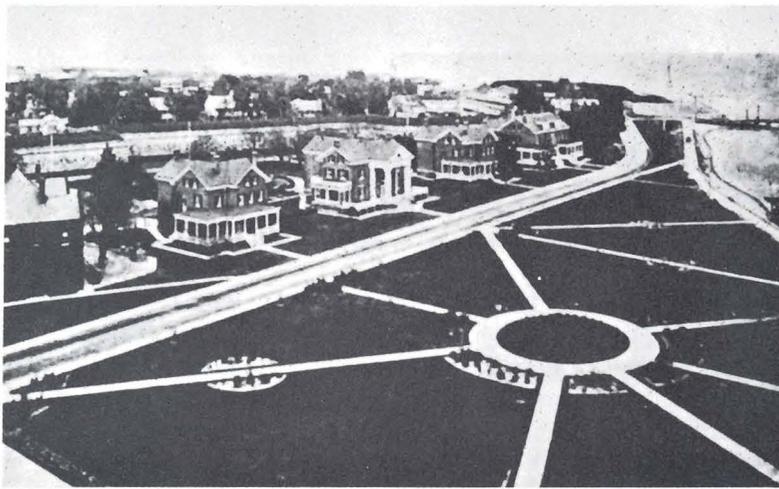
Lessons to be Learned

Today's air defenders can learn a great deal from the study of interwar anti-aircraft development. First, the effects of rapid demobilization combined with economic depression to emasculate the force in the 1920s and 1930s. Given the current geopolitical and economic environment a similar situation may emerge with today's force, both Armywide and within the branch, if planners do not meticulously manage all facets (manpower, weapons research and development, industrial production base, operations and maintenance) of the drawdown.

Second, despite the best efforts of planners and leaders, current reductions will have some undesirable effects on the size, role and readiness of the force. To ensure Air Defense Artillery retains its current level of institutional autonomy and legitimacy in tomorrow's Army, the branch needs to improve its ability to provide short-range air defense for maneuver units in the division as well as capitalize on its success in Desert Storm by asserting itself in the theater ballistic missile defense arena. By doing both, the branch not only retains the respect of the other combat arms who traditionally hold a foxhole view of combat, but also wins support within the Department of Defense where the focus is more globally oriented. With the worldwide proliferation of aircraft, long-range surface-to-surface missiles and helicopters in possibly hostile countries, *Air Defense Artillery has the potential to*

The .22-caliber rifle attached to the .50-caliber machine gun is for sub-caliber training.





Maj. Gen. Frank W. Coe and Fort Monroe in the 1920s. The Coast Artillery School appears at far left.

become the rapid deployment force for the 1990s and beyond, earning a reputation akin to the 82d Airborne or 101st Air Assault Divisions as global troubleshooters and living up to its "First to Fire" motto.

This will not occur, however, unless the branch asserts itself into the external defense establishment (Department of Defense and Department of the Army) and maintains a strong internal program of officer professional development. While the chiefs of the Coast Artillery during the interwar period fought with Congress and the War Department for financial support and institutional legitimacy, rank and file officers engaged in an intense study of their profession. They sought to improve their knowledge of the branch and its weapons, understand the roles of other branches in military operations and appreciate the general history of warfare. As a result, the branch emerged from the interwar period with a small corps of highly trained officers who understood their roles in both antiaircraft and combined arms operations. This corps of officers became the leaders of the branch when it expanded to its wartime size. As current cutbacks reduce the size of the branch, officers must not bury their heads in the sand, but must instead engage in meaningful studies of current as well as future branch and Army doctrine.

Finally, Air Defense Artillery must ensure that the corps of professionals that exists after the drawdown possesses the ability to

expand the force rapidly enough to meet the nation's defense needs. To avoid the difficulties the branch faced in the late 1930s and early 1940s, planners must structure ongoing weapons development in a manner that keeps pace with changing aircraft, helicopter and missile technology; uses existing weapons platforms; maximizes off-the-shelf technology; and minimizes the turbulence normally associated with rapid increases in force structure and new equipment training.

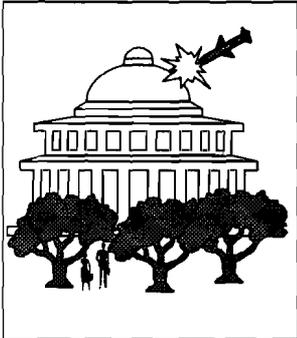
Many famous military leaders have credited their personal and professional success to an understanding of history. In some cases, leaders like Gen. George S. Patton Jr., who "believed he had been there before," are viewed by most with skepticism. In the case of Air Defense Artillery, however, evidence indicates that the branch has truly crossed a similar battlefield earlier this century. As the Army endeavors to maintain its fighting edge in a period of declining threat, Air Defense Artillery would do well to learn the lessons extant from a period remarkably reminiscent of today. Only then can the branch put the mistakes of the past behind and embrace a bright and rewarding future.

Capt.(P) Bryon E. Greenwald is an air defender with Chaparral, Vulcan, Stinger and Patriot experience. He has served with the 24th Infantry Division at Fort Stewart, Ga., and has commanded a battery in Germany with 32nd AADCOM.

We are at a watershed. At this crucial point in our history, we must strike a balance — both sustaining the values rooted in the past and adapting to new realities with resolve and vision. The nation expects our Army to be trained and ready. We are expected, indeed we are obligated by our oath, to protect and defend the republic. We will continue to do so.

— Gen. Gordon R. Sullivan
1991

© Cruise Control



A cruise missile compares the terrain it is flying over with computerized maps and digitalized photos of prominent landmarks to reach its target.

On a sixth-floor balcony in Baghdad's al-Rasheed Hotel, a British TV correspondent watched in amazement as a Tomahawk cruise missile glided past him at eye level. "I have covered many wars," he reported, "but this was the most extraordinary sight I have seen. It shot past with relatively little noise, unerringly streaking toward its target, which was the Defense Ministry, and scored a direct hit."

— *Time* magazine

Fifty of 51 Tomahawks fired on the first night of the war met their targets, much to critics' surprise.

— *Army Times*

In one of Dr. Kosta Tsipis' nightmare scenarios it is Super Bowl Sunday. The stands are full of cheering fans, but the real action is taking place not on the football field but aboard a rusty freighter riding at anchor in the Gulf of Mexico. There, crewmen are also cheering as the cruise missile they have just launched streaks toward New Orleans. Once the missile vanishes over the horizon, they will have just enough time to rush to the first mate's cabin and watch the missile, laden with a ton of high explosives, crash through the roof of the Super Dome. Their only worry is that the missile will hit during a commercial, in which case they will have to settle for an instant replay.

The Super Bowl scenario, though chilling enough, is not necessarily a worst case scenario. The cruise missile could have contained chemical or biological agents or a nuclear device. Few countries, it is true, have nuclear weapons, but, as Tsipis points out, people with cruise missiles need no nuclear weapon to cause a major nuclear incident. Nuclear power reactor operators store spent, but still furiously radioactive, fuel rods in large pools next to each reactor. By aiming their cruise missile at the storage pool, the attacker could create a nuclear explosion that would contaminate hundreds of square miles. Any nuclear power station within 300 miles of the sea becomes a potential Chernobyl.

Tsipis, who directs the program on science and technology for international security at the Massachusetts Institute of Technology, thinks that the United States, in its headlong rush to erect a shield against ballistic missile attack, is ignoring a more acute cruise missile threat. "President Bush has requested more than \$5 billion for 'Star Wars' ballistic missile defenses for the 1992 fiscal year," Tsipis says. "The United States will spend \$4.1 billion for such defenses in the current fiscal year. The military pre-

paredness this money is supposed to buy does not address the most probable and serious threat we face — highly accurate cruise missiles that cannot be stopped and can be guided to targets by technology that is available to everyone."

Cruise missiles performed spectacularly during the Gulf War, but since they were aimed at Baghdad, they made less of an impact on the national consciousness than did the Iraqi Scuds that smashed down in Israel and Saudi Arabia. Congress reacted to the spectacle of Scud-inflicted civilian casualties by rushing the Missile Defense Act of 1991 into law. The legislation requires the Pentagon to begin deploying a ground-based missile defense to protect the United States against accidental, unauthorized or limited ballistic missile strikes by 1996.

Some Pentagon officials, including Assistant Secretary of Defense David Chu who recommends delaying fielding until 2002 or 2003, consider the early deployment date impractical. However, the U.S. Army Air Defense Artillery School, which was designated the proponent for National Missile Defense (NMD) in March, plans to present an NMD operational requirements document to the Joint Requirements Oversight Committee for review on Aug. 17, 1992.

The rush to field a ground-based defense against ballistic missiles doesn't mean ADA combat developers are ignoring cruise missiles. Concerned that the cruise missile technology that crippled Saddam Hussein's command, control, communications and intelligence centers during the Gulf War may one day be turned against friendly forces, ADA planners are adding anti-cruise missile requirements into future ADA weapon system acquisition programs, including the Theater High Altitude Air Defense System, Corps SAM and Patriot PAC-3 improvements. Still, the cruise missile threat hasn't received nearly the attention, funding or

Emphasizing the Right Threat!

sense of urgency that Congress and the president have accorded tactical and strategic ballistic missile defense. Tsipis maintains cruise missiles, because of their deadly accuracy, represent a far greater peril to the United States than either tactical or strategic ballistic missiles.

"The U.S. ground position system used successfully in the Persian Gulf War consists of up to 24 satellites deployed around the earth," says Tsipis. "They simultaneously emit signals that permit any person with an appropriate receiver (a book-sized off-the-shelf device that costs a few thousand dollars) to determine a location instantaneously on the ground, at sea or in the air with an accuracy of dozens of feet.

"Carrying such a receiver," he continues, "an individual can walk into Congress, a nuclear reactor building, or, for that matter, any sensitive installation and record its location with almost perfect accuracy. If the installation is not accessible, someone can record the location of a nearby recognizable landmark and, from a map or aerial or satellite photograph, calculate the exact distance between the landmark and the installation. Thus anyone can pinpoint any installation or building in the United States with an accuracy of about 10 feet. In the near future, this accuracy could improve to about a foot.

"In contrast to cruise missiles, even the most sophisticated ballistic missiles cannot be guided to targets by a ground positioning system because of the multiple stresses they undergo during reentry into the atmosphere," Tsipis continues. "Besides, ballistic missile technology is restricted to very few countries, most of them industrialized democracies, and cannot be readily obtained. Thus, ballistic missiles, which at best can strike within 1,000 feet of their targets, are a much less dangerous military threat than cruise missiles equipped with ground positioning system receivers."

Field armies suddenly thrust into contingency areas would be no less vulnerable than civilian targets. Fifth columnists could use the receivers to target C³I complexes, logistics centers, airfields and other vital assets of the type that dotted the Saudi Arabian landscape during the Gulf War with pinpoint accuracy.

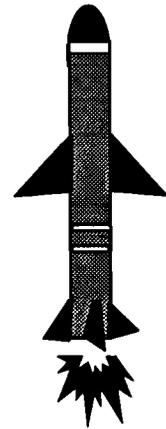
Although the proliferation of ballistic missiles around the globe made daily headlines during the months following Operation Desert Storm, Tsipis maintains that, for most developing nations, cruise missile technology is much more readily available. "A cruise missile is in effect a small unmanned jet plane and therefore immune to space-based ballistic missile defenses," says Tsipis. "Its technology is simple. Jet engines with the necessary thrust are made in a number of countries and are commercially available. The gyroscopes used in commercial aviation to maintain level flight are off-the-shelf items, as are autopilots needed to steer the cruise missile.

"A ground positioning receiver on a cruise missile can guide it with the help of the gyroscope and the autopilot to within a few feet of a target," Tsipis continues. "Any country that can manufacture simple aircraft can construct a cruise missile that can carry a ton of cargo at least 300 miles and land no more than 30 feet from its target. Thus, any point on the ground — the White House, the Super Bowl game — that is within say, 300 miles from shore, can be hit by a cruise missile loaded with powerful explosives, nerve gas or biological agents and hidden from view on an ocean-going vessel until launched.

"To devote billions of dollars to dubious Star Wars gadgets intended to counter the vanishing threat of ballistic missiles despite the present danger of accurate cruise missiles is an irresponsible waste of shrinking defense funds," Tsipis concludes.

Top analysts in the Pentagon's "Star Wars" program have concluded that even the most rudimentary defense of the nation from nuclear attack would violate the anti-ballistic missile treaty. But the director [Dr. Henry F. Cooper] of the anti-missile effort said yesterday that his agency had not adopted this view.

