



**U.S. Army Research Institute  
for the Behavioral and Social Sciences**

**Research Report 1920**

**Applying Combat Application Course Techniques to  
Rifle Marksmanship in Basic Combat Training (BCT):  
Acquisition and Retention of Skills**

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U.S. Army Research Institute

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Northrop Grumman Corporation



**March 2010**

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# APPLYING COMBAT APPLICATION COURSE TECHNIQUES TO RIFLE MARKSMANSHIP IN BASIC COMBAT TRAINING (BCT): ACQUISITION AND RETENTION OF SKILLS

## EXECUTIVE SUMMARY

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### Research Requirement:

As requested by the Commanding General (CG), Basic Combat Training Center of Excellence (BCTCoE), and the Director, Directorate of Basic Combat Training (DBCT), Fort Jackson, SC, the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) provided a preliminary assessment of the impact of integrating Combat Application Training Course (CAT-C) and Asymmetric Warfare Group (AWG) training techniques on Basic Rifle Marksmanship (BRM) performance outcomes within two training Companies. This report summarizes the retention of marksmanship skills associated with the integration of CAT-C/AWG training techniques and additional training time in BRM during the new ten-week BCT at Fort Jackson.

### Procedure:

This research used both observations of BRM training and standard measures of BRM performance to examine the impact of identified CAT-C/AWG training techniques as they were being applied to BRM training in BCT at Fort Jackson. A test/retest research design was used to collect data on participating Soldiers' marksmanship skills and skill retention. These data were compared to those collected at Fort Jackson for the Warrior Tasks Skills Retention Assessment (WTSRA) study (cf. Cobb, James, Graves, & Wampler, 2009) which focused on the retention of marksmanship and other skills prior to systematic implementation of CAT-C/AWG training strategies and techniques. The data collected here, i.e. record fire and refire performance scores, focused specifically on BRM performance and skill retention within a ten-week BCT. As a consequence, the retention interval (4 weeks) examined by this research was significantly shorter than those examined in the previous WTSRA study (14 to 24 weeks).

### Findings:

The Soldiers who participated in this research effort were demographically representative of Soldiers completing BCT at Fort Jackson, SC. Based on the results of this limited investigation, there were no significant differences in BRM performance outcomes and skill retention between the single CAT-C Company and the legacy group. Even the retention levels noted in the two groups were comparable, once time was controlled for within the analysis. The pattern of results, although limited by sample size and methodological considerations, also provide additional support for the general contention that the greatest decrease in BRM skills occurs after BCT, especially for Soldiers attending AIT programs where additional marksmanship training is not required.

### Utilization and Dissemination of Findings:

This investigation was a limited examination of the impact of employing AWG/CAT-C strategies in BRM training, providing essential insights into the initial integration of these training strategies and techniques within BCT at Fort Jackson. The results were briefed to the Director, DBCT, and members of the Fort Jackson Command Group who can assess potential modifications to desired training programs to meet more effectively the needs of the U.S. Army.

APPLYING COMBAT APPLICATION COURSE TECHNIQUES TO RIFLE  
MARKSMANSHIP IN BASIC COMBAT TRAINING (BCT): ACQUISITION AND  
RETENTION OF SKILLS

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# **Applying Combat Application Course Techniques to Rifle Marksmanship in Basic Combat Training (BCT): Acquisition and Retention of Skills**

## **Introduction**

Training units have utilized the additional time afforded by expanding the Basic Combat Training (BCT) period to ten (10) weeks to place greater emphasis on developing Basic Rifle Marksmanship (BRM) skills, with promising results (Dyer, Tucker, Wampler, & Blankenbeckler, 2009). For example, Dyer et al. (2009) reported that the percentage of sharpshooters increased in the ten-week BCT when compared to data collected in FY07 and FY08 as part of the previous Warrior Tasks Skills Retention Assessment (WTSRA) study (Cobb, James, Graves, & Wampler, 2009).<sup>1</sup> Anecdotal evidence and previous research indicates that many basic training units are also moving quickly to incorporate Asymmetric Warfare Group (AWG) training techniques into BRM training (see Cobb et al., 2009; Dyer et al., 2009). Cobb et al. (2009) and Dyer et al. (2009) provided anecdotal evidence indicating unit leaders and Drill Sergeants (DSs) perceived that these applications of AWG techniques in basic training had contributed to increased levels of BRM proficiency and skill retention over that achieved by the established training support package (TSP).

However, there has not yet been a systematic, independent assessment of BRM training outcomes at any level to discern the impact of these training changes on actual Soldier performance and skill retention during BCT. This report summarizes the retention of marksmanship skills associated with the integration of AWG taught Combat Applications Training Course (AWG/CAT-C) training techniques and additional training time for BRM during the new ten-week BCT at Fort Jackson. This effort intends to document what and how these techniques are being applied in the 10-week BCT at Fort Jackson and to examine their impact on BRM performance.

As requested by the Commanding General, U.S. Army Basic Combat Training Center of Excellence (USABCTCoE), and the Director, Directorate of Basic Combat Training (DBCT), Fort Jackson, the intent of this research was to:

- Provide an initial assessment of the impact of integrating AWG/CAT-C training techniques within two training Companies on BRM performance outcomes.
- Obtain a snapshot of the retention of marksmanship skills resulting from the integration of AWG training techniques and additional training time in BRM during the new ten-week BCT.

In addition to these research objectives, the Director, DBCT, requested the investigators also identify the impact these training changes had on the skill decay of Soldiers within these selected Companies who originally qualified as experts and sharpshooters during BCT.

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<sup>1</sup> The WTSRA study findings are based on data collected prior to the more systematic implementation of AWG techniques and the ten-week BCT, and examined BRM as well as a selection of other Warrior Tasks skills from BCT and One Station Unit Training (OSUT) and Advanced Individual Training (AIT).

As requested by the CG, Fort Jackson, AWG instructors taught their BRM focused CAT-C to personnel at Fort Jackson on a voluntary basis. According to AWG cadre, the CAT-C employs an educational approach to training to develop confidence, initiative, and accountability through a greater understanding and awareness of Soldier skills and their context of employment. The BCT Proponent at Fort Jackson described the instructional strategies and techniques taught in the AWG/CAT-C as employing enhanced BRM techniques to demonstrate the advantages of an interactive coaching strategy throughout BCT.<sup>2</sup> Attendees of the AWG/CAT-C learn instructional methods to ensure Soldiers are able to perform the task consistently and demonstrate an understanding of how different actions may impact personal performance, as well as techniques that specifically enhance their personal performance on weapons qualification. It is hoped that, as a result of employing this interactive coaching strategy in BCT, Soldiers will discover the problems and challenges associated with rifle marksmanship and create their own solutions through careful, knowledgeable deliberation and/or consideration of the task and conditions.

The AWG/CAT-C strategies and techniques were also embraced by the Drill Sergeant School (DSS) at Fort Jackson and served as the foundation for the current 11-day Combat Assault Rifle Training Course (CART-C) being utilized to teach DS Candidates (Currey, 2008). The USABCTCoE described the objectives of the course in the following way:

To enable the DS candidates to organize Basic and Advanced Rifle Marksmanship and conduct preliminary rifle instruction, concurrent and reinforcement training. The candidate will be able to identify problem shooters and apply techniques for assisting the [Initial Entry Training] IET Soldier in BRM. In addition, the candidate must be able to teach the M16 or M4 series rifle to the IET Soldier, and conduct a shot grouping or zeroing exercise, and downrange feedback with IET Soldiers (USABCTCoE, 2008b, p. 4-20).

In summary, CAT-C training focuses on issues related to marksmanship such as zeroing and ballistics, and on outcomes-based training strategies and techniques. It also provides students with opportunities for range time, firing a variety of marksmanship training scenarios under conditions specified by AWG in order to allow students to derive a more generalized and intuitive understanding of marksmanship principles. This effort seeks to examine how AWG's techniques and training philosophy, as described and trained in the DSS CART-C, are being applied in BCT and what impact they are having on new Soldiers' BRM performance.

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<sup>2</sup> In order to be as accurate as possible, the report will use "CAT-C" when referring to specific techniques identified with the original course and "AWG/CAT-C" when making more general references or referring to training strategies identified by SMEs as common to AWG cadre recommendations and the CAT-C.

## **Method**

### ***Procedure and Data Collection***

This investigation used both observations of BRM training and standard measures of BRM performance to examine the effects of AWG/CAT-C techniques as they were being applied in BRM training at Fort Jackson. A test/retest method, similar to that used in the WTSRA study (see Cobb et al., 2009), was used to collect data on participating Soldiers' marksmanship skills and skill retention. This research effort differed from the previous study in that it was limited to examining BRM performance and skill retention within a ten-week BCT and did not include any follow-up assessment during Advanced Individual Training (AIT). Consequently, the retention interval (4 weeks) examined by this research was much shorter than that presented in the WTSRA study (14 to 24 weeks). Yet, it provided a unique opportunity to reassess the level of BRM skills among Soldiers at the end of BCT that was not possible in the WTSRA study.

In addition, observation and performance data were collected throughout BRM training rather than being limited to zeroing and weapons qualification as in the WTSRA study. Observation protocols were developed to permit subject matter experts (SMEs) to document accurately the training techniques being employed by the selected training Companies during BRM. Firing range tower printouts were collected to determine performance outcomes from BRM training periods 6 through 13. Observers also questioned the Companies' leaders and DSs to identify and document desired training outcomes and specific AWG/CAT-C techniques being employed during the scheduled training. In addition, SMEs compared their observations with those activities required by the current BRM training support packages (TSPs). Objective performance data included the number of rounds fired, number of firing iterations completed, and individual qualification scores from BRM events. Initial tests (BRM 13 Record Fire) were observed and documented in the 5<sup>th</sup> week of BCT. Retests, which required Soldiers to reattempt the qualification scenario, were conducted approximately 4 weeks later, just prior to graduation.

Although not ideal, considering its longer interval and lower participation levels due to attrition and AIT class size limitations, comparison data were drawn from the previous WTSRA study (see Cobb et al., 2009). Since training units usually only document their final qualification scores, the Companies' archival records were inadequate as sources of comparative data for this research. Data included legacy record fire and refire training performance collected on Soldiers who participated in this research and completed BCT at Fort Jackson. Basic descriptive and inferential statistical tests were conducted to determine if statistically significant differences existed between the respective groups being compared.

### ***Participants***

As described above, installation leadership selected two training Companies to support this research effort. These Companies were identified as having extensively employed AWG/CAT-C techniques in BRM training and utilized the additional time available in the ten-week BCT schedule to expand BRM training over the number of hours employed during the

previous nine-week BCT. Table 1 summarizes the demographic characteristics of the two training Companies and the legacy (i.e. WTSRA sample) comparison group.<sup>3</sup>

Table 1

*Demographic Characteristics of the CAT-C Sample and Legacy Comparison Group*

Sample Group	N	Mean Age	Gender		Educational Degrees		Component		
			M	F	HS/ GED	College	RA	USAR	ARNG
Company A	230	21.8 y	52%	48%	89%	9%	65%	15%	20%
Company B	241	22.6 y	51%	49%	89%	9%	61%	17%	23%
Legacy*	344	21.3 y	58%	42%	97%	3%	55%	24%	21%

\*Note. Legacy Jackson BCT; 5 Military Occupational Specialties (MOSs) represented; data collected in FY08 for WTSRA. Companies A and B comprised 88 MOSs. HS = High School; GED = General Educational Development; RA = Regular Army; USAR = United States Army Reserve; ARNG = Army National Guard.

Although there were some differences in the sizes of the respective groups, the samples were statistically comparable to general statistics maintained by the DBCT and were very representative of the Soldier populations completing training at Fort Jackson. While there were some demographic differences between the groups (see Table 1), taken together, these differences were negligible and the groups were determined to be sufficiently comparable for statistical comparisons of BRM performance.

## Results

The first part of this section summarizes general observations concerning how the two Companies conducted their scheduled BRM training. This discussion initially reviews the specific AWG/CAT-C BRM training techniques SMEs identified during field observations of the two training Companies. Following this, the measured outcomes from each of the applicable BRM training events are then summarized and compared. The section concludes with a comparison of CAT-C trained Soldiers' performance in BRM 13 and their qualification reassessment prior to graduation from BCT with the performance of the Fort Jackson BCT legacy group from the WTSRA study.

It must be recognized that it was not possible to isolate the unique contributions of integrating AWG/CAT-C training strategies and techniques into BRM and that attributable to increasing the amount of time spent on BRM during the expanded ten-week BCT. As found in previous research, e.g., Dyer et al., 2009, these factors combined to frame the outcomes we observed and measured during this investigation. Therefore, the results reported must be interpreted in terms of these confounded factors.

<sup>3</sup> The participating training Companies were randomly designated as Company A and B for the analysis and this report to further protect the confidentiality of their data and outcomes.

## *General BRM Training Observations*

Training observations focused on each Company’s scheduled BRM training during the first five weeks of BCT. SMEs documented observed training techniques and collected performance data (number of rounds fired, number of firing iterations, etc) throughout BRM training. Investigators developed and used training observation protocols to ensure consistency of data collection and assessment throughout BRM. These protocols also assisted SME observers in documenting the differences in the training experienced by the Soldiers participating in this investigation and published TSPs (see Appendix A). These comparisons were essential to identifying AWG/CAT-C related training strategies and techniques.

Each Company followed a ten-week program of instruction (POI) and had the opportunity to add additional BRM training into the schedule. Table 2 summarizes the amount of training hours each Company dedicated to each BRM period in comparison with the amount specified in the current Training and Doctrine Command (TRADOC) BCT Course Management Plan (CMP) (USABCTCoE & Fort Jackson, 2008a).<sup>4</sup>

Table 2

*Comparison of the Number of Training Hours Allocated by BRM Period*

<b>BRM Period</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7/8*</b>	<b>9/10*</b>	<b>11/12*</b>	<b>13</b>	<b>Total</b>
11 Jul 2008 BCT CMP	5	4	4	8	8	8	4/4	4/4	6/6	8.1	73.1
Company A	4	28	8	8	16	16	0/8	0/8	4/0	16	116
Company B	9	0	8	16	24	8	0/8	0/8	2/0	22	105

\* **Note.** BRM periods 7/8, 9/10, 11/12 have been combined to reflect organization of BCT TSPs into 10 periods of instruction, which is how the training periods are typically conducted (i.e. units combine tasks from two BRM periods into a single execution period).

As can be seen in Table 2, there were significant deviations from the standard allotted hours of training specified in the CMP. The following briefly describes the training observed within the Companies during each BRM period.

**BRM 1 (Basic Rifle Marksmanship).** Company A conducted BRM 1 training at the platoon level immediately after the Soldiers received their weapons (weapons immersion program). The training focused on specific weapon tasks, such as how to carry, clear, safe, disassemble, and reassemble the weapon. The DSs informed the investigators that the remainder of the TSP tasks would be taught and reinforced over the next two weeks (the next period of BRM training was scheduled for 15 days later). Company B spread BRM 1 training over a 4-day period in the week prior to the live fire portion of BRM training. BRM 1 classes consisted of two 2-hour and two 2.5-hour blocks of instruction, and used a 190-slide power point presentation similar in content to that found in the CART-C training DS Candidates currently receive in DSS.

**BRM 2 (Marksmanship Fundamentals I).** Company A spread BRM 2 tasks over a 3.5-day period the week prior to the live fire portion of BRM training. Training was structured by the Company’s leadership, but executed by each Platoon. Each Platoon varied their training

<sup>4</sup> Reference TRADOC BCT CMP for a detailed description of the training requirements for all BRM periods (USABCTCoE & Fort Jackson, 2008a).

based on the DSs' assessment of their Platoons' progress and needs, as well as their personal mastery of the marksmanship fundamentals. To some degree, each Platoon reviewed the following:

- Ballistics
- How to Wear the Uniform (interceptor body armor (IBA), load bearing vest (LBV), etc)
- Weapons Safety
- Fundamentals (Steady Position, Aiming, Breath Control, and Trigger Squeeze)
- Basic Firing Positions (Prone and Kneeling, with and without full battle gear<sup>5</sup>)
- SPORTS<sup>6</sup> (Clear a stoppage)
- Range Procedures

The DSs reinforced marksmanship fundamentals and basic firing positions on a nearly daily basis throughout the 3.5-day period.

Company B incorporated the BRM 2 topics into their BRM 1 training, rather than focusing on these topics as a separate training event or spreading them across multiple periods as done by Company A. Thus, there was no separate, distinct BRM 2 training session conducted by Company B.

