





Safe Weapons Handling

#### **Rules of Firearms Safety**

Standardized for any weapon a Soldier may employ

- Rule 1: Treat every weapon as if it is loaded
- Rule 2: Never point the weapon at anything you do not intend to destroy
- Rule 3: Keep finger straight and off the trigger until ready to fire
- Rule 4: Ensure positive identification of the target and its surroundings





Safe Weapons Handling

### **Weapon Safety Status**

Standard code using common colors to represent level of readiness. Represents specific series of actions applied.

- Green: Bolt locked forward, fire/safe selector on FIRE.
   Feed tray and cover assembly closed. No ammunition.
- Amber: The M240-series machine gun does not have an amber status. Only aviation units may HALF-LOAD door mounted systems on Army aircraft.
- Red: Ammunition loaded on feed tray, bolt open and locked rearward, fire/safe selector on SAFE.
- Black: Red plus selector on FIRE, awaiting command to engage. Follow unit ROE and/or SOP.





Safe Weapons Handling

#### **Weapons Control Status**

Tactical method of fire control given by a leader incorporating the situation, ROE, and anticipated enemy contact.

- Weapons Hold: Engage only if engaged or ordered to engage.
- Weapons Tight: Engage only if target is positively identified as enemy.
- Weapons Free: Engage targets not positively identified as friendly.

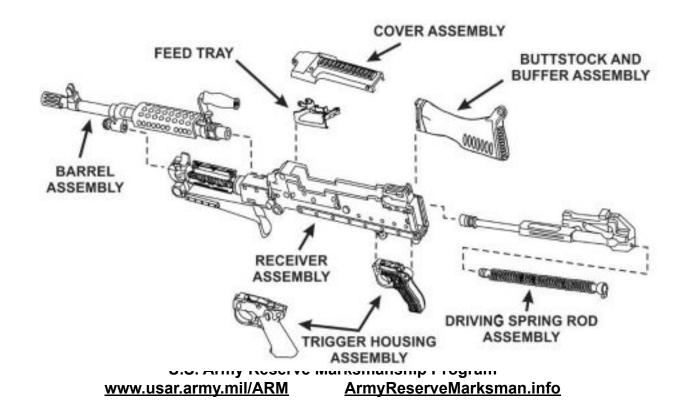




**Principles of Operation** 

### **Major Components**

The M240 is a gas-operated, belt-fed, air-cooled, fully automatic weapon that fires from the open-bolt position.







### Principles of Operation Technical Data

ROUNDS PER MINUTE				
100 rounds per minute (four to five seconds between bursts). Change barrel every 10 minutes.				
200 rounds per minute (two to three seconds between bursts). Change barrel every two minutes.				
650 to 950 rounds per minute. Not intended to fire at 950 rounds per minute. This will cause accelerated wear/damage to the barrel and rest of weapon.				
550 to 650 rounds per minute – M240B/M240L/M240N with hydraulic buffer.				
METERS				
3725 meters.				
1800 meters with M122A1 tripod or M192 tripod (M240B/M240L).				
800 meters M122A1 tripod or M192 tripod (M240B/M240L).				
Approximately 900 meters.				

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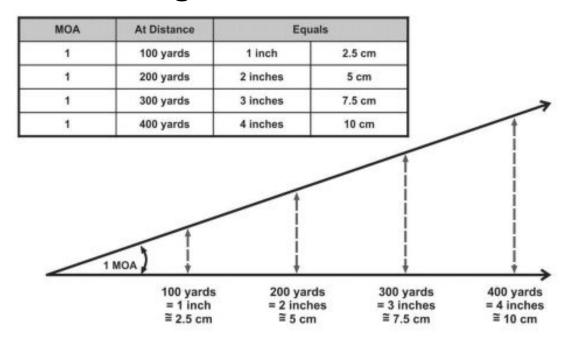
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### Aiming Devices

### **Units of Angular Measurement - MOA**



Angle dimension exaggerated for clarity. Examples are not to scale. Centimeter (cm) conversions are approximate.

