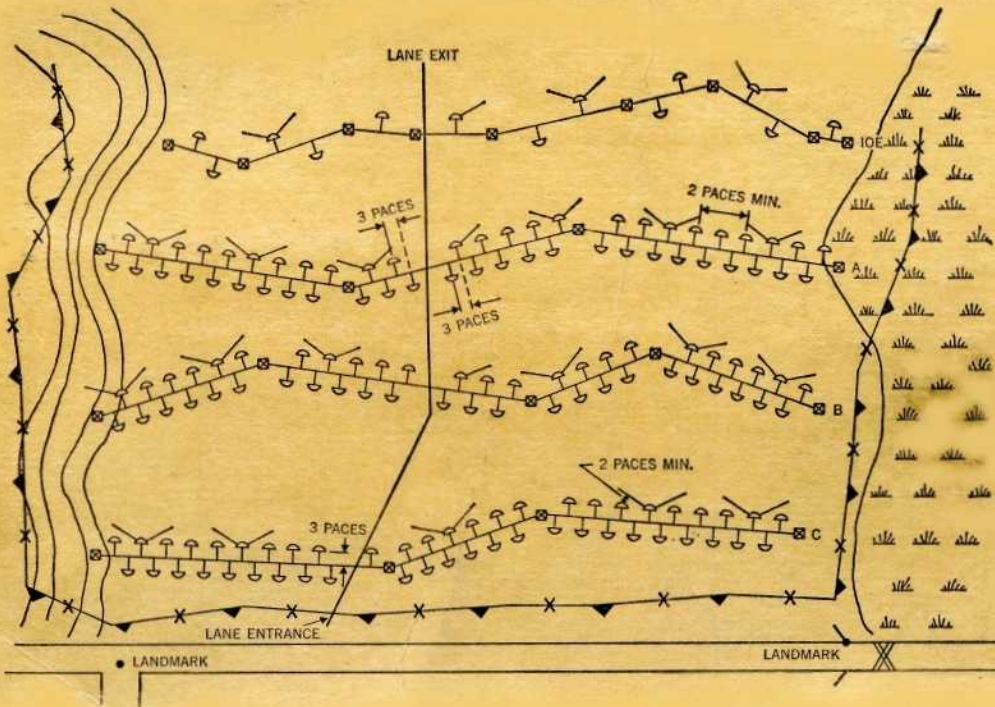


GTA 5-10-10

July 1965 (Supersedes GTA 5-21, 1960)

MINE CARD



LANE EXIT

IOE

3 PACES

2 PACES MIN.

3 PACES

A

B

C

2 PACES MIN.

3 PACES

LANE ENTRANCE

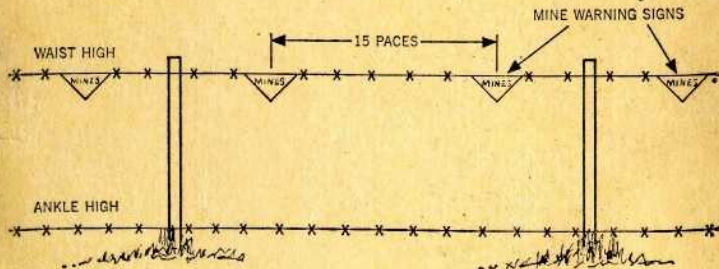
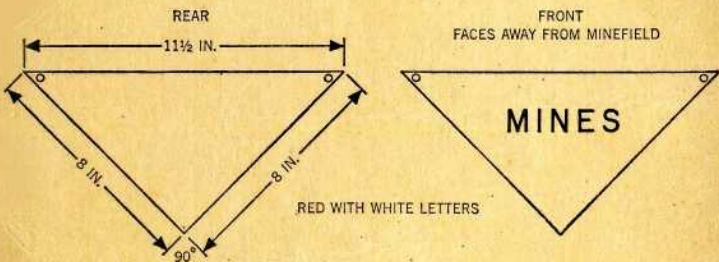
● LANDMARK

