A Mini Tank Range, Step by Step

by Captain Gregory M. Parrish

"Bravo 11, this is Charlie 92. Occupy firing point 1 on the course road. Battlecarry Sabot. Report Redcon 1. Gas, gas, gas." Sound like the Multi-Purpose Range Complex (MPRC) at Fort Carson, or Range 117 at Grafenwoehr? How about Mississippi Army National Guardsmen training in the motor pool at Camp McCain, Mississippi?

Armor leaders in both the Active and Reserve Components face substantial obstacles in maintaining the readiness of tank crews. Shrinking operating and maintenance budgets, strict environmental controls, and a lack of training areas present significant problems to achieving crew readiness. These problems must be overcome with imagination and ingenuity.

Members of Resident Training Detachments (RTDs) must apply all of their technical expertise and experience to assist their Reserve Component counterparts in overcoming problems experienced throughout the Army and those specifically related to the Reserve Component (RC). The RTD built a portable mini tank range for use by 2-198 Armor, MSARNG, to train its tank crews. This mini tank range has been used by active units in Germany and at Fort Carson, Colorado, to compensate for mileage constraints and a lack of available training areas.

The lack of resources causes some units to conduct Tank Tables I-III in the UCOFT rather than on the scaled and subcaliber ranges recommended in FM 17-12-1-1&2. Although this is an acceptable substitute, it fails to involve the entire crew. By using the UCOFT, TCs and gunners achieve a high degree of synchronization. The loaders and drivers, however, are not integrated into the rhythm that a crew must develop. To remedy this shortcoming, most gunnery training programs include flash card or chair drills to train crew drill. A few enterprising tank commanders place their crews on a tank and walk through crew drill. These methods help crew members memorize fire commands, target presentations, engagement ranges, and tower cues, but they do not help a crew improve on the one thing that makes the difference between a qualified or unqualified engagement: full crew coordination and synchronization.

There is a void in our gunnery training in the transition from UCOFT to full crew drill on the tank. In some cases, this leads to coordination problems for the crew on Tank Table IV (Tank Crew Proficiency Course). Failed tasks and numerous reruns result. The mileage savings realized by utilizing the UCOFT can easily evaporate. Most company commanders and platoon leaders recognize this shortcoming, but they are generally not allowed to run a practice TCPC due to mileage constraints or unavailability of training areas.

A mini tank range built on a 4′x8′x¾" sheet of plywood is a training device that gives crews more opportunity to practice crew drill prior to Tank Table IV. The targets are thermalized using reverse polarity thermal paper, which produces good images in the Thermal Imaging System (TIS). The range is hand-operated, portable, and sturdy. The range's scale and size make it suitable for use in the motor pool, or as a concurrent training station during Tank Table IV (TCPC).

A crew training on the mini tank range exercises all normal crew duties in preparing for and conducting an engagement. The crew places all the tank's systems into operation. The crew is given the "tower talk" that they hear during the table, and evaluation is conducted via jump radio by a Tank Crew Evaluator (TCE). Evaluation criteria is the Tank Table IV timing and scoring tables. Tank Table VIII may be replicated by using the tower cues and the timing and scoring tables for that table.

The limitations of the range include the inability of the loader to battlecarry, the gunner to lase (thereby inducing lead into the system), and the driver to move the tank during offensive engagements.

The inability to battlecarry is inconsequential. The tank commander simply reinforces the drill by announcing "Battlecarry Sabot." The loader announces "Sabot Loaded" and leaves the breech in the open position. Once the engagement is initiated, the loader loads a dummy round to replicate the second round being loaded. The inability to lase is overcome by the tank commander pressing the Battlesight Reset Button to manually induce lead when the gunner begins tracking a target. The inability to move the vehicle for offensive engagements cannot be overcome; however, the timing and scoring tables for offensive engagements are still used as evaluation criteria. The crew can practice the defense "berm drills" in the motorpool if space and safety allow, or just outside the back gate on a little-used earthen loading ramp if one is available.

