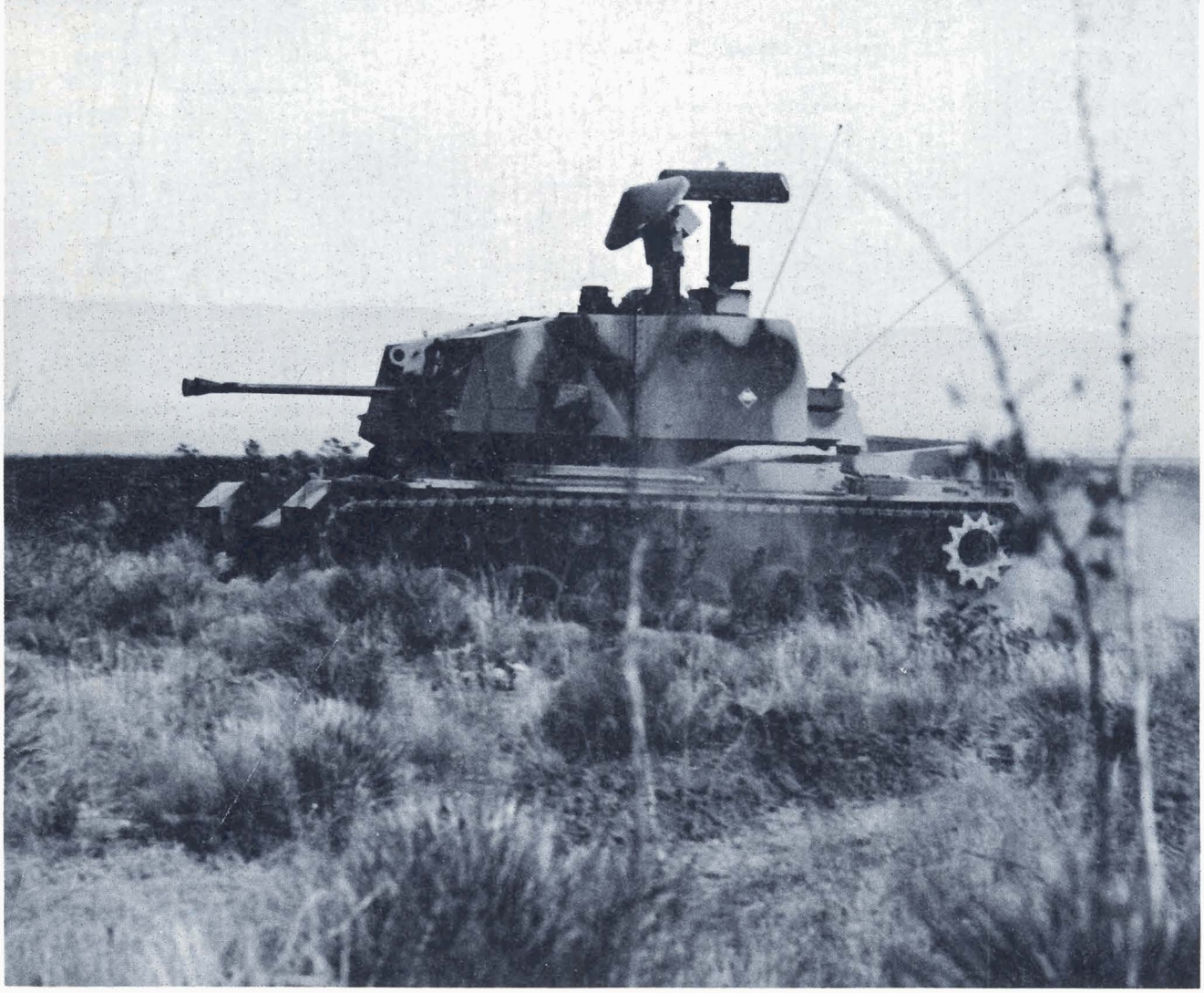
AIR DEFENSE ARTILLERY

SGT York Gun Special — page 18



WINTER 1984

AIR DEFENSE ARTILLERY

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About the Cover

Air Defense Artillery's newest weapon system, the SGT York Gun, rolled off the production line in September 1983. The SGT York Gun, the first major Army weapon system to be named for an enlisted soldier, is designed to give forward combat forces a fire-on-the-move gun system for defense against fixed- and rotary-wing aircraft attack.

FEATURES

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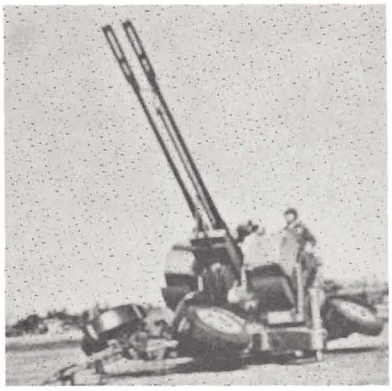

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DEPARTMENTS

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Air defense artillery force modernization reached a milestone in December 1983 when the SGT York Gun rolled off the production line to a cheering crowd. This issue features this latest development in the history of air defense artillery. Compiled and edited by assistant editor, Claire B. Starnes, the special section, which begins on Page 18, explores the mechanics of the 60-ton mobile air defense gun and the training involved in learning the new system. The section also features an interesting history of SGT York, the man, for whom the system was named. Our appreciation goes to all persons who supplied material that made this special section possible.

AIR DEFENSE ARTILLERY

Editor
William Blair Case

Assistant Editor
Claire B. Starnes

Associate Editor
Brian R. Kilgallen

Art Director
Terry G. Smith

Circulation Manager
Trinydad Ramirez

INTERCEPT POINT

The night the Chinese entered the war, the temperature dropped to 20 degrees below freezing. The U.S. troops shivering in their foxholes were warmed by hopes of being home by Christmas, but the massive Chinese offensive that swirled across the Yalu in November 1950 caught the U.S. Eighth Army by surprise and drove it into a headlong retreat which threathened its expulsion from the Korean peninsula. LTG Walton Walker issued an order to his regimental commanders: "There will be no more retreating, withdrawal or adjustment of the line or any other term you may choose."

The Eighth Army held, but what had started out as a "police action" had become a war, and during the bloody stalemate that followed, the soldiers of the Eighth Army relearned an old lesson atop insignificant terrain masses with names like Heartbreak Ridge and Porkchop Hill; for soldiers, the heady rhetoric of freedom often translates into dying for obscure pieces of geography. Heartbreak Ridge and Porkchop Hill possessed little tactical or strategic value. The opposing armies played a deadly game of King of the Hill with bullets and blood to test each other's resolve.

The most dreaded year of the century, 1984, is finally upon us, but the future world George Orwell described in his ominous novel, *1984*, has not become reality. One reason the Orwellian nightmare, in which human liberty is crushed and Big Brother is always watching, has not come true is because America still represents freedom in a largely unfree world and because American soldiers still possess the willingness to resist tyranny, even if it means dying on obscure pieces of geography.

The United States recently demonstrated that, despite its long Vietnam trauma, it still possesses the will and determination to commit troops to battle in defense of freedom when it sent marines, rangers and paratroopers (including the 82nd Airborne Division's 3rd Battalion, 4th Air Defense Artillery) ashore on Grenada.

The expulsion of Cuban combat troops from Grenada has done much to restore the American soldier's image as the representative of freedom. The courage and sacrifice our fellow soldiers displayed in these recent actions should also serve as a reminder to all air defense artillerymen that a soldier's job is not just another job the way a civilian job may sometime be just another job. The probable destiny of soldiers is to suffer, fight and perhaps die on a tiny island, an embattled hilltop or contested landing zone with little more to comfort them than the knowledge other soldiers before them have made similar sacrifices. This is the hard truth, the reality, that separates the soldier from the society he defends.

Major General James P. Maloney

That a soldier's job is different is something soldiers who served in the old Army—the Army that fought on the American frontier—could never have forgotten. They were mostly single men in barracks who served on isolated posts, separated from the civilian community not only by distance but by hardships and by ever-present danger. For soldiers who fight freeway traffic each morning on the way to jobs which often have civilian-sounding MOS designations, it's easier to forget.

The comforts of garrison duty and off-post housing make it easy for a soldier to think of his or her job as just another job, but higher pay standards and high technology training don't make the Army comparable to corporations listed in *Fortune's* 500. *Fortune* 500 corporation employees never receive directives like the one a machine gun section leader issued during the German offensive of March 1918: "If this section cannot remain here alive, it will remain here dead, but in any case it will remain here."

A modern peacetime Army has a tendency to resemble the society it represents, but those of us charged with defending freedom must remember the liberties we cherish in a free society will always be somewhat at odds with the discipline and sacrifice necessary to defend it. The parodox of the warrior ethic in a democratic society is that a soldier sent into combat must temporarily abandon his right to "life, liberty and the pursuit of happiness." Combat is a non-egalitarian enterprise. The sacrifices a nation demands of soldiers in wartime are not sacrifices a civilized nation should demand without qualms; however, a nation morally unprepared to wage war in defense of freedom must be morally prepared to sign documents of surrender. The frontiers of freedom are fragile and they will not go unchallenged. The call to duty will come again as it has always come.

It will not catch the armies who guard freedom's fragile boundaries today as unprepared and ill-equipped as it did the Eighth Army in Korea, but it will catch soldiers who think of the Army as just another career as unaware as yesteryear's soldiers were when bugles shrilled and Chinese "burp" guns erupted in the dark. The Army is not a career but a call to duty, and only a strong sense of duty, not comparability pay, re-enlistment bonuses or early retirement benefits, will sustain soldiers in combat.

The bugle call of duty grows faint in peacetime. Grenada reminds us of our awesome responsibility. We may congratulate ourselves that freedom still exists in the year 1984, but we also must be ever conscious of the need to nourish and sustain a strong sense of duty in peacetime as well as in wartime so that the fictional year 1984 will never arrive.

*

ON TRACK

I would like to begin this On Track with a riddle. A young boy was brought to the hospital with injuries after he fell off his bicycle. The doctor arrived and, seeing who it was, said, "I cannot operate on this child, he is my son." Yet, the doctor was not the boy's father! Who, then, was the doctor?

Of course, the answer has to be "his mother."

Similar examples have been used to illustrate how society tends to classify positions according to sex. In spite of protestations lodged by feminist factions, many people are still likely to think of doctors, lawyers, company presidents, generals and, yes, senior enlisted soldiers as positions principally or exclusively held by men.

In the civilian sector, many women have openly expressed their views on sexual discrimination, particularly with regard to the inequality in salaries for men and women working in the same job. That has never been the case in the military. A woman who is a specialist fourth class receives the same pay and "perks" as her male counterpart. Nevertheless, many of our noncommissioned officers may be guilty of using double standards to deal with, or even evade, problems concerning our female soldiers.

When you ask women in the Army why they enlisted, their answers are not so different from those given by our male soldiers. Generally, most felt the Army could give them what they wanted.

The question is: Is the Army giving our female soldiers a fair shake? Or put another way, are our NCOs doing their best to see that our female soldiers are properly looked after and cared for?

My guess is that the majority of offending NCOs simply are not familiar with the Army regulations governing women in the military. But ignorance, however innocent, is no excuse for prejudice or bigotry. One of the maxims of good leadership is to know your soldiers and look out for their welfare. I ask you, then, how can any NCO fulfill his role as a leader if he does not show concern for each and every one of his subordinates, regardless of race, sex or creed?

CSM Frederick T. Stafford Jr.

Two years ago, the Women in the Army Policy Review Group was established by the Department of the Army to look for answers to questions that had been raised by senior commanders. As a result of the group's findings, two major research efforts were developed —an MOS physical demands analysis (which included the development of a physical capacity test) and a direct-combat assessment. An analysis of the latter, the direct-combat exclusion policy, prompted the group to recommend that 23 additional MOSs be closed to women soldiers.

The Army recently reopened 13 of those MOSs, including MOS 23U (Nike Hercules radar simulator repairer). As NCOs, it is our duty to support the women in those MOSs.

On the surface the reopening of MOS 23U may appear to be an easy concession on the part of the Army since the specialty is being phased out. But the decision in itself reflects the military policy that women shall not serve in positions that perforce would require them to engage in routine direct combat. By definition 23U is a support rather than combat MOS. As an NCO in a leadership position, it is your duty to see that the female soldiers serving in those reopened MOSs receive the Army's full support.

As for equality in the other occupations opened to women, military entrance physical strength capacity tests, geared to MOS demands, have been approved and are being administered to male and female enlistees to determine whether they can meet the minimum standards of the jobs for which they have applied. The standards are the same for both sexes. Let us, then, make certain that they remain that way.

There is yet another area of concern regarding our female soldiers that has distressed me. I have had reports that some of our pregnant female soldiers have been the target of sexual discrimination. Again, I feel in many of these cases ignorance is to blame. For instance, do you know that based on what her doctor says, a pregnant soldier may go on maternity leave up to four weeks prior to delivery and return to duty up to six weeks after delivery? Are you aware that a female soldier is entitled to wear the maternity uniform as her duty uniform after her 24th week of pregnancy? Moreover, do you know that when a female soldier's pregnancy has been confirmed, she must be counseled by her unit commander and that, as her NCO, it is up to you to make certain that she gets that counseling?

If you hesitated when answering any of these questions, I strongly suggest you familiarize yourself with AR 40-3 (maternity care), AR 630 (maternity leave), AR 670-1 (maternity clothing and uniforms) and AR 635-200 (pregnancy counseling). One salient fact all of us should keep in mind is that it is a woman's God-given right to bear children. We must not interfere with that. Especially, we must not punish her for it.

Finally, I would like to say a word about women in senior NCO grades. Even though the percentage of women filling those positions is up over recent years, I feel that figure could be increased. The solution, of course, rests with our commanders and key NCOs. It's part of your job to see that our deserving female soldiers are promoted. You should ensure that they are recommended to go before the boards and that their files are up to date. If they merit an award such as the Army Achievement Medal or Army Commendation Medal, recommend them for it.

There is no room for duplicity in today's Army where equality and fairness have become major internal issues. It is up to you, the NCO, to set the example for others to follow.

Echoes Of A Distant Battle

Air Defense Lessons of the Philippine Defense Campaign of 1941-1942

by MAJ Charles E. Kirkpatrick

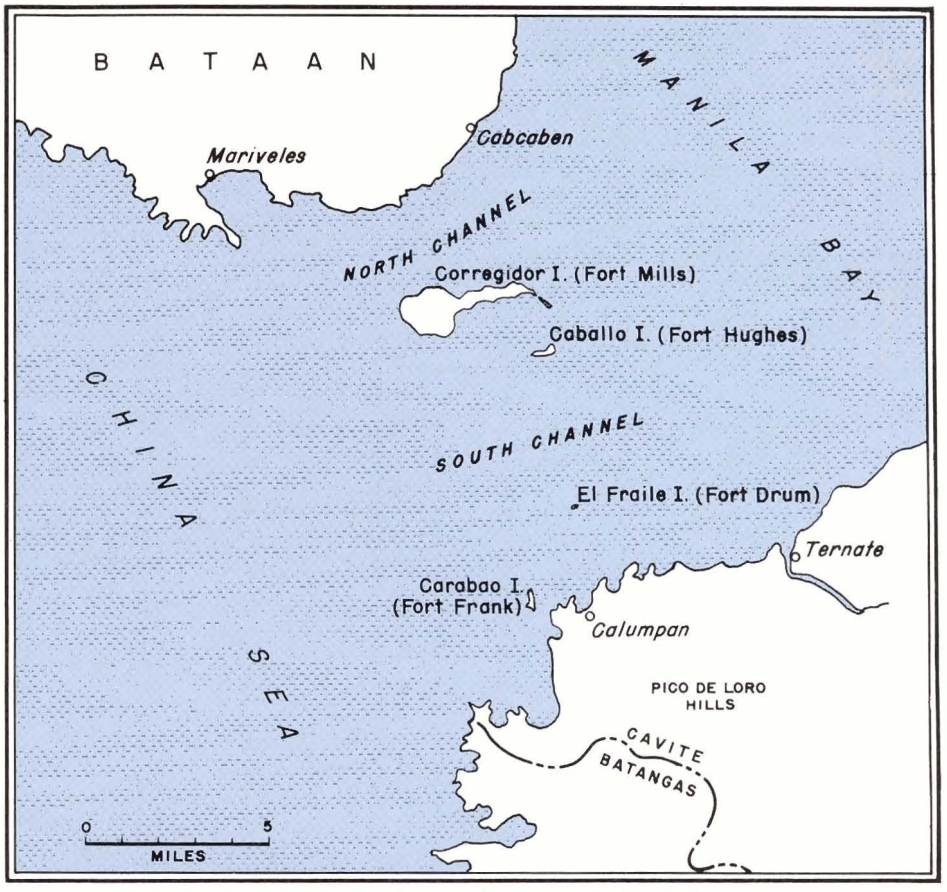
Army doctrine outlined in FM 100-5, Operations, informs us that the Army must fight the first battle of the next war outnumbered and win. We have enlisted the study of military history to help us learn the approaches to land combat that have been successful in the past. It seems, however, that we often study the wrong battles. The campaigns of GEN Patton's Third Army, for instance, make invigorating reading, but represent the Army at its peak.

First battles are another matter altogether. They are fought by armies still not completely mobilized, either in manpower and equipment or in spirit. Often, there are shortages in the means to wage war and shortfalls in training. Above all, first battles are characterized by lack of experience—troops, often unready troops, going into action for the first time.

For Air Defense Artillery, one of the most fruitful battles of that genre to study took place in 1941-42. The 60th Coast Artillery (AA), today the 60th Air Defense Artillery, conducted what was by any criterion the most successful anti-aircraft campaign of World War II between Dec. 8, 1941, and May 6, 1942.

In its defense of the fortified islands of Manila Bay, the 60th Coast Artillery shot down 54 confirmed Japanese aircraft and prevented enemy bombardment from causing any significant military damage to Corregidor and its satellite forts. In the course of 300 air raids, the regiment was awarded three Presidential Unit Citations and the Philippine Presidential Unit Citation. Many of the regiment's soldiers were awarded Distinguished Service Cross and Silver Star medals.

The 60th Coast Artillery was far and away the most distinguished American anti-aircraft unit of the war and was acknowledged by the British Broadcasting Corp. in London at the time as the premier anti-aircraft regiment in the world. The campaign those men fought can still tell us a few things today about how to fight our own "first battle." Here are some of the things they learned.



Anti-aircraft batteries defended the four besieged fortresses in Manila Bay.

Expect To Fight With The Means At Hand

Destruction of the American naval line of battle at Pearl Harbor effectively isolated the Philippines. The 60th Coast Artillery received nothing in the way of reinforcements except a small quantity of ammunition delivered by submarine. The unit had to make do with the equipment, manpower and ammunition on hand when the war broke out. Similarly, today's air defenders must expect to go to war with what they have on the last day of peace. The speed of modern war and the isolation from the United States, particularly if on a European battlefield, tend to make reinforcement of air defense artillery units improbable. Priority of airlift would surely go to Infantry and Field Artillery rather than to Air Defense Artillery. For today's air defender, as in 1941, the immediate need will be to conserve limited and irreplaceable resources once war begins.

Anticipate The Unexpected

The fall of Bataan in April 1942 allowed the Japanese forces to emplace artillery on all shores of Manila Bay and pound the harbor forts constantly. Anti-aircraft units had to remain exposed and were gradually whittled away by artillery barrages. Battery commanders minimized casualties and equipment damage by planning ahead.

Early in the war, batteries began work to revet, sandbag and splinterproof their positions. Wherever possible, guns were dug in and tunnels were used as troop shelters. Camouflage became a fine art, effective until intense shellfire denuded battery positions. The soldiers coped as well as they could with the unexpected—attack from an undefended rear.

The unexpected in a future war could take any form from airborne landings to rocket barrages. As in 1941, commanders today must think creatively about their future problems and make plans to counter them.

Provide Spares For Vulnerable Equipment

Again and again throughout the Philippine Defense Campaign, the 60th Coast Artillery found that the most vulnerable (and consequently the most frequently damaged and destroyed) equipment included battery cabling and fire direction equipment. Salvage and repair helped to keep units operational, but more spares were really needed.

The air defense community should consider the need today for stocking additional quantities of vulnerable equipment in oversea units.

There Is No Substitute For Live-Fire Training

Both the 60th Coast Artillery and its sister unit, the 200th Coast Artillery (New Mexico Army National Guard), went to war with great numbers of troops who had never fired an anti-aircraft gun. Before the war, the cost of firing was prohibitive for anything more than annual service practice, and many soldiers joined the two regiments after their last peacetime firing. Initial engagements were understandably unsuccessful and, although proficiency increased rapidly, the opening air raids destroyed most of the Far East Air Force on the ground.

It is axiomatic that soldiers must fire their weapons in order to become good gunners. Air Defense Artillery should be wary of any weapon system for which reasonably frequent firing is too expensive. Simulations are just that—mere approximations of the stress of actual firing. Given the limited amount of air power available to support operations in Europe, airfield defenses, as an example, must be supremely capable from the very start. The Air Force cannot stand a repetition of the Clark Field debacle in which the Japanese destroyed the major airfield in the Philippines on the first day of fighting.

Officers And NCOs Must Be Technically Proficient

Numerous cases of battery personnel making ordnance-level adjustments to their equipment while under fire were recorded by the 60th Coast Artillery. Damaged equipment often could not be transported to ordnance and had to be fixed on the spot. The 60th Coast Artillery's officers and non-commissioned officers were, for the most part, prewar professionals and utterly at home with the nuts and bolts of their equipment. Today's officers and NCOs must have the same abilities for the same reasons.

A three-inch anti-aircraft gun emplacement on Corregidor.

Integrated Fires Are Essential

The tactical plan for defense of the harbor forts required attachment of a platoon of .50-caliber anti-aircraft machine guns to every anti-aircraft battery. The obvious reason was that gun batteries could not otherwise defend themselves against low-flying attack aircraft. The experience of battle reinforced that decision, and the machine gunners accounted for their share of Japanese aircraft trying to destroy the anti-aircraft sites.

If, today, it is not practical for reasons of troop strength to attach platoons of Vulcans to Hawk batteries in wartime, the Air Defense Artillery needs to make provision for some other type of low-altitude defense. Hawk battery personnel should be armed with Redeye, Stinger, 7.62mm miniguns or even the old M-55 quad .50-caliber machine guns.

Dummy Positions Work

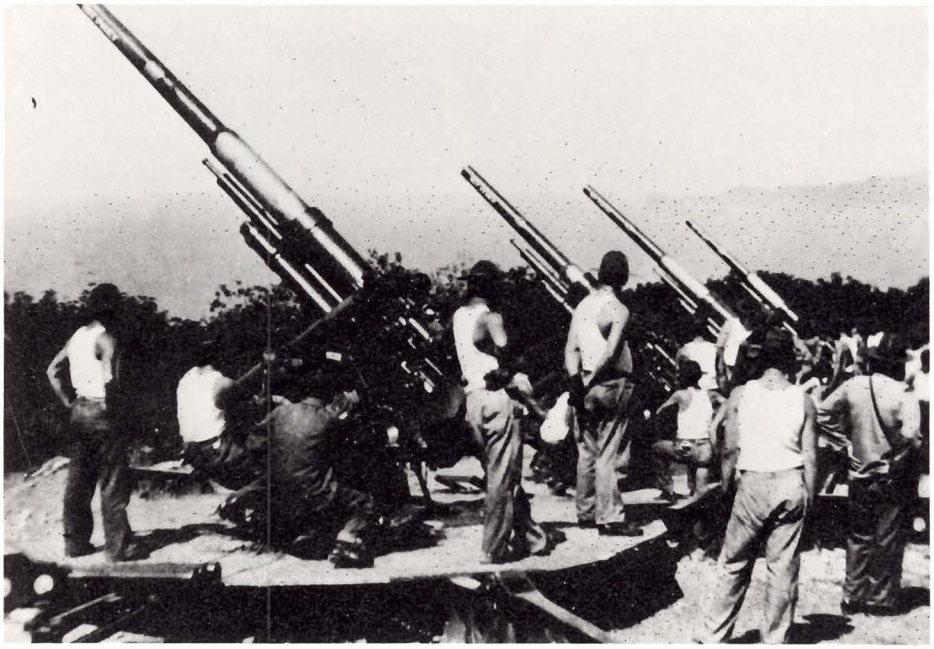
Battery G, 60th Coast Artillery, initially was deployed on Bataan to defend an airfield and other critical assets there. The original field position was a temporary one, selected for ease of installation. When the permanent battery position was ready, the gun commanders, on their own initiatives, built dummy anti-aircraft guns and left them in the gun pits. They erected dummy bunkers and shelters and, in general, left the old battery location in a condition which, from the air, resembled a real anti-aircraft site. Later, the men of Battery G were able to enjoy frequent Japanese bombings of the dummy position while they continued to operate from the new site only a short distance away.

The advantages of such a technique are obvious. A clever battery commander could lure the enemy into wasting a great deal of ordnance and a great many missions if he left behind a dummy position every time the unit moved. By the same token, the 60th Coast Artillery found that if camouflage were good, a short move was as good as a long one for battery survivability. Red flag exercises in the United States have confirmed that fact as well.

Early Warning Devices Don't Always Function

The anti-aircraft command post on Corregidor was supported by a series of radio direction-finding sets, chiefly in the hands of the regiment's two searchlight batteries, and an air warning network. Unfortunately, the primitive radars did not give satisfactory service and, in any case, could resolve only the azimuth of an approaching target. In the end, the command post had to rely on the air-warning network of observers and on battery "air guards" for air raid warning.

Air defense artillery units, particularly those in Europe, should be conscious of the fact that the sophistication of electronic warfare and the possibility of electromagnetic pulse damage to fragile microconductors after any tactical nuclear burst make reliance on radar for target acquisition problematical. The Army in Europe should design and implement an observer net to assist in locating and plotting enemy aircraft in the event of war.



New troops from Battery C, 60th Coast Artillery, train at Middleside, Corregidor, in November 1941. The artillerymen were firing into the South China Sea with M-2A3 three-inch anti-aircraft guns. (Photo by George Munson)

Centralized Control Doesn't Always Work

As the 60th Coast Artillery learned, people die, communications fail and sophisticated command and control techniques don't always stand the strain of action. The guns on Corregidor were often in local control and fired by the authority of the battery commanders. Fortunately, the maturity, experience and training of those officers made local control an effective way to fight.

Units today should expect to lose communications with central control authorities when war breaks out. Therefore, they should train under the assumption that they are going to have to make hard decisions about firing on their own.

Volume Of Fire Is Important

For gun units, volume of fire is one of the keys to success. The 60th Coast Artillery eventually had to limit its fire to six rounds per gun at any one track because of ammunition shortages. But it found that masses of machine gun fire, particularly with the appropriate amount of tracer ammunition, tended to cause enemy pilots to break off low-level attacks. By the same token, properly concentrated anti-aircraft artillery fire caused formations to break up, change course or abandon attacks.

The conclusion to be drawn from that experience is that pilots *are* affected by the visual effects of anti-aircraft fire. Units that can sustain a high rate of fire should be able to deflect attacks on the critical assets they are defending without necessarily hitting the enemy aircraft. To do that, troops need to be armed with gun systems that are simple, hardy and reliable under field conditions, cheap to manufacture and affordable in terms of ammunition supply.

You Don't Have To Shoot Down Airplanes To Accomplish The Mission

As the campaign progressed in the Philippines, the Japanese bombers were forced to higher and higher altitudes by the anti-aircraft gunners of the 60th Coast Artillery. Accurate gunnery at medium altitude led to unacceptable losses in aircraft. So the enemy flew higher, eventually flying above the fuze range of the guns. At that altitude, however, bombing accuracy was poor, and the bombers failed to accomplish their mission of destroying the fortifications that defended Manila Bay against the entry of a fleet.

Most of the kills for the anti-aircraft gunners came in the early part of the campaign, when the Japanese flew at lower altitudes. As the enemy flew higher, fewer and fewer of their aircraft were shot down.

In the final analysis, though, that was the desired goal, and it really would not have mattered if the 60th had not shot down any airplanes at all so long as they made it impossible for the bombers to do the job they were sent out to do.

The lesson today is that the air defense mission is to *defend* critical assets that are too valuable to give up, not to *destroy* enemy aircraft. If we can make the enemy drop his bombs in the wrong place, upset his aim, cause him to fly faster or higher than he needs to for optimum accuracy in weapons delivery, we will have accomplished our mission as surely as if we had shot him down.

In conclusion, we should bear in mind the fact that it is very risky to try to derive absolute laws from the historical past. At best, a study of such campaigns as the one in the Philippines can offer us pointers and advice about how to fight and what sort of problems we might encounter.

The lessons of Corregidor make good sense even today and can help the air defense artillery commander in his war planning. In a sense, it boils down to following one of Napoleon's favorite maxims: "I base my calculations on the expectation that luck will be against me."

MAJ Charles E. Kirkpatrick *is an instructor in the Tactics Department, U.S. Army Air Defense Artillery School, Fort Bliss, Texas. He has served in command and staff positions in air defense artillery units in Europe and the United States and has taught in the Department of History at the U.S. Military Academy. He received his bachelor's and master's degrees from Wake Forest University and is a candidate for a doctorate in history from Emory University.*

Sample Data Collection

What It Did For Chaparral And Hawk

by Warren Schoenknect

Article I, Section 2, of the Constitution states, "Representatives and direct taxes shall be apportioned among the several states. . .according to their respective number. . . ."

With this statement, the U.S. government entered into the realm of data collection. Since 1776, the government has collected and compiled data on countless categories such as law enforcement, climate, labor, transportation and status of military equipment.

Collecting data has gained popularity over the years while methods and techniques have improved. One of these methods is to take a complete census of the total population, as is done in our 10-year population census program. Another method is to mail questionnaires on a random basis, such as product promotions initiated by advertising agencies. Yet another way is to statistically determine the optimum minimal population from which data can be obtained, then intensely survey this small portion of the population. This method is known as sampling. The government and private sectors have been using the sampling technique quite successfully for a number of years. One of the most well-known uses of this technique is the weekly numerical ratings assigned to the various prime-time television programs by the Nielsen Co. Other well-known uses are for cost-of-living indexes, public opinion polls and political projections.

One of the advantages to sampling is its low cost when compared to the cost of a complete population census. Additionally, sampling provides for minimal inconvenience to the overall population. Another benefit is the speed with which data can be gathered, edited, correlated and reduced by computer terminals.

In the military, sampling techniques are used in numerous ways—one being lot sampling of ammunition, where a small quantity of ammunition out of

each lot is tested, and the acceptance or rejection of the entire lot is dependent on that sample. Another way is the collection from field units of maintenance information on various weapon systems. To accomplish this, the Army has developed a procedure which imposes minimum interference to field personnel yet provides maximum feedback to participating units. This procedure is covered in AR 750-37, Sample Data Collection. Under this regulation, the Materiel Readiness Support Activity, Lexington, Ky., is the executive agent for sample data collection within the Army and has the responsibility of interfacing and coordinating sample data collection programs with all major Army commands.

In the last 20 years the U.S. Army Missile Command initiated numerous sample data collection programs. Some of the air defense systems involved in these programs have been Chaparral, Hawk and the AN/TSQ-73.

Chaparral

One of the latest programs, which was on the Chaparral weapon system, was initiated in 1979 at the 3rd Battalion, 67th Air Defense Artillery, and the 2nd Battalion, 60th Air Defense Artillery, in Germany. It was recently expanded to include the 4th Battalion, 61st Air Defense Artillery, at Fort Carson, Colo. Analysis of the data generated from this collection system provided quantified data that resulted in the initiation of several modifications to the Chaparral system.

One of the modifications, the Block V Pneumatic System, will replace the present gas engine with a diesel power pack and a larger air compressor. It is estimated that installation of this modification will produce a cost savings of more than $20 million when projected for the life of the Chaparral system.

The detent-rail tester is a Block IV modification which will replace the present firing pin assembly with an improved design, resulting in a cost savings estimated at $50,000.

Hawk

The present Hawk data collection program uses two battalions in Germany, the 3rd Battalion, 60th Air Defense Artillery, and the 2nd Battalion, 62nd Air Defense Artillery. Analysis of this data by personnel of the Hawk Project Office, Missile Command Product Assurance Directorate, and the Missile Logistics Center has resulted in many system improvements.

