Research Note 87-33

Recommended Alternate Qualification Courses for the M16 Rifle

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This research effort was initiated to establish a standardized alternate rifle qualification course to be used by all components of the U.S. Army. Based on an Army-wide survey, two alternate rifle qualification courses were recommended: a Known Distance Alternate Course, and a 25-Meter Alternate Course. Data are presented for each alternate course of fire and appropriate scoring procedures are recommended. In addition, conduct of fire, alibi, and refire procedures are outlined. Adoption of the recommended alternate courses will provide

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20. ABSTRACT (Continued)

standardized methods for rifle qualification with existent range facilities for all components of the U.S. Army.

FOREWORD

The Army Research Institutre (ARI) Fort Benning Field Unit, Fort Benning, Georgia, has conducted ongoing research directed toward developing cost-effective training methods in M16 rifle marksmanship. The research included all aspects of inquiry from problem assessment through instructional improvements involving appropriate ranges, rifles, training aids, and devices. A survey was conducted to determine the availability of ranges and training facilities for use by all components of the Army. Results of the survey indicated that all Army units do not have access to standard range complexes for M16 rifle qualification. Accordingly, this report presents standardized methods for all components to conduct rifle qualification when a standard Record Fire range is not available.

The research effort and development of the research product were monitored by ARI's Fort Benning Field Unit whose mission is to conduct research and development of training and training technology using Infantry combat systems and problems as the vehicles. The major focus is on the field experimentation within the Infantry arena to obtain results that can be generalized to similar systems/problems in other segments of the Army or other services. Primary emphasis on the areas of training systems/training technology, team training, and weapons systems training seeks to improve the performance of soldiers and units. The research task that supports this mission is titled "Developing Training for Individual and Crew-Served Weapons" and is organized under the "Train the Force" program area. The United States Army Infantry School (USAIS) provided sponsorship under the letter of agreement "Joint Efforts on Improved Training for Moving Target Engagement and Other Advanced Marksmanship Skills," dated 20 December 1984. For the work described in this research, presentations were made to the USAIS in December 1986. The recommended alternate courses will provide for uniform testing of soldiers in this critical combat skill when trainfire ranges are not available. The recommendations for the alternate courses of fire will be included in the revised version of FM 23-9 M16A1 Rifle and Rifle Marksmanship in FY87.

RECOMMENDED ALTERNATE QUALIFICATION COURSES FOR THE M16 RIFLE

EXECUTIVE SUMMARY

Requirement:

The requirement of this research effort was to establish qualification scoring procedures for a Known Distance Alternate Course and a 25-Meter Alternate Course. The focus of this effort was to present a standardized method to conduct rifle qualification when a Record Fire range was not available.

Procedure:

Soldiers scheduled for rifle qualification were used as subjects in this effort. Soldiers in Experiment 1 fired the Known Distance Alternate Course and soldiers in Experiment 2 fired the 25-Meter Alternate Course. The scores for soldiers from each alternate course were compared with their performance on Record Fire. A Pearson Product-Moment correlation between Basic Rifle Marksmanship (BRM) qualification scores and scores on each alternate course was performed to determine if there was a significant relationship between the respective courses of fire.

Findings:

The results indicated that although a significant correlation between BRM qualification and each alternate course was obtained, the finding was trivial and accounted for approximately 7% of the variance associated with performance. Since there was no reliable relationship between the alternate courses of fire and BRM qualification, it was impossible to establish a scoring procedure utilizing identical cut-off scores for the marksmanship categories for all three courses of fire. A scoring procedure utilizing the distribution of scores obtained in each experiment was established for each alternate course of fire.

Utilization of Findings:

This report provides an established scoring procedure for both the Known Distance and 25-Meter Alternate Courses of fire for rifle qualification. The findings indicated that a standardized scoring procedure for BRM qualification and the alternate courses of fire was not possible; however, the implementation of these scoring procedures provides all components of the U.S. Army with standardized methods of conducting rifle qualification when a Record Fire range is not available.

RECOMMENDED ALTERNATE QUALIFICATION COURSES FOR THE M16 RIFLE

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INTRODUCTION

During the past nine years, the Army Research Institute (ARI) Fort Benning Field Unit, Fort Benning, Georgia, has been conducting research directed toward development of cost effective methods for individual and collective training in all aspects of rifle marksmanship. Most of the research was directed toward improving Basic Rifle Marksmanship (BRM) (Maxey & Dempster, 1985; Maxey & George, 1985; Maxey & Sweezy, 1985; Osborne, 1985; Osborne & Morey, 1980; Osborne, Schroeder, & Heller, 1984; Thompson, Smith, Morey, & Osborne, 1980) and Advanced Rifle Marksmanship (ARM) (Evans & Scherdel, 1984; Klein & Maxey, 1980; Klein & Tierney, 1978), with some effort directed toward improving rifle marksmanship in Tables of Organization & Equipment (TO&E) units (Osborne, Evans, Lucker. & Williams, 1985; Osborne & Smith, 1985; Rosen & Behringer, 1979; Smith & Osborne, 1981).

The limited research conducted on TO&E units identified shortcomings in the availability of standard Record Fire ranges required for rifle qualification. The solution to this resource limitation was the development and publication of the Reserve Component Proficiency "C" Courses (Appendix G) and the M261 Conversion Kit, (.22 Caliber Rimfire Adapter) (Appendix H) in C2, FM 23-9 M16A1 Rifle and Rifle Marksmanship. The implementation of these courses of fire was meant to alleviate rifle qualification problems; it did not. The void of a standardized alternate method for Active Army (AA) TO&E units to conduct rifle qualification still exists. This research note addresses this problem.

During this current research effort, a marksmanship survey of Army components was conducted. The survey requested information on the availability of ranges, facilities, training aids and type of training conducted for rifle qualification requirements from 838 separate battalions and companies (see Table 1).

