

the beginning. This will allow controllers to turn the tape player on before the unit is actually in position. In an ambush, the long time lag will serve as a good test of the unit's alertness, patience, and discipline.

When the unit arrives in the training area, the leaders are given their mission. The operations order (OPORD) or fragmentary order (FRAGO) must be doctrinally correct and must be prepared for one echelon above the unit going through the exercise. (A platoon leader should not receive a platoon OPORD from a controller!) When a leader is briefed on the location of the imaginary units to his left and right and on pertinent operational graphics, he is forced to create his own control plan to keep from firing on friendly units. This serves, to some extent, to keep fires within the range limits.

Before the leader issues his OPORD, he should be allowed to conduct a tactical leader's reconnaissance. This reconnaissance should allow the leader and his reconnaissance element to see what they could realistically be expected to see in combat. Unless range regulations require a unit to conduct a dry run of the exercise first, it should not do so, because dry runs destroy the realism of the training and can cause safety problems if leaders try to outsmart the scenario.

Before a leader gives his OPORD, he should back-brief the senior controller on the plan in the same manner as he would back-brief his commander before an operation. This will ensure that the leader has correctly interpreted the OPORD and has planned adequate internal control measures. It will also allow any necessary

corrections to be made before the order is given to the soldiers.

After the OPORD has been given, a safety briefing must be conducted. The entire unit should be brought to one location and briefed personally by the company commander. This not only gets the information down to the lowest level, it gives the senior controller a chance to impress upon each soldier his safety responsibilities. Although this mass gathering damages realism and disrupts the continuity of the exercise, it is fairly well established that platoon and squad operations orders are not the most effective way to disseminate safety instructions. At the end of the safety briefing a realism briefing should be conducted. In essence, this briefing tells the soldiers, "do the mission as you would in combat" and "if it isn't safe here it's not safe anywhere."

Once the execution phase starts, some basic rules must be followed. Leaders must make their decisions without interference from the commander unless the problem is becoming disorganized. Above all else, simulation should not be allowed. Whether a task is breaching a minefield or treating a simulated casualty, it must be done to Soldier's Manual standards.

When the battle is joined, all the planning comes together, and soldiers orient their movement on the targets as the targets appear. With the targets selectively placed, the maneuvering units and their fires can be guided away from each other.

The use of MILES helmets and body harnesses and a control gun allows overly aggressive soldiers and fire teams to be suppressed without the controllers in-

terfering with the problem. Selectively "wounding" and "killing" soldiers, along with MILES wound cards, can significantly slow the action down and also tax the platoon medic and the aid-and-litter teams. Care must be taken to "kill" leaders only if that is a planned situation to be injected into the exercise or if a leader obviously seems to consider himself invulnerable. The best candidates for simulated casualties are soldiers who are careless or inattentive to orders.

Suppressive fires can reduce entire squads to a slow crawl by making casualties of soldiers who do not respond to the simulated enemy fire. By using enemy action to set the pace at which units can maneuver, control can be more than adequately maintained without resorting to administrative measures.

Once an action has been completed, a thorough after-action review (AAR) should be conducted on the objective in the same manner as a MILES AAR. Immediate feedback should be provided to the unit on the number of targets successfully engaged as well as on the unit's losses.

If a live fire exercise is well-planned, it can be an invaluable training event in preparing for combat. For maximum value, each exercise must have a realistic scenario and a control plan that ensures safety and realism. Such an exercise is too costly in time and resources to be conducted any other way.

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Air Defense With Small Arms

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The critical role that tactical air support has played in conflicts over the past few years points to a continuing role for it in

the future. This means we must have a good air defense capability. Our current air defense artillery (ADA) weapons could

control a great deal more air space than those of World War II, and we have almost twice as many of them. But the tac-

al aircraft against which these ADA weapons might be employed have also improved—they are several times faster than their World War II predecessors and can carry 30 times the ordnance with greater accuracy and killing power.

In Soviet doctrine, the role of tactical air is changing as the mission of frontal aviation units shifts from air defense to ground support, and this shift poses a powerful threat to our ground forces. Too, the Soviets' increased emphasis on attack helicopters, along with the addition of a new series of such aircraft to their arsenal, reinforces their increased effort to beef up their ground attack capability.

