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**MOBILE DIVISION
TRAINING PAMPHLET**

No. 2

NOTES ON THE EMPLOYMENT OF THE TANK BRIGADE

1938

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CHAPTER 1

INTRODUCTION

1. The Evolution of the Tank Brigade.

(a) The plan of campaign for the 1919 offensive on the Western Front was based on the conception of an initial attack against the enemy front, supported by a large number of heavy tanks, and the subsequent launching of a mass of lighter faster tanks directed on objectives many miles behind the German front. It is, therefore, strange that the idea of using tanks for any other purpose than that for which they were originally designed, i.e. for close co-operation on the battlefield, found no place in post-war official tactical doctrine.

(b) But, curiously, although the role given to tanks in Field Service Regulations after the war was that of the slow, heavily armoured machine, when it came to re-equipping the Royal Tank Corps in 1922, units were issued with the Vickers Medium Tank, a very much smaller, lighter and comparatively fast type of tank.

(c) This undoubtedly gave impetus to the development of independent, as opposed to close co-operation tank tactics. The possibilities of this type of action had been realized by the many officers who had taken part in or studied the tank operations since the Battle of Cambrai in November, 1917, and particularly the many and varied engagements commencing with the Battle of Amiens in August, 1918, which culminated in the final defeat of the Germans in November of that year.

(d) Consequently, during the years 1925 to 1933, various experimental "armoured forces" were improvised, of which tank units formed the basis. In 1934 the permanent formation of the Tank Brigade set the official seal on the mobile role. The decision, made in 1935, to form, outside the Tank Brigade, new Army Tank Battalions to fulfil the original close co-operation role, gave final recognition to the existence of two separate and distinct tank functions requiring completely different machines, organization and training.

It is essential, therefore, to be clear as to their relative characteristics. On the one hand we have the Army Tank Battalions, with their thick armour, inevitable weight, slow speed and limited range, and a complete reliance on the support of other arms. On the other hand, the Tank Brigade battalions, with comparatively light armour, speed, extreme flexibility, extended circuit of action and self-containment as regards reconnaissance, protection and supporting fire.

(e) Since 1934, with the conversion of cavalry units into armoured regiments and the mechanization of other arms, the logical development has followed and, with the formation of the Mobile Division, the Tank Brigade has been incorporated in this higher organization.

The role of the Tank Brigade, however, remains the same, that of decisive armoured action; when operating with the Mobile Division it will constitute the main striking element in that formation.

(f) The operations which the Mobile Division will be called upon to carry out (*vide* Chapter 5) will not invariably require the presence of a hard-hitting formation such as the Tank Brigade. For this reason, the Tank Brigade does not form a permanent, integral part of the Mobile Division. In cases where the latter is employed on purely reconnaissance or protective tasks, the Tank Brigade may be retained in G.H.Q. reserve until such time as a suitable opportunity presents itself for its employment. When used it will probably operate within the Mobile Division and in co-operation with the Armoured Cavalry Brigades. It may, however, occasionally be employed on separate tasks and act independently.

CHAPTER 2 ORGANIZATION

1. Composition of the Tank Brigade.

The Tank Brigade consists of :—

Headquarters.

One Light Tank Battalion.

Three Mixed Tank Battalions.

The detailed composition of the above units is given in Appendix I.

2. Types of Tank.

It will be noticed that three types of tank are included in the equipment of the Brigade :—

(a) *Medium Tank*.—This is the principal assault weapon of the Tank Brigade ; it has a crew of five to seven ; it is armed with a high velocity Q.F. gun which is provided primarily for action against hostile tanks ; it has also three machine guns, one mounted co-axially with the Q.F. gun and two in separate mountings.

For further details see Appendix IX.

(b) *Light Tank*.—This is the same machine as that with which cavalry light tank regiments are armed. It is the reconnaissance machine.

The Light Tank Battalion is entirely equipped with Light Tanks. Mixed Battalions have a proportion of Light Tanks for immediate and local protection and reconnaissance of the mediums.

For particulars of performance, etc., see Appendix IX.

Developments in the speed and performance of the lighter class of tanks abroad will probably result eventually in the re-equipment of the Tank Brigade (both Light and Mixed Battalions) with a new type of light tank with a longer track base, more stable gun platform and better general cross-country performance. This is to be called the "Cruiser" tank. See Appendix IX.

(c) *Close Support Tank*.—The same machine as the Medium Tank in all respects except as regards armament. It carries a 15-pdr. 3.7-in. mortar instead of the Q.F. gun.

The role of this tank is, as its name implies, close support of the other types. This is provided mainly by means of smoke screens, but it carries a proportion of H.E. shell as well.

3. Brigade Headquarters.

This comprises the necessary number of tanks to enable command to be exercised. It, therefore, consists of :—

- Six Medium Tanks In which are carried the wireless sets required to communicate to units, aircraft, H.Q. Mobile Division, etc. (*vide* Chapter 4).
- Four Light Tanks In which travel unit liaison officers.

4. Light Tank Battalion.

The role of this unit is reconnaissance and protection. It consists of light tanks only. The organization of this unit is, therefore, similar to that of the Light Tank Cavalry Regiment, the only major difference being that in the latter an A/T gun troop is included in the Headquarters Squadron.

The role of the two units, however, differs fundamentally. Whereas the Cavalry Regiment must be prepared to provide reconnaissance and protection for the remainder of the Division, comprising, as it does, vulnerable unarmoured troops, the Light Tank Battalion has to carry out the same duties for an entirely homogeneous armoured and tracked formation.

This condition confers on the Tank Brigade unique powers of manœuvre and, in suitable country, ability to avoid or outflank hostile defended positions. The type of co-operation required, therefore, from the Light Tank battalion is such that speed and "thrust" is invariably paramount to methodical detailed reconnaissance. Success will depend largely on complete understanding and team work.

The Light Tank Battalion comprises a Headquarters and three companies, each of a headquarters and five sections. The section of three tanks is the patrol.

5. Mixed Tank Battalion.

The basic idea of a tank is a mobile armoured gun platform and it is upon its fire effect that it depends for its power in battle.

The medium tank, with its powerful weapons and comparatively stable gun platform, is the backbone of the offensive power of the Tank Brigade; it is the vehicle capable of delivering the maximum fire with accuracy.

When the decisive phase of its action comes, i.e. when it is launched to the attack by the Mobile Division or when, acting independently, the Brigade commences to act by fire and not by threat, it will usually be out of reach of the support of the other arms.

It must, therefore, be self-supporting as regards reconnaissance, protection and supporting fire.

These auxiliaries must be organized and grouped round the medium tank to give the maximum flexibility, the highest degree of mutual co-operation and speed in action.