MINUTE OF ANGLE (MOA) Unit of Measeurement				
There are 360 degrees in a circle.	There are 60 MOA in a degree.			
There are 21,600 MOA in a circle.	1 MOA at 100 yards ≈ 1 inch.			
	escribed in fractions, not seconds (i.e., 1/2 MOA)			

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### Aiming Devices Units of Angular Measurement - MOA

Rifle shooting is often measured in Minutes of Angle 60 Minutes of Angle per degree 21,600 Minutes of Angle per circle/revolution

1 MoA at 300 yards =  $\pi$  inches

Simplify this by rounding off:

100 yards: 1 MoA ≈ 1 inch (1.0471)

200 yards: 1 MoA ≈ 2 inches (2.0943)

300 yards: 1 MoA ≈ 3 inches (3.14159)

1000 yards: 1 MoA ≈ 10 inches(10.471)

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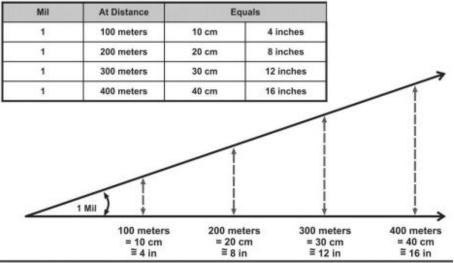


Aiming Devices

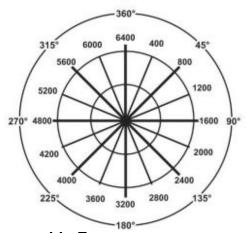
### Units of Angular **Measurement -**Mils (milliradians)

The mil is a common unit of angular measurement that is used in direct fire and indirect fire applications.

Check Technical Manual for your sight to know adjustments



MILS Unit of Measurement					
There are 360 degrees in a circle.	There are 17.78 mils in a degree.				
There are 6400 mils in a circle	1 mil at 100 meters = 10 cm.				



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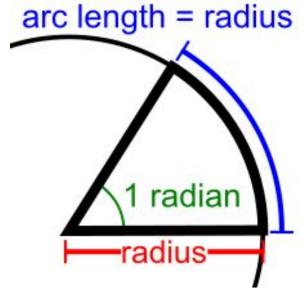


### Aiming Devices Units of Angular Measurement - Mils

Gunnery is often measured in Mils, increasingly popular for precision rifle

Mil (mrad) is short for milliradian

A circle (360 degrees) is  $2 \pi$  radians



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### Aiming Devices Units of Angular Measurement - Mils

"Milli-" prefix is 1/1000 Shortened to Mil, mil, or mrad

 $2000\pi$  milliradians =  $2\pi$  radians

360 degrees = 6.283 radians = 6283 mils

1 Mil = 3.43 MoA (≈ 3.5 MoA ≈≈ 4 MoA)





### Aiming Devices Units of Angular Measurement - Mils

6283 mils are the true unit of angular measurement 1 mil subtends 1/1000 of the distance (radius)

Telescopic sight manufacturers using rangefinding reticles (e.g., mil dots) use this

There is NO difference between Army and Marine mils

6400 mils in NATO countries ("artillery mils")
6000 mils in the former Soviet Union and Finland
6300 mils in Sweden (streck, or "line")

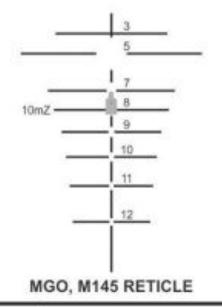


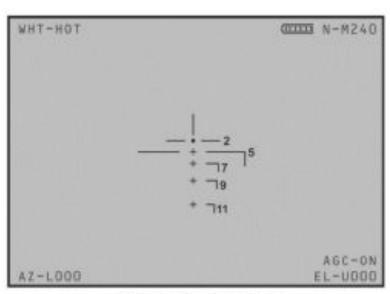


#### **Aiming Devices**

### **Ballistic Reticles**

A series of fine lines in the eyepiece used for aiming at varying distances and measuring for range estimation. Can be MOA or mils.





