

## **APPENDIX B**

### **RANGE INFORMATION/DESCRIPTIONS/CELLS**

## APPENDIX B

### RANGE INFORMATION / DESCRIPTIONS / CELLS

*Range cells* included in this appendix were created, which included *historical* regulations, manuals, photos, drawings, and documents. They represent typical (general) layouts, which include firing lines, target areas, target berms, and danger areas (aka SDZ). Each cell is a two-dimensional model, which does not take into account (during time of use) terrain, boundaries, or local requirements and/or restrictions.

As stated in an obsolete Army Regulation, AR 750-10, *Range Regulations for Firing Ammunition in Time of Peace*, dated May 22, 1939, "It is obviously impossible for any general range regulation to cover each local situation completely. Such additional regulations as may be necessary to meet local condition will therefore, be prepared and enforced by the post, camp, or station commander."

When the ranges were established, regulations such as AR 750-10 (now obsolete), along with others, such as TM 9-855, *Targets, Target Material, and Training Course Lay-Outs*, dated August 17, 1944 (now obsolete) would have been referenced. These guidelines would have been applied to the local environment at the time of construction.

Where applicable, right and left firing limits and down-range limits were required and set based on the local conditions. Taking in-to account the scores of ranges and the lack of first-hand knowledge, many ranges were estimated using the best available resources. Topographic maps were analyzed to determine if terrain features could be used to limit the extent of the range.

For most sites it's likely to locate numerous historical maps displaying firing ranges drawn in a various configurations, but not necessarily with a true representation. For instance, they may show the range as nothing more than a dot, a box, circles, or a V-shaped fan. However, in rare cases, a range map displays what appears to be a true fan with a calculated danger area. In these cases, the range fans may be a true representation of the actual range boundaries, and therefore be considered for use instead of the general *Range Cells*. An example where this applies is shown below:

A historical range map found for Fort Custer, Michigan identified numerous ranges, all having range fans drawn. The fans displayed on this map appear to be proportioned, and closely represent correct angles and distances according to regulations. It is believed this map was done with a high degree of accuracy; therefore the range fans were used instead of the general *Range Cells*. Also recovered, was a document referring to the artillery range. It explained the necessity to discontinue firing of artillery on this facility because of the inconvenience of reducing the propelling charges

on 155mm Artillery Shells. The rationale behind this reduced charge was to minimize the down-range distance the projectile would travel. At charge 7 (max), a 155mm projectile had a maximum range of approximately 17,400 yards. In addition to this distance, regulations required a mandatory 1,000-yard buffer zone beyond the max range. If the max charge had been used to calculate the danger area, the downrange distance for this artillery range would have extended more than 6-miles beyond the installation boundary. Maximum distance on artillery munitions can be calculated using appropriate Ammunition Firing Tables.

Unfortunately, this detailed information is seldom available. Other options to consider are included in the following example where the use of topographic maps and site inspections were used to determine the boundaries of Spencer Mountain Rifle Range in North Carolina.

The only available map displayed the range as a small rectangular box. Documents recovered stated that the range was positioned at the base of the mountain in order to reduce the danger area. The *range cell* for a rifle range was designed to include 50 firing positions, which calculates to a width of 400 yards. However, during the site inspection, the actual width of the range was determined to be no more than 150 feet. By reducing the width of the *range cell*, and using contour lines on a topographic map the delineated boundaries was realistically reduced from the standard 1259 acres down to 72 acres.

As indicated, there are many variables to account for when developing range boundaries, and it is unlikely that all of the data used when the range was originally laid out will be available. Therefore, the historical data found during research (maps, aerial photos, documentation, etc.) was utilized to represent the range as accurately as possible. In most cases, the only option was to use the general *Range Cell*.

Each range description contains a list of Ammunition Data sheets. The intention of this list is to provide a general idea of the ordnance that could have been used on the range. It is not intended to be all-inclusive and by no-means is an indication that these munitions are actually present.

A significant number of manuals, drawings, letters, instructions, reports, and miscellaneous documents were referenced in order to calculate the *Range Cells*. The following non-inclusive list are published Range Manuals that were referenced to create the range cells.

- TR 140-5, *Range Regulations for Firing Ammunition in Time of Peace*, dated November 1931
- AR 750-10, *Range Regulations for Firing Ammunition in Time of Peace*, dated May 1939

- AAF Manual 85-0.1, *Army Air Forces Gunnery and Bombardment Ranges*, dated June 1945
- AD-A954 905, *Training in the Ground Army 1942-1945, Study No. 11*, dated May 1948
- *Second Air Force Ground Gunnery Range*, dated July 24, 1943
- TM 9-855, *Targets, Target Material, and Training Course Lay-Outs*, dated August 1944
- TM 9-855, *Targets, Target Material, and Training Course Lay-Outs*, dated November 1951
- AFM No. 66, *Poorman Flexible Gunnery Trainer*, dated March 1945
- TC 25-1, *Training Land*, dated August 1978
- TC 25-8, *Training Ranges*, dated February 1992
- AFI 13-212, Vols 1,2,3, *Space, Missile, Command, and Control, Weapons Ranges*, dated July 1994
- AR 210-21, *Army Ranges and Training Land Programs*, dated May 1997
- AR 385-62, *Regulation for Firing Guided Missiles and Heavy Rockets for Training, Target Practice, and Combat*, dated June 1983
- AR 385-63, *Policies and Procedures for Firing Ammunition for Training, Target Practice, and Combat*, dated November 1983

**HISTORIC USE: ARTILLERY**

**ANTI-AIRCRAFT, up to 4.7-inch (aka: AA Range, AAA Range)**

Range Type: Artillery

Cell Name(s): AA4.7

Regardless of the elevation at which the firing is conducted, the maximum ground impact range of the piece will always be considered when determining the safe field of fire of antiaircraft cannon of any caliber. In addition to the limits of fire, the danger area includes areas 1,000 yards wide, which flank both the right and left limits of fire and extends 1,000 yards beyond the maximum ground impact range.

The field of fire would have been locally determined. However, arbitrary right and left limits of 20° have been used for the range cell. The 3" A.P., M62, which has a maximum range of 15,300 yards, was selected for calculating the down-range limit for the cell.

*The down range distance needs to be calculated if munitions used are suspected to be larger than 3-inch.*

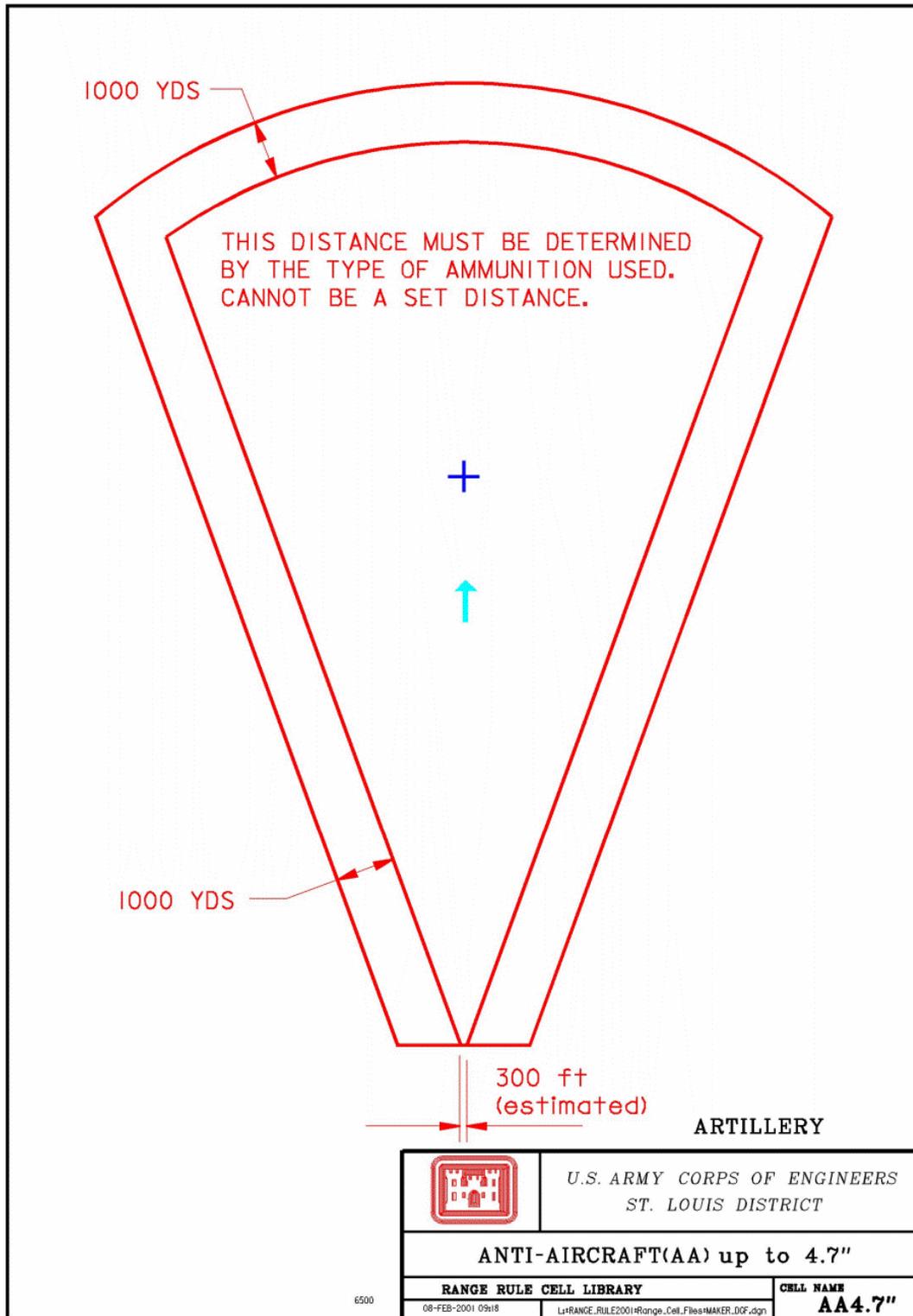
<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
.30 caliber	3,450	2,700
.50 caliber	7,500	2,545
20mm, HE, HEI, AP	6,500	2,850
37mm, HE; Practice; AP; APC	8,875	2,600
40mm, HE; AP	10,850	2,870
75mm, Shrapnel	10,450	1,825
3-inch, HE; Shrapnel, AP	15,300	2,800
90mm, HE	18,000	2,700
105mm, HE; Practice	20,000	2,800
4.7-inch, HE	28,250	3,100

Data sheet(s):

CTT01 Small arms, General  
CTT11 20mm, Ball, M55A1  
CTT13 37mm, AP, M74  
37mm, APC, M59  
37mm, APC, M54  
37mm, HE, MkII  
40mm, AP-T, M81  
40mm, HE & HEI, MkII  
75mm, AP, M72

75mm, HE M48  
75mm, Shrapnel, MKI  
90mm, APC, M82  
90mm, AP, M77  
105mm AA (currently, no data sheet available)  
4.7-inch, HE, M73  
CTT15 37mm, Practice, M55A1  
90mm, Practice, M58

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951



## ARTILLERY

Range Type: Artillery

Cell Name(s): ARTILL

The danger area for an artillery range, which is based on the caliber of ammunition, consists of the impact area and danger areas to the rear, sides, and fronts. Without information concerning elevation and charge used, the impact area needs to extend out to the maximum range of the weapons. Right and left limits of fire were the responsibilities of gun crews and range personnel at the time and are generally not identified on historical documents. The safety limits for cannon positions will apply to the individual cannon, except in the case of a battery, where the limits will be measured from the flank cannons. The estimated width of the impact area is 712 mils (40°).

Coastal Defense Guns: Unlike training ranges, these sites were established for national defense, therefore, would not have been subject to range regulations. The fans typically found on historical maps generally represent sectors of fire (the sector/area in which a particular gun (or guns) was responsible). Sectors were used to ensure total coverage in the event of an attack. Do not consider these as safety fans.

Targets may have included towed or moored barges and ships or target sleeves towed by aircraft.

It is likely that if a gun were fired it would have been directed towards the center of its sector, furthest from land. This fan should be drawn so that land is not within the SDZ. However, a small insignificant, uninhabited island may not have been excluded. The fan begins from the gun position; or in the case of a battery, from the two outside guns.

<u>Caliber of Ammunition</u>	<u>Sides (yds)</u>	<u>Danger Area</u>	
		<u>Rear (yds)</u>	<u>Front (yds)</u>
37mm or less	600	2,000	200
40mm to 75mm	800	2,000	500
90mm to 155mm	800	2,000	600
7" to 240mm	1,000	2,000	1,000

\* 3,000 yards if firing is less than 12° elevation

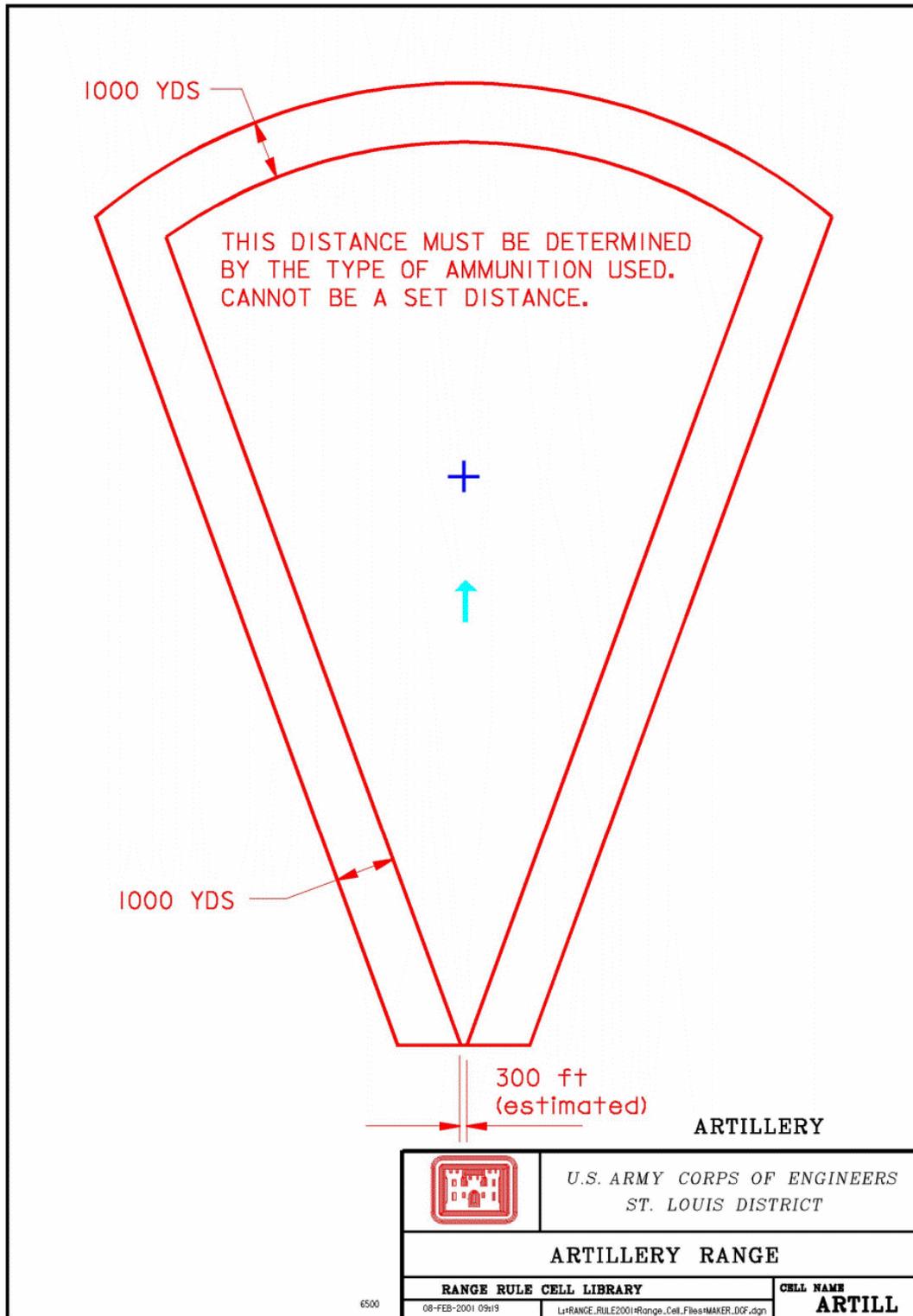
The following approximate maximum ground impact ranges can be used to estimate safety zones. The list is only a select few compiled to assist with estimating safety zones. It was not uncommon for restrictions to be placed on gun elevations and propelling charges. These restrictions were used to reduce maximum ranges in order to comply with local restrictions. Example: The maximum range for a 155mm, HE, M102 fired with charge 1 at 367 mils (20.6°) elevation is equal to 3,000 yards. The same

round fired with charge 7 at 843.8 mils (47°) elevation has a maximum range equal to 12,700 yards.

<u>Weapon</u>	<u>Ammunition</u>	<u>Elevation</u>	<u>Muzzle Vel (fps)</u>	<u>Max (approx) Range (yds)</u>
37mm gun	Fixed, HE, MkII	22° 10'	1,276	4,300
	Practice, MkII	22° 10'	1,276	4,300
75mm gun	HE, M48, normal	43° 00'	1,500	11,195
	HE, M48, supercharged	44° 00'	1,950	13,595
	HE, M48, reduced	44° 00'	950	6,960
	Shot, AP, M61	44° 00'	2,000	13,650
	Shrapnel, MkI	43° 40'	1,755	9,750
75mm pack Howitzer	HE, M48	44° 00'	1,250	9,800
105mm Howitzer, M2	HE, M1	44° 00'	1,550	12,150
	Smoke, M84	43° 40'	1,550	12,210
105mm Howitzer, M3	HE, M1	45° 00'	1,020	8,490
	Smoke, M84	45° 00'	1,020	8,490
155mm Howitzer, M19170-18	HE, M105	44° 16'	1,476	12,775
	Sand-loaded, MkI	44° 23'	1,479	12,300
	Shrapnel, MkI	47° 26'	1,434	10,850
155mm Howitzer, M1	HE, M107	44° 00'	1,850	16,000
	HE, M101	47° 00'	2,800	25,400
	Smoke, M116	45° 00'	1,850	16,200
4.5-inch Gun, M1	HE	45° 00'	2,275	21,125
8-inch Howitzer	HE, MkI	42° 30'	1,305	10,900
	Sand-loaded, MkI	43° 45'	1,525	12,700
240mm Howitzer	HE, MkII	45° 10'	1,700	16,400
	Sand-loaded, MkIII	45° 10'	1,700	16,400

Data sheet: selection depends on known or suspected ordnance. Refer to Artillery, all types.

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951



**RECOILESS RIFLE, KNOWN DISTANCE (aka: Reckless Rifle, Known Distance; Recoilless Rifle, KD; Reckless Rifle, KD)**

Range Type: Artillery

Cell Name(s): RERIKD

The references used to derive this range cell illustrate these types of ranges as being 800 yards long with individual lanes spread across its width. Each firing point has a 10-yard back blast area extending to each side. This indicates that the lanes would be approximately 20 yards wide. The number of lanes depends on local conditions. As illustrated in the references, 4 lanes are specified for 57mm ammunition, and two lanes for 75mm. Targets would have consisted of 55-gal drums or 3-ft by 5-ft log barriers, and positioned at 300, 500, and 800 yards for 57mm ammunition, and at 400 and 800 yards for 75mm.

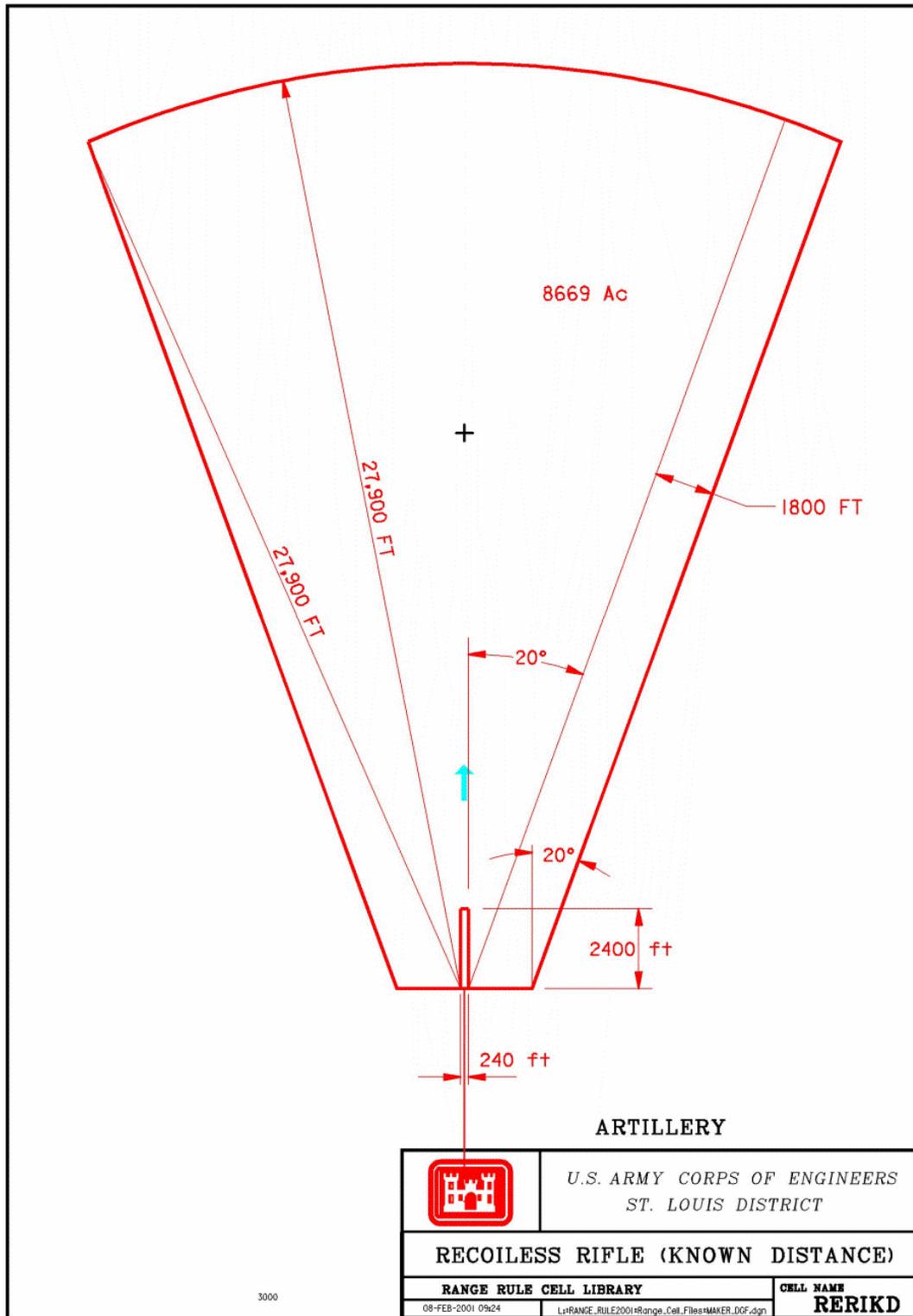
The danger area for the range consists of the impact area and danger area. The impact area extends out to the maximum range of the weapon corresponding to an elevation of 15°. Without information as to right and left limits of fire (which would have been established locally) it is estimated that limits of 20° are sufficient. Danger areas of 600 yards and 2,000 yards are added to both sides and the rear of the range, respectively.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
.30 caliber	3,450	2,700
.50 caliber	7,500	2,545

Data sheet(s):

CTT13     57mm Recoilless Rifle, M306A1  
             57mm Recoilless Rifle, HEAT, M307  
             75mm Recoilless Rifle, HE, M309A1  
CTT14     57mm Recoilless Rifle, WP, M308A1  
             75mm Recoilless Rifle, WP, M48A3

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951



**TANK (MAIN GUN)**

Range Type: Artillery

Cell Name(s): Refer to artillery

A Tank Gun is considered a direct fire weapon.

**HISTORIC USE: MORTAR**

## **MORTAR, 4.2-inch SUB-CALIBER**

Range Type: Mortar

Cell Name(s): MORT42

The 4.2-inch mortar, equipped with the subcaliber assembly, may be used on a training shell range, firing the training shell. The training shell range would have consisted of a target area, an observation post (OP), a mortar position, and a fire direction center (FDC). The width of the range depended on the number of platoons to be trained at one time. A width of 100 feet, the width of the range cell, was determined to be adequate for one platoon.

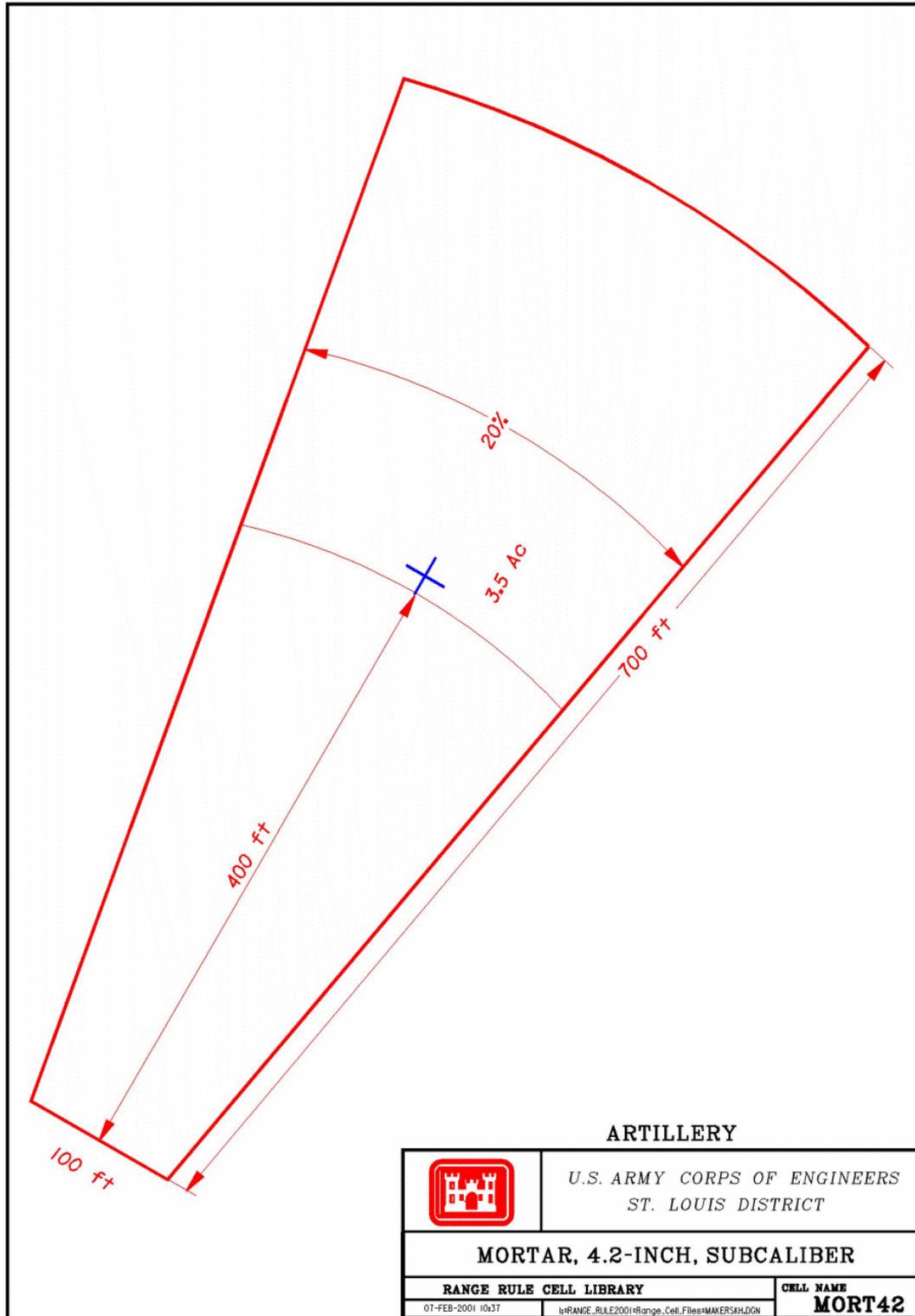
The target area consisted of range markers and targets, which were constructed of scrap lumber. The range markers were placed at 100-foot intervals; with the first being 400 feet from the OP and continuing out to 700 feet. Mortars would have been mounted laterally and positioned approximately 15 feet apart.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>
3-inch, M5 (subcaliber)	Unknown

Data sheet(s):

CTT18      3-inch, Subcaliber, M5

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951; *TM 9-1901, Artillery Ammunition*, September 1950



## **MORTAR**

Range Type: Mortar

Cell Name(s): MORTAR

A mortar range would have been laid out utilizing natural terrain features, which were varied enough to furnish reference points or targets and the desired firing distances.

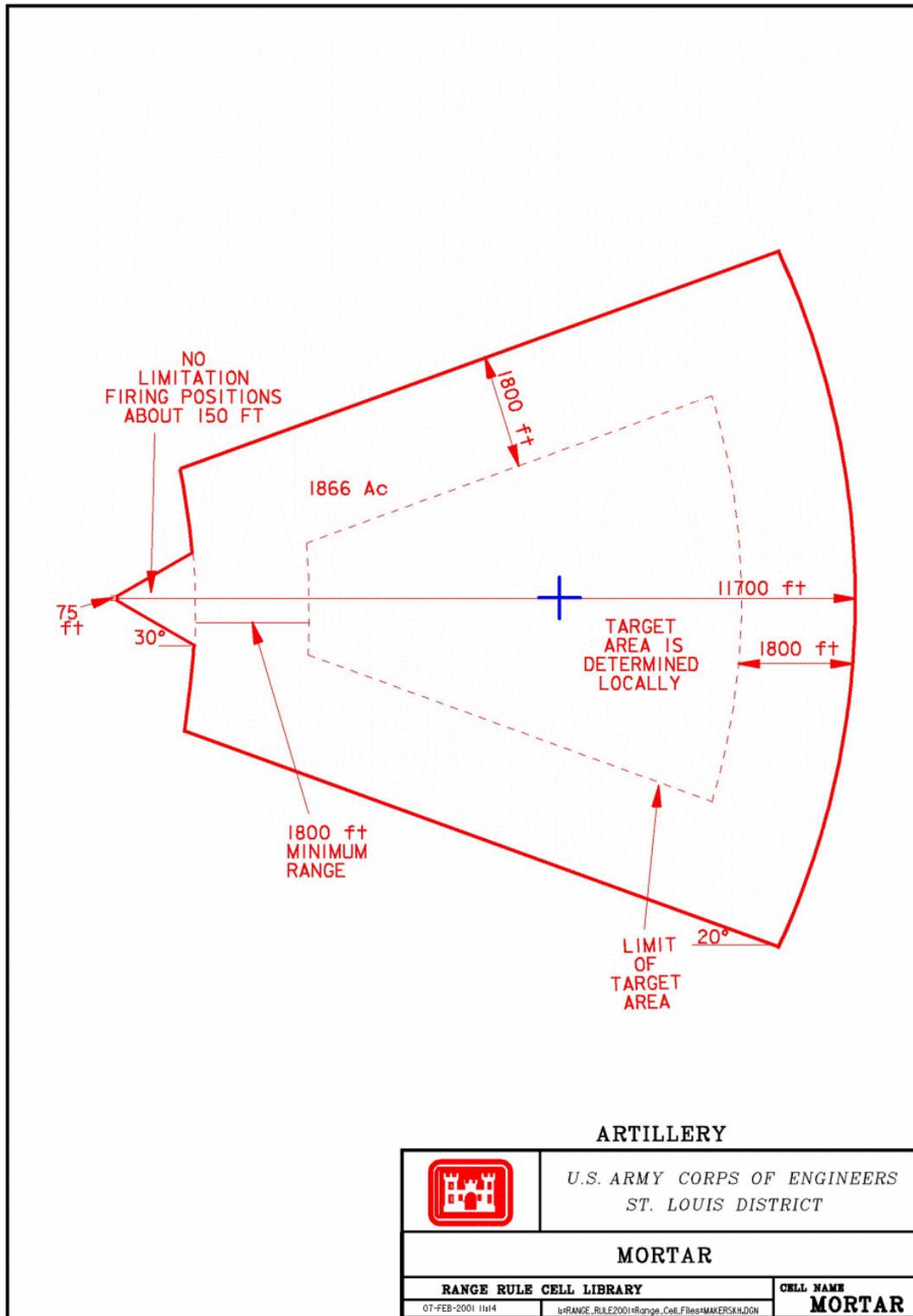
This range has three areas of concern, the firing point (firing line), the impact area, and danger area. The firing line is an arbitrary dimension established by the local requirements; but 25 yards would generally be sufficient. The impact area (target area), also determined by local requirements, would begin a minimum of 600 yards from the firing point and continue down-range the maximum range of the mortars fired. The range cell was derived by estimating the right and left limits of fire and the down range distance. Therefore, the estimated angle of fire is 30°. The down range distance of the cell was derived using an 81mm HE, M43 mortar as worst case, which has a maximum range of 3,300 yards. Regulations required an additional 600-yard danger area applied to each side and to the downrange distance.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>
60mm, Training	350
60mm, Practice	1,935
60mm, High Explosive	1,935
60mm, Smoke	1,610
60mm, Illumination	1,100
81mm, Training	350
81mm, Practice	3,300
81mm, High Explosive	3,300
81mm, Smoke	2,470
81mm, Illumination	2,300
3-inch, Stokes	750

Data sheet(s):

CTT01	Small arms, General
CTT16	60mm, HE, M49 81mm, HE, M43
CTT18	60mm, Training, M69 60mm, Practice, M50A2 81mm, Training, M68 81mm, Practice, M43A1

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951; *FM 23-30, Hand and Rifle Grenades, Rocket, AT, HE, 2.36-inch*, February 1944



**HISTORIC USE: RIFLE GRENADE, ANTI-TANK ROCKET**

## GROUND TOWED TARGET

Range Type: Multiple/Combined Use

Cell Name(s): GRTTG

Firing at a distance of up to 900 yards at targets on sleds or cars towed by motor vehicles is permitted on this range. Pulleys may be set at desired locations to accomplish changes in the direction of the target. More than one car or sled may be used at one time. Right and left limits of fire would have been established based on existing conditions. As shown in the cell, the suggested depth of the range is 1,000 yards and the firing line is 200 yards wide. A danger area would have been established based on the right and left firing limits and the width of the firing line. A 600-yard buffer is added to each side of the range and a 1,000-yard buffer is added downrange beyond the maximum range of the weapon used. An arbitrary safety fan angle of 30°, which is based on assumed right and left firing limits, the angle of fire, and ricochet zones, is used for this range cell. This range is designed to accommodate 37mm tank guns, 37mm sub-caliber weapons, rifle grenades and antitank rockets.

