

Marksanship Myth Busters

John M. Buol Jr.

Mechanical Zero

Myth: “You must always go to mechanical zero before zeroing.”

Fact: You are almost always better off starting with the dope already on the gun.

FM 3-22.9, Page 2-4

“Mechanically zeroing the weapon is only necessary when the weapon zero is questionable, the weapon is newly assigned to the unit, or the weapon sights have been serviced.”

Mechanical Zero is nothing more than putting the sights in their centermost setting. This setting has no direct effect on the relationship of the barrel, therefore has no direct relationship to any zero. Unless the sights have been completely replaced and the rifle has never been zeroed, you are better off starting with whatever zero the last shooter used (see “Rifle Zeroed by Another Shooter” below.)

Knowing and basing a zero from Mechanical is important only if you plan to “click on” corrections. For example, both SDMs and competitive shooters may dial a True Zero onto their sights based on specific environmental conditions for a given shot. A given engagement or string may require several sight adjustments. Should the shooter forget his dope, he can dial back to MZ and return to a No Wind setting, based on his previously recorded data.

For soldiers who will only adjust to and use a Point Blank/Battle Sight Zero this is not necessary. Hint: A soldier who cannot explain what “Minute of Angle” is should stick with a BZO and not worry about MZ.

Transferring Zero to Another Rifle

Myth: “Once I determine my zero from MZ, I can apply that dope to any rifle.”

Fact: A zero setting on one rifle applies only to that specific rifle.

FM 3-22.9, Page 5-14

“There is no relationship between the specific sight settings a soldier uses on his rifle to the sight settings he would zero another rifle to. For example, a soldier could zero his assigned rifle 10 clicks left of center, and then zero another rifle and his adjustments could be 10 clicks right of center. This is due to the manufacturing difference from one rifle to another, which makes it essential that each soldier zeros the rifle that he is assigned.”

Just as Mechanical Zero has no direct effect on actual zero, a setting from one rifle has no effect on another rifle. For example, I have had three different M16A2 rifles through the USAR shooting team. Shooting M193 ball the No Wind zero was L1, R3 and L9 from MZ for each.

Rifle Zeroed by Another Shooter

Myth: “Someone else zeroed this rifle but I still have to completely re-zero because shooters look at the sights differently.”

Fact: Assuming both shooters are competent, the difference in zero will be small.

FM 3-22.9, Page 5-15

“When standard zeroing procedures are followed, a properly zeroed rifle for one soldier is close to the zero for another soldier. When a straight line is drawn from target center to the tip of the front sight post and through the center of the rear aperture, it makes little difference whose eye is looking along this line. There are many subtle factors that result in differences among individual zeros. The similarity of individual zeros should be emphasized instead of the differences.”

There are some differences between shooters in how they hold a firearm and perceive the sights but these differences are minor. In one test conducted among Small-bore competitors using an iron-sighted match rifle mounted in a target box there was only about 1/6 MoA difference in Point of Aim, despite differences in dominant hand and eye and with some of the testees needing spectacles of varying amounts of correction.

Total difference in Point of Impact is rarely more than one or two MoA between shooters. That is, the difference in sight adjustments to zero different shooters with the same M16A2 will normally be less than one or two clicks on the front sight and two to four clicks of windage on the rear sight. There will probably be some difference, just not an astronomical amount. This assumes both shooters are competent and capable of consistently applying the fundamentals.



Adjusting Zero

Myth: “Even though the group isn’t centered I don’t want to adjust the sights because I already have a zero.”

Fact: A zero is only as good as the placement of each correctly called shot.