In conformity with these requirements, the mixed battalions, which are the offensive portion of the brigade, are organized so that each of their three companies contain Light Tanks for close reconnaissance and immediate protection; close support tanks for supporting fire and smoke screens; and Medium Tanks for hitting power, accurate and sustained fire power. The whole a complete, handy fighting unit, combining within itself the essential characteristics of the three arms.

The detailed organization will be seen in Appendix I.

The actual distribution of Close Support Tanks in the battalion is still under consideration, but the main principle is not affected; a proportion of smoke producing tanks will remain under control of each Mixed Company Commander.

CHAPTER 3

FORMATIONS AND MOVEMENT

1. Battalion Formations.

The basic formations used by tank battalions are shown diagrammatically in Appendix II.

For all battalions, in open order, any of six formations may be used :—

Line ahead	..	..	..	Tanks in single file.
Double line ahead	..	..	..	Tanks in file.
Column	..	..	..	One company frontage.
Line	..	..	..	Three companies abreast.
One up	..	..	..	One company ahead, the other two abreast following.
Two up	..	..	..	Two companies abreast, the other following.

In open order, company commanders move their companies in the formation best suited to the ground and circumstances. Light Sections of Mixed Companies will move at protection stations as ordered.

A typical case is shown diagrammatically in Appendix III.

2. Brigade Formations.

The Brigade on the move is shown diagrammatically in Appendix IV.

(a) The Light Battalion's role is reconnaissance and protection. Moving with all three companies forward on a frontage of some 12 miles, patrols can be provided on the scale of one per mile of front, keeping one patrol per company in reserve. Whether or not all three companies are "up" will depend on the requirements of each case. Often, one company or part of one will be kept in reserve or needed for some special reconnaissance task ahead, to the flank or even to the rear of the main body of the brigade.

The following details as to depth and distribution of Headquarters may be taken as a general guide.

The depth of the Light Battalion when deployed is about 3 miles. Company

Headquarters move about one mile behind the leading patrols ; Light Battalion Headquarters, with any reserve there may be, about another mile behind the line of company headquarters.

Behind Light Battalion Headquarters move Brigade Headquarters. On the principle that the Commander must be well forward, a principle which becomes more applicable as formations get faster, Brigade Headquarters will usually be only about one mile in rear of, and often in visual touch with, Light Battalion Headquarters.

(b) At Brigade Headquarters will be, not only the 6 medium and 4 Light tanks of Brigade Headquarters itself, but also No. 1 Party. This Party consists of the three C.Os. of Mixed Battalions, each in his own medium tank and each accompanied by one light tank of his Headquarters for liaison purposes.

The formation of No. 1 Party is normal and it remains at Brigade Headquarters until deployment is imminent, when the procedure described in paragraph 3 below takes place.

The formation and retention at Brigade Headquarters as long as possible of No. 1 Party is considered an essential feature in the technique of command of a mobile formation such as the Tank Brigade. Not only can C.Os. be kept fully posted with first-hand news of the situation as it develops, but, when the time for deployment comes, the Brigade Commander is able to give his appreciation and orders verbally to C.Os. who then go off, not only with immediate orders, but, what is even more necessary in a rapidly changing and fluid operation, with a knowledge of the Commander's intentions and alternative lines of action.

(c) In addition to No. 1 Party, No. 2 Party may be formed, consisting of Company Commanders of Mixed Battalions, each travelling in his own medium tank.

The situation may not always permit the formation of No. 2 Party, as, for instance, when the Brigade is moving through hostile country where the presence of Company Commanders with their units is of more importance.

If No. 2 Party is formed it will move some 3 minutes in time behind No. 1 Party.

The responsibility for forming No. 2 Parties rests with Battalion Commanders, unless specific orders are issued by Brigade Headquarters.

(d) Moving some 20 minutes in time behind Brigade Headquarters comes the mass of the Brigade, the three Mixed Battalions, sometimes referred to as No. 3 Party.

In the absence of C.Os. with No. 1 Party, each Battalion is commanded by the Second-in-Command. In a formation in which the C.O. is as likely as anyone else to become a casualty, if through nothing else than mechanical breakdown, the presence of an active Second-in-Command is an essential feature. This applies equally to Brigade Headquarters, where a full Colonel, a Brigade Second-in-Command, is now included in the War Establishment of the Headquarters.

The formation in which the mixed battalions move will depend on circumstances. If moving on roads, the three battalions will only move in one column when forced to do so ; they will usually move in two, three, or even six or nine separate company columns, depending on the roads available and other factors.

The principle to be followed is to move in as many columns on as wide a front as is consistent with control. By so doing the danger from hostile air attack is reduced ; accurate enemy observation is minimized ; the possibility of congestion and delay is removed, and handiness and rapidity of deployment is increased.

If moving across country, the Brigade may be in any of the following formations :—

Column	One battalion behind the other.
Line	Three battalions abreast.
One up	One battalion ahead, the other two abreast following.
Two up	Two battalions abreast, the third following.

Battalions move in the formations described in paragraph 1 above.

3. Deployment of the Brigade.

When the time for the deployment of the mixed battalions arrives, the following procedure takes place :—

(a) Each C.O., having received his orders, proceeds to the battalion deployment area, followed by his company commanders from No. 2 Party, picks up his battalion centre line and issues orders. The battalion adjutant goes back to the brigade mass, flying the battalion flag to indicate his mission, and leads up the battalion. During this period the latest information and the battalion commander's orders are broadcast to the battalion from the C.Os. tank. It is important that there should be no delay. It should seldom be necessary to check the advance of the brigade mass at all.

If the brigade and battalion commanders have explained their appreciations and intentions properly to their subordinates beforehand, and if intelligence has been methodically disseminated by R/T, it may be unnecessary for commanders to dismount at all.

In any case the dismounted conference should be confined to the few items which cannot well be given by R/T, such as indication of objects on the ground.

(b) As companies approach, each company commander will drive down his company centre line, followed by the company guide until the latter has picked up the company centre line. Subsequent positions of company commanders will be where they can best control their companies.

An essential factor to the success of this system is that junior commanders should be kept in touch with the situation.

4. Distances and Intervals.

In open order, distances and intervals will be governed by the following considerations :—

(a) On roads, the basic interval is 50 yards between tanks, but particular care must be taken to avoid regularity, as this renders movement obvious to hostile aircraft.

(b) Across country, distances and intervals will depend on the ground and visibility, but the maximum will be maintained consistent with control. Within sub-units, tanks must move so that they can afford each other mutual support.

