WEAPONS HANDLING

OVERVIEW

- Determine Weapons Condition
- Weapons Commands
- Cycle of Operations
- Immediate Action
- Remedial Action
- Weapons carries

LEARNING OBJECTIVES

Please Read Your

Terminal Learning Objectives

And

Enabling Learning Objectives

DETERMINING THE CONDITION OF A RIFLE

- Must know weapons condition at all times.

DETERMINING THE CONDITION OF A RIFLE

- **Determine if a magazine is present**
- **Ensure the weapon is on safe**
- **Conduct a Chamber Check**

DETERMINING THE CONDITION OF A RIFLE

Chamber Check – Conducted at any time

- Visually/Physically check chamber
- Insert finger/thumb feel for round
- Watch bolt go home empty chamber

DETERMINING THE CONDITION OF A RIFLE

- Tap forward assist
- Close ejection port cover

WEAPONS COMMANDS

Dictates steps to:

- Load
- Make ready
- Fire
- Cease fire
- Unload
- Unload show clear

WEAPONS COMMANDS

- **Load**
  Condition 4 To Condition 3

- **Make Ready**
  Condition 3 To Condition 1

- **Fire**
  Engage Targets

WEAPONS COMMANDS

- **Cease Fire**
  Stop target engagement

- **Unload**
  Any Condition to Condition 4

- **Unload Show Clear**
  Secondary check by another shooter

UNLOAD

- On SAFE
- Remove magazine; Retain
- Charging handle to rear; Remove ammunition
- Lock bolt to rear

UNLOAD (Cont)

- Weapon on SAFE if not already
- Ensure chamber is empty
- Watch bolt go home on empty chamber

UNLOAD (Cont)

- Close ejection port cover
- Return ejected round to magazine
- Return magazine to magazine pouch; Secure

WEAPONS HANDLING PROCEDURES

LOAD

- Rifle on safe
- Withdraw magazine
- Insert magazine in magazine well
- Tug to ensure magazine seated

WEAPONS HANDLING PROCEDURES

MAKE READY

- Pull charging handle to rear; release
  (DON'T RIDE BOLT HOME)
- Chamber check
- Close ejection port cover

WEAPONS HANDLING PROCEDURES

FIRE

- Acquire target
- Weapon off SAFE
- Squeeze the trigger

CEASE FIRE

- Finger straight and off trigger
- Weapon on SAFE

WEAPONS HANDLING PROCEDURES

UNLOAD

- Remove magazine
- Pull charging handle to rear
  lock to the rear
- Inspect chamber (visually/physically)
- Send bolt home
- Weapon on SAFE

UNLOAD, SHOW CLEAR

- Follow Unload procedures
- Secondary chamber check by other shooter
- Send bolt home, observe empty chamber

UNLOAD, SHOW CLEAR (CONT)

- Close ejection port cover
- Return ejected round to magazine
- Secure magazine

Show Clear

Procedures apply only when time and tactical situation permit

WEAPONS TRANSFERS

Handing Off

- Weapon on SAFE
- Remove magazine
- Lock bolt to rear
- Chamber check (visually/physically)
- Leave bolt locked to rear

  hand off weapon

WEAPONS TRANSFERS

Receiving Weapon

- Weapon on SAFE
- Inspect chamber (visually/physically)
- Send bolt home; observe empty chamber
- Close ejection port cover

WEAPONS TRANSFERS

Condition Unknown

- Weapon on SAFE
- Chamber check
- Remove and observe magazine for rounds
- Insert magazine in magazine well

CYCLE OF OPERATIONS

Firing

Ignition forcing projectile out barrel

Unlocking

Rotation of bolt

Extracting

Withdraw of cartridge

CYCLE OF OPERATIONS

Cocking

Resetting of hammer

Feeding

Strips round from magazine by bolt

Chambering

Round to chamber by bolt

Locking

Alignment of locking lugs

IMMEDIATE ACTION

- **Stoppage**
  - Unintentional interruption in cycle of operations

- **Malfunction**
  - Failure of weapon to fire satisfactory

IMMEDIATE ACTION (Cont)

- **TAP**

Bottom of magazine

- **RACK**

Charging handle

- **BANG**

Squeeze trigger

REMEDIAL ACTION

Indicators

- Bolt locked to rear

----Conduct speed reload

REMEDIAL ACTION (CONT)

- **Obstruction in chamber area**
- Remove magazine
- Attempt to lock bolt to rear
- If wont lock, hold charging handle
- Attempt shake round out
- Attempt fails strike butt stock on ground to clear chamber
- Reload
- Attempt to fire

REMEDIAL ACTION (CONT)

- **Brass stuck over and behind bolt face**
  - Weapon on SAFE
  - Remove magazine, butt stock on ground
  - Hold bolt to rear with sturdy object
  - Clear obstructing round
  - Conduct speed reload
  - Attempt to fire

REMEDIAL ACTION (CONT)

- **Audible pop/reduced recoil**
  - Only primer ignited
  - Propellant is ignited
  - Excessive smoke is indicator

WEAPONS CARRIES

Tactical

- No immediate threat

Alert Carry

- Enemy contact likely

Ready

- Enemy contact imminent

TACTICAL

ALERT

READY

DEMONSTRATION

PRACTICAL APPLICATION

WEAPONS HANDLING

FUNDAMENTALS OF RIFLE MARKMANSHIP

OVERVIEW

- 3 Elements of a shooting position
- 7 Common factors to all shooting positions
- Applying fundamentals

LEARNING OBJECTIVES

Please Read Your

Terminal Learning Objectives

And

Enabling Learning Objectives

3 ELEMENTS OF A SHOOTING POSITION

- Bone Support- The body's natural skeletal structure provides support for the rifle to manage recoil.

- Muscular Relaxation- Helps hold body steady while increasing aiming accuracy and providing maximum use of bone support

3 ELEMENTS OF A SHOOTING POSITION

- Natural Point of Aim- Point at which the rifle sights settle when in a firing position.
  - Move your body to settle the sights
  - DO NOT MUSCLE THE WEAPON

7 FACTORS TO SHOOTING POSITIONS

- 1) <u>Forward hand relaxed and elbow close to weapon</u>
  - Wrist is straight and locked to create resistance on sling. This allows front sight to be stabilized.
  - Elbow is inverted under weapon to allow bone support and resistance to recoil.

7 FACTORS TO SHOOTING POSITIONS

- 2) <u>Butt of weapon high in the shoulder</u>
  - Outboard tension applied by support elbow will help place buttstock in the “pocket” of the shoulder
  - This ensures the shooter to keep neck erect and allows them to look straight through the sights to acquire sight picture

7 FACTORS TO SHOOTING POSITIONS

- 3) <u>High firm pistol grip</u>
  - Place “V” formed by thumb and index high in pistol grip
  - Place thumb and non-shooting fingers in a comfortable position that DOES NOT interfere with the trigger finger
  - Shooter should slightly pull weapon into the shoulder “pocket”

7 FACTORS TO SHOOTING POSITIONS

- 4) <u>Placement of rear elbow</u>
  - Naturally positioned for balance and to provide a pocket for the rifle buttstock
  - Consistent shoulder placement ensures resistance to recoil will remain constant

7 FACTORS TO SHOOTING POSITIONS

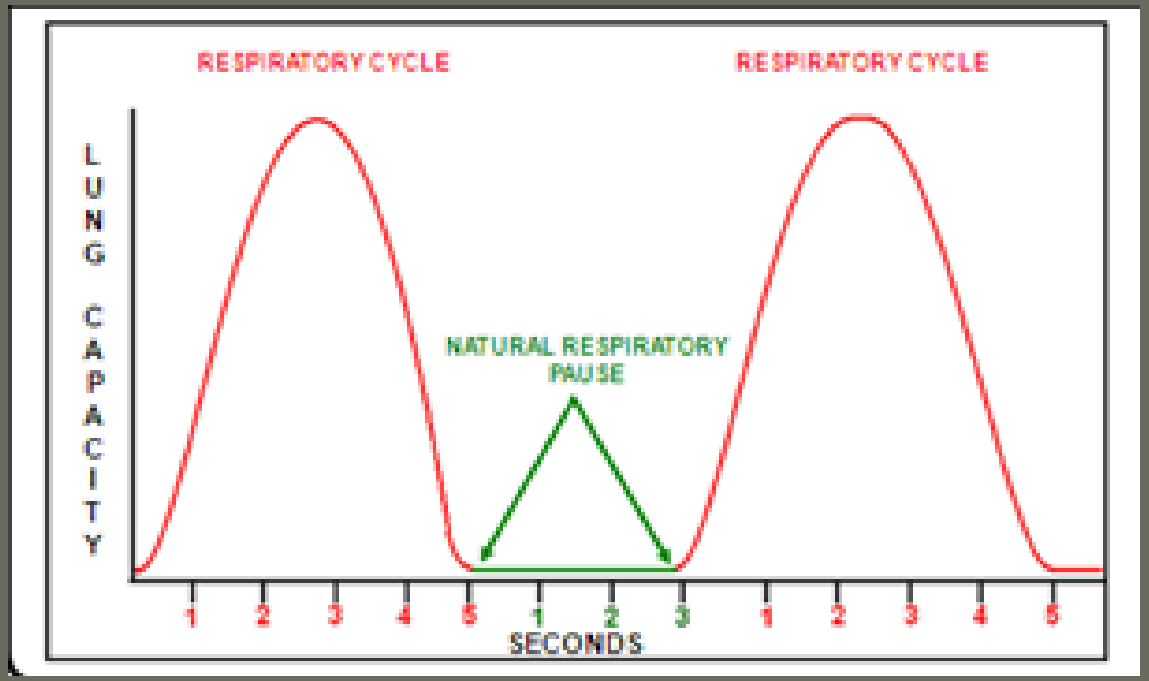
- 5) <u>Stock weld and eye relief</u>
  - Consists of proper placement of cheek against the stock. Should remain consistent between shots and can be accomplished by:
    - Anchoring stock under the cheek bone
    - Ensuring proper eye relief- distance between eye and rear sight (2-6 inches)

7 FACTORS TO SHOOTING POSITIONS

- 5) Stock weld and eye relief (cont'd)
  - Erect head will allow aiming eye to look straight through rear sight

7 FACTORS TO SHOOTING POSITIONS

- 6) Breathing
  - Natural respiratory pause
    - Inhale-Exhale-Pause-Shoot



7 FACTORS TO SHOOTING POSITIONS

– Technique for breath control during SLOW fire

- Assume firing position
- Stop breathing at your normal pause and make final adjustments to your natural point of aim
- Breathe naturally between shot, then take a deeper breath before shot
- Exhale and stop breathing
- Fire shot during pause

7 FACTORS TO SHOOTING POSITIONS

- Technique for breath control during RAPID fire
  - 2 methods

1) Breathing between shots
   - Assume firing position
   - Stop breathing after exhalation
   - Fire shot during pause
   - Repeat process for 5 shots

7 FACTORS TO SHOOTING POSITIONS

- Technique for breath control during RAPID fire (cont'd)

2) Holding the Breath

  - Assume firing position
  - Take a deep breath
  - Hold breath and apply pressure to trigger
  - Fire the shots

7 FACTORS TO SHOOTING POSITIONS

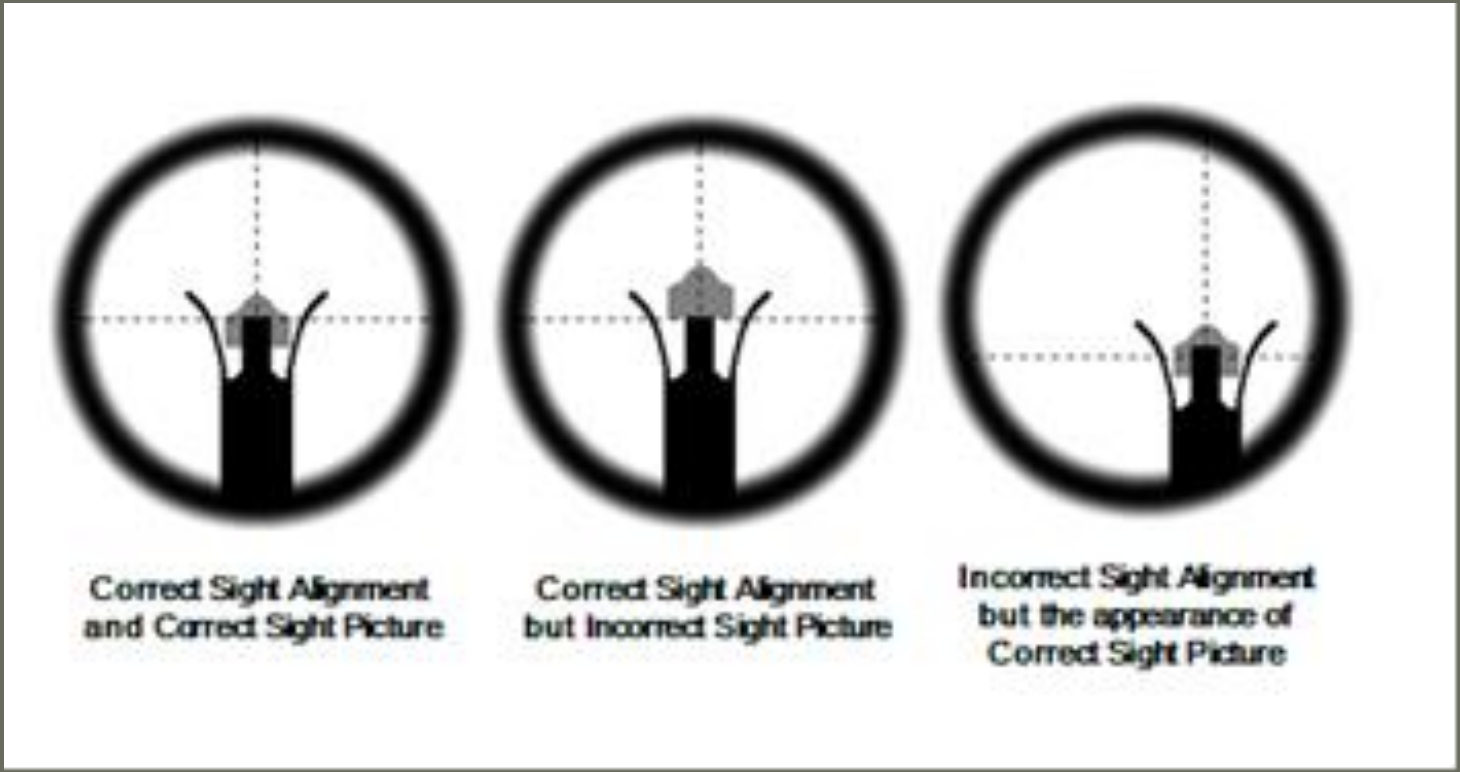
- 7) <u>Controlled Muscular Tension</u>
  - With loop sling donned, tension is used to stabilize weapon
  - Excessive tension results in shaking and fatigue

APPLYING FUNDAMENTALS

- Sight Alignment and Sight Picture
  - Sight Alignment- Relationship between front sight post, rear sight aperture, and aiming eye
    - To acquire correct sight alignment, center the front sight post vertically and horizontally in the rear sight aperture

APPLYING FUNDAMENTALS

– Sight Picture- Placement of the front sight post in relation to the TARGET, while maintaining sight alignment



APPLYING FUNDAMENTALS

- Relationship between the eye and the sights
  - For accurate shooting, focus on tip of front sight post. This can be accomplished by:
    - Exhaling and bringing sight picture to target. Once obtained, focus on tip of the front sight post
    - While firing, your peripheral vision will be blurry

APPLYING FUNDAMENTALS

- Trigger Control- Skillful manipulation of trigger that helps maintain sight alignment and sight picture
  - Uninterrupted trigger control- Trigger moved straight to rear with a single, smooth motion
  - Interrupted trigger control- Trigger pressure is interrupted occurring from an error in aiming. Applied pressure is kept on trigger until error is corrected.