FM 3-22.9, Page 5-21

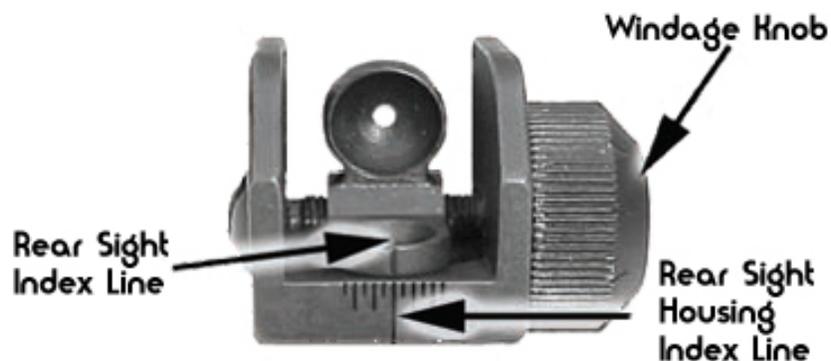
“KD Zeroing. The 300-meter target can be used at 300 meters to confirm weapon zero or to refine the zero obtained on the 25-meter range. The zero on this target is more valid than the zero obtained on the 25-meter range . . . Soldiers should fire two 5 round shot groups to confirm zero or three-round shot groups to refine their zero.”

The term “zero” implies no deviation from the point of aim to the point of impact. Because line of sight is straight and the trajectory is not, zero is used in reference to a number of different things:

-  Mechanical – physically centering the sights
-  No Wind – windage setting for a given lot of ammo, disregarding environment
-  True – specific sight setting for a specific shot in a specific environment
-  Battle (BZO) – no wind setting that allows the shooter to ignore range on a target of a certain size just beyond the point blank range.

Differences in environment (temperature, air resistance, altitude), ammunition lots and other factors can yield a zero change. Provided you fired and called a good group, never be afraid to make adjustments. This assumes you can accurately call each shot . . .

Mechanical Zero for Windage



Magazine On the Ground

Myth: “Touching the magazine on the ground will induce a stoppage.”

Fact: Touching the magazine of an AR-15/M16/M4 –series weapons has no adverse effect on functioning and have been PROVEN reliable and stable for decades.

FM 3-22.9, Page 7-3, Figure 7-5

“Once the basic firing skills have been mastered during initial training, the soldier should be encouraged to modify positions, to take advantage of available cover, to use anything that helps to steady the rifle, or to make any change that allows him to hit more combat targets.”

Certain detachable box magazine-fed, self-loading firearms may be susceptible to stoppages if the magazine is touched. The AR-15 series, including M16/M4s, is NOT one of them.

Since the introduction of Commonwealth-style International Combat shooting to the US Army in the early 1990's, military teams have been adapting the good skills learned in National Match-style shooting to more freestyle events shot with rack-grade gear. Being a combat match, no alibis are granted. Any stoppage has to be cleared on the clock, therefore, equipment and technique must be reliable.

If touching the magazine caused stoppages, nobody (at least not any winners) would use it because any risk of malfunctions would cancel the stability benefit. For about two decades, the winning technique has been to use the magazine as a base of support when possible. From a tactical perspective, Mag Prone puts the shooter in “Helmet Defilade”, the lowest possible shooting position where the shooter's helmet and muzzle are the most prominent things an enemy target can see.

Breathing

Myth: “Breath Control is the critical component of marksmanship fundamentals.”

Fact: Shot placement is determined where the barrel points, as indicated by the aligned sights, when the trigger is pressed.

Any movement, whether caused by breathing or any other factor, will show as motion in the sights. While the sight picture may wobble, the shot will always be where the aligned sights indicate when the trigger breaks. All breath control does is pause the shooter’s respiration while executing shot(s), helping minimize movement. That is it! Pause breathing while pressing the trigger and breathe normally at any other time.

The problem is novice shooters often tend to hold too long, over-staring the sights, holding their breath until blue in the face, and probably inducing a flinch just to be rid of the chambered round. Breath control alone cannot cause shots to go high or low. Even if it somehow could, the shooter can see that error in the sights. This assumes the shooter can call shots and fire without flinching

Breath Control does have one important contribution to improved marksmanship: If you are on a range and overhear “advice” such as “Watch your breathing” you can ignore anything that person says about marksmanship because they have just identified themselves as someone who does not understand the subject.

Finger Placement on the Trigger

Myth: “To shoot well you have to use the tip of your trigger finger.”

