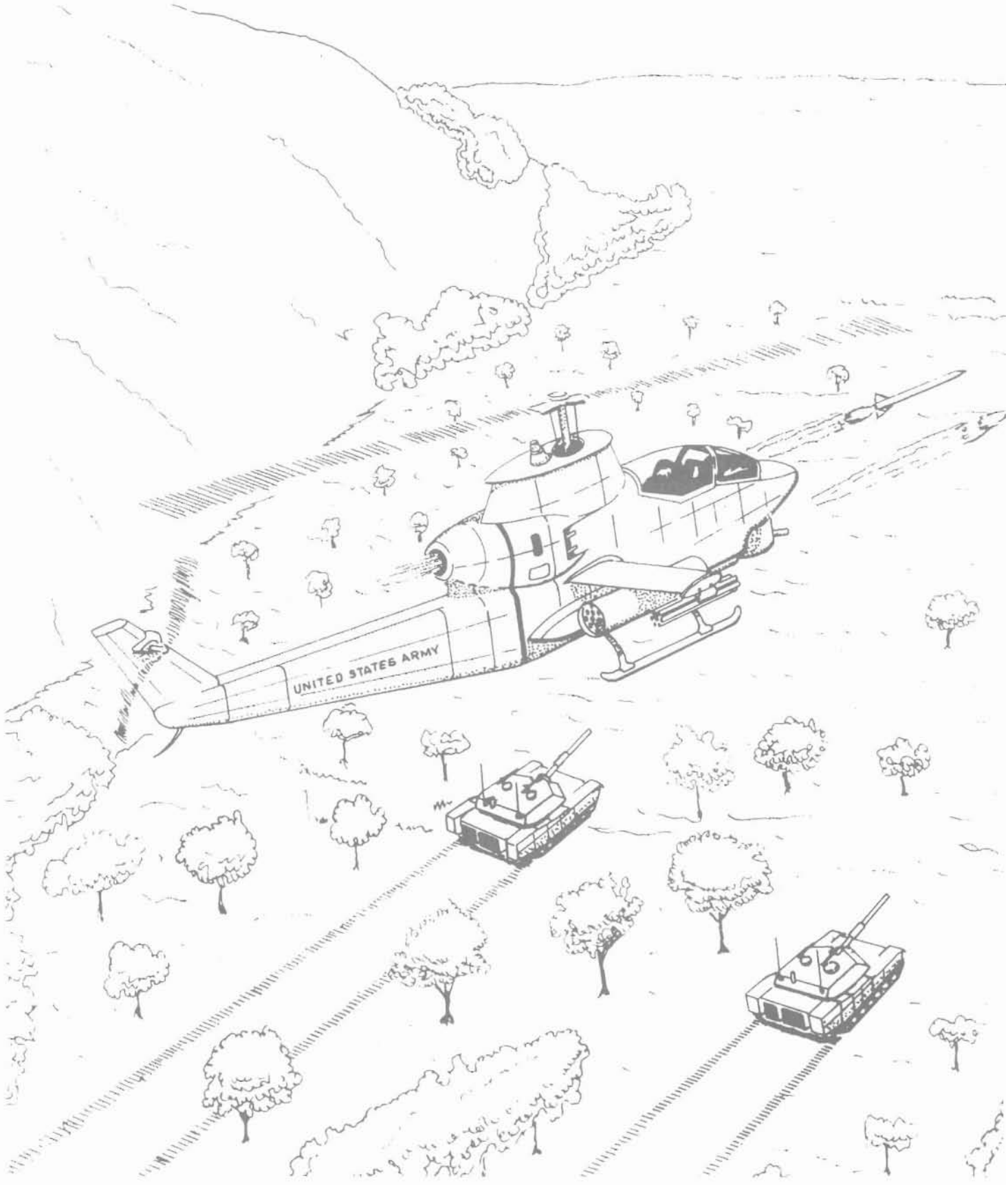
A New Way to Breach



Minefields

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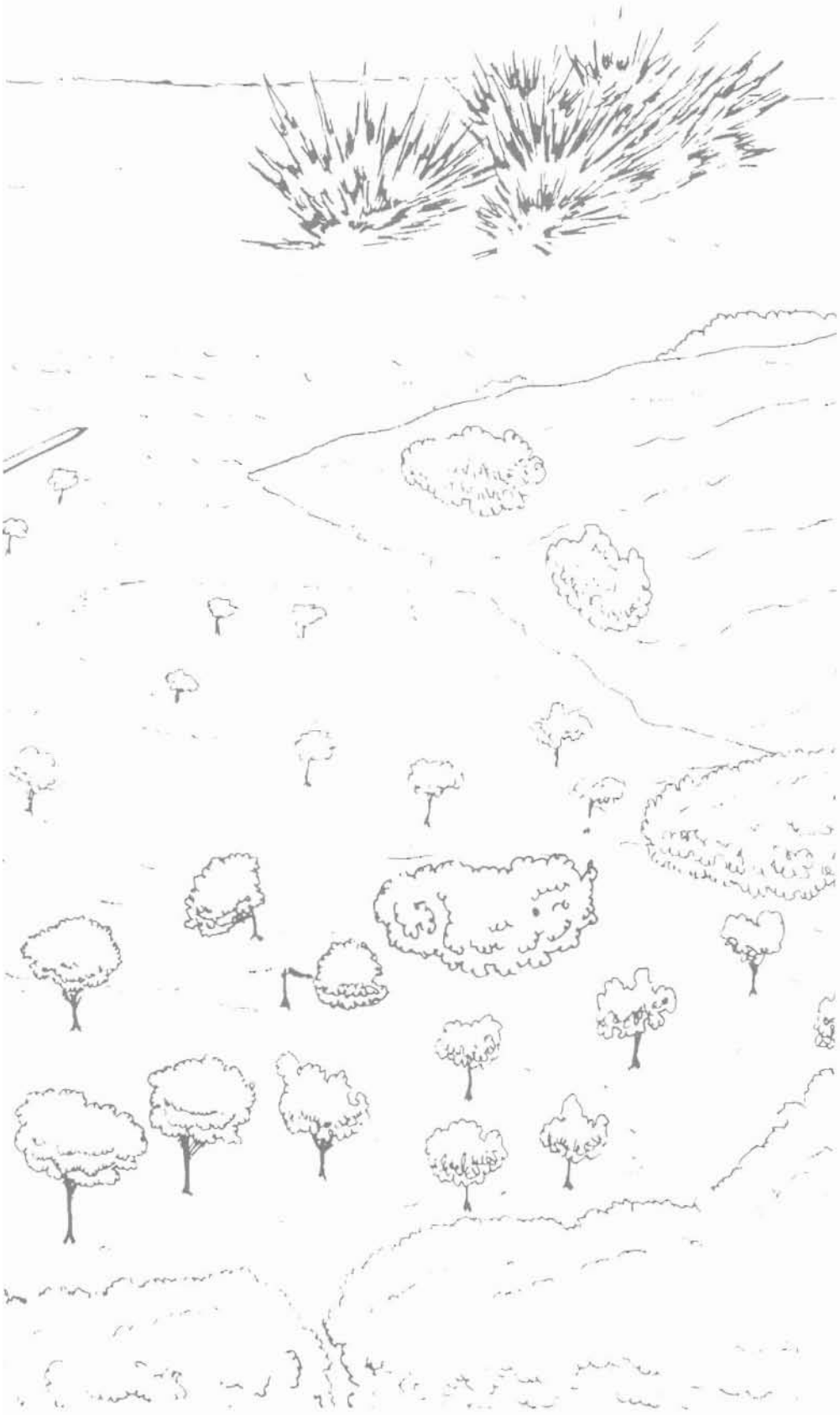

The lack of viable counterobstacle doctrine has long been a problem for an armed force desiring unimpeded battlefield maneuver.

When we examine the U.S. Army's requirements in this area, we find that there are five basic missions:

- counterobstacle missions such as negotiating craters;
- countermine missions such as clearing or breaching minefields;
- gap crossings missions such as river crossings, tank ditches, and overbridging existing structures;
- force mobility tasks such as constructing combat roads and trails;
- forward aviation Combat Engineering tasks (FACE) to construct landing zones and strips, low altitude parachute extraction system (LAPES) sites and forward arming and refueling points (FARPS).

In reviewing each of these missions we find that our capability to accomplish counterobstacle, gap crossing, mobility and FACE tasks are sufficient to provide U.S. forces with all the support necessary to operate on the Air-Land Battlefield. Countermine missions, however, are another matter.

For years, the methods we have used in breaching minefields have been so inefficient that they not only threatened the lives of our soldiers, but the success of important missions as well.

Modern technology and knowledge of potential adversaries require that we base our countermine requirements on a threat that routinely employs current mine delivery systems as part of a combined arms effort. The Warsaw Pact, as well as other countries trained by them, have well learned the lessons of mine warfare from World War II. They have continued to build on this knowledge by using information gained from the numerous conflicts and battles since then.

A simple review of the mine and countermine equipment available to threat forces reveals that they have substantial amounts of current hardware to both install and breach minefields. Threat force commanders have combined this equipment with viable doctrine and tactics to allow either system to be located well forward in the battle area. They have gone so far in their development of doctrine, that special combined arms teams or detachments are formed to install minefields and obstacles, or to breach those in their path.

