Provide continuous adequate fire support coverage within the zone of action.

Position indirect fire weapons well-forward.

Consider assigning route precedence to indirect fire units.

Consider replenishment of units.

Plan for continuous communications. Make use of radio relays, brevity codes, and signals. Use wire and messengers during preparation and shift to radio when the attack has begun.

Maintain close and continuous coordination with the FSC of the designated reserve unit to facilitate fire support if the reserve is committed.

Plan observation, including target acquisition, adjustment of fires, surveillance of prearranged fires, and battlefield surveillance. Observers must be positioned where they can see the battlefield. Remember reconnaissance teams, aircrews, and artillery weapons locating radars.

The rest of this section identifies other considerations appropriate to specific offensive operations. They should be used as a guide. They are not all-inclusive nor do they always apply.

MOVEMENT TO CONTACT

Assign priority of fires to the main effort.

Plan fires on critical points along the route of march.

Plan priority targets.

Plan fires to support the momentum of the supported unit; e.g., screens, suppressive fires on bypassed enemy defenses or obstacle clearing.

Consider laser designators positioning. Some may be positioned with the lead units. (See appendix K for employing lasers.)

Ensure communications for calling for fire.

Ensure FSCs in trailing and adjacent units coordinate and pass information continually.

Consider positioning FOs, FACs or spot teams in overwatch positions.

Plan for hasty attack contingencies, SEAD, and counterfire.

HASTY ATTACK

Give priority of fires to the main effort.

Plan fires on known and suspected enemy direct fire positions.

Plan electronic attack of critical targets when assets are available.

Plan priority targets.

Plan fires on likely assembly areas.

Plan fires on the objective, on gaps, and beyond the objective to exploit success.

Use smoke to obscure line of sight of enemy observers and to screen friendly movement.

DELIBERATE ATTACK

Plan fires to--

- Support the maneuver's attack on the objective.
- Prevent the enemy's withdrawal from the objective.
- Create a gap in the enemy's defenses or to cause him to react where he becomes vulnerable; e.g., fires to disrupt his direct fire weapons to facilitate maneuver of the supported unit.
- Attack enemy indirect fire assets to keep them from firing on friendly forces as they advance.

Consider using preparation fires on the objective coordinated with maneuver.

Attack targets beyond the objective to prevent reinforcements and resupply.

Plan smoke on the flanks and on crossings of exposed areas.

Plan fires on the flanks of the supported unit's advance to prevent counterattack or reinforcement; e.g., FASCAM.

Plan electronic attack on critical targets when assets are available.

Ensure fire support is positioned and supplied to provide continuous support during the attack.

RAIDS

Prepare detailed fire support plans to cover all phases of the operation and foreseeable emergency contingencies; e.g., aborting the mission before reaching the objective.

Fires may be directed against the objective immediately before the attack.

Plan fires to—

- Prevent reinforcements.
- Screen the raid force.
- Support a withdrawal.

EXPLOITATION AND PURSUIT

Use supporting fires to maintain momentum.

Plan fires to suppress bypassed pockets of resistance. forces.

Consider FASCAM on bypassed units to immobilize them but use caution to ensure the safety of follow on forces.

Consider CAS and attack helicopters to attack fleeting targets.

Restrictive fire lines (RFL) may be required between exploiting and converging forces.

Plan to shift FSCMs in advance of the supported unit.

SECTION VII. DEFENSIVE OPERATIONS

In the defense, the battlefield is organized into the security area, the main battle area (MBA), and the rear area. See MCWP 3-1, *Ground Combat Operations* and MCWP 3-15.1, *Antiarmor Operations*, for a detailed discussion on the conduct of the defense.

SECURITY AREA

Tasks

Engage the enemy with fires beyond the security area to create confusion and cause him to deploy early.

Provide adequate and continuous close support for committed units of the security force.

Maintain close liaison and communications with the MBA for withdrawal of the security force.

Command and Control

Assign on-order tactical missions to artillery units in the covering force to facilitate egress to the MBA.

Organize the covering force, including its own artillery, to operate independently.

Support the covering force in the division fire support plan. Regiment and battalion FSCs perform most fire support coordination in the covering force.

Clearly delineate the procedure for transfer of C2 for fire support responsibilities between security forces and forces in the MBA.

Planning

Centralize planning and coordination as much as possible to facilitate withdrawals, battle handoff, etc.

Plan fires to neutralize enemy reconnaissance elements and to slow, stop or canalize enemy movement.

Plan and coordinate routes, positions, communications, and control of fires to the MBA for the supported maneuver units.

Plan, coordinate, and disseminate permissive FSCMs to facilitate rapid engagement of enemy forces.

Plan FASCAM (air or artillery) to canalize and slow enemy forces.

Plan fires to cover obstacles.

Plan CAS on known concentrated enemy positions, but retain on-call CAS for immediate reaction when the enemy's main attack is discovered.