***BRM 3 (Marksmanship Fundamentals II - Engagement Skills Trainer 2000 (EST 2000)).***<sup>7</sup> Both Companies conducted BRM 3 training in the EST 2000. The Companies rotated Platoons through the EST training using the two buildings they had been allotted. Two Platoons conducted grouping exercises in the morning and two in the afternoon. However, due to time and facility limitations, the Soldiers only had one opportunity to meet the standard before the next group had to take their turn in the trainer. This resulted in Soldiers failing to meet the standard, without any opportunity for additional training in the EST 2000, before progressing to the live-fire grouping exercise in BRM 4.

***BRM 4 (Grouping Procedures).*** The Soldiers from both Companies fired in slick<sup>8</sup> uniforms during grouping. While Company A spent one day attempting to meet standards successfully, Company B used two training days for grouping. During the second day, Soldiers who successfully met the grouping standard the previous day began to zero their weapon (BRM 5) in the slick uniform as firing points became available.

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<sup>5</sup> Full battle gear consists of the Army Combat Uniform (ACU), Advanced Combat Helmet (ACH), IBA with two Small Arms Protective Insert (SAPI) plates, LBV, and eye and hearing protection.

<sup>6</sup> SPORTS refers to the initial sequence of actions required to clear a weapon malfunction or stoppage: Slap, Pull, Observe, Release, Tap, Squeeze (or Safe). Under AWG/CAT-C, Drill Sergeants are training the last action (S) as either to Squeeze the trigger to ensure the stoppage has been cleared or Safe the weapon before reacquiring the target.

<sup>7</sup> The EST 2000 is a laser-based arms trainer with 5 to 15 firing lanes, which utilizes real-time, 3-dimensional presentations on a screen 26 feet from the firer's position. As a simulated environment, the trainer has the capability to support Soldiers being trained in a variety of range conditions.

<sup>8</sup> "Slick" is a term used during the initial AWG training that describes the uniform the Soldiers would wear while grouping and zeroing. The uniform was specified to make the Soldier as comfortable as possible when initially shooting and consisted of ACUs, patrol cap, and eye and hearing protection.

**BRM 5 (Zero an M16/M4 Series Rifle).** Company A scheduled two days to facilitate employing the CAT-C strategy of firing first in slick uniform then moving gradually to full battle gear.<sup>9</sup> The Company commander later altered this plan by foregoing firing in full battle gear due to the number of Soldiers who had difficulty zeroing in the slick uniform.

Company B also scheduled two days to facilitate the CAT-C strategy of firing in a graduated level of uniform. Thunderstorms with lightning caused several training stoppages during the two days resulting in Company B scheduling an additional day for the Soldiers who were not able to zero their weapons successfully during the original two-day period.

**BRM 6 (Downrange Feedback).** Company A spread the 16 hours of BRM 6 training over a two-day time period. The first day of training employed the CAT-C technique of confirming zero at distance using the Location of Miss and Hit (LOMAH) range<sup>10</sup>. Each Soldier was required to shoot 3-round shot groups at the 175M target to further confirm and refine the zero on his/her weapon. Once Soldiers had confirmed their zero, they executed the scheduled training activities and engaged in downrange feedback from prone and kneeling firing positions.

Company B did not conduct downrange feedback during this scheduled range time. The training exercises that Company B performed for BRM 6 differed significantly from Company A. Company B utilized the training day to confirm zero at distance using the LOMAH range while wearing full battle gear. The choice to confirm zero in full battle gear was due to the low number of Soldiers that were able to zero their weapon to standard in full gear during the previous BRM 5 exercises. Two Platoons zeroed at 300M using the LOMAH system to determine their sight adjustments. The remaining two Platoons employed a 200-meter zero, which required the DSs or Soldiers to ignore the system determined adjustments and subjectively determine sight adjustments based on the visual information presented on the monitor at the firing point.

**BRM 7 and 8 (Simulated Field Fire I and II – EST 2000).** Neither Company A or B conducted BRM 7 (single timed targets). The Companies conducted BRM 8 for an 8-hour period. However, both Companies were limited to two EST 2000 buildings for training resulting in two Platoons conducting BRM 8 in the morning followed by two in the afternoon for approximately three to four hours per iteration. Soldiers who failed to meet the standard during their first attempt were given the opportunity to shoot again until they met the standard or their allotted training time expired.

**BRM 9 and 10 (Field Fire I and II).** Neither Company executed BRM 9 (single timed targets) as the commanders elected to conduct multiple iterations of BRM 10 (single and multiple timed targets). Company A fired a minimum of two iterations per Soldier with the second iteration requiring the Soldiers to correct a weapon malfunction that was induced using an expended blank round placed randomly in each magazine. Company B Soldiers fired a

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<sup>9</sup> A graduated level of uniform refers to the act of slowly increasing the uniform from Slick to full battle gear to gradually increase the Soldiers' stress and encumbrance levels. For example, Soldiers fired with LBV and ACH before adding the IBA for their next attempt.

<sup>10</sup> LOMAH is a computerized range facility. The system acoustically determines where fired rounds impact and relays the results to a monitor at the firing point. When running its weapons zero program, the system will calculate and provide the required sight adjustments for a 300-meter zero only.

standard BRM 10 table of fire and had multiple opportunities to achieve the standard of 27 targets hit out of 44.

***BRM 11 and 12 (Practice Record Fire I and II).*** In accordance with guidance issued by their respective Battalion Commanders, Companies A and B fired only one practice record fire consisting of 40-rounds per Soldier before proceeding onto BRM 13. Neither Company completely executed the current TSPs for these events by not conducting a second practice fire for BRM 12.

***BRM 13 (Record Fire).*** The abbreviated practice record fire allowed both Companies to extend the opportunity for Soldiers to continue to attempt qualification over the next two training days. Soldiers who shot 22 or lower had an opportunity to re-fire until they met the standard of 23 or until the respective Company commanders decided the Soldiers had sufficiently proven they were not capable of qualifying with their assigned weapon.

### ***BRM Training Observations: CAT-C Applications***

Application of the AWG/CAT-C techniques varied based on the experience and knowledge levels of the DSs and the training Companies' leaders. While many noncommissioned officers (NCOs) attended the CAT-C taught at Fort Jackson (Jan 07 – Sep 08), the DSs from the two Companies selected for this research effort were a mixture of CAT-C and CART-C trained personnel. The last CAT-C class at Fort Jackson was in September 08. The CART-C was piloted in the summer of 2008 and approved as part of the DSS POI in Oct 08.

SMEs with extensive knowledge of BCT and BRM training requirements identified the training techniques specific to AWG/CAT-C on the basis of observations of the two Companies' training. While not an exhaustive list of the training techniques recommended by AWG, they provided a sound basis for comparing the training strategies and level of integration of AWG/CAT-C by the participating Companies. The descriptions of the techniques provided in this report are based on feedback elicited from the DSs and Company leaders of the two observed Companies. No Army doctrinal publication or training manual was provided by the Company cadre as a source for these explanations, except in reference to the current CAT-C program. However, after further research, some of these techniques were later identified as potential modifications or applications of techniques found in past Army and Marine Corps rifle marksmanship publications. When appropriate, these archival references are provided for general amplification and consideration.

- “O” in SPORTS stands for “Observe” – While “observe” is consistent with the Army mnemonic device S-P-O-R-T-S, there is much greater emphasis placed on this step as the key decision point for Soldiers to continue immediate action or begin remedial action.
- Last “S” in SPORTS stands for “Safe” – this modifies the use of the mnemonic device where the “S” stands for “Squeeze.” The intent is that the Soldier must reacquire the target before he/she reengages; therefore, for safety considerations, the weapon is placed on “safe” until the Soldier is ready to fire.

- “Follow through”– the act of wrapping the firing finger around the trigger; squeezing and holding the trigger for a count of 2; releasing the trigger slowly and listening for the metallic click. As a CAT-C technique, it is similarly referenced in FM 3-22.9 as “...the firer follows through and holds the trigger to the rear for approximately one second after the round has been fired” (2008, para 4-62, p. 4-23). In Marine Corps Reference Publication (MCRP) 3-01A, it is referred to as “Resetting the Trigger” (2001, para 4003, p. 4-6).
- “Press Check” – the act of pulling the charging handle slightly towards the rear of the weapon allowing the Soldier to inspect visually for a round in the chamber. This is a variation of the United States Marine Corps (USMC) “Chamber Check” as referenced in MCRP 3-01A (2001, para 3003, p. 3-1).
- Four rules of the range: A variation of the USMC Safety Rules as seen in MCRP 3-01A (2001, para 3001, p. 3-1).
  - Treat the weapon as loaded.
  - Do not point the weapon at anything unless you intend to shoot it.
  - Weapon on safe and finger off trigger.
  - Maintain situational awareness.
- Point, Post, and Sprawl – the act of maneuvering your body into a prone firing position. Using one hand to hold the weapon, Soldiers *point* the weapon towards the target; squat and place the non-firing hand on the ground, *post*; and kick their legs out behind them to *sprawl* into a firing position. This appears to be a variation of the USMC technique of “Dropping Back into Position” referenced in MCRP 3-01A (2001, para 5005, p. 5-8).
- Prone magazine supported firing position – the Soldiers are taught to fire from a prone position in which the weapon is supported by the 30-round magazine resting on the ground or a sandbag. In effect, this eliminates the prone, unsupported position described in FM 3-22.9. This technique is used by the USMC in their combat marksmanship program; however, it is not applied until the Marine has demonstrated his/her ability to master the fundamental firing positions (Headquarters United States Marine Corps, Department of the Navy [DN], 2007, para 7004, p. 7-2).
- Ballistics training – Soldiers are taught the trajectory of the ammunition they will shoot. CAT-C reinforces this area as a subject that will allow for better understanding of the weapon system’s performance. This area is referenced in both FM 3-22.9 (2008, section V, p. 5-32) and MCRP 3-01A (2001, chap 9, p. 9-1).
- Green, Amber, and Red weapons status commands – commands given from the tower operator to the Soldiers who are about to fire.
  - Green – weapon is clear (bolt locked to the rear), selector lever on safe, and no magazine in the magazine well.

- Amber – weapon is clear (bolt is locked to the rear), selector lever on safe, a magazine is placed into and locked in the magazine well.
  - Red – the bolt is released locking a round in the chamber and the selector lever is on safe.
- Locally produced targets with a 1.25 inch black dot centered on a white sheet of 8.5x11 inch paper – used during BRM 4 for grouping procedures. Also, 25M zero targets with a 4 cm circle 1.1 inches below the center of the standard 300M silhouette - based on the ballistics of the M855 5.56mm bullet (see Appendix B).
  - 200M zero – the CAT-C 200M zero uses the same point of aim as the 300M zero; however, the point of impact is adjusted to a spot 1.1 inches below the point of aim. This zero is intended to improve short-range marksmanship.
  - Bullet Drop Compensator (BDC) set for 8/3 not 8/3+1 – current Army doctrine states that Soldiers must acquire a point of aim/point of impact zero at 25M to achieve a point of aim/point of impact zero at 300M where the bullet crosses the line of sight. When this is accomplished, the bullet impacts the 25M zero target .33 inches low. This is why it is necessary to raise the BDC to 8/3+1 during zeroing (+1 equaling .33 of an inch) to ensure the point of impact is the same as the point of aim (center of mass). The 200M zero eliminates the need to add “+1” to the BDC because the point of impact is adjusted 1.1 inches below the point of aim. (Zero Your M16A2/A4, n.d., slide 1)
  - Uniform – ACUs, eye and hearing protection – CAT-C recommends a graduated level of uniform that increases as Soldiers’ proficiency increases. This was identified and addressed as an issue in FM 3-22.9 (FM 23-9) (2003, para 4-7, p. 4-19) as “use an IBA immersion approach so the Soldier can adapt to weight and movement restrictions. Incrementally introduce the outer tactical vest (OTV) and front/back small arms protective insert (SAPI) plates for an easier weight transition.”
  - 5-round shot groups – CAT-C uses five rounds, rather than the Army standard of three, to make triangulation of the shot group more accurate and efficient. This technique is recommended by the United States Army Marksmanship Unit (Ballistics and Zeroing, n.d., slide 31), and is used by the USMC to conduct the Grouping Exercise (USMC, DN, 2007, p. A-1).
  - Grouping and Zeroing Standard #1 – 7 out of 10 rounds in two consecutive 5-round shot groups within the 4 cm circle, rather than the published Army standard of 5 out of 6 rounds from two consecutive 3-round groups.
  - Grouping and Zeroing Standard #2 - 8 out of 10 rounds in two consecutive 5-round shot groups within the 4 cm circle rather than the published standard.

- Confirming zero at distance – using the 175M target on a LOMAH range to either zero or confirm the zero of a Soldier’s weapon, as well as making additional sight adjustments to refine its accuracy.
- Induced stoppages - Expended blank cartridges were placed randomly in the magazine to induce a stoppage during firing, thus requiring the Soldier to react to the simulated malfunction before continuing to fire.

The two Companies participating in this effort differed in how they applied the training techniques described in the previous section. These variations seemed to be based on the DSs’ level of experience and confidence with the techniques, as well as each Company Commanders’ desired training outcomes for the day. The most to least frequently observed training techniques are listed in Table 3. Table 3 should be read from top to bottom, beginning with the left column first and the right column second. The order of the list in Table 3 should not be taken to indicate a ranking of importance, but only the frequency with which the specified techniques were observed during BRM training. Some techniques, such as “Follow Through,” were frequently reiterated throughout BRM, while others, such as “Induced Stoppages,” were addressed only a few times.

Table 3

*Most to Least Frequently Observed Training Techniques Described as Related to CAT-C*

<b>Training Techniques</b>	
(1) Follow Through	(11) Five Round Shot Groups
(2) Magazine Support	(12) ‘O’ in SPORTS is the decision point
(3) Point, Post, Sprawl	(13) 1.25” Black Dot
(4) Green, Amber, Red	(14) 200M Zero
(5) Four Rules	(15) Group and Zero Standard (8 out of 10)
(6) Full Battle Gear Uniform	(16) Group and Zero Standard 2 (7 out of 10)
(7) ‘S’ in SPORTS is for Safe	(17) Locally Produced Target
(8) Press Check	(18) Confirm Zero at Distance
(9) Slick Uniform	(19) Ballistics
(10) BDC Set 8/3 (not 8/3+1)	(20) Induced Stoppages

Table 4 compares the two training Companies in terms of which specific techniques they applied during each of the identified BRM periods.

Table 4

*Comparison of Company A and B Use of CAT-C Training Techniques by BRM Period*

<b>BRM Period</b>	<b>1</b>		<b>2</b>		<b>3</b>		<b>4</b>		<b>5</b>		<b>6</b>		<b>8</b>		<b>10</b>		<b>11</b>		<b>13</b>		
<b>CAT-C Training Techniques</b>	<b>A</b>	<b>B</b>	<b>A</b>	<b>B</b>	<b>A</b>	<b>B</b>	<b>A</b>	<b>B</b>	<b>A</b>	<b>B</b>	<b>A</b>	<b>B</b>	<b>A</b>	<b>B</b>	<b>A</b>	<b>B</b>	<b>A</b>	<b>B</b>	<b>A</b>	<b>B</b>	
“Follow-through”	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Prone magazine supported firing position	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Point, Post, and Sprawl			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Green, Amber, and Red tower commands			X		X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X
4 rules of the range			X	X			X		X	X	X	X	X	X	X	X	X	X	X	X	X
Uniform – ACUs, ACH, LBV, IBA w/SAPI plates, Eye and Hearing protection			X						X	X	X	X	X	X	X	X	X	X	X	X	X
“S” in SPORTS stands for safe	X	X					X		X		X		X		X		X		X		X
Press Check			X				X		X		X		X		X		X		X		X
Uniform – ACUs, Eye and Hearing Protection	X		X		X		X	X	X	X											
BDC set for 8/3 not 8/3+1							X	X	X	X											
5-round shot groups							X	X	X	X											

Table 4 (Continued)

*Comparison of Company A and B Use of CAT-C Training Techniques by BRM Period*

BRM Period	1		2		3		4		5		6		8		10		11		13	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
“O” in SPORTS is the decision point			X	X																
Target 1.25 inch black dot centered on white sheet of paper							X	X												
200M zero									X	X										
Grouping and Zero Standard #1 - 8 out of 10 rounds in two consecutive shoot groups within the 4-cm circle							X		X											
Grouping and Zero Standard #2 - 7 out of 10 rounds in two consecutive shoot groups within the 4 cm circle								X		X										
Locally produced 25M zero target with 4 cm circle 1.1 inches below center of 300M silhouette.									X	X										
Confirm Zero at Distance											X	X								
Ballistics training			X																	
Induced Stoppages														X						

As indicated by Table 4, there were many similarities in how the two training Companies executed their BRM training. There were also notable differences during the events that potentially impacted their training outcomes. Based on discussions with SMEs within the DBCT, many of these differences also ran counter to recommended strategies for employing those training techniques during BRM.

