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**Report date:** 18 May 1944

**Title:** Combined Infantry Tank Engineer Operations in the jungle, 18 May 1944

**Abstract:** Three enclosures: 1. Combined Infantry-Tank-Engineer operations in the jungle; 2. Training memorandum no. 1, HQ XIV Corps; 3. Tank-Infantry communications recommended by Armored Board, Fort Knox, Ky.

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D 793.52 Combined Inf Tk-Engr Opns in  
U 314 Jungle  
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AUTHORITY: COMGENPOA

INITIALS *on* AG

DATE, MAR 13 1945



HEADQUARTERS UNITED STATES ARMY FORCES, PACIFIC OCEAN AREAS  
OFFICE OF THE COMMANDING GENERAL

In reply refer to:

<sup>APD 958</sup>  
~~UNCLASSIFIED~~

Ser: 00158  
POCCT 052.9/75f

12 March 1945.

SUBJECT: Operation report - XXIV Corps, Leyte, 20 October 1944 - 25 December 1944.

TO : Commandant, Marine Corps School, c/o Navy Department, Washington, D.C.;  
Commanding General, Third Amphibious Corps, c/o Fleet Marine Force, c/o Fleet Post Office, San Francisco, California;  
Commandant, Army and Navy Staff College, New War Department Building, (21st and Virginia Ave.), Washington, D.C.;  
Commandant, The Infantry School, Fort Benning, Ga. ←  
Commandant, Navy War College, Newport, R.I.

The attached copy of report, subject as above, is forwarded for your information and file.

FOR THE COMMANDING GENERAL:

*L. Duennweg*

L. DUENNWEG,  
Lt. Col., AGT.

Assistant Adjutant General.

1 Incl.  
Subj report  
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HEADQUARTERS, ARMY GROUND FORCES  
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INITIALS: [REDACTED]  
1944

319.1/108 (Foreign Observer)(S)(18 May 44)GNGBI

18 May 1944.

SUBJECT: Combined Infantry-Tank-Engineer Operations in the Jungle.

TO: Commanding Generals,  
Second and Fourth Armies,  
All Corps,  
Airborne Center,  
Antiaircraft Command,  
AGF Replacement Depots No. 1 and No. 2,  
Replacement and School Command,  
All Divisions.

1. The attached report is from the Commanding General, XIV Corps with Inclosure No. 3 from the Armored Board, Fort Knox, Kentucky.

2. Attention is invited to the fact that the Jap has offered no effective antitank gun defense. The formations shown may be extremely vulnerable to antitank mines and guns.

3. The data and recommendations contained in this report are being studied with a view to the publication of appropriate changes to FM 17-6.

By command of LT. GEN. McNAIR:

*Charles D. Borden*  
CHARLES D. BORDMAN,  
Major, A.G.D.,  
Ass't Ground Adjutant General.

3 Incls:

- Incl No. 1 - Combined Infantry-Tank-Engineer Operations in the Jungle.
- Incl No. 2 - Training Memorandum No. 1, Hq XIV Corps.
- Incl No. 3 - Tank-Infantry Communications Recommended by Armored Board, Fort Knox, Ky.

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HEADQUARTERS XIV CORPS  
APO 453

AG 370.2 T (4-4-44)

4 April 1944.

SUBJECT: Combined Infantry-Tank-Engineer Operations in the Jungle.

TO : Commanding General, Army Ground Forces.

1. A special course of training in infantry-tank-engineer tactics, in accordance with Training Memorandum No. 1, Hq XIV Corps, dated 20 January 1944, (copy attached), was conducted by units of this corps. The tactics developed in this special training were used later in decisively defeating recent enemy attacks in force against defensive positions.

2. Most of the basic principles as outlined in our Training Memorandum No. 1 were found to be generally sound. The following comments and recommendations are based on specific phases of this type of operation:

a. Training technique: A thorough reconnaissance of all training areas to be used should be made by both tank and infantry officers prior to any field work. Areas selected should conform to the particular phase of training being emphasized. Pre-planning to include specific phases must be participated in by all elements of the team. The training program should begin with blackboard and classroom discussions of technique, formations and mutual coordination. Large sand-tables showing actual terrain to be operated over are excellent for demonstrating team formations. Extended order drill in open terrain is a very important preliminary step in familiarizing both infantry and tank personnel with actual formations to be used. Tactical problems in the jungle should be undertaken next, beginning first with the smallest infantry-tank unit and progressing to company and battalion attack problems. Extensive use should be made of blank and live ammunition, dummy pillboxes, explosive charges and any expedient which will render the training similar to battle conditions. At times special observers should watch the attack from the front in order to spot weaknesses in technique and later correct them.

b. Formations.

(1) The basic unit is the infantry-tank-engineer team. It comprises one platoon of tanks and one platoon of infantry with engineer specialists attached. This team is organized into three echelons (see sketch No. 1): first, an assault wave of three medium tanks; next, a support echelon of two light tanks each followed closely by an infantry squad with attached engineers; and last, the platoon reserve which contains one reserve tank and the remaining foot troops.

(2) With this team as a unit, suitable company and battalion formations may be built up. The combination may be varied in accordance with the situation. To exploit the full fire power of the tanks, to maintain direction, and to prevent tanks from endangering each other by their own fire, most of the teams should advance in line. Suitable company formations are shown in

Incl No. 1  
(18 May 44)

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sketches Nos. 2 and 3. Since combined operations of infantry and tanks are inherently complicated, every effort must be made to keep formations as simple as possible.

(3) The normal use of infantry-tank-engineers teams against definitely located areas of resistance contemplates the forcing of salients by a specific thrust and usually results in exposing the flanks of the rear. Provisions to protect these flanks with both tanks and infantry must be a prime consideration of any attack plan. Initial formations for this protection are the most desirable. See sketches Nos. 4 and 5.

c. Communication.

The following channels of communication were tested and found reliable:

⑤ (1) Infantry company commander to infantry platoon leaders - sound powered telephone or runner.

⑤ (2) Infantry company commanders to tank officers - SCR 510 to SCR 508 in tanks.

⑥ (3) Infantry platoon leader to infantry squad leader - SCR 536. The assistant squad leader carries the radio and passes orders to the squad leader, who is thus free to direct operations of the tank and infantry under his immediate control. Runners are used if radio communication fails.

(4) Infantry squad leader to tank commander.

⑦ Since the infantry squad leader furnishes information which directs the fire and movement of his support tank, communications must be continuous and reliable between the two. Many means of communication were tried, but the only one which worked under fire was the EE8A telephone. The telephone must not be strapped to the rear of the tank for enemy fire will destroy it. Since the telephone is too bulky to be carried by a man in action it must be adapted for infantry-tank communication as shown in annotated sketch No. 6. When modified in this manner, the telephone is less subject to failure. It was found that the squad leader is far too busy to operate the telephone, and also that he, being an infantryman, has difficulty in making himself understood in proper terms to the tank commander; hence, a special telephone orderly from the tank unit, armed only with the pistol, should be used to assist the squad leader.

(5) Infantry platoon leader to tank platoon leader:

⑨ No satisfactory means of communication has been developed. The EE8A telephone combination is best. However, since the Tank platoon leader rides the center tank of the assault wave, the wire cable between the tank and the infantry platoon leader becomes excessively long and often snarled and broken. An alternate means of communication may be had via a sound powered telephone to the infantry company CP and then by SCR 510 to the tank officer.

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(6) Engineer Officers.

10 The engineer officer is equipped with a SCR 593 (Receiver) to keep himself abreast of the situation. He communicates with the company CP by runner.

d. Target designation.

Tanks proved to be almost blind in thick jungle. Obstacles to be avoided and targets to be fired on must be designated to the tank commander by the infantry squad leader. Since enemy pillboxes are extremely well hidden, prime consideration must be given to target designation. Tracer fire proved unsatisfactory for designating targets to the tanks. The only method which succeeded was the use of grenades giving red or violet smoke. The full charge grenade produces too much smoke and obscures the target. However, if the fuze is unscrewed from the grenade and half the charge removed, an adequate amount of smoke will be produced. Rifle projection of the grenade is desirable for longer ranges.

e. Reconnaissance of terrain - An early and thorough reconnaissance by infantry, artillery, tank, engineer and communications officers is essential. Initial reconnaissance must ascertain that the terrain is suitable for the employment of tanks and that the enemy is definitely fixed. Further detailed reconnaissance must be done in order that all commanders may formulate a mutual plan of action.

11 f. Advance preparations.

(1) Routes of approach - If suitable routes of approach for tanks do not exist, they must be prepared by the engineers.

(2) Reduction of obstacles.

(a) Natural obstacles - The jungle contains many natural obstacles for tanks such as swamps, dense forest and undergrowth, precipitous slopes, coral or volcanic ridges, and numerous streams. Engineer troops assist tanks by clearing trails and improvising bridges and suitable crossings in swampy terrain. While medium tanks can operate through very thick undergrowth and small trees and matted vines will not stop them, they must detour large trees, stumps and fallen logs over two feet high.

(b) Minefields - It can be expected that our increased use of tanks will lead the enemy to employ minefields and anti-tank guns to cover likely avenues of approach to their positions. Preliminary reconnaissance must be made carefully to avoid use of tanks over such mined areas. Should it be necessary to make an attack over a mined area, the mines must first be removed or destroyed by use of mine detection apparatus and bangalore torpedoes under cover of darkness or smoke and heavy protective fires.

(3) Tank park - A tank park must be established near the main supply route. This park should be protected from hostile artillery or mortar fire, if possible, and must be secure from enemy raiding parties. Dumps of

fuel and ammunition should be established in the park and repair facilities instituted for the maintenance of tanks and ordnance. (See sketch No. 7).

(4) Reservicing point. This point is located conveniently near the zone of action. Normally two units of fire and one refill of fuel should be maintained at the reservicing point. Emergency maintenance crews should also be present.

(5) Attack position - This is an area close behind the front line where the tanks are carefully placed in the attack formation. Infantry and engineers take position in the formation and final instructions are given. Here timely coordination with front line units can be effected and information on additional targets obtained. Because excessive delay here may compromise the element of surprise, normally not over 20 minutes should be spent in the attack position. Selected routes from the attack position to the line of departure must be reconnoitered in advance and marked with guides or tape.

