within the regiment. Sniper shortcomings in Afghanistan promoted the need for centralized sniper schools, but quality sniper training did not appear until 1999. Most Soviet and Russian ground-gaining units did not need snipers as much as they needed marksmen. The prime question is where should snipers be assigned—in battalions or in a central reserve, or both?

Sniper tactics are an issue. Many Western armies deploy a sniper and an observer together. The observer carries an assault rifle to protect the sniper. The Soviets and Russians tried this approach with their snipers who were organic to motorized rifle platoons. This did not work effectively for them in either Afghanistan or Chechnya. The platoon sniper eventually ended up as part of a two- or three-man hunter killer team that employed the sniper as a marksman. Elite (professional) snipers worked in pairs with a security team backing them up. Many Western armies use the single sniper with a single security assistant approach.

The ideal sniper rifle is another issue. Deer hunters who hunt with a scoped rifle often miss close-in shots because they cannot acquire the animal quickly in the scope, and there are no open sights under the scope. The Soviets and Russians have consistently designed sniper weapons with open sights readily usable under the scope. Many Western sniper weapons lack this elementary characteristic. Even with open sights, Russian snipers carry an automatic weapon (assault rifle or machine pistol) as emergency backup. The Russian penchant for semi-automatic (and automatic) weapons extends to sniper weapons. Only recently have they explored the inherent accuracy of bolt-action sniper weapons, but the army has yet to buy any. The ideal caliber and characteristics of a sniper rifle continue as a matter of debate in the Russian Army and others.

Western and Russian snipers have access to the same types of equipment (laser range finders, binoculars, radios, and so on). The field periscope, which was very valuable for Soviet snipers during World War II, disappeared but quickly reappeared after the initial fighting in Grozny, since snipers often need to scout the battlefield without exposing their heads and hands.

Sniping is once again a hot topic in the U.S. Army. During Operation Anaconda in the mountainous Sharikot valley of Afghanistan, Canadian Snipers from the 3rd Battalion, Princess Patricia's Canadian Light Infantry Regiment, destroyed enemy targets at ranges well beyond the capability of the U.S. assault rifles. The Canadian .50 caliber rifles proved quite effective and created a demand for .50 caliber rifles in the hands of U.S. troops in that region. As the U.S. Army reexamines the mission and role of snipers in its infantry units, the Russian experience, and the recent Canadian experience, should certainly shape the debate.

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Lock and Load

Reengineering RC Marksmanship Training

DR. JOSEPH D. HAGMAN
MASTER SERGEANT DONALD RILEY

Commanders of Reserve Component (RC) units often have to make do with less when it comes to rifle marksmanship training. Time and other resource constraints often lead to compromises. But relief is on the way. The U.S. Army Research Institute (ARI) has been working with the U.S. Army Reserve Command's marksmanship executive agent—the 84th Division (Institutional Training)—to find a better way to train and evaluate marksmanship using training devices. The goal of this work is to field a home station program of sustainment-oriented instruction (PSOI) that will produce shooter proficiency levels that meet or exceed unit readiness requirements while keeping the resources needed to a minimum.

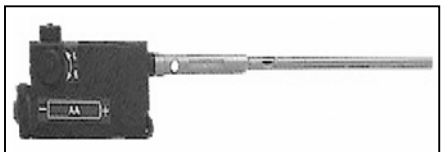


Figure 1

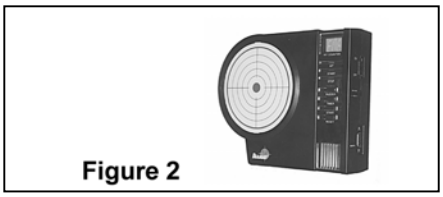


Figure 2

The development of the rifle program of instruction (POI) is now all but com-

plete. It relies on the use of the Laser Marksmanship Training System (LMTS), a laser-emitting device that lets shooters engage targets without firing live ammunition. Its major components include a battery-powered laser transmitter, a metal rod (mandrel) to which the transmitter is attached (Figure 1), a variety of laser-sensitive targets (Figure 2), and a laptop computer. 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. With a few exceptions, the same equipment configuration will be used to support training for all direct-fire small arms.

