

Improved Doctrine, Improved POIs, Improved Soldiers:

Using a Cognitive Approach to Refine Marksmanship Methodology

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The hard lessons learned from nearly 20 years of sustained combat operations, coupled with a number of studies aimed at improving Soldier performance and lethality, triggered orders to overhaul the U.S. Army weapons training strategy, associated doctrine, and methodology. This overhaul was centered on the innate cognitive ability within each Soldier. These changes are catalysts for building the modern Infantry Soldier and have enabled the 198th Infantry Brigade (One Station Unit Training) to refine its programs of instruction (POIs). The U.S. Army is now equipped with a more versatile and lethal Infantry Soldier who is ready to “fight tonight.” While recent Infantry Soldier graduates have been indoctrinated with this updated methodology, it is essential that all operational units continue to ingrain this new methodology and strategy within all Soldiers, Military Occupational Specialty (MOS) immaterial.

A Needs-Based Holistic Assessment

Numerous studies aimed at gaining an honest assessment of Soldier proficiency levels have been conducted in recent years. Doctrine writers and training development teams found the most merit with the studies that assessed overall Soldier marksmanship proficiency levels and those that examined Soldier cognitive ability.

A 2013 National Research Council of the National Academies study titled “Making the Soldier Decisive on Future Battlefields” was conducted due to “recognition by the U.S. Army that a great disparity exists between the decisive overmatch capability, relative to prospective adversaries, of major U.S. weapon systems (such as tanks, fighter aircraft, or nuclear submarines) and the relative vulnerability of dismounted soldiers when they are operating in small, detached units (squads).”¹ The study concluded that “an essential principle for achieving overmatch capabilities is to recognize that integrating the human dimension with materiel advances is at the core of all TSU (tactical small unit) improvements.”²



Above, a Soldier in Infantry One Station Unit Training with the 198th Infantry Brigade fires his weapon during marksmanship training. (Photo by Markeith Horace)

A Program Executive Office for Simulation, Training, and Instrumentation study in 2014 titled “Squad Overmatch Study: Training the Human Dimension to Enhance Performance” further supported the importance of the human dimension with respect to warrior skills training. The study stated that “integrating cognitive skills development into warrior skills training, leveraging Foundation Training and Practical Application, and using enhanced training devices will produce more cohesive and consistent squads having improved human performance — thus, filling a significant gap in Army readiness.”³ The results clearly indicated that at the time of the study Soldiers lacked the requisite higher-level cognitive understanding required to survive and win during large-scale combat operations (LSCO) within multi-domain operations, and the U.S. Army needed to address this shortcoming within its training methodology.

Several studies on marksmanship proficiency also yielded similar findings of shortcomings within the Army weapons training strategy. An Army Research Institute (ARI) study in 2014, titled “Marksmanship Requirements from the Perspective of Combat Veterans — Volume II: Summary Report,” surveyed 1,636 leaders across 14 different branches to identify perceived weapons proficiency requirements. These requirements included some skills that were not reflected in the previous carbine qualification course of fire such as engaging moving targets, firing from different positions, changing magazines, and discriminating between friendly forces, enemy forces, and noncombatants.⁴

The sentiments of the 2014 ARI study were validated by data and reports coming from the operational force. A Fiscal Year 2017 report from the 82nd Airborne Division highlighted trends from ranges with an enduring mission focus to conduct Table VI qualification. Across the entire division, the average “cold qualification” for Paratroopers with the M4 carbine was 25.44 out of 40 engagements under the previous Table VI.⁵ It is reasonable to assume that similar statistics can be found across units throughout the U.S. Army, clearly validating the concern which triggered the initial 2013 National Research Council study on Soldier decisiveness.