(12) (6) Rally point - The rally position may be the attack position or the reservicing point. Plans must be made for emergency maintenance crews to meet the tanks at this position where, after an attack, the tanks are re-organized, reoriented and reserviced. Casualties should be evacuated at this point. If possible, disabled tanks should be towed back to this point.

(13) (7) Reserve tanks - It is not deemed advisable for one tank company to make more than two sorties in a day's action in the jungle. When longer continuity of action is desirable, a reserve tank unit must be moved up to relieve the original unit.

(8) Supporting fires - Heavy concentrations of artillery prior to the attack are considered essential. Such concentrations must be withheld until after the detailed reconnaissance has been made. This permits reconnaissance parties to operate with a greater degree of concealment for artillery fire destroys the covering jungle growth. After all reconnaissance has been completed and before the tanks leave the tank park, a heavy artillery concentration should be placed on the enemy positions. Shells must not be fuzed for tree bursts for heavy limbs may be torn down and an abbatis formed which will hinder the advance of the tanks. Bursts which demolish undergrowth are especially desirable, for when shorn of screening vegetation enemy pillboxes are more easily spotted. As the tanks approach the front lines artillery fire should shift to the enemy rear; moreover, it must be kept at maximum intensity so that the noise will cover the sound of the approaching tanks. In general, infantry support weapons conduct fires as they would in any standard attack.

g. Conduct of the attack.

(14) (1) Advance - The line of infantry-tank teams moves forward at a slow rate. The tank company commander must keep the advancing tanks in line, and all commanders must be especially careful to prevent tanks from firing on each other or on friendly troops. To prevent tanks in a counter-attack from firing on emplacements held by our own forces, an infantry officer or NCO from the immediate front lines should ride in each of the assault tanks and indicate to the tank commander the positions held by our troops.

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(2) The infantry-tank-engineer team in action - The team is organized into three mutually supporting echelons or waves. The mission of the assault tanks is to advance at a slow rate, firing cannon and machine guns to gain fire superiority over the enemy, to force him into cover and to clear out jungle growth so that enemy pillboxes may be seen. If a definite target is located, these tanks will destroy it with cannon and machine gun fire. In thick jungle the two support tanks of the team advance along the tracks made by the two flank tanks of the assault wave. The mission of the support tanks is to knock out pillboxes and entrenched enemy by-passed by the assault tanks, to cover the assault tanks, and by cannister and machine gun fire to prevent the enemy from approaching the tanks to disable them with magnetic mines or incendiaries. Support tanks may also designate targets to the assault tanks by radio-transmitted messages coordinated with smoke grenades thrown by the infantry. If snipers begin firing from trees, support tanks may destroy them with cannister fired into treetops or AP shot fired into the tree crotches. The missions of the infantry squad in rear of each support tank are first, to locate enemy pillboxes and trenches, and to designate these targets for the tanks by throwing or projecting a colored smoke grenades on the target, and by giving appropriate directions to the tank commanders; second, to destroy by fire any enemy seen above ground, especially those who attempt to swarm over the tanks and damage them; and third, to search all holes and pillboxes passed over and to destroy the enemy therein with flame throwers, grenades, and explosive charges. Particular attention must be paid to enemy who feign death. The mission of the platoon reserve is to repel enemy counter-attacks; it also provides a reserve tank for replacing a damaged one. It is deemed more expedient for the support tank to replace a damaged assault tank, with the reserve tank moving forward to the support tank position. In this connection, all tanks used with infantry must have their external telephone circuits ready for instant use. Reserve tanks may also be employed to knock out by-passed pillboxes or to fire on snipers. Since both enemy camouflage and fire control is excellent, the enemy on the flanks can be expected to withhold fire until the assault tanks have passed and then to deliver flanking fire on the infantry. However, at times all enemy fire will be directed at the periscopes of the tanks. Infantry squad leaders must make every effort to locate enemy positions and foxholes and to direct the fire of the tanks toward these. To facilitate the locating of enemy positions, tanks and infantry should cease firing for a short period. The infantry platoon leader must decide when to effect this and must give the necessary orders for the temporary cessation of fire. The infantry platoon leader must be well forward and should be in a position between his two advance squads. This position enables him to fully be abreast of the situation at all times and to maintain adequate control. He must have two or three riflemen precede him for his close-in protection and a radio orderly to operate the SCR 535.

(3) General tactics of infantry dispersion, cover and concealment, and advancement by fire and movement is essential in infantry-tank operations. Infantry units must avoid being canalized (i.e., following trails, cleared areas or the swath cut by the tank itself) and must cover the complete area of advance. At no time must infantrymen stand up and walk along in the rear of tanks. They should not bunch up immediately behind the tanks, but should assume an extended wedge formation. Runners and flame throwers and demolition crews may follow the track cleared by the support tank, but

19 they must remain concealed until needed. In general, the infantry line follows closely the support tanks. Under no circumstances does infantry move abreast or forward of the support tanks. Usually, the enemy lies low in the jungle and fires high, and by keeping well down, the infantry can avoid casualties. However, squad leaders and target designators must momentarily stand up to locate enemy positions and direct the fire of the tanks..

20 h. Organization of the captured ground - When the final objective is reached the tanks should halt and fire with all available weapons at definite targets or places of likely enemy approach or concealment. The infantry squads of the two forward platoons, as well as the company support platoon, should immediately push forward to the rear and flanks of the tank line and construct a defensive position (See sketch No. 8). If the attack formation has employed a company of tanks with a company of infantry, (i.e., three infantry tank teams in line or in echeloned line), then a reserve reinforced company of infantry must be moved forward to construct the defensive position (see sketch No. 9). This position should follow standard infantry procedure of emplacing automatic weapons and mortars, or organizing the ground, digging in, and putting out protective wires. Prepared concertinas should be carried into action on the rear decks of support tanks because time is too short for apron fences to be constructed. No guns should be emplaced or wire laid in the lanes made by the tanks as they advance in the attack. After the defensive position is organized, the tanks and their protecting squads should withdraw via the original routes of advance. In turning about to withdraw, all tanks should turn to the right about if possible. A standard procedure like this enables the protecting squads to clear the danger space without confusion and subsequent loss of time. Tanks on withdrawing must reverse their turrets and keep them trained in the direction of the enemy, because of the possibility that enemy AT guns, silenced in the action, may be remanned in time to fire on the withdrawing tanks. After the tanks have withdrawn the lanes are closed by concertina wire. Further preparations must be made to repel an enemy counterattack. Special attention must be given to strengthening the flanks of the salient. Infantry must minutely investigate all ground within the salient to search all positions for enemy personnel. Heaps of enemy dead must be investigated to insure that none are feigning death.

i. Use of screening smoke - Visibility in the jungle is so limited and observation in the infantry-tank attack so essential that the use of screening smokes is to be discouraged. However, if a minefield exists in the line of advance, smoke screens may be used advantageously to conceal ground troops removing the mines. Smoke should be used early enough to allow it to dissipate by the time the attack is launched. At the end of the attack, a smoke screen may be utilized to cover the withdrawal of the tanks to mask from the enemy the digging and wiring operations of the infantry. While the jungle itself is a very effective screen, attacks may be launched in fairly open terrain utilizing smoke, in accordance with standard procedure, to good advantage. Here timely consideration must be given to possible variations of the winds to prevent smoke from drifting into the area to be attacked by the tanks and infantry.

21 j. Duration of the attack - In the jungle tanks can be expected to operate about three hours before reservicing is necessary. The following time allotments are suggested:

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- (1) Movement to and occupation of attack position - 30 minutes.
- (2) Fighting time - 2 hours.
- (3) Time for organization of positions by infantry - 15 minutes.
- (4) Time for withdrawal and return to resupplying point - 15 minutes.

In any case, tanks must be withdrawn before darkness falls.

k. Special missions.

(1) Often tanks are employed individually or in small groups of two or three to reduce an isolated strong point which cannot be overcome by artillery or mortar fire nor taken by infantry assault without undue cost. In such instances it is mandatory that the enemy position be definitely located and that the route of approach to the enemy position be reconnoitered and found feasible. The tanks, or tank, move over the route of approach to the enemy installation closely guarded by a detail of infantry. The attack may be launched with a combination of infantry-tank tactics, or the pillboxes may be reduced by direct fire from a short distance. Fire by cannister and machine gun will frequently tear away undergrowth or camouflage and permit the gun ports of the pillboxes to be seen. HE shell can then be fired into the openings. Tank-mounted flame thrower fire may also be used effectively. Where no openings appear, AP shot will frequently make a breach through which HE may be fired into the pillbox. As soon as the enemy installation has been reduced, the tanks should withdraw and, if necessary, prepare for a sortie against another target.

(2) At times enemy snipers armed with rifles or LMG's climb trees overlooking our lines and deliver plunging fire into our positions. Where the snipers are too close to be dislodged by tree bursts or mortar shells, tanks are effective in dispersing or destroying them. Usually the snipers are never definitely located. Cannister and machine gun fire delivered into suspicious looking treetops and AP shot fired through the holes of trees at suspected sniper perches will usually silence the enemy fire.

(3) Single tanks are sometimes employed as mobile pillboxes to secure avenues of approach into our positions or to guard vital installations which have been hastily organized and are without proper defense. Searchlights illumination of avenues of approach may be effected by using single tanks at night. When used alone in this manner, tanks must be protected by infantry.

(4) Small groups of tanks and infantry may be employed to make a feint on any enemy position in order to divert attention from another operation, such as recovery of wounded. In a ruse such as this the infantry-tank teams need not be so thoroughly organized, for the tanks will merely advance toward the enemy, fire a large amount of ammunition, and retire.

3. Operations against the enemy.

In general the enemy tactics were as follows:

He attacked on a very narrow front and with one, two or possibly three battalions in depth behind the attack. The normal frontage for this force was usually between 100 and 150 yards.

Beginning at sunset small parties cut lanes through our wire or blew out routes through it with bangalore torpedos. The operations of these parties were covered by heavy rifle, machine gun, and mortar fire by the enemy.

The enemy then started infiltrating through our wire and attacking our pillboxes, occupying those which they could knock out.

While this night attack was going on we placed heavy artillery and mortar concentrations as close into our wire as we dared. This resulted in breaking up the enemy's support battalions who usually were not able to support the advance battalion at daylight.

Our front line elements resisted the enemy infiltration with all suitable weapons and inflicted heavy losses on them but were unable in many cases to kill or drive out all the enemy before daybreak by fire alone.