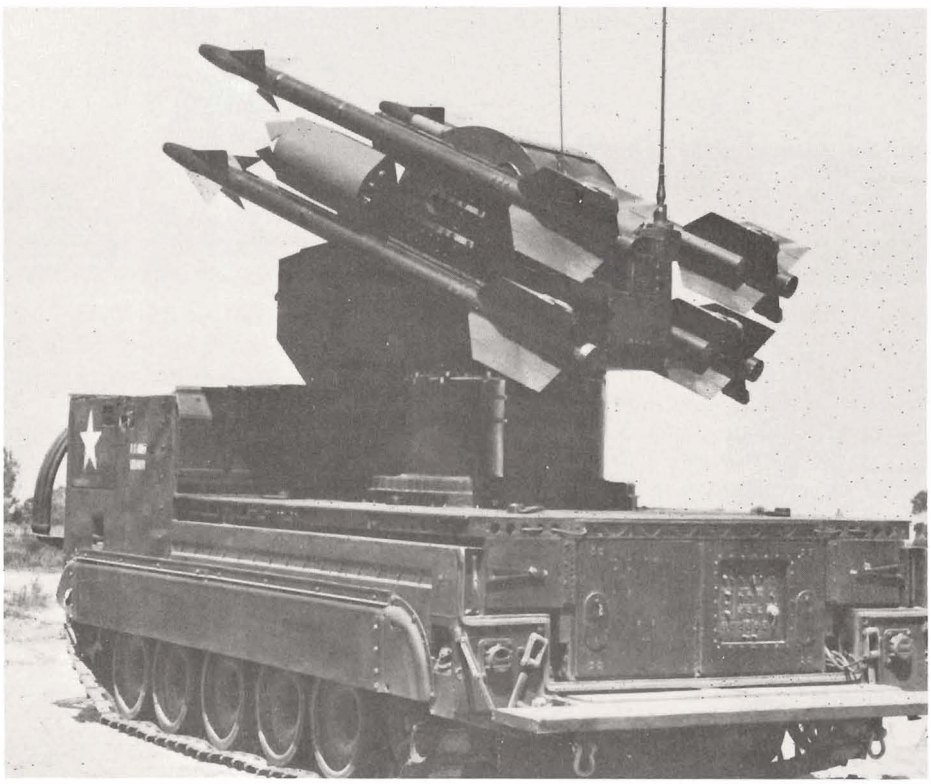
A number of major modifications that upgraded the basic Hawk to the Improved-Hawk configuration came from analyses of the sample data collection Hawk base. The acquisition radar had a continuing maintenance problem. The sample data collection program highlighted the high-failure components and provided statistical data for an economic analysis that resulted in a major redesign of the transmitter equipment, replacing the old power tube with a klystron power amplifier chain. This action will save approximately $20 million over the projected life of the Hawk system.

The tracker 1 chassis of the illuminating radar was another problem area. The sample data collection program was able to quantify the high no-evidence-of-failure rate of the tracker. Based on this information, a decision was made to develop a new field test procedure which significantly lowered the rate. Implementation of the procedure allowed the cancellation of $540,000 in tracker 1 back orders.

Another problem area that the sample data collection program was able to quantify concerned those assemblies having the highest failure in the system. Using the collected data as a guide, a reliability, availability and maintainability product improvement proposal was initiated for the illuminating radar. This one proposal will replace 13 of the top high-failure items in the system.

These are but a few examples of what field data is used for. Thorough analysis of maintenance data gives necessary information to determine where present fielded systems are having problems and what needs to be done to rectify those problems. In some cases, it is just a matter of changing test procedures or test equipment. Sometimes, as in the case of Hawk, a complete redesign is required.

Sample data collection program personnel are never idle. Their constant analyzing of data makes for better-equipped field soldiers. That is the end result of their mission. ✱



Warren Schoenknect *is chief of Maintenance Data Branch, Maintenance Engineer Directorate, Missile Logistics Center, Army Missile Command. He manages the sample data collection programs for the command.*

The SA-5: 1963-1983

Shifting The Middle East Air Defense Balance

by CPT Scott R. Gourley, USAR

The SA-5 Gammon missile made its first public appearance in the November 1963 parade in Moscow.

In January 1983 the Soviet Union drastically altered the air defense balance in the Middle East by introducing SA-5 surface-to-air missile systems into Syria. The occasion marked the first time that the long-range SA-5 has been deployed outside of the Soviet Union and served to aggravate existing tensions between Israel and Syria.

The SA-5 has been surrounded with confusion and controversy ever since it was first displayed for the public during the Nov. 7, 1963, Moscow parade. Initially there was a question of code names. Early sources referred to the two-stage missile, originally towed by either MAZ-502V or URAL-375S trucks, as the Griffon. Later sources identified it as the Gammon and specifically noted that it was not the Griffon.

Then the missile's propellant became sort of a mystery. While there is agreement that the booster is composed of solid propellant, there have been differences of opinion over the sustainer stage. Original reports claimed that the sustainer contained liquid propellant while some later sources indicated that it was a solid propellant, like the booster. Some publications avoided the problem, and still do, by simply not mentioning the sustainer stage propellant.

Finally, there has been a question of purpose. What was the SA-5 designed to do? At its first public parade, the SA-5 was identified as an anti-missile missile by a Soviet announcer, but this has been questioned by several analysts. It is certain, however, that the Soviets' original intention was for the SA-5 to replace many of the old SA-2 anti-aircraft missile sites inside the Soviet Union.

System Description

The SA-5 Gammon is a two-stage surface-to-air missile that has a range of between 250 to 300 kilometers and an effective ceiling of about 30 kilometers. The missile itself is 16.5 meters long (54 feet). The booster is 1 meter in diameter and its sustainer is .8 meter in diameter. It uses a radar-homing type of guidance system and has an intercept speed close to Mach 5.

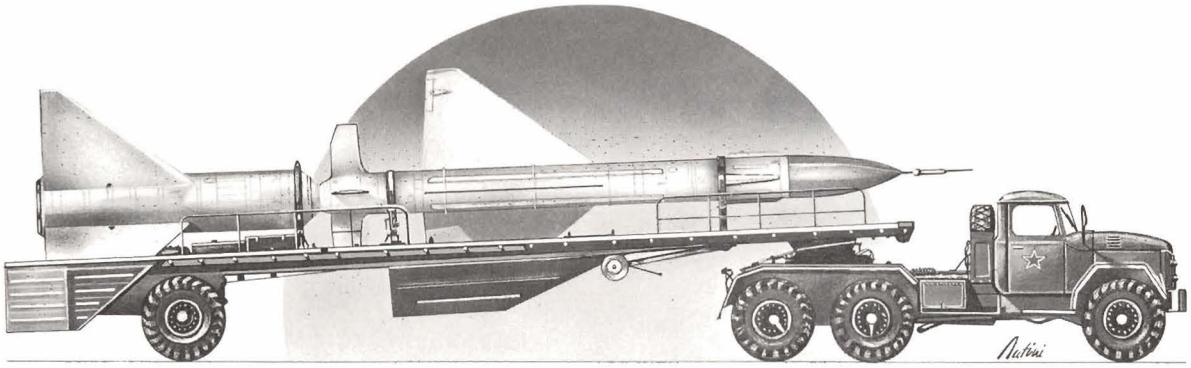
The SA-5 usually is used in conjunction with the Square Pair radar system, a target and missile tracking guidance radar that operates in the 6,500 to 7,200 megahertz range.

SA-5 and SALT I

The SA-5 and its possible roles and missions became the subject of considerable controversy during the SALT I negotiations. Shortly after the Soviets began installing the Galosh anti-ballistic missile system around Moscow in the 1960s, they began installation of another system, based on the SA-5 missile, in western Russia. This new system was named Tallinn for the Estonian capital where it was first observed by Western observers.

In the early 1970s some reports indicated that an improved version of the SA-5 was being tested at the Sary Sagan ABM test center near Lake Balkhash. The reports stated that the Gammon's effective ceiling may have been increased and that some of the missiles may have been equipped with nuclear warheads to neutralize incoming ICBMs. These reports fueled the debate that had been raging in the U.S. intelligence community for more than a decade—namely, whether the SA-5 was an anti-aircraft missile or an ABM. (Eventually, the Tallinn complex would be credited with being the catalyst for the SAM upgrade issue during the SALT I negotiations.)

Within the defense intelligence community, the Tallinn debate (anti-aircraft vs. ABM) split along service lines. The Army and Navy took opposing views; the Army claiming that the Tallinn was an ABM system while the Navy said it was only for anti-aircraft roles. Air Force opinion was divided. While the bomber forces worried about Tallinn, the missile forces would not admit that Tallinn could stop a missile



attack on the area. The Defense Intelligence Agency leaned toward an ABM role while the Central Intelligence Agency did not.

No doubt there will always be some disagreement about the purpose of the SA-5s in the Tallinn complex. However, a majority of sources today seems to believe that the SA-5 was originally designed as an anti-aircraft missile to destroy high-altitude bombers.

SA-5 and Syria

The deployment of SA-5s to Syria in 1983 signaled the dawn of a new era in the life of this controversial weapon system. The decision to export the SA-5 appears to be based on declining Soviet prestige in the Middle East, a lack of Soviet confidence in their own equipment and the prospect of increasing Soviet control over Syria.

The performance of Soviet SA-2, SA-3 and SA-6 systems in the Bekaa Valley against the Israeli air force in 1982 must have been, to say the least, disappointing for Moscow [*Air Defense Artillery,* Winter 1983, "Lebanon: An Air Defense Analysis"]. There is evidence that the Third World is losing confidence in Soviet SAMs. While Soviet SAM sales outnumbered U.S. sales by a ratio of nearly 3-to-1 (23,250 to 8,890) between 1970 and 1980, the United States sold 1,775 SAMs compared to the Soviets' 900 during 1980 and 1981. If this does reflect a trend, it will only be accelerated by Lebanon's Bekaa fiasco.

Perhaps the Soviet Union feels it can regain some of its lost respect by introducing more modern systems that have greater range, such as the SA-5, into the arena. This contention is supported by Syrian claims that they have also received some new Soviet SA-11s to replace the SA-6s rendered impotent by the Israeli air force. If these reports are correct, this would also be the first time that SA-11s have been deployed outside the Soviet Union. The SA-11 is the apparent replacement for the SA-6 [*Air Defense Artillery,* Fall 1983, "Intelligence"].

Declining prestige may be compounded by the fact that the Soviets themselves appear to be losing confidence in their other SAM systems. This conclusion can be supported by the Soviets' introduction of the SA-5s into Eastern Europe [*Air Defense Artillery,* Fall 1983, "Intelligence"] at about the same time that they sent them into the Middle East. The Soviets might view the air over Syria as a good location to test, prove and perfect the SA-5 in a combat environment.

Finally, the deployment of the Gammons allows the Soviet Union to expand its political power and tighten its control over the Syrian army. The rearmament of Syria includes approximately 5,000 Soviet advisors. Certainly the technology present in the SA-5, although not the most advanced, could be used as justification for some of these advisors to be worked into the Syrian defense structure.

The Israeli Dilemma

The presence of SA-5 systems in Syria presents the Israeli air force with quite a dilemma. The Gammons' 300 kilometer range can cover most of the airspace over Lebanon and Israel, yet they can sit back out of the effective range of most Israeli countermeasures. A pre-emptive attack on SA-5 batteries and the repercussions resulting from killing Soviet advisors manning them are something that all sides would like to avoid. Perhaps the solution lies in subjecting these systems to electronic countermeasures. However, it may be difficult to develop effective ECM without some combat experience against the system.

Whatever the answer, Israel faces the same dilemma that would face NATO pilots during any future conflict in Europe. The new Warsaw Pact SA-5 positions in East Germany, Czechoslovakia and Hungary can cover an area well into NATO airspace and could seriously degrade NATO AWACS operations.

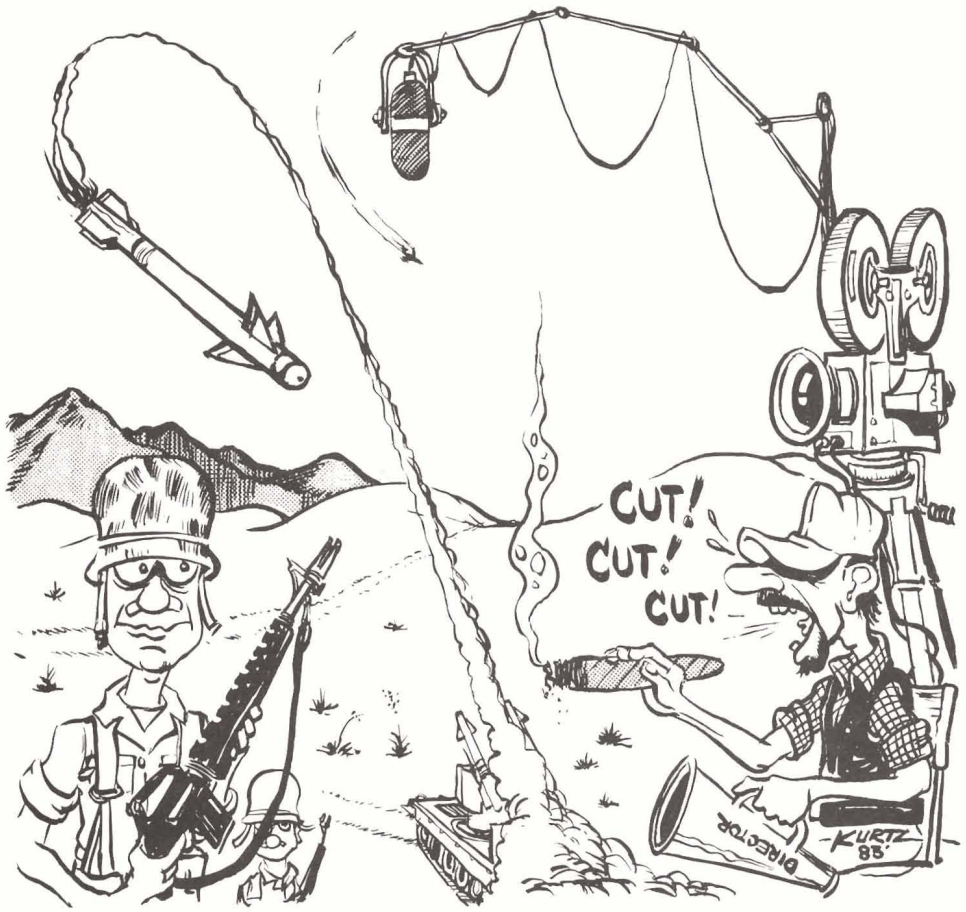
The Soviet deployment of SA-5s in Syria raises certain questions which remain unanswered. Will the SA-5s be able to function on a modern electronic warfare battlefield? Do SA-5 (and SA-11) deployments signal a Soviet willingness to begin exporting another segment of their weapon inventory around the world? Have these new systems become the Soviet carrot held out to Third World countries as a reward for closer cooperation with the Soviet Union? Perhaps only time, an electronic warfare environment or Middle East pilot proficiency will provide the answers. ✱

CPT Scott R. Gourley, *Field Artillery Reserve officer, received his commission upon graduation from the University of California at Los Angeles. A graduate of the Field Artillery Officer Advanced Course, he has served in both cannon and missile Field Artillery assignments in USAREUR and is a former threat instructor at the U.S. Army Field Artillery School, Fort Sill, Okla. He is currently a member of the USAR Control Group Reinforcement.*

The ADA Training Film

Celluloid Training Tips

by Shirlee Allen



Training films don't just happen. A common misconception among the uninitiated is that a cameraman follows a soldier during his daily activities, using a "candid camera" technique to capture on film those things necessary to accomplish his job. Then someone who understands why the soldier pushes that particular button at that particular time, or twists the second bolt to the left rather than the right, explains the "where," "what," "how" and "when" to the trainee to whom the film is directed.

Sound too simple? It is. Training films, while not as dramatic in style or content as Hollywood productions, are carefully planned and orchestrated, using professional production crews and actors.

The need for a training film as an adjunct to other training methods and materials is recognized during the analysis stage of the Instructional Systems Development process conducted by the Directorate of Training and Doctrine, U.S. Army Air Defense Artillery School, Fort Bliss, Texas. The request for a film is sent to the audiovisual program officer who prepares a list of general program objectives and assigns a training developer, who has responsibility for the content of the film, to the program. The request is then submitted to TRADOC for approval. TRADOC, upon approval, forwards the request to the Department of the Army for final approval and assignment of a production agency.

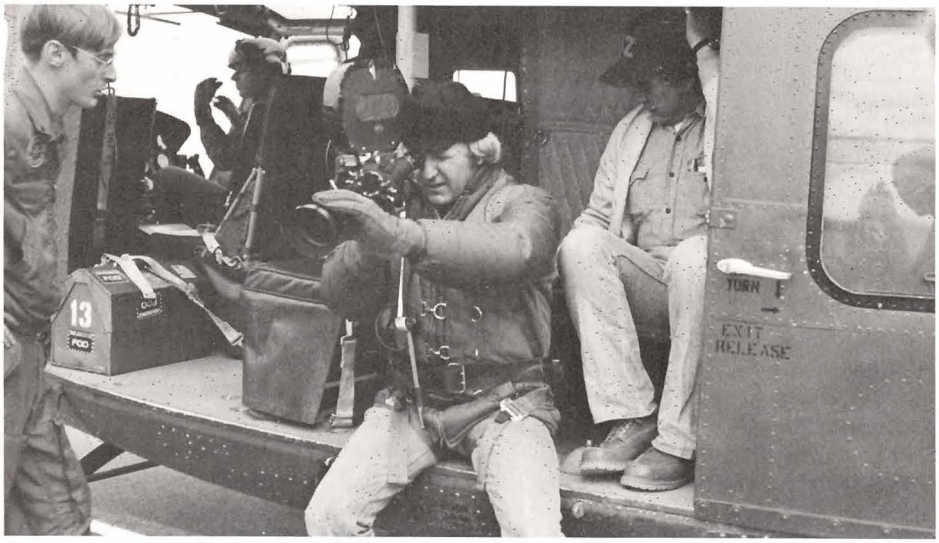
Production agencies are either TRADOC, DARCOM or commercial (Hollywood-type) agencies. Service agencies that provide support to Fort Bliss are located at White Sands Missile Range, N.M., Norton Air Force Base, Calif., and Anacosta Naval Base, Washington, D.C. The selected agency may provide a script writer for the program or, as happens frequently, an in-house Department of the Army civilian or military writer is assigned to write the script.

Notified that the request has been approved and the production agency identified, the audiovisual program officer, with the training developer and a subject matter expert or technical advisor, develops specific training objectives and a program concept. At the same time, they develop program time frames. Deadlines for the submission of draft and final scripts, shooting schedules and locations, support requirements and supporting agencies are identified during this phase.

The request for support from field units is submitted through TRADOC to FORSCOM. Many Air Defense Artillery training films are supported by units at Fort Bliss and shot on locations adjacent to or on the post. Occasionally, however, because of equipment and personnel limitations or prior commitments, units from other Army installations are needed to support the program. Air Force support is requested through the Tactical Air Command at Langley Air Force Base, Va., or from the base nearest to the supporting unit's home base. The Aviation Division of the Air Defense Artillery Center's Directorate of Plans and Training provides air support for those programs that are shot on location at Fort Bliss.

With the approved training objectives and program concepts in hand, the script writer, who is responsible for program style, begins his work by developing a film treatment—a scene-by-scene outline of the film. The treatment process, designed to insure that the writer understands the training objectives and the focus of the film, is a tool used to develop individual scenes and narration for the draft script. The training developer and the technical advisor work closely with the writer during this process. The draft script, when completed, is sent to the requesting agency for review. Comments from the requesting agency are incorporated into a final, finished script. After completion and approval of the final script, the writer identifies and locates any stock footage to be used in the film and prepares a list of production requirements. His job done, the writer exits the scene.

The script now belongs to the training developer and the production agency. At this stage, production of the program begins. Working closely with



Army camera crew filming at White Sands Missile Range, N.M.

the production agency and using the final script as a guide, the training developer:

- immediately forwards graphics and animation sequences for production.
- interviews and casts professional actors, if necessary.
- identifies shooting locations and maneuver areas.
- researches safety requirements for the use of ordnance and demolitions.
- identifies, locates and ships essential equipment to supporting unit.

Three days before the shooting begins, the training developer and the technical advisor arrive on location. They ensure that all support requirements are met; that equipment is available and in good working order; that personnel understand their functions and know where to be and when; and that shooting sites are available and usable. Producing a training film is an expensive undertaking and these three days are designed to eliminate costly delays.

The day before cameras roll, the film crew arrives. A film crew may be as small as three people; a cameraman, an assistant cameraman and a director. Commercial crews are generally larger and may have as many as 10 people. The director, with his crew, visits each shooting location and tentatively decides on camera placement and lighting requirements. That same day, the director meets with the training developer, the technical advisor and the unit coordinator in a final coordination meeting. They decide on the shooting schedule for the program, discuss anticipated problems and redefine areas of responsibility, if necessary.

Just in time for "lights," "camera," "action," the professional actors appear on the scene. They remain only long enough to shoot their scenes. They are hurrying down the footpaths prepared by other famous stars and directors who began or enriched their careers in Army training films: names like Jack Lemmon, Jane Fonda, Charlton Heston, directors Francis Coppola *(The Godfather)* and the renowned John Huston *(Annie)*.

On this, the first shooting day, "Murphy's Law" reigns supreme—cameras quit working; soldiers wear the wrong uniform, the wrong brass, the wrong T-shirt; a rust spot, on a vehicle critical to the scene, stands out like vapor trails in a Roman epic; and a cloud burst sends men and equipment scrambling for cover. On this day, production crews cry, swear and pray. Murphy gloats.

Each evening after the shooting day is over, the director, training developer, technical advisor and the unit coordinator meet for a script conference to discuss the shooting schedule for the next day. They rearrange the schedule to accommodate scenes that are not completed or that need to be reshot. Scenes completed during the day are shipped immediately to the production agency's headquarters for processing and review by experts and quality control personnel. Finger prints on the camera lens are Murphy's, of course, and the slightly out-of-focus actor most certainly did something to earn Murphy's ire. He will be foiled, however. Quality control personnel are expert at recognizing his signature and production crews are even more expert at erasing it.

After all the scenes are shot, the film is processed and rough edited. The training developer and the technical advisor may, or may not, be invited to participate in the procedure. Copies of the rough edit are sent to the audiovisual program officer and the requesting agency for review. The reviewers' comments are considered and the film is re-edited or reshot, if necessary.

When the errors in the rough edit are corrected, an interlock print (a rough edit with sound) is forwarded to the training developer for validation. The training developer designs both a pretest and a post test to ensure that the program's training objectives are met. A sample audience—an audience of the same rank and MOS as the film's target audience—takes both tests. The test results either validate or invalidate the program. Invalidation results in a redesign of the program and may cause extensive rewriting and reshooting. At best, re-editing is necessary.

An answer print of a validated program is reviewed by the technical advisor, the training developer and the audiovisual program officer for quality control and approval. It is then forwarded to TRADOC for approval. TRADOC returns the approved print to the production agency for release prints which are shipped to Tobyhanna Army Depot, Pa., for distribution to training and audiovisual support centers.

New and revised Air Defense Artillery training films are listed in the TASC Bulletin, the Air Defense Artillery Bulletin and the Tobyhanna Monthly Bulletin.

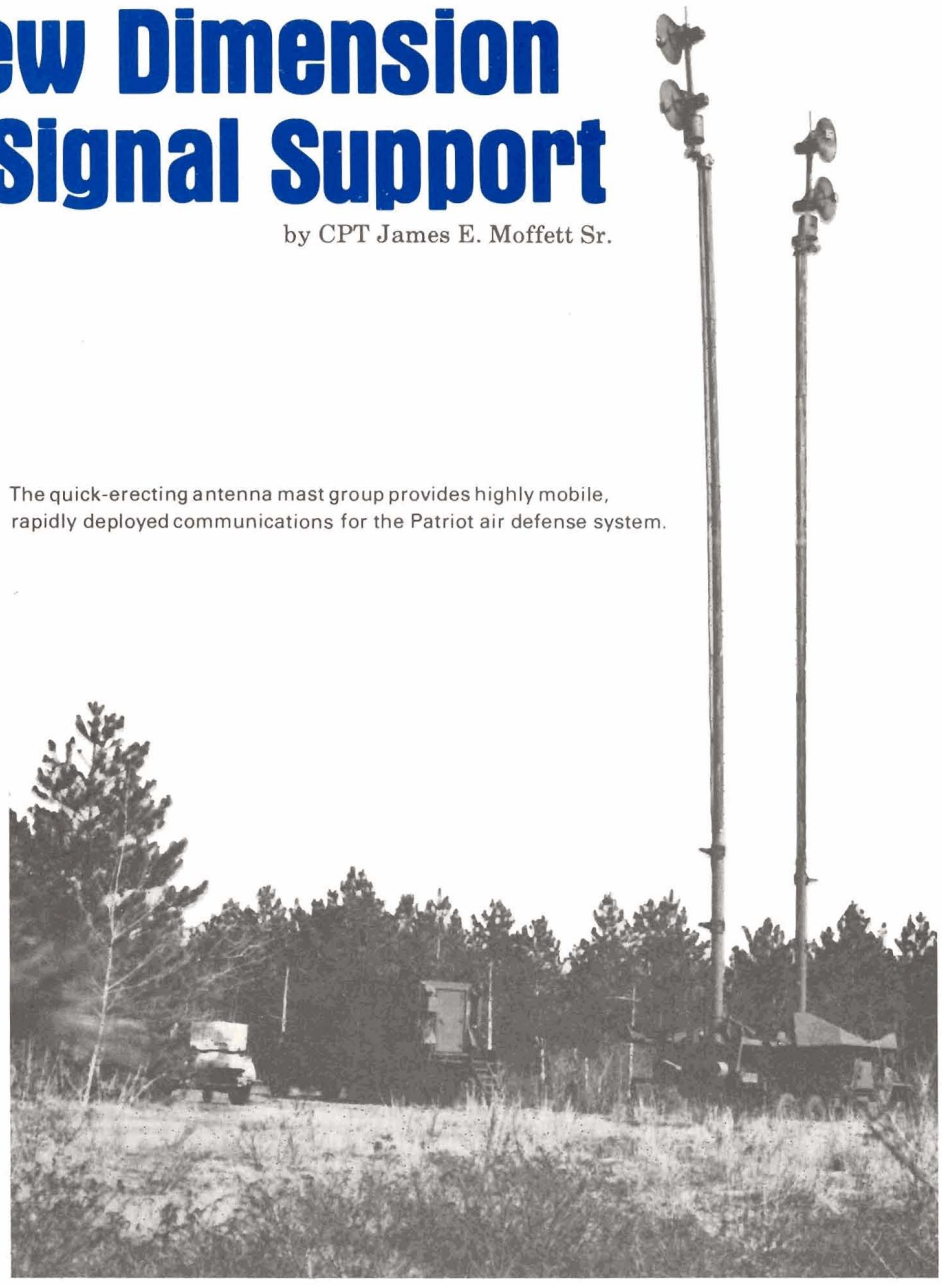
Army training films may not build to an exciting climax, or have beautiful Hollywood starlets pushing buttons or tightening bolts. You're not likely to see Robert Redford in the title role as Colonel Stargazer, and the cardboard bombs and paper bullets may lack the dramatic impact you want to see, but when you're living the high drama of live bombs and real bullets, you may be glad that an Army training film taught you the latest techniques for ducking.

*

Shirlee Allen, *a script writer with Audiovisual Section, Directorate of Training and Doctrine, U.S. Army Air Defense Artillery School, Fort Bliss, Texas, has attended St. Petersburg Junior College, St. Petersburg, Fla., El Paso Community College and the University of Texas at El Paso. She is a graduate of the Air Defense Artillery Officer Basic Course.*

Patriot's New Dimension In Tactical Signal Support

by CPT James E. Moffett Sr.



The quick-erecting antenna mast group provides highly mobile, rapidly deployed communications for the Patriot air defense system.

The problem most often encountered by tactical units using multichannel communications is the time it takes to emplace and erect the antenna system, the most demanding requirement for any mobile antenna system. The ease of emplacing and erecting the Patriot antenna mast group significantly reduces the time and opens the door to adaptation into the mechanical design of other weapon systems.

The Patriot missile system, which uses a phased-array radar to acquire, track and ultimately engage hostile air threats, receives its area coverage through an interlock of fire unit target engagement areas. The nerve center for each fire unit is the engagement control station under the operational control of the information coordination central at battalion headquarters.

To remain abreast of the total air defense picture, fire units must be interconnected via a data and voice communications link. The Patriot antenna mast group provides the needed tactical communications link for UHF voice and data communications to distant fire units and adjacent Patriot battalions. Composed of two quick-erecting mast systems, parabolic reflectors and highpowered amplifiers, the antenna mast group is collocated with each Patriot manned shelter.

Set-up times of at least 30 minutes, and in some cases more than an hour, are common for many standard inventory antennae. Furthermore, operators are required to man guys for mast stability during emplacement of guyed antennae. The Patriot antenna mast group does not use a guying system.

Antenna height has been another shortcoming for most standard tactical antenna systems. Many tactical antennae in the Army inventory are limited to heights of 35 to 50 feet and require cumbersome transport and assembly methods. In many cases, the limited height does not permit the radio-frequency energy to clear terrain obstacles and thus be received or transmitted by the antenna. This necessitates additional relays strategically placed to avoid the obstacles.

Patriot antennae have a maximum height of 91 feet. Measured from the upper antenna to the ground, this height represents a remarkable improvement over standard Army antennae. Although this added height capability exists, it will not be needed at all times. In fact, the antenna should only be elevated to the minimum height required by the operational scenario.

The Patriot antenna mast group is not the panacea for all communications problems, but it holds the potential to significantly reduce, if not eliminate, emplacement time and height limitations.

Components

The antenna mast group's five-ton truck transports the antennae and amplifiers for the UHF communications equipment in the collocated shelter. The communications equipment, which is compatible and interoperable with adjacent Patriot battalions and the air defense group AN/TSQ-73 control facility, consists of an AN/GRC-103 radio, TD-1065 data buffer, TD-660 multiplexer, security equipment and a new tunable filter to suppress out-of-band noise produced by the radio.

Each shelter contains an antenna mast monitor panel and antenna control unit. The panel monitors the operation of each UHF amplifier and deflections of each mast. Amplifier malfunctions are indicated via a summary fault light from built-in test equipment located on the antenna mast group. Essentially, the panel was designed for

operational interface with collocated manned shelters. The antenna control unit permits remote azimuth operation of each antenna; antenna elevation is adjusted manually.

Mounting the amplifiers atop each mast reduces cable losses, thus permitting the use of flexible radio frequency cables which can be stowed at the base of the mast. Each narrow-beam antenna and complimentary amplifier provides the Patriot system with increased jam-resistant UHF communications links.

The Patriot antenna mast group uses hydraulics to raise both masts from a horizontal to a vertical position. Extruded from tempered aluminum alloy, the mast extends by pneumatic pressure using an air compartment formed with leather seals at the base of each mast section. Each seal is reinforced by a copper-beryllium seal expander.

The mast group components, adapted for Patriot communications equipment and mounted on an M-811 five-ton vehicle, were orignally developed by the U.S. Army Signals Warfare Laboratory in support of the quick-erecting antenna mast requirements for signal intelligence, electronic warfare tactical systems.

Reliability of the mast group is enhanced through the use of multiple power sources. It can function with 115 volts AC, 50 to 400 hertz (cycles per second) or with 24 to 28 volts DC. The vehicle's DC power may be used during the initial emplacement phases. When AC power becomes available, DC power may be discontinued or allowed to continue as a supplement. Operation of mast group components is shown in Figure 1.

Emplacement and Road March

The Patriot antenna mast group is designed for a crew of three radio-relay operators (31M20) to emplace and make operational in less than 14 minutes, well within the prescribed time for activation of communications between Patriot fire units.

Road march of the antenna mast group requires slightly longer than 14 minutes because of the time needed to lace the radio frequency cables into the storage bins and to manually raise the protective shrouds.

After the M-811 vehicle has been positioned, the intervehicular cables are connected between the antenna mast group and the collocated shelter. Next, the crew unclamps, rotates and deploys the antenna masts. The twin-mast system may be deployed with both masts or only one mast, depending upon the site communications plan. Like all Patriot equipment, the antenna mast group can be emplaced on terrain slopes of 10 degrees or less.

During road march, the antennae are protected by shrouds that have a ground clearance of 142 inches when elevated and approximately 80 inches when lowered. The shrouds also serve as maintenance platforms for the amplifiers and antennae.

Safety Features

A series of automatic switches and interlocks has been designed into the Patriot antenna mast group to facilitate safe, sequential operation.

- A zero-degree limit switch prevents the mast from being extended when in the horizontal or stowed position.
- A 15-degree limit switch automatically stops the mast when it is being lowered within 15 degrees of horizontal. This permits the crew to ensure that personnel or other obstructions are not underneath the mast.
- A 100-degree limit switch prevents the mast from being raised beyond the 100-degree vertical position. The mast attains this position when the vehicle is emplaced on a 10-degree downslope.
- A hydraulic cylinder interlock switch allows mast extension only when the hydraulic cylinder lock is in place.
- A mast pressure switch prevents the mast from being lowered to a horizontal position when it is pressurized.
- A vertical interlock switch prevents the mast from being extended until it is within five degrees of vertical. Premature mast extension could damage the mast seals and tubular sections.

Additional interlocks affecting radio frequency radiation and antenna rotation are being considered.

Figure 1.

Operation of mast group components

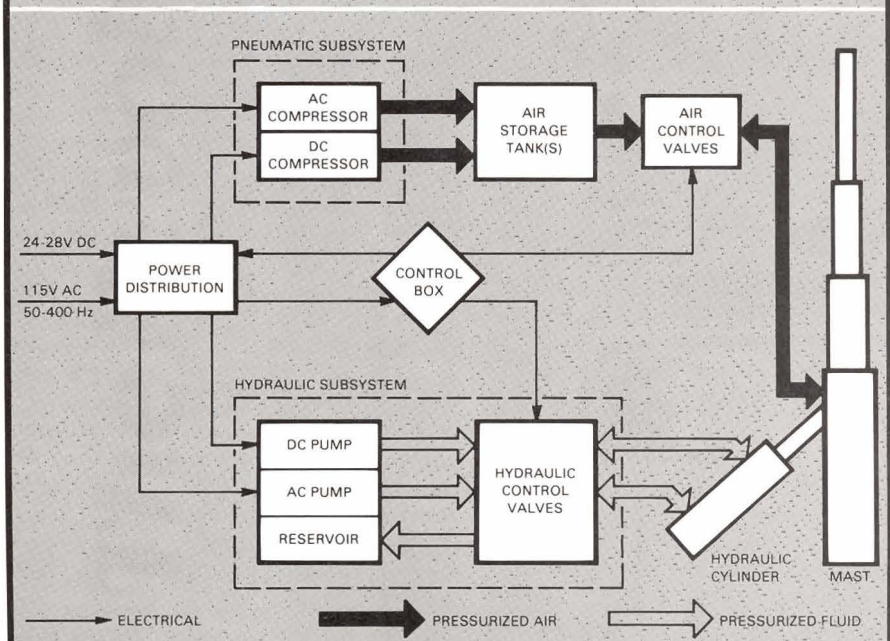


Figure 2.