The first of these differences concerns the amount of time the two Companies spent conducting preliminary marksmanship training (BRM 1 – 3) prior to their first live-fire exercise. Company A spent 23 more hours conducting this training than did Company B. The training during these early periods of BRM focuses on the four fundamentals of marksmanship and is considered by the authors of the TSPs within the DBCT as essential to any Soldier’s performance during BRM training.

As previously described, the exact nature of what was covered in training depended largely on individual DSs’ personal experience and knowledge. In fact, many differences were noted between Platoons within the same Company due to variations in what individual DSs

chose to emphasize and how they trained these respective points of emphasis. For example, one Platoon within a Company consistently focused more on teaching the Soldiers the four fundamentals of marksmanship, using training aids and techniques described in FM 3-22.9 (HQDA, 2008, p. 4-28). The DS took the lead and used the prescribed crawl-walk-run method of training by first introducing the Soldiers to their weapons, then to the firing positions, and finally the four fundamentals of marksmanship. He also used a series of training drills detailed in the marksmanship manual, which incorporated the M15A1 aiming card, M16 sighting device, Target Box exercises, and Dime (Washer) exercises to build, apply, and reinforce the basic firing fundamentals. Seventy five percent (75%) of the Soldiers in this Platoon qualified after the first iteration of qualification firing as opposed to 62% in the next highest Platoon, with an overall qualification rating of 98% vs. 96%, and a refire (skill retention) qualification of 69% compared to 69%, 39%, and 35% in the other Platoons. While the other three Platoons used some of these same techniques, the level of detail and way in which the techniques were explained and applied differed from DS to DS.

The next notable observed difference between the two Companies relates to how each occupied the grouping and zeroing ranges and the consistency of the feedback and instructions provided to their Soldiers. Company A's leadership ensured that the number of firing points on each range was evenly divided between the Platoons such that each Platoon's DSs trained their own Soldiers. Company B's leadership, however, occupied the firing points in the order of their Platoons. That is, 1<sup>st</sup> Platoon occupied as many points as they needed, then 2<sup>nd</sup> Platoon occupied the remaining points. DSs were assigned a set of firing points to observe and to assist Soldiers. This process resulted in DSs training Soldiers who did not belong to their Platoons, thereby not leveraging the DS's familiarity with his/her Soldiers' strengths and weaknesses. Based on observed interactions, many of these Soldiers were given feedback and instructions that disregarded previous points directed and emphasized by other DSs.

The two Companies conducted training in a very similar manner during the live-fire portion of BRM in that each used the magazine for supporting the weapon and grouped and zeroed in a basic, unencumbered uniform (i.e. "slick" uniform consisting of ACUs and ballistic eyewear) before transitioning to full battle gear for the record fire (BRM 13). Although both Company commanders indicated they intended to use a graduated level of uniform before BRM 13, neither did so. As observed in previous research (see Cobb et al., 2009), a large number of Soldiers had difficulty establishing a stable firing position when wearing the full battle gear due to improper fit and inexperience.

Both Companies also used a nonstandard target for the grouping exercise and 5-round shot groups for grouping and zeroing. However, the Companies differed in the standards they applied during grouping and zeroing, as well as the targets they used for zeroing at 25M. Company A enforced a consistent standard of 8 out of 10 rounds from two consecutive shot groups within a 4 cm circle, while Company B generally enforced a 7 out of 10 round standard with some variations among the DSs ranging from a minimum of 5 and a maximum of 8 rounds out of 10. Company A used a locally reproduced zero target (Appendix B) that had a 4 cm circle superimposed 1.1 inches below center of mass of the silhouette for the 200M zero which eliminated the need for the Soldier or a DS to subjectively estimate the required adjustment. Company B used a standard 25M zero target depicting 300M zero references, which required the

Soldiers and DSs to adjust subjectively for a 200M, zero and determine if the rounds impacted in a 4 cm circle below the center mass of the silhouette.

Both Companies used the LOMAH range to have at least a portion of their Soldiers confirm zero at 175M. The LOMAH system has a zero confirmation program as part of the down range feedback process and this confirmation program is usually shot as the first scenario. The Soldier shoots six rounds at the 175M target while aiming at the target's center of mass. If the shot group falls within an 11-inch diameter circle, the LOMAH system determines the location of the shot group in relation to the center of mass and calculates the sight adjustments necessary to move the shot group to the point of aim. This program, which is based on a 300M zero, is designed to refine the Soldier's weapon zero and "when Soldiers properly compensate for the wind, the zero on this target is more valid than the zero obtained on the 25M range" (HQDA, 2008, para 5-56, p. 5-23).

Another difference in the training executed by the two Companies was in their utilization of the LOMAH range. Company A applied the CAT-C technique of zeroing at 200M on the LOMAH range for improving short-range marksmanship. Since the range's programming does not calculate sight adjustments for a 200M zero, the DSs estimated the required adjustments subjectively based on the monitor's display. Company B, on the other hand, had two Platoons apply the 200M zero and complete training when the DSs subjectively determined the Soldiers were zeroed and two Platoons apply the 300M zero and complete training when the system registered them as zeroed. No Soldiers in either Company had another opportunity to confirm zero again before attempting to qualify during BRM 13.

BRM periods 8 and 10 were executed in a similar fashion, with the only significant difference between the Companies observed on BRM 10. Company A's leadership elected to increase the task conditions while the Soldiers were conducting single and multiple timed targets by placing an expended blank round in each magazine, thereby requiring the Soldier to clear an induced stoppage during firing. This emphasis on correcting a weapon malfunction during firing was a result of the Company's desire to increase the combat orientation of the training and prepare for experimenting with a proposed combat familiarization fire scenario after BRM 13.

Both Companies limited BRM 11 (Practice Fire) to a single iteration of 40 rounds<sup>11</sup> per Soldier. They then transitioned directly to BRM 13, thereby omitting the second scheduled period of practice fire (BRM 12) from their BRM training. During BRM 13, both Companies allowed their Soldiers multiple opportunities to qualify (23 hits and above) resulting in Soldiers shooting anywhere from one to 26 iterations.

### ***CAT-C BRM Training Outcomes Comparisons***

***BRM 4 (Grouping Procedures).*** Soldiers reported to SME observers if they had successfully met the standard for the task. DSs confirmed the Soldiers' self-reports. Table 5 provides a summary of BRM 4 grouping performance outcomes by each Company. The table reflects percent of Soldiers receiving a "Go" on the task and the average number of rounds shot by all Soldiers. A "Go" indicates a Soldier met the standard for the task, which currently

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<sup>11</sup> Based on their clarification, this practice was in accordance with the Battalion Commander's guidance.

requires the Soldier to place 5 out of 6 rounds from two consecutive 3-round shot groups inside a 4cm circular area from the prone supported position. In accordance with CAT-C techniques, the Companies had their Soldiers use 5-round shot groups to achieve the desired standard. There was variability in the standards used by the two Companies and across DSs. To achieve a “Go” on this task, Soldiers were required to have 5 to 8 hits, out of two consecutive 5-round shot groups, within a 4cm circular area.

Table 5  
*BRM 4 Grouping Performance by Company*

<b>Company</b>	<b>% Go</b>	<b>Avg. Rounds (Go)</b>	<b>Avg. Rounds (No Go)</b>	<b>Avg. Rounds Overall</b>	<b>Range</b>
A (n=207)	93%	29.1 (SD=19.4)	53.6 (SD=16.5)	30.7 (SD=20.2)	10 to 105
B (n=195)	95%	33.3 (SD=30.1)	52.0 (SD=37.9)	34.3 (SD=31)	5 to 170

As seen in Table 5, the performance of the respective Companies did not show any statistically significant differences. Overall, Company B had a notably wider range for the number of rounds required to obtain an acceptable grouping than Company A.

***BRM 5 (Zero an M16/M4 Series Rifle).*** Table 6 summarizes the zeroing outcomes of the two Companies in slick and full battle gear. In the current Army standard a “Go” indicates the Soldier met the standard for the task, which currently requires the Soldier to place 5 out of 6 rounds in a designated impact area (a 4cm circle) from two consecutive 3-round shot groups, while firing from the prone supported position. Following CAT-C recommendations, Company A consistently enforced an 8 out of 10 rounds standard (from two consecutive 5-round shot groups). Company B was less standardized in their desired outcomes, as a “Go” was given for 6 or 7 out of 10 rounds within the designated impact area. Again, Soldiers reported their Go/No Go status to the SME observers, which were confirmed by the DSs.

Table 6  
*BRM 5 Zeroing Training Outcomes*

Task Condition	Company	% Go	Avg. Rounds to Zero		% DS Determined Sight Adj.	% DS Made Sight Adj.
			Go	No Go		
Slick	A (n=204)	66%	57.4 (SD=32.6)	n.r.	99%	3%
	B (n=186)	76%	40.7 (SD=24.5)	49.6 (SD=21.5)	99%	56%
Full Battle Gear*	A	--	--	--	--	--
	B (n=90)	64%	19.4 (SD=6.9)	24.1 (SD=9.0)	80%	15%

\*Full battle gear includes ACUs, ACH, LBV, knee and elbow pads, IBA w/SAPI plates, eye and hearing protection.

As discussed earlier, Company A did not fire in full battle gear. The lower number of Soldiers in Company B (n=90) who participated in the full battle gear training condition reflect the fact that only some of those Soldiers who were able to zero in their slick uniform were allowed to attempt to confirm zero in full battle gear. The remaining Soldiers in Company B did not confirm zero in full battle gear since they were unable to zero the weapon properly when in slick uniform or time and resources did not allow them an opportunity.

Additional data comparisons are possible with the legacy group, since zeroing data was collected during the WTSRA study. Out of 288 Soldiers for whom zeroing data were collected in the WTSRA study (Cobb et al., 2009), the mean number of rounds needed to zero was 23.6 (SD=14.9). In Company B, 41% of the 90 Soldiers who fired in full battle gear were able to successfully zero within 20 rounds compared to 45% of the WTSRA Soldiers, firing under similar conditions. Soldiers in Company A did not fire in full battle gear.

While the DSs determined the sight adjustments for their Soldiers at the same rate across the two Companies (i.e. 99%), only 3% of the Soldiers reported their DSs made the sight adjustments to their weapons in Company A. Whereas, 56% of the Soldiers in Company B reported that the DSs adjusted their sights.

***BRM 6 (Downrange Feedback).*** On average, Soldiers in Company A required an average of 41.1 rounds (SD = 29; N = 171) to confirm zero at a distance. Forty-three percent (43%) of the Soldiers completed this task within 20 rounds. The second day of BRM 6 focused on the TSP task of Down Range Feedback in which the Soldier engaged 75M, 175M, and 300M targets from the prone and kneeling firing positions. In Company A, 84.5% of Soldiers passed the Down Range Feedback exercise; with means and standard deviations listed in Table 7. Since Company B did not accomplish this training and this data was not collected for the legacy group, no comparisons are possible.

Table 7  
*BRM 6 Company A Down Range Feedback*

<b>Position</b>	<b>Distance</b>	<b>Mean</b>	<b>SD</b>
Prone		18.0	4.0
	75M	4.5	0.8
	175M	8.2	1.9
	300M	2.7	1.5
Kneeling		10.6	2.9
	75M	4.1	1.1
	175M	6.6	2.1
	300M	2.5	1.5
N = 182			

As described earlier, Company B focused on using the range to confirm zero and did not conduct downrange feedback during BRM 6 as required by the current TSP. Using the LOMAH system, 91% of the Company's Soldiers were able to refine or confirm their weapon's zero by the end of the day. The average number of rounds required to achieve zero was  $M=38.1$  ( $SD=35.9$ ;  $n=199$ ). During these exercises, the majority of Soldiers in Company B determined their own sight adjustments (55%) and moved their own sights (53%). The Soldiers also relied on each other, with peer coaches determining the required sight adjustments in 36% of cases, and adjusting the firer's sights in 38% of cases, while DSs determined the sight adjustments and adjusted the sights in 9% of the cases.

***BRM 8 (Simulated Field Fire II – EST 2000).*** As described earlier, both Companies spent six to eight hours in the EST with Platoons spending three to four hours conducting BRM 8 (multiple timed targets). Soldiers were assigned a pass or fail based on their shots fired, hits, misses, and percent hits statistics. Soldiers who passed this task, based on the simulation's feedback, were assigned a Go rating. A single iteration consists of a Soldier attempting the event one time, although the Company often had to progress through multiple firing orders in order for each Soldier to fire a single iteration. Soldiers who did not successfully meet the standard within the first iteration were given additional opportunities to fire. Both Companies fired a total of 4 iterations by the end of the training period. Some Soldiers who had met the standard were allowed to fire again based on the number of unoccupied firing positions and the discretion of individual DSs. Table 8 summarizes the Companies' respective performance outcomes during BRM 8, discounting Soldiers' performances after meeting the standard.

Table 8

*BRM 8 Multiple Timed Targets Percentage of Hits on Target by Company*

Company	Iterations								
	First			Second			Third		
	Mean % Hits on Target	% Go	N	Mean % Hits on Target	% Go	N	Mean % Hits on Target	% Go	N
A	66.5 (SD=17.4)	66%	172	63.4 (SD=17.3)	67%	33	62.6 (SD=13.6)	60%	5
B	58.4 (SD=21.3)	51%	195	55.0 (SD=17.8)	40%	25	50.3 (SD=12.9)	0	5

Note. Data for the 4<sup>th</sup> iteration are not reported as there was only a single Soldier in each Company who fired for this iteration.

**BRM 10 (Field Fire II).** As described earlier, neither Company executed BRM 9 (single timed targets). Company A fired one iteration of standard BRM 10 and four iterations with induced stoppages, while Company B fired nine iterations of BRM 10 without employing any induced stoppages. Only two Soldiers in Company B fired a ninth iteration of this task.

**BRM 11 (Practice Record Fire I).** As discussed earlier, the two Companies fired only one practice record fire consisting of 40 rounds per Soldier in accordance with their Battalion Commanders' guidance. The following, Tables 9, 10, 11 and 12, summarize the Companies' performance on this single practice record fire iteration. No comparable data is available from the legacy group since firing data was not collected during practice record fire.

Table 9

*Practice Record Fire: Comparison of Companies A and B on Mean Number of Rounds on Target (Out of 40)*

Company	Mean Score (Number of Rounds on Target Out of 40)	SD	N
A	22.4	7.5	200
B	19.9	7.9	200

Table 10 provides the percentage breakdown of scores by Army Marksmanship Categories.

Table 10

*Practice Record Fire: Percent of Soldiers within Company and Overall by First Iteration Marksmanship Score Category*

Company	% of Company Within Score Category			
	Expert (36 - 40)	Sharpshooter (30 - 35)	Marksman (23 - 29)	Unqualified (22 & Below)
A (N = 200)	1.5 (n = 3)	18 (n = 36)	32 (n = 64)	49 (n = 97)
B (N = 200)	0 (n = 0)	12 (n = 23)	30 (n = 59)	59 (n = 118)

Table 11 describes the percentage of targets hit by Company and distance (in meters), since the percentage of targets hit in the 50M to 200M target range is often used as a measure of close-range marksmanship.

Table 11

*Practice Record Fire: Percentage of Targets Hit by Company and Distance (in Meters)*

Company	% Hits by Target Distance (Meters)						
	50M to 200M (32t)*	50M (6t)	100M (8t)	150M (11t)	200M (7t)	250M (5t)	300M (3t)
A	62	68	58	69	50	44	20
B	55	58	49	65	44	38	15

\*The number in parenthesis followed by ‘t’ indicates the number of targets that were presented at the specified distance during the exercise.

Table 12 describes the percentage of targets hit by firing position and by single/multiple presentations of targets by Company.

Table 12

*Practice Record Fire: Percentage of Targets Hit by Firing Position and Single/Multiple Targets*

Company	% Hits on Target			
	Prone Position (30t)	Kneeling Position (10t)	Single Target (26t)	Multiple Target (14t)
A (N = 200)	51	60	57	55
B (N = 200)	46	52	50	50

### *CAT-C and Legacy Record Fire and Refire Outcomes Comparisons*

CAT-C and legacy training were compared based on record fire and refire performance scores of Company A (CAT-C) and of Fort Jackson BCT legacy BRM trained Soldiers obtained in FY08 as part of the WTSRA study (Cobb et al., 2009). Company B was excluded from this

comparison for two reasons. First, in the investigators' judgment, Company B applied the identified CAT-C techniques in a far less systematic and significantly less standardized manner than Company A. Therefore, investigators concluded that Company B was not representative of units that have fully integrated the CAT-C strategies and techniques into their BRM training. Second, as indicated in Table 13, Company B exhibited an extremely high attrition rate at reassessment which resulted in high performers being greatly overrepresented in their reassessment sample, as compared to the Company B sample at initial qualification as well as comparable samples from Company A and the legacy group.

