

# The Mk 19

## As an Indirect Fire Weapon

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The company order called for one platoon to place two dismounted .50 caliber heavy machineguns in the battalion support-by-fire (SBF) position. The two platoons tasked to augment the battalion reserve were to move onto Objective DOG after it was secure, to prepare for a possible enemy counter-attack. The two remaining platoons were tasked to seal off the objective from enemy reinforcements. They were to take up positions within 2,000 meters of the objective to provide indirect fires with their Mk 19s to suppress and disrupt enemy defenses, while the 81mm mortars and 105mm artillery rounds obscured the main effort's breach site.

The Company B executive officer running the SBF position saw it first. The enemy was repositioning one of its DShK machineguns to cover the breach site. It was moving behind a piece of micro terrain that masked it from his SBF element. He radioed D46 and D56 and called for an immediate suppression mission. Within 60 seconds both elements had rounds landing within 200 meters of the target. The XO made the corrections for D46 while the 2d Platoon sergeant adjusted rounds for D56. The next rounds landed 25 seconds af-

ter the corrections were sent; this time they landed within 50 meters of the DShK crew. The next call was a Fire for Effect.

As the enemy was repositioning, 96 rounds of 40mm HEDP (high-explosive, dual purpose) from four Mk 19s (two 12-round bursts from each weapon) landed on top of them. The beaten zones from the four converging cones of fire, each 70 meters long and 30 meters wide, tore into the gun crew and the surrounding enemy soldiers. By this time the assault element was moving to the objective. The XO moved the Mk 19 fires up the hill, keeping the edge of the beaten zone 50 to 75 meters in front of the lead fire team.

The effects achieved with the Mk 19 in this hypothetical scenario are well

within the capabilities of today's anti-armor platoons, given adequate training and resources.

My company—Company D, 1st Battalion, 187th Infantry—wanted to move into a more direct role with the battalion and was therefore looking for more ways the heavy weapons could support rifle company operations. The following are the task, conditions, and standards that we used in employing the Mk 19 in the indirect fire mode:

**Task.** The maneuver commander was provided with a system that accurately put a large number of high explosive rounds onto an objective within 120 seconds of the call for fire.

**Conditions.**

- The gunners could not see the targets.

BASIC CHARACTERISTICS OF THE MK 19	
Maximum Range	2,212 Meters
Rates of Fire	
Sustained	40 rounds each minute
Rapid	60 rounds each minute
Cyclic	325-375 rounds a minute
Planned Operating Load	400 rounds per HMMWV
Muzzle Velocity	790 feet each second
Angle of Fire	0 to 70 Degrees

- We used 11H infantrymen as forward observers.

- All targets were between 1500 and 2000 meters.

- The observer and the Mk 19 crew knew each others' PLGR (precise lightweight GPS receiver) grids.

- The observer had a six-digit or eight-digit grid for the target.

**Standards.**

- Initial rounds were fired within one minute of receiving the call for fire.

- The squad leader with the Mk 19 gave the observer a gun to target (GT) line before the first 3- to 5-round burst was fired.

- The observer used the GT line to make his spottings. The observer then sent the correction based on the impact in reference to the GT line; Example RIGHT 50, DROP 50 (for a target over 1,500 meters). The last standard allowed the gunner to index corrections on his traversing and elevating (T&E) mechanism without the use of a fire direction center (FDC). (The observer makes use of the GT line by drawing it on his map through the target, then bisects the GT line through the target. He then plots his corrections on the map so he can send the squad leader ready corrections he can input to the T&E.

In actual test fires on Fort Campbell ranges, we achieved impressive results. The initial 3-5-round bursts were fired within one minute. Adjustments were made and rounds fired in bursts within 15 seconds of the FO's corrections. The FO called for a fire for effect of two 10-12-round bursts after two to four adjustments. The beaten zone averaged 60 to 80 meters long and 20 to 40 meters wide, between distances of 1,200 and 2,000 meters, respectively. The gunner can add further depth and width to the fire for effect by manipulating his T&E in increments of 2-5 mils after his first burst.