— New York Times



They [U.S. Air Force] will have difficulty taking on the cruise missile threat. The U.S. Navy has all the capability of the Air Force in their interceptors, yet must rely on surface fires to destroy the relatively simple Silkworm threat. The same will be true of the Air Force. Once the world recognizes that we have an adequate defense against the tactical ballistic missile, efforts will likely shift to cruise missile technology. The level of technology necessary for the development of, and improvements to, cruise missiles is probably less than that needed for tactical ballistic missiles.

— Maj. Gen. John H. Little

COMMAND OPPORTUNITIES

Drawdown will have little impact on number of ADA command slots

The Total Army Analysis (TAA) 1999 has been approved by the Army chief of staff. The TAA-99 ADA active component force will consist of 27 battalions and five separate batteries. The TAA-99 ADA reserve component force will consist of 22 battalions and two separate batteries. Approximately 55 percent of Air Defense Artillery's force structure will be reserve component.

Individual MACOMs may modify the basic TAA-99 force structure. In any event, work on TAA-2001 has begun and will alter the projected force structure.

As the Army downsizes, Air Defense Artillery's anticipated reductions are in line with other combat arms branches. As the branch's force structure is reduced, the average between "14" coded positions and officer inventory numbers grows smaller each year; thus, opportunities for ADA officers to serve in key leadership positions (brigade or battalion

command, S-3/XO and battery command) will remain about the same.

Battery command: From FY92 to FY95, ADA battery commands are expected to decrease from 179 to 168. The opportunity to command should increase from 99 percent in FY92 to 104 percent in FY95. The reason for the increase, even though there will be fewer command slots, is that there will also be fewer captains.

Battalion S-3/XO: The 74 ADA battalion S-3/XO positions currently available will shrink to 63 by FY95. Opportunity rates, however, will remain essentially the same.

Battalion command: The number of battalion commands in Air Defense Artillery will decrease from 39 in FY92 to 35 in FY95. Opportunity rates will decrease slightly from 45 to 44 percent.

Brigade command: The number of brigade commands will actually increase from eight to nine between FY92 and FY95. Opportunity rates will climb from 14 to 26 percent.

The bottom line is that command opportunities for ADA officers will remain about the same, or only slightly less, than prior to the drawdown.

FIELD GRADE OFFICERS PROMOTION BOARDS

ADA officers prove highly competitive

The most recent selection and promotion results indicate that ADA officers continue to prove highly competitive with officers from other branches.

Colonel: 22 ADA officers, or 19.8 percent of those eligible, were selected for promotion to colonel. Air Defense Artillery's promotion rate continues to exceed the Armywide total and was surpassed only by the Armor branch.

Lieutenant Colonel: 47 ADA officers, or 29.9 percent of those eligible, were selected for promotion to lieutenant colonel. The board results reflect an Armywide decrease (2.1 percent) in the percent selected for promotion compared to the previous year. For ADA, the first time consid-

ered selection rate of 62.6 percent represented an 11.9 percent branch increase, exceeding the Army first time considered average by 0.9 percent.

Major: 87 ADA officers, or 48.1 percent of those eligible, were selected. The results reflect an Armywide decrease (2.1 percent) in the percent selected for promotion compared to the previous year. For ADA, the first time considered selection rate of 60.7 percent reflects a 6.8 percent increase from the previous year.

Captain: 134 officers, or 91.2 percent of those eligible, were selected. The board results reflect an Armywide decrease in the percentage selected for promotion.

ADA Command Slots

	AC TOE	AC TDA	RC
Colonels	6	3	0
LTC	27	8	22
XO/S-3	60	63	44
CPT	150	18	91

ADA NCO PROMOTION BOARD RESULTS

Career Management Field Selection Board draws the fine line between the "fully qualified" and "best qualified"

The CY92 Career Management Field (CMF) 14 Selection Board met recently to identify and select "best-qualified" master sergeants, first sergeants and sergeants major for promotion. Applying the "whole soldier" concept, the panel rated the overall quality of CMF 14 soldiers as excellent, but noted the following areas that separated the "best qualified" from the "fully qualified."

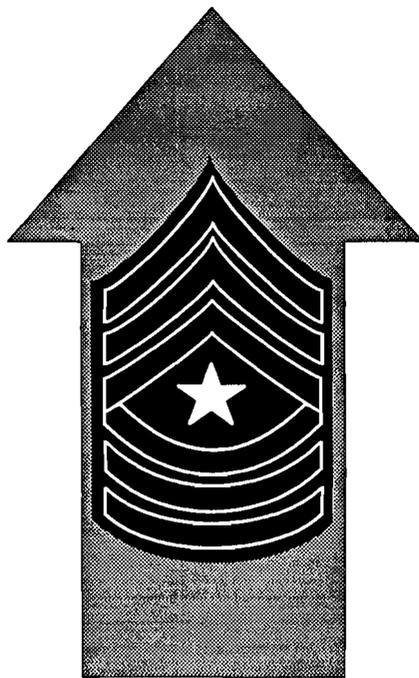
Up-to-date photos, current and verified 2As and 2-1s and updated microfiches portrayed NCOs who were professionally prepared and concerned.

Physical fitness played a decisive part. Soldiers who failed the Army Physical Fitness Test (APFT) without medically extenuating circumstances were not considered qualified for promotion or selection to attend the Sergeants Major Course. "Fully qualified" soldiers passed all APFTs while "best qualified" soldiers consistently scored above 270.

There were signs that AR 600-9 is not being universally enforced. Incidents of height inflation coupled with weight gain were a red flag to the panel.

Soldiers who had pursued civilian or military education in conjunction with military duties stood out. Soldiers garnered points for completing the resident or nonresident Sergeants Major Course, graduating in the top 20 percent or being selected as honor or distinguished honor graduate.

"Best qualified" soldiers exceeded course standards in one or more of the



NCOES courses and demonstrated initiative throughout their careers by attending military schools other than NCOES courses. Pursuit of civilian education above the high school level concurrent with military duty was deemed indicative of dedication to self-improvement, effective time management and potential for academic success. High school diplomas or GEDs were sufficient to make an NCO "fully qualified," but soldiers needed college credit or a degree to enter the ranks of "best qualified".

The panel deemed a successful mix of challenging job assignments (i.e., first sergeant and operations sergeant) to be an excellent indicator of an NCO's potential. They devoted particular attention to an NCO's

amount of time and quality of performance in selecting soldiers for promotion to command sergeant major. "Best qualified" soldiers served successfully in leadership positions at each grade. The panel credited soldiers singled out for special or demanding jobs, such as drill sergeant, recruiting, Reserve advisors and ROTC instructors, within or external to the CMF. However, excessive time spent in a special assignment was not viewed favorably because it generally hindered professional development or prevented assignment to critical troop-leading positions.

Successful performance of duty was clearly the single most important factor. Regardless of the assignment, senior NCOs were expected to be successful in their duties. The panel carefully assessed the performance of NCOs who were marked "needs improvement" in light of the NCO's particular assignment. An isolated incident did not necessarily earn NCOs "not fully qualified ratings," but a pattern of such ratings was seen as a clear indicator of serious professional difficulties.

The panel paid careful attention to potential as addressed by the rater in the form of recommended positions for service and by the senior rater in the form of a block recommendation. Repeated "Fair" or "Poor" ratings by the senior rater caused NCOs to be rated "not fully qualified".

Since NCOs are the Army's standard bearers, the panel frowned on

(Digest continued on page 22)

BSFV

Transition Training

by Tom Cooper

The BSFV platoon's basic mission is to maneuver with, and provide air defense for, combined arms task forces. The primary and most capable air defense weapon the BSFV carries is the Stinger missile, thus its principal role in providing air defense is to safely deliver and effectively employ the squad's own two-man Stinger team.

— ADA Magazine

Air Defense Artillery has produced a new breed of air defenders trained to engage and destroy attack helicopters and fixed-wing aircraft — the 14R, Bradley Stinger Fighting Vehicle (BSFV), soldier. The cadre of the 2nd Battalion, 6th Air Defense Artillery Regiment, Fort Bliss, Texas, celebrated a major training milestone June 11 as the first 14R transition class graduated.

The Army plans to field 267 BSFVs, the forward area air defense system's interim line-of-sight forward (heavy) component, to heavy divisions. Currently two BSFV en-

listed and one BSFV (14B) officer resident classes are in progress at Fort Bliss. Training projections call for 296 transition and advanced individual training soldiers to complete BSFV training during FY93.

The BSFV will be manned by a crew of five. Each platoon will consist of four BSFV systems with the grade configurations shown at right.

The BSFV course trains the 14R crewmembers to operate as three-man teams. Hands-on training comprises about 95 percent of the grueling but rewarding eight-week, four-day BSFV transition training course.

As part of the overall training strategy, transition students (most of them former Vulcan crew members) must demonstrate proficiency in maintenance, driving and gunnery skills.



BSFV Grade Configurations

Platoon Headquarters

Platoon Leader:	14B First Lieutenant
Platoon Sergeant:	14R Sergeant First Class
Senior Gunner:	14R Sergeant
Gunner/Driver:	14R Specialist
Prime Mover Driver:	14R PFC

System 1

Squad Leader:	14R Staff Sergeant
Senior Gunner:	14R Sergeant
Gunner/Driver:	14R Specialist
Team Leader:	16S Sergeant
MANPADS Crew Member:	16S Specialist

System 3

Crew Chief:	14R Sergeant
Gunner/Driver:	14R Specialist
Prime Mover Driver:	14R PFC
Team Leader:	16S Specialist
MANPADS Crew Member:	16S PFC

System 2

Squad Leader:	14R Staff Sergeant
Senior Gunner:	14R Sergeant
Gunner/Driver:	14R Specialist
Team Leader:	16S Sergeant
MANPADS Crew Member:	16S Specialist

System 4

Crew Chief:	14R Sergeant
Gunner/Driver:	14R Specialist
Prime Mover Driver:	14R PFC
Team Leader:	16S Specialist
MANPADS Crew Member:	16S PFC



During the spring, USAREUR fielded [Bradley] Stinger Fighting Vehicles to both 1st Armored and 3rd Infantry Divisions. Last month we began training 3ID's air defenders on Bradley fighting vehicles and the ADA School's TTP for this new capability. The first battery is about to complete their training and I wanted to share their success story. Even in light of competing demands for our limited resources, the decision to mount air defense in Bradleys for the heavy force is sound. That action increases the number of air defense weapon systems in the divisional area, modernizes the force, and builds an organization ready for the Avenger missile system fielding. Our air defense is now able to maneuver with the combined arms team. Bradley mounted Stinger teams are able to keep up, survive and succeed, especially when compared with Vulcan and HMMWV-mounted Stinger teams which are constrained by vehicle or system limitations in the heavy force. As a result of the [Bradley] SFV fielding our air defense commanders talk of an unexpected dividend: morale has taken off. Knowing they are integral to the combat team, soldier motivation, esprit, and initiative are highly visible. Our young air defenders perceive they are an asset to the maneuver commander and can contribute in a positive way to his mission. The first battalion completes NET early next month and the NET team reports that our 16R, 16P, and 24M soldiers are making the transition handily. Their performance in Table IV gunnery demonstrates they are exceeding the standard with a 90% average GO rate.

— Gen. Crosbie Saint
CinCUSAREUR mesageo

The training includes hull and turret maintenance, turret system operation, march order and emplacement, target acquisition and engagement, and global positioning system orientation.

Students complete 30 hours in a conduct-of-fire trainer (COFT) before moving to live-fire ranges. The BSFV live-fire includes sub-caliber 5.56mm, 7.62mm and 25mm, the BSFV's automatic chain gun, commonly referred to as the Bushmaster. The sub-caliber 5.56mm firing range (Tables III and IV, FM 23-1) is conducted at the Fort Bliss Rod and Gun Club. Students fire the BSFV's 7.62mm coaxial machine gun and the 25mm Bushmaster (Tables VI-A and VI-B, FM 23-1) at Range 51 in Fort Bliss' Dona Ana Range Complex. The course integrates night firing, jump-start and mission-oriented protective posture gear training into the range firing exercises.

Day and night driver training requires drivers to negotiate right and left turns, back up, pivot, negotiate slopes and operate the system's smoke generator. The drivers must then perform the same tasks over a three-mile course using state-of-the-art thermal imagery devices.

The highlight of BSFV training is the Bradley Gunner Skills Test administered prior to live-fire training. During the test, students must demonstrate their hands-on ability to perform the full range of BSFV weaponry tasks. They install, remove, disas-

semble and apply immediate action to clear jamming on the 25mm chain gun and M-240C coaxial machine gun. They load and remove misfires from the TOW launcher and boresight all turret weapons. They also acquire and track targets with all turret weapons, including the TOW. Students must perform the timed events according to Appendix D of FM 23-1, *Bradley Fighting Vehicle Gunnery*.