AN/PAS-13 RETICLE

#### Legend:

AZ= azimuth

EL= elevation

mZ= meter zero

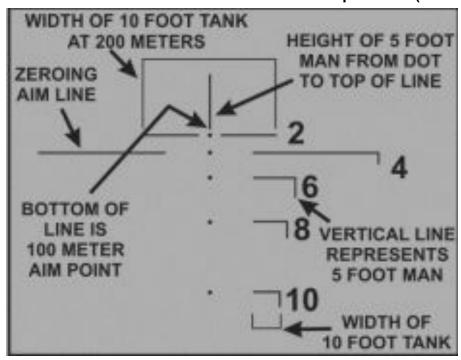


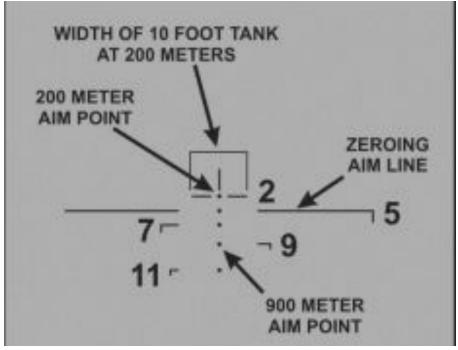


#### Aiming Devices

#### **Stadia Reticles**

Vertical and horizontal lines reflect size of vehicles, personnel, etc. at distance. Placed next to a series of aim points (dots here) for different ranges.









### **Aiming Devices**

### **Iron Sights**

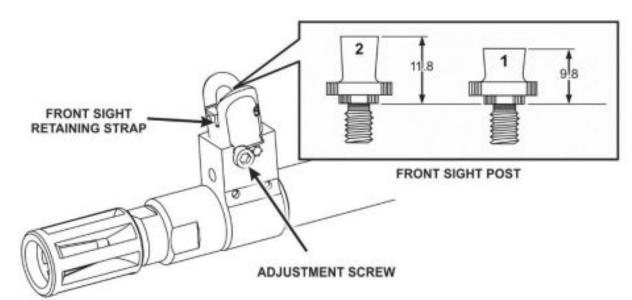
Front sight adjusts elevation and windage/azimuth

- Elevation: Remove retaining strap. 1 mil = 1 full revolution
- Windage: Push sight with Adjustment Screw. Loosen Adjustment Screw on other side first. 1 mil ~ 1 full revolution

POI in OPPOSITE direction sight moves.

Rear sight adjusts for range AFTER zero

500m = 10m zero







### **Aiming Devices**

#### **M145 MGO**

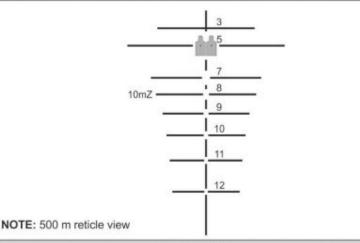
- 100m Bullet Drop Compensator
- Double target (1 meter) wide
- Clicks: 0.25 mil ~ 1 MOA
- Illuminated reticle (battery)
- 10mZ/800: Aim point for 10 mete zero and 800 meters
- Elcan (Canada) made sight



M145 STF	RAIGHT TEI	ESCOPE
	DIMENSIONS	3
LENGTH	7.0 in	17.8 cm
BATTERY		rs average Battery)
WEIGHT	24 oz	681 g

FUNCTION	SINGLE CLICK			
FUNCTION	10 METERS	500 METERS		
ZERO WINDAGE	2.5 mm	5 inches		
ZERO ELEVATION	2.5 mm	5 inches		

#### RETICLE



LEGEND

inches mZ centimeters meter zero millimeters OZ ounces

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### Mountable Equipment

### **Tripods: M122**

Critical for gunnery (not just marksmanship.) Stable, repeatable adjustments along left/right (traverse) and up/down (search) axis.

