

# Mortars for Light Platoons

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The evolution of light infantry platoon organization and firepower since the late 1950s has been particularly interesting to me, since I led two rifle platoons in the 2d Battle Group, 2d Infantry in Germany during 1959 and 1960. I would therefore like to share a historical perspective on the subject and argue the case for a bold and aggressive adjustment in firepower at platoon level. In short, I propose that the M60 machinegun be replaced by the M224 60mm mortar—and the sooner the better.

When I came on active duty in the late 1950s, my first rifle platoon was made up of 45 men—a three-man headquarters, three 11-man rifle squads, and a nine-man weapons squad. At platoon level, the primary direct-fire weapon was the M1919A6 caliber .30 machinegun. At squad level, the M1918A2 Browning automatic rifle (BAR) provided fire support for each five-man fire team.

The organization and weaponry of the rifle platoon at that time reflected the lessons learned in the Korean War. Thanks to a peacetime draft, rifle squad strength had increased from nine to 11 men. Squad organization and tactics had matured from an unstructured, individual-initiative fire-and-movement context to a well-conceived, two-fire-team unit employing fire and maneuver.

Today's light infantry platoon is authorized 34 men. The current platoon structure consists of a seven-man headquarters (including two machinegun teams) and three nine-man rifle squads. Fire team strength has been reduced from five men to four. M60 machineguns have replaced the BARs used in my era. The new M249 5.56mm squad automatic weapon (SAW) now provides the base of fire at fire team level.

By 1986 standards, my 1959 rifle platoon

was manpower-rich and firepower-poor. On the surface, these seem to be the trends:

- Manning has declined by almost 25 percent.

- Automatic firepower potential has increased by more than 84 percent. (See table for a quick trend analysis.)

- The automatic firepower for each man in the platoon has nearly doubled.

Although this may give the impression that today's light infantry is doing just fine, a second look at the table reveals some *disturbing underlying* trends:

- The machinegun range advantage over the squad automatic weapon has decreased from a ratio of 2.2:1 in the late 1950s to about 1.3:1 today.

- The rate of fire of the M249 SAW now exceeds that of the M60 machinegun by 27 percent.

- Although overall platoon automatic firepower has increased, most of this growth has occurred at squad level.

- The firepower contribution of the platoon-level machinegun has fallen off from 38 percent in 1959 to 25 percent today. The future deployment of the burst-capable M16A2 rifle will further erode this contribution.

We owe it to ourselves as professionals to ask some obvious—and rather tough—questions: Has the platoon-level machinegun outlived its usefulness? Has the time come to replace it, *and if so, with what?*

Complete answers to these questions won't be found in the trend statistics in the table or, for that matter, in this article. Some insights do begin to take shape, however, after walking the FLOT (forward line of own troops) and visualizing a light infantry platoon dug in along the military crest of a ridgeline.

Traditionally, platoon-level weapons have served three tactical purposes: They permit the platoon leader to influence the action (by range, rate of fire, and lethal-

**Platoon Trends in Firepower Potential, 1950s-1980s**

	Late 1950s		Mid-1980s	
	M1918A2 BAR	M1919A6 LMG	M249 SAW	M60 LMG
<b>WEAPON CAPABILITY</b>				
Effective Range (meters)	460	1,000	800	1,000
Cyclic Rate of Fire (RPM)	550	450	700	550
Firepower Potential <sup>1</sup>	253	450	560	550
	Late 1950s		Mid-1980s	
<b>FIREPOWER POTENTIAL<sup>1</sup></b>	Amount	Percent	Amount	Percent
Squad-level <sup>2</sup>	1,518	62%	3,360	75%
Platoon-level <sup>3</sup>	900	38%	1,100	25%
Platoon Totals	2,418	100%	4,460	100%
Net Change			+2,042	+84%

**Notes**

1. Defined as the product of cyclic rate of fire and effective range (expressed in kilometers) per engagement minute.
2. Squad-level firepower based upon six automatic weapons.
3. Platoon-level firepower based upon two machineguns.

ity, or any combination of these) throughout his assigned sector of responsibility, provide a sustainable base of fire to facilitate platoon maneuver; and provide a firepower edge that not only complements the capabilities of squad-level weapons but extends beyond them.

There is no doctrinal evidence to suggest that these basic roles have changed or that they should change. What has changed, however, is the fact that platoon-level machineguns may no longer be up to the task.

Let's consider a hypothetical situation: A full-strength light infantry platoon has been assigned a defensive sector about 400 meters wide. The platoon is semi-isolated from its parent company and has overwatch responsibility for one of the division's boundaries. Platoon defense is tied in with an Allied unit on the flank. The enemy is made up of motorized infantry. Terrain is close and broken. Observation and fields of fire are fair-to-good out to about a kilometer. The platoon leader has been ordered to establish a combat outpost forward of his main defensive position.