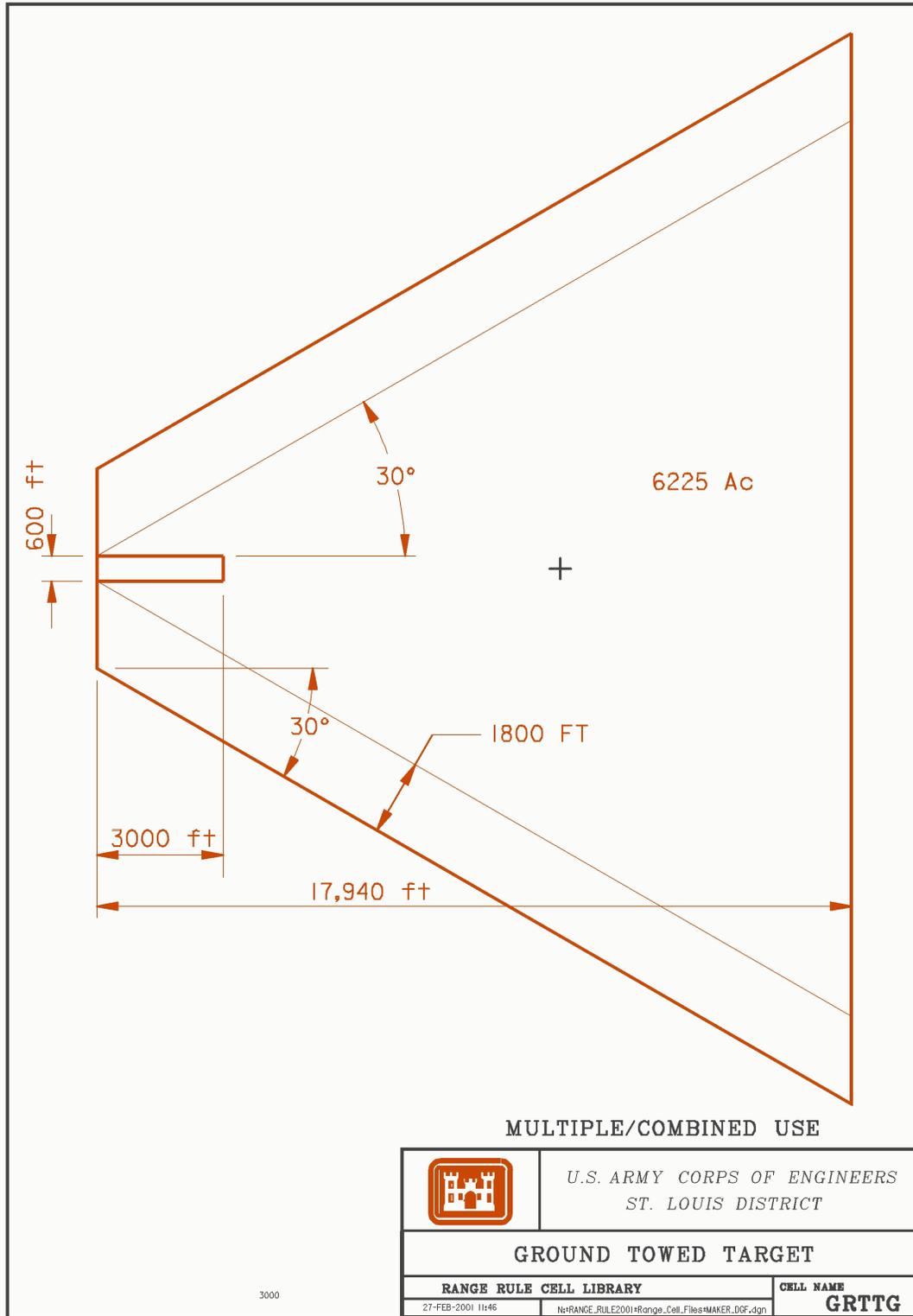
Note: Rockets and Rifle Grenades have a limited effective range so targets would be engaged from 100 to 300 yards, and from 25 yards to 125 yards; respectively.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>
37mm AP	4,950
2.36" Rocket (Practice)	700
Rifle Grenade (Practice)	< 400

Data sheet(s):

CTT01	Small arms, General
CTT10	M7A1, Practice Rocket, 2.36"
	M7A3, Practice Rocket, 2.36"
	M11A2, Practice Rifle Grenade
CTT13	37mm, APC, M59

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951; *FM 23-30, Hand and Rifle Grenades, Rocket, AT, HE, 2.36-inch*, February 1944



## **40mm GRENADE LAUNCHERS M79 AND M203 (HE)**

Range Type: Rifle Grenade/Anti-Tank Rocket

Cell Name(s): L40mmG

The surface danger zone represents three firing lanes. Additional firing positions may be added if a minimum separation of 6 meters is maintained between positions.

For the Mk19, 40mm machine gun (MG), the distance to the back of the impact area is 2,000m and will not be reduced.

Ammunition (probable)

40mm HE

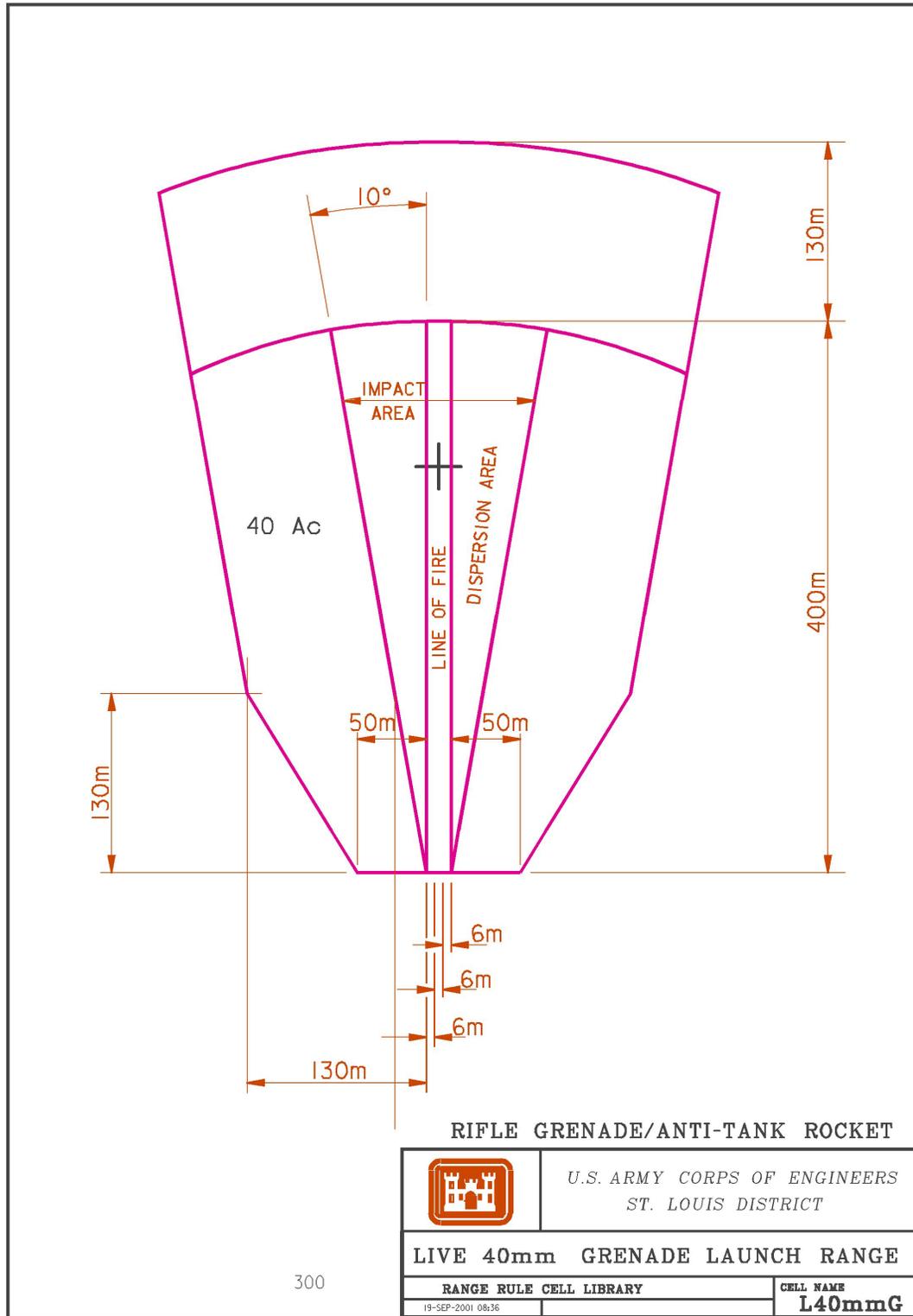
40mm Practice

40mm Illumination

Data sheet(s):

CTT13	40mm, HE, M381
	40mm, HE, M386
	40mm, HE, M406
	40mm, HEDP, M433
CTT14	40mm, Parachute, Star, M583, M661, M662
CTT15	40mm, Practice, M382
	40mm, Practice, M407
	40mm, Practice, M781

Reference(s): AR 385-63, *Policies and Procedures for Firing Ammunition for Training, Target Practice, and Combat*, November 1983.



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## **40mm GRENADE LAUNCHERS M79 AND M203 (PRACTICE)**

Range Type: Rifle Grenade/Anti-Tank Rocket

Cell Name(s): P40mmG

The surface danger zone represents three firing lanes. Additional firing positions may be added if a minimum separation of 6 meters is maintained between positions.

For the Mk19, 40mm machine gun (MG), the distance to the back of the impact area is 2,000m and will not be reduced.

Ammunition (probable)

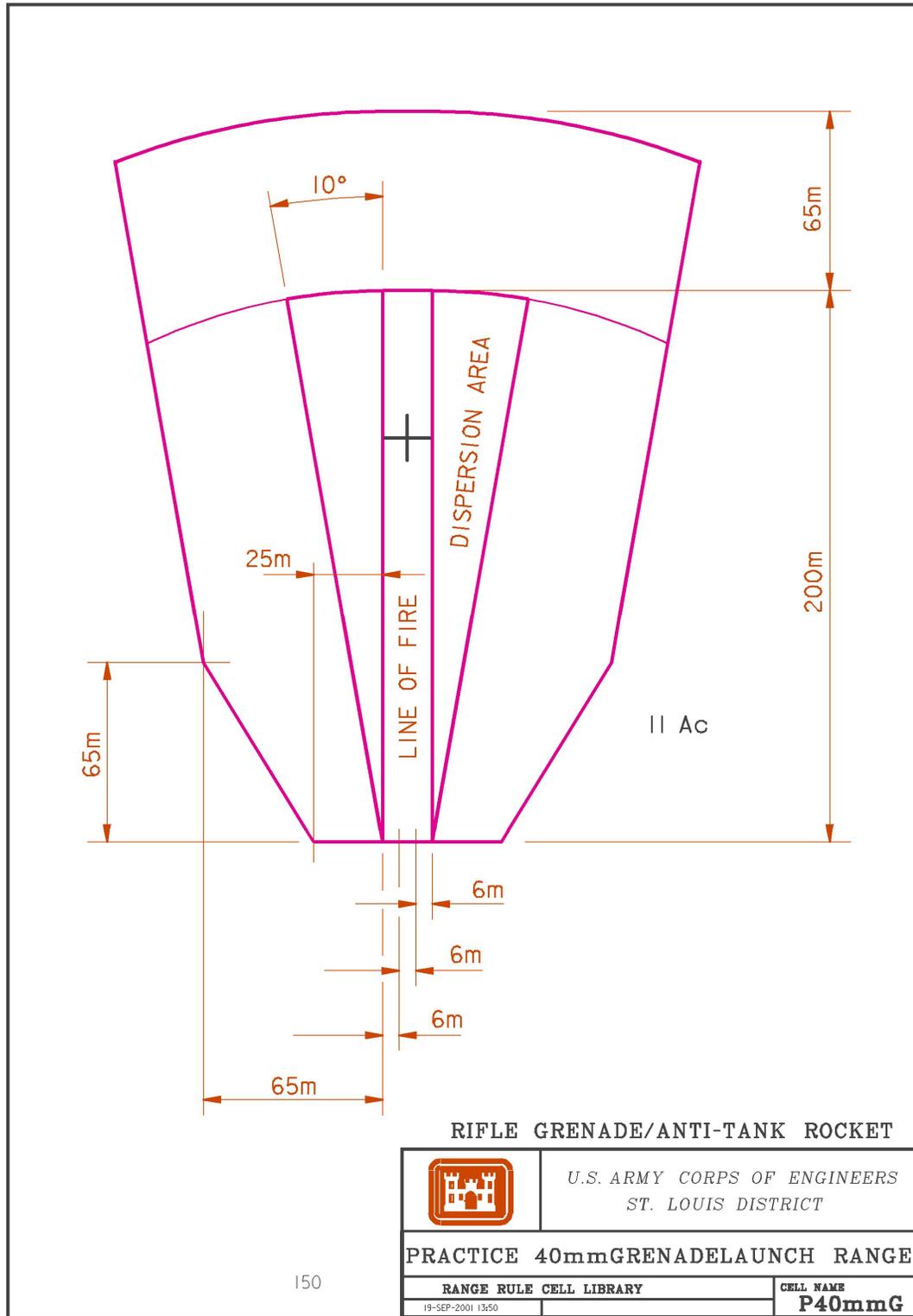
40mm Practice

40mm Illumination

Data sheet(s):

CTT14	40mm, Parachute, Star, M583, M661, M662
CTT15	40mm, Practice, M382
	40mm, Practice, M407
	40mm, Practice, M781

Reference(s): AR 385-63, *Policies and Procedures for Firing Ammunition for Training, Target Practice, and Combat*, November 1983.



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## **RIFLE GRENADE (PRACTICE)**

Range Type: Rifle Grenade/Anti-Tank Rocket

Cell Name(s): RGREN

As stated in the regulations, "The number of targets and firing points depends upon local conditions." The safety zone extended 500 feet beyond all targets.

Three types of rifle grenade ranges are described below. One or all of these types could have been located on the rifle grenade range depicted in the range cell.

- Antipersonnel Marksmanship
  - o High trajectory fire – the range would encompass an area 200 yards long and approximately 40 yards wide with targets located at the far end. Firing points would be established at ranges of 50, 100, 150, and 200 yards. Foxholes are dug at the 200-yard firing position.
  - o Flat trajectory fire – this court is 75 yards long and has 6 targets at the far end. Sandbags are placed at the 25-yard mark, shell craters are dug at the 50-yard mark, and stakes indicate other firing points at the 75-yard mark.
- Antitank Marksmanship
  - o A court for known-distance firing at stationary targets would consist of a single firing line using shell craters and/or 1-man foxholes for firing positions. Targets would be located at 25 yards, 37½ yards, and 75 yards.
  - o A court for firing at moving targets could and most likely be constructed on the same stationary target court. Moving targets would either be towed parallel or perpendicular to the firing line. All firing positions are allowed to use one target when towed parallel to the firing line. However, only two firing positions are allowed to use one target when towed perpendicular to the firing line.
- Antitank Field Firing – This ground towed target range may be utilized for field firing exercises with practice antitank grenades. Several standing-type 1-man foxholes or shell craters at a location near the center of the range would be constructed.

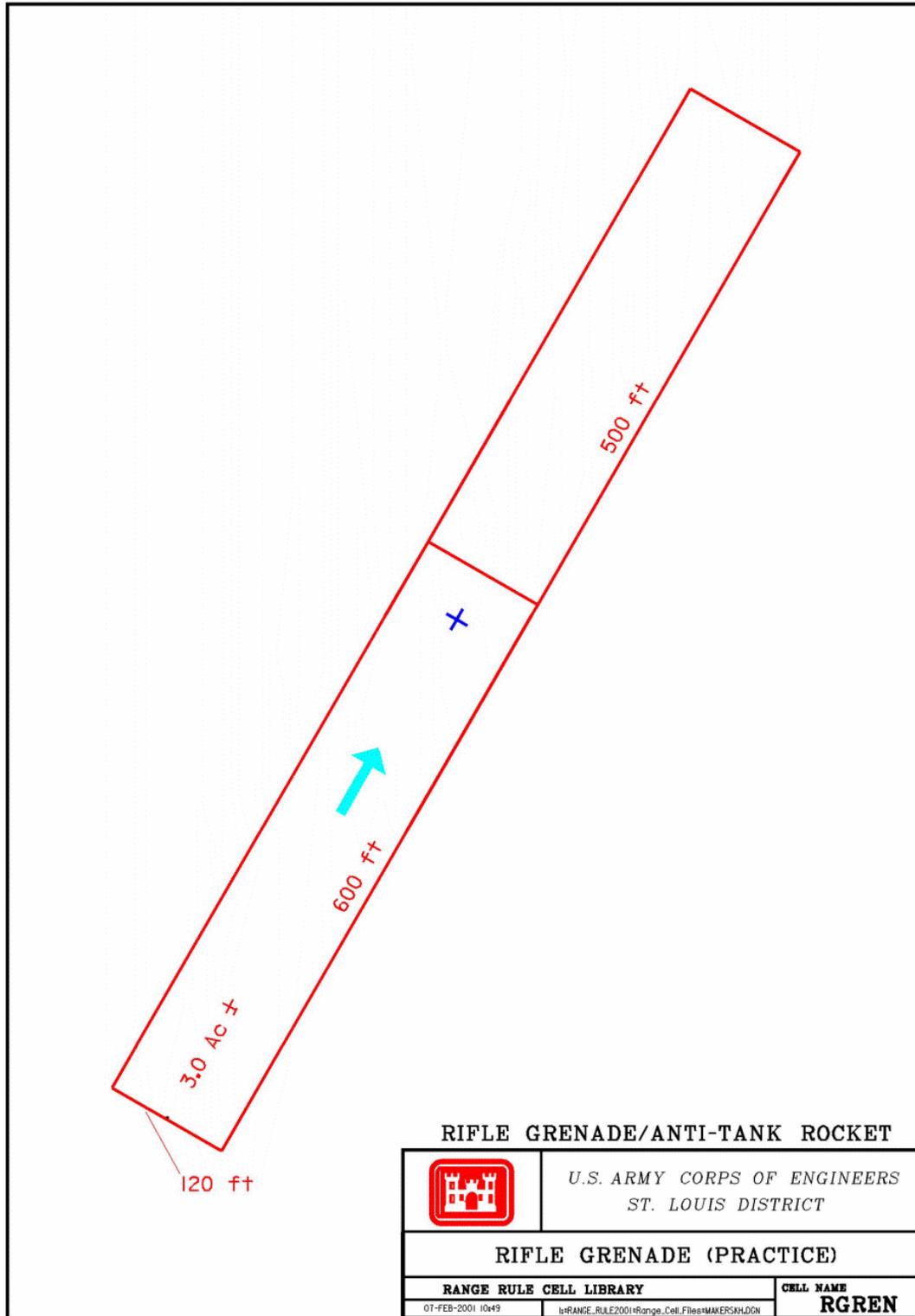
Since practice antitank rifle grenades do not contain an explosive charge, training in their use may be given in any area where troops are not within a distance of 200 yards to the rear of the target. In order to minimize damage to fin assemblies, an area free from trees, stumps, rocks, and other hard objects would have been selected.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>
Practice Rifle Grenades	<400

Data sheet(s):

CTT10 M11A2, Practice, Rifle Grenade

Reference(s): *FM 23-30, Hand and Rifle Grenades, Rockets, AT, HE, 2.36-inch*, February 1944; *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944.



**ROCKET, 2.36-inch (STATIONARY TARGETS)**

Range Type: Rifle Grenade/Anti-Tank Rocket

Cell Name(s): ROCKET

Target areas would have been established with consideration given to terrain and local restrictions; however, a width of 356 mils (20°) is assumed for this range cell. Targets would have been located at 100, 200, and 300 yards, with some down range as far as 650 yards. Typically, targets would have been at least 10 feet square and constructed from paper, cloth, wood, or metal. However, targets would have been constructed of wood or metal when high explosive rockets were used. The impact area would begin at the short limit of the target area (100 yards for this range cell) and extend to the maximum range of the rocket (approximately 700 yards). A 20° angle of fire is established by adding 10° to each side of the target area (assumed to be 20° wide). The safety fan includes a 300-yard danger zone beyond the impact area, plus a 200-yard danger zone parallel to the angle of fire that extends the length of the range.

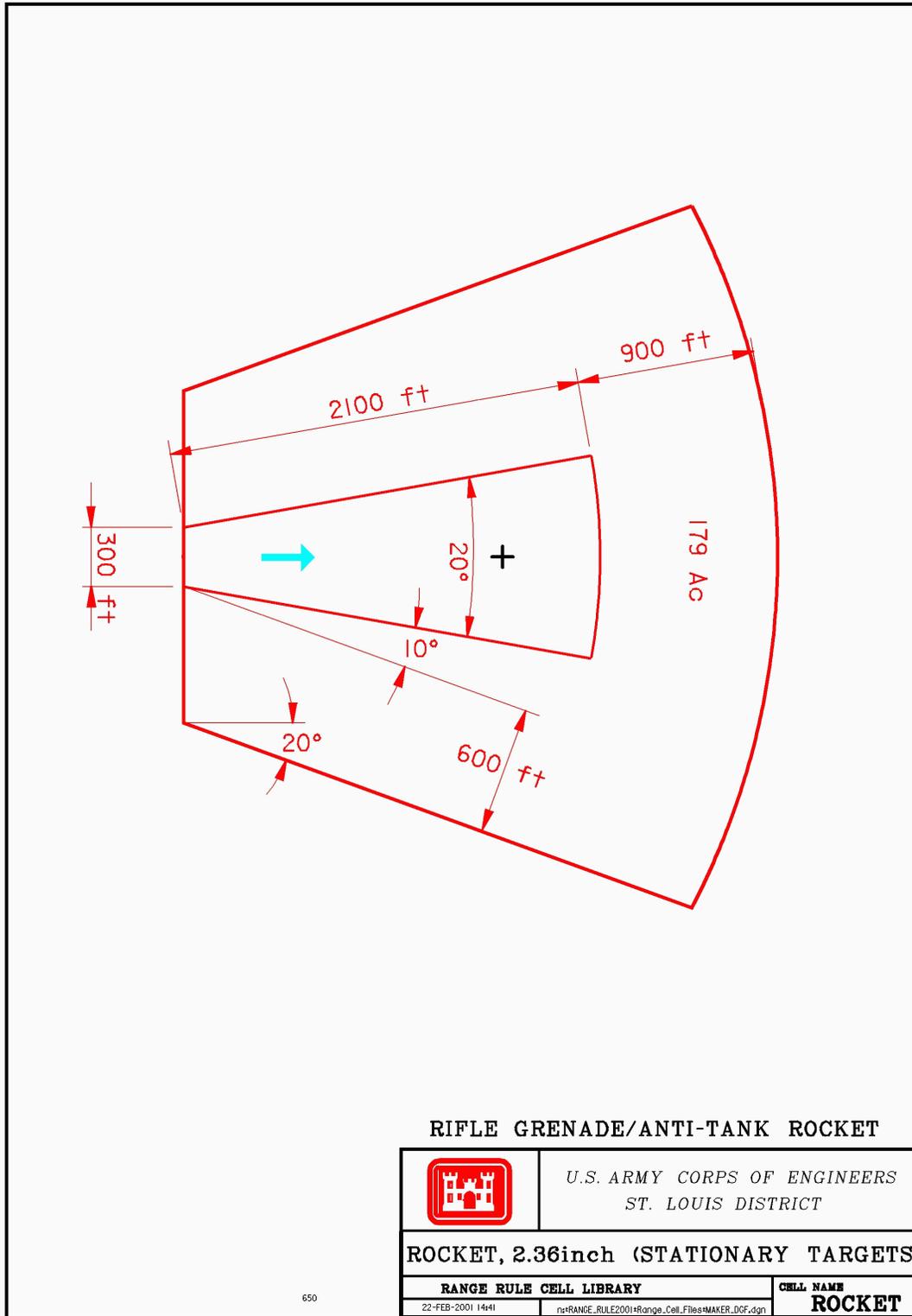
Note: Rifle grenades were commonly used on these ranges.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>
Rocket, 2.36" Anti-tank	700
Rocket, 2.36" Practice	700
Rifle Grenade, Anti-tank	<400
Rifle Grenade, Practice	<400

Data sheet(s):

CTT08	M6A1, Rocket, HEAT, 2.36"
	M6A3, Rocket, HEAT, 2.36"
	M9A1, Rifle Grenade, Anti Tank
CTT10	M7A1, Rocket, Practice, 2.36"
	M7A3, Rocket, Practice, 2.36"
	M11A2, Practice, Rifle Grenade

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951; *TM 9-294, 2.36-inch A.T. Rocket Launcher M1A1*, September 1943; *FM 23-30, Hand and Rifle Grenades, Rocket, AT, HE, 2.36-inch*, February 1944



## **ROCKET, 3.5-inch (MOVING TARGETS)**

Range Type: Rifle Grenade/Anti-Tank Rocket

Cell Name(s): ROCKMT

The target area would have been established with consideration given to terrain and local restrictions; however, a width of 356 mils (20°) is assumed for this range cell. The target locations are not described in the references used to derive this range cell. The impact area begins at the short limit of the target area and extends to the maximum range of the rocket (1,300 yards for practice rockets). A 30° angle of fire is established by adding 20° to each side of the target area. The safety fan includes a 300-yard danger zone beyond the impact area, plus a 300-yard danger zone parallel to the angle of fire that extends the length of the range.

Note: This range was not available during WWII, but rather sometime around the end of the Korean War.

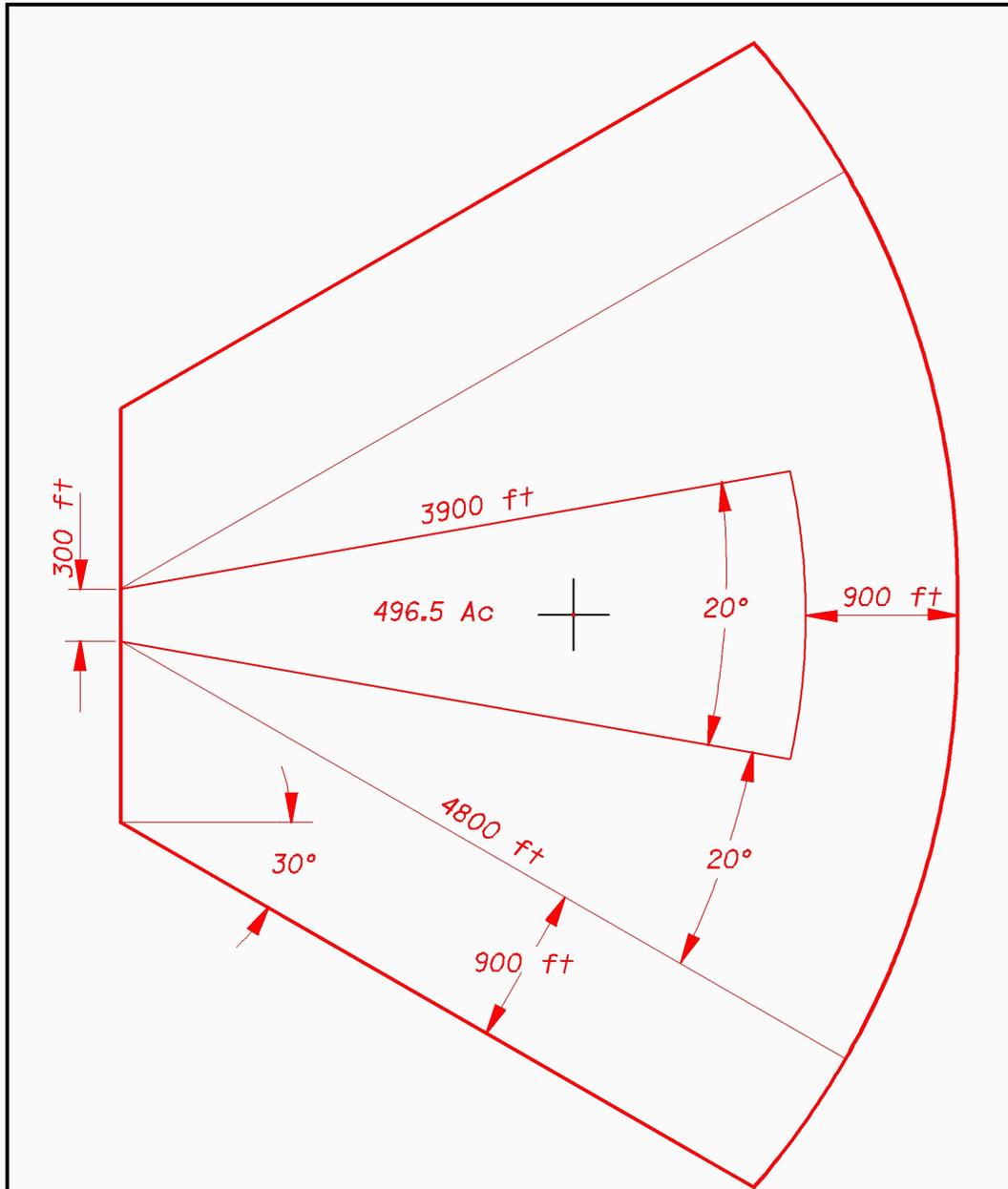
<u>Ammunition</u>	<u>Max Range (yards)</u>
Rocket, 3.5" Practice	1,300

<u>Ammunition (possible)</u>	<u>Max Range (yards)</u>
Rocket, 3.5" Anti-tank	945
Rocket, 3.5" WP	945

Data sheet(s):

CTT09	M30, Rocket, WP, 3.5"
CTT10	M28, Rocket, HEAT, 3.5"
	M29, Practice Rocket, 3.5"

Reference(s): *Targets, Target Material, and Training Course Lay-outs*, November 1951



**RIFLE GRENADE/ANTI-TANK ROCKET**



U.S. ARMY CORPS OF ENGINEERS  
 ST. LOUIS DISTRICT

**ROCKET, 3.5-INCH (MOVING TARGETS)**

RANGE RULE CELL LIBRARY

CELL NAME

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**ROCKMT**

## **ROCKET, 3.5-inch (STATIONARY TARGETS)**

Range Type: Rifle Grenade/Anti-Tank Rocket

Cell Name(s): ROCKST

Target areas would have been established with consideration given to terrain and local restrictions; however, a width of 356 mils (20°) is assumed for this range cell. Targets would have likely been located at 100, 200, and 300 yards, with some down range as far as 650 yards. Typically, targets would have been at least 10 feet square and constructed from paper, cloth, wood, or metal. However, targets would have been constructed of wood or metal when high explosive rockets were used. The impact area would begin at the short limit of the target area (100 yards for this range cell) and extend to the maximum range of the rocket (approximately 1,300 yards for practice rockets). A 20° angle of fire is established by adding 10° to each side of the target area (assumed to be 20° wide). The safety fan includes a 300-yard danger zone beyond the impact area, plus a 300-yard danger zone parallel to the angle of fire that extends the length of the range.