As soon as it was light the enemy would be found occupying a V-shaped salient about 100 yards across at its base and from 50 to 250 yards deep. He would have occupied some of our pillboxes and communication trenches and would be dug in in small holes all over the salient.

We would then launch a counterattack against the salient using as a spearhead one infantry-tank-engineer team with additional infantry in support.

The soundness of our previous training was proven by the success of these counterattacks. After a few initial mistakes which were caused by failure to employ the principles taught, the wiping out of the salients settled down to almost routine action.

In all counterattacks where the infantry-tank-engineer team was used, the enemy lost within the salient itself more than ten to our one, and all positions were fully restored.

4. At daylight on 12 March a hostile attack in force was launched by elements of the 45th Japanese Infantry on positions of the MLR held by Company - - - Infantry. The enemy penetrated our line on a narrow front, gained a salient 200 yards deep and 100 yards wide, and occupied seven of our pillboxes. The terrain was very open. Our counterattacks regained two pillboxes but failed to eject the enemy from our lines. On 13 March just before daylight the enemy again attacked in this sector and captured one additional pillbox. The attack was stopped at 0730 but the enemy still held the ground he had taken. At 0905 a counterattack was launched by one platoon of tanks (3 medium and 2 light) supported by elements of Company - and Company - , - Infantry. One medium tank bellied up on a stump and had to be replaced with a light tank. The infantry part of the team, although organized to designate targets to the tanks and support them, failed to follow the tanks closely enough into action. When our forces were withdrawn at 1130 only two positions had been retaken from the enemy. From 1145 until 1300 the tanks were reserviced and a new attack was planned. At 1315 another infantry-tank attack was delivered on

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the same positions. Again, teamwork was lacking. Tanks were not properly directed to their targets and they were not given adequate support. Although numbers of the enemy were killed above ground, his forces succeeded in surrounding two tanks, but were finally driven off. At 1415 the tanks withdrew unharmed, and the enemy remained in our positions. A fresh platoon of tanks arrived soon thereafter and at 1700 a coordinated infantry-tank attack was launched. This time the attack was conducted in the form of the infantry-tank-engineer team. Infantry squads stayed in position behind the tanks and directed the fire by telephone and colored smoke grenades. Tanks were brought within 15 yards of enemy trenches and positions, and fire from cannon and machine guns was delivered at close range. At one point 18 enemy were killed by 75mm shell fired into the roots of a giant banyan tree. By dark all our pillboxes had been retaken, the MLR restored and a strong defense established. The tanks withdrew. 155 enemy dead were counted within the wire. The number of dead beyond the wire was estimated at 200. Although the great fire power of the tanks killed many enemy, our artillery and mortar fire undoubtedly destroyed a large number of them also. Our casualties for 12 March were four killed and eight wounded; for 13 March, there were killed, 2; wounded, 10.

At 0400 March 15, the 45th Japanese Infantry attacked in force the positions of MLR held by Company -, - Infantry. The terrain, being in our fire lane, was cleared of undergrowth. After heavy fighting, the enemy by 1000 had penetrated our lines to a depth of 100 yards and had occupied 5 of our pillboxes. At 1430 a counterattack by elements of the 1st and 2nd Bns supported by one platoon of tanks was launched. The tanks moved out with an infantry NCO in each assault (medium) tank. However, even the infantrymen were unable to distinguish between friendly pillboxes and those held by the enemy, with the result that the tanks could fire only on enemy actually seen. One medium tank sustained a direct hit on the turret by an enemy 75mm shell, but was unharmed. Infantry failed to follow the tanks closely into action. Tanks did not close with the enemy, but remained at a distance and attempted to machine gun him out of position. The attack gained only limited success. It failed to dislodge the enemy who was hastily consolidating his gains by constructing trenches and moving heavy weapons into position. A second attack, supported by a heavy preparation of artillery and mortar fire, and led by one platoon of tanks (3 medium and 2 light) was launched on the enemy at 1635. Coordination between infantry and tanks was good until several telephones were shot away. Although infantry accompanied the tanks, close in protection was not continuous and the enemy succeeded in exploding two mines on the tanks. A magnetic mine exploded on the sponson of a medium tank without causing any damage whatever. An enemy soldier placed a land mine under a light tank. The track of the tank was blown off, and the tank was temporarily abandoned. Later it was towed away by a medium tank. At one time a group of enemy swarmed onto one of the assault tanks; several well-placed charges of cannister from the support tanks swept them away, without damage to the assault tanks. When the fierce fighting ended at dark our forces had completely annihilated the enemy, had captured many of his weapons including a 75mm field gun, and had re-established our MLR. 190 Japanese dead were counted on the field. We lost three killed and twenty-six wounded. Large quantities of Japanese antitank equipment found in his positions included magnetic mines, land mines, and hollow-charge rifle grenades.

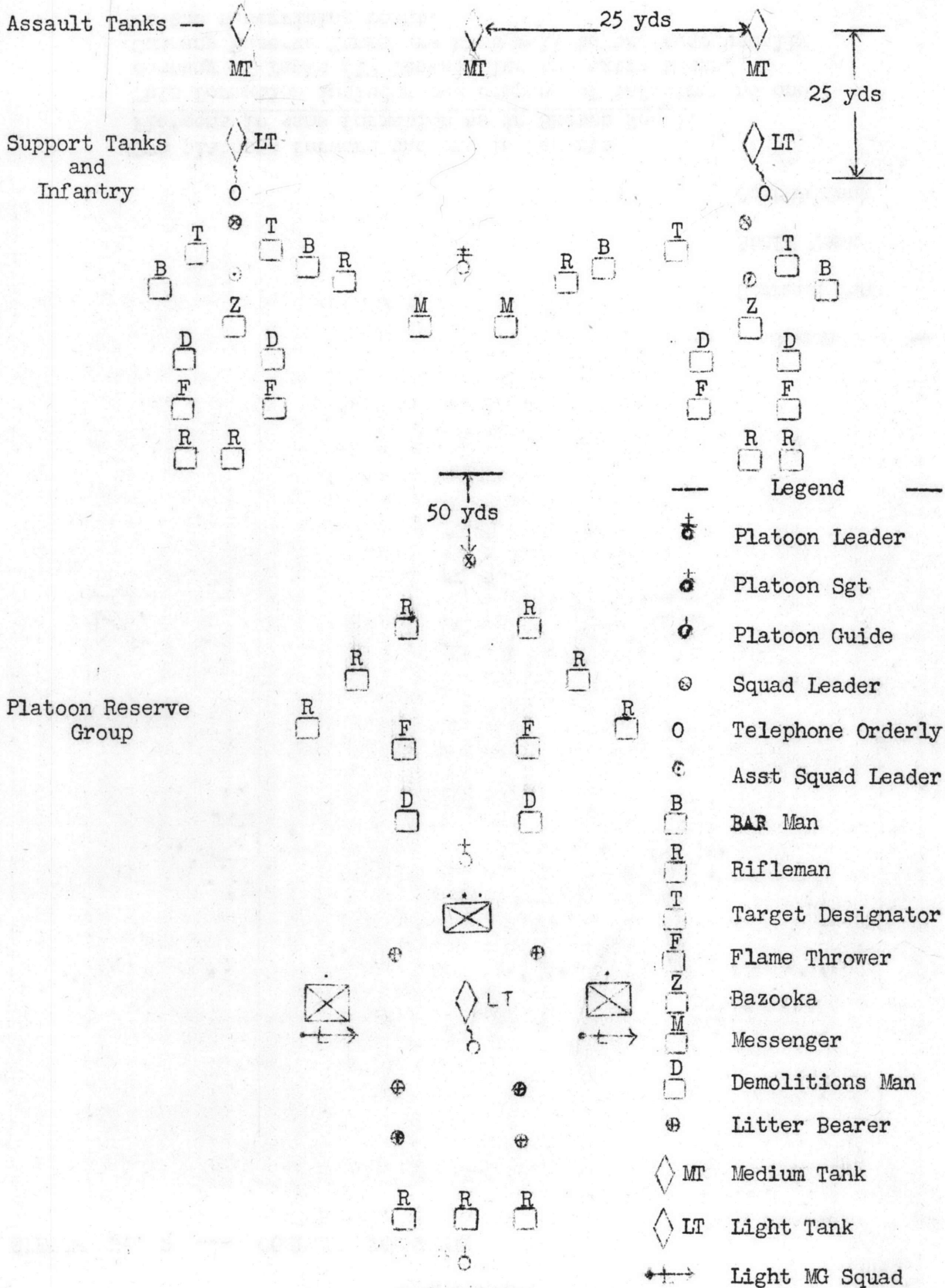
About 0400 on 17 March, the enemy again attacked the same positions. The attack was identical with that delivered two days before. It penetrated our lines to a depth of 75 yards. The attack was quickly stopped and the enemy dug in. At 0815 Company -, - Infantry counterattacked, lead by one platoon of tanks (3 medium and 2 lights). In this attack ideal coordination between the tank platoon and its supporting infantry platoon was realized. Infantry squad leaders could see the fresh dirt which indicated enemy entrenchments, halted the tanks just short of these, tossed out colored smoke grenades and gave directions for fire. 75mm and 37mm shell blew the enemy from the ground. Jap machine guns delivered a stream of fire against the tanks but inflicted no damage. Infantry quickly spotted the gun positions, some of which were only 15 yards off on the flank. These were designated as targets to the tanks and were quickly knocked out. By 0950 our MLR was restored, and 200 enemy dead were counted within our wire. We had two killed and thirty-five wounded. At 1230 one platoon of tanks coordinated with one platoon of infantry moved through our wire and heavily shelled and machine gunned enemy positions just outside the perimeter. Enemy attacks on this point ceased.

Shortly after midnight on 24 March, the enemy began infiltrating through our lines in Company -, - Infantry sector and at dawn launched a general attack from a valley known as COX CREEK DRAW which was on the left flank of the Company - sector. The terrain was fairly well cleared tableland within our lines, and held a salient 250 yards deep. At 0725 a counterattack of the AT Company and elements of - Company, - Infantry, led by one platoon of tanks, hit the enemy and after intense fighting, regained the tableland. At 0930 a fresh platoon of tanks arrived, and a coordinated attack was launched by Company -, - Infantry. Using one infantry-tank team as a spearhead, our forces moved into the draw and attacked the enemy on his flank. Tank fire destroyed a large group of enemy as well as a dump of ordnance and ammunition on the protected slope of the draw. Tanks and infantry moved up the draw from hole to hole, killing the enemy as he lay in his trenches. Extensive use was made of smoke grenades for target designation. Tank fire was to a great extent directed by infantry squad leaders using telephone communication. Flame throwers were freeley used. By 1400 our positions had been retaken. 79 enemy dead were counted in the area, and many enemy machine guns and mortars were captured. We lost 16 killed and 46 wounded. No large enemy attacks were launched on the TOROKINA perimeter after 24 March.