Plan screening or obscuring smoke in front of friendly positions to reduce enemy observation and to facilitate withdrawal to subsequent battle positions.

Establish communications procedures and radio nets for calls for fire and coordination/clearance during the rearward passage of lines.

Plan fires on enemy C2 elements and key enemy vehicles to cause confusion, force early deployment, break up formations, separate tanks from infantry, and force tanks to button up.

Plan fires to cover disengagement and repositioning of supported maneuver elements.

Plan fires to complement direct fire weapons.

Position lasers forward to overwatch likely avenues of approach.

Plan target acquisition to detect targets for deep attack; e.g., reconnaissance, UAVs, and sensors.

Coordinate any electronic attacks to protect friendly communications required during withdrawal to subsequent battle positions.

MAIN BATTLE AREA

Tasks

Mass fires to canalize and slow enemy forces. Plan fires/FASCAM on obstacles to disrupt breaching effort and to inflict maximum casualties. Use fire support to isolate enemy forward echelons. Use smoke and other fires to assist supported units in disengaging and moving. Plan fires to separate infantry from armor.

Command and Control

Make contingency plans and implement based on the enemy main effort.

Maximize use of wire communications including laying wire in advance to planned alternate positions.

Centralize control of fire support.

Planning

Plan massed fires on enemy avenues of approach. Establish killing zones within the battle area using all fire support means.

Plan fires on potential enemy overwatch positions and observation posts.

At battalion level, coordinate supporting arms fires with direct fire weapons, including antitank guided missiles (ATGM). Integrate fires with obstacles to slow and canalize the enemy for better shots from direct fire weapons or other supporting arms.

Establish final protective fires (FPFs) and allocate them to units with the main defensive effort. Artillery and mortar FPFs should be planned and closely tied to direct fire final protective lines (FPLs). Ensure that everyone understands who is to order firing the FPF, under what conditions, and when; i.e. the signal or code word.

Plan on-call CAS for lucrative targets such as armored formations.

Develop a fire support plan for the counterattack.

Reinforce obstacles with fire. Consider FASCAM to augment existing obstacles and/or re-seed breached minefields.

Use smoke screens behind forward enemy elements to isolate them and break up their formations. Smoke can be fired behind the enemy during daylight to silhouette.

Plan CAS employment; e.g., responsive airspace coordination or alert status. Air support is planned on deep targets and those targets that can be attacked as the situation develops using on-call missions and search and attack methods.

Plan fires to support disengagement and repositioning maneuver forces.

Plan for counterfire. Consider a counterpreparation to disrupt the enemy preparation fires. Use all available assets. Air support can be employed on-call and in search and attack missions against deep counterfire targets.

Plan fires to bring the enemy under fire early or to withhold fires until the enemy reaches designated positions or trigger points to effect surprise. Figure 3-8 shows a trigger point.

The FSC must work closely with the G-2/S-2 to synchronize fires with the enemy's movement. The time distance table in appendix L may make this easier.

See appendix L for targeting, symbology, and scheduling.

REAR AREA

Fire support planning and coordination in the rear area is complex. The rear area may contain a large number of combat support and combat service support (CSS) units. This density and the challenge of timely exchange of information between fire support agencies and the CSS unit's parallel chain of command can increase the chance of fratricide. Commanders may choose to require positive clearance for missions requested in the rear area. See MCWP 3-4.2, *Rear Area Operations*.

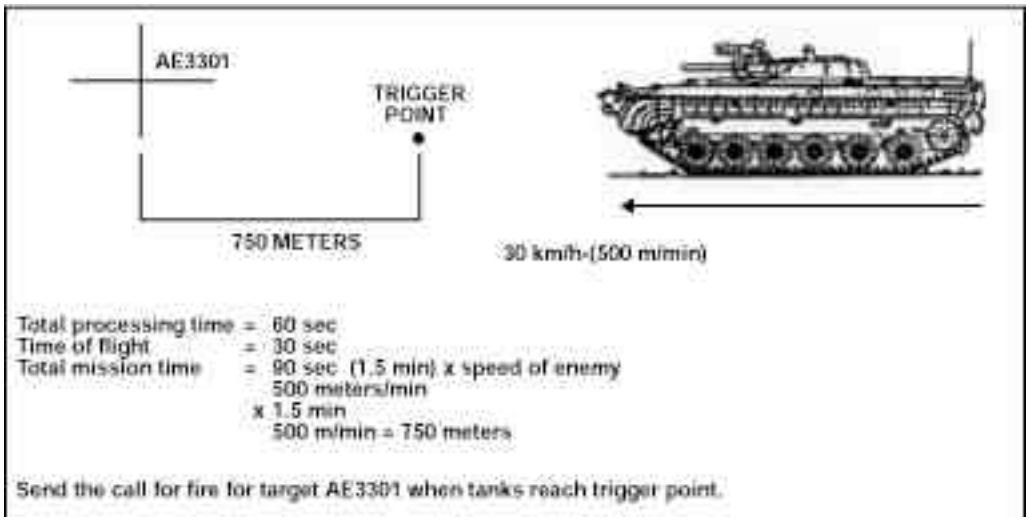

Figure 3-8. Trigger Point.