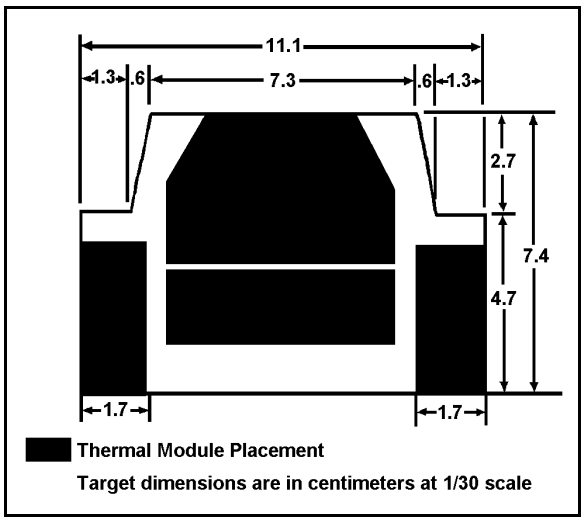
The advantages of the mini tank range are full crew participation, the use of all systems in the tank, portability, conservation of mileage, minimum resources required to build and operate the range, and low cost of construction. The entire crew manipulates all controls needed to execute an engagement. The range may be moved by two soldiers and transported by HMMWV or pick-up truck. The tank uses no mileage executing the training. Only two soldiers are required to operate the range, and all required equipment is available at platoon or company level. All materials used to build the range are available through the supply system, local hardware store, or SSSC.

Using dummy rounds during mini tank range training and during a dry Tank Table IV reinforces crew coordination and synchronization while giving crews a more accurate picture of their engagement times. Tank Table IV, with live ammunition and stiff scoring and timing tables, is not the place to discover a coordination problem with the loader. Resulting reruns can add great cost in ammunition expenditures.

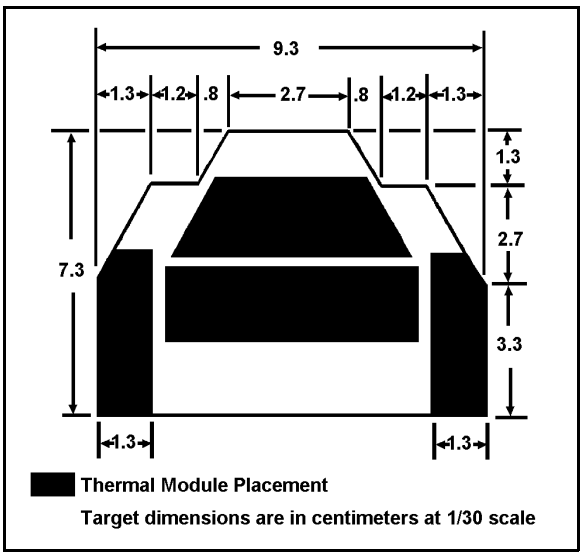
AARs must focus on actions which cost the crew time. Was the loader too slow with the second round, or was the gunner too slow pulling the trigger? Feedback such as this helps tank commanders zero in on what corrective training is necessary to shorten the engagement time. The former problem is remedied with mini tank range and Tank Table IV training with dummy rounds. The latter is a matter of a gunner's confidence in his system and is remedied with more time in the UCOFT.

Use of the mini tank range has resulted in better prepared crews and fewer reruns on Tank Table IV. This increased crew proficiency saves both mileage and time. These savings can then be used to practice Tank Table VIII engagements with remaining mileage and time while on the Tank Table IV range.