Table 1

Summary of the Marksmanship Survey Indicating Range Availability for Active Army, US Army Reserves, and National Guard

	Record Fire	Known Distance	25-meter
Active Army (AA)	73.3%	90.0%	80.8%
US Army Reserves (USAR)	52.1%	67.1%	94.1%
National Guard (NG)	59.9%	67.0%	96.5%

Results of the survey formulated the requirement for two proposed alternate courses, the Known Distance Alternate Course (KDAC) and the 25-Meter Alternate Course (AC). The M261 .22 Rimfire Device may be used on the AC in lieu of service ammunition. The KDAC and AC are recommended to be used by all components of the Army whenever a Record Fire range is not available. The recommended alternate courses use available ranges and targets.

The scoring procedures for the alternate courses of fire were based on a sample of 2,141 soldiers who had fired Record Fire at an Automated Record Fire range (see Table 2). The scoring procedures for the alternate courses of fire were based on the percentage of soldiers who were classified as Unqualified, Marksman, Sharpshooter, or Expert. Thus, while the cut-off scores for the various marksmanship categories for the three courses of fire are different, they are representative of each other in terms of the percentage of soldiers in each marksmanship category.

Table 2

Basic Rifle Marksmanship Qualification Scores of Soldiers Firing on an Automated Record Fire Range

Marksmanship Category	# Targets Hit	% of Sample in Category
Unqualified	1 - 22	46.4% (n = 994)
Marksman	23 - 29	39.7% (n = 850)
Sharpshooter	30 - 35	13.3% (n = 284)
Expert	36 - 40	0.6% (n = 13)

KNOWN DISTANCE ALTERNATE COURSE (KDAC)

Purpose

To establish a qualification scoring procedure for the Known Distance Alternate Course (KDAC).

Method

Subjects

Subjects were 104 soldiers from a One Station Unit Training (OSUT) company who had completed Basic Rifle Marksmanship Training one week prior to this experiment.

Apparatus

The KDAC was performed on a KD range at Fort Benning, Georgia. A detailed description of this type of range can be found in Field Manual 25-7 Training Ranges (FM 25-7, p. 4-25). Soldiers performed the KDAC with their issued M16A1 rifles and unit allocated ammunition. A standard 25 m zero target (NSN 6920-01-167-1392) with a modified (half-moon) four centimeter circle was used for zero confirmation. A standard E-type silhouette was used for the prone supported position at 300 m and the prone unsupported position at 200 m. An F-type silhouette was used for the kneeling unsupported firing position at 100 m.

Procedure

All soldiers were required to confirm zero with nine rounds using the 25 m battlesight zeroing procedure prior to firing the alternate course. Upon completion of zero the soldiers were briefed by research personnel and divided into two equal firing orders. One firing order was used as a pit detail while the other order fired the course. Soldiers fired 20 rounds in 120 seconds in the prone supported position at a range of 300 m, 10 rounds in 60 seconds in the prone unsupported position at a range of 200 m, and 10 rounds in 60 seconds in the kneeling unsupported position at a range of 100 m[1]. Targets hit at each range were scored by soldiers in the pit detail; total targets hit at all three ranges were compiled for each soldier who fired the course. A Pearson Product-Moment correlation between BRM Qualification scores and the KDAC was performed to determine the relationship between the two courses of fire. In addition, descriptive statistics for the KDAC were obtained to establish a scoring procedure for this course of fire. Data for nine soldiers who had rifle and/or ammunition malfunctions were dropped from the analysis.

Results

The Pearson Product-Moment correlation between BRM qualification scores and the KDAC revealed a low but significant correlation ($r = .28$, $p < .01$). While this correlation is statistically significant, its practical significance is negligible because it accounts for only 7.5% of the variance associated with performance[2].

The descriptive statistics for the sample ($n=95$) yielded a mean of 25.83 with a standard deviation of 7.27 for the KDAC. These data were used to determine cut-off scores for marksmanship ability for this course of fire. The cut-off scores were determined by the approximate percentage of soldiers in the same marksmanship category as those who fired the Record Fire course at the Automated Record Fire range (see Table 2). Additional comparisons between the percentage of soldiers in each marksmanship category were made between BRM Record Fire for soldiers in this experiment, BRM in Table 2 and the KDAC. While the percentages are not identical for each category they provide a guideline for scoring the KDAC (see Table 3).

Table 3

Recommended Scoring Procedure for the Known Distance Alternate Course

Marksmanship Category	# Targets Hit	% of Sample in Category (KDAC)	% of Sample in Category (BRM)	% of Sample in Category (Table 2)
Unqualified	1 - 25	44.2% ($n = 42$)	37.9% ($n = 36$)	46.4%
Marksman	26 - 32	42.1% ($n = 40$)	50.5% ($n = 48$)	39.7%
Sharpshooter	33 - 37	11.6% ($n = 11$)	10.5% ($n = 10$)	13.3%
Expert	38 - 40	2.1% ($n = 2$)	1.1% ($n = 1$)	0.6%

Two separate chi square analyses were used to compare the differences between the percentages of soldiers in the four marksmanship categories. The analysis between BRM Record Fire and KDAC was not significant, $X^2_{(3)} = 5.50$, $p > .05$. Similarly, the analysis between BRM Record Fire and BRM in Table 2 was not significant, $X^2_{(3)} = 4.22$, $p > .05$.

Discussion

While both BRM Record Fire and the KDAC require soldiers to apply the four fundamentals of marksmanship (steady position, trigger squeeze, breath control, and aiming), the low correlation indicates there are fundamental differences between the two courses of fire (see Footnote 2). Because the correlation

between the two courses of fire was so low, it precluded using one score as a predictor for the other. An alternative method for scoring the KDAC was developed based on the percentage of soldiers in each marksmanship category for the two courses of fire. The low correlation indicates that the same soldiers that failed to qualify on BRM Record Fire will not be the same soldiers that fail to qualify on the KDAC. These results may be explained by the variability of performance typically shown by OSUT soldiers and the fact that there is little or no transfer between the tasks because of the many differences that exist between the tasks.