Establish liaison with the force controlling the rear area.

Allocate or designate fire support to support a rear area contingency plan.

Identify fire support request procedures, means of observation, and communications links for fire support for a rear area contingency.

Determine ammunition requirements for rear area contingencies.

Designate fire support elements by on-order missions.

Make liaison early between the GCE unit with the on-order rear area mission and the RAOC.

Rear area units fire support plans must be incorporated into the MAGTF's fire support plan.

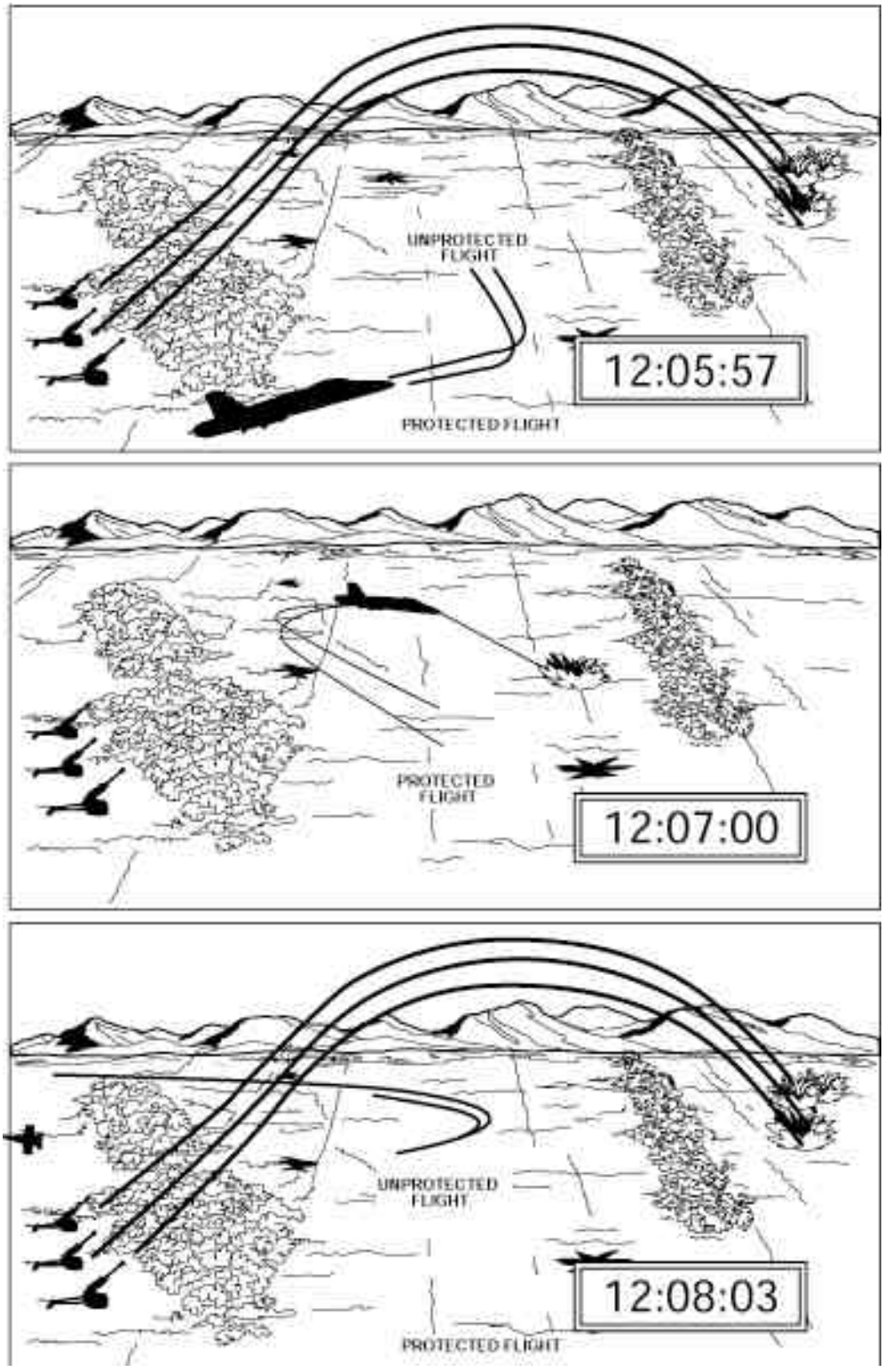

Figure 5-10. Artillery-Aircraft Timed Separation.