Note: Rifle grenades may be found on these ranges. This range was not available during WWII, but rather sometime around the end of the Korean War.

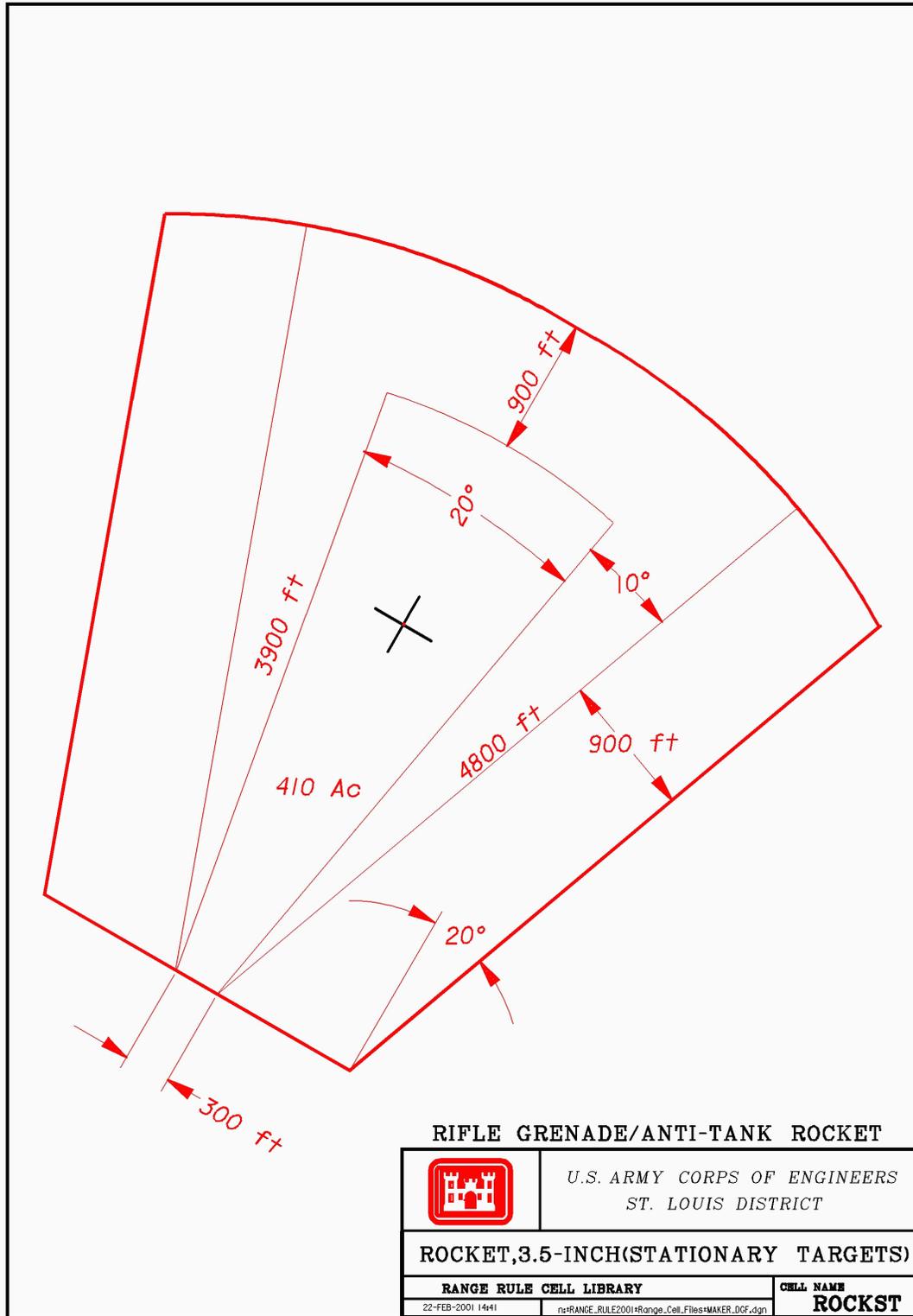
<u>Ammunition</u>	<u>Max Range (yards)</u>
Rocket, 3.5" Practice	1,300
Rifle Grenade, Practice	400

<u>Ammunition (possible)</u>	<u>Max Range (yards)</u>
Rocket, 3.5" Anti-tank	945
Rocket, 3.5" WP	945
Rifle Grenade, HEAT	400

Data sheet(s):

CTT08	M28, Rocket, HEAT, 3.5" M9A1, Rifle Grenade, Anti Tank
CTT09	M30, Rocket, WP, 3.5"
CTT10	M29, Practice Rocket, 3.5" M11A2, Practice, Rifle Grenade M29, Practice Rifle Grenade

Reference(s): *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, November 1951



## **ROCKET, 2.36-inch (MOVING TARGETS)**

Range Type: Rifle Grenade/Anti-Tank Rocket

Cell Name(s): RRMT

A moving target range may incorporate one or two firing lines. Typically no more than four launchers were used simultaneously. Targets, measuring 15-18 feet long by 6-8 feet high, were pulled through the target area with the use of ropes and pulleys. Targets were fired upon from a distance of 100, 200, and 300 yards. The impact area would begin at the short limit of the targets (100 yards from the targets in this case) and extend to the maximum range of the rocket (approximately 700 yards).

Target areas would have been established with consideration given to terrain and local restrictions; however, a width of 356 mils (20°) is assumed for this range cell. An angle of fire (30°) is established by adding 20° to each side of the target area.

The safety fan includes a 300-yard danger zone beyond the impact area, plus a 200-yard danger zone parallel to the angle of fire that extends the length of the range.

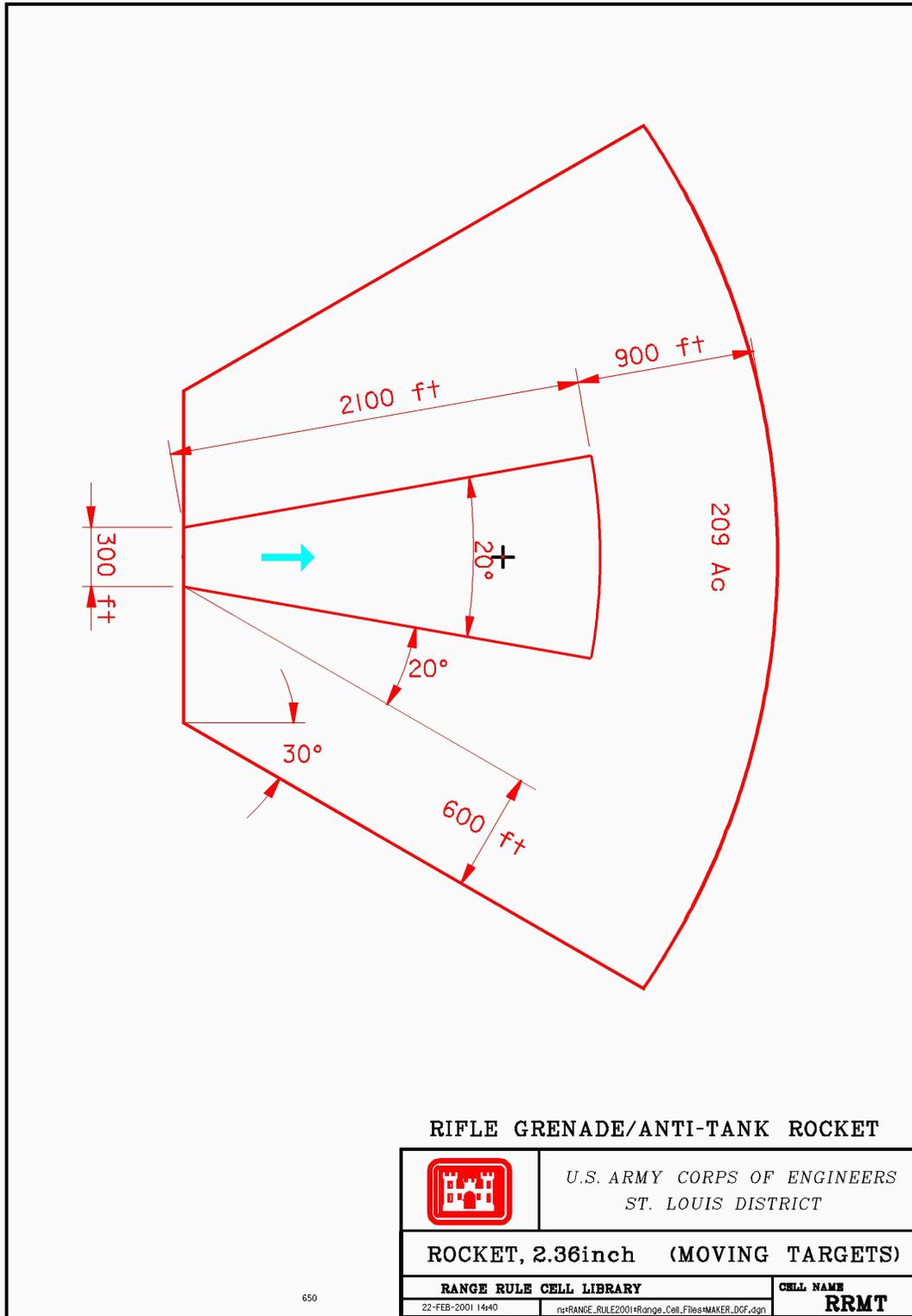
Note: Rifle Grenades were commonly used on these ranges.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>
Rocket, 2.36" Anti-tank	700
Rocket, 2.36" Practice	700
Rifle Grenade, Anti-tank	<400
Rifle Grenade, Practice	<400

Data sheet(s):

CTT08	M6A1, Rocket, HEAT, 2.36" M6A3, Rocket, HEAT, 2.36" M9A1, Rifle Grenade, Anti Tank
CTT10	M7A1, Rocket, Practice, 2.36" M7A3, Rocket, Practice, 2.36" M11A2, Practice, Rifle Grenade

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & Nov 1951; *TM 9-294, 2.36-inch A.T. Rocket Launcher M1A1*, September 1943; *FM 23-30, Hand and Rifle Grenades, Rocket, AT, HE, 2.36-inch*, February 1944



**HISTORIC USE: SMALL ARMS**

**ANTI-AIRCRAFT, MINIATURE .22 CALIBER (aka: Miniature AA Range)**

Range Type: Small Arms

Cell Name(s): AAMINI

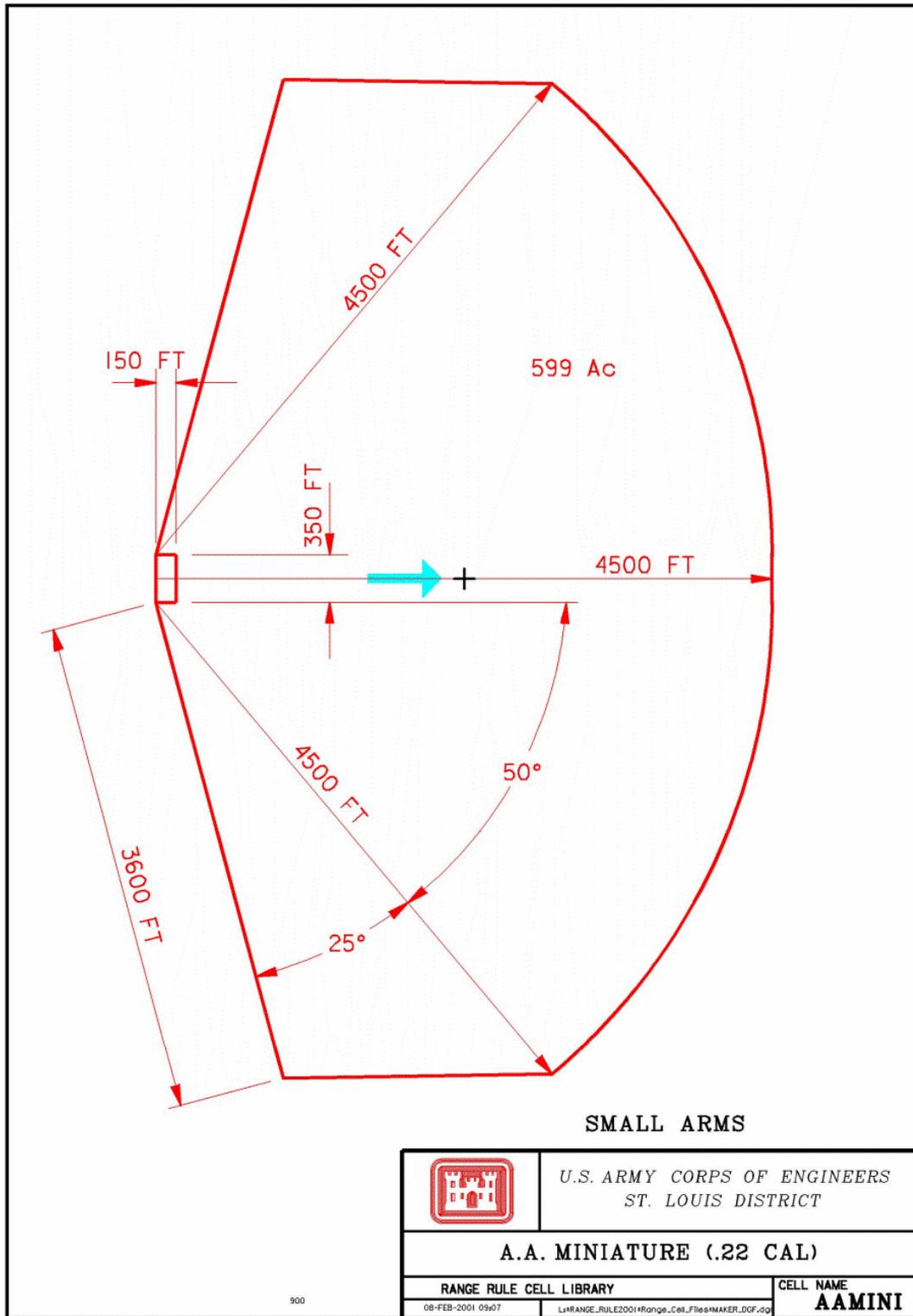
This range requires an area approximately 350 feet wide by 150 feet long. It accommodates three types of targets: Parachute, Climbing-Diving, and Horizontal. A single firing line runs the full length of the range. The Parachute target is located 92 feet down range, and the Climbing-Diving and Horizontal targets are positioned 500 inches down range. The danger area consists of the 50° angle of fire plus a required safety angle of 25°. The 50° angle of fire extends from the beginning of the range down range a distance of 1,500 yards; and the additional 25° safety angle extends from the same point down range a distance of 1,200 yards.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
.22 caliber	1,500	1,100

Data sheet(s):

CTT01      Small arms, General

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951



**ANTI-AIRCRAFT, TOWED TARGET and/or OQ (.30-CALIBER, .50-CALIBER)  
(aka: AA Range, AAA Range)**

Range Type: Small Arms

Cell Name(s): AATT50, AATT30

Details of these ranges were established locally. Construction would have consisted only of the necessary clearing to provide a firing point and the required visibility within the limits of fire and adjacent danger area.

The range was used for firing at either towed or radio controlled airplane targets. The designation "OQ" refers to the type of target used on the range. The "O" means pilotless and the "Q" stands for radio-controlled. The firing point should accommodate at least 50 men, spaced at 1½ yards, in a line. A level strip of ground, 100 yards long by 2 yards wide, preferably on a hill, was suitable. A firing point similar to that of a Known Distance rifle range may have been constructed. The angle of fire included a 5° angle added to the left limit, and a 10° angle to the right. Without specific information as to the location of the left and right limits of fire, a 30° safety fan is assumed (but could be as much as 40°) to extend down-range a distance of 4,300 yards for .30 caliber ammunition and less.

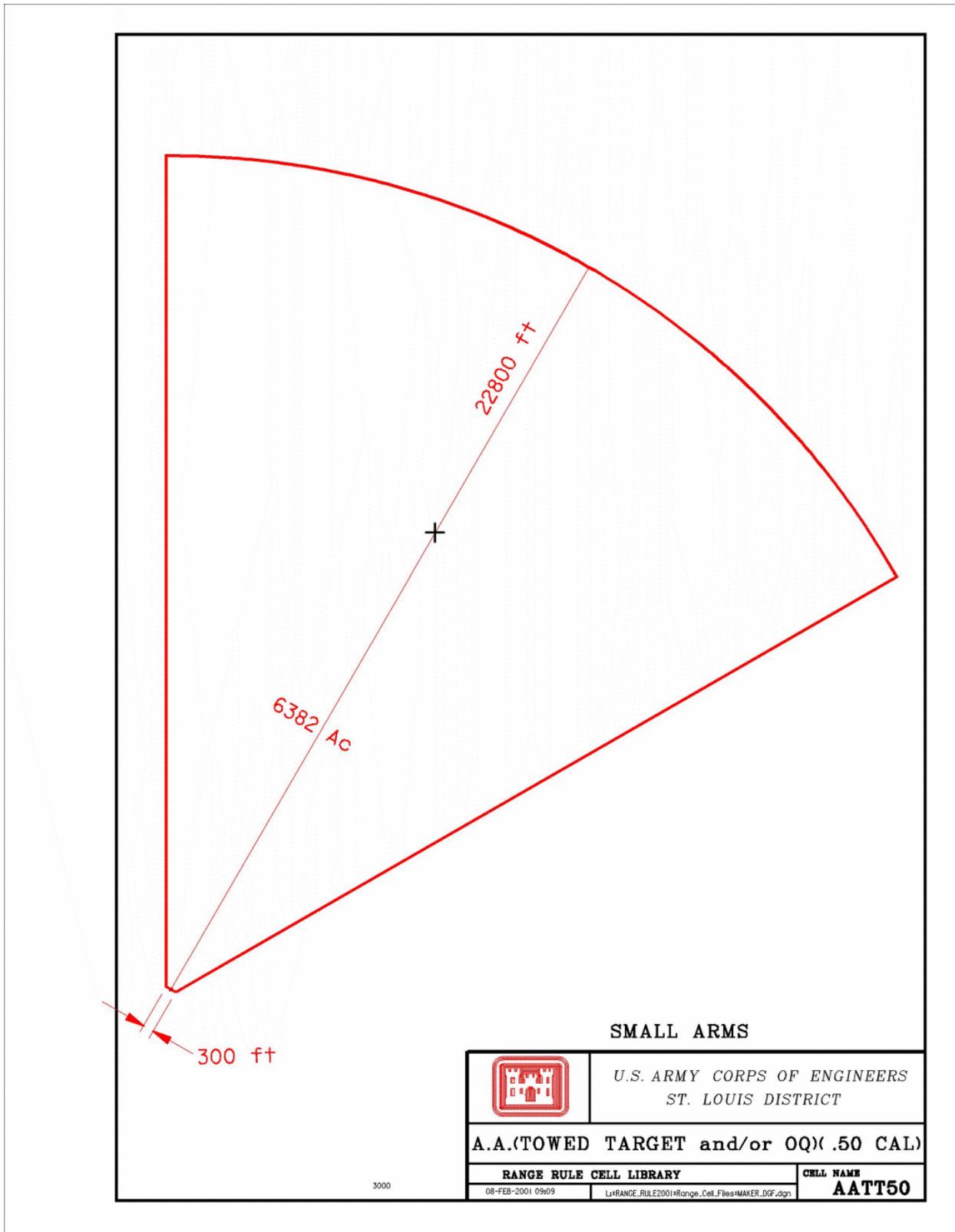
For ranges utilizing .50-caliber ammunition, this safety fan would be increased to 7,600 yards. Cells for both .30-caliber and smaller and .50-caliber are shown.

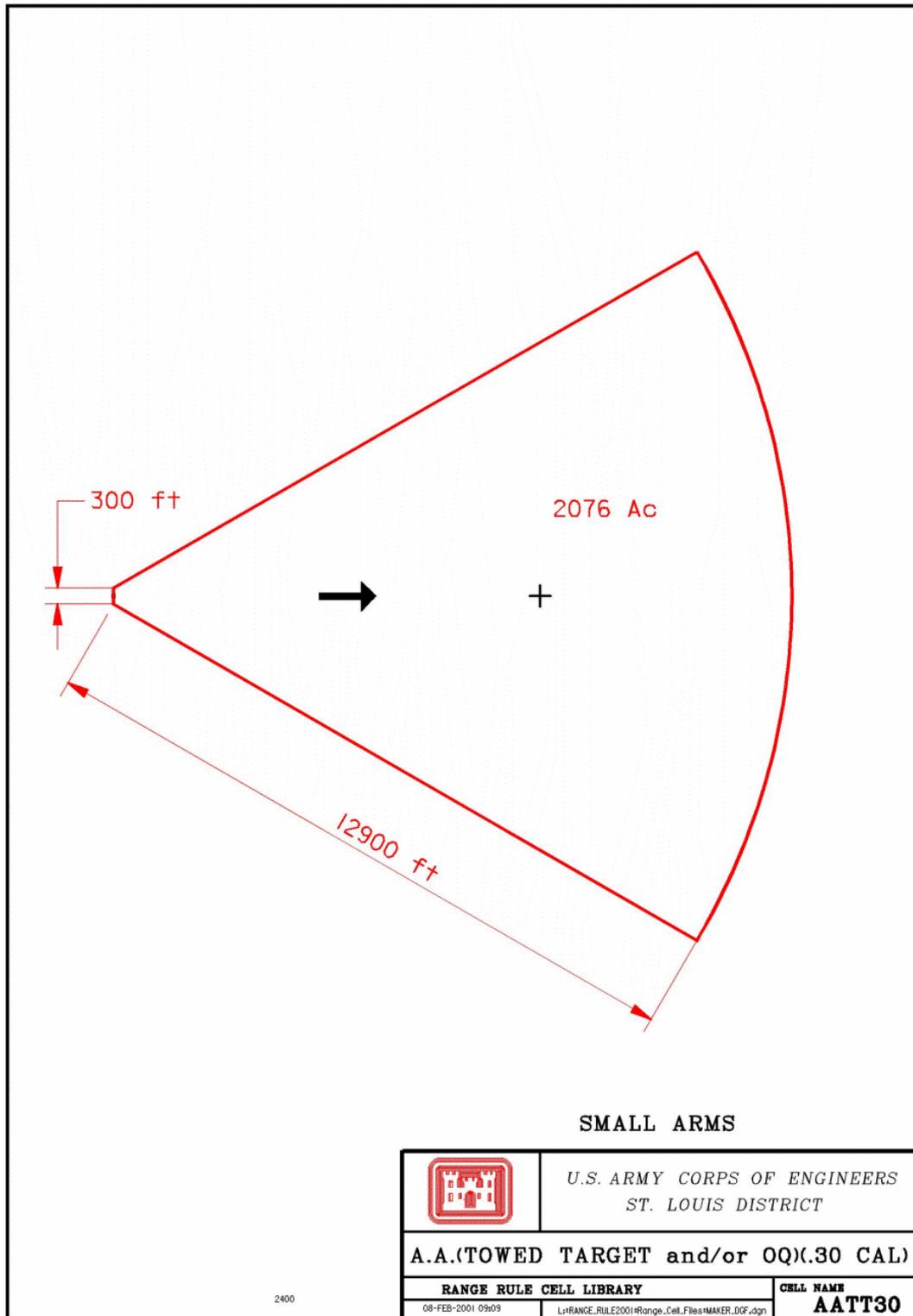
<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
.50 caliber	7,500	2,545
.30 caliber	3,450	2,700
.22 caliber	1,500	1,100

Data sheet(s):

CTT01 Small arms, General

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951; *Range-Safety Factors & Range Facilities for Infantry Regiments* (circa 1944)





## **ANTI-TANK, 1,000-inch**

Range Type: Small Arms

Cell Name(s): ANTANK

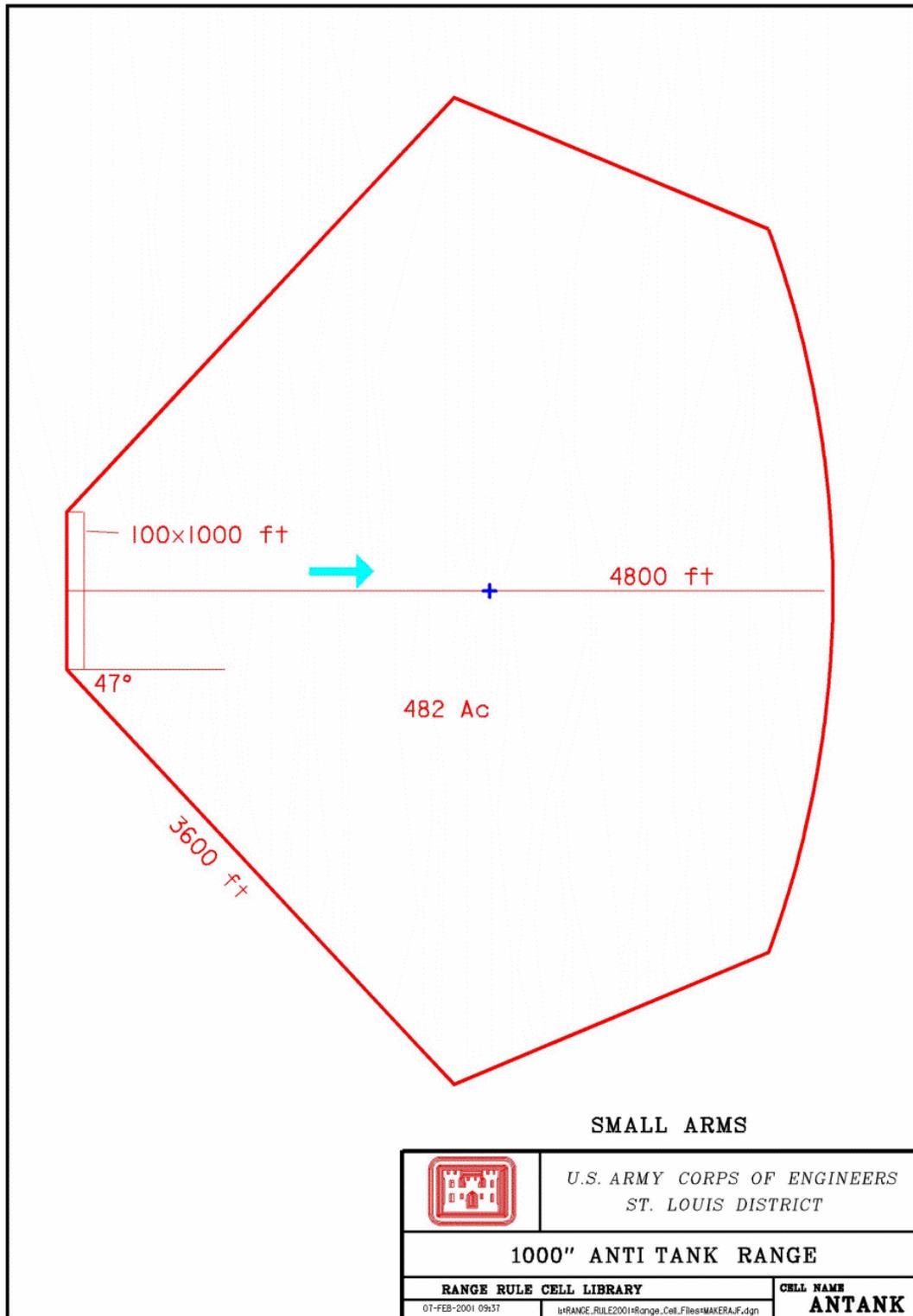
An Infantry Division would require that this range have twelve 48-foot wide target units. Allowing for separation between units, the range would be approximately 1,000 feet wide by 100 feet long. A single firing line would stretch across the width of the range and target tracks would be positioned 1,000-inches down-range. The danger area would include a 22° angle of fire that extends 1,600 yards down range, and a 25° safety fan, added to both sides, which extends 1,200 yards down range.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
.22 caliber	1,500	1,100

Data sheet(s):

CTT01      Small arms, General

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951



## COMBAT/FIELD TARGET (MACHINE GUN)

Range Type: Small Arms

Cell Name(s): CFTMG

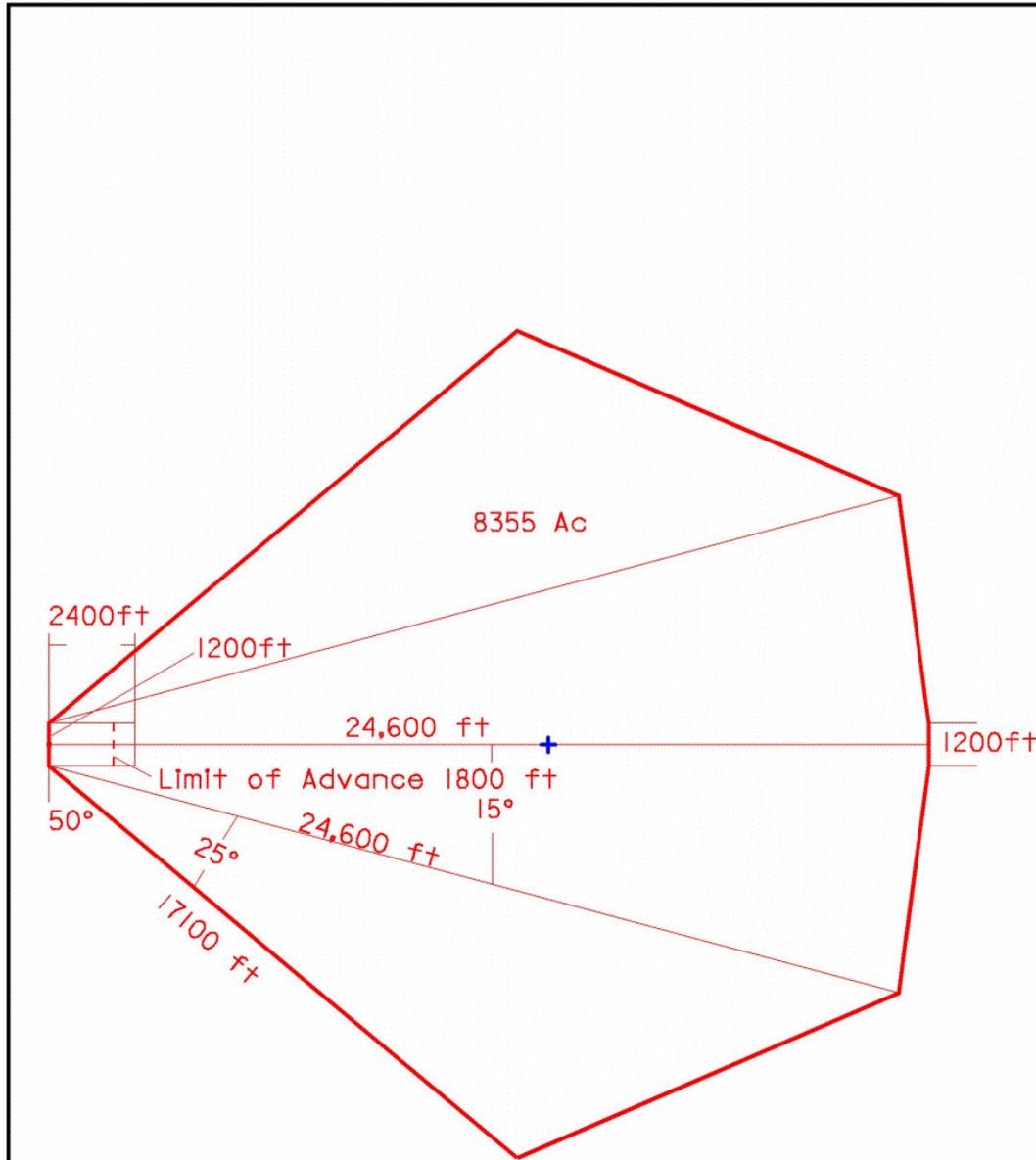
The "typical" Combat Range is comprised of various components. Once the training officer determined the locations of these components, the danger areas could be established. When practical, target units would have been placed on reverse slopes approximately 1 foot below the crown of a rise. Typical dimensions of a range were 400 yards wide by 800 yards long. A limit of advance would have generally been established 600 yards downrange. The safety/danger area included a 15° angle of fire that extended from each side of the range down range a distance of 8,200 yards, and an additional 25° safety fan, which originated from the same points as the angle of fire, that extended down range a distance of 5,700 yards.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
.30 caliber	3,450	2,700
.50 caliber	7,500	2,545

