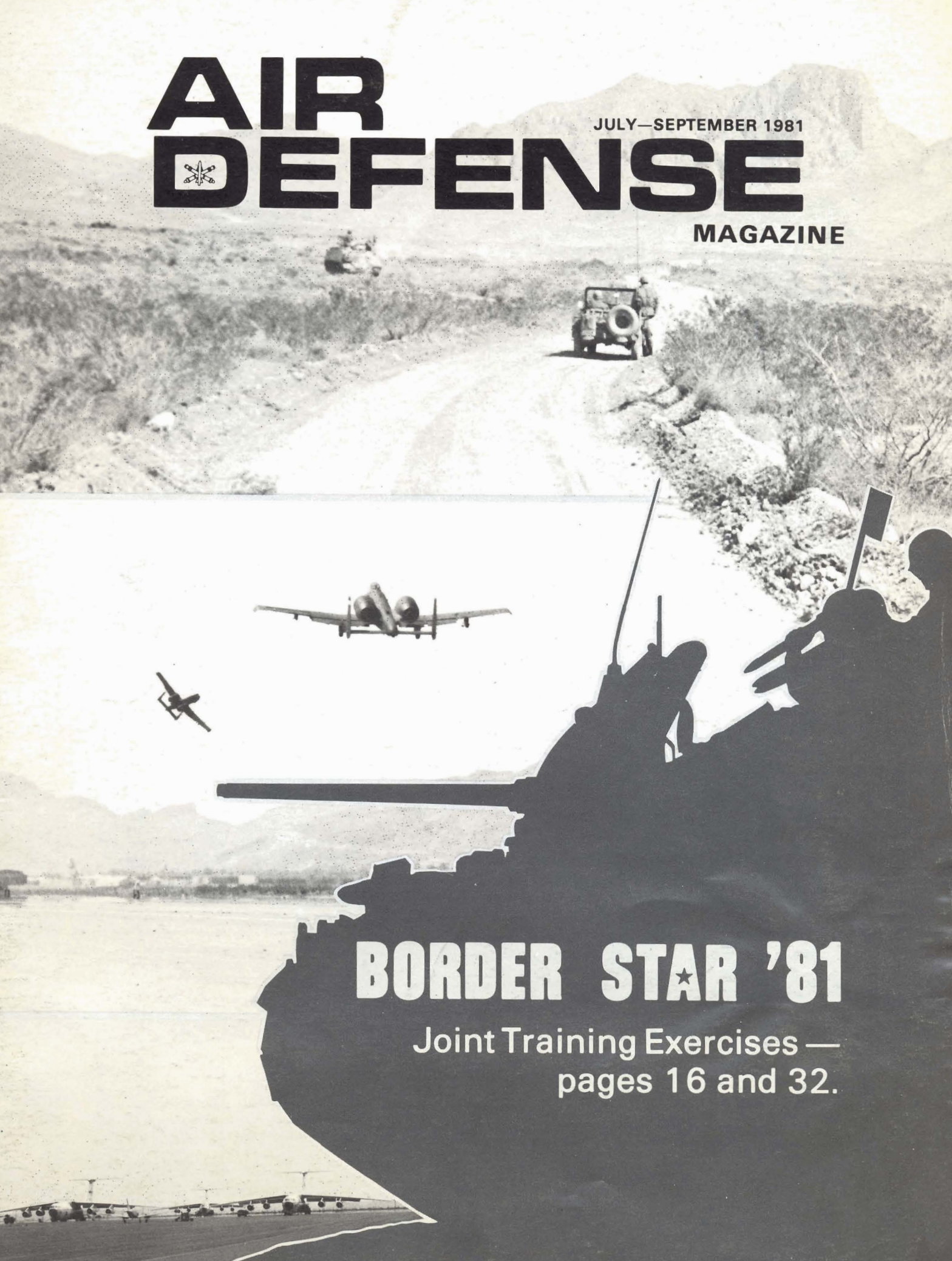
AIR DEFENSE MAGAZINE

JULY—SEPTEMBER 1981



BORDER STAR '81

Joint Training Exercises — pages 16 and 32.

AIR DEFENSE MAGAZINE

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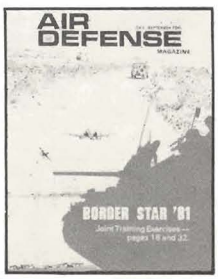
About the Covers

Our front cover features Border Star '81, a joint military exercise (pages 16 and 32).

The back cover portrays the new DIVAD Gun system. The story surrounding the Division Air Defense Gun and its combat role will appear in the October - December issue of AIR DEFENSE Magazine.



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Looking ahead. . .

The Secretary of the Army has announced that "The Army at Yorktown: Spirit of Victory" is the Army's theme for 1981. A 1981 Bicentennial celebration commemorating the victory will take place at Yorktown, Virginia, October 16-19. The Yorktown victory emphasizes parallels between the all volunteer forces of that day and our Army today.

THE ARMY AT YORKTOWN 1781 SPIRIT OF VICTORY

AIR DEFENSE

"The Bridge over the Chasm of Defeat."

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INTERCEPT PO

The Chemical Warfare Threat on the Integrated Battlefield

Major General John B. Oblinger, Jr.

In this issue, I want to discuss an aspect of combat that merits the concern of every air defense artilleryman. I'm referring to the chemical warfare (CW) threat that the Soviet Union has developed to be unleashed upon any adversary who faces her in battle.

Any major conflict involving the Soviets is almost certain to be an airland battle that will include the integrated battlefield. By integrated battlefield, we mean that nuclear, biological, and chemical munitions will be in use as well as conventional munitions. Air defense troops must be prepared to fight on the integrated battlefield if we are to accomplish our mission in combat. We know that the Soviets have invested a great amount of money and manpower in preparing for chemical warfare. This fact alone dictates that the CW threat to NATO must be understood by all our soldiers. Therefore, training programs must develop a clear understanding of that threat. This discussion of the CW threat as it exists today is a step in that direction. Facts I want to present are well documented in C.J. Dicks' "Soviet Chemical Warfare Capabilities," published in Vol. 14, No. 1/1981 of the *International Defense Review*, which is the basic source of much of this information.

An unclassified assessment of Soviet chemical warfare capabilities and doctrine must necessarily be speculative since no information dealing with Soviet offensive chemical warfare is published in open Soviet sources. We can, however, examine Soviet CW defense literature and western studies on the characteristics and effectiveness of agents available to the Soviets and develop an estimate of the threat.

We begin our assessment of the threat with a brief description of the chemical agents available to the Soviet forces. It is known that in 1945 the Soviets captured stocks of, or at least the chemical formulas for, the nerve agents sarin (GB) and soman (GD). The Soviets are also suspected of stocking the blood agent hydrogen cyanide, the choking agent phosgene, the vesicant mustard gas, and nerve agents representing various levels of toxicity. For example, one milligram of sarin is a lethal dose, while less than half a milligram of nerve agent VX is needed to kill. The toxicity of soman falls somewhere between. Although not as toxic as sarin and soman, hydrogen cyanide has military applications in the forward area because it is fast-acting and nonpersistent, leaving the strike area safe for attacking troops minutes after the chemical strike. The more toxic the agent, however, the more likely it is to be employed against NATO. This is because small amounts of highly toxic chemical agents can contaminate large areas and cause greater casualties with a relatively small expenditure of ammunition. Friendly forces can be exposed to a lethal dose of a highly toxic agent before they realize it and have time to take defensive measures — a rather stark reality but one of which we must be aware.

The most toxic and effective CW agents are the nerve agents (sarin, soman, and VX). These agents work rapidly through the skin or lungs and are easily dispensed. Their low cost and stability insure availability and safe movement to the battlefield. Soman and VR-55 (thickened soman) are believed to be the standard Soviet nerve agents. The exact size of Soviet stockpiles of chemical weapons is not known, but evidence indicates that stockpiles far exceed what is considered necessary for deterrence and retaliation.

The Soviets have a variety of means to deliver CW agents. Targets in NATO's forward areas (where SHORAD and MANPADS weapons will be interspersed) can be hit with artillery and heavy mortars, while targets in the rear (where Hawk, and later Roland and Patriot, personnel will be located) can be hit by missiles, rockets, and aircraft with bombs or spray tanks. Chemical mines can also be used to slow down NATO's counteroffensives. In the employment of chemical munitions, the Soviets will hope to surprise NATO forces by delivering large quantities of agents quickly. Surprise can be

achieved by exploding chemical munitions high above troop concentrations and creating a rain of chemical agents over a wide area. Aircraft using spray tanks can release chemical vapors upwind to drift down on our forces. Combining the fragmentation effect of HE rounds with chemical munitions can cause confusion and delay the soldiers' defensive response to the toxic chemicals. The Soviet BM-21, multiple rocket launcher, and the SS-21 and SS-23, short-range ballistic missiles, are ideal chemical munition delivery systems. With the BM-21, a large number of chemical rounds can be delivered rapidly, while the SS-21 and SS-23 can deliver large chemical warheads at greater ranges. (Air defense weapons may stop the enemy aircraft but troops would still be vulnerable to CW attack by artillery and missiles.)

Soviet aircraft are perhaps the most versatile of all delivery systems. Aircraft such as the Mig-27 FLOGGER D and the SU-24 FENCER can deliver massive bombs (e.g., 500-kg bombs), 60 percent of which can be filled with chemical agents. In addition, spray tanks carried by these aircraft can be used to contaminate large areas.

As can be seen, the Soviets have available a variety of means of delivering chemical munitions rapidly, accurately, and in large quantities. The percentage of munitions delivered that we can expect to be filled with chemical agents is estimated to vary from 5 to 30 percent. Given the Soviet belief in the mass use of any available weapons, 30 percent is perhaps the more reliable figure. The chemical munitions inventory of Soviet frontal aviation may be greater than 30 percent of allocated munitions due to its ability to attack front and rear targets accurately with large payloads. The inventory of chemical munitions available to the Soviet BM-21 multiple rocket launcher battalion may also be greater than 30 percent of the allocated munitions due to the large number of rounds that can be delivered in a matter of seconds. On the other hand, the munition stocks of guns, howitzers, and mortars may be significantly less due to logistical complications and the need for these systems to deliver the bulk of HE munitions in support of advancing Soviet ground forces.

In accordance with the Soviet offensive philosophy of surprise and overwhelming numbers, we can expect any possible Soviet chemical attack to be a theater-wide, in-depth, mass attack. Thereafter, Soviet divisional commanders will likely employ nonpersistent agents such as sarin and hydrogen cyanide against forward positions to soften NATO's defense. Even against well-equipped troops, a surprise chemical attack can inflict up to 30 percent casualties. Also, nonpersistent agents would likely be used in NATO's rear areas to harass and disrupt resupply operations and troop movements. Chemical agents employed against NATO's rear areas may also cause panic among the civilian populations, further hampering NATO's resupply and deployment efforts.

Persistent agents such as mustard gas, soman, and VX will likely be controlled at army level and above. These agents would be employed against NATO's reinforcement ports, airfields, and prestocked equipment and vehicle storage points. Persistent agents will in all probability be used against high-value targets such as NATO POL points, ASPs, communications centers, air defense sites, and nuclear-capable weapon systems.

On the battlefield, chemical munitions may be employed to hamper our troop movements by hitting key road junctions and bridges. Persistent agents could also be used to protect the exposed flanks of the rapidly advancing Soviet ground armies. Built-up areas could be rendered uninhabitable and airfields unserviceable with persistent agents.

In summary, the Soviets have invested a great deal of money and manpower in preparing for chemical warfare. Chemical troops and weapons capable of delivering chemical munitions are found throughout Soviet tactical formations. The Soviet philosophy of complete and decisive use of all available combat power insures that the battlefield of the future will be totally integrated. Soldiers who are inadequately trained or equipped may not survive in a chemical environment. It is essential that every soldier understand the chemical threat and be comprehensively trained so as to be completely confident in the reliability of his chemical defense equipment. I urge all leaders to make every possible effort to insure that our soldiers are prepared to fight and win on the integrated battlefield.

John B. Ohlinger

ENGAGEMENT ZONE

letters to the editor

ON SUBSCRIPTIONS

Dear Sir:

I am a Bolivian Army officer, and I completed the Air Defense Officer Basic Course by correspondence. I am interested in the AIR DEFENSE Magazine because it has information of great interest. I would like to know whether I can subscribe to the Magazine and, if so, what the rates are per year to have it sent to my country. Also, where must I send payment for the subscription?

CPT GONZALO M. ARRENDONDO
Comando De Artilleria del Ejercito
Estado Mayor
La Paz, Bolivia

As a general policy, former US Army Air Defense School students of foreign nations are eligible to subscribe to AIR DEFENSE Magazine. However, each request is handled on an individual basis and must be presented in writing to the AIR DEFENSE Magazine business office, ATSA-TDL-S, Fort Bliss, Texas 79916. Subscription information is furnished in our answer to the request.

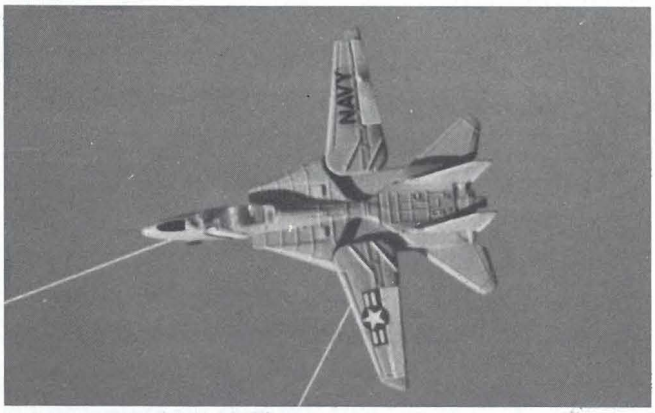
— Ed.

AIRCRAFT RECOGNITION

Dear Sir:

As a National Guard officer, I am always looking for economical methods to improve training for my Redeye section. I feel that I have found an excellent training aid that may be of interest to other ADA officers in the form of the enclosed model aircraft.

I have an inventory of 20 such models, including American, NATO, and Soviet fastmovers and helicopters. With their sturdy, metal construction and fine detail we have been able to take them into the field as aircraft recognition aids, and they have survived being dropped numerous times as well as being stepped on. Our models are attached to fishing lines so they can be hung from a pole. At even short classroom distances, my teams must practice with binoculars so they can readily identify each aircraft. We are developing a ceiling pulley system to provide indoor aircraft tracking practice when the moving target simulator is not available.



F-14 Tomcat model aircraft.

Retailing at $.99 each, these models should wholesale for almost half this amount. Perhaps the training support personnel would even consider outfitting SHORAD units with them as a GOAR Kit supplement because the various aircraft would definitely be a cost effective addition to any air defense training program. We know ours are.

JEFFREY M. HOWARDS
2LT, ADA
HHB, 1st Bn, 487th FA,
Hawaii ARNG

Thanks for passing your innovation on to our readers. It should stir up some interest, especially with MANPADS people. We are running a picture of the model you included with your letter.

— Ed.

EXPERT ADVICE

Dear Sir:

The October-December 1980 issue of the AIR DEFENSE Magazine had two articles that merit comment and/or clarification. The first of these is "Advantages of a Large QSS," by CPT David C. Bedard.

CPT Bedard clearly states the advantages of the Quick Supply Store or QSS in terms of rapid repair parts supply for customer units. Direct support unit commanders must, however, realize that use of QSS procedures does require special management considerations and that there are daily transactions in the QSS part of the authorized stockage list (ASL) as well. Accountable officers must, for example, establish controls so that customer units won't buy 2 years of supplies in one trip. Why? The result would be insufficient demands on the item during the 360-day calculation period and subsequent deletion from QSS (ASL) and automatic transfer to FRINGE as EXCESS. Another critical concern would be proper use of QSS reorder point (ROP) procedures. QSS clerks must insure that ROP quantities are segregated so that when available stocks are consumed and stocks removed from the ROP quantity, immediate replenishment requisition action is taken to build stocks back to the requisition objective level. The point here is that if proper replenishment action is not taken, QSS stocks may only provide momentary relief while zero balances wait just around the corner. One final caution about QSS is that accountable officers must insure that parts controlled by special programs never are included in QSS computations. If this rule is not observed, the unit faces the problem of losing control of critical assets. The QSS system is completely informal and prescribed load list records need not be maintained at battery level as they should be if the item is, for example, an essential repair part stockage list item. In summary, QSS can indeed provide benefit to customer units, but all concerned must be aware of the constraints and pitfalls if the program is to be efficient.

The second article is "ICWAR Flat Panel System Simulator," by Walter C. Lee.

I commend the Air Defense School for doing what DARCOM would not accomplish. The use of flat panel simulation systems (FPSS) is a well-known training method, first used by the Navy and more recently by the Transportation, Engineer, Ordnance, and Armor Schools. The Air Defense School initiated a program to acquire a series of FPSSs for use in the Hawk Maintenance Course, more specifically the HIPIR portion of the course, in 1975, but the program was not successful because of funding/administration problems. At any rate, the utility of FPSS is well-known and documented. Again, I congratulate the school and Mr. Lee for a job well done.

HAROLD N. RICHARDSON
LTC, ORDC
DG4, HQ 32d AADCOM

We appreciate this extension of information on the subjects involved, and it is with genuine enthusiam that we pass it along to our readers.

— Ed

IMPORTANT NEW PERIODICAL

Dear Sir:

The US Army Training Support Center, Fort Eustis, VA, is starting a publication aimed at helping to train the Army's trainers. The new quarterly magazine, titled *THE ARMY TRAINER*, is targeted to those soldiers in grade E5 to O-3 who are involved in training — from platoon sergeants through company/battery commanders — along with training developers.

THE ARMY TRAINER's purpose is to provide an Armywide forum to identify, integrate, and explain the use of the many and varied parts of the Army training system. The goals of the magazine are to improve training ideas, techniques, and products; translate training policy into action; stimulate interest in the training system; and create a medium for the exchange of information and ideas. *THE ARMY TRAINER* is anxious to receive articles about unit/collective training and experience with new training methods/devices. Feature articles (dealing with trainers) that the magazine's audience would find useful are also needed.

For further information, or to inquire about submitting articles, contact:

Editor, *THE ARMY TRAINER*
US Army Training Support Center
ATTN: ATIC-AET
Fort Eustis, VA 23604

The telephone number is (804) 878-4587/4605; AUTOVON 927-4587/4606.

ROBERT C. REID
COL, GS
Chief of Public Affairs
HQ, TRADOC

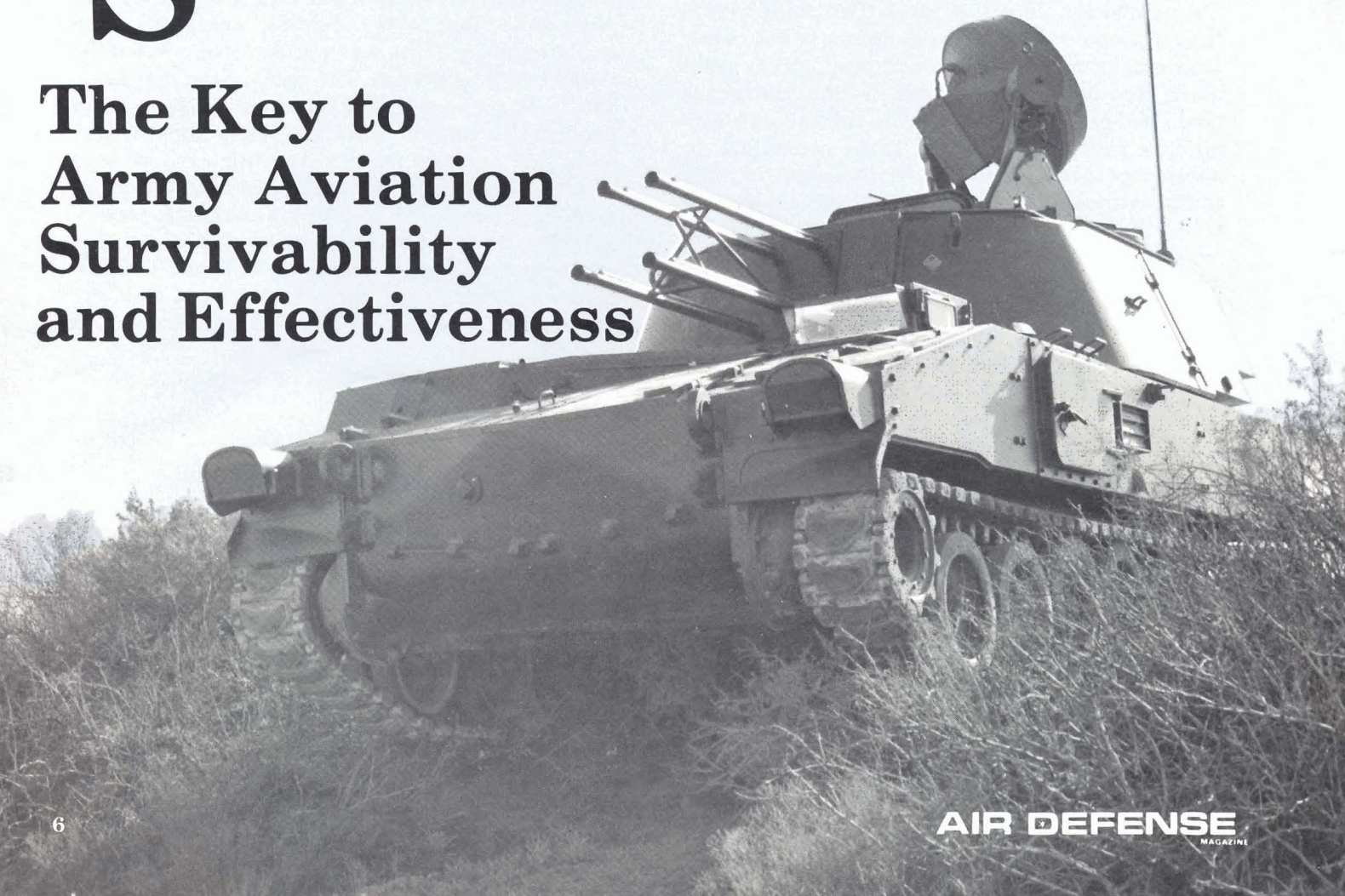
ADATS

The Key to Army Aviation Survivability and Effectiveness

As the sun slowly burns away the mist covering the western European countryside, an attack helicopter pilot cautiously peers into the valley before him. Only his helicopter rotor blades are visible from the valley floor which is literally covered with the advance elements of a Soviet Front. They are advancing relentlessly against the lightly defended NATO sector. The pilot checks the positions of the other members of the Joint Aerial Attack Team (JAAT), which consists of attack helicopters, aeroscout helicopters, and A-10s. They are in position and have been authorized to engage with all available armament: HELLFIRE and Maverick missiles, 2.75-inch rockets, and 20-mm and 7.62-mm guns. As the gunner is about to launch a HELLFIRE missile, the radar warning receiver (RWR) suddenly emits the tell-tale "rattlesnake" sound which tells him he's being tracked by a threat air defense radar. The pilot aborts the fire mission and heads for another firing position. One of his sister ships erupts in flames after deciding to abort too late. Overhead, an A-10 is hit by an SA-8 missile and suddenly disintegrates. Its wing man aborts the firing run and turns toward the rear. The pilot of the attack helicopter slowly brings his aircraft into its new firing position. The enemy tanks are much closer now. The RWR is silent except for the intermittent sounds of search radars. Suddenly, as the gunner prepares to launch, the helicopter's canopy is shattered by 23-mm rounds from an optically tracked ZSU-23-4. Another mission is aborted —permanently.

This scenario is not written into any test or exercise but is one that could quite possibly occur in any of several places in the world where fragile peace now prevails. An ongoing Army program has the sole purpose of preventing such a scenario from occurring on a future battlefield.

The Army Development and Acquisition of Threat Simulators



(ADATS) program provides operational duplicates of threat systems for testing newly developed equipment and for conducting force-on-force type tests and exercises in a realistic threat environment. It is managed by the Directorate of Combat Developments of the US Army Air Defense School (USAADS) at Fort Bliss, Texas.

The program has experienced tremendous growth since its inception in 1972. It was initiated as a result of a Department of Defense directive that required all newly developed equipment to be tested in the operating environment that would be expected in wartime. This meant that prior to any procurement decision, equipment under development had to be tested in a realistic threat environment to assess its survivability and effectiveness. That threat is provided by ADATS.

Until recently, ADATS was known as the Air Defense Artillery Threat Simulator program and was concerned only with threat air defense systems. However, in December 1980, a decision at Department of the Army included all threat systems in the program. Thus, the name was changed and the mission and scope of responsibilities were expanded.

A realistic battlefield is created through the use of ADATS. Decision makers are provided with field-tested, substantiated facts and data, not computer-developed "best guesses." This enhances the survivability and effectiveness of Army aviation. One can assess the criticality of ADATS when considering the vital role of attack helicopters in the combined arms team.

Just how does ADATS do its job which is so essential to the development of Army aviation equipment? ADATS, with Test Schedule and Review Committee approval, allows users to plan tests that include threat forces as part of the Army's Five Year Test Program. It also allows them to support test scenarios to meet their testing requirements.

The threat simulators translate the latest intelligence into hardware. This allows the user to develop weapon systems and test them against Soviet threats, tactics, techniques, and operational procedures. Each system is fully instrumented to assist the user in obtaining the desired test data. The program is currently capable of fielding the air defense systems found in a typical Soviet regiment as well as some found up through army level.

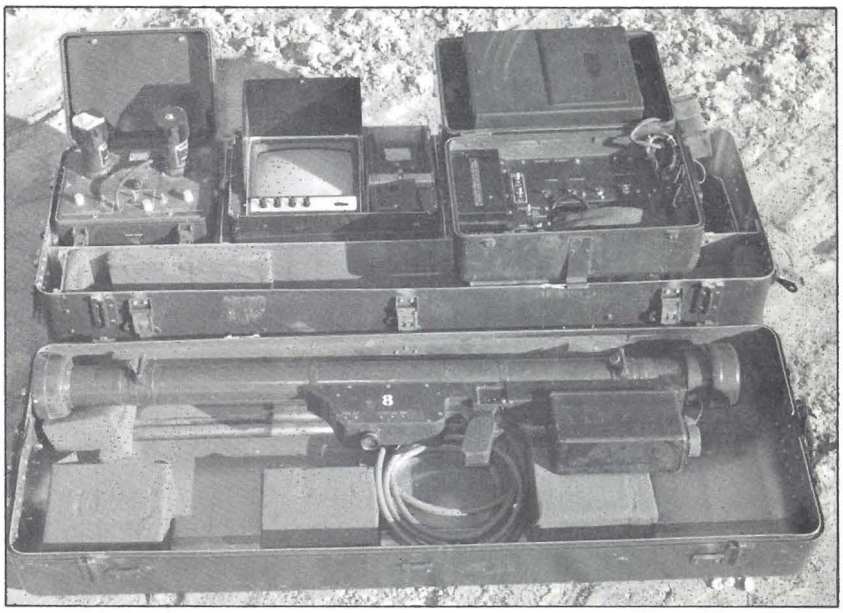
The simulators operated by the ADATS program include:

At company/battalion level.

SA-7 — A manportable IR missile system similar to the US Redeye.

At regiment level.

ZSU-23-4 — A track-laying, 4-barrel, 23-mm gun system that is radar and optically directed and is considered the premier self-propelled air defense gun system fielded in the world today.



Above: SA-7 Simulator

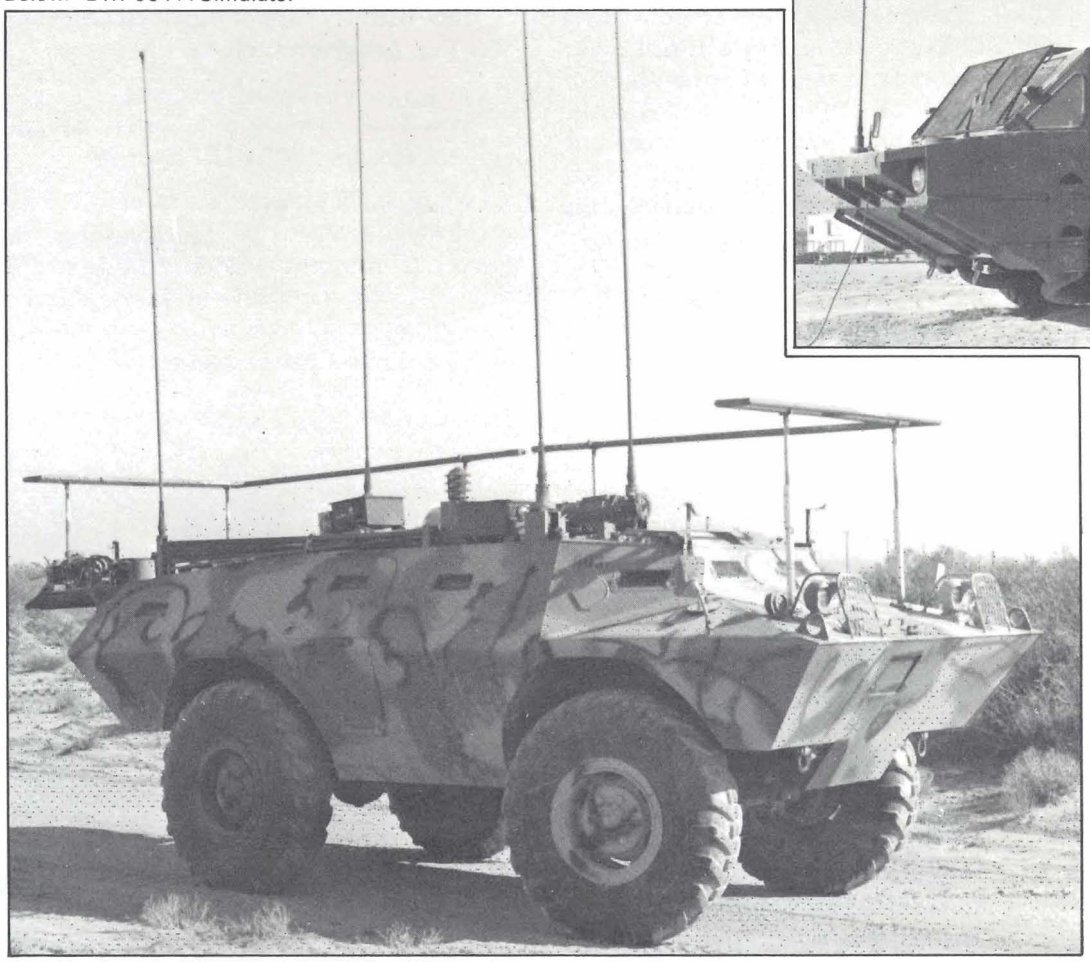
Below: ZSU-23-4 Simulator

SA-9 — A self-propelled IR missile system similar to the US Chaparral.