(c) Light Sections of Mixed Battalions, at protection stations, will move sufficiently far ahead or to the flank to ensure that their parent units are not engaged by surprise A.T. gun fire. This involves moving one tactical feature in advance.

The frontage and depths of a Mixed Battalion, deployed in open country, may be taken to be approximately 1000 yards square, but this will vary very considerably according to the shape of the ground.

5. Speed of Movement.

(a) With the present types of tanks, the average speed maintained by the Brigade when deployed is 17 miles in two hours.

Units will march at a speedometer speed of 11 m.p.h. for 100 minutes and halt for maintenance for 20 minutes. This two-hourly maintenance halt is of the utmost importance and, if it has to be neglected owing to the urgency of the tactical situation, it is the responsibility of unit and sub-unit commanders to halt at the first favourable opportunity for this purpose.

(b) To carry out their role of reconnaissance ahead of the Brigade without impeding the movement of the main body behind, individual light tanks must move at 20-25 m.p.h. A very high standard of training, particularly in map reading, is necessary amongst all ranks, especially junior leaders, to maintain this rate of movement.

6. Maintenance of Direction.

The term "Direction" indicates the general direction of movement of the brigade or a unit during operations, e.g. "Brigade Direction WARMINSTER—TIDWORTH."

The term "Centre Line" refers to the more concise axis of movement of the brigade or a unit during a phase of an operation, e.g. "QUINTUS Centre Line BOWLS BARROW—BRATTON CASTLE." The centre line also refers to the road or route along which the headquarters of the unit referred to is to move. Should a unit headquarters find it necessary to leave its centre line it will inform all concerned so that, in the event of wireless silence or a breakdown in wireless communications, touch can be maintained by liaison officers in light tanks or other means.

CHAPTER 4

INTERCOMMUNICATION

1. Means of Intercommunication.

The following means of intercommunication are provided :—

- (1) Wireless.
- (2) Visual :—
 - Mechanical Arm Signals.
 - Lamp.
- (3) Liaison Officers.
- (4) Despatch Riders.

2. Wireless.

(a) The primary means is wireless, Radio Telephony reverting to Wireless Telegraphy if and when circumstances make this necessary.

Every tank is fitted with a transmitting and receiving set. This is essential, for,

if commanders' tanks only were provided with sets, casualties to tanks either through mechanical breakdown or any other cause would seriously interfere with control. Any commander must be able to tranship into any tank and exercise command from it. It cannot be sufficiently emphasized that the Tank Brigade relies for success on speed in movement and action and extreme flexibility. This demands personal voice control by all commanders from the Brigade Commander downwards. Consequently all commanders actually operate their sets, so far as speaking and receiving is concerned. The system of wireless communications is shown diagrammatically in Appendix V.

It will be seen from this diagram that there are breaks in through communications at Brigade and Battalion Headquarters. In order to avoid the necessity for halting to pass messages verbally or in writing from one tank to another, all headquarters tanks are to be equipped with a second short-range wireless sending and receiving set for local intercommunication.

(b) It will be noticed that only one frequency is allotted for internal communication within both light and mixed battalions.

Good training and wireless discipline are essential to work such large groups of stations. Messages must be concise and kept as short as is compatible with clearness. To cut down wireless traffic to a minimum, stations below Section Commander in the light battalion and below Company Commander in mixed battalions normally receive only; they only transmit when they have particularly urgent or important messages to send.

3. Visual.

Control within sections of the Light Battalion and Companies in Mixed Battalions is, therefore, mainly by visual methods.

These consist of a simple code of signals given by hand-operated mechanical arms and a code which is transmitted by daylight signalling lamp, using the morse alphabet. The latter code can, on occasions, be sent over the wireless using W/T.

4. Liaison Personnel.

A further means of intercommunication is by liaison personnel travelling in light tanks. As described in Chapter 2, paragraph 3, one liaison officer for each battalion forms a permanent part of Tank Brigade Headquarters. Two light tanks are also included in each mixed battalion Headquarters for this purpose and a spare light tank is provided at Light Battalion Headquarters.

This method of control can only be considered as an auxiliary for use in emergency, such as when wireless silence is ordered or when wireless communications are not operating owing to mechanical breakdown or enemy action. But control by liaison methods is possible and satisfactory for short periods, although it must be realized that the speed and handiness of the formation will be reduced considerably for the time being.

Liaison personnel may, of course, be employed to convey verbal messages when necessary when wireless communications are functioning. They are most useful for carrying marked maps.

5. Motor Cycle Despatch Rider.

A number of motor cyclist despatch riders are included in the establishment of all units. Owing to their vulnerability these will be unable normally to accompany the Brigade during active operations when contact and deployment is probable. Their main use during operations is employment as a means of control of Brigade Transport.

6. Wireless Security.

As inferred in paragraph 4 above the imposition of wireless silence is likely to impede seriously the speed and flexibility of the brigade. It is important, therefore, to employ all other means of obtaining the maximum possible degree of signal security whilst retaining the use of wireless.

To this end the following methods are employed :—

(a) The use of code names for all units. (A list of those in common use is given in Appendix VI. These will, of course, be varied during operations.)

(b) The use of the Protractor Code Disc (Appendix VI).

(c) The use of substitution codes, the numbering of name places before an operation, etc.

CHAPTER 5

OPERATIONS—GENERAL ROLE AND TASKS

1. Duties of Mobile Forces.

The duties of all types of mobile forces may be stated to be :—

(a) *Reconnaissance* of a strategic nature.

(b) *Protective duties*, i.e. covering the advance of the main forces; guarding a flank or covering a withdrawal.

(c) *Exploitation* or pursuit.

(d) *Offensive action* in direct or indirect co-operation with the main forces.

2. The Mobile Division may be called upon to carry out any of these tasks. If employed on a purely reconnaissance or protective operation it is possible that it will not require the offensive power of the Tank Brigade to assist it (but see paragraph 6 below).

If employed to exploit a success of the main forces or in offensive operations, it is probable that the Tank Brigade will be used with the Mobile Division to increase its striking power.

3. The Tank Brigade operating separately from the Mobile Division, either independently or with detachments of mobile troops, is unlikely to be called upon to carry out duties of a reconnaissance or protective nature except in an emergency. It may, however, have to undertake offensive operations or a pursuit.

The operations of the Tank Brigade may, therefore, be conveniently classified as follows :—

Either working independently or in co-operation with the whole or part of the Mobile Division :—

(a) To operate in or near the battle zone to exploit a success, or to attack objectives on or close behind the battlefield.

(b) To operate at a distance from the battlefield in pursuit of a defeated enemy, or to attack deep objectives, or to carry out some special mission.

(c) Action against hostile armoured formations.