Data sheet(s):

CTT01      Small arms, General

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951



**SMALL ARMS**

	U.S. ARMY CORPS OF ENGINEERS ST. LOUIS DISTRICT
<b>COMBAT/FIELD TARGET (MACHINE GUN)</b>	
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<b>CFTMG</b>	

## CLOSE COMBAT COURSE

Range Type: Small Arms

Cell Name(s): CLOSE-D

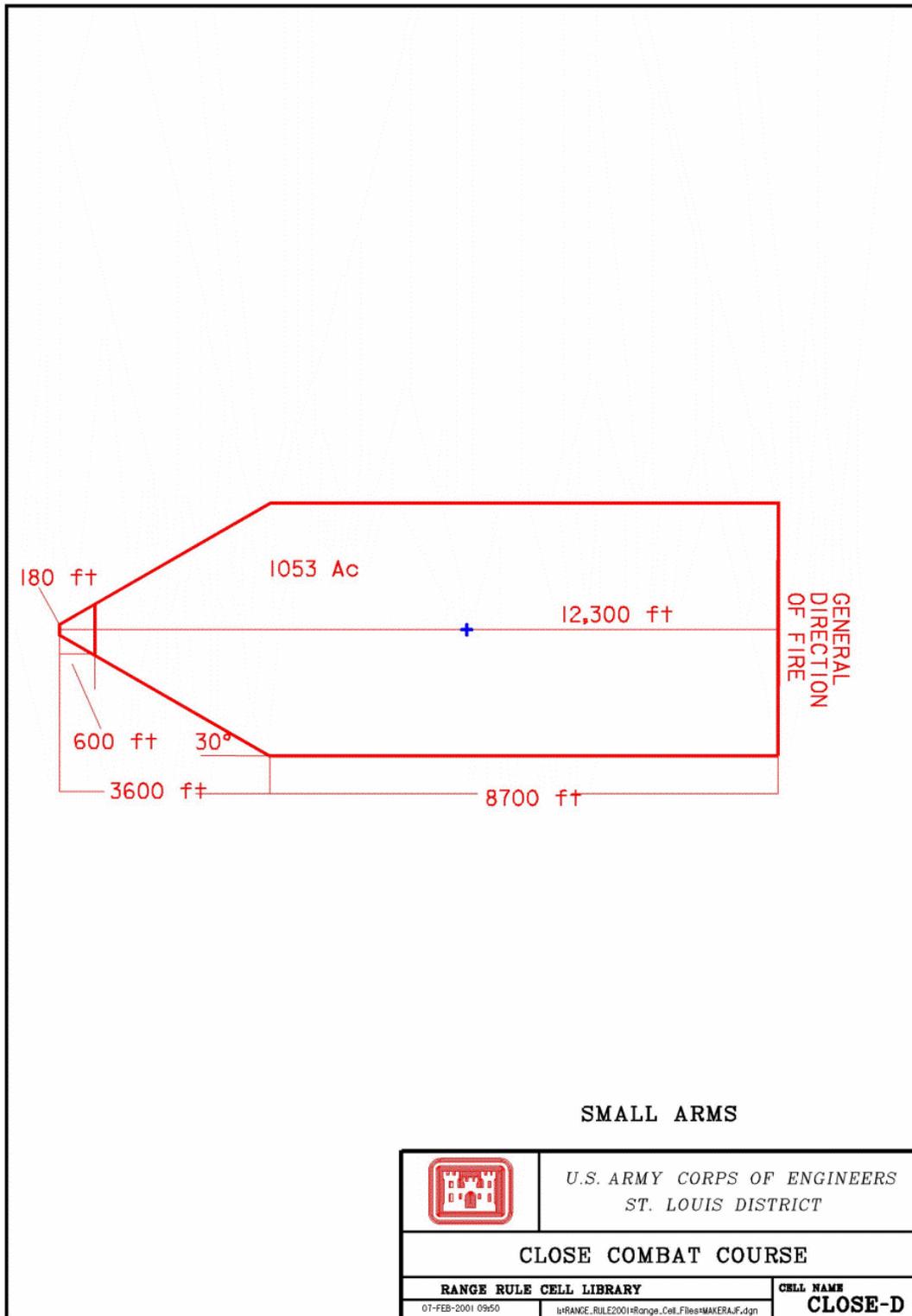
A Close Combat Course/Range is basically an assault course approximately 200 yards long. The range may consist of one or two individual courses commonly referred to as a single leg or double leg course. Each leg was approximately 30 yards wide; however, the width, in addition to the overall range boundaries, was established with consideration given to terrain and local restrictions. Where multiple courses joined each other, pronounced changes in direction of fire were not considered practical. Targets were arranged so that they could appear and disappear quickly and were positioned at various points ranging from 5 to 50 yards. Men were required to engage targets while negotiating wire entanglements, shell craters, trenches, or other obstacles. The quantity of targets varied, but 16 positions were identified in the reference. At least one situation (target) should have been present for the use of a practice grenade (likely at the end of the course). The danger area consisted of a 5° angle of fire and a 25° safety fan. The danger area is represented as a 30° fan originating from the beginning of the range and extending 1,000 yards past the forward limit of advance. At this point the fan extends an additional 2,900 yards parallel to the direction of fire.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
.45 caliber	1,600	802
.30 caliber	3,450	2,700
.22 caliber	1,500	1,100
Practice Hand Grenades		

Data sheet(s):

CTT01	Small arms, General
CTT04	M21, Practice Hand Grenade Mk 1A1 Practice Hand Grenade

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951



## COMBAT/FIELD (RIFLE & LIGHT MACHINE GUN)

Range Type: Small Arms

Cell Name(s): COMBAT

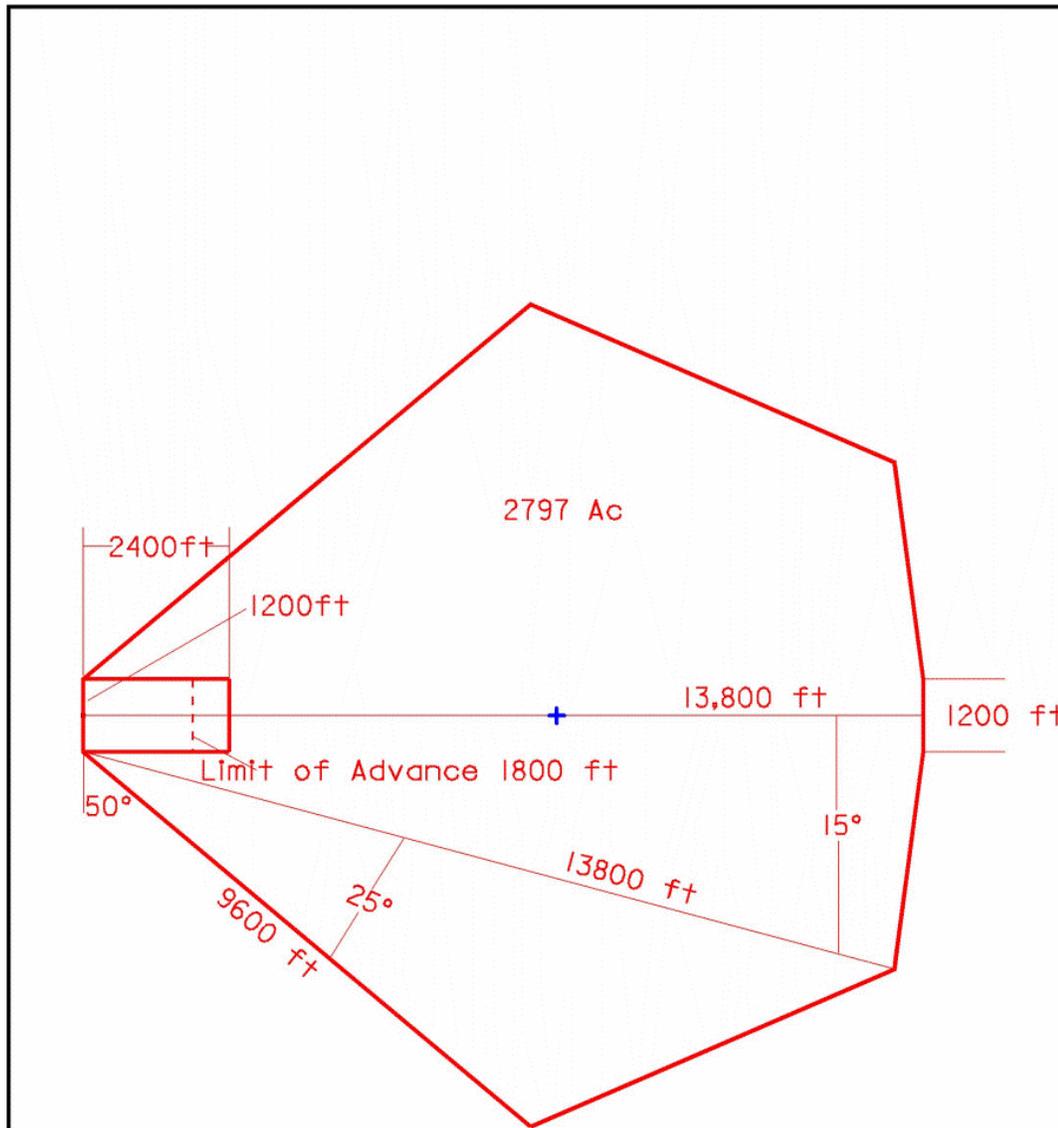
The "typical" Combat Range is comprised of various components. Once the training officer determined the locations of these components, the danger areas could be established. When practical, target units would have been placed on reverse slopes approximately 1 foot below the crown of a rise. Typical dimensions of a range were 400 yards wide by 800 yards long. A limit of advance would have generally been established 600 yards downrange. The safety/danger area included a 15° angle of fire that extended from each side of the range down range a distance of 4,600 yards, and an additional 25° safety fan, which originated from the same points as the angle of fire, that extended down range a distance of 3,200 yards.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
.22 caliber	1,500	1,100
.30 caliber	3,450	2,700

Data sheet(s):

CTT01      Small arms, General

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951



**SMALL ARMS**

	U.S. ARMY CORPS OF ENGINEERS ST. LOUIS DISTRICT	
	<b>COMBAT/FIELD TARGET (RIFLE &amp; LIGHT MACHINE GUN)</b>	
<b>RANGE RULE CELL LIBRARY</b>		<b>CELL NAME</b>
<small>01-FEB-2001 0950</small>	<small>h:\RANGE_RULE2001\Range_Cell_Files\MAKERA.F.dgn</small>	<b>COMBAT</b>

**FIRING-IN-BUTT (aka: Harmonizing Range)**

Range Type: Small Arms

Cell Name(s): FIRINB

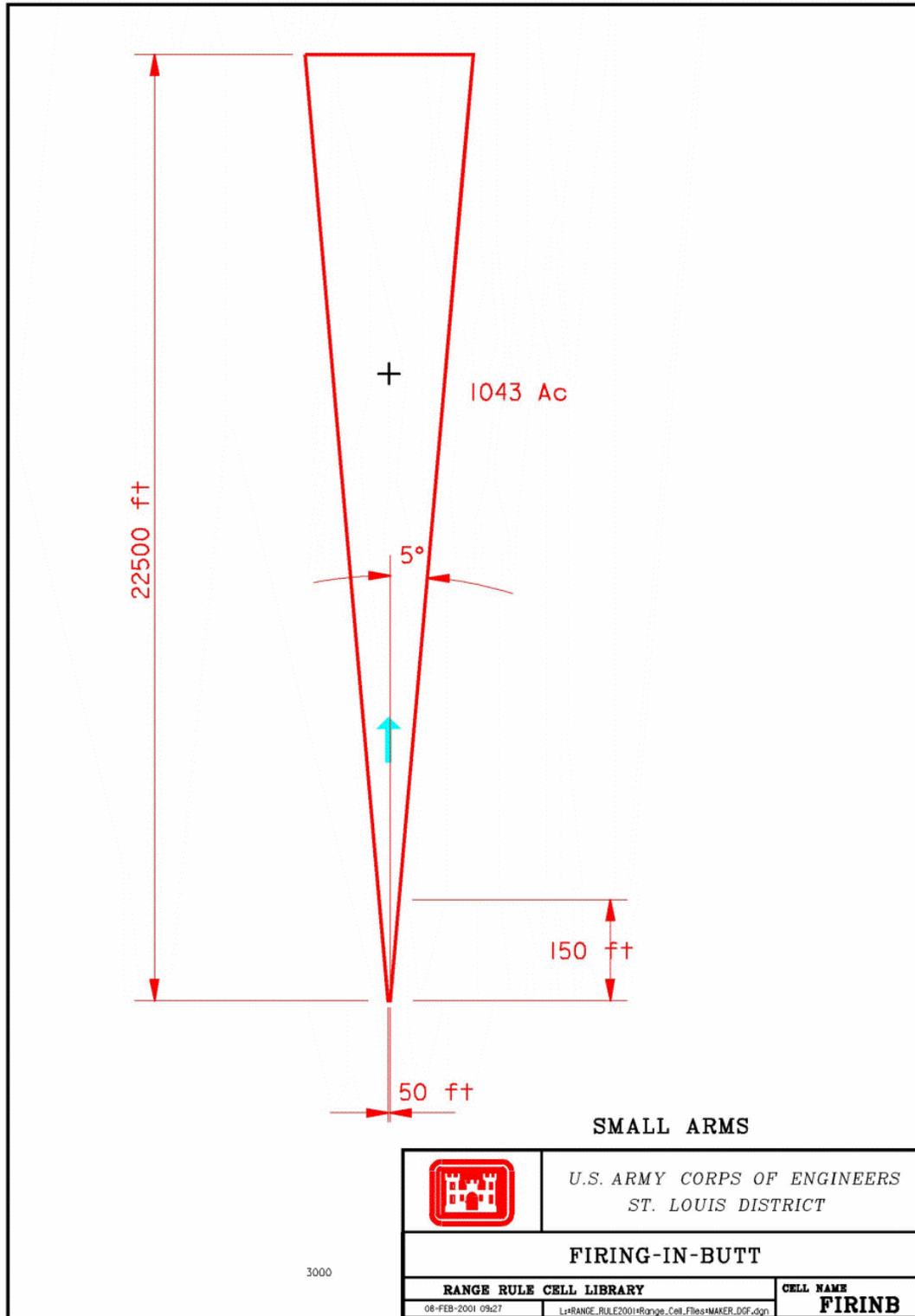
Firing-in-butts were common to airfields. This range provided a designated area for crews to zero, service, and maintain aircraft weapon systems (fixed guns). Typical construction consisted of a hardstand for aircraft positioning. An earthen berm would have been necessary and constructed to the front of the aircraft. The distance from the hardstand is unknown, and may differ at various airfields. Based on experience (archive searches, site inspections, etc.), 150 feet is an accurate estimate. The safety zone for this range was derived using 5° angles that extended downrange a distance of 7,600 yards (consistent with .50 caliber ammunition). There is a possibility that when the berm was constructed, personnel considered it to be satisfactory in limiting the downrange distance for fixed guns. Therefore, firing-in-butts may be found in areas not favorable for a general range safety fan.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
.50 caliber	7,500	2,545
.30 caliber	3,450	2,700
20mm		

Data sheet(s):

CTT01 Small arms, General

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944



## **TANK, 1,000-inch**

Range Type: Small Arms

Cell Name(s): IKTANK

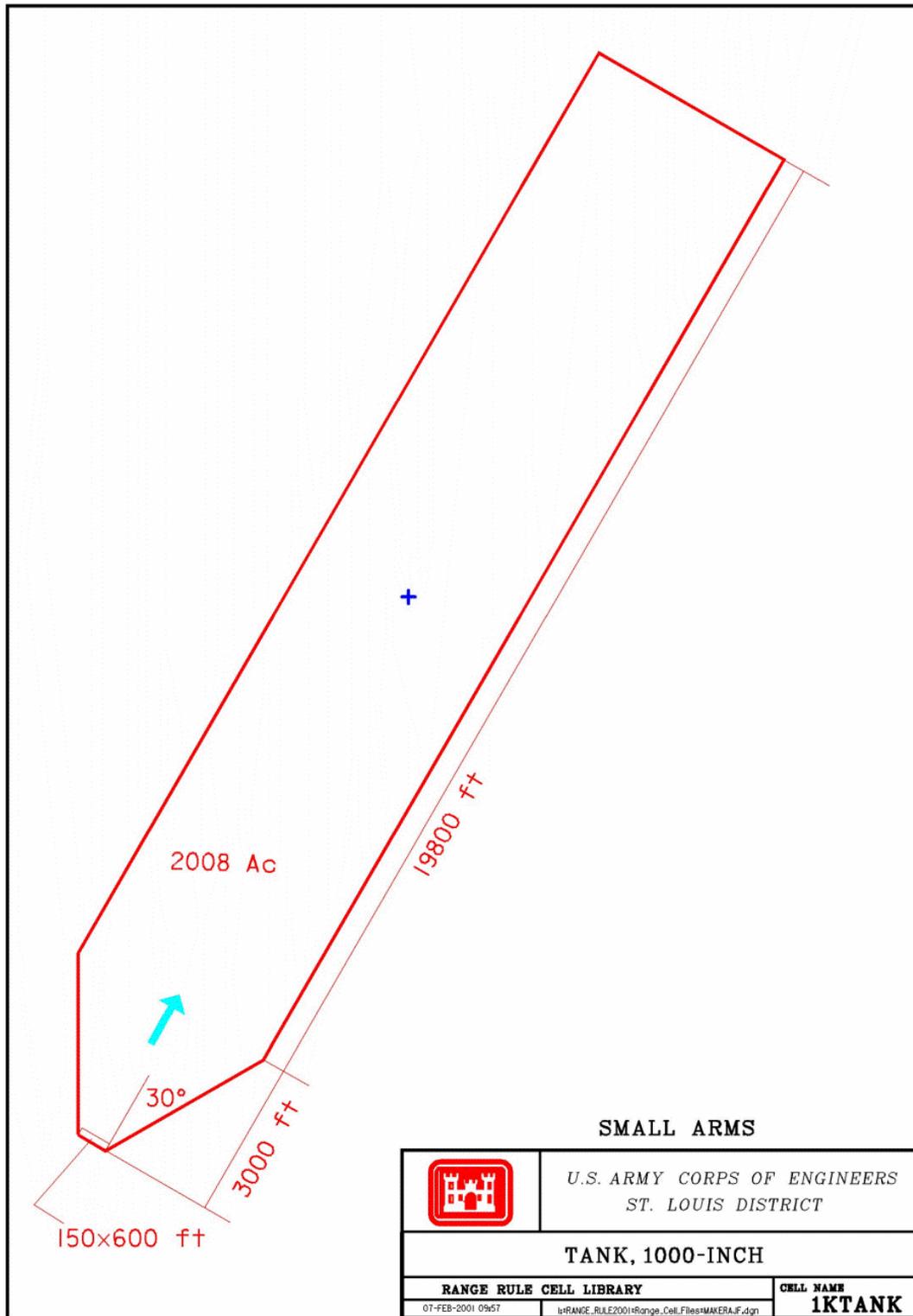
A 1,000" Tank Range is designed for practice with the cal. 30 and cal. 50 machine guns mounted on tanks (stationary). Targets would have been placed 1,000 inches (83 feet, 4 inches) in front of a firing line. The firing line would need to be large enough to accommodate several light tanks. The estimated size of the range area is approximately 200 yards wide by 150 feet long. A 30° safety fan originating from both ends of the firing line would extend down range 1,000 yards, at which point it would continue an additional 6600 yards parallel to the direction of fire.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
.50 caliber	7,500	2,545
.30 caliber	3,450	2,700

Data sheet(s):

CTT01      Small arms, General

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951



## INFILTRATION COURSE

Range Type: Small Arms

Cell Name(s): INFILTX

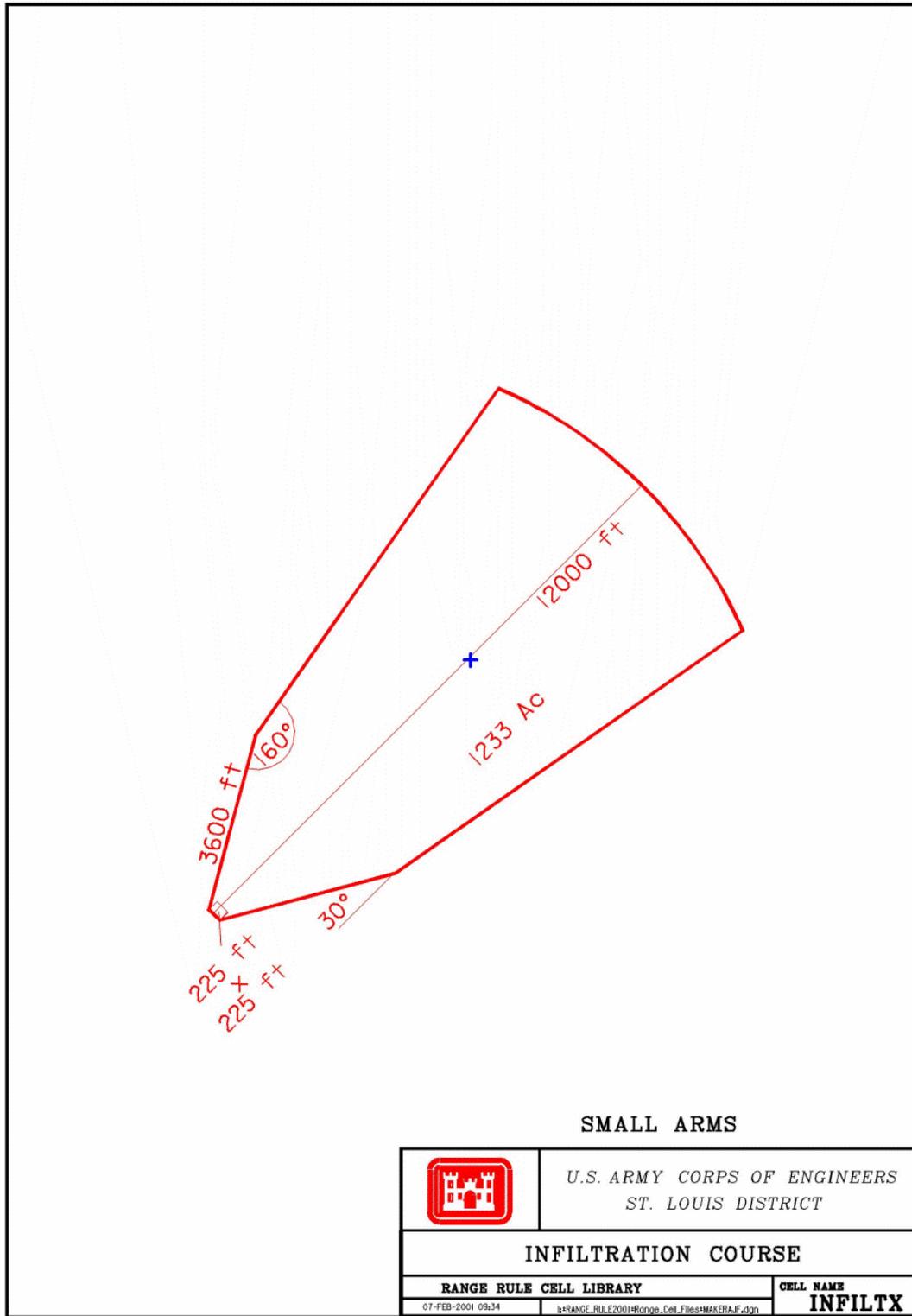
The typical range would occupy an area 75 yards wide by 50 to 100 yards deep. The range cell represents an area 75 yards wide by 75 yards deep. The ground for the infiltration course would generally be level, with logs and small mounds of dirt 10 to 12 inches in height for men to roll over. The ground would have contained shell holes, trenches, slit trenches, wire entanglements, stumps, sparse brush, and other obstacles. Two to three machine guns would have been bolted to stable platforms at the front of the range. Reduced charges of explosives were placed in craters throughout the course. The dimensions of the embankment into which the machine guns fired would have been 15 feet high by a distance long enough to provide safety to the flanks of the infiltration course. The 30° safety fan extends 1,200 yards, at which point it continues at a 10° angle an additional 3,000 yards. Because of the fixed machine guns, a safety fan would not be required beyond a suitable earthen berm constructed to the rear of the range.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
.30 caliber	3,450	2,700
TNT		
Dynamite		
Blasting Caps		

Data sheet(s):

CTT01	Small arms, General
CTT27	Explosives, Dynamite, Commercial Explosives, TNT Blasting Caps

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951



## **MACHINE GUN, ROLLING TARGET, 1,000-inch**

Range Type: Small Arms

Cell Name(s): K.50C

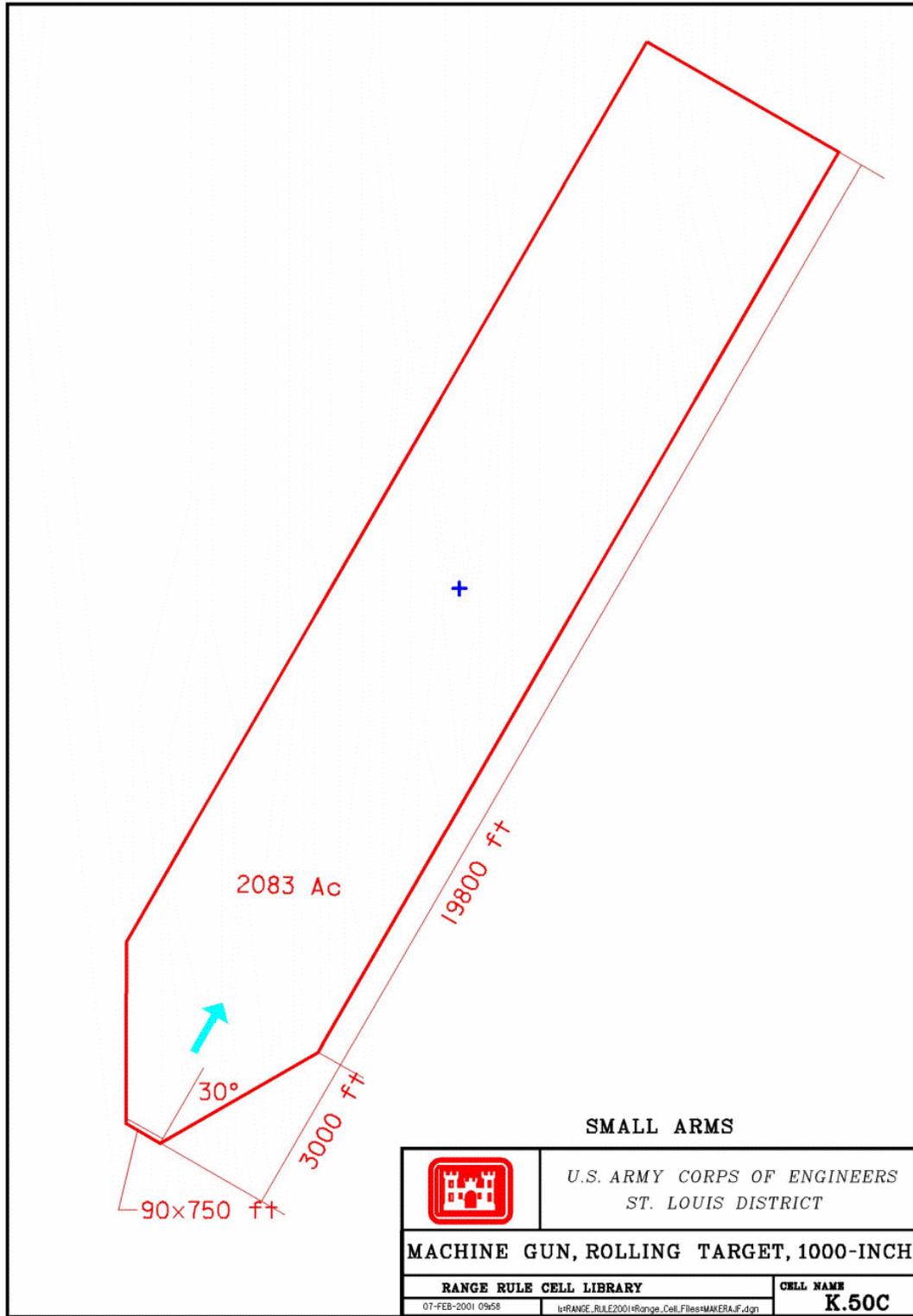
Typically, light and/or heavy machine guns may be used on this range. In order to meet requirements for an Infantry Division, the range should be approximately 250 yards wide. A salvage wall (earthen berm) would have been constructed approximately 5 feet beyond the target area; and the firing line would have been positioned 1,000 inches in front of the targets. A range this size could accommodate 45 tracks, with two targets per track. The danger area includes a 5° angle of fire plus a required safety angle. The estimated 30° safety fan originates from both ends of the firing line, extends down range a distance of 1,000 yards, at which point it extends an additional 6,600 yards (based on .50 caliber ammunition) parallel to the direction of fire.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
.50 caliber	7,500	2,545
.30 caliber, M1	5,500	2,700
.30 caliber, M2	3,450	2,700

Data sheet(s):

CTT01      Small arms, General

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951



**LANDSCAPE, 1,000-inch (aka: Landscape 1,000-inch; Landscape and MG; Landscape; Machine Gun; Portrait Range)**

Range Type: Small Arms

Cell Name(s): LAND

Landscape targets are used for rifle practice on this 1,000-inch range. The complete target set consists of five black and white paper landscape targets mounted on individual target frames and held in place on six vertical posts. The complete set of five landscape paper targets makes a panoramic picture of a landscape. The size of this panoramic picture is such that all (or nearly all) of the salient features are recognizable at a distance of 1,000-inches.