Table 13  
*Confirmation of Zero, Attrition, and First Attempt Record Fire/Refire Performance for Companies A and B*

Company	Record Fire N Overall (% of Go) (N of Go)	Confirmation of Zero			Refire N Overall (% Go) (N of Go)
		Attempted N	% Confirmed	% Attrition	
A (n=230)	200 (60% Go) (n=120 Go)	166	96%	4%	160 (53% Go) (n=84 Go)
B (n=241)	181 (44% Go) (n=80 Go)	186	39%	61%	72 (57% Go) (n=41 Go)

As indicated in Table 13, the total number of Soldiers enrolled in Company A at the beginning of BCT was 230 Soldiers. Of this group, First Attempt Record Fire scores were collected for 200 Soldiers. Within this group, 120 Soldiers received a Go (60%). Prior to being allowed to refire, the investigators had participating Soldiers confirm their weapons' zero within 20 rounds. If a Soldier was not able to reconfirm his/her zero on his/her own, the results of their effort were recorded and the Soldier was given 20 additional rounds to attempt to meet the standard. During this second attempt, DSs could assist the Soldiers in any way, other than firing their weapons, to zero their weapons. Any Soldiers who failed to meet the standard after this second attempt were not allowed to refire on the qualification range. In Company A, 166 Soldiers attempted to confirm zero, of which 96% were successful. On the Refire assessment, 160 Soldiers from Company A participated, with a Go rate of 53%, meaning that these Soldiers had scores of 23 or more hits on target.

In Company B, the total enrollment at the outset of BCT was 241 Soldiers. At First Attempt Record Fire, data were collected on 181 Soldiers, of whom 80 received a Go (44%). At Confirmation of Zero for Refire, 186 Soldiers participated, increasing the number of participating Soldiers by five. Of this group, only 39% were able to confirm their weapon's zero, indicating a 61% attrition rate even with assistance. Of the 72 Soldiers who were allowed to participate in the Refire, the Go rate was 57%. However, as discussed earlier, investigators determined that the significant differences in applications of CAT-C training across BRM and

the lack of sample representativeness eliminated Company B from any additional comparisons with the legacy group.

Based on these findings, Company A was selected to represent AWG/CAT-C training for comparisons with the legacy group. The legacy group consisted of five Companies from Fort Jackson that were assessed during the WTSRA study in FY08. Within the CAT-C group, 23 Career Management Fields (CMFs) are represented, whereas for the legacy group, 4 CMFs are represented. The CAT-C group consisted of 160 matched cases, meaning that the investigators obtained both Record Fire and Refire scores for individual Soldiers. The legacy group consisted of 49 matched cases. Finally, the interval between Record Fire and Refire was 4 weeks for the CAT-C group and, due to AIT training schedules and the experimental design of the WTSRA study, 14 to 24 weeks for the legacy group.

Figure 1 illustrates comparisons of the first iteration Marksmanship scores for the CAT-C and legacy groups in terms of the number of rounds on target.

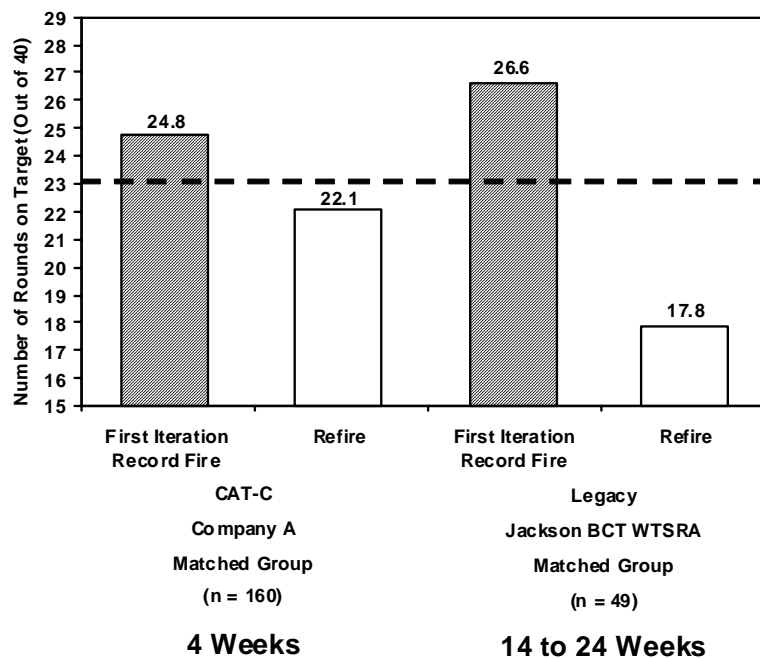


Figure 1. CAT-C versus Legacy: Number of Rounds on Target (Out of 40) at First Iteration Record Fire and Refire

Comparing the respective performance of the two groups indicated that Company A, with CAT-C trained Soldiers, showed a performance decline at a rate of approximately 0.68 rounds on target per week (from an average score of 24.8 (SD= 6.4) at Record Fire to 22.1 (SD=6.9) at Refire). Whereas, the Fort Jackson legacy group showed an average weekly rate of decline of approximately 0.46 rounds on target (from 26.6 (SD=5.0) to 17.8 (SD=6.1) rounds on target).<sup>12</sup>

<sup>12</sup> The rate of decline is based on the average length of interval between the two combined intervals of 14 and 24 weeks. The denominator used to provide the estimate of per week rate of decline was 19 weeks. In this case, 0.46 fewer rounds on target per week may present a very conservative estimate of the true rate of decline.

A similar pattern of results is indicated by Figure 2, which illustrates the percentage of Soldiers qualified on the first iteration for Company A and the Fort Jackson legacy group.

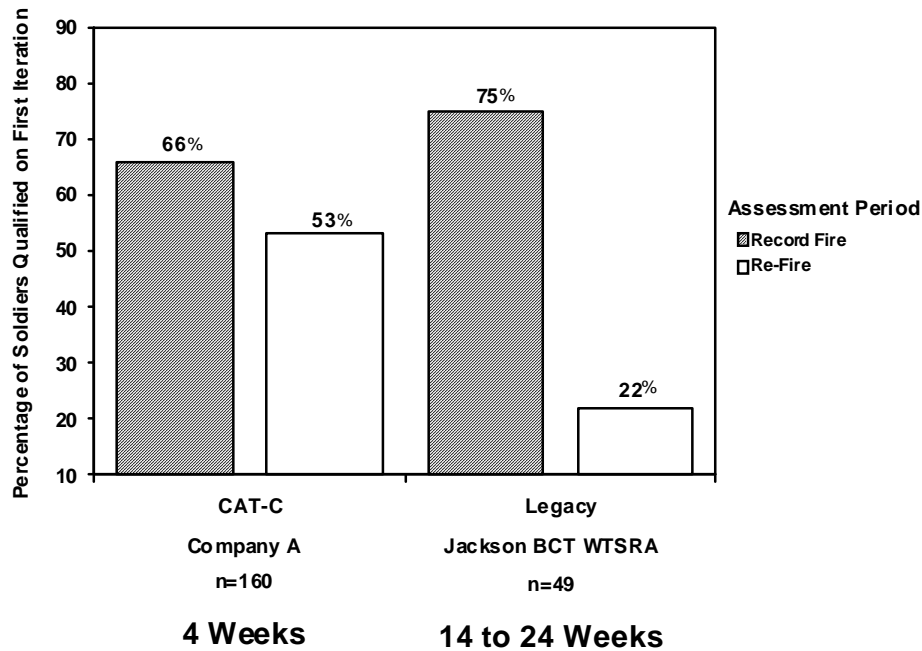


Figure 2. Percentage of Soldiers Qualified on First Iteration Record Fire and Refire for Company A (CAT-C) and Legacy Jackson BCT Groups

For Company A, a 13 percentage point decrease in the number of Soldiers qualified was found for the 4 week interval, indicating a rate of decline of approximately 3.3% per week. In the legacy Jackson BCT group, a 53% decrease in the number of Soldiers qualified was found for an averaged 19 week interval, indicating an approximate 2.9% per week rate of decline. Based on these general assessments, the overall rates of decline between the groups did not appear to differ substantially.<sup>13</sup>

Table 14 compares the CAT-C trained group (Company A) with the legacy group in terms of Marksmanship Score Categories. Table 14 presents the percentage of Soldiers within each score category based on the Soldiers' first iteration scores for the group who participated at Record Fire and Refire.

<sup>13</sup> The estimate for the rate of decline for the legacy group was calculated on the basis of an averaged 19 week interval. Based upon previous research (e.g., Wisher, Sabol, & Ellis, 1999), this is a conservative estimate of the true rate of decline. In addition, the rate of forgetting often described in psychological literature is curvilinear and based on measures taken at three or more points across a time interval; however, since measures were taken at only two points in this research effort, the investigators were limited to analyses based on a linear model of the decline (e.g., percent change per week).

Table 14

*Percentage of Soldiers in Marksmanship Score Categories by Training Type and Record Fire / Refire Assessment*

Training Type	Assessment	Percentage within Score Category*			
		Expert (36 – 40)	Sharpshooter (30 – 35)	Marksman (23 – 29)	Unqualified (22 & Below)
CAT-C	Record Fire (n=200)	2%	21%	39%	39%
	<b>4 Weeks</b> Refire (n=162)	0	17%	35%	48%
Legacy	Record Fire (n=343)	2%	19%	41%	38%
	<b>14 to 24 Weeks</b> Refire (n=51)	0	2%	24%	77%

\* Note. Reported values are +/- 1% due to rounding.

The high retention of Sharpshooters in the CAT-C group may be due to the shorter retention interval for this group, as well as differences in training techniques. In academic skill decay models (cf. Arthur, Bennett, Stanush, & McNelly, 1998; Adams, Webb, Angel, & Bryant, 2003), performance based skills tend to decay rapidly after training/testing is completed, even after adjusting for different levels of initial proficiency. Thus, the projected trend would tend to look more like the pattern exhibited by the legacy group.

Table 15 summarizes movement across the marksmanship categories in the CAT-C matched sample at First Iteration Record Fire and at Refire.

Table 15

*Change in AWG/CAT-C Marksmanship Score Categories (Matched Cases)*

	Refire Assessment (N=160)			
	Expert (36-40) (n=0)	Sharpshooter (30-35) (n=27)	Marksman (23-29) (n=57)	Unqualified (22 & Below) (n=76)
First Iteration Record Fire (N=160)				
Expert (36-40) (n=2)	0	1 (< 1%)	0	1 (< 1%)
Sharpshooter (30-35) (n=35)	0	14 (9%)	13 (8%)	8 (5%)
Marksman (23-29) (n=68)	0	7 (4%)	28 (18%)	33 (21%)
Unqualified (22 & Below) (n=55)	0	5 (3%)	16 (10%)	34 (21%)

Note. Reported values are +/- 1% due to rounding.

Of the two (2) Soldiers in the CAT-C group who were Expert marksmen (with scores between 36 and 40) at the First Iteration of Record Fire, one became a Sharpshooter and the other was Unqualified at the Refire four weeks later. Of the 35 Soldiers who were Sharpshooters, 14 remained Sharpshooters, 13 became Marksmen, and 8 were Unqualified. Of the 68 Soldiers who were Marksmen at the First Iteration of Record Fire, 7 became Sharpshooters, 28 remained Marksmen, and 33 became Unqualified. For the Unqualified group at Record Fire, 5 improved their skill and became Sharpshooters, 16 became Marksmen, and 34 remained Unqualified.

For purposes of comparison, Table 16 summarizes the changes in Marksmanship score categories for the Fort Jackson legacy group.

Table 16  
*Change in Fort Jackson Legacy BCT Marksmanship Score Categories (Matched Cases)*

<b>Refire Assessment (N = 49)</b>				
<b>First Iteration Record Fire (N=49)</b>	<b>Expert (36-40) (n=0)</b>	<b>Sharpshooter (30-35) (n=1)</b>	<b>Marksman (23-29) (n=10)</b>	<b>Unqualified (22 &amp; Below) (n=38)</b>
Expert (36-40) (n=2)	0	0	1 (2%)	1 (2%)
Sharpshooter (30-35) (n=8)	0	0	3 (6%)	5 (10%)
Marksman (23-29) (n=27)	0	0	6 (12%)	21 (43%)
Unqualified (22 & Below) (n=12)	0	1 (2%)	0	11 (22%)

Note. Reported values are +/- 1% due to rounding.

Comparing Tables 15 and 16, Experts are notably absent in the Refire assessment. In addition, both groups showed a significant decline in Sharpshooters and Marksmen over time.

Table 17 presents a comparison of the CAT-C and legacy groups by target distance and target type.

Table 17  
*Comparison of CAT-C and Legacy by Distance and Target Type on Record Fire, Average Number of Hits on Target*

<b>Group</b>	<b>N</b>	<b>50 to 200M (32 Targets)</b>	<b>250 to 300M (8 Targets)</b>	<b>Single (26 Targets)</b>	<b>Multiple (14 Targets)</b>
CAT-C	200	21.0	2.9	16.0	7.9
Legacy	343	22.9	3.6	17.7	9.0

## Discussion

Based on the results of this investigation, there were no significant differences in BRM performance outcomes and retention between the single AWG/CAT-C Company and the legacy group. Even the retention levels noted in the two groups were comparable, once differences in the time intervals between assessments were controlled for within the analysis. It must be noted that these results reflect the combined effects of integrating the identified AWG/CAT-C strategies and techniques into BRM and increasing hours of BRM training due to extending BCT to ten-weeks. As found in previous research (e.g., Dyer et al., 2009), these complimentary factors were confounded to a point where it simply was not possible to isolate the unique contributions of each. However, the overall pattern of results noted in this limited effort seem to provide additional support for the general contention that the greatest decrease in BRM skills occurs after BCT (i.e. as the time interval increases), especially for Soldiers attending AIT programs where additional marksmanship training is not required.

The results noted in this effort echoed those from the earlier WTSRA study (see Cobb et al., 2009) in highlighting how quickly Soldiers' ability to meet the established Army qualification standards erode during the interval between assessments (in this case, 4 weeks and 14 to 24 weeks respectively). This skill decay pattern is very prevalent for discrete (i.e., have 'a distinct starting and ending point') perceptual-motor skills, such as marksmanship. In a literature review conducted for the Canadian Department of National Defense, Adams et al. (2003) found that discrete perceptual-motor skills decay most rapidly and require the most frequent retraining to maintain a minimally acceptable level of performance. As discrete perceptual-motor skills, one would expect marksmanship skills to exhibit a far more rapid decay rate when compared to continuous perceptual-motor skills, such as driving a car or riding a bicycle.

Additional factors may have affected the Soldiers' performance in this research effort. First, as discussed earlier, the two Companies selected for this research identified their desired training outcomes very differently. Second, DSs held their Soldiers to different levels of proficiency within the two Companies. Since standardization and a fully familiarized cadre are essential to executing these new strategies, the differences in performance noted in this report certainly reflect differences in how AWG/CAT-C techniques were comprehended and implemented within the respective Companies.

Differences in training execution seemed to have had the greatest impact on the Soldiers' ability to confirm their weapons' zero before being allowed to refire the qualification scenario at the end of BCT. Although a very limited sampling, the fact that 61% of all the Soldiers within one Company had, in the judgment of the investigators, problems to the extent they could not successfully confirm their weapons' zero at this point in their training stands in stark contrast to the 96% success rate in the remaining Company.<sup>14</sup> Additionally, by examining each Soldier's target, it was determined that DSs who did not enforce tight, consistent shot groups during BRM 4 and 5 resulted in a much wider shot dispersion at greater ranges and increased confusion among the Soldiers about the required or desired standard/outcome. Since these DSs tended to

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<sup>14</sup> These outcomes were not compared to those in the legacy group, since the WTSRA study required the Soldiers, who were issued a new weapon from AIT, to return the weapons' sights to mechanical zero then attempt to zero them on their own in accordance with published Army conditions and standards (see Cobb et al., 2009).

be in one Company, these variations in the enforced standards impacted the outcomes noted in this research.

As discussed earlier, this effort also provided investigators with a unique opportunity to record detailed observations of the two Companies' BRM training. Based on these observations, investigators concluded that the Soldiers had a great deal of difficulty maintaining a steady firing position when they utilized the weapon's magazine for support, especially when wearing full battle gear. Frequently, the combination of equipment, body type, and firing point condition prevented Soldiers from getting low enough to sight the weapon from a stable position using this technique. This was especially apparent when the Soldiers were grouping and zeroing their weapons. Additionally, based on discussions with the DSs and Company leaders, using the magazine for support during record fire appeared to increase confusion about the differences between supported and unsupported positions.