Technical Specifications

Military Nomenclature	OA-9054 (V)/G
Extended Height	80 Feet
Minimum Length (Telescoped)	235 Inches
System Weight (Excluding top load)	3,000 Pounds
Erection Time	3 Minutes
Mast Deflection With winds of	3 Degrees 35 MPH
Wind Survival	70 MPH
Load Area	10 Sq. Feet
Maximum Top Load	600 Pounds
Operating Temperature	-50°F TO +160°F
Pointing Accuracy	0.5 Degrees
Power Requirements	115 VAC, 50-400 Hz, 2 KW. 24 VDC, 500 Watts
Qualification Tests	Mil Qualified

The antenna mast group prepared for road march.

Unlimited Potential

Several factors make the mast group and its associated communications equipment attractive for use in systems other than Patriot. This vast potential should not be overlooked.

System versatility. Although the antenna mast group is configured for Patriot UHF communications, it need not be restricted to Patriot. The mast group supports four antennae, uses multiple power sources, is adaptable to VHF antennae and its height is variable. Antenna mast group communications equipment accommodates band-3, 695-1,000 megahertz. Conversion to band-4 is under consideration. Minor hardware modifications may be required for other specific applications.

Operational capabilities. Figure 2 presents the capabilities for a quick-erecting mast with a 10-square-foot payload. These capabilities were reviewed in early antenna mast group development and found promising. They may be suitable for other potential users.

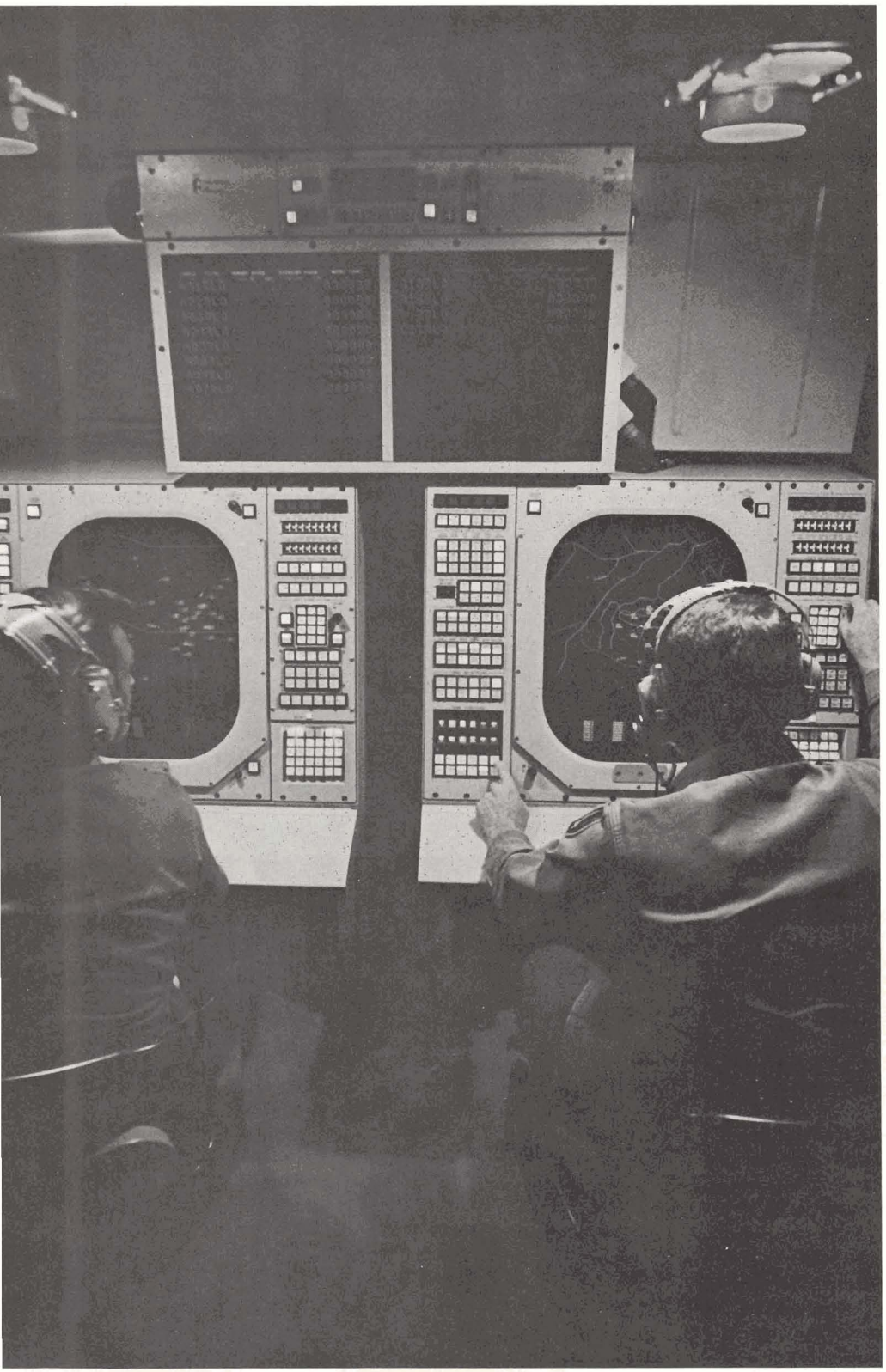
Reduced acquisition costs and time. A stringent requirement of Department of Defense Directive 5000.1, Major System Acquisition, is to evaluate existing equipment for modification or upgrade prior to initiating research and development programs. This directive was promulgated as a cost-saving measure to eliminate similar development programs. Modification of existing equipment is advantageous. Not only is development time reduced, but tremendous savings can be realized in system acquisition and lifetime ownership costs. This acquisition strategy saved the Patriot Project Office more than $150 million in antenna mast group procurement costs and saved three to five years in development time. New equipment requires an average of eight to 10 years, sometimes longer, to develop and deploy. Mast group adaptations may be feasible for similar uses. The potential exists for savings in development and lifetime ownership costs.

Following extensive subsystem testing at Raytheon, the Patriot prime contractor, GTE/Sylvania Corp., the mast group developer, and the National Bureau of Standards, the antenna mast group is now undergoing end-item testing at White Sands Missile Range, N.M. During testing, valuable data will be collected to determine its responsiveness to environmental conditions and other pertinent parameters of the Patriot system. ✱

CPT James E. Moffett Sr. *is responsible for Patriot prototype antenna mast group development and acquisition at the Patriot Project Office, Huntsville, Ala. He holds a bachelor's degree from Jackson State University and a master's from Florida Institute of Technology. A graduate of the Signal Officer Basic, Advanced and Telecommunications Systems Staff Officer courses, he has served in tactical signal units in the United States and Europe.*

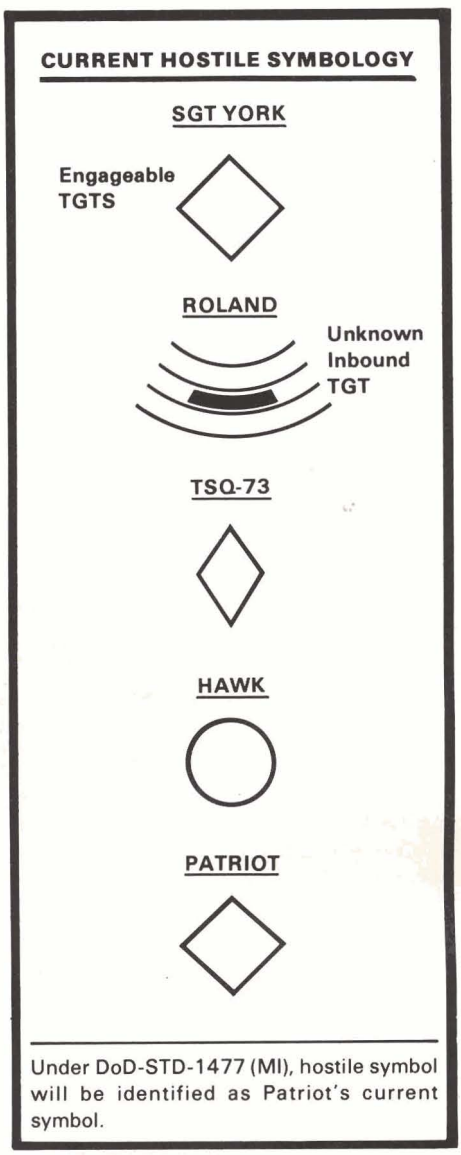
Symbology Standardization A Reality

by CPT Steve Navedo



The AN/TSQ-73 (above) friend symbol is equivalent to the Hawk hostile symbol. Standardized symbology will make it easier for soldiers trained on one system to transfer to another.

As air defense systems have become more complex and automated, each system developed has incorporated its own unique symbol set. Consequently, Air Defense Artillery has compiled an aggregation of different symbols that represent the same status in various systems. This has caused the training of operators on more than one system and their transfer from one system to another to be extremely difficult. In comparing HIMAD systems, there is disparity in even the most basic symbols. For example, Hawk's hostile symbol is equivalent to the Patriot and AN/TSQ-73 friend symbol.



Under DoD-STD-1477 (MI), hostile symbol will be identified as Patriot's current symbol.

To reduce the proliferation of symbol sets, the Army has established a new military standard which prescribes symbols for air defense system displays which are electronically or optically generated. The new standard, DOD-STD-1477(MI), provides a guideline for the symbols of new systems and those in the genesis of their development.

The rationale used in selecting these symbols is based on standard symbologies which have evolved through research and past system development. Since the symbology used in the Patriot and AN/TSQ-73 systems is quite extensive, it was used as a basis for the standard. Although most systems would not need the entire symbology repertoire, the symbols which are used by a specific weapon system should be chosen from among the new standard symbols.

DOD-STD-1477(MI) is intended for application with high-quality, calligraphically written cathode ray tube displays. The standard may be applied to other displays if the provisions are tailored to ensure that image quality provides legible symbols, modifiers and alphanumerics.

The standard is generally composed of five catagories: basic graphic symbols, symbol modifiers, map symbols, special symbols and alphanumerics. Other major aspects specified in the document are blink rates, symbol size, line brightness, line structures and symbol track data.

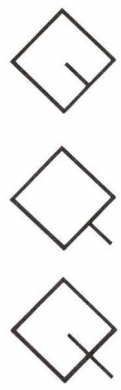
The basic air track symbol shapes are open, as opposed to filled structures (O rather than ●), to provide space for effective integration of modifiers. One of the major modifiers developed is the speed and heading vector for the basic hostile, friend and unknown symbols. The main intent of this modifier is for the operator to quickly determine whether a track is a high-, medium- or low-speed aircraft. To simply and rapidly look at a track and be able to determine speed information without having to make any subjective decisions will be a significant aid to system operators.

A similar concept was used in the development of the multiple target symbols. It was determined that operators would be able to glance at a double symbol and immediately identify that track as multiple aircraft. However, a fire distribution system such as the AN/TSQ-73 might need to distinguish the degree of multiplicity of a particular track. In that case, the modifier S, F or M (single, few or many) should be included in the track's tag data for further reference.

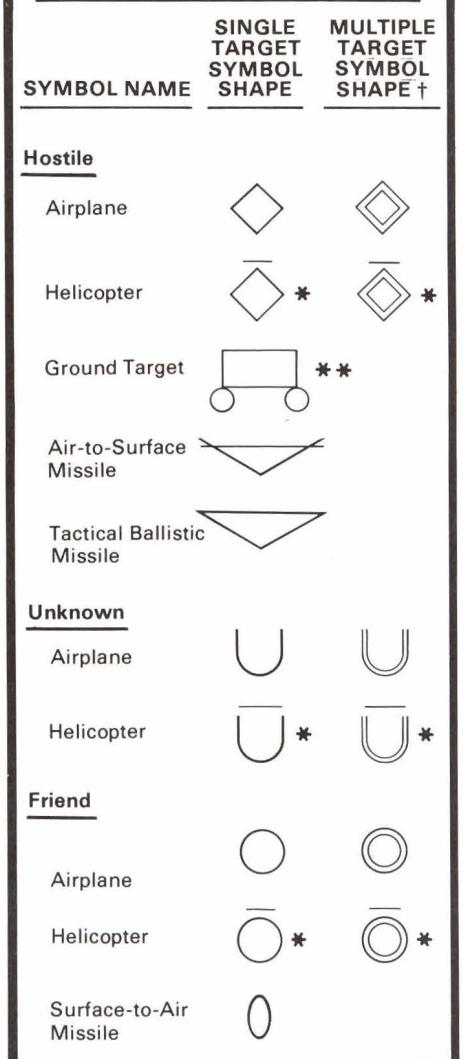
DOD-STD-1477(MI) maintains that in the development of new systems, flexibility shall be given to allow operator selection of symbol categories and data, primarily to reduce display clutter and to provide only the specific information needed for the tactical situation at any given time.

Although this standard was developed to reduce the number of symbol sets used by air defense systems, it also can serve as a foundation should the joint services pursue a symbology standardization effort. Approved by the Missile Command, the standard is available to all departments and agencies of the Department of Defense. ✱

SPEED-HEADING VECTORS
NEW STANDARD



AIR TRACK
BASIC GRAPHIC SYMBOLS
NEW STANDARD



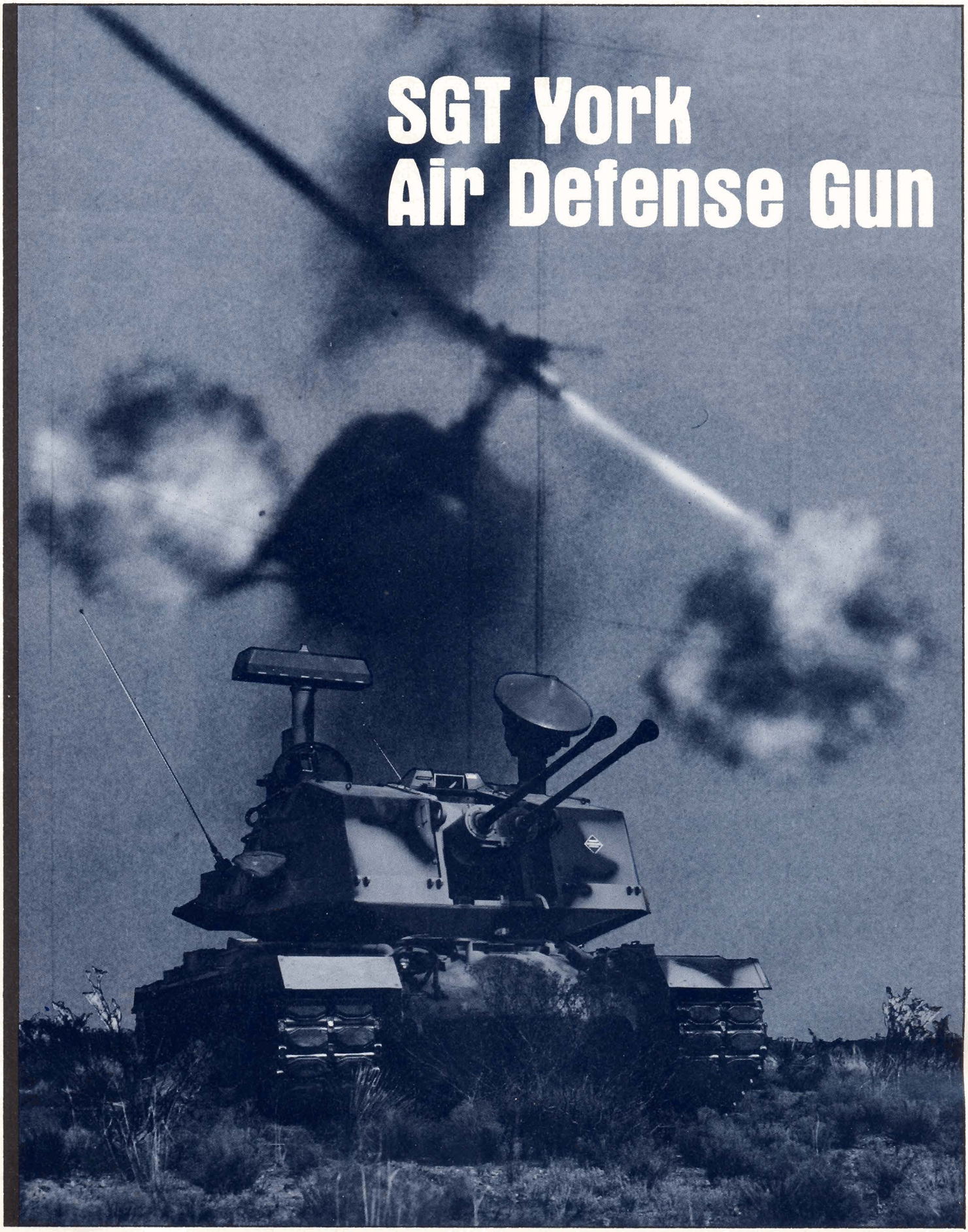
† For systems not requiring precise quantification of multiple targets.

* Horizontal bar length same as width of symbol for single target.

** Circles ½ diameter of friend circle.

CPT Steve Navedo *is assigned to the Directorate of Combat Developments, USAADASCH, Fort Bliss, Texas. A graduate of Fordham University and the U.S. Army Air Defense Artillery Officer Advanced Course, he has served as a training officer and S-3 for the 4th Battalion, 1st ADA, and as a FAAR platoon leader with the 2nd Battalion, 61st ADA, 2nd Infantry Division, Korea.*

SGT York Air Defense Gun



The SGT York Gun Makes Its Debut

A new weapon system, considered to be among the most effective for air defense, made its debut in September at Irvine, Calif., to a cheering crowd of more than 2,000 people representing the U.S. government, the Army and the prime contractor.

The first production model of the SGT York Air Defense Gun was rolled out in ceremonies conducted jointly by the Army and Ford Aerospace & Communications Corp. Special guest of honor for the occasion was Mrs. Gracie Loretta York, widow of SGT Alvin C. York, the World War I Medal of Honor recipient for whom the new weapon is named. It is the first major U.S. Army system named for an enlisted man.

Why a New Weapon System?

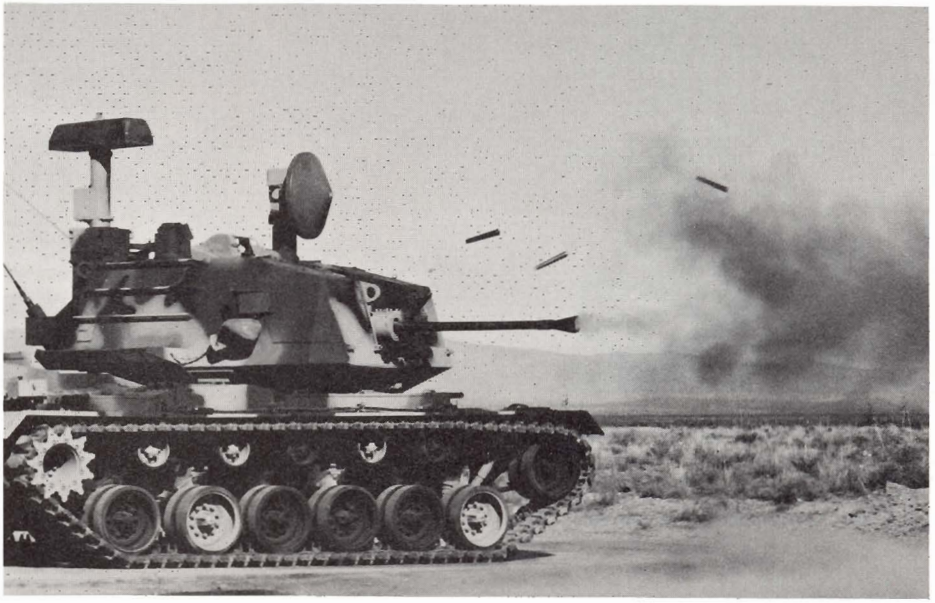
The future battlefield will present an extremely hostile and dynamic environment. Mechanized infantry and armor will face a significant threat from attack helicopters as well as from high-performance, fixed-wing aircraft armed with a wide range of munitions: bombs, cannons, rockets and anti-tank guided missiles.

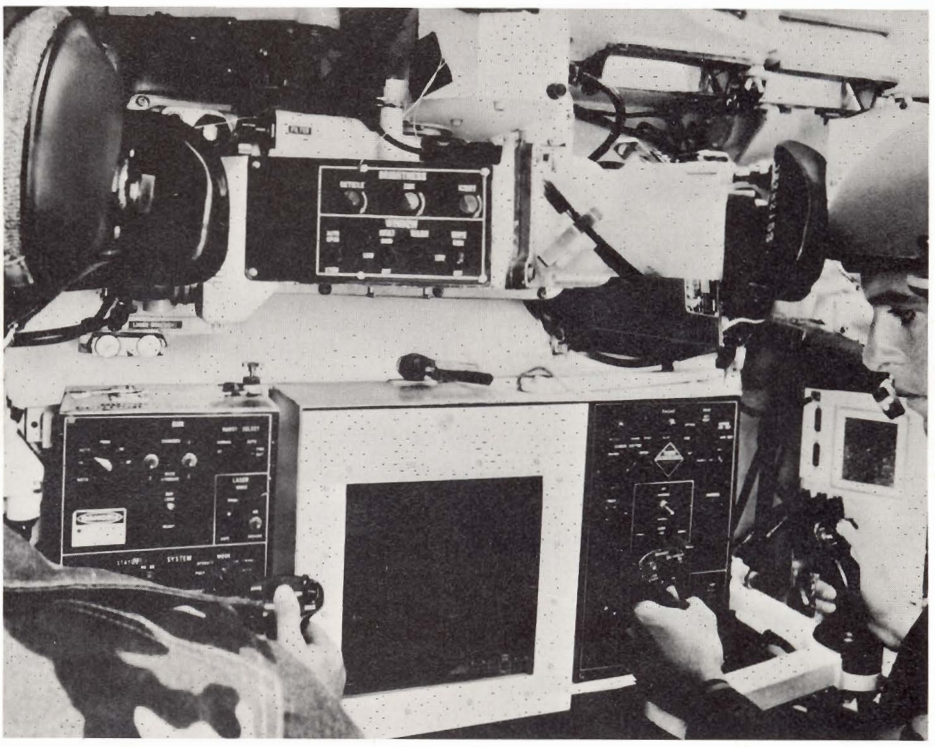
The Army's air defense concept is based on a mix of guns and missiles. Each of these weapon types has inherent strengths and weaknesses. A gun-missile mix enables the weaknesses of one to be countered by the strengths of the other which produces a desirable synergistic effect.

The Army's current family of air defense weapons, however, does not provide adequate protection against the projected air threat facing front-line armor and mechanized forces. To defeat this formidable threat requires an air defense gun that has rapid reaction and is significantly lethal. To survive on the future battlefield and be able to operate with the forces it is to defend, the system must also be mobile, armor protected and have an all-weather capability.

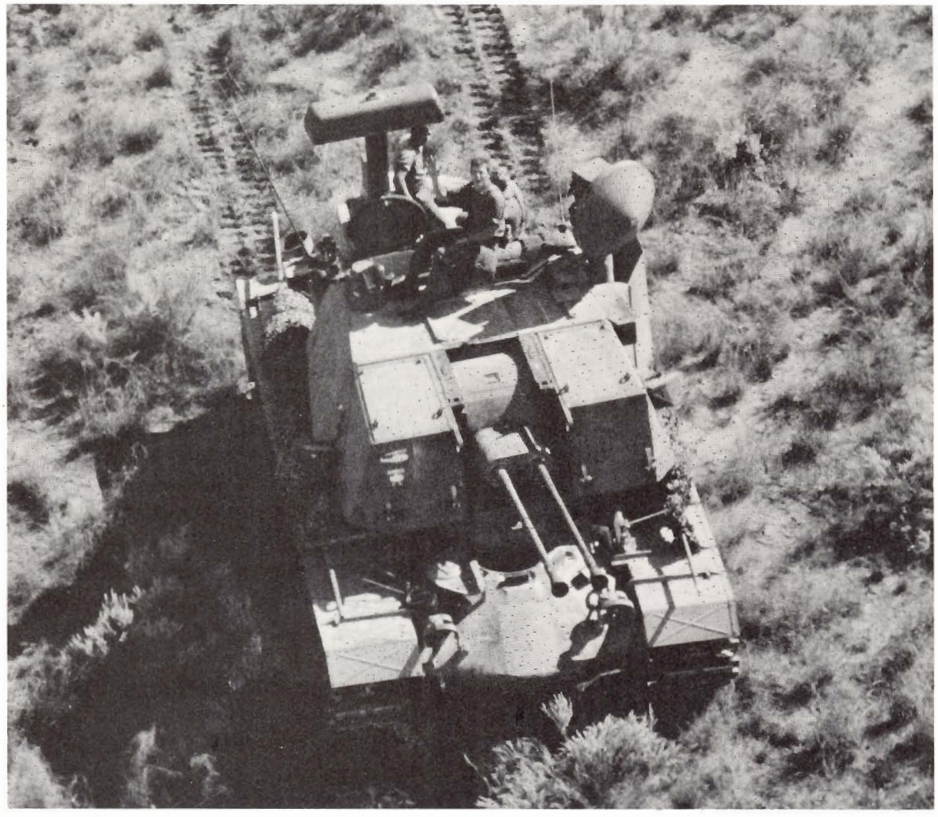
The SGT York Gun is the only system available that is capable of filling the critical void in air defense protection. Scheduled to replace the Army's current air defense gun, the Vulcan, fielded as an expedient during the Vietnam War, the new gun system will offer greater range, better reaction time, greater armor protection and a sufficiently lethal projectile. Furthermore, it can shoot on the move.

Unlike missiles that cannot provide the fast reaction, relatively close-in accuracy and degree of invulnerability to countermeasures that a gun can provide, the SGT York Gun, with its acquisition and track radar coupled to a digital computer and its ability to shoot on the move, can rapidly detect, tentatively identify, set priority and place accurate fire on attack helicopters and fixed-wing aircraft. Its 40mm projectile with proximity fuze provides significant lethality and a high probability of kill. The SGT York Gun has the range to reach out and kill the threat, and it has the armor protection, mobility and all-weather capability to operate effectively with heavy forces in their hostile environment.





The two-man crew station of the SGT York Gun is designed for effective control in the combat environment and can be operated by only one crewmember.



The SGT York Air Defense Gun

The self-propelled M-247 SGT York Air Defense Gun is designed to fight with and protect the M-1 Abrams main battle tank and other mechanized maneuver forces on the forward edge of the battle area.

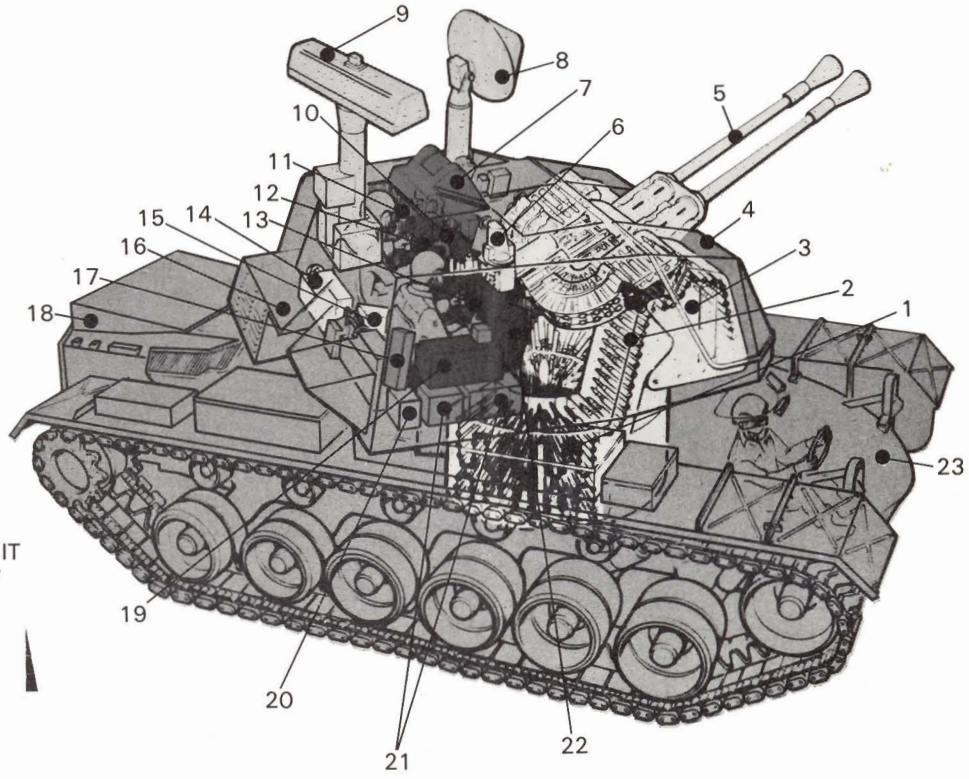
The SGT York Gun integrates twin Bofors L/70 40mm guns with a derivative of the Westinghouse AN/APG-66 search and track radar and an optical/laser rangefinder. The 40mm ammunition family includes highly lethal proximity fuzed and point detonating rounds as well as target practice rounds. The two 40mm guns have a rate of fire of 300 rounds per minute per gun and are declared NATO standard. The armored turret, mounted on a modified M-48A5 tank chassis, is designed to rapidly turn toward an airborne threat, acquire and track the target and fire several types of antiaircraft rounds with minimal operator intervention.

The heart of the 60-ton SGT York Gun is the digital system controller, which provides centralized hardware control, graphics display, built-in test and power subsystems. In its role as a "system controller," it provides a single integrated interface for all hardware and software associated with target search and acquisition, turret and gun/feed control and interaction with the crew.

Supportability of the system is attained through a completely integrated logistics support program. This program provides trained operators and maintenance personnel to all Army

Major Subsystems

1 LOWER MAGAZINE
2 AMMUNITION
3 UPPER MAGAZINE
4 ARMORED TURRET
5 40mm TWIN GUNS
6 SQUAD LEADER'S PERISCOPE
7 STABILIZED SIGHT WITH LASER RANGEFINDER
8 TRACK RADAR
9 SEARCH RADAR
10 SQUAD LEADER'S TELESCOPE
11 GUNNER'S TELESCOPE
12 GUNNER'S CONSOLE
13 SQUAD LEADER'S CONSOLE
14 FIRE CONTROL COMPUTER
15 RADAR PROCESSOR
16 ENVIRONMENTAL CONTROL UNIT
17 LOW VOLTAGE POWER SUPPLY
18 PRIMARY POWER UNIT
19 SYSTEM CONTROLLER
20 NBC FILTER
21 RADIO
22 DISPLAY ELECTRONICS
23 TANK CHASSIS

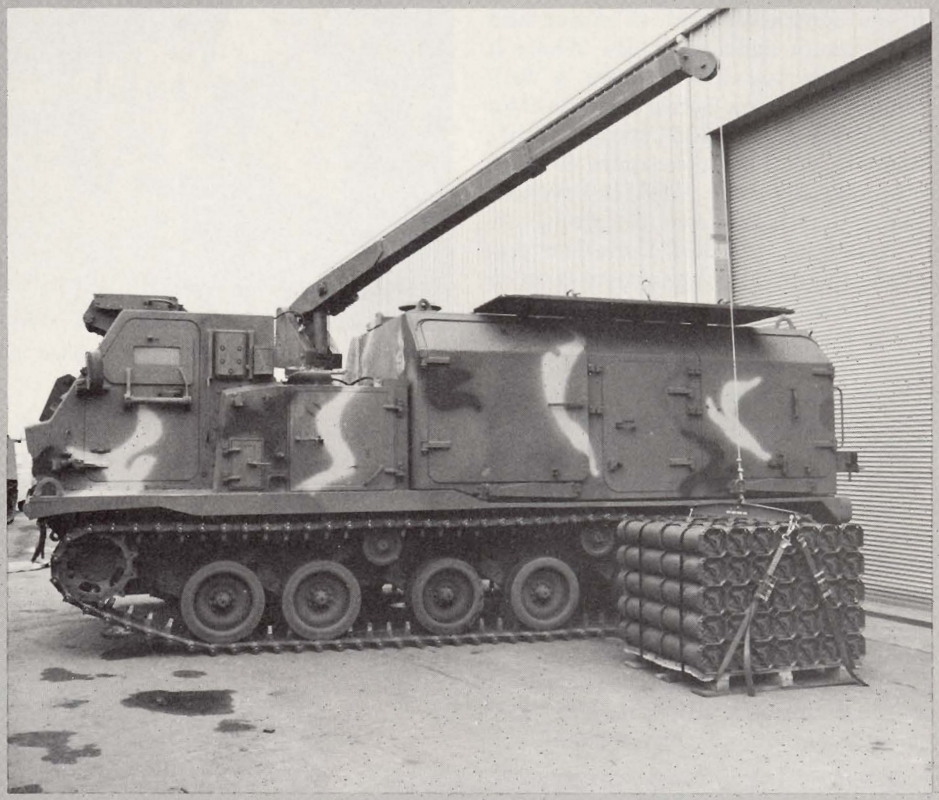


organizational levels, complete sets of support equipment, technical manuals and a formal provisioning and spares program. In addition, contractor personnel are supplying the initial training and deployment activities and providing a depot-level maintenance effort at the factory.