O. W. GRISWOLD,  
Major General, U. S. Army,  
Commanding.

# S E C R E T

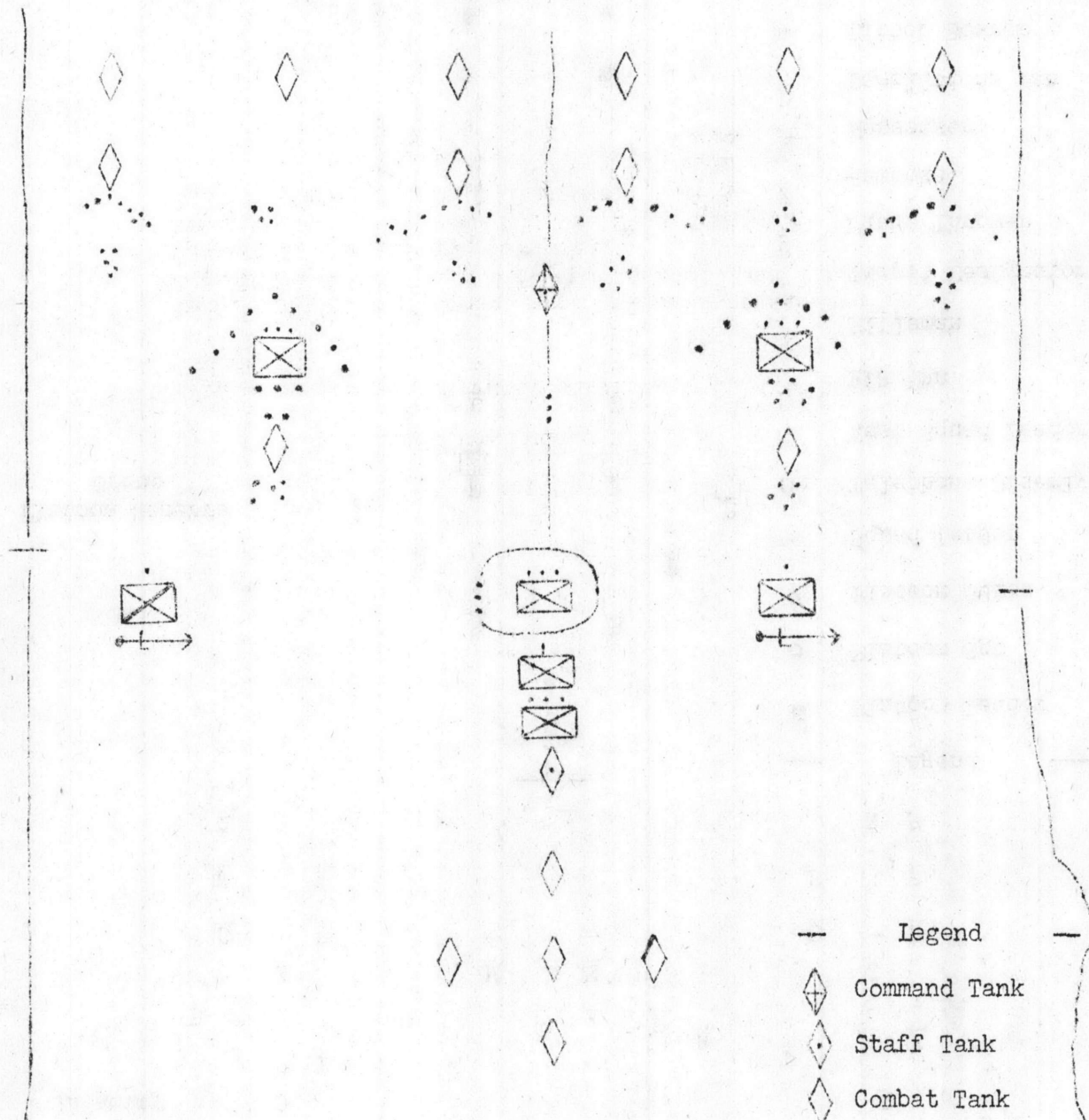
SKETCH No. 1 --- The INF-TANK-ENGR TEAM



S E C R E T

# S E C R E T

## SKETCH No. 2 --- COMPANY FORMATION



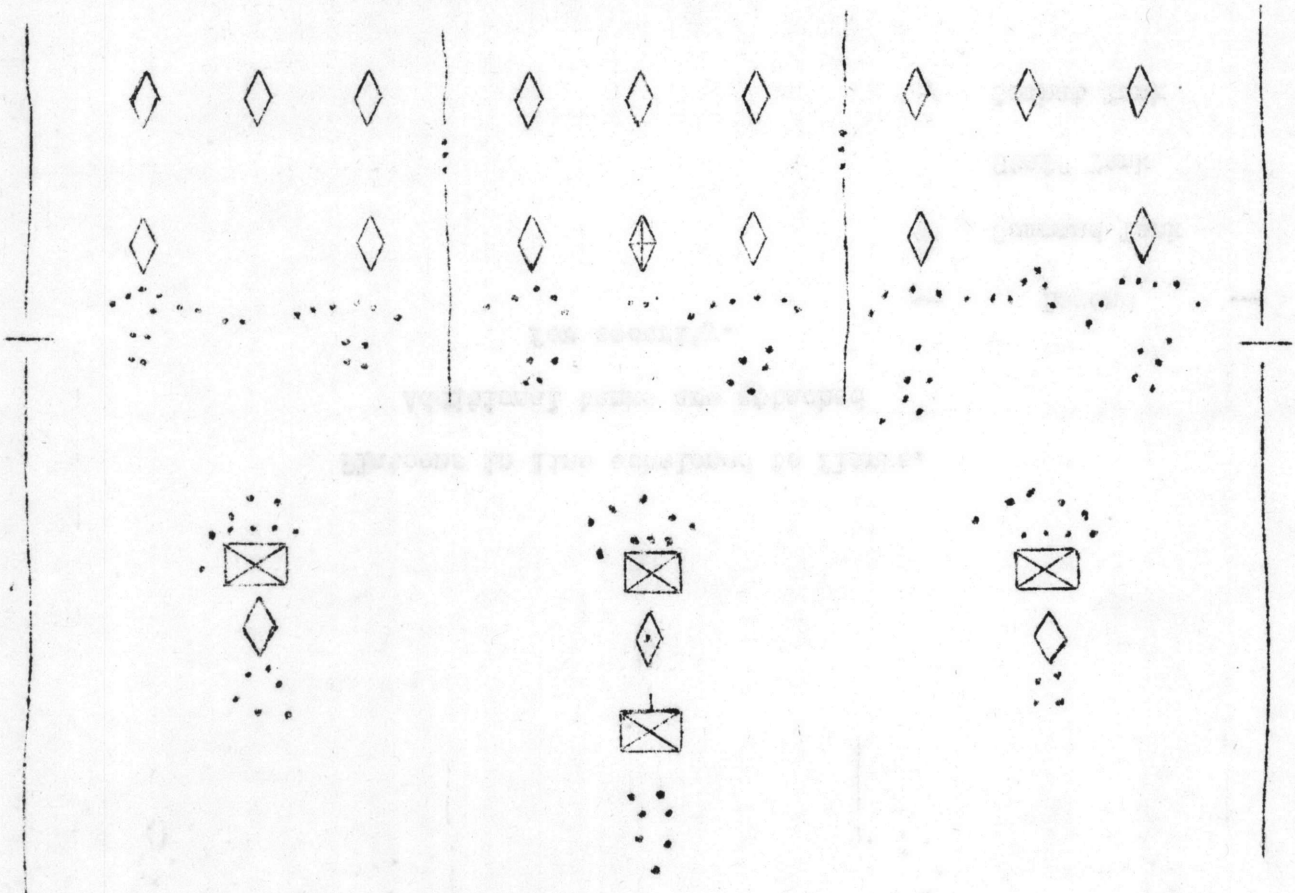
Two platoons forward and one in Reserve  
Platoons in same formation as in Sketch No. 1.

This formation includes one company of infantry and one company of Tanks (17 Tanks) plus two extra tanks. Company Reserve Tanks are kept well to the rear usually at the reserving point.