After conducting a thorough map and ground reconnaissance, the platoon leader jots down his main areas of concern for later discussion with his commander:

- *Limited grazing fire available—OK for the SAWs but no really profitable opportunity to employ and control machineguns and detail them to squads but have no other choice.*

- *Combat outpost has to occupy an exposed knoll. It will be difficult to break off contact and withdraw without supporting fires.*

- *Once the combat outpost is driven in, the enemy can exploit several covered dismount points. He has good hull-defilade positions for overwatching fire from his BTRs, and I have nothing available to keep him from using the terrain to his advantage.*

- *Plamayas (Soviet automatic grenade systems) can spray the entire platoon area with a heavy volume of 30mm grenades from partial defilade positions at about a kilometer—too far out for my M203s, and my M60s can't touch them.*

- *Gaps in FPLs outnumber available M203s—some on-call area denial artillery munitions (ADAMs) will help—but*

*the commander says battalion doesn't have priority of fires.*

- *Once the combat outpost pulls back, I can use the bald knoll as a reference point for an air strike—sure could use some WP for marking insurance and screening.*

- *Looks like it's going to be another long night—better get hot on range cards.*

But suppose the platoon's two M60 machineguns were replaced by two M224 60mm mortars? Would it make a difference to this hypothetical platoon?

### SOME LIABILITIES

Before arguing the affirmative case, it should be remembered that mortars do bring some liabilities to the battlefields:

- **Mortars are notoriously manpower-intensive.** They require three separate and independent system components: a forward observer to control the mission, a fire direction computer to develop firing data, and a team to prepare ammunition for, to lay, and to fire each mortar.

- The probability of achieving a successful mortar mission is determined by the probability that all three of these components will operate successfully. Even at 95 percent efficiency, mortar system efficiency turns out to be about 86 percent.

- To gain adequate sector coverage of their parent-unit positions, mortar elements must accept a reduction in their maximum engagement range to obtain the necessary setback distance from the FLOT. The employment rule of thumb is that setback distance equals about one-third of the mortar's maximum engagement range.

- Mission fire commands are habitually transmitted over jammable radio nets.

- A mortar's high angle-of-fire trajectory can be detected on the enemy's countermortar radar screens. Fire unit locations can expect quick-response countermortar suppressive fires.

- When the parent unit assumes a reserve mission, all unit weapons, including mortars, assume non-firing roles. Unlike artillery, which is never held in reserve, up to one-third of infantry mortars could be placed in non-firing reserve during a defense of the main battle area.

- Many of these liabilities can be alleviated, however, by employing the 60mm mortar under an autonomous infantry mortar (AIM) concept. Basically, each 60mm mortar team would habitually employ one of two direct-lay, direct-fire techniques—the team-leader adjust or the gunner direct lay.

In the first of these, the team leader remains within 100 meters of the mortar and acts as the observer. All corrections are given to the gunner in mils for direct sight-setting. The team leader uses land-line communications or arm-and-hand signals to control the mission.

In the other technique, the gunner lays his mortar directly on the target. He estimates the range and sets the proper elevation, while his assistant prepares the round with the proper charge. The gunner gives the command to fire.

From a doctrinal standpoint, the employment exception would become the employment rule.

### ADVANTAGES

This proposal also has several advantages:

- **Engagement Range.** When the 60mm mortar is employed at—not behind—the FLOT, there is no range penalty for setback distance. The 60mm mortars can be brought to bear on known or suspected targets out to a maximum standoff range of 3,490 meters—about 260 meters short of the maximum range of the TOW-2 and a 249 percent improvement over the effective range of the M60. Combat outposts can be supported by mortars from the main defensive position. Important boundary "seams" can be protected by mutually-supporting mortar positions. The platoon leader is better able to influence the action throughout his sector.

- **High-angle, top-attack.** The 60mm mortar takes away the enemy's free ride on defilade. Compared to direct fire weapons, mortars have a relatively unlimited target access. Except for caves, terrain offers no natural protection from mortar fire. Potential BTR troop dismount points and hull defilade overwatch fire support positions beyond the effective range of the M60 can be targeted and

masked. The AGS-17 Plamya, firing from partial defilade, can be targeted and mortared. Closer in, gaps in final protective lines can be covered by 60mm mortar barrages.

• **Effectiveness.** Although the direct-fire M60 machinegun and the indirect-fire M224 60mm mortar cannot be precisely compared, several "lowest common denominators" can be used to compare their effectiveness. Both systems can employ traverse-and-search techniques for wide-target engagement. The M60's sustained rate of fire (SROF) is 200 rounds per minute (RPM) compared to 120 RPM for the M224. What the 60mm mortar loses in SROF, however, it more than makes up for in area coverage and lethality. At a comparable range of 1,000 meters, the circular bursting area of one high explosive round sprays fragments over more than 700 square meters. The beaten zone of one burst of six 7.62mm rounds covers a considerably smaller area. The handheld laser rangefinder used with the M224 can provide precise target range, which permits the M224 to use multi-round ambush, or surprise, fires on troops in the open. The M60 loses the element of surprise after the initial burst and provides a detection signature with its tracer rounds. As for accuracy, the M60 must hit to wound or kill, while with the mortar's area fire, close may be close enough.