BTR-60 PA — The command control vehicle deployed with each ZSU-23-4 and SA-9 platoon and battery headquarters. This same vehicle is used with division level systems.

SA-8 Simulator

Below: BTR-60 PA Simulator



Below: S

At division level.

Long Track Acquisition Radar — The acquisition radar feeding the command control and communications system of the division.

SA-8 — A mobile, command-guided missile system that has both optical and radar target-tracking capability. The acquisition, target-tracking, and missile-guidance radars and missiles are all mounted on one amphibious vehicle.

Straight Flush Radar — The acquisition, tracking, and missile guidance radar for the SA-6 missile system.

Flapwheel Radar — An antiaircraft gun fire direction radar associated with the 57-mm, S60 gun system.

At army level.

VHF Jammers — Communications jammers that target air-to-air and air-to-ground nets in the VHF range.

UHF Jammers — Communications jammers that target air-to-air and air-to-ground nets in the UHF range.

Each simulator development is a thoroughly coordinated program. User requirements are forwarded to Department of the Army through the United States Army Training and Doctrine Command (TRADOC), by the

9 Simulator

USAADS project office. The simulator program is developed and closely monitored by the Missile Intelligence Agency Project Office and is coordinated through the Tri-Service CROSSBOW-S Committee. Changes to the intelligence data base are incorporated during the development of the simulator. The end product of this combined effort is validated jointly by the Missile Intelligence Agency and USAADS ADATS offices to insure the simulator duplicates the weapon system we can expect to face in any future battle.

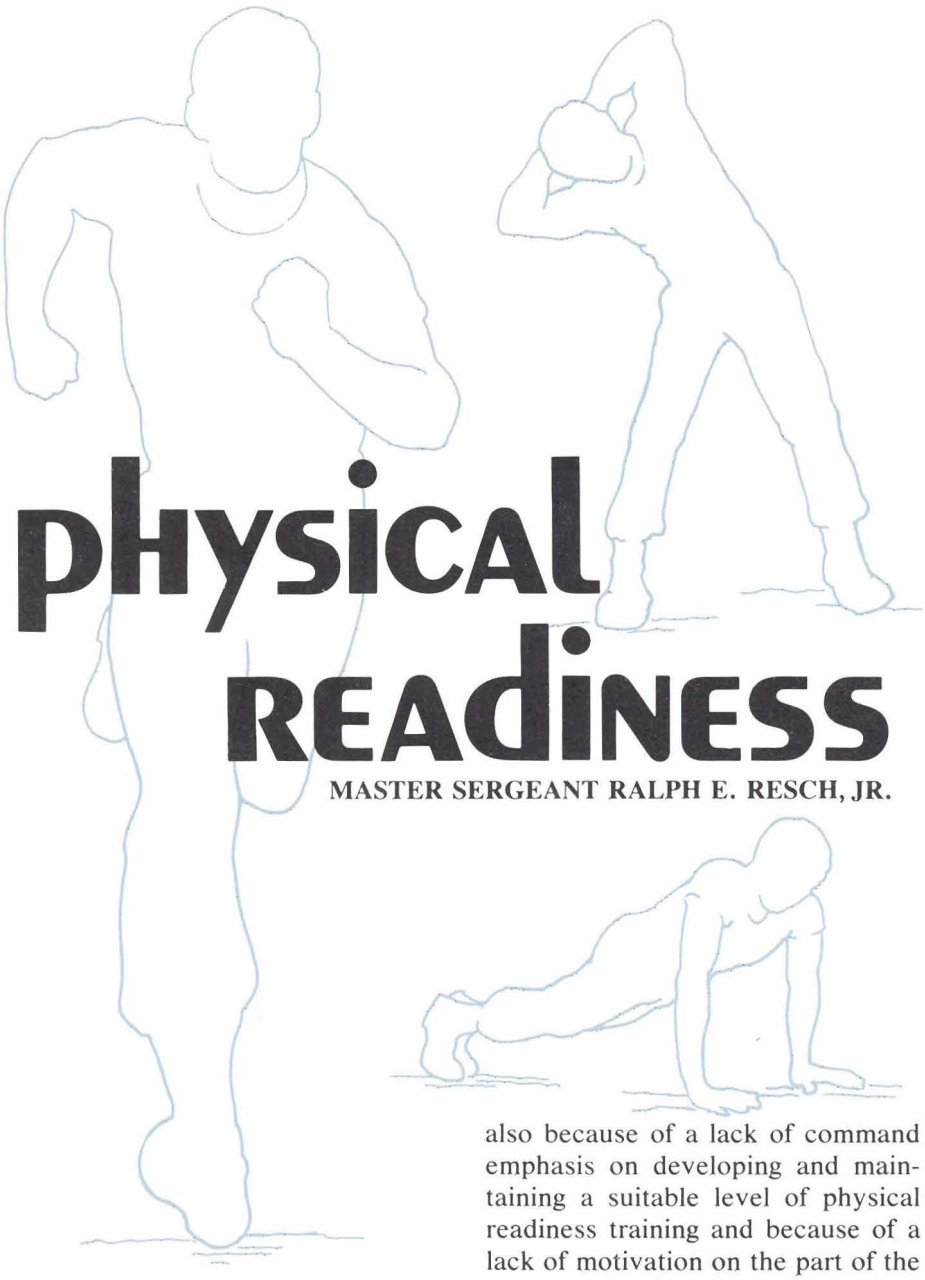
In addition to developing new systems, existing systems are continuously being modified to incorporate changes in the intelligence data base to insure that the simulators are accurate representations of current Soviet systems.

This equipment is not sitting around waiting to be used. In fact, testing requirement conflicts and the resulting rescheduling indicate that ADATS systems are not simply supporting tests, but that their availability is a strong consideration in the scheduling of tests.

Some of the agencies and commands who have used ADATS in the past and have continuing requirements are:

- Aviation School and Aviation Board
- TRADOC Combined Arms Test Activity
- Forces Command
- Combat Development Experimentation Command
- 101st Airborne Division (Air Assault)
- US Army, Europe (Reforger)
- Test and Evaluation Command
- Intelligence and Security Command
- Office of the Secretary of Defense and Joint Test Programs

The ADATS goal is to increase the survivability of aviation assets while diminishing the effectiveness of the Soviet armor and air defense threat, thereby enabling a first battle victory. Proper use of available ADATS assets puts this goal in the realm of possibility.



physical readiness

MASTER SERGEANT RALPH E. RESCH, JR.

This article was originally published in INFANTRY Magazine.

In the Army's lexicon, physical fitness is not necessarily the same thing as physical readiness. You may say, "I'm physically fit and so is my 70-year-old grandmother; she's never been sick a day in her life." But it's unlikely that your grandmother is physically ready to carry out the Army's mission. And you may not be either. A lot of soldiers these days are not.

The Army's physical readiness has been weakening in recent years. This is partly because of the mechanization of our society in general. But it is also because of a lack of command emphasis on developing and maintaining a suitable level of physical readiness training and because of a lack of motivation on the part of the individual soldier.

Command emphasis refers not just to company or unit commanders but to all leaders of soldiers, whether they are in staff, hospital, administrative, combat, combat support, or combat service support units. When a leader disregards the physical readiness of his soldiers, he allows a weak link to develop in his unit's ability to perform its mission. The soldiers who make up this link then will not have the capacity for sustained and skillful performance, the ability to recover quickly from exertion, the desire to complete a designated task, or the endurance and confidence to face difficult, demanding situations.

In an effort to correct these deficiencies, Field Manual 21-20 has been under revision for the past four years. When the new manual gets to the field, it should help to stimulate the command emphasis that is needed, which in turn will stimulate in the soldiers the motivation that is needed to turn their physical fitness (and their physical unfitness) into physical readiness.

During the revision period, various physical training programs were proposed, including a baseline program for initial entry training units, an MOS PT program, and a unit PT program. Other proposals involved the physical testing of individuals by MOS tasks and the formulation of progression tables and levels for all conditioning drills, circuits, activities, and sports.

The developers of the new FM took the best parts of these programs and, guided by a number of primary considerations, worked toward the final product. These were the things they tried to do:

- Simplify and clarify instructions.
- Include drawings to support verbal explanations.
- Include physical readiness training for women without lowering the standards required for men.
- Include an individual exercise program for those who cannot participate in group training — office personnel, for example.
- Develop a single test for all soldiers that would require a minimum of facilities, equipment, and preparation.
- Develop test events that would measure upper body, abdominal, and lower body strength as well as aerobic endurance.
- Develop a PRT program for soldiers age 40 to 60.

We believe that these goals have been met with the new manual, now entitled Physical Readiness Training, which will soon be in the field.

The new manual no longer contains the physical training prerequisites for the Airborne, Ranger, and Special Forces courses. These are now outlined in DA Pamphlet 351-4, Formal

Schools Catalog, while other programs that were also previously in the manual, such as Run for Your Life, are being reviewed for possible dissemination through other publications.

A separate PRT program for soldiers 40 to 60 years of age is now in the validation phase and will be published later. (No physical readiness test will be administered to personnel 40 and over until announced by Headquarters, Department of the Army.)

The manual contains chapters on the concept of developing physical readiness; physical readiness leadership and instructor training; developing physical readiness training programs; drills and exercises; circuits, running, guerrilla exercises, and relays; competitive activities; individual exercise activities; and basic physical skills and obstacle courses.

The test section has been moved to the end of the manual for quick reference, and a new APRT scorecard (DA Form 705) is included.

A major feature of the new manual is that it is in loose-leaf form, which means that whole pages can be replaced when changes are published. In the past, this has been a major problem for leaders and instructors who must use the manual in the field.

THE TEST

The revised test will include only three events — pushups, situps, and a two-mile run — events that require no special equipment or facilities. The emphasis on the first two events is on correct performance rather than on speed, as the following extracts will illustrate.

Pushup: The event supervisor reads the following instructions:

The pushup event measures the strength of your shoulder-girdle muscles. On the command "get set," assume the front leaning rest position and place your hands where they are comfortable for you. The arms, back, buttocks, and legs must be straight from head to heels. This will be the start position. On my command "go," you are to begin your pushups by bending the elbows and lowering

SCORE TABLES AGE 17-39

PUSHUPS				
REPS	17-25	26-30	31-35	36-39
68	100			
67	98			
66	96	100		
65	94	98		
64	92	96		
63	90	94		
62	88	92		
61	86	90	100	
60	84	88	98	100
59	82	86	96	98
58	80	84	94	96
57	78	82	92	94
56	76	80	90	92
55	75	78	88	90
54	74	76	86	88
53	73	75	84	86
52	72	74	82	84
51	71	73	80	82
50	70	72	78	80
49	69	71	76	78
48	68	70	75	76
47	67	69	74	75
46	66	68	73	74
45	65	67	72	73
44	64	66	71	72
43	63	65	70	71
42	62	64	69	70
41	61	63	68	69
40	60 100	62	67	68
39	59 98	61	66	67
38	58 96	60 100	65	66
37	57 94	59 98	64	65
36	56 92	58 96	63	64
35	55 90	57 94	62	63
34	54 88	56 92	61 100	62
33	53 86	55 90	60 98	61
32	52 84	54 88	59 96	60
31	51 82	53 86	58 94	59
30	50 80	52 84	57 92	58 100
29	49 78	51 82	56 90	57 97
28	47 76	50 80	55 88	56 94
27	45 74	49 78	54 86	55 91
26	44 71	47 76	53 84	54 88
25	42 69	45 74	52 82	53 85
24	40 68	43 71	51 80	52 82
23	39 67	42 69	50 78	51 79
22	37 66	40 67	48 76	50 77
21	35 65	38 66	46 74	49 75
20	34 64	36 65	44 71	47 72
19	32 63	34 64	42 69	45 70
18	30 62	33 63	40 67	42 68
17	29 61	31 62	37 65	40 66
16	27 60	29 61	35 63	38 64
15	25 56	27 60	33 61	36 62
14	24 53	25 56	31 60	33 61
13	22 60	24 53	29 56	31 60
12	20 47	22 60	27 53	29 56
11	19 43	20 46	24 50	26 53
10	17 39	18 42	22 47	24 50
9	16 35	17 38	20 42	22 47
8	14 31	15 34	18 38	20 42
7	12 27	13 30	16 33	17 37
6	10 24	11 26	14 29	15 32
5	9 20	10 21	11 24	13 27
4	7 16	8 17	9 20	11 22
3	5 12	6 13	7 15	8 17
2	4 8	5 9	6 11	7 12
1	2 4	3 5	4 6	5 7

SITUPS				
REPS	17-25	26-30	31-35	36-39
69	100			
68	98			
67	96	100		
66	94	98		
65	92	96	100	
64	90	94	98	
63	88	92	96	100
62	86	90	94	98
61	84 100	88	92	96
60	82 98	86	90	94
59	80 96	84	88	92
58	78 94	82	86	90
57	77 92	80	84	88
56	76 90	78	82	86
55	75 88	77	80	84
54	74 87	76	78	82
53	73 86	75	77	80
52	72 85	74	76	78
51	71 84	73 100	75	77
50	70 83	72 98	74	76
49	69 82	71 96	73	75
48	68 81	70 94	72	74
47	67 80	69 92	71	73
46	66 79	68 90	70	72
45	65 78	67 88	69	71
44	64 77	66 86	68	70
43	63 76	65 84	67	69
42	62 75	64 82	66	68
41	61 74	63 80	65 100	67
40	60 73	62 78	64 98	66
39	58 72	61 76	63 96	65
38	56 71	60 74	62 94	64
37	54 70	58 72	61 92	63
36	52 69	56 71	60 90	62
35	50 68	54 70	58 88	61
34	49 67	52 69	56 86	60
33	48 66	50 68	54 84	58
32	46 65	49 67	52 82	56
31	45 64	48 66	50 80	54 100
30	43 63	47 65	49 78	52 96
29	42 62	45 64	48 76	50 92
28	40 61	44 63	47 74	49 88
27	39 60	42 62	45 71	48 84
26	38 58	41 61	43 69	47 80
25	36 56	39 60	42 67	46 76
24	35 54	38 58	40 64	45 72
23	33 52	36 56	39 60	43 68
22	32 50	35 54	37 58	41 64
21	30 46	33 52	35 56	40 60
20	29 44	32 50	34 54	38 58
19	28 42	30 47	32 52	36 56
18	26 39	29 44	31 50	35 54
17	25 37	27 42	29 49	33 52
16	23 35	26 39	27 48	31 50
15	22 33	24 37	26 46	29 47
14	20 30	22 34	24 43	28 44
13	19 28	20 32	22 39	26 41
12	18 26	19 29	21 36	24 38
11	16 23	17 27	19 32	22 35
10	15 21	16 24	18 29	21 32
9	13 19	14 22	16 26	19 29
8	12 17	13 19	14 23	17 26
7	10 14	11 17	13 20	16 22
6	9 12	10 14	11 17	14 19
5	8 10	9 12	10 14	12 16
4	6 8	7 9	8 12	10 13
3	5 5	5 7	6 9	9 10
2	2 3	4 4	5 6	7 7
1	1 1	2 2	3 3	4 4

RUNNING TABLES				
TIME	17-25	26-30	31-35	36-39
13:05	100			
13:12	99			
13:20	98			
13:27	97			
13:34	96			
13:40	95	100		
13:49	94	98		
13:56	93	96		
14:03	92	95		
14:10	91	94		
14:20	90	93	100	
14:25	89	92	98	
14:32	88	91	96	
14:39	87	90	94	
14:47	86	89	92	
14:57	85	88	91	
15:05	84	87	90	100
15:08	83	86	89	98
15:15	82	85	88	96
15:23	81	84	87	94
15:30	80	83	86	92
15:37	79	82	85	90
15:45	78	81	84	88
15:52	77	80	83	86
15:59	76	79	82	84
16:06	75	78	81	83
16:14	74	77	80	82
16:21	73	76	79	81
16:28	72	75	78	80
16:35	71	74	77	79
16:43	70	73	76	78
16:50	69	72	75	77
16:57	68	71	74	76
17:04	67	70	73	75
17:10	66 100	69	72	74
17:19	65 98	68	71	73
17:25	64 96	67 100	70	72
17:33	63 94	66 98	69	71
17:41	62 92	65 96	68	70
17:48	61 90	64 94	67	69
17:55	60 88	63 92	66	68
18:08	59 86	62 90	65	67
18:20	58 84	61 88	64	66
18:30	57 82	60 86	63	65
18:45	56 80	59 84	62	64
19:00	55 78	58 82	61 100	63
19:10	54 76	57 80	60 98	62
19:23	53 74	56 78	59 96	61
19:35	52 72	55 76	57 94	60
19:48	51 70	54 74	56 92	59
20:00	50 69	53 70	55 90	58
20:14	49 68	52 69	54 88	57
20:30	48 67	51 68	53 86	56 100
20:35	47 66	50 67	52 84	55 98
20:58	46 65	49 66	51 82	54 96
21:15	45 64	48 66	50 80	53 94
21:26	44 63	47 64	49 79	52 92
21:41	43 62	46 63	48 76	51 90
21:55	42 61	45 62	47 77	50 88
22:14	41 60	44 61	46 76	49 86
22:29	40 59	43 60	45 74	48 84
22:38	39 58	42 59	44 72	47 82
22:53	38 56	41 57	43 70	46 80
23:07	37 55	40 56	42 68	45 79
23:22	36 54	39 55	41 66	44 78
23:36	35 53	38 54	40 64	43 76
23:60	34 62	37 53	39 62	42 74
24:04	33 51	36 52	38 60	41 72
24:19	32 50	35 51	37 59	40 70

TIME	17-25	26-30	31-35	36-39
24:34	31 49	34 50	36 58	39 68
24:48	30 48	33 49	35 57	38 66
25:02	29 47	32 48	34 55	37 64
25:17	28 45	31 47	33 54	36 62
25:34	27 45	30 46	32 53	36 60
25:46	26 44	29 45	31 52	34 59
26:00	25 43	28 44	30 51	33 58
26:09	24 42	27 43	29 50	32 57
26:29	23 41	26 42	28 48	31 56
26:43	22 40	25 41	27 45	30 55
26:58	21 39	24 38	26 42	29 54
27:12	20 38	23 36	25 40	28 52
27:26	19 36	22 34	24 38	27 51
27:39	18 34	21 32	23 36	26 50
27:55	17 32	20 30	22 34	25 49
28:10	16 30	19 28	21 32	24 47
28:24	15 28	18 26	20 30	23 46
28:38	14 26	17 24	19 28	22 42
28:53	13 24	16 22	18 26	21 39
29:07	12 22	15 20	17 24	20 36
29:22	11 20	14 18	16 22	19 33
29:36	10 18	13 16	15 20	18 30
29:50	9 16	12 14	14 18	17 27
30:05	8 14	11 12	13 16	16 24
30:19	7 12	10 10	12 14	15 21
30:34	6 10	9 8	11 12	14 18
30:48	5 8	8 6	10 10	13 15
31:02	4 4	7 5	9 8	10 12
31:17	3 3	5 4	7 6	8 9
31:31	2 2	3 3	5 4	6 6
31:46	1 1	2 2	3 3	4 4

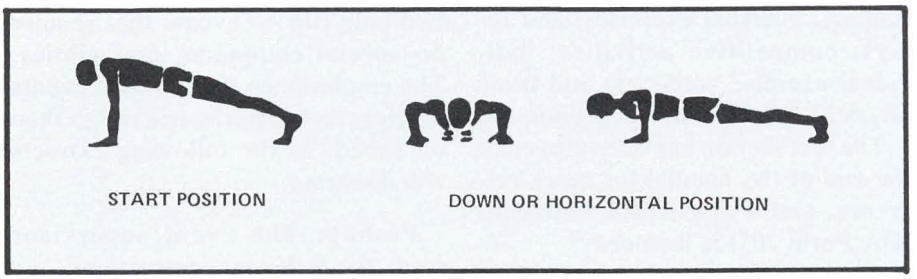
PART III.

40 AND OLDER MINIMUM REQUIREMENTS

	40-45		46-50	
PUSHUP	TBA	TBA	TBA	TBA
SITUP	TBA	TBA	TBA	TBA
2-MILE RUN	20:00	26:00	21:00	27:00
	51-55		**56-60**	
PUSHUP	TBA	TBA	TBA	TBA
SITUP	TBA	TBA	TBA	TBA
2-MILE RUN	22:00	28:00	23:00	29:00

NOTE:

INDICATES FEMALE TABLES

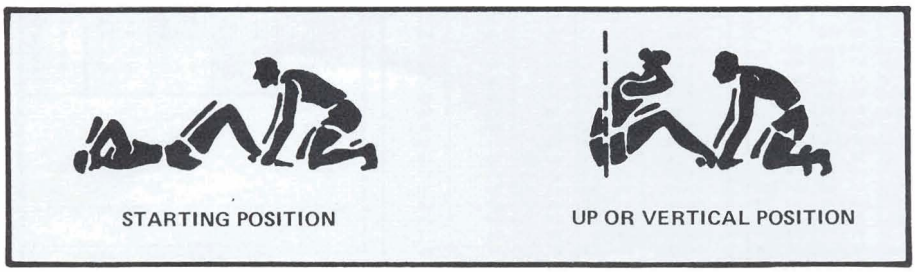


your entire body until the top of your upper arms, shoulders, and lower back are aligned and parallel to the ground. You will then return to the start position by locking your elbows. This is one repetition. At the end of each repetition, the scorer will count the number of repetitions you have performed correctly. You may rest at any time, but you cannot rest your body on the ground. If you do not keep your body straight, or if you fail to completely lock your elbows, that repetition will not count, and the scorer will repeat the number of your last correct repetition. Correct performance, and not speed, is important. You will have 2 minutes in which to do as many correct pushups as you can. Watch this demonstration. What are your questions on this event?

Situp. Instructions:

This situp event measures your abdominal muscle strength. On my command "get set," assume the start position by lying flat on your back with your knees bent at approximately a 90-degree angle, and with feet flat on the ground with another individual holding your ankles on the ground with his hands only. No other method of bracing or holding the feet is authorized. Your fingers will be interlocked behind the head with the back of the hands touching the ground. Your arms and elbows need not touch the ground. On my command "go," begin raising the upper body forward to the vertical position. The base of the neck must at least reach the vertical position. After you have reached the vertical position, lower your upper body to the ground until the upper portion of your back has touched the ground. Again, your arms and elbows need not touch the ground. This is one repetition. At the end of each repetition, the scorer will count the number of repetitions you have performed correctly. You may rest in the up or down position at any time, but if you lower your legs, fail to keep your fingers interlocked and behind your head, arch your back to raise your upper body forward, or do not attain the vertical position, that repetition will not count, and the scorer will repeat the number of your last correct repetition. Correct performance, and not speed, is important. You will have 2 minutes in which to do as many correct situps as you can. Watch this demonstration. What are your questions on this event?

Two-mile run. Instructions:



The 2-mile run tests your ability to complete a prolonged run. You will be running individually. At the start, all soldiers will line up behind the starting line. Time will not begin until the last soldier crosses the starting line. When given the command "go," each soldier will begin running at his own pace. You will run the distance on (here describe the running area or the number of laps around the track.) *You will be scored on your ability to run the distance in the least possible time. The number on your chest is for identification. Make sure that the number is visible at all times. Turn in your number when you finish the run, and return to your equipment for the cool down period. Do not remain near the scorers or the finish line, as you may interfere with the scoring. What are your questions about this event?*

The scoretable that accompanies this article applies to all soldiers from 17 to 39 years of age, regardless of rank, sex, or duty position. Soldiers who are just finishing basic training must earn a minimum of 160 points with at least 50 in each event. Soldiers finishing AIT, OST, and OSUT, and all other soldiers (officer and enlisted) must attain a minimum of 180 points with at least 60 in each event. The maximum number of points possible is 100 per event, or a total of 300 points for the APRT.

The materials in this new manual should make it easier for the commanders and leaders of various types of units to organize their physical readiness training and to provide programs that will give their soldiers the motivation they need to achieve and maintain their units at an appropriate level of physical readiness.

MASTER SERGEANT RALPH E. RESCH, JR., is presently assigned as a project noncommissioned officer in the Infantry School's Directorate of Training Developments. He formerly served as senior instructor in the School's Airborne Department and as the chief instructor of the Department's conditioning and drill branch.

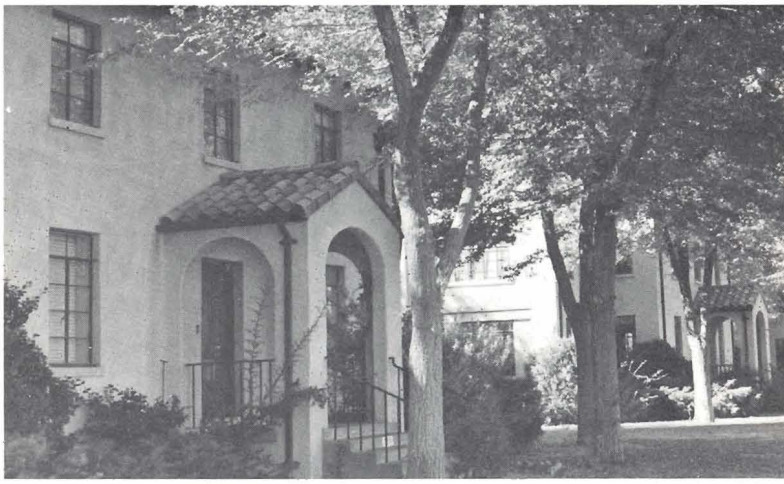
Fort Bliss Community Life Program

Mayors take the oath of office administered by the commanding general, Fort Bliss.

Private cars on lawns aparking;
Neighbors' straying dogs abarking;
Dead-bolt locks for family quarters;
Lights.
Local cars on side streets speeding;
Playgrounds, pools, ball diamonds, needing;
Excess signs that stall the traffic;
Blights.

This little jingle may seem reminiscent of some lighthearted effort by Ogden Nash, but actually it involves matters that are serious to members of the Fort Bliss community. The items are but a few that were surfaced at a recent Community Action Council (CAC) meeting held as part of the Fort Bliss Community Life Program (CLP).

The function of the program is to improve the quality of life for Fort Bliss families. To make the program manageable, and promote effectiveness, Fort Bliss family housing areas have been divided into communities headed by town councils. Each town council includes a mayor, assistant mayor, secretary, and treasurer (who are elected by community members) plus the number of council members necessary to meet the needs of the community, including a community life sponsor.



Council members are either active duty military or military dependents residing in post housing. Bylaws have been established under which the town councils operate. The number of people and the capacity in which each council member serves are based entirely on the desires and needs of the mayor and the community.

Elections for mayor are held annually. If the mayor departs before the end of the year, he is succeeded in accordance with the community bylaws. Comprehensive guidance on the conduct of elections is provided by the Air Defense Center Director of Personnel and Community Activities.

There are enough council members to deal with each area of interest so that neither the mayor nor any member is so burdened with duties that he finds it difficult to devote time to his family and friends.

A sponsor unit has been assigned to each Fort Bliss Community. The sponsor unit is tasked to advise, assist, and support the community in its effort to improve the quality of life of its residents.

The mayors keep the sponsor unit representatives informed in matters that affect the community. And if a mayor or community council representative asks a resident to consider his neighbors and stop whatever action he is taking in violation of people's rights or of post regulations, the sponsor unit representative will deal with him if he fails to comply.

Sponsor units also provide equipment and transportation on a limited basis. Tables and chairs for community functions, tents for fairs and flea markets, trucks to pick up materials or playground equipment, and other assistance of this nature are provided whenever possible.

Sponsor unit representatives help the mayor with correspondence and communications to the commander or post staff. Representatives also assist in preparing for the CAC meeting by reviewing and assisting in refining presentations. In many ways the sponsor unit representative guides and supports the community in its efforts to improve the quality of life of all residents. However, the mayor follows his own judgment if he cannot agree with his advisor.

The Community Action Council, chaired by the deputy post commander, is composed of mayors, sponsor unit representatives, and designated post staff members. The CAC meets on the second Wednesday of each month to review community improvement programs and act on proposals submitted by members. The CAC seeks resolutions to problems submitted by the communities and recommends courses of action that best meet the needs of the total Fort Bliss community. Post staff members provide responses to questions or comments posed by mayors during the meeting if possible or within a few days after the meeting if research is required. Normally, the deputy commander will provide guidance on how post staff members are to pursue such answers or solutions and will brief the post commander on key issues brought before the council. Matters brought before the council are also brought before the commanding general when he reads the CAC minutes. He may offer guidance on priorities and how he wants problems solved.

The mayors inform their residents of CAC actions through town meetings, community bulletins, and articles in the post newspaper. Mayors also report for the CAC record the opinions, desires, and needs of their communities that are surfaced at town meetings.

Town meetings are held as often as will meet the needs of the community. Some communities have meetings once each month and others every other month. Most communities do not have meetings during July or December and some skip July, August, and December. Each town meeting is well planned and includes something that will make residents glad they attended and participated in community decisions. Meetings also include something that sparks a desire among residents to attend the next meeting.

A majority vote on an issue (at a town meeting that has been advertised to all) is considered by the CAC and commanding general to represent the entire community. This point may be strengthened when the specific issue to be settled has been advertised as being one that will be voted on during the meeting.