4. Action close to the main battle.

The first role entails operations in an area where the enemy is deployed and prepared. It thus offers diminished possibilities of surprise and manoeuvre and of action by threat. Organized opposition will be encountered and, with the comparatively lightly armoured tanks with which the Tank Brigade is equipped, considerable casualties must be expected. Every endeavour should, therefore, be made to launch the Tank Brigade at a time and from a direction which will give the maximum degree of initial surprise.

A prolonged action against an unbroken enemy must be avoided and cannot achieve results commensurate with the losses involved.

The types of objectives which offer themselves are :—

(a) In areas immediately behind the battle front, enemy artillery, local reserves and headquarters of formations in the line.

(b) Further in rear, enemy reinforcements and reserves at rest or in movement, forward installations and higher formation headquarters.

5. Distant action.

In the case of the second role, although at a distance from the main battlefield, the action of the force (Mobile Division and/or Tank Brigade) must form part of the general plan and must be timed and co-ordinated with the operations of the main forces.

There are two essential conditions which must be present to enable such an operation to be carried out :—

(a) The area of operations must be generally suitable for armoured forces.

(b) There must be a choice of objectives, widely separated, which will enable the force to employ its speed and power of rapid manoeuvre to deceive the enemy and forestall his counter-measures.

The types of objectives in this kind of operation are :—

(i) Reserve formations, particularly large M.T. movements.

(ii) Military Headquarters.

(iii) Centres of communication and other essential services.

(iv) In a pursuit, the enemy columns retiring after a defeat.

Although considerable material damage may be done, the primary purpose of such operations must be to dislocate the machinery of command, to cause delay in the

movement of hostile reinforcements and some diversion of forces during a critical period in the main battle.

6. Action against armoured formations.

(a) With regard to the third role. In any campaign in which the Tank Brigade is engaged, it is probable that the enemy will possess armoured formations.

These formations may be used by him :—

(i) To support his mobile troops which are covering the advance or withdrawal of his main forces.

(ii) To act offensively on or near the battlefield, or to operate against the flanks and communications of our forces.

(b) The Mobile Division, in carrying out its reconnaissance or protective duties, may therefore be threatened with or attacked by such forces.

The Tank Brigade will constitute an essential reserve in the hands of the Commander, Mobile Division, to deal with the enemy armoured formations.

(c) When the main forces are in contact, the Tank Brigade may be retained as a reserve in the control of G.H.Q. for counter-attack measures.

7. Negotiation of obstacles.

(a) It is unlikely that extensive areas will be found without certain natural obstacles, impassable to tanks. Rivers and railways will certainly be turned to advantage by the enemy.

Railways are usually passable at many points, such as bridges, tunnels and the level places where cuttings and embankments meet. It is unlikely that all such places will be strongly held.

Rivers, on the other hand, constitute serious obstacles. Although the speed and power of manoeuvre of the force may hope often to disclose weakly held or undefended crossings, the negotiation of a defended river line may have to be undertaken.

When the Tank Brigade is operating with the Mobile Division, the task of securing crossings over such an obstacle will usually be undertaken by the mechanized infantry, supported by artillery and engineers. When operating independently, or if the obstacle is encountered after having been launched by the Mobile Division, the Tank Brigade must force a crossing with its own resources. The provision of light, rapid methods of bridging capable of accompanying the Tank Brigade is, therefore, essential. Probably, the most suitable are the Light Tank flotation equipment and the Dragon bridge.

(b) It is certain that an enemy will use A/T mines for blocking roads and similar defiles, either alone or in conjunction with other artificial or natural obstacles. Mines will usually be covered by fire.

In mobile operations time is unlikely to permit of laying extensive minefields. It is probable, therefore, that the flanks of mined areas may be quickly found. It will thus often be quicker to move by alternative routes and avoid a mined area, even though this may mean a considerable detour.

If circumstances make it necessary to force a passage through a mine obstacle, until a mechanical means of clearing a passage is evolved, personnel must be dismounted to remove the mines by hand. A plan deploying all available support by machine guns

and smoke producing weapons (mortars and projectors) must be made to cover the action of the dismounted party.

8. R.A.F. Co-operation.

For all types of Tank Brigade operations co-operation by the Royal Air Force is a vital necessity.

The types of co-operation required are :—

(a) *Army Co-operation Aircraft.*

- (i) Prior to an operation, comprehensive and detailed topographical reconnaissance will be required to supplement information obtained from maps and other sources.

These reconnaissances will be mainly photographic, but visual reconnaissances will also be necessary. Air reconnaissances by Commanders, Staff Officers and Intelligence Officers of the Tank Brigade of the area of operations will also be of great value.

- (ii) During an operation.

Changes of plan and of direction of movement will make frequent demands for further topographical reconnaissance.

Tactical reconnaissance, particularly to report hostile armoured forces, will be required to a distance of 50 miles ahead or to the flank of the Brigade. When contact with the enemy is imminent, close co-operation patrols will often be of great value.

(b) *Bombers.*

Co-operation by bombing aircraft may take the form of :—

- (i) Bombing attacks on targets timed and co-ordinated with the attack of the Tank Brigade on other objectives in the vicinity ; e.g., if an attack is being made on enemy reinforcements moving through a certain area, aircraft might bomb columns moving through close country, whilst the Tank Brigade attacked other columns moving in an area more suitable for tank operations.
- (ii) Bombing attacks to provide support to cover the attack of the Tank Brigade on a given objective in circumstances when other forms of supporting fire are impossible.

(c) *Fighters.*

The co-operation of fighter aircraft will be invaluable :—

- (i) To obtain local and temporary air superiority during a critical phase of an operation ; e.g. to prevent hostile air reconnaissance observing an important change of direction or to drive off hostile bombers attempting to attack the brigade whilst it is passing a defile.
- (ii) To carry out low-flying attacks on targets in conjunction with the Tank Brigade.

CHAPTER 6

ATTACK

1. The Light Tank Battalion.

(a) When a Tank Brigade is operating with the Mobile Division, reconnaissance will usually be carried out by mechanized cavalry and aircraft and, possibly, armoured cars.

Before the Tank Brigade is launched to the attack, and during the attack, the higher commander will keep the Tank Brigade Commander fully posted with information regarding the general situation.

Once launched, or if the Tank Brigade is acting independently, it must carry out its reconnaissance with its own resources, and the provision of information is the primary task of the light battalion.

Tactical information is required over an area which includes the flanks and often the rear of the brigade, frequently to considerable distances. It is, therefore, beyond the scope of the light battalion to supply the Tank Brigade Commander with all the information required, and it is necessary to supplement the work of the light battalion by placing Army Co-operation aircraft under the control of the brigade. On occasions armoured cars may also be of great value.