APPLYING FUNDAMENTALS

- Factors affecting trigger control
  - Grip
    - Must be firm with applied pressure
  - Trigger finger contact with trigger
    - Trigger finger needs to be in the middle of the trigger

APPLYING FUNDAMENTALS

- Breathing-
  - Natural Respiratory Pause
    - One respiratory cycle- Inhale and exhale
      - Lasts 4-5 seconds
    - Pause between cycle lasts 2-3 seconds
      - During this time, muscles relax and rifle sights settle. This is the time to fire!

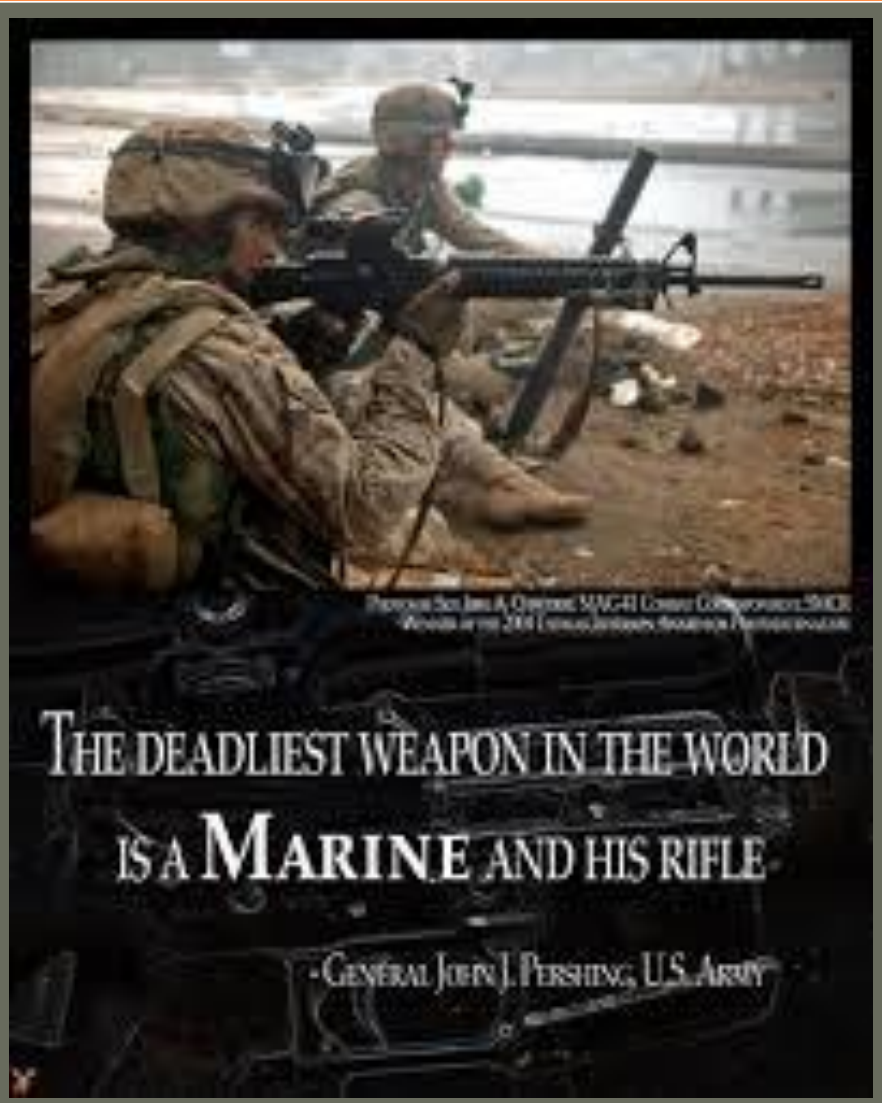
APPLYING FUNDAMENTALS

- Follow-Through
  - Continued application of fundamentals through firing process
  - Body should absorb recoil and settle back into your natural point of aim
  - DO NOT shift your position, move head, or let muzzle drop until bullet is fired

APPLYING FUNDAMENTALS

- Follow-Through (Cont'd)
  - Proper follow-through reduces error
  - Ensure weapon is on SAFE after follow-through of last fired bullet

FUNDAMENTALS OF RIFLE MARKMANSHIP



FUNDAMENTALS OF RIFLE MARKMANSHIP

SHOOTING POSITIONS

OVERVIEW

- Prone Position
- Sitting position
- Kneeling Position
- Standing Position

LEARNING OBJECTIVES

Please Read Your

Terminal Learning Objectives

And

Enabling Learning Objectives

PRONE POSITION

- Allows for most stable position
- Allows for lowest profile

Moving into position

- Stand erect towards target
- Feet shoulder width apart
- Drop to knees

PRONE POSITION

Straight leg position with sling

- Move forward or drop back
- Feet facing outboard
- Correct body alignment will absorb recoil

PRONE POSITION

Cocked leg position with sling

- Move forward or backward
- Support leg straight, firing leg cocked
- Firing shoulder higher than support shoulder

SITTING POSITION

The following are requirements for the sitting position:

- Butt, Feet, Ankles will support body weight
- Both hands, sling, and shoulder support rifle
- Arms rest on legs any point above the ankles
- Magazine placement

SITTING POSITION

- Extremely stable
- Good bone support
- Three variations
  - Cross ankle sitting position with loop sling
  - Cross leg sitting position with loop sling
  - Open leg sitting position with loop sling

SITTING POSITION

Crossed ankle sitting position with sling

- 30 degree angle to target
- Bend at knees break fall with firing hand

SITTING POSITION

Crossed leg sitting position with loop sling

- 45-60 degree angle to target
- Bend at knees break
- fall with firing hand

SITTING POSITION

Open leg shooting position with loop sling

- 30 degree angle to target
- Bend at knees break fall with firing hand

KNEELING POSITION

- Provides tri-pod of support
- Provides higher profile for better observation
- Three variations
  - High
  - Medium
  - Low

KNEELING POSITION

Assuming the kneeling position

- Moving Forward into Position
- Dropping Back into Position

KNEELING POSITION

High kneeling position

- 45 degree angle right line of fire
- Toe of rear leg in contact with ground

KNEELING POSITION

Medium Kneeling position

- 45 degree angle right line of fire
- Bootlace of rear foot in contact with ground

KNEELING POSITION

Low kneeling position

- 45 degree angle right line of fire
- Outside portion of rear foot contact with ground

KNEELING POSITION

Adjusting natural point of aim

- **Buttstock placement**
  - High in shoulder lowers muzzle
  - Lower in shoulder raises muzzle

- **Forward hand placement on hand guards**
  - Further forward lowers muzzle
  - Further back raises muzzle

STANDING POSITION

Standing position

- Quickest position to assume
- Easiest to maneuver from
- Often used for immediate combat engagement

STANDING POSITION

Standing position using the parade sling

- Face target approximately 90-degrees
- Feet shoulder width apart
- Toe of rifle butt high in shoulder
- Bring sights to eye level

  (Don't bring head to sights)

STANDING POSITION

Adjusting natural point of aim

- **Feet Placement**
  - Feet further apart lowers muzzle
  - Feet closer together raises muzzle
- **Butt stock Placement**
  - High in shoulder lowers muzzle
  - Lower in shoulder raises muzzle

STANDING POSITION

- **Placement of “V” of forward hand**
  - Forward on hand guards lowers muzzle
  - Hand back on hand guards raises muzzle

DEMONSTRATION

COACHING / PRACTICAL APPLICATION

SHOOTING POSITIONS

COMBAT MARKSMANSHIP

OVERVIEW

- Compressing the fundamentals
- Application of the fundamentals

LEARNING OBJECTIVES

Please Read Your

Terminal Learning Objectives

And

Enabling Learning Objectives

COMPRESSING THE FUNDAMENTALS

Must be **QUICK** and **EFFECTIVE**

NO ROOM FOR ERROR OR HESITATION!!!

COMPRESSING THE FUNDAMENTALS

Quick Engagement

- Must gain Sight Alignment and Sight Picture simultaneously
- Shots should be rapid, but effective and accurate. Do NOT use burst
- Do not exceed your shooting skills in order to quickly put rounds on target

APPLYING THE FUNDAMENTALS

Aiming

- Sight Alignment and Sight Picture is the first priority

- Sight Alignment and Sight Picture should be simultaneous

APPLYING THE FUNDAMENTALS

Long range engagements

- Correct Sight Alignment and Sight Picture is essential
- Target comes to sights NOT sights to target

APPLYING THE FUNDAMENTALS

Short range engagements

- Brief deviation from sight alignment
- Front sight tip, rear sight aperture and target must be aligned
- Dictated by own personal abilities

APPLYING THE FUNDAMENTALS

Presentation

- Stock weld and eye relief should remain consistent

- Initial focus on target, then concentrate on sights, tip of front sight on target for sight picture

APPLYING THE FUNDAMENTALS

O-2 Sights

- Engagements under 200 yards or at night
- Wider field of view
- Sight alignment more difficult
- Use 300 yard line setting (8/3)

APPLYING THE FUNDAMENTALS

Breath Control

- Will vary due to increased heart rate, physical exertion, and stress of battle
- Take well aimed shots while shooting on the Exhale or your breathing cycle

APPLYING THE FUNDAMENTALS

Trigger Control

- Begins with presentation after the Safety off
- Firm grip to maintain stability
- After Sight Picture, one applies slow steady pressure in order to maintain sight alignment

Follow Through/Recovery

- Starts when a round leaves the barrel
- Allows for sights to be back on target for the next shot

APPLYING THE FUNDAMENTALS

Controlled Pair

- A controlled pair is two aimed shots in rapid succession
- The intent is to fire two accurate rounds before the target can react to the first shot

Purpose

- Size & Distance of target will effect the level of accuracy & trauma delivered by the pair
- Do not compromise accuracy for speed

APPLYING THE FUNDAMENTALS

Controlled Pair Technique

- Present your weapon to the target
- Acquire Sight Picture, fire a shot, and recover the sights back on target
- Reestablish Sight Picture and fire a second shot in rapid succession to the first

APPLYING THE FUNDAMENTALS

Failure to stop drill

- Assessment of the target following an engagement in which the target is not incapacitated.
- Followed by a single shot fired to an alternate aiming area.
- Commonly executed following a pair fired to the torso.

APPLYING THE FUNDAMENTALS

Failure to stop technique

- After firing a controlled pair to the torso, assess the situation.
- If the target has not been eliminated, establish sight picture on the alternate aiming area.
- Fire a precision shot on the alternate aiming area.
- Search and assess (dead check)

APPLYING THE FUNDAMENTALS

Two threats

- Multiple adversaries
- Determining the greater threat forces you to consider what is the appropriate method of engagement.
- The speed that you engage with becomes critical.

APPLYING THE FUNDAMENTALS

Two threats Cont.

- Acquire sight picture and engage the first target with two shots to the torso. Do not assess (yet)
- Immediately transition to the second target
- Acquire sight picture and engage with two shots to the torso.
- Follow through back to the torso of the second target. Then and only then, assess both targets.

APPLYING THE FUNDAMENTALS

Box drill using failure drill

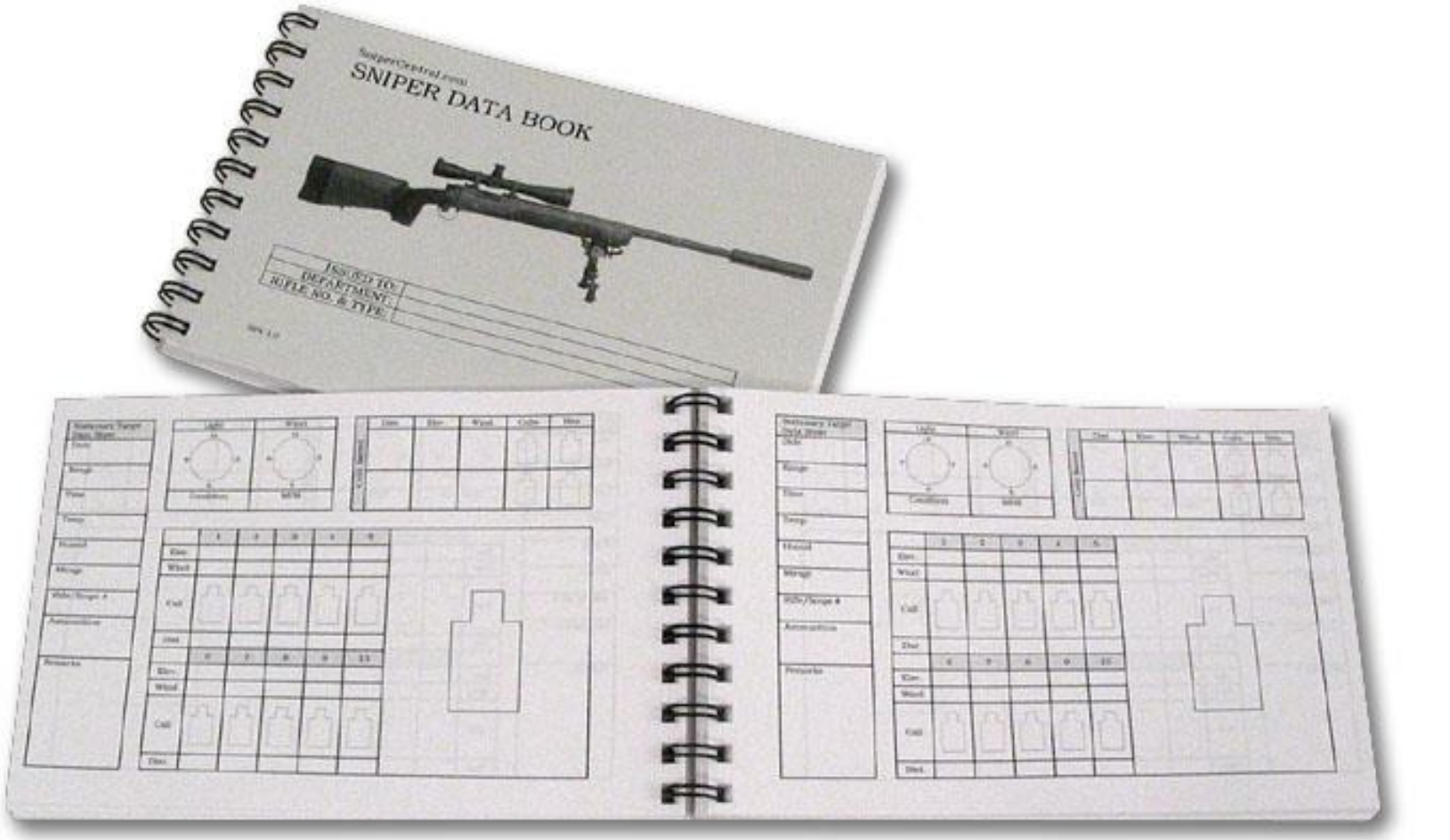
- If two shots to the torso fail, employ a box drill:
- Acquire sight picture on the greatest threat and engage it two shots to the torso.
- Transition to the second target
- Acquire sight picture and engage with two shots to the torso.
- Assess the target.