The CLP office (chief of the CLP and staff) is devoted to the full-time support of all Fort Bliss communities. The function of the CLP office is to coordinate the post-wide community life effort, serve as the communications link with the post commander, obtain answers and responses to questions and requests, and provide administrative supplies and equipment to the mayor and his council. The CLP office (staff) keeps the mayors informed of actions that may affect their communities and of any information that may be of benefit to the communities.

MG Oblinger opens first mayors meeting.

Each community has, as a minimum, residents to head committees to welcome new residents (publicize community life efforts), a secretary, and a treasurer. Other committees such as health and welfare, buildings and grounds, ecology, adult and youth recreation, religious activities, security, and school representatives are part of the program. The most important committee is the welcoming committee, which welcomes new residents and informs them about the Community Life Program.

By organizing and staffing various committees, the mayor creates an atmosphere of individual involvement in command decisions. The committee chairman or the mayor is offered the opportunity to serve as the community representative during board meetings or proceedings of five Fort Bliss staff organizations and governing boards:

Commissary:

The Commissary Advisory Council is convened once each quarter by the Director of Industrial Operations. This council allows direct community input into the decision-making processes affecting commissary operations.

PX:

The Southwest Area Exchange Council meets once a quarter. The purpose is to exchange ideas and provide a line of communications to effect proper changes within the PX system. This council allows community input in the interest of developing a more desirable PX for Fort Bliss dependents.

Health Services:

The Health Consumer Committee meets quarterly. Each community sends a representative to provide input that will affect decisions of the committee. The committee seeks feedback from communities on services and effectiveness of recent changes.

Fort Bliss Mayors receive recognition during a recent visit to an El Paso City Council meeting.

DYA:

The Dependent Youth Activities Advisory Council meets quarterly. Membership consists of representatives of various DYA agencies, on-post housing committees, and sponsors of the different sports activities. Feedback is solicited on current programs. The subcommittees and councils of the DYA offer reports on current status and projects at these meetings. Attendance at meetings offers the community first-hand information on activities being offered to Fort Bliss dependent youth.

Publicity:

The Publicity Board meets once a month. The board is service oriented rather than advisory oriented. The communities send their publicity representatives to this meeting. The purpose of this board is the progressive development of the CLP through effective advertising of the program using various media.

Community bulletins have become one of the most important factors in community cohesiveness. They spread the word of community events, announce recent command decisions, welcome newcomers, and recognize outstanding residents. To avoid complicated and costly methods of distribution, the "Pony Express" is used, where the bulletins are delivered by volunteer youths of the communities.

Flyers are an easy, quick, and inexpensive way to print information, announcements, ballots, or surveys for distribution to residents. Flyers are prepared by typing or drawing on a stencil. The CLP office does the printing.

Funds received by a community belong to the community as part of the Community Life Program. Funds must be deposited in a community bank account, and the Community Life office assists communities in establishing accounts. Only the mayor and the treasurer are authorized to sign checks. A financial statement reflecting monthly amounts received, amount expended, and balance of community funds is placed in each news bulletin.

This is a somewhat summarized account of the Community Life Program at Fort Bliss. As the program progresses, skills at improving the quality of life will sharpen and interest will grow. The overall result of new intiatives and those that have gone before is certain to result in greatly improved satisfaction with community life among the soldiers and their families.

Editor's Note: Numerous experiences evolved during Border Star '81 such as Marine Corps/Army Air Defense Artillery cooperation, command control functioning, etc. Stories covering these experiences are being developed for publication in following issues of AIR DEFENSE Magazine.

Ever hear of a war in which both sides won? Such was the case during Border Star 81, a joint training exercise held at Fort Bliss, Texas, and sponsored by the US Army Forces, Readiness Command. Exercise officials pointed out that while there were opposing forces, there were no losers, only winners. Everyone who participated learned what he did wrong or how to capitalize on the right thing to do. It was also an opportunity for different members of the Armed Forces to work together as a team.

Border Star 81 was one of four annual exercises conducted by Readiness Command. This particular exercise provided the participating forces an opportunity to plan, test, and evaluate an integrated air defense mission.

At 0600 on 2 April, the opposing forces, led by the 3d Armored Cavalry Regiment (ACR) from Fort Bliss, attacked forces led by the 5th Infantry Division (Mechanized) from Fort Polk, Louisiana.

Mixed Crews

Both sides employed a combined team of Active Army, Army Reserve, and National Guard forces to test and evaluate the total Army concept of operations. For the first time, Active Army and National Guard crewmembers were mixed in the same vehicles, providing an opportunity for counterparts to work closely together during the entire exercise.

Being the so-called "bad guys" didn't bother the troopers from the 3d ACR. According to Major James Mullett, 3d ACR Adjutant, "It's better training. We operate under less control, which allows us to enjoy greater freedom of action. This is the first time we have operated as a regiment with opposition forces other than ourselves."

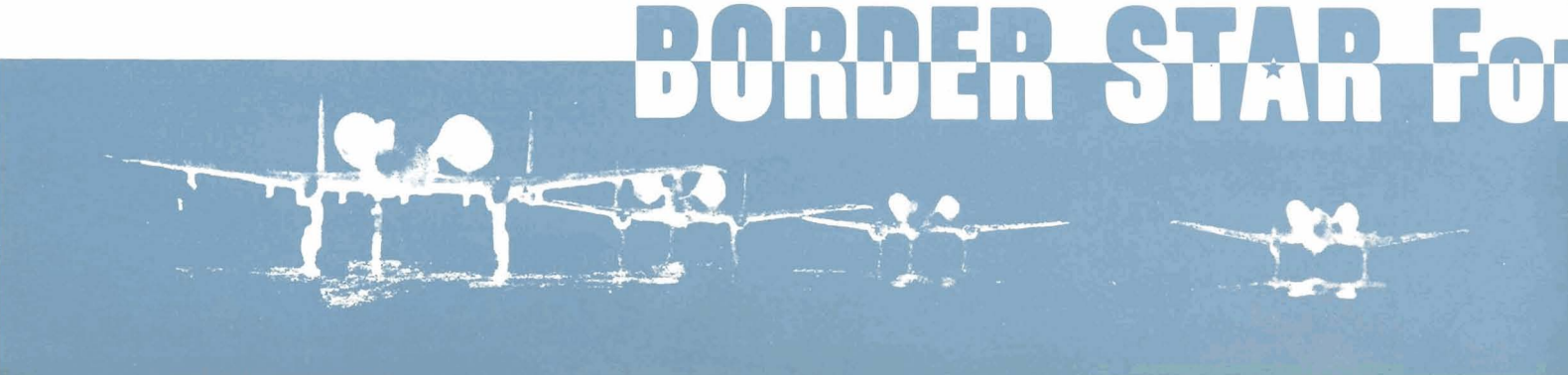
The unit, with its attached assets, operated during Border Star much like a division. As the Army's "desert experts," the 3d ACR's 5,300 troopers provided a very effective, realistic opposing force to the 5th Infantry Division. The 5th Infantry Division received its air defense support from both the Air Force and 11th Air Defense Artillery Brigade.

Units of the 5th Infantry Division (Mechanized) from Fort Polk, Louisiana, form up before moving out in search of the enemy.

First for Brigade

The 11th ADA Brigade, supported by Duster units from the National Guard, provided Hawk, Chaparral, and Vulcan air defense for friendly forces. A first for the brigade during Border Star was the inclusion of an Army officer aboard the Air Force E-3A airborne warning and control system (AWACS), providing an additional insight into the overall air threat picture. The brigade was thus enabled to function as an integral part of a joint air defense system that included Air Force and Marine assets.

BORDER STAR Fo



Members of the 60th Military Airlift Wing load a C-141 cargo aircraft as Border Star 81 winds to an end.

Providing Air Force support was the 12th Air Force from Bergstrom AFB, Texas. Support included A-10 close air support and transport aircraft.

The 1st Battalion, 65th Air Defense Artillery, 11th ADA Brigade, airlifted its Hawk equipment in C-130 aircraft from Biggs Army Airfield to an unimproved airstrip to test its tactical employment capability using "get light" principles.

Another major unit involved in the exercise was the 43d Corps Support Command from Fort Carson, Colorado. This unit aided both opposing forces with support such as bath and laundry services, maintenance, fuel, ammunition, food services, engineering, and supply. Total medical assistance provided included transportation for injured soldiers, medical supplies, inspection of mess halls, and disease control. Included as a support unit for the 43d was the 70th Ordnance Battalion from Fort Bliss.

The major items of concern during Border Star 81 were:

- Testing and evaluating joint integrated air defense.
- Planning and coordinating air-ground operations involving infantry, armor, and mechanized forces supported by tactical fighters.
- Conducting operations in an electronic warfare environment.
- Conducting joint suppression of enemy air defense capabilities.
- Exercising logistical support of joint forces in a desert environment.

The field portion of the exercise concluded on 7 April. Units were deployed to their home stations through 15 April.

The maneuver area stretched from main Fort Bliss, Texas, in the south to White Sands Missile Range, New Mexico, in the north. Playing active roles in the exercise were about 21,000 active duty soldiers, sailors, airmen, and marines and some 5,300 Army and Air National Guard and Army Air Force Reserve personnel.

The exercise forces were drawn from three major commands: the US Army Forces Command, Fort McPherson, Georgia; the US Air Force Tactical Air Command, Langley Air Force Base, Virginia; and the Fleet Marine Force Atlantic, Norfolk, Virginia.

Communications support was provided by the US Army Communications Command, Fort Huachuca, Arizona, and Air Force Communications Command, Scott Air Force Base, Illinois. Joint communications support was also provided by the Joint Communications Element, MacDill Air Force Base, Florida.

Transport aircraft for the movement of troops and equipment to and from the exercise were provided by the Military Airlift Command. Group movement of oversize equipment was controlled by the Military Traffic Management Command.

More than a year was spent in planning the exercise.

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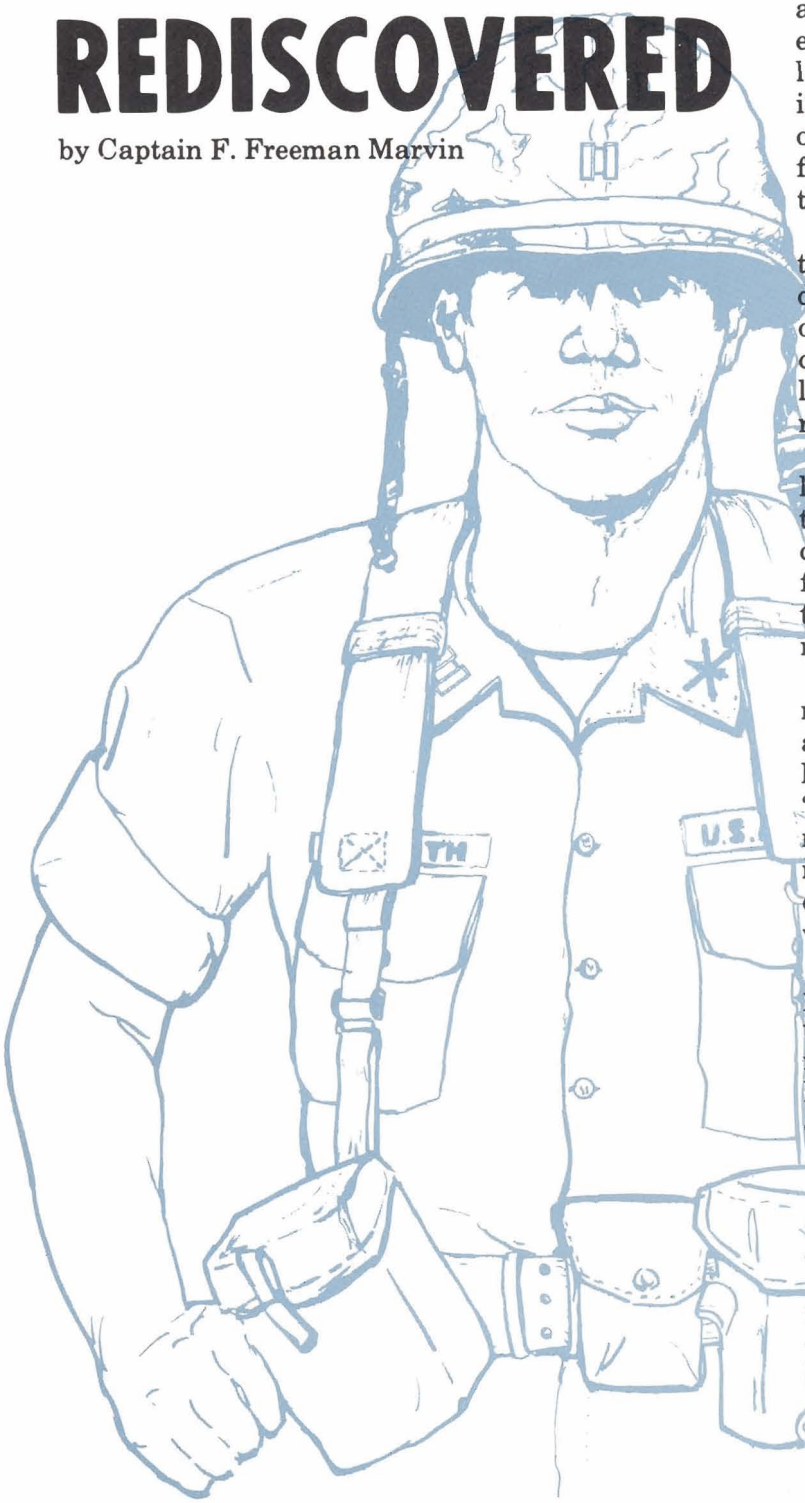
ces Simulate Battle

by E.C. Starnes

JUNIOR LEADERSHIP REDISCOVERED

by Captain F. Freeman Marvin



George S. Patton, Jr., once wrote in his diary, "The thing as I see it is to get a definite, simple plan quickly, and win by execution and careful detailed study of the tactical operation of the lesser units. Execution is the thing — that and LEADERSHIP."[1] His emphasis on the small unit leader as the critical link between the planning and implementation of military operations is evidenced throughout his writings. Trained leaders are invaluable to every army. Yet, the importance of the leadership provided by officers of company grade seems to me to have been forgotten in our Army since General Patton wrote those words.

I believe this perceived indifference has caused the quality of junior leadership in the Army to decline. But fortunately, we can train our junior officers to improve their leadership. The battery commander in particular must be a fully proficient leader to accomplish his most critical responsibility: fight the battle — and win.

Close attention must therefore be paid to junior leadership, its importance, its recent decline, and the unique problem it presents to the young captain. Part of the cure for the decline may be found by understanding the value of leadership training and application of the technique of role reinforcing.

Military command at the junior level is much more than a function of management techniques and job skill proficiency. It also includes leadership at all levels down to the squad leader. "Military leadership is the process of influencing men in such a manner as to accomplish the mission."[2] The test of leadership is whether men continue acting in the manner the leader would wish when he is not present.[3]

It is important not to confuse leadership with personnel management. All leaders are managers to some extent. But the proportion of leadership to management responsibilities increases at each lower level of command. Thus, the lowest level of command is the most important leadership level and the least important management level.

It is important not to confuse innate leadership *qualities* with learned leadership *techniques*. Junior leaders must inspire their followers to accomplish difficult tasks. They must also inspire their soldiers to where they overcome the fear of pain or death. This responsibility sets them apart from the civilian leader. Finally, the desirable capability for autonomous action by small units in combat demands especially good leadership at that level.

Despite all this, the Air Defense Officer Basic Course includes only 7 hours of leadership instruction, and the Advanced Course students do not receive a single hour on military leadership. What has become of junior leadership instruction? I believe it gets less attention for two reasons: the great infusion of personnel management techniques and the emphasis on performance-oriented training. The Army has been much improved by modern personnel management techniques. However, good management cannot substitute for good leadership. The requirements for leading soldiers in combat are only remotely related to performance counseling and organizational effectiveness. Performance-oriented training is an excellent concept for teaching job skills. Leadership, though, is not merely a skill; it is an art. It cannot be taught simply as —

TASK: Each lieutenant will lead in combat.
CONDITION: Given one platoon.
STANDARD: IAW FM 22-100.

The most serious junior leadership decline today is not with the squad or platoon leader, but with the battery commander. I say this because battery command is the first level of leadership where it becomes impossible for the leader to personally influence all his subordinates through face-to-face dealings. The battery commander is expected to influence his soldiers to win the battle, even though he may have minimum experience using intermediate leaders. The lack of training in the techniques of leading other leaders as well as troops has caused a deficiency. The rediscovery and application of these techniques can correct the deficiency.

The Army has never been able to depend on "natural" junior leaders to fill all the responsible positions. There are just not enough young Napoleons to go around. We must train young people with some leadership *qualities* to apply proven leadership *techniques* to instill esprit, courage, and confidence in our soldiers. At the individual study level, the TEC Series 909-071 is a good start, but I believe battalions should reinstitute the unit officer school. (In this connection, LTG Arthur S. Collins gives some excellent ideas in *Common Sense Training.*) I also believe the Air Defense School should establish instruction in the officer basic and advanced courses to include the fundamentals of leadership, techniques applicable to the junior leader, and readings from selected works.

Teaching leadership techniques is not easy. Applying them skillfully requires acumen, and evaluation is difficult because the results of good leadership emerge only under stress. Yet, several simple techniques illustrate what can be taught:

- Good leaders are efficient managers. Soldiers hate paperwork, so do not become identified with it.
- Find an uncommon trademark to set you apart — one that your troops can appreciate.
- Prepare a couple of questions to ask soldiers during training. If they do not know the answers, explain or show them to demonstrate your competence.
- Always participate in unit physical training. Get in good shape and stay there.

A proven leadership technique of special help to the new battery commander is role reinforcing. A platoon leader uses a style of leadership within each situation depending on his personality and the motivational needs and expectations of his soldiers. Most of his subordinates have similar needs and expectations, and his personal span of control extends to each of them. The new battery commander finds, however, that his personal span of control cannot extend across the entire battery and that an intermediate level of subordinates must control the various elements of the battery for him. These intermediate leaders respond to a different set of motivating needs and expectations.

Instead of trying to be consistent in his role as leader, the commander should seek to reinforce the expectations of his subordinates. The platoon leaders expect *freedom of action* to allow them to be leaders in their own right. The soldiers expect *direction of action* to establish the rules and set the objectives. The commander does not treat these groups differently but presents himself uniquely to each. The lieutenants must know the commander's weaknesses so they can compensate and respond. They are motivated by active participation in decision making. The soldiers gain confidence by the commander's competence and resolution, and the platoon leader inspires them to trust him with their lives.

These techniques of leadership are not new. Quite the contrary, we learn them by watching others. During World War II, General Patton was known to his men as "Old Blood and Guts." That this rather fearsome moniker was usually spoken with a grin is evidence of a great psychological need that he fulfilled for them. He loved to put on his "war face" and lecture them on the impending battle. In their presence, he was always confident,

decisive, and ruthlessly demanding. In his leadership of his subordinate commanders, however, Patton displayed his lesser known style. "If he knew that a subordinate did his best, he would make allowance for the performance. In this way, those who worked with him constantly did better than they knew how."[4]

"Old Blood and Guts" employed some shrewd techniques to inspire the best in his men. His first Tunisian campaign was not against the Axis powers, but against slovenliness. The resounding demand for helmets, leggings, and neckties was a daily reminder to his troops that he was their leader. Yet, he really was not inflexible. He always encouraged new ideas and fit his actions to the situation as it developed. Each morning he held a special staff briefing "in open forum style, where thoughts were exchanged and all were invited to present their views."[5] In this way, his staff always felt that he listened to them as individuals. Patton explained his varied behavior to his wife once this way, "one must be an actor."[6]

Not surprisingly, General of the Army Omar Bradley thought less of Patton's methods than did Patton's devotees. The "GIs' General" used techniques less similar to Patton's in style than in substance. Known to be taciturn, Bradley listened to his soldiers. After the fighting at Kasserine Pass, he was sent to find out what went wrong. Not satisfied with commanders' explanations, he chatted at length with noncoms about the problems. Always decorous and polite, "Bradley was never known to issue an order to anybody. . . without first saying please."[7]

But he knew his responsibilities as well as his men. "When an officer performed as I expected him to, I gave him a free hand. When he hesitated, I tried to help him. And when he failed, I relieved him."[8] He encouraged his subordinates to speak up if they thought he was wrong. "It is a grave error for a leader to surround himself with a 'yes' staff."[9] Bradley also knew the wisdom of having leaders train their junior leaders. He was convinced that leadership can be developed and improved by study and training.[10]

These men did not become good leaders because they were generals. They became generals by being good leaders — of their first platoon and of every command they held.

It is certain that we will fight like we train. Therefore, we must train as we intend to fight. If we do not expect a gunner to hit his target without adequate training, how can we expect an officer to rise to the challenge of combat leadership without adequate training? It is accepted among our top level national leaders that there will not be time or resources in a future war to allow poor leaders to learn from their mistakes.

During the Battle of the Bulge, MG Willard S. Paul, commanding the 26th Division, was faced by elements of nine German divisions trying to keep him from breaking their supply road to Bastogne. Paul was under great pressure to get his division moving forward, and progress was very slow. An angry Patton appeared at his command post and Paul was sure he was going to be relieved. "Patton sensed the situation and, walking up to Paul (who was a man of small physique), threw his arm around his shoulder and said, 'How's my little fighting sonofabitch.' " Paul said later that Patton could never have asked anything of him after that that he would not have done cheerfully, even to trying the known impossible.[11]

Perhaps with a little more emphasis, the junior leader may again become that officer for whom soldiers would try anything — including the impossible.

Footnotes:

[1]Harry H. Semmes, *Portrait of Patton* (New York: Appleton-Century-Crofts, Inc., 1955), p. 153.

[2]FM 22-100, *Military Leadership* (HQDA, June 1973), p. 1-3.

[3]LTJG David M. Kennedy, "Imperatives of Stress on Leadership," *U.S. Naval Institute Proceeding*, 105:76, February, 1979.

[4]Semmes, p. 186.

[5]Semmes, p. 193.

[6]Semmes, p. 166.

[7]Bill Mauldin, "Foreword," *A Soldier's Story* by Omar N. Bradley (Chicago: Rand McNally & Company, 1951), p. xx.

[8]Omar N. Bradley, *A Soldier's Story* (Chicago: Rand McNally & Company, 1951), p. 20.

[9]Omar N. Bradley, "Leadership," *Military Review*, 46:49, 1966.

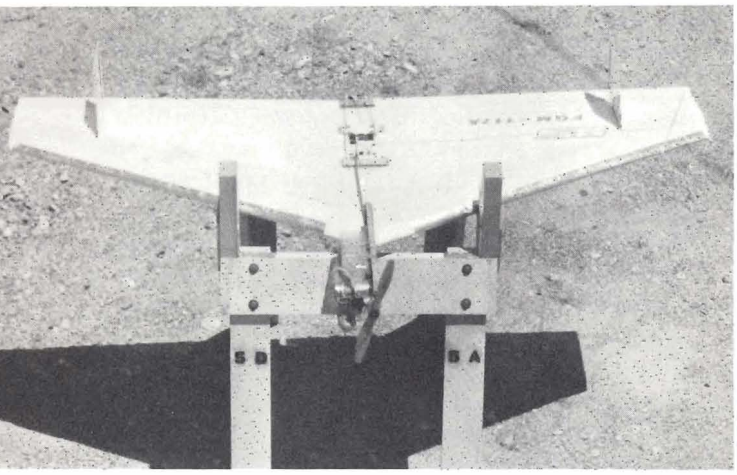
[10]Ibid, p. 53.

[11]Semmes, p. 233.

CAPTAIN MARVIN *is presently assigned as commander of Battery B, 151st Air Defense Battalion, 7th Division, at Fort Ord, California. A graduate of the US Military Academy, he subsequently served in the 76th US Army Artillery Detachment in Greece. He graduated from the ADA Officer Advanced Course just prior to his present assignment.*

FQM-117A IN AIR DEFENSE TRAINING

by David Barron



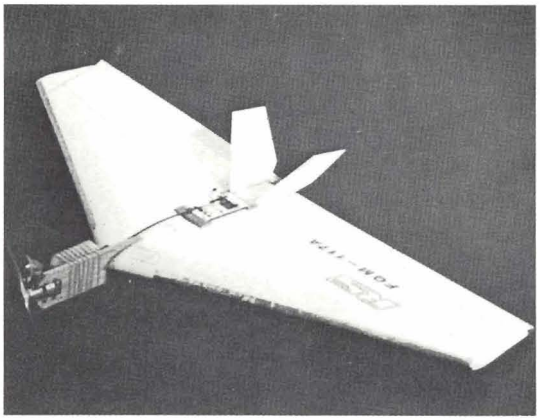
FQM-117A (RCMAT)

The US Army's FQM-117A radio-controlled miniature aerial target (RCMAT) is an effective air defense training device. RCMAT is a small-scale, visually guided, radio-controlled target that provides an accurate representation of a full-scale aircraft for training of air defense weapon crews. When flown at one-sixth the distance of an actual aircraft, the target simulates the speed, maneuverability, attack profile, and radar signature of the aircraft.

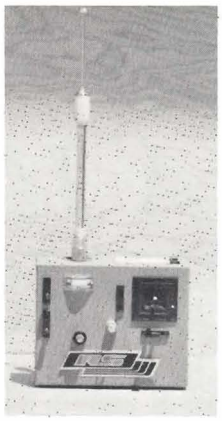
Training coordinators prefer tracking practice with the FQM-117A over live aircraft. Obtaining Air Force aircraft for this purpose requires precise coordination and is sometimes difficult to arrange because of aircraft unavailability. RCMATs, on the

SFC Wolfe, RCMAT pilot course instructor, discusses the operation of RCMAT transmitter as SSG Kline demonstrates its application.

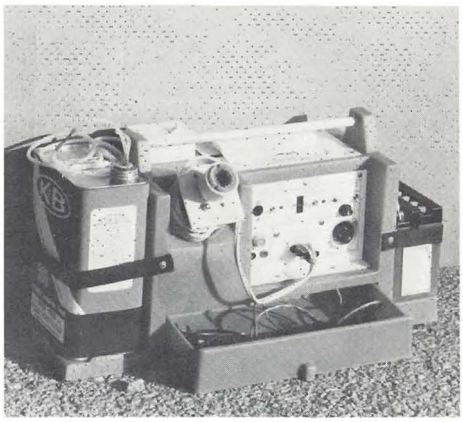
SGT Littlejohn activates transmitter as PFC Shoop prepares to launch RCMAT.



RCMAT airframe.



Hand-held transmitter.



Ground support equipment.

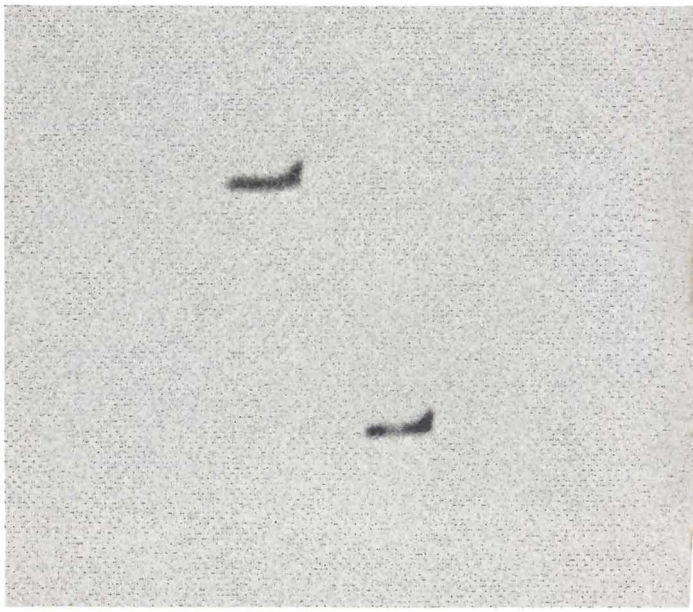
other hand, are readily available on short notice from training and audiovisual support centers or the battalion for use in unit training areas, and they are infinitely cheaper to operate. Other salient features of the target system that have made it attractive to the air defense training community include low cost, durability, ease of operation, realism, and versatility.

The FQM-117A is constructed of fiberboard-covered plastic foam with aluminum components to enhance radar detection. It uses a methanol/oil/nitromethane mixture as fuel, which can sustain target flight for up to 20 minutes at maximum speed (92 mph/148 kmph). The target system consists of the airframe, a hand-held transmitter, and related ground support equipment. The system is portable and does not require dedicated transportation, storage, or maintenance facilities. No special tools or hardware are needed to assemble the target, and a prepared range or recovery site is not necessary.

FQM-117As are durable and designed for multiple use. Recovery of the target upon flight completion is made by shutting off the engine and gliding the RCMAT to a nearby open area. The rugged plastic foam airframe allows it to resist structural damage in most cases.

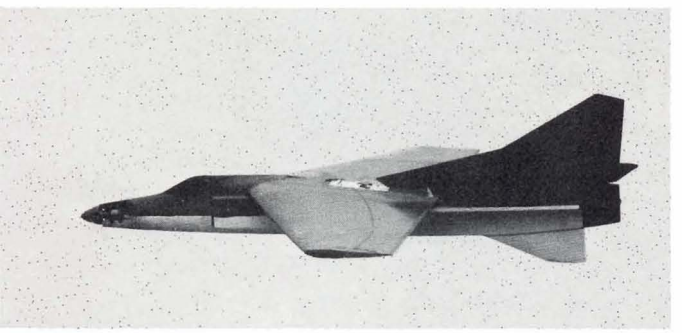
In addition to its durability, the FQM-117A is desirable because of its ease of operation. Preflight operations in the field can be accomplished in less than 10 minutes. Recovery time to subsequent launch time is approximately 2 minutes. Only two individuals are needed to operate the system. A trained operator works the hand-held transmitter to maneuver the target and a helper launches and recovers the target. Of these two individuals, only the operator must be formally trained. The 5-7 week training primarily stresses skillful hand/eye coordination, and practically all soldiers can qualify for operator training. Incidentally, a recent need has arisen for RCMAT-trained operators. The initial graduates from the new equipment training courses held from January through April 1979 are gradually being lost through reassignments and separations from active duty.