S E C R E T

S E C R E T

SKETCH No. 3 --- Company Formation



Three platoons in line

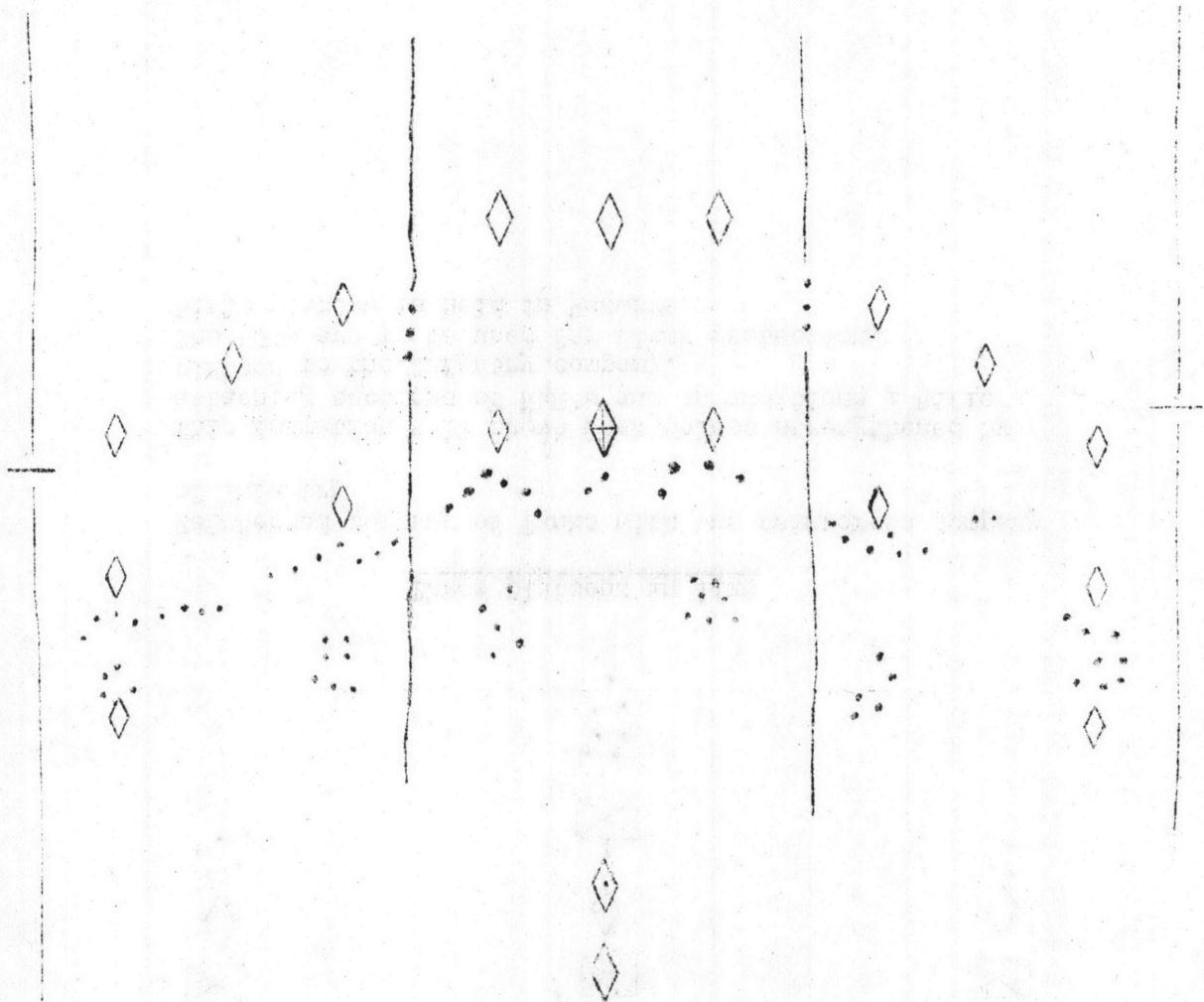
Reinforced company of Tanks with one reinforced company of Infantry

This formation will prove weak unless strengthened by attaching sections of HMG's and an additional Rifle platoon to the Infantry company. The MG's are to be used for flank protection. Rifle platoon is held in Reserve.

S E C R E T

S E C R E T

SKETCH No. 4 --- FORMATION FOR FLANK PROTECTION



Platoons in line echeloned to flanks.

Additional tanks are attached

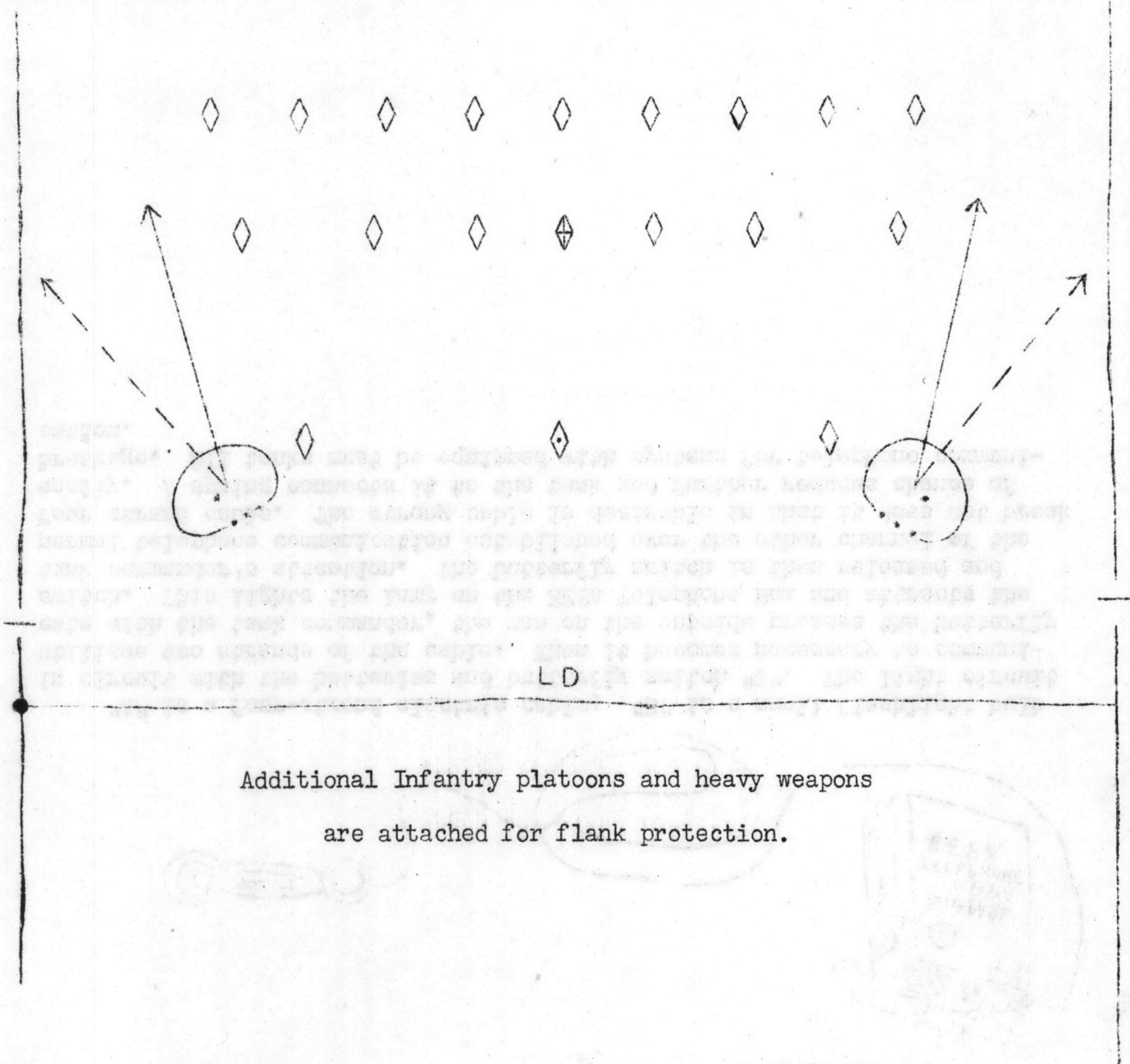
for security.

- Legend
- ◆ Command Tank
  - ◆ Staff Tank
  - ◆ Combat Tank

S E C R E T

S E C R E T

SKETCH No. 5 --- FLANK PROTECTION BY INFANTRY

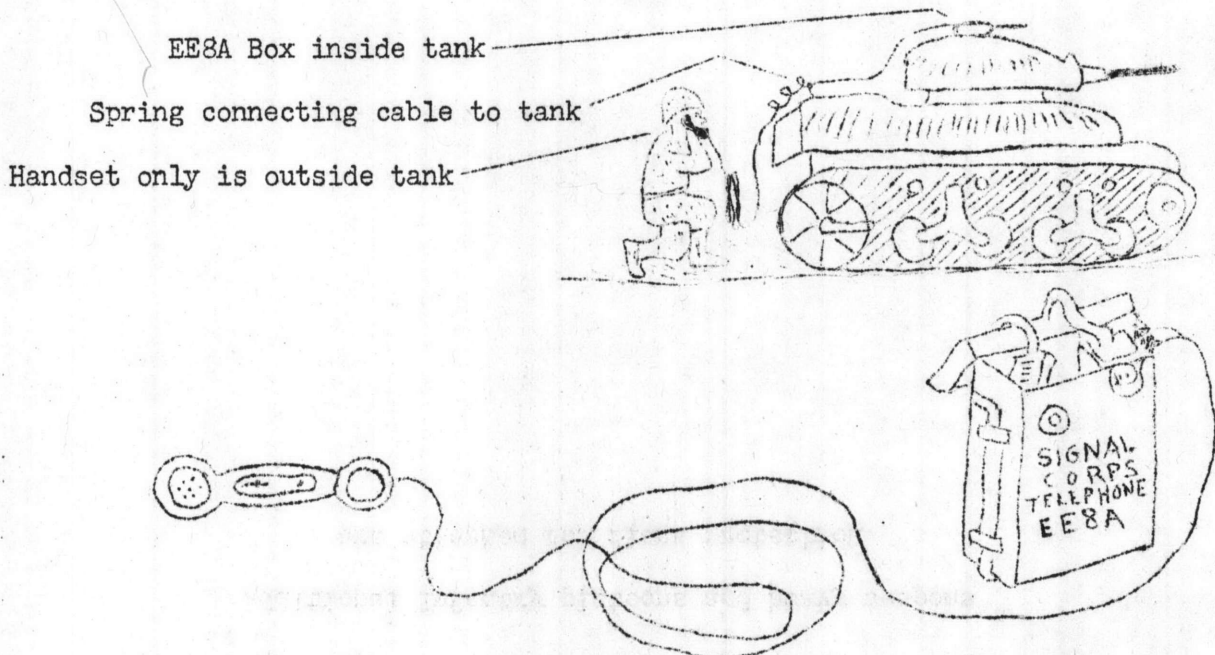


Additional Infantry platoons and heavy weapons  
are attached for flank protection.