The serious student of military science has little difficulty in recognizing that a U.S.-equipped force encountering a Warsaw Pact minefield on today's battlefield would experience serious difficulty. The mines by themselves would have a small impact and could be overcome with existing technology and doctrine. Combined, however, with the direct and indirect fires available to the defender, they would be capable of quickly and substantially degrading the combat effectiveness of an attacking U.S. force.

The threat commander has the capability to quickly locate, target and mass indirect fires anywhere within his sector. This capability requires that an attacker must overcome minefields rapidly. Loss of momentum by the attacking force gives the defender an opportunity to catch it in a devastating "fire sac" as well as gaining time to call forward reinforcements.

Current U.S. Army doctrine for overcoming minefields stresses "bypassing" the minefield. If bypassing is not possible, either a "hasty" or "deliberate" breach must be conducted.

If the defender has made the mistake of leaving a tactically sound by-pass, there is no requirement for countermine activities and the assault can continue. When there is no alternative but to cross the minefield, a breach is conducted.

A "hasty" breach is defined as one which uses assets organic to the force and is accomplished without loss of momentum. Although a hasty breach is accomplished as fast as possible, it may take hours.

A "deliberate" breach occurs when a hasty breach has failed or when the tactical situation dictates. The deliberate breach requires a build-up of substantial combat power and will usually be conducted by Combat Engineers brought forward for the mission. A deliberate breach may take several hours or even days depending on the strength of the defenders and magnitude of the minefields and other obstacles.

Because of the threat's ability to locate and target our forces quickly, a hasty breach taking longer than 30 minutes or a deliberate breach will receive severe opposition. The longer it takes to accomplish the breach, the greater the opposition—the greater the attacker's casualties.

Current U.S. Army combined arms doctrine specifies that an attacking force be organized into three elements: a support force to suppress the defenders with direct and indirect fires and obscure the breaching mission; a breaching force to conduct the breach, mark the lanes and secure the far side; and an assault force to continue the attack against the objective.

The breaching force will have tank-mounted mine rollers for detection and proofing; line changes for breaching lanes; or as most Engineers and infantrymen are aware, the mine detector and probe.

Although there are other items such as plows and fuel air explosives, they are not available now and there is no assurance that they will be available in time for the next war.

Some U.S. commanders, realizing that they cannot rely on a capability that does not exist, have developed expedient breaching methods such as pushing disabled vehicles through the minefield, aiming unmanned vehicles at the objective, using Engineer equipment to scrape the ground, or employing indirect fires in an attempt to provide a safe lane. Some commanders have given serious thought to "bulling" through a minefield to maintain momentum and escape the effect of massed fires.

Even with our current hardware and doctrine there is little doubt that crossing a defended minefield is a dangerous undertaking. There is also no doubt that until we provide a better means through equipment, techniques or doctrine, enemy minefields will dangerously impede mission accomplishment.

As mentioned earlier there are items which are developed and waiting to be called forth. Other systems and concepts using special sensors and electronics to detect and neutralize minefields are being studied, but some require major technology breakthroughs before they can be available for actual battlefield use.

Because of limited advances in the countermine arena we can expect that our force's capability to breach minefields on today's battlefield will be at or below what we had in World War II!

Perhaps some relief to this problem can come from existing equipment or weapon systems. The question is: "Which ones, and how can we employ them to provide the capability we need?"

One such proposal is to consider the combat power of attack helicopters. These helicopters can carry 76 2.75-inch free flight rockets.

There are currently two warhead options which may be suitable for breaching a path through minefields. One is the 17-pound high explosive warhead, and the other is the flechette warhead. By launching the rockets at a predetermined air speed, altitude and aircraft attitude in quick sucession as specified in FM 17-40, *Helicopter Gunnery*, a narrow, but long "beaten area" is produced. Mines close to this path would be detonated or destroyed by the 17-pound warhead explosion.

Flechettes from the other warhead would penetrate the mine case and damage internal components but may not detonate the mine.

Perhaps with minor modifications flechettes could be made even more effective by making them pyrophoric or capable of providing the flame necessary to initiate the mine's explosive charge.

At this time we do not have the techniques or a doctrine, or for that matter, assurance that this concept would be effective. If it were proven effective, it would be the only system ever available which could provide U.S. forces with the capability to conduct a truly hasty breach through a conventional or FASCAM minefield.

Explosive Warhead Rockets

In considering the results from actually using these proposals, we can see where they might be effective. The 17-pound warhead rockets would be fired in pairs. The helicopter's firing attitude and altitude, its speed, and launch sequence of the rockets could be correlated to cause the rockets' path to form a clear lane of a specific width and length.

