



Figure 3. Steps in constructing a cardboard contour model.

A terrain walk is, in fact, an absolutely necessary part of the terrain appreciation process. If an instructor does not take the soldiers out to confirm and reinforce their confidence in their ability to visual-

ize what is on the map, then he has wasted a lot of valuable training time. I have found that my soldiers have a much easier time using maps for field exercises after they have been through a few terrain appre-

ciation problems.

Trainers who plan to use this technique in their units should allocate at least 16 hours per terrain appreciation exercise for the first one or two. After that, they can figure on between four and eight hours each, depending on the size of the group. (This estimate is based on a class of 15 to 20 people.)

For this entire process to be of any real use, local maps must be used. If you're stationed in Georgia, for example, don't use the old faithful Tenino, Washington, sheet. I use 1:24,000 U.S. Geological Survey (USGS) maps. These are readily available and have enough information in the marginal data that a grid system can be put on them for reference if the instructor so desires.

Too, in making the graphs for the cross-section step, I get the best results by using graph paper that is divided ten lines per inch or five lines per centimeter. These divisions are large enough to be seen easily but small enough to reduce vertical exaggeration to a tolerable level.

Anyone who has questions or comments concerning this method of instruction may write to me at 1685 Copeland Circle, Canton, Michigan 48187.

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Smallbore Riflery

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There are not many things we do in the Army that are really new. And so it is with our marksmanship

training techniques, some of which have been around since just before the turn of the century.

Smallbore training in the Army with the caliber .22 round is one such technique. But with the transi-

tion to the 5.56mm bore in the M16 series service rifle in the 1960s, smallbore riflery with the caliber .22 round became possible without issuing special weapons to units.

The .22 rimfire round has been used as a training round since the turn of the century when 600 Krag-Jorgensen rifles were made for the Army. These rifles were bought to be used for "gallery" practice on smallbore ranges to supplement service rifle marksmanship. Even this idea was not really new; it was a modification of an earlier system of using reduced-load cartridges with the model 1873 Springfield rifle and carbine, a system that had been developed by Colonel George W. Wingate and that had resulted in a substantial monetary savings over a period of time.

Reduced-load cartridges were fired into sand-filled boxes at short ranges, and each of these locally fabricated traps had a holder for a target. These traps could be used under cover during inclement weather. The primary advantage was that a soldier actually practiced with his service weapon, the main differences being in the load of the cartridge and the ranges to the targets.

The Army's purchase of the .22 caliber Krag-Jorgensen gallery rifle in 1892 did away with the need for the caliber .45 reduced-load cartridges. Being identical to the service rifle in most respects, the Krag .22 again replicated the firing of the service rifle except for the size of the round. The soldier still had the advantage of working with a weapon that was similar in operation to his service weapon.

The U.S. Springfield caliber .30-06 rifle, adopted in 1903, had several smallbore variations. Like its Krag-Jorgensen predecessor, the caliber .22 Springfield was intended for gallery practice. About 41,860 of these in different models were manufactured.

The first models produced were similar to the full-stock service rifles and incorporated a caliber .22

adapter for the barrel and receiver. In 1922 a lighter sport-stock version was produced—the M1922, some of which are still in use today. This model differed from the previous caliber .22 Springfield rifles in the sights and the bolt.

Although the caliber .22 versions were bolt-operated like the service rifle, most similarities between them ended at that point. The M1922 weapons, for instance, were target rifles, and there was no direct correlation between firing them and firing the service rifle.

After World War II, the emphasis on smallbore marksmanship in the Army seemed to decline, for various reasons. Except in marksmanship training units, the smallbore and known-distance ranges all but disappeared.

CONVERSION KIT

Today we have a smallbore caliber .22 conversion unit that again enables a soldier to use his service rifle, the M16, in this type of training. Yet we do not take full advantage of it, and marksmanship seems to receive less attention today than it did in earlier times. This lack of interest in smallbore training may result more than anything else from a lack of information regarding how such training can be conducted.

Smallbore marksmanship training offers the same advantages that were previously gained when special weapons were produced for this particular purpose. Of course, an appreciation for marksmanship and the premise that marksmanship skills are transferable from smallbore target shooting to service rifle firing must first be accepted. Although smallbore marksmanship should not and cannot be substituted for service range firing or Trainfire exercises, it does provide an excellent way of improving marksmanship skills. It can be time-efficient, cheap, challenging, and moderately realistic. It also requires fewer resources than service firing, and it can be fun for the soldiers.