The SGT York Gun system entered production in May 1981, following completion of the engineering development phase. The initial production rate is two systems per month and will gradually build up to 11 per month by the end of 1985 for a total of 618 units. The system that rolled out in September is undergoing tests at Ford Aerospace's remote site near San Juan Capistrano, Calif., before delivery to the Army later this year. SGT York Gun batteries will be part of the air defense battalion in each of the Army's heavy divisions. The first is scheduled for deployment in 1985 or 1986.

Less than six years have elapsed since the initial development contract award in January 1978 to rollout of the first system in September. This is considered a short time for complete development of a major system. ✱

Rearm Vehicle For SGT York Gun Studied



A rearm vehicle is being studied by Headquarters, U.S. Army Training and Doctrine Command, as the possible resupply vehicle for the SGT York Air Defense Gun as well as for other forward units. The armored forward area rearm vehicle proposed by FMC Corp. has the mobility of and components commonality with the M-1 Abrams main battle tank and the M-2/M-3 Bradley Fighting Vehicle. The armored forward area rearm vehicle, which can carry a maximum load of 24,000 pounds, provides ballistic and nuclear, biological and chemical protection for the resupply crew. The vehicle rearms an Abrams with its conveyor-belt system during concept evaluation plan testing (left). (Photos courtesy of FMC Corp.)

Assembling The SGT York Gun

by David E. Oberheim

(Photos courtesy of Ford Aerospace & Communications Corp, DIVAD Division)

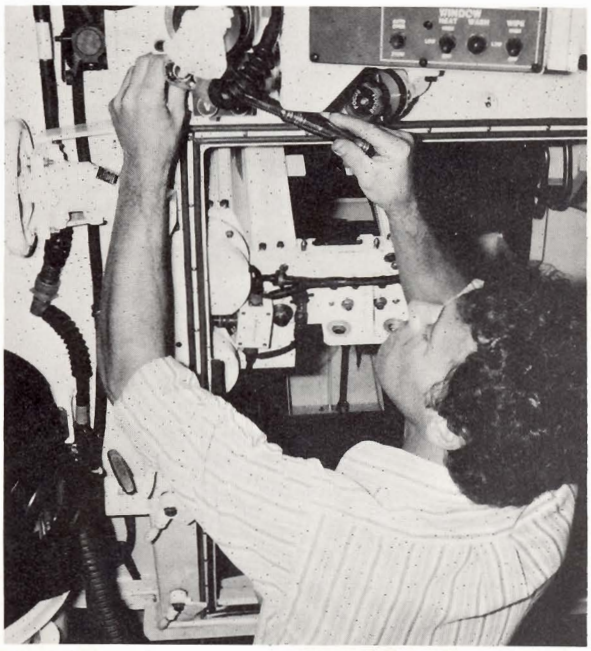
The computerized, numerically controlled machine shop is the most advanced in aerospace industry.

Building a SGT York Air Defense Gun takes several thousand people and more than 10,000 parts provided by the prime contractor and 45 major and 2,155 minor subcontractors. Where it all comes together—where a full-fledged SGT York Gun is born—is at an industrial complex in Irvine, Calif., home of the Ford Aerospace & Communications Corp., DIVAD Division, Lake Forest final assembly plant.

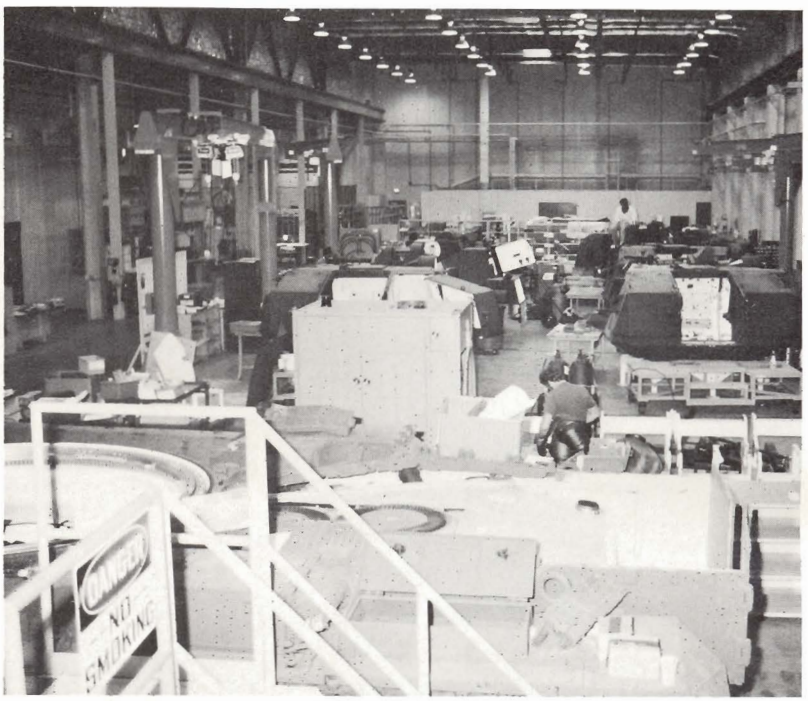
To support the SGT York Gun program, the division has grown from 75 people and 40,000 square feet in 1978 to today's level of 1,600 people and more than 500,000 square feet. The Lake Forest plant is a new 108,000-square-foot production facility designed to accommodate metal parts fabrication, mechanical assembly, final assembly, integration and preacceptance testing of the launch system. Cable, harness, electronic and optical assembly was performed at Newport Beach, Calif., until the Lake Forest plant was completed in June 1982.

Metal parts fabrication is performed in three uniquely different shop bays: sheet metal shop, conventional machine shop and computerized, numerically controlled machine shop. Mechanical assembly is partially done by line-flow operation (automatically flowing from station to station) supported by in-line riveting and tungsten inert gas welding processes. The ammunition feed system, the mechanical heart of the SGT York Gun, comprises the majority of this assembly effort.

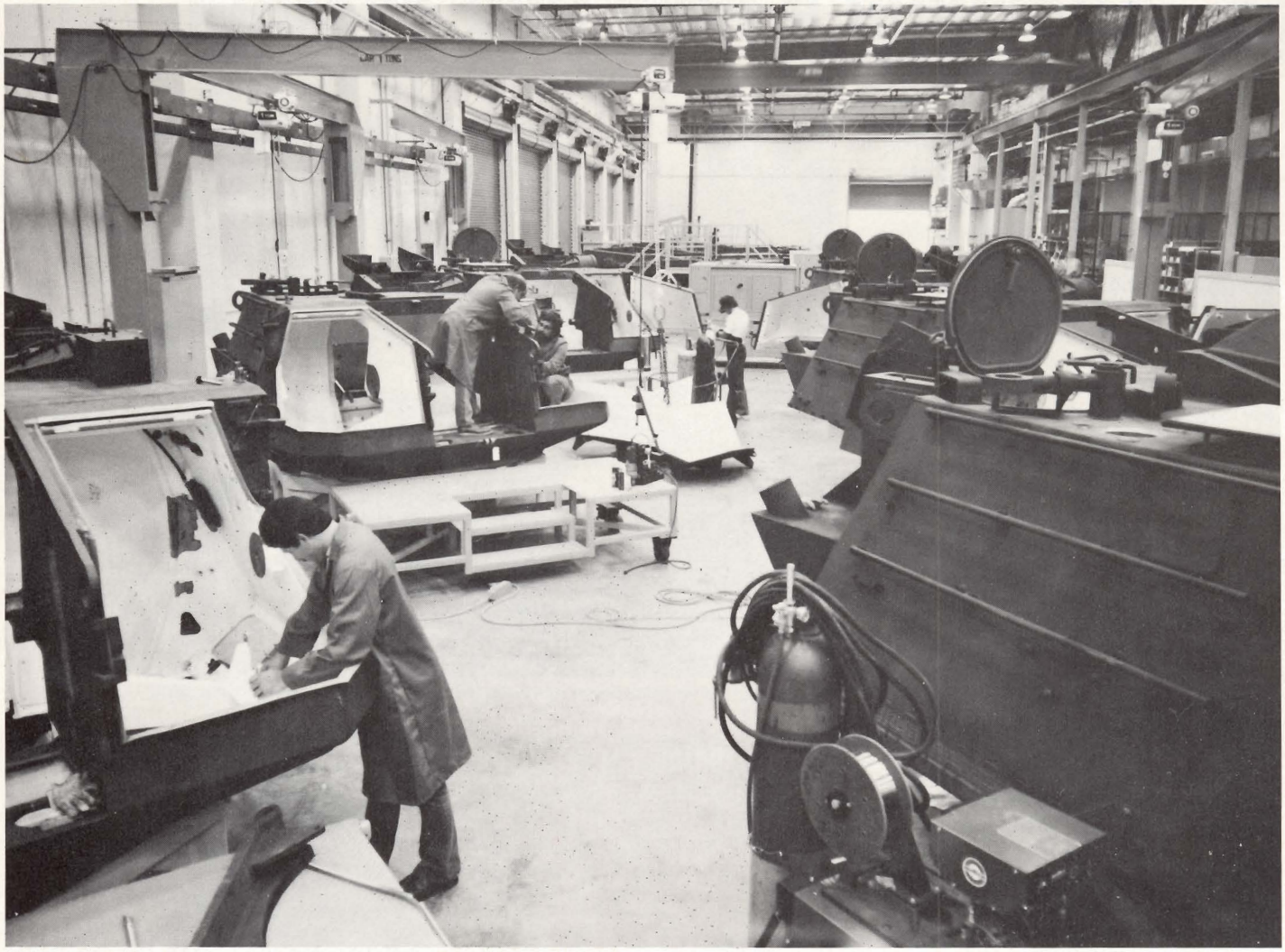
Final assembly and integration of the system are performed in single-unit-build fashion in a high-bay area. Preacceptance testing of the completed system is performed in a computerized, vented, acoustical test bay.



Turret integration work in progress on the second SGT York Gun production unit.

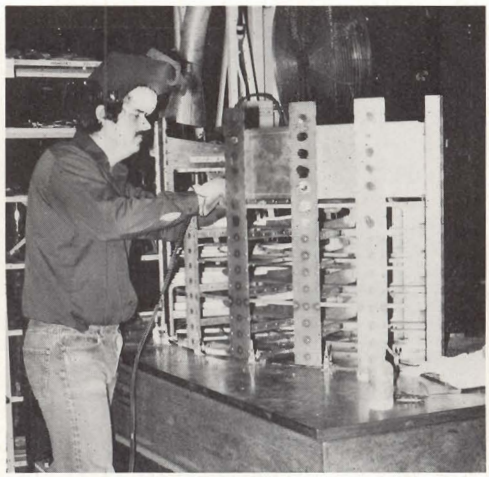


Main turret and chassis integration bay.



Turret assembly area.

Processing feed system ammunition buckets.



Assembling and welding the SGT York Gun magazine.

*

David E. Oberheim *is manager of the Ford Aerospace & Communications Corp., DIVAD Division, Lake Forest final assembly plant in Irvine, Calif.*

Learning A New Gun System

by Tom Christofk

Since February 1983, more than 55 soldiers and civilians from the U.S. Army Air Defense Artillery School, Fort Bliss, Texas, have received classroom and hands-on training to become instructors and key personnel in the operations and maintenance of the SGT York Air Defense Gun system. Taught by personnel of Ford Aerospace & Communications Corp.'s DIVAD Division at Irvine, Calif., the courses are customized to the requirements of specific MOSs that will support the SGT York Gun. Nine courses, ranging in length from 40 to 480 hours of instruction, are being developed. All courses will be conducted at least once; some will have multiple sessions with eight to 14 students enrolled in each. Designed to maximize student exposure to areas of the SGT York Gun in which they will have on-the-job involvement, the courses combine lectures, production facility workshops and practical exercises on hardware.

The SGT York Gun MOSs covered in the courses taught by DIVAD Division are 16L (crewman), 24W (system mechanic), 27P (system repairer), 27Q (system test specialist), 52C (utilities equipment repairer), 63N (tank system mechanic), 63G (fuel and electrical system repairer), 35H (calibration specialist), 224DV (DS/GS system technician) and 224DO (organizational system technician). Civilian job series 1710 (education specialist), 1712 (training specialist) and WG-2610 (electronic integrated systems mechanic) are also included.

Bill Dunn, DIVAD Division field service technician, explains primary alternate operation of the SGT York Gun to CW3 Dick Harper.

SFC Tony Ernst receives ammunition from SSG Vick Garcia during loading drill.

Pat Boyer, DIVAD Division instructor, teaches acquisition mode to 16L (SGT York Gun crewman) students.

Through a multimedia approach that incorporates up-to-date data on manufacturing, engineering and logistics, the students receive information that is available at the time of the classes. Individual students are encouraged to seek additional information beyond the scope of their course if they feel it will aid them in performing their future jobs.

In addition to the instructor and key personnel courses, a series of resident courses is currently under development. These courses, to be taught primarily by personnel trained at Irvine, are scheduled to be implemented at the Air Defense Artillery School and the Missile Munitions and Chemical School. Other instructors will come from cadre training programs.

CW4 Donald Akins (left) and SFC James Young perform maintenance on the SGT York Gun magazine.

In March 1983 the first group from the U.S. Army Air Defense Artillery School completed the 24W (SGT York Gun system mechanic) course at Ford's DIVAD Division in Irvine, Calif. They are from left to right, (front) SSG Timothy Nelson, SFC James Young, (rear) SFC William Spetter, Dave Parker, Bob Williams, SFC Dale Blacketter, CW3 Davis Brooks, SFC Wayne Brassell and SFC Edward Kvapil Jr.

SSG Charles Johnson (left) and SFC Pat Whelan replace a component on the prime power unit mock-up.

SGT York Training Schedule

COURSE	DATE
24W (system mechanic) OSUT	May 1984
24W (system mechanic) Transition	June 1984
224DO (organizational system technician)	June 1984
16L (crewman) OSUT	August 1984
16L (crewman) Transition	October 1984
14B Officers Course	October 1984
1st Battery Collective Training	January 1985

An instructor utilization course, taught by Ford personnel at the school, will focus on various training devices, principally the computer-aided training device.

The resident courses, the scope of which is centered around performance of critical tasks jointly selected by the contractor and the school, will train the personnel needed to support the initial fielding of the SGT York Gun.

The SGT York Gun program represents an attempt to shorten the acquisition cycle from drawing board to fielding. The shortened acquisition time leads to a concurrency in engineering and logistics activities, which in turn places unusual demands on technical manuals and training development that are only overcome by extra efforts on the part of both the contractor and Army personnel working the program. Those efforts are apparent and the progress towards a successful resident training program is steady. ✱

Tom Christofk, *a former Marine Corps officer, has experience in military training programs that range from formal school instruction to war-game development. He is the DIVAD Division Training Course manager for MOSs 16L and 24W at Ford Aerospace & Communications Corp.*

Radar Gives Fighting Edge

by Tom Burgher

Increased emphasis by Warsaw Pact air forces on air-to-ground offensive capabilities considerably raises the vulnerability of our armored and mechanized infantry units. The large numbers of deployed Soviet Hind-D and Hind-E helicopters, with their complement of anti-tank guided missiles, are of particular concern, as is the Su-25 Frogfoot which is especially designed for anti-tank and close air support missions.

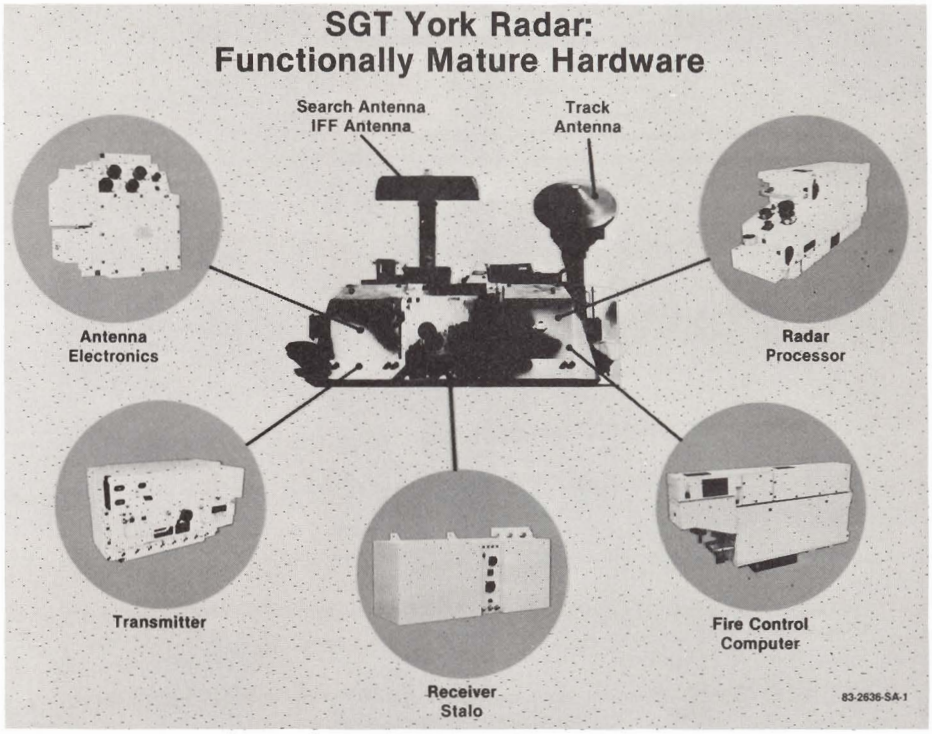
In such a target-rich battlefield, the capability to engage targets beyond visual detection range and fast reaction time are essential to the survivability and effectiveness of our armored forces. This requires fully automatic target acquisition with continuous target search in adverse conditions, 24-hours a day. Only radar can provide the necessary early warning under these conditions. In the presence of adverse weather, ground clutter and enemy countermeasures, the radar must quickly detect and track hovering helicopters, high-speed and jinking aircraft and small missiles. Multiple targets and ground reflections further complicate an already difficult target environment.

Such a radar is used in the SGT York Gun, which must operate on the move with maneuver units under such battlefield conditions in the vicinity of the forward line of own troops.

The Westinghouse radar in the SGT York Gun is a fully coherent X-band pulse doppler radar. It can detect and track aircraft at all aspects and all altitudes while its M-48A5 mount is stationary or moving. Special features enhance fast, positive target detection while minimizing the effect of enemy electronic countermeasures. The radar and fire control computer provide real-time data analysis for non-cooperative target classification of hovering helicopter, fixed-wing aircraft, ground mover or missile threats. Friend-or-foe identification is fully integrated with radar-target detection so that interrogations occur only once and are limited in duration. Special techniques are also incorporated to attenuate radar-tracking errors induced by ground reflections (multipath effects), thus allowing for effective gun laying against nap-of-the-earth targets. Separate search and track processing allows multiple targets to be detected, classified, identified and placed in proper priority while the highest priority threat is tracked and engaged by the twin 40mm guns.

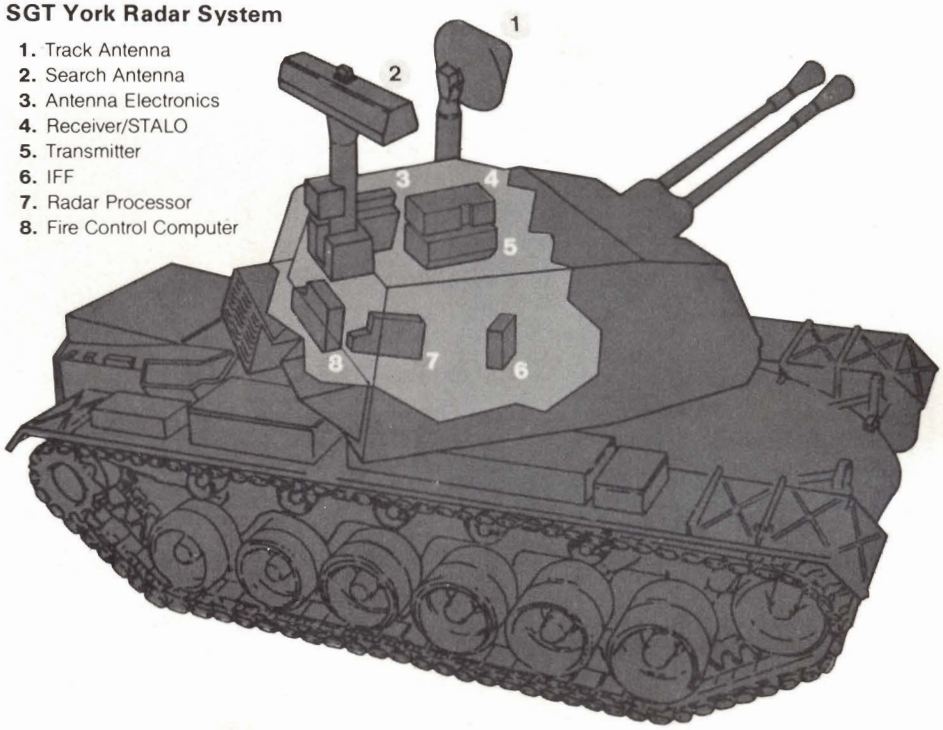
Radar Operations

The crew has the option to automatically or manually operate the radar.

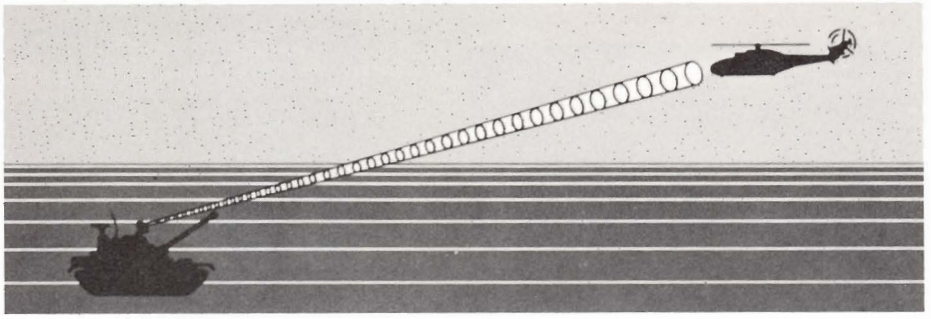


SGT York Radar System

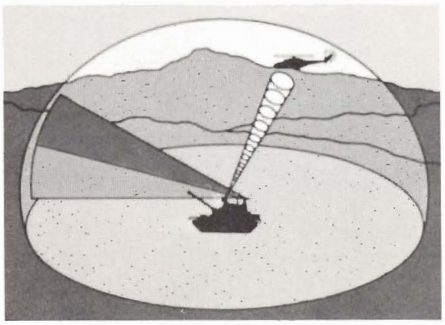
1. Track Antenna
2. Search Antenna
3. Antenna Electronics
4. Receiver/STALO
5. Transmitter
6. IFF
7. Radar Processor
8. Fire Control Computer



Monopulse Tracking



Simultaneous Search While Tracking



Automatic target detection, identification, classification, priority assignment, acquisition and tracking ensure minimum response time. Other than squeezing the trigger on one of the hand grips, no crew action is required once automatic radar operation is selected. Manual operation is done by using the controls on the hand grips.

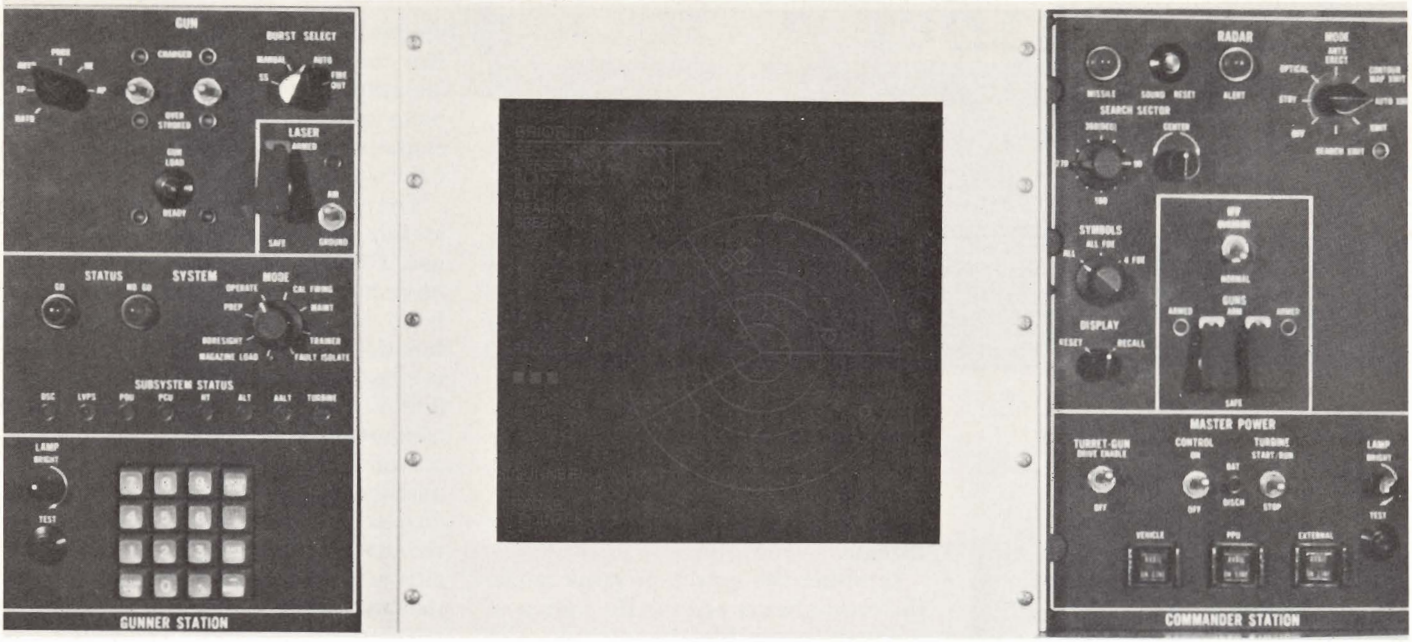
The search mode provides continuous hemispheric coverage even when a selected target is being tracked and engaged. The search mode, in conjunction with a fully automated IFF system and the fire control computer, detects and sets priority of multiple targets. Targets are classified as enemy fixed-wing, helicopter, missile, ground target or friendly. Priorities are primary, secondary or other threats. The primary threat is automatically acquired by the track antenna and, while tracking is maintained, continuous search goes on simultaneously.

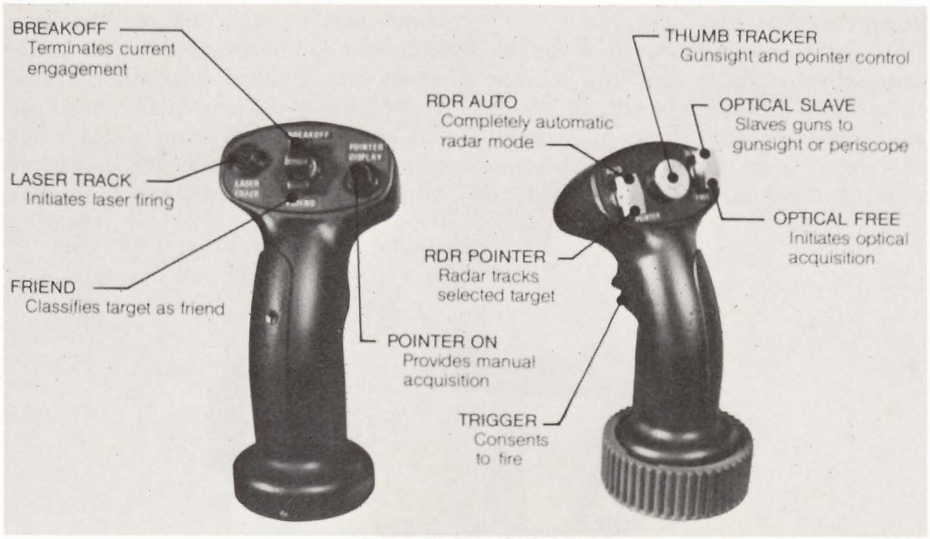
Target acquisition occurs by cueing the separate tracking antenna to the highest priority target in the search antenna files. Monopulse tracking provides accurate target location and velocity data to the fire control computer. A flashing symbol on the display represents the target being tracked. Once in the track mode, the radar is automatically time-shared between the search and track antennas. Thus, while accurate track is maintained on one target, the radar continues to detect, classify, identify, set priority and display other threats.

In either the search or track mode, the crew always retains the option of manually overriding the automatically selected target and designating any other displayed target for firing engagement.

Alternate radar modes that require manual selection by the crew include the ground-target mode, which detects slow-moving enemy armor and trucks; the projectile-track mode, a calibration mode that tracks a single projectile to update the ballistic equations in the fire control computer; and the fault-isolation mode, which initiates a complete fault isolation sequence to verify radar readiness or identify a faulty field replaceable unit.

The controls and displays of the crew station are designed for simplicity of use. Critical radar-control functions have been minimized and segregated from non-critical "house-keeping" functions to ensure rapid, error-free combat operation. The radar outputs digital target data to a rugged plasma combat-situation radar display, which presents the data in a simple plan-position indicator format. Because radar returns are digitally processed to remove clutter prior to radar output, only actual targets, identities, priorities and battle status information are presented to the crew. The radar display is entirely clutter-free, presenting the crew with a clean, easily understood battlespace. The plan-position indicator can be oriented to grid north, or to any desired bearing in mils. Where the guns are pointing, and optical sight, periscope and radar track line-of-sight positions, are computed automatically and displayed relative

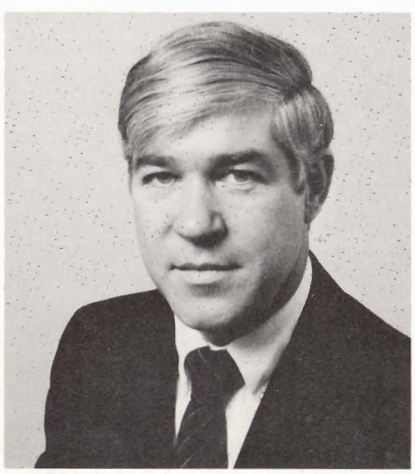




to the plan-position indicator reference and the hull. And the crew can select a search sector which is input into the fire control computer for display and automatic engagement of targets entering that sector.

Radar Technoloy for the Future

Other high-priority air defense requirements can be met by reusing the SGT York Gun radar hardware at a fraction of the research and development cost or logistics support costs normally associated with new sensor development because of a unique, digitally controlled modular architecture. Most radar designs today are highly centralized in either power or data management. By contrast, the SGT York Gun radar, like the AN/APG-66 (F-16) radar from which it was derived, is of a distributive architecture. Consequently, both hardware and software modules can be reused and tailored to perform different jobs. The same modular architecture that allows easy adaptation also permits radar growth without major hardware changes. Performance enhancements now being studied for the SGT York Gun radar include a positive hostile identification capability as well as the netting of these radars throughout the division to reduce the number required to be radiating. ✱

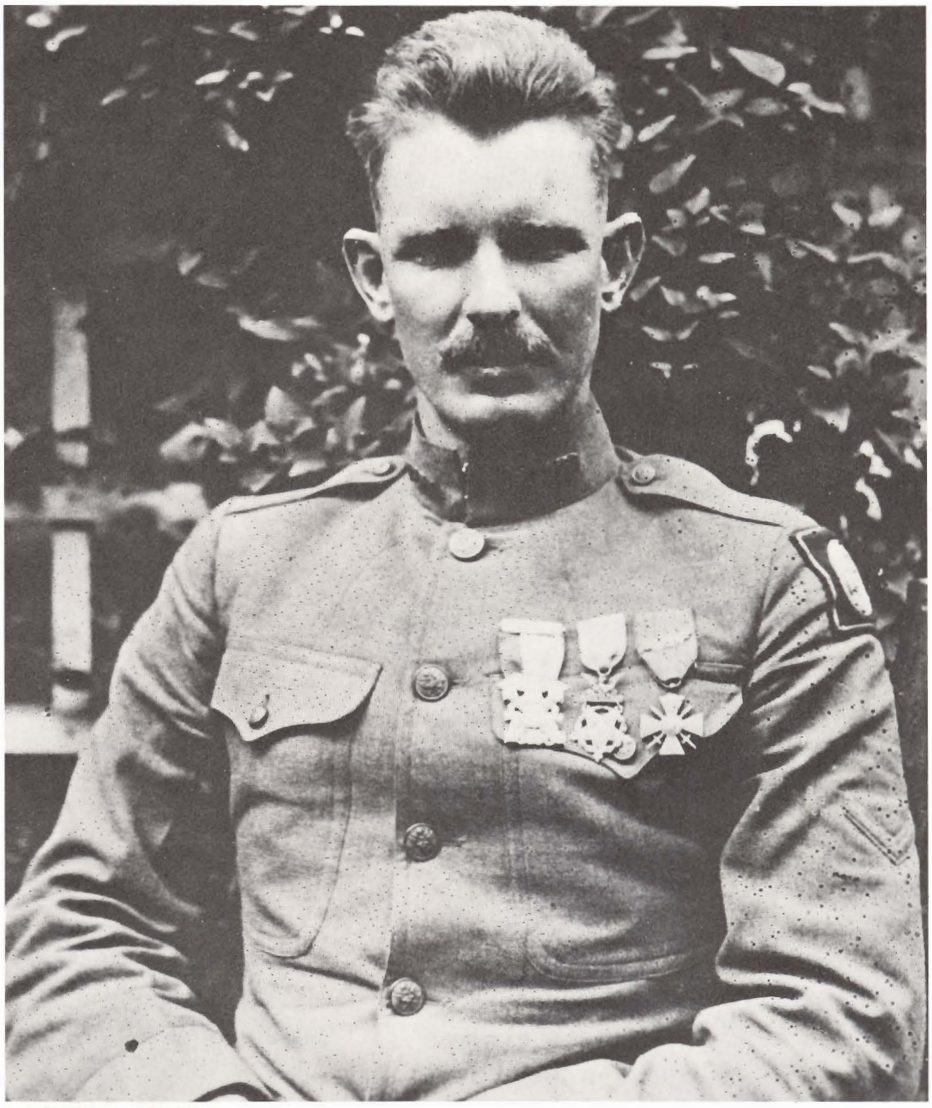


Tom Burgher *is advanced systems marketing manager for Westinghouse Aerospace Divisions. His principal concern is to sponsor the application of advanced avionics technology to Army air defense and battlefield surveillance requirements. He received a bachelor's degree in English in 1967 from the University of Pennsylvania and a bachelor's degree in physics from Johns Hopkins University in 1971.*

Sergeant York—The Man

by Nathan H. Brandt Jr.