These results provide an important methodological reference for future research. Invariably when the same skill is performed by the same people a high correlation is expected. However, as these results show, the effects of the different demands of the two courses of fire are such that the reverse is true. In future research efforts it would be beneficial to obtain test-retest correlations for the alternate course of fire to use as a baseline for the alternate course/BRM correlations. These correlations could then be used to determine effective scoring procedures for alternate courses of fire. This suggests that in investigations of this type a correlation between performance is an excellent precautionary measure prior to developing predictive criteria for one task based on performance of another task. Based on the results of this research effort, a proposed KDAC was developed for the USAIS for inclusion in the revised FM 23-9 M16A1 Rifle and Rifle Marksmanship in FY87 (see Appendix).

25-METER ALTERNATE COURSE (AC)

Purpose

To establish a qualification scoring procedure for the 25-Meter Alternate Course of fire.

Method

Subjects

Subjects were 230 soldiers with 96 from a TO&E unit and 134 from an OSUT company comprised of Split Option II Reserve personnel who had completed BRM training.

Apparatus

The AC was performed on a 25-meter range at Fort Benning, Georgia. A detailed description of this type of range can be found in FM 25-7, p. 4-4. Soldiers performed the AC with their issued M16A1 rifles and unit allocated ammunition. A standard 25 m zero target (NSN 6920-01-167-1392) with a modified (half-moon) four centimeter circle was used for zero confirmation. A 25 m scaled silhouette target (NSN 6920-01-167-1398) was used for the AC.

Procedure

All soldiers were required to confirm the zero of their rifles with nine rounds using the 25 m battlesight zeroing procedure prior to firing the AC. Upon completion of zero confirmation, each unit was briefed by research personnel and divided into two firing orders. As one order fired the course, the other acted as safety personnel and scorers. Each soldier was issued four 10-round magazines to fire the course. Twenty rounds were fired in 120 seconds in the prone supported position followed by 20 rounds in 120 seconds in the prone unsupported position. Firing in both positions required the soldier to make one rapid magazine change in each firing position.

Soldiers being tested with the AC were required to engage each scaled silhouette on the target sheet with 2 rounds of ammunition during each table. Soldiers were penalized for less than 2 hits on each scaled silhouette and excessive hits were scored as misses. During development of the AC, it was determined that soldiers were more successful using the "single shot per target" technique versus the "two shot per target" technique[3]. Performance improved for both methods of target engagement when the firers engaged the upper left scaled silhouette and then traversed in an orderly manner from left to right as they "worked" their way down the target sheet.

The "single shot technique" precludes the firer from having to remember which silhouette he engaged last while performing the rapid magazine change. Using the "single shot technique," the firer performs the rapid magazine change after traversing the target sheet and firing one round at each of the 10 scaled silhouettes. The firer performs the rapid magazine change and resumes firing at the upper left scaled silhouette. If an alibi occurs, the firer should know exactly where he fired his last round and begin the alibi exercise with the appropriate scaled silhouette. This allows the soldier to attain the maximum score regardless of the weapon malfunction.

The scoring for the AC was performed by research personnel after both firing orders completed the course of fire. Treatment of the data was identical to that described for the KDAC experiment. Data for 54 soldiers who had rifle and/or ammunition malfunctions were dropped from the analysis.

Results

A Bartletts test of homogeneity of variance yielded a chi square of .236, $df = 1$, $p < .63$. This indicated that the marksmanship ability of the two units did not differ significantly, which allowed the data for both units to be combined for the purpose of the subsequent analysis. As with the KDAC, a low but significant correlation ($r = .21$, $p < .05$), was obtained between the BRM scores and the AC.

The descriptive statistics for the sample ($n = 176$) yielded a mean of 25.85 with a standard deviation of 6.75. The mean was rounded to 26 for the purpose of establishing a scoring procedure for the alternate course of fire (Table 4).

Table 4

Recommended Scoring Procedure for the 25-Meter Alternate Course

Marksmanship Category	# Targets Hit	% of Sample in Category (AC)	% of Sample in Category (BRM)	% of Sample in Category (Table 2)
Unqualified	1 - 25	44.9% (n = 79)	56.2% (n = 99)	46.4%
Marksman	26 - 32	38.1% (n = 67)	32.4% (n = 57)	39.7%
Sharpshooter	33 - 37	14.7% (n = 26)	9.6% (n = 17)	13.3%
Expert	38 - 40	2.3% (n = 4)	1.8% (n = 3)	0.6%

Two separate chi square analyses were used to compare the differences between the percentages of soldiers in the four marksmanship categories. The analysis between BRM Record Fire and AC was not significant, $X^2_{(3)} = .87$, $p > .05$. Similarly, the analysis between BRM Record Fire and BRM in Table 2 was not significant, $X^2_{(3)} = 3.19$, $p > .05$.

The cut-off scores for this alternate course were determined by the approximate percentage of soldiers in the same marksmanship category as those who fired the Record Fire course at the Automated Record Fire range. While the percentages are not identical for each category for the BRM course and the AC, they provide a guideline for scoring the AC.

Discussion

A proposed AC was developed for the USAIS for inclusion in the revised FM 23-9 M16A1 Rifle and Rifle Marksmanship in FY87 (see Appendix) based on the results of this research effort.

As with KDAC, the criteria for successful performance on the AC are not the same as those required for successful performance on BRM Record Fire. Thus, transfer from one course of fire to another would be predicted to be low. These data again indicate that determining a test-retest correlation as a baseline for the AC for AC/BRM correlations is desirable. These correlations could then be used to determine effective scoring procedures for alternate courses of fire.