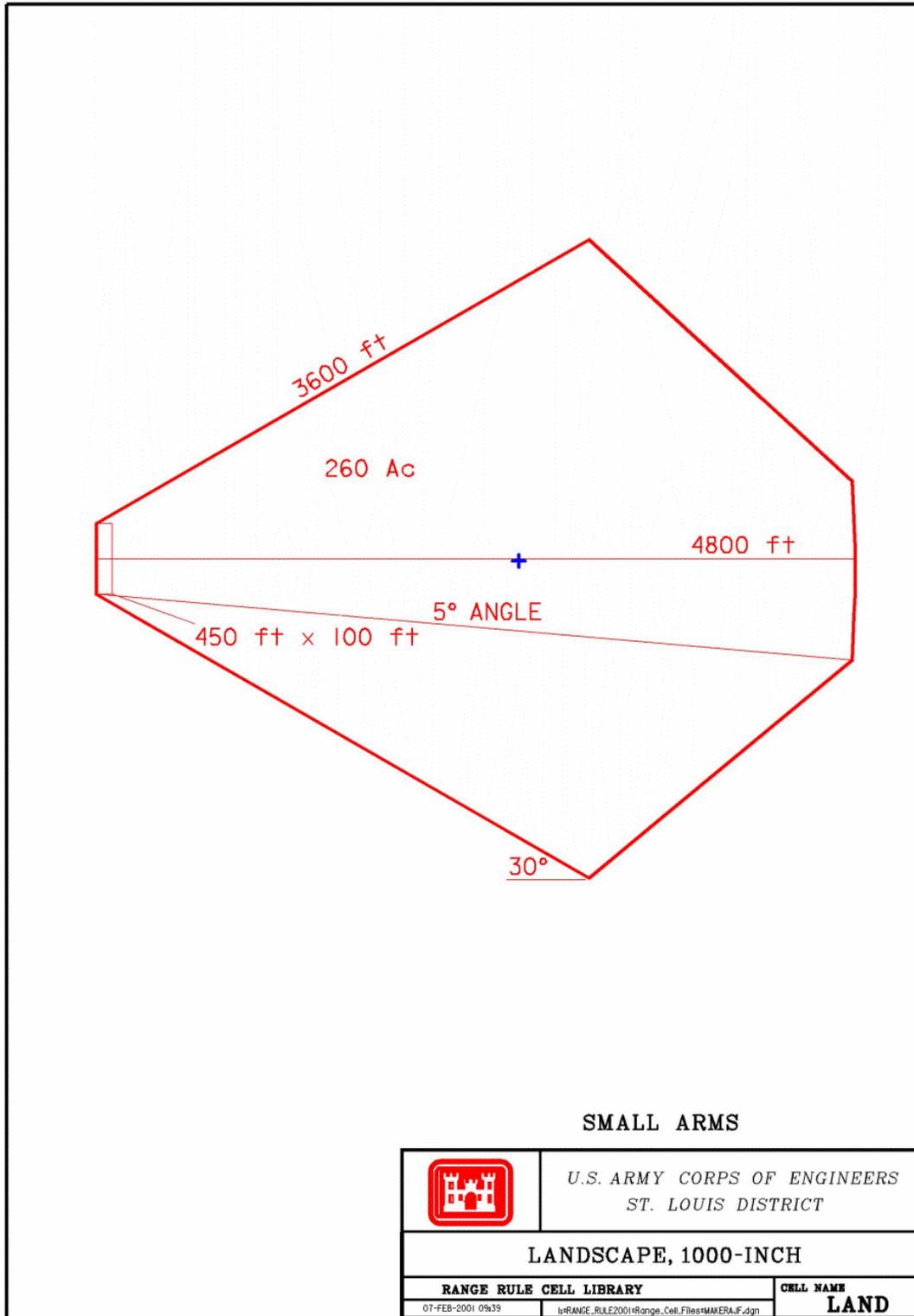
Based on the size requirements for each target unit (a complete set of landscape paper targets), it is assumed that no more than 6 units were constructed on a single range. In order to provide a safety space between adjacent targets and to allow independent operations, a distance of 50 feet separated each 25-foot wide target unit. Approximate dimensions for this range are 450-feet wide by 100-feet long. A single firing line stretched across the width of the range. Personnel fired .22-caliber weapons (preferably) at a panoramic picture of a landscape, which was positioned 1,000-inches down-range. An additional area behind the firing lines included the ready line, ammunition issue point, and administrative area. A 5° angle of fire extended from each end of the firing line down range a distance of 1,600 yards; and an additional 25° safety fan, which originated from the same points as the angle of fire, extended down range a distance of 1,200 yards.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
.22 caliber	1,500	1,100

Data sheet(s):

CTT01 Small arms, General

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951



**MALFUNCTION, .50 CALIBER (aka: Small Arms Malfunction Range)**

Range Type: Small Arms

Cell Name(s): MAL50C

The range area, which includes the danger area, is approximately 850 feet by 500 feet. To conform to this limit, a 16-foot earth embankment was required to be constructed to the rear of the range (approximately 500 feet to the front of the firing line) and extend to the outer limits of the safety fan. A firing line approximately 250-foot long would accommodate up to 25 machine guns.

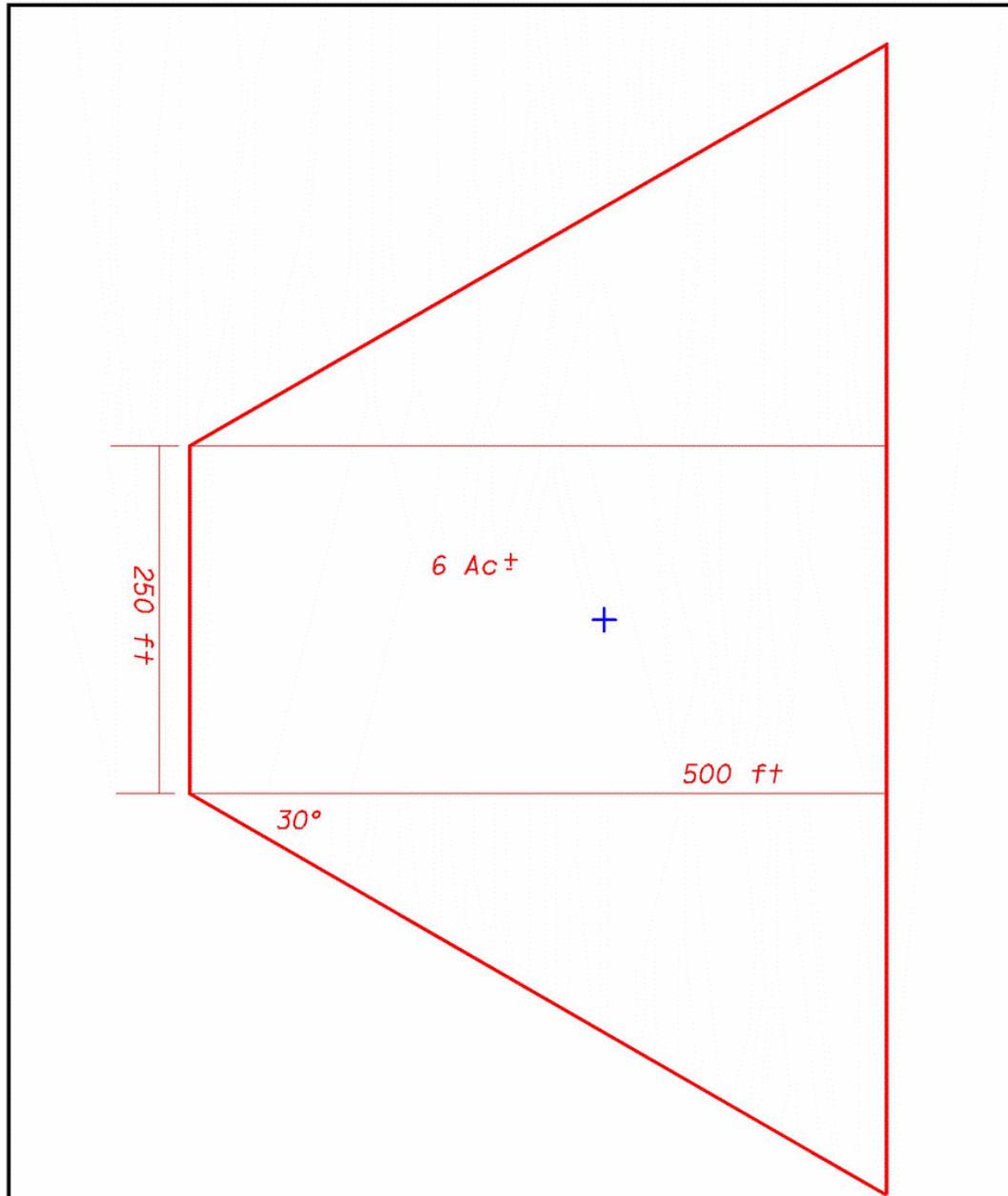
All guns would have been post mounted (fixed), thereby restricting movement in azimuth and elevation. The earth embankment plus the fixed guns allowed for the reduction in the downrange danger area typically seen on small arms ranges. The danger area includes an angle of fire plus the required safety fan, totaling 30°, which originates from each end of the firing line and extends to the earthen berm.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
.50 caliber	7,500	2,545

Data sheet(s):

CTT01 Small arms, General

Reference(s): 2<sup>nd</sup> Air Force Ground Gunnery Range Requirements, July 1943; *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944.



SMALL ARMS

	<p>U.S. ARMY CORPS OF ENGINEERS          ST. LOUIS DISTRICT</p>
<p><b>MALFUNCTION, .50 CALIBER</b></p>	
<p>RANGE RULE CELL LIBRARY</p>	<p>CELL NAME  <b>MAL50C</b></p>
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## **MOVING FIELD TARGET (.30 CALIBER)**

Range Type: Small Arms

Cell Name(s): MFT30C

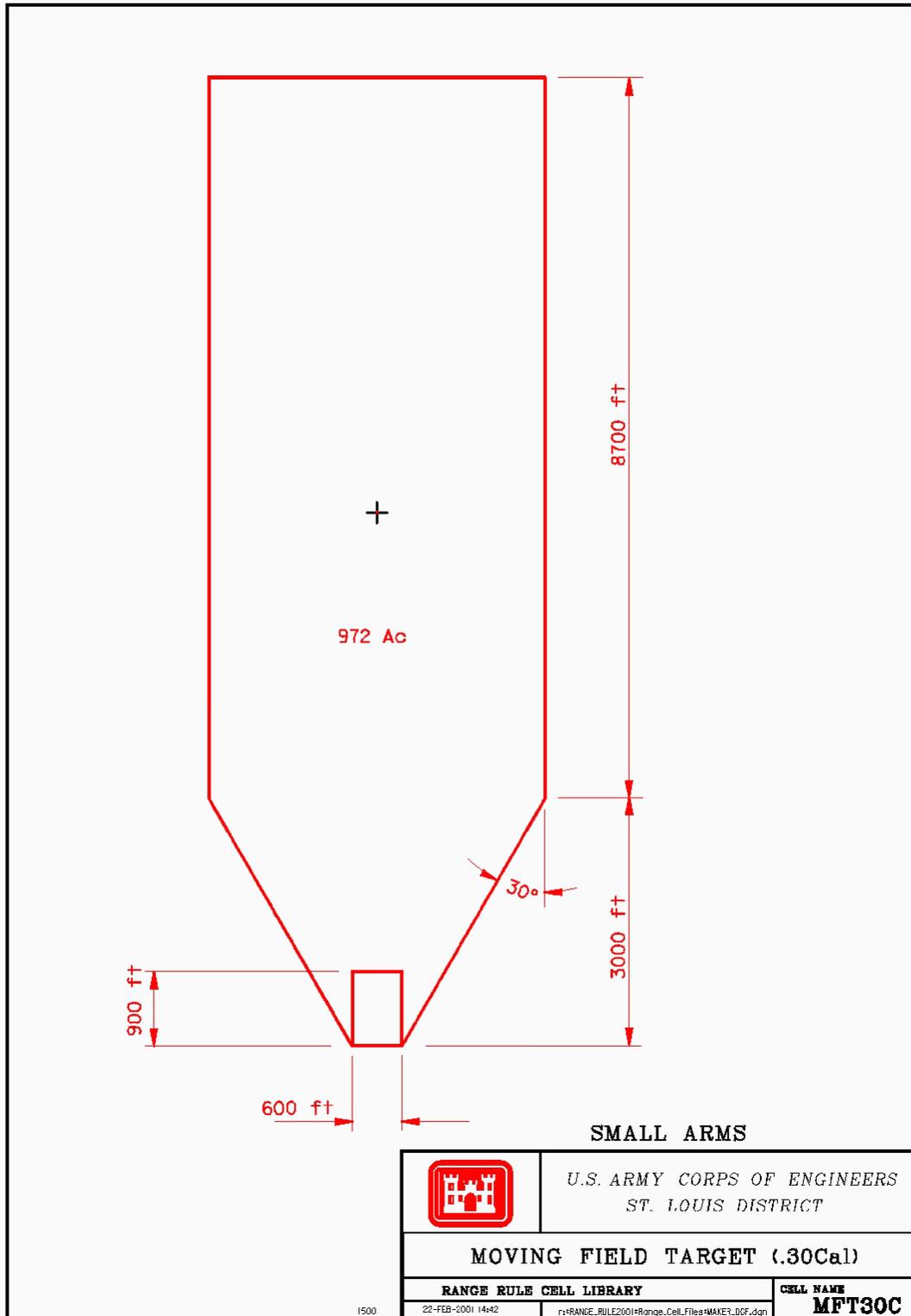
The only description available in the references is an illustration showing a target car mounted on a narrow gage track at the rear of a range. The target may have been towed using a stationary motor drum or by a vehicle. The width of the range is not described and it is unknown as to the number of firing points allowed. Therefore, the range size is estimated to be 200 yards by 300 yards. A salvage wall (earthen berm) would have been constructed directly behind the targets. An additional area behind the firing lines would have included the ready line, ammunition issue point, and administrative area. The danger area would have included a 5° angle of fire plus a 25° safety fan. The danger area is represented as a 30° fan originating from the ends of the firing line, extending down range a distance of 1,000 yards, at which point it continues an additional 2,900 yards (8700 feet) parallel to the direction of fire.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
.30 caliber	3,450	2,700
.22 caliber	1,500	1,100

Data sheet(s):

CTT01      Small arms, General

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951



**MACHINE GUN, AUTOMATIC RIFLE (BAR), 1000-inch (aka: Machine Gun, Automatic Rifle, 1,000-inch; BAR, 1,000-inch; Browning Automatic Rifle, 1,000-inch)**

Range Type: Small Arms

Cell Name(s): MGARB

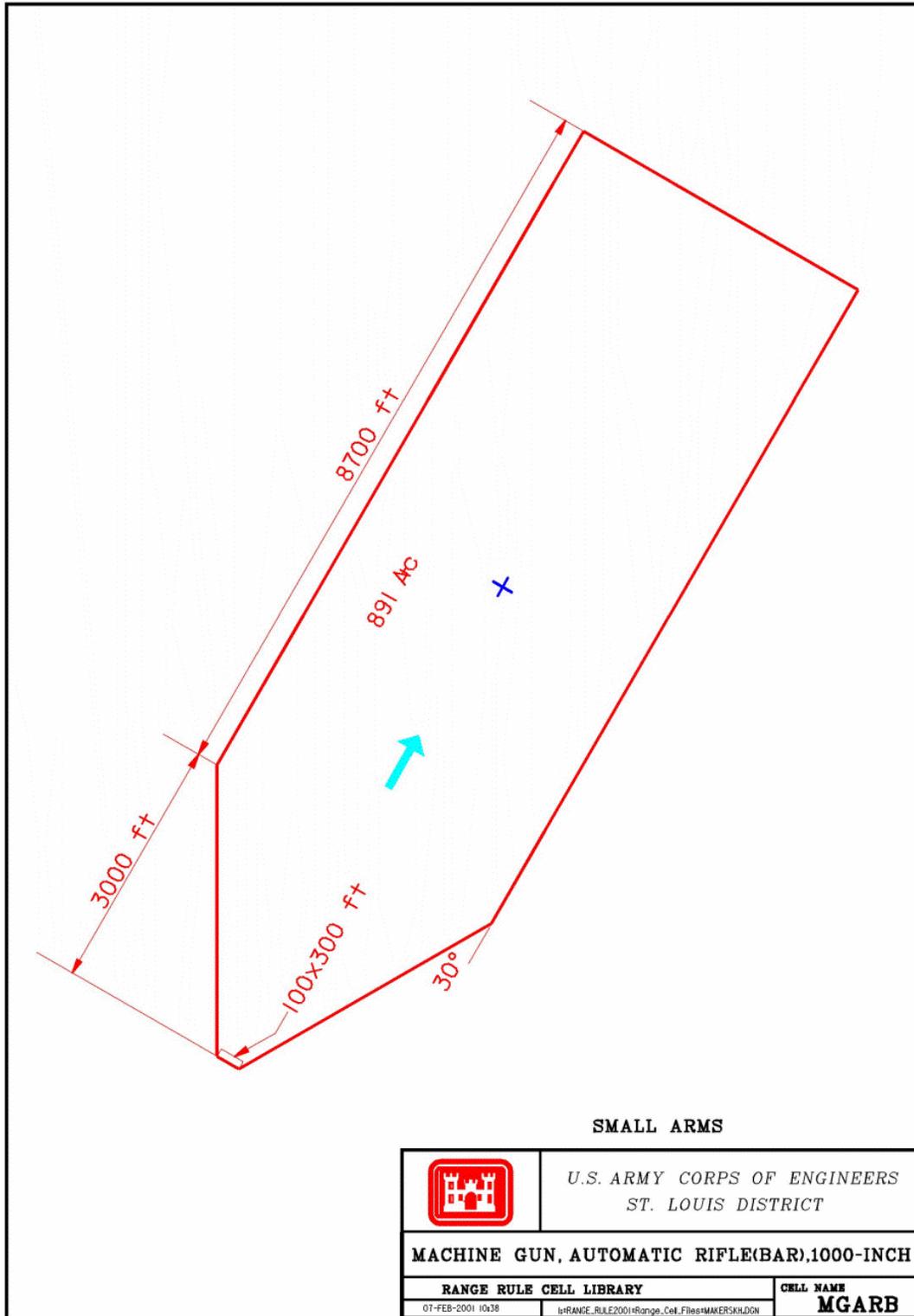
The estimated size of the range is 300 feet wide by 100 feet long. An additional area behind the firing lines would have included the ready line, ammunition issue point, and administrative area. The danger area consisted of a 5° angle of fire and an additional 25° safety fan. The 30° fan would have originated from each end of the firing line, extended 1,000 yards down range, at which point it would have continued an additional 2,900 yards parallel to the direction of fire.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
.30 caliber	3,450	2,700

Data sheet(s):

CTT01      Small arms, General

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951



## **MOVING VEHICLE (.30 CALIBER MACHINE GUN)**

Range Type: Small Arms

Cell Name(s): MOV.30

A .30 caliber machine gun moving vehicle range may be located adjacent to or within the limits of a submachine gun moving vehicle range where the size of the danger area could be reduced. Log type obstacles were desirable at locations other than where continual use by tank traffic occurred.

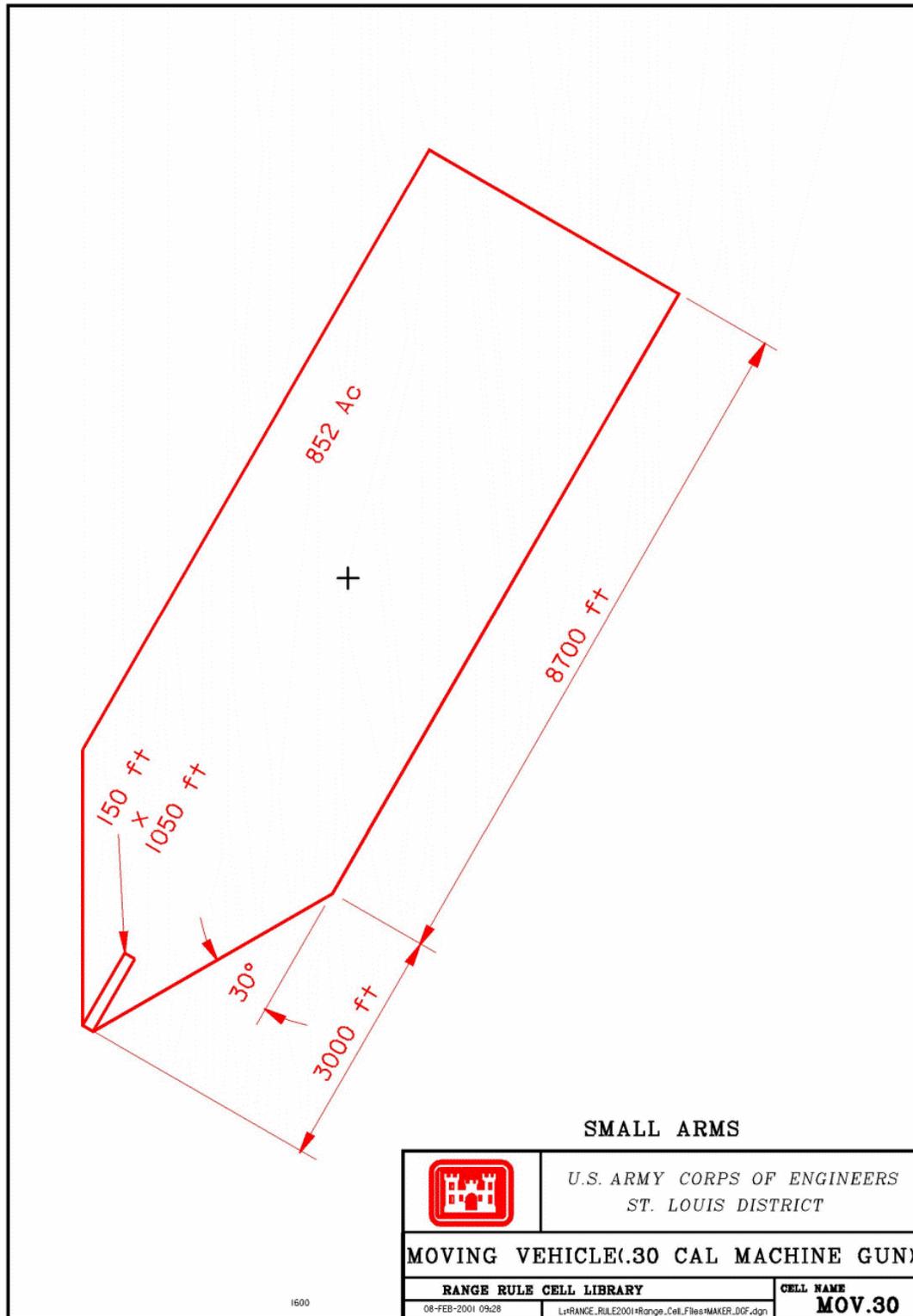
A typical firing lane consisted of a straight road, 350 yards long with targets positioned at the rear of the range. The target area would have been approximately 50 yards wide. Vehicles were required to traverse the road and obstacles while gunners engaged targets. Firing commenced at the 50-yard line and continued to the 275-yard line. The danger area would have included the angle of fire and the prescribed safety fan, which would have extended downrange 4,300 yards beyond the cease-fire line.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
.30 caliber	3,450	2,700

Data sheet(s):

CTT01 Small arms, General

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951



## **MOVING TARGET 1,000-inch (STRAIGHT TRACK)**

Range Type: Small Arms

Cell Name(s): MT1000

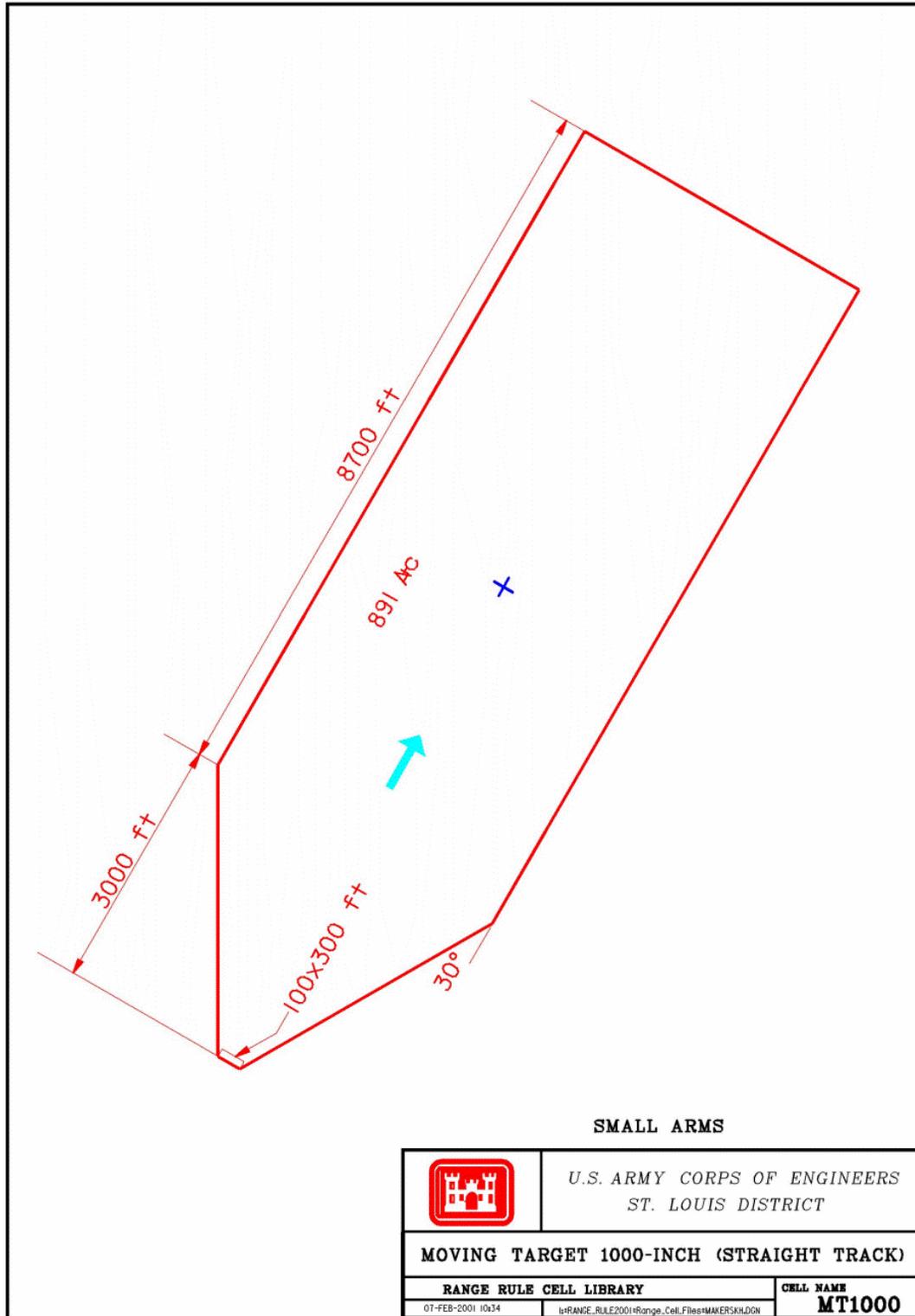
The only description available in the references is an illustration showing a target car mounted on a track at the rear of a 1,000-inch range. As illustrated, as the target car is pulled along the track, it is visible to the gunner for no more than 35 feet. The width of the range is not described and it is unknown as to the number of firing points allowed. It may be possible that a range consists of multiple tracks with multiple firing lines. Therefore, the range size is estimated to be 300-feet by 100-feet. A salvage wall (earthen berm) would have been constructed directly behind the targets. An additional area behind the firing lines would have included the ready line, ammunition issue point, and administrative area. The danger area would have included a 5° angle of fire and a 25° safety fan. The area is represented as a 30° fan that originates from the ends of the firing line, extends down range a distance of 1,000 yards, at which point it continues an additional 2,900 yards (8700 feet) parallel to the direction of fire. If .50-caliber ammunition is suspected, the safety fan should be extended to 6,600 yards in lieu of 2,900 yards (on the range cell).

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
.50 caliber	7,500	2,545
.30 caliber	3,450	2,700
.22 caliber	1,500	1,100

Data sheet(s):

CTT01      Small arms, General

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951



## MOVING TARGET (CURVED TRACK)

Range Type: Small Arms

Cell Name(s): MTCUTR

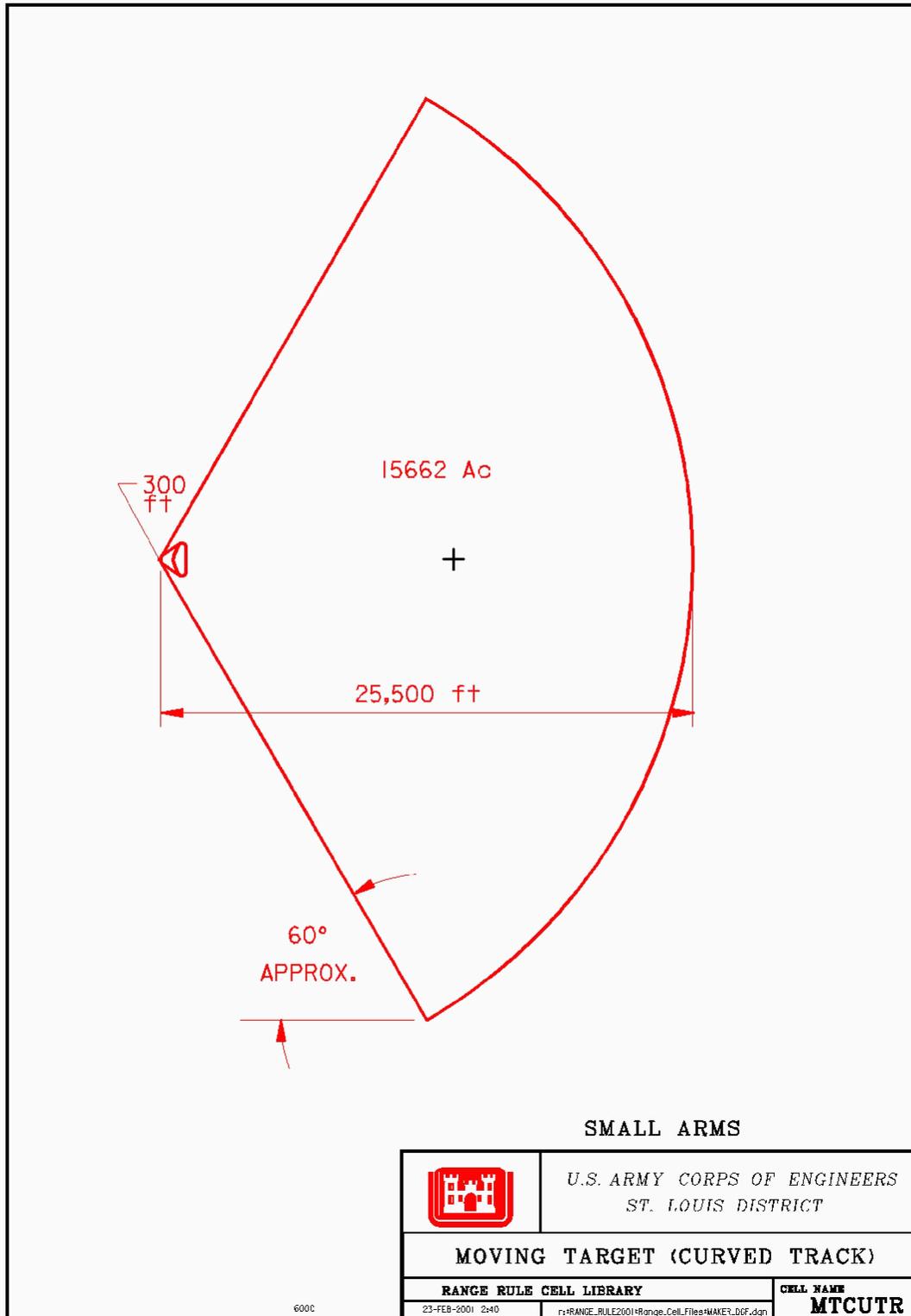
Typically, a Moving Target (curved type) is designed to provide practice for calibers .30 and .50 machineguns. However, this range also accommodated guns up to 75 mm (it is possible that 37mm subcaliber munitions were used for these guns). The target area consists of a continuous narrow gage rail (tracks) approximately 600 feet by 1,500 feet. The track layout may vary. Targets are mounted on target cars, which operate on the track. The cars and tracks are protected by earthen berms. The firing line is typically located 600 feet from the target area, and is wide enough to accommodate 24 firing positions (spaced at 12 feet apart plus room at both ends calculates to approximately 300 feet). Left and Right limits of fire are established based on the width of the target area. A danger area would include 300 mils (17°) added to the left and right limits of fire and extend down range a distance of 1,000 yards beyond the maximum range of the largest munitions used. The cell represents the size of range necessary to accommodate .50 caliber ammunition. High explosive munitions would not have been authorized for use on this type of target range.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
.50 caliber	7,500	2,545
.30 caliber	3,450	2,700
37mm AP	(at elev. 15°) 4,980	data not available
75mm AP	(at elev. 15°) 7,140	2,030

Data sheet(s):

CTT01	Small arms, General
CTT13	37mm, APC, M59 75mm, AP M72

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951



## MOVING TARGET, JEEP TYPE

Range Type: Small Arms

Cell Name(s): MVJEEP

This type of range consists of a jeep-mounted target that is driven on a track laid out in a triangular shape. Gun turrets mounted on stationary platforms were positioned along the firing line approximately 600 yards to the front of the target. Local requirements would have dictated the number of turrets. An earthen berm constructed around the target area was required to conceal and protect the vehicles and personnel.