(Condensed by the author from his copyrighted article, "Sergeant York," published in *American Heritage,* August 1981.)



World War I hero Alvin Cullum York, Company G, 328th Infantry Regiment, 82nd Division. His exploits in the Argonne Forest on Oct. 8, 1918, brought him honors that included the Medal of Honor.

Pershing called him "the greatest civilian soldier" of World War I. Foch described his exploit in the Argonne as "the greatest thing accomplished by any private soldier of all the armies of Europe."

And in many ways, Alvin Cullum York did seem the perfect hero: a tall, lean, red-haired man with blue-gray eyes, a crackerjack marksman whose religious faith made him totally fearless. Yet in other ways he seemed the least likely of heroes—a barely literate pacifist and a conscientious objector. His home was a log cabin in the tiny Cumberland mountain village of Pall Mall, Tenn., in the Valley of the Three Forks of the Wolf River, close by what is now the southwestern tip of the Daniel Boone National Forest.

Alvin was the third of eight sons and three daughters born to William and Mary York. His father was a blacksmith whose fortune had dwindled by the time Alvin was born on Dec. 13, 1887. The cabin his father had built, its walls papered with newspapers and old catalogue pages, was, said a later visitor, "painted by Poverty." York's father hired out to do chores for other households for 25 cents a day. When Alvin did start school, he went off in a homemade linsey-woolsey dress. He didn't wear store-bought shoes until he was 16, and then only on Sundays. By then he was 6 feet tall and still growing.

William York was "a most wonderful shot," according to his son. "The best shot in the mountains." He was so good that when neighbors got together for Saturday shooting matches, they often picked him to be judge rather than compete against him. And the neighbors could shoot, too; calipers were often needed to determine the winning bullet closest to dead center of the target.

There were turkey shoots, as well—some at a range of 150 yards. The men used "hog rifles," old muzzle-loaders, some fashioned by their pioneer ancestors. They could reload quickly; a few could even do it on the run. They knew all the ways their aim could be affected by wind, sunlight and humidity. As he grew up, Alvin earned the reputation of being an even better shot than his father.

When William York died of typhoid fever in 1911, Alvin, whose two older brothers had married and moved away, found himself head of the household. Together with friends and some of his brothers, Alvin spent weekends carousing.

Alvin occasionally tried to mend his ways, but the turning point came when a "saddlebagger," a traveling preacher, rode into Pall Mall and began holding nightly revivals at the little Wolf River church. Alvin started attending; he listened and prayed, asking God to forgive his sins and to guide him. On Jan. 1, 1915, York forswore "smoking, drinking, gambling, cussing and brawling." He kept that pledge for the rest of his life.

Looking back on his conversion long afterward, he called it "the greatest victory I ever won." It was, however, a triumph that precipitated another crisis of conscience. When the United States joined in the war in Europe,

York did not want to serve. "I had had fighting and quarreling myself. I had found it bad. . . . I just wanted to be left alone to live in peace and love."

York claimed exemption when he officially registered, writing "I don't want to fight" on his form and declaring that his church forbade participation in the war. The local board refused to accept this, on the grounds that the Church of Christ in Christian Union was not a "well-recognized" sect.

On Nov. 14, 1917, a month shy of his 30th birthday, he was ordered to report immediately at Camp Gordon, Ga. York was assigned to Company G, 328th Infantry [Regiment], 82nd Division—the All-American Division, a newly created fighting force whose officers and men represented virtually every state in the Union. They soon found out York was a conscientious objector "and they hadn't much use for that." When they teased him, he scrupulously avoided arguing or getting angry. He had only one friend, his bunkmate, CPL Murray Savage, who read the Bible with him.

One of the first things York had done on arriving at Camp Gordon was to tell his company commander, CPT E. C. B. Danforth Jr., about his religious beliefs. Danforth informed the battalion commander, MAJ George E. Buxton Jr., who summoned York to his hut and quoted St. Luke, St. John, St. Matthew and Ezekiel to show how "under certain conditions a man could go to war and fight and still be a good Christian." Though York was impressed by Buxton's arguments, he was not convinced. He asked the major for time to think.

When York returned to Pall Mall in March on a 10-day furlough, he was still opposed to fighting. "But something in me had . . . changed. I was beginning to see war in a different light."

York sought solace in the mountains. He knelt and prayed. "I begun to understand that no matter what a man is forced to do, so long as he is right in his own soul, he remains a righteous man. I knowed I would go to war."

The 82nd Division arrived in France in mid-May of 1918 and was immediately sent in reserve to the British army on the Somme. In late summer the 82nd was shifted to the Marbache sector along the Moselle and took part in the first American offensive, holding the extreme right flank and capturing the towns of Norroy and Vandervies during the St. Mihiel drive.

On Sept. 17 the division was pulled out of the front lines and a week later transferred to the Argonne Forest, in preparation for what was to be the final campaign of the war. As part of that offensive, the 82nd would remain in continuous action for 26 days, longer than any other division in the battle.

The 82nd went into action Oct. 8, making a complicated and hazardous attack across the front of one of its own sister divisions in order to relieve pressure on the Americans' exposed left flank. The objective was the narrow-gauge Decauville Railroad, which supplied the Germans.

As the early morning mist cleared, the 2nd Battalion found itself poised along the slope of Hill 223, captured the day before by the 1st Battalion. An open valley several hundred yards wide stretched ahead, and at its end three hills stood before the rail line, the center one ragged and steep, the others gently sloping. The crest of the ridge they formed was defended by veteran Prussian Guards, machine gunners massed in battalion strength. As the sun came up, the German gunners had an unobstructed view of the entire valley.

York's platoon, the 1st, was on the far left. It jumped off at 6:10 a.m. without benefit of the artillery barrage that was supposed to precede the assault. With no covering fire, the men descended the wooded slope and started across the floor of the valley. The Germans had it enfiladed, the flanking fire so heavy that the first wave of doughboys was virtually wiped out.

With his men pinned down by enemy fire, CPT Danforth sent a detachment

A 12-foot bronze statue on the grounds of the State Capitol in Nashville, Tenn., pays tribute to SGT Alvin C. York.

from the 1st Platoon to outflank the guns. SGT Harry Parsons, who commanded it, saw Danforth motion to the hill on the left. Parsons quickly chose three squads for the mission—York's and those led by CPLs William C. Cutting and Murray Savage. Altogether they had already lost seven of their 24 men.

Parsons put SGT Bernard Early, an Irishman from New Haven, Conn., in charge. As the squads formed and moved out, Parsons was sure they were going to certain death.

With Early in the lead, the men dropped back from the battalion and in single file skirted far to the left and deep into the brush, finding an old, abandoned trench and following it around the hill to somewhere behind the German defense perimeter without being seen. They paused to discuss what to do next. Some wanted to attack from the flank—they were now 300 yards to the left and in front of the American line. Early, York and a few others decided it would be best to get still farther behind the Germans and then swing in and attack from the rear.

The men ran crouching from bush to bush and stump to stump, seeking cover as they pushed deeper into German territory. Suddenly two German stretcher-bearers appeared. Ignoring an order to halt, they ran, trailed by a few shots from the Americans. Early got the squads into a skirmish line and gave chase, hoping to cut off the fleeing Germans before they could sound an alarm.

Jumping a small stream, they came upon a stretch of flat ground, and there, beside a hut, was a German major conferring with two other officers; not far from them sat some 20 enemy runners and stretcher-bearers. They had stumbled on the headquarters of a German machine gun regiment. The enemy soldiers had their backs to the Americans, eating breakfast. Beyond them, a steep, thickly wooded slope rose to where German machine gunners were firing into the valley.

The Americans got off some shots, wounding two or three Germans, and raced forward with fixed bayonets. Most of the Germans surrendered immediately. One fired at York. The mountaineer shot him dead. Early ordered his men to quit firing and surround the enemy. Then, as he told the doughboys to line up the captured Germans, a burst of bullets struck him. The machine gunners on top of the slope had heard the shooting and, frantically swiveling their weapons, had opened fire into the camp.

Early fell with six bullets in him. He called out to Cutting to take command but Cutting was out of action, too, with three bullets in his left arm. Two of the men in his squad had been killed outright. Savage fell to what seemed like 100 bullets that nearly stripped his body naked. The only two remaining members of his squad died too, and two of York's own squad were down—one dead, the other wounded in the shoulder.

The ferocious storm of bullets was now chopping through the brush. Only York and seven privates had escaped being hit by the initial burst. George Wills, who had been following Cutting, now dropped to the ground and edged closer to some German prisoners. "I knew that my only chance was to keep them together," he remembered, "and also to keep them between me and the Germans who were shooting." Wills kept his rifle trained on the nearest prisoners.

Privates Joe Konotski, Theodore Sok, Thomas Johnson and Patrick Donohue were hugging the ground too, keeping their prisoners covered. Meanwhile, off to the side, Percy Beardsley, who had trailed behind York all morning, ducked behind a tree. Dead Americans lay sprawled on either side of him and he couldn't get his gun to operate. "It looked pretty hopeless for us," he said.

Fifteen paces away, on the extreme left, at the bottom of the steep slope scoured by enemy fire, and less than 30 yards from the nearest machine gun nest, was Alvin York. He had been caught in the open when the shooting began. The machine guns—there were between 20 to 30 of them—were firing straight down at him. "Thousands of bullets kicked up the dust all around us," he said. "The undergrowth was cut down . . . as though they had used a scythe."

The German bullets were flying high now; apparently the gunners were trying to avoid hitting their own men. Lying prone in the mud, York began to return fire with his rifle. As soon as he saw a helmet, he would shoot. "Every time one of them raised his head, I just teched him off." It was like a shooting match back home, "but the targets here were bigger. I just couldn't miss."

Then, without a care for the storm of bullets around him, York stood up. "Somehow I knew I wouldn't be killed." He was now firing "offhand," mountain style, his right elbow raised high, his body tilted slightly backward to balance his rifle. Offhand was his favorite position.

York had used up several clips of ammunition and the rifle barrel was getting hot in his hand when a German lieutenant and five of his men rose from a trench 25 yards away and charged down the slope toward him, bayonets fixed. York dropped his rifle and pulled out his .45 Colt automatic. Carefully he fired at the last man first, then the next farthest from him, and the next, "the way we shoot wild turkeys at home. You see we don't want the front ones to know that we're getting the back one. . . . I knowed, too, that if the front ones wavered, or if I stopped them, the rear ones would drop down and pump a volley into me." York killed all six men. Then he picked up his rifle again and waited for the next German head to appear. He shouted to the Germans on the slope to come down and surrender; "I didn't want to kill any more'n I had to. I would tech a couple of them off and holler again."

York had already killed 21 Germans. He had fired 20 shots.

The death of the lieutenant and his men had demoralized the Germans, and their machine gun fire began to slacken. The lull allowed York to check something; all during the fight he had sensed someone firing at him from behind, where the prisoners were. He turned to see the German major, an empty revolver in hand. He had missed with every shot.

The major—who, it turned out, had once worked in Chicago—approached York. "English?" he asked.

"No, not English."

"What?"

"American."

"Good Lord," the major said. "If you don't shoot any more, I'll make them surrender."

He blew his whistle. Down from the slope came the machine gun crews, throwing off their belts and arms.

As everyone got to his feet, York called out to the surviving Americans to search the prisoners and form them up. There were 90. York led the group through the German lines. As they left the scene of the fight, the corporal passed the body of Murray Savage. "I

had to leave him there. I didn't dare to take my eye off the mob of prisoners."

As they wound their way back, the Americans flushed other machine gun nests until they had 132 prisoners. Word spread quickly that York had "captured the whole damned German army." More important, the silencing of the machine guns had enabled the division to seize the railroad.

York was showered with honors—a promotion to sergeant, the Distinguished Service Cross, the *Croix de Guerre* with palms, the French Legion of Honor, the *Croce di Guerra* of Italy, the War Medal of Montenegro and ultimately the Medal of Honor in March of 1919.

When York's ship docked in New York May 22, 1919, the city gave him a ticker-tape parade unequalled in enthusiasm until Lindbergh's. When he appeared at the Stock Exchange on Wall Street, the brokers stopped trading to carry him on their shoulders.

He was deluged with offers—to make a movie, write his life story, tour theaters—but, as he put it, "I . . . felt that to take money like that would be commercializing my uniform and my soldiering."

On his return home, the Tennessee Legislature made him an honorary colonel and awarded him 385 acres in the Valley of the Three Forks. On June 7, 1919, he wed Grace Williams on the mountain ledge where they used to sit and talk together.

In 1939, as World War II approached, he said he saw no need to "get tangled up with any foreign row." Axis ambitions changed his mind, and by June 1941 he was warning that "liberty and freedom and democracy are prizes awarded only to those people who fight to win them and then keep fighting eternally to keep them." Finally persuaded that it was his patriotic duty, he consented that year to being portrayed in a movie. *Sergeant York,* with Gary Cooper in the starring role, was filmed on York's own property in Pall Mall. It won the actor an Academy Award.

Actor Gary Cooper (left) confers with Alvin York during the filming of *Sergeant York* in 1941. (Museum of Modern Art photo)

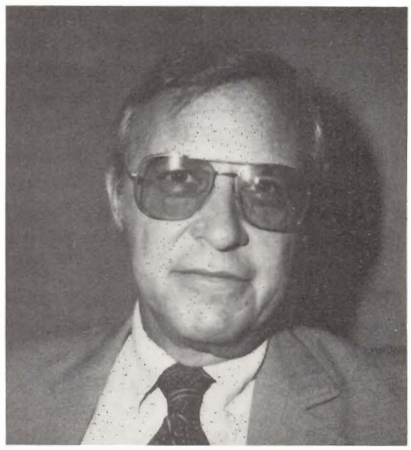
In the living room of her home in Pall Mall, Tenn., Mrs. Gracie Loretta York reminisces about her late husband, Alvin C. York. On the table at left, next to the old cathedral radio, is a scale model of the SGT York Air Defense Gun. (Photo courtesy of Ford Aerospace & Communications Corp.)

York's last battle was with the Internal Revenue Service. In 1961 the IRS sued him for back taxes it said he owed from income received for the movie biography. It claimed that York—who had suffered a series of strokes and was now partially paralyzed, bedridden and almost completely blind—owed $85,442 plus an additional $87,155 in accumulated interest. The IRS offered to settle the debt for $25,000 because "it appears to be in excess of the sum collectible from a forced sale of all" of York's assets.

When news of York's plight became public, House Speaker Sam Rayburn launched a campaign to raise the money by public subscription. In all, Americans chipped in almost $50,000, enough to pay off the tax debt and establish a trust fund.

Late in August 1964, York entered the Veterans Administration Hospital in Nashville, suffering from an internal infection. He died there Sept. 2, age 76.

York was buried in the Wolf River Cemetery, near the home he built and within view of the church where he had been converted in 1915. A flag flies over his grave year round. On Memorial Day each year, a wreath is placed there, and on Armistice Day there is a parade in his honor and sometimes veterans of the old 82nd come to pay tribute. The grave is marked by a stone monument on which are carved two books—a Bible and a textbook. ✱



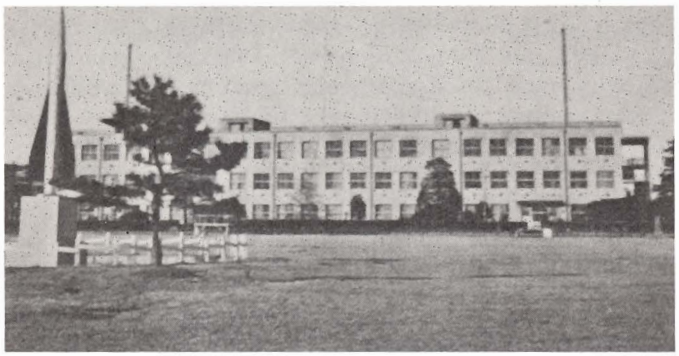
Nathan H. Brandt Jr., *former managing editor of* American Heritage, *is a free-lance journalist who teaches journalism and communications at St. John's University in New York.*

Air Defense In Japan

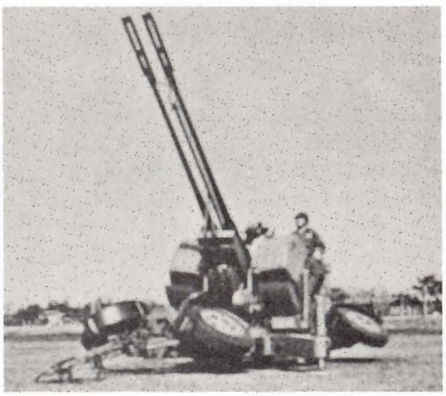
by COL M. Takegami and COL T. Tada

Photos courtesy of Japanese Self-Defense Forces.

Japanese air defenders, who receive much of their training in the U.S., form one of the cornerstones of the defense of Japan, an island nation whose constitution bans offensive military ventures. This is the first in a series of features which will explore the air defense philosophies of U.S. allies.



Army Air Defense School Headquarters, Camp Shimoshizu.



Training on the L-90 35mm twin gun.

Following World War II, the Japanese Imperial Army and Navy were dissolved, and the nation was demilitarized in accordance with the occupation policy of the Allied Powers. In 1947, a formal constitution was adopted, which made provisions for renunciation of war, non-possession of war potential and rejection of the right of belligerency of the state.

When war broke out between North and South Korea in June 1950, a National Police Reserve was established to reinforce the police forces and was charged with the task of preserving peace and order and guaranteeing public welfare. This force was reorganized later as a National Safety Force and, in 1954, was reorganized again as the current Self-Defense Forces—Ground, Maritime and Air—tasked primarily with defending the nation against direct and indirect aggression.

Since the constitution does not deny the right of self-defense, which Japan possesses as an independent sovereign nation, the Japanese government accordingly holds the view that the constitution does not ban the maintenance of minimum military strength necessary to exercise this right.

Today, Japan maintains a defense capability through its Self-Defense Forces of 267,000 men and women to prevent any aggressions against the country and, if such an aggression does occur, to repel it alone or jointly with the United States under provisions of the U.S.-Japan Security Treaty of 1951.

The following three points must be kept in mind when examining Japan's defense needs.

The first point relates to geographical features. Japan is a narrow arc-shaped archipelago located in northeastern Asia. An aggressor against this country of four main and 4,000 small islands would have to pass over water or through airspace.

Secondly, it is extremely important for Japan, which depends heavily on energy and raw material imports, to protect sea lanes in order to survive and prosper. Japan annually imports resources totaling about 600 million tons and exports industrial goods totaling about 80 million tons. Also, Japan accounts for about 20 percent of the world's total maritime traffic.

Thirdly, Japan's policy of confining her military operations exclusively to self-defense makes it imperative that her forces be the passive party in a military action.

In view of Japan's geographical features and the trends of modern warfare, it is most probable that an invasion of Japan would start with an aerial attack and, therefore, that Japanese air defense would precede and greatly influence all other operations. In this sense, air defense is of the most importance. Thus, the general mission of the army's and air force's air defense is to maintain vigilance and surveillance throughout Japanese airspace on a continuous basis, to carry out

The L-90 35mm gun fire control station.

operations for preventing seaborne and airborne invasions, to protect depots and air bases and to support ground defense forces.

Ground Self-Defense Force

The Ground Self-Defense Force is responsible for the short- and medium-range and low- and medium-altitude air defense. Its mission is to protect and defend vital points around cities, radio facilities, military installations and ground units.

In peacetime, the force regionally deploys 12 infantry divisions, one armored division, two composite brigades, one artillery brigade, one airborne brigade, three training brigades, one helicopter brigade, two air defense artillery brigades and four air defense artillery groups. (A group is equivalent to a battalion.) Each division has one air defense artillery group, except the 7th Armored Division which has an air defense artillery regiment. Each air defense artillery unit is equipped with either the Hawk missile or TAN-SAM systems and the L-90 35mm twin gun. (TAN is Japanese for short, thus short-range surface-to-air missile.) The 7th Armored Division's regiment is equipped with the TAN-SAM, the L-90 twin gun and the M-42 "Duster."

These divisions, brigades and groups have many functions necessary for ground combat and are capable of independent combat activities for a certain period of time. In this respect, they are considered basic operations units.

The air defense artillery groups, equipped with Hawk missiles, are engaged in the low- and medium-altitude defense of the Kanto and Kansai areas, which are political and economic centers, the Seikan and Kanmon areas, which are strategic transportation points, and northern and central Hokkaido, western Kyushu and Okinawa, which are vital defense zones.

Ground Self-Defense Force Training

An air defense artillery unit, equipped with either Hawk missiles, TAN-SAM or L-90 35mm guns, forms the basis of the Ground Self-Defense Force's anti-aircraft firepower. The training of Japanese air defenders at the Japanese Army Air Defense School, Camp Shimoshizu, 40 kilometers from Tokyo, involves making firing preparations by quickly moving to indicated firing positions and simulating anti-aircraft fighting.

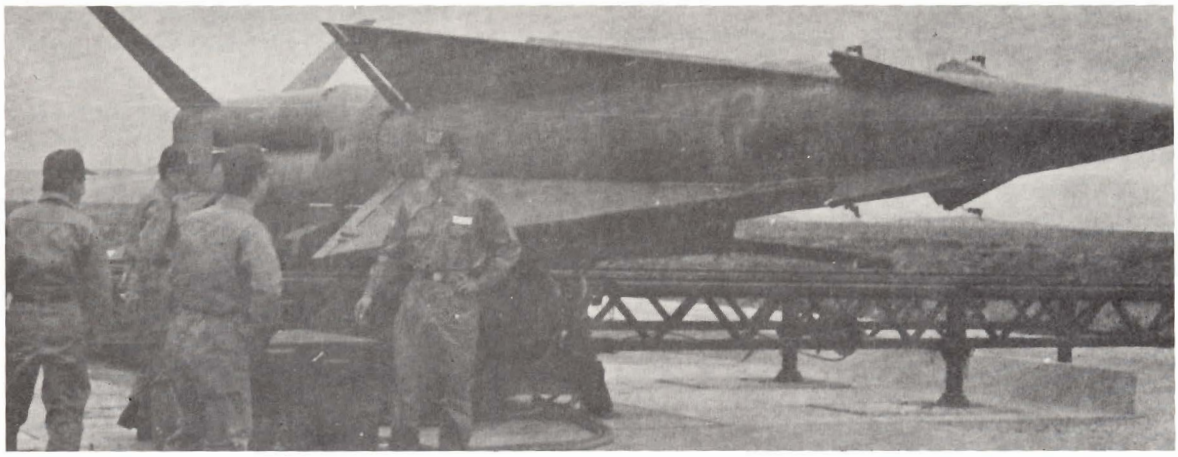
Since there are no ranges in Japan that can accommodate the firing of the Hawk missile, annual firing exercises —the first of which took place in 1964— are conducted at Fort Bliss' McGregor Range near El Paso, Texas. In FY83, 22 air defense artillery batteries, or about two-thirds of all the Japanese Self-Defense Forces units equipped with Hawks, participated in firing exercises at McGregor Range.

Units equipped with the L-90 guns also use live ammunition against radio-controlled target airplanes and fire in Japan.

Larger-scale skill training is conducted at the combined brigade level. The combined brigade is a multiple unit created to demonstrate overall fighting strength. It consists of an infantry regiment and several smaller units such as a field artillery battalion, a tank company, an air defense artillery battery, an engineering company and anti-tank platoons.

Other training involves command post exercises and comprehensive skill

Japanese air defenders learn to operate the TAN-SAM (SHORAD) launcher.



Airmen from the 4th Missile Group, 12th Squadron, Japanese Air Self-Defense Force, prepare to launch a Nike Hercules at McGregor Range, Fort Bliss, Texas. (U.S. Army photo)

training through simulated mobilization of personnel and units. Further training is conducted at the divisional and army levels, leading finally to general Ground Self-Defense Force exercises.

Air Self-Defense Force

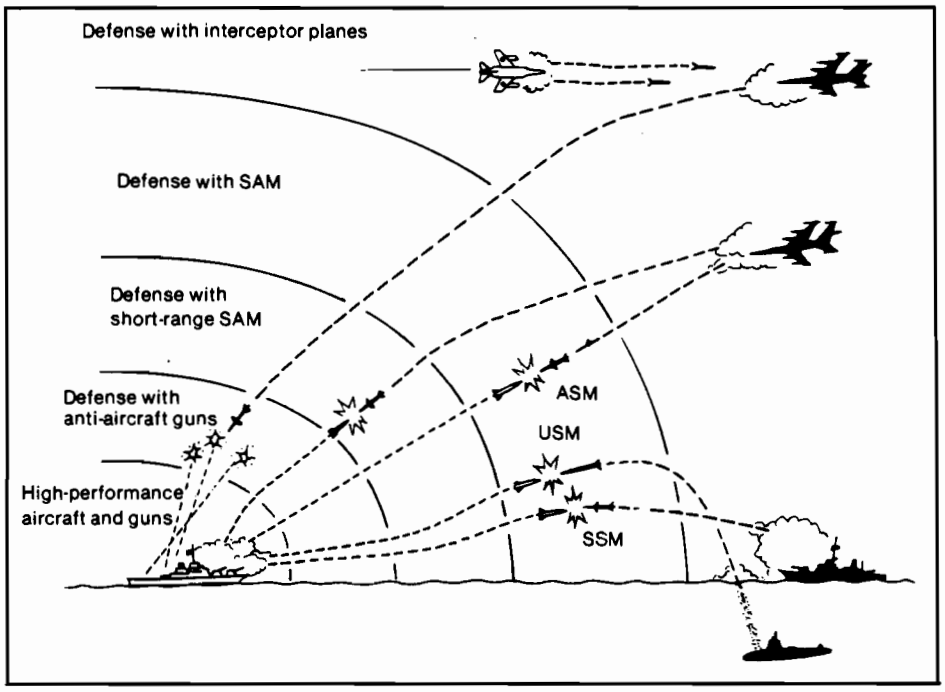
The mission of the Air Self-Defense Force is to maintain watch over the whole country, including the islands and surrounding waters, and to be in constant readiness to take instant appropriate measures against violation of Japanese airspace or air invasion by enemy aircraft.

The Air Self-Defense Force is composed of 10 interceptor squadrons, three support fighter squadrons, three air transport squadrons, one air reconnaissance squadron, one early warning squadron, 28 control and warning groups and six surface-to-air missile groups (20 batteries). It has command and control of all surface-to-air missiles except when units are positioned outside the network, such as in northern Hokkaido where the army has its own C^2. The command and control network is composed of the center post in Tokyo, six C^2 posts and 29 sites.

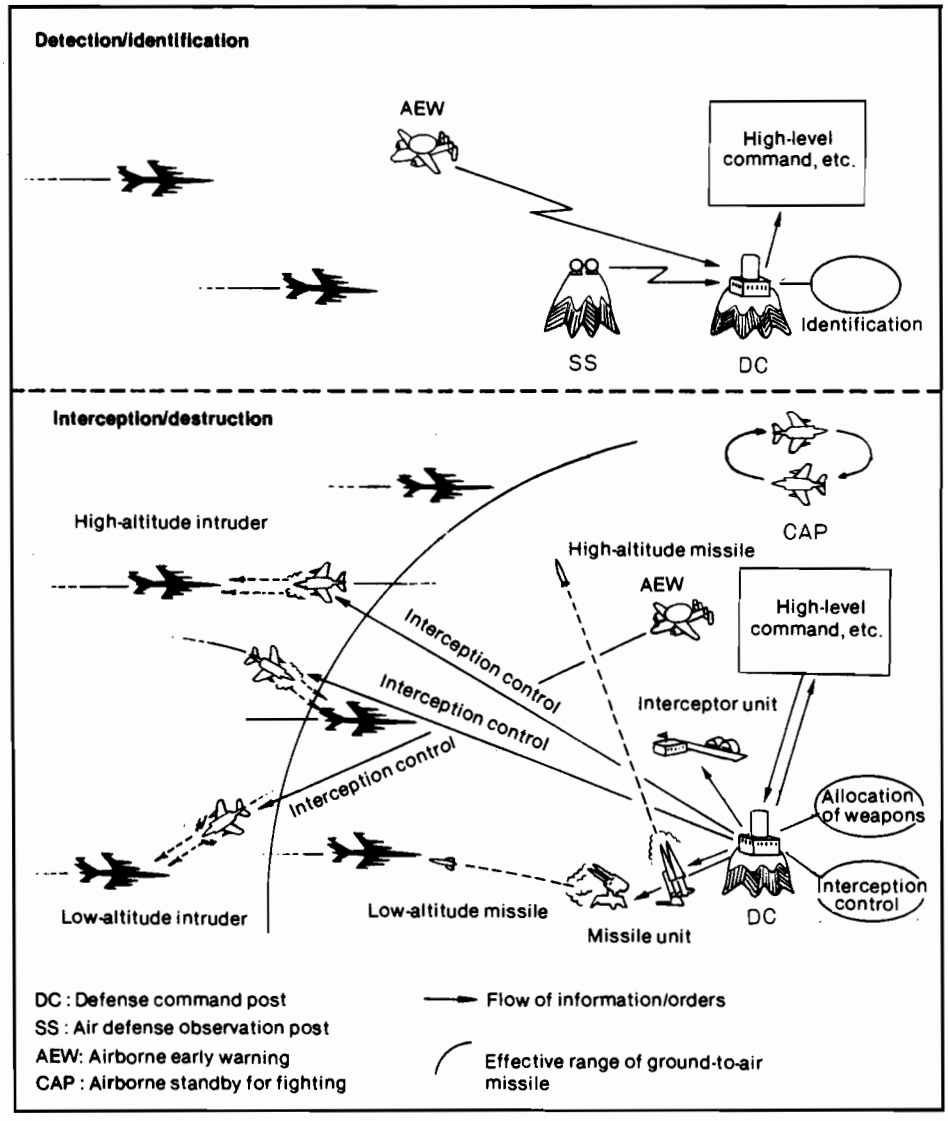
The missile groups, equipped with Nike J missiles, are stationed in politically, economically and strategically

The TAN-SAM fire control station.

Air Defense Warfare



Air Defense System



important areas for the medium- to high-altitude defense of cities, ports, military bases, airfields and islands.

Air Self-Defense Force Training

All Air Self-Defense Force air defenders must attend the Second Technical School in Hamamatsu, located on the southern coast of Honshu, approximately 400 kilometers from Tokyo. Systematic air defense training is conducted in cooperation with aircraft control and warning units, fighter units and other units. Other training areas include rapid deployment, interception by simulator, firing preparations and simulated firing.

Extensive training from missile assembly to live firing has been carried out once a year since 1962 at McGregor Range. In FY83, 19 anti-aircraft missile units participated in the training where one live missile was fired by each unit.

In addition to unit-by-unit skill training, general multiunit exercises are conducted several times a year. The Air Self-Defense Force conducts an overall exercise, normally once a year, in which most of its units participate.

The Future

It has been nearly 20 years since the Nike and the basic Hawk were introduced to the Self-Defense Forces. It will become increasingly difficult to maintain these missiles over an extended period of time because of problems related to performance, supply and maintenance. Their effectiveness against more sophisticated aircraft has relatively declined. For this reason, there is a need to replace these systems with advanced weaponry that can cope with the future air threat.

The likely candidates to replace the Nike J are the Patriot and the Nike-Phoenix, an improved version of the Nike J. Replacements for the basic Hawk will include the Improved-Hawk and Patriot. This year, Self-Defense Forces will receive the Stinger for self-defense. A self-propelled 35mm gun is also in development.

Studies of performance, cost and other matters are being made to determine the advisability of starting other technological developments on these types of missiles. ✱

COL M. Takegami *is the Ground Self-Defense Force liaison officer at the U.S. Army Air Defense Artillery School, Fort Bliss, Texas.*
COL T. Tada *is the Air Self-Defense Force liaison officer at the school.*

Army Tests New Battle Management Center

The Army has developed an air battle management operations center to facilitate information transmission to air defense fire units and supported maneuver elements. Performance tests of the newly designed center were conducted at the Human Engineering Laboratory, Aberdeen Proving Ground, Md., to determine the effectiveness of short-range air defense's command and control system in tracking friendly and hostile aircraft in a simulated Western European combat scenario. The study focused on how information is correlated and passed to weapon systems.

The development of the air battle management operations shelter system came about when the Army realized that the current SHORAD command and control system had many deficiencies. New crewmembers were not familiar with their new organizational system and often became confused. The first step was to standardize the wide variety of early warning systems.