FOOTNOTES

[1]The KDAC experiment was conducted using three firing positions: prone supported at 300 yards, prone unsupported at 200 yards, and kneeling unsupported at 100 yards. Since the completion of this research the kneeling unsupported position has been deleted from the KDAC course of fire by the Directorate of Training and Doctrine (DOTD), United States Army Infantry School (USAIS), Fort Benning, Georgia. This change is reflected in the Appendix of this report.

[2]A similar correlation was obtained between the BRM scores and the AC. A possible explanation for the low correlations between the BRM qualification scores and the KDAC and AC scores is that there are fundamental differences between the two courses of fire. A comparison between the courses of fire is shown in the table below:

	RF	KDAC	AC
Targets:	E & F Silhouettes	E & F Silhouettes	Scaled E/F Silhouettes
Type:	Random Pop ups	Single Lane	Fixed Target Sheet
Multiples:	Yes	No	No
Ammo:	40 rds	40 rds	40 rds
No. of Magazines:	2 w/20 rds ea.	1 w/20 rds ea. 2 w/10 rds ea.	4 w/10 rds ea.
Distance:	50 - 300 meters	100,200,& 300 yds	25 meters
Feedback:	Hit/Miss	Disked/Spotters	Visual Inspection
Rapid Magazine Changes:	None	One	Two
Tgt Detection:	Yes	No	No
Alibis:	No	Yes/1 per tbl.	Yes/1 per tbl.
Refires:	Yes	Yes	Yes
Positions:	Foxhole Supported Prone Unsupported	Prone Supported Prone Unsupported Kneeling Unsupported	Prone Supported Prone Unsupported
Scoring:	Computer or Observed	Pit Detail - Physical Count	Physical Count
Hit Value:	1 hit = 1 hit	1 hit = 1 hit	1 hit = 1 hit
Ratings:	Expert: 36-40 Sharpshooter: 30-35 Marksman: 23-29	Expert: 38-40 Sharpshooter: 33-37 Marksman: 26-32	Expert: 38-40 Sharpshooter: 33-37 Marksman: 26-32

[3]The "two shot technique" requires the firer to recover from the recoil of the fired weapon and fire a second shot at the same scaled silhouette. While this may not be a hard task for an accomplished marksman, it is extremely difficult for the less skilled. Pilot data collected prior to this research effort indicated that the processing demands of this method of target engagement caused considerable problems for the firer. Use of this technique necessitated the firer to perform a rapid magazine change "somewhere in the middle" of the target sheet and resume firing at this poorly defined location. Invariably, firers were unable to remember where they fired their last round, which in turn, greatly increased their chances of engaging some scaled silhouettes with more

than two rounds and others with less than two rounds. Similarly, if an alibi occurs the same problem was evident. These problems adversely affected the scores achieved by firers and were not indicative of their shooting abilities.

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APPENDIX

Alternate Qualification Courses

A-1. GENERAL

a. Units will conduct rifle qualification on a standard Record Fire range whenever possible. The Known Distance Alternate Course (KDAC) will be used by all components of the Active Army (AA), Army Reserves (USAR), and National Guard (NG) whenever a standard Record Fire range is not available for rifle qualification. The 25-Meter Alternate Course (AC) will be used when neither a standard Record Fire nor a Known Distance range is available for rifle qualification requirements.

b. The official records of those personnel utilizing either alternate rifle qualification course will be annotated to distinguish alternate qualification ratings from standard Record Fire course ratings. Official personnel records will be annotated as follows:

JONES, Oreo Q. 000-00-0000 Expert 36 (RF)

or

JONES, Oreo Q. 000-00-0000 Expert 38 (KDAC)

or

JONES, Oreo Q. 000-00-0000 Expert 38 (AC)

A-2. Known Distance Alternate Course (KDAC)

a. Scope. The KDAC affords soldiers the opportunity to engage targets at range, with time constraints, and receive feedback. The affects of wind and gravity are clearly demonstrated while firing on the KDAC. Prior to firing the KDAC, soldiers will confirm the zero of their assigned rifles. The zero may be confirmed at the nearest 25-meter range or at range with 6 "sighter" rounds

prior to qualification. Sighter rounds may be used by soldiers whose rifle zero is not in question. Training/sustainment ammunition will be used for sighter rounds provided a zeroing exercise is not conducted the day of record fire. The 6 sighter rounds will be fired in the prone supported position from the 300 yard line prior to qualification. Sighter rounds do not count for score. The 25-meter battlesight zeroing procedure is recommended. The KDAC is a 12-hour course of instruction, as follows:

25-meter zeroing.....4 hours.

Record fire.....8 hours.

b. Range Organization.

Known Distance (KD) ranges are organized and operated unlike all other ranges. KD range personnel are organized into Firing Line Safety and Pit Crews. The Firing Line Safety Crew (FLSC) operates under orders from the Chief Range Officer (CRO). The Pit Crew (PC) operates under orders from the Pit Officer (PO).

(1) Chief Range Officer (CRO).

(a) The CRO has primary responsibility for the safety of all personnel and the operation of this range. The CRO may elect to appoint a Tower Operator (TO) to issue fire commands or he may perform TO duties himself.

(b) The CRO will give the pertinent range safety briefings to all firers and support personnel prior to organizing firing orders and pit crews. Local regulations may require an appointed Safety Officer (SO) to perform this duty.

(c) The CRO is responsible for ammunition details. The ammunition and target preparations should be made by the entire unit to enable the range to operate efficiently.

(d) The CRO will organize personnel to be tested into firing orders. If a pit detail is provided, the CRO may use as many firing points as he deems appropriate to conduct his range. When a pit detail is not provided, the CRO must organize the firers to assign a minimum of 4 firers per firing point. For example, if a unit has 100 personnel, the CRO should elect to use 25 firing points.

