



Courtesy photo

The Laser Marksmanship Training System's manufacturer now offers an indoor pop-up target engagement capability that allows shooters to complete a dry fire on an indoor, scaled version of the standard qualification course.

PREDICTING LIVE-FIRE MARKSMANSHIP: A Simulation-Based Tool for the RC Trainer

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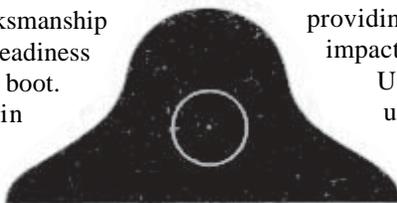
Constraints on training time, ammunition, and access to live-fire ranges make it a real challenge for Reserve component (RC) trainers to sustain their Soldiers' marksmanship proficiency. To provide some relief, Master Sergeant Donald Riley and I published an article in the Summer 2002 issue of *Infantry Magazine* (pages 11-13), that describes a simulation-based, home-station program of instruction (POI). The POI is designed to produce rifle marksmanship proficiency levels that meet — or beat — unit readiness standards while saving time and ammunition to boot.

The U.S. Army Research Institute, in partnership with the U.S. Army Reserve Command's marksmanship executive agent, the 84th Division (Institutional Training), has enhanced this POI by placing another tool in its training and evaluation tool kit. This article describes what this tool looks like, how it works, and how it can help units meet the challenge of marksmanship sustainment training.

The POI

As described in Appendix C of FM 3-22.9 (*Rifle Marksmanship M16A1, M16A2/3, M16A4, and M4 Carbine*), the POI relies on the use of the Laser Marksmanship Training System (LMTS), a

laser-emitting device that allows Soldiers to engage targets without firing live ammunition. The device's major components include a battery-powered laser transmitter, a metal rod (mandrel) to which the transmitter is attached, a variety of laser-sensitive targets, and one or more laptop computers. With one end of the rod holding the transmitter and the other end slipped into the muzzle of the rifle, LMTS lets Soldiers fire their own weapons while providing feedback on both point of aim and point of impact.



Using LMTS, the POI calls for Soldiers to first undergo a series of three dry-fire training exercises designed to promote a firm grasp of marksmanship fundamentals (steady position, aiming, breath control, and trigger squeeze) followed by a fourth exercise where shooters get the opportunity to dry fire a simulated Alternative Qualification Course C (ALT-C) with an electronic replicate of the ALT-C paper target. LMTS ALT-C scores are then used for evaluation purposes to:

- Predict Soldiers' chances of first-run, live-fire ALT-C qualification, and
- Separate shooters who need remediation (unlikely live-fire qualifiers) from those who don't (likely live-fire qualifiers).

Until now, the POI's live-fire predictions have applied only to

ALT-C because an LMTS version of the Army's standard pop-up target qualification course has been unavailable. Recently, however, the LMTS' manufacturer (Beamhit, Inc.) has added a pop-up target engagement capability that now lets shooters dry fire an indoor, scaled version of the standard qualification course. The addition of this enhanced capability has made it possible to proceed with development of a tool that RC trainers can use to predict Soldiers' chances of first-run, live-fire qualification on the standard qualification course from scores fired on LMTS' simulated pop-up course.

The Tool

To develop the tool, we simply entered the first-run LMTS and live-fire target hit scores of 110 Idaho RC Soldiers into the prediction software program previously described in the September-December 2000 issue of *Infantry Magazine* (pages 10-12). Table 1 shows the resulting prediction tool created in the form of a look-up table.

The tool is easy to use. Once your Soldiers have fired the LMTS version of the standard qualification course, plug their individual hit scores into Column 1 of the table and read across to predict each Soldier's chances of first-run live-fire qualification. A Soldier firing an LMTS hit score of 28, for instance, would be predicted to have an 80-percent chance of qualifying "marksman" (Column 2), a 20-30 percent chance of qualifying "sharpshooter" (Column 3), and less that a 10-percent chance of qualifying "expert" (Column 4). It's that easy.

The Payoff

So how can this prediction tool help to better your rifle marksmanship sustainment training program? First, the tool's predictions can be used during pretesting to identify those Soldiers who have a reasonable chance, say 80 percent or better, of first-run qualification and those who don't. You can then maximize the payoff from your training resources by targeting the Soldiers in need of remediation before they fire for record on the range.

Second, the tool can be used during post-testing to determine when enough remedial training has been provided (that is, when the chances of a Soldier qualifying on the first try have been boosted to an acceptable level). Thus, time won't be spent overtraining those who have already regained their proficiency, thereby leaving time for you to concentrate on those who haven't.

Third, you can use the tool to ensure your unit meets or exceeds the live-fire marksmanship proficiency standard you select. Suppose you set the standard at 80-percent first-run qualification. If you then train Soldiers to a point where they can fire at least 28 hits on LMTS, then you can be reasonably confident that 80 percent of them will qualify the first time out on the range at marksman-level or better.

Fourth, and lastly, you can use the home station LMTS scores in place of scores fired on the range for purposes of yearly qualification or validation when outdoor facilities are not readily available. Of course, the notion of using simulation-based scores in place of live-fire scores for qualification purposes is still

Chances of a Live-Fire Score of ...			
LMTS Score	23-29 Marksman	30-35 Sharpshooter	36-40 Expert
5 or less	10	--	--
6	20	--	--
10	30	--	--
14	40	--	--
17	50	--	--
19	--	10	--
21	60	--	--
24	70	20	--
28	80	--	--
29	--	30	--
32	--	40	--
34	90	--	10
35	--	50	--
39	--	60	--
40	--	--	20

Table 1 - Prediction Tool for the Standard Qualification Course

controversial, but when the time comes for its Army-wide acceptance, you'll be good to go without delay.

What Next?

We have yet to collect the marksmanship data necessary to determine if the predictions developed for the RC also apply to the Active component (AC). We'll let you know as soon as we have the answer. In the meantime, the RC now has two live-fire prediction tools in its LMTS tool kit:

- One for predicting the chances of first-run qualification on ALT-C, and

- One for predicting the chances of first-run success on the standard qualification course.

Use of either tool will enable the RC to take a giant step toward meeting the Total Army readiness challenge by enhancing the effectiveness of home-station, rifle marksmanship training and evaluation while saving precious time and ammunition in the process.

If you have any questions or comments about the research conducted to support prediction tool development, you can contact me at the U.S. Army Research Institute field office in Boise by calling (208) 334-9390 or e-mailing jhagman@boisestate.edu. Questions about LMTS fielding plans and instructor certification training should be directed to Master Sergeant Donald Riley at (404) 469-7195 or donald.riley@us.army.mil.

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