Width of the lane would be based on the effective radius of the warhead to detonate, destroy or clear mines from the lane. The length of the lane provided by a single aircraft would depend on aircraft speed, launches per second and the number of rockets fired. The deeper the minefield depth, the greater the number of firing runs which would be required to breach the entire depth.

The effect of the rockets on the minefield could be as follows:

- Mines close enough for sympathetic detonation would, of course, explode. The combined force of the rocket and

mine explosion may destroy or detonate other nearby mines.

- Through the forces transmitted from the ground, mines not detonated may be displaced or crushed. By shifting the mine from the horizontal position, more force would be required to activate the fuze mechanism. In addition, the ground would be disturbed and could conceivably be so loose that the mine would sink into the ground without exploding. An undesirable factor resulting from this is that some mines may become *sensitized*.
- Mounds of debris covering the mine would also transfer a vehicle's weight over a greater area so that the fuze does not receive sufficient pressure to activate.
- Mounded dirt and debris would also expend some of the explosive force even if the mine did detonate, thereby decreasing the damage probability.
- Mines with anti-handling devices would be disturbed and might detonate.
- Magnetically fuzed mines might also explode when quickly shifted. They would be vulnerable to being displaced, detonated, covered by debris or rolled into craters resulting from explosions.
- The resulting path (lane) from warhead explosions would be readily visible because of the close proximity of the linear crater path.
- The entrance and end of the cleared path could be designated by using perhaps a "marking" rocket which emits a colored smoke. White Phosphorous (WP) would not be feasible because it would mask the clear lane.
- Resulting mounds and craters would preclude the effective use of proofing devices such as rollers, but the self-bridging capability of armored vehicles would allow them to stay on mounds and other debris. This practice would drastically reduce the probability of detonating a mine.

Flechette Rockets

Flechette rounds would be employed in the same manner as the explosive warhead. They would be employed at an airspeed, altitude, aircraft attitude and range which would create a thin, long, beaten area in which flechettes would cover the beaten area in any density desired.

The current flechette would have a low probability of detonating a mine, but two or three of them hitting a mine could damage the fuze or firing chain.

In addition to breaching conventional or FASCAM minefields in a unit's path, this concept, if feasible, could be the answer to a major problem which all armies have today—extricating friendly units from air or artillery-delivered mines which have been placed directly on them. A friendly force in this situation could button up and have attack helicopters fire directly onto them. Safe lanes could be quickly breached without damage to the force.

A warhead containing 2,500 flechettes could cover a 20-foot x 20-foot area with six flechettes per square foot. Firing the rockets in pairs would place twelve flechettes in each square foot. This would allow a helicopter with 76 rockets to breach a 20-foot x 760-foot lane with a high probability of damaging any mine in the lane.

Combined High Explosive and Flechette Warheads

An alternative concept would have each pair of rockets contain one high explosive (HE) warhead and one flechette warhead. This would provide a high probability that any mines in the lane would be damaged by the flechettes and exploding warhead. This concept would also provide an instant means for marking the cleared lane using the craters formed by the HE rounds.

For this reason the concept of using a mix of one HE and one flechette appears to offer advantages over firing just flechettes. Not only will the lanes be marked by craters, but the craters and resulting spoil will provide loose soil in the same manner as using purely HE warheads. The possibility of affecting each individual mine, however, increases with each flechette round used.

Certainly there is some question of the danger involved in a proposal such as this. However, when you compare it with our present breaching capability, it provides us with capabilities we have not had before. That is, the ability to maintain force momentum, the ability to safely counter air or artillery-delivered mines, and the ability to combine breaching and marking into a single operation without exposing soldiers.

The important factor is that U.S. forces would be able to plan for and cross large mined areas much quicker than the critical 30-minute time limit. This would prevent them from being exposed to the full force of the threat's direct and indirect fires.

Doctrinal Implications

Minefields would be breached in minutes rather than hours. This factor would allow the force commander to count on a much larger portion of his force to be intact when he reached the objective.

In addition, the speed with which the objective could be reached would prevent enemy reinforcement. By the time enemy fires could be brought on the attacker, it would be too late. The two forces would be so close to each other that effective supporting fires would be difficult and dangerous to deliver.

The use of air-delivered, free flight rockets in a minefield breaching role is just an idea; and there are certainly many who could argue against it. There are also many who may consider it to be a good idea, particularly since this method of delivering free flight rockets with a high degree of reliability can be trained on using existing techniques. Good or bad, it is an idea which may get other people thinking.

U.S. forces have some of the best combat vehicle systems in the world. Their speed and survivability will be worthless if they spend valuable minutes or hours waiting for a minefield to be breached.

Somewhere there is a better way to breach minefields and we need to find this technique before the next battle. The concept of using free flight rockets launched from attack helicopters, a system already available to the force, may be the answer.

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