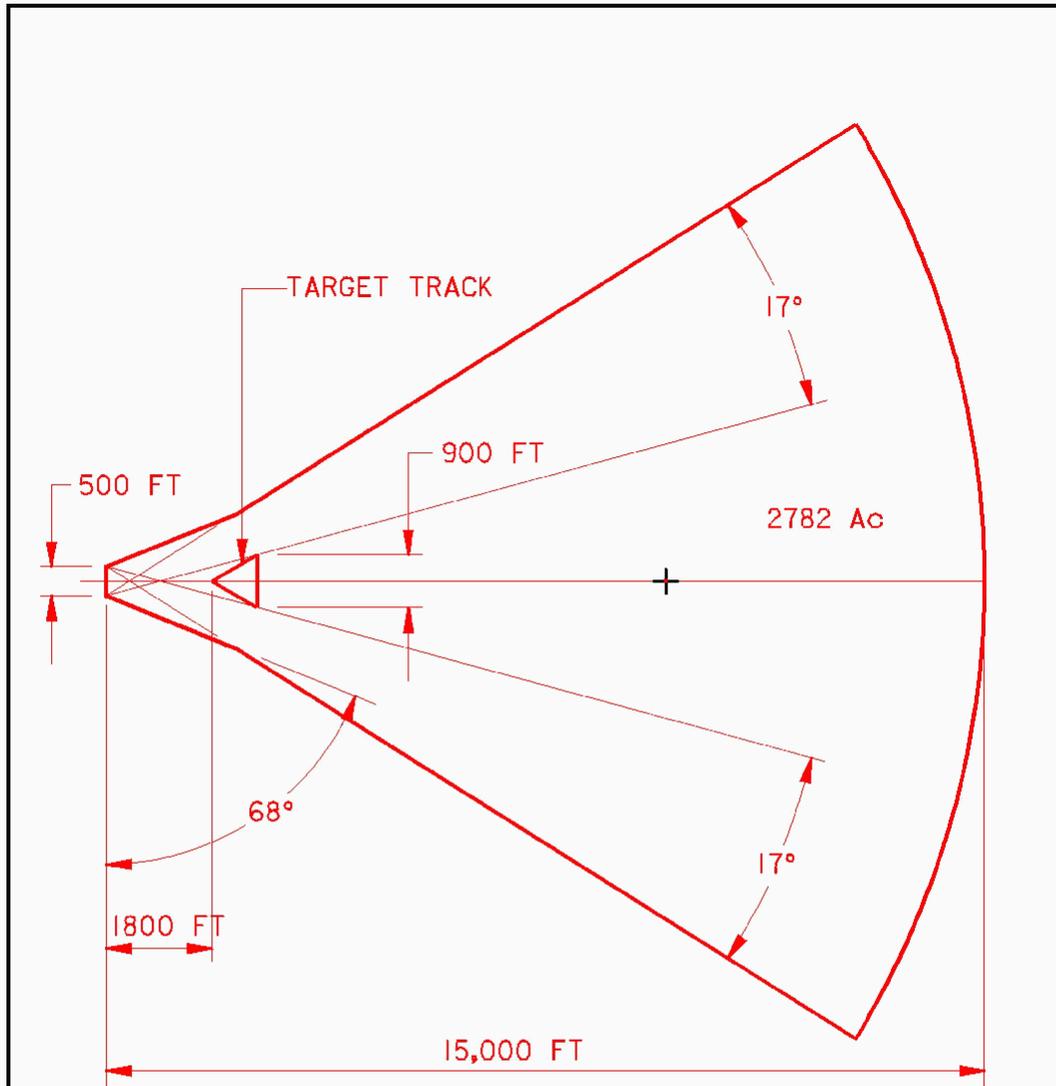
The range cell was derived using the following assumptions: a 500-foot firing line positioned 1,800 feet from the forward edge of the target; a 900-foot wide target; the down range distance (as stated in reference – from the firing line to the end of the safety fan) is 15,000 feet (5000 yards). Safety fans were calculated by adding an additional 17° safety fan to the right and left limits of the far right and far left gun positions. Right and left limits are locally established, but typically set at the ends of the target area. A set safety fan of 22° would extend from each end of the firing line and extend to intersect the right and left limit safety fan.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
.50 caliber	7,500	2,545

Data sheet(s):

CTT01      Small arms, General

Reference(s): *Second Air Force Ground Gunnery Range Requirements*, July 1943; *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951



2500

**SMALL ARMS**

	U.S. ARMY CORPS OF ENGINEERS ST. LOUIS DISTRICT	
	<b>MOVING JEEP TYPE TARGET</b>	
<b>RANGE RULE CELL LIBRARY</b>		<b>CELL NAME</b>
<small>22-FEB-2001 14:42</small>		<b>MVJEEP</b>

## **MOVING VEHICLE (SUBMACHINE GUN)**

Range Type: Small Arms

Cell Name(s): MVRANG

A Moving Vehicle Range for submachine guns consisted of a u-shaped vehicle track with three separate target groupings. It was typically located along a ridge or on topography that permitted a wide angle of vision. Road construction would have consisted primarily of clearing enough of an area to provide for satisfactory passage of vehicles. Its arrangement would have been subject to modifications in order to accommodate the local terrain and danger area restrictions. Gunners were tasked to engage three target groups while mounted in a moving vehicle

The area required for this range is approximately 150 yards by 225 yards, which provides enough room to construct the road, have adequate separation between the three target groups, and provide approximately 50 yards of length, which allows the vehicle to reach the required speed. The terrain for this range would have been generally flat with a good field of fire for the gunner; and the vegetation would have typically consisted of grass, weeds, and underbrush. The three separate target groups (consisting of E-type targets) would have been positioned appropriately to meet local terrain and restrictions.

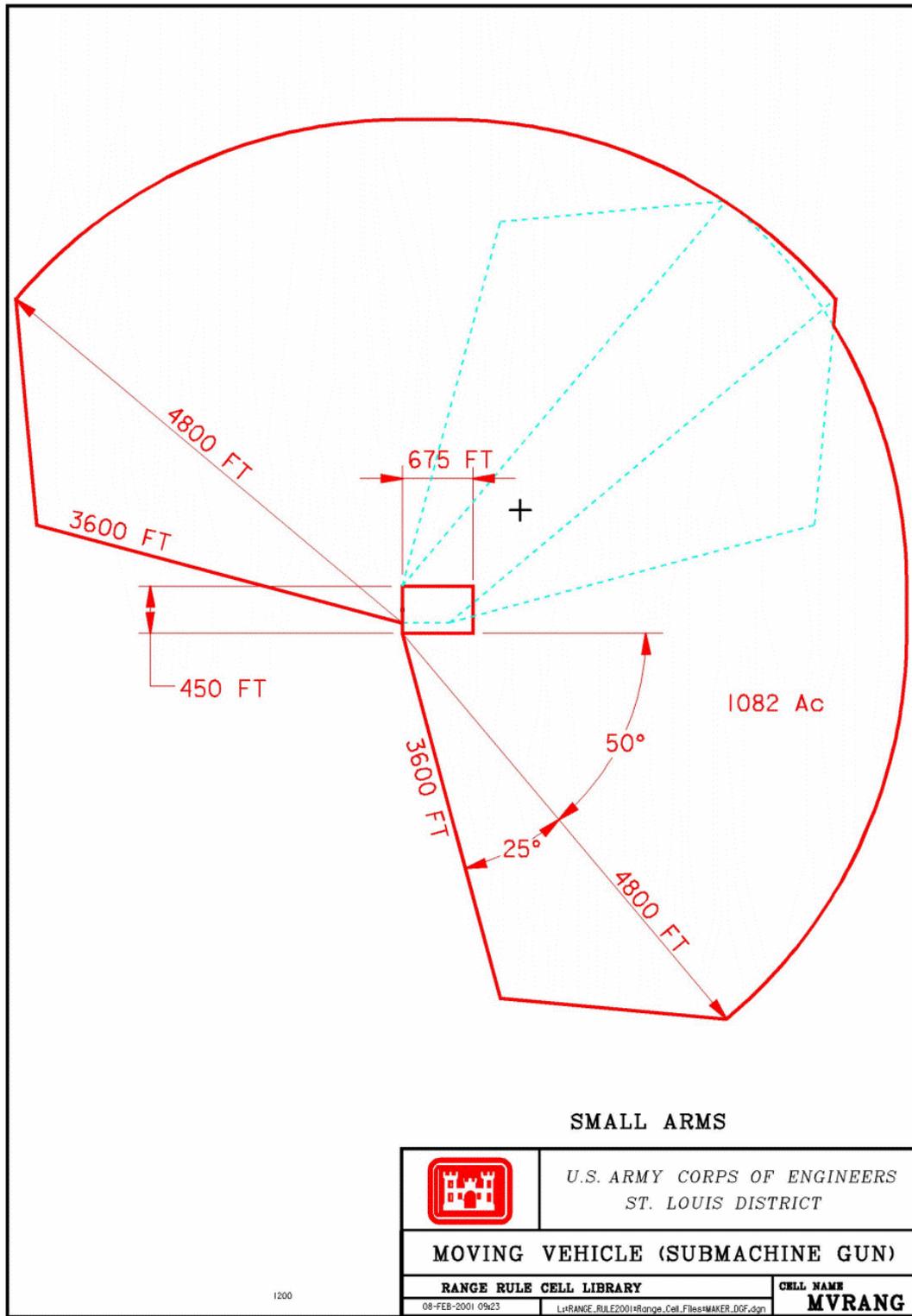
The range cell was derived using the following assumptions: 150 yard by 425 yard range area; vehicle route constructed within these limits; danger area developed using two machinegun danger areas to account for the two directions of fire.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
.45 caliber	1,600	802

Data sheet(s):

CTT01      Small arms, General

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951



## MOVING BASE (SHOTGUN)

Range Type: Small Arms

Cell Name(s): MVSHOT

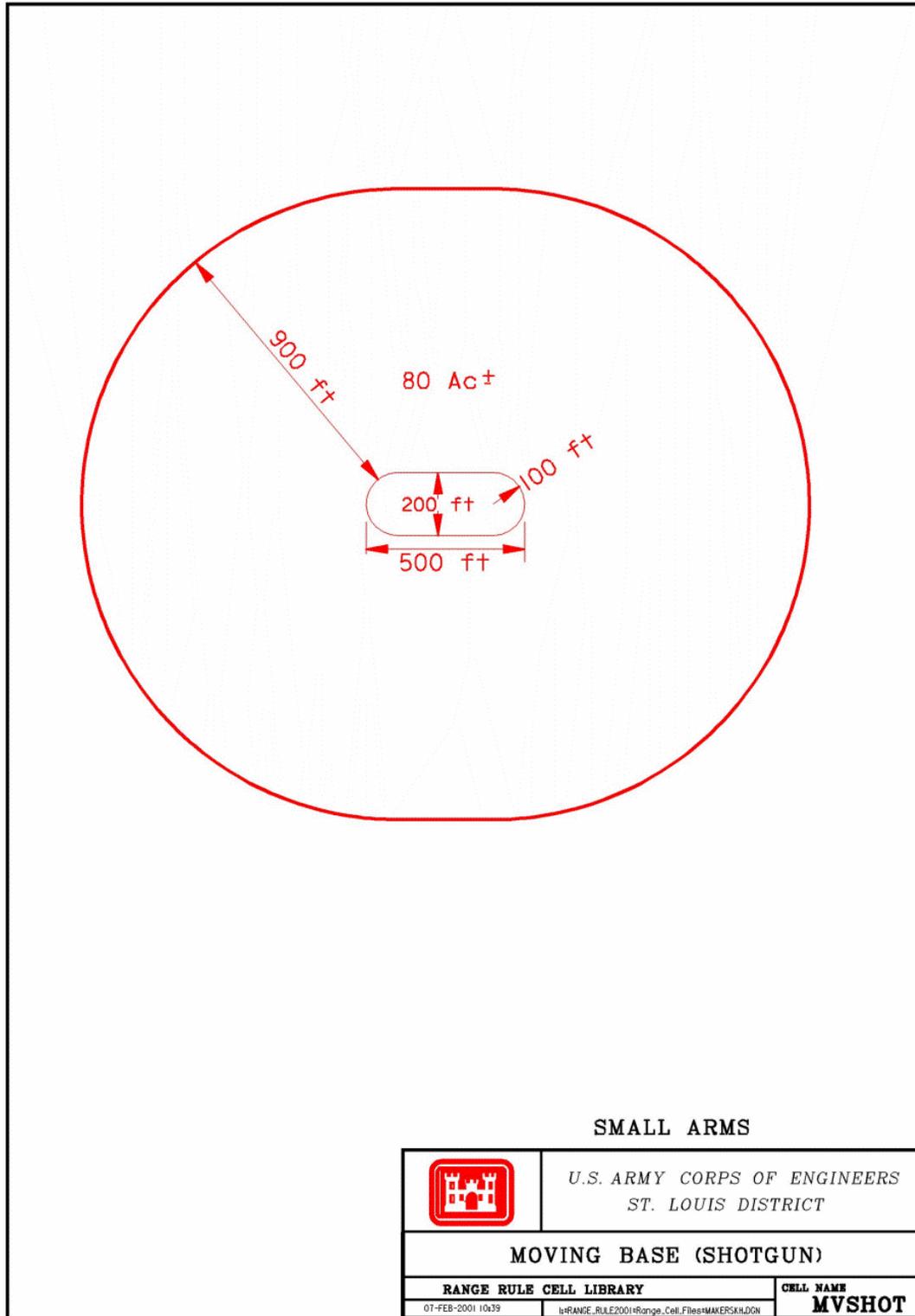
Similar to skeet and trap, this range uses clay targets (clay pigeons) thrown from trap houses. Shotguns would have been the authorized weapons. Shooters would have engaged targets from a moving vehicle traversing a set course, which was generally an oval track. No standards are known for this range. However, it is estimated that the oval track was approximately 500 feet by 200 feet and that a 900-foot safety fan extended from the oval.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
12 gage shotgun	NA	NA

Data sheet(s):

CTT01      Small arms, General

Reference(s): No references available



## **PISTOL**

Range Type: Small Arms

Cell Name(s): PIRAN

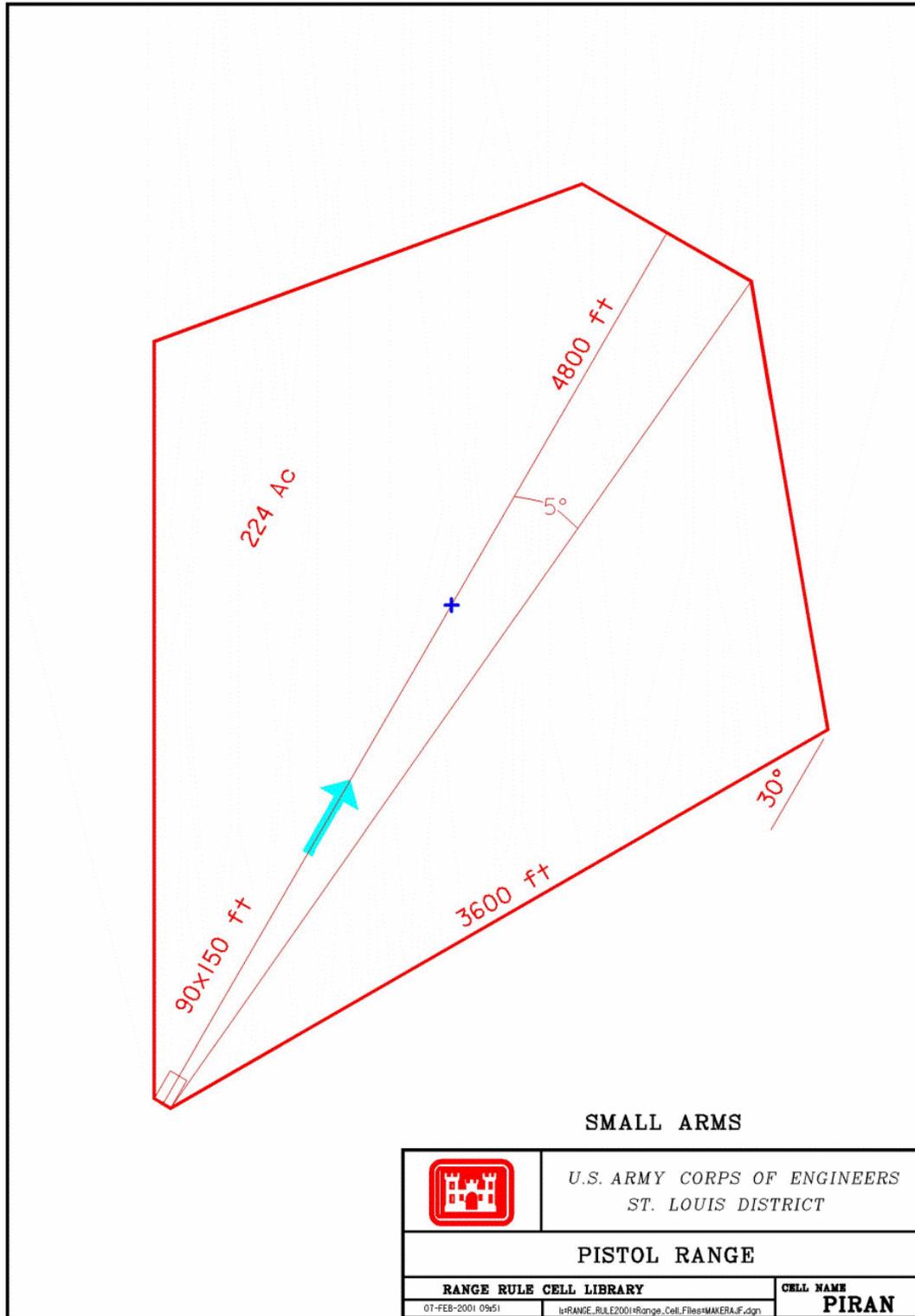
Typically, a Pistol Range accommodated 25 firing positions, and was approximately 30 yards wide by 50 yards deep. A pistol range is comprised of a salvage wall (earthen berm), the targets, the firing line(s), safety fan, and an area behind the firing lines, which typically included the ready line, ammunition issue point, and administrative area. The salvage wall (earthen berm) would have been constructed along the backside of the range approximately 5 feet to the rear of the target line. In situations where bluffs or steep hills were present, a salvage wall may not have been required. A five-foot opening typically separated each target. Firing lines would have been positioned at 5, 10, 15, and 25 yards in front of the targets. A 5° angle of fire extended from each end of the firing line down range a distance of 1,600 yards; and an additional 25° safety fan, which originated from the same points as the angle of fire, extended down range a distance of 1,200 yards.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
.45 caliber	1,600	802
.22 caliber	1,500	1,100

Data sheet(s):

CTT01      Small arms, General

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951



## **POORMAN RANGE**

Range Type: Small Arms

Cell Name(s): POORMN

A machine gun range utilized to provide a ground trainer designed to simulate problems encountered in the air while firing at a fighter attacking on a pursuit curve. Along the firing line are positioned one or more Poorman Flexible Gunnery Trainers or Poorman Hand-Held Trainers. A cloth target is mounted on a target car running on a track from the firing line to a point 1000 inches (83' 4") in front and directly on the center-line of the firing turret.

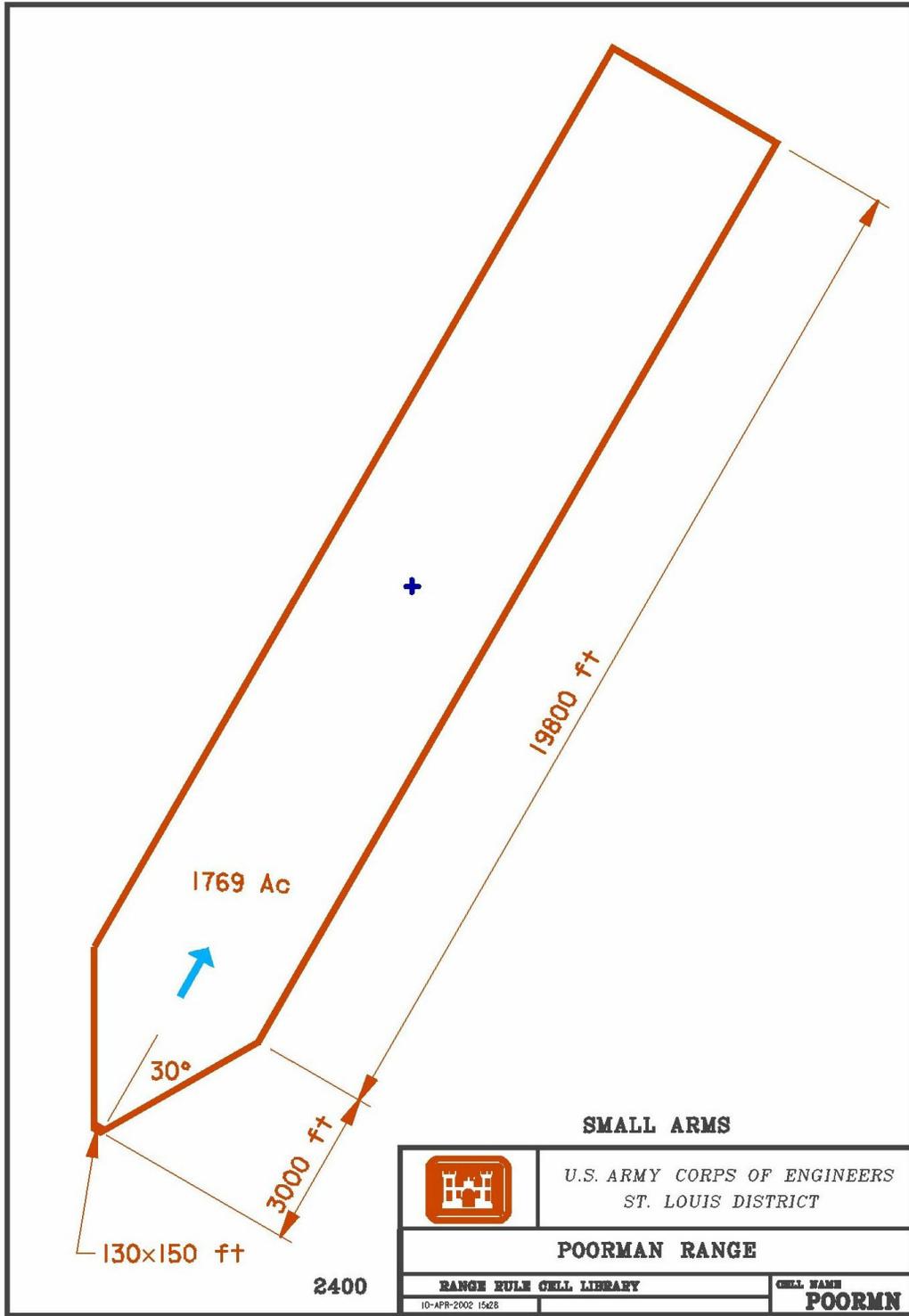
Currently, no references are currently available to provide a range layout. The trainer manual on hand gives no dimensions other than the target distance. Modification to width depends on quantity of trainers. The estimated size of the range, based on six trainers, is approximately 130 feet wide by 150 feet long. A 30° safety fan originating from both ends of the firing line would extend down range 1,000 yards, at which point it continued an additional 6600 yards parallel with the direction of fire.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
.50 caliber	7,500	2,545
.30 caliber	3,450	2,700

Data sheet(s):

CTT01      Small arms, General

Reference(s): AF Manual No. 66, *Manual for the Instructor on the Poorman Flexible Gunnery Trainer*; AR 750-10, *Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951



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**RIFLE, KNOWN DISTANCE (aka: KD Range, Known Distance Range, Qualification Range, Rifle Range, Musketry Range)**

Range Type: Small Arms

Cell Name(s): KD500, KD300, RIFLE

A known distance (KD) rifle range was utilized for weapons familiarization and qualifications. KD ranges may be designated 200-yard, 300-yard, or 500-yard. Based on the designation, firing lines were positioned at 100 yd and 200 yd, 100 yd, 200 yd, and 300 yd, and 100 yd, 200 yd, 300 yd, and 500 yd, respectively. An additional 1,000-yard firing line may have been present; although, these firing lines typically consisted of a small number of firing points.

The width of the range would have been determined based on terrain and installation requirements. A range constructed to accommodate 50 men was approximately 400 yards wide. A range is comprised of a salvage wall (earthen berm) constructed directly behind the targets, the targets, the firing line(s), an area behind the firing lines, which typically included the ready line, ammunition issue point, and administrative area. The 30° safety fan originates from the ends of each firing line, extends down range 1,000 yards, at which point it continues an additional 2,900 yards parallel to the direction of fire.

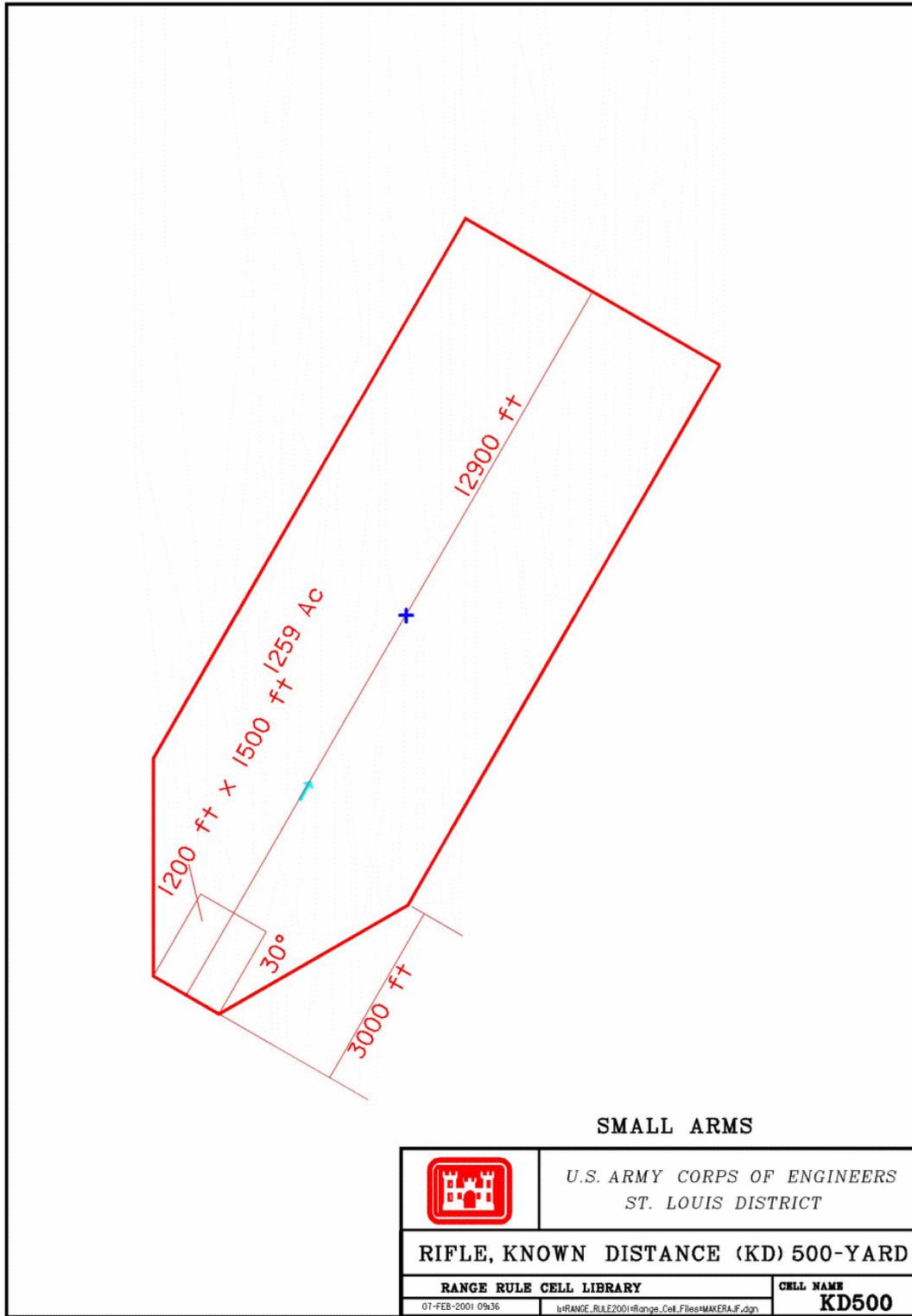
Note: Since the downrange distance is calculated from each firing line, the difference in the down range distance between a 200-yard range (12,000-foot down range distance) and a 500-yard range (12,900-foot down range distance) is 300 yards (900 feet).