DEMONSTRATION

COACHING / PRAC AP

COMBAT MARKSMANSHIP

DATA BOOK



DATA BOOK

- Purpose of the Data Book
- Record tri fire data
- Record slow fire data
- Record rapid fire data
- Compare true zeros

LEARNING OBJECTIVES

Please Read Your

Terminal Learning Objectives

And

Enabling Learning Objectives

DATA BOOK

Purpose

- Shot by shot, group by group
  page by page review of firing

- Helps coach pin point weaknesses
  so performance can be corrected

200 YARD TRI-FIRE

Recording data before firing

- Recording information in the data book prior to firing saves valuable time on the firing line
- In the BEFORE FIRING section of the data book, record the following:

200 YARD TRI-FIRE

Recording data before firing

- Initial Sight Setting: Front Elev
- Initial Sight Setting: Rear Elev
- Initial Sight Setting: Wind

200 YARD TRI-FIRE

Recording data before firing

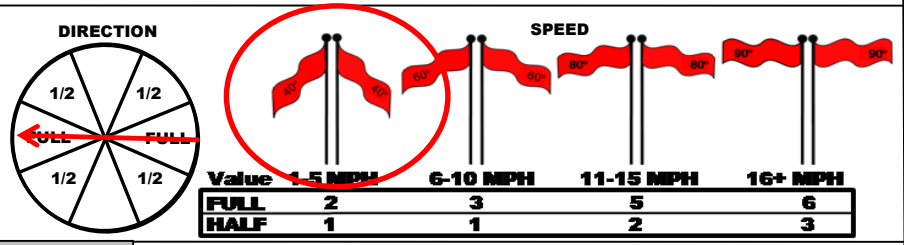
- Prior to firing, check the wind to determine sight adjustment. Look for:
  - Direction
  - Value
  - Speed

BEFORE FIRING — 200-YARD SLOW FIRE (DAY ONE) — SITTING

TRUE ZERO

FRONT ELEVATION	REAR ELEVATION	WIND
_____ ⇧	8/3 - 3	_____R
	8/3 - 2	
	8/3 - 1	
_____ ⇩	8/3	_____L

PLUS WIND =



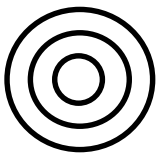
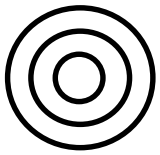
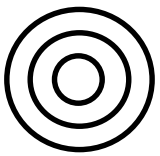
Value	1-5 MPH	6-10 MPH	11-15 MPH	16+ MPH
FULL	2	3	5	6
HALF	1	1	2	3

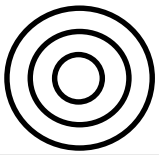
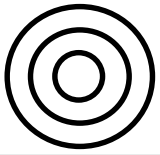
ZERO

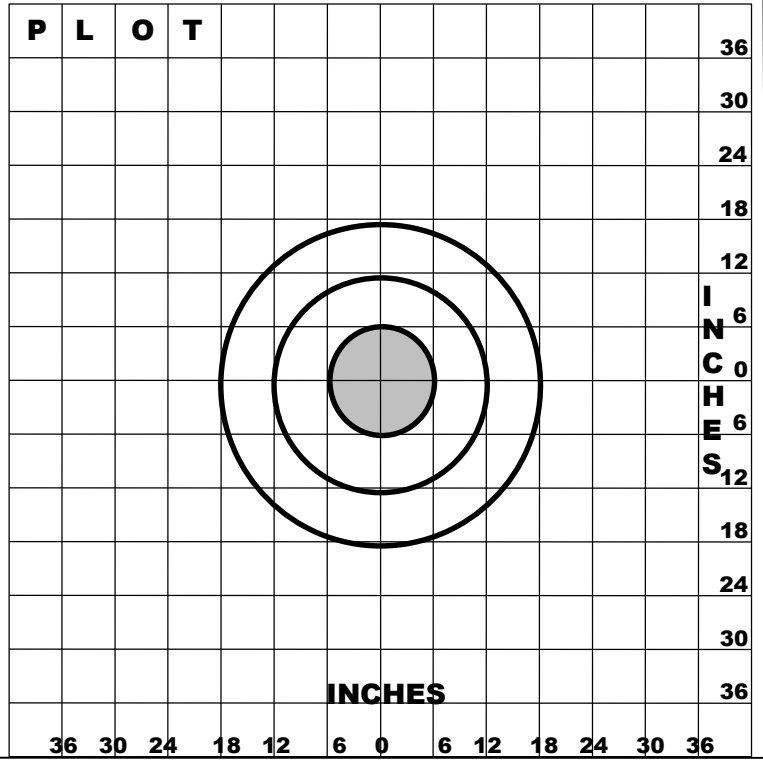
FRONT ELEVATION	REAR ELEVATION	WIND
_____ ⇧	8/3 - 3	_____R
	8/3 - 2	
	8/3 - 1	
_____ ⇩	8/3	_____L

DURING FIRING

CALL

	1	2	3
			
ELEV			
WIND			

	4	5
		
ELEV		
WIND		



REMARKS

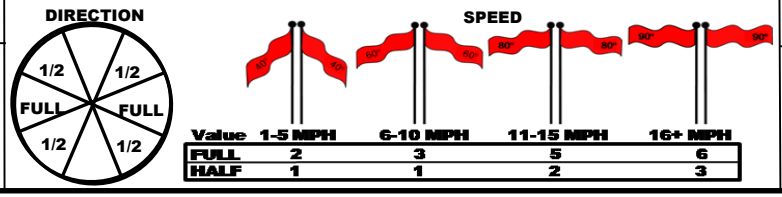
Windage and Elevation Adjustments
Rear Sight Elevation: 1 click = 2" at 200yds
Windage: 1 click = 1" at 200yds

AFTER FIRING

ZERO

FRONT ELEVATION	REAR ELEVATION	WIND
_____ ⇧	8/3 - 3	_____R
	8/3 - 2	
	8/3 - 1	
_____ ⇩	8/3	_____L

MINUS WIND =



Value	1-5 MPH	6-10 MPH	11-15 MPH	16+ MPH
FULL	2	3	5	6
HALF	1	1	2	3

TRUE ZERO

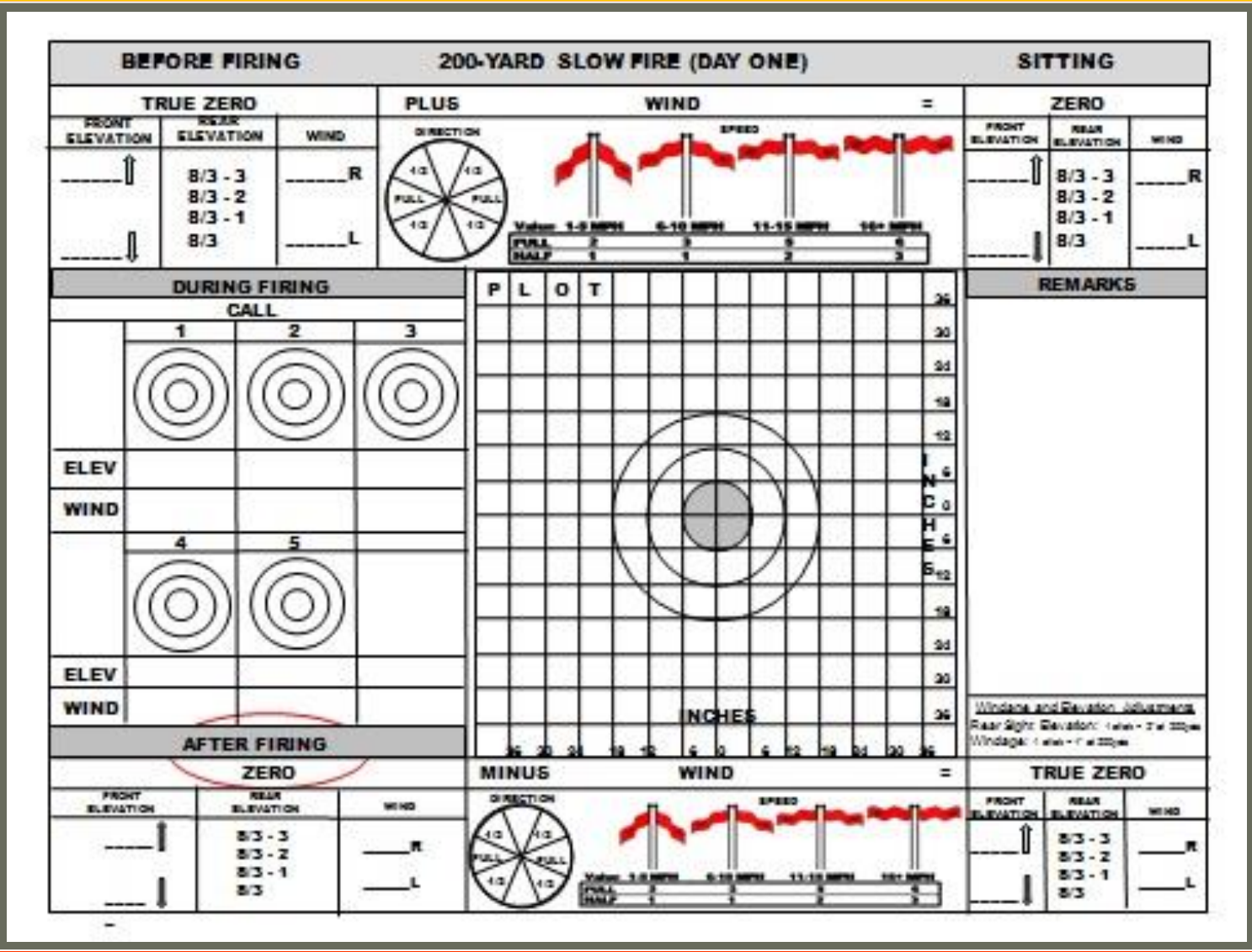
FRONT ELEVATION	REAR ELEVATION	WIND
_____ ⇧	8/3 - 3	_____R
	8/3 - 2	
	8/3 - 1	
_____ ⇩	8/3	_____L

200 YARD TRI-FIRE

Recording data during fire (Tri-fire)

- Fire initial three shots
- Make sight/wind adjustments based off grouping
- Fire next three round group
- Make sight adjustments based off grouping
- Fire final four round group

Recording data after firing (Tri-fire)



RECORDING DATA FOR SLOW FIRE

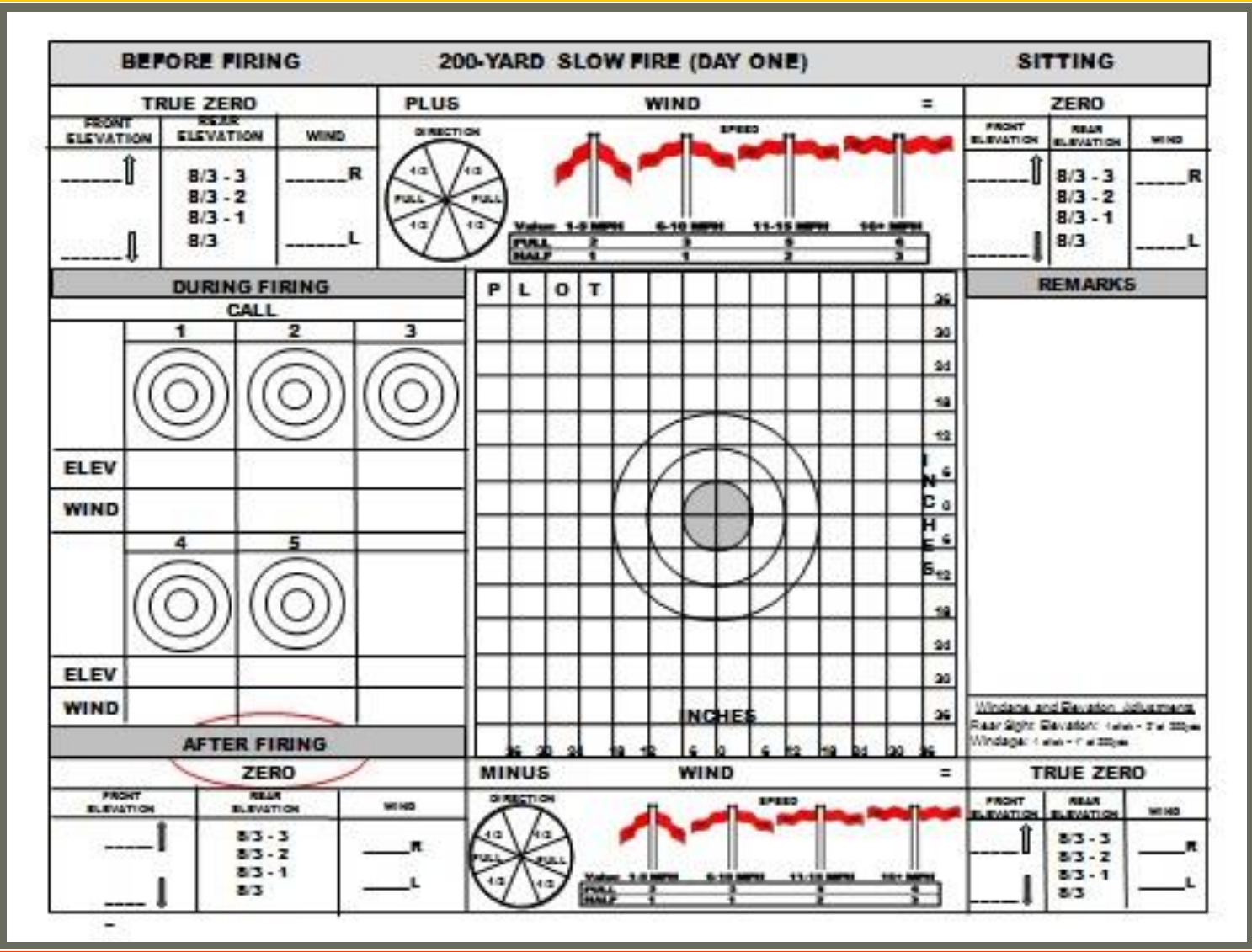
- **True Zero**: Based off tri-fire
- **Wind**: Set prior to first shot and during (Full/Half)
- **Zero**: New setting after sights changed if any