(b) During battle the Commander will control his force by information derived from his own observation and from the reports of his units. The particular duty of close co-operation aircraft and the light battalion during this period is to look for the approach of any hostile troops, and if such are discovered, to keep the Commander of the Tank Brigade fully informed as to their movements.

(c) The reconnaissance duties required from the mixed battalions are limited to those necessary to secure their own local protection and to obtain topographical information. Such duties are performed by light tank sections. They must only be detached from their companies to carry out more distant reconnaissances under exceptional circumstances when the light battalion is not available for this purpose.

(d) Although the primary object is to gain information and not to fight, it will often be necessary for the light battalion to fight in order to obtain the information. In such cases vigorous aggressive action will usually be the best course, as this will establish a moral ascendancy over the enemy which will facilitate further reconnaissance.

When touch with the enemy has once been gained it should never be lost, unless by maintaining it the accomplishment of the task would be endangered, or unless orders to the contrary are received from superior authority.

(e) The light battalion commander usually receives his orders from the Tank Brigade Commander verbally.

The orders will include :—

- (i) All relevant information as to the enemy and the country.
- (ii) The Brigade Commander's intentions and plan.
- (iii) Instructions regarding the information which the light battalion is to furnish.

On receipt of orders his first consideration is to decide the number of companies which he will require to deploy. This will depend on his general task, the nature of the country to be searched and the degree of resistance to be expected. The latter consideration affects the strength of the company and battalion reserves which it is desirable to maintain. In addition the maintenance of reserves enables unexpected changes in the direction of movement of the Brigade to be carried out without confusion or delay. As a rough guide, one company may be able to cover 4 to 5 miles of frontage in favourable country.

Since the range of R/T is limited an important consideration is his own position. In general he should be well forward and centrally placed, and his company commanders must be kept informed as to the route by which he is moving. It is the duty of the Brigade Commander to transmit to the light battalion commander any information obtained from aircraft or other sources which will assist him in the execution of his task. While, conversely, the battalion commander must ensure that all information obtained by him is rapidly transmitted to the Brigade Commander.

(f) The company is the normal reconnoitring detachment and the section forms the normal patrol. The company commander thus has five patrols under his hand, and manoeuvres these in order to carry out the instructions which he has received from his battalion commander. He should try to maintain at least one patrol in reserve. Although he will usually move behind the line of his patrols, occasions will often arise, e.g. in the reconnaissance of a tank obstacle, when his personal observation is essential.

(g) The success of a patrol depends principally on the leader and the clearness of the orders he is given.

He should be told :—

- (i) What is known of the enemy and the country over which he is to operate.
- (ii) Movements of neighbouring patrols so that he may not duplicate their work and may know where to look for assistance.
- (iii) His direction of movement, and in the case of protective reconnaissance, the average speed at which he is to carry this out.
- (iv) The direction of movement of his company commander so that he can find him if wireless communication fails.
- (v) What information is required and the times by which it should be sent.

He will obtain information by means of his own observation and is responsible for its timely transmission to his company commander. It must be remembered that all patrols are working on the same wireless frequency, hence the vital importance of short and concise messages.

(h) The normal method of movement of a patrol is the point, the commander, the reserve. The essential consideration is that the point should be far enough ahead to ensure that the whole patrol should not be ambushed at once. The value of concealment both on the move and at rest should also not be forgotten. If the point is held up the leader may attempt to overcome resistance by making a flanking movement with his reserve with the object of threatening the enemy's line of retirement and so bringing about the enemy's withdrawal. At the same time he must make such movement with due caution, as he may find himself involved in a fight with an enemy force of superior strength. Movement should be controlled as far as possible by visual signals, so that

wireless may be left free for the transmission of information—both of his own and that of other patrols.

2. Mixed Battalions.

(a) The Tank Brigade Commander directs the battle by the manœuvre of his mixed tank battalions. As in the case of other formation commanders he should maintain a reserve. Unlike other formations in which the reserve is kept out of the battle until required, in a tank brigade the reserve will usually be in movement on the battlefield. For example, when moving in "column" the second and third battalions constitute the reserve, and when moving "two up" the rear battalion constitutes the reserve. Again when moving "two up" and the Brigade Commander changes direction to form "two up" to the right, then the original left leading battalion becomes the reserve.

(b) The role of the mixed tank battalion in the attack is the destruction of the enemy in the area laid down by the Brigade Commander.

(c)—(i) During the period immediately preceding an attack the battalion commander will normally be moving with No. 1 Party in readiness to receive the Brigade Commander's final orders. His battalion will be under command of the second-in-command of the battalion. No. 2 Party may have been formed, and the battalion will be ready for deployment on the reception of final orders as described in Chapter 3, paragraph 3.

(ii) During battle the battalion commander will move so that he can control his companies without, if possible, becoming embroiled in the fight.

(iii) During both periods wireless forms the principal means of intercommunication. Two light tanks are available at battalion Headquarters for message carrying. Since all tanks in the battalion, except the rear link tanks, are on the same wireless frequency, the foundation of control is a high standard of wireless discipline, and economy in the use of wireless. The latter is dependent not only on the efficiency of the sets, but on the training of the operators with special reference to their ability to send short, clear and concise orders, messages and reports, and to keep silent unless speech is essential.

(iv) The battalion commander will direct the battle by the manœuvre of his unit in the formation suited to the ground and the tactical situation.

Column is suited for an attack against deep and narrow objectives.

One-up is suited for attacking an area about which the commander has limited information.

Two-up is suited for attack an area about which the commander has good information and where the attack is being made on a broad front.

Line should rarely be used, as this formation does not permit the battalion commander to maintain a reserve; it may, however, be useful in an attack delivered on a wide front against a shallow objective, e.g. a flank attack against a marching column.

(v) As in the case of the brigadier, the battalion commander affects the battle by the manœuvre of his reserve. This is dependent on the formation in which he is moving; thus if in column or one-up he has a reserve of two companies, if in two-up a reserve of one company.

(vi) After the capture of each objective the battalion will be rallied in readiness for further action.

The term "rally" does not mean that the unit will be assembled in close formation;

companies will move to a named area and halt dispersed under available cover, report their position and prepare for further action.

The battalion commander will carry out such re-organization as may be required and will inform the brigadier as to his casualties and his degree of readiness for further action.

(vii) During the action it is the duty of the battalion commander to forward to the brigadier any information likely to affect his plan. Early information as to the approach of hostile tanks is especially important.

(d)—(i) The role of the mixed tank company in the attack is the destruction of the enemy in the area laid down by the battalion commander.