Target Identifiers

Although executing CAS missions at night has many advantages, darkness and unfavorable weather exasperates the problem for aviators to identify targets. To increase aviation assets effectiveness and strive for first pass hits, fire support planners must consider multiple and redundant means to aid aviators in identifying targets.

Airborne Illumination

Most USMC aircraft capable of providing CAS can employ flares that provide illumination for up to 3 minutes. See MCWP 3-23, *Offensive Air Support.*

Surface Delivered Illumination

Illumination can be delivered by artillery, mortars, and NSFS to illuminate the target area. If more than one illumination round is employed, pilots must be briefed. Illumination on the deck has a tendency to degrade NVG performance and disorient pilots. 81mm mortar red phosphorous may also be considered for night CAS MARKS.

Enemy Ground Fire

Enemy ground fire, AAA, tracer rounds, and SAM firings can disclose target locations.

Laser Designators and IR Pointers

These tools can enhance night target acquisition. CAS aircraft with laser spot trackers can acquire targets marked by a designator without using conventional illumination. FACs and terminal controllers armed with IR pointers can identify targets to pilots using NVGs quicker than by "talking-on." Coordination is paramount between the ground unit, FAC, and CAS aircraft. Controllers and aviators must be wary of the number of pointers used by adjacent friendly units and the enemy. If there are a number of IR beams in the area, it will be difficult for CAS aircraft to identify the correct target area. All USMC aircraft can acquire laser or IR illuminated targets.

Friendly Positions

Marking friendly positions improves CAS safety and can provide target area references. Whenever possible, friendly positions should be marked if safe separation is a factor.

Flares in the air, such as pyrotechnics and 40mm illumination grenades, are effective marks but are usually visible to the enemy. Wind and cloud cover are important factors in using flares successfully at night.

Strobe lights, if available, can be used for night marking. Infrared filters can be installed when using NVGs and forward looking infrared (FLIR)-equipped aircraft.

Any light source that can be readily covered and uncovered can be used for coded signaling. Vehicle headlights are useful nighttime marks, but for security, cover headlights and use tail or brake lights.

SECTION VI. DASC-FSCC COORDINATION

Upon phasing control ashore, the DASC directs OAS and assault support functions under the operational control of the TACC. The DASC is the principal air control agency responsible for directing aviation operations that support ground forces. The DASC processes requests for OAS, assault support, and reconnaissance. It provides procedural control for aircraft transiting its area of operations and coordinates with the ground force on routes, FARPs, frequencies, and airspace control measures.

The DASC or a DASC liaison team collocates with the GCE FSCC for the most effective integration of direct air support missions. This ensures the most economical use of resources for a timely, flexible response to requests from the MAGTF. When collocation is not possible; e.g., with a GCE FSCC in a fast moving mobile operation or during displacements, reliable communications must be established between the two agencies. See MCWP 3-25.5, *Direct Air Support Center Handbook*.

DASC RESPONSIBILITIES

The DASC is responsible to provide timely information to the FSCC on—

- Aircraft routing plans.
- BDAs reported by air crews.
- The status of outstanding requests.
- Pertinent intelligence data.
- Recommended FSCMs as they relate to air support.
- Changes to the ATO.
- UAV operations to preclude interference with surface fires.
- Air defense weapons control status and warning conditions.
- Availability of aircraft to satisfy joint tactical air strike requests (JTARs)/assault support requests (ASRs).
- Validation on requirements if requests were not received over TAR/HR.
- Diverts of aircraft from preplanned missions when required.
- Recommendations on air allocation.
- Recommend alert status of aircraft (alert 15, 30, 60, etc.).
- FARP status.

FSCC RESPONSIBILITIES

The FSCC continuously provides the DASC with pertinent information. The point to remember is that the DASC pictures the battlefield based on the information it is provided by the FSCC, other MACCS agencies, and reports received from pilots. Information passed by the FSCC to the DASC includes—

- Boundaries, FSCMs, and maneuver checkpoints.
- Positions of indirect fire weapons.
- Pertinent intelligence data, especially antiair threats.
- Friendly unit locations.
- Scheme of maneuver, objectives, and commander's intent.
- Air targets that require terminal control that exceeds the GCE's organic TACP capability; e.g., FAC(A).
- Status of terminal controllers with the GCE.
- Schedules of fire (and changes).
- LAAD locations (if LAAD is in DS of the GCE).

SECTION VII. COUNTERFIRE COLLECTING AND REPORTING

Counterfire is fire intended to destroy or neutralize the enemy indirect fire capability. It provides freedom of maneuver and unrestricted use of friendly indirect fire support. Units must be prepared to determine and report counterfire information.

Counterfire information produces intelligence on the location, number, disposition, zones of fire, caliber, and type of enemy artillery, mortar, and rocket weapons. It has great value in estimating enemy tactical capabilities. Counterfire information may also disclose new types of enemy ammunition and weapons, a knowledge that may permit early development of effective countermeasures.