LANDMARK

MINELAYING

1. The base mine of a cluster may be either an antitank or a metallic APers mine. Additional mines are APers only. **FIVE MINES PER CLUSTER IS THE MAXIMUM.**
2. Each cluster is laid in a 2-pace semicircle, placed 3 paces from the strip centerline. Strips have a cluster every 3 paces on opposite sides of the centerline.
3. Strips are spaced a minimum of 18 paces from centerline to centerline. No cluster will be placed closer than 3 paces to a turning point and the first cluster after the turning point will be located on the opposite side of the centerline from the last cluster.
4. The IOE has $\frac{1}{3}$ as many clusters as a regular strip.
5. At least two landmarks must be recorded. Both must be indicated on the map and be present at the site of the minefield.
6. If a landmark is over 200 paces from the field, or is not visible from the field, intermediate markers must be used.
7. Strip marker and turning point stakes are driven flush with the ground.

MINEFIELD MARKING



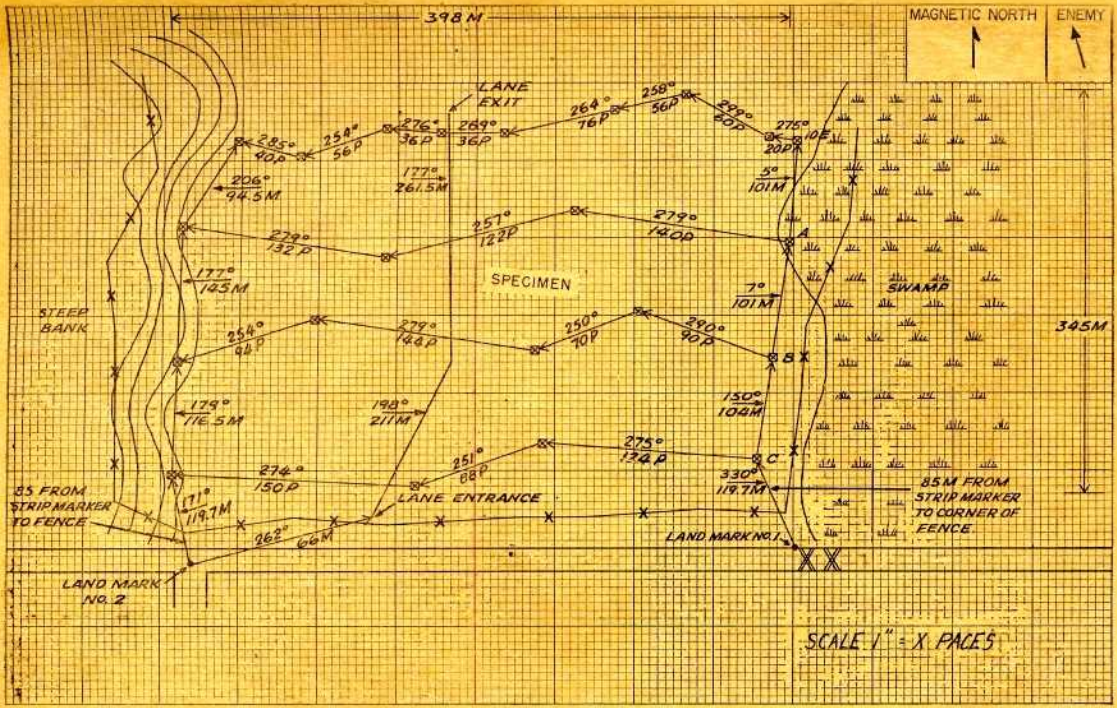
REAR AREA MINEFIELDS ARE INCLOSED BY A TWO-STRAND FENCE WITH AN IRREGULAR TRACE. THE FRONT PORTION OF THE FENCE IS NORMALLY OMITTED ON FORWARD AREA FIELDS. MINE SIGNS ARE PLACED EVERY 15 PACES ON THE TOP WIRE WITH THE WORD "MINES" FACING TOWARD OUTSIDE OF FIELD. THE FENCE SHOULD NEVER COME ANY CLOSER THAN 20 PACES TO ANY MINE OR TRIP WIRE.