The device that makes possible the conversion of the M16 rifle to caliber .22 is known as the Conversion Kit, M261, NSN 1005-01-010-1561. Essentially, the device is a replacement bolt and a supplemental buffer spring configured to fire the caliber .22 rimfire cartridge from a special magazine that comes with the kit. Although magazines are available in different sizes, the Army normally purchases the ten-round version. The converter takes only moments to fit to a rifle and does not change the overall functioning of the weapon.

Like other smallbore programs, the use of the converter for M16 rifles has its disadvantages also. It does not substitute for service ammunition firing (noise, recoil, and trajectory determination due to weather), range estimation, or target acquisition practiced on an outdoor known-distance or Trainfire range.

In addition, with the current converter, there is an accuracy problem that might prevent its use for training in the very areas where it might have proved most useful—zeroing, qualification, and competitive target shooting.

There may be a solution to the accuracy problem, which is probably a function of the ammunition and not of the converter device itself. The Army has noted a dispersion when the converter is used to fire caliber .22 rimfire ammunition at point targets. Although the .22 rimfire round is very close to the same size as the 5.56mm service round (which is .223), there may be just enough difference in tolerances to cause a small dispersion at the point of aim. The problem would therefore appear to be a difference in the size of the round and not in the interchangeability of the converter device as implied in FC 23-11.

The solution to this problem may be the redesign of the caliber .22 round so that the lead bullet fits the bore more closely. Although I do not profess to be a munitions designer, E. C. Minie found the so-



lution to a similar problem more than 100 years ago.

Since the U.S. Army purchased the first converter kits, two improved kits have been designed that solve the reliability problems encountered with the first kit. Indeed, there are kits now that fit the 30-round magazines for the M16 and fire caliber .22 rounds on both semiautomatic and automatic settings. The Army has not bought the new kits, however, and is still using the first-generation kits.

Should the dispersion-accuracy problem be solved, major training requirements could be accomplished on a smallbore range or a 25-meter/1,000-inch zero range using caliber .22 ammunition. This would mean that a tremendous amount of savings could be realized using the converter kits and rimfire ammunition instead of 5.56mm service ammunition. There would be other benefits as well.

Monetary constraints and ammunition allocations are inexorably tied together in an annual document for units called "STRAC" (for the Standards in Training Commission, which establishes requirements).

There are no unlimited ammunition resources and, unlike a few years ago, ammunition is allocated on the basis of specific training

missions. Every round of 5.56mm saved on the zero, familiarization, and alternate qualification courses could therefore be used to conduct more beneficial training such as unit maneuver live fire courses (CALFEXes, for example) where the caliber .22 could not be interchanged.

Modified qualification firing could be done on 25-meter ranges. These ranges are especially important to units stationed in Europe, and to Reserve Component units for whom the ranges were originally intended (because of the lack of available facilities for known-distance and Trainfire ranges).

Alternate course qualification is authorized for units when 300-meter known-distance (KD) ranges are not available. The target, NSN 6920-01-167-1398, represents the scaled "E" and "F" silhouettes normally found on Trainfire ranges with distances represented from 50 to 300 meters. Since the trajectory of the caliber .22 rimfire bullet out to 50 meters is virtually identical to that of the 5.56mm round, qualification on the 25-meter course would be just as effective and more efficient with the converter kit.

The construction of a range with a proper backstop could more easily fit into most local training areas. Noise considerations with the cali-

ber .22 rimfire ammunition would be minimal. The firing would remain moderately realistic in the sense that the soldier would use the same weapon that he would fire on a service range. It would still provide a training correlation better than that of simulators while allowing more than one soldier to train at a time. Instead of waiting for a unit to go to a zero range, which might be a long time, the new soldiers entering units could be met at the inprocessing center by a unit representative, given their assigned weapons, and have those weapons zeroed before leaving the inprocessing location.

Even if a unit is not interested in training with the smallbore devices in a marksmanship program, there are other possible uses for the devices. For example, the converter might provide an inexpensive and much safer live fire option in training for urban operations than service ammunition. The caliber .22 round would cause less damage to the inside of a building and would be less prone than the 5.56mm service round to ricochet long distances. If a protective liner were used inside a building, training could be conducted more safely with the converter. The caliber .22 rimfire tracer, M861, might also offer interesting possibilities for night training.

The use of a smallbore training program could provide some new alternatives to a unit that was serious about marksmanship. With the continued emphasis on saving money and ammunition, smallbore training would provide a reasonable solution to these concerns. The venerable caliber .22 rimfire round has served well for the past 90 years and will continue to make a valuable contribution to the U.S. Army's marksmanship program through smallbore riflery.

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