COLLECTION MEANS

Some means used to collect to determine information are crater and shell fragment analysis, SHELREPs, and detection by target acquisition devices; e.g., radars, air and ground observation, electronic signatures, and target prediction. Counterfire information is forwarded by observers to the FSCC in the most direct manner for processing. The SHELREP usually provides the medium for this reporting. The SHELREP allows for cueing of artillery radars in the appropriate search sector to locate the weapon. The FSCC will use this information to locate the enemy firing agency. Based on commander's guidance, several sources of information, intelligence or reports may be required to confirm target location. Once the target meets the criteria, the FSCC will task an agency to perform counterfire. Chapter 3, section IV discusses the planning sequence for counterfire.

REACTIVE COUNTERFIRE

Proactive counterfire based on IPB is the preferred counterfire method. However, not all enemy indirect fire can be destroyed prior to commencing an attack.

Reactive counterfire normally requires quick response capabilities for optimum effectiveness. MCRP 3-16B, *Targeting and Procedures for Time Critical Targeting*, has an indepth discussion of attacking time-sensitive targets. Aviation assets provide an excellent source to provide reactive counterfire, particularly outside the GCE's area of influence. An air quick fire channel, TAD-UHF net can be established between the counterfire section in the FDC, FSCC, or a FAC(A). Upon target acquisition, the AirO hands off the mission to the FAC(A), who executes with available CAS. Prior coordination with the DASC and coordination techniques for maneuver and indirect fires must be incorporated into the fire support plan.

SECTION VIII. FAMILY OF SCATTERABLE MINES

Artillery and air delivered mines provide the maneuver commander with a rapid, flexible means of delaying, canalizing, or attriting enemy forces in offensive and defensive operations. FASCAM can also augment conventional minefield capability. The engineer officer and the G-3/S-3 at each level of command share the primary staff responsibility for the planning and employment of mines. The engineer advises the G-3 on the use of all minefield systems, including FASCAM. The G-3/S-3 recommends priorities, delegation of employment to subordinates, restrictions on usage, and positioning of minefields. The FSC has two responsibilities in incorporating FASCAM into the unit's minefield program: advising the supported unit on the capabilities and limitations of FASCAM and keeping the supporting arms notified as far in advance as possible of the supported unit's intentions to use FASCAM. The delivery of FASCAM may require approval from higher headquarters.

AIR DELIVERED MINES

Air delivered FASCAM has the same advantages of artillery FASCAM but can be employed anywhere aviation flies. The major difference between the two is that air delivered FASCAM has three selectable times: 4 hours, 48 hours, or 15 days. Both types of mines are found in one piece of ordnance: the GATOR, CBU 78. It consists of 60 submunitions: 45 BLU-91B antitank and 15 BLU-92B antipersonnel mines. The mines arm themselves within two minutes of deployment. The BLU-91B employs the same warhead and functions the same as RAAMS. The BLU-92B employs an omni-directional warhead and a fragmentation case to create its antipersonnel effect. It employs four 40 feet tripwires for detection. GATOR is best suited to preplanned missions. They are requested using the JTAR via normal air request channels. Regardless of the location of air delivered mines in relation to the FSCL, the use of air delivered mines is coordinated because of their obvious effect on future operations.

ARTILLERY DELIVERED MINES

Remote antiarmor mine system (RAAMS) and area denial artillery munition (ADAM) each come in two preset self-destruct times: short duration (4 hours) and long duration (48 hours). Mines begin self-destructing at 80% of the stated time. Both munitions have an approximate 4.5% dud rate. When both munitions are employed together, fire ADAM *last*.

RAAMS (M718-L and M741-S)

RAAMS are used to achieve tactical kills on tanks and other armored vehicles. Each projectile contains nine mechanically fuzed, antitank mines. Upon arming (approximately 45 seconds after impact), the mine uses electromagnetic signature to detonate a shaped charge at the vehicle when it passes over the top of the mine. Mines function right side up or down, but only achieve mobility kills at cants of greater than 30 degrees. Some mines have an anti-disturbance feature.

ADAM (M692-L and M731-S)

ADAM projectiles are used against personnel. Each projectile contains 36 antipersonnel mines. Upon fuze function of the projectile, individual mines are dispersed over the target area. While arming (complete by 2 minutes after impact), each mine deploys 7 anti-disturbance, tripwire sensors. When disturbed, the mine propels its munition 3-8 feet into the air, detonating into 600 1.5 grain steel fragments. When employed in combination with other projectiles, ADAM rounds are always the last rounds fired.

MINEFIELD TARGET CATEGORIES

Two types of minefield target categories may be employed using FASCAM: planned and targets of opportunity. The type used depends on the amount of planning and coordinating time available and the desired density of the minefield. The primary reference for minefield employment is MCWP 3-16.4/ FM 6-40, *Manual Cannon Gunnery*.