LMTS Score	Predicted Average Record Fire Score	Chances (%) of Firing an ALT C Live-Fire Score …		
		≥ 26 (Marksman)	≥ 33 (Sharpshooter)	≥ 38 (Expert)
3	19	10	--	--
8	21	20	--	--
13	23	30	--	--
16	25	40	--	--
18	25	--	10	--
19	26	50	--	--
23	28	60	--	--
24	28	--	20	--
26	29	70	--	--
28	30	--	30	--
29	30	--	--	10
30	31	80	--	--
31	31	--	40	--
34	33	--	--	20
35	33	--	50	--
36	34	90	--	--
38	35	--	60	--
39	35	--	--	30

LMTS Prediction Table

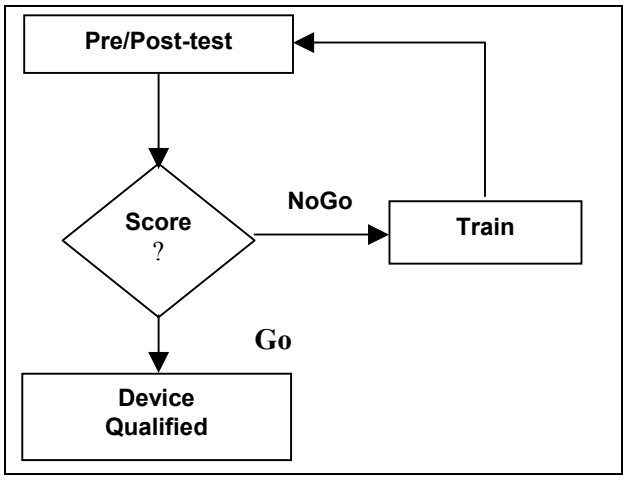
Exercises are fired according to the delivery strategy shown in the flow chart (next page).

Because the strategy is based on proficiency, shooters first demonstrate their current level of marksmanship proficiency while firing an LMTS-based pre-test. Scores on the pre-test are then used to identify shooters who need sustainment training—those who are unlikely to qualify on the first run on the live-fire range. After training, shooters are administered a post-test (a repeat of the pre-test) to make sure they have mastered the necessary fundamentals to support a good chance of live-fire qualification.

During pre-testing, all soldiers fire the electronic simulated ALT C target with LMTS. Their scores are then plugged into the LMTS Prediction Table (shown here) to find each soldier's predicted average live-fire score and associated chances of first-run, live-fire qualification. (Prediction table values were calculated using the automated prediction tool described in the article "Using Devices to Predict Live Fire: A Tool for the Marksmanship Trainer," by J.D. Hagman, *Infantry* Magazine, September-December 2000, pages 10-12.)

A soldier who fires 30 on the pre-test (Column 1), for example, would be predicted to fire an average score of 31 on the range (Column 2) and have an 80 percent chance of qualifying Marksman (Column 3), a 30 to 40 percent chance of qualifying Sharpshooter (Column 4), and a 10 to 20 percent chance of qualifying Expert (Column 5). Depending on the overall standard set for unit qualification, say 80 percent, some soldiers will "Go" the pre-test and be rated device-qualified, whereas others will "NoGo" the pre-test and be rated device-unqualified. Accordingly, only the latter group will need sustainment training and follow-up post-testing.

So, what can you do with the new POI that you were not able to do without it? For starters, you can train your soldiers to be better shooters while saving time and ammunition in the process. (Historically, RC units are not resourced with live rounds to support marksmanship training. All of their allocations are used for grouping, zeroing, and qualification firing. In addition, soldiers who fail to meet standards are not given the additional time and ammunition needed for remedial training.) Just how much better your soldiers will shoot and how much savings you can expect have yet to be nailed down. But a recent Fort Benning-sponsored comparison test of LMTS-based against current Basic Rifle Marksmanship (BRM) training has shown comparable record fire qualification scores under the two approaches, with LMTS-trained soldiers needing 20 percent fewer rounds to group and zero. In addition, soldiers who have had LMTS-based training hit 14 percent more targets and fired a 37 percent higher "Go" rate during known-distance firing in preparation for record fire.