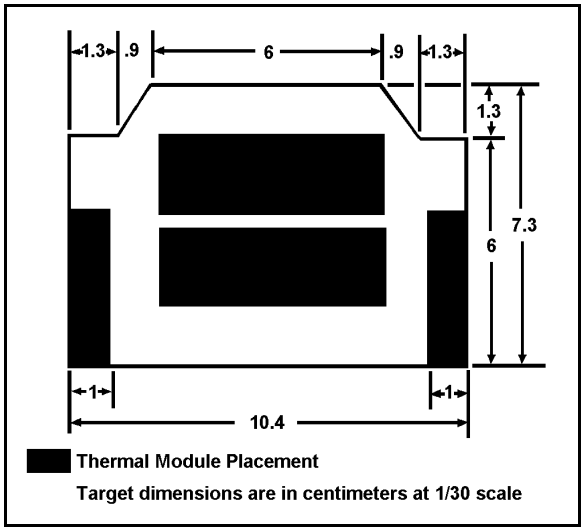
TARGET DIMENSIONS



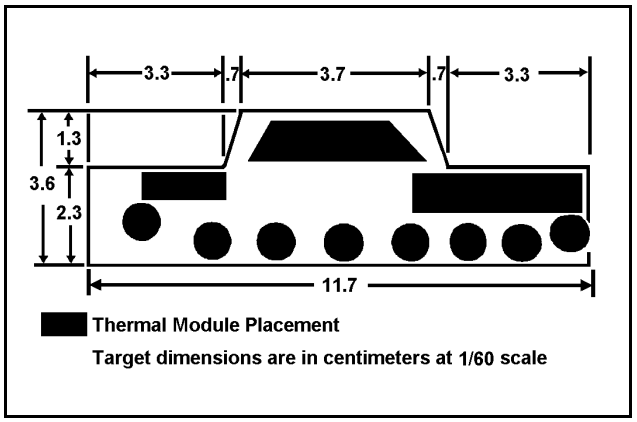
T-72 Front Target



BTR Series Front Target



BMP-1981 Frontal Target



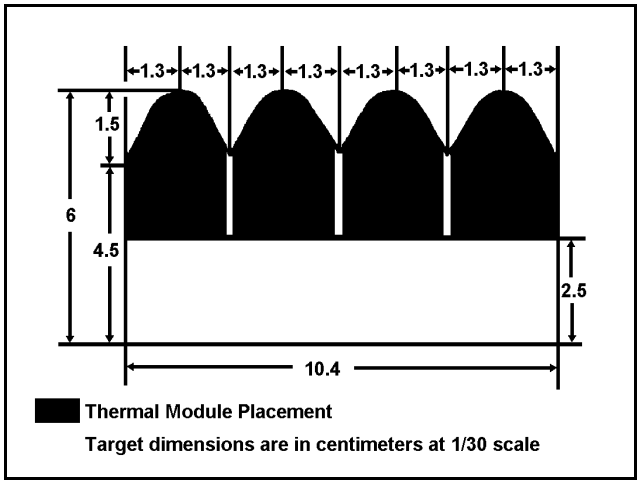
T-72 Flank Target

Targets are cut from 1/2-inch plywood and No Power Thermal Paper is applied to blackened areas with Elmer's Stix All glue.

All stationary target dimensions are for 1/30 scale, replicating engagements at 1800 meters. Tank front slope to range table distance should be 60 meters. The "mover," a T-72 flank target, is scaled at 1/60 to keep the range at a portable size.

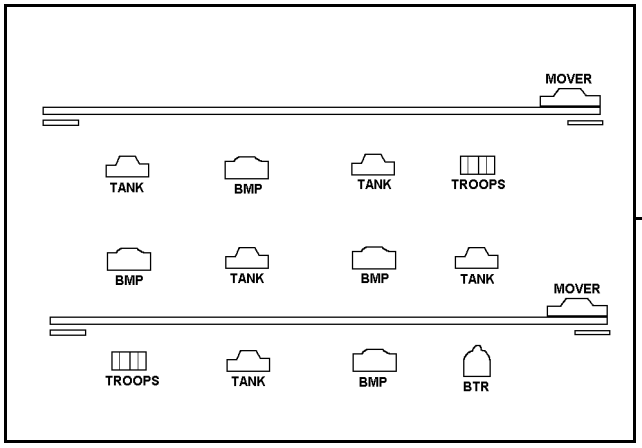
Inner surfaces of the "mover" track should be smoothed with 100-grit sandpaper and lubricated with bar soap to ease operation.

Total cost of parts is estimated at $70.