A Paradigm Shift: Integrated Weapons Training Strategy

This small sample of studies provides a snapshot of the concern over a lack of Soldier cognitive development and lethality. In response, the Army set out to overhaul the entire weapons strategy for both individual and mounted platforms. One of the early outputs of this overhaul mission was the release of the inaugural version of Training Circular (TC) 3-20.0, *Integrated Weapons Training Strategy* (IWTS). The ultimate intent of the TC was to provide an overarching, integrated, and standardized training strategy for U.S. Army maneuver brigade combat teams (BCTs).⁶ With a principal target audience of trainers, planners, master gunners, and commanders, TC 3-20.0 provides the training path strategy for weapon, system, and unit proficiency.⁷

TC 3-20.0 highlights numerous overarching critical principles that guide the IWTS methodology. The significance of this is depicted within the six individual tables in which live rounds are not fired until Table IV, with preceding tables being reserved for preliminary marksmanship instruction (Table I), pre-live-fire simulations (Table II), and drills (Table III). This is a significant paradigm shift for commanders. All echelons are now required to conduct this training prior to Table VI qualification. Furthermore, the existence of Table II indicates that aspects from the Squad Overmatch Study from 2014 were integrated into the IWTS to maximize virtual systems. The use of virtual systems should be a key indicator to commanders that the Army is fully committed and vested with both time and resources in the human dimension and the enhancement of overall performance.

How to Plan and Prepare for Individual Weapons Training

While TC 3-20.0 provides the overarching training strategy, leaders will also need to reference TC 3-20.40, *Individual and Qualification - Individual Weapons*. This TC provides the nuts and bolts for building a unit training plan for individual weapons. TC 3-20.40 is comprised of four overarching chapters that provide key information that must be applied when training all individual weapon systems.

Chapter One — Individual Weapons Training — provides users with insight into how the IWTS is synthesized into other weapons, systems, platforms, maneuver echelon training strategies, and the table structure.⁸

Chapter Two — Unit Training Plans — provides the structure for developing a unit plan as well as a detailed description of a marksmanship master trainer (MMT). This enables unit MMTs to synthesize commander’s guidance into a detailed training plan and timeline that will serve as a planning and preparation guide.⁹ Chapter two also includes a detailed description of how an MMT can address a number of critical skills to include communications,



Rangers assigned to the 2nd Battalion, 75th Ranger Regiment conduct training on Joint Base Lewis-McChord, WA.
(Photo by SPC Gabriel Segura)

force protection, battle drills, and other various warfighting skills in an integrated unit training plan.¹⁰ This enables commanders to buy back time and alleviates concerns with the required time investment.

Chapter Three provides leaders with guidance on range requirements to develop plans which facilitate effective training events for individual small arms weapons training, qualification, and sustainment.¹¹ The details listed in this chapter enable trainers to proof ranges and ensure all targets and scenarios meet the standard for each course of fire.¹²

Chapter Four covers duties, procedures, planning, and preparation for executing small arms live-fire ranges. Arguably the best features of the chapter are the sections covering detailed descriptions of range support personnel and medical evacuation procedures. While useful for any end user, this critical information can mitigate the gap of both knowledge and experience in junior officers and NCOs typically charged with the conduct and safety of a small arms range.

While not all encompassing, TC 3-20.40 in many ways can be considered the go-to document for planning and conducting individual skills training density, and it should be a staple in every range box and company leader's inventory of doctrinal publications.

Upgrading the Individual Weapon Training Circular

The final component of the ongoing overhaul to weapons training strategy and training and education updates are the TCs for each respective weapon system. In order to address the human and cognitive dimensions sought by Army leadership, an upgrade to the instructional methodology for employment of each individual weapon system was required. While this article does not have time to cover each individual system, TC 3-22.9, *Rifle and Carbine*, will be reviewed due to the commonality of the M4 carbine across most formations.

The Army introduced its dramatically overhauled approach to weapon system employment with the implementation of TC 3-22.9. Significant in this new employment strategy was the introduction of the shot process and the functional elements of the shot process.¹³ The shot process outlines an individual engagement sequence that all

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

Figure 1 — Shot Process Example (TC 3-22.9)

firers — regardless of the weapon employed — must consider during an engagement. This process encompasses all assessments, decisions, and actions leading up to the firing of the weapon. It also shows that Army and doctrine writers restructured marksmanship methodology with consideration for the Soldier cognitive process.