#### **Traverse & Elevation**

Search: 250 mil depression,

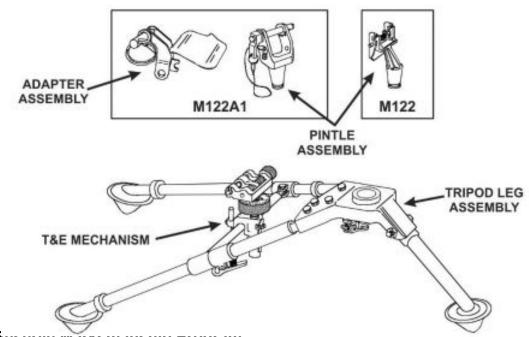
100 mil elevation

Traverse: 100 mil on T&E

Traverse Bar: 450 mils left, 425

mils right

1 mil clicks



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### Mountable Equipment

**Tripods: M192** 

Critical for gunnery (not just marksmanship.) Stable, repeatable adjustments along left/right (traverse) and up/down (search) axis. Integrated T&E

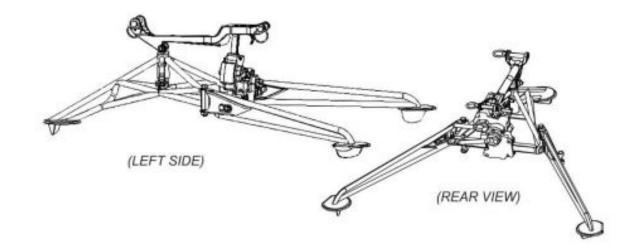
#### **Traverse & Elevation**

Search: 0-530 mils total

Traverse: 0-900 mils

4-5 mils push/release

Pull handle(s) out to freely adjust







### **Employment**

#### **Shot Process**

The object is to fire an Accurate Initial Burst, adjust fire, and develop speed.

•	Pre-shot	
•		

- Shot
- Post-shot

	Position
Pre-shot	Natural Point of Aim
	Sight Alignment / Picture
	Hold
	Refine Aim
Shot	Breathing Control
	Trigger Control
	Follow-through
Post-shot	Recoil management
Post-snot	Call the Shot
	Evaluate

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### **Employment**

#### **Functional Elements**

The object is to fire an Accurate Initial Burst, adjust fire, and develop speed.

- **Stability**: Provide a consistent base to fire from and maintain through the Shot Process until the recoil pulse has ceased. Includes hold/position.
- Aim: Continuous process of orienting the weapon, aligning the sights, using appropriate lead and elevation during engagement.
- **Control**: All conscious actions before, during, and after the Shot Process. Trigger control is of primary importance, along with whether, when, and how to engage. Incorporates the Soldier as a function of safety and responsibility.
- Movement: The process of moving during the engagement process. Into and out of position, moving laterally, forward, diagonally, and in a retrograde manner while maintaining stabilization, appropriate aim, and control

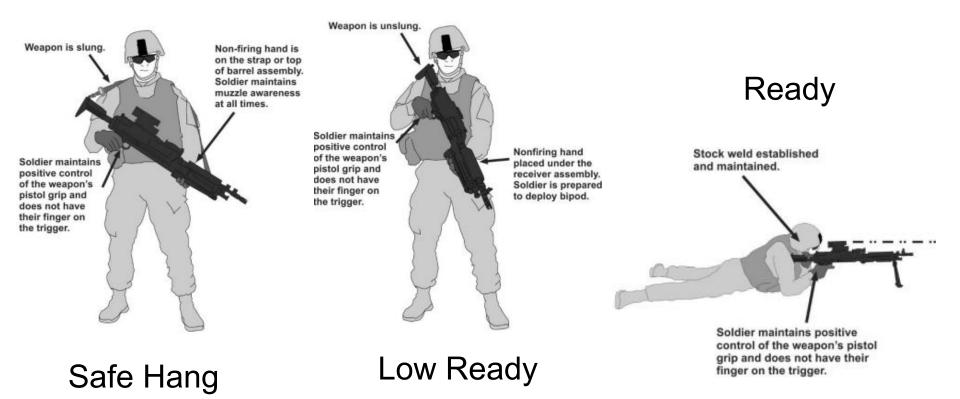




TC 3-22.240

**Employment** 

### **Carry Positions**







### **Employment**

#### **Stability**

The object is to fire an Accurate Initial Burst, adjust fire, and develop speed

- Support: Use support (tripod/bipod) and bone structure primarily.
- Muscle relaxation: Use good positioning (cheek weld, body straight behind line of recoil, etc.) to enhance support.
- Natural Point of Aim: Where barrel naturally orients when position is solid, muscles relaxed and support is achieved. Should be on target.
- Recoil management: Maintain stable firing position and followthrough the recoil pulse to mitigate movement during the cycle of function,

**Note**. The steadier the position, the smaller the wobble area. The smaller the wobble area, the more precise the burst.