These benefits are encouraging for *initial* training, but they should be even greater for *sustainment* training where marksmanship-proficient soldiers can "test out." For example, by using the LMTS prediction table to support both pre-testing and post-testing, training can be scheduled more efficiently by targeting only the soldiers in need of remediation, and these will receive only as much remediation as is necessary. This should save considerable training

time, as well as time and ammunition later on the range. In support of this notion, sustainment data collected recently by the 84th Division showed that LMTS-trained soldiers from the 100th Battalion, 442d Infantry (the USAR's only infantry unit) took 50 percent less time and ammunition than normal to group and zero, and also raised their first-run qualification rate from a historical 60–80 percent to 98 percent. As a result of these positive findings for both initial and sustainment training, the Infantry School's device-based marksmanship training strategy now endorses the use of LMTS.

Lastly, and perhaps most importantly, the delivery strategy's prediction table provides a reliable set of live-fire qualification probabilities (Columns 3–5 in the prediction table) that can be used to set record fire standards on LMTS in the form of cutoff scores (Column 1 of the table). A soldier would have to achieve 30 hits on LMTS, for example, to ensure an 80 percent chance of first-run, live-fire qualification. Thus, when adequate range facilities are not readily available, LMTS scores fired at home station can be used in place of scores fired on the range for purposes of yearly qualification or validation. Of course, the notion of shooting record fire on a device instead of on the range is still controversial. But when the time comes for its adoption Army-wide, the RC will have already laid the groundwork, thereby saving time and ammunition without compromising the intent and outcome of the marksmanship qualification process.

Although the POI is now far enough along for implementation purposes, we still have a few things to do to make it even better. One of these is to add the option for shooters to engage pop-up targets and to practice fire on a simulated Remote Electronic Targeting System (RETS) range in preparation for standard qualification firing. Right now, the POI benefits technically extend to stationary, known-distance target engagements fired on ALT C. Recently, however, a pop-up target engagement capability and a mini-RETS qualification course have been developed. We have not yet developed the LMTS prediction table that needs to go with it to support pre-testing and post-testing.

Assuming that the option to conduct qualification fire on LMTS is just around the corner, we need to determine how often soldiers need to qualify on the range as opposed to on the device. Should device-based qualification be allowed every year, every other year, every third year, or what? Over the next year, we plan to gather the data needed to answer this question, as well as to develop the table for predicting pop-up target qualification. We'll keep you informed of our progress.

In the meantime, the USAR is planning distribution to all reserve centers, and the 84th Division already has an instructor certification course in place. So unbox your LMTS equipment and POI support package as soon as they arrive; get your instructors certified on the LMTS; and start down the road to more effective and efficient rifle marksmanship training and evaluation—without ever leaving home station.

Any questions or comments about the research conducted to support the development of this POI can be directed to the Army Research Institute field office in Boise, Idaho, by telephone (208) 334-9390, or e-mail jhaman2@email.boisestate.edu. Questions about LMTS fielding plans and instructor certification training should be directed to MSG Donald Riley at (414) 535-5850 or rileydo@usarc-emh2.army.mil.

Dr. Joseph D. Hagman is a senior research psychologist at the U.S. Army Research Institute's field office at Gowen Field, Idaho. Since earning a Ph.D. in engineering psychology from New Mexico State University in 1975, he has focused his research interests on human learning and memory, and more recently, on soldier performance on marksmanship-related simulation and training devices.

Master Sergeant Donald Riley is the Weapons Training Strategy Coordinator for the U.S. Army Reserve. He is an Active-Guard-Reserve soldier assigned to the Deputy Chief of Staff, Operations, at the 84th Division (Institutional Training) in Milwaukee, Wisconsin. He has been involved in soldier training since 1970.

AC/RC Battalion Command

A Superb Opportunity

LIEUTENANT COLONEL KEVIN J. DOUGHERTY

I am getting toward the end of a two-year tour as commander of the 2nd Battalion (TS) (IN), 393d Regiment at Fort Chaffee, Arkansas, and can say that this has been one of the best assignments in my career. I also think that these Active Component/Reserve Component (AC/RC) battalion commands are among the best-kept secrets in the Army. So this article is designed to provide some information about the job. It's certainly not intended to be a "how I did it" war story—just an effort to share what I think is a really good deal.

Background. The AC/RC program stems from the difficulties experienced during the Persian Gulf War in deploying the Army National Guard's "round-