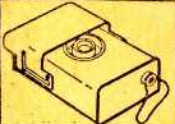
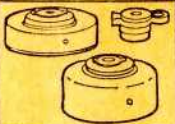
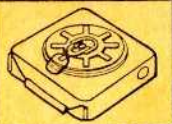

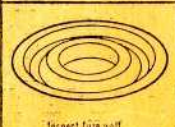



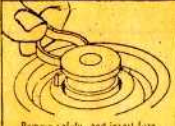


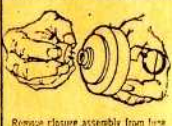
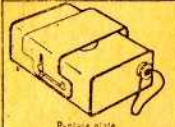
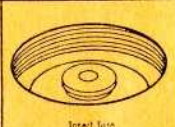
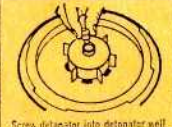




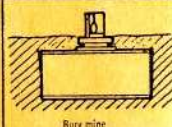
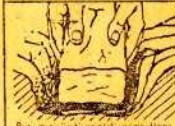

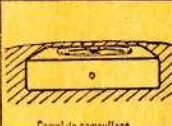

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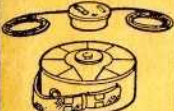








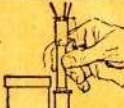
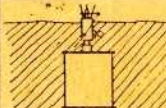
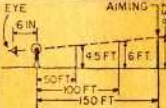


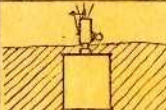
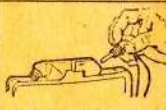
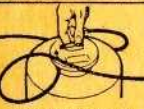
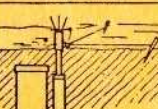
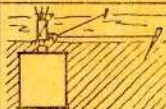
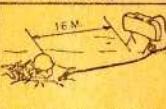


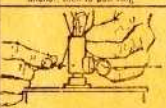

MINEFIELD RECORD FM 30-33		LAYING UNIT CoB 20TH ENGR. COMBAT BN	OFFICER IN CHARGE (Name, grade and service number) LOUIS P. SHUBA 1STLT	COMPLETION TIME 041800 DATE JUN 65	SHEET NO MINEFIELD NUMBER 20 C 69
LANDMARKS			INTERMEDIATE MARKERS		
NUMBER	COORDINATES	DESCRIPTION	NUMBER	DESCRIPTION	
1	PY 833 057	N. CORNER BRIDGE ABUTMENT	1	X	
2	PY 826 058	R/U	2		
3			3		
4			4		
DESIGN OF OR SQUARE PENCIL STANDARD			MAY SHEET (Name) INGOLSTADT		
SCALE OF THIS P 3			SHEET NUMBER 7234		
LENGTH OF THIS P 2" X 2" WOODEN STAKES DRIVEN FLUSH			SCALE 1:50,000		
GENERAL ORIENTATION			RECORDER M/SGT WILLIAM W. MUSTER		
LINES			NOTES		
NUMBER	W DTH	HOW MARKED	NUMBER	TYPE	TYPE
1	8 M	FIELD WIRE DOWN C/L			
2					
3					
ANTI-TANK MINES			ANTI-PERSONNEL MINES		
TYPE	TYPE	TYPE	TYPE	TYPE	TYPE
M15	M19		M16	M14	
NUMBER	NUMBER	NUMBER	NUMBER	NUMBER	NUMBER
252	130	382	23	773	755
TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL
382	130	382	23	773	755
BOOBY TRAPPED	BOOBY TRAPPED	BOOBY TRAPPED	BOOBY TRAPPED	BOOBY TRAPPED	BOOBY TRAPPED
0	0	0	0	0	0
STRIP	SECTION/DISTANCE (PACES) FROM STRIP STAKE TO CLUSTER				
A	1/16 1/99 2/18 2/45 2/102 3/27 3/48 3/120				
B	1/12 1/60 1/71 2/3 2/39 2/60 3/114 4/57 4/114				
C	1/3 1/39 2/60 2/72 3/6 3/69				
FIRING DEVICES: M5 USED IN BOTTOM ACTIVATING WELLS. SIDE WELLS NOT B/T.					
SIGNATURE AND GRADE Louis P. Shuba 1STLT.					