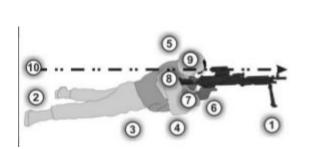


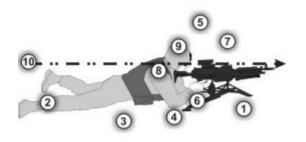


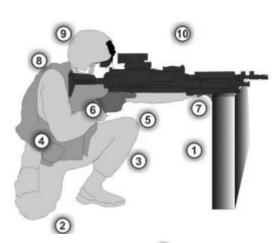
### **Employment**

#### **Firing Positions**

A position is good ONLY if it consistently produces a tight Cone of Fire!







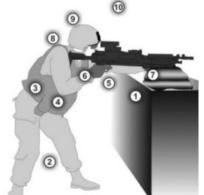
**Bipod** 

**Tripod** 

- Straight inline with recoil
- Both hands firm grasp
- Pull into shoulder
- Firm cheek weld

- Straight inline with recoil
- Left hand T&E
- Right down/pull into shoulder
- Firm cheek weld

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### **Employment**

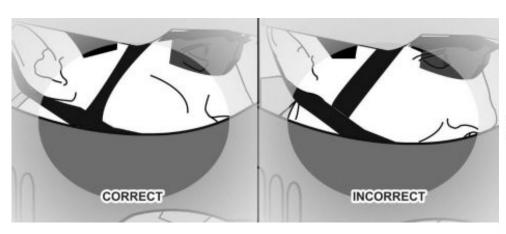
#### **Aim**

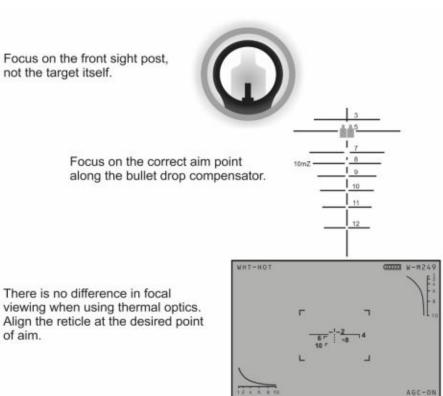
**Sight Alignment**: Relationship between the aiming device and the firer's eye. Maintain by using **consistent cheek weld and head placement**.

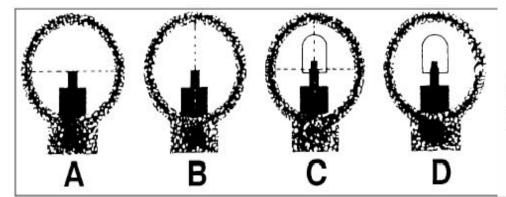
- Iron sight. Relationship of front sight, rear sight, and firer's eye. Maintain by keeping focus on the top of the front sight.
- Optics/Thermal. Relationship between the reticle and the firer's eye.
   Maintain by ensuring full, centered field of view (no shadow in magnified optics)
- Pointers/Illuminators/Lasers. Relationship between the firer's eye, the night vision device placement and focus, and the laser aiming point on the target.

















### **Employment**

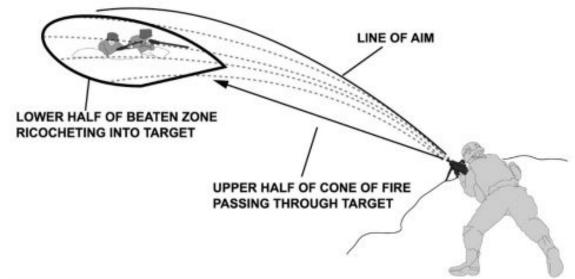
### **Center Base Aimpoint**

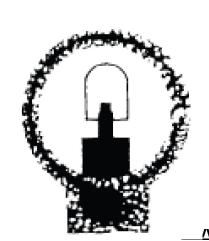
- Used to place Beaten Zone correctly on targets with depth
- **NOT** because "the gun climbs in recoil"
- Gun climbing in recoil = poor position and bad shooting