(ii) During the period immediately preceding an attack the company commander will normally be moving with No. 2 Party in readiness to receive his battalion commander's final orders. On receipt of these he will select his company centre line and place himself upon it, so that his company can form up on him as it is led up from the position of deployment. When it arrives all tank commanders will have heard the battalion commander's orders on the wireless and will similarly know the latest information regarding the situation. A short wireless order or visual signal from the company commander indicating the objective and company centre line should then be sufficient to launch his company to the attack. It should thus be unnecessary to dismount tank commanders in order to give verbal orders; this procedure should be avoided if possible.

(iii) During battle the company commander will move so that he can control his company. In the early stages of an attack he will move well forward in close proximity to his light section commander, so that he can observe the situation as it develops. At a later stage when it becomes necessary to commit his medium section, he will indicate to it the direction of its advance, but he should avoid becoming involved in the fire fight. During this period he will move so that he can observe, control the action, and prepare for the next phase.

(iv) After the capture of an objective the company will be rallied and re-organized in readiness for future action, and casualty reports will be forwarded to the battalion commander.

(v) Whilst the detailed method to be employed in each operation depends on the ground and the nature of the opposition, the tactics of the mixed tank company are dependent on a clear understanding of the characteristics and roles of the light, close support and medium tanks. A consideration of these leads to the following fundamental principles :—

First, success depends on the close co-operation of the light, close support and medium tank sections, so that the last-named can obtain a decision in accordance with the commander's plan with the minimum of interference and casualties from the enemy's weapons. Second, the medium sections should never be committed without the co-operation of light and close support tanks.

(e)—(i) The medium section is the principal assault weapon of the company. During the early stages of the attack the medium section will advance behind the light section. Its distance behind it will depend on the ground, the chief consideration being to avoid coming into the effective range of unneutralized anti-tank weapons. The section commander will not confine his advance to the company centre line, but will lead his

section in the formation, and by the route, which affords the maximum concealment from observation and protection from fire.

(ii) During the final phase it should move so as to allow the development of its maximum fire power whilst at the same time affording the minimum target to the enemy. An important factor is co-operation of the two tanks which form a sub-section; the training of the sub-section is therefore an important part of section training.

During this phase the section commander should move so that he can rapidly regain control of his section in order to deal with unexpected situations, e.g. the approach of enemy tanks.

(iii) After the capture of an objective he will rally his section in the area ordered by his company commander.

(f) The principal roles of the light section are :—

(i) to act as ground scouts for the medium section.

(ii) To discover the enemy and locate his defence.

(iii) At all times to protect the medium section from the fire of anti-tank weapons.

(iv) To overcome resistance within its power and so avoid delaying the advance of the company.

(g) In the early stages of an attack the light section precedes the medium section. Since the protection of the medium section entails the neutralization of anti-tank weapons on the flanks of the medium section as well as to its front, this involves considerable dispersion of the light section, which will usually have to deploy all three sub-sections. Although the maintenance of a sub-section in reserve is desirable, it will thus seldom be practicable, unless the company is advancing "en cadre," or the ground is exceptionally favourable.

(h) Light tanks rely on their speed and handiness, inconspicuousness, fire, and ability to provide themselves with their own local smoke screen, to penetrate a position. It will seldom be possible before an attack to give the light tank section detailed instructions; in addition its dispersion makes control by the section commander difficult. A high standard of tactical training is therefore required by sub-section commanders, who must understand, not only their own role, but those of the medium and close support sections. They must also have a highly developed sense of finding their own way across country, and understand that mutual co-operation of the tanks forming their sub-sections is at all times essential.

(j) When the medium section is ordered to attack an objective a proportion of the light section will keep the objective under fire while the remainder protects the medium section during its movement. The light section is also responsible for the protection of the medium section both when engaged in mopping-up an area or in occupying a forward rallying area. It will do this by taking up positions to prevent anti-tank weapons from bringing effective fire on the medium section and to give warning of attack by enemy tanks.

(k) The normal role of the close support tanks is the protection of the light and medium sections by screening with smoke the enemy's anti-tank weapons. On occasions, close support tanks may fire H.E. shell.

During the early stages of an attack the close support tanks will usually be well forward moving where they can quickly support the light section.

When the company commander decides to commit this medium tank section, the close support tanks will assist its advance in co-operation with the light section.

The indication of targets may be given to close support tanks by the company commander. Commanders of close support tanks must, however, be prepared to support an attack on their own initiative and without orders. The close support tank is largely a weapon of opportunity in which the time factor is of first importance. Its successful handling thus depends on the training and knowledge of its commander.

3. Special considerations regarding the attack on artillery areas.

(a) Although the Tank Brigade can attack a hostile artillery area and achieve a degree of success which will divert the guns from their normal tasks of supporting the battle front, it is probable that such an action would only be carried out at considerable cost in casualties.

The decision to launch the Tank Brigade against such an objective, therefore, requires to be carefully weighed.

(b) In an attack by the Tank Brigade against an artillery area, the first requirement is information of the location of the enemy batteries. The Tank Brigade will be furnished with the latest information in this respect before it sets out on its task, after which further information will be supplied by the close reconnaissance aircraft operating under control of the Tank Brigade, and by the light battalion.

If possible, artillery areas should be attacked in flank and rear, and at a time when the artillery is engaged in supporting their own infantry. The area should be subdivided into battalion objectives.

The timing of the attack will depend on the ground, but a simultaneous attack in all battalion areas will enable the maximum value to be obtained from surprise.

(c) In forming a battalion plan it must be remembered that batteries are likely to be situated in positions affording mutual support to each other against tank attacks. The maintenance of a battalion reserve is, therefore, important.

(d) The general mechanism of the attack on a battery by a company is :—

- (i) The discovery of the battery by the light tank section, based probably on information previously supplied.
- (ii) Engaging the battery by the fire of the light tank section.
- (iii) The employment of the close support section to smoke the battery.
- (iv) The assault by fire from a flank by the medium section under cover of the protection of the light and close support sections.
- (v) Finally, a sub-section of tanks will probably be required to close on the battery to complete the destruction of material and prevent surviving personnel from re-manning the guns.

NOTE.—In order to avoid surprise by a supporting battery the medium section will always be covered by a proportion of the light section during its flanking movement.

4. Special considerations regarding the attack on marching columns.

- (a) There are two possible methods of dealing with this type of objective :—
- (i) Threat of attack.
 - (ii) Actual attack.

The threat of attack is very likely to impose caution and may cause columns to halt. This, may, therefore, have a considerable delaying effect and may, in certain circumstances, achieve the object to be attained.