(e) The CRO will number the firing orders. Firing orders 1 and 2 will remain at the firing line while firing orders 3 and 4 will perform PC duties. Firing order 1 will fire first and firing order 2 will perform as FLSC personnel. The FLSC personnel are also responsible to the CRO for confirming allowable alibis during record fire. The FLSC personnel are responsible for precise timing of individual alibi firers. The FLSC will inform the CRO of rounds fired after the time allowed for alibis. The CRO will inform the PO of rounds fired after the allotted time, which will be scored as misses. Scorecards will be filled out by all personnel and are maintained by firing order and firing point number in the pits by the PO.

(f) The CRO will inform the PO when refires are to be conducted.

(g) The CRO will inform the PO when pit crew changeovers will be executed. PC changeovers will take place when firing orders 1 & 2 have completed the KDAC, including initial refires. Refires will be conducted immediately upon completion of that firing table. Refires may be conducted during alibi firings.

(2) The Pit Officer (PO).

(a) The PO is the primary link in the range chain of command and operates under the orders of the CRO. The PO will maintain radio or telephone

communications with CRO at all times during the operation of the range. The PO may be a Noncommissioned Officer (NCO), dependent on local restrictions.

(b) The PO is responsible to the CRO for the safety and conduct of the pit crew.

(c) The PO will conduct a pit safety briefing prior to firing and each time a pit crew changeover takes place.

(d) The PO is responsible for target preparation and operation, scoring and alibi target exposures.

(e) The PO is the timekeeper for target exposures.

(f) The PO will brief the pit crew to ensure each firing point pair understands their responsibilities. The PC will raise, lower, disk and repair its respective targets upon command from the PO. All targets must be raised or lowered simultaneously on order of the PO. The PC will score its assigned target only upon command from the PO.

(g) The PO will announce alibi and refire targets. Alibi and refire targets will be raised and lowered upon command from the PO. All other targets will remain lowered. Alibi target exposure time is determined by the firing table in which the alibi occurred.

(h) The PO will collect the scorecards from the PC at the completion of each firing order.

(i) The PO will verify and sign the scorecards.

(j) The PO will announce individual scores if requested by the CRO.

c. Conduct of Fire.

Fire commands will be given by the CRO or TO verbatim to conduct the KDAC. Fire commands are to be given as follows:

TABLE 1 Prone Supported, 300 yards, 2 magazines of 10 rounds each, 120 seconds, "E" type silhouette.

"FIRERS, assume a prone supported position."

"COACHES, issue the firer 2 magazines of 10 rounds each."

"The firing line is no longer CLEAR."

"LOCK, 1 magazine of 10 rounds, LOAD." (Pause)

"Load your second magazine at your own command."

"Is the line READY?" (Pause to observe the firing line to ensure all firers are in position and are READY. If not, attempt to remedy the situation. If all firers are READY, continue the commands).

"The LINE is READY."

"Ready on the RIGHT."

"Ready on the LEFT."

"FIRERS, WATCH YOUR LANE."

At this time the Pit Officer (PO) will issue the command "TARGETS UP." When the targets are in the fully raised position, the PO will start his stopwatch. The raising of the targets is the command to commence fire. The CRO may also announce, "Commence Fire." Upon completion of the allotted time, the PO will command, "TARGETS DOWN," to the PC. The CRO will announce, "CEASE FIRE, CEASE FIRE, CEASE FIRE" when he observes the targets being lowered. The CRO may also keep time with the PO; however, the PO is the official timekeeper.

"Are there any ALIBIS?" (Allowable alibis will be allotted 6 seconds for each unfired round. An allowable alibi is a malfunction of the weapon or ammunition which is in no way associated with firer error. Rounds not expended during the allotted time do not constitute an alibi and will be counted as misses. Only one (1) alibi per table is authorized. If a weapon continually

malfunctions, it should be removed from the firing line for inspection and/or repair by an armorer. The CRO will repeat the fire commands for alibi firers. Cross fires are not allowable alibis for the cross firing soldier. The recipient of the cross fired rounds will refire the table. The cross firer will be awarded "misses" for those shots on the wrong target. The cross firer may be allowed to refire the course. Regardless of his total hits during refire, he can be rated only as a Marksman with a score of 26. The recipient will not be so penalized. The FLSC personnel will "time" their firer. Upon completion of the alibi firings and upon order from the PO, all targets will be scored, disked, and raised by the pit crew for firers to receive feedback regarding shot group size and location. The CRO will have the PO lower the targets when all firers have had the opportunity to observe their shot groups. The PO will have the disks removed and targets repaired in preparation for the next firing table. The CRO will inform the PO if he elects to fire all personnel at each yard line prior to moving to the next firing line. The CRO will have all weapons cleared by the FLSC at the completion of each firing table and prior to changing yard lines.

"CLEAR ALL WEAPONS."

"Clear on the RIGHT?"

"Clear on the LEFT?"

"The firing line is CLEAR."

TABLE 2 Prone Unsupported, 200 yards, 1 magazine of 10 rounds, 60 seconds, "E" type silhouette.

TABLE 3 Prone unsupported, 100 yards, 1 magazine of 10 rounds, 60 seconds, "F" type silhouette.

Fire commands for Tables 2 & 3 including alibi and refire procedures, are the same as Table 1. The PO will have the targets changed from "E" type to "F" type silhouettes while the firers are moving from the 200 to 100 yard line. The PO will inform the CRO when the target changeover has been completed.

d. Scoring Procedures.

The PO is responsible for scoring targets. The PC will:

(1) Respond promptly to commands from the PO.

(2) Inform PO of cross fires.

(3) Accurately count hits and misses. A hit is any bullet hole that is either completely within or touches some part of the silhouette facing. If a bullet hole does not touch some part of the silhouette facing, it is counted as a miss. Ricochets will be counted as hits or misses.

(4) Fill in scorecards legibly.