A three-phase manual SHORAD control system was developed. The three phases include basic, improved and enhanced control systems. These will lead to the ultimate objective, an automated SHORAD command and control system.

Although the basic manual control system greatly increased SHORAD's early warning capability, the communications equipment and personnel shortages reduced its efficiency. In spite of new AM radios being added at the divisional, battalion, battery and platoon levels under the improved system, it still had deficiencies. Under the basic and improved control system, early warning is relayed from the high-to-medium altitude air defense source through the SHORAD tactical operations center and from the FAAR directly to the fire units.

The enhanced control system improves early warning procedures by adding air battle management operations center personnel and equipment. Under the enhanced system, all early warning information is centralized at the air battle management operations center where personnel correlate the information and transmit it by AM radio to the batteries and platoons. There, the information is automatically converted from AM to FM and retransmitted to the fire units. The center also transmits airspace management information to the division air management element.

To obtain early warning information, each SHORAD battalion deploys a team to the nearest HIMAD unit. These teams collect pertinent track information from assorted HIMAD radars and automatic data links. Once deployed, the team leader views a radar scope and radios information to the SHORAD air battle management operations center.

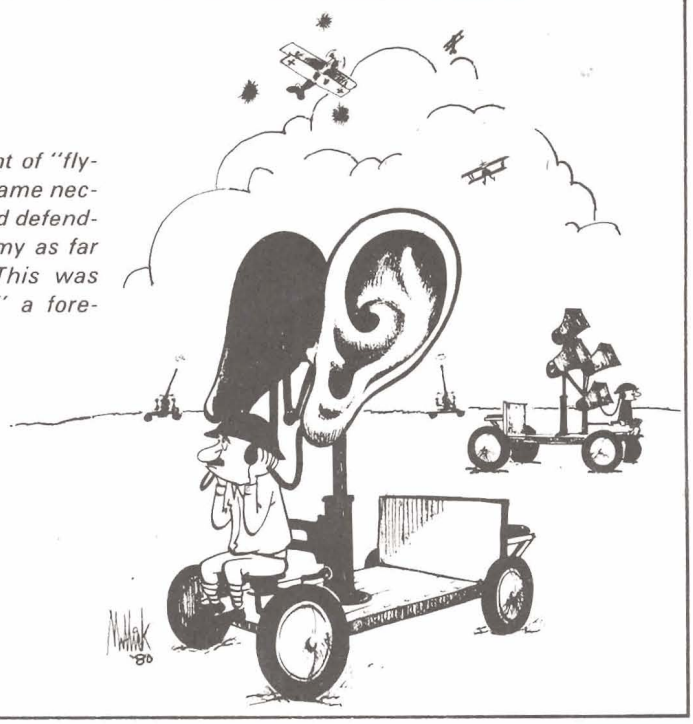
The main features of the new operations system are three plotting boards used to show air tracks detected by organic FAAR sensors, tracks passed from HIMAD sensors and friendly track information received from the division airspace management element. A crew of four plotters records radar information, while a radiotelephone operator and an assistant correlate the track information and retransmit it over a dedicated division air defense early warning net.

After the information is plotted on the appropriate board, the radiotelephone operator correlates the tracks and relays pertinent information to the fire units and supported maneuver elements. The use of a grid system gives fire unit personnel, familiar with their own map and grid location, a better idea of the aircraft's approaching azimuth and alerts them to prepare for engagement within their area. A primary benefit of a grid system is that soldiers at a fire unit can quickly sort out which aircraft should be of concern and which may be disregarded.

The manual command and control system will serve as a model for the automated C^2 system of the future, which will follow the same information flow pattern. *

HISTORY OF ADA

With the development of "flying machines" it became necessary for the intrepid defender to detect the enemy as far away as possible. This was called. . ."listening," a forerunner of radar.



The Transformation of Soviet Frontal Aviation

by CPT Greg Parlier

Soviet airmen celebrate a victory during World War II. The Soviet air force was virtually annihilated on June 22, 1941, the day Germany launched its sudden onslaught against Russia, but rose from the ashes of its burning airfields to become the world's largest tactical air force by the end of World War II. (Smithsonian Institute)

During the past decade, dramatic changes have occurred within the Soviet air force. The most significant and radical transition has been within the Soviet tactical air force, Frontal Aviation, and can be characterized as a fundamental switch from a defensive air-cover mission to a comprehensive and powerful offensive capability encompassing air attack in all its forms.

Although Soviet air support to ground troops historically has been the chief mission of Soviet aviation, the means of implementing this mission have varied widely during the past 40 years. During World War II, the Soviets succeeded in massing air power for frontal air superiority, in the development of robust close-support aircraft and in the development of a battlefield surveillance system. Unlike the United States, which developed and refined strategic bombing as an instrument of warfare, the Soviet Union concentrated on using its air force to increase the striking power of its ground forces. Not only was the Soviet air force committed exclusively to ground support missions, but air armies, created in 1941, operated under the control of army front commanders. Hence, within the framework of joint operations, the air force was an extension of the ground commander's artillery.

One of the failures of Soviet aviation during the war was its inability to consistently conduct in-depth penetrations behind the German lines. Eliminating this deficiency has been a priority for Soviet planners during the past 15 years. The results are tremendous quantitative and qualitative advances in Frontal Aviation assets. However, during the immediate postwar years and especially since the advent of the extensive U.S. nuclear bomber threat, Soviet aviation was designed and organized to conduct defensive air operations rather than ground attack missions. Nearly all of the first generation (design period 1946 to 1955) and second generation (design period 1956 to 1965) aircraft were interceptors designed for counterair missions against high altitude bombers rather than ground support missions.

Organization

Soviet military aviation is organized into three separate forces: Soviet air force (Frontal Aviation, Long Range Aviation and Military Transport Aviation), National Air Defense and Soviet

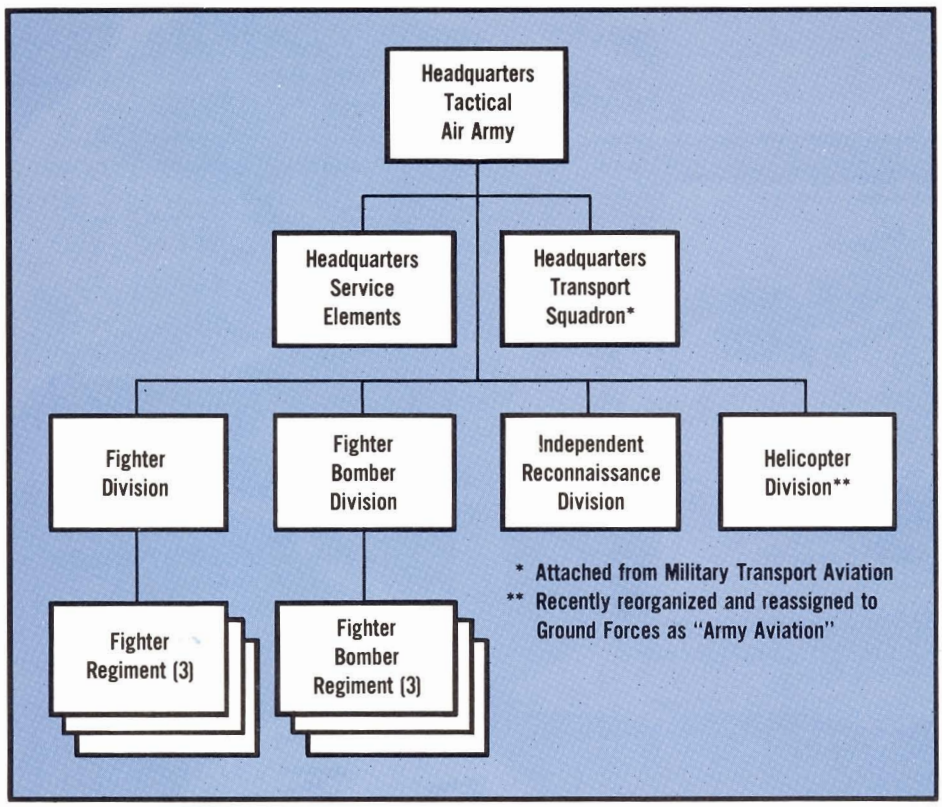


Figure 1. Soviet Tactical Air Army

Naval Aviation. Frontal Aviation, under administrative control of the Soviet air force in peacetime, consists of about 16 tactical air armies which are operationally subordinate to military districts within the Soviet Union and to groups of Soviet forces outside the Soviet Union. Soviet ground forces organized into groups during peacetime would be organized as fronts in wartime and Frontal Aviation units would be subordinated to front commanders.

These military districts and groups of forces are operational commands roughly equivalent to the unified commands of the United States. The triangular structure shown in Figure 1 is typical, although there are considerable differences among various air armies, based on the perceived threat. For example, the 16th Air Army, which supports Groups of Soviet Forces, Germany, contains two corps with a total of five or six air divisions whereas, in every other instance, divisions are directly subordinated to the air army headquarters. The 16th Air Army also contains more than 1,000 tactical aircraft while the 17th, in the Kiev Military District, contains only 100. Presently, about three-quarters of Frontal Aviation's combat strength is deployed in Eastern Europe and the western military districts.

Frontal Aviation, the Soviet equivalent of our Tactical Air Command, is the largest component of Soviet military aviation forces. The shift from a defense-oriented counterair to an offensive air attack capability was, no doubt, motivated by NATO's strategy of flexible response. The Soviets believe a conventional war can be fought and won by combined ground and air forces conducting deep, rapid penetrations along multiple axes of advance into Western Europe. The attacking force would have to maintain an absolutely essential high-speed rate of advance, destroying or overrunning NATO nuclear arsenals and launch sites and eliminating NATO's tactical nuclear retaliation capabilities. The ground forces would rely heavily on close air support to maintain their speed of advance. This realization threw the Soviet military production machine into high gear.

During the 1970s, the Soviets produced twice the number of fighter aircraft produced by the United States and are currently out-producing the United States by a margin of more than 2½-to-1. The production rate of the MiG-27 Flogger alone exceeds that of all U.S. fighter aircraft production combined.

As a result of sustained high production rates, the Soviets have been able to modernize their tactical air force. Two-thirds of Frontal Aviation aircraft are third generation (design period 1966 to 1975) aircraft such as the MiG-27 Flogger and Su-24 Fencer, which are designed for offensive air support operations. The average age of their tactical aircraft is about six years while U.S. aircraft are nearly twice as old.

There was a simultaneous and equally impressive improvement in ground-based, mobile air defense during the 1970s. This concurrent buildup in tactical ground-based air defense enabled Frontal Aviation to shift its emphasis from counterair to direct ground support operations without a loss in overall tactical air defense capability.

In addition to sustained quantitative increases in Frontal Aviation aircraft since the 1970s, the Soviets have made significant technological improvements in aircraft design to support offensive air operations. Improved avionics (including terrain-avoidance radar), fire control systems (including laser designators and range finders) and thrust-to-weight ratios characterize third generation Soviet aircraft. They are able to deliver, with vastly improved accuracy, much larger conventional or nuclear payloads over longer distances at lower altitudes and higher speeds, thus avoiding or significantly delaying detection by NATO radars. Although Soviet pilots apparently receive fewer flight training hours than their U.S. counterparts, Frontal Aviation in general is characterized by high operational readiness and a capacity for high sortie rates with quick turnaround times. The increased size and improved delivery capability of Frontal Aviation aircraft and the concurrent development of tactical air-to-surface missiles with increasingly greater stand-off ranges have increased ninefold the weight of tactical (nuclear and conventional) ordnance that Frontal Aviation can deliver into NATO territory.

The reconstitution of Frontal Aviation has also lessened Soviet reliance on theater nuclear rocket strikes and Long Range Aviation bomber strikes against NATO nuclear arsenals and delivery sites. Frontal Aviation capabilities permit both nuclear and conventional payload deliveries and provide for an extension of the ground commander's supporting fires well beyond tube artillery range. The Soviets can attack NATO nuclear arsenals and launch sites for Lance and Pershing II missiles with more confidence due to the high-speed, low-level flight capa-

bilities and advanced fire control systems of their new aircraft.

Missions

Frontal Aviation has three basic missions:

It will conduct *independent air operations* to pre-empt, by neutralization or destruction, NATO rear area nuclear facilities and command and control centers in an effort to eliminate an immediate NATO nuclear retaliation capability, thereby exerting reflexive control over NATO tactical options.

It will conduct *offensive counterair operations* to establish early air superiority by suppressing and eliminating NATO air defense artillery sites and by launching strikes against 2nd and 4th Allied Tactical Air Force airfields. The Soviet battlefield air defense mission is predominantly assigned to Soviet mobile, ground-based air defense units integral to all command levels from front to maneuver battalion. However, Frontal Aviation retains a significant air-to-air capability.

It will conduct *offensive air support operations* with emphasis on battlefield air interdiction in support of the ground commander's maneuver plan. The offensive air support mission includes tactical air reconnaissance to provide near-real-time intelligence input into the Soviet automated troop control system.

Frontal Aviation will also provide air support for independent forces such as operational maneuver groups, airborne units and air assault forces operating autonomously on an extended battlefield.

The Advent of Combat Helicopters (1974 to 1983)

Perhaps even more worrisome than improvements in Frontal Aviation's fixed-wing aircraft are the rapid advances made by the Soviets in helicopter warfare and the use of assault forces. The past decade has witnessed a complete revolution in Soviet helicopter doctrine. The Soviets devoted great attention to the U.S. use of heliborne forces in Vietnam as well as helicopter performance in the 1973 Mideast War. It is apparent that they now regard the helicopter as a crucial element of combined arms operations.

One of the most visible advocates of the helicopter in Soviet military literature is MG M. Belov. He regards future operations as doomed "unless mass use is made of helicopters" and has successfully argued (as evidenced by increasing Soviet helicopter production rates and his subsequent promotion to his present rank) that "the mass employment of helicopters is becoming an objective necessity in the tactics of land forces." The Soviets clearly regard the anti-tank capability of the helicopter as essential to the maintenance of momentum in modern armored warfare. GEN V. V. Reznichenko, a respected Soviet author, writes: "They are superior to other anti-tank weapons in terms of field of vision, maneuverability and firepower. They are capable of hitting armored enemy targets while remaining out of reach of anti-aircraft weapons. The correlation between tank and helicopter losses is 12-to-1 or even 19-to-1 in the helicopter's favor, according to practical experiments."

To complement an already substantial transport helicopter inventory, the Mi-24 Hind attack helicopter was introduced in 1974. By late 1977 Soviet military literature together with intelligence analysis of large scale Soviet training exercises conducted in 1976 and 1977 indicated that the Hind would be utilized in major tactical missions.

By late 1977 it had become evident that the versatile and potent Hind was quite capable of lending its mobility and firepower in close air support operations. Today, the Mi-24 Hind has demonstrated that it is not only an effective anti-armor weapon, but is capable of functioning as a high-speed, nap-of-the-earth "tank" and in an anti-helicopter role in air-to-air combat.

Since its introduction in 1974, the Hind production rate has been phenomenal. The total Mi-24 inventory exceeds 1,000 with a current production rate of more than 15 a month. The 1,000-plus Mi-24 Hinds and more than 1,600 Mi-8 Hip assault-transport helicopters constitute the most formidable helicopter assault force in the world.

The stress upon deep multiple axes of rapid advance and simultaneous destruction or seizure of critical air bases, command and control centers and nuclear storage and delivery sites in the NATO rear is further manifested in the recent Soviet emphasis on air assault

FRONTAL AVIATION CAPABILITY

Design Generation and Aircraft	Ordnance load (tons)	Maximum combat radius (miles)	Offensive load carrying capacity	External ordnance stations	Maximum speed (Mach number)
First (1946-55)					
Il-28 Beagle	2.2	600	1,320	3.0	0.80
MiG-15 Fagot	0.5	280	140	2.0	0.87
MiG-17 Fresco	0.5	360	180	2.0	0.96
MiG-18 Farmer	0.5	400	200	2.0	1.35
Average	0.9	410	460	2.3	n.a.
Second (1956-65)					
MiG-21 Fishbed D	1.0	200	200	2.0	2.00
Su-7 Fitter	2.0	300	600	6.0	2.00
Yak-28 Brewer	2.2	500	1,100	3.0	1.10
Average	1.7	333	633	3.7	n.a.
Third (1966-75)					
MiG-23 Flogger B	2.2	525	1,155	5.0	2.30
MiG-27 Flogger D	2.2	600	1,320	7.0	1.60
Su-17 Fitter C	3.0	600	1,800	8.0	1.60
MiG-21 Fishbed J	1.0	400	400	5.0	2.10
Su-24 Fencer	5.0	800	4,000	6.0	2.30
Average	2.7	585	1,735	6.2	n.a.

HELICOPTER INVENTORY

	1977	1978	1979	1980	1981	1982
Total	470	612	3700	3460	3200	3500
Mi-8 HIP	—	161	1660	1470	1600	1600
Mi-24 HIND	—	31	310	580	750	950

operations. In addition to one training and seven full-strength Soviet airborne divisions, there is now believed to be an air assault brigade for each front. The new Soviet air assault brigades consist of a regiment of 64 Hinds, a squadron of new Mi-26 heavy-lift helicopters and three air assault rifle battalions. Additionally, each army now has a helicopter transport regiment capable of lifting a normal motorized rifle regiment, and one of every three motorized rifle regiments is receiving extensive air assault training.

The Hind-D attack helicopter exemplifies the renewed Soviet emphasis on tactical air support for ground maneuver forces.

Command, Control and Coordination

The simultaneous development of attack helicopters and resurgence of the fixed-wing, ground-attack mission in Frontal Aviation necessitated closer coordination between ground and tactical air forces. The problems of effective joint air operations and airspace management, especially in the close air support arena, are complicated and often simply impossible to overcome in a fast-moving, electronic warfare environment.

Command, control and coordination problems confronting Soviet Frontal Aviation involve battlefield airspace congested by friendly and enemy high-performance aircraft, rockets, missiles, helicopters, air defense and field artillery fires. These problems are certainly not unique to the Warsaw Pact. They are also being addressed within the NATO alliance with various procedural and technical innovations but without much success. As a result, friendly aircraft are destroyed by friendly air defense systems in practically every major exercise.

No doubt the Soviets recognize the extreme vulnerability of their reliance upon ground intercept controllers and air directing officers in an electronic warfare environment and the complications in airspace management that have arisen due to the rapid expansion of both air and ground-based-air-defense assets. Soviet military press reports have indicated less than completely successful results in effecting coordination between air and ground forces, especially at lower levels where responsiveness is most acute. Major causes of their lack of success appear to include lack of an airborne forward air controller, an inflexible preplanned fire support request system and lack of real-time information between the aviators and ground commanders.

NATO has also experienced difficulties with its tactical air control procedures. Fundamental differences exist between American and European concepts of tactical air operations. British Royal Air Force CDR Jeremy G. Saye, in an *Air University Review* article titled "Close Air Support in Modern Warfare," illuminates compelling reasons for NATO to re-examine its offensive air support missions. He states that close air support missions should be confined only to aircraft that can be immediately responsive to ground force mission needs, can conduct an effective attack by readily acquiring the target and can survive Warsaw Pact surface-to-air missiles and anti-aircraft guns. He concludes that fixed-wing aircraft, with the possible exceptions of only the AV-8 Harrier and A-10 Thunderbolt II, lack a forward basing capability with quick turnaround capacity, require target acquisition assistance from forward air controllers (which implies an ECM-free environment) and are extremely vulnerable to Soviet air defense weapons. Saye thus essentially eliminates fixed-wing aircraft as effective close air support weapons and relegates the close air support role to attack helicopters. He convincingly argues that the appropriate mission for fixed-wing aircraft is battlefield air interdiction in the rear area. What is significant about Saye's article is that the Soviets seem not only to have reached the same conclusions, but have implemented his recommendations as well.

Soviet military authorities recognized in the late 1970s that, with the immense firepower, mobility and re-

Soviet infantry launch a training assault off an Mi-8 Hip assault-transport helicopter.

sponsiveness of the rapidly expanding helicopter force, it was no longer feasible to concentrate high-speed modern aircraft in a vulnerable close air support role in or near the forward line of own troops. They concluded that such operations would be wasteful and decided that Frontal Aviation's fixed-wing aircraft should be used to find and destroy objectives in the enemy's rear areas.

Clearly, the combat helicopter provides Soviet ground commanders with an extremely versatile and capable close air support weapon, thus enabling Frontal Aviation to concentrate its fixed-wing aircraft on the battlefield air interdiction mission in NATO rear areas. Such a division of tactical resource effort optimizes the capabilities offered by both the rotary-wing and fixed-wing assets. A secondary, yet extremely significant advantage which accrues as a result of this division of effort and the forward basing capability of fixed-wing Frontal Aviation aircraft is an alleviation of the airspace management and missile engagement coordination problem.

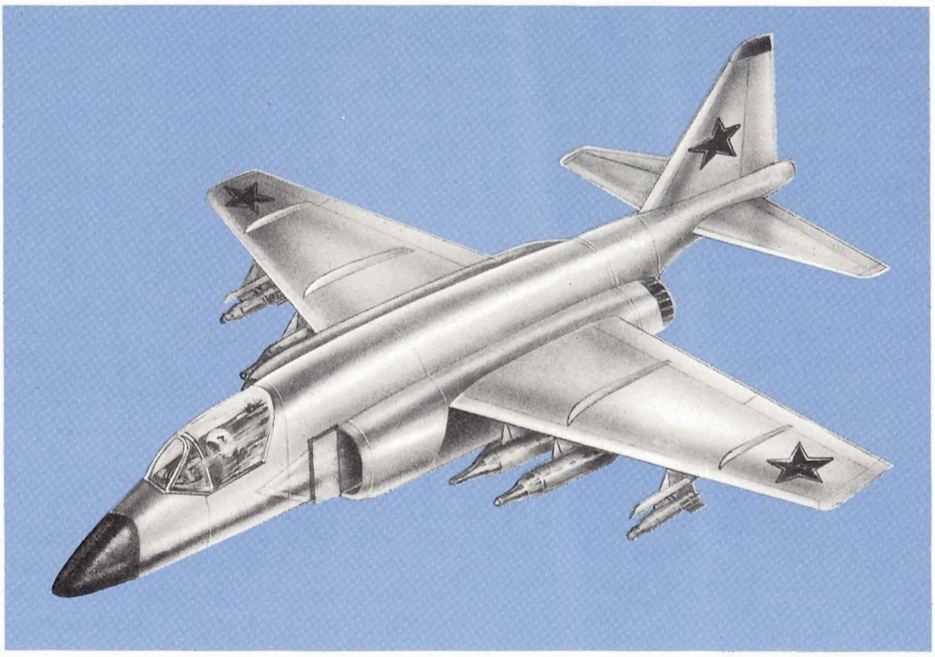
Trends and Developments

Although the transformation of Soviet Frontal Aviation from a defensive to an offensive air arm has been rapid and comprehensive, there are clear indications that this transition is not complete. Soviet plans for air support of ground operations are still undergoing major organizational and doctrinal changes.

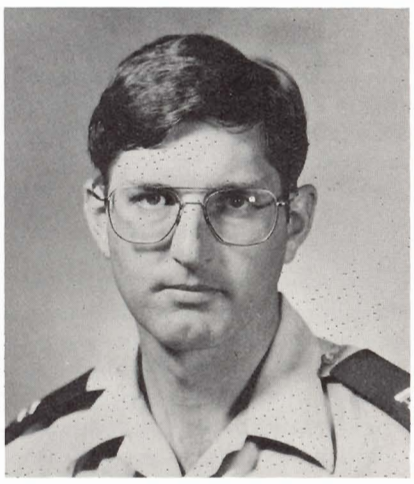
The most significant of these recent changes is the decentralization of the helicopter forces. Until recently all Frontal Aviation assets, including attack and transport helicopters, were assigned to tactical air armies subordinate to front commanders. These rotary-wing regiments have now been placed under the operational control of army commanders and are regarded as army aviation units. There is evidence that this decentralization is occurring down to division level with squadron-size helicopter forces now under the tactical control of division commanders. This reorganization of helicopter forces more closely integrates helicopters into combined arms operations and increases their responsiveness to ground commanders.

Advancements in Soviet aviation technology continue unabated as fourth generation aircraft (design period 1976 to the present) enter into the operational forces. The new generation of aircraft includes the MiG-29 Fulcrum and Su-27 Flanker, which have look-down, shoot-down capabilities, and the variable-wing, supersonic Blackjack strategic bomber which is larger than the B-1B. Another new addition is the Su-25 Frogfoot. The Frogfoot, with its 10 hardpoints for externally stored munitions and large-caliber, Gatling-type gun, has the same long-loiter, close support mission as the A-10 Thunderbolt II, although initial indications are that it possesses even better performance capabilities than its U.S. equivalent. The first operational Su-25 squadron was deployed to Afghanistan in 1982 and is operating as a developmental unit to perfect techniques for coordinating low-altitude close support during joint air attack team operations with attack helicopters. A new heavy lift helicopter, the Mi-26 Halo, is also in production. Used to provide transport support to the new Frontal Aviation air assault brigades, the Halo is the heaviest helicopter in production anywhere in the world. With its 22-ton payload lift capacity, the Halo has a cargo capacity similar to the C-130 Hercules tactical transport turboprop. Soon, the Soviets are expected to deploy a new helicopter specifically designed to counter the NATO helicopter threat.

The push for military technological advancement will no doubt continue to receive Soviet priority. Nine research institutes allied with eight Soviet design bureaus under centralized direction are laboring on new aviation concepts while improving existing production aircraft. The Soviets also can be expected to continue their revision of organization and doctrine that has transformed Soviet Frontal Aviation into a formidable threat. ✱



The Soviet Su-25 Frogfoot has the same long-loiter, close-support mission as the U.S. A-10 Thunderbolt II. The first operational Frogfoot squadron was deployed to Afghanistan in 1982.



CPT Greg H. Parlier *is an instructor in the Department of Engineering at West Point. He recently received a master's degree in operations research from the Naval Postgraduate School. His previous assignments include two tours with the 82nd Airborne Division and one tour with an Improved Hawk battery in the Republic of Korea. He is a graduate of the Air Defense Artillery and Infantry Officer Advanced Courses.*

Training For The NCO

by MAJ H.S. Walker

Acronyms like NCOES, BNCOC, ANCOC and PLDC don't mean much to the average person, but they mark some of the most important events in a soldier's career. Unfortunately, they are also often misunderstood.

The Non-commissioned Officer Education System (NCOES) is the Army's formal training systems for our NCOs. It is a progressive system designed to promote competency in both MOS and common tasks for all NCOs. The system is progressive in that courses exist for each skill level, and each is designed to prepare the student to perform the duties required of him at the appropriate skill level. Let's start at the bottom and work up.

The first NCOES course that an air defense artillery soldier may attend is the Primary Leadership Development Course (PLDC). It is also the newest course in the system. Developed by the U.S. Army Sergeants Major Academy, it replaces the old Primary Leadership Course (PLC) and the Primary Noncommissioned Officers Course (PNCOC). This is a non-MOS specific course, so no matter what your MOS, you'll take the same course as everybody else. PLDC is open to soldiers in grades E-6 and E-5 who never attended a primary level course, E-4(P) and to E-4s who are holding jobs that call for an E-5 or E-6. PLDC is taught at NCO academies worldwide.

The NCOES also has primary technical courses (PTC) for soldiers in the same grades as those eligible to attend PLDC. There are not PTCs available now for ADA MOSs, but some are planned for the future.

The next step of NCOES is basic level courses. They include basic noncommissioned officer courses (BNCOC) and basic technical courses (BTC). Both courses offer MOS training as well as leadership, supervisory instruction and training in common tasks. The differences between them only. At the moment, BNCOC is available for MOS 16R, 16P and 16S. The U.S. Army Air Defense School is developing BNCOCs for 16D, 16E and 16J. These courses will be available at the Fort Bliss, Texas, NCO Academy starting late this year and in early 1985. Additionally, BNCOC will be available for 16L (SGT York Gun) and 16T and 24T (Patriot) when those new systems are fielded. BTCs are being developed for MOS 24C, 24E and 24G with an implementation date in 1985.

Selection for BNCOC is made by the unit, while selection for BTC attendance is made by the U.S. Army Military Personnel Center based on unit commanders' recommendations. BNCOC and BTC are available to E-6, E-5(P) and to E-5 and E-4(P) who are filling E-6 slots in their home units.

The next step on the NCOES ladder for ADA NCOs is the Advanced Noncommissioned Officer Course (ANOC). The ADA ANOC is taught at Fort Bliss to DA-selected soldiers in grades E-7, E-6(P) and E-6. The ADA ANCOC is a 10-week course designed to prepare its graduates to perform duties as platoon sergeants and section sergeants. Designed by the Air Defense Artillery School and the Sergeants Major Academy, the ANCOC is an interesting and challenging course.

ANCOC is the highest level NCOES course most NCOs will attend. Selection for the First Sergeants Course and the Sergeants Major Academy is difficult, and the number of NCOs selected to attend is small. Although these courses are taught at Fort Bliss, they are not ADA courses. Both are offered to senior NCOs from all branches of the Army.

Being selected to attend an NCOES course is one of the most important things that can happen in an NCO's career. Sending the right NCO to the right course is the commander's responsibility. Although the units will be missing a good NCO for a few weeks, they'll get back a better NCO who will do a better job.

MAJ H.S. Walker *is the chief of the NCOES Division, Tactics Department, U.S. Army Air Defense Artillery School, Fort Bliss, Texas.*

An Inspector General Speaks Out

by SSG Jack Loudermilk

(Editor's note: COL William H. Hicks has been the Communications Command's IG for the past three-and-a-half years. What he says in the following article applies to everyone in the Army.)

There are two kinds of mistakes in the Army: those that are made and those that are covered up. Making mistakes, for the most part, is expected. They can even be educational if a lesson is learned.

Covering up mistakes, on the other hand, can be disastrous. It can lose battles or result in death. Unfortunately, the act of hiding a mistake is often treated as a game.

Prior to Custer's "Last Stand" at the Little Big Horn in 1876, Indian agencies had been falsifying reports on the number of hostile Indians leaving the reservations. Some historical accounts say that the false reports were used to keep the government from cutting back on goods being issued to the agencies for distribution to the Indians. Others add that the agencies also withheld accurate information to prevent themselves from looking bad, hiding the fact that their efforts to keep Indians living peacefully on the reservations were failing.

The result: Custer and about 275 men of the 7th Cavalry Regiment were told they would find no more than from 500 to 800 hostile warriors. Instead, they were met by nearly 3,000 angry Indians. The rest is history.

Despite the obvious lessons to be learned from the past, many people are still playing the cover-up game.

COL William W. Hicks, U.S. Army Communications Command's Inspector General, claims many commanders at all levels see their problems as dirty linen. "And when it's time for an IG inspection, they try to hide their problems."

Hicks cites a lack of understanding of the IG system as the main reason for trying to hide problems. "I've been kicking around in the Army for a long time, and I know how people view the IG," he says.

"Inspectors under the old system used to be a pain in the butt. They dwelt on the inspections in ranks, shoe shines, haircuts and the layout in the footlockers. They would look down a row of lockers and see that everything was standard and say, 'That's very nice.' But what does that tell you about the quality of a unit? It was phony.

"I'm not saying that those things aren't important, but the commander or platoon sergeant should be performing the inspections in ranks and checking lockers.

"We've got to get the IG out of that business and get him looking into the system. Why isn't the system working? What problems are inhibiting the command from doing its job? That's what the IG of today is concerned with."

Hicks says that the first step to overcoming this fear of the IG is to understand that there is no such thing as a professional inspector general.

"The IG is tasked to the job for three years. That's the way it should be. You want someone who has been out there [in the field] and knows what is going on in the Army. And then you want to get him out of the IG spot so he doesn't have a chance to sour on the job."

But even after the fear of the IG is overcome, there's still the problem of people wanting to be number one. As Hicks explains, "We've got this great big system for reporting readiness up through the Army and everybody wants to be A-1. They're not going to put down A-2 because that reflects on their company or the quality of their training.

"God, you could be C-3 because you don't have the equipment. Tell it like it is!

"But someone is afraid that telling it like it is will reflect on them adversely, so they pad their report. What happens? When all of that rolls out of a big computer someplace, it says here is a unit ready to go to war. Baloney! We're kidding ourselves," Hicks says.

"There are more problems out there than you can shake the proverbial big stick at—big-time, absolute problems. The only way to begin to find a solution to these problems is for commanders to realize that there's nothing wrong with admitting that you need something."

In order for leaders to overcome their problems within their own commands and to feel more comfortable with the inspector general, Hicks says that there's an Armywide campaign among IGs to educate people about the role of the IG.

"The primary role of the IG is that of the teacher. We've got to educate the people to be smart enough to realize what the problem is and that the IG is here to help.

"We're not bound to a cut and dried command channel. We can take shortcuts to the head of the problem. What we need from the commanders is the trust that will allow us to do our job—making that unit a better unit."

The first step of conducting an inspection begins with a phone call to the unit to find out what major problems commanders want the IG to look into. "This extra time is very important to begin our research so more time is available once we arrive at the command," Hicks explains.

Systemic Approach

Once the inspector arrives on location, his inspection takes on a "systemic approach."

"Instead of going out and looking at everybody—inspecting all the companies within a battalion and later the battalion—we inspect a couple of sites, follow up through a platoon or two, a company or two, then a battalion, through a brigade, and finally the command itself.

"We don't look at everybody in the command, but that vertical slice, sampling approach, makes it very easy to get the pulse of the command. It's impossible to go to a headquarters and get a feel for what's going on out at the sites; you have to roll up through it."