As observed in earlier research efforts, the Soldiers participating in this effort struggled with equipment not consistently sized to their physical build and size. SAPI plates too large for the IBA resulted in the plate pushing up on the back of the advanced combat helmet (ACH) causing the front of the ACH to impede Soldiers' vision and ability to sight their weapons accurately on the firing range. Company A prepositioned a selection of sizes at each firing position for Soldiers to use during practice and record fire in order to minimize the impact of Soldiers wearing mismatched equipment on qualification outcomes.

Regardless of BRM event, investigators observed very little remediation to correct firing difficulties while on the firing range. As seen in the earlier WTSRA study (see Cobb et al., 2009), DSs largely relied upon continued firing attempts within a single BRM period to enable each Soldier to reach the prescribed standard. As the number of Soldiers experiencing difficulty dwindled, there was a greater tendency to leave the remaining Soldiers on the firing line and "feed" them ammunition for successive attempts. This continued until either the Soldier met standards, the Commander ordered a break in firing for the Soldier or determined that no more attempts to meet the standard would be permitted, or the Company could no longer fire due to environmental conditions or lack of ammunition.

Also, as described earlier, Company A applied the CAT-C technique of zeroing at 200M on the LOMAH range to improve short range marksmanship. Prior to training, the DSs were told by the range operator that the LOMAH system software had not been reprogrammed for this difference in the point of impact. As a result, the DSs would need to ignore the system determined adjustments and subjectively determine the necessary adjustments to move the strike of the rounds to the bottom of the displayed 11 inch circle in order to achieve a 200M zero. This resulted in each DS<sup>15</sup> having to subjectively determine how a Soldier should adjust his weapon's sights. Ultimately, the Soldiers completed this exercise when the DS determined that they were "close enough." The Soldiers did not have another opportunity to confirm zero before attempting to qualify with their weapons.

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<sup>15</sup> In some cases the Drill Sergeant was not available and the BCT Soldier who was operating the firing point equipment made the subjective decision.

Finally, investigators did not observe AWG based coaching strategies being used to focus on Soldiers both performing the task and demonstrating an understanding of their actions as described by the DSS Cadre and Currey (2008). While generally encouraged in previous DS training and the current TSPs, such coaching strategies are a key aspect of the AWG/CAT-C training. Thus, investigators concluded that, despite its emphasis as a selection criterion, neither Company selected for this research completely understood and fully implemented the desired coaching strategies and simply focused, to differing degrees, on those unique BRM techniques used during CAT-C/CART-C to illustrate how changes in training approaches could impact basic training.

### **Recommendations**

The results from this limited effort indicate that units should use at least a portion of the additional training time made available by the expansion of BCT to a ten-week schedule to expand their focus on basic BRM fundamentals such as achieving a stable firing position and tight shot group. Consistent with previous efforts (e.g. Smith, Osborne, Thompson, & Morey, 1980; Smith, Thompson et al., 1980), being able to achieve a stable firing position is essential to achieving a consistently tight shot group, and a tight shot group, in turn, is critical to effective record fire performance.

As discussed earlier, the Soldiers participating in this investigation had difficulty maintaining a steady firing position when utilizing the magazine for support when grouping and zeroing. This difficulty was amplified by the fatigue associated with prolonged, continuous firing attempts within the same BRM period. In order to reduce these effects, investigators recommend units use sandbags for support during grouping and zeroing. If desired, then eliminate the sandbags once Soldiers understand how to establish a stable firing position and have been able to ensure that their weapons are properly zeroed. This should provide the Soldiers with enough time and opportunities to adapt to using their weapons' magazines for support before record fire. Additionally, if CAT-C BRM techniques are adopted and implemented by the Army, the prone position within the record fire scenario and standards (see FM 3-22.9, USDA, 2008) should reflect the use of the magazine for support.

Based on training observations and discussions with Company leaders, there is a consistent desire to use a graduated approach in getting Soldiers comfortable and confident to firing in full battle gear. Based on this effort, units should consider incrementally increasing the equipment encumbrance Soldiers experience in the following manner: ACH and LBV through BRM 11; add OTV and SAPI plates during BRM 12 to prep for using full battle gear for qualification at BRM 13. In cases when IBAs are not available in appropriate sizes, units should preposition a selection of sizes at each firing position for Soldiers to use. However, Soldiers must be given a chance in practice record fire sessions to become comfortable with better fitting equipment and adjusting their gear at the firing position.

In order to eliminate much of the confusion regarding zeroing standards, investigators recommend the Army further clarify zeroing requirements for basic training. The investigators recommend that units should employ either a 200M or 300M zero, but not both, as well as utilize a standardized target with a 4cm circle at the appropriate point of impact for the 25M zero.

Additionally, due to units' inconsistent use of the LOMAH range to establish or confirm zero at distance, if CAT-C BRM techniques are adopted and implemented by the Army, the existing LOMAH software for a 200M zero and 5-round shot group should be modified in order to reduce subjectivity and increase the benefit of LOMAH feedback.

If integration of AWG/CAT-C techniques is implemented, use of desired coaching strategies within BRM training must be well established and accepted among DSs to be effective. Regardless of the specific BRM techniques being used, outcomes and training plans must be clearly understood and consistently applied across DSs during training. Inconsistent standards and outcomes increase confusion among Soldiers and hinder their capability to improve their performance regardless of the training strategies being employed.

Since this current effort provided a limited snapshot of two training Companies in the initial stages of implementing AWG/CAT-C strategies and techniques, additional research is needed to fully determine the utility of integrating new AWG/CAT-C training strategies in basic training. Additionally, focusing on limited performance outcomes (e.g., qualification scores, rounds to group or zero) does not provide a sufficient assessment of the utility of integrating these training techniques and strategies throughout basic training. Since AWG emphasizes Soldiers achieving a sound understanding of the factors contributing to success during BRM, future research should include assessments of their BRM related knowledge and the effectiveness of identified actions to improve BRM outcomes and performance.

### **Limitations and Future Research**

As discussed at several points in this report, this investigation provided an extremely limited examination of the impact of employing AWG/CAT-C strategies in BRM training. Limited comparisons of a legacy group with a single training Company is insufficient to assess accurately the potential impact of these new training strategies and techniques. Additional research is needed with training units that have had an opportunity to refine and mature their integration of these new training strategies and techniques. A larger sample size is also required to assess adequately their potential impact in training. However, as many of the BRM specific techniques identified in this effort continue to spread across training units, it will be increasingly difficult to identify an adequately comparative baseline sample for analysis.



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## Acronyms

ACH	Advanced Combat Helmet
ACU	Army Combat Uniform
AIT	Advanced Individual Training
ARI	U.S. Army Research Institute for the Behavioral and Social Sciences
ARNG	Army National Guard
AVG	Average
AWG	Asymmetric Warfare Group
BCT	Basic Combat Training
BDC	Bullet Drop Compensator
BRM	Basic Rifle Marksmanship
CAT-C	Combat Application Training Course
CART-C	Combat Assault Rifle Training Course
CG	Commanding General
CMF	Career Management Field
CMP	Course Management Plan
DBCT	Directorate of Basic Combat Training
DN	Department of the Navy
DS	Drill Sergeant
DSS	Drill Sergeant School
EST	Engagement Skills Trainer
FM	Field Manual
GED	General Education Development
HS	High School
IBA	Interceptor Body Armor
IET	Initial Entry Training
LBV	Load Bearing Vest
LOMAH	Location of Miss and Hit
MCRP	Marine Corps Reference Publication
MOS	Military Occupational Specialty
NCO	Noncommissioned Officer
OSUT	One Station Unit Training
OTV	Outer Tactical Vest

POI	Program of Instruction
RA	Regular Army
SAPI	Small Arms Protective Insert
SD	Standard Deviation
SME	Subject Matter Expert
SPORTS	Slap, Pull, Observe, Release, Tap, Squeeze (or Safe)
TSP	Training Support Package
TRADOC	Training and Doctrine Command
USABCTCoE	United States Army Basic Combat Training Center of Excellence
USAR	United States Army Reserve
USMC	United States Marine Corps
WTSRA	Warrior Tasks Skills Retention Assessment

**APPENDIX A**  
**OBSERVATION AND TESTING PROTOCOLS**

# BRM 1 (Introduction to Basic Rifle Marksmanship and Mechanical Training) Observer's Guide

## GOAL

The goal of observing the training event is to document how the lesson plan is implemented, what equipment is used, and what, if any, variations there are from the TSP.

## Observer DUTIES

- Carefully prepare in advance of the event, i.e. familiarize yourself with all the training devices used, ensure you have a copy of the most current TSP, etc.
- Observe the initial instructions to the Soldier(s), and observe as many aspects of the training as possible.
- Use multiple guides to capture data if necessary.
- After the event, organize all notes and protocols, then deliver them to the Data Compiler.

## ADMINISTRATIVE DATA

1. Observer's Name \_\_\_\_\_
2. Date of Observation \_\_\_\_\_
3. Training Observation Start Time (24 hr clock) \_\_\_\_\_
4. Training Observation Stop Time (24 hr clock) \_\_\_\_\_
5. Installation \_\_\_\_\_
6. Training Unit \_\_\_\_\_
7. Number of Soldiers assigned \_\_\_\_\_
8. Number of Soldiers present for training \_\_\_\_\_
9. TSP Name/Date/Version (if applicable) \_\_\_\_\_
10. Local Title of Exercise (if applicable) \_\_\_\_\_
11. Training Location \_\_\_\_\_

1. What are the weather conditions during training (select one)?

- N/A (Indoor Training)
- Sunny and clear
- Overcast
- Rain
- Snow

Approximate Temperature \_\_\_\_\_

2. Who is the instructor (select all that apply)?

- Civilian Contractor
- Training Cadre
- Drill Sergeant

3. What is the **Instructor and/or Drill Sergeant** to Soldier Ratio (select one)?

- 1:15 – 1:30
- 1:30 – 1:45
- 1:45 – 1:60
- 1:60 or more

Write in ratio \_\_\_\_\_

4. Are the Assistant Instructors/Drill Sergeants assisting in training (select one)?

- Yes
- No

How?

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5. How are the Soldiers being trained?
- Small Group (1 – 15 Soldiers, same instructor)
  - Small Group (1 – 15 Soldiers, round robin stations)
  - Platoon Size Group
  - Large Group (All Soldiers at one time)
6. What uniform are the Soldiers wearing (select one)?
- ACUs and Patrol Cap
  - ACUs, LBV, and Kevlar
  - ACUs, LBV, IBA, and Kevlar
  - ACUs, LBV, IBA w/SAPI plates, Eye protection, and Kevlar
7. What type of weapon is being used (select one)?
- M16A1 or A3 (Automatic)
  - M16A2 (Burst)
  - M4 (burst)
8. Select the training aids/devices that apply.
- M16A1 Front Sight (Mock-up)
  - M16A1 Rear Sight (Mock-up)
  - M16A1 Disassembly Mat
  - M16 Rifle Cleaning Kit
  - 5.56mm Dummy Ammunition
9. What tasks are being trained (select all that apply)?
- M16 Rifle capabilities and characteristics

- △ M16 Rifle Disassembly and Assembly
- △ Conduct Preventive Maintenance Checks and Services on an M16/M4 Series Rifle
- △ M16 Rifle Function Check
- △ Load and Unload an M16/M4 Series Rifle Magazine
- △ Load and Unload an M16/M4 Series Rifle
- △ Correct Malfunctions of an M16/M4 Series Rifle
- △ Adjust Front and Rear Sights on the M16/M4 Series Rifle
- △ Standard Firing Positions

10. How much hands-on training do the Soldiers receive (select one)?

- 1 – 5 minutes
- 5 – 10 minutes
- over 10 minutes

11. What is the percentage of Soldiers waiting to train (select one)?

- 10%
- 20%
- 30%
- 40% or more

12. How much time are the Soldiers waiting to train (select one)?

- no waiting
- 5 minutes or less
- 5 to 10 minutes
- 10 minutes or more



13. List the AWG/CART-C techniques being taught.

- Δ Ballistics (Minute of Angle (MOA))
- Δ Magazine supported firing position (Prone)
- Δ Barricade supported firing position (Standing and Kneeling)
- Δ 5 round shot group
- Δ Blank paper grouping technique
- Δ Upside down 25 meter zero target (point of aim – center mass / point of impact – head of silhouette)
- Δ 25 meter zero target with red boxes (point of aim – center mass / point of impact – bottom of silhouette)
- Δ Confirming zero @ 175M / 200 yards (LOMAH)
- Δ Rapid Magazine Change
- Δ Graduated level of uniform

Other

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14. List any significant differences from the TSP.

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15. What is the units' expected outcome for this period of instruction?

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16. What is the units' performance metric for measuring the Soldiers ability to perform each task to standard?

△ Written Test

△ Hands-on Evaluation

17. List any Concurrent training stations.

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18. List any Reinforcement Training.

Scheduled

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Unscheduled

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# Rifle Marksmanship Fundamentals (BRM 2 and 3) Observer's Guide

## GOAL

The goal of observing the training event is to document how the lesson plan is implemented, what equipment is used, and what, if any, variations there are from the TSP.

## Observer DUTIES

- Carefully prepare in advance of the event, i.e. familiarize yourself with all the training devices used, ensure you have a copy of the most current TSP, etc.
- Observe the initial instructions to the Soldier(s), and observe as many aspects of the training as possible.
- Use multiple guides to capture data if necessary.
- After the event, organize all notes and protocols, then deliver them to the Data Compiler.

## ADMINISTRATIVE DATA

Observer's Name \_\_\_\_\_

Date of Observation \_\_\_\_\_

Training Observation Start Time (24 hr clock) \_\_\_\_\_

Training Observation Stop Time (24 hr clock) \_\_\_\_\_

Installation \_\_\_\_\_

Training Unit \_\_\_\_\_

Number of Soldiers assigned \_\_\_\_\_

Number of Soldiers present for training \_\_\_\_\_

TSP Name/Date/Version (if applicable) \_\_\_\_\_

Local Title of Exercise (if applicable) \_\_\_\_\_

Training Location \_\_\_\_\_

**Training Outcomes**

**Units' scheduled training:**

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**Units' desired training outcome**

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**Company Commanders method for determining successful outcome.**

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Did the unit achieve the desired outcome? (Circle YES or NO)

YES                  NO

Do the desired outcomes match the TSP Standards? (Circle YES or NO)

YES                  NO

**Units' scheduled training:**

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**Units' desired training outcome**

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**Company Commanders method for determining successful outcome.**

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Did the unit achieve the desired outcome? (Circle YES or NO)

YES                  NO

Do the desired outcomes match the TSP Standards? (Circle YES or NO)

YES                  NO

**Units' scheduled training:**

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**Units' desired training outcome**

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**Company Commanders method for determining successful outcome.**

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Did the unit achieve the desired outcome? (Circle YES or NO)

YES                  NO

Do the desired outcomes match the TSP Standards? (Circle YES or NO)

YES                  NO

**Units' scheduled training:**

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**Units' desired training outcome**

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**Company Commanders method for determining successful outcome.**

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Did the unit achieve the desired outcome? (Circle YES or NO)

YES                  NO

Do the desired outcomes match the TSP Standards? (Circle YES or NO)

YES                  NO

## **BRM 2 and 3 TSP Tasks and Standards**

**TSP Task:** *Learn the Fundamentals of Marksmanship* (4 fundamentals- steady position, aiming, breath control, and trigger squeeze). Firing positions (prone supported, prone unsupported, and kneeling). “Peer Coaching” techniques. Range and Safety Procedures (weapons safety, unsafe acts), cease fire (verbal and visual signals), tower commands, and entering / exiting the firing line.