The realism that the RCMAT displays is graphically shown in the accompanying photographs. In one photograph, the RCMAT is approximately 400 meters from



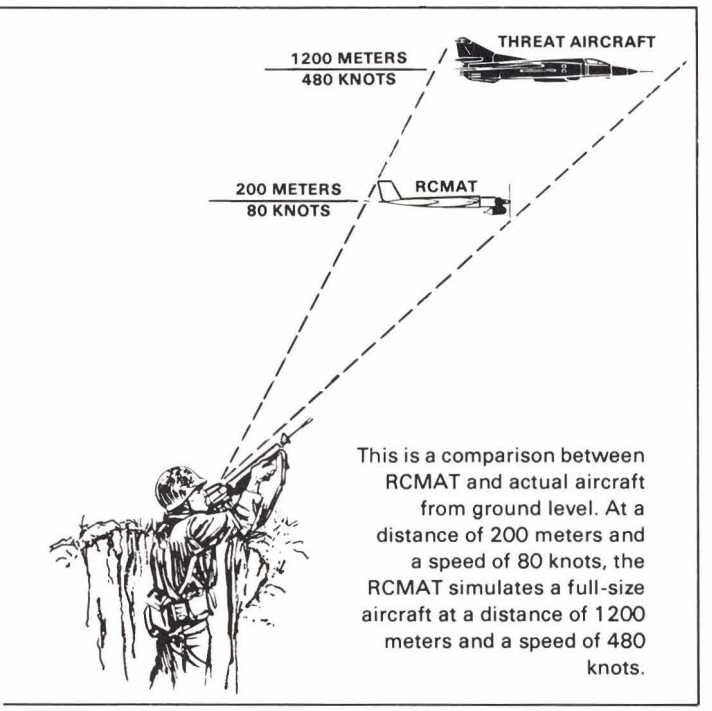
Size and shape comparison between RCMAT and A-7 Corsair.

the gunner's position. Just above it is an A-7 Corsair flying 4,000 meters from the same position. The similarity between the target and the aircraft is readily seen. By installing a different fuselage and vertical stabilizer, an augmented RCMAT is created to more closely resemble a threat aircraft. In this instance, three-dimensional nose, fuselage, and tail sections are added to make the augmented RCMAT an authentically scaled version of a MiG-23. The modification kit currently being considered would enable transformation of a RCMAT presently in the field to an augmented RCMAT in 20 minutes.



AUGMENTED RCMAT

The operator has the ability to vary target speed, distance, and approach angle to duplicate the slowest or fastest threat aircraft. The maneuverability of the target then matches that of any full-size, fixed-wing aircraft. The target challenges the gunner by flying in a realistic manner, taking advantage of terrain features, evasive maneuvers, and scaled speed. RCMAT maneuvers can range from easy-to-track to impossible-to-track. One thing is certain — live-tracking or firing exercises with RCMATs seldom fail to capture the attention of all in attendance and thus provide an effective learning environment.



This is a comparison between RCMAT and actual aircraft from ground level. At a distance of 200 meters and a speed of 80 knots, the RCMAT simulates a full-size aircraft at a distance of 1200 meters and a speed of 480 knots.

Regarding its versatility, the RCMAT has been used as a tracking target for various ADA short-range weapon systems. It has also doubled as a target for Vulcan subcaliber and Duster fires. Additionally, the target has been used to train infantrymen in using small arms against air attacks. Testing is in progress to develop a suitable and cost-effective infrared radiation source attachment. Such an attachment would enable the target to become a viable tracking target for infrared-directed ADA weapon systems — Redeye, Stinger, and Chaparral.

By adding different payloads, the FQM-117A can be used in other interesting ways. For example, flour sacks can be carried and then dropped by the target to simulate bombing runs. By mounting a camera on the RCMAT, the target can perform photographic reconnaissance missions. Used in this manner, the RCMAT can disclose flaws in weapon system camouflage. RCMATs can also effectively dispense smoke and gas on troop concentrations. A modification currently under development by the Chemical School calls for a device to allow nuclear/biological/chemical "rain" to be delivered by the RCMAT.

These modifications and other improvements, such as the refinement of the hand-held transmitter, can make the FQM-117A an even more effective training device for the ADA community.

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CIVIL DEFENSE IN SWEDEN: planning for survival

by Dr. William J. Stover

Editor's Note: Here is a firsthand account of how one European nation is acting to assure its survival to carry on the fight against aggression.

This article is based on Svensk Soldat and The Total Defense of Sweden published by Sweden's Ministry of Defense as well as interviews with defense officials by the author while an American-Scandinavian Foundation Fellow at the Swedish Defense Ministry.

Swedish national defense is based on a policy of neutrality designed to keep the country out of war. To accomplish this, Sweden has attempted to make its defense so powerful that the sacrifices an aggressor would have to incur to conquer Sweden would bear no reasonable relationship to the advantages obtained.

This defense effort encompasses the entire nation. An army of citizen soldiers totaling approximately 10 percent of the population is equipped with modern, sophisticated weapons, 90 percent of which are produced in Sweden. However, soldiers and weapons are not enough. Incorporated into Sweden's national defense organization is a vast civil defense program directed toward four ends: citizen protection, medical care, economic preparedness, and the will to resist. This article examines each aspect of Sweden's civil defense with special attention devoted to the planning necessary for survival.

Citizen Protection

Sweden's civil defense is based on the principle of providing protective shelter for the civilian population who must remain in areas exposed to attack. Evacuation to less risky areas is preferable, of course; but those who must remain to carry out war duties in the central parts of major cities after an evacuation are given the best possible protection. They have been provided with group shelters blasted out of rock or constructed of concrete. Presently, these shelters can accommodate more than 100,000 people in the larger cities, and approximately 100 civil defense control stations have been given similar protection.

These shelters are constructed by local governments, but the central government pays two-thirds of the cost. Because the cost is high, efforts are made to find use for the shelters in peacetime. For example, the large shelters in Stockholm are used for parking and garage facilities while in Vasteras and Karlskrona they are used for sports and study activities.

All multifamily apartment buildings in communities of more than 5,000 inhabitants contain a standard shelter in the cellar which meets fixed regulations for sturdiness. By the early 1970s, there was room for more than 3.5 million people in these standard shelters. Each year shelters to house an additional 250,000 people are

built involving a yearly investment of approximately $14 million.

In addition to shelter construction, a large-scale evacuation plan has been established for more than 5 million people, over half the population. That number has been increased yearly as the cities grow. Moreover, the scope and direction of evacuation can be adapted to various military situations.

Evacuation is planned in stages. Emergency evacuation takes children, the sick, and the elderly. Final evacuation takes those remaining. However, if it is necessary to proceed with a rapid evacuation, all people can be taken in one stage. In addition to emergency evacuation, plans have been made in the major cities for moving workers to buildings with shelters close to their place of work.

Planning is based on the assumption that evacuation will be of a long duration. As a result, the plan requires administrative, materiel, and economic preparations. Each individual can find where he is to proceed by consulting the telephone directory. Upon arrival, the individual finds an administrative organization to give directions and to provide care. Radiation protection is provided, and special units have been trained to rescue the injured and those trapped under rubble.

Sweden's evacuation and shelter plans are not simply a paper exercise. They have been tested in part by large-scale exercises in which the civilian population has participated. Indeed, the Swedish Civil Defense Act requires all citizens (with certain exceptions) to serve in civil defense. This includes an obligation to participate in peacetime training as well as in wartime duties.

In peacetime, 220,000 people serve in local civil defense organizations. About 65,000 people who have defense duties at their place of work serve in factory defense organizations. During peacetime, the period of service varies between 35 hours and 80 days yearly, depending on one's post. Training is arranged either locally or at civil defense training establishments. A large part of the population has participated in voluntary training for defense against atomic, bacteriological, and chemical warfare.

Local recruitment, planned procurement of equipment in peacetime, and a scattering of supply dumps enable mobilization to be completed rapidly. For example, evacuation units can be mobilized in 6 hours and most others within 24 hours. As a result of this planning, the civilian population receives the maximum allowable protection.

Medical Care

During wartime, medical services are separated into military and civilian organizations. The civilian part embraces civil defense medical care and general civilian medical services. Operation in wartime is the overall responsibility of the National Board of Health and Welfare at the central government level, but civil defense commanders and county administrators are responsible at the regional and local level.

During wartime, severe cases are cared for at emergency hospitals that are specified peacetime hospitals with preplanned annexes. Located in areas less exposed to attack, these emergency hospitals vary in size according to estimated requirements. In each, there is room for twice as many severe cases as in peacetime.

In certain designated areas, military hospitals are set up by the armed forces where both civilian and military patients receive treatment. Additional resources can be supplied to hospitals in the event of a major disaster. In wartime the nonemergency civilian and military health services are directed by the Wartime Medical Districts under the command of military medical officers. This extensive planning insures both the continuation of normal medical services and the emergency requirements of a natural or military disaster.

Economic Preparedness

If Sweden is subjected to an attack or cut off from trade with other countries, economic preparedness is essential for civil defense. Comprehensive planning in peacetime is necessary if the state is to deal with the problems of war. This requires attention to manpower, food, energy, raw materials, transportation, and production.

To keep factories operating, planning requires the availability of manpower. After personnel requirements for the armed forces, civilian protection, and medical care are met, the remaining manpower is at the disposal of wartime economic preparedness. This assures that industry and agriculture will continue to function.

The major portion of Sweden's food requirements, expressed in calories, is met by domestic production. This is dependent, however, on the import of fuel, oil cakes, meal, and fertilizer. To compensate for a decrease in these imports during war, Sweden has planned for a change in the patterns of agricultural production. Crop production will be increased while animal production decreases, providing the maximum possible calorie

The mobilization is safeguarded by the Home Guard and available training units. Air force and navy units are deployed at protected war bases. To a great extent the air force uses ordinary highways as war bases. Widened parts are used as runways.

yield. High levels of crop production are assured by stockpiling the necessary commodities. In addition, foodstuffs are stockpiled in areas where residents are to be evacuated. Peacetime preparation of a rationing system also provides the means to restrict consumption when required.

Sweden's water resources provide abundant energy in the form of electric power. The supply of this power is in the north, however, while the demand is located principally in the southern cities. As a result long transmission lines link the source with the area of consumption. Comprehensive planning measures are designed to protect the power stations and lines and to expand repair facilities during war.

Oil represents one of the more difficult problems because Sweden relies on imports for all its needs. To meet a blockade or other wartime crisis, oil is stockpiled mainly within the private sector of the economy but also under state auspices. The oil is stored in rock shelters and consists both of a war reserve and a blockade reserve.

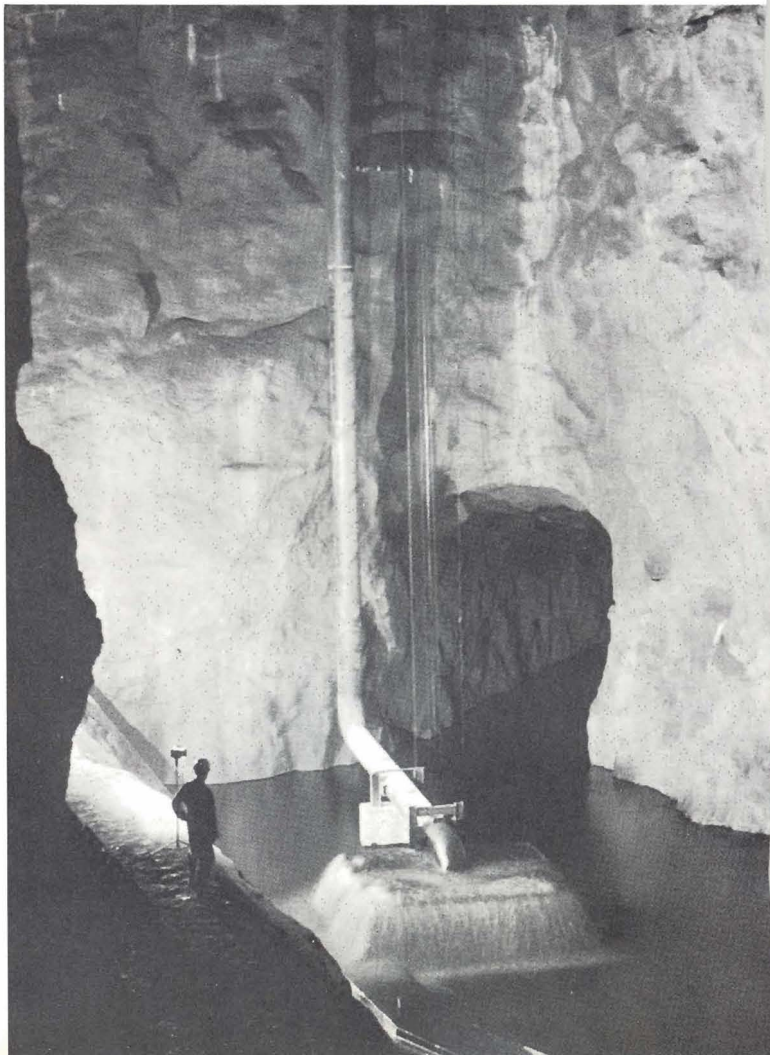
Other commodities have also been stockpiled, including raw materials and semifinished products not produced domestically. These are stored by private enterprises complemented by state-held emergency supplies spread over a large number of locations. In addition to this large scale emergency stockpiling of important materials, plans have been made for receiving and rapidly distributing imports that succeed in getting through during wartime. For example, storage facilities have been blasted out of rock on the coast for holding oil, and special harbors and moorings have been prepared.

The civil transport system serves the entire defense organization. During mobilization, the armed forces will claim a considerable portion of the country's transport resources. The remainder will be used by civil defense. Those sectors of the economy that are essential for the war effort will be allocated transportation facilities in accordance with a plan drawn up in peacetime.

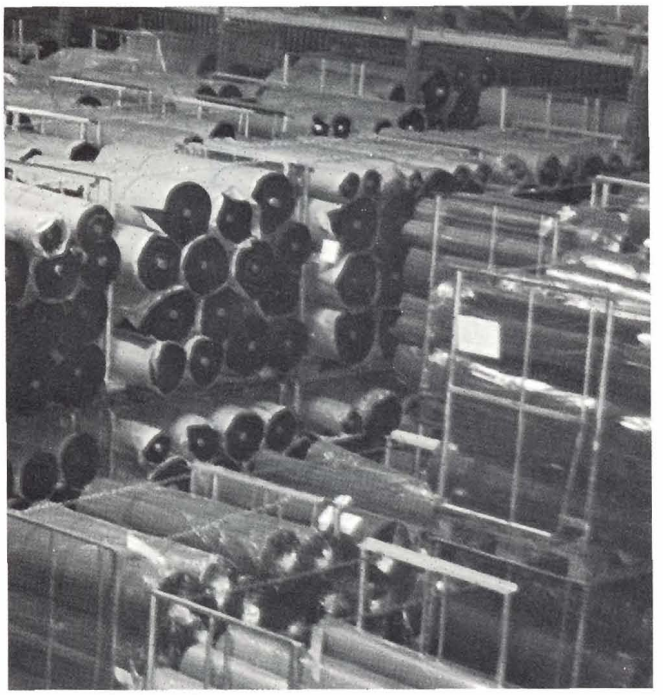
Swedish industry is able to produce the major portion of the equipment required for modern war. Detailed plans have been prepared to enable industry to adjust rapidly to wartime production both for civilian and military purposes. The plans deal with companies' requirements for manpower, electricity, fuel, raw materials, and transportation. The government has also stored machinery with certain companies so that armament production can be rapidly increased. Economic preparedness also includes construction companies, and resources have been allocated to firms that are part of the Emergency Construction and Repair Organization. This allows them to plan for repair work during war.

To insure a smooth transition during times of emergency, only limited use is planned for production in localities scheduled for final evacuation. Most facilities will be scattered throughout the countryside in less exposed areas. In addition, certain essential functions have been located in rock shelters.

An efficient economic defense — including stockpiling of oil and raw materials — is of vital importance to the total defense.



Storing oil directly in rough underground tunnels below the ground water level is safer and cheaper than storage in metal cisterns. The oil is extracted by pumping water into the tunnels. Here a newly finished oil dump is being filled.



Above: Raw material and semifinished products are stockpiled for future use by industry.

Below: The Lottas — Women's Auxiliaries — are trained to serve in air and sea communications centers, while mobile transmitters provide live broadcasts from all parts of the country.

The Will to Resist

In modern warfare, the individual is subjected to physical hardships and mental strain, which increase susceptibility to propaganda and rumors. Combined with political, economic, and military activities, such propaganda becomes a powerful tool for an enemy who seeks to influence peoples' opinions and feelings. Therefore, one wartime objective of civil defense is to maintain and strengthen the will to resist. To accomplish this, civil defense has three main tasks: maintain an active news service, advise on what is published, and provide reliable information both at home and abroad.

The wartime news service must be prompt and accurate. Extensive preparations have been made to insure the continuation of newspaper publication and radio/television broadcasting. Truthful and detailed information via the normal news channels will strengthen the citizens' confidence and counter enemy propaganda.

Swedish law concerning freedom of the press does not permit censorship even in wartime. However, it is important that information not be published that could be of value to an enemy. The necessary wartime restraint is based on prior cooperation between the authorities and news media. Instructions have been prepared about what should not be published during wartime.

The National Office of Information assures that accurate information is available both in Sweden and in foreign nations. This office assists radio, television, and newspapers with advice and information, assesses the mood of the people, and analyzes rumors and foreign propaganda. Leading representatives of the press, advertising, popular movements, and science participate.

Conclusion

Despite Sweden's good fortune in remaining out of war for more than 160 years, the country recognizes that international conflict is still a possibility, even in Scandinavia. As a result, Sweden has prepared elaborate civil defense plans covering citizen protection, health care, economic preparedness, and the will to resist. Coupled with Sweden's military organization, civil defense is designed to convince any would-be aggressor that war with Sweden would be irrational. By planning for survival, Sweden has made a convincing case that outside pressure will be met with internal strength and resistance.

DR. STOVER *is chairman of the Political Science Department at the University of Santa Clara. Formerly a foreign service officer with the Department of State, he received his Ph.D. from the University of New York and writes extensively on defense and civil-military relations.*

VIEW from the FIELD

ADA ARTEP AND COMBINED ARMS TRAINING AT POHAKULOA

by Major Lewis J. Goldberg
(S3, 1st Battalion, 62d ADA)

Fighter aircraft flew overhead, ordnance fell on ground targets, and "enemy" aircraft were tracked and engaged. As the soldiers on the ground concentrated on missions, the fact that they were in the tropical island paradise of Hawaii was farthest from their minds. It was October 1980. The scenario was part of a 25th Infantry Division combined arms training exercise and a 1st Battalion (Chaparral/Vulcan) (Self-Propelled), 62d Air Defense Artillery (ADA), ARTEP. The entire exercise lasted 30 days and covered a lot of ground — literally.

The 25th Infantry (Tropic Lightning) Division, based on the island of Oahu, is somewhat limited in training areas. The Division's 1st Bn, 62d ADA, for instance, has to maneuver its 24 Chaparrals, 24 Vulcans, and 18 other tracked support vehicles on the relatively small ranges of Schofield Barracks. The fact that these ranges are only 22 miles from Waikiki Beach is a plus, but it doesn't remedy the lack of training space. So when elements of the 25th Division need elbow room, they head south. A mere hour's flight away by C-141 is the "big island", Hawaii, and the 56,000 acre Pohakuloa Training Area (PTA), the primary off-island training ground for the Tropic Lightning Division. It was at PTA that the combined arms training/ARTEP took place.

Accompanied by a Vulcan platoon from Battery B and three forward area alerting radars (FAARs) from Headquarters Battery, Battery D (Chaparral), 1st Bn, 62d ADA, was tasked to support the 2d Infantry Brigade Task Force Warrior, which had deployed to PTA for combined arms training. While supporting the brigade task force for 4 days, the ADA battalion would undergo an ARTEP.

During the initial part of the 2d Brigade's 30-day deployment, Battery D(+) accomplished training at unit level. While training for its participation in the combined arms exercise, it was evaluated by a team from the Training and Doctrine Command's Training and Systems Analysis Activity (TRASANA). The TRASANA team had traveled to Hawaii to evaluate the Chaparral personnel as part of a worldwide study to determine the level of crew drill performance, proficiency in visual aircraft recognition, and equipment knowledge. One squad was evaluated while wearing mission-oriented protective posture (MOPP) level 4 clothing during crew drill. When the evaluations were complete, the results indicated that the 25th Division's Chaparral crewmen were knowledgeable, high-spirited, and professional. With these essential skills and attributes, they were well prepared for the

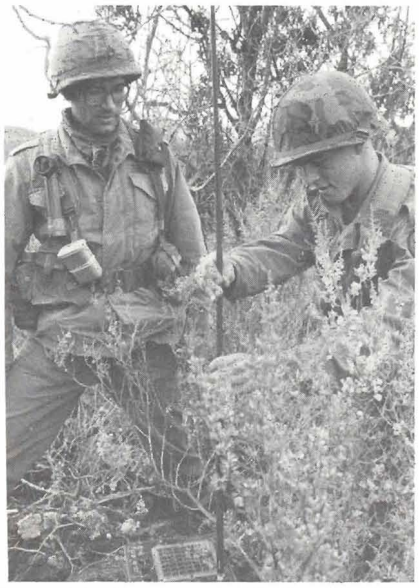
A Chaparral from Battery D, 1st Battalion, 62d ADA, with SP4 Donald E. Gibson at the controls, is ready to protect friendly forces and key installations from A7 COPE ELITE exercise aircraft simulating enemy aircraft.

ADA ARTEP and the combined arms exercise that followed.

Battery D was in direct support of the 2d Infantry Brigade. Air defense priorities were established, and an air defense plan was developed to protect critical assets throughout the brigade area of operations. The battery commander initially deployed his assets to provide prepositioned air defense convoy coverage to protect the 1st Bn, 14th Infantry, during its movement from the assembly area to its initial defensive positions. The Vulcan platoon was alined with elements of the 3d Squadron, 4th Cavalry, which was acting as the covering force. The FAARs provided early warning by digital display and by voice to the ADA fire units.

Once the initial defensive positions were occupied by the 1st Bn, 14th Infantry, the Chaparral platoons of Battery D provided air defense coverage for the battalion command post (CP), battalion trains, and brigade CP/trains. At night the platoons took up nighttime defensive positions.

Later in the exercise, two Chaparral platoons were given the mission of protecting a special ammunition supply point while the third Chaparral platoon became involved in an airmobile operation to protect the newly relocated battalion trains. The trains had withdrawn because of anticipated enemy approach. (The 1st Battalion, 35th Infantry, acted as the opposing force.) The Vulcan platoon continued its air defense of the covering force. However, after conducting a night passage of lines, the Vulcan platoon joined the remaining 1st Bn, 14th Infantry, forces to provide air defense for battalion defensive positions.



SSG Ambrose J. Probst observes PFC Ronald J. Kimpel, both of Battery D, as he employs the target alert data display set to provide his Chaparral with early warning information transmitted by the forward area alerting radar.

Eventually, the 2d Brigade's ADA priorities were modified and the 2d Battalion, 11th Field Artillery (the Brigade's direct support artillery battalion), became the top priority for ADA fires. The artillery battalion was also undergoing an ARTEP during the combined arms training exercise.

Throughout the 30 days, A-7 Corsairs, simulating both hostile and friendly aircraft, provided a realistic air threat. Flying as part of COPE ELITE, an Air Force training exercise, the fighter aircraft tactically maneuvered through the airspace, dropping ordnance in the impact area while air defenders, including Redeye, tracked and engaged.

The 4-day involvement with the 2d Brigade task force was a learning experience for the ADA leaders. The Chaparral battery commander had to constantly discuss, coordinate, and negotiate the air defense situation with brigade and field artillery S3s. Platoon leaders were required similarly to coordinate with personnel responsible for the security of critical assets. The coordination of Chinooks to support airmobile operations made the air defense personnel aware of tactical considerations that must be met to insure a properly executed mission.

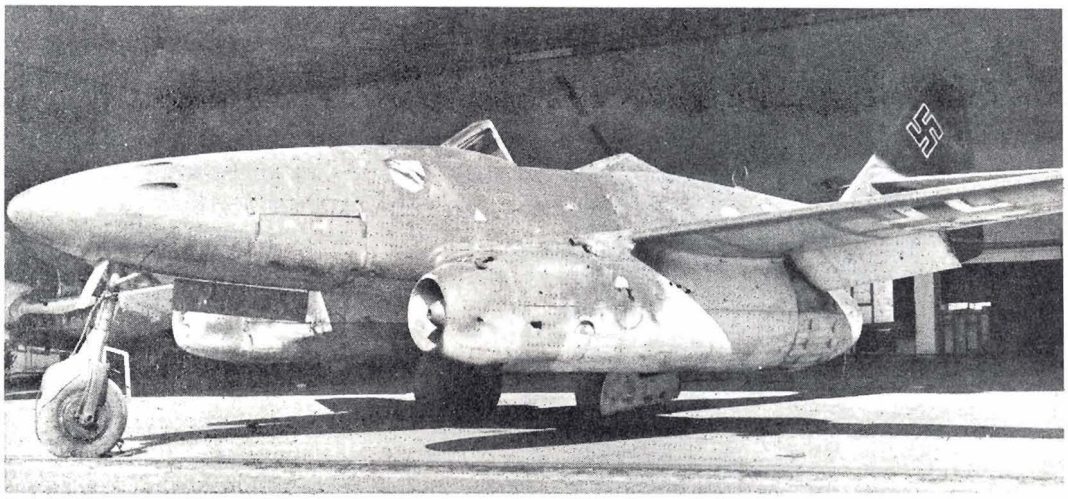
The vastness of PTA added to the realism of combat. Unit movements were lengthy and required long periods of time to complete; this was partially attributable to engineer-built barriers. Even the weather was different from familiar conditions on Oahu. The 7000-foot-level temperatures of PTA approached freezing during the night.

For ADA members supporting the 2d Brigade, the training was more realistic than ever before. The air defenders came to realize that the battlefield is a busy place and competition for advantageous terrain is keen. In ARTEPs and FTXs that do not include the combined arms concept, the air defender is mistakenly led to believe that the terrain belongs to him.

As the motto of the 25th Infantry Division's Chaparral/Vulcan battalion implies, the air defenders were ready to "AIM HIGH" during their ARTEP and effectively protect their infantry and field artillery counterparts from the hostile air threat.

World War II Super Plane — Me-262

by Clyde D. Boden



Captured Messerschmitt Me-262.

Listening to retired German Air Force LTG Adolph Galland talk at length to a huge appreciative audience in the Air and Space Museum of the Smithsonian Institution about the Luftwaffe's fighter-bomber jet aircraft, Messerschmitt Me-262, brought back memories of World War II. Especially, it revived thoughts associated with the 557th Antiaircraft Artillery Battalion, an automatic weapons unit that was attached to the 84th Infantry Division in the European Theater of Operations. The 557th was a superbly trained, highly disciplined, mobile organization of about 800 officers and men (mainly from Virginia, Pennsylvania, Maryland, and the District of Columbia) who fought in four major campaigns from September 1944 to May 1945.

The 557th was impressed with and was challenged by the German Me-262, the first jet aircraft to become operational in combat. Contacts were mostly at tree-top level or a little higher. The unit's first encounter with the Me-262 was in early November 1944 in the vicinity of Vise, Belgium. The speedy enemy aircraft was on a west-to-east course at an altitude of about 4,000 feet.

Again on December 26, near Marche, Belgium, 557th gunners fired on Me-262s flying low over the frontlines. It was the first sunny day during the Battle of the Bulge near the point where the massive German drive was stopped.

Five of the jets appeared in the battalion area near Leiffarth, Germany, in mid-February 1945, and were engaged.

While fighting raged during the crossing of the Roer River on February 24, 1945, numerous aircraft (some could have been Me-262s) were potential targets. During the hours of darkness, 22 unseen barrage fire encounters were executed while the enemy planes strafed, bombed, and reconnoitered the area.

The next day (in the vicinity of Linnich, Germany), 16 Me-262s — about 20 percent of those on combat missions on any given day — were encountered. One, circling at 3,500 feet, was shot down. Two more at about the same altitude, flying a west-to-east course, were destroyed, and a direct hit by the gunners of the 557th was scored on a bomb dropped by the swift jet during a battalion barrage.

Three Me-262s were fired on early in March 1945 in the Hebler-Dolken-Lemmenhofe area in Germany. Four more came under attack early in April 1945 in the vicinity of Bad Oyenhausen. One in the later fight was downed.

The last engagement with the German super aircraft was late in April 1945 near Seehausen, Germany. Two were engaged in that skirmish.

In defending against 171 air raids during a 9-month period of combat, the 557th guns fired nearly 20,000 rounds of 40-mm ammunition and about 350,000 rounds of .50 caliber ammunition at 418 aircraft. Nearly one-tenth of the targets was Me-262s, and most of the others were Me-109s and FW-190s. Other aircraft encountered were FW-200s, Ju-87s and -88s, an HS-126, and a Gotha 145D. Overall, the battalion was credited officially with destroying 44 enemy aircraft.

In the ground role, the 557th fired nearly 2,000 rounds of 40-mm ammunition and more than 310,000 rounds of .50 caliber ammunition on river crossings, on the march, and on other occasions. Included in this total were about 400 rounds of 40-mm ammunition expended in direct and indirect fire against 18 different types of targets of opportunity on the Rhine River and on its East Bank. The quadruple .50 caliber M-51 mount was used for direct fire. Hits were observed on all targets. Harassing fire was used against the same type target from captured 2-centimeter (20-mm) Flakvierling guns and a 20-mm antiaircraft antitank gun. Hits were observed in many instances. The enemy responded with small arms, burp gun, and mortar fire in these actions, which occurred during the last part of March 1945.