Fact: The only factor is can the shooter consistently press straight to the rear without disturbing alignment.

FM 3-22.9, Page 7-3, Figure 7-5

“The trigger finger (index finger on the firing hand) is placed on the trigger between the first joint and the tip of the finger (not the extreme end) and adjusted depending on hand size, grip, and so on. . . . It is important to experiment with many finger positions during dry-fire training to ensure the hammer is falling with little disturbance to the aiming process.”

Both humans and firearms vary greatly in size and shape. To make a general rule that every person must index the controls exactly the same on every type of firearm is ridiculous. The only factor that matters anyway is that the trigger is moved straight to the rear without adding any addition motion. Start by taking a strong grip on the cleared firearm, letting the index finger lie across the face of the trigger wherever is natural, and pressing the trigger straight to the rear while watching and maintaining sight alignment.

If alignment can be maintained through the trigger press, the shot will be true. The firearm does not know or care what part of your finger you use.



Kevlar on the Range

Myth: “You always have to wear your Kevlar/helmet/body armor on the range for safety ‘cause Army Regulation says so.”

Fact: There is no such printed guidance for small arms ranges and it is not a safety issue.

The current Army Regulation on Range Safety (AR 385-63, published 19 May 2003) and Training Circular on Training Ranges (TC 25-8, published 5 April 2004) has no such requirement. In fact, the word "helmet" and "Kevlar" never appears in either text.

The Department of the Army Pamphlet on Range Safety (PAM 385-63, published 10 April 2003) goes into greater depth. The section on small arms (Chapter 6, page 24) specifically mentions hearing and eye protection and specifically allows an installation commander to reduce or eliminate even these requirements, based on risk management assessment. There are guidelines on when body armor and helmets are required, typically when handling or shooting certain kinds of explosive munitions. Small arms such as machine guns, rifles and pistols are NOT included in this.

All these documents are available through USAPA and can be downloaded at:



http://www.army.mil/usapa/epubs/pdf/r385_63.pdf



https://akocomm.us.army.mil/usapa/doctrine/DR_pubs/dr_aa/pdf/tc25_8.pdf



http://www.army.mil/usapa/epubs/pdf/p385_63.pdf

Eventually, the Soldier must learn to shoot with all his equipment on. Qualifications, for example, should be shot in full gear for such a proficiency evaluation. However, these skills are best learned when unencumbered and then adapting as necessary. If the skills are never really learned strapping on gear merely hampers the shooter from ever become skilled. Doing this under the facade of “safety” confuses the issue more.