The shot process is broken down into three phases: pre-shot, shot, and post shot.¹⁴ The need to break away from the fundamentals of marksmanship was derived from knowledge gained through real-world combat experience and a far more combat-centric approach to marksmanship. The advantage of this paradigm shift in approaching marksmanship not only produces more lethal shooters but lends to the innate cognitive ability in each Soldier. For example, a Soldier utilizing an optic estimates the distance to a standard 40x19.5-inch E-Type silhouette as 400 meters. After building a position and engaging, the Soldier observes the round impact slightly to the left of the target. Through the understanding of the shot process, the Soldier calls the shot as the shot breaks, prior to observing the round impact just to the left of the target. Through a higher order understanding of complex engagements and an estimated no value wind call based on visual observation, the Soldier assesses a lapse in trigger control. Rather than adjusting his hold on the target, the Soldier re-engages using the proper application of the shot process and successfully neutralizes the target. While the shot process is absolute, the functional elements of the shot process are simultaneously independent and interdependent variables that directly correlate to any successful engagement, depending on the engagement and associated considerations.

The functional elements of the shot process — stability, aim, control, and movement — should not be confused as mere replacements for the fundamentals of marksmanship. At the core of the shot process is a holistic system of weapons handling and a target engagement sequence aimed at supporting a host of learning styles and experience levels. For example, a Soldier assesses an engagement at 150 meters and begins his or her shot process with assessing stability. The environmental considerations, enemy capabilities, on-hand equipment, ability level, and kinesthetic awareness are among several factors to consider when assessing the required stability when building a position. In this case the Soldier must assess the requisite amount of stability to successfully engage a target at 150 meters. Therefore, stability in conjunction with aim, control, and movement can be altered based on the complexity of the engagement based on the surrounding dynamics and atmospheric.

Without a comprehensive understanding of TC 3-22.9 and the overall shot process methodology, Soldiers will fail to meet the standard within the updated rifle qualification outlined in TC 3-20.40. This Table VI course of fire includes shortened target exposures, additional firing positions, and seamless transitions requiring magazine changes. Considering the increased pace of the updated qualification, Soldiers must now process information quicker and possess the ability to perform several tasks at a level of automaticity. Similar requirements have been built into the other individual weapon system qualifications within TC 3-20.40. These updates give further notice to leaders that the Army demands Soldiers who possess metacognitive skills and creative problem solving skills.

Finally TC 3-22.9 features a number of critical upgrades from the previous rifle and carbine manual. Included are upgrades such as the six carry positions, 12 firing positions, complex engagements, drills, ballistics, and

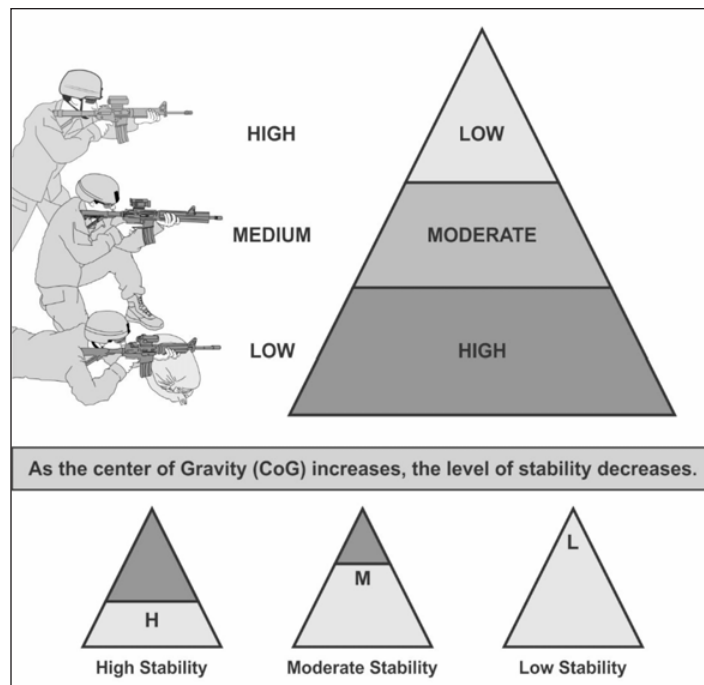


Figure 2 — Firing Position Stability Example (TC 3-22.9)

ammunition. All of these updates are nested within the previously mentioned IWTS within TC 3-20.40 and are paramount to Soldier success.