Planned minefields are normally initiated and coordinated at higher echelons. They are planned as scheduled or on call to support barrier/obstacle plans. Planned minefields can consist of either short or long duration mines.

Targets of opportunity are immediate minefields initiated by calls for fire or unplanned operational

changes. They consist of short duration mines delivered in preplanned or standard planning modules. Normally, a standard target of opportunity minefield is an adjusted, low angle, short duration, 200 x 400 RAAMS, 400 x 400 ADAM, medium density field. Depending on variables, this would consist of approximately 36 to 48 RAAMS and 12 ADAM projectiles. Authorization to employ FASCAM and the number of howitzers immediately available to fire is a large factor in responsiveness.

Firing Unit Considerations

Three factors must be considered when employing artillery delivered FASCAM: the counterfire threat, availability of the desired munition, and how long the artillery unit will be occupied firing.

Minefield Density and Size

Standard minefield modules are 400 by 400 meters for ADAM and high angle RAAMS. Low angle RAAMS use a 200 x 200 meter module. The width of the field is always applied as a multiple of the module planning size. Lengths determine the number of aim points and are always the longest axis.

There are three basic minefield types *categorized by required density*: low, medium, and high density. Density depends on the mission of the minefield. A low density minefield harasses an enemy but is quickly breached. A medium density field will provide an effective obstacle if the minefield is covered with direct fire and enemy vehicles are buttoned up. High density fields require considerable clearing and are useful for forces that are heavily outnumbered and cannot provide adequate covering fires for the obstacle or need time to withdraw to subsequent positions.

Ammunition availability, combined with fire unit positioning and delivery capabilities, provide an estimate of how many meters of minefield of various densities are available. The basic allowance for FASCAM for a unit is low and normally restricted to short duration mines. To use significant quantities of FASCAM requires added logistical planning and a decision to use ammunition transport assets to move FASCAM at the expense of other, more widely used munitions Minefields should be emplaced using all available units rather than firing one unit for a long duration.

SAFETY ZONE DETERMINATION

The safety zone represents the effective obstacle for friendly forces as it contains spillover mines from the targeted area (99% within the safety zone). No friendly forces should be located within the safety zones prior to emplacement nor maneuver through them before destruction. The FSC is responsible for obtaining safety zones. Safety zones for preplanned minefields are computed by the FSC for incorporation by the engineer and distribution by the G-3. Safety zones for short duration minefields are computed by the artillery FDC and forwarded to higher headquarters via the FSC after the mission is completed. The engineer officer coordinates the field artillery planning sheet with the FSC. Automated fire support systems such as AFATDS can determine the safety zones for FASCAM minefields. See figure 5-11.

Fired Minefield Data

See table 5-1. Use the following fired minefield data:

- Type of projectile fired (ADAM or RAAMS).
- Trajectory (high or low angle).
- Range to minefield center.
- Technique (met + velocity error [VE]/transfer or observer adjust).
- Aimpoint coordinates (single or left and right).

Enter the table at the nearest range for the projectile type and trajectory and use the correct employment technique column to determine the size of the safety zone. Draw the determined safety zone centered over each aimpoint to establish the minefield safety zone.

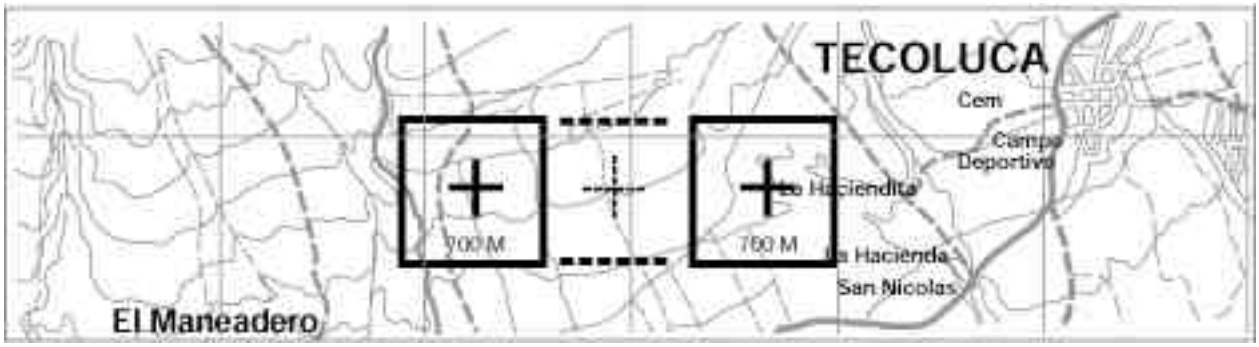

Figure 5-11. Safety Zone Example.

Table 5-1. Minefield Safety Zone.