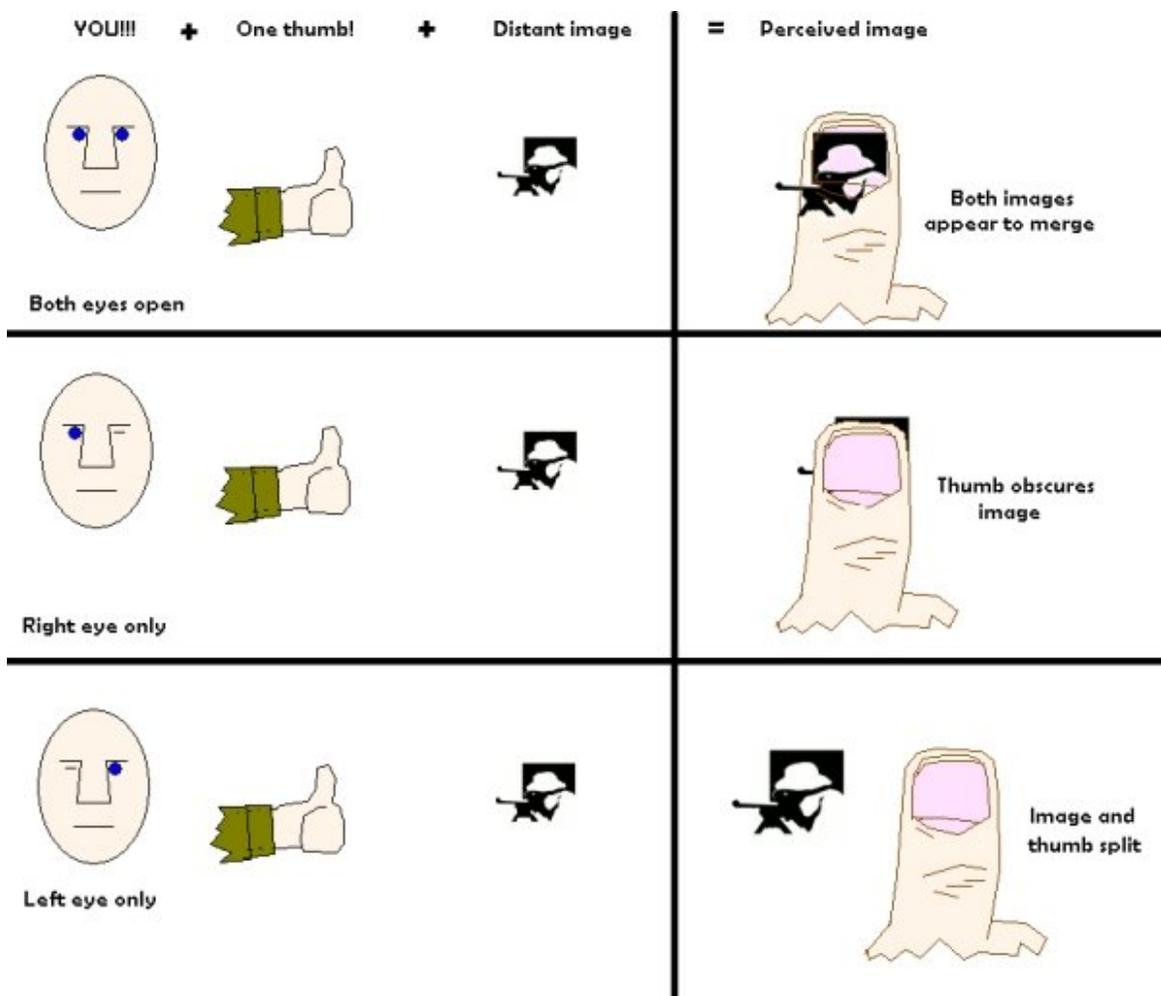
Dominant Eye, One Eye or Two?

Myth: "You must aim with your dominant eye." and/or "You must keep both eyes open."

Fact: You can learn to shoot well with your dominant or non-dominant eye, both eyes open or one eye closed.

There are a number of advantages to choosing to aim with your dominant eye and to keep both eyes open while shooting and this is always preferred. In fact, it is usually better to shoot from your non-dominant side in order to allow aiming with the dominant eye. However, it is possible, with a little effort, to train oneself to shoot well when aiming with the non-dominant eye. It is also preferred to keep both eyes open, but if sight alignment can be obtained and maintained through shot release the called shot will be accurate. Regardless, you must have at least one aiming eye open while shooting . . .

Dominante Eye Test:



NOTE: If you get different results then this example, you are LEFT eye dominate.

Accuracy of Issue, Rack-Grade Weapons

Myth: "Issue weapons are/are not accurate."

Facts: Tests of rack grade firearms with issue ball ammo by the USAR shooting team have found:



M16A2/A4 will typically hold about two MoA at 100 yards for 10 rounds from machine rest.



A good shooter from Mag Prone can shoot up to this slow fire.



M9 will typically hold about three inch groups at 25 yards for 10 rounds from machine rest (Ransom Rest.)



A good shooter from unsupported, two-handed standing, can usually shoot four-inch, five rounds groups at 25 yards.

Good Shooting

Myth: “You can't measure good shooting.”

Fact: Good shooting is readily measurable and we can choose from a variety of yardsticks.

The yardsticks we use for this particular match are based on US Army Qualification courses and International Combat courses. Decades of experience has indicated that “good” performance would be:



APQC – Good shooters expect to shoot clean (200 points).