RECORDING DATA FOR SLOW FIRE

- **Recording Data During Firing**

- Fire the First Shot
- Call the Shot Accurately
- Prepare to Fire the Second Shot
- Look at Where the First Shot Hit
- Fire the Second Shot
- Call the Second Shot and Plot the First Shot
- Prepare to Fire the Third Shot
- Make a Sight Adjustment if Required
- Prepare to Fire the Fourth Shot

Recording data after firing (Tri-fire)



RECORDING DATA DURING RAPID FIRE

- **True zero:** Based off current yard line slow fire
- **Wind:** Will be dependent on wind call
- **Zero**: New setting after sights changed if any

DATA BOOK

- Fire initial 10 round group
- Make mental not of each shot
- Make necessary adjustments
- Record data in PLOT box

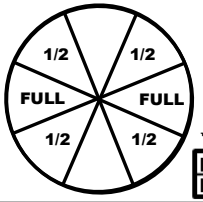
BEFORE FIRING | **200-YARD RAPID FIRE (DAY ONE)** | **SITTING**

TRUE ZERO

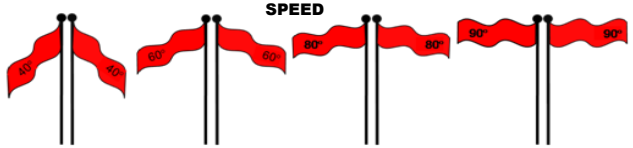
FRONT ELEVATION	REAR ELEVATION	WIND
_____ ↑	8/3 - 3	_____R
	8/3 - 2	
	8/3 - 1	
_____ ↓	8/3	_____L

PLUS WIND =

DIRECTION



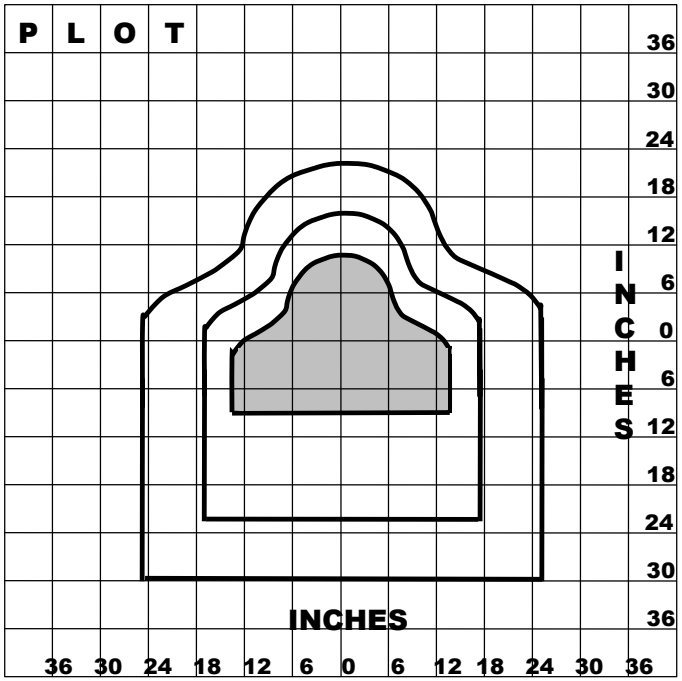
SPEED

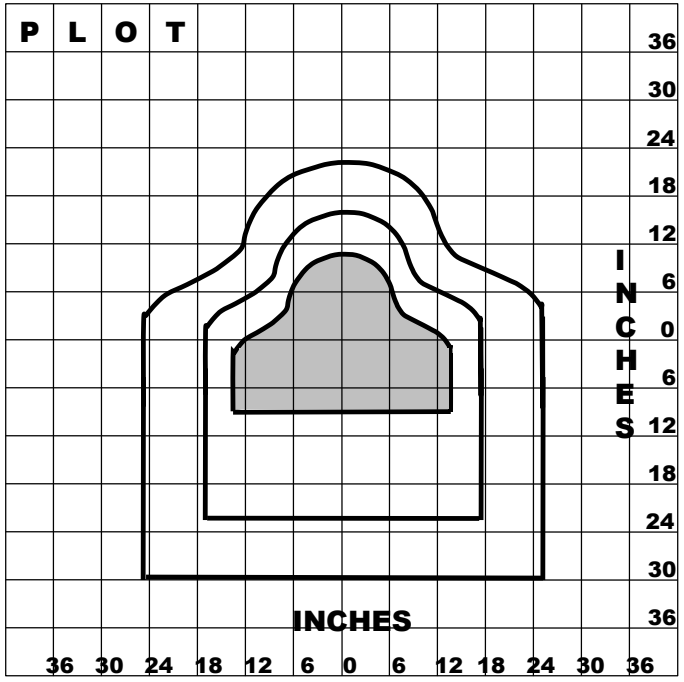


Value	1-5 MPH	6-10 MPH	11-15 MPH	16+ MPH
FULL	2	3	5	6
HALF	1	1	2	3

ZERO

FRONT ELEVATION	REAR ELEVATION	WIND
_____ ↑	8/3 - 3	_____R
	8/3 - 2	
	8/3 - 1	
_____ ↓	8/3	_____L





REMARKS

Windage and Elevation Adjustments
Rear Sight Elevation: 1 click = 2" at 200yds
Windage: 1 click = 1" at 200yds

SECOND STRING ZERO

FRONT ELEVATION	REAR ELEVATION	WIND
_____ ↑	8/3 - 3	_____R
	8/3 - 2	
	8/3 - 1	
_____ ↓	8/3	_____L

AFTER FIRING

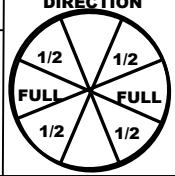
ZERO

FRONT ELEVATION	REAR ELEVATION	WIND
_____ ↑	8/3 - 3	_____R
	8/3 - 2	
	8/3 - 1	
_____ ↓	8/3	_____L

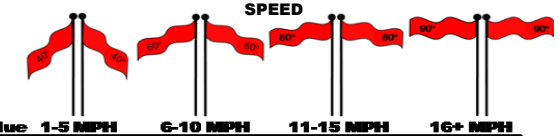
FMST WP 5

MINUS WIND =

DIRECTION



SPEED



Value	1-5 MPH	6-10 MPH	11-15 MPH	16+ MPH
FULL	2	3	5	6
HALF	1	1	2	3

TRUE ZERO

FRONT ELEVATION	REAR ELEVATION	WIND
_____ ↑	8/3 - 3	_____R
	8/3 - 2	
	8/3 - 1	
_____ ↓	8/3	_____L

DATA BOOK

Compare True Zeros

- Will show coach if shooter needs help with applying fundamentals
- Will show coach if shooters needs help in recording data
- Will show coach if shooter needs help in making proper wind calls or sight adjustments

DATA BOOK

RANGE OPERATIONS

OVERVIEW

- Range Personnel
- Range Safety
- Scoring Procedures
- Pit Commands

LEARNING OBJECTIVES

Please Read Your

Terminal Learning Objectives

And

Enabling Learning Objectives

RANGE PERSONNEL

- **Coaches**

  -There for assistance to the shooter

  - Instruct on marksmanship

- **Block NCO**

  - Assist coach for alibis

  - Assist for troubled shooters

RANGE PERSONNEL

- **Line SNCO**
  - Assist Range Safety Officer
  - Enforces range safety
  - Monitors conduct of fire

- **Tower NCO**
  - Assist Line SNCO
  - Gives all commands

RANGE PERSONNEL

- **Range Safety Officer (RSO)**
  - Ensure range is safe and efficient
  - Final say in alibis
- **Pit NCO**
  - Reports to RSO for the pit
  - Responsible for pit operations and safety

RANGE PERSONNEL

- **Pit Operator**
  - Follows commands from Pit NCO
  - Responsible for lowering/raising of target
  - Marks shot accordingly

RANGE SAFETY (ON THE LINE)

- Anyone can call CEASE FIRE
- Condition 1 only on firing line
- Abide by lateral limits
- Condition 4 if not on firing line, unless snapping in

RANGE SAFETY (ON THE LINE)

- On CEASE FIRE immediately put weapon on SAFE
- When firing hearing protection worn

RANGE SAFETY (IN THE PIT)

- Noise at a minimum
- Fast orderly movements
- Stay within red limiting lines

RANGE SAFETY (IN THE PIT)

- Hands off weapons after initial stage

SCORING PROCEDURES

- **Shot Spotters**
- Mark location of shot

- Two sided (Black & White)

- Sizes (3”,5”, & 10”)

SCORING PROCEDURES

- **Pasters**
  - Used to cover shot holes

- **Scoring Disk**
  - 10” Red
  - Used to mark score

PIT COMMANDS

- **Mark**
  - Shooter shot pull target down

- **Disregard**

- **Re Disk**
  - At least 3 Sec in air

- **Put target back in air**

RAPID FIRE SCORING

- **Count shot holes**
  - Given for specific target

- **Excessive hits on target**
  - More than 10 shots

- **Insufficient hits on target**
  - Fewer than 10 shots

PIT COMMANDS

- **Integrate Spotter**
  - White on black; black on white

- **Straighten Target**
  - Align target in carriage

PIT COMMANDS

- **Slow Target**
  - Speed Up

- **Target in Repair**
  - Repair is underway

RANGE OPERATIONS

Zero The Rifle Combat Optic (RCO)

OVERVIEW

- **CHARACTERISTICS**
- **NOMENCLATURE**
- **MAINTENANCE**
- **MOUNTING**
- **EMPLOYMENT**
- **RCO ZEROING**

CHARACTERISTICS

- The AN/PVQ-31A (AN/PVQ-31B) (RCO) is, the official US Marine Corps designation for the Trijicon TA31RCO-A4, known as the Advanced Combat Optical Gun sight (ACOG).
- Mounted on the M16-A2, M16-A4

CHARACTERISTICS

- **Provides the shooter:** Quick target acquisition at close combat ranges.

- Enhanced target identification and hit probability out to 800 meters, utilizing the Bullet Drop Compensator.

CHARACTERISTICS

- Dual-illumination technology:
  - Combination of fiber optics and self-luminous tritium, allows the sight to be continuously illuminated without the use of batteries.
- Aiming point will illuminate in total darkness
- Fiber-optic self-adjusts reticule brightness during daylight according to ambient light conditions

CHARACTERISTICS

WARNING

- **RADIOACTIVE MATERIALS**
- **RADITATION HAZARD**
- **SAFETY PRECAUTIONS**

SPECIFICATIONS

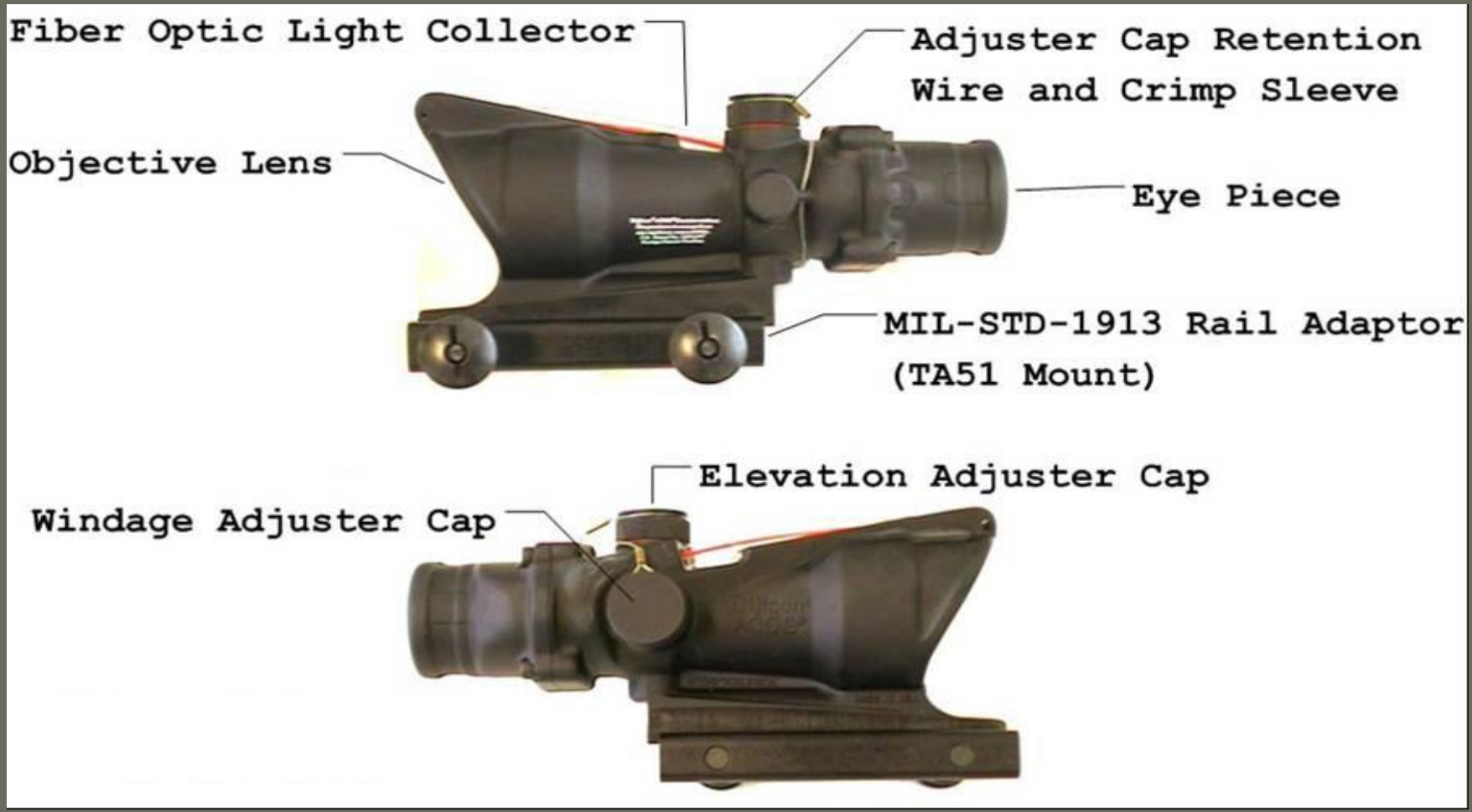
• Objective Lens	32mm
• Magnification	4 power
• Eye Relief	1.5 in
• Field of View	36.7 ft @ 100 yards
• Length	5.8 in
• Weight	15.3 oz w/ mount

SPECIFICATIONS

• Waterproof	66 ft
• Tritium	Useful up to 15 years
• Range	Up to 800m optimal
• Disassembly	Strictly prohibited

NOMENCLATURE

Controls & Indicators:



IDENTIFICATION

IDENTIFICATION

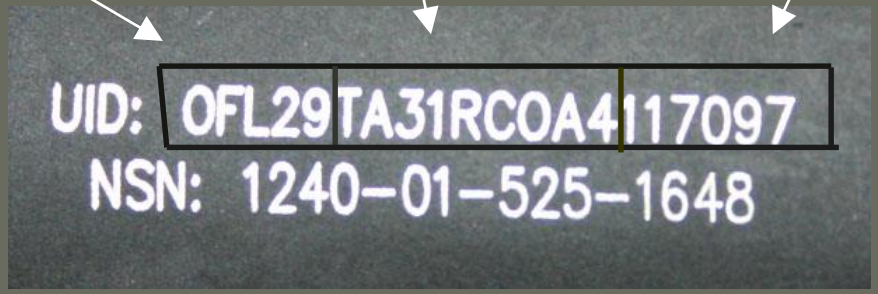
Left side-
National Stock Number (NSN)

