
APPENDIX C

MORTAR SMOKE OPERATIONS

Smoke is used to increase the effectiveness of friendly operations by--

- Denying the enemy information by screening or obscuration.
- Reducing effectiveness of enemy target acquisition systems.
- Restricting nap-of-the earth and contour approaches for aircraft.
- Disrupting enemy movement, operations, and command and control.
- Deceiving the enemy as to the intent of friendly forces.

Technical information regarding ammunition and the employment of smoke is contained in applicable mortar field manuals and technical manuals. (Additional information about smoke operations can be found in FM 3-50 and TC 6-40.)

C-1. EMPLOYMENT OF SMOKE

Smoke operations has two general categories: *immediate* and *preplanned*. Immediate smoke missions are conducted with minimum planning, normally to counter some enemy action or anticipated enemy action of immediate concern to a commander. Immediate smoke is used to cover a small area and is of short duration. Preplanned smoke is planned in greater detail. It is often employed over a large area for a relatively long period. Mortars are mainly used to fire immediate smoke but can also participate in preplanned smoke missions. Preplanned smoke missions often require extensive logistical support due to large expenditures of smoke ammunition.

a. **Basic Applications on the Battlefield.** Smoke has four applications on the battlefield: obscuration, screening, deception, and signaling/marketing.

(1) **Obscuration smoke** is employed on or against the enemy to degrade his vision both within and beyond his location. Smoke delivered on an enemy ATGM position can prevent the system from acquiring or subsequently tracking targets, thereby reducing its effectiveness. Employment of obscuration smoke on an attacking armored force can cause it to vary its speed, to inadvertently change its axis of advance, to deploy prematurely, and force it to rely on less effective nonvisual means of command and control.

(2) **Screening smoke** is employed in friendly operational areas or in areas between friendly and enemy forces to degrade enemy ground and aerial observation, and to defeat or degrade enemy vision systems. Screening smoke

from mortars is used to conceal friendly ground maneuver, and breaching and recovery operations.

(3) *Deception smoke* is employed to create the illusion that some tactically significant event is occurring in order to confuse or mislead the enemy. Deceptive smoke from mortars can be used in river crossings, withdrawals, and air assault operations.

(4) *Signaling/marking smoke* is employed to relay prearranged communications on the battlefield and to mark unit locations. Occasionally, WP mortar rounds can be used to signal the end of a preparation on a target and the beginning of an assault. Marking smoke is used to identify targets, evacuation points, landmarks, and friendly unit positions.

b. **Employment of Smoke.** Normally, the battalion commander makes the decision of when to fire smoke missions. Several factors must be considered when employing smoke:

- Time required to fire the mission.
- Observation required while the smoke mission is conducted.
- Size of the area to be obscured.
- Characteristics of ammunition fuzes (Table C-1).
- Availability of ammunition.
- Length of time obscuration is desired.
- Effects of smoke on adjacent friendly units.
- Effects of smoke on friendly supporting fires.
- Capability of resupply.
- Weather conditions (see FM 23-91 for the effects of weather).
- Desirability of dual effect of obscuring and producing casualties by firing HE and WP.
- Closure rates (Table C-2).

DELIVERY SYSTEM	TYPE ROUND	TIME TO BUILD EFFECTIVE SMOKE	AVERAGE BURN TIME	AVERAGE OBSCURATION FRONTAGE FOR FIRING UNITS (METERS) WIND DIRECTION		
				CROSS	QUARTERING	HEAD/ TAIL
107-mm (4 mortars)	WP	30 sec	1 min	200	80	40
81-mm (3 mortars)	WP	30 sec	1 min	100	60	40

All rounds are fired as standard missions with parallel sheafs under favorable conditions.

Table C-1. Planning data for mortar smoke.

DISTANCE TRAVELED (METERS)	VEHICLE SPEED (KMH)					
	5	10	15	20	25	30
	TIME (MINUTES)					
3,000	36	18	12	9	7.2	6
2,500	30	15	10	7.5	6	5
2,000	24	12	8	6	4.8	4
1,500	18	9	6	4.5	3.6	3
1,000	12	6	4	3	2.4	2

Table C-2. Rates of closure.

(1) To obtain the best combination of smoke effects at the right time requires knowledge of a given type of round. Once all of the information is known about the type of smoke to use, the number of rounds must be decided to build the smoke and to maintain it.

(2) If HE and smoke are to be mixed, it may be desirable to use two separate sources to deliver the rounds. For example, one section of the battalion mortars provides obscuration and the company mortars provide HE. This can increase the effect of the mission and can reduce the problems of the FIST FOs who are adjusting both types of rounds on one radio net. Detailed coordination is required for this type mission.