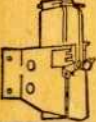



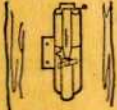


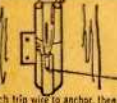





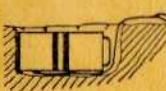


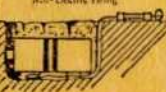

* GPO : 1966 O - 340-407

398 M



M7A2 METALLIC LIGHT ANTITANK AND ANTIVEHICULAR MINE	M6A2 MEDIUM AND M15 HEAVY METALLIC ANTITANK MINES	M19 PLASTIC HEAVY ANTITANK MINE	M21 METALLIC (KILLER) ANTITANK MINE
			
<p>Wt.....4.9 lb. Expl.....3.5 lb. Fuze.....M603 Act Wells.....1 Functioning.....140 to 240 lb. press</p>	<p>M15 M6A2 Wt.....30 lb. 20 lb. Expl.....22 lb. 12 lb. Fuze.....M603 M602 Act Wells.....2 2 Functioning.....300 to 400 300 to 400 lb. press lb. press</p>	<p>Wt.....28 lb. Expl.....21 lb. Fuze.....M606 Act Wells.....2 Functioning.....350 to 500 lb. press</p>	<p>Wt.....18 lb. Expl.....10.5 lb. Fuze.....M607 Act Wells.....None Functioning.....290 lb. press, on fuze or 20' deflection of tilt rod blows concave steel plate into target</p>
 <p>Inspect fuze well</p>	 <p>Remove plug and inspect fuze well</p>	 <p>Remove pressure plate</p>	 <p>Remove closing plug. Insert M-120 booster in bottom. Replace closing plug</p>
 <p>Remove safety and insert fuze</p>	 <p>Inspect fuze and remove safety</p>	 <p>Remove shipping plug. Inspect position of striker (offset). Remove safety fork and turn dial to ARMED. Check position of striker (center). Turn to SAFE and replace safety fork</p>	 <p>Remove closure assembly from mine</p>
 <p>Replace plate</p>	 <p>Insert fuze</p>	 <p>Screw deflator into deflator well</p>	 <p>Remove shipping plug from mine. Screw in fuze</p>
 <p>Sandbag cover</p>	 <p>Replace plug in safe position</p>	 <p>Place mine in hole. Remove safety fork and turn dial to ARMED</p>	 <p>Bury mine</p>
 <p>Bury mine and complete camouflage</p>	 <p>Turn dial to ARMED</p>	 <p>Complete camouflage</p>	 <p>Remove safety (pull ring assembly) and complete camouflage</p>
<p>Burial: Pressure plate at ground level or slightly above To Disarm: Reverse arming procedure. Note: Sandbag prevents earth, gravel, etc., from getting under pressure plate and causing inaction.</p>	<p>Burial: Pressure plate at ground level or slightly above To Disarm: Reverse arming procedure. Note: Additional 8 lb. expl. charge buried with the M6A2 to improvise a heavy antitank mine.</p>	<p>Burial: Pressure plate at ground level or slightly above To Disarm: Reverse arming procedure</p>	<p>Burial:—Pressure: fuze cap flush with ground surface Tilt Rod: Seat mine firmly in snug-fitting hole. Most effective in brush, weeds, etc. To Disarm: Reverse arming procedure</p>

M612 FUZE USED WITH M21 ANTITANK MINE	M2 SERIES BOUNDING ANTIPERSONNEL MINE	M16 SERIES BOUNDING ANTIPERSONNEL MINE	M18A1 FRAGMENTATION ANTIPERSONNEL MINE
			