Right side-
Model number

Cage Code

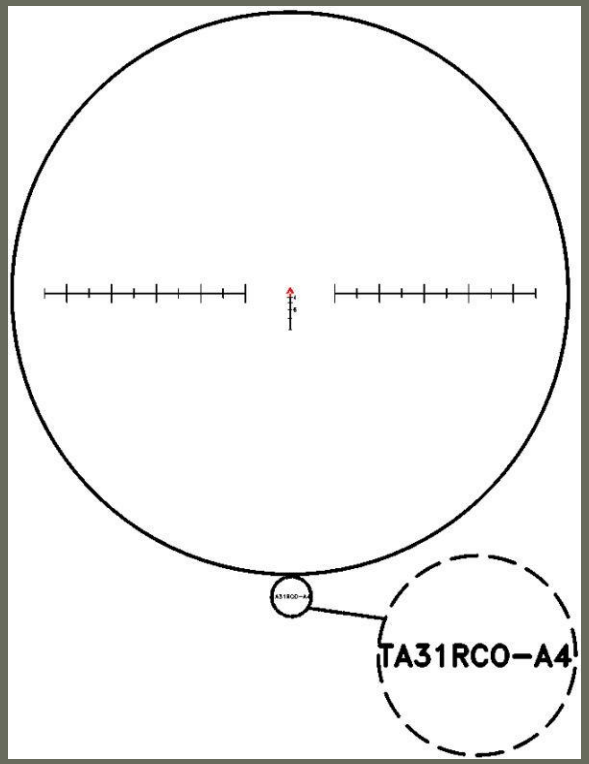
Model

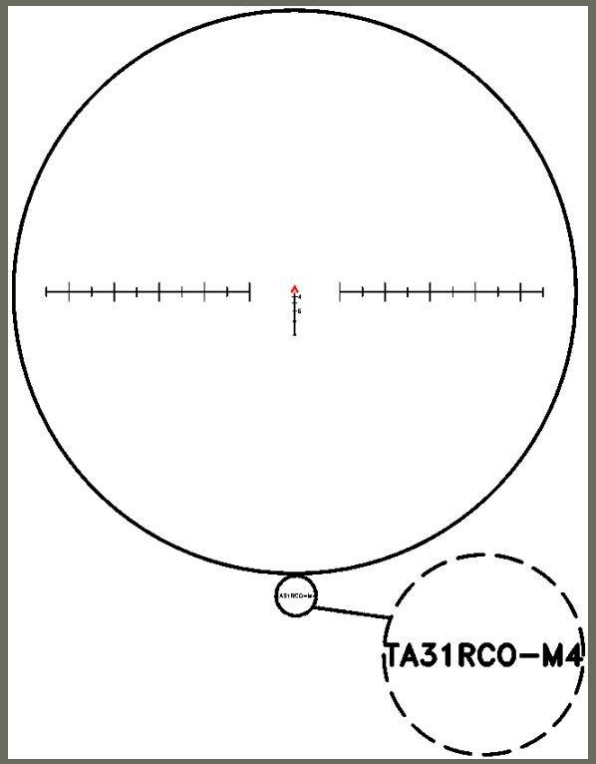
Serial Number



IDENTIFICATION

- The model type will be noted at the bottom of the Field of View when looking into the optic.





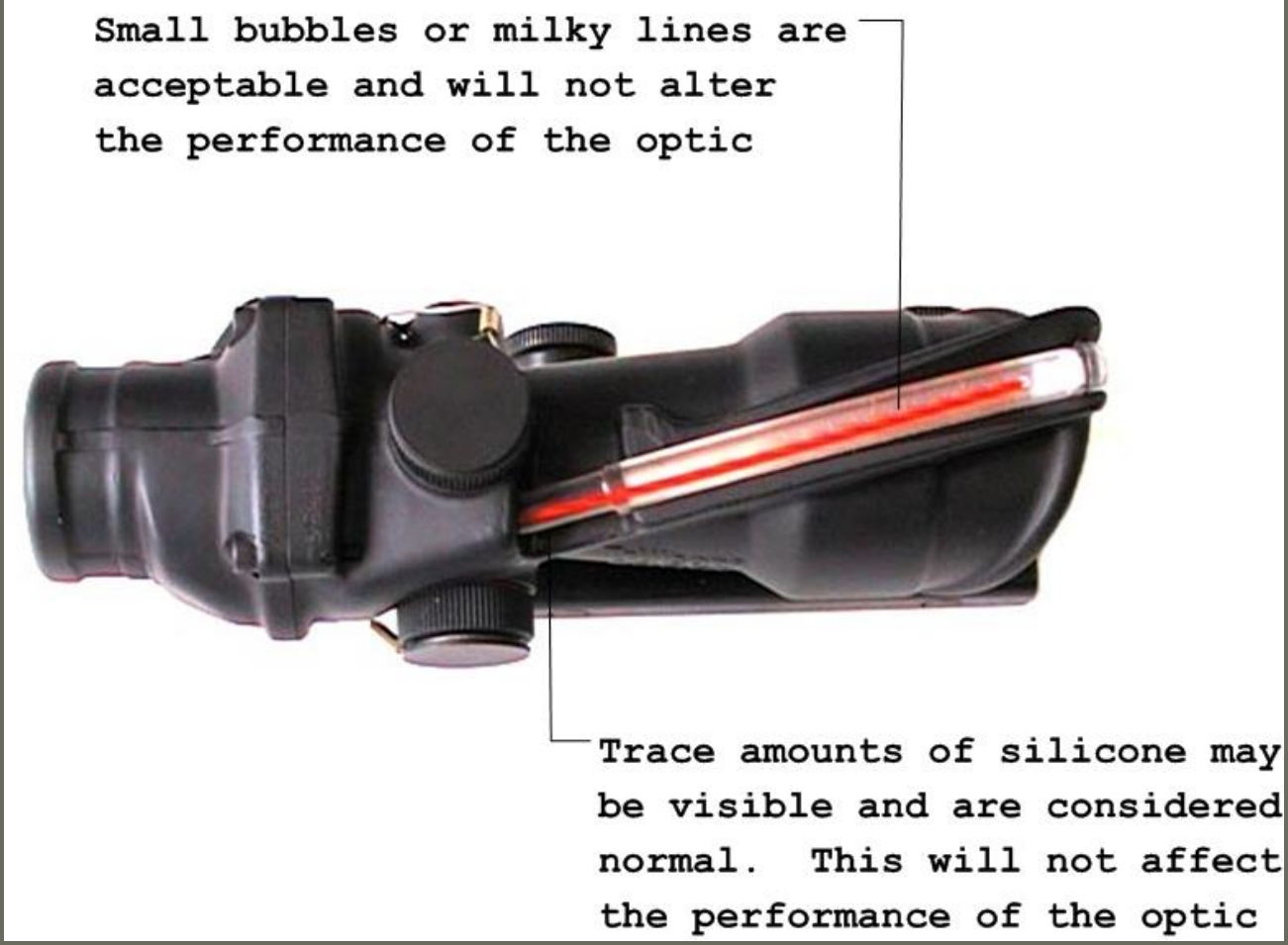
MAINTENANCE

Inspection:

- Tritium lamp
  - Check prior to deployment of the optic
- Every six months or immediately following any incident which might lead to lamp failure, such as the dropping of the AN/PVQ-31A (RCO) onto a hard surface
- Determine if tritium lamp is functioning
  - Enter a dark room and look though the optic
  - The Chevron should be **illuminated red.**
- Reticule does not appear to illuminate in the dark
  - Contact your unit maintainer for confirmation and disposal

MAINTENANCE

Inspection:



MAINTENANCE

Cleaning the AN/PVQ-31A (RCO):

- It is recommended that clean water be used to rinse foreign material from the external surfaces and lenses.

- Soapy water is better but, rarely available in the field.

- If water is unavailable, the AN/PVQ-31A(RCO) comes with a cleaning tool (Lens Pen) that does not require the use of water.

MAINTENANCE

- If fresh water is not available, utilize Lens Pen to remove all foreign material from the unit

- Pay special attention to the lenses
  - ALL foreign material must be removed before continuing

- Remove the cap to expose the Felt Lens Cleaner
  - Ensure there is NO foreign material on the felt surface
  - Starting in the center of the lens press the felt surface of the lens cleaner against the lens and in a spiral motion, work from the center to the outside edge of the lens.
  - Repeat if necessary.

MAINTENANCE

Do Not:

- Use any type of solvent on the AN/PVQ-31A (RCO).
- Use non-prescribed tools in an attempt to "break down" the AN/PVQ-31A (RCO).
- Use anything other than water, soap, and/or the Lens Pen to maintain the AN/PVQ-31 (RCO).
- DO NOT DISASSEMBLE the AN/PVQ-31A (RCO)

MOUNTING

Installation: Rail

The AN/PVQ-31A(RCO) can be placed in any of the slots on top of the receiver to allow for eye relief adjustment. Once the ideal position has been determined, apply forward pressure on the optic and tighten the knobs using finger pressure only. Then, add another ¼ turn utilizing a coin or bladed screwdriver.

Mark Thumb Screw location with permanent marker or other means.

Caution: DO NOT tighten beyond this recommended method.

MOUNTING

Carrying handle:

Align the forward mounting hole with the carrying handle mounting hole. Once properly aligned, seat the optic into the carrying handle channel ensuring the hole alignment is retained. Placing the optic into the carrying handle may require substantial pressure. Use hands only. Do not use impact.

MOUNTING

Carrying handle:

CAUTION: alignment is crucial. **DO NOT** force screw set into the threaded hole of the optic. Damage will occur to the special threads. If resistance is met, check optic/carry handle alignment and try again.

MOUNTING

Carrying handle

U shape fits under the handle against the curved surface. Using maximum finger pressure only, to tighten the screw.

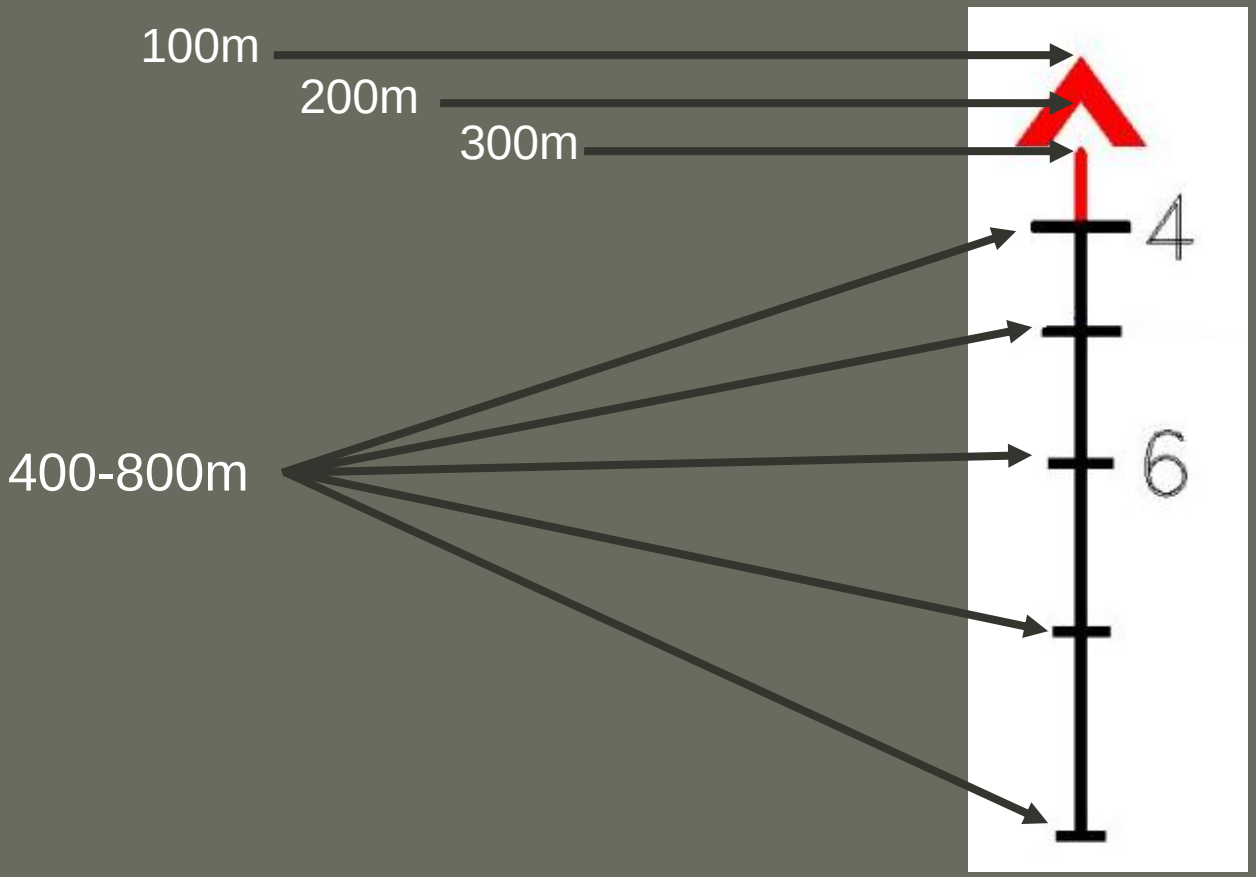
CORRECT

INCORRECT

Not seated correctly

EMPLOYMENT

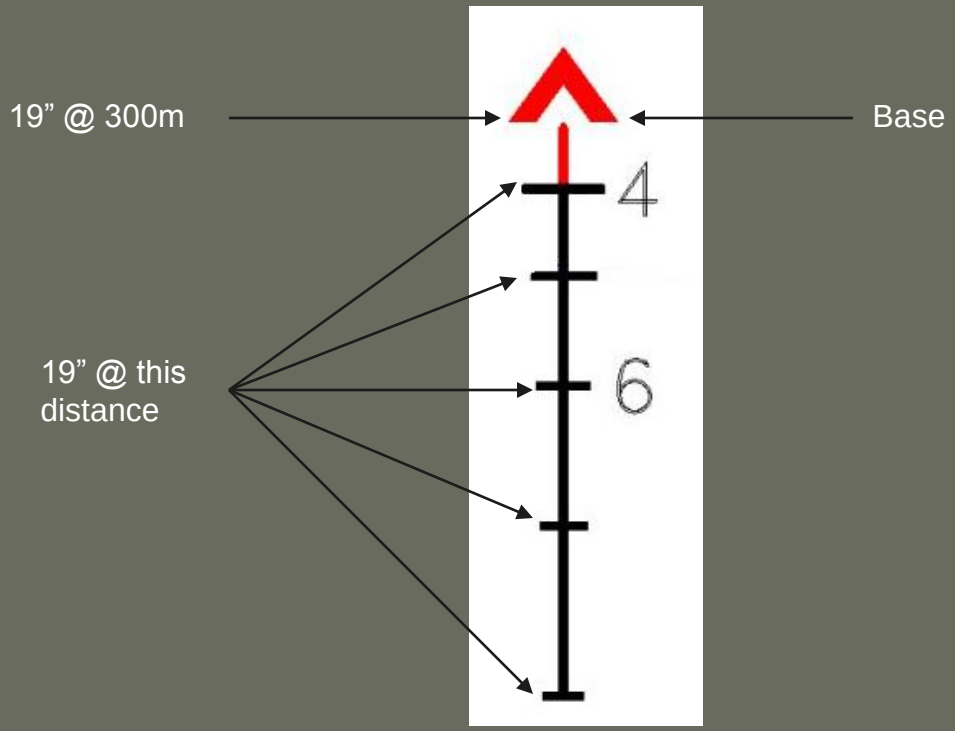
Bullet Drop Compensator (BDC) Points of Impact:



EMPLOYMENT

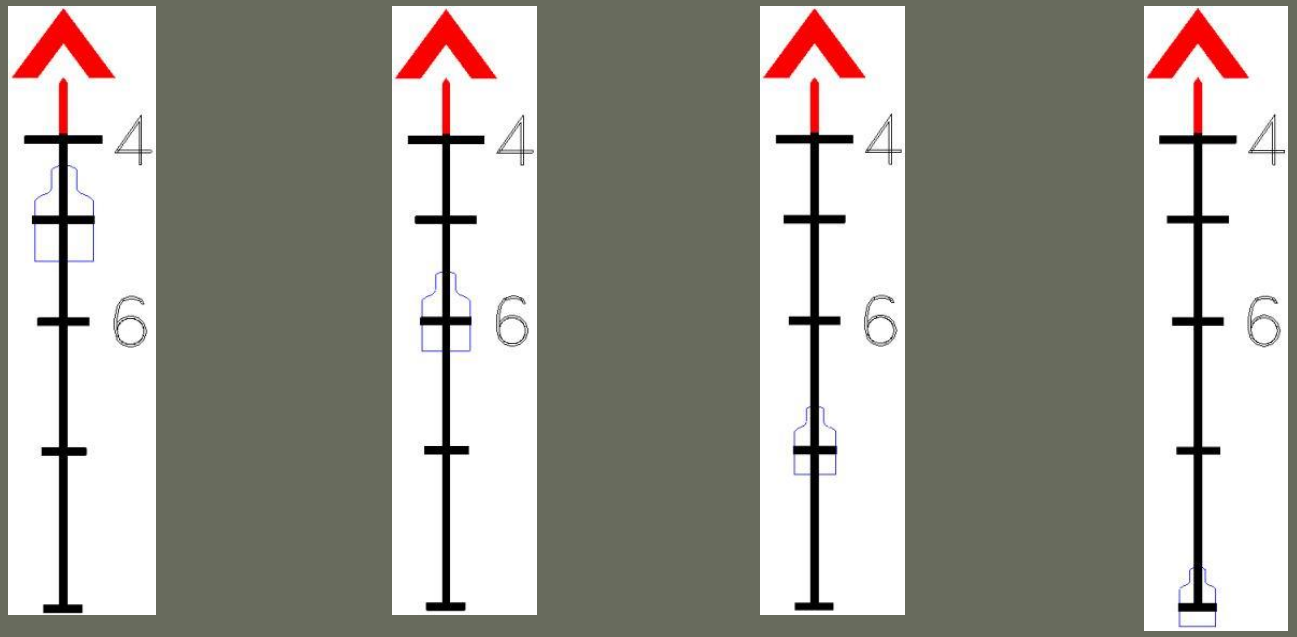
Ranging Capability:

The base of the chevron and the horizontal stadia lines represent 19 inches at the respective range, (average width of a man's shoulders). Range your target using the chevron and the width of the stadia lines.



EMPLOYMENT

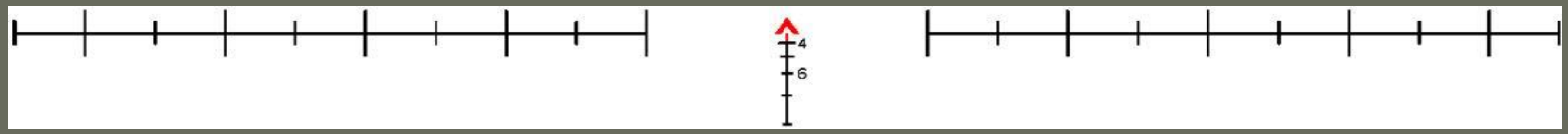
Ranging Capability:



500m 600m 700m 800m

EMPLOYMENT

Target Reference System:



NOTE: The right side of the horizontal mil scale will appear out of focus. This is normal.

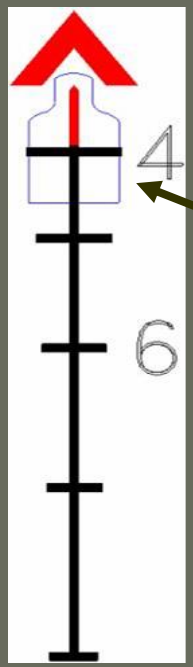
The AN/PVQ-31A(RCO) reticle includes a horizontal mil-scale graduated in 5 mil increments. The distance from the tip of the chevron to the first mil scale left and right is 10 mils.

The horizontal mil scale is primarily used for communicating target positions and other relationships to team members within the fire team.

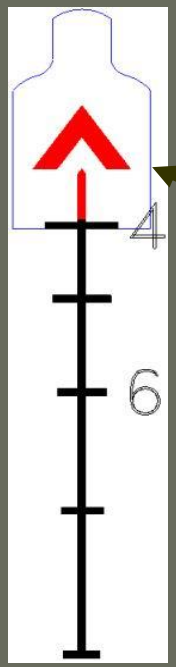
EMPLOYMENT

Ranging Capability: Shooting 200m-800m:

For quick target acquisition at 300m or less, place the illuminated chevron aiming point on a high center chest hold.



400m POI



100m-200m POI

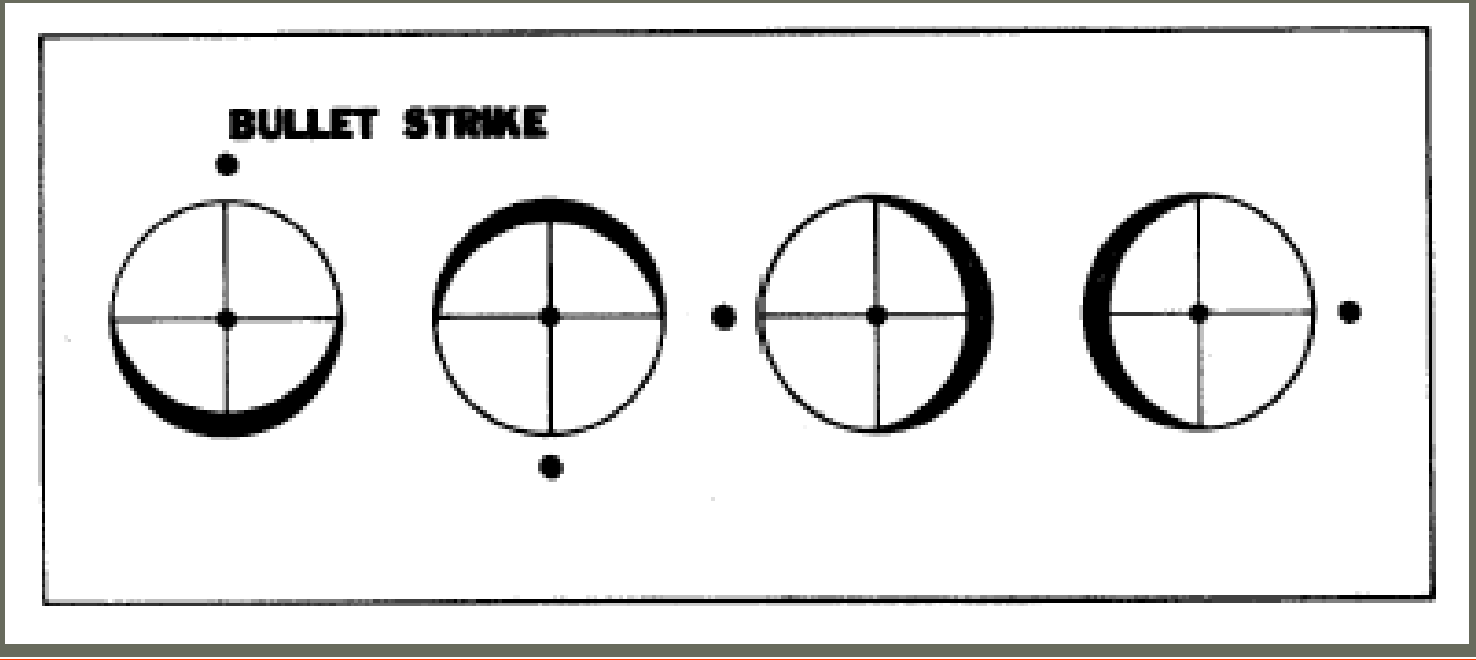

4
6
FMST WP7

FMST WP7

EMPLOYMENT

Shooting 100-800m: (Traditional Marksmanship skills)

Ensure you have a FULL field of view with NO shadows. Improper eye relief, or sight alignment will cause scope shadow. This will result in improper shot placement.



EMPLOYMENT

CORRECT

INCORRECT

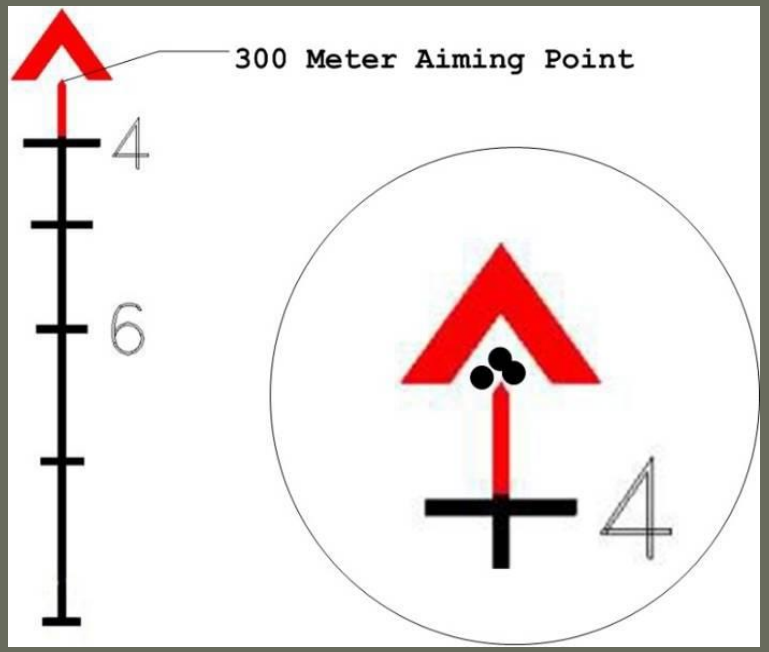
ZEROING

- Internally adjustable
- Adjuster screws used to adjust internal roof prism.
- After adjustments have been made a light tap must be made to adjusters to allow for accurate zero
- Shipped with a factory-centered zero
- DO NOT adjust the adjust the optics to the extreme

ZEROING

25 Meter Grouping Exercise

12 clicks = 1 inch



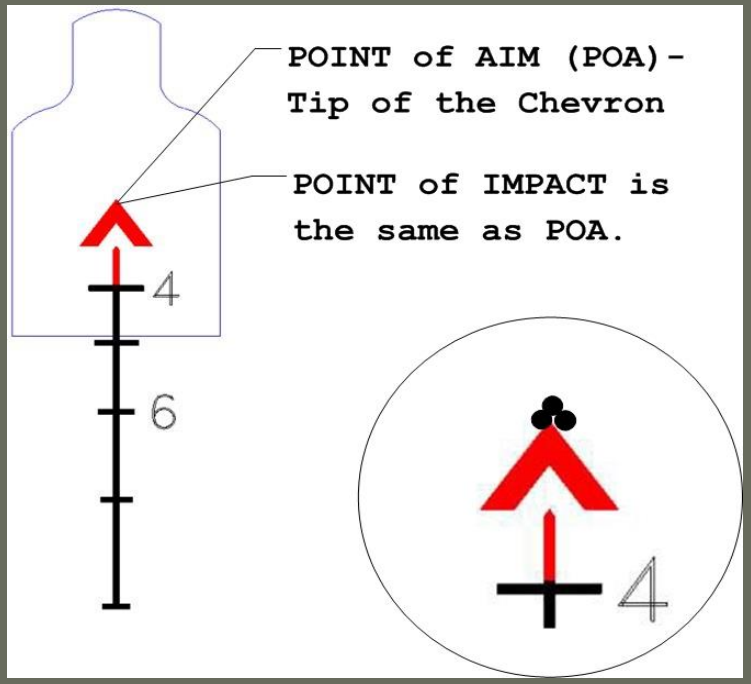
To acquire a field expedient Zero for the AN/PVQ-31A(RCO) at 25 meters, use the **tip of the 300 meter aiming point** to acquire Point of Aim/Point of Impact.

NOTE: This is a field expedient Zero only. Confirm zero at 100 meters as soon as possible

ZEROING

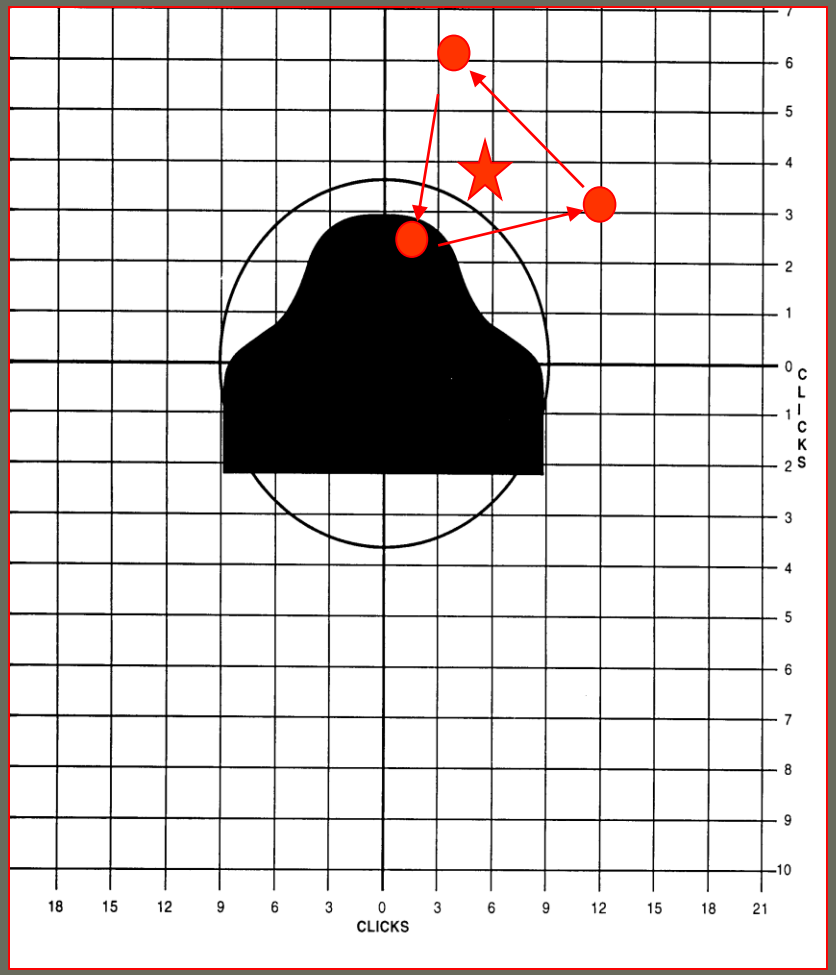
Zeroing at 100m -(preferred method):

3 clicks = 1 inch



When zeroing at 100 meters, the **tip of illuminated chevron** is used to acquire the Point of Aim/Point of Impact. This method ensures maximum accuracy out to 800 meters utilizing the Bullet Drop Compensator.