### PLACEMENT OF THE CENTER OF THE BEATEN ZONE ON THE TARGET



LOWER HALF OF BEATEN ZONE RICOCHETING INTO TARGET





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### **Employment**

#### **Control**

- All conscious actions before, during, and after the shot process
- Includes safety and decision to shoot (when/if based on ROE)
- Proper trigger control without disturbing the sights is a critical aspect of Control and the most difficult to master
- Shot anticipation (flinch, pre-ignition push) disrupts Control
- Reducing or eliminating shot anticipation with good trigger control is often most effective way to improve shooting results



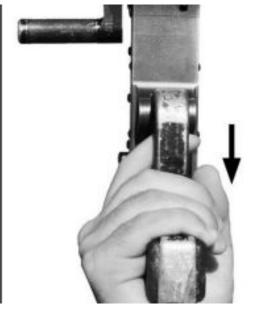


### **Employment**

#### **Control**

- Trigger finger placement lays naturally across the trigger after achieving proper grip.
   No specified point must be used
- Trigger squeeze/press. Pull in a smooth, consistent manner. Add steady pressure until the weapon fires.
- Trigger reset. Retain sight focus while resetting the trigger









### **Employment**

#### **Control**

- Follow-through: Continued mental and physical application of the shot process' functional elements
  - Firer's head stays in contact with the stock, the firing eye remains open, and the trigger finger holds the trigger back through recoil (semi-auto and fixed ammunition drill)
- Calling The Shot: State where you think the shot/burst went based on where the sights were when the shot/burst was released
  - Call is expressed in clock direction and amount from point of aim
  - Peer coach/Assistant Gunner verifies actual location
  - Poor/inconsistent shot call is a poor application of Control





#### **Drills**

Drill structure is standardized for all weapons to reinforce common actions

- A: Weapon Check-Condition Green, serial numbers, function check
- B: Sling/Unsling. Go between Safe Hang, Low Ready, Ready, and other positions
- C: Equipment Check/PCC
- D: Load
- E: Carry (5/3) Move between 5 methods of carry 3 times.
- F: Fight Down. Start in the standing/offhand position and assume the kneeling, sitting, and prone (or variations) in order.

- G: Fight Up. Start prone and assume positions up to standing in order.
- H: Go-To-Prone. Rapidly drop from standing/crouching low ready into prone. Do while stationary, walking, or during a tactical rush.
- I: Reload and Barrel Change.

  Completely reload from ammunition stored in load bearing equipment.
- J: Clear Malfunction. Reduce the most common malfunctions.
- K: Unload/Show Clear
- L: Mount To Tripod

M: Manipulate Traverse & Elevation U.S. Army Reserve Marksmanship Program





Drill A: Weapon/Function Check

Go to Condition Green

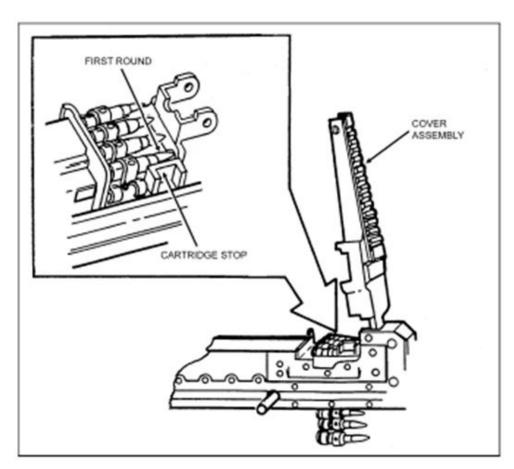
- Lock bolt to rear, place on SAFE. Pull trigger. Nothing should happen.
- Grasp charging handle, place on FIRE, pull trigger, ride bolt forward.
- Lock bolt to rear, place on FIRE.
- Use linked dummy ammo to check stripping, locking, loading, unlocking, extracting and ejecting.
- CAUTION: Do not dry fire on empty chamber.
- Weapon should not go on SAFE when bolt is forward
- DO NOT HALF COCK
- There is no Amber with the M240 series