S E C R E T

S E C R E T

SKETCH No. 6 --- TELEPHONE COMMUNICATION

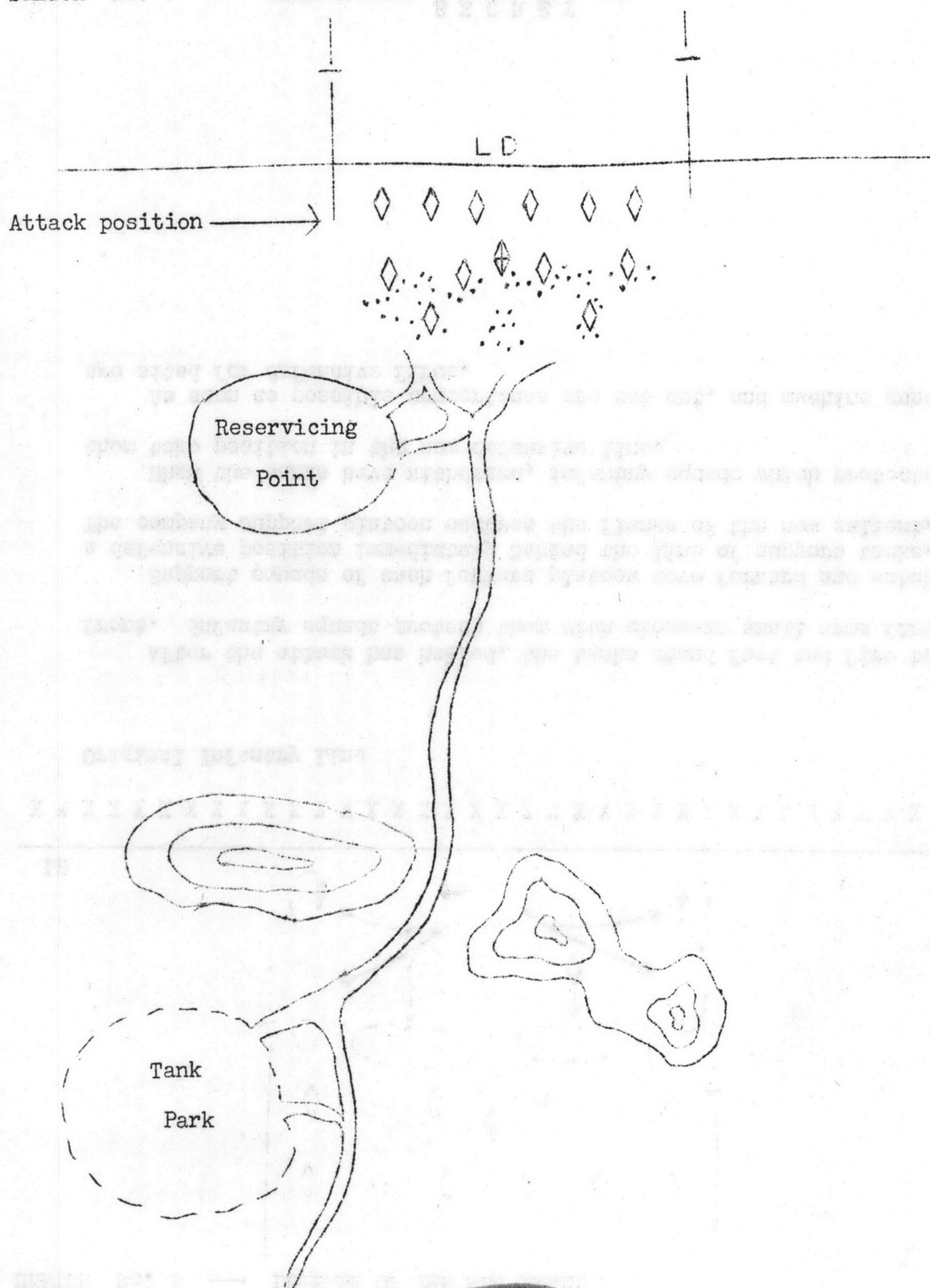


"A" is a four-strand electric cable; "B" is a small flashlight bulb in circuit with the batteries and butterfly switch "C". The light circuit utilizes two strands of the cable. When it becomes necessary to communicate with the tank commander, the man on the outside presses the butterfly switch. This lights the lamp on the EE8A Telephone Box and attracts the tank commander's attention. The butterfly switch is then released and normal telephone communication established over the other channel of the four strand cable. The strong cable is desirable in that it does not break easily. A spring connects it to the tank and further reduces chance of breakage. All tanks must be equipped with systems for telephone communication.

S E C R E T

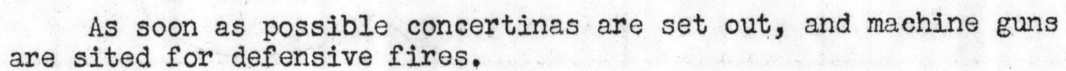
S E C R E T

SKETCH No. 7 --- ORGANIZATION OF THE REAR AREA



S E C R E T

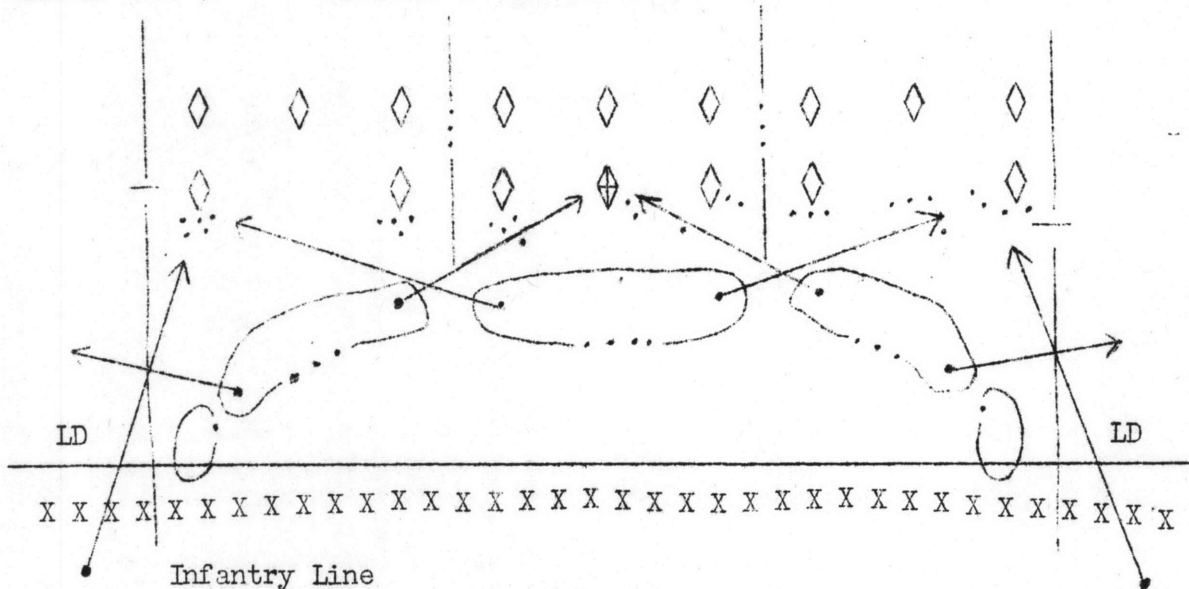
SKETCH No. 8 --- DEFENSE OF THE NEW SALIENT



S E C R E T

S E C R E T

SKETCH No. 9 — DEFENSE OF THE NEW SALIENT



If three platoons attack in line there are not enough troops available to organize new defensive positions after the attack halts. To offset this handicap, a reserve rifle company with attached heavy weapons must be moved quickly into the new salient. This company must speedily organize defensive positions to hold the newly gained ground. Lanes made by the tanks in their advance must be left open so that the tanks can withdraw. After the withdrawal concertina wire is so placed as to close the lanes used in withdrawal of tanks.

S E C R E T

SECRET

HEADQUARTERS XIV CORPS  
APO # 453

January 20, 1944.

TRAINING MEMORANDUM)

NUMBER

1)

THE TANK INFANTRY ENGINEER TEAM IN JUNGLE OPERATIONS

1. In compliance with Training Memorandum No. 10 Headquarters USAFISPA, 18 November 1943, infantry, tank, engineer familiarization training will be conducted by infantry divisions and tank battalions assigned to this corps.

2. Purpose:

a. Initially to familiarize tank, infantry, and engineer units in tactics of combined operations in the jungle.

b. With continued training to perfect hard hitting well coordinated infantry, tank, engineer teams.

c. To evolve improvements in the technique of the tank, infantry, engineer team.

3. Recent operations in this theater have proved the value of tank support for infantry troops in the jungle. Tank fire power and movement has been very effective in supplementing artillery fire to neutralize Japanese defensive positions sufficiently to permit infantry assault. However, the improper employment of tanks on several occasions has caused the loss of tanks without benefit to the supported troops.

4. The principles described in this memorandum governing the employment of tanks in support of infantry are based on combat experience. This experience has been limited both in number of times tanks have been used and in number of tanks used in any one attack. Therefore, the principles enumerated cannot be considered as final. They do form a basis upon which infantry, tank, engineer training and operations may be conducted and from which specific and clear cut principles and technique may be evolved. The following is a brief summary of general principles:

a. Tanks must be used only over terrain suitable for tank movement and against definitely located enemy resistance which has been holding up an advance and not against areas of unknown resistance.

b. In the jungle the fire power of the tank assumes far greater

(25)

importance due to inherent limitations on maneuver and shock action. Therefore a portion of the tanks must be formed in line in order to exploit maximum fire power.

- c. Tank formations must be very simple to facilitate control and wherever possible the tanks must be carefully placed in attack formations behind the line of departure.
  - d. The infantry - tank attack requires maximum fire support by infantry and artillery weapons both before and during the attack.
  - e. Advances must be by very short bounds with frequent halts for reorientation and reorganization.
  - f. Tanks must be employed in mass; not piecemeal, and to insure continuity of effort it will be rare that less than a Tank Company will be employed.
  - g. Tanks and infantry must develop perfect teamwork. The tanks must provide accurate direct fire against resistance holding up the infantry advance. The infantry must provide close in security for tanks during their approach, attack and withdrawal.
  - h. Constant communication between infantry and tank commanders is essential for continuous control.
  - i. In the jungle the tanks will normally require the services of an engineer bulldozer to make a trail to the attack position.
5. Advance preparation for a tank attack.
- a. Even before it has been decided to use tanks in any area the tank unit commander will make detailed reconnaissance for possible places of tank employment to include tank parks, routes of approach to forward positions, reservicing points, attack positions, and rally points. He should be prepared to make recommendations at any time as to the feasibility of the use of tanks in any part of the combat area.
  - b. As soon as it has been decided that tanks will be used on a mission the tank unit commander will report to commander of the infantry unit he will support and also send a liaison officer to the headquarters of the unit to be supported. The tank unit commander and his subordinates will make detailed reconnoissances in conjunction with the proper engineer and infantry personnel. The infantry commander, utilizing the advice of the tank and engineer unit commanders, will complete his detailed plans for the attack. These plans will include.

SECRET

- (1) Routes of approach for the tanks.
- (2) Location, organization and stockage of reservicing point or points.
- (3) Attack positions.
- (4) Formation for the attack.
- (5) The detailed conduct of the attack.
- (6) Location of rally point or points.