Projectile & Trajectory	Range (KM)	MET & VE/Transfer Technique	Observer Adjust Technique
RAAMS Low-Angle	4	500 x 500	500 x 500
	7	550 x 550	500 x 500
	10	700 x 700	550 x 550
	12	850 x 850	550 x 550
	14	1000 x 1000	650 x 650
	16	1050 x 1050	650 x 650
	17.5	1200 x 1200	650 x 650
ADAM Low-Angle	4	700 x 700	700 x 700
	7	750 x 750	700 x 700
	10	900 x 900	750 x 750
	12	1050 x 1050	750 x 750
	14	1200 x 1200	850 x 850
	16	1250 x 1250	850 x 850
	17.5	1400 x 1400	850 x 850
RAAMS or ADAM High-Angle	4	750 x 750	700 x 700
	7	900 x 900	700 x 700
	10	1050 x 1050	750 x 750
	12	1200 x 1200	750 x 750
	14	1400 x 1400	850 x 850
	16	1500 x 1500	850 x 850
	17.5	1400 x 1400	850 x 850

Minefield Safety Template

- Enter the template with the fired minefield data:
- Technique (met + VE/transfer or observer adjust).
- Trajectory (high or low angle).
- Type projectile fired (RAMMS or ADAM).
- Range (to minefield center).
- Aimpoint coordinates (center or left and right).

Center the selected template safety zone square over the aim points. Draw a square to establish the minefield safety zone. See figure 5-12.

DA FORM 5032-R, FIELD ARTILERY DELIVERED MINEFIELD PLANNING SHEET

The delivery unit initiates the scatterable minefield report. For the artillery, the battalion receiving the call for fire designates the firing units. After the minefield is emplaced, the fired data is forwarded to the division, regiment, or battalion FSCC. The fired data is recorded on DA Form 5032-R, Field Artillery Delivered Minefield Planning Sheet, Section D. (See FM 6-40/MCWP 3-16.4). The FSCC computes the safety zone according to the fired data and passes it to the engineer for dissemination to higher, lower, and adjacent units as appropriate.

Interdiction or Area Denial

Artillery-delivered scatterable mines are not well-suited for interdiction or area denial. Because artillery-delivered minefields tend to be small and of low density (low ammunition availability), they are easily

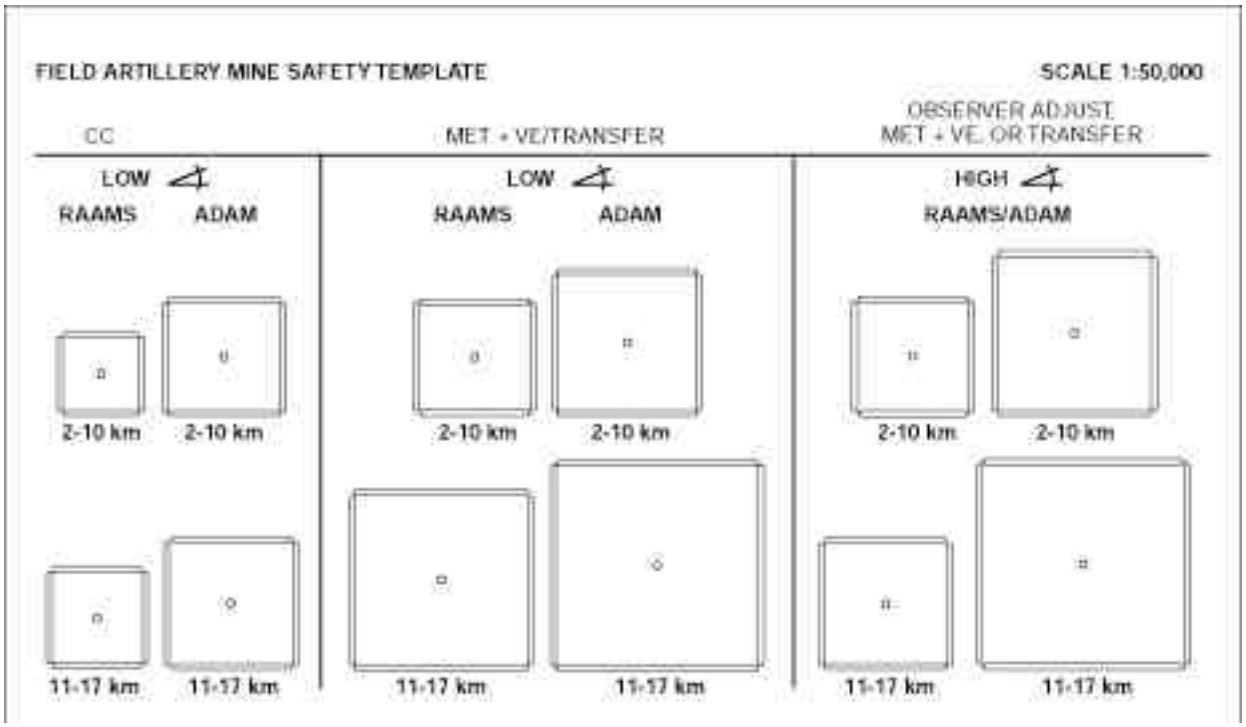

Figure 5-12. MIne Safety Template.

bypassed and/or breached. FA-delivered mines are poorly suited for interdicting roads because--

- Mines tend to break up or malfunction when they land on a hard surface road.
- Mines are easy to see against the uniform background of a road.
- Units on roads are already moving in column and columns are the best formations for breaching scatterable minefields.