Sophisticated air-to-surface weapon systems are capable of destroying even the most fleeting of targets. The threat of devastating air attack is therefore very real for the frontline soldier, and our combat operations must take this threat into careful consideration.

Air defense artillery weapons and fighter interceptors will not be available in sufficient numbers and strength to ensure our air superiority, or even parity. In addition, their primary mission will be to defend priority targets, such as logistical centers, command and control areas, and airfields, which will leave few of these scarce assets available for commitment to forward units. These maneuver units must therefore be able to provide some sort of defense for themselves.

Presented with this threat, and without the firepower, computer controls, and electronic guidance of sophisticated ADA missiles, what effect can an individual soldier and his small arms have on aircraft? Quite a bit, judging from past wars. During the Korean War, 544 U.S. aircraft were lost to small arms and air defense fire, and in Vietnam 410 fixed-wing aircraft and 2,100 helicopters were downed by small arms fire. More recently, in the Falklands War, Blowpipe missiles, machineguns, and other small arms played an important air defense role.

With the cancellation of the division air defense gun (DIVAD), the need for a soldier to protect himself from air attack is greater now than ever. With some imagination, however, most units can incorporate effective air defense training into their busy training schedules without disrupting their other training.



Soldiers should be trained to react to enemy aircraft.

First, the actions a unit takes to increase its air defense capability can be broken down into passive and active measures. Passive measures are based on camouflage and protection, while active measures are those taken to avoid being hit and to engage and defeat hostile aircraft. Then, both can be integrated into a five-step air defense training program:

- The integration of air defense actions and drills into normal tactical operations.
- Aircraft identification training for the individual soldiers.
- Drone or glider dry fire and immediate action drills. (See also "PORTRAD," by Lieutenant Philip D. Macklin, *INFANTRY*, September-October 1981, pages 38-39.)
- Drone firing exercises with the multiple integrated laser engagement system (MILES).
- Live fire exercises with radio-controlled miniature aerial targets (RCMATs).

In the first training step, passive air defense actions are analyzed and adopted. In this part of the training the techniques involved are the same as those used in normal tactical exercises—camouflage, cover, and concealment—except that a soldier is taught to view his position from a new direction; that is, from above as well as from ground level.

Darkening or covering reflective surfaces, seeking shadows and overhead cover, moving to locations that break up the outline of a vehicle from above, and dispersing are all techniques of passive air defense. Other essential actions are posting air guards and developing a warning system to alert troops to the approach of hostile aircraft.

Air guards and passive techniques, therefore, should be incorporated into field exercises. If air assets are available, they should be integrated into the tactical play; if not, a unit can use RCMATs to simulate hostile air.

Air defense annexes should become part of every SOP and should be exercised. An ADA annex should also become routine in all tactical operations orders, especially in convoy and movement orders, since that is when a unit is particularly vulnerable.

The next step is to train the individual soldiers to identify hostile aircraft, react to it, and engage it—if attacked or ordered to do so.

Enemy aircraft identification can be introduced with the use of training aids such as playing cards, scale models, and pictures. To speed training and minimize confusion, emphasis should be placed on an ability to identify only a limited number of ground attack aircraft and, more im-

portant, helicopters. In all probability, attack helicopters will be the primary threat to the frontline soldier. Because they are slower, however, helicopters can be more effectively engaged with small arms fire.

A good background in aircraft identification will enable soldiers to avoid detection and to engage only hostile aircraft when both hostile and friendly aircraft are operating in the same area. The exact composition of this training program should be adapted to the area where each unit is stationed; in Europe, for example, more emphasis should be placed on NATO aircraft. Soldiers should learn to identify at least 10 fixed-wing and 10 rotary aircraft. On this list should be the A-10, UH-1, AH-1, Black Hawk, CH-47, Hind (in both variations), and C-130. (Training Circular 44-30, Chapter 2, provides guidance on picking out the differences between aircraft and on aiding aircraft recognition training.)