The more detailed the planning for coordination between all parties the better chance of success of the attack.

c. In jungle warfare the following tank installations will prove useful:

- (1) Tank Park - Wherever possible a tank park should be established, normally near the beachhead or main supply point. This park should be protected from hostile artillery fire and as far as possible from enemy harassing parties since tanks are particularly vulnerable in bivouac and while undergoing maintenance. In the tank park supply personnel establish dumps of fuel and ammunition and attached ordnance as well as tank personnel perform field maintenance. Tanks should be returned here for the periodic 25 and 100 hour checks necessary for sustained action.
- (2) Reservicing Point - This point should be near the front line and if possible give protection to personnel from effective small arms fire. Normally it is felt that two units of fire and one refill of gasoline should be maintained at the reservicing point. This should be increased if long sustained action is expected. Emergency maintenance crews should also be available here.
- (3) Attack Position - This is some convenient place as near as possible behind the infantry front line where the tanks can be placed in attack formation. Attempts to form line and attack formations after passing the infantry front line are difficult in the jungle. In the attack position last minute instructions will be issued and final coordination with the front line infantry leaders be assured. Also information of additional targets can be obtained. Because excessive delay here may compromise the element of surprise normally not over twenty minutes should be spent in the attack position. Selected routes from the attack position

to the line of departure must be reconnoitered in advance and marked. Infantry guides or tape can be used for this.









- (4) Rally Point - This is normally the attack position or the reservicing point. Plans must be made for emergency maintenance crews to meet the tanks at this position where after an attack the tanks are reorganized, reoriented and reserviced. Emergency maintenance is performed and casualties are evacuated. If possible disabled tanks are recovered and towed back to the reservicing point or the tank park. It is not believed advisable except in an emergency for one tank company to make more than two sorties in a day's action in the jungle. Continuity of action, if further required, should be provided by additional tank companies.

# 6. Conduct of tank attack.

## a. Tank Formations.

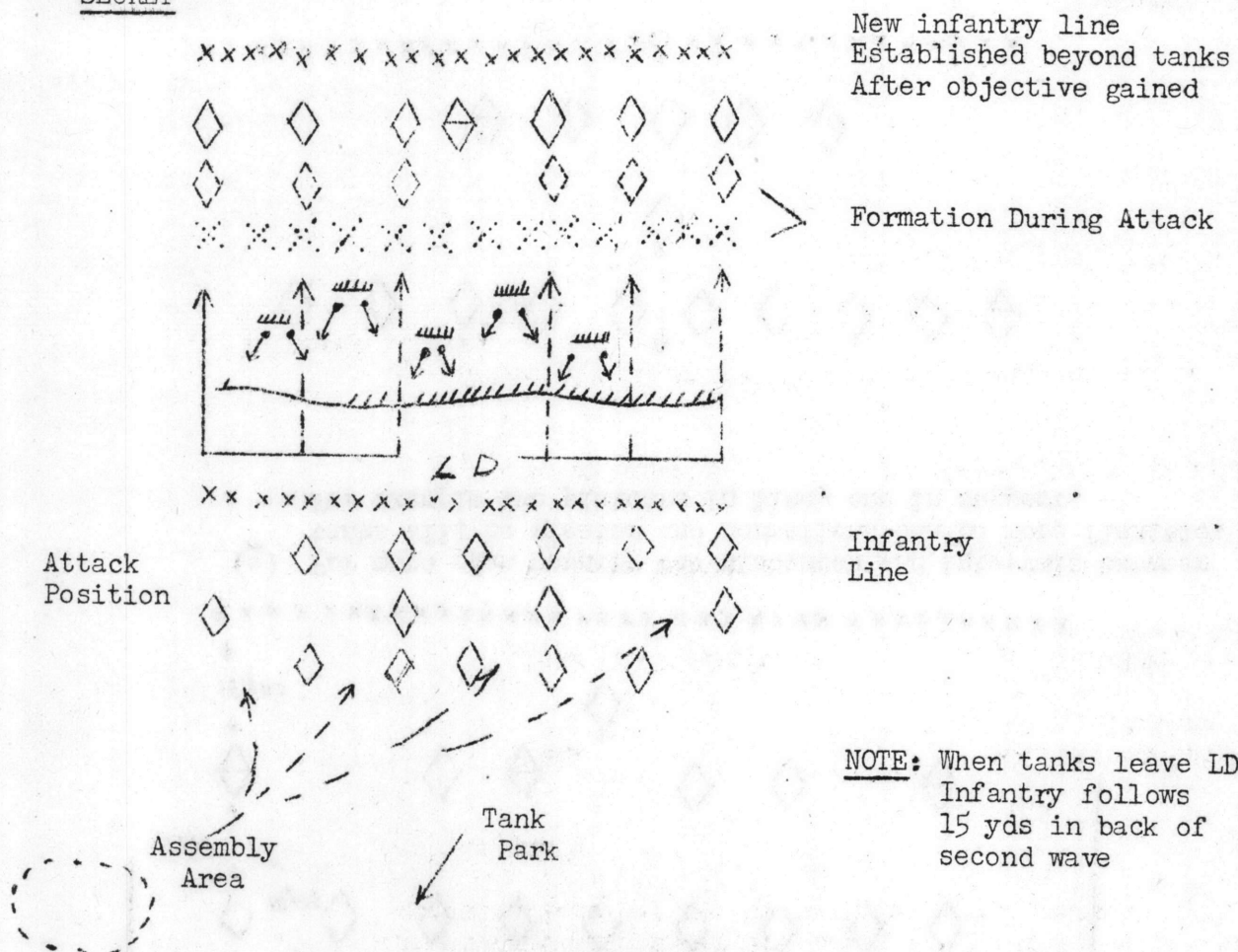
- (1) The following diagrams illustrate possible tank attack formations: Distances are elastic. Those specified are approximations derived by test in normal jungle.

Symbols used:

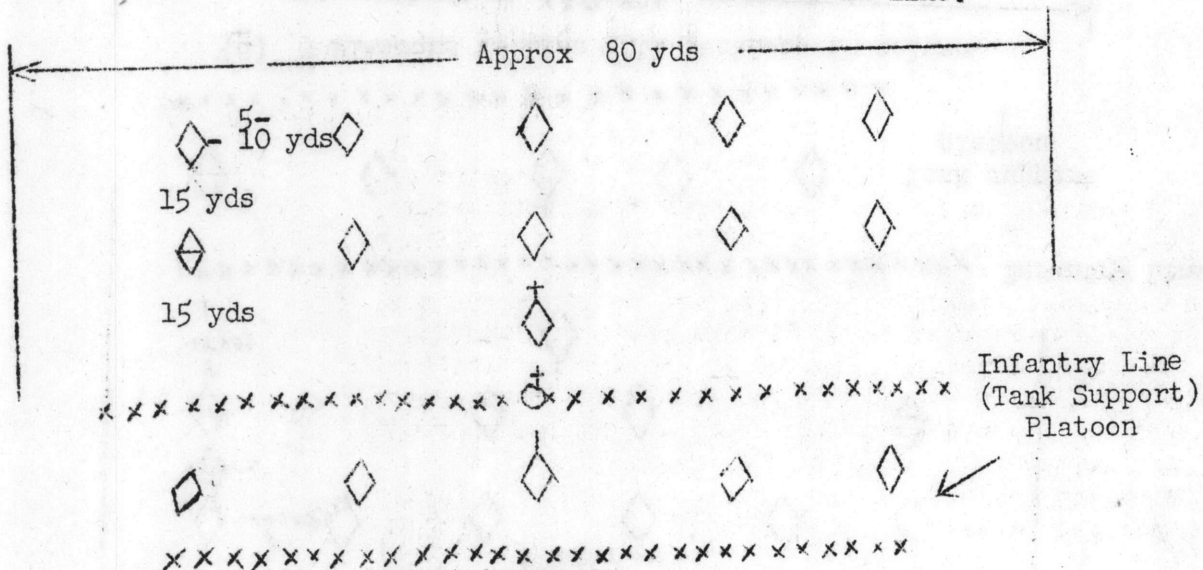
 Tank	 Platoon Sgt in tank
 Tank Co Commander	 Infantry Commander
 Platoon leader in tank	 Friendly Infantry
 Enemy MG's	 Enemy Infantry

(a) Schematic diagram of 1 tank co in support of an Infantry attack.

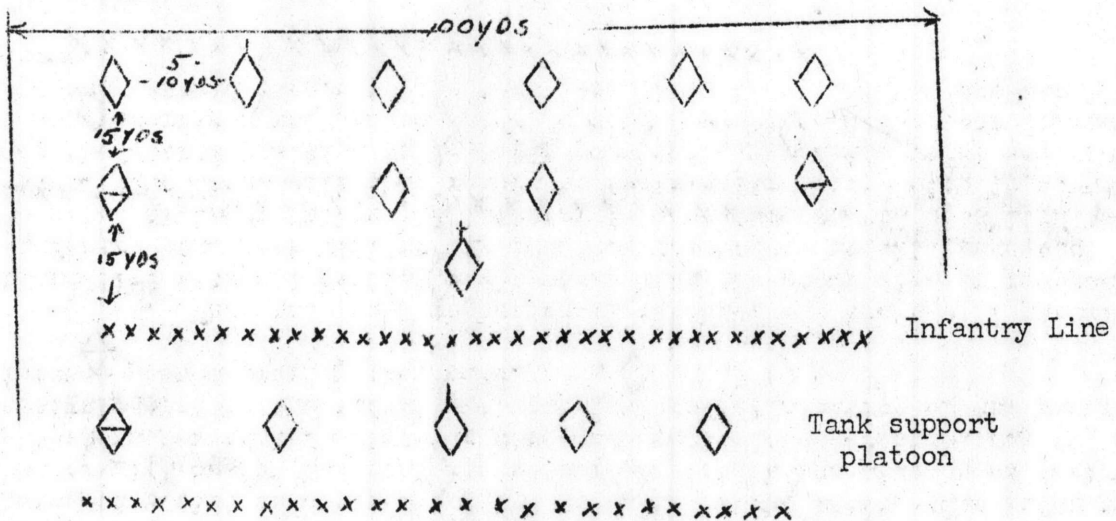
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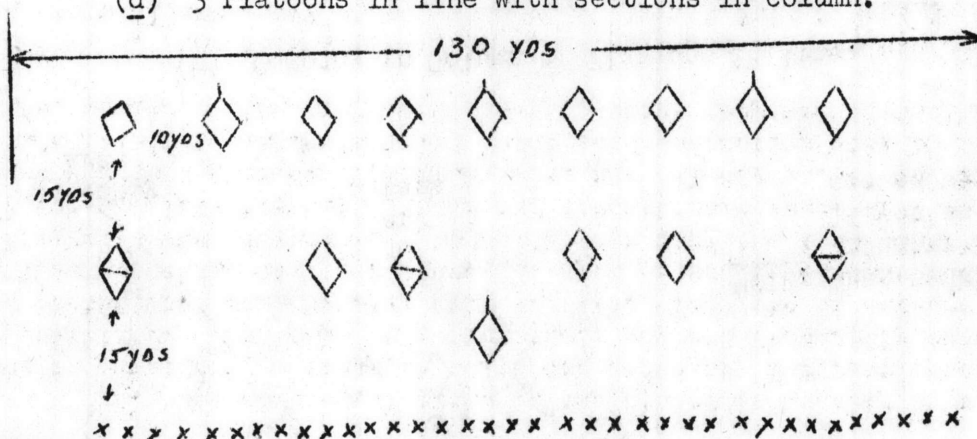
(b) Company in Column of Platoons in line.