TRIANGULATION



1. CONNECT THE SHOT HOLES.
2. FIND THE CENTER OF THE SHOT GROUP.
3. USE CENTER OF SHOT GROUP TO DETERMINE HOW TO MAKE ADJUSTMENTS.

TRIANGULATION

- Course of fire for triangulation fire will be as follows
  - 5 rounds (used to make adjustments)
  - 5 rounds (used to make adjustments)
  - 5 rounds (used to confirm zero)

ZEROING

Adjustment Procedures: VERTICAL / ELEVATION

Remove the **top** adjuster cap, direction of the arrow (clockwise) will move the strike of the bullet **UP** as indicated on the adjuster. Tap the adjuster after making each adjustment.

Adjustment increments are 1/3 inch per click at 100 meters. This means that 3 clicks are required to move the bullet impact one inch on a target at 100 meters.

ZEROING

Adjustment Procedures: HORIZONTAL / WINDAGE

Remove the **side** adjuster cap, direction of the arrow (clockwise) will move the strike of the bullet **RIGHT** as indicated on the adjuster. Tap the adjuster after making each adjustment.

Adjustment increments are 1/3 inch per click at 100 meters. This means that 3 clicks are required to move the bullet impact one inch on a target at 100 meters.

DEMONSTRATION

PRACTICAL APPLICATION

SUMMARY

- CHARACTERISTICS
- NOMENCLATURE
- MAINTENANCE
- MOUNTING
- EMPLOYMENT
- RCO ZEROING

ZEROING THE SERVICE RIFLE

OVERVIEW

-Elements of Zeroing

-Types of Zeroes

-Sighting System

-Windage / Elevation

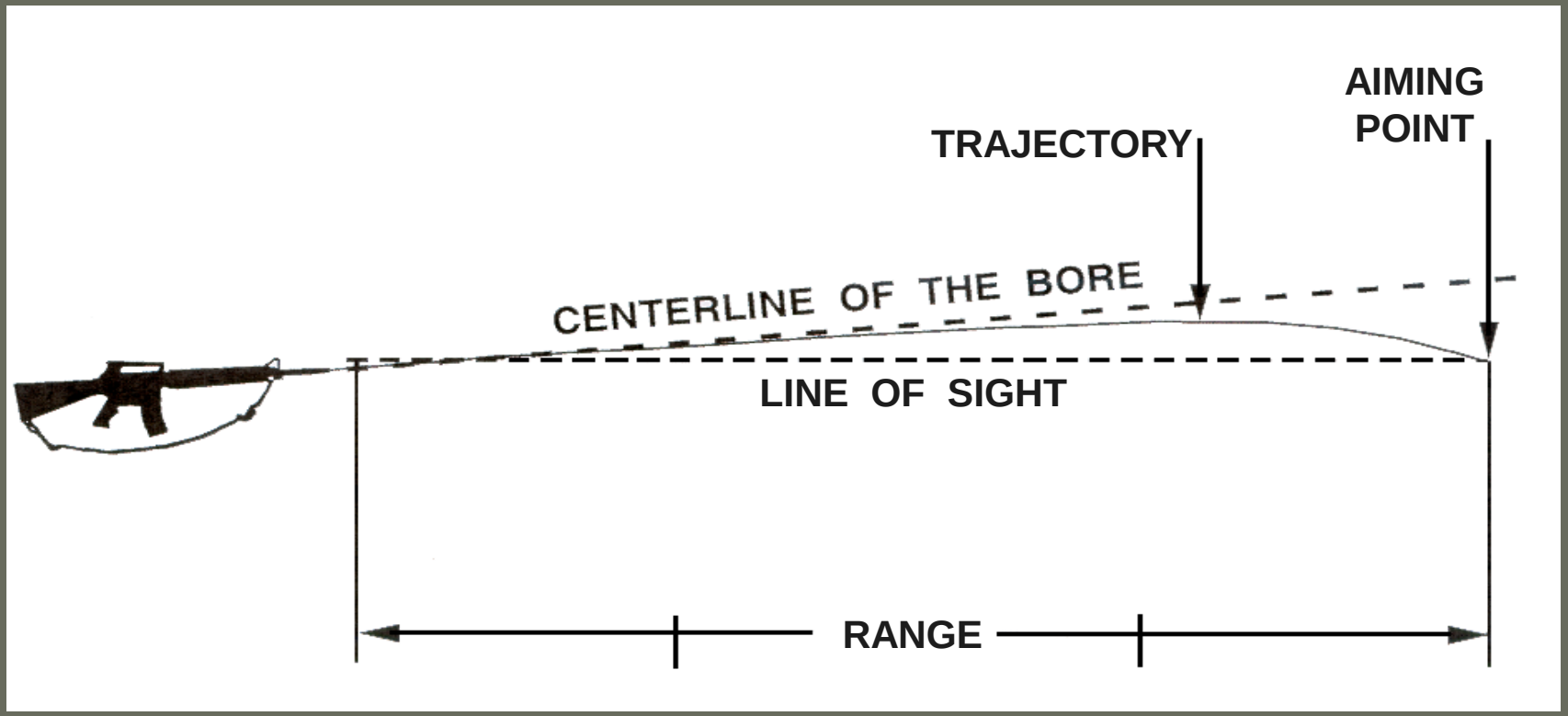
-Grouping Exercise

ZEROING THE SERVICE RIFLE

LEARNING OBJECTIVES

ELEMENTS OF ZEROING

NOTE: The bullet will rise approximately 7 1/2 inches above the line of sight between 0 and 300 yards / meters.



TYPES OF ZEROS

-ZERO

-TRUE ZERO

-BATTLE SIGHT ZERO (BZO)

TYPES OF ZEROS

ZERO

Elevation and windage settings required to place a single shot, or the center of a shot group, in a:

- predesignated location on a target
- at a specific range
- from a specific firing position
- under specific weather conditions

TYPES OF ZEROS

TRUE ZERO

A true zero is the elevation and windage settings required to place a single shot, or the center of a shot group, in a:

- predesignated location on a target at a specific range
- from a specific firing position
- under ideal weather conditions **(i.e., no wind).**

TYPES OF ZEROS

BATTLE SIGHT ZERO (BZO)

Elevation and windage settings required to place a single shot, or the center of a shot group, in the center of a target at 300 yards/meters, under ideal weather conditions (i.e., no wind)

- Setting on rifle for combat
- BZO setting will enable engagement of point targets from 0 – 300 yards/meters in a no wind condition

RIFLE SIGHTING SYSTEM

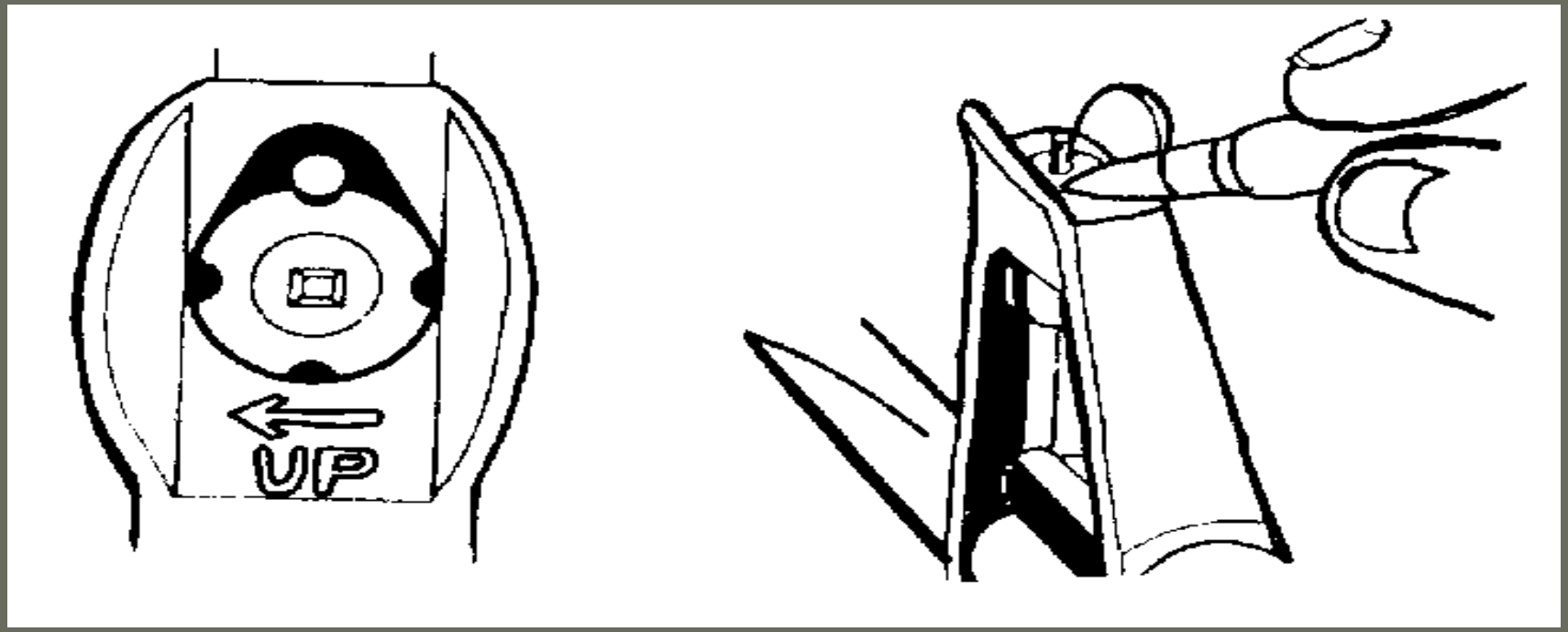
Consists of:

- Front sight post
- Rear sight apertures with windage knob
- Rear sight elevation knob

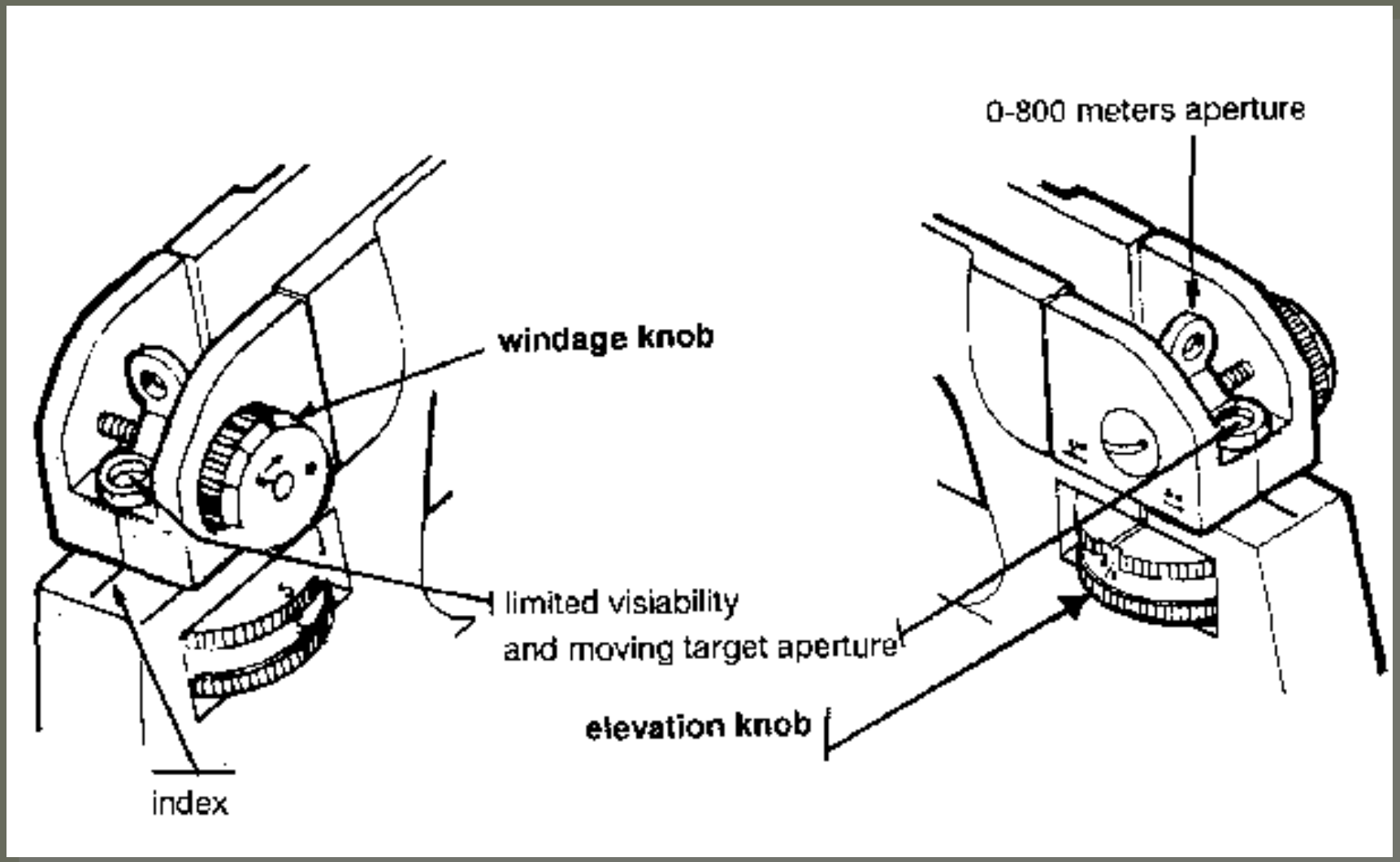
Moving each of these sights one graduation or notch is referred to as moving one "click" on the sight system.

RIFLE SIGHTING SYSTEM

FRONT SIGHT: Consists of a square, rotating sight post with a four-position, spring-loaded detent. The front sight post is moved up or down when zeroing the rifle for elevation. Depress the detent and rotate the post to adjust for elevation up or down.



REAR SIGHT


0-800 meters aperture
windage knob
limited visiability
and moving target aperture
elevation knob
index

WINDAGE AND ELEVATION RULES

DEFINITION: The windage and elevation rules define how far the strike of the bullet will move on the target for each click of the front/rear sight elevation or rear sight windage knob for each 100 yards of range to the target.