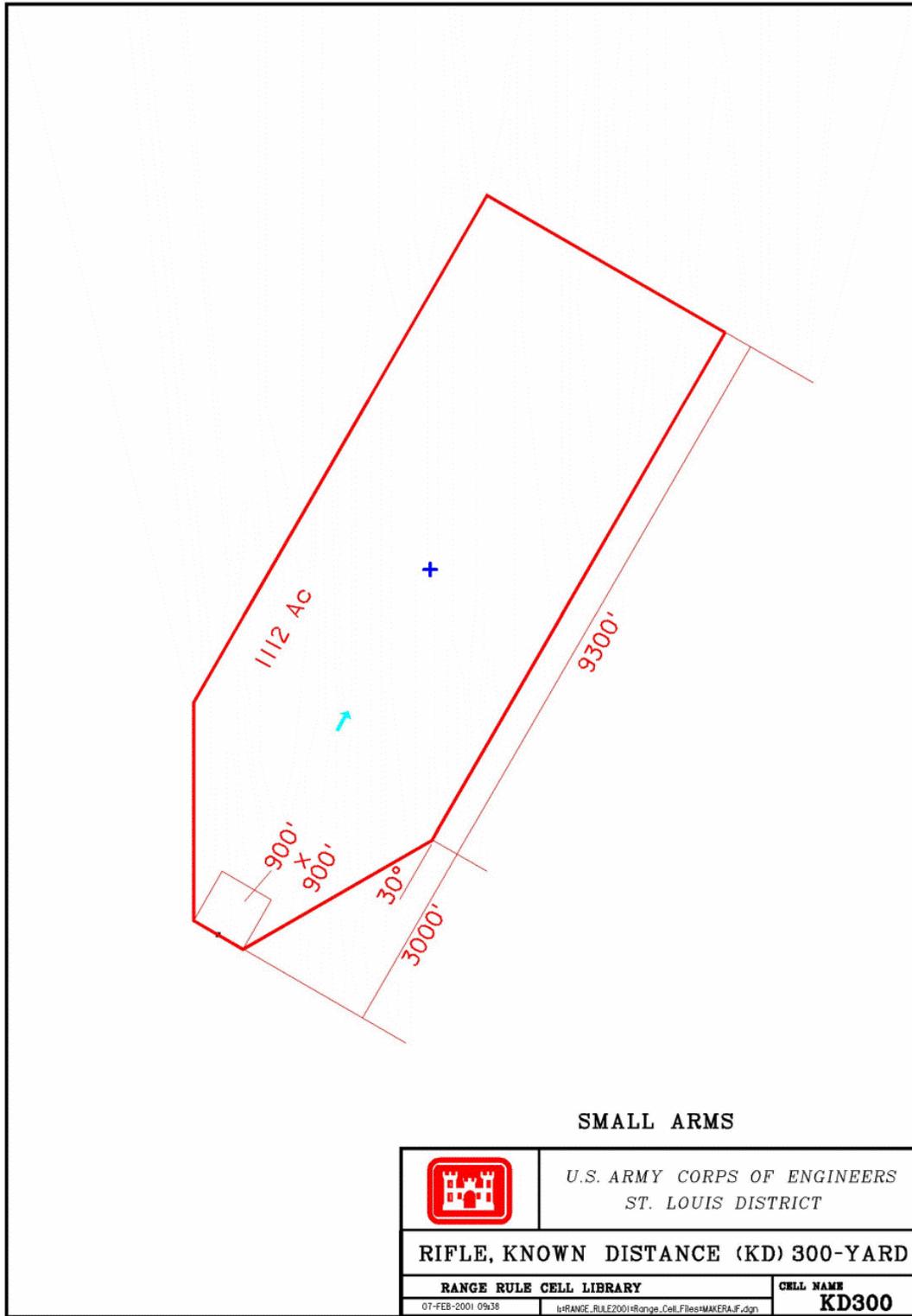
<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
.30 caliber	3,450	2,700
.22 caliber	1,500	1,100
.45 caliber	1,600	800

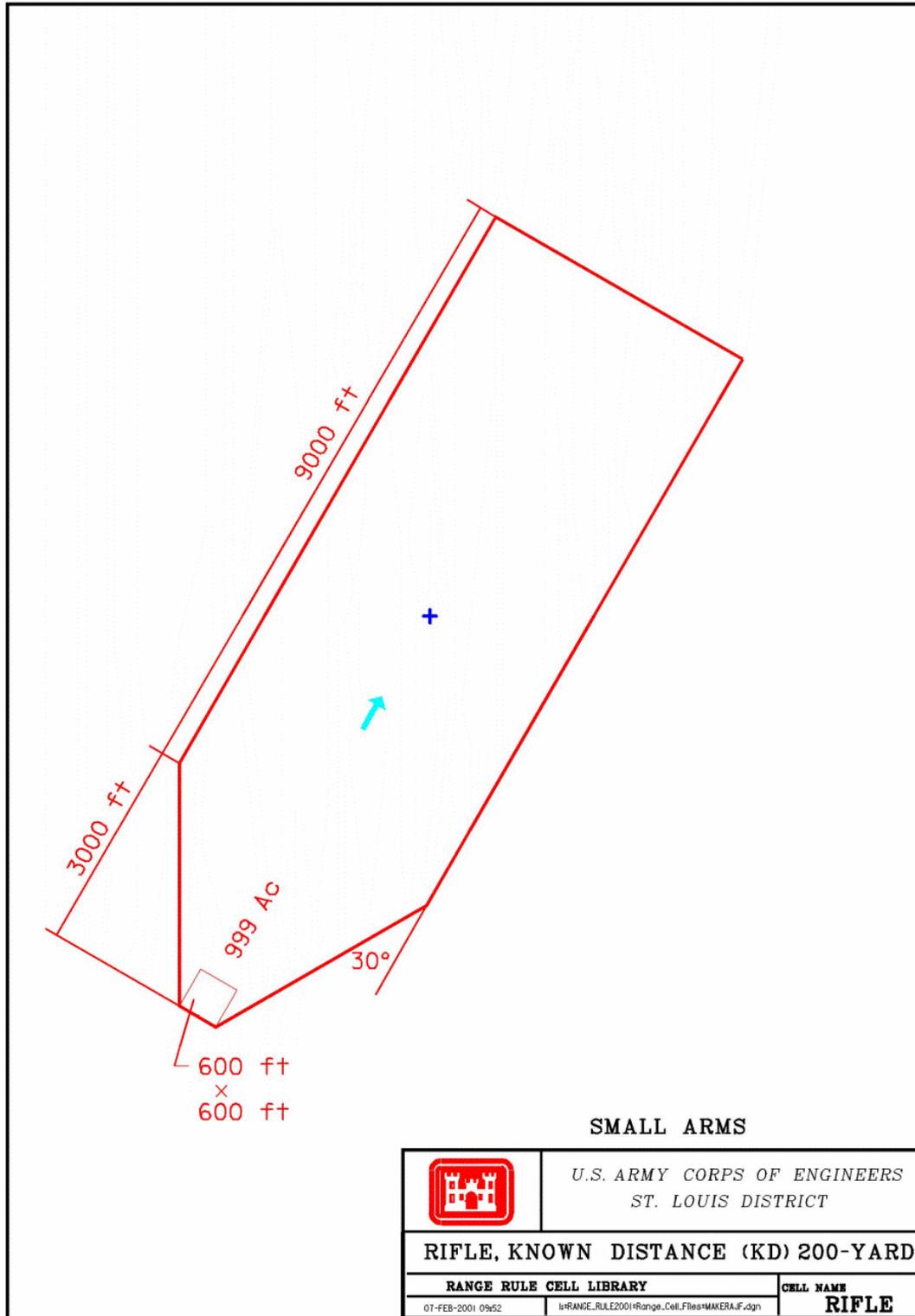
Data sheet(s):

CTT01      Small arms, General

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951







**SKEET & TRAP (aka: Skeet Range, Shotgun Range)**

Range Type: Small Arms

Cell Name(s): SKEET, DSKEET, TSKEET

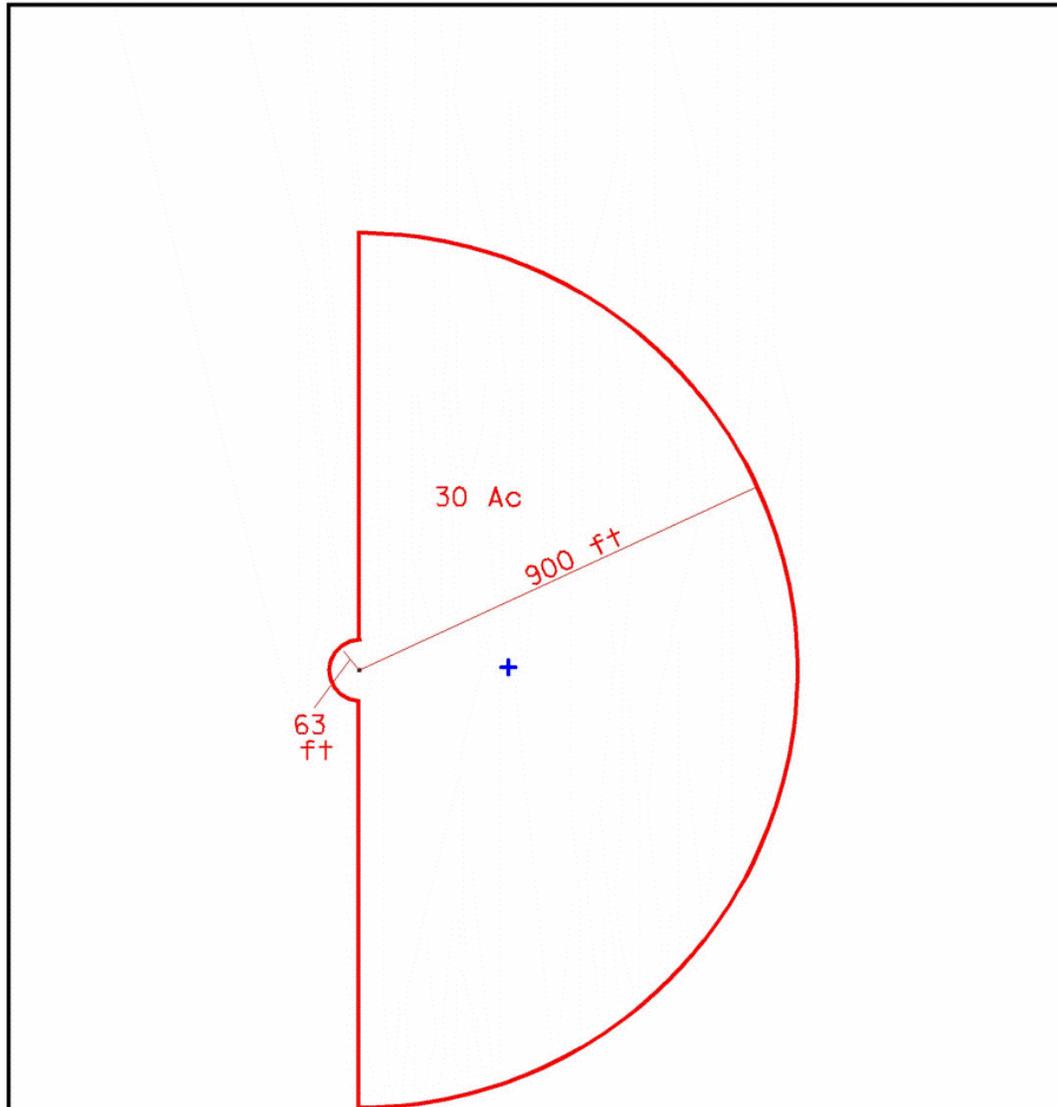
Typically, skeet ranges should be located in open country. A range facility may consist of one or several shooting fields, which are normally positioned side by side. A shooting field is laid out in a semi-circle with a 63-foot radius. Many ranges utilized concrete walkways. The safety fan consists of a semi-circle with a 900-foot radius that utilizes the same apex as the shooting field. Trap houses may have been constructed of wood, concrete, or brick.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
12 gage shotgun	NA	NA

Data sheet(s):

CTT01 Small arms, General

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951



SMALL ARMS



U.S. ARMY CORPS OF ENGINEERS  
ST. LOUIS DISTRICT

SINGLE SKEET & TRAP RANGE

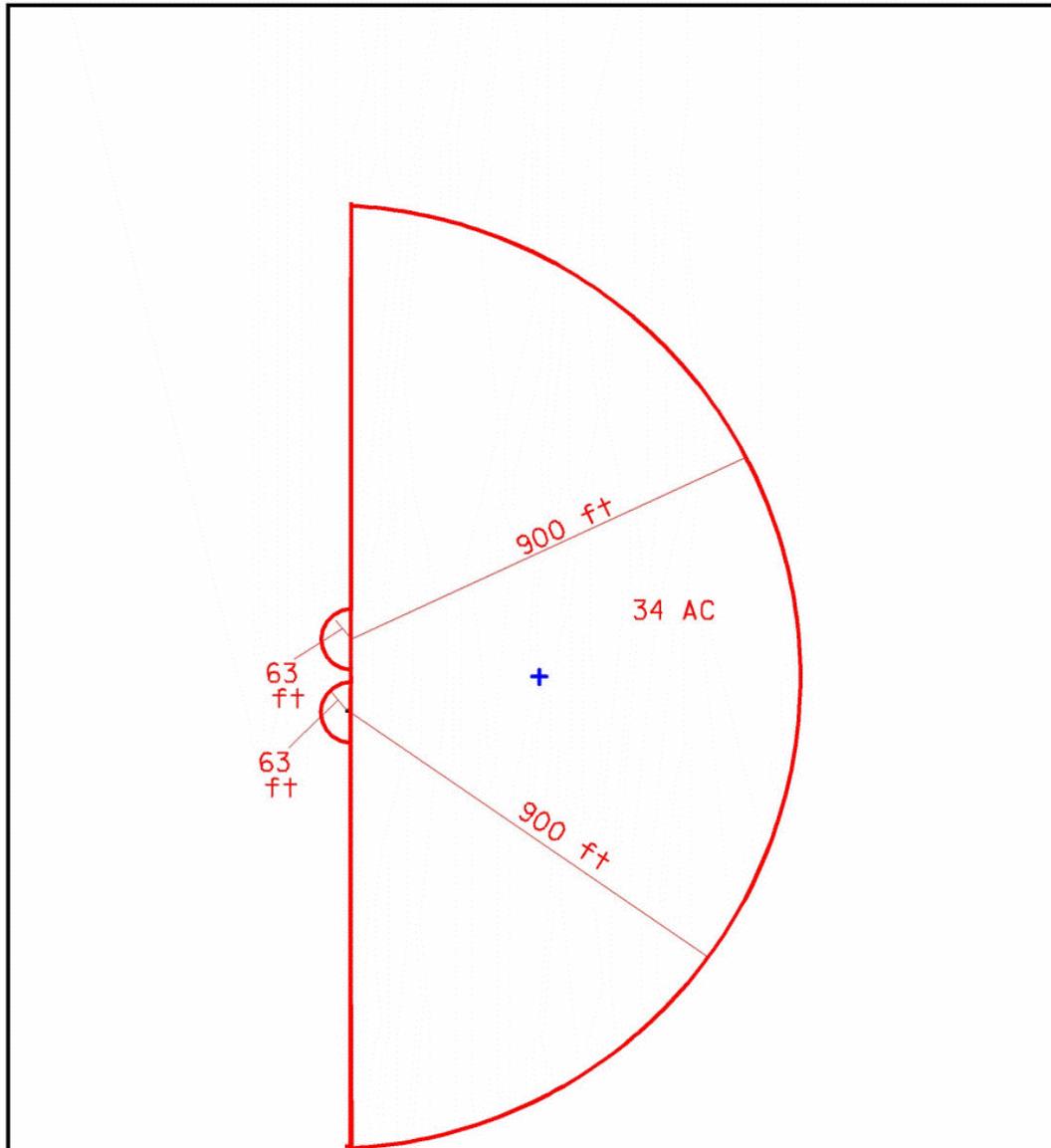
RANGE RULE CELL LIBRARY

CELL NAME

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**SKEET**



SMALL ARMS



U.S. ARMY CORPS OF ENGINEERS  
ST. LOUIS DISTRICT

DOUBLE SKEET AND TRAP RANGE

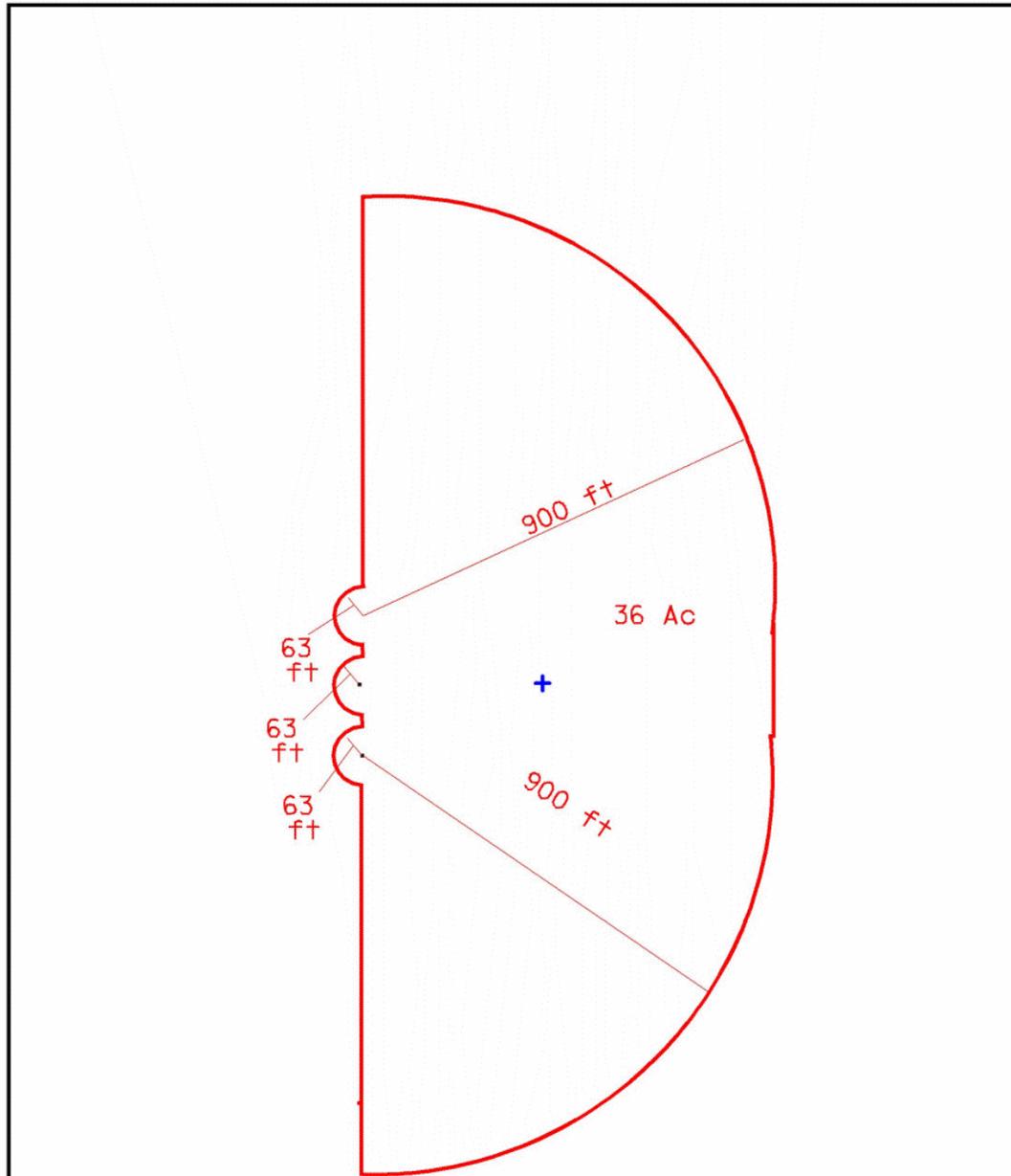
RANGE RULE CELL LIBRARY

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**DSKEET**



SMALL ARMS



U.S. ARMY CORPS OF ENGINEERS  
ST. LOUIS DISTRICT

TRIPLE SKEET RANGE AND TRAP RANGE

RANGE RULE CELL LIBRARY

CELL NAME

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**TSKEET**

**SUBMACHINE GUN MOVING TARGET (aka: Tommy Gun Moving Target)**

Range Type: Small Arms

Cell Name(s): SUBGMV

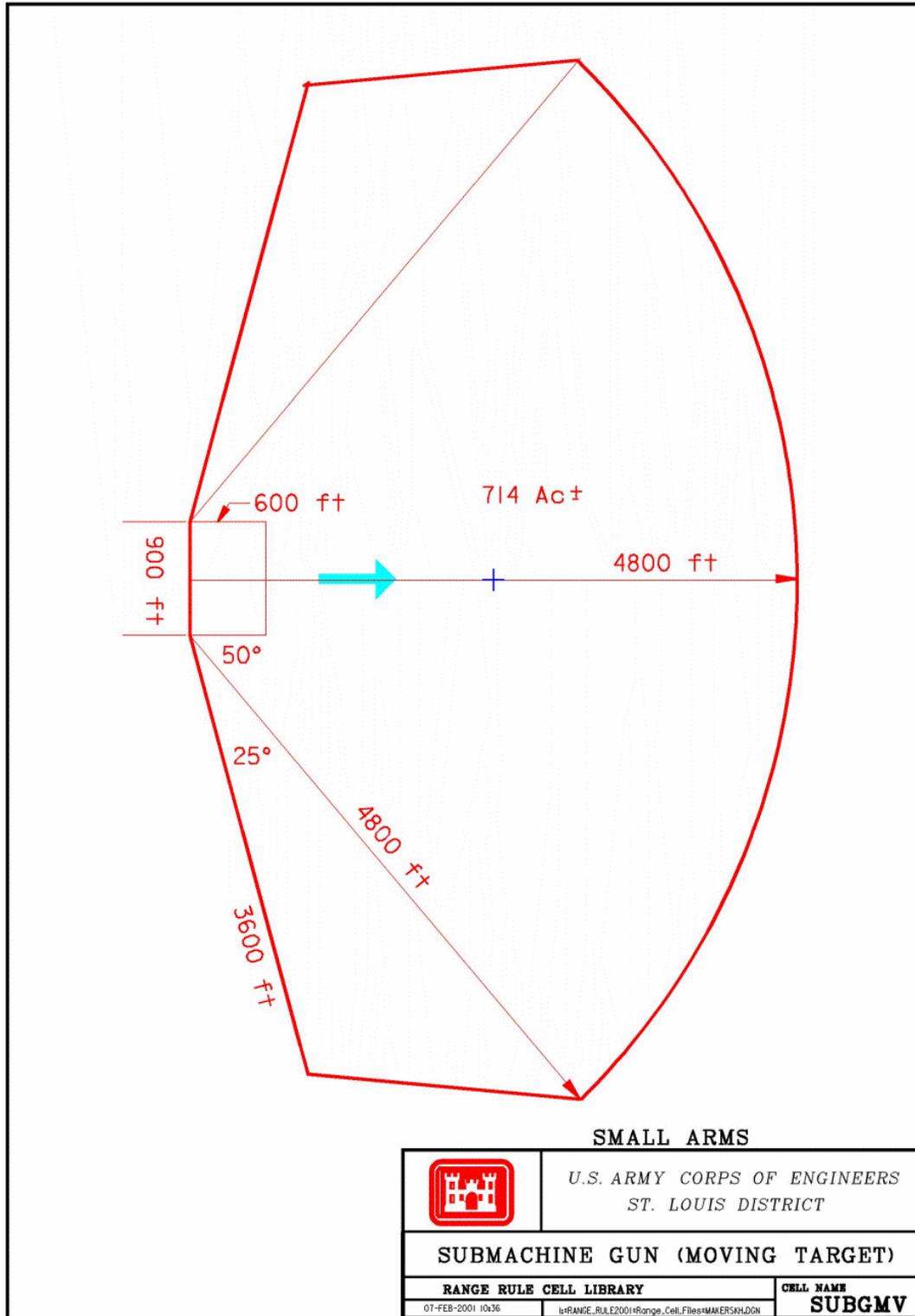
The area required for this range is approximately 300 yards wide by 200 yards deep. A straight length of narrow gage track would have been set up at the rear of the range. A target car carrying a 5-ft by 8-ft target would have run along this track. A towed target sled may have been used in situations where materials were unavailable. Gunners engaged targets from moving vehicles. The vehicles required a smooth level road surface. A danger area included a 50° fan extending 1,600 yards down range from each end of the range, and an additional 25° fan, originating from the same point, extending down range a distance of 1,200 yards.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
.45 caliber	1,600	802

Data sheet(s):

CTT01      Small arms, General

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951



## **SUBMACHINE GUN (aka: Tommy Gun Range)**

Range Type: Small Arms

Cell Name(s): SUBMGT

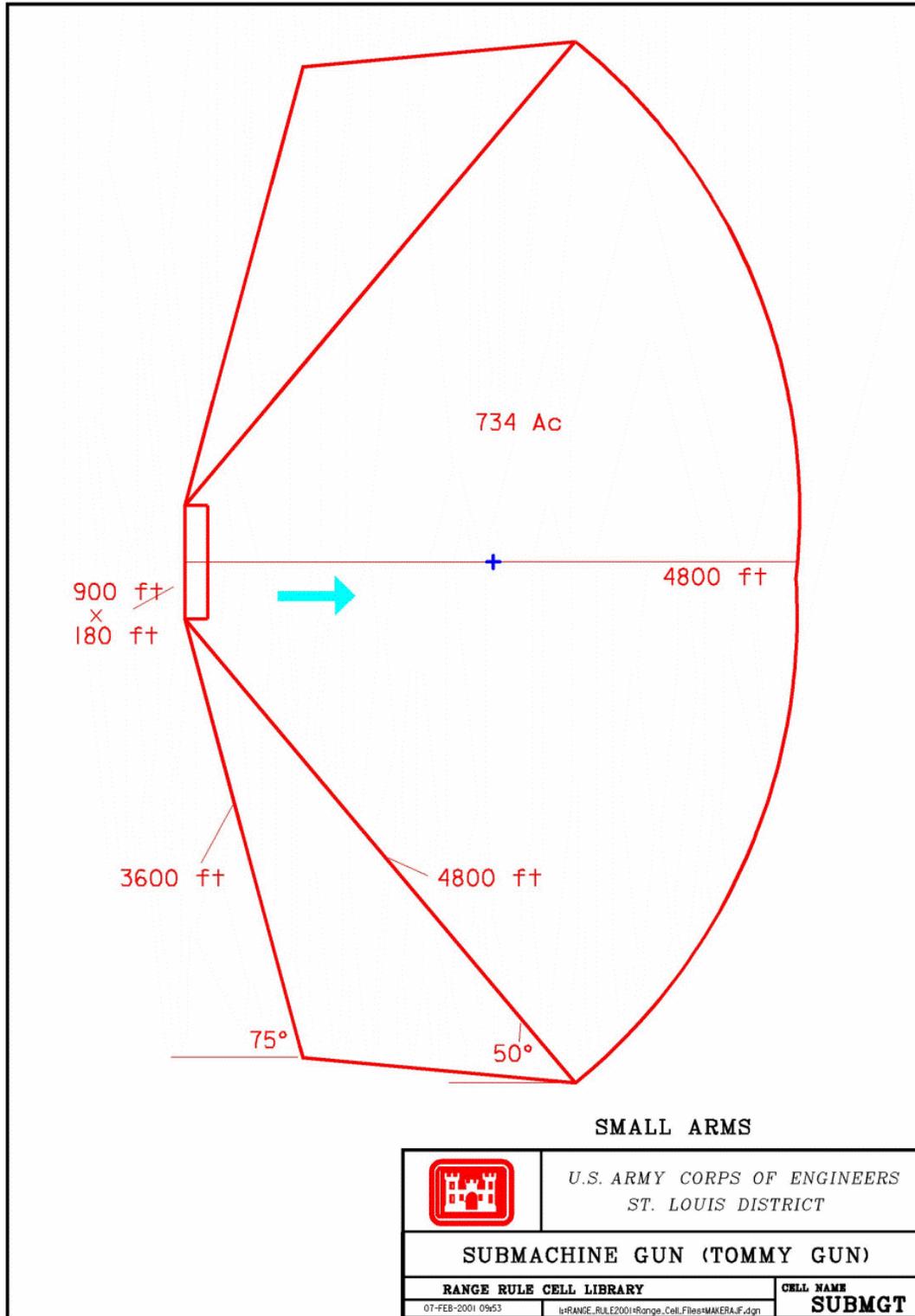
A Sub-machine Gun Range (.45 caliber), which was approximately 300 yards wide by 60 yards long, was laid out with 10 targets per firing position. Six firing points (allocation for one Infantry Div) may be laid out to allow for independent or non-independent operation. The difference between independent and non-independent is the minimum separation between firing positions. Non-independent firing requires a 160-foot separation, whereas independent firing requires a 350-foot separation. Therefore, 6 firing positions would require 800 feet and 1,750 feet of separation, respectively. Because of the lateral distance involved, it is assumed unlikely that a single range accommodated 6 firing positions with independent operations. Therefore, the range is estimated to be no more than 300 yards (900 feet) wide. The danger area consists of a 50° fan, which extends 1,600 yards downrange from each end of the range, and a 25° fan, originating from the same point, which extends 1,200 yards downrange.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
.45 caliber	1,600	802

Data sheet(s):

CTT01      Small arms, General

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951.



## **TRANSITION (AUTOMATIC RIFLE)**

Range Type: Small Arms

Cell Name(s): TRANAR

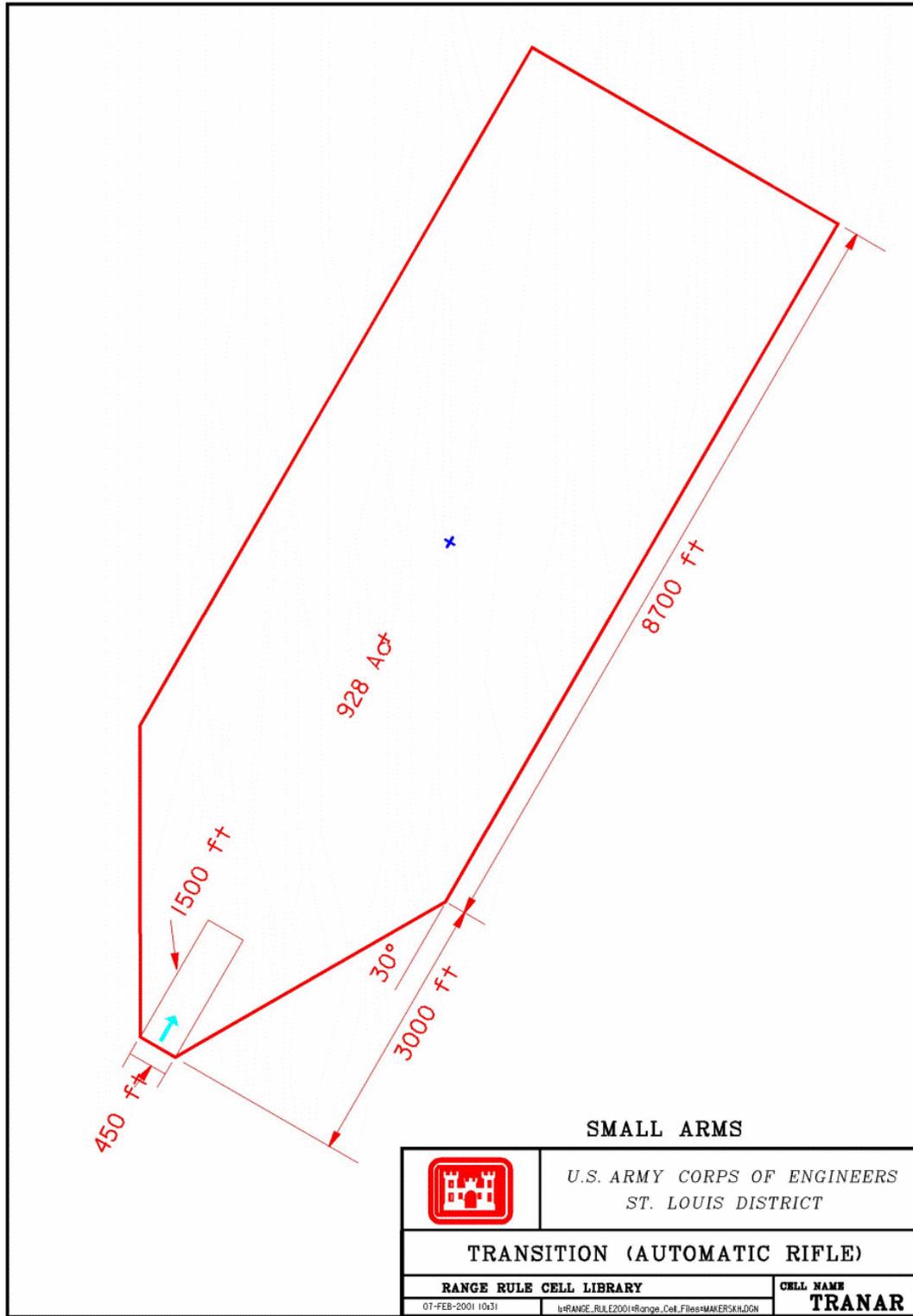
The Automatic Rifle Transition Range is similar to the rifle transition range. This type of range consists of individual firing lanes approximately 150 yards wide by 500 yards long. Each lane uses unique firing positions (fox hole, window, and prone). Each soldier transitions along the firing line engaging targets from each position. Targets were positioned at various distances ranging from 150 to 500 yards. The danger area includes an angle of fire and a prescribed safety fan. A 30° fan originates from each end of the firing line, extends 1,000 yards downrange, at which point it continues an additional 2,900 yards parallel to the direction of fire.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
.30 caliber	3,450	2,700

Data sheet(s):

CTT01      Small arms, General

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951.



**TRANSITION, RIFLE; TRANSITION, RIFLE (WITH LIMIT OF ADVANCE);  
TRANSITION, RIFLE (TYPES I AND II)**

Range Type: Small Arms

Cell Name(s): TRARIF, TRANSR, TRARLA

Note: Although there is a difference of 6-years between the two referenced regulations, each of the four transition rifle ranges described were used during the WWII era.

TRANSITION, RIFLE (TYPES I AND II) – A 1944 range regulation describes transition ranges as Type I and Type II.

- Type I has an undetermined number of firing lanes, which have a single firing point and pop-up targets set at 200, 300, and 500 yards. Each firing lane is approximately 60 yards wide. The regulation states that a number of these firing lanes together constitute a Transition Firing Course Range, Type I.
- Type II has an undetermined number of firing lanes, which have a single firing point and 6 stationary targets placed at random distances ranging from 200 to 500 yards. Each firing lane is approximately 50 yards wide. The regulation states that a number of these firing points together constitute a Transition Firing Course Range, Type II.