While developing the tactics, techniques, and procedures (TTPs), we found that Appendix E to Field Manual (FM) 23-27, *Mk 19 40mm Grenade Machine Gun MOD 3*, provided the necessary raw data to make a ballistics chart for the M430 HEDP round out to 2,000 meters for the M430 HEDP round. With the maximum range of the

BALLISTIC CHART FOR THE M430 HEDP ROUND				
Range Meters	Impact Angle Degrees	Muzzle Elev Degrees	Max Ordinate	Time of Flight
2200*	80	54	1000	26
2100*	64	42	690	23
2000	53	31	453	19
1900	4	26	325	16
1800	38	22	252	14
1700	33	19	201	13
1600	28	17	161	11
1500	25	15	129	10
1400	21	13	103	9
1300	18	11	82	8
1200	15	10	65	7
1100	13	9	51	6
1000	11	8	39	6
900	9	6	30	5
800	7	5	22	4
700	6	5	16	4

\*Data for 2200 and 2100 meters is based on an increase in ratio. Max range we achieved was 2050 (estimated by the observer).

BALLISTIC DATA FOR THE M918 TPT ROUND				
Range Meters	Impact Angle Degrees	Muzzle Elev Degrees	Max Ordinate	Time of Flight
2100	64	43	700	24
2000	45	27	352	17
1900	39	23	278	16
1800	34	20	223	13
1700	30	18	181	12
1600	26	16	147	11
1500	22	14	119	11
1400	19	12	96	9
1300	17	11	77	8
1200	14	9	61	7

system listed as 2,202 meters, we used the increase in ratio of the last four ranges to provide rough data for 2,100 and 2,200 meters.

The problem we ran into was that some of the data was ambiguous in terms of the way it was used, and the data was not in the units of measurement that we needed. First, the muzzle elevation was listed in mils, and we needed it in degrees. This was an easy fix: The 17.8 mils in a degree translates to 33 degrees at 2,000 meters. Second, the maximum ordinate was in feet, and we needed it in meters. This translates to 1,486 feet times 12 inches, divided by 39.37, which equals 453 meters.

With a ballistics chart we were able to construct a sight we could index the elevation onto, since the rear sight only goes up to 1,500 meters. We bought a *Stanley Quick Square* (which is basically a T-Square that gives degrees between zero and 90) and sawed off one of the inside edges so it would mount

flush to the right-hand side of the Mk 64 cradle. We attached a turret level at the base of the T-Square so that the level reads zero degrees at zero degrees on the T-square. We used a bolt and wing nut to mount our sight to the upper right-hand corner of the Mk 64 so the base of the sight was in line with the center of the barrel. The gunner could now zero his T&E using the sight by aligning the level at zero then bringing the muzzle down to zero degrees elevation on the sight, regardless of the angle of the vehicle. This gave the gunner his course elevation adjustment.

The next problem with elevation is that the Mk 19 must be fired from a reverse slope to achieve a maximum range of 2,212 meters. Since the T&E will not allow the gunner to achieve a 54-degree angle, it must be supplemented by a firing point on micro terrain that elevates the front wheels, and the sight must be zeroed as explained above.