Drill D: Load

- Condition Red
- Bolt rear, on Safe
- Cover open, belt placed on feed tray
- Condition Black
- Red plus selector on Fire
- Follow unit ROE and/or SOP







#### **Drill J: Clear Malfunctions**

Any failure of the weapon to complete normal cycle of function. Correct by:

- Use secondary weapon (if available and appropriate)
- Apply Corrective Action
  - Immediate action. Simple, rapid action to correct basic disruptions
  - Commonly fix simple failures to fire, especially ammunition related
    - Pull and lock the cocking handle to the rear
    - **Observe** ejection port and belt for ejection and advance
    - Push the cocking handle to its forward position
    - Proceed/Press trigger
  - Remedial action. Skilled/thorough response to specific problem or issue that simple Immediate action cannot correct
  - Typically requires unload/show clear to correct

No single corrective resolve all malfunctions.





#### Drill K: Unload/Show Clear

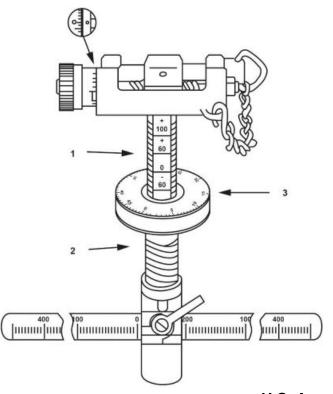
- Check feed pawl assembly under feed cover
- Check feed tray assembly
- Lift feed tray assembly and inspect chamber
- Check space between bolt assembly and chamber
- Weapon is now Green

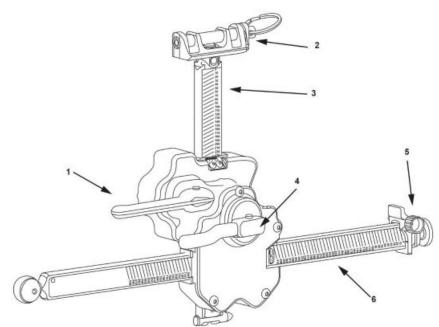




### Drill M: Weapon and T&E Manipulation

- Practice traversing and searching between target and along target areas.
- Need large swings (move to different objective) and controlled increments (~4-5 mils) search and traverse for even, overlapping coverage





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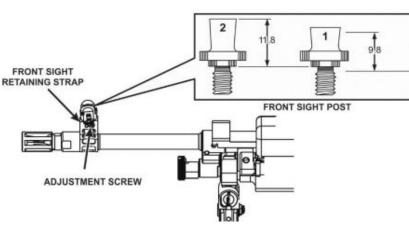


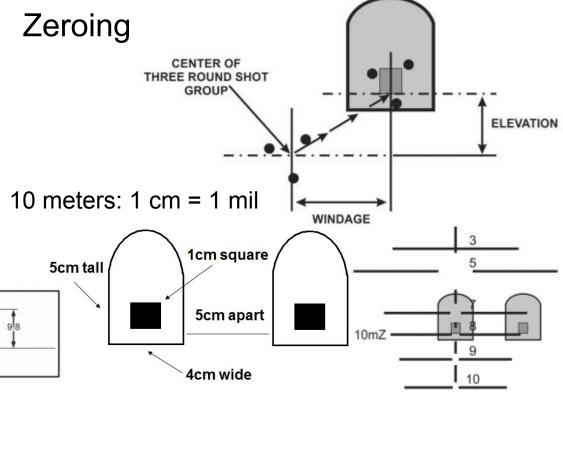
### At 10 meters:

- Iron sight: 500 meter
- M145: Top of 800 meter

Zero "slick" (no field gear)

#### **Always use Peer Coaches!**











TC 3-22.240

### Zeroing

- 1. Start with single-loaded rounds
  - Center groups with center base hold
  - Single round zeros need confirmation
- 2. Continue zeroing with bursts
  - Load using exact number of rounds
  - Hold trigger and let gun empty out
  - o Follow-through!
  - Start with three rounds, then seven
- 3. Groups and bursts should be 2-4 mils and centered in target as pictured
  - Continue until this is achieved









Qualification: 10 Meters

Objectives:

Accurate Initial Burst, Adjust Fire, Develop Speed

#### **Qualification Task 5&6:**

Only shoot **ONE** burst per target area/paster. Remaining ammo is NOT used or alibi granted.