221 (Pistol EIC) – Competent handgun shooters who have never fired this course before should be have no problem scoring over 115 with a borrowed gun. USAR team shooters are expected to be in the 150's and match winners are in the 170's.



KD Qual – Good shooters expect to shoot over 185 on the E-9 scoring rings.



321 (Rifle EIC) – Competent rifle shooters who have never fired this course before should be have no problem scoring over 200 with a borrowed gun. USAR team shooters are expected to be in the 250's and match winners are in the 280 or 290's.

Weapon Cleaning

Myth: “Weapons must be thoroughly cleaned every time they’re fired and must never be stored dirty.”

Fact: Basic maintenance is simple and quick requiring little more than a wipe down and light lubrication.

This myth was a truism at one time. Many decades ago, the priming mixture was corrosive and would line the bore with sediment that left unchecked would cause excessive rust and deterioration of the metal. Storing a weapon dirty after firing could destroy it. Some units maintained a 1:3 regimen, cleaning a rifle three times after each trip to the range.

However, since the introduction of non-corrosive primers after World War II this is no longer the case. Powder fouling (“carbon”) does not harm the weapon and will not cause problems unless left to build up to the point that it physically blocks or stops the mechanism. This rarely happens. For example, some gunsmiths recommend removing the bolt from the carrier of an AR-15-series only if there is a problem, not for routine maintenance. Disassembly presented in the TM *-10 is the lowest level a basic operator can go if need be. That does not mean you must disassemble that far every time.

Visit www.armalite.com and read “Technical Note 29, Rifle Cleaning.” ArmaLite, Inc., the company that initially released the AR-15/M16 rifle, recommends a “detail cleaning” (complete field strip) once every 1000 rounds and a “combat cleaning” wipe down every 250 rounds. This will change based on environmental conditions, and the fact that Soldiers may carry a weapon daily, but shoot it very little. At any rate, the inventors of the M16 insist that it is important to clean properly, not totally, and that most weapons are damaged by over cleaning them.

Most military weapons are damaged by improper and/or excessive cleaning. Most soldiers never shoot enough to wear a firearm out. Just clean it so it works.

Vision Quality

Myth: “I used to be able to shoot well, but now my eyes are bad.” and/or “I wear glasses so I can’t learn to shoot well.”

Fact: Anyone who can see well enough to read and safely drive an automobile can see well enough to shoot good scores.

Anyone can learn to shoot at a high level as long as he has one functioning eye able to sufficiently resolve sight alignment, even if optical correction is required. As humans age, the muscle which control the eyes may weaken. The vision is probably fine, but the muscles that help adjust and control focus weaken, requiring reading glasses or bifocals, even for people who never previously needed spectacles before. The only hindrance to shooting is that most prescription lenses are ground to focus at a “normal” distance that will aid the wearer in typical tasks such as reading. Lenses can be set up to focus at some other specific distance, such as a front sight on a rifle or pistol. Visit <http://CustomSightPicture.com> for an example.

Gender

Myth: “Shooting is a man’s game.”

Fact: Gender has no factor on marksmanship skill.

Marksmanship is a technical skill requiring little strength. The physical component of shooting has more to do with the endurance and coordination of specific muscle groups and reflexes unique to marksmanship and raw muscle provides almost no benefit. Anyone that is able bodied enough to lift a firearm will, in time, with sufficient correct practice, develop these consistent reflexes and endurance. “Holding Hard” is an oft-heard expression regarding shooting well, but crude force is not the answer. Holding with consistency is.

Proper Practice

Myth: "Practice makes perfect"

Fact: Practice makes permanent

If a shooter practices a poor technique, or practices it inconsistently, the shooter will not improve his ability to shoot. More of the same can never improve things. Good marksmanship involves programming a series of conditioned reflexes, some of which are contradictory to natural human response. Shooting more, but failing to develop certain specific reflexes and removing others (flinch), will only condition the shooter to stumble along at a lousy level.

It is not like physical training, where simply pounding out repetitions will probably yield some gains. A person could expend 100 rounds a day for years and possibly never improve his ability to shoot.