The most effective method, however, is undoubtedly actual attack, to inflict serious physical and material damage and loss. If columns halt and have time to deploy, and if the ground offers facilities for A/T defence, attack may not be profitable. The attainment of the maximum degree of surprise is, therefore, most important.

If columns continue to advance under cover of a system of A/T picquets and protective detachments, attack may be justified. Such protection will probably lack depth, and if the ground lends itself to free manœuvre by tanks, a concentrated attack may break through with little loss.

- (b) The method of attack varies according to the nature of the column.
- (i) Non-motorized troops.

The greater mobility of the tank brigade enables the Tank Brigade commander to select the time of his attack and the area in which he will carry it out. It is thus unnecessary to stop the head of the column. The first requirement is information as to the enemy's advance. This may be provided either by air or by patrols of the light battalion.

The second requirement is the surprise of the enemy; hence light tank patrols, which have discovered the enemy and are watching his advance, must take every precaution to avoid being seen, and will usually not disturb the enemy by opening fire on him.

The brigade commander's plan will depend on the nature of the country and the enemy's dispositions as far as these are known to him. In general, an attack against one or both flanks by one or more mixed tank battalions is usually the most effective method. In the battalion attack the first step is the neutralization of the enemy's anti-tank defence, the second is the destruction of his personnel.

This will be achieved primarily by advancing to positions from which overwhelming fire can be brought to bear. A proportion of the tanks may, finally, close with the column to complete the destruction of material.

- (ii) Attack against motorized troops.

Such columns are extremely vulnerable to attack by tanks; but, being faster than the tanks, rely on their speed for their protection.

The first essential is to stop the column at or near its head. For this reason any light tank patrol which discovers such a column should at once attack it as far forward as possible, thus causing it to halt and creating the opportunity for an attack by the main body of the brigade.

If the discovery of the column has been made by air and it is desired to attack it, the first step is to send a detachment of light tanks at full speed to

attack its head. This should be followed up by similar detachments to prevent the diversion of the column.

If the light tanks are too far away to intervene, the column will escape unless the air can impose sufficient delay on it.

5. Special considerations regarding the forcing of a defended river line.

(a) When the Tank Brigade is operating with the Mobile Division the mechanized infantry and supporting arms will usually undertake the forcing of a defended river line. It is to be borne in mind that in such circumstances it will be the object of the Divisional Commander to launch the Tank Brigade intact and in the best conditions.

(b) When the Tank Brigade is operating independently, or if it encounters the obstacle after it has been launched to the attack, and is out of support of other arms, it will be necessary for it to negotiate the obstacle using its own resources.

(c) The light battalion will be carrying out its task of reconnaissance and protection ahead of the brigade. Its duty will be to reconnoitre on a wide front in order to discover any undefended crossings and, if unsuccessful, to provide the Tank Brigade Commander with information as to the most favourable places at which to force the obstacle.

Speed to forestall any movement of enemy troops to resist the crossing is essential. The Tank Brigade commander, having foreseen the possibility, will, therefore, probably move one or more mixed battalions close behind the light battalion to take advantage quickly of the information gained. He will, himself, be well forward in order to be able to make a quick personal reconnaissance and make his plan with the least possible delay.

(d) Having decided at which point or points to attack, the Brigade Commander may delegate to a subordinate commander the executive command of the action, placing at his disposal the necessary troops.

In this case it will usually be advantageous to vest the command of the operation in the commander of the light battalion or company, who will probably be on the spot and have personal knowledge of the ground and situation, and to re-inforce him with a mixed battalion or company.

(e) The plan for forcing the crossing will embody the following :—

- (i) Light battalion patrols in the vicinity should be placed so that they can bring the maximum fire to bear to support the subsequent crossing.
- (ii) The bulk of the medium tanks and the close support tanks should be deployed to produce the maximum supporting fire.
- (iii) If the crossing is blocked by an obstacle, a sub-section of medium tanks will usually be required to negotiate or remove the block and cross first.
- (iv) The light section of that mixed company should then follow and clear the immediate vicinity of hostile defenders.
- (v) Patrols of the light battalion should be prepared to cross as soon as possible subsequently and enlarge the bridgehead, gain control of the commanding ground on the far bank and continue with their normal tasks.
- (vi) To summarize, the main conditions are :—

Speed.

Deployment of all available supporting fire of all natures.

A clear plan and order of priority for crossing.

(f) In the event of the bridge being destroyed or being otherwise impassable, thus making it necessary to cross by the use of light tank flotation equipment or Dragon bridge, the same principles apply. It will then be the duty of the first light tank elements, having effected a crossing, to operate against the rear of any defended and intact bridges in the vicinity and thus open a path for the remainder.

6. Special considerations regarding attacks on headquarters, depots and installations.

(a) Such objectives may often be situated in villages and towns. They will usually be defended.

The Tank Brigade should, as a general rule, avoid entering towns, but its speed and power of manoeuvre may often make surprise attacks possible, particularly if the general plan of the operation includes a number of alternative objectives (*vide* Chapter 5, paragraph 5).

(b) When the objective is in a town the light battalion will penetrate any outlying A/T defences and will surround the town and block all exits prior to the attack by the Mixed Battalions.

The town will be divided into sectors, each containing one or more battalion objectives.

The Mixed Battalions will then enter by as many roads as possible, and simultaneously from all sides of the town.

Liaison points between units must be fixed beforehand.

For street fighting mixed parties, each of one close-support tank, one or two medium tanks and three or four light tanks, are most effective.

(c) The control of a large town for any length of time by a tank brigade is difficult on account of the small number of personnel available. If this is desired, the assistance of mechanized infantry will be necessary.

(d) In dealing with a headquarters the following considerations must be borne in mind :—

- (i) The number of prisoners which a tank unit can take is strictly limited.
- (ii) The communications must be destroyed—these will consist of wireless sets carried in vehicles, and distributed around the headquarters, and a signal office from which telephone wires radiate.
- (iii) Valuable documents should be looked for and seized as soon as possible.
- (iv) The number of personnel in the tanks is small. They should not leave the protection of their armour, except when necessary to enter buildings. In such cases they must always be covered by the fire of the tanks. The moral effect of the presence of the tanks will enable such men as have to dismount to carry out their tasks with little fear of opposition.

(e) In dealing with depots and installations it may be necessary to carry out demolitions.

Explosives form part of the equipment of tanks of the Tank Brigade and crews are trained in their use.

In the case of extensive demolitions being required the attachment of R.E. personnel

and special materials may be necessary. The role of the tank units will then be to obtain control of the area and protect the work of demolition.