(5) Repair targets as quickly as possible.

Qualification ratings for the KDAC are as follows:

Expert.....38 to 40 hits.

Sharpshooter.....33 to 37 hits.

Marksman.....26 to 32 hits.

Unqualified.....25 and below.

e. Range Equipment

"E"-Type Silhouette facing, paper NSN: 6920-00-600-6874	2 per firer
"F"-Type Silhouette facing, paper NSN: 6920-00-610-9086	1 per firer
Pasters, Black NSN: 6920-00-165-6354	As required
Pasters, Buff NSN: 6920-00-172-3572	As required
Disk, Spotter with spindle NSN: 6920-00-713-8255	20 per lane used
Communication Set w/Loudspeakers	2 sets

Walkie/talkie Set	1 each
Ammunition, Zeroing	18 (6)* rnds per firer
Ammunition, Record firing	40 rnds per firer
Magazines, Ammunition	4 each firer
Paste, Wheat	Optional
Tacker, Target w/staples	As required
Stopwatch	1 each
Scorecard	1 per firer

*6 used if sighter rounds are fired.

RECORD FIRING SCORECARD * KNOWN DISTANCE COURSE

RECORD FIRING SCORECARD * KNOWN DISTANCE COURSE

For use of this form, see back. The proponent agency is TRADOC.

DATA REQUIRED BY PRIVACY ACT OF 1974

AUTHORITY: 10 USC 3012(g); Executive Order 9397. PRINCIPAL PURPOSE(S): Records individual's performance on record fire range. ROUTINE USE(S): Evaluation of individual's proficiency and basis for determination of award of proficiency badge; SSN is used for positive identification purposes only. MANDATORY OR VOLUNTARY DISCLOSURE AND EFFECT ON INDIVIDUAL NOT PROVIDING INFORMATION: Voluntary. Individuals not providing information cannot be rated/scored on a mass basis.

1. NAME (LAST, FIRST, MIDDLE INITIAL)	2. SSN	3. GRADE	4. UNIT	5. FIRING POINT AND ORDER

6. TABLE 1 - PRONE SUPPORTED				7. TABLE 2 - PRONE UNSUPPORTED				8. TABLE 3-PRONE UNSUPPORTED				9. SCORE
ROUND	RANGE 300	HIT	MISS	ROUND	RANGE 200	HIT	MISS	ROUND	RANGE 100	HIT	MISS	
1	E-SIL			1	E-SIL			1	F-SIL			☐ 38-40 EXPERT
2				2				2				☐ 33-37 SHARPSHOOTER
3				3				3				☐ 26-32 MARKSMAN
4				4				4				☐ 25-BELOW UNQUALIFIED
5				5				5				
6				6				6				
7				7				7				
8				8				8				
9				9				9				
10				10				10				
11				TIME 60 SEC	TOTAL			TIME 60 SEC	TOTAL			
12												
13				11 REMARKS								10. LIGHT / DIRECTION / WIND / MPH
14												
15												
16												
17												
18												
19												
20												
TIME 120 SEC	TOTAL											

NIGHT FIRE EXERCISE

DATE	HIT	MISS	GO	NO GO

NBC FIRE EXERCISE

DATE	HIT	MISS	GO	NO GO

ZERO			
ELEV			
WIND			

*FIRER ISSUED 40 ROUNDS. THE ROUNDS WILL BE PRELOADED IN FOUR 10-ROUND MAGAZINES - TWO FOR TABLE 1, ONE FOR EACH REMAINING TABLE. ALL ROUNDS WILL BE FIRED WITH THE M16A1 SHORT RANGE SIGHT.

12 DATE SIGNED	13. DATE SIGNED
14 SCORER'S SIGNATURE	15. OFFICER'S SIGNATURE

Figure 1 (Front)

RECORD FIRING SCORECARD * KNOWN DISTANCE COURSE

This scorecard is used to score Known Distance Course record fire qualification when the Known Distance Range is used. This course is used only when the standard record fire course is not available.

NOTE: If zeroing/grouping exercises are not performed on the day of record fire, 6 rounds of training/sustainment ammunition are fired from the 300 yard/meter line for confirmation of zero prior to conducting the Qualification Course.

CONDUCT OF FIRE

For Table 1, the firer is given two 10-round magazines to engage an E-silhouette at 300 yards within 120 seconds in the prone supported position. Table 2 is fired with a 10-round magazine at an E-silhouette at 200 yards within 60 seconds in the prone unsupported position. Table 3 is fired with a 10-round magazine at an F-silhouette at 100 yards within 60 seconds in the prone unsupported position.

SCORING

Scoring is conducted in the pits, with the results provided after each table. One point is awarded for each round hitting the target. A hit is scored for any bullethole that is within or touches some part of the silhouette facing.

Figure 2 (Back)

A-3. 25-Meter Alternate Course (AC)

a. Scope. The AC will provide units with a means of testing their soldiers' rifle marksmanship proficiency. Soldiers undergoing rifle qualification should confirm the zero setting on their rifle prior to engaging the AC. The zero may be confirmed with the 25-meter battlesight zero procedure or 6 "sighter" rounds prior to qualification. Sighter rounds may be used by soldiers whose rifle zero is not in question. Training/sustainment ammunition will be used for sighter rounds provided a zeroing exercise is not conducted the day of record fire. The 6 sighter rounds will be fired in the prone supported position on the 25-meter line prior to qualification. Sighter rounds do not count for score. The 25-meter battlesight zeroing procedure is recommended. Firing at scaled silhouettes provides the soldier the opportunity to engage targets, with time constraints, and with feedback after completion of the course. Engaging targets at 25 meters precludes any training value received on the effects of wind and gravity learned when firing at longer distances. Rifle qualification requirements will be scheduled on the 25-meter AC when a standard Record Fire or Known Distance range is not available to conduct training. The AC is an 8-hour course of instruction, as follows:

25-meter zeroing..... 3 hours

Record fire..... 5 hours

b. Range Organization.