On the subject of captured materiel, a few weeks earlier, in the vicinity of Hulshorst, Germany, the battalion captured a six-gun, 88-mm antiaircraft antitank battery complete with 52 men, their small arms, and their equipment. The 557th troops were deployed as infantry. Overall, more than a thousand prisoners were taken.

As General Galland, the German Ace, said in conclusion, "why was it we should have fought so fiercely to kill each other when all along, as today, we would rather be friends." This, from the man who had the courage to face the German leaders, Hitler and Goering, and express opinions contrary to theirs. Think about it.

CLYDE BODEN, *a free-lance consultant and writer, was a platoon commander in the 557th AAA Automatic Weapons Battalion in World War II. He is the author of Clear Skies — The Story of the 557th.*

GHOST Hawk Battalion in

BORDER STAR '81

by Veto Ghost

"Veto" is the motto of the 5th Battalion, 57th Air Defense Artillery. No one person can take credit for the efforts of every soldier in a battalion. We take the position that this article was written by all the soldiers of the 5th Battalion, 57th Air Defense Artillery. It was their hard work and ideas in an impossible situation that turned a concept into reality. And we appreciate the cooperation of the 11th Air Defense Artillery Brigade; 3d Armored Cavalry Regiment; 4th Battalion, 1st Air Defense Artillery; and the 1st Battalion, 200th Air Defense Artillery (New Mexico Army National Guard).

The war is only 2 days old and Hawk commanders are forced to drag together the tattered remnants of their units. Slow-moving convoys of 25 or more vehicles have been hit and destroyed, leaving burning hulks on the sides of the roads. Aircraft scream overhead as the enemy maintains air superiority. Downtime due to the lengthy emplacement of batteries has allowed the batteries to become targeted and destroyed. Equipment has broken down and the nonavailability of repair parts has left that equipment virtually useless. Cannibalization has become standard procedure. As each battery goes out of action, more flights of aircraft penetrate defenses, causing more and more destruction of maneuver forces, critical support activities, and counterstrike forces.

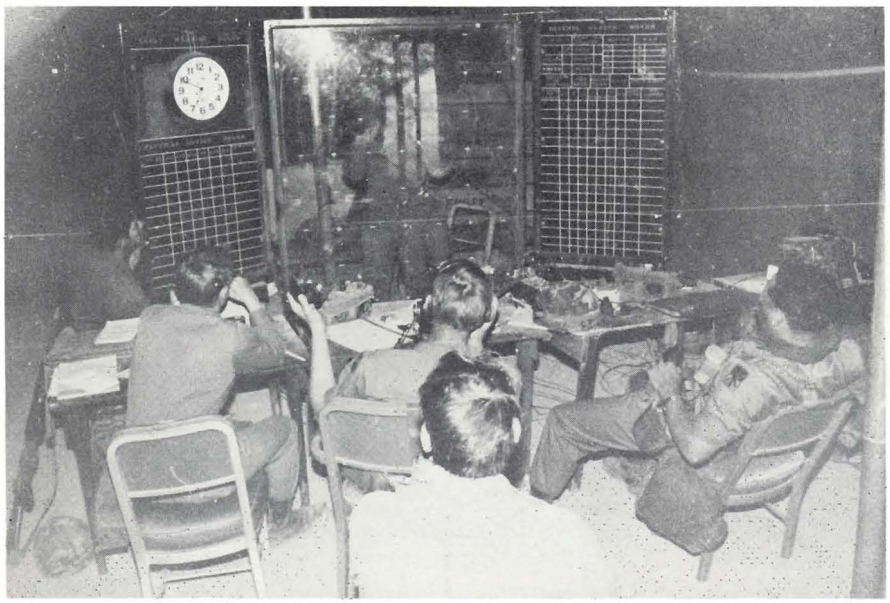
This could happen anywhere in the world, anywhere Hawk is being used. Even one enemy aircraft flying behind friendly lines and left unchallenged

poses disaster. It is the job of Army air defense to prevent this sort of crisis. Flexibility, small convoys, and limited downtime must become the code words for accomplishment in any future conflict. One method of achieving this is ground hidden offensive site tactics (GHOST) Hawk.

During Border Star '81, the 5th Battalion, 57th Air Defense Artillery, was faced with the impossible challenge of providing low-to-medium-altitude air defense for the opposing forces — impossible because the battalion was crippled from the outset since it had no automated command control system. As a result, it had to rely on a manual Army air defense command post (AADCP). Additionally, since the batteries of this battalion are square, having only a battery control central and no platoon command post, they could not split the batteries and use assault fire units. Thus, for the battalion to have flexibility, it would have to move one complete battery at a time. This type of movement entails long, slow, and easily detected convoys, a situation that must be avoided. Finally, the battalion had only two batteries. This factor alone decreases the amount of combat flexibility immensely. If one battery is in the process of moving and the other goes out of action, air defense becomes nonexistent.

The battalion had to develop new tactics or be targeted for destruction at the outset of the exercise. Battalion headquarters was divided in a traditional manner, but with a few unique concepts. First, an administration and logistics support element, comprised of the S1, S4, distribution point, motor and mess facilities, was emplaced on the north side of Elephant Mountain near Orogrande, New Mexico, as far from enemy attack as possible and protected by the mountain. Tents and equipment were camouflaged and the activity hidden so as to make it difficult for the enemy to determine the function of the site. The second portion of the headquarters element was the command control element. This element was comprised of the battalion command post, S2, S3, fire direction center, and communications. The S2 and S3 operated out of the tactical operations center (TOC), the center tent in the compound, which was on the west side of the mountain. Other tents provided billeting and space for some of the communications. At the extreme south edge of the compound was the manual AADCP. It was placed on the fringe to increase survivability. (If this site was targeted, the center of the site was more likely

Erecting a site at the base of the mountain.



The manual Army air defense command post directing the missile firing.

to be hit than the edge.) In the exercise, this arrangement allowed the AADCP, which commanded the air battle, to continue to function.

The question of how best to camouflage a command control facility and reduce its battlefield signature was easily answered. First, the normal measures of keeping unnecessary vehicles out of the area and good use of netting were taken. But the real indicator of any air defense command section is the number of communications antennas around it. To mask the command control element, all antennas were remoted 1.8 kilometers away, at the extreme southern edge of the mountain. Here the battalion tried another experiment. The battalion acquisition radar antenna was painted a light blue. Because the desert terrain is flat and any dark (olive drab) object can be seen against the light horizon, the light blue antenna became almost invisible. This scheme of camouflage can also be applied to radio antennas of all types. Because any emitting site can be targeted by electronic intelligence (ELINT), few personnel were left near the equipment. The radar scope was remoted 50 feet and placed in a reinforced, dug-out position. Also at the communications site, multiple FM, AM, and VHF backups were used to insure that the command structure would remain intact as long as possible.

Because many ground forces were depending on the battalion for air defense cover, some type of early warning was necessary to alert the ground forces of possible air attacks. With both AM and FM backup for the air defense command (ADC) net within the AADCP, it was possible to provide this early warning. Once every 15 minutes, a one-way message was passed over both of these nets. The message stated only the air defense warning, weapons control status, defense condition, weapons alert designator, and Zulu time with a one-way transmission authenticator. When the AADCP determined that an air strike would occur at a specific location, the following message was passed: "Strike warning, strike warning, area___,___AC, heading___, ETA___," followed by a one-way authenticator. This action alerted both maneuver and air defense forces of an attack at a specific position.

The air defense units were using AM; therefore, the message passed over that net used GEOREF to designate the area. For all other ground forces, the area was given in universal transverse mercator (grid) over the FM. This net was open to any ground unit that wished to tune to that frequency.

The battalion then examined the batteries themselves. How do you make two square Hawk batteries flexible? Each battery was reorganized into four sections. The first was the battery command post, mess facilities, motor section, missile assembly, supplies, and billets. The battery train remained semifixed, as distant, dispersed, and camouflaged from the rest of the fire element as possible. Emphasis was placed on the maximum use of wire to help hide the site and all radios were remoted. The next element was the command element, which was comprised of the battery control central/information coordination central (with a VHF 103 stack), a generator, and one communications van — making a total of three vehicles. This element moved quickly with only limited problems. The third element was firing leg A, which consisted of the pulse acquisition radar (PAR), a high power illuminator radar (HIPIR), a launcher section, and two generators. The final element was firing leg B which was organized the same as leg A with the exception that the PAR was replaced by the continuous wave acquisition radar (CWAR). The key to the new technique was emplacing the two legs independent of each other.

The blue camouflage of the AN/GSS-1 antenna (right) in contrast to the AN/TPX-46 (IFF) antenna.

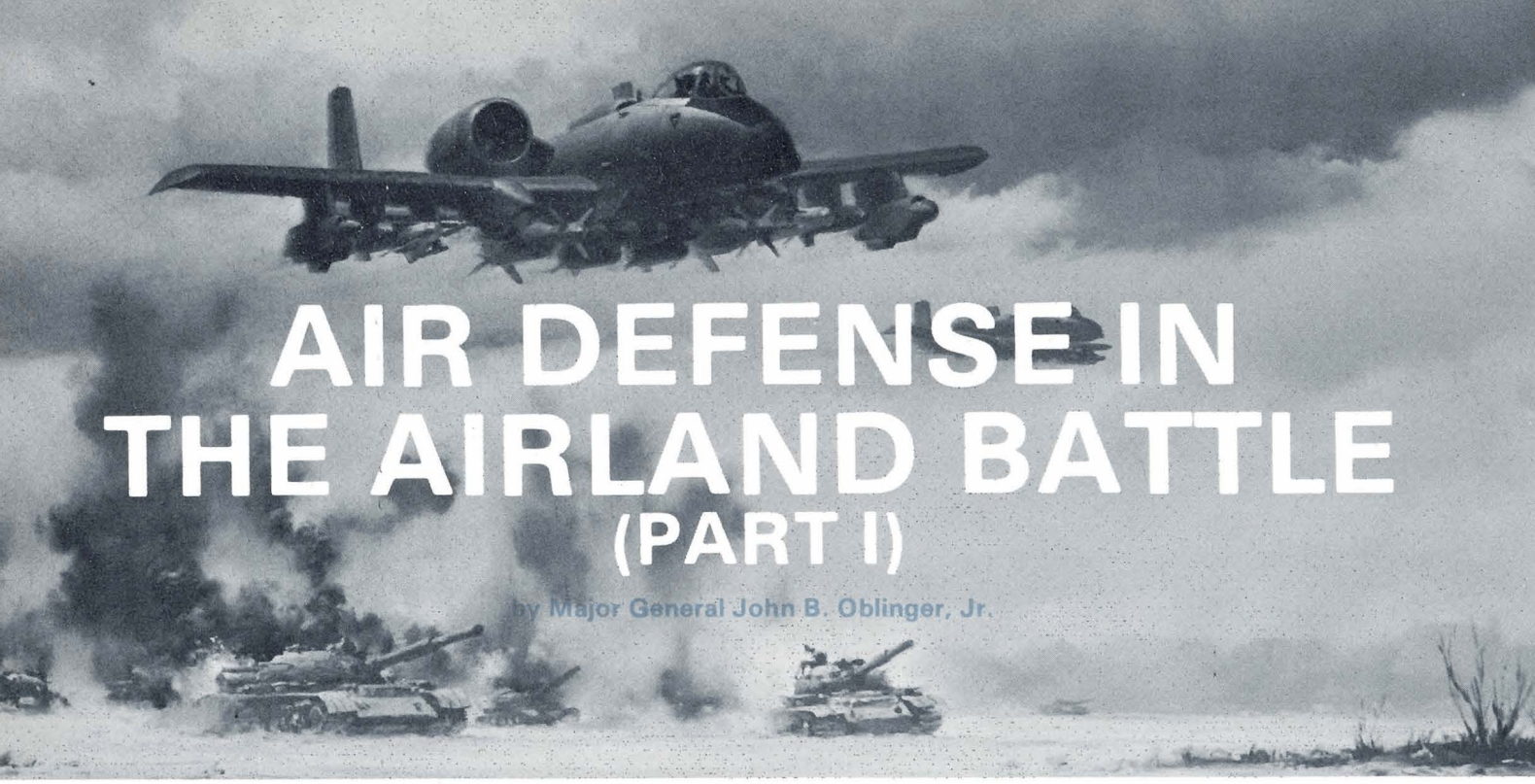
Positions for each leg as well as additional positions were prepared as far in advance as possible. To aid the "hiding" of a leg, the position of each piece of equipment was revetted by a scoop loader. When the equipment was in position, all cables were laid and buried. The command element was moved into position briefly to insure ADC that the radio link (VHF) was operational and then it was pulled out. All radars in a hidden site were completely covered with camouflage and VHF antennas were dropped, with the exception of the base, to insure proper positioning when the site was activated. Once a site was camouflaged and reinforced, all trucks and nonessential equipment were moved from the area and returned to the battery train area. A small manning crew was left at the inactive site with rations to cut down on traffic into a hidden site. Once both sites were completed, the battery commanders and battalion staff coordinated on which of the positions would be occupied and activated. If one battery commander uses leg A, the other must use leg B. This insures that while one leg is using the higher altitude acquisition capability of the PAR, the other active site complements it with the lower altitude acquisition capability of the CWAR. Once the sites were determined, the command element was moved into position.

The minute a site becomes operational and radiates its radars, the assumption must be made that the site can be targeted. When an attack becomes imminent on one of the two active positions, the targeted command element moves to its hidden position and the firing leg moves into a new prepared site. After the first battery moves and becomes operational, the second moves. This way the active sites will still complement each other. Movements should always be at night; however, if a deception of the enemy is desired, inactive sites may move at first light or last light so the enemy will attack the "down" site, leaving the active system open to engage the aircraft as they approach the "down" or "dummy" site. If there is equipment failure, the equipment may be placed in the "dummy" legs so that each battery is still capable of firing while deceiving the enemy. In effect, the batteries are able to split the size of the convoys and minimize downtime due to emplacement and movement. The battalion (less headquarters) moved five times during the exercise.

During Border Star '81, three other air defense units and one Air Force element served with 5th Bn, 57th Air Defense Artillery. The 4th Bn, 1st Air Defense Artillery, Fort Bliss, provided combat teams to the opposing forces army. These teams were placed with maneuver elements on the battlefield and forced enemy aircraft into higher altitudes so they could be engaged by Hawk. The 1st Bn, 200th Air Defense Artillery's Dusters also served to push the aircraft into the Hawk engagement zone. The Air Force provided four simulators that served as "dummy" sites. Two of these simulators were MPQ-10Ss, which acted as surface-to-air missile (SAM) sites; one was an MPQ-10A, which served as a triple-A site; and one was a Vitro simulator, which can act as either a SAM or a triple-A site. These were placed at varying locations throughout the battlefield so as to degrade the enemy's ELINT capabilities.

The GHOST Hawk technique was a total success. The AADCP and batteries suffered minimal "controller" damage. To further the deception plan and reduce detection and aggressor activity at "active" sites, the battalion moved one "dummy" leg during dusk. This action was detected and targeted by the Joint Unconventional Warfare Group but had no major impact on the conduct of the air battle. During BORDER STAR '81, the battalion achieved its major objective: to support the opposing force by providing effective air defense.

In and around the bushes, the only signature is the AN/TRC 145 antennas.



AIR DEFENSE IN THE AIRLAND BATTLE (PART I)

by Major General John B. Oblinger, Jr.

Introduction

US Army air defenders everywhere must learn the meaning of the airland battle and its implications to air defense. This is the first article of a series that will introduce the role of air defense artillery in the airland battle, a term encompassing a number of tactical concepts. Among others, the term incorporates both the integrated battlefield (where conventional, nuclear, chemical, and electronic means are used) and the extended battlefield (which extends the integrated battlefield to allow for interdiction of the enemy's follow-on echelons). The objective of airland battle is to create opportunties for our fighting forces to seize the initiative, go on the attack, thwart the enemy's plans, and bring the battle to a quick conclusion on our terms. The thrust of airland battle is not to avert defeat but to win. We must begin today to refine and implement air defense fighting techniques that will lead to victory on the airland battlefield.

Overview

General Starry, Commanding General, US Army Training and Doctrine Command, in his article, "Extending the Battlefield," published in the March 1981 edition of *Military Review*, described the airland battle as an extension of the battle and the battlefield that makes full use of our acquisition, targeting, and weapon systems. The airland battle encompasses a battlefield in which resources are employed in a way that offers great promise toward achieving victory anywhere in the world, over numerically superior and well-equipped forces that use Soviet-style operational concepts and tactics. We will fight the airland battle not only in Europe and Korea but also in areas of the world where our contingency forces might fight.

The battlefield and the battle are extended in three ways: in distance, in time, and in the type of assets commanders use to fight the battle. Commanders must see deep — in the case of corps commanders, out to about 300 km — to determine the enemy's capability to affect the friendly commander's future operations. When possible, the corps commander will selectively attack critical deep targets out to about 150 km to disrupt the follow-on echelons. Commanders must plan well into the future so they can prepare alternatives and be ready to fight the close-in battle. For example, the corps commander's planning horizon is about 72 hours into the future while the division commander's influence focuses on the next 24 hours. Finally, commanders must expand the number of assets they will use to fight the airland battle. The corps commander uses artillery, electronic warfare, and supporting air forces to strike deep, and he relies on a variety of national- and theater-level sensors to give him the necessary targeting information. The division commander strikes with maneuver forces, tactical air, scatterable mines, and field artillery. He sees with such systems as his ground surveillance radars, supporting OV-1D sidelooking airborne radar assets, and stand-off target acquisition systems.

Deep Attack

In his article in the June 1981 issue of *Army* magazine, titled "Winning on the Extended Battlefield," Lieutenant General Richardson, Commanding General of the US Army Combined Arms Center, discussed in detail a fundamental tactic of airland battle: deep attack. In the offense, successful deep attacks preclude the defender from rapidly reinforcing his forward forces, thus allowing the attacking forces to retain the initiative. In the defense, deep attacks delay, disrupt, or divert the enemy follow-on forces in an effort to stall or break up his momentum. The main goal of deep attack in the defense is to create openings where the defending force can achieve local superiority over the attacker. In this way, the defender can attack, wresting the initiative from the enemy. Since we simply do not have enough resources to destroy all of the enemy's systems at great range, we must be selective in the targets we choose. We must concentrate on knocking out high pay-off enemy elements that are required to command, control, and sustain the battle. Consequently, command posts and lightly armored logistic equipment are excellent targets for deep attack.

The primary tools for striking deep are friendly air, artillery, Special Forces, Rangers, electronic warfare, and deception. At the present time our only strong suit is air or artillery interdiction, but there also may be opportunities for the limited use of Special Forces or Rangers in an offensive role against follow-on echelons. Electronic warfare and deception are, at present, potential means of deep attack which need to be developed. The current range of friendly jammers precludes effective use against follow-on echelons. However, jamming can be used in the close-in battle as a nonlethal substitute for fires, thus freeing battlefield air interdiction sorties that can then be allocated for deep attacks. Deception offers great promise in terms of diverting, delaying, or disrupting an enemy, thus frustrating his plans for commitment.

Dual Responsibility

In the airland battle, commanders have the dual responsibility of fighting or attacking one echelon while observing and preparing to attack follow-on echelons. An illustration will help to explain this. Figure 1 shows an enemy attack formation moving toward a defending US corps. The enemy's front is echeloned into two armies. Similarly, the enemy's first echelon army consists of first and second echelon regiments.

The corps commander's responsibility is to see the enemy deep — 72 hours before the enemy would arrive at the forward line of troops (FLOT) or at a distance of about 300 km — and to attack the second echelon divisions of the first echelon army. In his attack of these divisions, the corps commander's current strike assets include air delivery systems, Special Forces, Rangers, and tactical nuclear weapons (if authority to use them has been granted). Targets could include key command and control centers, bridges, soft-skinned logistical elements, and forward airbases. The most important point here is that the corps commander is looking for those time-specific targets whose destruction or engagement will give high pay-off later in the close-in fight: namely, those targets that will contribute the most to slowing the arrival of follow-on forces at the FLOT.

The division commander attacks the second echelon regiments of the first echelon divisions and uses his sensors to observe and plan for the attack of the follow-on divisions. The division commander uses his own as well as supporting corps' long-range field artillery and air, and (if authority has been granted) nuclear weapons. The division targets potential choke points such as narrow valleys, built-up areas, key bridges, fording sites, and more vulnerable assets such as command posts. If the tactical situation permits, the division commander might commit his maneuver forces against a following echelon,

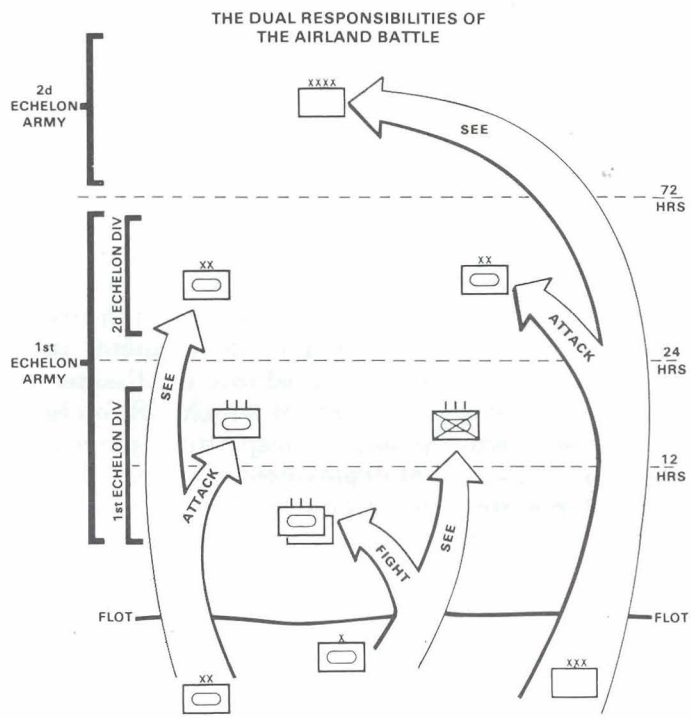


Figure 1.

seizing the initiative and seriously disrupting the attacking force.

The brigade commander's dual responsibility is to fight the assaulting regiments while finding the follow-on regiments of the first echelon divisions. It is here that the complexion of the airland battle changes from one predominantly of air to that of land combat. The brigade commander takes action at this point to destroy the enemy in contact at the FLOT and to delay and disrupt the following echelon of the first echelon division. The brigade commander will use all available resources to get the job done, including his maneuver forces, the family of scatterable mines (deliverable by either aircraft or field artillery), electronic warfare, and supporting long-range field artillery.

Targeting

To integrate the process of developing attack options and the acquisition data available from the numerous sensors and surveillance systems, targeting cells must be established in the fire support elements at levels from brigade through echelons above corps. To fight the airland battle successfully, a great deal of advance planning is required. At each level, planners must conduct a thorough intelligence preparation of the battlefield, including forecasts of enemy strength, progress, and dispositions at selected times during the attack. This preparation serves as a yardstick against which the enemy's actual progress can be measured. The enemy's attack options must be analyzed and the vulnerabilities of each determined. Through this process, potential high-value targets can be anticipated and, when realized, attacked at the most opportune time. For example, the destruction of a key river-crossing site should not be effected until well after the enemy is committed to that avenue of approach.

Airland Battle in Contingency Operations

The underlying principles of the airland battle transfer readily to non-NATO scenarios. Successful contingency operations require winning two wars: the war of deployment, in which US forces are introduced into the theater, and the war of employment, in which US forces maneuver to win the battle. Deep attack plays a key role in the war of deployment by preventing enemy forces from converging on the initial forces during the critical early hours and days. During the war of employment, deep attack is critical to creating opportunities for friendly forces to go on the attack.

The Future

As General Starry has stated, the airland battle is not a concept. It is the way we must fight if called upon today. My discussion in this article will describe those things we can do today (fig 2), with current resources, to insure that ADA is ready to play its part on the airland battlefield at all echelons of command. The next article will emphasize in more detail the implications for air defense and the airland battle in contingency corps operations and the Rapid Deployment Force. Subsequent articles will focus on the NATO environment.

Operative Tactics

The operative tactics of the airland battle must provide for quick resolution of the battle on our terms. This is so because the enemy generally enjoys a short-term advantage in ability to mobilize additional forces quickly. The objectives of these operative tactics are:

- Deny the enemy the objectives he seeks.
- Prevent enemy forces from massing for the close-in fight.
- Find or create the opportunity to seize the initiative.

ADA supports accomplishment of the first objective in several ways. First, ADA limits the enemy's use of reconnaissance aircraft during hostilities and provides surveillance data on these types of activities. Second, friendly forces that are mobilizing are protected by ADA to facilitate their employment. Finally, ADA is used to limit the air support of attacking enemy forces and to assist the Air Force in its efforts to deny the enemy the air superiority that he surely will seek.

ADA assists in preventing the enemy from massing for the assault force fight by protecting those deep-strike assets that US forces must use to interdict enemy second echelon forces. The deep-strike assets are located at each level of command and require both high- and medium-altitude air defense (HIMAD) and short-range air defense (SHORAD) protection.

ADA supports finding or creating opportunities to seize the initiative through performance of all the ADA functions previously discussed and, most importantly, by protecting maneuver forces, command and control facilities, and friendly intelligence sensors and organizations.

Having generally outlined how ADA supports the operative tactics to be employed in the airland battle, let's discuss the specifics of how this impacts on the different levels of command.

Air defense artillery's direct contribution at theater level in support of the airland battle is to protect the strike assets, the command and control complexes, and the surveillance and sensor

systems. Air defense artillery may also be able to provide information to the target cells based on radar acquisition and surveillance data.

If the corps commander is to strike deep, he must rely not only on his own artillery but also on the assets of the theater commander, namely the Air Force and theater long-range artillery. Today, we place a high priority on protecting our main operating bases in Europe. In addition to our HIMAD assets, Chaparral/Vulcan battalions are deployed to provide SHORAD terminal defense of these airbases. In the future, Roland battalions will assume this mission. We must now consider the added requirement of better protection for the theater level artillery (including the Pershing system), which has no dedicated air defense. Additionally, there are theater sensors that may require airfield terminal point air defense protection. Further analysis is required to identify other potential high priority assets that may also require additional air defense protection, such as joint or theater level reconnaissance elements.

In Europe we now have theater-level ADA units (namely the two forward deployed Hawk groups) located in the corps commander's areas that provide long-range observation beyond the FLOT. These units have information in the form of acquisition and surveillance data that may be of use to the target cells, provided that the data are made available in a timely manner. For example, observed heavy air traffic in and out of a specific location might indicate a formerly undetected enemy airfield in the corps commander's area of influence.

ADA in the Corps

Today, the only dedicated air defense in the corps base of our NATO corps is those Stinger or Redeye assets organic to the armored cavalry regiment and corps artillery; however, the Army 86 Study identified the requirement for a SHORAD group for these corps. This organization would provide the corps commander with his own air defense for terminal SHORAD protection of many of his critical assets. This group will consist of DIVAD Gun, Stinger, and Improved Chaparral units, providing the corps commander with dedicated ADA resources to influence the air battle. (I will discuss the corps SHORAD group in greater detail in a future article.) For contingency missions, a contingency corps would be supported by an ADA brigade. If the corps commander is to see deep and fight deep, we must protect his command and control activities, the corps aviation assets, and his long-range artillery such as Lance, as well as any air force advance-operating bases located in the corps area. This also includes those corps assets deployed forward with the divisions. As all of these elements are integral to successful implementation of the airland battle, all must be protected from air attack.

Since the corps commander must rely heavily on tactical aircraft for interdiction as well as surveillance, the need for effective airspace management is all-important. The Aviation School has led the effort to develop more effective airspace management procedures and has drafted FM 1-103, *Airspace Management and Air Traffic Control in a Combat Zone,* which is now in the staffing process. Related to this effort, there is a definite need for an organic air defense element to provide air defense-related input and expertise to the corps commander's staff. The two CONUS-based corps have air defense elements on their staffs, but liaison elements from supporting Hawk groups must fulfill this function in Europe.

The need for a corps SHORAD organization and for more effective airspace management were both identified in the Army 86 Study as well as in our recently completed Air Defense System Program Review. Actions are now underway to support the ADA section of the corps airspace management element and we will continue to support the establishment of a corps SHORAD group.

Division Air Defense

In the division the brigades must fight the close-in battle. It is the divisional air defender's task to fight two distinct air battles. In the forward area, he must protect the maneuver forces from the threat's attack helicopters and ground support fighters. The rear divisional air battle requires protection for combat support and combat service support assets from threat interdiction aircraft and heliborne operations. I believe we will be in great shape in the future with respect to our divisional air defense capabilties with the DIVAD Gun, Chaparral (with its numerous improvements), and Stinger; however, we must be most concerned with what we have today. We have recently consolidated divisional Redeye teams into the SHORAD battalions, a move that will lead to better training for these teams while providing more effective air defense for the combined arms team. We have begun to replace Redeye with Stinger, another tremendous step toward providing more effective air defense to the divisions. The early transition to our Division 86 SHORAD battalion organization using existing weapons requires a review of the way Vulcan and Chaparral fight. We must be sure our techniques are sound and consistent with maneuver force requirements of the airland battlefield.

Because of the expected fluid nature of the

division's fight, the principle of centralized control and decentralized execution will take on even greater significance. Successful engagements will require split-second decisions, yet we can ill afford downing friendly aircraft. Thus, command and control and airspace management are again of major concern. We have recently developed a standardized, manual, SHORAD control system that makes the most effective use of the equipment available to the divisions today. We will pursue acquisition of an improved high-frequency radio as well as an automated SHORAD command and control system for cueing and alerting. This will allow us to take better advantage of the capabilities our new weapons possess while insuring that alerting information is provided to the force in a timely manner.

Equally important as command and control is the way we design defenses. New priorities will emerge based on the airland battle requirements. Perhaps logistical elements must be left to passive measures while air defense systems are allocated to protect reinforcing corps artillery units, the army aviation forward area rearm and refuel points and divisional artillery. Perhaps more dedicated protection must be provided to the critical nuclear delivery units at the expense of no dedicated protection to other assets. Air defenders must be cognizant of these considerations and advise the division commander accordingly.