The third step is training the soldiers to react to enemy aircraft. The exact nature of the reaction depends on the air defense posture the unit assumes—the weapon control status, enemy activity, and command guidance from higher headquarters. Once attacked, however, a unit must assume an active defense, initiating evasive action and seeking covered positions. During this time, soldiers who are able should return the fire of the attacking aircraft.

Active air defense measures consist of the actions taken when a hostile aircraft starts to approach a unit's position—stopping, turning into the attack, or dispersing. Once the unit engages the aircraft, everyone who is able takes the proper lead and opens fire. In air defense, the volume of fire is the key to an effective small arms deterrent.

The best way to engage hostile aircraft with small arms is covered in various manuals. The individual Soldier's Manual for MOS 11B10 provides some instruction on how to fire an M16 rifle at aircraft; ARTEP 7-15 has the engagement of aircraft as a supplemental task for a light infantry battalion. TC 23-44 still provides the best guidance on small arms in air defense and includes both active and passive techniques that can be incorporated into field exercises.

Although there is no need to repeat what

is covered in the manuals, some of the points should be considered. One of these is the importance of "leading" a target. An aircraft traveling at 150 miles an hour will travel 218 feet in one second; a bullet will hit a target 460 meters away in about half a second. This means that even a slow target such as a helicopter at 460 meters will need to be given about 100 to 200 feet of lead; as the distance increases so must the lead. In that same half-second, the bullet will have dropped four feet, so super-elevation is also needed. Since there is only a slight probability that a single round will hit, the volume of fire is important since it increases the number of bullets a plane must fly through.

Having a soldier fire service ammunition at RCMATs is an excellent way to train him and test his air defense weapon skills. Unfortunately, there are two basic drawbacks to this system. First, there are no aerial gunnery standards for small arms, although Appendix B of FM 44-20 does contain some suggestions for range operations. Captain Robert Kilmer, Jr., in his article "Air Defense Training" (INFANTRY, January-February 1982, page 26) also lays out the operation of an air defense range.

Other problems are a shortage of ammunition and also of areas in which small arms can be fired at high elevations. This is especially true in Reserve Component units where access even to a standard range may be limited and where live ammunition is tightly controlled and used only for weapons qualification.

A solution to this problem and a relatively cost-effective way to train even active duty soldiers is to incorporate MILES equipment into the RCMATs. With this technique, extensive hours of training can be conducted in a garrison environment in an area no larger than a football field. This training, then, constitutes the third and fourth steps in the proposed training program—dry fire and immediate action drills that include drones or gliders, and drone MILES firing.

The use and operation of RCMATs is discussed in FM 44-1-2, Chapter 14, and need not be covered here. But what is of note is the ability to modify the miniature targets to resemble other operational aircraft. Because these drones can carry the additional weight of the MILES equip-

ment, they can be used both at home station and in a garrison environment for aircraft recognition and aerial gunnery drills.

One problem must be considered, however—a laser does not have the same ballistic properties as a 5.56mm bullet. This problem can be addressed by shifting the firer's sights. With maximum windage cranked into the rear sight, the firer's line of sight will lead the target while the muzzle will actually be pointed at the target. This effect will work, of course, only in one direction at a time, so this somewhat arbitrary constraint must be allowed for. If RCMATs are not available, cheap training aids in the form of styrofoam gliders can be obtained from some hobby shops.

These models can be fitted with the MILES equipment and towed behind a quarter-ton truck. Used in this fashion they can simulate a slow speed ground attack, allowing the soldiers to practice immediate action drills and aerial gunnery in a small area as part of squad or section battle drills. If blank ammunition is in short supply or if noise is a problem, the MILES dry fire cord can be used to determine target hits.

The final step in the program is to take the soldiers and vehicles to a range and have them fire service ammunition at RCMATs to test the effectiveness of their earlier training. At the same time, studies should be conducted on the effectiveness of various weapons—such as TOWs, Dragons, and tank main guns—on aerial targets to determine how these weapons can best join in the anti-aircraft battle, especially against attack helicopters.

While the air threat is real and deadly, an infantryman or a tanker does not have to be a helpless victim. If properly trained, he can play a significant role in fending off hostile aerial targets.



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