**TSP Standard:** *Received the fundamentals of marksmanship.*

**TSP Task:** *Maintain an M16/M4 Series Rifle*

**TSP Standard:** *The Soldiers performance will be evaluated by successfully performing a function check after completing disassembly & assembly of their weapon*

**TSP Tasks:** *Demonstrate Consistent Aiming*

**TSP Standard:** *Each Soldier will acquire a sight picture six consecutive times without error and dry fire two consecutive three-round shot-groups that will fit within a 2-centimeter circle.*

**TSP Task:** *Conduct Dime or Washer Exercise*

**TSP Standard:** *Execute six out of six consecutive (Dry-fire) shots during shot grouping without dropping the dime or washer in the prone while following range safety procedures.*

**TSP Task:** *Correct Malfunctions of an M16/M4-series Rifle.*

**TSP Standard:** *Each Soldier must demonstrate the ability to reduce a stoppage by applying the six steps of immediate action (SPORTS).*

**TSP Task:** *Demonstrate the Integrated Act of Firing Using the EST 2000 (EST 2000 Exercise Number A002)*

**TSP Standard:** *Achieved 6 consecutive shots (two 3 round shot groups) inside a 4 cm circle within 27 rounds.*

Skill / Knowledge	Introductory Training Technique	Intro Time	Reinforcement Training Techniques and Skill Application Exercise	Time (per individual, exercise, or order)	Drill Sergeant Reinforcement/Feedback Techniques and Remarks
	L - lecture/conference D - demonstration G - guided demo E – unguided exploratory P – practical application - self/individual B – practical application – with/battle buddy/peer		E – unguided exploratory P – practical application - self/individual B – practical application – with/battle buddy/peer T – table fired or exercise performed to evaluate (write in)		D2 - Directive- “do as I say’ I - Interrogative – “You determine solution” C - Combined – “we’ll figure it out together”
<b>Fundamentals</b>					
Steady position					
Aiming					
Breath Control					
Trigger Squeeze					
Follow-thru (5 <sup>th</sup> fundamental from CART-C)					
<b>Firing Positions</b>					
prone supported (sandbags)					
prone supported (magazine)					
prone unsupported					
kneeling					
kneeling (barricade supported)					
standing (barricade supported)					
<b>Range Operations/Procedures</b>					
Safety					

Skill / Knowledge	Introductory Training Technique	Intro Time	Reinforcement Training Techniques and Skill Application Exercise	Time (per individual, exercise, or order)	Drill Sergeant Reinforcement/Feedback Techniques and Remarks
	L - lecture/conference D - demonstration G - guided demo E – unguided exploratory P – practical application - self/individual B – practical application – with/battle buddy/peer		E – unguided exploratory P – practical application - self/individual B – practical application – with/battle buddy/peer T – table fired or exercise performed to evaluate (write in)		D2 - Directive- “do as I say” I - Interrogative – “You determine solution” C - Combined – “we’ll figure it out together”
Tower Commands					
Entering and exiting procedures					
<b>SPORTS</b>					
<b>CART-C Techniques</b>					
Last “S” in SPORTS is “Safe”					
Graduated level of uniform (ACU – ACU and LBV – ACU, LBV, and IBA, etc)					
Ballistics (Minute of Angle (MOA) Adjustments)					
Rapid Magazine Change					
4 rules of the range Treat the weapons as loaded Don't point weapon at anything unless you intend to shoot Weapon on “Safe” and finger off the trigger Maintain situational awareness					
“Press Check” (The action of pull the charging handle back slightly to check if the weapon is loaded by seeing the brass casing in the chamber “AWGism”)					
Magazine supported firing position (Prone)					
Barricade supported firing position (Standing and Kneeling)					

Skill / Knowledge	Introductory Training Technique	Intro Time	Reinforcement Training Techniques and Skill Application Exercise	Time (per individual, exercise, or order)	Drill Sergeant Reinforcement/Feedback Techniques and Remarks
	L - lecture/conference D - demonstration G - guided demo E – unguided exploratory P – practical application - self/individual B – practical application – with/battle buddy/peer		E – unguided exploratory P – practical application - self/individual B – practical application – with/battle buddy/peer T – table fired or exercise performed to evaluate (write in)		D2 - Directive- “do as I say’ I - Interrogative – “You determine solution” C - Combined – “we’ll figure it out together”
5 round shot group					
Blank paper grouping technique					
200 meter zero – rounds impacting 1 to 1.5 inches below center mass of silhouette on 25 meter standard zero target.					
Upside down 25 meter zero target (point of aim – center mass / point of impact – head of silhouette)					
25 meter zero target with red boxes (point of aim – center mass / point of impact – bottom of silhouette)					
Confirming zero @ 175 meters / 200 yards (LOMAH)					
<b>Ballistics</b>					

## BRM 4 (Grouping) Observer's Guide

### GOAL

The goal of observing the training event is to document how the lesson plan is implemented, what equipment is used, and what variations, if any, there are from the TSP.

### Observer Duties

- Carefully prepare in advance of the event, i.e. familiarize yourself with all the training devices used, ensure you have a copy of the most current TSP, etc.
- Observe the initial instructions to the Soldier(s) and observe as many aspects of the training as possible.
- Use multiple guides to capture data, if necessary.
- After the event, organize all notes and protocols, then deliver them to the Data Compiler.

### ADMINISTRATIVE DATA

Observer's Name \_\_\_\_\_

Date of Observation \_\_\_\_\_

Training Observation Start Time (24 hr clock) \_\_\_\_\_

Training Observation Stop Time (24 hr clock) \_\_\_\_\_

Installation \_\_\_\_\_

Training Unit \_\_\_\_\_

Number of Soldiers assigned \_\_\_\_\_

Number of Soldiers present for training \_\_\_\_\_

TSP Name/Date/Version (if applicable) \_\_\_\_\_

Local title of exercise (if applicable) \_\_\_\_\_

Training Location \_\_\_\_\_

## Training Outcomes

**Units' scheduled training:**

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**Units' desired training outcome**

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**Company Commanders method for determining successful outcome.**

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Did the unit achieve the desired outcome? (Circle YES or NO)

YES

NO

Do the desired outcomes match the TSP Standards? (Circle YES or NO)

YES

NO

### **TSP Task and Standard**

**Task:** Conduct Shot Grouping Exercise

**Standard:** *From the prone supported firing position, fire 6 consecutive shots (two 3 round shot groups) inside the same 4cm circle target hits by correctly applying the fundamentals of marksmanship.*

## Questions for Soldiers

**Procedures:** Position yourself on the range where you will have access to the Soldiers as they come off the firing line (RSO is optimum). After the Soldier is cleared off the range, identify the Soldier by assigned ID number and annotate in column 1 of the Soldier Response Spreadsheet. Ask the Soldier the below listed questions and annotate their response in the appropriate column.

1. Did you group?

Annotate in column 2.

2. How many rounds did you fire when grouping?

Annotate in column 3.

3. Were the sights moved at all during the grouping exercise?

Annotate in columns 4.

4. Who moved the sights?

Annotate in column 5.

### Soldier Response Sheet

<b>ID Number</b>	<b>Grouped (Yes or No)</b>	<b>Number of Rounds fired</b>	<b>Were the sights moved (Yes or No)</b>	<b>Who moved the sights (Drill Sergeant, Soldier, Peer Coach)</b>
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
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36				
37				
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39				
40				

## Grouping on a 25-meter range

The organization and conduct of a grouping range are based on the availability of ammunition, number of personnel, and the firing ability of personnel in training.

1. The unit is divided into firing orders. The first order fires while the second order coaches. Firing points are reserved to conduct corrective instruction.
2. Sandbags should be provided at each firing point to accommodate supported firing positions.
3. Each shot is fired using the same aiming point (center of mass) from a supported firing position.
4. Each Soldier ensures his sights are set for 25-meter firing.
  - a. Ensure M16A1 rear sight is set on the aperture marked L.
  - b. Ensure proper rear sight setting to zero (M16A2/3=8/3+1, M16A4=6/3+2, M4=6/3).
  - c. Ensure the rear sight aperture is set on 300+1, not 800+1.
  - d. Ensure small aperture is being used.
5. The Soldier fires a three-round shot group at the 25-meter zero target. The firing line is cleared, and he moves downrange to examine the shot group. The Soldier and coach examine the shot group for fundamental errors, triangulate the shot group and put the number 1 in the center of the shot group.
6. If the shot group is off of the 25-meter zero target the weapon should be mechanically zeroed. If the shot group is barely on the target a bold adjustment should be made.
7. Each shot is fired using the same aiming point (center of mass). The objective is to fire tight shot groups and to place those shot groups inside a 4-centimeter circle (the actual location of groups on the target is not important).
8. The Soldier returns to the firing line and fires a second three-round shot group.
9. The firing line is cleared, and he moves downrange to examine the second shot group, triangulate, and mark the center of the shot group with the number 2. The Soldier groups the two shot groups and marks the center.
10. Steps 1 through 8 are repeated until the Soldier places six out of six consecutive rounds inside a 4-centimeter circle. (The majority of the round must be inside the circle or it is not counted). If the Soldier is not grouped in 18 rounds, he should be removed from the firing line and given remedial training before attempting to group again.

11. Once firing proficiency has been demonstrated from the supported firing position, grouping exercises can be conducted from the unsupported firing position. For example, 27 rounds are allocated for the grouping exercise, if the Soldier groups in 18 rounds, he can fire the remaining 9 rounds from the unsupported firing position.

Skill / Knowledge	Introductory Training Technique	Intro Time	Reinforcement Training Techniques and Skill Application Exercise	Time (per individual, exercise, or order)	Drill Sergeant Reinforcement/Feedback Techniques and Remarks
	L – lecture/conference D – demonstration G – guided demo E – unguided exploratory P – practical application – self/individual B – practical application – with/battle buddy/peer		E – unguided exploratory P – practical application – self/individual B – practical application – with/battle buddy/peer T – table fired or exercise performed to evaluate (write in)		D2 – Directive- “do as I say’ I – Interrogative – “You determine solution” C – Combined – “we’ll figure it out together”
<b>Fundamentals</b>					
Steady position					
Aiming					
Breath Control					
Trigger Squeeze					
Follow-thru (5 <sup>th</sup> fundamental from CART-C)					
<b>Concurrent Training</b>					
Dime / Washer Exercise					
Consistent Aiming Exercises					
SPORTS					
Rapid Magazine Change					
<b>CART-C Techniques</b>					
Graduated level of uniform (ACU – ACU and LBV – ACU, LBV, and IBA, etc)					

Skill / Knowledge	Introductory Training Technique	Intro Time	Reinforcement Training Techniques and Skill Application Exercise	Time (per individual, exercise, or order)	Drill Sergeant Reinforcement/Feedback Techniques and Remarks
	L – lecture/conference D – demonstration G – guided demo E – unguided exploratory P – practical application – self/individual B – practical application – with/battle buddy/peer		E – unguided exploratory P – practical application – self/individual B – practical application – with/battle buddy/peer T – table fired or exercise performed to evaluate (write in)		D2 – Directive- “do as I say’ I – Interrogative – “You determine solution” C – Combined – “we’ll figure it out together”
Ballistics (Minute of Angle (MOA) Adjustments)					
Rapid Magazine Change					
4 rules of the range Treat the weapons as loaded Don’t point weapon at anything unless you intend to shoot Weapon on “Safe” and finger off the trigger Maintain situational awareness					
“Press Check” (The action of pull the charging handle back slightly to check if the weapon is loaded by seeing the brass casing in the chamber “AWGism”)					
Magazine supported firing position (Prone)					
Barricade supported firing position (Standing and Kneeling)					
5 round shot group					
Blank paper grouping technique					

## BRM 5 (Zeroing) Observer's Guide

### GOAL

The goal of observing the training event is to document how the lesson plan is implemented, what equipment is used, and what, if any, variations there are from the TSP.

### Observer Duties

- Carefully prepare in advance of the event, i.e. familiarize yourself with all the training devices used, ensure you have a copy of the most current TSP, etc.
- Observe the initial instructions to the Soldier(s) and observe as many aspects of the training as possible.
- Use multiple guides to capture data, if necessary.
- After the event, organize all notes and protocols, then deliver them to the Data Compiler.

### ADMINISTRATIVE DATA

Observer's Name \_\_\_\_\_

Date of Observation \_\_\_\_\_

Training Observation Start Time (24 hr clock) \_\_\_\_\_

Training Observation Stop Time (24 hr clock) \_\_\_\_\_

Installation \_\_\_\_\_

Training Unit \_\_\_\_\_

Number of Soldiers assigned \_\_\_\_\_

Number of Soldiers present for training \_\_\_\_\_

TSP Name/Date/Version (if applicable) \_\_\_\_\_

Local Title of Event (if applicable) \_\_\_\_\_

Training Location \_\_\_\_\_

## Training Outcomes

**Units' scheduled training:**

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**Units' desired training outcome**

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**Company Commanders method for determining successful outcome.**

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Did the unit achieve the desired outcome? (Circle YES or NO)

YES                  NO

Do the desired outcomes match the TSP Standards? (Circle YES or NO)

YES                  NO

### TSP Task and Standard

**Task:** Zero an M16/M4 Series Rifle

**TSP Standard:** *From a prone supported firing position, adjusts the sights so 5 out of 6 rounds fired in two consecutive shot-groups strike within the 4cm circle on the 25m zero target*

## Questions for Soldiers

**Procedures:** Position yourself on the range where you will have access to the Soldiers as they come off the firing line (RSO is optimum). After the Soldier is cleared off the range, identify the Soldier by assigned ID number and annotate in column 1 of the Soldier Response Spreadsheet. Take the 25m zero target from them and count the holes (turning the target over as necessary) annotate the amount of rounds fired in column 3. Ask the Soldier the below listed questions and annotate their response in the appropriate column.

5. Did you zero?

Annotate in column 2.

6. How many rounds did it take you to zero (verify by matching to the number you determined by counting holes)?

Annotate in column 3.

7. Who determined the sight adjustments?

Annotate in columns 4 – 6.

8. Who made the sight adjustments?

Annotate in column 7 – 9.

9. At what point during your zeroing did the assistance start?

Annotate in column 10

Soldier Response Sheet

ID Number	Zeroed (Yes or No)	Number of Rounds fired	Who determined sight adjustments (Drill Sergeant, Soldier, Peer Coach)	Who moved the sights (Drill Sergeant, Soldier, Peer Coach)
1				
2				
3				
4				
5				
6				
7				
8				
9				
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11				
12				
13				
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36				
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38				
39				

## **Zeroing on a 25 meter range**

All Soldiers should successfully group prior to zeroing. If the unit is proficient at grouping, then two (2) shot groups should be fired to confirm proficiency prior to making any sight adjustments during zeroing procedures.

1. The unit is divided into firing orders. The first order fires while the second order coaches. Firing points are reserved to conduct corrective instruction. When using smaller ranges, the unit should be divided into three or more orders.
2. Sandbags should be provided at each firing point to accommodate supported firing positions.
3. Each shot is fired using the same aiming point (center of mass of the target) from a supported firing position.
4. Each Soldier ensures his sights are set for 25-meter zeroing.
5. The Soldier fires a three-round shot group at the 25-meter zero target. The firing line is cleared, and he moves downrange to examine the shot group. The Soldier examines the shot group for fundamental errors, triangulates the shot group and puts the number 1 in the center of the shot group.
6. Initially the Soldier should fire two individual shot groups before a sight change is considered. If the initial shot group is not on paper the weapon should be mechanically zeroed before the Soldier fires this weapon again.
7. The Soldier returns to the firing line and fires a second three-round shot group.
8. The firing line is cleared, and he moves downrange to examine the second shot group, triangulate and mark the center of the shot group with the number 2. The Soldier groups the two shot groups and marks the center of the two shot groups with an X. If the two shot groups fall within a 4-centimeter circle the firer determines what sight adjustments need to be made, identifies the closest horizontal and vertical lines to the X, and then reads the 25-meter zero target to determine the proper sight adjustments to make. If the two shot groups did not fall within a 4-centimeter circle the Soldier continues grouping.
9. The Soldier then annotates any sight adjustments that need to be made to the weapon on the 25-meter zero target and ensures his name is also on the target. If five out of six rounds fell within the 4-centimeter circle the Soldier is zeroed and can be removed from the firing line. (The majority of the round must be inside the circle to be counted.)
10. The unzeroed Soldier returns to the firing line and makes sight adjustments.

11. Steps 1 through 8 are repeated until the Soldier places five out of six consecutive rounds inside the 4-centimeter circle. If the Soldier is not zeroed in 18 rounds, he should be removed from the firing line and given remedial training before attempting to zero again.
  
12. Once firing proficiency has been demonstrated from the supported firing position, zeroing exercises can be conducted from the unsupported firing position. For example, 18 rounds are allocated for the zeroing exercise; if the Soldier zeroes in 9 rounds, the Soldier can fire the remaining 9 rounds from the unsupported firing position.