The AC may be conducted on any 25-meter, 1000 inch or Indoor Range where it is allowable to fire service ammunition. As range facilities differ, necessary range equipment may vary for each unit conducting training. Target frames may be constructed locally. Target tackers or paste may be used to affix target sheets to target frames. Target sheets may be repaired with pasters or

changed at the completion of each table. It is recommended the target sheet be replaced for each firer. Local supplies shall dictate target repair and/or replacement procedures.

The Chief Range Officer (CRO):

(1) The CRO is responsible for the safety of all personnel and the operation of his range. The CRO may elect to appoint a Tower Operator (TO) to issue fire commands or he may perform TO duties himself.

(2) The CRO may appoint a Safety Officer (SO) to give required range safety briefings to firers and support personnel prior to organizing firing orders or he may perform this duty himself. Local regulations may require an appointed SO.

(3) The CRO will organize personnel to be tested into firing orders and number them. Firing orders will perform as the Firing Line Safety Crew (FLSC) as needed. The FLSC will also perform as coaches and scorers.

(4) The CRO is responsible for ammunition and target details. The CRO may assign noncommissioned officers (NCOs) to perform these duties. Initial ammunition and target preparations should be made by the entire unit to enable the range to operate efficiently.

c. Conduct of Fire.

Firers will engage each scaled silhouette with one (1) round from the first magazine. Firers will perform a rapid magazine change and engage each scaled silhouette again with one (1) round from the second magazine.

Fire commands will be given by the CRO or TO verbatim to conduct the AC. Fire commands will be given as follows:

TABLE 1 Prone Supported, 2 magazines of 10 rounds each, 120 seconds.

"FIRERS, assume a prone supported position."

"COACHES, issue the firer 2 magazines of 10 rounds each."

"The firing line is no longer CLEAR."

"LOCK, One magazine of 10 rounds, LOAD." (Pause)

"Load your second magazine of 10 rounds at your own command."

"Is the line READY?"

(The Chief Range Officer (CRO) pauses to observe the firing line to ensure all firers are in position and ready to begin the engagement. If not, the FLSC will attempt to remedy the problem as quickly as possible and to inform the CRO when all firers are ready. If no problems exist, the CRO continues with the fire commands.)

"The line is READY."

"Ready on the RIGHT."

"Ready on the LEFT."

"FIRERS, Watch Your LANE."

(A whistle, buzzer, horn, or other loud audible signal will be sounded to begin the exercise and sounded again to cease fire.)

"CEASE FIRE, CEASE FIRE, CEASE FIRE." (Given simultaneously with the signal)

"Are there any alibis?"

(Allowable alibis will be allotted 6 seconds per unfired round. An allowable alibi is a malfunction of the weapon or ammunition. It is in no way associated with firer error. Rounds not expended during the allotted time

period do not constitute an alibi and will be counted as misses. The FLSC will note the number of alibi rounds to be fired and time the firer accordingly. If a weapon continually malfunctions, it should be removed from the firing line for inspection and repair by an armorer. Cross fires are not allowable alibis for the cross firing soldier. The recipient of the cross fired rounds will refire the table. The cross firer will be awarded "misses" for those shots on the wrong target. The cross firer may be allowed to refire the course. Regardless of his total hits during refire, he can be rated only as a Marksman with a score of 26. The recipient will not be so penalized. If there are alibis, the CRO will repeat the fire commands. If there are no alibis, the CRO will continue the exercise.)

"CLEAR ALL WEAPONS."

"Clear on the RIGHT?"

"Clear on the LEFT?"

"The firing line is CLEAR?"

"Firers and Coaches move down range, score and repair/replace your target."

TABLE 2 Prone Unsupported, 2 magazines of 10 rounds each, 120 seconds.

(The fire commands and alibi procedures apply as in Table 1.)

d. Scoring Procedures.

The CRO will brief all firers on the proper scoring procedures. The Firing Line Safety Crew (FLSC) will:

(1) Perform as scorers.

(2) Inform the CRO of cross fires.

(3) Inform the CRO of allowable alibis.

(4) Accurately count hits and misses. A hit is any bullet hole that

is either completely within or touches some part of the scaled silhouette. If a bullet hole does not touch some part of the scaled silhouette, it is counted as a miss. Ricochets will be counted as hits or misses.

(5) Count only two hits per silhouette for score in each table.

(6) Fill in the scorecard legibly.

(7) Assist the firer with target repair.

(8) Total, sign, and return the completed scorecard to the CRO.

Qualification ratings for the AC are as follows:

Expert.....38 to 40

Sharpshooter.....33 to 37

Marksman.....26 to 32

Unqualified.....25 and below

e. Range Equipment.

Frame, Target (Local manufacture)	1 per lane
E-Silhouette (NSN: 6920-00-071-4780)	1 per lane
Target, Zeroing, 25-meter (NSN: 6920-01-167-1392)	1 per firer*
Target, Scaled Silhouette (NSN: 6920-01-167-1398)	2 per firer
Pasters, Black (NSN: 6920-00-165-6354)	As required
Pasters, Buff (NSN: 6920-00-172-3572)	As Required
Tacker, Target w/staples	As required
Ammunition, Zeroing	18 (6) rnds per firer**
Ammunition, Record firing	40 rnds per firer

*also used if sighter rounds are fired.