Every systemic inspection and every systemic finding have to start with a simple compliance. "You're supposed to have an item but don't have it. You just have to be smart enough to ask why. Don't stop with the obvious," Hicks says.

"The key is not to focus on what is wrong but why it's wrong. You can write up a commander for being short an item in supply, but what have you accomplished? The commander knows he is short an item; he's been trying for six months to get it ordered. So an inspector has got to find out why the commander can't get the item. After you've taken it all the way through the

system, you may find out someone in DARCOM didn't order the item four years ago.

"If we're smart enough to push this system all the way through and really use it, we'll never have a repeat finding (the same deficiency on later inspections). Under this system, the finding should never be closed until you have finally pinned the tail on the ultimate donkey.

"You're still going to find a lot of puff balls under the bunks, there's just no way around it. We're just not going to get all wrapped around the axle pushing a lot of paperwork back and forth because of the police of the area. You find it and hand it off; let the company take care of it. The IG needs to be concerned about the more important issues."

How the New System Works

The thing that's driving IG system changes is the IG Act of 1978 which is now federal law, Hicks says. "There is no longer a Department of Defense Audit Agency. It's now part of the DoD IG."

The IG Act of 1978 originally had no provision for a DoD IG. In 1982, an amendment establishing the DoD IG was added to the act. All audit, investigative, compliance and service agencies of the DoD are now under the staff supervision of the DoD IG.

It used to be that if the IG was going to do an inspection, he went out to the headquarters and spent two or three weeks or however long it took, wrote up his report and left. Now it's going to be a little different.

"The first step is to do a long-range analysis, review previous inspections, audits, TDAs—learn as much as you can about what that unit is supposed to do and how it's organized. We try to identify major problems from past reports," explains Hicks.

"Based on what we find, we decide when, where and what to inspect.

"Next, we do a preinspection visit; something we've never done before. We actually go out to the unit we intend to inspect.

"We tell them, 'Here's what we think your major problems are; what do you think? What other problems do you think you have?' We may have someone tell us that we don't know what we're talking about, but we initiate a dialogue.

"What we want to do is come out of there with an agreement as to what the problems really are. Then we devise an inspection concept based on what was found during the preinspection. How much time do we need to spend in this area? Should we go there first? Then we go into Phase I of the inspection."

One thing to remember, Hicks says, is that an inspection that used to roll up in weeks is now going to last months; and it'll be different for every unit.

"Afterwards, the inspectors return to home base and review their findings and discuss refinements in the original plan.

"When we have revised our plan, we go out for Phase II, return again to review our findings and go out again for Phase III. We do this as many times as it takes. We can't stick with an inspection for six months straight without burning out. That's why we do it in phases," he adds.

"Next comes the outbriefing. That's when we tell them, 'Here's what you told us. Here's what we found. Here's what we think the fixes are. Here's what you can do to fix what we've found. Here's where we're going.' Then we go on to DA or JCS or wherever it takes us to find the fix.

"Later, we come back to the inspected command with the feedback and followup. We tell them again, 'Here's what you told us. Here's what we found. Here's what you did and didn't do. Here's where we went, and what we found there. Here's what they're doing.'

"Then, of course, we follow it up later to make sure we've got the hummer whipped. This is why we should never have a repeat finding, because you never let loose until it's finished."

Hicks admits that some things aren't going to be easy to fix, and others could take years to fix.

"I'm not sure how we're going to manage that, but we haven't gotten there yet. We've just got to be smart about it. Maybe someday we'll end up with a bucket of unresolved problems that we're just managing.

"The message to the field," he concludes, "has to be that the IG inspection is an opportunity to let the system work for commanders. We've just got to be smart enough to use the inspectors and use them in the right way."

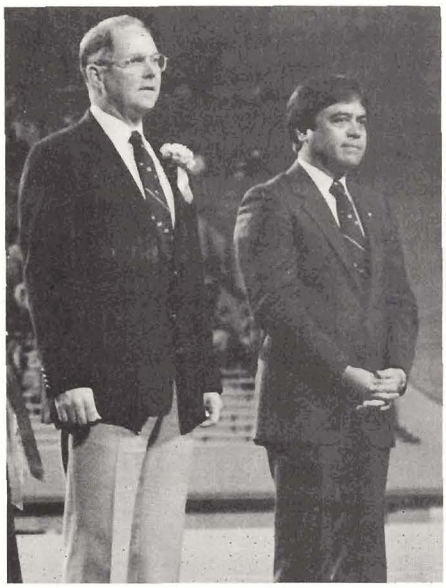
"LET ME SEE YOUR ANTENNA MAINTENANCE SAFETY PROCEDURES."

SSG Jack Loudermilk *is the NCO in charge of the Office of the Chief of Public Affairs, U.S. Army Communications Command, Fort Huachuca, Ariz. He is a graduate of the Defense Information School, Fort Benjamin Harrison, Ind.*

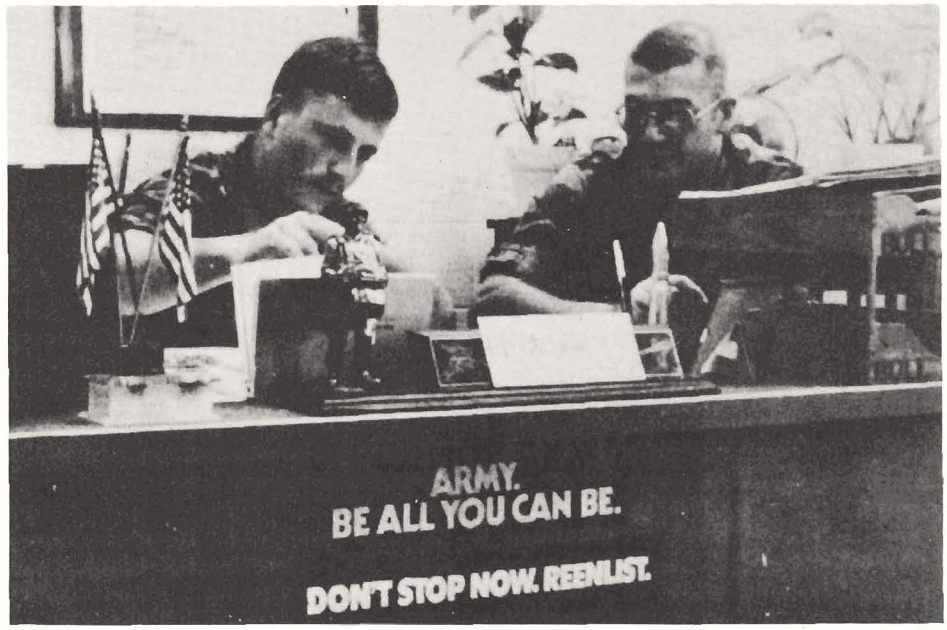
WHO'S NEWS

The Army Commendation Medal was awarded to ***SP4 Richard T. West*** of Battery C, 4th Battalion, 1st Air Defense Artillery, Fort Bliss, Texas, for his part in saving the life of an Egyptian soldier who was seriously injured and pinned inside his overturned truck. West was one of four soldiers cited for heroism in the incident that occurred during Bright Star exercises in Egypt last fall. According to the citation, West disregarded leaking fuel, hooked up the wrecker "at great personal risk and then proceeded to help free the Egyptian driver." ✶

MG James P. Maloney, commandant of the U.S. Army Air Defense Artillery School, Fort Bliss, Texas, was named 1983 outstanding former alumnus by the University of Texas at El Paso. Maloney, who graduated with a civil engineering degree in 1954 from what was then Texas Western College, was regaled at several UTEP socials and was guest of honor at the homecoming game between the Miners and Colorado State. ✶



MG James P. Maloney (left) with Hugo Bustamante, president of the UTEP Alumni Association, during homecoming festivities at the Sun Bowl stadium. (U.S. Army photo by SP4 Tom McCurdy)



SGT Patrick D. Paternostro, commander for a week, prepares his unit's daily training schedule under the guidance of CPT David M. Casmus, commander. (U.S. Army photo by SP4 Ray Thomas)

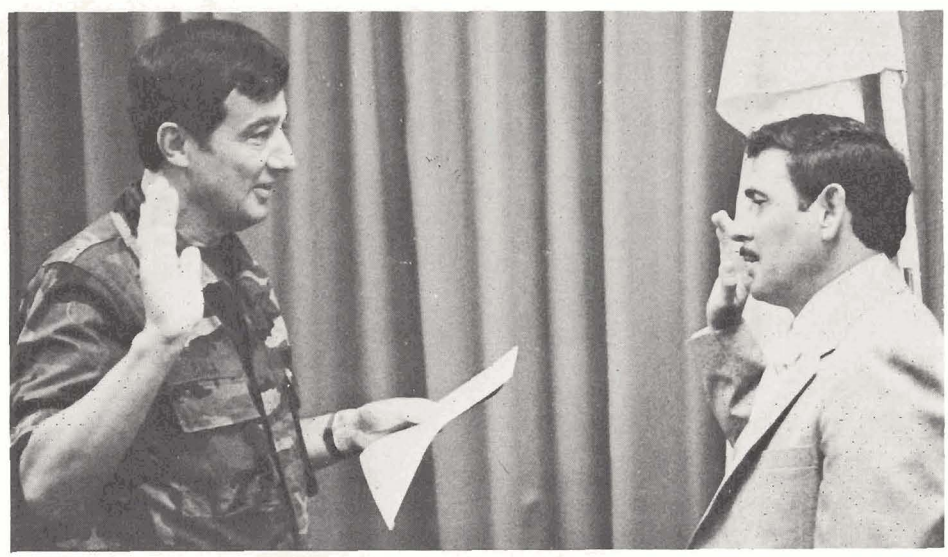
Last fall, enlisted soldiers of Battery B, 3rd Battalion, 4th Air Defense Artillery, Fort Bragg, N.C., assumed command of their unit for a week. The move was an exercise in leadership, according to ***CPT David M. Casmus,*** battery commander, who felt that giving his soldiers acting command positions would be an effective way for them to gain firsthand experience of what it is like to work at higher levels.

"Those in the command positions could compare their perceptions to the actual reality of bearing command responsibility," he said.

The unit held a change of command ceremony, wherein ***SGT Patrick D. Paternostro,*** a Vulcan senior gunner, became the acting battery commander. ***SGT Michael L. Delaney*** assumed the duties of the executive officer and ***SGT Ronnie L. Riddick*** became the first sergeant. Junior enlisted soldiers became platoon sergeants and section chiefs. ✶

SP4 Rene Bonilla, a carpenter from El Paso, Texas, was the first drill-status individual to enlist in the New Mexico Army National Guard's new Roland battalion. Bonilla, sworn in by New Mexico Adjutant General ***MG Edward D. Baca,*** will serve as a radio operator with Headquarters Battery, 5th Battalion, 200th Air Defense Artillery, at McGregor Range, N.M.

Of the 392 guardsmen to be assigned to the Army's only Roland battalion, 308 will hold full-time positions. The remaining 84 will be drill members. ✶



SP4 Rene Bonilla is sworn in by MG Edward D. Baca.

BG William H. Riley Jr. is the new assistant commandant of the U.S. Army Air Defense Artillery School, Fort Bliss, Texas. He comes to the school from his post as chief of staff of the Multinational Peace Keeping Force and Observers (Sinai). Previous air defense assignments include command of the 1st Battalion, 65th ADA, and command of the 9th Infantry DIVADA. He succeeds ***BG Stansilaus J. Hoey***, who has taken a new assignment as chief of staff of 2nd U.S. Army, Fort Gillem, Ga. ✶

The 5th Battalion, 52nd Air Defense Artillery, Fort Stewart, Ga., invited military, family members and civilians to its annual service practice live fire. "Despite some malfunctions with some older missiles," said ***CPT Mark Steg,*** battalion S-1, "all training objectives were met, and the overall firing was a huge success."

Pictured at right is family member ***Dorothy Williams***, assisted by two Vulcan crewmembers as she inspects the weapon. ✶

(U.S. Army photo by SP4 Chris Feola)

(Photo courtesy of Ford Aerospace)

73-year-old civil servant ***Mack Carroll*** recently completed the three-day Night Chaparral Training Course at Ford Aerospace & Communications Corp., Aeronutronic Division, in Newport Beach, Calif. Carroll, section chief of the 24N Chaparral Branch, SHORAD Weapons and Electronic Department at the U.S. Army Air Defense Artillery School, Fort Bliss, Texas, is the school's oldest civil servant. The course he attended is designed to instruct Chaparral operators on how to use the system. ✶

The ***4th Battalion, 61st Air Defense Artillery,*** Fort Carson, Colo., captured the Commanding General's Annual Battalion-level Sports Trophy for 1983. The Sentinels won League One in flag football and placed second in the flag football championship. They were also runners-up in their volleyball league and runners-up in the Fort Carson Track and Field Championship. The air defenders dominated the battalion softball league, taking first place in the league and the championship, and were runners-up in the Fort Carson soccer championship. ✶

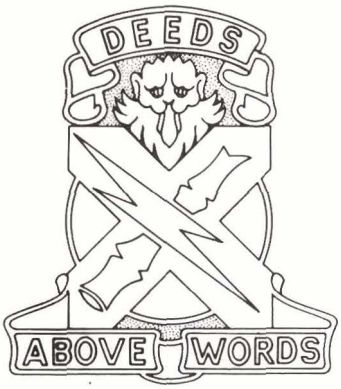
Running more than 1,600 miles is not something many people would dream of doing in a lifetime, but for ***SFC Wilson Walker*** of Battery A, 2nd Battalion, 2nd Air Defense Artillery, it's a feat he's achieved in less than three years.

Walker, a platoon sergeant in Giessen, Germany, clocked up the miles by running, not walking, in literally hundreds of volksmarches. When asked why he chose the faster pace, he said, "Basically for the challenge. I got serious about running when I just about collapsed after doing a mere mile and a half. I was so disgusted with myself that I began setting goals of, say, five miles to that castle on the hill and back. Once I reached that, I got interested in volksmarching as a way of seeing the country and challenging myself."

Volksmarches range in length from 10 to 20 kilometers and take place all over Europe, mostly on weekends. The sport is fast becoming popular in America as well. ✶

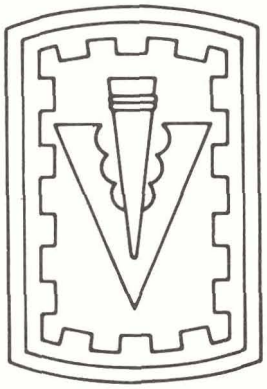
108th Air Defense Artillery Brigade

by Danny Johnson



Distinctive Unit Insignia

The black roundel, representing a gunstone, and the scarlet lightning flash refer to artillery fire. The upper end of the flash symbolizes the unit's air defense and anti-aircraft heritage. The gold X-shaped saltire is for strength. The gold lion's face is taken from the arms of Normandy and stands for the unit's local combat service in the campaign for Normandy during World War II. The green bamboo shoot and the colors green, gold and scarlet allude to service in Vietnam.



Shoulder Sleeve Insignia

The patch is a blue rectangle within a yellow crenelated design surrounded by a scarlet border. The crenelated configuration of the border indicates a strong defensive position. The blue center symbolizes the sky, while the arrowhead alludes to the unit's strike capabilities. Thus, the design elements portray the mission of the 108th ADA Brigade. They also refer to the unit's location, Kaiserslautern, Germany, which derives its name from a local stream (the blue area) and a castle built there in the 12th century (the crenelated border).

The history of the 108th Air Defense Artillery Brigade began in July 1923 when it was constituted in the organized Reserves as the 514th Coast Artillery (Anti-aircraft) and allotted to the 2nd Corps Area. It was organized in October 1923 with headquarters in Albany, N.Y. The 514th Coast Artillery was withdrawn from allotment as an organized Reserve unit and assigned to the 2nd Corps Area Jan. 1, 1938, as an inactive Regular Army unit.

The 514th Coast Artillery was activated March 1, 1942, at Camp Davis, N.C., and attached to the 1st U.S. Army. Two months later, the unit was relieved from assignment to 1st Army and assigned to the Anti-aircraft Artillery Command. It was reorganized in May 1942 as the 514th Coast Artillery Regiment (AA).

The regiment was broken up Jan. 20, 1943. Headquarters and Headquarters Battery became Headquarters and Headquarters Battery, 108th Coast Artillery Group (AA). The 1st Battalion became the 217th Coast Artillery Battalion (AA). The 2nd Battlion was redesignated as the 639th Coast Artillery (AA) and the 3rd Battalion became the 363rd Coast Artillery Searchlight Battalion (AA).

Headquarters and Headquarters Battery, 108th Coast Artillery Group, was redesignated and reorganized May 26, 1943, as Headquarters and Headquarters Battery, 108th Anti-aircraft Artillery Group. On Oct. 18, 1943, the 108th moved to Camp Stewart, Ga. Two months later, in December, the unit moved again, this time to Camp Shanks, N.Y., where it prepared for oversea shipment. The unit departed on the *Christian Hugens* from the New York Port of Embarkation, arriving in Dorchester, England, Jan. 10, 1944.

The 108th was stationed in England until June 1944, preparing for oversea shipment and additional air defense duties. The unit departed from Southampton aboard the *S.S.Enoch Train* June 19 and arrived at Utah Beach in Normandy June 28, 1944. The group remained in France where it provided air defense in Cherbourg and the surrounding area until it moved into Germany May 2, 1945. After the war, the unit remained in Germany on occupation duty until Dec 14, 1945, when it was inactivated at Bad Neustadt. The group is credited with the Normandy, Northern France, Rhineland and Central Europe campaigns for World War II.

It was not until Sept. 25, 1956, that the 108th's colors were to be seen again. That was the day the group was activated at Los Angeles, Calif., and assigned to the Army Anti-aircraft Command with the mission of air defense for the Los Angeles area. The unit was redesignated March 20, 1958, as Headquarteres and Headquarters Battery, 108th Artillery Group (Air Defense). The group was later inactivated in April 1960 at Fort MacArthur, Calif.

On May 1, 1967, almost seven years later, the 108th Artillery Group was activated at Fort Riley, Kan., and assigned to 5th U.S. Army. Its stay at Fort Riley was short lived. The group left there Oct. 3, 1967, and arrived at Oakland Army Terminal. It shipped out aboard the *USNS Weigel* and arrived in Da Nang, Vietnam, Oct. 28, 1967.

Chaparral crewmen from the 108th Air Defense Artillery Brigade prepare their weapon for firing at the NATO missile firing installation on the Greek island of Crete.

At first the 108th was stationed at Dong Ha but moved to the Hue-Phu Bai vicinity in December 1970. It was assigned to XXIV Corps during its stay in Vietnam. At one time, the group had as many as seven battalions of field artillery assigned to it. The unit took part in 11 Vietnam campaigns and was awarded the Republic of Vietnam Cross of Gallantry with Palm. Later, the group was reduced to a color guard and returned to Fort Lewis, Wash., where it was inactivated Nov. 22, 1971.

The group was reactivated Nov. 21, 1974, this time in Germany, and assigned to the 32nd Army Air Defense Command. At the same time, it was redesignated as Headquarters and Headquarters Battery, 108th Air Defense Artillery Group, and stationed at Kaiserslautern where it remains today. The 108th Air Defense Artillery Group was redesignated as the 108th Air Defense Artillery Brigade in July 1983.

Danny Johnson *is a management analyst for Assistant Chief of Staff for Intelligence, DA, at the Pentagon. This article is one in a series he is compiling from official Army sources for* Air Defense Artillery *magazine.*

Scanning

Roland Gets Improved Radar

The first of an improved breed of radar for the U.S. Roland has been delivered to Roland's prime contractor, climaxing a five-year development effort. In October, Hughes began delivery of track radars that incorporate a follow-on modification to the improved radar, designated as the "final configuration." The delivery schedule is a result of program changes stemming from a decision by the Department of Defense to reduce the number of Roland systems produced.

Improvements consist of electronic modifications to Roland's track radar subsystem. The track radar, one of two types of radar on the mobile SHORAD system, guides Roland's supersonic missiles to low-flying targets in clear or adverse weather. The modifications enable the track radar to perform its guidance task despite hostile electronic countermeasures.

Previous versions of the radar will be retrofitted to give Roland fire units the improved countermeasures capability of the final configuration. This effort will continue through fall of 1984.

Current procurement contracts call for 27 fire units to be built. Finished Roland fire units, which include an electro-optical sensor and tracker, electronics, missile launchers, the two radar subsystems and the crew's control stations, will be delivered by Boeing Aerospace to the Army for deployment with the New Mexico Army National Guard.

As part of the nation's multiservice rapid deployment force, the New Mexico National Guard's mission is to provide Roland's mobile, air defense capability for U.S. forces anywhere in the world on a three-day notice.

EW Symposium To Highlight Air Defense

The U.S. Army Air Defense Artillery School, Fort Bliss, Texas, will host a special Department of Defense symposium for the Association of Old Crows, April 10, 11 and 12. The theme will be "Air Defense Suppression and Air Defense Survivability."

The three-day air defense special electronic warfare technical symposium will highlight current red and blue air defense postures in suppression and survivability and the usage of electronic warfare in those exchanges. Exhibits of electronic equipment will enhance briefings on the latest technology and concepts circulating throughout government and industrial laboratories. During the symposium, attendees representing the military community and civilian industry will be given the opportunity to view the results of air defense training at the school.

The Association of Old Crows is made up of Army, Navy, Air Force, Marine Corps and other Department of Defense personnel, members representing NATO and other friendly nations, and civilians from industrial and educational communities and university research centers. Its purpose is to maintain close communications among the designers, manufacturers and users of electronic warfare equipment.

The name "Old Crows" emerged from the first large-scale use of electronic warfare during World War II. United States and Allied bombers were outfitted with radio and radar receivers to monitor enemy transmitters and to jam enemy frequencies. The receivers and transmitters were part of U.S. radio countermeasures efforts and were designed, produced and used under the equipment's common code word "Raven." Operators who flew on the missions were called "Raven operators." Common jargon later changed the term "Raven" to "Crow." Naturally enough, there evolved a group of professionals engaged in electronic warfare who became known as the "Old Crows."

New Missile System Concept Requested

The Army Missile Command, Redstone Arsenal, Ala., awarded competitive contracts of approximately $500,000 each to three companies to develop a concept for a major new tactical missile system based on Army and Air Force requirements.

Studies will include a system design concept, missile configuration, test program recommendations and cost and schedule estimates prior to full-scale engineering development expected to begin this year.

The joint tactical missile system is intended to be a weapon system that can carry a variety of warheads and can be air- or ground-launched against targets deep behind enemy lines under all-weather conditions.

Started in early 1983, the joint system project combines two earlier study programs, the Army corps support weapon system and the Air Force

conventional standoff weapon, into a joint missile program. *(Redstone Rocket)*

New Guidance Technology Explored

Compensating for wind, the biggest obstacle to free-flight rocket accuracy, is the goal of a program now underway at the Army Missile Laboratory, Missile Command, Redstone, Ala. Under the dynamically aimed, free-flight rocket program, researchers are exploring technology to develop and demonstrate a new guidance technique for free-flight rockets. The program is based on a rocket and launcher concept that uses radar-directed fire correction.

An accurate, lightweight, highly mobile, rapid-firepower prototype system, particularly suitable for rapidly deployed forces, has been demonstrated in tests at Redstone Arsenal and at Eglin Air Force Base, Fla. The prototype consists of four 10-round pods mounted on a truck that can be transported by a C-130 aircraft. The launcher has a built-in radar device that looks up the bore sight line and collects data to make between-flight corrections. The radar tracks initial rocket launch, measures surface wind, predicts rocket impact and issues firing information to automatically reaim the launcher within seconds before winds change. The Navy's five-inch Zuni rocket was used for the tests.

Plans call for further testing at Eglin Air Force Base once modifications from lessons learned are made on the design. *(MICOM)*

Developments

Army Ends Viper Contracts

In a recent competitive test and evaluation of lightweight, individual anti-armor weapons, the Swedish-made AT-4 weapon system (above) outperformed all others, including the Viper and the M-72A3 LAW systems. The purpose of the test was to validate manufacturer's claims of performance and to determine the most cost-effective candidate for possible procurement. Based on the results, Army officials announced the termination of Viper production contracts.

Test officials explained that since none of the tested lightweight systems demonstrated enough armor penetration, the Army will continue the production of medium and heavy anti-armor systems to provide soldiers with weapon systems fully capable of defeating threat tanks. The M-72A3 LAW, say officials, will be retained as a multipurpose defense weapon. *(ARNews)*

New Protective Uniform Tested

Personnel at Dugway Proving Ground, Utah, test the protective outfit, toxicological, microclimate-controlled uniform. The outfit, which is fully self-contained with its own air supply, is designed for use by explosive ordnance personnel working in a contaminated area. *(TECOM)*

Black Hawk Reaches Milestone

The UH-60A Black Hawk helicopter, equipped with the external stores support system, reached a significant milestone by making a non-stop, 1,300-nautical-mile flight. The flight, which exceeded the stated range certification requirement of 1,150 nautical miles, took 12 hours.

The external stores support system, designed to extend the aircraft's range and multimission capabilities, consists of stub wings mounted on each side of the aircraft under which are four removable pylons that carry two 450-gallon tanks and two 230-gallon tanks.

Camouflage Pattern Redesigned

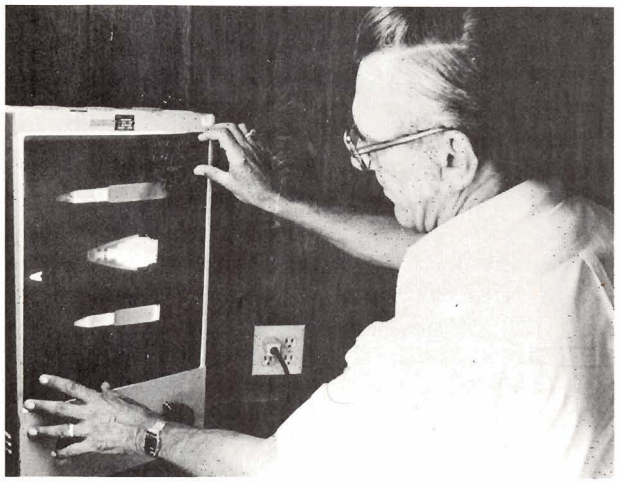
Three-color camouflage patterns being developed by the Army's Mobility Equipment Research and Development Command, Fort Belvoir, Va., will replace the familiar four-color pattern currently used on tactical equipment. The new design will use brown, green and black, eliminating the tan now included in the pattern. In theory, the new broad patches of color will break up a vehicle's silhouette, making it blend better with its background at close-up range and harder to identify at a distance. Conventional camouflage simply blends with the background.

The Army's decision to adopt the new pattern came about as a result of discussions with West German military officials who want to standardize camouflage used by U.S. and West German armies so that enemy forces can not identify a vehicle's country of origin by its pattern. After a series of tests, the three-color German pattern was shown to provide better protection than the four-color American design.

To adapt the pattern to the wide variety of Army vehicles, the command negotiated a contract for a computerized program to create individual pattern designs. So far, camouflage patterns have been designed for armored personnel carriers, self-propelled howitzers and commercial utility cargo vehicles.

Conversion to the three-color pattern will be in conjunction with the introduction of a new chemical agent-resistant coating that will protect surfaces from absorbing chemical agents and allow soldiers to decontaminate their equipment without dissolving the paint. *(MERADCOM)*

Mobile X-ray Lab Developed



James D. Moravec Sr., chief radiographer, checks an X-ray processed in the mobile lab.

Army technical test radiographers at Yuma Proving Ground, Ariz., designed and built a trailer-mounted X-ray laboratory in which a mix of off-the-shelf and locally fabricated equipment produces top-quality radiographs of microsecond firings in two minutes.

Field radiography systems have existed for many years, but most systems provide only a fuzzy, quick-look radiograph which has to be enhanced or supplemented with additional processing in a fixed lab to be of report quality. The new mobile system can provide quality X-ray photos on the scene, giving engineers usable test data on the spot.

Radiography applications at Army proving grounds include microsecond views of fuses and projectile firings at the exit and while still in the fireball. Other uses include air-drop load inspections to ensure that dropped items are safe to move. Standard optical photographs cannot penetrate metal or blast effects.

Cost of the new system was minimal. The trailer, a surplus M-447 semitrailer van, was virtually free. Internal improvements and processing system totaled about $30,000. The cost will be recouped many times over in saved man-hours alone.

MLRS Production Contract Awarded

In September, the Army Missile Command awarded the first increment of a $1.2 billion contract to Vought Corp. for production of the Army's new Multiple Launch Rocket System. The fixed-price, five-year contract will complete the MLRS production requirements. The Army's initial award was $47.9 million.

The MLRS is a free-flight artillery rocket consisting of a 12-round launcher mounted on a highly mobile, tracked vehicle. The rockets have a range of more than 30 kilometers and can be fired singly or in rapid bursts.

The MLRS is being developed as a standard NATO rocket by the United States, United Kingdom, France, West Germany and Italy.

Tomahawk Joint Testing Ends

The seventh and final joint Navy and Air Force operational and evaluation flight test of the Tomahawk ground-launched cruise missile was successfully completed in late summer. The missile flew a fully guided mission over a ground target on the Utah Test and Training Range. This was the final launch under the joint cruise missile project. Follow-on test and evaluation will continue under direction of the Air Force Operational Test and Evaluation Center at Kirtland Air Force Base, N.M.

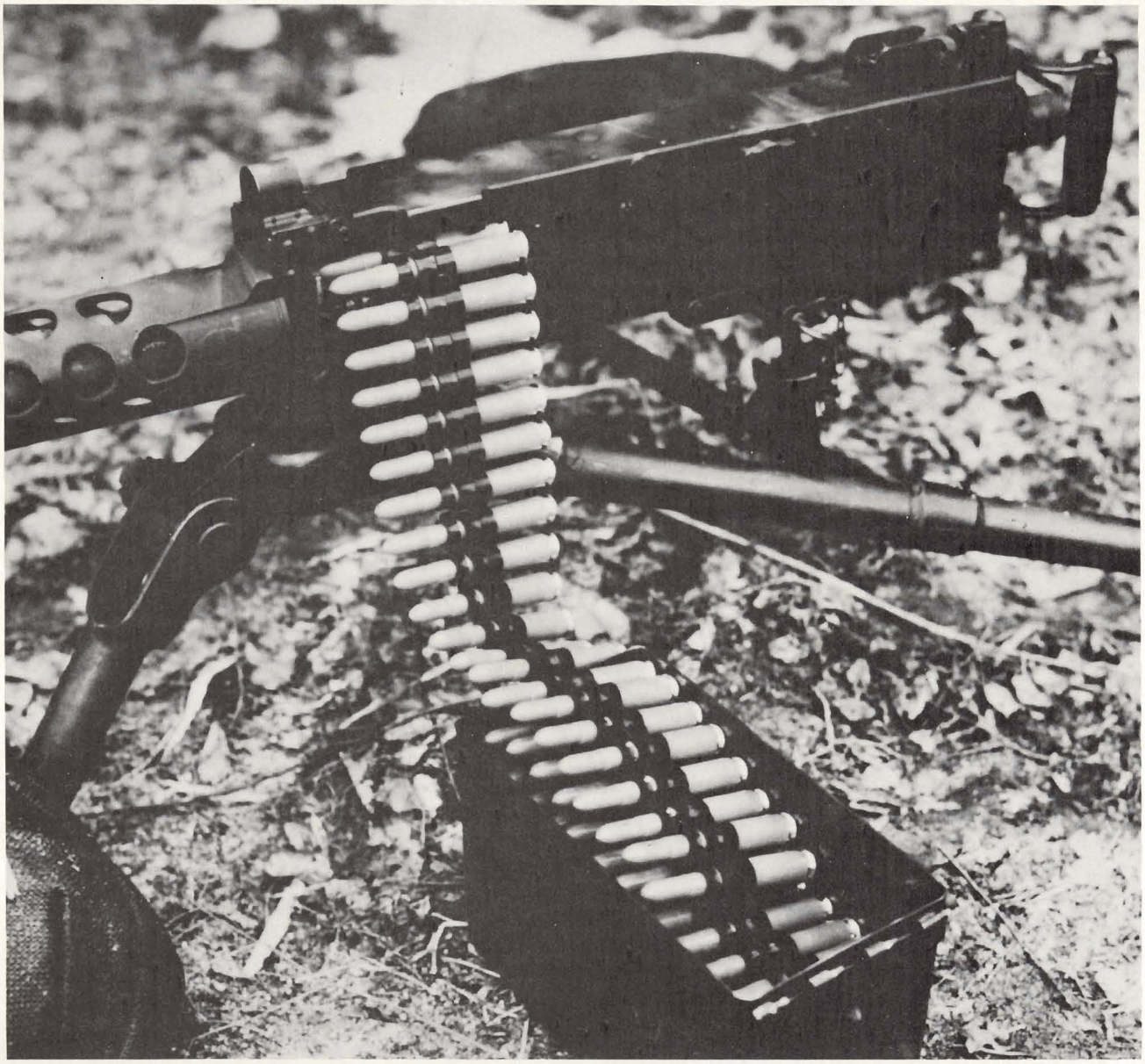
The follow-on program will include additional test flights as well as evaluation of communications, maintenance and operational procedures.

Flotation Kit Undergoes Testing

A soldier inflates an LRU-18/U miniboat flotation kit during development testing at the U.S. Army Aviation Development Test Activity, Fort Rucker, Ala.