2-6 ADA battalion cadre members say that attention to detail and hands-on rehearsals are the keys to success in the Bradley Gunners Skills Test. There are now 17 trained BSFV 14R instructors. Three of the BSFV instructors have completed Bradley Fighting Vehicle COFT certification training at Fort Benning, Ga.

BSFV crews and their Stinger teams will soon represent the only dedicated air defense firepower available in the brigade forward area. This makes only one training standard — excellence — acceptable. 14R soldiers must prepare to fight and win at any intensity level, anywhere, anytime.

Tom Cooper, currently the instructional systems specialist for 2nd Battalion, 6th Air Defense Artillery Regiment, has served in the Forward Area Air Defense Training Division for 10 years.

(continued from page 19)

documented ethics and values shortcomings.

The panel found chronic problems with inadequate substantiation of "excellent" ratings by the rater. Specific comments with "success" ratings were especially helpful in providing a fuller picture of the rated NCO's performance. Panel members also found specific "bullet" comments extremely helpful and felt they should become standard.

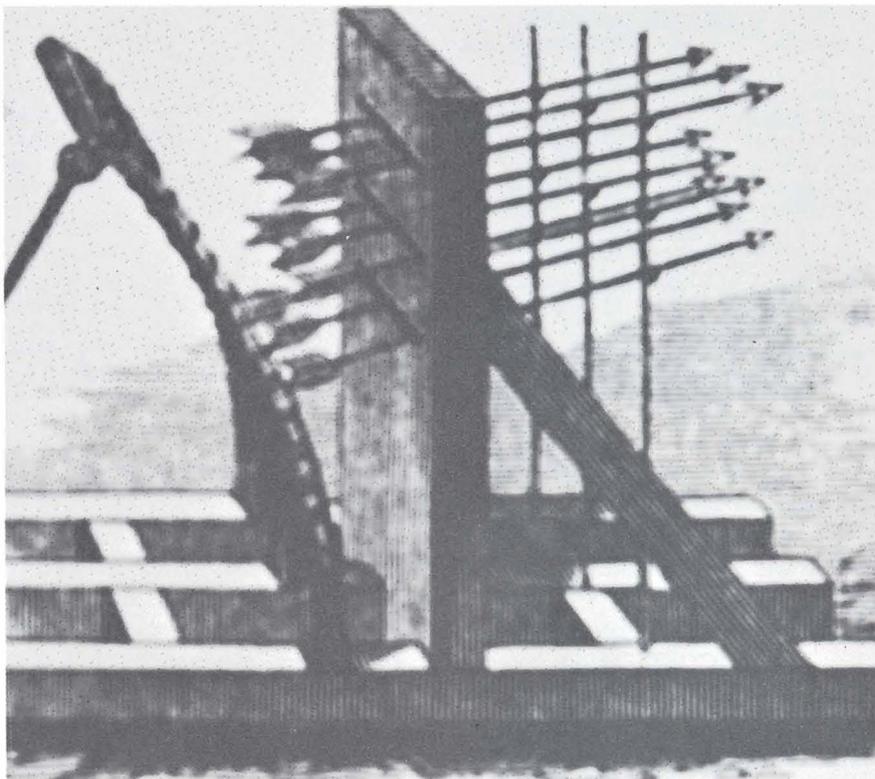
Raters should establish and list priority one through three positions in which the rated NCO could best serve the Army at the current or next higher grade. These should be substantiated by the performance bullet comments. Senior raters should address at least one bullet to each potential.

Some NCOs still do not update their photos when they are promoted; in fact, some of the photos are five years old. The implicit message to the panel was that these NCOs had little initiative and little regard for their records. Photos that portrayed NCOs as fat or overweight stood out negatively.

The CY92 CMF 14 Board made several recommendations, shown below, to soldiers that should help them to be more competitive on promotion boards.

- Teach soldiers to see themselves in the eyes of the selection board.
- Emphasize civilian education in all NCOES courses.
- Consider linking a college course with ANCOC.
- Educate battalion commanders to encourage and allow their NCOs time to pursue civilian education.
- Educate officers and NCOs in their responsibilities as raters, senior raters and reviewers.
- Make *excellence* and *success* identifiable and shared standards.

WEAPONRY



COMMON LAUNCHER

Look-alikes in ADA's future

ADA crews who operate one of ADA's high- to medium-altitude air defense (HIMAD) systems may one day soon share more than a mission — identical launchers.

The U.S. Army Air Defense Artillery School, Fort Bliss, Texas, is studying the feasibility of using a common launcher for HIMAD systems. The prime candidates for common launch systems are Patriot, the Theater High Altitude Area Defense (THAAD) System, the Extended Range Interceptor (ERINT) and possibly the Corps Surface-to-Air Missile (Corps SAM) systems.

The major design drivers for the common launcher are azimuth trainability, launcher angle, reliability and, in an era of contingency warfare, airlift requirements.

ADA combat developers say the common HIMAD launcher is expected to provide savings in development and production costs and will allow for use of a common launcher MOS for several systems.

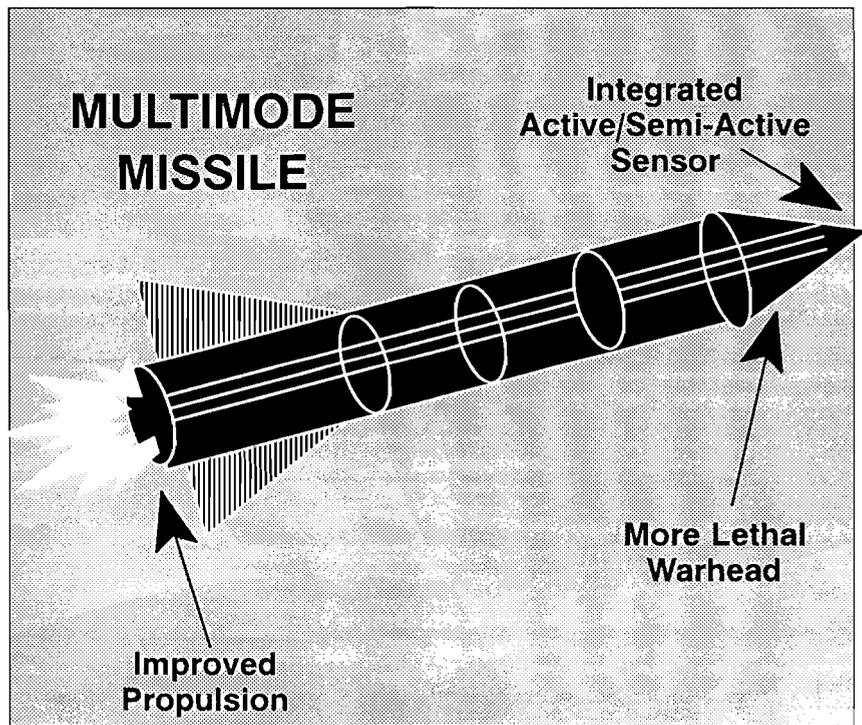
The goal in considering a common launcher is to capitalize on the synergism of future air defense systems and increase combat capability throughout the HIMAD community.

PAC-3 MISSILE

New Multimode Missile outshoots Gulf War Scudbusters

The Patriot air defense system passed a major milestone in its growth program, which is designed to expand air defense capability for the United States and its allies, when Raytheon's newly developed Patriot Multimode Missile successfully intercepted a tactical ballistic target at White Sands Missile Range, N.M. The July 24, 1992, test was the second successful guidance flight test of the Multimode Missile and demonstrated the ability of Patriot to intercept tactical ballistic missiles at altitudes far greater than those the Patriot Advanced Capability-2 (PAC-2) missiles that engaged Iraqi Scuds during Operation Desert Storm could reach. Raytheon's new multimode seeker allows the Patriot missile to track its target without help from a ground radar in the final seconds before intercept and improves Patriot's performance against advanced aircraft and cruise missiles as well as tactical ballistic missiles.

During the test, a Patriot fire unit with a tactically integrated Patriot missile, using a multimode seeker, successfully intercepted and destroyed a surrogate tactical ballistic missile. The target was detected, placed under track and classified for engagement by the Patriot radar and fire control system. At engagement, the Multimode Missile was launched and successfully progressed through



the normal guidance modes. In the terminal mode, C-band semi-active track-via-missile and K-band active guidance modes were exercised, with intercept occurring under the active guidance mode. The Multimode Missile's integrated fuze initiated the warhead and destroyed the incoming ballistic missile at high altitude.

Raytheon is developing the Multimode Missile under a memorandum of understanding between the United States and Germany for extended air defense. The Multimode Missile is a candidate, along with LTV's Extended Range Interceptor (ERINT) missile (see "ERINT Test," page 24) for integration into the PAC-3 program. The Army may choose both or only one of the systems for continued development.

An improved Patriot missile is just one of a number of PAC-3 upgrades that were briefed in August to Maj. Gen. William S. C. Chen, the Army's newly assigned program executive

officer for Global Protection Against Limited Strikes (PEO-GPALS). PAC-3 refinements include radar enhancements, a more mobile launcher, identification improvements and communications upgrades.

The latest Army reassessment of Patriot PAC-2 missile performance against tactical ballistic missiles during the Gulf War places Patriot's effectiveness at 70 percent in Saudi Arabia, where it was employed in point defense, and at 40 percent in Israel, where it was assigned an area defense mission that exceeded the system's operational design parameters.

William H. Swanson, Raytheon senior vice president and Missile Systems Division's general manager, said, "This successful test of the Patriot Multimode Missile is a major milestone in the Patriot growth program and continues the U.S. Army's program to make Patriot 'all it can be.' "

ERINT TEST

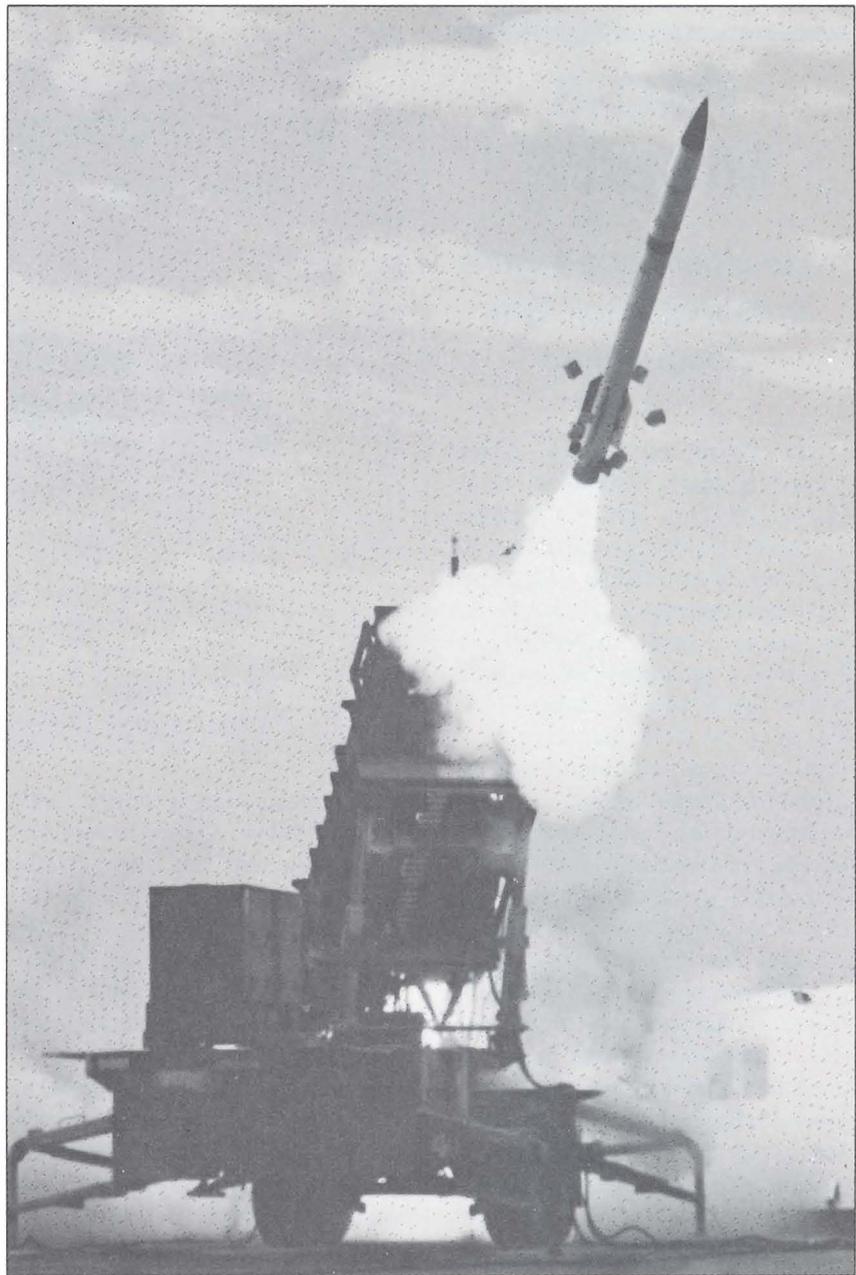
New missile to improve tactical theater missile defense

The U.S. Army Strategic Defense Command and Strategic Defense Initiative Organization conducted a highly successful test firing of an experimental theater missile defense interceptor at White Sands Missile Range, N.M., on June 26.