<p>Has two 9-ft. pneumatic leads, safety latch, and arming lever</p>	<p>Wt.....5.3 lb. Projectile.....Steel Fuze.....MG05 combination Function: Pressure.....8 to 20 lb. Pull.....3 to 10 lb.</p>	<p>Wt.....8.25 lb. Projectile.....Steel Fuze.....MG05 combination Function: Pressure.....8 to 20 lb. Pull.....3 to 8 lb.</p>	<p>Wt.....3.5 lb. Expl.....1.5 lb. c-4 Missiles.....700 steel balls. Equipment, 1 electric cap with 100 ft. leg wires per mine, 1 circuit tester per 6 mines 1 electric firing device per mine Mine is control fired</p>
 <p>Remove closure plug and insert 120 booster</p>	 <p>Remove shipping cap</p>	 <p>Remove shipping plug and install fuze</p>	 <p>Test Circuit: Male firing device, circuit breaker, and blasting cap. Depress handspark should show in window. Separate test components</p>
 <p>Remove shipping plug from mine. Screw in fuze</p>	 <p>Screw in fuze</p>	 <p>Pressure installation</p>	 <p>EYE AIMING 6 IN 45 FT 6 FT 50 FT 100 FT 150 FT Position and aim mine</p>
 <p>Bury mine. Cross and extend hoses</p>	 <p>Pressure installation</p>	 <p>Trip wire installation</p>	 <p>Remove shipping plug—priming adaptor and secure cap</p>
 <p>Lift safety latch and turn arming lever to ARMED. Recross hoses</p>	 <p>Trip wire (and pressure) installation</p>	 <p>Attach trip wires—first to anchor, then to pull ring</p>	 <p>16 M Use all firing wire and connect directly to "saled" firing device</p>
 <p>Complete camouflage</p>	 <p>Positive Safety Pin Remove locking safety first, then positive safety</p>	 <p>Remove locking safety first, then positive safety</p>	 <p>Direction of aim 60° Dangerous out to 250 meters 50 M 100 M Mine</p>
<p>Timer provides a 30 ± 5 minute safe separation period. Both leads must be depressed for initiation. To Disarm: Reverse arming procedure</p>	<p>Shell is propelled to height of 6 to 8 ft. and detonated. Mine has 10-yd. casualty radius. To Disarm: Reverse arming procedure</p>	<p>Mine bounds into air and explodes at height of 2.4 ft. Has 35 ft. casualty radius. To Disarm: Reverse arming procedure</p>	<p>Firing Position: Min. of 16M to rear in fox hole. Friendly troops at side and rear should be under cover at min. of 100 M To Fire: Offset safety tail and depress handle To Disarm: Reverse arming procedure</p>

M14 BLAST ANTIPERSONNEL MINE	M25 BLAST ANTIPERSONNEL MINE (ELSIE)	M23 AND M1, 1-GALLON CHEMICAL LANDMINES	M49A1 TRIP FLARE
			
<p>Wt. 3 1/2 oz. Exp. 1 oz. TETRYL Fuz. Integral, with Belleville Spring Functioning. 20 to 25 lb.</p>	<p>Wt. 3 1/2 oz. Exp. 1/2 oz. shaped charge Fuz. Integral, with ball release Functioning 17 to 22 lb. press</p>	<p>When armed for pressure detonation, employ in same manner as the M15 antitank mine</p>	<p>Has 55 to 70 sec surface burning period and an illumination radius of approxi- mately 330 yds. Initiates by taut or loose trip wire</p>
 <p>Unscrew shipping plug from bottom of mine. Turn pressure plate to ARMED position with arming tool</p>	 <p>Push mine into ground. If ground is hard, dig hole with bayonet</p>		 <p>Attach flare</p>
 <p>Remove safety clip & check for malfunctioning</p>	 <p>Remove dust cap</p>	<p>Wt. 11 lb. loaded, has an 8-ft. length of detonating cord for burster charge. May be armed for electric or trip wire actuation</p>	 <p>Attach trip wire to anchor, then to trig- ger. Pull trigger to vertical position and secure</p>
 <p>Replace safety</p>	 <p>Insert charge</p>	<p>Electric Firing</p>  <p>Attach burster charge - 8 ft. length of detonating cord - to side of mine</p>	 <p>To Arm; remove safety pin</p>
 <p>Screw detonator into detonator well</p>	 <p>Remove safety clip</p>	 <p>Bury mine 4 in. and attach detonating rod to controlled firing system</p>	 <p>To Disarm; Insert safety clip</p>
 <p>Bury mine & remove safety clip</p>	<p>The M25 will penetrate a soldier's leg, and foot or puncture a 12-ply tire and tube</p>	<p>Non-Electric Firing</p>  <p>Bury mine as above and attach non- electric detonator to burster</p>	 <p>Check both ends, then cut taut trip wire</p>
<p>Neutral: Pressure plate slightly above ground level. To Disarm: Insert safety clip and re- move detonator. Caution: Do not turn pressure plate back to safe position as it creates SAFETY HOLE!</p>	 <p>To Disarm: Replace safety clip and lift charge container from mine</p>	<p>Warning: SOLDIERS PREPARING, LAYING, and REMOVING CHEMICAL LAND MINES, MUST WEAR PROTECTIVE MASK and PROTECTIVE CLOTHING</p>	<p>Caution: NEVER LOOK DIRECTLY AT BURNING FLARE Note: for loose wire operation Attach wire to eye of Safety Pin</p>

1. Prepare table shown for calculations.

2. To design a minefield and calculate the number of mines, three essentials must be established: average trace, desired density, and an assumed cluster composition for the IOE.