If RAAMS and ADAM are used for interdiction or area denial, employ them—

- Only at choke points to keep the enemy from easily bypassing the minefield.
- In high-density fields to prevent breaching.
- When and where they are hard to detect; e.g., in limited visibility (at night or in fog) or where the enemy will be buttoned up (as in a chemically contaminated area).

EMPLOYMENT AS AN OBSTACLE

Any type of FASCAM should be employed according to the basic principles of minefield employment as follows.

Employ mines at a choke point.

Cover mines with effective direct fire and indirect fire by using HE-VT or DPICM.

Keep minefields under continuous observation. Use night observation devices and planned illumination targets at night.

Emplace minefields in belts if possible. It is better to force the enemy to breach three narrow minefields than to have him breach one wide one.

Plan to defeat enemy breaching efforts. Coordinate with the S2 and engineer to anticipate how and where the enemy will try to breach the minefield. Plan direct and indirect fires to defeat enemy breaching parties.

SPECIAL CONSIDERATIONS

FASCAM in general presents a unique planning challenge for fire support personnel because it is visible and vulnerable on the surface of the terrain. This leads to--

- Reducing the enemy's ability to see; use indirect fire to make him button up.
- Minimizing indirect fires on top of the FASCAM. This represents a judgment call. Firing on the minefield destroys breaching parties, but it also makes the minefield easier to breach by destroying the exposed mines.

One compromise is to concentrate indirect fires on targets immediately beyond the minefield and direct fires on targets in the minefield. If a mine plow or other mine-clearing vehicle enters the minefield and clears a lane, following vehicles will have to bunch up to enter the lane and may present a good target.

If the enemy has cleared a lane and is on the verge of breaching the minefield, consider firing a heavy concentration of smoke and/or DPICM directly on top of the minefield. Smoke should obscure the remaining mines as well as the clear lane markers that the vehicles are trying to follow. Using smoke will have to be carefully coordinated, since it will inhibit friendly direct fire weapons. However, a fire mission of this type should be on-call in case the enemy places smoke in between your maneuver force and the minefield to screen his breaching efforts. If the enemy fires smoke first, it is to your advantage to shoot the minefield with smoke and/or DPICM to disrupt his crossing efforts.

TIMING

Artillery-delivered scatterable mines introduce another planning problem—timing. Firing mines too early gives the enemy time to avoid them, limits friendly freedom to maneuver, and can result in the mines self-destructing too early. Firing mines too late can result in their landing behind attacking enemy forces. This is why the trigger point for firing RAAMS and/or ADAM must be very carefully coordinated between the S2, S3, and FSC. The trigger point for firing artillery-delivered mines must meet two criteria:

- When the enemy reaches the trigger point, he must be committed to the avenue of approach where the mines will be delivered.
- It must be far enough forward of the proposed minefield that the minefield can be emplaced before the enemy reaches it.

The trigger point should be a targeted area of interest (TAI) in the S2's IPB. The TAI should be under surveillance at all times. The element observing the TAI should have the authority to fire the oncall minefield or a direct communications link to whoever is going to call for the mines. The TAI must be far enough beyond the minefield that the minefield will be in place in time in a worst-case scenario. The FSC should allow for the time it takes to send the call for fire, process the call for fire, execute the mission, and arm the mines.

EMPLOYMENT TO AUGMENT AN OBSTACLE

FA-delivered scatterable mines are optional weapons for closing lanes in existing obstacles or reseeding breached minefields.

RAAMS and/or ADAM used to close a lane in an obstacle should be planned with the same considerations as RAAMS and/or ADAM planned as an obstacle. Another consideration in using RAAMS and/or ADAM to close a lane is how wide the artillery minefield should be. A rule of thumb is to use the width of the lane plus the expected delivery error when mines are fired. To minimize the amount of ammunition used, get the best possible grid to the center of the lane. Use survey if possible, intersection or resection if necessary. If possible and depending on the tactical situation, adjust the mission in advance onto the center point of the lane and record it as a target.

Planning for using artillery-delivered mines to close breached obstacles should involve the S2, S3, engineer representative, and FSC. This group should identify the most likely points where the enemy will try to breach the obstacle and how wide the breach will probably be. As with using mines to close a lane, these points should be identified by the most accurate grid attainable, fired in, and recorded as targets. Even if the enemy does not breach at these exact locations, targets should provide accurate points to shift in firing mines.