(3) Normally, the mortar platoon carries only a limited number of smoke rounds. This number and the capability of the load must be made known to commanders. Special requests for smoke or changes in smoke round allowances can be made, but they must be prepared in advance and submitted before the required mission.

C-2. SMOKE IN SUPPORT OF OFFENSIVE OPERATIONS

There are five specific ways that mortar smoke can be used in offensive operations.

a. **Blind Enemy Observers/Gunners.** This technique is effective when conducting a movement to contact or when enemy contact is likely. Mortars can fire smoke directly on all suspected or known enemy observer/gunner positions; or fire smoke between known or suspected enemy observer/gunner positions and the supported unit. The smoke cloud must be maintained in both until the attacking unit reaches its objective or passes the danger area.

b. **Screen an Attack.** This technique is used to cover a unit while moving forward in an attack. Maneuver is concealed by a smoke screen to the attacking unit's front. Ideally, the screen is maintained continuously along the axis of advance. It is terminated for mounted forces about 500 to 800 meters short of the objective to allow for maximum visibility

during the final assault. For dismounted forces, this distance is about 100 to 200 meters. By using this technique, a unit can move behind smoke without being effectively engaged. If necessary, the flanks or rear of the supported unit can also be screened.

c. **Conceal a Bypass.** There are two ways to conceal a bypass:

(1) Screen the bypassing unit while it is moving around the enemy. A smoke cloud is fired in front of the enemy position and on his left or right with mortar fire. When the smoke is in position, the bypassing unit moves around the screened flank towards its objective.

(2) Make the enemy believe he is the object of an attack. Mortars fire smoke and HE directly on the enemy position. With the smoke cloud in place, the bypassing unit moves around the enemy to its objective.

d. **Cover a Breaching Operation.** This technique is employed by mortars (or mortars and artillery) firing two smoke clouds at the same time. One cloud is fired directly on the enemy. The other is fired between the enemy position and the breaching force. Continuous smoke is maintained in both areas, because minefields are normally covered by direct and indirect fires.

e. **Obscure Vehicles From Enemy Direct Fire Gunners.** This technique is used to degrade the capability of enemy ATGM gunners. Once the vehicle commander realizes that his vehicle is being engaged by enemy missiles, he employs vehicle smoke or smoke hand grenades and directs his driver to take evasive action. To further degrade every gunner's vision, mortar smoke should also be requested. It can be fired on the enemy gunners or between them and friendly vehicles. This prevents enemy gunners from tracking vehicles and guiding missiles to the vehicles.

C-3. DEFENSIVE AND RETROGRADE USE OF SMOKE

There are five specific ways that mortar smoke can be used in support of defensive and retrograde operations.

a. **Force Enemy Infantry to Dismount From Mechanized Vehicles.** Ideally, this technique employs mortar and artillery smoke, HE ammunition, and scatterable mines or chemicals together. Smoke is fired to the front of the attacker. The smoke should be fired beyond the range of direct-fire weapons to give the defender more time to engage targets. Scatterable mines (if available) and HE are then fired into the smoke.

b. **Slow the Advance of Attacking Forces.** This technique causes the attacker to reduce his speed, thus slowing the momentum of his attack. It is employed by firing smoke across the front of the advancing enemy. HE rounds are also fired with smoke to make the enemy button up his tanks and personnel carriers. Vehicles are silhouetted as they emerge from the smoke, making them easier to track and destroy.

c. **Separate and Isolate Attacking Echelons.** This technique is employed by firing smoke between two echelons of an attacking enemy force (for example, between two battalion echelons of company size). The smoke visually separates the two echelons and prevents the second echelon from seeing the first being engaged. The second echelon is also slowed by the smoke. This gives the defender more time to fire at targets in the first echelon without being engaged by enemy in the second. It also provides the defender with easy targets as the second echelon emerges from the smoke.

d. **Cover Displacement.** This technique fires smoke in front of the defensive position so the supported unit can move without being observed. When the initial smoke screen begins to dissipate, more smoke is fired between the enemy and the displacing unit. Smoke is also fired on suspected enemy locations and routes.

e. **Expose Enemy Helicopters.** This technique makes enemy helicopters vulnerable to air defense systems, because smoke forces them to fly at higher altitudes. It may occur as a result of mortar smoke that has already been employed in fighting enemy ground forces. Also, smoke can be employed in a specific location (such as, a flank) to prevent enemy helicopters from attacking undetected by flying nap-of-the-earth. When helicopters fly above the smoke to engage their targets, they are engaged by air defense weapons.