3. To find minefield trace:

- a. Divide average trace in yards or meters by .80 or .75, respectively, to get paces of trace.

Example: $1000 \text{ yd} \div .80 = 1250 \text{ paces}$

$1000 \text{ meters} \div .75 = 1334 \text{ paces}$

4. Problem: Trace, 295 meters; desired density, 1-2-2; assumed IOE cluster composition, 1-2-2.

a. Mines required.

$295 \div .75 = 394 \text{ paces}$

Multiply number of paces by desired density:

$394 \times 1 = 394 \text{ A/T mines}$

$394 \times 2 = 788 \text{ APers frag}$

$394 \times 2 = 788 \text{ APers blast}$

- b. IOE requirements. The IOE contains $\frac{1}{3}$ the clusters calculated for a regular strip. Clusters are placed every 3 paces. To find the number of clusters on any strip divide by 3 and take $\frac{1}{3}$ of the result. This is the number of clusters in IOE. For simplicity: $\frac{1}{3} \times \frac{1}{3} = \frac{1}{9}$; then divide trace by 9.

Problem: $394 \div 9 = 44 \text{ clusters for IOE}$

Multiply clusters by assumed cluster composition:

$44 \times 1 = 44 \text{ A/T mines}$

$44 \times 2 = 88 \text{ APers frag}$

$44 \times 2 = 88 \text{ APers blast}$

Add mines for field to mines for IOE to get sub-totals.

Due to damaged items and irregularities in terrain and in pacing, add 10% to sub-totals for grand total. If A/T mines are to be troby trapped, take necessary percentage of A/T grand total.

5. Minimum strips needed.

- a. Apply two rules and use the largest number.

(1) Add total desired density (A/T and APers mines) and multiply by $\frac{1}{3}$ (3 strips needed to get a density of one, 5 is the maximum number of mines per cluster).

(2) Multiply desired A/T density by 3 (3 strips needed to get a density of 1 mine)

- b. Example: Desired density 2-4-8: $14 \times \frac{1}{3} = 9 \text{ strips}$

Desired density 2-4-8: $2 \times 3 = 6 \text{ strips}$

Use larger number: Use 9 strips.

Problem: Desired density 1-2-2: $5 \times \frac{1}{3} = 3 \text{ strips}$

Desired density 1-2-2: $1 \times 3 = 3 \text{ strips}$

Results are identical: Use 3 strips

6. Cluster composition of strips. Clusters on any one strip should be of the same composition; not to exceed 5 mines each. Cluster composition in additional strips may vary. A/T mines can be used only as base mines in clusters. APers mines, when used as base mines, must be metallic for ease of detection. To find totals always multiply desired density by constant 3 (3 strips needed for a density of 1).

Problem: $3 \times 1-2-2 = 3-6-6 \text{ (Totals)}$

Distribute the totals down through the calculated three strips (A,B,C) never exceeding one A/T mine per strip or a total of 5 mines per cluster. The results are the cluster composition on any one strip. Clusters laid in the IOE may vary in cluster composition.

MINE REQUIREMENTS TABLE

TYPES OF MINES	A/T	A/P FRAGMENTATION	A/P BLAST
DENSITY	1	2	2
MAIN FIELD	394	788	788
IOE	$\frac{1}{3}$ 44	$\frac{2}{3}$ 88	$\frac{2}{3}$ 88
SUBTOTALS	438	876	876
10% ADDED	44	88	88
GRAND TOTAL	482	964	964

CLUSTER COMPOSITION

DENSITY		1	2	2
CONSTANT		3	3	3
TOTALS		3	6	6
STRIPS	A	1	2	2
	B	1	3	1
	C	1	1	3
	D			
	E			