The Extended Range Interceptor (ERINT), a small, lightweight, guided hit-to-kill missile, successfully completed its first control flight test demonstrating airframe integrity as well as solid rocket motor and autopilot performance.

The June experiment was the first of eight flight tests that the Strategic Defense Command will conduct during the next 12 months to test the ERINT against a variety of ballistic, maneuvering and aircraft-like targets. A second flyout test is on tap for later this summer, followed by guided tests against tactical ballistic missile targets later this year. Subsequent tests against an aircraft-like drone and maneuvering missile targets are planned for 1993.

ERINT is a candidate for integration into the Patriot to enhance its lethality and firepower against the tactical theater missile threat. The ERINT canister will be compatible with the Patriot launcher, but will hold four ERINT missiles instead of one Patriot missile, thus quadrupling the firepower without increasing the force structure. ERINT's advanced on-board radar homing also promises direct body-to-body impact for improved warhead kills. The ERINT



on-board radar is geared to permit terminal homing against targets with low radar cross sections and complex radar signatures at increased ranges.

The U.S. Marine Corps is looking at ERINT as a possible near-term upgrade of the Hawk III air defense system as a way of providing an interim air defense combat capability until

the Corps Surface-to-Air Missiles (Corps SAMs) or Theater High Altitude Area Defense (THAAD) air defense systems now under development become available.

LTV Aerospace & Defense Company, Dallas, Tex., developed the interceptor and fire control system for the ERINT test program.

FORWARD AREA AIR DEFENSE



C³I ON SCHEDULE

*Sensory perception on the way
for ADA's Avengers
and Bradley Stinger Fighting Vehicles*

The Forward Area Air Defense (FAAD) command, control, communications and intelligence (C³I) is on schedule. Fielding to light divisions should begin 4QFY93.

Testing of FAAD C³I began in FY92 and will run through FY93. A highly successful field demonstration of the FAAD C³I software was conducted in the field at Fort Bliss in February 1992. This demonstration used the actual software and hardware planned for fielding to the 7th Infantry Division in 1993.

The Light and Special Division Interim Sensor (LSDIS) contract was awarded in May 1991 to Lockheed Sanders. The LSDIS is a short-range air defense sensor to be fielded as an interim system to meet the Army's need for an alerting radar for light and special divisions and contingency corps ADA battalions. The light-weight, ruggedized, transportable and air droppable sensor provides short-range low-altitude airspace surveillance. It is modular in design and easy to operate and maintain.

The LSDIS detects fixed- and rotary-wing targets and hovering helicopters at reduced ranges, providing ADA weapons early warning and detection of aircraft approaching the maneuver force as well as coverage in airhead/beachhead defense and other contingency operations. It can be employed autonomously in force insertion contingency operations or as part of an integrated air defense on the nonlinear battlefield. Its mobility, simplicity, light weight and ruggedness enhance the capabilities of "ninja scout" teams and air attack artillery units to defeat hostile aircraft.

The LSDIS is undergoing production qualification testing. The first LSDISs were delivered to the U.S. Army Air Defense Artillery School for training purposes in July 1992. The Army currently plans to field the LSDIS to the 2d Infantry Division in Korea during 2QFY93. The 7th Light Infantry Division should begin receiving LSDISs in 4QFY93. Fielding to other light and special division units will stretch through 4QFY94.

Hughes Aircraft Company has won a contract to develop the objective FAAD ground-based sensor (GBS). Hughes will deliver six GBSs for testing to begin in FY94. The Army plans to field GBS to the first heavy division in FY95.

The GBS is the key air surveillance and target acquisition/tracking capability for divisional and corps FAAD weapons. It cues Avengers and Bradley Stinger Fighting Vehicles to hostile and unknown aircraft, protects friendly aircraft from fratricide and provides air situation data to command and control centers. Targets include fixed- and rotary-wing aircraft with growth to cruise missiles and unmanned aerial vehicles. Hughes' FAAD GBS system consists of a rear-based sensor with integrated identification, friend or foe and non-

ADA GETS NEW TOP NCO

cooperative target recognition identification devices, prime mover/power, communications, an operator's remote control unit and FAAD command and control interfaces.

The FAAD GBS can be operated by one soldier and march ordered and emplaced by two soldiers. Highly mobile and reliable, the GBS' electronic countermeasures and anti-radiation missile resistant performance will support both heavy and light forces in contingency and mature theaters.

The first six pre-production GBS units are scheduled for delivery to the Army in October 1993. After technical and operational testing, they will be fielded to the 1st Cavalry Division at Fort Hood, Texas, in late 1994. Low rate initial production of eight sensors will begin in 1994, followed by a Defense Acquisition Board review and full scale production of 140 sensors in 1995.

FAAD GBS' importance increased significantly with the demise of the ADATS program. ADATS' organic radar provided it an autonomous, all-weather surveillance and target acquisition capability.

Now, with ADATS out of the picture, only the FAAD GBS has the range and accuracy, plus electronic countermeasures and anti-radiation missile resistance, to perform this vital mission within the current force structure, throughout the spectrum of conflict in support of light and heavy forces.

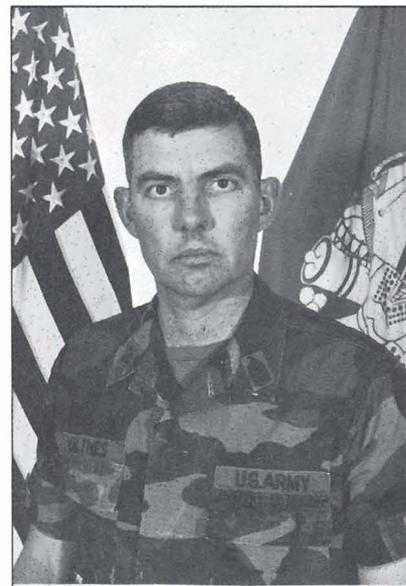
Highly mobile and reliable, FAAD GBS' electronic countermeasures and anti-radiation missile resistant performance will support both heavy and light forces in contingency and mature theaters. FAAD GBS meets today's and tomorrow's Army needs to support light and heavy forces throughout the spectrum of battlefield intensities and contingencies.

CSM James E. Walthes has succeeded CSM Robert W. Harman as Fort Bliss, Texas, command sergeant major and as Air Defense Artillery's top NCO.

The Fort Bliss post command sergeant major fills two positions. As the senior noncommissioned officer on the post, he is the enlisted advisor to the Fort Bliss commanding general. In this capacity he oversees the training, welfare and professional development of more than 19,000 enlisted soldiers assigned to Fort Bliss. Since the Fort Bliss commanding general is also the chief of Air Defense Artillery, the post command sergeant major also serves as the senior NCO of the Air Defense Artillery branch.

Today, Walthes is responsible for policy development regarding training, doctrine and professional development for air defense soldiers worldwide. He directly influences assignments, schooling and promotions for the branch's more than 16,000 enlisted soldiers.

"The only reason I am successful is because I had outstanding noncommissioned officers and officers bring me up through the ranks," Walthes explained. "I had outstanding squad leaders who properly trained me. I had outstanding platoon sergeants who guided me when I was a platoon sergeant, and as a drill sergeant I had an outstanding platoon sergeant who taught me the right things and took me under his arm. I've had outstanding commanders as a command sergeant major who have allowed me to do those things I have been taught you have to do to be a good NCO.



"The Air Defense Artillery branch is a good branch to belong to," he continued. "I want us to be just as competitive, if not more so, than any other branch."

Air Defense soldiers can expect to see a lot of the ADA's top NCO as he settles into his new job. "I like to be out among soldiers, where the rubber meets the road, because that's where you learn a lot of things about what's happening," Walthes said.

When he's visiting units, the commanding general's chief advisor on enlisted affairs and training said he'll be looking to see that training is being conducted properly and that units are meeting standards. He promised to provide soldiers a "good flow of communication" to let them know what the branch is doing and where the branch is heading so that they know what they need to do to prepare themselves for success.

ADA GENERAL TO HEAD SPACE & STRATEGIC DEFENSE

Secretary of Defense Dick Cheney announced in July that Maj. Gen. Donald M. Lionetti has been nominated for promotion to lieutenant general and reassignment as commanding general of the newly created Army Space and Strategic Defense Command (USASSDC).

The new command combines the Strategic Defense Command in Arlington, Va., and Huntsville, Ala., with the Army Space Command in Colorado Springs, Colo. The July announcement said the merger "strengthens the Army's commitment to the ground-based portion of the national missile defense mission."

Lionetti is currently the deputy commander and chief of staff of the U.S. Army Training and Doctrine Command, Fort Monroe, Va. He served as chief of Air Defense Artillery from October 1989 to November 1991.

As USASSDC commander, Lionetti will oversee the Army's missile program, including the Global Protection Against Limited Strikes (GPALS) national missile defense mission as well as theater missile defense, both missions assigned to Air Defense Artillery.

The branch prepared a national missile defense operational requirements document for release in August. The first GPALS ground-based interceptors are scheduled for deployment near Grand Forks, N.D., as early as 1996. Maj. Gen. William S. C. Chen will take over the USASSDC's new GPALS Program Office.



Maj. Gen. Donald M. Lionetti
Commander

**U.S. Army Space
&
Strategic Defense
Command**

ADA OAC

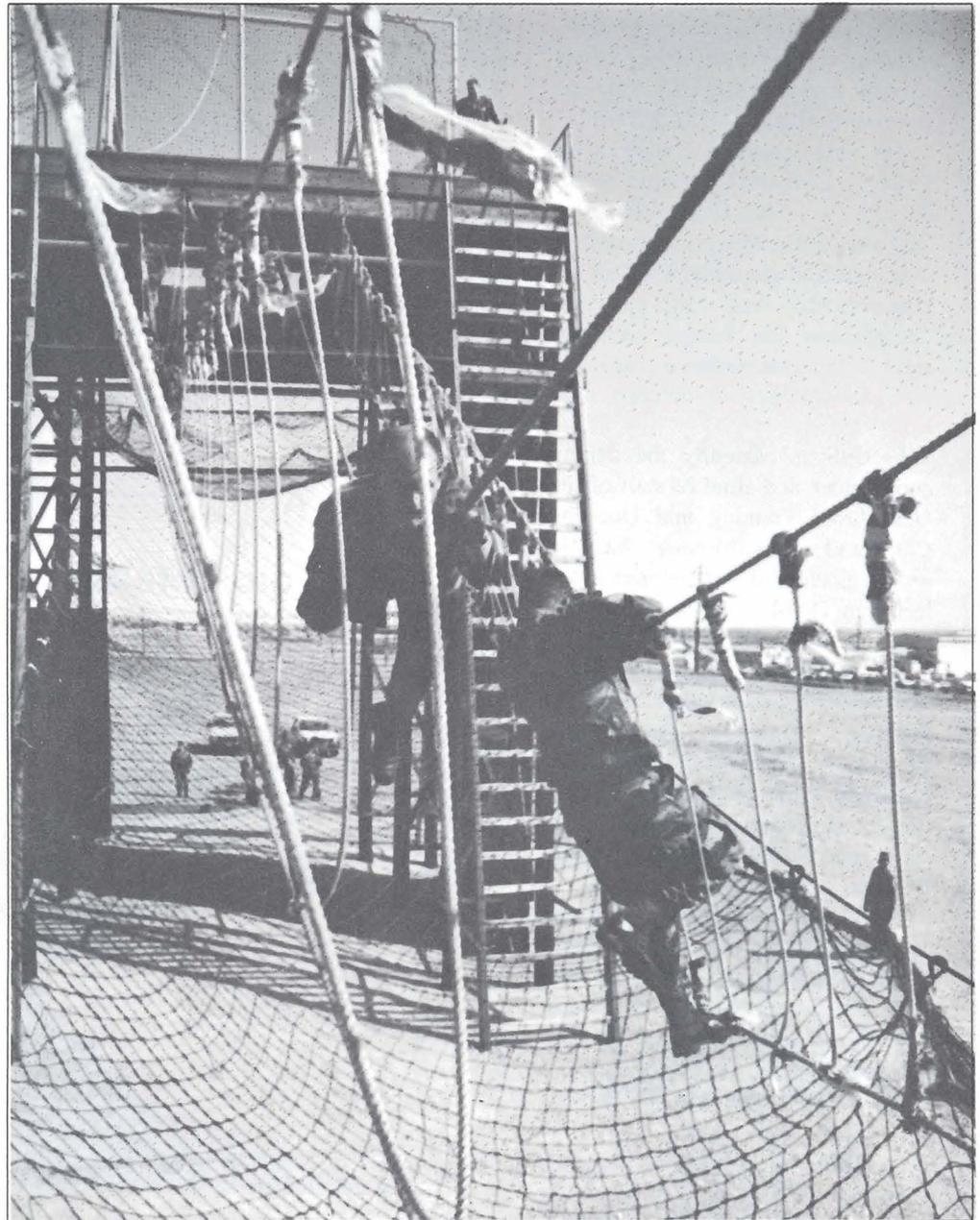
for the 1990s

by Capt. Tim Tritch



A Perfect Officer: He who combines the genius of the general with the patient endurance, both mental and physical, of the private; who inspires confidence in himself and in all under him; who is at all times the gentleman, courteous alike to inferior, equal and superior; who is strong and firm in discipline, without arrogance or harshness, and never too familiar toward subordinates, but to all is the soul of courtesy, kind, considerate and just.