What We Must Do Now

The considerations I have outlined above can be distilled into a number of things that I feel we can do today with resources currently available.

THINGS TO DO TODAY

- ☐ **Educate the Air Defender.**
- ☐ **Link ADA with Target Cells.**
- ☐ **Protect Air, Artillery, Sensors.**
- ☐ **Develop and Implement Flexible SHORAD Tactics**

Figure 2.

We must be sure air defenders everywhere are knowledgeable of the airland battle and of our responsibilities on that battlefield. At every level of command the air defense staff officer recommends air defense courses of action or alternatives to the commander, who then decides how to allocate his air defense resources. We must educate our air defense officers so that our recommendations continue to be realistic and supportive of the overall airland battle plan. Consequently, the airland battle will become an integral part of our program of instruction as well as our training and doctrinal literature programs. We will soon begin teaching the airland battle in our basic and advanced courses. Additionally, to help bring our field commanders up to speed, we will soon send out packets containing briefing materials and other information for their use. Also, our branch training teams will solicit feedback during their visits to the field.

At all levels, we must use our ADA sensors wisely to help the commander observe activities deep in the enemy rear. Information of enemy air activity must be passed not only forward as early warning to subordinate or supported air defense elements but to the targeting cells at each level so that the intelligence value of our data may be considered. We are refining this idea and will find the best ways to do it.

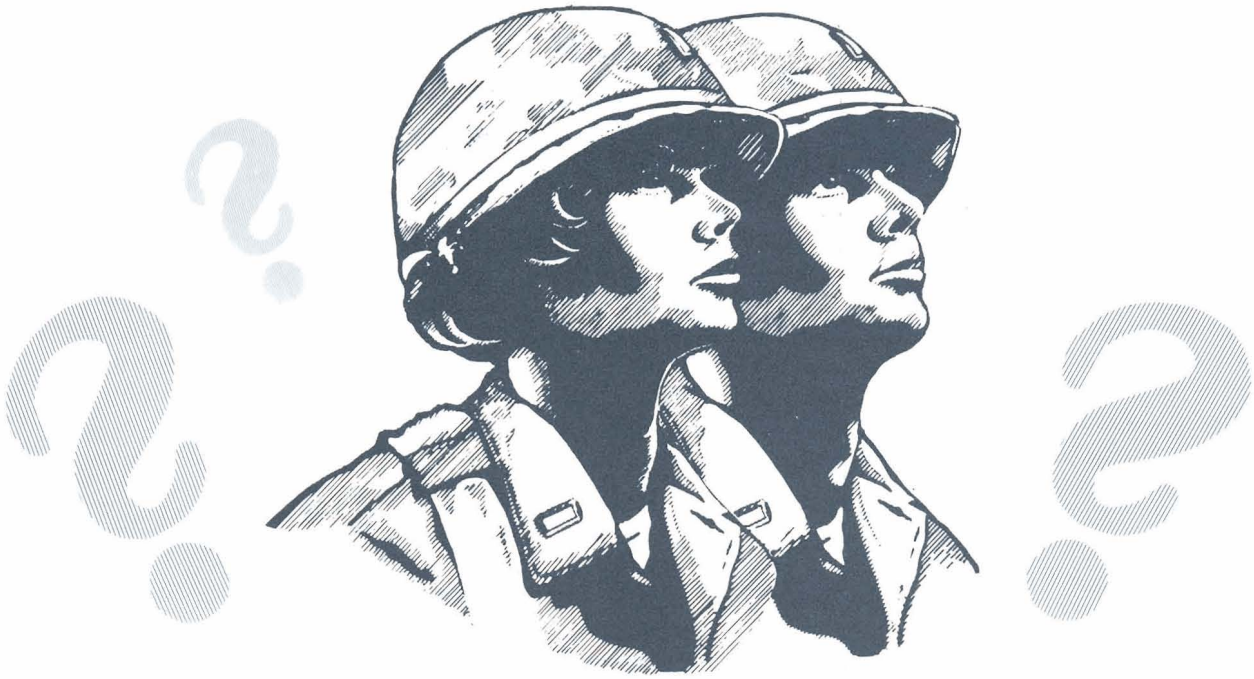
An important contribution ADA has to make on the airland battlefield is protection of the surveillance sensors and weapon systems so vital to deep attack. We face a real challenge in protecting Pershing and Lance, and in the future the multiple launch rocket system, since our assets above the division are limited and already committed to other missions. We fully recognize the challenge and we have begun working on this problem within the Air Defense School to find solutions.

Finally, we must evaluate our divisional SHORAD tactics to be sure they meet requirements to support the close-in fight. We know that divisional ADA must be ready to transition from support of defensive operations to that of offensive operations at a moment's notice. We must look directly at the way we organize for combat to be sure we can do the job required in the most effective way.

Our Task

If we are to meet the airland battle challenge, we must all begin to practice, learn, and refine procedures to win — it is not enough simply to avoid defeat! We at the Air Defense School are directing our doctrinal, materiel, organizational, and training programs so that they are consistent with and supportive of the airland battle. Your experience, ideas, and thoughts on what works and what doesn't are important, and we need to know your initiatives. In this way, we can be sure that our programs and the results of those programs closely track with what is needed in the field. I look forward to working with you to meet the challenges ahead.

WHAT DO YOU DO NOW,



LIEUTENANT?

Prepared by Tactics Department, USAADS

by Captain Richard A. Palmer

SITUATION:

First Lieutenant James Whitcomb is the Assistant Operations Officer, 1st Battalion (Hawk), 74th Air Defense Artillery, Federal Republic of Germany. Two weeks before a joint command post exercise, Lieutenant Whitcomb was tasked by the S3 to present a class on the effects of electromagnetic pulse and the precautions that could be taken against its effects. The class would be presented to the officers in the battalion who would in turn use the information as background for instruction to their troops.

Fortunately, Lieutenant Whitcomb had taken good notes during a briefing presented by a Defense Nuclear Agency officer who was visiting Fort Bliss while Lieutenant Whitcomb was attending the Officer Basic Course. The lieutenant was able to make extensive use of these in developing the class.

SOLUTION AND DISCUSSION:

Lieutenant Whitcomb organized his discussion in this fashion:

Everyone is aware of the three major effects of nuclear weapons — blast, thermal, and radiation. However, another effect that can be just as important is electromagnetic pulse or EMP.

When a nuclear detonation occurs, a strong pulse of electromagnetic radiation (or simply a radio signal) is produced. This very strong radio wave is called EMP. The strength of this pulse depends on the weapon's yield, but it can be quite sizable, and it can seriously affect our electronic equipment — either temporarily or permanently. Depending on the weapon's strength and our precautions, it can:

- Burn out transistors.
- Trip circuit breakers.
- Blow fuses.
- Introduce errors in computers.

EMP is associated with all nuclear explosions, both tactical and strategic. With tactical nuclear weapons, however, it is the blast, thermal, and radiation effects that will hurt you and your equipment. The damaging EMP will come from strategic weapons.

A high yield nuclear weapon exploded at an altitude of 400 kilometers over Moscow will produce an EMP covering all of Germany and most of western Europe. If you are in Germany, you will see no flash and feel no shockwave, yet the EMP produced by such a weapon could incapacitate your electronics.

EMP is a quick pulse. This can be appreciated by comparing EMP with lightning. Both are strong waves of short duration. A lightning bolt requires up to 1/10 of a second to peak, but EMP peaks in only one-millionth of a second. Therefore, devices that protect equipment from lightning are far too slow for EMP. Entirely different methods must be used.

How does this "faster than lightning pulse" get into your system? One of the simplest and most damaging ways is through an antenna. Antennas are designed to pick up a radio wave and transfer it, with as few losses as possible, into the guts of the system it services. However, antennas are not the only devices that can transfer EMP into your equipment. Masts, wiring loops, cables, and loops in the electronics of the equipment can do it as well. These "nondeliberate antennas" act as antennas even though they were not designed as such.

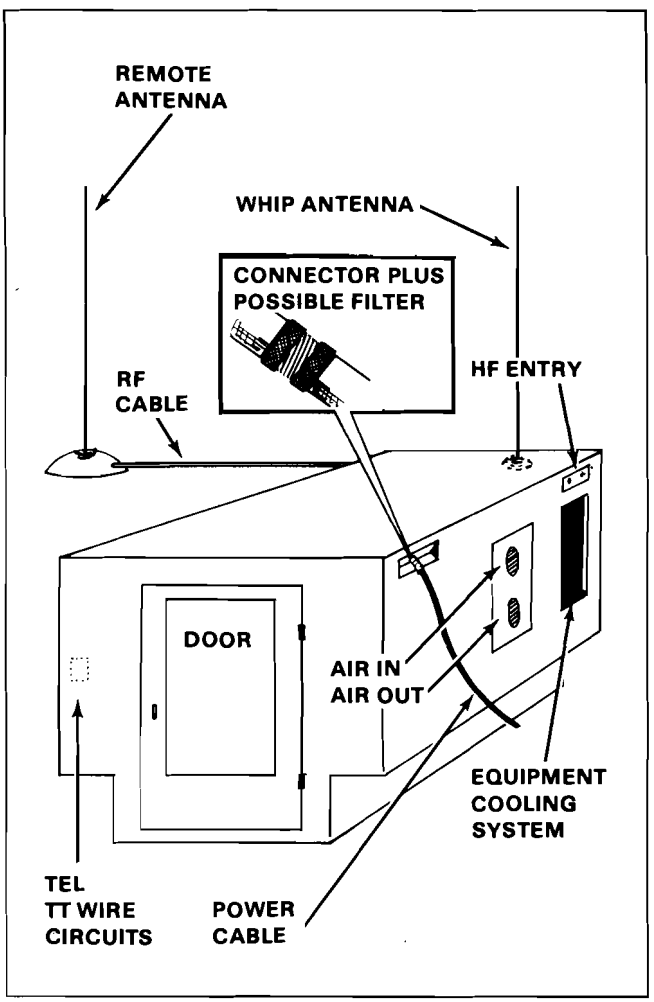
One important way to reduce pickup from these sources is through the use of shielding. Although not always practical for large rolls of cable, it is often useful for electronic components inside a piece of equipment. If the electronics are placed in a closed metal box, the electric fields inside the box are less than those on the outside of the box. A general rule is that if the box is tight enough to hold water without leaking, it will reduce the fields on the inside by a factor of from 10 to 1000 times. This means that the EMP pickup would be similarly reduced.

There are two possible EMP effects on equipment. Either the system can be temporarily upset but will continue to operate after the transient EMP has passed, or the system will sustain permanent damage because of the destruction of some of its components. In this case, operation can only be restored by replacement of the damaged components.

All systems are not equally susceptible to EMP. A general rule of thumb is that systems that can handle a lot of power can handle a lot of EMP. Motors, generators, and power transformers show very little susceptibility. On the other hand, the integrated circuits in our computers are susceptible to extremely low levels of energy. Fortunately, the most probable EMP effect in these systems is operational upset. This might mean the introduction of errors into the system or the complete erasure of what is stored in memory. These are usually overcome by reloading the system.

As we mentioned earlier, energy gets into our system through antennas (intentional or unintentional) and through individual components that lack sufficient protective shielding. Intentional antennas are necessary for the operation of the system and there is usually little we can do with them and still accomplish our mission. However, measures can be taken to minimize EMP effects on unintentional antennas, the most common of which are cables. A few simple rules can be used as protection guidelines. The larger the cable, the more energy it will collect. Second, raising the cable above the earth will enhance the pickup. Finally, cables configured to form loop antennas versus straight runs may result in additional pickup. Shielded cables are generally better protected against EMP. Unfortunately, sometimes we don't have a choice about which type of cable we can use.

Some shielding is built into the system. There are factors, however, that can limit its effectiveness. For example, in the shelter diagram there are a number of openings which negate any shielding the shelter would otherwise provide.



SHELTER DIAGRAM

Some of these are the open duty door, the equipment cooling air intake, and the air conditioning ducts. To maintain the shielding effectiveness, good metal to metal contact must be maintained around the doors, and screens should be placed over the air intakes and exhausts. Also shown are a number of cable penetrants such as the telephone and teletype circuits, the power cable, and the antenna.

Minimizing the destructive effects of EMP depends on appropriate maintenance practices, and appropriate operational procedures. In many systems, including our Hawk system, shielding has been provided for both the equipment and the cables for the purpose of reducing interference with nearby or collocated systems. The shielding effectiveness can and does deteriorate with time and usage. If it is maintained correctly, a significant level of protection can be retained. The following maintenance is required:

1. Where gasketing is used around doors and vents, etc., maintain clean metal contact for the gaskets and, if possible, replace the gaskets periodically.
2. Check and repair, if necessary, the connection of cable shields at connectors. Good peripheral connection is mandatory.
3. Insure that any new cables brought into the enclosure have the cable shields terminated on the enclosure.
4. Keep all access panels and other apertures closed at all times other than when they must be removed for maintenance.
5. Minimize cable loops whenever possible, and keep cable runs as short as possible.
6. Maintain filters, if used, on power systems, etc. (Check periodically and repair/replace if necessary.)

Operational practices follow policies designed to reduce the exposure of the system. If for some reason the equipment is not needed for a period, disconnect the external cables (power, information, and antenna), and button up the unit. In this configuration, the susceptibility has been reduced if not eliminated. At all times, whether in operating or nonoperating status, keep all doors and access panels closed. For critical systems, and if the SOP allows, maintain a supply of critical spares.

If in spite of all precautions you have an outage due to EMP, the first step is to find out what failed. By exercising the system, it is possible to determine where the outage occurred. For example, if breakers opened, good practice would be to reset them. If they do not go out again, it can be assumed that it was a transient upset.

Also be sure to make use of available redundant systems. If EMP causes an outage of only part of your system, it may be possible to use another unit or other equipment to perform that function even if it is slightly degraded.

CONCLUSION:

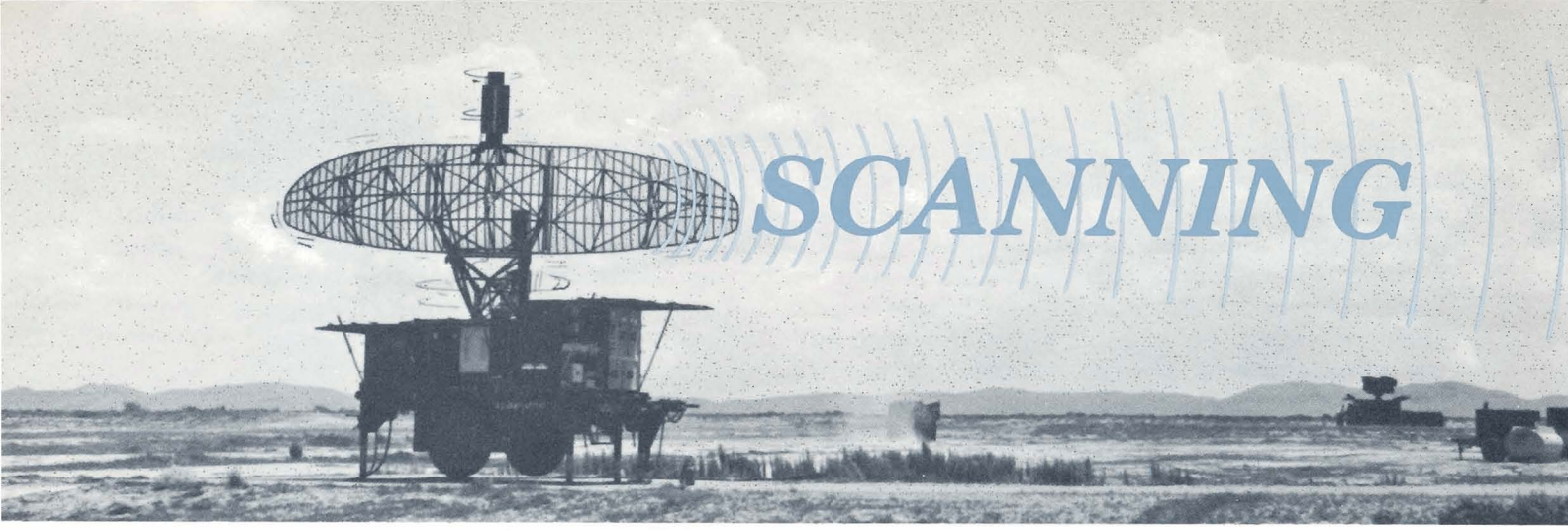
EMP is a serious threat to the battlefield. The protection of our critical systems from its effects will continue to be a problem in the future. Each of us has a part in the solution of this problem. The weakest link in the chain is each of us as a human being. The operational capability of the finest system can be degraded by a single careless operator or maintenance man. If someone improperly mates just one critical connector or fails to install a ground cricuit or a gasket as it should be, an entry path for the electromagnetic pulse may result. This single weakness may result in system death, failure to accomplish the mission, and unnecessary loss of lives.

The battalion commander was pleased with the class Lieutenant Whitcomb presented. But even more important, the officers of the battalion took to heart the imperatives presented. They insured that the battalion was prepared and doing everything possible to reduce the potential effects of EMP on their ability to accomplish the mission.

ACKNOWLEDGEMENT:

Acknowledgement is given to the Defense Nuclear Agency and the US Army Field Artillery School for briefings and classes from which much of the information contained in Lieutenant Whitcomb's class was taken. Without their assistance, the class would not have been possible.

CAPTAIN PALMER *graduated from Georgia Tech with a degree in physics and has done graduate work in electrical engineering at Rensselaer Polytechnic Institute. A military intelligence officer, he is currently serving as a senior instructor and the electronic warfare/C² section chief in the How To Fight Branch, Tactics Department, DOTD, US Army Air Defense School.*



STINGER UPDATE

The fielding of Stinger triggered a chain of events that has affected both Redeye and Stinger personnel. Changes have occurred ranging from individual MOSs to unit organizations.

MOS

In September 1980 a new MOS, 16S, was established for MANPADS gunners. This MANPADS crewman MOS, which is awarded to Redeye and Stinger trained personnel, allows for a career progression from E-1 to E-7. The 16S40 will be a MANPADS platoon sergeant and will feed into 16Z50 at the E-8 level.

SQI

To identify MANPADS gunners who have received Stinger training, a skill qualification identifier (SQI) of "T" is used. This "T" SQI is to identify those individuals who have received formal Stinger training. This SQI will be used during the next 4 to 5 years while Stinger is being deployed throughout the Army.

Individual Training

Initial entry training for the 16S MOS began in November 1980. Twenty-four classes will be conducted each year with a new class starting every 2 weeks. Class size will vary between 40 and 50 students. The 16S10 MOS training is a 13-week, performance-paced, OSUT course that emphasizes hands-on instruction. This course prepares MANPADS gunners for Redeye and Stinger assignments.

Transition Training

Perhaps the most frequently asked question (and area of most concern) is "How do I become Stinger trained?" To convert USAREUR units from Redeye to Stinger a new equipment training (NET) team has been established at the moving target simulator at Vilseck, Germany. This MICOM-supervised NET team will convert all USAREUR Redeye-equipped units to Stinger over the next several years.

Transition training for the other major commands (FORSCOM, WESTCOM, SOUTHERN Command, Eighth Army) will make use of a training cadre provided by the gaining unit. For example, under this plan the 82d Airborne Division would send a 3-4 man cadre to Fort Bliss for instructor training. Upon completion of its training the cadre, along with USAADS personnel, would deploy back to Fort Bragg and begin to convert 82d Airborne Division units from Redeye to Stinger. This plan allows the unit to retain the Stinger expertise even after the formal transition training period ends.

Basic Noncommissioned Officers Course

Actions are underway to establish a 16S basic noncommissioned officers course (BNCOC) in the various NCO academies. The 16S BNCOC will offer two separate tracks, Redeye and Stinger, thus allowing local NCO academies the ability to tailor the 16S BNCOC to meet the needs of the student. The 16S BNCOC should be implemented in NCO academies in October 1981.

Skill Qualification Test

In FY 81 individuals serving in 16S Redeye assignments were required to take the 16P SQT, Redeye track. In FY 82 this practice will be eliminated by a new 16S SQT. The 16S SQT will contain Redeye and Stinger tracks allowing for individuals to be tested only on the weapon system to which they are assigned. The FY 82 16S SQT is scheduled to be administered from July 1982 to March 1983.

Reorganization

In August 1981 the Army Chief of Staff approved the consolidation of the maneuver battalion MANPADS sections into a MANPADS platoon assigned to the Chaparral/Vulcan battalion. This change will now provide for a fourth platoon in each Chaparral/Vulcan battery. In nondivisional situations, each regiment or

separate brigade will have a MANPADS platoon at regiment or brigade headquarters. MANPADS sections assigned to corps artillery units will not be consolidated into platoons.

Existing Devices

The M134 training set, guided missile system consists of the tracking head trainer, trainer batteries, IFF simulator, and a shipping and storage container. The tracking head trainer closely approximates the appearance, operating characteristics, weight, and balance of a live round. A performance indicator box is included on the launch tube to evaluate gunner performance. A series of indicators identifies successful performance or pinpoints the cause of unsuccessful engagements. The trainer is used in the moving target simulator and in the field to train gunners in firing techniques.

The M60 field handling trainer consists of a weighted and balanced dummy launch tube, inert separable gripstock assembly, and a shipping and storage container. The field handling trainer is used to provide practice in weapon handling, including weapon round assembly and disassembly, preparation of basic load and ready rounds, reaction drills, sighting, and ranging. Controls and mechanical actions are the same as the tactical round; however, the trainer has no active internal components or electronics.

SSG Adcock, a 16S3T, prepares to engage target with Stinger.

Publications

To support both Stinger and the new MOS, a variety of new publications is being fielded, including the soldier's manual, trainer's guide, and job book. During the 4th quarter of FY 81, publications will be available for the 16S MOS. The 16S soldier's manual (SM) will have a different appearance from previous SMs in that many of the previous SMs' common tasks will not be included. These tasks will now be contained in a separate common task SM prepared by TRADOC. The manual was fielded during 3d Qtr FY 81.

New how-to-fight manuals also are being prepared for Stinger. FM 44-18-1, Stinger Team Operations, was fielded in January 1981. During FY 81 its companion manual FM 44-18, Platoon Operations, will be fielded. No revisions of the current Redeye manuals, FM 44-23 and FM 44-23-1, are planned.

THE AIRLAND BATTLE

As tactics and doctrine progress with time, new names and definitions emerge and become part of our military language. Recently we began to see use of the term, "integrated battlefield." Still more recent was the term, "extended battlefield." And now we have "the airland battle." For the sake of consistency, TRADOC has directed that the latter term be used when we talk about the total battlefield. Here is how the term, "airland battle," evolved:

The Integrated Battlefield.

This is a battlefield where conventional, nuclear, biological, and chemical munitions are in use or are expected to be used. The integrated battlefield is expected to be the normal battlefield of the future.

The Extended Battlefield.

This battlefield is an extension of the integrated battlefield to allow for the interdiction of the enemy's second-echelon force. The depth at which interdiction operations are carried out varies as a function of the level of command but ranges from 5 km beyond the forward line of own troops (FLOT) at battalion level to 15 km at brigade, 70 km at division, and 150 km at corps. These distances

represent those areas of influence where targets must be acquired and fire brought to bear against enemy forces by weapons under the commander's direction. Beyond the area of influence will be an area in which enemy forces are capable of affecting future operations. This is known as the area of interest and generally ranges from 15 km beyond the FLOT at battalion level to 70 km at brigade, 150 km at division, and 300 km at corps.

The Airland Battle.

This term encompasses both the integrated and extended battlefields and will be used when referring to the total battlefield. It includes the direct fire battle, the interdiction of follow-on forces, the air defense battle, electronic warfare, and the suppression of enemy air defense.

BMD GETS PRIME CONTRACTOR

McDonnell Douglas Astronautics Company (MDAC), Huntington Beach, California, has been elevated from an associate contractor to the prime contractor for the Ballistic Missile Defense (BMD) Low-Altitude Defense (LoAD) Project.

The LoAD project, managed by the BMD System Technology Project Office in Huntsville, Alabama, is designed to provide a cost effective, rapidly deployable, low-altitude system to defend US land-based intercontinental ballistic missiles from enemy attack. The system, composed of an inertially guided interceptor, a small phased-array radar, and a distributed data processor, can be used alone to defend such targets as the MX missile or used as the lower, underlay portion of a layered defense concept.

The LoAD Project Office will retain overall responsibility to oversee and direct project development.

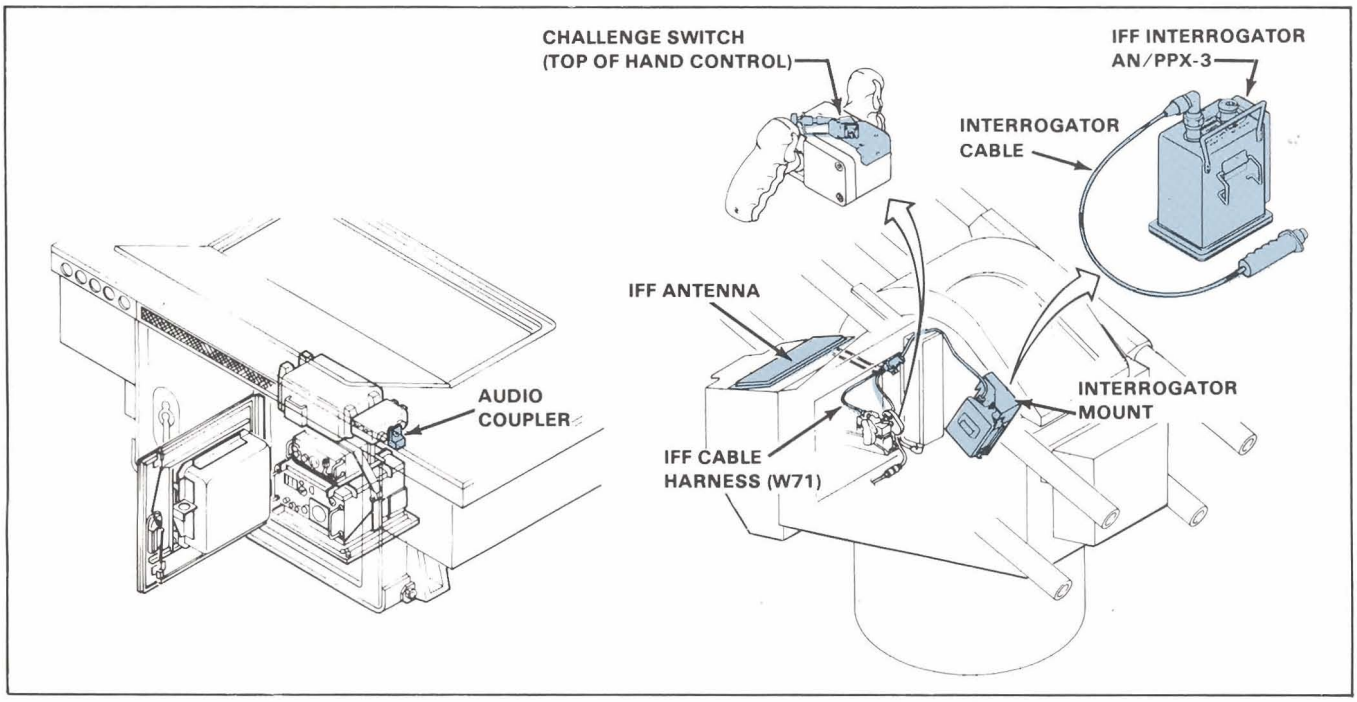
IFF FOR CHAPARRAL

A Ford Aerospace modification team is currently installing the Chaparral Block IV modification on Chaparral missile systems. The new modification has already been installed on five US Army Air Defense School (USAADS) M54/M48 launch stations that are being used for instructional purposes. The IFF new equipment training (NET) program for instructors and other key personnel has been completed at USAADS.

IFF training for the 16P10-OSUT and the Chaparral System Mechanic Course, No. 121-24N10, was implemented during May 1981 at USAADS. Instruction on the following subjects is included in the Chaparral training:

- Theory of Operation of the IFF System.
- Programing/Battery-Charging Procedure.
- Organizational Maintenance.
- Equipment Operation.

In addition to adding an IFF capability, the Chaparral Block IV modification will increase the overall reliability of the system.



New IFF Components for Chaparral.

BULLETIN BOARD

General Information

MODIFYING AUTO ENGINES FOR OVERSEA USE

Recent information provided to the Department of Defense indicates that many US-manufactured 1981 automobiles can be modified to use leaded gasoline overseas and then refitted for driving in the United States.

Officials at the Military Traffic Management Command (MTMC) have questioned US auto manufacturers concerning 1981 models and have received the following information:

General Motors — All engines can be modified, as with earlier year models. However, an oxygen sensor in the exhaust system adds an additional step to the refit program. Using leaded fuel may contaminate oxygen sensors in vehicles so equipped and consequently activate the engine warning light on the dashboard. (MTMC advises that replacement sensors will be available through the Army and Air Force Exhange System.)

Ford — The 2.3-liter engine cannot be modified. Some 1981 Mustangs, Fairmonts, Granadas, Capris, Zephyrs, and Cougars are fitted with this engine. The 5.0-liter engine in the Mark VI and the Lincoln cannot be modified either. Ford has said that it expects to have modification programs in effect for these engines before the end of the 1981-model year. All other Ford engines can be modified as in past years. When parts previously removed are reinstalled as part of shipment back to the United States, the oxygen sensor must be removed from the exhaust manifold and cleaned to remove lead contaminants. If the unit cannot be cleaned, it must be replaced.

American Motors — All engines except those with California emission systems can be modified as in past years. Kits for conversion of vehicles equipped with oxygen sensors are available through American Motors.

Chrysler — All engines can be modified as in past years, except the Imperial engine.

A COLLEGE DEGREE THROUGH SOCAD

The Army wants to make it easier for you to get an associate degree.