Skill / Knowledge	Introductory Training Technique	Intro Time	Reinforcement Training Techniques and Skill Application Exercise	Time (per individual, exercise, or order)	Drill Sergeant Reinforcement/Feedback Techniques and Remarks
	L - lecture/conference D - demonstration G - guided demo E - unguided exploratory P - practical application - self/individual B - practical application - with/battle buddy/peer		E - unguided exploratory P - practical application - self/individual B - practical application - with/battle buddy/peer T - table fired or exercise performed to evaluate (write in)		D2 - Directive- "do as I say" I - Interrogative - "You determine solution" C - Combined - "we'll figure it out together"
<b>Fundamentals</b>					
Steady position					
Aiming					
Breath Control					
Trigger Squeeze					
Follow-thru (5 <sup>th</sup> fundamental from CART-C)					
<b>Concurrent Training</b>					
Dime / Washer Exercise					
Consistent Aiming Exercises					
SPORTS					
Rapid Magazine Change					
<b>CART-C Techniques</b>					
Last "S" in SPORTS is "Safe"					

Skill / Knowledge	Introductory Training Technique	Intro Time	Reinforcement Training Techniques and Skill Application Exercise	Time (per individual, exercise, or order)	Drill Sergeant Reinforcement/Feedback Techniques and Remarks
	L - lecture/conference D - demonstration G - guided demo E – unguided exploratory P – practical application - self/individual B – practical application – with/battle buddy/peer		E – unguided exploratory P – practical application - self/individual B – practical application – with/battle buddy/peer T – table fired or exercise performed to evaluate (write in)		D2 - Directive- “do as I say’ I - Interrogative – “You determine solution” C - Combined – “we’ll figure it out together”
Graduated level of uniform (ACU – ACU and LBV – ACU, LBV, and IBA, etc)					
Ballistics (Minute of Angle (MOA) Adjustments) (Sight Adjustments)					
Rapid Magazine Change					
4 rules of the range Treat the weapons as loaded Don’t point weapon at anything unless you intend to shoot Weapon on “Safe” and finger off the trigger Maintain situational awareness					
“Press Check” (The action of pull the charging handle back slightly to check if the weapon is loaded by seeing the brass casing in the chamber “AWGism”)					
Magazine supported firing position (Prone)					
Barricade supported firing position (Standing and Kneeling)					
5 round shot group					

Skill / Knowledge	Introductory Training Technique	Intro Time	Reinforcement Training Techniques and Skill Application Exercise	Time (per individual, exercise, or order)	Drill Sergeant Reinforcement/Feedback Techniques and Remarks
	L - lecture/conference D - demonstration G - guided demo E - unguided exploratory P - practical application - self/individual B - practical application - with/battle buddy/peer		E - unguided exploratory P - practical application - self/individual B - practical application - with/battle buddy/peer T - table fired or exercise performed to evaluate (write in)		D2 - Directive- "do as I say" I - Interrogative - "You determine solution" C - Combined - "we'll figure it out together"
Blank paper grouping technique					

## BRM 6 (Downrange Feedback) Observer's Guide

### GOAL

The goal of observing the training event is to document how the lesson plan is implemented, what equipment is used, and what, if any, variations there are from the TSP.

### Observer Duties

- Carefully prepare in advance of the event, i.e. familiarize yourself with all the training devices used, ensure you have a copy of the most current TSP, etc.
- Observe the initial instructions to the Soldier(s) and observe as many aspects of the training as possible.
- Use multiple guides to capture data, if necessary.
- After the event, organize all notes and protocols, then deliver them to the Data Compiler.

### ADMINISTRATIVE DATA

Observer's Name \_\_\_\_\_

Date of Observation \_\_\_\_\_

Training Observation Start Time (24 hr clock) \_\_\_\_\_

Training Observation Stop Time (24 hr clock) \_\_\_\_\_

Installation \_\_\_\_\_

Training Unit \_\_\_\_\_

Number of Soldiers assigned \_\_\_\_\_

Number of Soldiers present for training \_\_\_\_\_

TSP Name/Date/Version (if applicable) \_\_\_\_\_

Local Title of Event (if applicable) \_\_\_\_\_

Training Location \_\_\_\_\_

## Training Outcomes

**Units' scheduled training:**

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**Units' desired training outcome**

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**Company Commanders method for determining successful outcome.**

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Did the unit achieve the desired outcome? (Circle YES or NO)

YES                      NO

Do the desired outcomes match the TSP Standards? (Circle YES or NO)

YES                      NO

### TSP Task and Standard

**TSP task:** Obtain Downrange Feedback at 75, 175, and 300M (KD Range 100, 200, 300 yards)

**TSP Standard:** *Obtained eight hits out of ten shots on the 75 meter (100 yards) target; fourteen hits out of twenty shots on the 175 meter (200 yard) target; and five hits out of ten shots on the 300 meter (300 yard) target*

(If the range is equipped with the LOMAH system the coach will be used to operate the LOMAH. When using LOMAH the zero confirmation is part of the program and will be shot as the first scenario. The Soldier will shoot six rounds at the 175M/200yd target while aiming center mass of the target. If the shot group falls within the 11-inch circle on the LOMAH monitor the Soldier will continue the Programmed scenario, which is identical to the Down Range Feedback scenario without LOMAH. If the Soldier shoots a shot group that is 11-inches or smaller but is clearly not zeroed then the Drill Sergeant/trainer should assist the Soldier in making sight adjustments based upon the data provided on the LOMAH monitor. If the shot group is not a tight shot group, greater than 11-inches, then the Soldier should be removed from the firing line and receive remedial training on the four fundamentals. The Soldier will then be placed in the last firing order. If ammunition is available, this Soldier should fire the zero confirmation exercise again, before proceeding to downrange feedback exercise.)

Skill / Knowledge	Introductory Training Technique	Intro Time	Reinforcement Training Techniques and Skill Application Exercise	Time (per individual, exercise, or order)	Drill Sergeant Reinforcement/Feedback Techniques and Remarks
	L - lecture/conference D - demonstration G - guided demo E – unguided exploratory P – practical application - self/individual B – practical application – with/battle buddy/peer		E – unguided exploratory P – practical application - self/individual B – practical application – with/battle buddy/peer T – table fired or exercise performed to evaluate (write in)		D2 - Directive- “do as I say’ I - Interrogative – “You determine solution” C - Combined – “we’ll figure it out together”
<b>Fundamentals</b>					
Steady position					
Aiming					
Breath Control					
Trigger Squeeze					
Follow-thru (5 <sup>th</sup> fundamental from CART-C)					
<b>Firing Positions</b>					
prone supported (sandbags)					
prone supported (magazine)					
prone unsupported					
kneeling					
kneeling (barricade supported)					
standing (barricade supported)					

Skill / Knowledge	Introductory Training Technique	Intro Time	Reinforcement Training Techniques and Skill Application Exercise	Time (per individual, exercise, or order)	Drill Sergeant Reinforcement/Feedback Techniques and Remarks
	L - lecture/conference D - demonstration G - guided demo E – unguided exploratory P – practical application - self/individual B – practical application – with/battle buddy/peer		E – unguided exploratory P – practical application - self/individual B – practical application – with/battle buddy/peer T – table fired or exercise performed to evaluate (write in)		D2 - Directive- “do as I say’ I - Interrogative – “You determine solution” C - Combined – “we’ll figure it out together”
<b>CART-C Techniques</b>					
Last “S” in SPORTS is “Safe”					
Graduated level of uniform (ACU – ACU and LBV – ACU, LBV, and IBA, etc)					
Rapid Magazine Change					
4 rules of the range Treat the weapons as loaded Don’t point weapon at anything unless you intend to shoot Weapon on “Safe” and finger off the trigger Maintain situational awareness					
“Press Check” (The action of pull the charging handle back slightly to check if the weapon is loaded by seeing the brass casing in the chamber “AWGism”)					
Magazine supported firing position (Prone)					
Barricade supported firing position (Standing and Kneeling)					

Skill / Knowledge	Introductory Training Technique	Intro Time	Reinforcement Training Techniques and Skill Application Exercise	Time (per individual, exercise, or order)	Drill Sergeant Reinforcement/Feedback Techniques and Remarks
	L - lecture/conference D - demonstration G - guided demo E – unguided exploratory P – practical application - self/individual B – practical application – with/battle buddy/peer		E – unguided exploratory P – practical application - self/individual B – practical application – with/battle buddy/peer T – table fired or exercise performed to evaluate (write in)		D2 - Directive- “do as I say’ I - Interrogative – “You determine solution” C - Combined – “we’ll figure it out together”
Confirming zero @ 175M / 200 yards (LOMAH)					

# BRM 7 and 8 (Simulated Field Fire I and II - EST 2000) Observer's Guide

## GOAL

The goal of observing the training event is to document how the lesson plan is implemented, what equipment is used, and what, if any, variations there are from the TSP.

## Observer Duties

- Carefully prepare in advance of the event, i.e. familiarize yourself with all the training devices used, ensure you have a copy of the most current TSP, etc.
- Observe the initial instructions to the Soldier(s) and observe as many aspects of the training as possible.
- Use multiple guides to capture data, if necessary.
- After the event, organize all notes and protocols, then deliver them to the Data Compiler.

## ADMINISTRATIVE DATA

12. Observer's Name \_\_\_\_\_
13. Date of Observation \_\_\_\_\_
14. Training Observation Start Time (24 hr clock) \_\_\_\_\_
15. Training Observation Stop Time (24 hr clock) \_\_\_\_\_
16. Installation \_\_\_\_\_
17. Training Unit \_\_\_\_\_
18. Number of Soldiers assigned \_\_\_\_\_
19. Number of Soldiers present for training \_\_\_\_\_
20. TSP Name/Date/Version (if applicable) \_\_\_\_\_
21. Local Title of Event (if applicable) \_\_\_\_\_
22. Training Location \_\_\_\_\_

## Training Outcomes

**Units' scheduled training:**

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**Units' desired training outcome**

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**Company Commanders method for determining successful outcome.**

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Did the unit achieve the desired outcome? (Circle YES or NO)

YES                  NO

Do the desired outcomes match the TSP Standards? (Circle YES or NO)

YES                  NO

### TSP Task and Standard

**Task:** Engage Single and Multiple Timed Targets with the M16/M4 Series Rifle during Field Fire II Using the EST 2000

**Standard:** *Achieved a minimum of 22 target hits out of 36 timed target exposures for Field Fire I and a minimum of 27 target hits out of 44 timed target exposures for Field Fire II. If this isn't achieved the Soldier will receive remedial training before his final attempt to meet the requirement.*

#### NOTE:

1. If possible have computer operator print all firing order results
2. Record firer's ARI identification number to proper firing order and lane.

<b>ID Number</b>	<b>BRM 7 Simulated Field Fire I Score</b>	<b>BRM 8 Simulated Field Fire II Score</b>
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## BRM 9/10 (Field Fire I/II) Observer's Guide

### GOAL

The goal of observing the training event is to document how the lesson plan is implemented, what equipment is used, and what, if any, variations there are from the TSP.

### Observer Duties

- Carefully prepare in advance of the event, i.e. familiarize yourself with all the training devices used, ensure you have a copy of the most current TSP, etc.
- Observe the initial instructions to the Soldier(s) and observe as many aspects of the training as possible.
- Use multiple guides to capture data, if necessary.
- After the event, organize all notes and protocols, then deliver them to the Data Compiler.

### ADMINISTRATIVE DATA

Observer's Name \_\_\_\_\_

Date of Observation \_\_\_\_\_

Training Observation Start Time (24 hr clock) \_\_\_\_\_

Training Observation Stop Time (24 hr clock) \_\_\_\_\_

Installation \_\_\_\_\_

Training Unit \_\_\_\_\_

Number of Soldiers assigned \_\_\_\_\_

Number of Soldiers present for training \_\_\_\_\_

TSP Name/Date/Version (if applicable) \_\_\_\_\_

Local Title of Event (if applicable) \_\_\_\_\_

Training Location \_\_\_\_\_

## Training Outcomes

Units' scheduled training:

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Units' desired training outcome

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Company Commanders method for determining successful outcome.

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Did the unit achieve the desired outcome? (Circle YES or NO)

YES                  NO

Do the desired outcomes match the TSP Standards? (Circle YES or NO)

YES                  NO

### TSP Task and Standard

**Task:** Detect and Engage Single and Multiple Timed Targets with the M16/M4 Series Rifle

**Standard:** *Detect and achieve a total of 27 target hits out of 44 timed target exposures. If the Soldier fails to engage 27 targets during the first attempt the Soldier will receive remedial training and will be allowed one more attempt to meet the requirement.*

#### NOTE:

1. If possible have tower operator print all firing order results
2. Record firer's ARI identification number to proper firing order and lane.

**SINGLE AND MULTIPLE TARGETS  
FIELD FIRING SCORECARD**

For use of this form, see FM 3-22.9. The proponent agency is TRADOC.  
DATA REQUIRED BY PRIVACY ACT OF 1974

AUTHORITY: 10 USC 3012/(g)/Executive Order 9397. PRINCIPAL PURPOSE(S): Facilitates individual's transition to distant target and provides feedback. ROUTINE USE(S): Evaluate individual proficiency; SSN is used for positive identification purposes only. MANDATORY OR VOLUNTARY DISCLOSURE AND EFFECT ON INDIVIDUAL NOT PROVIDING INFORMATION: Voluntary. Individual not providing information cannot be rated/scored on a mass basis.

1. NAME (LAST, FIRST, MIDDLE INITIAL)					2. SSN		3. GRADE		4. UNIT		5. ROSTER NO.								
<b>6. INTRODUCTION</b> TABLE 1 - SUPPORTED FIGHTING POSITION					<b>7. TABLE 2 - SUPPORTING FIGHTING POSITION</b>					<b>8. TABLE 3 - PRONE POSITION</b>					<b>9. SCORE</b>				
RD	RANGE (M)	TIME (SEC)	HIT	MISS	RD	RANGE (M)	TIME (SEC)	HIT	MISS	RD	RANGE (M)	TIME (SEC)	HIT	MISS	TABLE	HIT	MISS		
1	75	5			1	175	7			1	75	6			2				
2	175	7			2	75	10			2	175	8			3				
3	75	11			3	300				3	75	13							
4	300				4	75	9			4	300								
5	75	9			5	175				5	75	11							
6	175				6	300	9			6	175								
7	75	10			7	75	9			7	75	12							
8	300				8	175				8	300								
9	175	11			9	175	11			9	175	13							
10	300				10	300				10	300								
					11	75	9			11	75	11							
					12	175				12	175								
					13	175	11			13	175	8							
					14	300				14	75	6							
					15	75	5			15	75	11							
					16	175	11			16	175								
					17	300				17	75	12							
					18	75	9			18	300								
					19	175				19	75	11							
					20	75	10			20	175								
					21	300				21	175	13							
					22	175	7			22	300								
<b>TOTAL</b>						<b>TOTAL</b>						<b>TOTAL</b>						<b>TOTAL</b>	
10. REMARKS																			
11. DATE SIGNED												12. SCORER'S SIGNATURE							

## FIELD-FIRE STANDARDS

Field Fire I and II are part of the continued progression in the development of combat shooting skills. This begins the Soldier's critical transition from unstressed firing at single known distance targets during downrange feedback, to targets at various ranges for short exposures. It also requires the Soldier to practice and refine those skills that have been previously taught. This section introduces the need and techniques for scanning the range for targets, and quick accurate firing.

**Field Fire I (Single Timed Target).** Field Fire I is broken down into three firing tables. Figure 6-2 shows the number of target exposures, target ranges, and exposure times for each firing table. Firing tables 1 and 2 are fired from a supported firing position, and firing table 3 is fired from the prone unsupported firing position.

FIRING TABLE 1			FIRING TABLE 2			FIRING TABLE 3		
ROUND	RANGE (M)	TIME (SEC)	ROUND	RANGE (M)	TIME (SEC)	ROUND	RANGE (M)	TIME (SEC)
1	75	6	1	75	6	1	75	7
2	75	6	2	175	8	2	175	9
3	75	6	3	300	10	3	300	11
4	75	6	4	175	8	4	175	9
5	75	6	5	75	6	5	75	7
6	175	8	6	300	10	6	300	11
7	175	8	7	300	10	7	300	11
8	175	8	8	75	6	8	75	7
9	175	8	9	175	8	9	175	9
10	175	8	10	175	8	10	175	9
11	175	8	11	300	10	11	300	11
12	175	8	12	175	8	12	175	9
13	300	10	13	75	6	13	75	7
14	300	10	14	300	10	14	300	11
15	300	10	15	175	8	15	175	9
16	300	10	16	75	6	16	75	7
17	300	10	17	300	10	17	300	11
18	300	10	18	75	8	18	75	7

**Figure 6-2. Field Fire I firing tables.**

Firing table 1, consisting of 18 targets, helps the firer practice shooting skills and develop a sense of timing and a rhythm required to make the transition from KD to field fire. This builds confidence prior to firing the exercises in firing tables 2 and 3, and identifies Soldiers who are having difficulty and need reinforcement.

Every firer is given 54 rounds of 5.56-ball ammunition with 18 rounds loaded into each of three separate magazines (one magazine per firing table). During firing tables 2 and 3, each Soldier must demonstrate his ability to apply the fundamentals of marksmanship during the integrated act of firing by successfully detecting and engaging single timed targets. Each Soldier must achieve 22 hits out of 36 timed target exposures.

**Field Fire II (Multiple or Single Timed Targets).** Field Fire II consists of three firing tables. Figure 6-3 shows the number of target exposures, target distance, and exposure times for each firing table. Firing tables 1 and 2 are fired from a supported firing position and firing table 3 is fired from the prone unsupported firing position.