— Alexander Hamilton



The U.S. Army Air Defense Artillery School, Fort Bliss, Texas, restructured the ADA Officer Advanced Course (OAC) in the late 1980s to make battle-focused training and small group instruction the course's defining characteristics. Since that time the course, conducted by the school's Combined Arms and Tactics Department, has earned lavish praise from students and senior Army leaders who welcome graduates to their staffs. A former chief of ADA said the revitalized ADA OAC is producing "a new breed of ADA officers" whose impact on the branch will be far more profound than new weapon system acquisition programs.

Today, the ADA OAC remains a mentally and physically demanding course that challenges first lieutenants and captains to become well-rounded, technically and tactically proficient ADA warriors who can fight any ADA system on the battlefield. It is also a dynamic course with an evolving curriculum that is quick to respond to changes in the global strategic environment, new missions and the advent of new training technology.

The Combined Arms and Tactics Department's four ADA OAC courses per year produce technically and tactically proficient battery commanders of excellence, prepare staff officers and provide officers with the vision of synchronization between Air Defense Artillery and the combined arms team. The current ADA OAC is a 20-week resident course focused on teaching combat fundamentals while preparing students to take command of a battery or to serve as a primary staff officer. The OAC curriculum is laid out to integrate mission essential training throughout the course. It is divided into four blocks: Leadership (9 days); Command and Staff (16 days); Combined Arms, Threat and Weapons (41 days); and Warfighting (34 days).

The Leadership block stresses the fundamentals of leadership in combat. Battalion commanders and command sergeants major from Fort Bliss units conduct seminars with students on officer and noncommissioned officer relationships. Training management instruction incorporates battle-focused training into the Command and Staff block. Instructors stress the fundamentals of FM 25-100 and FM 25-101, focusing on mission essential task list (METL) development.

The staff field exercise (STAFFEX) is an integral portion of the Command and Staff block. Students prepare a unit METL and training guidance for a battalion-size unit based on its and the supported unit's METL.

The Combined Arms block focuses on AirLand Battle and/or AirLand Operations and threat analysis. Students learn to apply doctrine at all levels. Threat analysis includes briefings on regional threats and a week of training on intelligence preparation of the battlefield (IPB), culminating in a practical exercise. "Weapons Week" training on weapons capabilities and employment guidelines improves the students' knowledge of all ADA weapon systems.

The Warfighting block allows students to "put it all together" by applying leadership, staff and combined arms and weapons skills in a 34-day STAFFEX. Using the U.S. Army Training and Doctrine Command's common teaching scenario, students "fight" air defense units ranging from an ADA platoon to a corps ADA brigade. During this block, the students learn to interact as a staff, use the estimate process and use IPB as a basis for course of action development. The Maneuver Control System (MCS) is incorporated into the training to give students a chance to work with fielded technology. The Brigade Battle Simulation rounds out the Warfighting block.

Neither academic nor physical training at the ADA OAC is easy. Students participate in a rigorous physical training program. The goal is to produce well-rounded, intelligent, physically fit officers who, when they arrive at their next unit, can lead physically as well as mentally. Students conduct physical training five days per week, with emphasis on upper body conditioning and endurance running.

Unlike large group instruction, the small group instruction method builds cohesion, develops esprit and fosters teamwork. This concept helps build cohesive groups and achieves the optimum teacher-student ratio of one instructor-facilitator for about 13 students. The small class size allows each student to enter into or lead discussions and helps the instructor create an atmosphere in which group dynamics play a key role in the successful accomplishment of the group mission. Rather than being told what to

The Army can live on short rations, it can be insufficiently clothed and housed, it can even be poorly armed and equipped, but it is doomed to destruction without the trained and adequate leadership of its officers. An efficient and sufficient corps of officers means the difference between victory and defeat.

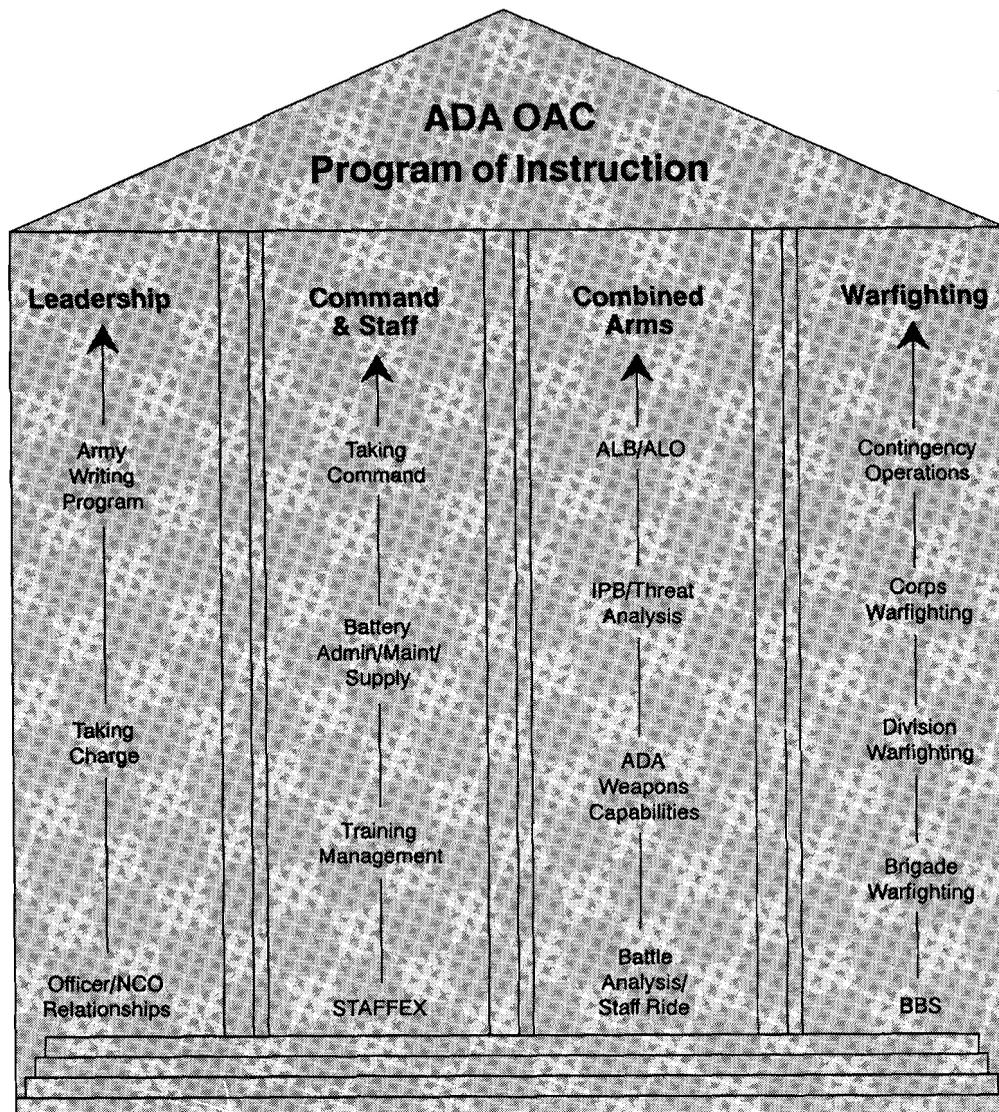
— Gen. Douglas MacArthur

OAC METL

Teach Combat Fundamentals
Teach Battle-Focused Training
Maintain High Academic and
Physical Fitness Standards
Build Cohesive Groups by
Working as a Team
Build on ADA Heritage

Hannibal, Caesar, Hercules, Charlemagne, Richard, Gustavus, Turenne, Frederick, Napoleon, Grant, Lee, Hindenburg, Alleby, Foch and Pershing were deeply imbued with the whole knowledge of war as practiced at their several epochs, but so were many of their defeated opponents; for as has been pointed out, success in war lies not wholly in knowledge. It lurks invisible in that vitalizing spark, intangible, yet as evident as the lightning — the warrior soul.

— Gen. George S. Patton Jr.



think, students learn how to think and reason their way to solutions.

Throughout the course, students have a chance to build on their ADA heritage. Professional reading broadens their knowledge of military history, and the course challenges them to apply lessons drawn from historical vignettes during classroom instruction.

The Army Writing Program requires each student to prepare a manuscript worthy of publication in professional military journals. Since the topics, while focusing on ADA contributions, range the entire spectrum of military history, the program increases the students' historical perspective and, at the same time, improves their writing skills.

Future Vision

The size and shape of our Army is changing rapidly. We need to keep pace with the rapid changes in tactics and doctrine. The next generation of officers must be able to fight in tomorrow's smarter, lighter, leaner force. We need thinkers and executors. Our vision for tomorrow's officer is to produce ADA warrior-officers who are well-rounded, highly trained, computer literate, physically fit and capable of fighting any ADA system on the battlefield. Some of the future has just arrived, and some of it is just around the corner.

ADA OAC Class 2-92 recently completed the first Mud Soldier Competition in June. The Mud Soldier Competition was con-

ceived by Capt. John Rossi, commander of C Battery, 1-6 ADA (OAC), as a six-event, team-building competition for the OAC small groups. The events consist of a five-mile run through El Paso's rugged McKelligon Canyon, a 12-mile foot march with rucksack, day and night land navigation competition, a common task training test, team sports events and a final examination. These events, combined with Army Physical Fitness Test scores, are the basis for each small group's score.

Automation plays a big role in ADA OAC now and will play an even bigger role in the future. The future of communications relies on fast, reliable data transmission from various sources on the battlefield. Computers, such as the MCS, provide this necessary advantage. According to Maj. Armando Macias, operations officer for the 69th ADA Brigade in Germany, MCS is "driving the train" in table of organization and equipment units throughout U.S. Army-Europe. ADA OAC currently provides a four-hour block of instruction to familiarize students with the MCS. Plans are to expand the number of hours to increase student computer literacy. The ADA OAC staff is working hard to make computers and software available for student use. The desired end state is a computer lab open 24 hours a day with laptop computers available for checkout.

Additional software for incorporation into the ADA OAC environment includes the Standard Army Training System, which greatly enhances training, and the Air Load Planning System, which reinforces the critical aircraft loading skills all tactical-level planners need. These software programs reinforce our mission essential tasks and improve our ability to work as a combined arms team. The course already includes one hour of training on the Unit Level Logistics System. Future programs of instruction will increase the number of instruction hours.

The Brigade Battle Simulation is a computer simulation that permits students to gain combined arms experience by fighting brigade- and battalion-size maneuver units. The BBS is used in conjunction with the MCS. While the BBS provides realistic training, it does not allow players to control ADA assets above battalion level. Thus, exercise play is somewhat limited. But the new

JANUS system, scheduled for incorporation in 1994, will allow ADA play above battalion level, including Army airspace command and control (A²C²) at all echelons.

Future ADA OAC field training exercises will incorporate Roving Sands into the ADA OAC curriculum. Roving Sands, which integrates A²C², maneuver units and live fire for Hawk, Patriot and Stinger weapons, will add excitement and realism and allow students to "get down and dirty" with ADA systems. Since Roving Sands takes place each spring at Fort Bliss, two of the four classes will participate each year.

The reserve component, a key player in military readiness, must be fully integrated to function as a member of the combined arms team. Reserve component officers previously instructed reserve component ADA OAC. However, in FY93, the school will assume the full-time mission to provide the reserve component ADA OAC curriculum and instruction to reserve component officers. The Senior Leader Division's OAC Branch recently modified the current program of instruction to accommodate reserve component officers in preparation for this future mission.