The idea is to increase opportunities for enlisted soldiers and warrant officers to get off-duty professional development while satisfying personal education goals. That's the reason for the Servicemember's Opportunity Colleges Associate Degree (SOCAD) Program.

The program links major Army installations with colleges and universities offering military career-oriented courses of study. Degrees are offered in such fields as accounting, law enforcement, food service management, automotive maintenance, and office management.

When institutions join the program, they agree to provide professional counselors to advise soldiers on enrollment, academic matters, and financial aid. The counselors work with soldiers to decide how the degrees are to be earned. They help discover what credits may be gained from knowledge, skills, and experience already gained from career specialities. Counselors also help find credits for correspondence, extension, and independent study courses.

Once a study program is worked out, the college makes a contract with the soldier to award an associate degree when the program is successfully completed. That college then becomes the soldier's "home" school. This way soldiers can transfer anywhere in the world or even separate from active duty and still continue the program at other colleges. Earned credits are transferred back to the "home" school.

Not all major Army installations offer the SOCAD Program yet, but efforts are underway to expand the program.

For more information on the program and how you can become a part, contact your local education center.

ENLISTED CAREER NEWS

ZONE B REENLISTMENT BONUS

Thousands of midcareer soldiers with 6 to 10 years of service recently became eligible for reenlistment bonuses. More than 60 new military occupational specialties (MOSs) were added to Zone B of the Selective Reenlistment Bonus (SRB) Program. Most of the MOSs are in the combat arms career fields. The few combat arms MOSs not previously designated for Zone A SRB in FY 80 were also added to the SRB Program. Zone A includes soldiers who reenlist between 21 months and 6 years of active service, while Zone B includes those soldiers who reenlist between 6 and 10 years of active service.

As a result of new legislation, bonuses also became available for soldiers in selected skills who have between 10 and 14 years of service. The Army's FY 81 Zone C Program will permit about 400 highly skilled linguists and other technicians to reenlist and receive a bonus. In the past, provisions for bonuses were only in Zones A and B.

Also, as a result of recent legislation, the maximum authorization payment for the SRB Program was increased from $12,000 to $16,000, and the maximum years of service for bonus computation was extended from 12 to 16 years. Thus, soldiers in Zone B may now reenlist for up to 6 years and receive a bonus based on the total additional obligated service. In the past, a soldier with 9 years service who reenlisted for 6 years at ETS could be paid a bonus based only on 3 more years of service rather than the full 6 years. Example: an air defense staff sergeant (16E) can now reenlist and receive a lump sum Zone B bonus of about $5,500 (before taxes). Prior to 1 Oct 80, a bonus was not available for MOS 16E (Hawk Fire Control Crewman). Had one been available then, the same soldier would have received about $2,400 under the pay scales then in effect.

Additional information on the above material may be obtained from local reenlistment NCOs.

IRR AND ING REENLISTMENT BONUS

A $600 bonus will be paid to combat arms veterans who reenlist for 3 years in either the Individual Ready Reserve (IRR) or the Inactive National Guard (ING).

The incentive bonus program initially will include enlisted soldiers with combat arms MOSs — either Active, Reserve, or prior service — who have completed their military obligations and who reenlist for 3 years in the IRR or ING. To be eligible, a soldier must have less than 10 years total service, but waivers of that time will be considered.

The first $300 of the bonus is to be paid when the soldier reenlists and the rest in $100 increments at the end of each year he serves in the IRR or ING.

The IRR is intended to furnish personnel to complete manning of Active Army and Reserve Component units upon mobilization, and to replace combat casualties in the intial stages of any conflict. The ING is composed primarily of soldiers who have a remaining National Guard commitment but are not in a unit.

The bonus is being offered to attract and retain trained soldiers to fill vacancies within the total Army upon mobilization.

While the first bonus will go to soldiers with combat arms MOSs, it is possible that other badly needed skills could be included later.

ENLISTED FORCE MANAGEMENT PLAN

The Enlisted Force Management Plan (EFMP), which was recently approved, addresses total Army (Active Army, National Guard, and US Army Reserve (USAR)) needs through 1987. The plan outlines future policy and initiatives necessary to maintain the effectiveness of the total Army.

The Active Army emphasizes the career force and projects a top five grade content of 273,500 to lead a 680,000 enlisted force. The top five increase of 14,500 is projected due to the needs generated by "force modernization" and the improved retention rates among career personnel.

The Army National Guard objective is to fully man the force at the peacetime authorized level of 390,000. This represents an increase of 71,000 end strength over fiscal year 1980 and includes a top five grade increase of 5,000.

The USAR objective is to fully man the peacetime authorized level of 226,000 which is an increase of 60,000 and includes a top five grade increase of 25,000.

The 1980 plan emphasizes retention beyond reenlistment, including shifting priority and emphasis to the career force, use of different pay/compensation systems, and emphasis on incentive management as demonstrated by Army skill and grade requirements. The plan also emphasizes total Army needs and includes transfer to the Reserve Component as a part of the soldier's life cycle.

UNIFORM ISSUES

Enlisted personnel in the rank of corporal and higher are authorized to wear shoulder marks on the Army green 415 shirt. The shoulder marks will be on black cloth with gold colored, embroidered insignia of rank. The shoulder marks are being developed and are estimated to be available for optional purchase from the Army and Air Force Exchange Service during the first quarter of fiscal year 1982 at a cost of approximately $2.60 - $3.00. Personnel may continue to wear the insignia of rank on the collar after availability in the supply system until a mandatory wear date is established. The new shoulder marks will be issued as soldiers are promoted to the next higher grade. There is no change in wear policy for personnel in the rank of SP4 and lower.

Major commanders may authorize the optional wear of awards and decorations on the Army green 415 shirt for personnel assigned to and physically present in commands located in Clothing Zone I. Areas in Clothing Zone I are listed in Common Table of Allowance (CTA) 50-900. Wear of awards and decorations will not be mandatory.

The foregoing changes will be included in a forthcoming change to AR 670-1.

"SWAPS" RIP-OFF

Unofficial word has reached Department of the Army that possible fraud or misrepresentation rip-offs may occur in enlisted assignment "swaps." One or more individuals or companies are contacting soldiers who send their names into selected service journals asking for CONUS assignment swaps. The potential "swapee" is asked to send in money (usually $5 to $8) for a "swaps listing."

Service journals that offer swap opportunities carry such name listings *free of charge* as a convenience to their readers. There is no reason whatsoever for the soldier to send in money to have his name listed.

US Postal Service headquarters has been alerted by at least one service journal that mail fraud could be involved.

REVIEW YOUR RECORDS

To obtain a microfiche copy of your personnel file, send a request to US Army Enlisted Records and Evaluation Center, ATTN: PCRE-RF-I, Fort Benjamin Harrison, Indiana 46249. Be sure to include your social security number on the request.

PROMOTION RECONSIDERATION

After the adjournment of each centralized promotion selection board, Department of the Army agencies are flooded with applications from noncommissioned officers requesting promotion reconsideration. The majority of these applications circumvent the chain of command and are sent to the wrong agency. These applications must be forwarded through the battalion or comparable commander and the soldier's military personnel office to Commander, US Army Military Personnel Center, ATTN: DAPC-POS-PE, Alexandria, VA 22332. This guidance is contained in paragraph 7-43, AR 600-200 (1 Jan 81).

Requests concerning a soldier's relative competitive posture should be sent to Commander, US Army Military Personnel Center, ATTN: DAPC-EP (specify appropriate career branch), Alexandria, VA 22332.

BARS to STARS

OPMD UPDATE

HOMEBASING

Recently, installation commanders have indicated that they would like to become more involved in the homebasing aspect (the return of soldiers to the same installation) of the Homebase and Advance Assignment Program (HAAP) as it affects officers. Under a new system that went into effect 1 October 1980, US Army Military Personnel Center (MILPERCEN) assignment managers advise officers of their HAAP options when they are alerted for assignment to an unaccompanied short-tour area. An officer who wants to return to the same installation (a homebase assignment) must apply using DA Form 4187. This application must be processed through the installation commander to MILPERCEN.

The new procedures allow the commander to participate more fully in the assignment process. Commander comments will be considered by MILPERCEN assignment managers when they program an officer for a homebase assignment.

Requests, in writing, for homebase assignments must arrive at the appropriate MILPERCEN assignment division within 30 days after an officer is notified of a short-tour assignment. If the request is not received within 30 days, an advanced assignment will be projected based on Army requirements, the officer's career development needs, and personal desires.

KEEP YOUR CAREER UP-TO-DATE

The Officer Record Brief, more commonly known as the ORB, is a vital personnel management document. It provides commanders and personnel managers with a concise, easy-to-read record of key personnel information. Every time there is a requirement to review an officer's qualifications, the ORB is one of the first documents screened. Such a review might be done by a career manager screening candidates for a particular assignment, or a selection board member evaluating promotion or schooling potential. The one positive step that an officer can take toward influencing assignments, schooling, or promotion is to insure that the information on the ORB is accurate and up-to-date. This can be primarily accomplished through the annual ORB audit followed by the proper submission of all required corrections.

The primary responsibility for initiating ORB corrections rests with the individual officer. However, the responsibility for processing these corrections belongs to the local military personnel office (MILPO). To accomplish ORB corrections, the MILPO and the officer must work hand in hand.

An officer who feels that certain information on the ORB is incorrect should seek assistance from the local MILPO. The officer should point out the error and be prepared to document the correction. Once all corrections are submitted, the officer should stay in contact with the MILPO to insure that the corrections are made to the automated record.

DA Pamphlet 600-8, Procedure 5-1, is the regulatory authority for processing ORB corrections. The submission/processing instructions outlined in this procedure are complex because not all corrections can be made through the Standard Installation/Division Personnel System (SIDPERS).

First, certain types of corrections must be submitted to the US Army Military Personnel Center (MILPERCEN) using the ORB coding sheet. Second, changes to certain data elements on the ORB must be verified by the proponent of those data elements before being made. Requests for correction of these elements must be forwarded by the MILPO to either the appropriate office within MILPERCEN or to one of the DA professional branches (Medical, Chaplain, JAG). All other corrections are submitted through normal SIDPERS transactions.

Every officer visiting MILPERCEN to review his Official Military Personnel File is provided an

ORB for review. At that time, an officer may submit ORB corrections for MILPERCEN input, if supporting documentation is provided. These corrections are all processed at the top of the system; however, certain types of corrections must also be input to the SIDPERS Personnel File (SPF). This is critical in maintaining compatibility between field and MILPERCEN automated files. To support this compatibility, officers who initiate ORB corrections at MILPERCEN are informed of those corrections that must also be submitted to their local MILPO for input to the SPF. The officers must insure that these corrections are submitted to the MILPO.

It was previously reported that DA Forms 2 and 2-1 would be phased out, leaving the ORB as the personnel qualification record for use in the field and at DA. A new semiannual ORB audit was also incorporated into this plan. The transition from the DA Forms 2 and 2-1 to the ORB was scheduled for completion in October 1980. However, due to continuing research into the new procedures, the implementation date of this project has been indefinitely extended.

To obtain a microfiche copy of your personnel file, send a request to MILPERCEN, ATTN: DAPC-POR-RS, 200 Stovall Street, Alexandria, Virginia 22332. Be sure to include your social security number on the request.

FLIGHT PAY

The Office of the Secretary of Defense has agreed to indorse proposed legislation to increase warrant officer flight pay up to the level of commissioned officer aviators. The Department of Defense (DOD) reversed its long-standing opposition to the equalization of flight pay because of efforts of the Chief of Staff of the Army, the Deputy Chief of Staff for Personnel, and other officials within the Army. They finally convinced DOD that the inequity in flight pay was a major reason for poor retention of aviation warrant officers.

Although the final authority for passing this legislation rests with the Congress, officials of the US Army Warrant Officers Association are encouraged by the support of senior army leadership.

NEW SERVICE SCHOOL

The Combined Arms and Services Staff School, Fort Leavenworth, Kansas, became the newest of the Army's service schools when it opened in April. Approximately 120 Active Army and Reserve Component captains and majors received 13 weeks of resident training in the opening course. Long-range plans call for the course to be broken into two segments. The resident portion of the course will be 9 weeks long, with 120 hours of nonresident instruction. It is projected that by FY 85 an entire commissioned officer year group will be trained.

The review of education and training of officers study group recommended the school's establishment to provide education beyond the advanced course level. The purpose of the Combined Arms and Services Staff School is to teach the basic staff skills needed to perform at the level of major and beyond.

WARRANT OFFICER ORIENTATION COURSE

Newly appointed, nonaviation warrant officers (WOs) will now have the benefit of a Warrant Officer Orientation Course. Recently established by the Department of the Army, the 2-week course is conducted at the Warrant Officer Career College (WOCC), Fort Rucker, Alabama. It is designed to fill the Army's need to give new warrant officers, regardless of branch, the equivalent of a basic course.

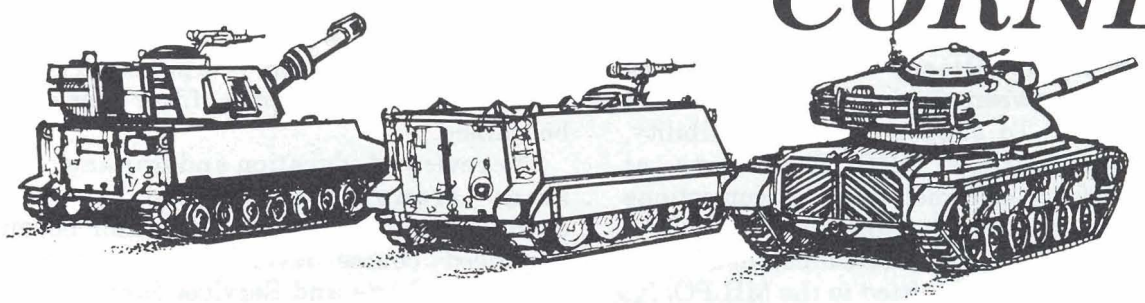
The resident course is conducted every 2 weeks with 36 students per class. It is primarily academic and offers instruction in social and military customs, traditions, and the responsibilities of the WO. The course also offers a foundation in management and leadership principles.

Newly appointed WOs qualified for the WOCC and receiving their appointments in the continental United States (CONUS) will attend the course en route to their initial duty assignment. Those appointed outside CONUS will attend the course en route to their first assignment upon returning from overseas.

Prior commissioned service or equivalent instruction in a preappointment course is considered suitable preparation for the new nonrated WO. Persons meeting these qualifications need not take the course.

Local training support centers in the US Army Training and Doctrine Command (TRADOC) and other commands have 17-minute film tapes to orient prospective students about Fort Rucker and the area. More information about this course is available from the Course Development Information Office, Fort Rucker, AUTOVON 558-4785.

COMBINED ARMS CORNER



VIPER TESTS

The US Army Missile Command (MICOM) recently conducted the first successful manned firings of the Army's new Viper tank killer.

MICOM and General Dynamics Corporation (Viper prime contractor) conducted the joint flight test program at Redstone Arsenal, Alabama. It was the first test with a man in the loop. Viper safety and accuracy and the acceptability of weapon noise levels were demonstrated.

"The flight tests were highly successful," said COL Aaron J. Larkins, Viper Project Manager. Additional firings are planned, along with environmental tests (hot and cold temperatures, vibration, shock, etc.) before the Army and General Dynamics conclude the program this year.

Earlier Viper firings were unmanned shots from a fixed launcher.

To man-rate the 8-pound tank killer, eight General Dynamics gunners each fired three rounds — a single round one day and two rounds less than 1 minute apart the next day. Medical experts from Fort Rucker, Alabama, monitored the tests and performed audio checks on the gunners before and after they fired.

Viper tank killer.

"There was no degradation, not even a temporary hearing loss, by any of the gunners," Larkins said.

The Viper is light, compact, and shoulder-fired from a throwaway case that serves as the launcher. It will be substantially more powerful, accurate, and effective than the M72 light antitank weapon and will have a much longer effective range.

Once in production, each Viper will be issued as an individual round of ammunition.

ABRAMS TANK NOW STANDARD

After extensive testing, the US Army has designated the Abrams tank as standard. The decision to type-classify the Abrams was made at a meeting of the Army Systems Acquisition Review Council on 17 February 1981.

While the tank was in an experimental status, it was designated the XM1. The tank's certification as the M1 Abrams means it is operationally and logistically acceptable for its intended mission.

Test results were considered from troop testing at Fort Hood, Texas, and Fort Knox, Kentucky, and from engineering testing at Aberdeen Proving Ground, Maryland; Fort Greely, Alaska; White Sands Missile Range, New Mexico; and Yuma Proving Ground, Arizona. The tests to date show that engineering problems discovered in the experimental model have been corrected in the production model. Quality control problems found on early production vehicles are also being resolved.

The Abrams tank got its name from a promise made to the widow of General Creighton W. Abrams, one of the Army's most celebrated tank commanders. In a letter to Mrs. Abrams after the general's death, then-Secretary of the Army Howard "Bo" Calloway told her that a new tank

was being tested. If this tank turned out to be a "winner," it would be named after another "winner," Abrams.

The M1 Abrams tank joins the new M2 infantry fighting vehicle and M3 cavalry fighting vehicle as the leading edge of the Army's program for modernizing its combat vehicle fleet.

PORTABLE DECONTAMINATION DEVICE

The Army Chemical Systems Laboratory, Aberdeen Proving Ground, Maryland, is developing a portable chemical decontamination device.

The device is designed to be mounted on wheeled or tracked vehicles, towed artillery, and aircraft. It consists of a decontamination solution container, a manual pump, hoses, and an attachable brush and weighs less than 60 pounds when filled with the decontamination solution.

In operating the device a soldier would manually dispense the decontamination solution through the brush. He would then clean the contaminated vehicle's entrances and any areas that would have to be clean for the safe operation and maintenance of the vehicle.

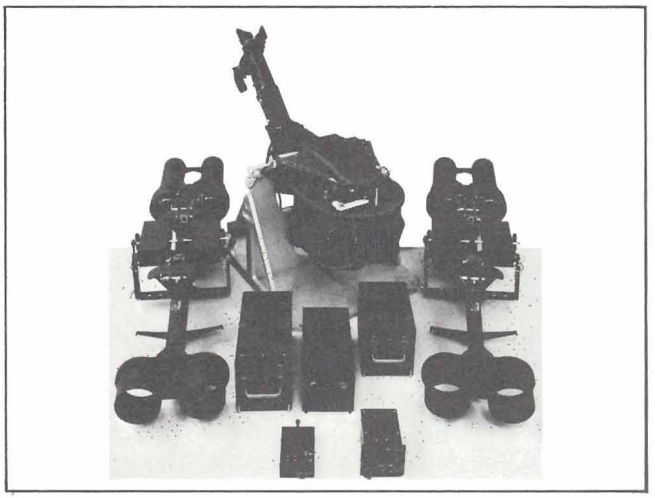
According to a laboratory spokesman, the decontamination device is being developed under an accelerated program and should be ready for Army use later this year.

A soldier uses the decontamination device.

CHOPPER MUSCLE

The 1,000th airborne TOW missile system was recently delivered to the US Army for installation in a Cobra attack helicopter. The missile system is the tank stopper for the AH-1 Cobra series helicopter used by the Army, Marine Corps, and many nations other than the United States.

The components of the TOW missile system are shown in the photograph. In the rear, center, is the telescopic sight unit. It enables gunners to fire TOW missiles accurately from standoff ranges against tanks, trucks, and ground installations. The three large boxes in front of the sight are electronic units and the two smaller boxes are aircrew controls. Two twin-barreled missile launchers are also shown.

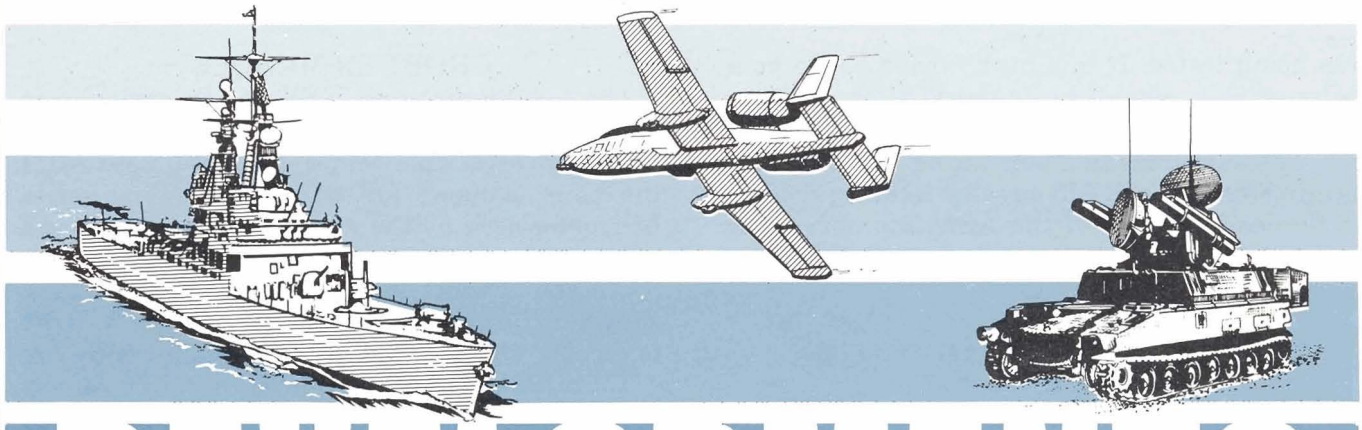


The TOW missile, developed for the US Army, has been deployed with the air and ground forces of 32 foreign countries.

FIREFINDER SYSTEM OPERATIONAL

The first of the Army's new artillery-locating radars, the AN/TPQ-37, is in initial operational status at Fort Hood, Texas, with the 1st Cavalry Division. The Army Electronics Research and Development Command developed this radar set, the first one that can locate single or multiple hostile artillery and rocket launchers at their firing sites. A combination of radar techniques and sophisticated computer-controlled signal processing allows the radar to detect and track hostile projectiles simultaneously. This information is then forwarded either manually or automatically to an artillery fire direction center for use in directing accurate counterfire.

The new radar system will be assigned to field artillery target acquisition batteries at division level. Full-scale production will start at the end of the extended low-rate, initial production period.



DEVELOPMENTS

CATALOGING OBJECTS IN ORBIT

A tracking system that can detect objects 25,000 miles from the earth has begun operating at a site on the northern edge of White Sands Missile Range, New Mexico.

Major Chuck Staley, US Air Force commander at the site, said nearly all construction is finished on the ground-based, electro-optical deep space surveillance (GEODSS) system.

The Air Force system can track and catalog objects orbiting earth at altitudes between 3,500 and 25,000 miles. For example, the system can detect an object the size of a soccer ball at 12,500 miles.

The entire GEODSS program has a $63 million price tag and includes four similar sites located in South Korea, the Hawaiian Islands, the Middle East, and the eastern Atlantic Ocean. The initial cost includes both development and the budget for the first year of operation.

The Air Force's Electronic Systems Division, Hanscom Air Force Base, Massachusetts, was responsible for developing GEODSS for the Strategic Air Command (SAC). Now that the system is operating, the satellite monitoring sites will be controlled by SAC.

The GEODSS stations gird the earth at intervals to insure worldwide coverage. The system combines a sophisticated telescope equipped with electro-optics (which tracks both satellites and stars), a television camera, a digital computer, and communications equipment. GEODSS operators will identify and catalog some 500 separate orbiting objects in deep space.

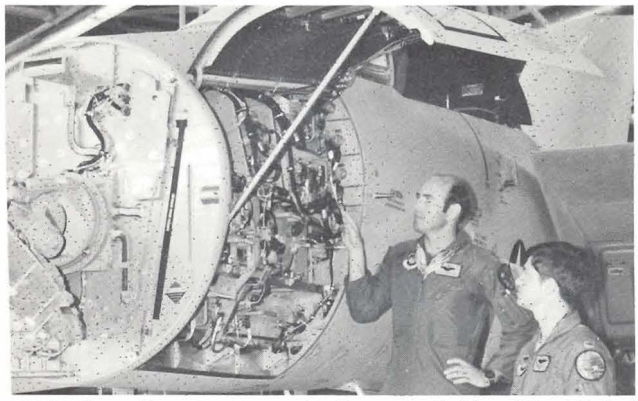
The GEODSS system was built by TRW, Incorporated, and the sites are maintained by RCA Corporation.

EAGLES' EYES SHARPENED

A fifth-generation programable signal processor (PSP), which enhances the AN/APG-63 radar, is providing the US Air Force's F-15C Eagle fighters with the ability to change or add radar modes through software reprograming rather than by extensive hardware retrofit.

The PSP is composed of high-speed, digital logic and memory elements under software control. Its instruction set is tailored specifically for efficient processing of repetitive radar functions. Instructions are altered in flight depending on mode selections.

Incorporation of the PSP enhances the Eagle's all-weather air superiority and beyond-visual-range capabilities through improved processing algorithms. A ground-mapping mode is also included in the unit. Beyond these immediate enhancements, the PSP provides the potential to respond to new threats and accommodate improved modes and weapons through its reprograming capabilities.



US Air Force Captains Howard L. Pope, Jr., (left) and Fred Bell of the 36th Tactical Fighter Wing, Bitburg, Germany, examine the enhanced AN/APG-63 radar in a new F-15C Eagle.

The 36th Tactical Fighter Wing, Bitburg, Germany, and the 32d Tactical Fighter Squadron, Camp New Amsterdam, The Netherlands, were the first to receive F-15C fighter aircraft with the PSP-enhanced radars. Aircraft deployed prior to the full-scale production of the PSP will also receive the new equipment.

The PSP and the AN/APG-63 radars are produced by Hughes Aircraft Company under contract to McDonnell Douglas Corporation.

NEW TRANSPORT AIRCRAFT

Included in the FY 81 defense budget is $35 million to begin development of a new Air Force transport aircraft. Called the C-X it will airlift heavy, outsize Army equipment to the battlefield to support NATO reinforcement and the Rapid Deployment Forces. Currently, only the C-5 can carry large-size cargo such as the 60-ton M1 tank.

Design specifications for the C-X call for an unrefueled range of at least 2,400 nautical miles when carrying at least 130,000 pounds of cargo, with a cruising speed of at least 475 miles per hour at an altitude of not less than 26,000 feet.

It must be able to operate from small, unimproved airfields and be able to back up and turn around in as little as 90 feet. The C-X should need a maximum of 4,000 feet of runway to land with its maximum payload and be able to take off in 3,000 feet with a 70,000-pound payload.

Preliminary estimates indicate the size of the C-X will be about half that of the C-5. Its cargo compartment will be long enough to carry three infantry fighting vehicles and wide enough for the M1 tank.

ASSAULT BREAKER TEST

The Department of Defense has confirmed the successful completion of the first high-speed sled test of the Vought Assault Breaker dispensing system.

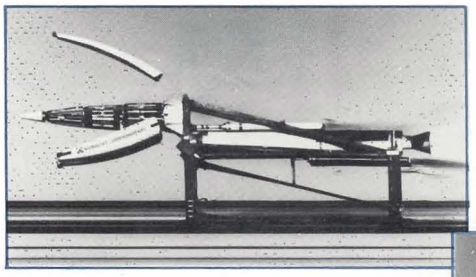
The test was accomplished at the Naval Weapon Center at China Lake, California. Assault Breaker is a Defense Advanced Research Projects Agency joint Army/Air Force feasibility demonstration of a system to defeat second echelon armor.

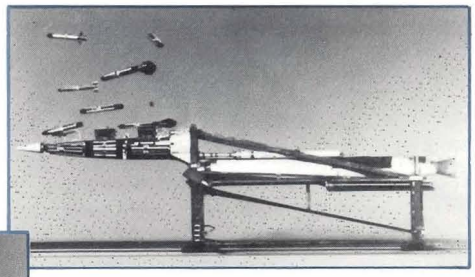
In the test, the system dispensed 10 submunitions of 5 different types: terminally guided submunitions (TGSM) with balloon parachute stabilization, TGSM with fin stabilization, skeet delivery vehicle assemblies (SDVA) with balloon parachute stabilization, SDVA with fin stabilization, and nonstabilized inert munitions.

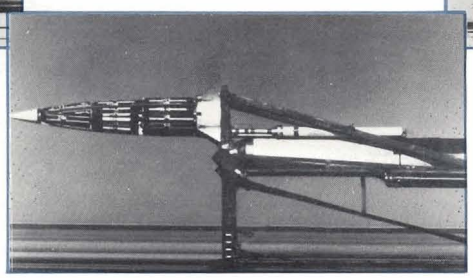
The warhead skins separated and cleared the structure and the submunitions remained within the vehicle until the programed dispense time, when they were ejected with specified separation and stability.

Sled tests are being conducted under a contract awarded to Vought last fall to provide six T-22 missiles and six dispensing systems for the Assault Breaker demonstration program. The dispensers are to be capable of distributing submunitions in a controlled pattern over a target area.