# TRAINING NOTES

## SAMPLE CALL FOR FIRE TO A DELA SECTION FOR INDIRECT Mk 19 FIRE

OBSERVER: D26 THIS IS R6, ADJUST FIRE, OVER  
SECTION LEADER: R6 THIS IS D26, ADJUST FIRE, OUT

OBSERVER: GRID DR 35955350, MACHINEGUN POSITION, OVER  
SECTION LEADER: GRID DR 35955350, MACHINEGUN POSITION, OUT

SECTION LEADER: GT LINE 05 DEGREES, RANGE 1700  
SQUAD LEADER: GT LINE 05 DEGREES, RANGE 1700

SECTION LEADER: GT LINE 05 DEGREES, OVER  
OBSERVER: GT LINE 05 DEGREES, OUT

SECTION LEADER: BURST, OVER  
OBSERVER: BURST, OUT

OBSERVER: LEFT 100 METERS, DROP 200 METERS, OVER  
SECTION LEADER: LEFT 100 METERS, DROP 200 METERS, OUT

SECTION LEADER: LEFT 50 MILS, DROP 100 MILS  
SQUAD LEADER: LEFT 50 MILS, DROP 100 MILS

SECTION LEADER: BURST, OVER  
OBSERVER: BURST, OUT

OBSERVER: RIGHT 25 METERS, ADD 50 METERS, OVER  
SECTION LEADER: RIGHT 25 METERS, ADD 50 METERS, OVER

SECTION LEADER: RIGHT 12 MILS, ADD 25 MILS  
SQUAD LEADER: RIGHT 12 MILS, ADD 25 MILS

SECTION LEADER: BURST, OVER  
OBSERVER: BURST, OUT

OBSERVER: TARGET, FIRE FOR EFFECT, OVER  
SECTION LEADER: TARGET, FIRE FOR EFFECT, OUT

SECTION LEADER: BURST, ROUNDS COMPLETE, OVER  
OBSERVER: BURST, ROUNDS COMPLETE, OUT

OBSERVER: TARGET DESTROYED, OVER  
SECTION LEADER: TARGET DESTROYED, OUT

## SUGGESTED EQUIPMENT

GUNNER		FO	
DAY	NIGHT	DAY	NIGHT
Compass	Compass	Compass	Compass
Map	Map	Map	Map
MELIOS*	Mk II**	MELIOS*	Mk II**
PLGR	PLGR	PLGR	PLGR
Radio	Radio	Radio	Radio
Binoculars	Binoculars	Binoculars	Binoculars
	NVDs		NVDs

\*Mini-eyesafe laser infrared observation set

\*\*A night laser ranger and compass binocular, fielded to Company D in July 1998.

To index the GT line onto the gun, the squad leader stood behind the gunner and shot the azimuth to the target and then brought the gunner on line with commands of Left, Right, Steady, and Stop. We experimented with using aiming stakes like the mortars use, but

this system is faster and takes advantage of the turret ring's ability to go quickly to a new azimuth and engage a new target.

All adjustments after the first burst were made with the T&E and the turret ring. When the observer sends in a

spotting to the section leader, the section leader does the math, using the formula of 1 mil equals 1 meter at 1,000 meters, or 2 meters at a range of 2,000 meters. The section leader sends the squad leader "Drop 100," and the gunner moves the muzzle down 100 clicks on the elevation wheel. For the deviation, any corrections above 30 are made using the turret ring. There are 128 holes in the turret ring, which works out to 50 mils per hole. If the correction is RIGHT 220, the gunner moves 4 holes right and 20 clicks on the traversing wheel. If the gunner's traversing wheel is all the way to the right before the correction, he can move 5 holes and back off 30 mils on the traversing wheel. With the observer sending spottings to the section leader and the section leader sending the ready corrections to squad leader, the squad leader can concentrate on helping the gunner and monitoring the net instead of acting as FDC.

Some of the strong points for using the Mk 19 in the indirect fire mode can turn limitations, such as range, into steady attributes. The standard muzzle velocity insures no short rounds due to a change in charge. The 15-meter burst range allows maneuver forces to work closer to the beaten zone. The available data allows for solid planning in terms of maximum ordinate and angle of impact. It also increases the system's survivability by providing maximum standoff.

There are ten Mk 19s in a light infantry battalion's Delta Company and many possibilities for their use as indirect fire weapons in the attack. If the battalion's indirect fire assets are tied up obscuring the breach or supporting the main effort, the Mk 19s can be used to suppress and reduce the enemy forces on the objective.

The use of the Mk 19 in the indirect fire mode fits the definition of a screen, according to FM 101-5-1, *Operational Terms and Symbols*. It would also work well in a mission to suppress enemy air defense (SEAD). We ran immediate suppression and within one adjustment had suppressed the target. This mission is especially applicable since the Mk 19 does not need to be dismounted to fire.

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In the defense it can be used to provide on-call indirect fire to units fighting the counterreconnaissance battle or the dismounted battle while the Delta Company sits farther back in the battalion sector or screens the flanks. Additionally, it can be fired out of the back of the platoon sergeant's or the platoon leader's vehicle to cover dead space in front of the screen line, if the gun-trucks are TOW pure. This could be accom-

plished by caching supplies and sandbagging the bed of the cargo compartment. The legs of the tripod must be tied to the cargo tie-down rings for added security. Firing points must be prepared behind the screen lines by registering the intended targets, then driving pickets to mark the vehicle's orientation. The azimuth should be rechecked before firing, but the adjustments should be minor.

These are just a few of the missions that fall within the Mk 19's capabilities as an indirect fire system.

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