A Matter of Time

The continuing focus of the ADA OAC will be to further professional development and well-roundedness of every officer. In light of the shrinking defense budget, we must find new and better ways to train more efficiently. The OAC staff is working hard to integrate improvements mentioned in this article. Since courses like the OAC continue to enjoy a high priority despite the draw-down, it is hoped that it will be just a matter of time before our plans to improve ADA OAC are realized.

A future fraught with uncertainty demands the best officers we can produce. Let there be no doubt, the OAC will continue to challenge ADA officers to attain new peaks of professional excellence. At a time when we have to do more with less, the Army deserves no less.

Capt. Tim Tritch is an Officer Advanced Course small group instructor.

That a man shall serve his country in time of war is noble, brave and patriotic; but that a man shall properly prepare himself in time of peace to serve in war is all of these things and more. It is noble with nobility that is real, not show. It is brave with a bravery which assumes in time of unemotional peace many burdens; not the least among them that of bearing the lack of appreciation of those who do not consider preparedness or training necessary. It is patriotic with a patriotism more impelling than the fires which burned in the breast of Leonidas at Thermopylae.

*— Third Coast Artillery
District Bulletin, 1937*

Corregidor

and the

60th Coast Artillery

by Lt. Col. Frank J. Caravella

The flag of Corregidor drew the figurative eyes of the world upon it. For long anxious months it was the focus of their attention, for whether Allied or Axis, friend or foe, all nations still paid tribute to a historic defense in the making.

— Coast Artillery Journal
May 1942

Corregidor, P.I. — That world captivating phrase, "London can take it," most definitely covers also the defenders of this fortress in Manila Bay.

Not only can these American and Filipino soldiers take it, but they have poured it back at the Japanese air force during almost constant raids the last three days and nights. The deadly fire of Corregidor's anti-aircraft guns, including the famed 60th Coast Artillery, have caused enemy pilots to climb higher and higher as their respect increased for the ability of these gunners.

— Dean Schedler
AP war correspondent



Dec. 29, 1941 — Sergeant Swanson briefed his crew in the gunpit. "Remember, you guys, what I taught you." He pointed his arm into the sky. "Read the signs of an air attack and you'll be OK."

It was a hot, beautiful day. The sky was clear and blue all the way to the heavens, and the sea lapped the shoreline below. It wasn't the thought of a swim that caused Bressi to daydream — in any case, he was frightened stiff of sharks — rather it was the convoy that was rumored already on its way to the rescue. Was that haze on the horizon or the funnel of smoke of many ships?

"What does that mean, Bressi? the sergeant asked, catching the young soldier gazing out over the sea.

"Watch the gun barrel, Sergeant," he replied promptly. You won't catch me like that, he thought.

"Right, Bressi," the sergeant said. "If the barrel rolls in elevation, don't traverse right or left, but stays on a steady line, then we've got trouble with that incoming flight. It's a zero-zero approach." Even Bressi listened carefully to the words of wisdom as the sergeant described their nightmare, a bomber flight that had their battery as a target.

"Even if it's a zero-zero approach, you still man the gun and get off the six rounds for the box barrage, no matter what!" he emphasized. "On my word of command, and only then, do you hit the deck, fast! But don't look so worried fellas," he concluded. "A gun position is so small that the statistical odds on us getting hit, even by fragments, are minute."

Sergeant Swanson dismissed the men, and they picked up their mess cans and trooped the short distance down the hill to the battery headquarters and the chow line that was already forming. Bressi looked out over the sea again; it was heat haze after all. But they all knew that a convoy was on its way. The San Francisco station had broadcast the news only the night before. The soldiers had made scant progress toward the steaming cauldrons of stew when the air raid alarms sounded.

"If this is another damn exercise, I'll [expletive] resign," panted Bressi as he pounded up the hill to the gun.

It was no exercise. Eighteen twin-engined Japanese Navy bombers of the 14th Heavy Bombardment Regiment had the privilege of opening the air war on Corregidor. At a height of 18,000 feet, they pounded the headquarters and barracks of Middleside with 550-pound bombs.

Half an hour later Japanese Army bombers put in their appearance. Twenty-two Bettys smothered Topside in high explosives while 18 dive bombers of the 16th Light Bombardment Regiment, screaming down below 2,000 feet, dropped their bombs on selected targets. They ran into a steel wall of .50-caliber rounds that sent four of them corkscrewing into the ground. The Japanese did not risk dive bombers again over Corregidor for many a day.

At 1300 the Japanese Navy returned and 60 Nells continued the bombardment. There were no pursuit planes to contest the sky so the whole weight of the island defense fell to the antiaircraft gunners. Bressi and the others sweated away, stripped to the waist, replenishing the ready-use ammunition trays beside the gun. Throughout the raid he kept a wary eye on the barrel, and three times the crew ran for cover. In what proved to be the last Japanese sortie, the bombers passed over the tip of Bataan and wheeled high over the North Channel. Once again it was the turn of Topside.

"Zero-zero approach!" Swanson yelled suddenly between the sharp, earsplitting barks of the gun.

The crew fired their six rounds at the incoming flight in record time, and Swanson yelled, "Hit the deck!"

Bressi moved about 20 yards out of the pit and threw himself behind some crates as the whistle of the falling salvo blotted out his senses. The ground heaved and buckled beneath him; he listened to the "whang" of the shrapnel immediately followed by the heavier rattle of cascading debris. Bressi lay there momentarily stunned until a cry jerked him back to reality.

"Swanson's hit!"

He looked up and saw the sergeant sprawled motionless across the entrance to the gunpit. Bressi crawled across and, with the other members of the gun crew, watched his gun captain die. A single bomb fragment had caught him under the jaw.

They called for a medic, but there was nothing anyone could do. Bressi bent low over the prostrate sergeant. All he could see was a mark under the chin and the jugular vein turning blue and then black. The sergeant, paralyzed with shock, died within a couple of minutes. It was the battery's first battle casualty. The fact that it was the popular Swanson caused a particular sadness and sense of loss among the men. The man they had placed their trust in, the seemingly indestructible Swanson, was dead. What chance did they have?



Corregidor, P.I. — Corregidor's accurate antiaircraft guns shot down 12 Japanese planes in the last week, making a total of 66 bagged by the island fortress' guns since the start of the war. The figures are taken from the scoreboard which lists only confirmed losses inflicted on the enemy.

— Dean Schedler
AP war correspondent

Intrinsically Corregidor is but a barren war-worn rock, hallowed as some other places by death and disaster. Yet it symbolizes within itself that priceless, deathless thing, the honor of a nation. Until we lift our flag from its dust, we stand unredeemed before mankind. Until we claim again the ghastly remnants of its last gaunt garrison, we can but stand, humble supplicants, before almighty God. There lies our Holy Grail.

— Gen. Douglas MacArthur
May 6, 1943

During Corregidor's and the 60th Coast Artillery's two-hour baptism by fire, 81 medium and 18 dive bombers dropped more than 60 tons of bombs on the fortress. Damage to the surface structures was considerable: the barracks and wooden buildings were destroyed and the electric railroad track was shattered in a dozen places. There were some 20 dead and 80 wounded among the garrison. The Japanese, however, had not gotten away completely unscathed. Besides the dive bombers that fell to the .50-caliber guns, the heavier guns put up a lethal barrage. Communications at the end of the day claimed that 13 Japanese bombers had been destroyed.

The defense of Corregidor is a story of brave men and big guns. Huge artillery pieces set in reinforced concrete emplacements, antiaircraft batteries, .50-caliber machine guns and vital searchlights were the primary defense of the islands. Battles generally involved strategic maneuvers, troop advancements, reinforcements and all the

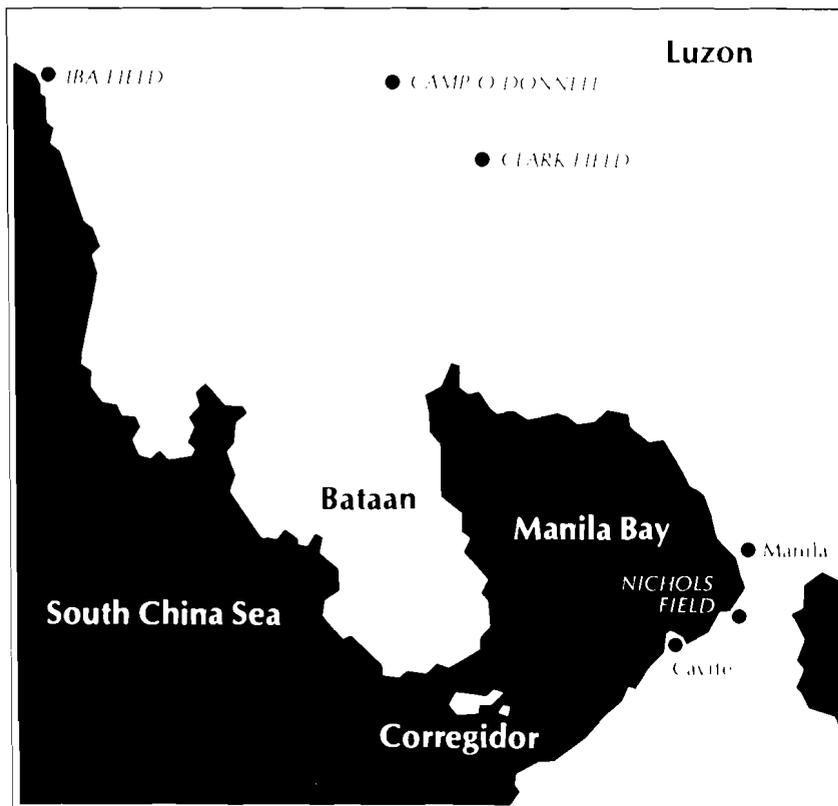
other complicated technical details. Not so for Corregidor. The order was to hold — at whatever the cost, delay the enemy as long as possible — while the military powers plotted the course of the war in the Philippines and in the entire Pacific. Hold — with inadequate ammunition and outdated artillery pieces. Without air cover and with little or no hope of help ever reaching them, these brave men, Filipinos and Americans, from all branches of service followed their orders — and for what they lacked in modern equipment and supplies, they made up for in bravery, nerve and just plain "guts." Men remained at their posts while shells dropped on and around them. They dug in, determined to extract a deadly price from the enemy for this small piece of real estate.

December 8, 1941

At 0340 the first word of the attack on Pearl Harbor reached Corregidor. At 0620 MacArthur's headquarters issued the notification that an official state of war existed between the United States and Japan. The officers and men of Corregidor, serving under Maj. Gen. George F. Moore, commander of the Harbor Defenses with headquarters on the island, waited anxiously to get a shot at the invaders. The first air raid alarm sounded over Corregidor at about 1000 that same day. But the Japanese did not attack, nor did they have any intention of doing so in the first days of the war. They fully appreciated the strategic significance of the island and they had no intention of bypassing the fortress, but their first task was to sieze Manila and defeat MacArthur's Army. The conquest of Corregidor would follow in due time.

Corregidor was temporarily spared, but not so Clark Field 60 miles north of Manila. Air defense, if Corregidor was to hold against the enemy for any length of time, was vital and this support was expected to come from Clark Field. Fully aware that an attack on Clark Field was imminent, the pilots kept the planes in the air all morning, but had come in for landings at noon to have lunch and refuel. Lined up in perfect formation the planes made an ideal target for the Japanese bombers that hit the airfield at 1245. The devastating toll from this first attack was 45 fighting and bombing aircraft destroyed at Clark Field, six planes at Ni-

Corregidor's big guns continued to block entry into Manila Bay following the fall of Bataan.



chols Field and the loss of 20 planes that were in for repair and maintenance. With no facilities for dispersal of aircraft after the intense bombing and strafing of the few days of attacks, the results were disastrous: a tremendous loss of men and planes and Corregidor and Bataan left completely without air cover. In a matter of days, the U.S. Army Air Corps in the Philippines was destroyed.

During this time, the 60th Coast Artillery, Antiaircraft Regiment, on the island of Corregidor readied themselves for battle. Enemy bomber flights would pass over the island returning to the Japanese bases after their bombing missions over Clark Field. Battery commanders, who could no longer contain their enthusiasm, fired on the flights at maximum fuze range — but to no effect. In subsequent days, before the actual bombing of Corregidor, other flights came by from Clark and Nichols Field operations and were again fired upon. But the results were the same. The planes stayed at a safe distance.

The 60th Coast Artillery, assigned the mission of defending Corregidor from air attack, was a formidable organization with 72 officers and 1,896 enlisted personnel. Sixty-five civilians were also present to support unit operations and sustainment. These civilians assisted greatly given the fact that all weapons systems were of World War I vintage.