Good Training

Myth: “Our unit shot the qual course a bunch of extra times. It was good training.”

Fact: Shooters improve by focusing on core fundamentals and maximizing feedback.

FM 3-22.9, Page 1-9

“Feedback (precise knowledge of bullet strike) must be included in all live-fire training. The feedback is not adequate when bullets from previous firings cannot be identified ...”

The only way to yield consistent improvement is to maximize feedback so the shooter so he can compare his efforts to the results. Some of feedback that would be useful to receive would be:



Shooting on a feedback target plotting the exact location of each shot. This can be done on a KD range or electro-acoustic/LOMAH targetry



Recording both the call and actual location of each shot in a data book



Dummy rounds and dry practice interspersed with live shooting



Video recording the shooter as he trains



System to trace movement before, during and after a shot, dry or live (i.e., Noptel)



A good coach to help interpret the results

We often cannot have all of this available but the more feedback a shooter can get the more he can learn and, consequently, the better he will perform. As you can see, RETS “pop up” courses offer almost no feedback. Field courses are fine for testing and qualification, but not for training and learning.

Short Range

Myth: “The 10 and 25 meter ranges don’t provide good training.”

Fact: Short range shooting can provide just as much feedback in training fundamentals.

Scaled targets at close range provide a nearly identical marksmanship challenge as the full size equivalent at actual distance. What’s more, the scaled ranges are the only place most Soldiers ever receive any useable feedback for improving their shooting, because they certainly are not getting it with “pop up” targets. A nine-inch group at 300 yards is three minutes, as is a three-inch group at 100 yards or a ¾-inch group at 25. True, scaled targets at short range cannot take environment into account and the only way to ensure a solid zero at a certain distance is to shoot at that actual distance. However, this lack of environmental effect can be an advantage. It is hard to blame a wide shot on a poor wind call at 25 meters. At any rate, the training benefit of practicing fundamentals is the same and can be learned and refined at closer range.

Dry Firing Guns

Myth: “Dry firing guns can damage them or wear them out.”

Fact: Dry fire exerts virtually no wear on most firearms.

Other than some slight wear and tear on some moving parts, dry fire does no harm and is crucial to learning to shoot better. Besides, if a firearm is doomed to failure if exposed to dry fire how can it ever hope to withstand the tens of thousands of pounds of pressure exerted inside the barrel every time a live cartridge is discharged?

Let us pretend that dry fire will wear out parts prematurely. Ammunition is expended after one firing and must be replaced in order to shoot again, too. Having to occasionally replace some other component is just the cost of learning how to shoot better.

Dry Practice

Myth: “Dry fire is a poor substitute for shooting live ammo.”

Fact: Dry practice is superior training for almost every facet of shooting and gun handling.

Every firearm will have the same heft, sights and trigger release whether there is live ammunition in the chamber or not. The process is identical, from presentation until the hammer hits home, both dry and live.

Not only can any manipulation up through trigger release can be learned and refined through dry practice, this is a superior way to learn. Physiologists estimate that it takes most humans about 3,000 correct repetitions in order to imbed a physical skill at the subconscious level. That is correct repetitions, see “Proper Practice” above. Without recoil to mask error, hold and press can be evaluated more easily. Recoil, blast and noise often causes an unconscious reaction in most people, otherwise known as a flinch. Plus, there is no ammunition cost and no range requirement so training can be done anywhere at any time making it easier to work toward those initial 3K reps.

Zeroing Machineguns

Myth: “You don’t need to zero or aim a machinegun because you just ‘walk’ it in.”

Fact: Projectiles can only affect what they can hit

Crew served machineguns are often the heaviest, casualty-producing weapon and likely will be used to initiate an attack, but it can only be “casualty producing” if the first bursts actually hit something.

Used defensively, a range card should accompany the set position. Unless the gunner is fortunate enough to register with live ammo, the data on that card is only as accurate as the quality of the previously obtained zero. You cannot “walk-in” range card data.