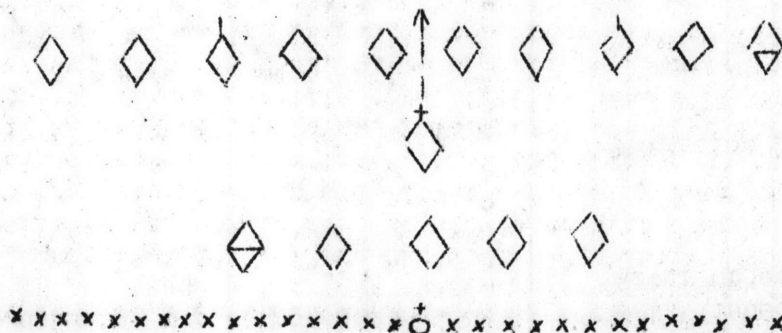
(c) 2 Platoons in line with sections in column, 1 Platoon in support.



(d) 3 Platoons in line with sections in column.



(e) For more open country the distances and intervals between tanks will be greater and formations can be more flexible. For example two platoons in line, one in support.



SECRET

b. During the attack the infantry will give close and continuous fire support to the tanks to prevent the enemy from jamming the turrets and guns or using magnetic mines, flame throwers and Molotov cocktails. All available artillery and mortar fire should be brought down on the objectives just prior to the attack and should lift to the enemy rear areas after the jump off. This serves to clear the area of undergrowth so that tanks have better visibility and also keeps enemy fire down enabling the infantry to advance behind the tanks. Certain tank officers should be designated as observers for supporting weapons, to be used if the forward observers are not able to adjust fire. The tank unit commander will provide one (1) armored half track with radio to operate in tank net for the use of artillery or mortar liaison officers from the infantry unit headquarters. It may sometimes be possible to place rear or flank tank platoons in position to exploit their great fire power in support of the attack. The assault guns, 81mm mortars and tank mounted flamethrowers of the tank units will also be used wherever possible. Flanking action by fire and maneuver is sometimes possible. Weapons of cannon companies can be used to render close direct support.

c. The advance of tanks in the attack is usually by very short bounds in first gear. Frequent halts are necessary for reorientation and reorganization. The tanks must pick their way and frequently back up to avoid obstacles. They usually halt to fire. The rate of advance is seldom more than about one mile per hour. If open ground is encountered distances and intervals can be increased and tanks can make the best possible use of their speed. Infantry using their own formations advance as fast as possible to occupy ground gained. The tanks will not all advance at the same speed nor on a straight line. Infantry formations and action will be coordinated with the action of the tank or tanks with which they are advancing.

d. The tank company commander, platoon leaders and platoon sergeants will each have a hand telephone plugged into a jack at the rear of their tank. By using these phones, the infantry leaders can designate targets and assist in controlling the movement of the tanks. The infantry commander will assign BAR men with tracer ammunition the mission of designating targets for tanks. Flamethrowers and demolitions personnel may be effectively used by the infantry to complete the elimination of any enemy resistance passed over by the tanks.

e. When the final objective is reached, the tanks will normally halt and fire with all available weapons. When the enemy fire is reduced, the infantry commander will notify the tank commander who will have the tanks cease firing to allow the infantry to pass through and establish their position. The tanks will then return to their rally point which is normally either the attack position or assembly position. Here, the tanks are reorganized and reserviced and prepared for further operations. Whenever operations permit they should return to the tank park where heavy maintenance can be performed.

f. Infantry troops of tank support companies are responsible for the security of disabled tanks and recovery of personnel. If recovery is not practicable the withdrawal of tank crew members will be covered. Smoke screens can be used to cover these operations.

g. Attacks on Pillboxes: Fire by tank cannister and machine guns can frequently be employed to clear sufficient jungle growth so that pillbox openings can be seen. HE 37mm or 75mm fire can then be directed into pillbox openings. Tank mounted flame thrower fire also may be used effectively. Where no openings appear, armor piercing 37mm or 75mm (medium tanks) ammunition will frequently make a hole through which HE shell may be fired into the pillbox. Where a line of mutually supporting pillboxes can be bypassed, a special tank - infantry - engineer team may be organized to effect their reduction. The use of smoke, incendiary grenades and demolitions as well as tanks and flame throwers can be particularly effective provided it is properly coordinated.

## 7. Operation of tanks over obstacles.

### a. Minefields.

It can be expected that our increased use of tanks will lead the Japanese to employ minefields and antitank guns to cover likely tank avenues of approach to their positions. Preliminary reconnaissance must be carefully made to avoid use of tanks over such mined areas. Should it be necessary to make an attack over a mined area the mines must first be removed or destroyed by use of mine detection apparatus and bangalore torpedos under cover of darkness or smoke and heavy protective fires.

### b. Natural Obstacles.

The jungle contains many natural obstacles for tanks such as swamps, dense forest and undergrowth, precipitous slopes and numerous streams. Engineer troops will be trained to give close support to tanks by clearing trails with bulldozers and improvising bridges and crossings over unfordable streams and swampy terrain.

8. Under exceptional circumstances tanks may be employed individually or in a small group of 2 or 3 to reduce an isolated strong point which cannot be overcome by air attack, artillery and mortar fire or infantry assault. This situation has occurred and has been successfully solved by use of tanks in small numbers. It is mandatory that the enemy position be definitely located and that the route of approach to the enemy position has been reconnoitered and found feasible. The tank or tanks move over the route of approach to the enemy installation closely protected by a detail of infantry. As soon as the enemy position can be seen the tank stops and uses its appropriate weapon on the enemy. Flame throwers either mounted in the tank or on the ground can be used against an enemy pillboxes with good effect. As soon as the enemy installation has been reduced the tank or tanks withdraw and, if necessary, prepare for another sortie against the next target.

SECRET

9. Communications: Communications between tank units and the close supporting infantry is essential. Training in communications should include use of radio by infantry commander in the same net with tank commander, and use of sound powered or field telephones between command tank and infantry commander. (Wire should be taped to a light cable dragged by tank).

10. Combined infantry tank training based on the principles described above will be conducted by the 37th Div, Americal Div and the 754th Tank Bn(-) beginning Feb 7, 1944.

a. Training schedules will be submitted by the 37th Div and the Americal Div so as to reach this headquarters by Feb 1. They will provide for a minimum of 2 days training with tanks for each infantry company. Reserve companies will be rotated for this instruction and each Division will conduct training for at least two companies simultaneously.

b. Training will provide for brief lectures and demonstrations followed by practical exercises. Each practical exercise will be followed immediately by a short critique.

c. Divisions will submit timely requests to this headquarters for personnel and equipment from the 754th Tank Battalion and for training areas for use in this training.

d. The commanding general of the 37th Div, the Americal Div and the commanding officer of the 754th Tank Bn will submit a report of training with recommendations for changes and additions in the principles, tactics and technique of the use of tanks in jungle warfare within 10 days after the completion of the training period.

GRISWOLD

RIDINGS

G-3

DISTRIBUTION

2 - COMGENSOPAC  
2 - COMGENSOPAC ADVANCED  
10 - CG, 37th Div  
10 - CG, Americal Div  
5 - 754th Tank Bn  
1 - G-1  
1 - G-2  
1 - G-4  
2 - G-3

SECRET

TANK - INFANTRY COMMUNICATION RECOMMENDED BY ARMORED BOARD, FT. KNOX KY.

Communication between tanks and the infantry organizations they may be assigned to support is presently a pressing problem. Radio communication can be provided by the Radio Set SCR 300, which is an infantry battalion command set, in those cases where the tank organization has been provided with the radio sets and installation kits for them. It is then necessary for the tank personnel to find out from the infantrymen what the correct channel is, turn the set to that channel, and they have radio communication up to three miles.

However, this does not take care of the infantryman who has only a rifle, regardless of how close he may be to the tanks, or how desperately he is in need of assistance they can give. One solution to his problem is the provision of an extension to the tank interphone, with an interphone control box and a handset on the back of the tank. Another solution; one which can be applied in the field in a matter of a few minutes, is the connection of an ordinary field telephone into the tank interphone system. In an emergency the telephone can be strapped to any available support on the back of the tank, but it is better to mount it in a welded bracket if such can be made, since in time the straps will wear through. The telephone then can be connected into the assistant driver's interphone box with a piece of ordinary field wire, which can be run through the engine compartment for a neat job, or in an emergency, merely brought over the outside of the tank, taping it to D-rings and pioneer tool racks for support, and in through the periscope mount, ventilator, or through the hatch, taking care not to cut the insulation when closing the hatch. It should be connected to terminals 7 and 8 in the interphone box, or can be fastened to a plug PL-55, and plugged into the headphone outlet, if the assistant driver can do without his headphones.

This gives an external telephone which can be heard by all members of the crew, and enables the man on the ground to hear any member of the crew talk on the interphone. There is a theoretical mismatch of about 1 to 4 between the telephone and the interphone, but in practice this will not be found to cause any trouble. The telephone is susceptible to shorting by water, so that if it is to be used in a landing operation or in an extremely wet climate, it must be fastened on after the tanks have waded ashore or must be made as near waterproof as possible. If it does short out, the assistant driver should disconnect it at his interphone box so that it will not interfere with the use of the interphone, and should remove the telephone as soon as possible to prevent misleading the infantrymen.