Both systems would use range cards and night sights for low-visibility firing. Although not required by definition, the 60mm mortar team could employ expedient reference stakes marked with strips of luminous tape to fire pre-planned targets and illuminate pre-designated areas. Finally, the M224 fires a tactically versatile family of ammunition, including high explosive, smoke, and illumination, while the M60 is limited to ball and tracer.

• **Terrain-siting.** The platoon leader could employ his 60mm mortars on the reverse slope, just over the topographical crest, or in natural defilade on the forward slope. The gun sites afford cover from enemy direct-fire weapons. The mortar observation post could be forward of, at, or behind the gun positions, so long as it remained within 100 meters. Later development of an extendable peri-

scope-type sight could improve site effectiveness.

• **Greater Response.** Direct observation means the rapid, direct adjustment of mortar fires, yielding shorter response time, and rapid engagement of fleeting targets of opportunity. Masked observation in one sector may not mean masked observation throughout. Squad leaders can be trained to call for and adjust fires beyond the platoon leader's direct observation.

• **Mission Continuity.** The proximity of the observer and alternate communication means (wire, hand signals) reduce the probability that radio jamming will abort fire missions. Centralizing all three mortar system functions at one geographical location would improve command and control and overall efficiency. The platoon leader, platoon sergeant, or senior mortar team leader could exercise direct control over the two-team section.

• **Higher, Dispersed Density.** The replacement of the M60 machinegun by the M224 would triple the number of 60mm mortars in a light infantry division—from 54 to 162 tubes. Mortar firepower, therefore, would become more dispersed, complicating enemy targeting. The proliferation of light mortars would saturate enemy countermortar radar crews, increase targeting workloads, burn up reaction times, and perhaps take some heat off other divisional indirect-fire systems.

• **Committed Mortars.** In a classical "two-up, one-back" defense, the number of committed (non-reserve) 60mm mortars would increase by 200 percent.

• **Weight.** The replacement could be accomplished at an equal weight trade-off. The four-component 60mm mortar is manportable and weighs 45.7 pounds. The inclusion of the AN/GVS-5/6 handheld laser rangefinder would increase the weight of the system to just over 50 pounds. This approximates the weight of the current M60 machinegun when the gun, the M122 tripod, the traverse and elevation mechanism, the AN/TVS-5 night sight, and the spare barrel kit are included.

• **Manpower.** The M60s could be replaced at an equal manpower trade-off. Each light infantry company is authorized two crewed M224 60mm mortars. Assuming the six 60mm mortar crewmen

currently authorized at company level could be used, together with the 12 men who now man the machineguns, two three-man 60mm mortar teams could be organized in each light infantry platoon.

## DISADVANTAGES

The proposal does have some disadvantages.

• **Minimum Range.** At charge "0" (emergency fire), the minimum range of the M224 is 70 meters, while the M60 has no minimum range. But subject to troop safety and the availability of overhead cover, one 60mm mortar team could displace to an alternate firing position (within a FLOT setback of about 100 meters) and continue to walk the supporting fires right into the foxhole line.

• **Ammunition Weight.** The 7.62mm linked ammunition for the M60 is packed in 960-round containers, each weighing about 74 pounds. Ammunition for the 60mm mortar is currently packed in 16-round containers, each weighing about 112 pounds. That computes to a packed weight of about seven pounds per 60mm mortar round and .08 pounds per 7.62mm round. For logistical planning, the ammunition trade-off would be about 88 7.62mm rounds per round of 60mm mortar ammunition. One method of easing the 60mm ammunition resupply burden at platoon level would be to repack the 60mm ammunition in four-round bandoleers, each weighing 28 pounds. The 30 non-mortar members of the platoon could carry at least one bandoleer each for a distributed basic load of 120 rounds.

• **Costs.** The equal-crew trade-off would generate no additional manpower costs, but the deployment of the M224 would represent a new, out-of-pocket cost to the Army. The cost of an M224 (in Fiscal Year 1986 dollars) would be about \$21,000. (This figure was arrived at by going back to the last Army procurement of 190 XM224 60mm mortars for \$2.7 million in Fiscal Year 1978 and inflating those dollars to Fiscal Year 1986 dollars at a constant five percent per year.) The procurement cost of deploying the M224 to all five light infantry (and mountain) divisions (at 162 mortars per division) is estimated to be \$3.4 mil-