The antiaircraft equipment consisted of three-inch guns with a vertical range of 27,000 and 32,000 feet (depending on the type of ammunition used), .50-caliber machine guns and 60-inch Sperry searchlights. Another battery of three-inchers was initially emplaced on the southern tip of Bataan to tie in those at Corregidor. Ammunition for all the antiaircraft weapons was less plentiful than that for the seacoast guns, and there was a critical shortage of mechanically fuzed three-inch high-explosive shells.

The combat history of the 60th Coast Artillery can be well defined in three distinct phases that parallel the fighting on Corregidor in 1942. The first aerial attacks occurred in late December 1941 and early January 1942. The second series of attacks corresponded with the arrival of Japanese aerial reinforcements to the theater in late March and early April 1942. The third and final

phase lasted for 27 days. It began with the fall of Bataan on April 9, 1942 and ended with Corregidor's surrender on May 6, 1942. During each phase, the 60th Coast Artillery performed magnificently. However, the three distinct phases placed significantly different demands on the unit and each deserves a separate discussion.

The First Aerial Bombardment

On Dec. 28, 1941, Lt. Gen. Masaharu Homma, commander of the Japanese theater forces, ordered his 5th Air Group to begin operations against Corregidor. In agreement with the Navy, his plan was to strike the island with their entire strength for a battle of two and a half hours that would, he believed, "destroy the center of the Far East Command." The first attack came on schedule and Corregidor faced what has been described as its worst one-day bombing and strafing.

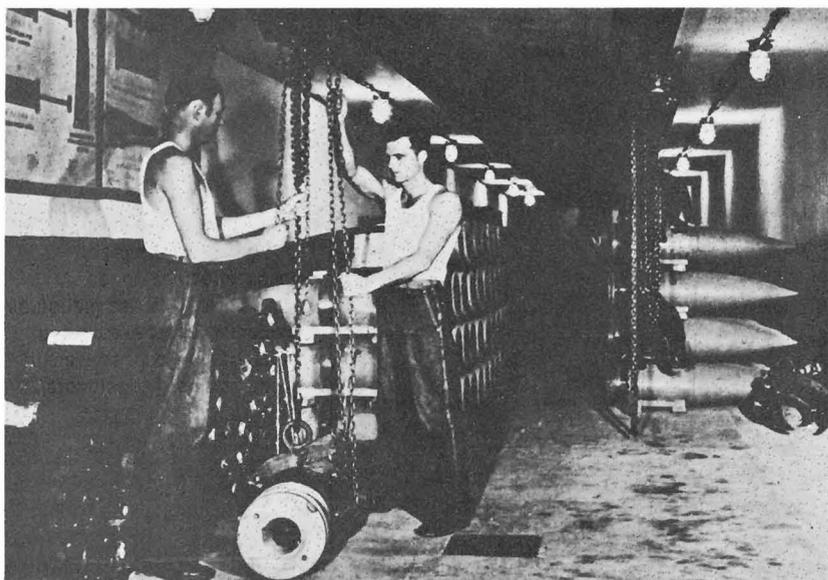
1145 — Twelve twin-engined bombers, protected by 19 fighters, covered the island for 30 minutes and dropped nearly 50 bombs.

Gen. MacArthur and Philippines President Manuel Quezon were evacuated to Australia.



Corregidor, P.I. — The 60th Coast Artillery antiaircraft units are over-careful in crediting the batteries with hits and with recording planes actually downed. Planes are marked as down only after this has been confirmed by observation. Many times bursts of antiaircraft fire and tight formations of enemy planes are seen to shake up the planes, causing some to veer from their course, trailing smoke as far as they can be seen. But unless such a plane is seen actually to come down, it is marked up as a "probable" loss to the enemy.

— *Dean Schedler*
AP war correspondent



Chain hoists moved shells from underground magazines to gun emplacements on the surface.

The enemy air force attacking the island was composed of at least 60 bombers. There was no material damage to installations on the island. Our casualties resulting from this attack were 13 killed and 35 wounded. At least three enemy planes were shot down by anti-aircraft fire.

— *Communique No. 43*
Jan. 3, 1942

Corregidor needs no comment from me. It has sounded its own story at the mouth of its guns. It has scrolled its own epitaph on enemy tablets. But through the bloody haze of its last reverberating shot, I shall always seem to see a vision of grim, gaunt, ghastly men, still unafraid.

— *Gen. Douglas MacArthur*

1230 — Twenty-two bombers and 12 dive bombers followed the same pattern as the first flight, dropping their loads on Topside and Bottomside. This wave dropped approximately 66 2,000-pound bombs with smaller ones pouring from the dive bombers.

1300 — Sixty Navy bombers concentrated their attack on the shipping in the harbor areas.

Americans estimated that a total of 160 tons of bombs fell on Corregidor during the first three hours of bombing. None of the few remaining defense planes rose from the fighter field on Bataan, and no one questioned the Japanese supremacy of the air on this day or during any of the following attacks. It was with great satisfaction, however, that Capt. Roland G. Ames, commander of C (Chicago) Battery, 60th Coast Artillery (AA), wrote after the attack that his men "had performed wonderfully" in their first encounter with the enemy and had brought down at least three Japanese planes.

For the next eight days the Japanese continued to bomb Corregidor intermittently, with less and less effect and at greater cost to themselves. Their daily pattern was usually the same. During the morning a lone reconnaissance plane would encircle Corregidor for a time and then return to base. At about 1230 the bombers would fly in at an altitude well above 20,000 feet, bomb the island for

approximately two hours and then fly off. Until the last day, they approached the target from the same direction in a large V formation, then broke up into smaller formations for the run over the island. Only at the end did the Japanese abandon this irregular formation and approach the target from different directions in scattered formations and at varying altitudes.

The six days of bombing wrought extensive damage. By Jan. 7 practically all unprotected surface installations had disappeared or were in ruins. Bomb craters were uniformly scattered over the island and one could hardly walk more than 25 yards in any direction without stumbling into one. However, the armament of the island suffered comparatively light damage. The coastal batteries with their magazines and power plants had been bombproofed before the war and escaped almost unscathed. The more exposed 60th Coast Artillery anti-aircraft units suffered more from the bombings, but such damage was usually repaired within 12 hours. The gun crews suffered some casualties, but none serious enough to interfere with operations.

The air attacks against Corregidor ended on Jan. 6, the day the Bataan campaign opened. The attacks proved costly to the Japanese and produced no decisive military results. Except for sporadic raids by three or four planes and occasional dive bombing and strafing, the first aerial bombardment was over.

The Second Aerial Bombardment

By mid to late March, the Japanese theater commander was reinforced with additional air power to complete the conquest of the Philippines. The plan for the final assault against the defenders of Bataan provided for heavy artillery and aerial preparation, starting on March 24, and continuing until victory was achieved. To the air forces, a three-fold mission was assigned: support the advance of ground units, bomb forward and rear installations and cut the supply line between Bataan and Corregidor. Most aircraft were given targets on Bataan, but additional targets were designated on Corregidor. Priority remained with Bataan, but a small number of planes would bomb Corregidor around the clock.

The enemy air attack resumed intensity on March 24 with 54 aircraft attacking at altitudes between 27,000 and 31,000 feet. Only two of the antiaircraft batteries were able to reach the formations. The significance of this second series of aerial attacks relates to Japanese tactics. According to Ames, they flew higher in formations of nine planes or less. During the daylight they made their bombing runs out of the sun, changing course and altitude immediately after the moment of bomb release.

Earlier the antiaircraft gun batteries had been able to get in about 10 salvos before the Japanese flew out of range, usually bringing down the lead aircraft in the formation. When the enemy changed its tactics, the antiaircraft guns could get in fewer salvos and could no longer count on the lead plane maintaining the same course.

Under ideal conditions antiaircraft guns form a ring around the defended area, or a line in front of it, from where they can strike enemy aircraft before they reach the objective. On Corregidor, this was not possible. The antiaircraft guns could not engage the enemy until enemy aircraft were almost over the island. Moreover, by being located on the target, they became part of what was being bombed, resulting in limited efficiency and freedom at the moment of greatest need.

"Naturally our job is to fire on the bombers," wrote Ames, "... and if possible prevent the bombings. Fire we do, but prevent the bombing we cannot." In a letter that never reached his wife, he graphically explained the difficulties that beset all the antiaircraft artillerymen.

"The bombers come over; we see them drop their bombs — all the while we are tracking them with our instruments — our guns point upward more and more steeply; the bombs continue downward on their way toward us. Then our indicators show that the bombers are 'in range.' We open fire. In about 15 seconds our guns are pointing as nearly straight up as they can, and hit the mechanical stop. We cease firing. The bombs whistle; we duck for a few seconds while the bombs burst, and pop up again to engage the next flight. When fighters come in one after another we stay up while the bombs hit all around us



Malinta Tunnel served as Corregidor's command center and as a makeshift field hospital.

"Some of the bombers come in higher than we can shoot. In such cases we vainly wait for our indicators to show 'in range,' and take cover just as the bombs begin to whistle."

The most serious limitations on the effectiveness of the three-inch guns arose from the shortage of mechanically fuze ammunition, which could reach a height of 30,000 feet. There was an adequate supply of powder train fuze ammunition, effective to a height of about 24,000 feet. There was

Constant exposure to gunfire, destruction and death altered our sense of values drastically. We asked only to live from day to day. A full meal, a bath, a chance to sleep under a bombproof roof — these were the essentials.

— Corregidor survivor

With broken heart and head bowed in sadness but not in shame, I report to Your Excellency that today I must arrange terms for the surrender of the fortified islands in Manila Bay.

— Gen. Jonathan Wainwright
Cable to President Roosevelt



I have fought for you to the best of my ability from Lingayen Gulf to Bataan to Corregidor. Goodbye General.

— Gen. Jonathan Wainwright
Message to Gen. MacArthur

enough of the longer range ammunition to equip only one of the 10 anti-aircraft batteries. On Feb. 3 a submarine brought in 2,750 more rounds of the mechanically fuzed ammunition, and it became possible to supply an additional battery. Thus when the enemy planes came in at an altitude of greater than 24,000 feet, only two batteries could reach them. Nonetheless, the contributions of the other eight batteries were invaluable. By forcing the enemy to remain at an extremely high altitude, they decreased the bombing accuracy and diminished the effectiveness of the air attack.

With the second aerial bombardment of Corregidor the Japanese, for the first time, resorted to night bombing. During this period they made 23 such attacks, delivered by small groups of bombers from an altitude of 24,000 to 27,000 feet. In almost every case the searchlight batteries illuminated the planes before they reached the bomb release line. Many of the pilots seemed confused by the lights and turned away to approach from another direction; others jettisoned their bombs or abandoned the attack altogether. On the whole the night attacks proved ineffective and were discontinued after April 6.

On April Fool's Day, 1942, Corregidor faced its 116th bombing raid. Two Japanese bombers came down in flames; the rest turned and fled without completing their mission. Wainwright marveled at the incredible feats being performed with the antiquated equipment of the anti-aircraft units. The day before, one battery had made a one-round bull's eye and another had brought down two bombers with four shells.

By the beginning of April, the aerial bombardment was virtually over. Little additional damage had been received and compara-

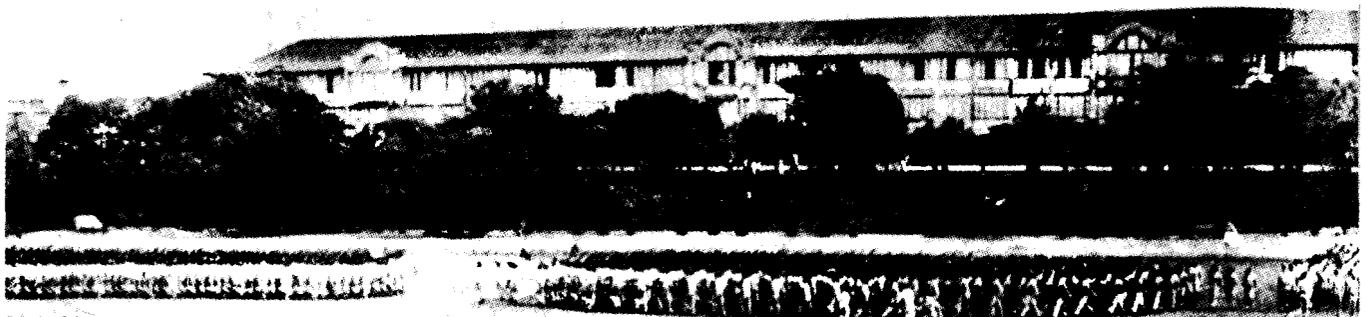
tively few casualties had been suffered by the men who had two months to prepare. All eyes turned toward Bataan, upon which the Japanese had concentrated their entire air and artillery strength in preparation for the final assault. For the next 10 days, while the fight for Bataan ran its grim course to a bloody and tragic end, the men were granted a brief respite. Their turn, they knew, would soon come.