If it costs a couple bursts to get on each target it will take at least two to three times as much ammo for the same down range effect, plus twice as much time. But each enemy will appreciate a series of warning shots while the gunner fumbles about trying to get on target.

Free Gunning Machineguns

Myth: “Based on current lessons learned, you’ve got to throw the FM away ‘cause everybody just free guns machine guns in combat.”

Fact: Machinegun doctrine is based on real world lessons learned.

Current US machinegun doctrine was first developed during World War I from the artillerymen who were assigned the new weapon systems. Definitions of Characteristics and Classes of fire (Gun, Ground, Target) codify ballistic phenomenon and help trained crews better control their weapons.

Machinegun doctrine was developed from real world lessons learned as a way to maximize the capability to support an assault or defend an area. It is effective for what it was designed for, but other techniques can be added for new employments.

Free gunning a machinegun is like “quick kill” or point shooting with rifles or pistols offhand. Flex mount free gunning may be the best choice for fleeting, close targets but it cannot be considered a complete solution for all situations and targets. Just as sandbag-supported prone is a poor choice for engaging humanoid targets inside a room, offhand snap shots are a poor choice for engaging targets 500 meters away. The truly competent shooter will be proficient at both in order to have an effective response in any situation.

Competition Shooting

Myth: “Competitive shooting isn’t ‘real’ shooting.”

Fact: Weapons only put projectiles where and how their pointed and do not care what they are pointed at.

A firearm is a chemically operated, mechanical projectile launcher. Given proper functioning, projectiles only begin their launch when triggered to do so and follow a path directed by line of bore. It cannot think or feel and only responds to the skill and technique of the operator regardless of the target shot at. If you cannot hit a target on a range, you will not magically gain the ability to hit it anywhere else.

Any range that is not “two way” is a simulation. The quality and significance of the simulation is as good as the course designer makes it. Any simulation is inherently abstract and relevance is very subjective so it will never be perfect for all people and situations. This is true of any course and is not a problem with competition shooting, per se. Participants can either step up and accept the challenge as presented, or step up and design something else.

The stress of the simulation is as intense as the participants can be pressured with it. Qualification attempts to only filter out the worst performers, ensuring that everyone is “qualified” (at least that is what the training records claim.) “Qualified” can entail a whole range of skill levels. If the goal is get everyone qualified then the standards have to be adjusted so that everyone can.

Competition, on the other hand, attempts to filter out the best performers. Nobody cares what an adequate performance is because the goal of competition is to find what the best possible performance can be. The stress of qualification is to be good enough. The stress of competition is to be the best possible.

In order to have any meaning we have to measure performance by devising a way to reduce it to numbers such as points earned, elapsed time, etc. Any course can be created or adjusted in order to emphasize and reward a desired performance.

Army Regulation 350-66

Chapter 2

General Competitive Marksmanship Policy

2-1. Small arms marksmanship

Participation in military and civilian-sponsored small arms marksmanship competitions offers soldiers the opportunity to refine their marksmanship skills, compete against other military and civilian marksmen, and earn superior marksmanship awards in addition to the Army basic marksmanship awards available through annual qualification standards.

- a) Army personnel should be provided opportunities to prepare for and participate in small arms marksmanship competition. These preparations, which include those for international competitions, are classified as training.
- b) Authority for planning, directing, conducting, supervising, and publicizing competitive marksmanship activities within the Army is delegated to the lowest possible command element.

- Plans for competitive marksmanship activities will include provisions to publicize excellence in marksmanship, both internally and externally.
- c) Competitive marksmanship match programs must include Excellence in Competition (EIC) matches. In addition, the program of matches will include a National match course individual rifle and pistol EIC match provided adequate facilities are available. Credit toward the Distinguished Designation Badge may be earned.
 - d) Match programs should emphasize and encourage the following:
 - a. A variety of shooting styles, distances, and timing of firing with as many weapons and weapon systems as possible.
 - b. Training of experienced competitive marksmen.
 - c. Development of shooter/instructors.
 - d. Off-duty competitive marksmanship activities.
 - e) MACOM participation in international level competitions is authorized and encouraged.