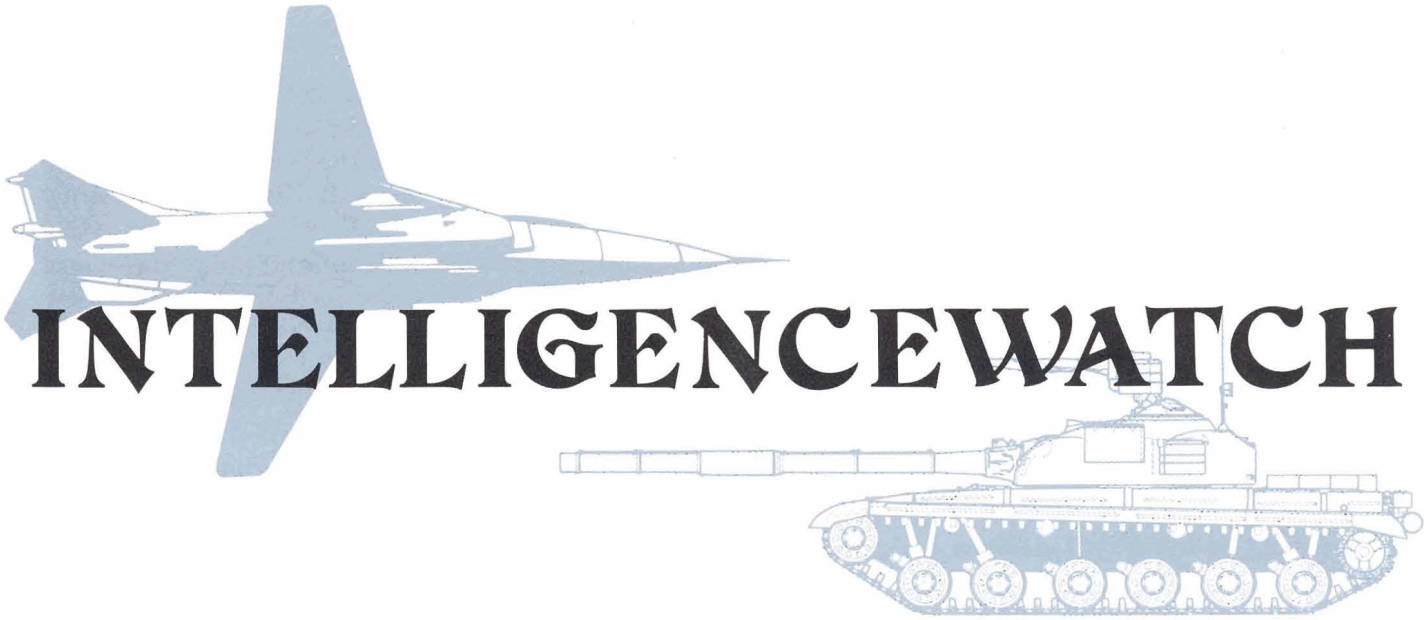
The Vought T-22 for the Assault Breaker demonstration is a variation of the Army Missile Command's Simplified Inertial Guidance Demonstration (SIG-D) missile, which completed a successful test program at White Sands Missile Range, New Mexico, last year.







ASSAULT BREAKER SLED TESTS—High-speed, synchro-ballistic photographs show the first sled test of the Assault Breaker dispensing system. Top photo shows the outer skins separating and clearing the dispenser. Center picture, the submunitions remain inside the vehicle until programed dispense time. Photo at right shows the five different types of submunitions dispensing.



INTELLIGENCEWATCH

SOVIET COMMANDOS

The following is from the 32d Army Air Defense Command News. It was written by James Tomasello.

The British have the Special Air Services, the Germans have antiterrorist squads, and the United States has the Special Forces and Rangers. Just about every military power has some sort of elite, special operations force. The Soviets are no exception.

One such unit that our European-based troops are likely to encounter is the Soviet long-range reconnaissance patrol (LRRP). Intelligence sources believe that all Soviet tactical units from division level upward have LRRP capability.

LRRP troops are trained in all aspects of unconventional warfare and are highly skilled in the art of entering and surviving in hostile environments. Teams of five or six may operate deep in the North Atlantic Treaty Organization (NATO) area, possibly linking up with and assisting agents who have already been infiltrated into West Germany.

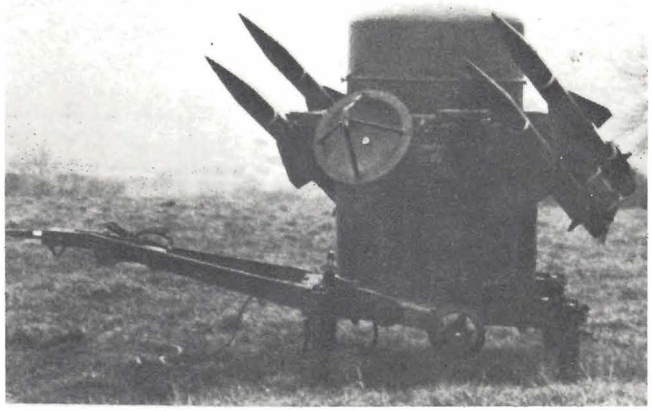
LRRP tasks would include locating our nuclear delivery means, carrying out acts of sabotage against headquarters and sensitive air defense sites, and assassinating senior officers.

Infiltrators can come by air or by land. They may be on foot or, if necessary, on skis or in a boat. Every trick in the book will be used to try to deceive soldiers and to gain access to sensitive areas. Civilian clothes or possibly German police and NATO uniforms may be worn by the agents .

G2 analysts indicate that LRRP commandos will be a serious threat during hostilities. Air defenders must ask themselves the following questions: Are you an important person? Are your vehicles and equipment vital? Is yours a key location? If you can answer "yes" to any of these questions, then you could be a likely target for LRRPs.

SWITZERLAND GETS THE BRITISH RAPIER

A contract valued at 200 million pounds was given to British Aerospace Dynamics group by the Swiss government for procurement of the Rapier air defense missile system. Designed for rapid deployment, Rapier is a lightweight, highly-mobile system in which a supersonic, direct-hitting missile is automatically commanded to follow an optical or radar sightline to the target. A Marconi Blindfire radar is used for fire control.



The Rapier launcher.

The system can easily be transported by helicopters. Part of the Rapier equipment for Switzerland will be manufactured under license in Switzerland. The Rapier system is in use with the British Army and has also been sold to six countries in Asia, the Middle East, and Africa.

RADAR CONTRACTS

The government of Norway will augment its NATO air defense system with the Hughes Air Defense Radar (HADR). Also, four HADR systems are currently being produced for the Federal Republic of Germany under a $36 million contract.

HADR is a new, fully automatic, remote-controlled radar designed to provide air defense battle commanders with long-range, three-dimensional surveillance information. The HADR system will automatically detect, classify, and report on all targets in its area of coverage. The radar features extremely low sidelobes, which make it virtually jam resistant. Its design, automatic troubleshooting, and fault isolation features substantially reduce maintenance costs.

ANTISHIPPING MISSILE DEFENSE

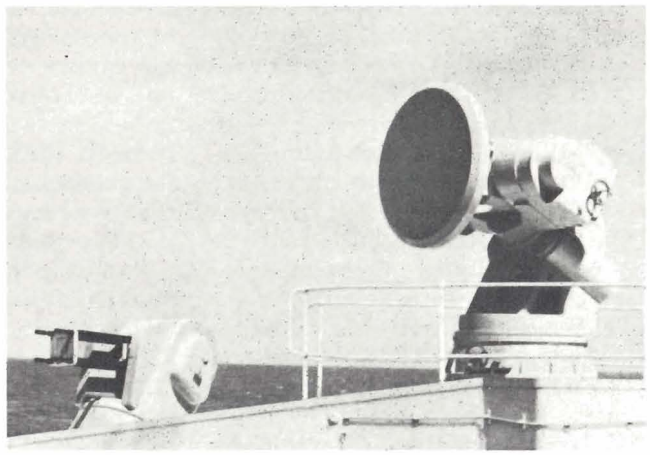
Two European companies recently exhibited antimissile weapons for installation aboard ships.

Contraves AG, a Swiss company, calls its system Seaguard. Oerlikon of Zurich and Siemens of Munich were also associated with the project. The Seaguard system consists of a powerful quadruple antiaircraft gun with special ammunition for a high rate of fire. It also features an all-weather, multisensor fire control system. Company data results estimate a kill rate of 80 percent.

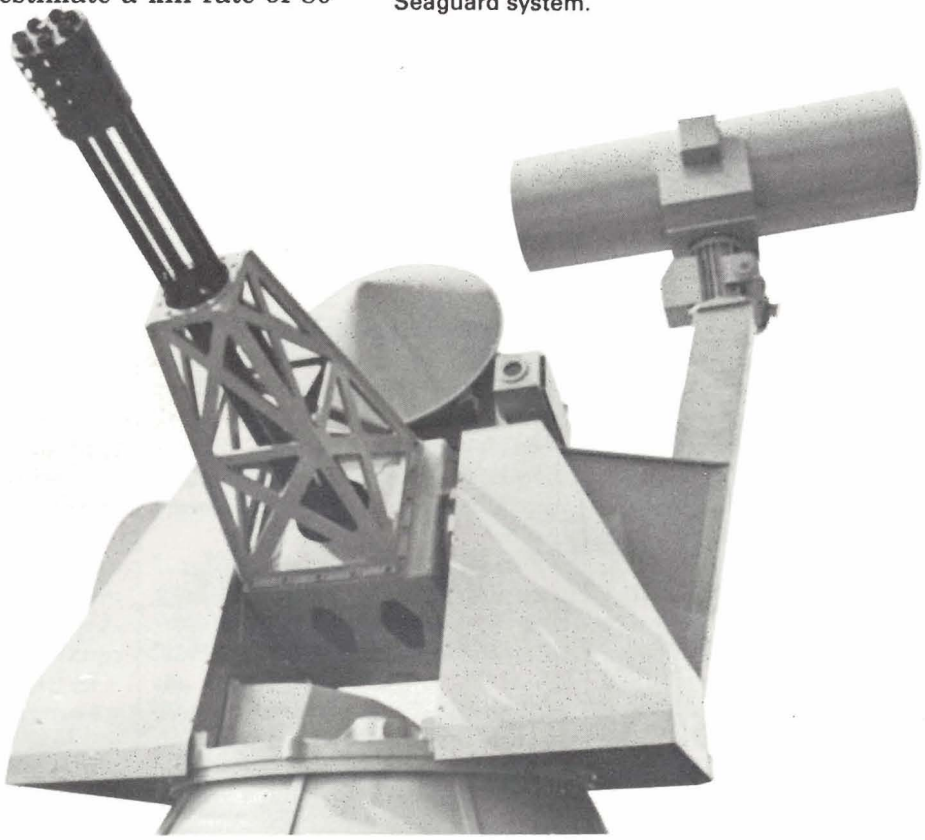
From Hollandse Signaalapparaten comes the Goalkeeper system, which uses the General Electric 30-mm GAU-8/A gatling gun and a Dutch-developed acquisition, tracking, and missile control system combined in one unit. The whole system weighs 3,800 kilograms and is suitable for installation in small vessels. The 7-barrel gun has a maximum rate of fire of 600 rounds per minute with an initial velocity of 1,040 meters per second.

Both weapon systems were developed for protection against the ever-increasing threat of antishipping missiles.

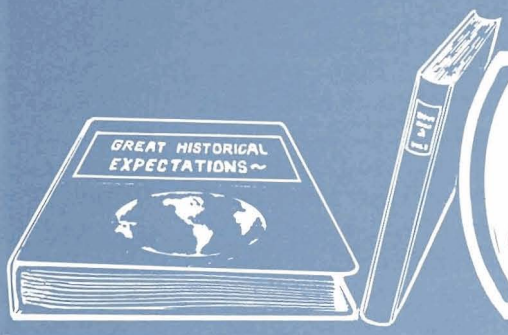
— *Soldat und Technik*



Seaguard system.



Mock-up of the on-deck part of Goalkeeper. *(SIGNAALFLASH photo)*



BOOKS

ELECTRONIC COUNTER-MEASURES

APPLIED ECM, VOLUME I,
by Leroy Van Brunt.
Published by EW Engineering, Inc., P.O. Box 28, Dunn Loring, Virginia 22027. 973 pages, hardbound, $39.95.

This book is the most comprehensive text on electronic warfare I have ever seen published in the open press. It covers the basic concepts and techniques of ECM in a heretofore unavailable single-source reference. This reference volume is definitely one to occupy space on one's desk rather than just another space on the bookshelf.

Subjects listed in the encyclopedia are presented in such a way as to make them easily understood. Sometimes this is simply an adequate narrative; other times it includes diagrams, charts, drawings, and whatever else is functionally necessary. The glossary contains more than 1,000 entries, and both the glossary and the encyclopedia listings cover a broad spectrum of topics. Chapter 3 on fundamentals of ECM is logically organized and includes definitions, fundamental equations, jammers, passive ECM, and signal processing. Some 244 separate tactics or techniques are detailed in chapter 4.

The book is well put together technically. This first volume is thoroughly indexed and has numerous diagrams that function as useful aids to the explanatory text. Although equations are used sparingly, they are discussed when necessary or appropriate. The simple, clear writing style, the thoroughness of the indexing system, and the frequent cross-references allow the reader to find and focus on the material quickly.

This volume should find wide acceptance from a variety of audiences. The presentation of material is suited for the practicing EW engineer or military EW officer, as well as those relatively unfamiliar with the field. Enough theory of sufficient depth and detail for general study is also included, thus assuring the work a position as a widely used textbook.

Van Brunt has made an excellent start with Volume I of *Applied ECM.* One can expect that Volume II (to be published in mid-1981) and Volume III will be of equal value, especially to those in air defense.

CPT Richard A. Palmer
USAADS

DEFENDER OF THE CHESAPEAKE — THE STORY OF FORT MONROE,
by Richard P. Weinert, Jr., and Colonel Robert Arthur.
Leeward Publications Inc., Annapolis, Maryland, 1979. 293 pages, $12.95.

The book traces the history of Fort Monroe, Virginia, from Revolutionary times to the present. Military history buffs will find this book extremely interesting both from a historical context and from insight into military thinking in the United States.

Fort Monroe has been the center of a great deal of our nation's military history. But it did not begin until after the disastrous war of 1812, when the young United States got serious about coastal fortifications. In 1819, work on Fort Monroe began slowly. Upon completion it would be the largest fort in the United States.

Fort Monroe emerged as one of the key elements in the national defense — not due to size alone, but also to its role in the intellectual development of the Army. In the years following the establishment of the fort, an artillery school was founded there. Over several years the school declined due to frequent moves of the garrison and constantly changing personnel. In 1834 the school was disbanded and Fort Monroe converted to a regular post. The school was reopened as the Artillery School for Heavy Guns in 1856.

Instruction was discontinued during the Civil War. The fort was never seriously threatened during the war, and it was used as a base of operations for recapturing Atlantic coastal area forts and government property. Its involvement in the war ended with the imprisonment of Jefferson Davis there.

After the war, the school reopened and an Artillery Board was established to which questions were referred for discussion and recommendations. Fort Monroe's mission remained essentially the same until the separation of the coast and field artillery in 1907, at which time the school was renamed the Coast Artillery School. In World War I the school was converted to a training center. It concentrated on training officer candidates. After the war the school resumed normal instruction.

From 1924-30 more and more antiaircraft artillery training was integrated into the curriculum. It eventually reached a proportion equal to the coast artillery.

In 1946 the Coast Artillery School was moved from Fort Monroe and the Army Ground Forces Command was established there. The name of the command was changed to Army

Field Forces, and in 1955 it became Headquarters, Continental Army Command (CONARC). CONARC's mission was training, but it also assumed direct command of the continental armies.

Fort Monroe's contribution to conflicts since World War II consisted of direction of training, mobilization of reserves, and preparation of units and replacements for deployment. In 1973 CONARC was phased out. The US Army Training and Doctrine Command (TRADOC) assumed the functions of individual training, education, and combat developments.

I recommend this book to any serious student of Army history. Mr. Weinert's authorship and editing have faithfully followed the flow of history and have provided contemporary insight.

CPT DOUGLAS WARRAN
Student, DLI

ONE MORE RIVER, The Rhine Crossings of 1945,
by Peter Allen.
Charles Scribner's Sons, New York, 1980. 320 pages, $16.95.

Mr. Allen has set out to fill a gap in history. Quite rightly, he contends that most of the literature of World War II deals at length with the Battle of the Bulge but then skims rapidly over the remaining months of the war. Yet at the end of 1944, the Allied armies still had to cross the Rhine River (Western Europe's most formidable water barrier) and, in fact, had reached it only on its extremities in Holland and Alsace. Of the campaign to clear the Rhine's west bank and then breach the line of the river itself, only the dramatic seizure of the unblown bridge at Remagen is generally known. Actually, there were five more crossings: Patton at Oppenheim near Mainz, Montgomery at Wesel, Patton again at Boppard north of the Main's juncture with the Rhine, the US Seventh Army at Worms, and a largely symbolic French crossing in the south.

Unfortunately, *One More River* does not adequately fill the gap, principally because it is a most uneven book. At times it follows individual platoons; at others it brushes very lightly over corps and army operations. This is due to the author's preoccupation with the British and Canadian forces. Montgomery's drive south and east between the Maas and the Rhine is set forth in painstaking detail. The US Ninth Army's crossing of the Roer and subsequent push north to linkup are merely sketches. The Wesel crossing by Montgomery, with the US Ninth Army under command, is well covered, and its associated airborne operation is given the fullest treatment I have yet read. But all the other crossings are either treated very briefly, characterized as publicity stunts intended to embarrass Montgomery (e.g., Patton at Oppenheim on the night of 22-23 March 1945, 24 hours before the Wesel crossing), or downplayed (as is the seizure of the bridge at Remagen) as somehow counterproductive, drawing attention and forces away from the more important northern (Monty's) sector.

Certainly nothing is wrong with underscoring the skill and bravery of the British soldier and his Canadian counterpart; none were better on either side. Nor should their contribution to the defeat of the German Army in the West be in any way minimized. In fact, both that courage and those achievements are imperfectly appreciated on this side of the Atlantic — south of the Canadian border, that is —and entirely deserve the reemphasis this book gives them. But it is not necessary to deemphasize the role of American forces and their commanders to do so and in this respect, too, the book is uneven. Mr. Allen's pro-British attitude shows through in his treatment of Montgomery's feud with Eisenhower over the priority to be given to his northern wing of the Allied armies, and his attacks on General Bradley are distressing to me and seem unwarranted.

I made the Rhine crossing just south of Wesel with the 79th Infantry Division in a landing craft whose US Navy crew, looking slightly uncomfortable in Army ODs, was just as seamanlike on fresh water as on salt water. But, unfortunately *One More River* is silent on the Navy's role. I would have thought it impossible for anyone to write a book about a military campaign that would prove uninteresting to this old soldier-participant. Mr. Allen, however, has managed it.

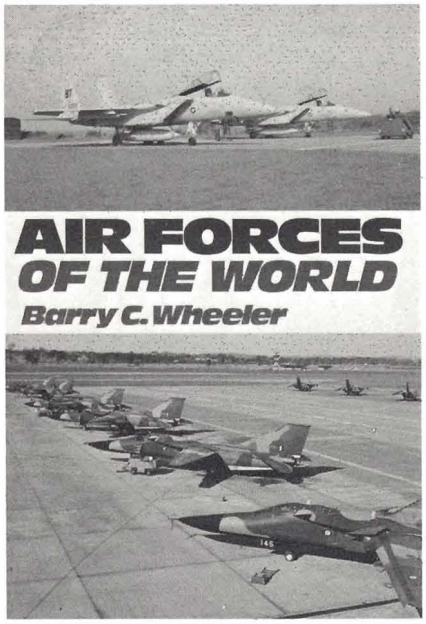
BG Jack A. Rogers
USA, RET

A-20 HAVOC AT WAR,
by William N. Hess.
Charles Scribner's Sons, New York, 1980. 128 pages, $17.50.

The basic design of the Douglas A-20 produced a fast, extremely rugged, versatile, and dependable series of aircraft whose service in the later A-26 variant extended well beyond World War II. The original design was a Douglas-inspired, private venture DB-7, whose performance and potential in 1939 attracted the attention of the French and the British. Britain named all the light bomber versions of the A-20 "Bostons" and the night-fighter and night-intruder versions "Havocs." The name "Havoc" was adopted by the Americans later in the war to describe the USAF fighter-bomber. Late in World War II, the excellent performance of all variants of the A-20 led to the development of the A-26 Invader, which exceeded all its load-carrying and performance requirements and would have been produced in vast numbers had the war not ended. As it was, the A-26 (redesignated B-26 in 1948) remained in frontline service with the USAF until the late 1960s, by which time it had added Korea and Vietnam to its battle honors.

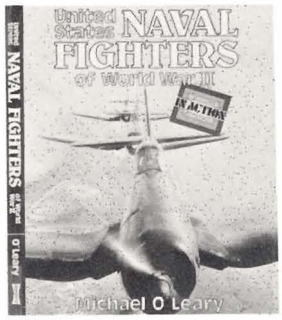
In *A-20 Havoc at War*, the author, himself an aviation specialist and veteran airman of World War II, tells the story of this remarkable series of aircraft in the words of the crews who flew them in action,

embellished by a new selection of photographs, many of which have not been published before.



AIR FORCES OF THE WORLD,
by Barry C. Wheeler.
Charles Scribner's Sons, New York, 1979. 112 pages, $11.95.

The purpose of this book is to provide the reader with a quick reference to the world's military air forces. Facts such as numbers and types of aircraft are given for each in a "thumbnail-sketch" style format that may have been better presented in tables and charts. With most air forces there is included one black and white photograph of an aircraft belonging to that country's air arm. In addition to strength data, this book also gives a brief description of the organization and some of the air bases used by each country. Four pages of color at the center of the book contain six color photographs. Presentation of facts for each country is held to an absolute minimum, with only one and one-half pages used to cover the Soviet Air Force. However, the book does have some value as a ready reference on the most important "common knowledge" data and information about the world's air forces.



UNITED STATES NAVAL FIGHTERS OF WORLD WAR II,
by Michael O'Leary.
Blandford Press, Poole, Dorset, England, 1980. 160 pages, $17.95.

Operating from an ever-increasing number of aircraft carriers and from rough strips carved out on jungle islands and coral atolls, fighter aircraft of the US Navy and US Marine Corps took the fight to Japan in the Pacific. On the Atlantic side, they turned the German U-boat haven into a death trap. Of course the dive bombers, torpedo bombers, and various other types of naval aircraft did their share, but it was the fighters that protected these aircraft while they performed their missions. Often, the fighters also carried bombs, depth charges, and rockets to the targets.

It was in air-to-air combat, however, where the fighters won their glory and captured the headlines. Beginning in 1942 with the obsolete Brewster Buffalo still in some squadrons, and ending in 1945 with the finest fighters in the air, *United States Naval Fighters of World War II* tells the story of these aircraft, their pilots, and the campaigns.

The book includes individual pilot's reports that recount what it was like to fly the aircraft in combat. Accounts about the aces and heros of the war detail the most exciting missions flown by each and introduce the reader to the personal side of each man. Famous names like Gregory Boyington, Marion Carl, Joe Foss, Butch O'Hare, Jimmy Thach, "Indian" Joe Bauer, Ira Kepford, and Bob Hanson are mixed with exciting tales that include names like Wildcat, Hellcat, and Corsair.

Illustrated with photographs and drawings, *United States Naval Fighters of World War II* is not only an informative reference book, but is also an interesting, sometimes exciting, "adventure book of aerial combat." Distributed by Sterling Publishing Company in the United States, this is a worthwhile addition to the library of any aviation enthusiast.

THE ENGLISH LANGUAGE, ITS HISTORY AND ORIGIN,
by Rudolph C. Bambas.
University of Oklahoma Press, Norman, Oklahoma, 1980. 241 pages, $12.95.

If you have wondered about the origin and history of our native language, then this book is a must for you. The light, easy style allows the casual reader to "read over" the technical content and still retain interest and grasp the meaning of what is said.

The book explains that one of some three thousand languages now spoken has risen to prominence as an international language. Spoken as native language by about three hundred million people, it is also a second language to millions more.

English belongs to a family of languages called "Indo-European" which had its origin in southeastern Europe more than five thousand years ago. No record of the original language exists, but it is obvious that migrating Indo-European communities, separated from one another through centuries, developed mutually unintelligible varities of the original tongue. German, French, English, Latin, Greek, Sanskrit, Russian, Indian, and Iranian are all Indo-European languages. A Germanic branch of the original language is the source of English. West Germanic had several subdivisions of which Old English was one. The traditional date for the arrival in Britain of the first English speakers is AD 449. Old English lasted until about AD 1100. To English speakers now, Old English is unintelligible as the following

lines from the poem "Beowulf" show:

"Oft scyld scefing sceapena preatum monegum
(Often shield sheaf's son scathers troops from many)
Maegpum meodosetla ofteah eqsode eorlas"
(Nations mead-seats took away overawed earls).

Old English was essentially pure German in the year 700, but through association, words were assimilated from the Celtic, Latin, and Scandinavian languages, causing grammar and pronunciation to emerge as Middle English about the year 1100. During the period 950 to 1350, English was influenced by thousands of Danish and French speakers. A "pidgin" form of English was used in communicating with these non-English speakers and those to whom a "pidgin" form was spoken tended to respond in kind. The result was toward a simplification of the English language. The language was progressing toward its present form as the following lines from the 1375 poem "The Bruce" show:

"And wreik on thame the mekill ill
(And avenge on them the great evil)
That thai and tharis has done us till"
(That they and theirs has done to us).

Middle English evolved into Modern English by the year 1500. The language at this time was greatly influenced by the advent of printing. While the classical languages, Latin and Greek, were used in the early printed books, there was a desire to make English books available to the masses. The Protestants took the position that every Christian should read the Bible for himself, without the intercession of an educated priesthood. The King James Version of the Bible was available in 1611, and dictionaries appeared as early as 1604. They continually improved until Samuel Johnson's "Dictionary" finally evolved in 1755. Early Modern English (1500-1700) is understandable to today's speaker, though it would "sound funny" to him. Later Modern English (1700-present) is easily understandable. The language continues to evolve through addition of technical and scientific terms, slang, and foreign words. The world-wide communications of today tend to blur regional variations, and today's English speaker, be he American, British, Australian, or whatever, can generally be understood in most parts of the world.

Milton F. Krone
US Army Air Defense School

WORLD CIVIL AIRCRAFT SINCE 1945,
by Michel Hardy.
Charles Scribner's Sons, New York, 1980. 128 pages, $10.95.

All the important details of the origins, history, development, and commercial use of all the most important types of postwar commercial aircraft are provided in this book. The scope of its coverage ranges from the small, single-engined, short takeoff-and landing-type aircraft (such as the de Haviland Beaver) to the long-haul, intercontinental jets. Routes covered, speeds traveled, and the number of passengers carried today far surpass the expectations of early aviation experts. This indispensable reference tells how the various planes cover different national needs and approaches to the problems of air transport engendered by the numbers, speeds, and demands upon civilian aircraft. The civil aircraft production of such major countries as the United States, Canada, Britain, France, and Russia, as well as the output of smaller countries such as Israel, Czechoslovakia, Switzerland, Brazil, and Peru, is cataloged to show differing requirements in air travel.

With a cutoff date of 1970, *World Civil Aircraft Since 1945* complements the successful book, *Civil Aircraft of the World*. Together, these books provide an all encompassing reference to the main civil aircraft in use since World War II. The wealth of detailed information they contain makes them indispensable to civil aircraft hobbyists and prize possessions to other enthusiasts.

OF SPECIAL INTEREST. . .

A new book has just been published that will be of great interest to most military commanders and those who follow military history. The book, *Harbottle's Dictionary of Battles (Third Edition)*, revised by George Bruce, is one of the most valuable reference books ever published. It was originally compiled by Thomas Harbottle in 1904. In 1971 George Bruce completely revised and updated the work to take in twentieth-century military operations from the Boer War to Vietnam. Now, in this new Third Edition, Mr. Bruce has again updated the book so that it covers the battles of the last decade — including the Arab-Israeli War, the Cambodian War, the Sino-Vietnamese War, and the "end" of the Vietnam War.

For the historian, the student, the amateur, and the professional, *Harbottle's Dictionary of Battles* offers the key facts about all the major battles fought in the world. Each entry gives the date of the battle and the war during which it was fought, identifies the opposing sides, and describes the outcome. In addition, the dictionary is carefully cross-referenced to indicate, where appropriate, other battles associated with each entry.

George Bruce is a military historian with many previous books to his credit. In World War II he served in North Africa, Sicily, Italy, and Greece. Subsequently, he was a journalist with Reuters, UPI, *Illustrated* magazine, and the *Sunday Times* (Insight).

Harbottle's Dictionary of Battles, (Third Edition) is priced at $7.95 paperback, $14.95 cloth. Publication: April, 1981.

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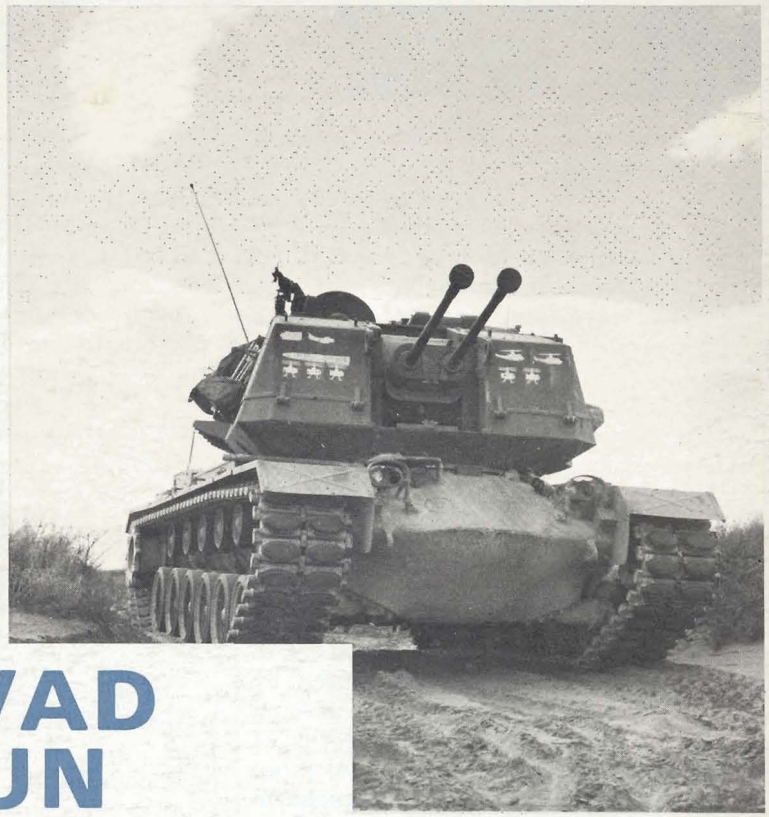

DIVAD GUN SELECTION ANNOUNCED

Ford Aerospace and Communication Corporation has been selected to produce the Division Air Defense Gun system. A comprehensive article on the new gun system is scheduled for the October — December issue.