An additional area to the front of the firing line included the ready line, ammunition issue point, and administrative area. The estimated width of both ranges is 400 yards. Each would utilize a typical danger area for small arms ammunition. A 30° safety fan originated from the ends of each firing line, extended 1,000 yards down range, at which point the fan continued an additional 2,900 yards parallel to the direction of fire.

TRANSITION, RIFLE (with and without a limit of advance) – A 1951 range regulation describes rifle-type transition ranges with and without a limit of advance.

- Transition, Rifle (w/o a limit of advance) – This type consisted of up to ten firing lanes where each offered a unique firing position (i.e., fox hole, rooftop, logs, window, etc.). Personnel transitioned along the firing line shooting from various positions. Targets were placed at random distances out to 500 yards. Assuming that each lane requires a width of 20 yards, the width of the range may be up to 200 yards. The danger area included an angle of fire and a prescribed safety fan. A 30° fan originated from each end of the firing line, extended 1,000 yards downrange, at which point it continued an additional 2,900 yards parallel with the direction of fire.
- Transition, Rifle (with a limit of advance) – This type of transition range utilized firing lanes in which personnel transitioned down-range while engaging pop-up targets. Each lane was approximately 25 yards wide and 130 yards long. An earthen berm may have been constructed between firing lanes. Targets were

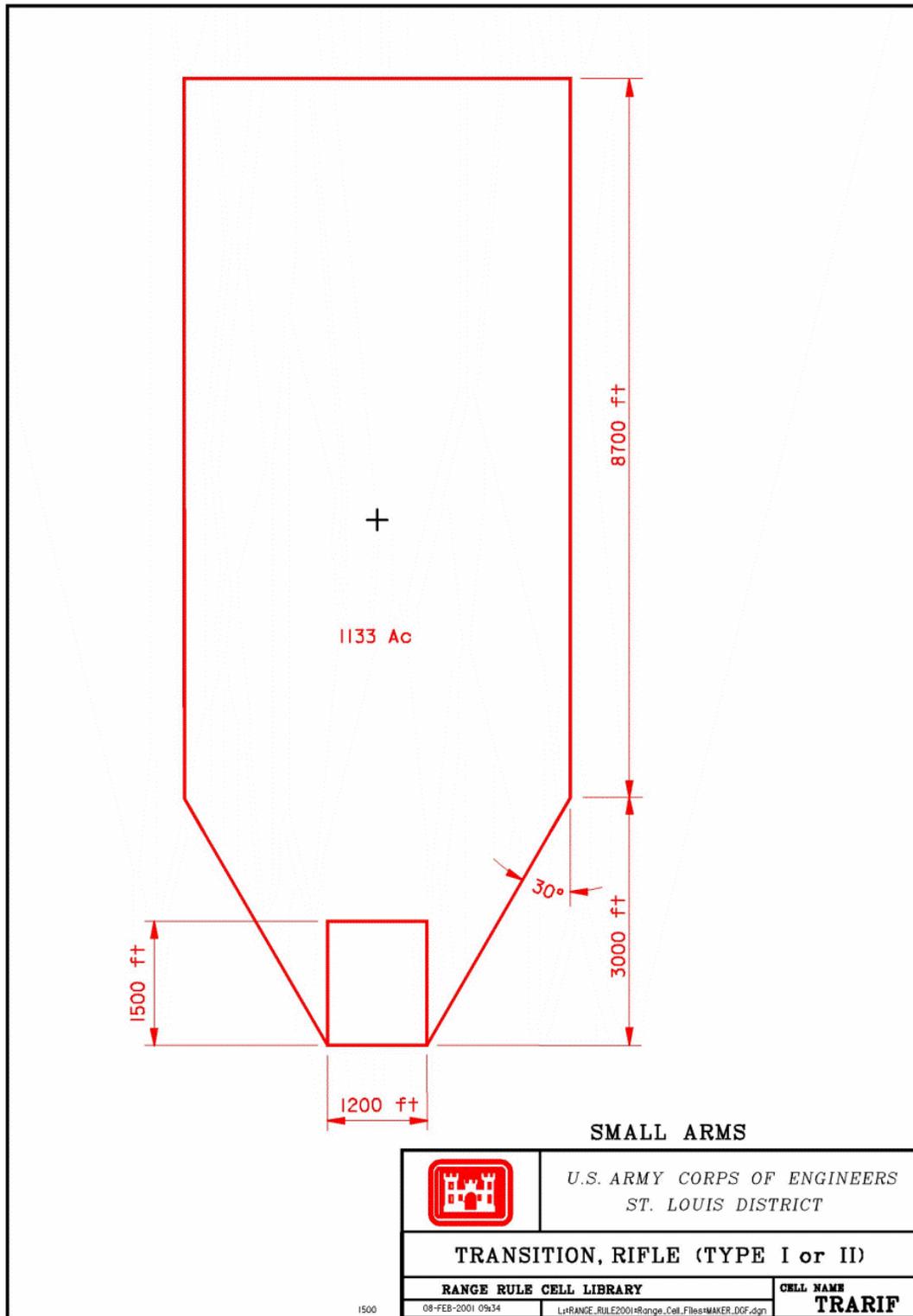
positioned at various locations between 40 and 130 yards down range. A limit of advance would have been established no farther than 90 yards down range. The number of firing lanes was determined by local terrain and safety conditions. A range with 6 firing lanes is estimated to have been 200 yards wide and 130 yards long. The danger area includes an angle of fire and a prescribed safety fan. A 30° fan originated from each end of the firing line, extended 1,000 yards downrange, at which point it continued and additional 2,900 yards parallel to the direction of fire.

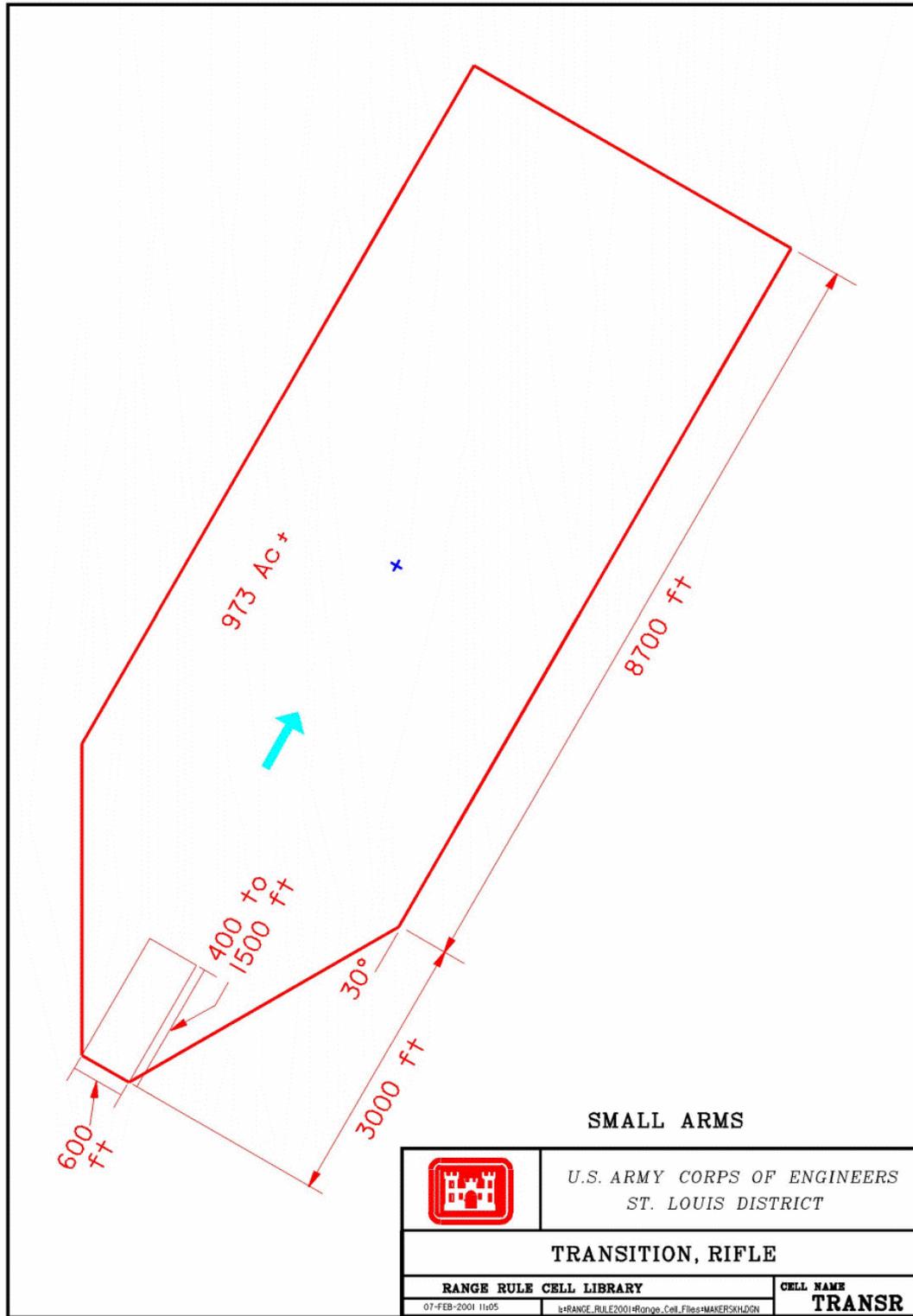
<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
.30 caliber	3,450	2,700

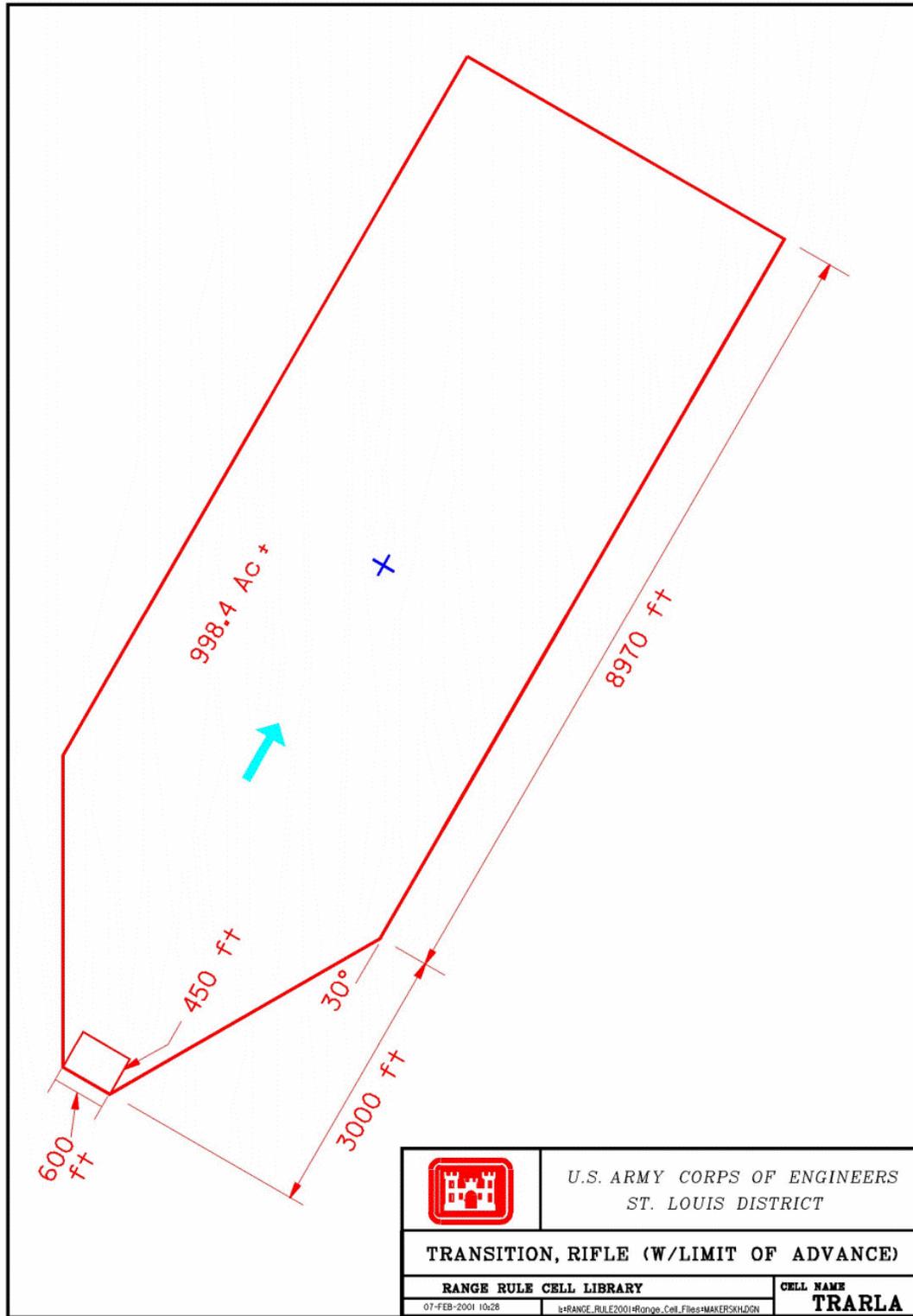
Data sheet(s):

CTT01      Small arms, General

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951.







**HISTORIC USE: TRAINING AREA/MANEUVER AREA**

## CAVE

Range Type: Training Area / Maneuver Area

Cell Name(s): None available

Training areas are established locally to meet specific requirements. They typically utilize available terrain features such as natural caves to simulate mountain type fortifications. No available references describe these areas. A description of this training area would come from historical documents relating to a particular site; and the boundaries delineated on historical maps should be used in lieu of a standard cell.

It is speculated that practice munitions would have been used on an area such as this. All weapons available to the infantry may have been utilized. These would have included: small arms, rockets, mortars, rifle grenades, hand grenades, and flame-throwers.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>
Small Arms, Blanks	N/A
Rocket, 2.36", Practice	700
Rifle Grenade, Practice	< 400
60mm, Training	350
60mm, Practice	1,935
81mm, Training	350
81mm, Practice	3,300
Practice Hand Grenades	N/A
Pyrotechnics	N/A
Flame Thrower	N/A

Data sheet(s):

CTT01	Small arms, General
CTT04	M21, Practice Hand Grenade Mk1A1 Training Hand Grenade
CTT10	M7A1 Practice Rocket, 2.36" M112A2 Practice Rifle Grenade
CTT18	60mm, Training, M69 60mm, Practice, M50A2 81mm, Training, M68 81mm, Practice, M43A1

Pyrotechnic data sheets from this era are not available in the database

Reference(s): No references available

**COMBAT IN CITIES COURSE (aka: Village, Jungle Village, Mock City, MOUT Site)**

Range Type: Training Area / Maneuver Area

Cell Name(s): CCI3W

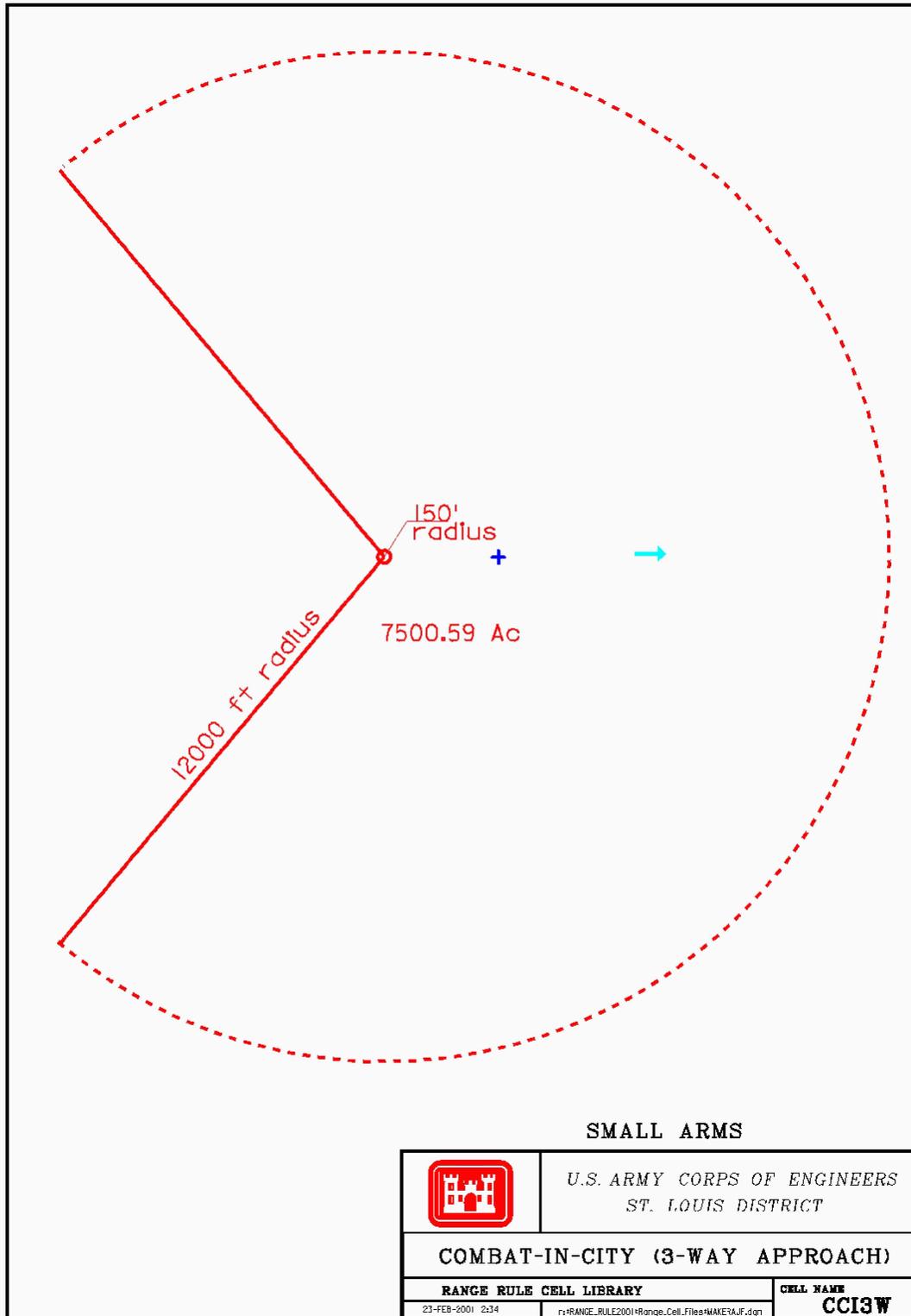
Mock villages may consist of anything from a few grass huts to as much as a small city complete with full size buildings, roads, wells, fountains etc. Facilities were constructed to meet specific training requirements. Regardless of the structures, training was designed for house-to-house fighting. The 3-way approach course permits a 180° field of fire, versus direct fire for the single approach course. Ammunition use was restricted by regulations to M2, cal. .30 or others that do not require a danger area that exceeds 4,000 yards. Training may have included the use of pyrotechnics, booby traps, and land mines.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
.45 caliber	1,600	802
.30 caliber	3,450	2,700
.22 caliber	1,500	1,100
Small arms Blanks		
Pyrotechnics		

Data sheet(s):

CTT01      Small arms, General  
Pyrotechnic data sheets from this era are not available in the database

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951



**COMBAT IN CITIES COURSE (aka: Village, Jungle Village, Mock City, MOUT Site)**

Range Type: Training Area / Maneuver Area

Cell Name(s): CCITY

Mock villages may consist of anything from a few grass huts to as much as a small city complete with full size buildings, roads, wells, fountains etc. Facilities were constructed to meet specific training requirements. Regardless of the structures, training was designed for house-to-house fighting. The 3-way approach course permits a 180° field of fire, versus direct fire for the single approach course. Ammunition use was restricted by regulations to M2, cal. .30 or others that do not require a danger area that exceeds 4,000 yards. Training may have included the use of pyrotechnics, booby traps, and land mines.

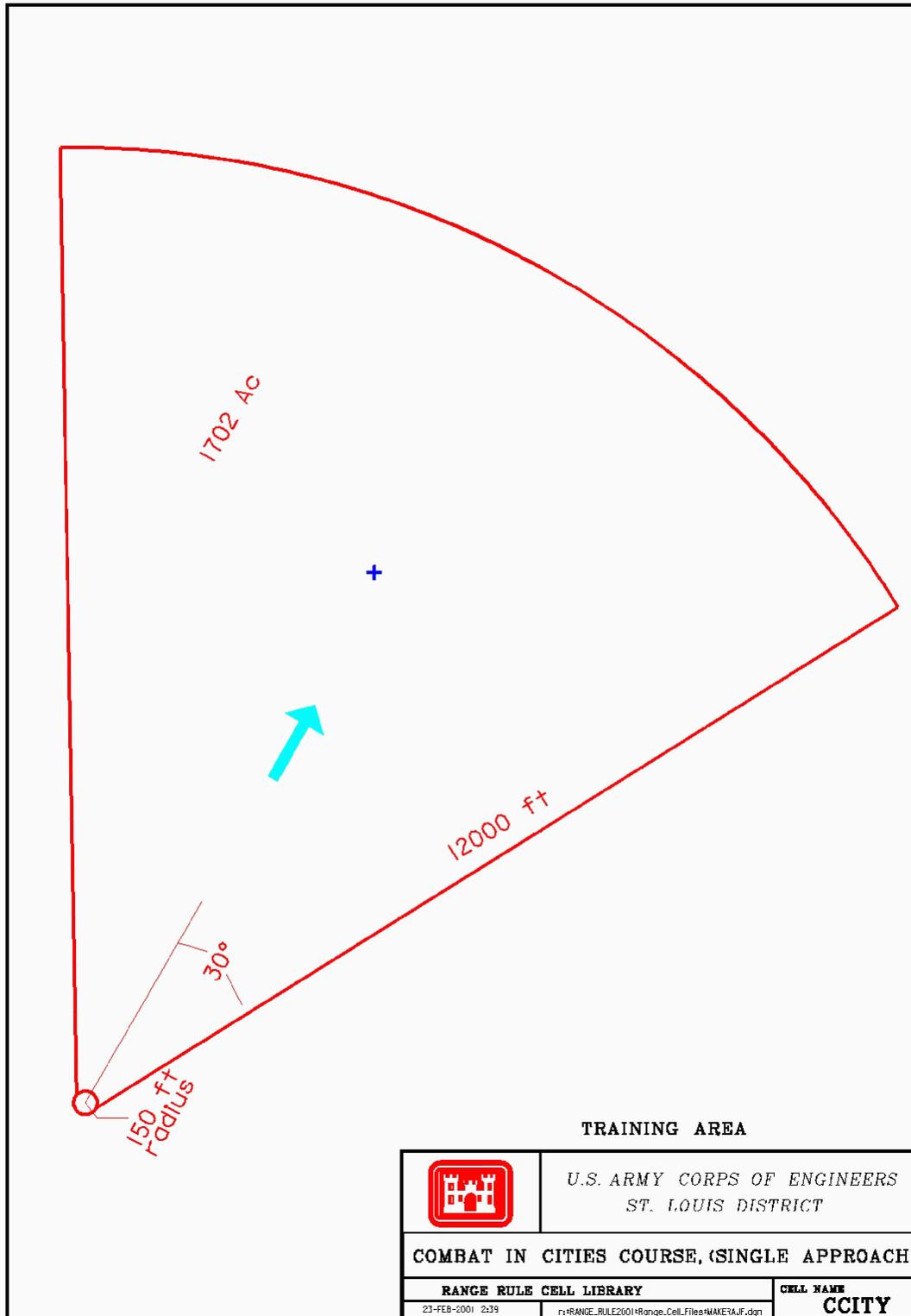
<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
.45 caliber	1,600	802
.30 caliber	3,450	2,700
.22 caliber	1,500	1,100
Small arms Blanks		
Pyrotechnics		

Data sheet(s):

CTT01 Small arms, General

Pyrotechnic data sheets from this era are not available in the database

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace*, May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951



## FLAME THROWER

Range Type: Training Area

Cell Name(s): FLAME

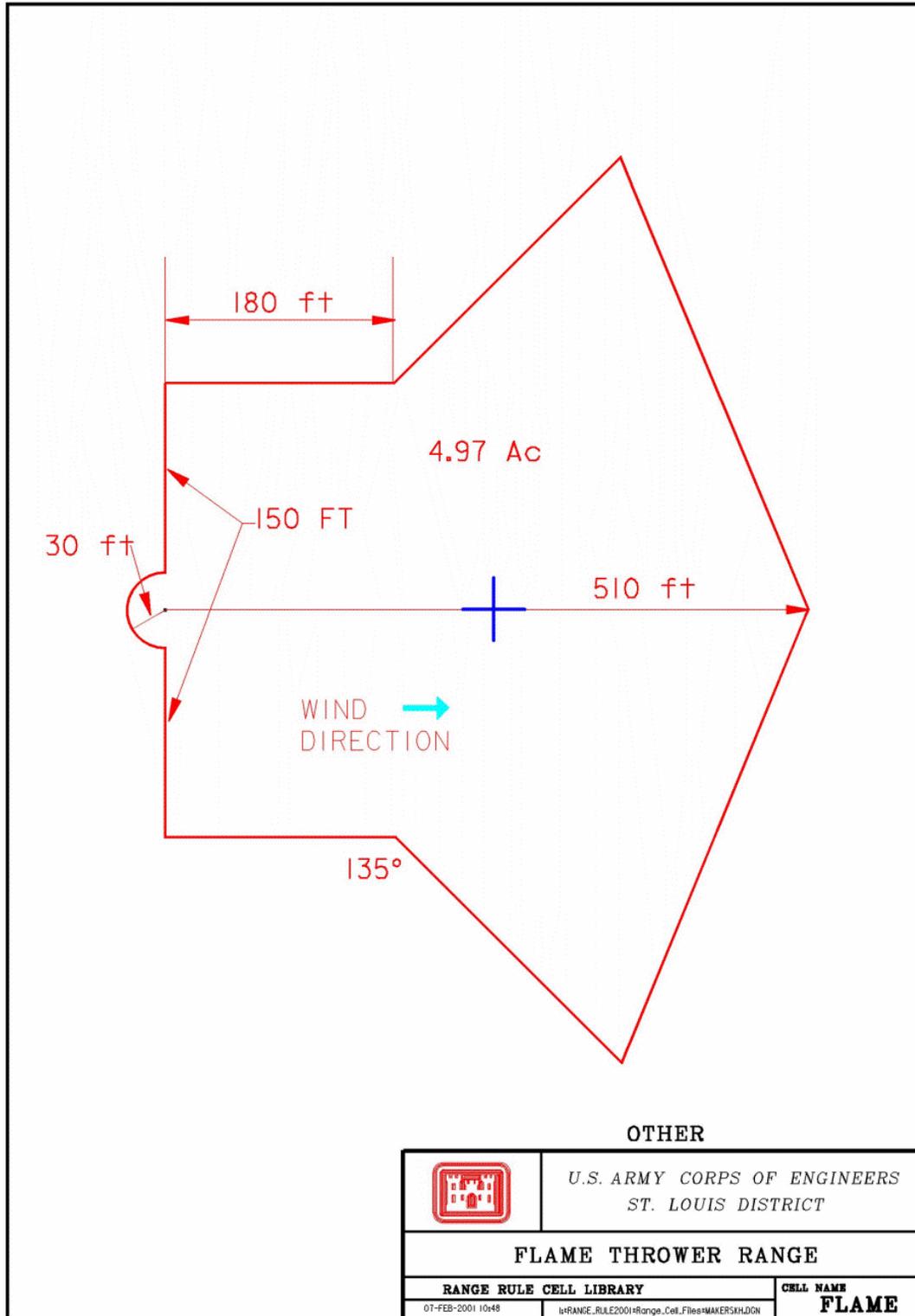
A flame-thrower range is 10 yards wide at the firing line and has a safety fan that extends a distance of 50-yards on each side of the firing line. The danger area begins at each end of the safety fan, extends down range a distance of 60 yards, at which point it continues on a 45° angle from the centerline an additional 50 yards. Typical targets used were concrete structures resembling pillboxes.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>	<u>Muzzle Velocity (fps)</u>
None	N/A	N/A

Data sheet(s):

No data sheets available

Reference(s): *TM 9-855, Targets, Target Material, and Training Course Lay-outs,* August 1944 & November 1951



OTHER

	U.S. ARMY CORPS OF ENGINEERS ST. LOUIS DISTRICT
<b>FLAME THROWER RANGE</b>	
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<b>FLAME</b>	

## **PILL BOX**

Range Type: Training Area / Maneuver Area

Cell Name(s): None available

In general, the training area consists of a single or multiple concrete fortifications, commonly referred to as pillboxes. The area may be a 10-foot by 10-foot concrete box or a large concrete gun emplacement on the side of mountain. No available references describe these areas. A description of this training area would come from historical documents relating to a particular site; and the boundaries delineated on historical maps should be used in lieu of a standard cell.

It is assumed that practice munitions would have been used on an area such as this. All weapons available to the infantry may have been utilized. These include: small arms, rockets, mortars, rifle grenades, hand grenades, and flame-throwers.

<u>Ammunition (probable)</u>	<u>Max Range (yards)</u>
Small Arms, Blanks	N/A
Rocket, 2.36", Practice	700
Rifle Grenade, Practice	< 400
60mm, Training	350
60mm, Practice	1,935
81mm, Training	350
81mm, Practice	3,300
Practice Hand Grenades	N/A
Pyrotechnics	N/A
Flame Thrower	N/A

Data sheet(s):

CTT01	Small arms, General
CTT04	M21, Practice Hand Grenade Mk1A1 Training Hand Grenade
CTT10	M7A1 Practice Rocket, 2.36" M112A2 Practice Rifle Grenade
CTT18	60mm, Training, M69 60mm, Practice, M50A2 81mm, Training, M68 81mm, Practice, M43A1

Pyrotechnic data sheets from this era are not available in the database.

Reference(s): No references available

## TYPES OF TRAINING AREAS

There are six different types of training areas: Institutional Area, Garrison Area, Local Training Area, Major Training Area, Range and Impact Area, and National Training Center.

An **Institutional Area** is usually associated with service schools and training centers. But, the division post also has an institutional setting. For example, schools at division posts conduct Primary Noncommissioned Officer Courses (PNCOC), Basic Noncommissioned Officer Co (BNCOC), Primary Leadership Courses (PLC), and NCO Academies. The skills acquired at institutions focus on individual proficiency. Institutional courses cannot be taught at other training areas because they require educational devices, which can only be used cost effectively in the classroom.

A **Garrison Area** includes such things as barracks, dayrooms, motor pools, battalion classrooms, parade fields, and installation warehouse facilities. Garrison training areas are usually controlled by a company or battalion commander. While in the garrison area, soldiers learn by using Soldier's Manuals, Training Extension Courses (TEC), Army Correspondence Courses (ACCP), field manuals, training circulars, simulation devices, and some actual weapons. Garrison training concentrates on individual proficiency. A garrison area requires small amounts of land.

A **Local Training Area** consists of sites close to the garrison area. Usually, these sites are only large enough to conduct training up to the company level. The local training area is normally controlled by the post or division headquarters. Sometimes, individual training takes place in this area; but more often, it is used for the collective training of crew through company units. In many instances, it is at the local training area where the collective training process begins.

The **Major Training Area** is a large site used to train units above company level. As a minimum, the major training area at the division post should be large enough to let battalions meet their ARTEP requirements. The type of training conducted in this area varies with the unit and the characteristics of the training site. However, it usually consists of live fire exercises, unit maneuvers, simulation engagements, and Army Training and Evaluation Program (ARTEP) tasks without troops. Because of the size of the major training area, units may have to travel many miles from their garrison area.

A **Range and Impact Area** is located at the division post where units can fire their major weapon systems, which include armor, anti-armor, infantry, artillery, air defense, and Army air-delivered weapons. The impact area is that portion of the training area contaminated by duds. Because of this, it cannot be used for maneuver training. Munitions that do not explode (SABOT projectiles and small arms rounds) may be used in maneuver areas as long as troops stay out of the safety fan during firing.

**National Training Center** information can be obtained from the cited reference below.

Reference(s): TC 25-1, *Training Land*, August 1978