FIRING TABLE 1			FIRING TABLE 2			FIRING TABLE 3		
ROUND	RANGE (M)	TIME (SEC)	ROUND	RANGE (M)	TIME (SEC)	ROUND	RANGE (M)	TIME (SEC)
1	175	5	1	175	7	1	75	6
2	175	7	2	75	10	2	175	8
3	75		3	300	-	3	75	
4	300	11	4	75	9	4	300	13
5	75		5	175	-	5	75	
6	175	9	6	300	9	6	175	11
7	75		7	75	9	7	75	
8	300	10	8	175	-	8	300	12
9	175		9	175	11	9	175	
10	300	11	10	300	-	10	300	13
			11	75	9	11	75	11
			12	175	-	12	175	
			13	175	11	13	175	8
			14	300	-	14	75	6
			15	75	5	15	75	
			16	175	11	16	175	11
			17	300	-	17	75	
			18	75	9	18	300	12
			19	175	-	19	75	
			20	75	10	20	175	11
			21	300	-	21	175	
			22	175	7	22	300	13

**Figure 6-3. Field Fire II firing tables.**

Firing table 1, consisting of 10 targets, helps the firer practice shooting skills and develop a sense of timing and a rhythm required to make the transition from single timed targets to multiple or single timed fleeting combat targets. This builds confidence prior to firing the exercises in firing tables 2 and 3, and identifies Soldiers who are having difficulty and need reinforcement.

Every firer is given 54 rounds of 5.56-ball ammunition with 10 rounds loaded into one magazine (for firing table 1) and 22 rounds loaded into each of two separate magazines (for firing tables 2 and 3). During firing of tables 2 and 3, each Soldier must demonstrate his ability to apply the fundamentals of marksmanship during the integrated act of firing by successfully detecting and engaging multiple and or single timed targets. Each Soldier must achieve 27 hits out of 44 timed target exposures.

<b>ID Number</b>	<b>BRM 9 Field Fire I Score</b>	<b>BRM 10 Field Fire II Score 1<sup>st</sup> Iteration</b>	<b>BRM 10 Field Fire II Score 2<sup>nd</sup> Iteration</b>
1			
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## BRM 11/12 (Practice Record Fire I + II) Observer's Guide

### GOAL

The goal of observing the training event is to document how the lesson plan is implemented, what equipment is used, and what, if any, variations there are from the TSP.

### Observer Duties

- Carefully prepare in advance of the event, i.e. familiarize yourself with all the training devices used, ensure you have a copy of the most current TSP, etc.
- Observe the initial instructions to the Soldier(s) and observe as many aspects of the training as possible.
- Use multiple guides to capture data, if necessary.
- After the event, organize all notes and protocols, then deliver them to the Data Compiler.

### ADMINISTRATIVE DATA

Observer's Name \_\_\_\_\_

Date of Observation \_\_\_\_\_

Training Observation Start Time (24 hr clock) \_\_\_\_\_

Training Observation Stop Time (24 hr clock) \_\_\_\_\_

Installation \_\_\_\_\_

Training Unit \_\_\_\_\_

Number of Soldiers assigned \_\_\_\_\_

Number of Soldiers present for training \_\_\_\_\_

TSP Name/Date/Version (if applicable) \_\_\_\_\_

Local Title of Event (if applicable) \_\_\_\_\_

Training Location \_\_\_\_\_

## Training Outcomes

**Units' scheduled training:**

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**Units' desired training outcome**

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**Company Commanders method for determining successful outcome.**

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Did the unit achieve the desired outcome? (Circle YES or NO)

YES                  NO

Do the desired outcomes match the TSP Standards? (Circle YES or NO)

YES                  NO

### TSP Task and Standard

**Task:** Detect and Engage Timed Targets during Practice Record Fire I and II with the M16/M4 Series Rifle

**Standard:** *Obtain at least 23 target hits on the 40 targets exposed.*

#### NOTE:

1. If possible have tower operator print all firing order results
2. Record firer's ARI identification number on firing lane every time he/she fires.
3. Ask the NCOIC if this score will count for graduation if a Soldier fails to qualify during BRM 13.

### RECORD FIRE SCORECARD

For use of this form see, FM 3-22.9; proponent agency is TRADOC

DATA REQUIRED BY PRIVACY ACT OF 1974

**AUTHORITY:** 10 USC 3012(g) Executive Order 9397.  
**PRINCIPAL PURPOSE(S):** Facilitates individual's transition to distant target and provides feedback.  
**ROUTINE USE(S):** Evaluate individual proficiency; SSN is used for positive identification purpose only.  
**DISCLOSURE:** Voluntary. Individuals not providing information cannot be rated/scored on mass basis.

1. NAME (LAST, FIRST, MIDDLE INITIAL)	2. LAST 4 SSN	3. GRADE	4. UNIT	5. ROSTER NO.
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6. TABLE 1 - PRONE SUPPORTED OR FOXHOLE SUPPORTED												7. TABLE 2 - PRONE UNSUPPORTED						8. TABLE 3 - KNEELING					
RD	RANGE (M)	TIME (SEC)	HIT	MISS	NO FIRE	RD	RANGE (M)	TIME (SEC)	HIT	MISS	NO FIRE	RD	RANGE (M)	TIME (SEC)	HIT	MISS	NO FIRE	RD	RANGE (M)	TIME (SEC)	HIT	MISS	NO FIRE
1	50	3				11	100	8				1	200	6				1	150	8			
2	200	6				12	200					2	250	8				2	50	4			
3	100	4				13	150	10				3	150	6				3	100	5			
4	150	5				14	300					4	300	10				4	150	6			
5	300	8				15	100	9				5	200					5	100	5			
6	250	7				16	250					6	150	12				6	50	4			
7	50	3				17	200	6				7	200					7	100	5			
8	200	6				18	150	5				8	250	9				8	150	6			
9	150	5				19	50	6				9	150					9	50	4			
10	250	7				20	100					10	150	6				10	100	5			
TOTAL					TOTAL					TOTAL					TOTAL								

9. SCORE				10. QUALIFICATION SCORES/RATINGS (Check One)			
TABLE	HT	MISS	NO FIRE				
1							
2							
3							
TOTAL				<input type="checkbox"/> 36-40 EXPERT <input type="checkbox"/> 30-35 SHARPSHOOTER <input type="checkbox"/> 23-29 MARKSMAN <input type="checkbox"/> 22-BELOW UNQUALIFIED			
11. FIRER'S QUALIFICATION SCORE							

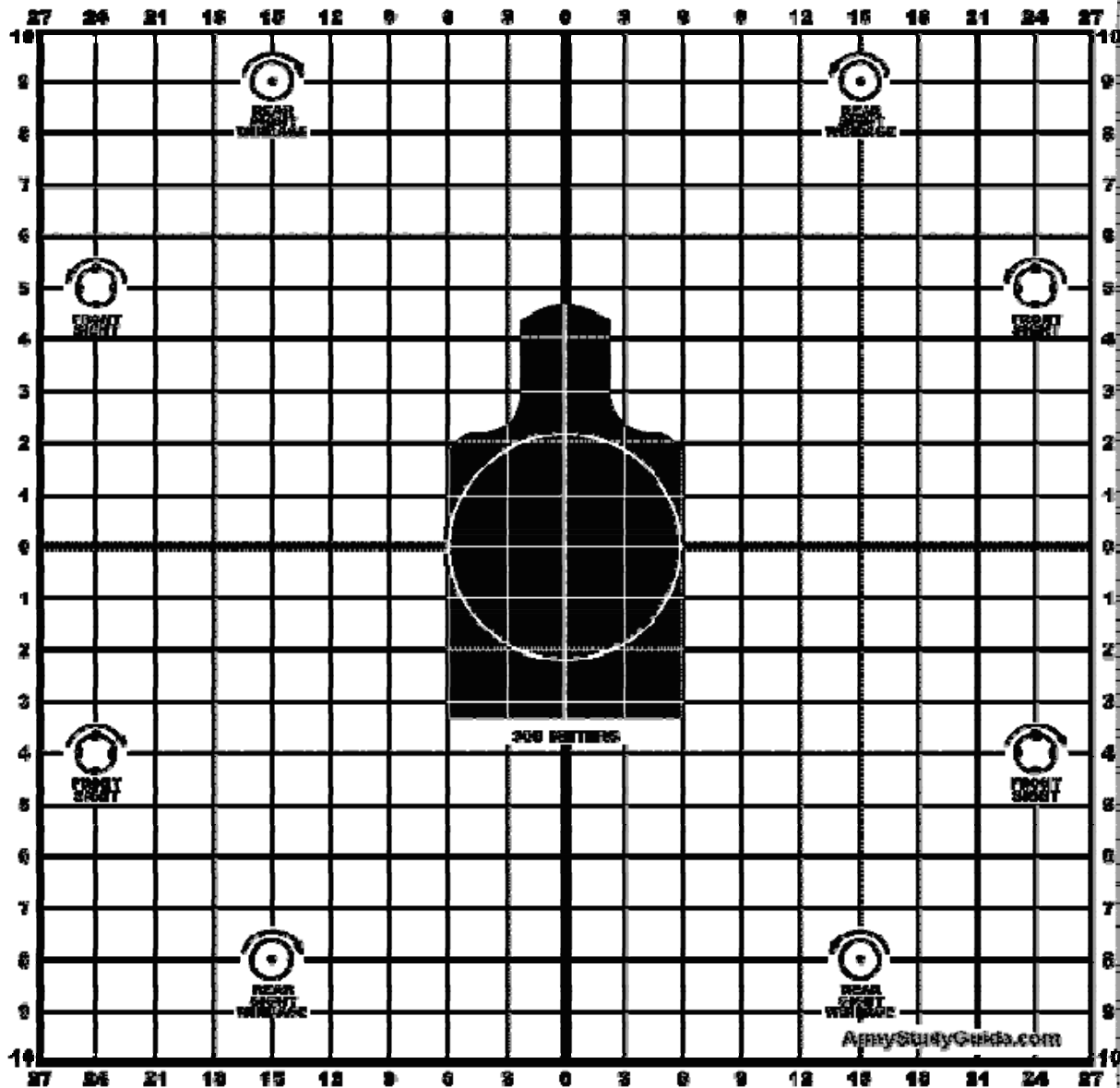
12. REMARKS	13. NIGHT FIRE EXERCISE	15. CHECK WHICH AIMING DEVICE WAS USED										
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>DATE</th><th>HIT</th><th>MISS</th><th>GO</th><th>NO GO</th></tr> <tr> <td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>	DATE	HIT	MISS	GO	NO GO						<input type="checkbox"/> IRON SIGHT <input type="checkbox"/> AN/PAS-13 (DAY) <input type="checkbox"/> BACK UP IRON SIGHT <input type="checkbox"/> AN/PAS-13 (NIGHT) <input type="checkbox"/> MGS
	DATE	HIT	MISS	GO	NO GO							
14. CBRN FIRE EXERCISE												
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>DATE</th><th>HIT</th><th>MISS</th><th>GO</th><th>NO GO</th></tr> <tr> <td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>	DATE	HIT	MISS	GO	NO GO						
DATE	HIT	MISS	GO	NO GO								

16. DATE SIGNED (YYYYMMDD)	17. SCORER'S SIGNATURE
18. DATE SIGNED (YYYYMMDD)	19. OFFICER'S SIGNATURE

<b>ID Number</b>	<b>BRM 11 Practice Qualification 1</b>	<b>BRM 12Practice Qualification 2</b>
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**APPENDIX B**  
**SAMPLE TARGETS**

## 25 METERS ZEROING TARGET M16A2

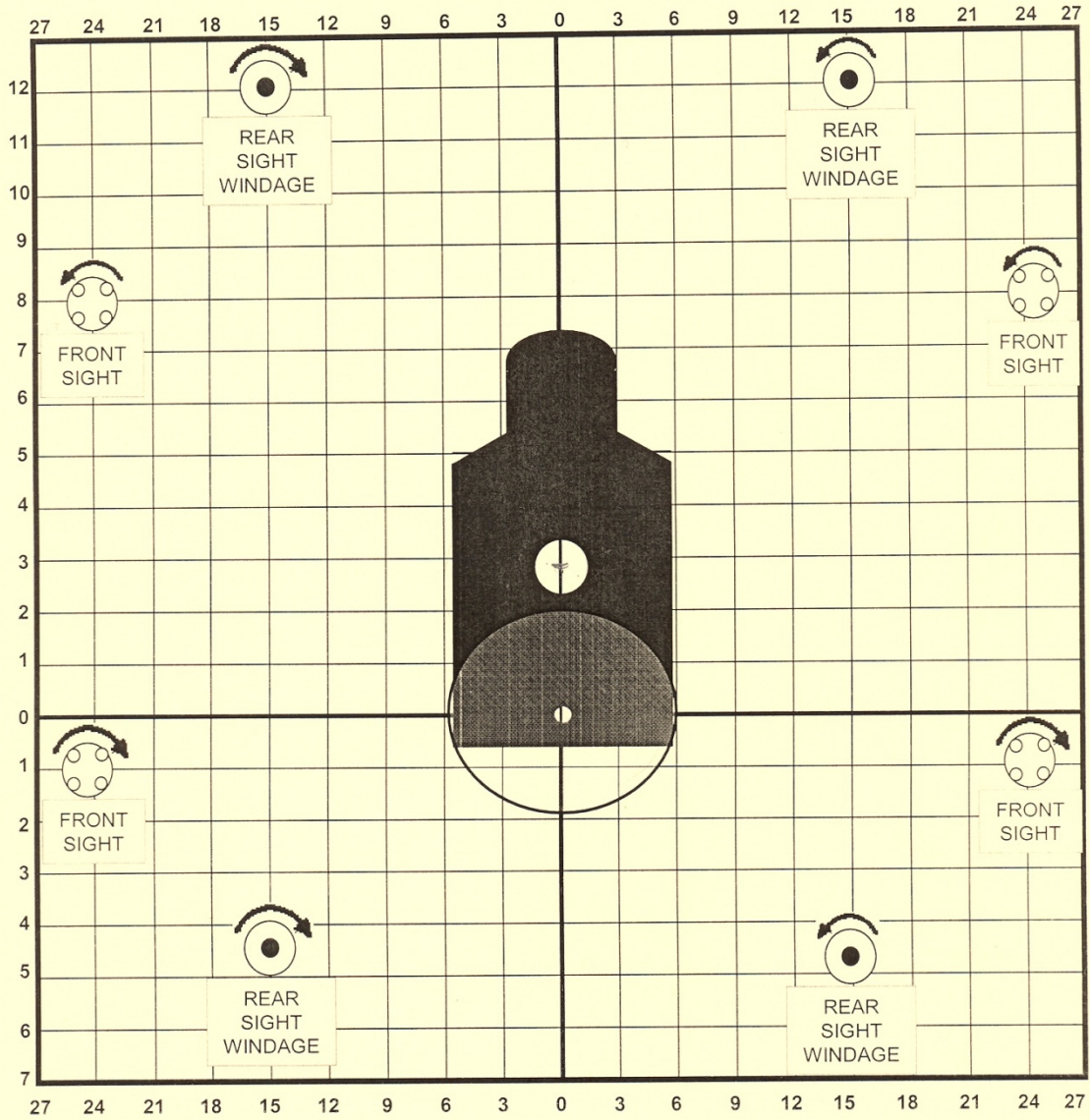


### ZERO TARGET DATA

- 1- ROTATE REAR SIGHT ELEVATION KNOB TO THE 90 SETTING, THEN UP (RIGHT) ONE CLICK PAST THE 300 MARK, FOR ZEROING AT 25 METERS.
- 2- BIPAL TARGET CENTER, ADJUST SIGHTS TO MOVE SHOT GROUP CENTER AS CLOSE AS POSSIBLE TO THE WHITE DOT IN CENTER OF THE TARGET.
- 3- AFTER COMPLETION OF THE 25 METER ZERO, ROTATE THE REAR SIGHT ELEVATION KNOB BACK ONE CLICK TO THE 300/300 METER MARK, THE WEAPON WILL BE ZEROED FOR 300 METERS.

Figure B-1  
Standard 25M Zeroing Target (not to scale)

**25 METER ZEROING TARGET  
M16A2/M16A4**



25m ZERO TARGET DATA FOR M16A2/M16A4 RIFLE

- 1- SET ELEVATION TO THE 300 METER SETTING (8/3 FOR M16A2, 6/3 FOR M16A4).
- 2- AIM AT TARGET CENTER. ADJUST SIGHTS TO MOVE SHOT GROUP AS CLOSE AS POSSIBLE TO THE WHITE DOT IN THE CENTER OF TARGET.
- 3- USE FRONT SIGHT ONLY TO ADJUST ELEVATION.

**Target For Printing**

Figure B-2  
25 Meter Zeroing Target with ellipse drawn 1.1 inches below center mass of the target.