The LRU-18/U, developed by the Navy for use in tropic and temperate environments, is designed to increase survivability of helicopter crewmembers and passengers while awaiting rescue. Release of carbon dioxide from a small bottle inflates the top three rings; additional flotation is obtained by orally inflating the remaining tubes. *(TECOM)*

Plastic Training Ammo Approved



The Army has approved the .50-caliber plastic practice ammunition after nearly four years and more than 70,000 test rounds. Developed by the U.S. Army Armament Research and Development Center, Dover, N.J., the ammunition is expected to be in the field by September 1984.

The plastic round was developed to let soldiers train in areas that have been closed to them because of real estate restrictions that prevent the firing of full-scale standard service ammunition.

The round consists of a metal cartridge head and primer which are press-fitted into a plastic outer case, a projectile and a plastic inner case with propellant. The tracer round exhibits a bright trace for more than 200 meters during flight.

The average muzzle velocity of the cartridge is 830 meters per second. The accuracy of the round at 150 meters is the same as that for the service-grade .50-caliber M-33 ball and the M-17 tracer ammunition at 600 meters. The maximum range in terms of range safety is 700 meters. The round tip of the projectile increases drag, causing a rapid velocity drop-off that keeps it within a short range.

The .50-caliber plastic practice ammunition will be used to support reduced-range gunnery training on tank and infantry weapon systems. Cost savings will be realized in reducing the cost of transporting troops for training.

Career

Soldiers Wanted As Warrant Officers

Air defense artillery soldiers interested in the Army's warrant officer program should apply now for appointment in technical service fields.

A recent change to AR 135-100, Appointment of Commissioned and Warrant Officers of the Army, allows the direct appointment of soldiers in grades E-7, E-8 and E-9 to grade CW2. With the appointment comes a six-year initial service obligation. Appointments otherwise are made at WO1 with a four-year active duty commitment.

A complete listing of warrant officer military occupational specialties and specific prerequisites is given in DA Circular 601-83-2, Warrant Officer Procurement Program-FY84. Air defense artillery-related MOSs opened for procurement are 223B (Hawk missile system technician) and 224B (SHORAD air defense system technician). The closing date for applications to be submitted is Sept. 30, 1984, for both MOSs. Preferred qualifications and application procedures also are listed in DA Circular 601-83-2.

Latest Re-enlistment Standards

A good record and an awareness of the Army's policies and attitudes about re-enlistment will help a soldier to stay in. Here are some things to keep in mind:

Check your status. First-term soldiers should have their records screened by their company re-enlistment NCO at least eight months before their ETS. Check if waivers of any kind are needed.

Do you need a board? All first-term soldiers who have not made the E-5 standing promotion list must go before a board of senior NCOs to explain why they want to stay in the Army. The board checks SQT and EER scores, military and civilian education and past self-improvement. Be certain enough enlistment time is left to appear before the board if required to do so. No enlistment extensions are allowed.

Pass your PT test. There are no waivers allowed for those who are medically fit but don't pass the physical training test.

Qualify with your weapon. To re-enlist, a soldier must pass the weapon firing test if given a chance to fire and if physically able to do so.

There are other obstacles. Although there are waivers available, a soldier may be denied further service if overweight, has a bar to re-enlistment or has refused to comply with assignment orders.

Keep up professionally. The Army's emphasis is on keeping high-quality soldiers. NCOs must keep up technically and professionally so they can lead the Army of the future.

Bad marks weigh heavily. You'll need a waiver to re-enlist if you have any Article 15s.

Consider changing jobs. You might better your chances by switching to a shortage skill, especially a high-tech or intelligence MOS. *(Soldiers Scene)*

Army Stengthens EO Program

The Army wants to ensure that equal opportunity program advisors have recent experience with the kind of work performed by the soldiers they are helping and advising. Therefore, the following steps are being taken to strengthen the program.

- Soldiers trained in equal opportunity no longer will lose their basic MOS, but will be given an additional skill identifier to indicate their training as equal opportunity advisors. Thus, soldiers will be able to return to performing their basic skills upon completing a single utilization tour as equal opportunity advisors. Under this policy, MOS OOU no longer will be awarded. To provide continuity during the transition period, some NCOs now holding MOS OOU in the ranks of E-8 and E-9 will be retained in the specialty indefinitely.

- The enrollment of soldiers in the 16-week course will be more than doubled at the Defense Equal Opportunity Management Institute, Patrick Air Force Base, Fla .

- A new, three-week course will be added to the school curriculum to train selected officers and senior NCOs for their assignments to equal opportunity positions on the staffs of major commands at corps level or higher and at Department of the Army headquarters.

Force Modernization Course Established

The U.S. Army Logistics Management Center, Fort Lee, Va., has developed a 15-day Force Modernization Management Course to teach logistical managers how to solve the variety of problems faced as the Army modernizes. The

course covers various processes and techniques required to manage force modernization. These include force development, materiel acquisition, distribution of equipment and the programming and budgeting cycle.

Commissioned and warrant officers, enlisted personnel in grades E-7 and above, and civilians in grades GS-09 and above are eligible to attend. They should be occupying or moving to positions in force modernization, project or product management, TRADOC system management or integrated logistic support.

For more information, write to: Commandant, U.S. Army Logistics Management Center, ATTN: DRXMC-ACM, Fort Lee, VA 23801.

OER Profiles Overemphasized

Selection board members say senior raters who check only the top boxes of the officer evaluation report profile lose their credibility, waste their "vote" and hurt their subordinates.

Most senior raters appear to be spreading the potential evaluation of their effective officers across the four boxes above the center of mass, while others spread effective officers through the fifth and sixth boxes.

The chart below gives an indication of how selection boards interpret the senior rater profile. It shows that an officer does not have to receive all top-box checks from his senior raters to have a successful, long-term Army career.

Senior Rater Evaluations

Board	Date	Selected officers with at least one evaluation which was less than a top profile box	Profile box range
SSC	Oct 82	More than two-thirds	1 - 4
COL Cmd	Jan 83	Considerably more than two-thirds	1 - 3
CSC	Jan 83	Approximately two-thirds	1 - 4
LTC Cmd	Feb 83	Considerably more than half	1 - 4
CW3	May 83	More than nine-tenths	1 - 5
COL	Jul 83	Approximately four-fifths	1 - 5
MAJ	Aug 83	Considerably more than four-fifths	1 - 6
BG	Sep 83	About half	1 - 3
LTC	Sep 83	More than four-fifths	1 - 6

The interpretation of the senior rater's evaluation is dependent upon joint consideration of all three components of the evaluation report: the box check, the profile and the narrative. There seems to be a tendency to overestimate the power of the profile boxes and underestimate the power of the narrative. The narrative has always been the bedrock of the officer evaluation report system. Nothing has changed this. All three aspects of the officer evaluation report should contain the senior rater's message.

Center For Leadership, Ethics Established

The U.S. Army Training and Doctrine Command has established the Center For Leadership And Ethics at the U.S. Army Command and General Staff College, Fort Leavenworth, Kan.

The center's charter calls for the development, integration and coordination of Army leadership and ethics through a single agency for all Army branch schools. Tasked to develop a core curriculum and program of instruction for leadership and ethics, the center is coordinating with various military and civilian research institutions to provide courses that will be used in all TRADOC schools. One result of this research so far is FM 22-100 (Military Leadership), which was distributed in November 1983.

OPMS Receiving In-depth Review

The structure and operation of the Army's officer personnel management system are being studied to determine if the system is adequately fielding an officer corps, both active and reserve, that is prepared to meet the leadership requirements of the next decade.

During its review, the 26-member study group will visit major Army commands, service schools and tactical and non-tactical organizations throughout the Army. An analysis of OPMS subsystems such as strength management, evaluation and professional development also will be made and a profile of the officer of the 1990s will be studied.

In mid-October, an opinion survey was mailed to a random sampling of 14,000 commissioned officers who graduated between 1953 and 1982. Input from the survey will be extremely important to the study group, and the data gained will be used throughout the review.

A supporting study, conducted by Headquarters, U.S. Army Training and Doctrine Command, will look at OPMS from the school commandants' perspective. Additionally, selected Army students at the senior service colleges also will be asked to provide input to the study.

The group is expected to complete its review of the OPMS in about a year. Some personnel management adjustments are likely to be made in response to the progress of force modernization, AirLand Battle Doctrine and the new manning system.

Members of the study group are seeking ideas and suggestions from the entire officer corps as to where changes should be made. Individual officers are encouraged to contribute their ideas for improving the current OPMS by writing to: OPMS Study Group, HQDA (DAPE-MP-OPMS), Washington, DC 20310.

Intelligence

Europeans To Produce Stinger

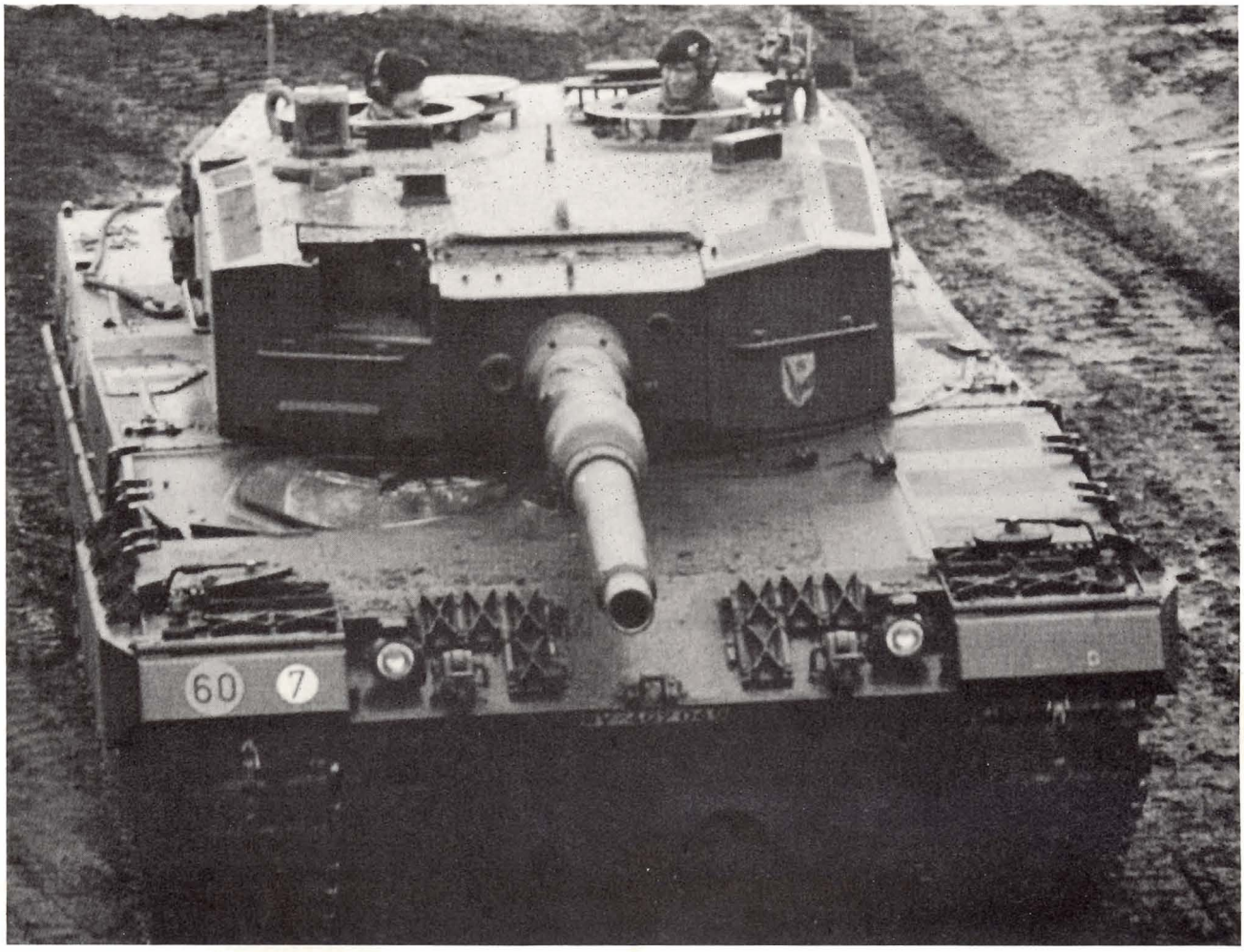
A U.S.-West German arrangement to co-produce Stinger air defense missile systems has evolved into an agreement in principle by six European nations to produce approximately 10,000 systems.

Two years ago, the United States allowed West Germany to produce the system. This agreement was amended in mid-1983 to include other interested nations. By fall 1983, Turkey, Greece, Italy, the Netherlands, Belgium and West Germany had signed a memorandum of understanding to participate in production work based on the number of systems purchased. Denmark and Norway may be included at a later date.

The decision to co-produce the Stinger came after evaluation of other systems that included the British Blowpipe and the French Mistral. The Stinger selection was based on its fire-and-forget capability and its overall kill probability.

The multinational European Stinger project group will request production proposals from various West German consortiums. Selection of a prime contractor is not expected until the end of 1984.

Swiss Opt For Leopard IIs



Switzerland has announced that it will buy 455 Leopard II tanks from West Germany instead of the M-1 Abrams. Thirty-five of the tanks will be bought directly. The remainder will be built in Switzerland under license. The Leopard is equipped with a 120mm gun.

Javelin Production Begins

Production of the British Javelin, a shoulder-launched surface-to-air missile system, has begun. The weapon, derived from the combat-proven Blowpipe, is expected to enter service with the British armed forces by 1985 to augment and eventually succeed the Blowpipe.

The basic layout of the Blowpipe has been retained for the Javelin, although the design has been modified so that the operator can use the weapon while wearing items such as a respirator or sunglasses. The firing grip also has been improved.

The Javelin's main advantage over the Blowpipe is its semiautomatic command to line-of-sight rather than manual guidance capability. This new feature reduces the missile's minimum range and gives it far greater accuracy at extreme range. A blast-fragmentation warhead, heavier than the hollow-charge type with fragmentation casing used in Blowpipe, has also been adopted.

Javelin and Blowpipe missiles and aiming units will be interchangeable.

U.S., Soviet Union Agree To Joint Study

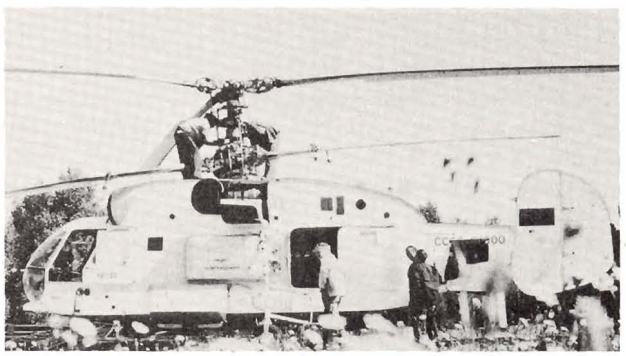
In what the Italian press has characterized as a "sudden change of attitude," the Soviet delegation attending an August 1983 top-level scientific conference on nuclear war in Erice, Sicily, agreed to set up a joint U.S.-Soviet commission that would study "the possibility of creating a new type of defense against nuclear destruction."

In a message sent to the conference, President Ronald Reagan reasserted his commitment to ending mutually assured destruction by developing new defensive weapon systems. Soviet officials and scientists have repeatedly stated that such defensive weapons were an "illusion" and "not feasible" and that their development would be "destabilizing."

The final communique signed by U.S. and Soviet scientists calls for the formation of a commission of about 100 persons to study both the feasibility of a directed-energy beam weapon system and the effects of nuclear war on the biosphere.

Among the Americans attending the annual conference were Dr. Edward Teller and other scientists working on the development of a U.S. defensive beam weapon system at the Lawrence Livermore National Laboratory. The Soviet delegation was led by the vice president of the Soviet Academy of Sciences, E. P. Velikhov, who oversees the Soviet work in laser fusion.

Soviets Test Cargo Helicopter

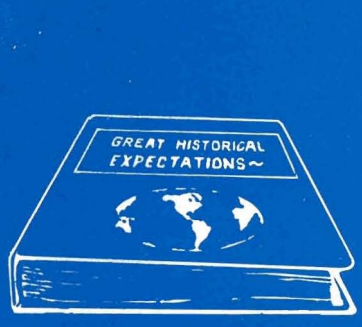


The Soviets are evaluating a prototype of the Ka-32 helicopter for use in unloading cargo ships at Soviet arctic seaports. The helicopter is expected to be put into series production following completion of arctic tests.

The twin-engine helicopter, which has contra-rotating rotors, is listed as having a payload of just over 11,000 pounds. It is a version of the new Soviet anti-submarine Helix helicopter.

Turkey Selects F-16

The Turkish defense ministry announced that its air force has selected the F-16 as its new front-line aircraft. The requirement is for 160 aircraft. Present plans call for the initial 15 aircraft to be built in the United States, with the remainder to be partly assembled in Turkey during the next decade.



BOOKS

YURI ANDROPOV. A Secret Passage Into The Kremlin
by Vladimir Solovyov and Elena Klepikova
MacMillan Publishing Co, Inc., New York, 1983. 320 pages. $15.95.

Vladimir Solovyov and Elena Klepikova are two former Soviet journalists who worked in Moscow for *Literaturnaya Gazeta* and *Novy Mir* (The New World). In 1977 they were blackballed, on Andropov's personal directive, for speaking out against censorship and anti-Semitism.

In *Yuri Andropov,* the writing team looks at the rise to power of the man who now heads the Soviet Union. They describe how Andropov has woven a web of mystery about himself, a web that has shrouded him in a world of dangerous power grabbers. The portrait that emerges is that of a dangerous political animal, dedicated to assuming more and more power from both the old line and the "young Turks."

Andropov is a great manipulator of events and people, according to the writers. This political biography outlines his efforts to subvert detente, his anti-Jewish stance and his temporary alliances with the military and other groups to further his ambitions. The man who was seen by the world as a leader who enjoyed Western writings, films and tastes appears as a smiling "friend" waiting to plunge his political knife into a bare back.

The authors focus on the inability of Soviet watchers to really understand the politics and ideology of the Soviet Union. They point out that U.S. Kremlinologists said in early 1982 that Andropov had no chance of becoming the leader of the Soviet Union. Unknown to the world was that Andropov already had control. Brezhnev was then in decline and was shown "in profile," even to the Soviet people.

Andropov's outward appearance of frailty should not deceive anyone, say the authors; the regime he has established will continue. "Andropov's accession to the Kremlin marked the collapse of the earlier Soviet system of government by triumvirate, with both collaboration and competition among its three sectors: the Party, the government and the secret police." The history of the Soviet Union has actually been a progression toward this end, the rule of the police state, say the authors.

They warn of the state to follow, with or without Andropov at the head. They describe Andropov as "the chief of the omnipotent Mafia of KGB men that had seized power in the country, replacing the Party Areopagus."

Understanding that the authors may have an inbred bias, it is true that there is little known of the real Yuri Andropov, his ambitions, goals and way of life. Any part of the puzzle should be looked at closely. This book gives an insight into the life and political rise of Yuri Andropov. But even more, it shows a glimpse of what is happening to the political structure of the Soviet Union. George Orwell may not have been far off if he had been prophesying the year 1984 in the Soviet Union. It is a must book to read.

—Edward C. Starnes

ON STRATEGY
by COL Harry G. Summers Jr.
Presidio Press, Novato, Calif., 1982. 225 pages. $12.95.

It wasn't until a year after its 1982 publication that *On Strategy* gained interest, an interest sparked by articles published in national news media such as *Newsweek.* Originally written for the Strategic Studies Institute at the Army War College, *On Strategy* has, in fact, been used there as a textbook.

In his book, COL Harry G. Summers takes a critical look at the many aspects of the Vietnam War in two overall categories—the environment and the engagement. In the first category, Summers notes that the biggest problem in pushing the war in Vietnam was the lack of public support. He blames this on the administration and the military for not being firm enough in support of the war. The lack of a declaration of war made the public leery of military action in Southeast Asia.

"The main reason it is not right to blame the American public," he writes, "is that President Lyndon Baines Johnson made a conscious decision not to mobilize the American people—to invoke the national will—for the Vietnam War. The failure to invoke the national will was one of the major strategic failures of the Vietnam War. It produced a strategic vulnerability that our enemy was able to exploit." This refusal to gain the backing of the American public caused the protestors of the 1960s to misdirect their criticism at the military. They forgot that it was not the military that made the policy, but rather the civilians who controlled the military, he says.

Political and military actions in Vietnam were often in conflict. As Summers points out, we failed to learn our lesson in Korea. In both Korea and Vietnam, our aim was to control the spread of communism, but not to commit the military in such a way as to draw us into a major war. The struggle in our own policymaking proved a benefit to the enemy. We failed to distinguish between the internal Vietnamese problems and the threat of North Vietnamese aggression, or to discern how North Vietnam used insurgency as a cloak to hide their real objective.

The lessons learned from Vietnam

have been numerous and varied. They have been tinged with political belief and emotionalism. *On Strategy* should be read by all military planners because it strips the emotion from the issue to bring out the basic problems that caused our "failure" in Vietnam.

—Edward C. Starnes

ESCORT CARRIER: HMS Vindex at War
by Kenneth Poolman
Secker & Warburg, distributed by David & Charles, Inc., North Pomfret, Vt., 1983. 216 pages. $24.50.

This book tells the story of a ship which was designed as a refrigerated cargo and passenger liner, was converted to an escort carrier for an anti-submarine role during World War II and then reconverted to a merchant ship before finally going to the breakers yard. The key feature of the book is the men who served on *HMS Vindex* and what they achieved by determination, ingenuity and the will to win.

Inevitably, glamorous stories are told of the pilots and less glamorous ones of those who manned the ship and maintained the planes, whether on Atlantic Patrol or escort duties on convoy runs to the Soviet Union. This beautifully illustrated book is a magnificent record of achievement for anyone connected with the ship or its crew, as it gives a very personalized account of individual and team effort.

The reading is enjoyable, although some parts are heavy going because of overemphasis on names and individuals, but this does not detract from the admiration one has for those who achieved so much.

—LtCol Michael F. Bremridge, MC Royal Artillery

THE FIGHTING SHIPS OF THE RISING SUN
by Stephen Howarth
Antheneum, New York, 1983. 398 pages. $19.95

Stephen Howarth's *The Fighting Ships of the Rising Sun* chronicles the rise and fall of the Imperial Japanese Navy from its beginning as little more than a ragtag fishing fleet, through its ascendancy as one of the world's great sea powers, to its final defeat at the Battle of Leyte Gulf.

The early chapters of the book make fascinating and illuminating reading, but many readers will find Howarth's excellent account of World War II battles, such as Pearl Harbor, Midway and the Marianas Turkey Shoot, overly familiar.

As a fighting force, the Imperial Japanese Navy existed only 60 years—from 1885 to 1945—but its career was meteoric. Modeled after its British counterpart, the Imperial Navy, while still in its infancy, humbled two great empires: China at the Battle of the Yellow Sea in 1895 and Russia at the Battle of Port Arthur and Tsushima in 1905, the first battles fought between modern dreadnoughts.

Admiral Togo Heihachiro hoisted a "Z" flag, patterned after the flag Nelson flew at Trafalgar, to signal his ships into battle at Tsushima Strait. But the Imperial Navy was much more than a carbon copy of Western navies. Despite a complete lack of naval tradition (Japanese feudal law forbade the construction of craft larger than fishing boats), the Japanese, in a few brief decades, managed to build a first-class navy. Finding out how they did it and why they did it make *The Fighting Ships of the Rising Sun* rewarding reading.

—Blair Case

HOME BEFORE MORNING
by Lynda Van Devanter with Christopher Morgan
Beaufort Books, Inc., New York, 1983. 320 pages. $16.95.

Richard Hooker would be proud to know that M*A*S*H has gone to Vietnam. While many reviewers have said that Lynda Van Devanter brings out the "truth" about the horrors of Vietnam, what one receives is a large credibility problem.

To read Devanter's recollections of Pleiku from mid-1969 to mid-1970 is to read a version in direct contrast with the recollections of anyone else who served there at that time. We get from the author an image of daily and nightly rocket attacks, blood pouring on the operating room floor from a countless, never-ending stream of bodies torn apart in a ruthless war being fought on the front doorstep of the 71st Evacuation Hospital in Pleiku. Through page after page of impossible working conditions and daily tragedies, she paints a M*A*S*H-like picture with everything included, even the Swamp (substitute Bastille).

Unfortunately, her recollections are not those of others who served in the area while she was there. In fact, the workload at the 71st Evac was such that the Army actually eliminated 100 of the 305 operating beds at the facility. Army records show that even during the heaviest month that Devanter was at Pleiku there actually were fewer patients operated on than in a normal stateside hospital.

COL Mary Grace, who was a nursing supervisor with Devanter at the 71st Evac, said in an interview, "I certainly don't recognize [the incidents in the book]. I'd say she's been watching too much M*A*S*H."

Devanter goes on in her post-Vietnam recollections to blame Vietnam and her war-related nightmares for the failure of her marriage, for her need to be promiscuous and for her failure to keep several nursing jobs. One should not expect too much from a book that starts with the disclaimer: "Although the people and events described in this book are real, names and other identifying characteristics relating to certain public and non-public figures have been changed to protect their privacy."

It is unfortunate that this book loses its credibility, because the women veterans of Vietnam deserve to have their story told. Devanter may well have suffered from her experience in Vietnam, but the female veteran suffers more from her incorrect recollections.

If you like M*A*S*H you'll enjoy *Home Before Morning.* If you like accurate stories of veterans' experiences in Vietnam, don't read *Home Before Morning.*

—Ed Starnes

VIETNAM: A HISTORY
by Stanley Karnow
The Viking Press, New York, 1983. 750 pages. $20.

The number of books that have been written about the Vietnam War is increasing rapidly. None, however, explains the history of that war in greater detail than Stanley Karnow's *Vietnam: A History.* With "no cause to plead," Karnow writes about what he calls "a human tragedy; a war that nobody won—a

struggle between victims."

As a journalist in Paris in the early 1950s, Karnow became familiar with names and places of Vietnam, reporting from afar about the Vietminh and France's struggle to retain her foothold in the region. Then in 1959, he was assigned to cover East Asia. The region that included Vietnam became his beat for more than two decades. His most recent visit to Vietnam was in 1981 when he spent seven weeks traveling about the country, the longest period permitted an American correspondent since the fall of Saigon in 1975.

Karnow opens his book with the deaths of the first GIs in Vietnam and ends it with the reminiscence of the Communist officer who accepted the surrender of the South Vietnamese regime in 1975. Chapter 1 reviews Saigon and Hanoi today. His observations about the Communist regime and the people it governs are startling. He writes of the mismanagement, corruption, starvation, fear and hopelessness that permeate the country. Some Vietnamese are outspoken, but most remain silent about their plight. While visiting with a distinguished lady and her husband, Karnow stressed the brighter side, noting that the "bloodbath" forecast by many Americans and South Vietnamese never happened. "So instead of dying quickly," his hostess answered, "we are dying slowly." Another woman who spent years as a Viet Cong doctor, hiding in the jungles and traveling abroad on propaganda missions, confessed her disenchantment. "I've been a communist all my life. But now, for the first time, I have seen the realities of communism. It is failure. . . . My ideals are gone."

Chapter 2 ushers in the history of the country, its people and its wars. The following 15 chapters take the reader on an enlightening trip as the Vietnamese go through French colonization, Americanization, Vietnamization and, finally, communism. A series of photographs starts each chapter as if to emphasize what is about to be told.

Meticulously researched, *Vietnam: A History* has been heralded as the first complete account of Vietnam at war. It was published as a companion to "Vietnam: A Television History," a 13-part documentary film series, for which Karnow served as chief correspondent, for the Public Broadcasting System network.

With its in-depth list of characters and comprehensive notes on sources, this book will certainly become a classic that will be read for generations to come.—*Claire Starnes*

CHICKENHAWK
by Robert C. Mason
The Viking Press, New York, 1983. 339 pages. $17.95.

This is not just another book about Vietnam. It is about the most famous symbol of the Vietnam War, the helicopter. It is about one man's dream of flying and how that dream took him through the realities of the Army's aviation school at Fort Wolters, Texas, and on to Vietnam as a UH-1 pilot.

Robert Mason breaks new ground with his frightening and sometimes bitter experiences as a member of the first air assault unit deployed to Vietnam, the 1st Air Cavalry Division (Airmobile). He gives life to personalities and experiences of fellow pilots as they depart the United States and undergo their trial by fire in Vietnam. For the uninitiated, he gives highly accurate and sometimes breathless accounts of flying as he leads the reader through mission after mission into the heart of North Vietnamese-occupied jungles and into some of the more famous battles such as Ia Drang, Plei Mei and the Bong Son Valley. As his story progresses, the reader will notice a subtle change come about in Mason as he describes his companions falling by the wayside in what he thinks were senseless retakings of the same jungle patches.

Finally, he leads the reader through his subsequent traumatic re-adjustment to stateside life as he tries in vain to understand the hostility which greets him upon his return home.

This book does not deliver a pro or con statement about the Vietnam War. It simply relates the experiences of one man and how they affected his life. It is a memoir based on a journal the author kept and letters to his wife while he was in Vietnam. Personal photographs complement the text. Though a participant in one of the most politically controversial and inflamatory of American military actions to date, Mason confines himself to recording and commenting upon what he observed, what he saw and heard. "The events," he says, "will speak for themselves."

The epilogue, which gives the story an ironic twist, will leave the reader surprised and somewhat saddened.—*Pilots of the Aeroscout Platoon, Air Cavalry Troop, 3rd Armored Cavalry*

MODERN FIGHTING AIRCRAFT
F-15
by Mike Gething

MODERN FIGHTING AIRCRAFT
F-16
by Doug Richardson

MODERN FIGHTING AIRCRAFT
F-111
by Bill Gunston
Arco Publishing, Inc., New York, 1983. 64 pages. $11.95 each.

Each large-format book of this *Modern Fighting Aircraft* series is illustrated with photographs and diagrams, most in color. They cover a wide range of topics, including history and development, analysis of aircraft structure and design, propulsion, avionics and weaponry, combat capabilities, performances and pilots' flying reports.

AN ILLUSTRATED GUIDE TO MODERN NAVAL AVIATION AND AIRCRAFT CARRIERS
by John Jordan
Arco Publishing, Inc., New York, 1983. 160 pages. $9.95.

The latest in a continuing series on modern aircraft, this "pocket guide" is packed with more than 200 photographs and drawings of naval aircraft from several countries, including the United States and the Soviet Union. Most of the illustrations are in full color and feature descriptions of 23 aircraft carriers, 31 fixed-wing aircraft and 19 maritime helicopters. This book is not nearly as comprehensive in scope as, say, *Jane's,* nor is it intended to be. However, its style, format and tight compendium of photos and facts make it interesting reading.

Senior Air Defense Artillery Commanders

MG Victor J. Hugo
32nd AADCOM

COL Robert J. Weinfurter
10th ADA Bde

LTC Joseph G. Garrett III
1st Bn, 1st ADA (Hawk)

LTC Robert UpChurch
2nd Bn, 2nd ADA (Hawk)

COL Wallace C. Arnold
69th ADA Bde

LTC Maurice R. Alexander
3rd Bn, 7th ADA (Hawk)

LTC Stephen J. Kemf
6th Bn, 52nd ADA (Hawk)

LTC John J. O'Connell
2nd Bn, 57th ADA (Hawk)

COL Joe B. Thurston
94th ADA Bde

LTC John P. Rose
3rd, Bn, 59th ADA (Hawk)

LTC Donald E. Nowland
2nd Bn, 62nd ADA (Hawk)

LTC Theodore S. Clements
3rd Bn, 71st ADA (Herc)

LTC William M. Arrants
2nd Bn, 56th ADA (Herc)

COL Domenic P. Rocco Jr.
108th ADA Bde

LTC Fredrich Meauchamp
6th Bn, 56th ADA (C/V)

LTC Vernon L. Conner
2nd Bn, 60th ADA (C/V)

LTC James L. Smith
2d Bn, 67th ADA (C/V)

LTC James P. Durbin
2nd Bn, 59th ADA (C/V)
1st Armd Div

LTC Richard D. Kline
3rd Bn, 1st ADA (C/V)
3rd Armd Div

LTC Leopoldo R. Vasquez Jr.
3rd Bn, 67th ADA (C/V)
3rd Inf Div

LTC Richard N. Murray
1st Bn, 59th ADA (C/V)
8th Inf Div

LTC Joe B. Carden
5th USA Arty Group

ITALY

COL Richard J. Galliers
559th USA Arty Group

KOREA

LTC Herbert J. Smith III
2nd Bn, 61st ADA (C/V)
2nd Inf Div

HAWAII

LTC Donald J. Banta
1st Bn, 62nd ADA (C/V)
25th Inf Div

CONUS

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3rd Bn, 68th ADA (Hawk)
XVIII Abn Corps

LTC James L. Fredrick
3rd Bn, 4th ADA (V/S)
82nd Abn Div

LTC Joseph B. Berger
1st Bn, 3rd ADA (V/S)
101st Abn Div (Air Assault)

LTC Gary L. Bridgewater
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2nd Armd Div

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1st Cav Div

LTC Neal J. Delisanti
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LTC George L. Martindell
4th Bn, 61st ADA (C/V)
4th Inf Div

LTC David G. Bell
1st Bn, 55th ADA (C/V)
5th Inf Div

LTC Edgar L. Wylie
1st Bn, 51st ADA (C/V)
7th Inf Div

COL Gerald H. Putman
11th ADA Bde

LTC Charles L. Wood
4th Bn, 1st ADA (C/V)

LTC Terry D. DePhillips
1st Bn, 7th ADA (Hawk)

LTC Robert N. Davis
2nd Bn, 55th ADA (Hawk)

LTC Willian H. Gardner
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School Brigade

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