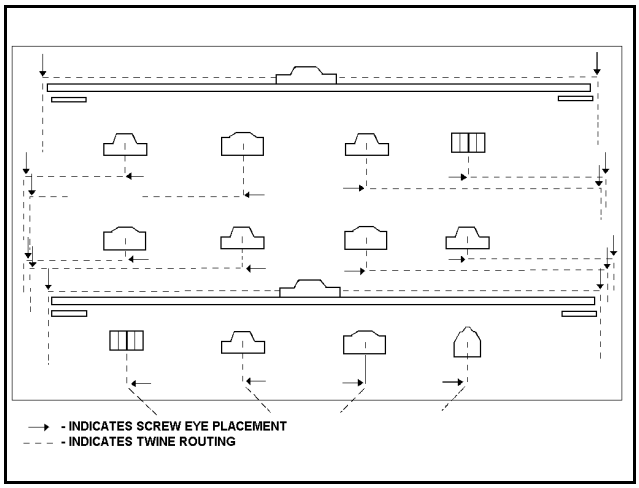


Personnel Target

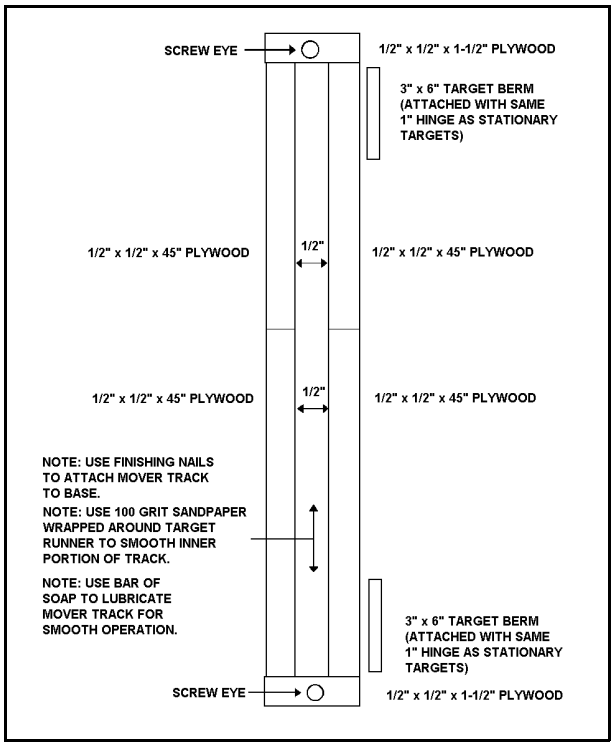
ASSEMBLY NOTES



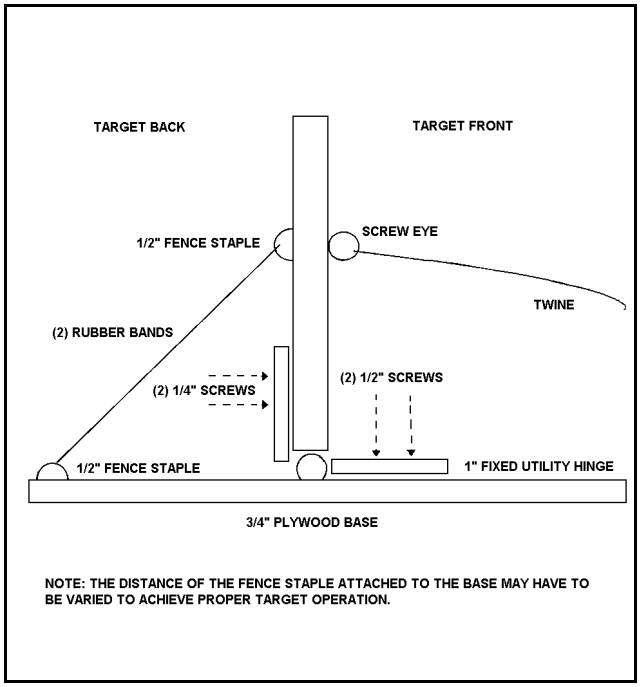
TARGET LAYOUT



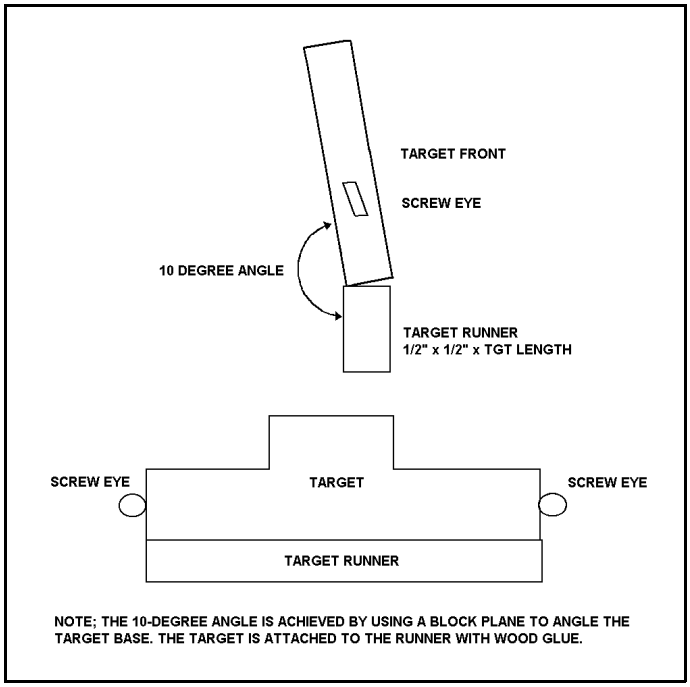
SCREW EYE PLACEMENT



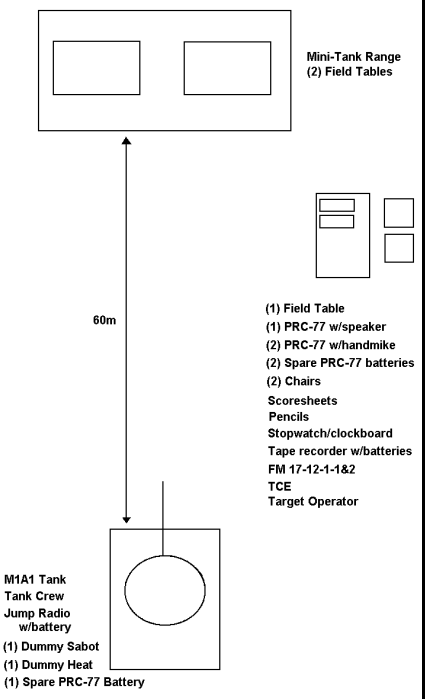
MOVER TRACK ASSEMBLY



STATIONARY TARGET ASSEMBLY



MOVING TARGET ASSEMBLY



RANGE LAYOUT

Overall view of the completed mini tank range

The completed mini tank range, as seen through sight set to Black Hot

List of Materials

1 4x8 plywood sheet - ¾"
1 4x4 plywood sheet - ½"
16 1" fixed pin utility hinges
32 ½" flat head wood screws
32 ¼" flathead wood screws
32 ¾" screw eyes
¼ lb. 3D finishing nails - 1" long
2 cans OD spray paint
1 roll heavy binding twine
1 bar bath soap
1 box heavy rubber bands
¼ lb. ½" fencing staples
1 tube Elmer's Stixall glue
1 sq. yd. No Power Thermal Target Material PN CAMCAL 210G095
1 bottle Elmer's Wood Glue

TOOLS:

Jigsaw, ruler, hammer, cross-tip screwdriver, scissors or knife, awl, 100-grit sandpaper, block plane.

Range Setup List

1 M1A1 tank
1 mini tank range
3 field tables
1 PRC-77 w/speaker, batteries
1 PRC-77 w/hand mike, batteries
1 jump radio w/batteries
1 stopwatch, clockboard
1 FM 17-12-1&2
scoresheets
pencils
2 chairs
1(ea) sabot, HEAT dummy rnds
3 spare PRC-77 batteries
1 tape recorder w/batteries

Captain Gregory M. Parrish is a 1986 Distinguished Military Graduate of West Texas State University. A graduate of AOBC, AOAC, Airborne, JOMC, Scout Platoon Leader, M1A1 Tank Commander Certification, and Northern Warfare Courses, he has served as a tank platoon leader in A/2-70 Armor, company executive officer in B/2-70 Armor, 1st Armored Division, Erlangen, FRG; assistant S3, 3d Brigade, 4th Infantry Division (Mech); and commander of A/2-77 Armor, 4th Infantry Division (Mech), Fort Carson, Colo. He is currently assigned to HHC, 1st Cavalry Division as a member of a Resident Training Detachment (RTD) with duty at 2d Battalion, 198th Armor MSARNG, Greenville, Miss.