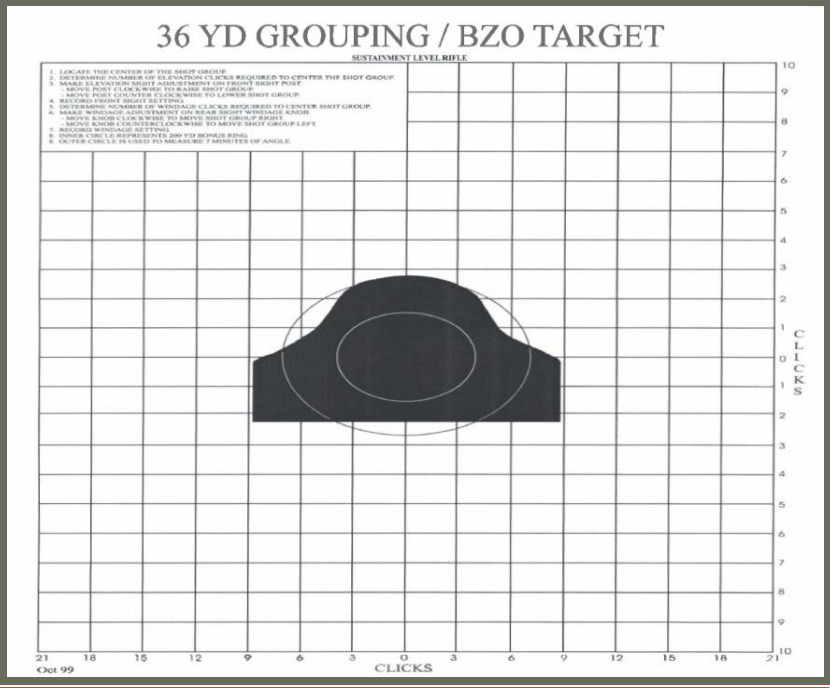
WINDAGE AND ELEVATION RULES

SIGHT	ONE "CLICK" MOVES STRIKE OF BULLET (AT 100 YARDS):	
	M-16 A2	M-16 A4
FRONT SIGHT POST	1 1 / 4 INCHES	1 1 / 4 INCHES
REAR SIGHT ELEVATION KNOB	1 INCH	1 / 2 INCH
REAR SIGHT WINDAGE KNOB	1 / 2 INCH	1 / 2 INCH

GROUPING EXERCISE

When a rifle is zeroed at 300 yards, the bullet will cross the line of sight twice. The bullet will cross the line of sight first on its upward path of the trajectory at 36 yards, and again farther down range at 300

That is why there is an alternate method for zeroing the rifle at 36 yards when a 300-yard range is not available.



GROUPING EXERCISE

Establishing Initial Sight Settings:To begin the zeroing process the rifle sights are placed on a known BZO previously established or on initial sight settings.

GROUPING EXERCISE

Steps for Zeroing the Rifle:

- Fire a 5 round shot group
- Mark the target
- Plot the group
- Circle the shot group
- Locate the center of the group and make the necessary elevation and windage adjustments

GROUPING EXERCISE

Steps for Zeroing the Rifle:

- Fire 2nd 5 round shot group
- Mark the target
- Plot the group
- Circle the shot group
- Locate the center of the group and make the necessary elevation and windage adjustments

GROUPING EXERCISE

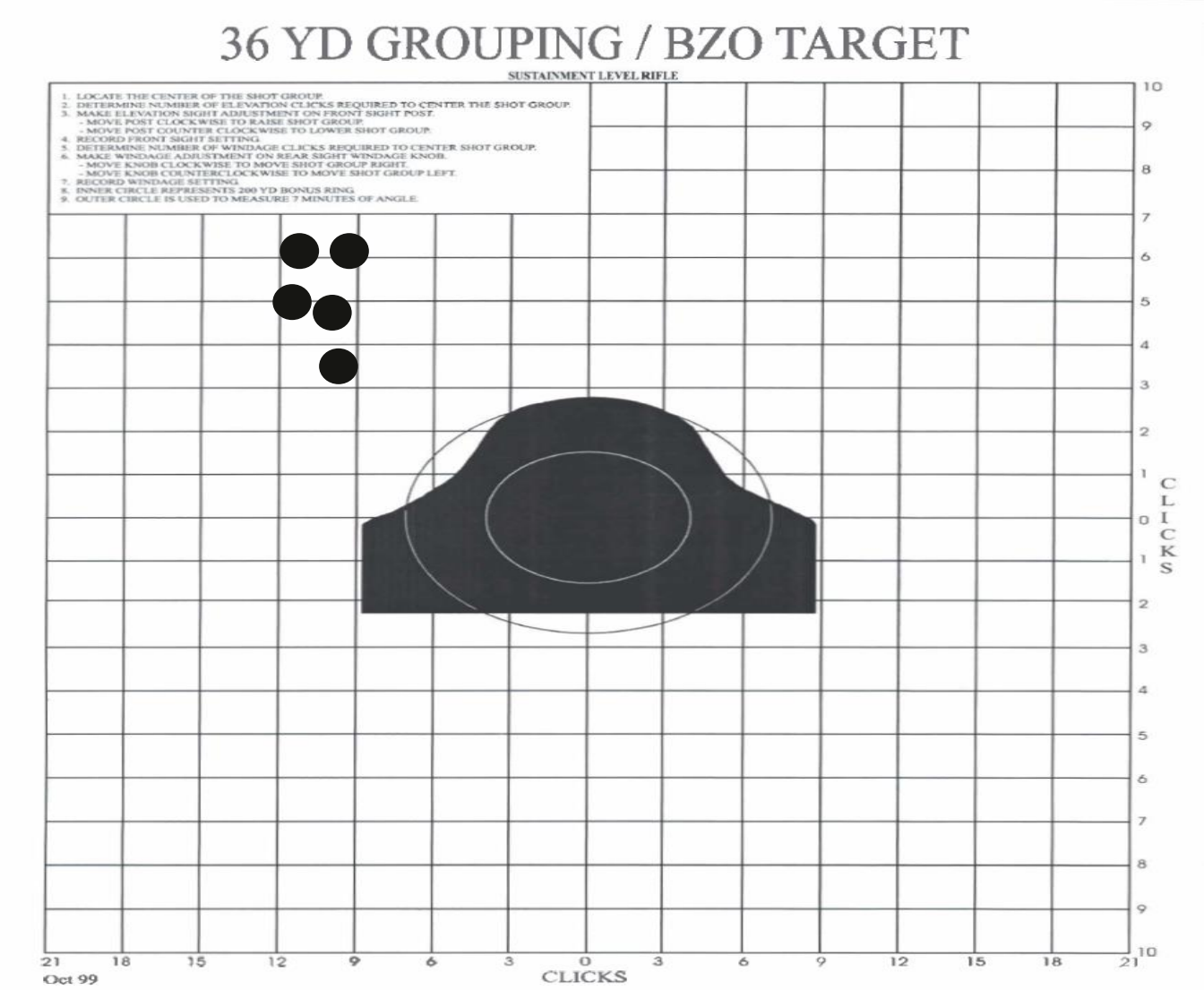
Steps for Zeroing the Rifle:

- Fire 3d 5 round shot group to confirm the sight adjustments that were made

- Once confirmed adjustments are determined for the wind (if present) and taken off the sight settings. This setting becomes the zero setting for the rifle, and must be recorded in the data book.

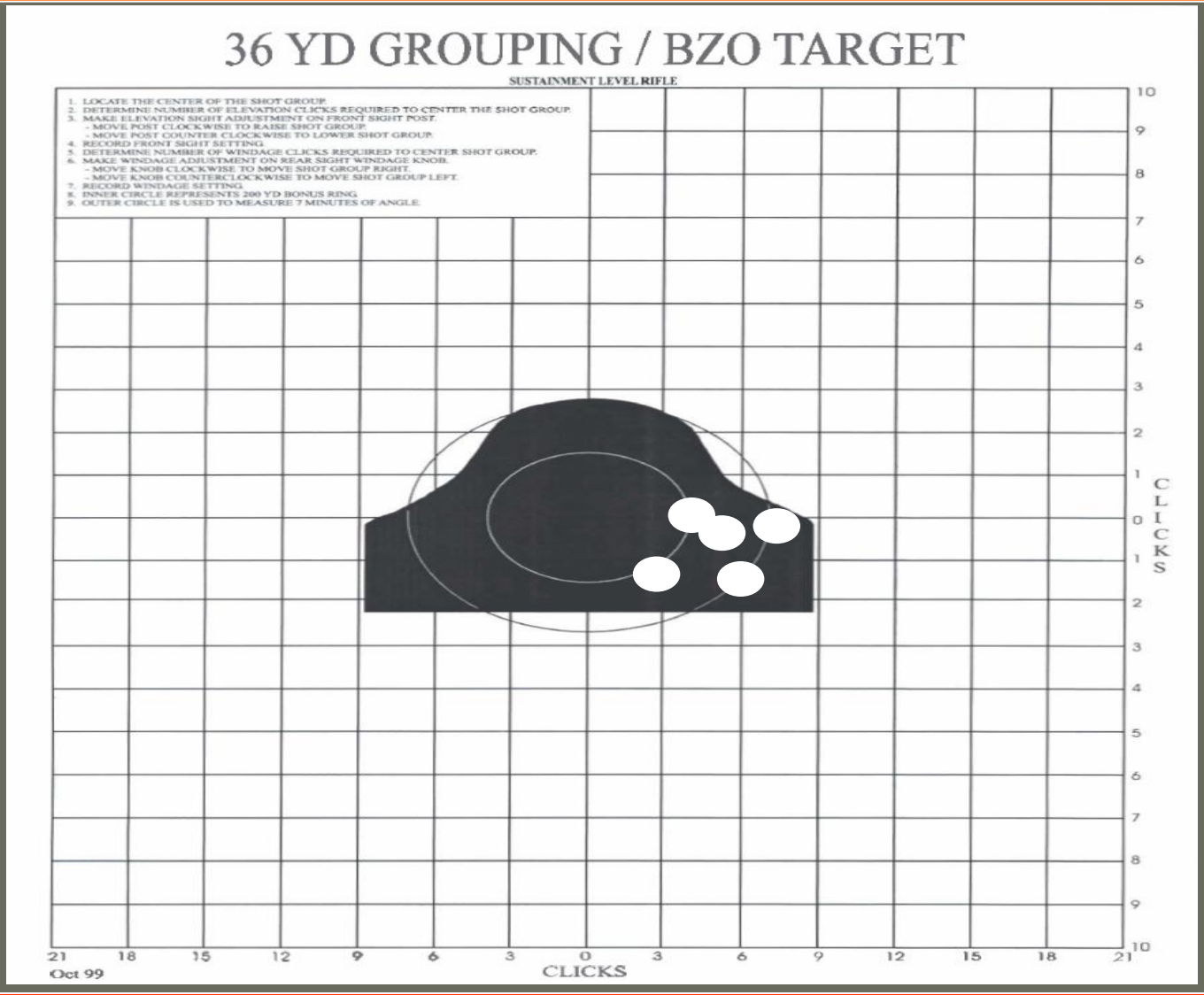
DEMONSTRATION

SHOT GROUP 1



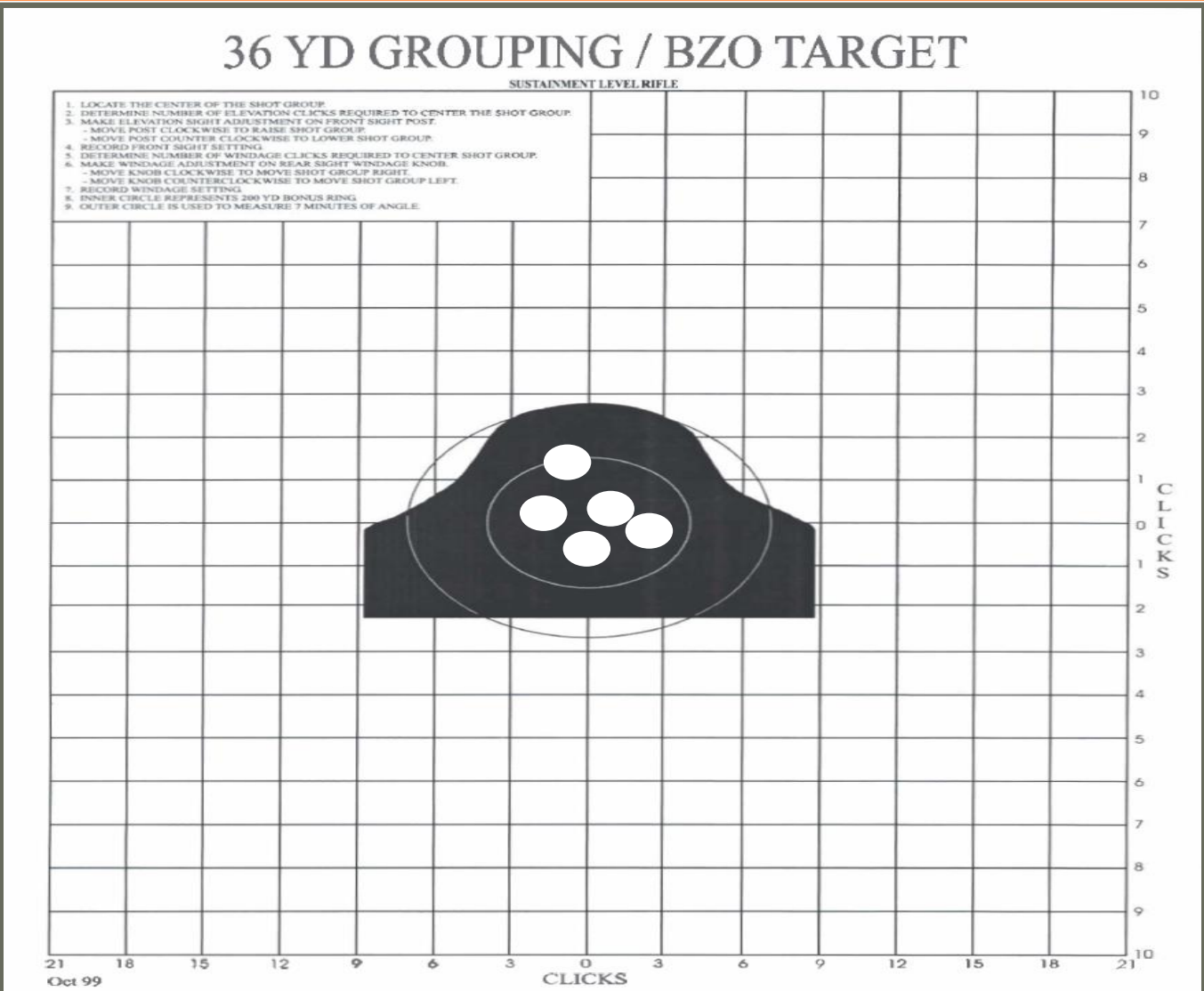
DEMONSTRATION

SHOT GROUP 2



DEMONSTRATION

SHOT GROUP 3



ZEROING THE SERVICE RIFLE