- 1 point per hit, max 7 per paster
- 63 minimum, 91 max

1	No limit	12	Ball	A1 and A2	12 single rd (zero).
2	No limit	28	Ball	A3 and A4	5- to 7-rd bursts for each paster.
3	No limit	35	Ball	A5 and A6	5- to 7-rd bursts for each paster traverse and search.
4	No limit	56	Ball	A7 and A8	5- to 7-rd bursts for each paster.
*5	45 sec	56	Ball	B7 and B8	5- to 7-rd bursts for each paster.
*6	30 sec	35	Ball	B5 and B6	5- to 7-rd bursts for each paster.

#### TC 3-20.40 Training and Qualification, Individual and Crew Served Weapons, 7-119

"Qualification requires gunners to practice trigger control and requires the firer to fire **ONE** five to seven round burst at each specified point target or series of targets in the area target sequences. Gunners are authorized to fire **only ONE** five to seven round burst at each paster."





Objectives:

Qualification: Transition

Accurate Initial Burst, Adjust Fire, Develop Speed

#### **Qualification:**

Firers may only shoot **TWO** bursts per target.

- Fire a burst, adjust fire (if missed) and re-engage ONCE
- Remaining ammo is NOT used or alibi granted.
- 10 points per hit (1st or 2nd burst)
- 70 pass, 110 max
- DA Form 85

		QTY TYPE		T400FT	24405	TYPE FIRE Fixed, 5- to 7-round burst (field zero)
TASK	TIME				RANGE	
1	No Limit				500	
2ª	10	14	4:1 <sup>b</sup>	Single E	400	Fixed, 5- to 7-round burst
3ª	15	14	4:1 <sup>b</sup>	Double E	500	Fixed, 5- to 7-round burst
4ª	20	14	4:1 <sup>b</sup>	Double E	600	Fixed, 5- to 7-round burst
5ª	30	14	4:1 <sup>b</sup>	Double E	800	Fixed and area, 5- to 7-round burs
6ª	30	28	4:1 <sup>b</sup>	Single E Double E	400 600	Fixed, 5- to 7-round burst
7ª	45	28	4:1 <sup>b</sup>	Double E Double E	700 800	Fixed and area, 5- to 7-round burs
8a	45	42	4:1 <sup>b</sup>	Single E Double E Double E	400 500 600	Fixed, 5- to 7-round burst

Notes. The unit commander determines the position.

Note: Enforcement of only one burst per target area/paster (10 meter) and two bursts per target (transition) is NOT a change to the Qualification. The Training Circulars have finally explicitly stated what the standard always was supposed to be.

You've been cheating!

<sup>&</sup>lt;sup>a</sup>Qualification task.

<sup>&</sup>lt;sup>b</sup>Ball-to-tracer ratio (mix), that is, four ball rounds are loaded for every tracer round loaded.





#### Postal Match: 10 Meters

#### **Qualification Task 5&6:**

Shoot and time as normal (45 and 30 seconds, respectively.

**Burst**: One distinct press-release of the trigger, regardless of number of rounds.

While shooting the Qual as a Postal Match, count the total number of bursts fired.

**Scoring**: Score target as normal (1 point per hit, max 7 per paster)

- -5 per excess burst (8 and 5, respectively)
- -5 per overtime burst
- Fire Distribution Bonus: Paster in group with least hits x5 points.

#### Postal Match: Transition

Shoot the Transition course as normal.

**Burst**: One distinct press-release of the trigger, regardless of number of rounds.

While shooting Qual as a Postal Match, count the total number of bursts fired at each target.

**Scoring**: Score as normal (10 point per hit)

- +10 First Burst Hit
- 0 Second Burst Hit
- -10 Excess Burst (shooting 3 or more bursts at a target

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