**6 used if sighter rounds are fired.

Magazine, Ammunition	2 each firer
Paste, Wheat	Optional
Stopwatch	1 each
Scorecard	1 per firer
Whistle, buzzer or horn	1 each

RECORD FIRING SCORECARD * SCALED TARGET ALTERNATE COURSE

RECORD FIRING SCORECARD * SCALED TARGET ALTERNATE COURSE

For use of this form, see back. The proponent agency is TRADOC

DATA REQUIRED BY PRIVACY ACT OF 1974

AUTHORITY: 10USC 3012(g)/Executive Order 9397. PRINCIPAL PURPOSE(S): Records individual's performance on record fire range. ROUTINE USE(S): Evaluation of individual's proficiency and basis for determination of award of proficiency badge; SSN is used for positive identification purposes only. MANDATORY OR VOLUNTARY DISCLOSURE AND EFFECT ON INDIVIDUAL NOT PROVIDING INFORMATION: Voluntary. Individuals 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

6 TABLE 1 FOXHOLE/PRONE SUPPORTED			7. TABLE 2 - PRONE UNSUPPORTED			8. QUALIFICATION	9. REMARKS
TARGET	RANGE (M)	HIT (✓)	TARGET	RANGE (M)	HIT (✓)		
1	300		1	300		☐ 38-40 EXPERT	NIGHT FIRE EXERCISE
2	300		2	300			
3	250		3	250		☐ 33-37 SHARPSHOOTER	
4	250		4	250			
5	200		5	200		☐ 26-32 MARKSMAN	
6	200		6	200			
7	200		7	200		☐ 25-BELOW UNQUALIFIED	NBC FIRE EXERCISE
8	200		8	200			
9	150		9	150			
10	150		10	150			
11	150		11	150			
12	150		12	150			
13	100		13	100			
14	100		14	100			
15	100		15	100			
16	100		16	100			
17	100		17	100			
18	100		18	100			
19	50		19	50			
20	50		20	50			
TIME 120 SEC	HITS		TIME 120 SEC	HITS		TOTAL HITS	

DATE	HIT	MISS	GO	NO GO

DATE	HIT	MISS	GO	NO GO

*FIRER ISSUED 40 ROUNDS TO ENGAGE 20 TARGETS—NO MORE THAN 2 RDS PER TARGET. THE ROUNDS WILL BE PRELOADED IN 4. 10 ROUND MAGAZINES—TWO PER TABLE. ALL ROUNDS WILL BE FIRED WITH THE LONG RANGE SIGHT ON THE M16A1 RIFLE. HITS ARE DENOTED BY A "✓"

12 DATE SIGNED	13 DATE SIGNED
14 SCORER'S SIGNATURE	15 OFFICER'S SIGNATURE

Figure 3 (Front)

RECORD FIRING SCORECARD * SCALED TARGET ALTERNATE COURSE

This scorecard will be used to score Alternate Course record fire qualification when the 25M (NSN 6910-01-167-1398) scaled silhouette target is used. The Alternate Course will be used only when standard record fire and Known Distance ranges are unavailable.

NOTE: If zeroing/grouping exercises are not performed on the day of record fire, 6 rounds of training/sustainment ammunition will be fired for 25 meter zero confirmation prior to conducting the Qualification Course.

CONDUCT OF FIRE

The firer will be given two 10-round magazines to engage the 10 silhouettes on the target. This includes 2 rounds for each silhouette from the foxhole supported position to be completed in 150 seconds, including the magazine change. No more than two hits for each silhouette will be scored.

The firer will then be given 2 additional 10-round magazines to engage the 10 silhouettes on a second target sheet. This includes 2 rounds for each silhouette from the prone unsupported position to be completed in 120 seconds, including the magazine change. No more than two hits for each target will be scored from the prone unsupported position.

The prone supported position can be substituted for the foxhole position.

SCORING

Award one hit for each round that is within or touches some part of the silhouette for a maximum of two hits for each silhouette on each target sheet.

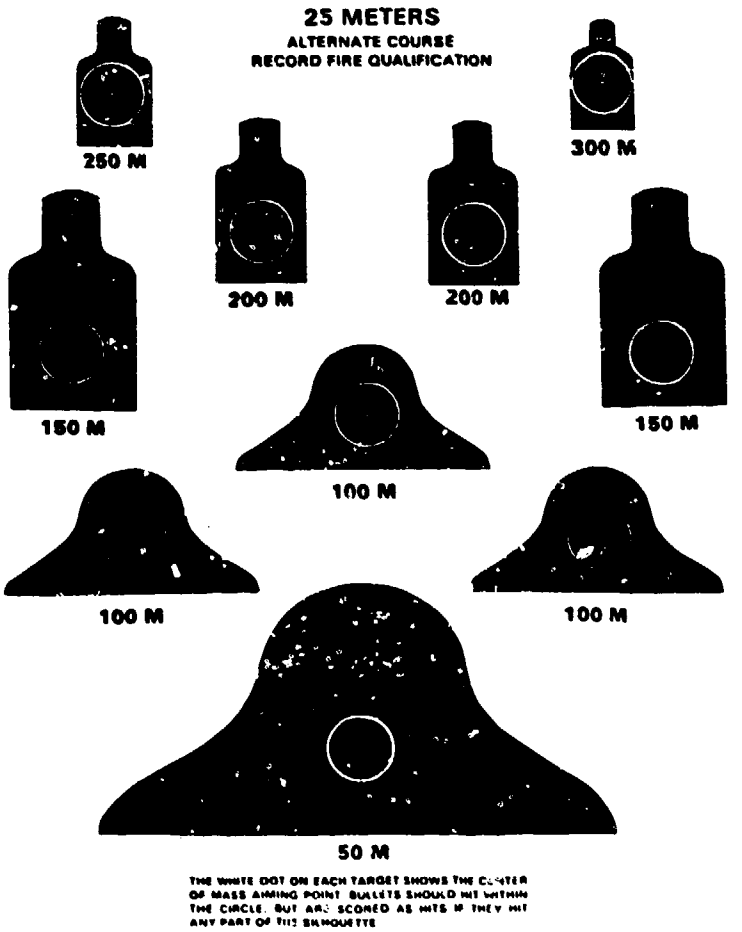

Figure 4 (Back)