Third Aerial Bombardment and Siege

Following the capture of Bataan on April 9, the final 27-day siege of Corregidor commenced. The Japanese had not anticipated a stand of any consequence on the island once Bataan had fallen. They had planned on capitulation either at the same time or within a few hours. However, those events failed to unfold. To cover their frustration, the Japanese prepared for an attack with everything that could shoot. They began emplacing additional artillery units on the enfilades and slopes of Mt. Mariveles on the peninsula. With a smaller area upon which to concentrate their fire and with complete control of the air, the Japanese decidedly had the upper hand.

Japanese aircraft, lacking targets on Bataan, turned their attention to Corregidor. At about the same time that the 75mm guns commenced firing, high altitude bombers on April 9 made their first attack on the island since the end of March. Between 1630 and 2030, the 22nd Air Brigade sent 44 light and 35 heavy bombers against Corregidor with ineffective results.

In the days that followed the Japanese brought up their heavier guns in preparation for more intense bombardment. By April 12 many of the Japanese batteries were in posi-



tion, and at 0600 that day the bombardment of Corregidor began in earnest. Japanese aircraft made nine separate attacks against the island that day.

During the next week the tempo of the Japanese bombardment increased steadily. The shelling never really stopped. With over 100 artillery pieces ranging in size from 75mm guns to 240mm howitzers, the Japanese were able to fire almost steadily. They destroyed gun emplacements, shelters, beach defenses and buildings at a rate that made repair or replacement impossible.

Air attacks usually accompanied the shelling. Between April 9 and the end of the month there were 108 air alarms, totaling almost 80 hours. Practically all the attacks were directed at Corregidor. At first the planes came in at high altitude, over 20,000 feet and beyond the range of all but two of the antiaircraft batteries. But as the days passed and damage to equipment and installations mounted, the Japanese pilots became bolder. They came in at lower altitudes and bombed more accurately. It became more and more difficult for the antiaircraft artillerymen to keep their guns and height finders serviceable. During some periods only one height finder was in operation, and the altitude of attacking aircraft was relayed via telephone to all antiaircraft batteries.

There were moments of heroism during this time. On April 16, four men of B Battery, 60th Coast Artillery (AA), Capt. Arthur E. Huff and three volunteers, earned Silver Stars when they left shelter during an intense bombardment to raise the American flag. A shell fragment had struck the 100-foot flagpole on the Topside parade ground and severed the halyard. Before the flag reached the ground the four men gathered it into their

arms, quickly repaired the halyard, raised the flag and ran back to shelter.

The month's air and artillery attacks reached their height on April 29, Emperor Hirohito's birthday. The day began with an 0730 air alarm, the 260th of the campaign, when two flights of bombers and three dive bombers hit Corregidor. Concurrently, Japanese artillery on Bataan opened up. About a half hour later six more planes dropped their loads on Malinta Hill while the artillery concentrated on other targets. After a brief lull Japanese aircraft came over the island again while artillery registered targets on Middle-side. The attacks continued unabated throughout the day, and by evening large sections of Corregidor lay shrouded under a dense cloud of dust and smoke.

All of the north shore batteries and antiaircraft guns were knocked out by April 31. Enemy planes carried on saturation bombing while the artillery concentrated on point targets.

At the beginning of May, Japanese artillery and aircraft opened the final phase of the bombardment. Little of the 60th Coast Artillery (AA) equipment was operational so little air defense could be provided. At 1515, May 1, the 274th air alarm sounded and eight bombers dropped their loads before the entrances to Malinta Tunnel. That night when Lt. Col. Earl L. Barr, executive officer of the 60th Coast Artillery (AA), returned to Malinta Tunnel from a visit to an antiaircraft battery, he encountered a "morgue-like gloom."

On Sunday, May 3, there were five air raid alarms during the day. The enemy aircraft

Everyone is bawling like a baby. They are piling dead and wounded in the tunnel . . . The jig is up.

— Cpl. Irving Strobing
In the last message tapped out from Malinta tunnel

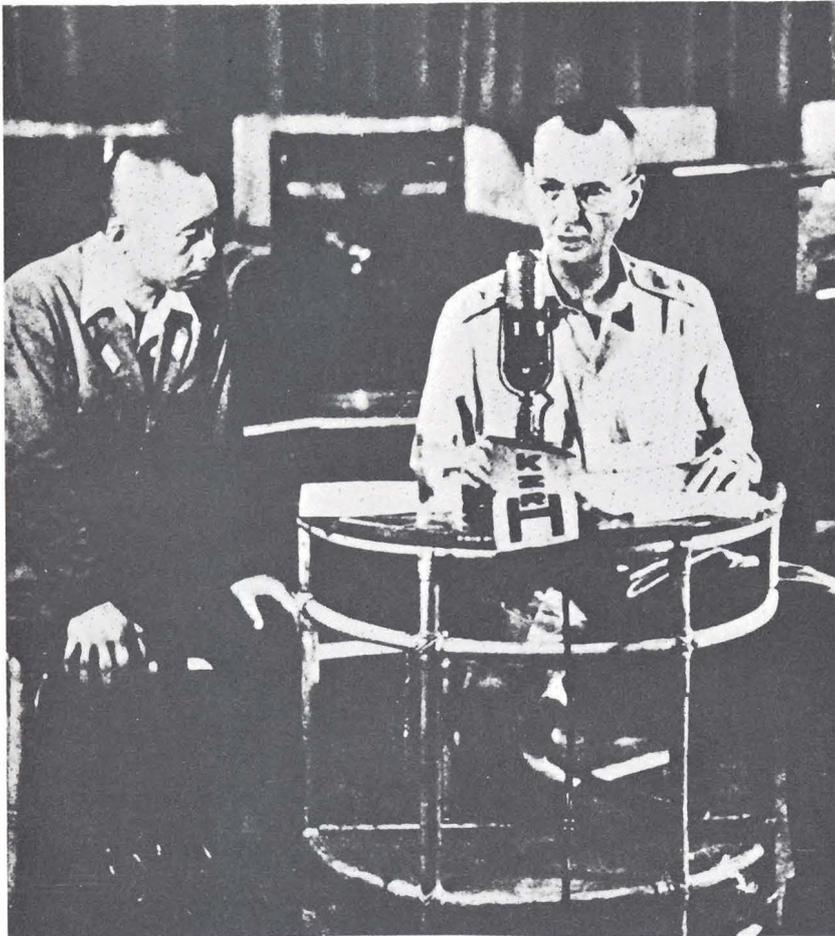


I was the leader of that lost cause, and from the bottom of a seared and stricken heart I pray that a merciful God may not delay too long their redemption, that the day of salvation be not so far removed that they perish, that it be not again too late.

— Gen. Douglas MacArthur

Corregidor's Topside Barracks before (opposite page) and after the war.





Gen. Wainwright broadcasts a surrender order following the fall of Corregidor.

For heroes have the whole earth for their tomb; and in lands far from their own, where the column with its epitaph declares it, there is enshrined in every breast a record unwritten with no tablet to preserve it, except that of the heart. These take as your model, and judging happiness to be the fruit of freedom, and freedom of valor, never decline the dangers of war.

— *Pericles*

met no fire from the antiaircraft batteries, whose guns and height finders had already been damaged or destroyed.

“Situation here is fast becoming desperate,” Maj. Gen. Jonathan M. Wainwright reported to Gen. Douglas MacArthur at the end of the day.

The intensity of the air and artillery bombardment reached a new peak on May 4. The bombardment of the 5th destroyed the little that was left to stop a Japanese assault. Beach defenses on the north side of the island were practically nonexistent.

Men were living on nerve alone, and morale was dropping rapidly. All hope of reinforcements had long disappeared. There was only enough water to last four more days. There was a limit to human endurance and that limit, Wainwright told the President, “has long since passed.”

On the basis of the estimate of the situation, Wainwright at 1000 decided to sacrifice one day of freedom in exchange for several thousand lives and surrendered. Wainwright had concluded that there was nothing to be gained by further resistance.

Summary

Prior to the war, the *Coast Artillery Journal* published a “News and Comments” section that featured one-page reports from Coast Artillery garrisons around the world. After Wainwright’s surrender, there were, of course, no more bimonthly submissions forthcoming from Corregidor, but the editors didn’t abandon the Corregidor page. Instead they continued, throughout the war years, to reprint the Corregidor column that had appeared in the November-December 1941 edition. Across the page, in bold lettering, they splashed MacArthur’s famous vow: **I shall return!**

Generations of Americans “remembered the Alamo” or “remembered the Maine.” The generation of the 1940s “remembered Corregidor.” It was a covenant struck between the nation and the ragged remnants of an army clinging precariously but tenaciously to life in Japanese prisoner of war camps.

Members of the 60th Coast Artillery (AA) should be proud of their performance in the Corregidor campaign. They performed superhuman feats under treacherous fighting conditions. Their “never say quit” attitude contributed significantly to American efforts to delay the Japanese. The Japanese air command paid a heavy toll for their victory.

On this 50th anniversary of the Corregidor campaign, we remember the warriors of the 60th Coast Artillery, Antiaircraft Regiment, with respect and awe. In awe, because of the tortuous conditions they endured while they courageously defended their beleaguered bastion. The men of the 60th Coast Artillery provide a proud legacy for future air defenders to follow.

Lt. Col. Frank J. Caravella, a former professor of geography at West Point, is being reassigned to Fort Bliss, Texas.



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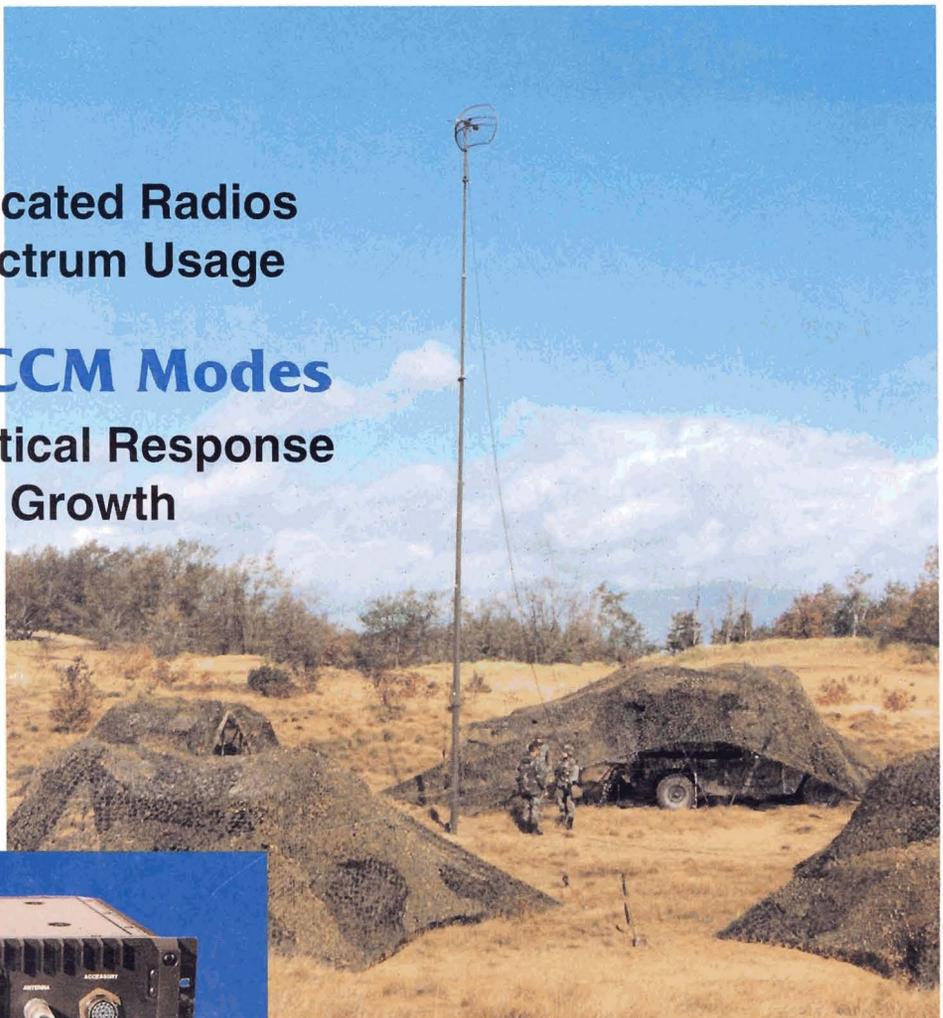
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