Everyday Strategies to Amplify Training Success

These TCs provide clear and predictable training glide paths that enable units to plan efficiently and effectively. This weapons training strategy can be further amplified with a few successful tactics, techniques, and procedures (TTPs) and tools aimed at augmenting Soldier training.

TC 3-22.9 Appendix D, *Drills*, features a set of given drills that should be performed on a regular basis.¹⁵ These dry-fire drills help reinforce weapons employment techniques, and like physical training should be performed on a daily basis. Drills are critical to ensuring that Soldiers can manipulate a given weapon at a level of automaticity, thus enabling them to focus on the shot process and fully maximize their given cognitive potential, and can be augmented by a number of critical training aids.

Some of the training aids utilized to amplify training already exist within the U.S. Army inventory. The AN/PEM-1 Laser Borelight System (LBS) is a tool often neglected by units prior to conducting zeroing procedures. A little-known feature of the LBS is the pulse setting which enables a brief activation of the laser through the rifle bore. While the LBS does not account for the external ballistics of ammunition, efforts have been made in the commercial sector to develop a target that accounts for the ballistics of various types of ammunition. When the LBS is used in conjunction with an M150 Rifle Combat Optic (RCO) M855A1 dry-fire target, Soldiers can receive hundreds of additional dry-fire repetitions with feedback allowing them to assess the shot process. The use of smart sensor rail systems provides feedback on weapon movement throughout the shot process. These simple rail attachment sensor systems provide Soldiers with real-time data feedback which enables them to analyze and diagnosis a Soldier's shot process in both the dry and live-fire settings. Sensor system tools allow units to have virtual system feedback in any environment and better enable cognitive learning.

Conclusion

Soldiers must be ready to step into any assigned role within their unit with the assumption that they may have little to no time to integrate within a formation and receive additional training on an assigned weapon system. While the U.S. Army Training and Doctrine Command is building better Soldiers, it is the responsibility of all Army units to continue to integrate the new and improved marksmanship and weapons training strategy. It is imperative that the IWTS and new approaches to lethality are ingrained into each Soldier.



Members of the 198th Infantry Brigade at Fort Benning, GA, utilize a dry-fire target to conduct Table III, Drills, in preparation for upcoming live-fire gates during the Infantry One Station Unit Training 11B program of instruction. (Photo courtesy of authors)

Notes

¹ "Making the Soldier Decisive on Future Battlefields," National Research Council of the National Academies, 2013, <https://apps.dtic.mil/dtic/tr/fulltext/u2/a584601.pdf>.

² Ibid.

³ "Squad Overmatch Study: Training the Human Dimension to Enhance Performance," Program Executive Office for Simulation, Training, and Instrumentation study, 30 September 2014, <https://apps.dtic.mil/dtic/tr/fulltext/u2/a613853.pdf>.

⁴ Jean L. Dyer, "Marksmanship Requirements from the Perspective," U.S. Army Research Institute for the Behavioral and Social Sciences, February 2016, <https://apps.dtic.mil/dtic/tr/fulltext/u2/1006163.pdf>.

⁵ Raymond Miller, "Fiscal Year 2017 Enduring Range Reports," 82nd Airborne Division, 29 September 2017.

⁶ Training Circular (TC) 3-20.0, *Integrated Weapons Training Strategy*, 11 June 2015.

⁷ Ibid.

⁸ Ibid.

⁹ Ibid.

¹⁰ Ibid.

¹¹ Ibid.

¹² Ibid.

¹³ TC 3-22.9, *Rifle and Carbine*, May 2016.

¹⁴ Ibid.

¹⁵ Ibid.

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