(f) When objectives of this nature are given to the Tank Brigade it is essential that the fullest information of the topography of the town is placed in the hands of the Tank Brigade Commander prior to the commencement of the operation, so that detailed plans can be formulated in advance and promulgated to units. Air photography will be of value in this respect.

An intensive bombing raid timed to take place immediately before the town is entered is likely to disorganize defensive arrangements. The co-operation of bombing aircraft in such an operation is, therefore, invaluable.

CHAPTER 7

DEFENCE

1. General considerations.

The tank is primarily a weapon of offence and the Tank Brigade a powerful offensive organization. There will be periods, however, in every campaign when the Army will be forced to adopt the defensive. In such circumstances the Tank Brigade will best fulfil its purpose if it is employed in a manner in which its mobility and fire power are exploited to the full.

2. Counter-attack.

(a) The primary role of the Tank Brigade in defence is, therefore, counter-attack.

In carrying out this role the Tank Brigade may operate independently or in co-operation with other mobile troops. In either case counter-attacks by the Tank Brigade should form part of a co-ordinated plan with the action of the other formations.

(b) The Tank Brigade forms a powerful reserve in the hands of a commander.

Its value as a reserve lies partly in the fact that its presence will be a factor to be taken into consideration by the enemy which will influence his plan, impose caution, and possibly deter him from taking a course of action which would otherwise be advantageous to him. Further, the value of the Tank Brigade as a reserve is enhanced by its mobility and range of action which enables it to intervene rapidly in any selected area.

(c) The Tank Brigade should not be split up and allotted to various sectors of the defence for local counter-attack, but should be retained entire for definite counter-attack on a major scale. Such local counter-attacks are the role of Army Tank Battalions.

(d) One of the tasks which the Mobile Division may be called upon to carry out is to protect the withdrawal of the main forces.

When pressing forward rapidly, enemy columns are liable to become strung out, and normal precautions are apt to be neglected. In these circumstances opportunities for an effective counter-attack may occur, the remainder of the force being used to hold or distract the enemy, whilst the Tank Brigade is launched to attack the flanks. Such counter-attacks will be rapid and limited in scope.

(e) In considering the employment of the Tank Brigade in defence, probably the

chief pre-occupation of a commander will be to use it to neutralize or destroy hostile armoured formations.

The enemy may employ his mobile armoured troops to attack the flanks and rear of our forces. In such circumstances his object will be to avoid contact with the defending tank formations and operate against columns, communications and installations with a view to causing the maximum confusion and casualties.

To accomplish this object a degree of dispersion by the enemy is inevitable, and opportunities may occur for attacking him in detail with the concentrated Tank Brigade.

Early and accurate information of the enemy movements is essential. The co-operation of aircraft and, if available, other armoured mobile troops is required for this purpose.

The Tank Brigade will move to the attack covered by its light battalion, which will finally and definitely locate the enemy and provide the Tank Brigade Commander with information on which to make his detailed plan.

If the enemy does not disperse, but keeps concentrated, and is in superior force, once he has been located, the aim of the Tank Brigade will be to hamper and delay his movements and to draw him into areas where he can be engaged by established A/T defences.

3. Tank Infested Areas.

(a) To use tanks to occupy fixed positions is to sacrifice their mobility and make them particularly vulnerable, when located, to attack by A/T weapons, by bombing aircraft and by artillery fire. Tanks cannot, therefore, hold positions, or carry out a static form of defence.

On the other hand, by making use of their power of rapid manœuvre and ability to bring sudden and intense bursts of fire from unexpected and constantly changing directions, tanks can impose very considerable delay on an advancing enemy and, under favourable conditions, force him to a standstill. The Tank Brigade can, therefore, deny areas of ground for limited periods of time.

This form of defensive action, which is best described as the creation of a "tank infested area" can, when desirable, be adopted as an alternative to counter-attack. It is a particularly effective method of delaying hostile columns when conditions are not favourable to attack.

(b) The detailed methods used are :—

- (i) The Light Battalion is deployed on a wide frontage, each company being given an area in which it establishes piquets, usually one patrol, on all the routes through the area. These patrols engage the enemy by fire, from concealed positions, as he attempts to move through the area, withdrawing subsequently to a succession of previously selected positions in rear or to a flank from which the action is repeated.
- (ii) The Mixed Battalions are held as a reserve in rear. They will, according to the frontage and the ground, be either concentrated or located separately in positions from which they can strike at favourable targets which present themselves; the object of the light battalion patrols in withdrawing must be to draw the enemy into areas favourable for attack by the Mixed Battalions.

(c) This type of action can be carried out by day or night. The retention of a reserve of Mixed Battalions at night is not necessary, as such a reserve could not be used effectively in the darkness. At night, therefore, the Light Battalion may be withdrawn to rest and the Mixed Battalions employed in small detachments of light and medium tanks covering all routes. These detachments will operate on the lines described above in the case of light tank patrols by day.

(d) The main considerations to be borne in mind are :—

- (i) When the Tank Brigade is employed to deny ground in this way, it must commence operating well in front of the ground it is intended to deny.
- (ii) Liberty of manœuvre over a wide area and in depth is essential.
- (iii) Considerable dispersion of the Brigade is inevitable. Consideration must be given, therefore, to the possibility of attack by superior hostile armoured formations.

4. Holding an obstacle.

(a) The Tank Brigade can hold an obstacle such as a river or canal line for a limited time. The time will depend on :—

- (i) The length to be held.
- (ii) The number of bridges and fords to be defended.
- (iii) The suitability of the ground for fire positions covering the defiles and for manœuvre in rear of these positions.
- (iv) The composition of the enemy's advanced elements. Against light A.F.Vs., light guns and lorry carried M.Gs., considerable delay may be imposed. Against infantry, however, it will be difficult to prevent a crossing being forced at selected points, but the tank reserve should still be able to impose considerable delay by operating against the unsupported hostile elements which have succeeded in crossing.

(b) The main points to consider are :—

- (i) A detailed reconnaissance by all commanders is vital, not only of the obstacle but the ground in rear.
- (ii) All crossings must be covered by adequate S.A. and A/T fire from concealed positions, and the dispositions and fire plans of neighbouring sub-units must be co-ordinated.
- (iii) Concealed routes for each tank up to and back from the obstacle should be selected, together with alternative fire positions.
- (iv) An adequate mobile reserve must be kept in hand and sufficiently far back to have liberty of manœuvre.
- (v) Adequate communication between the forward elements and the reserves is essential.
- (vi) Crossing should be blocked by obstacles and these should be as inconspicuous as possible.

(c) The Brigade Commander will allot battalion sectors and decide on the strength and location of the battalion reserve.

Company commanders will decide the number of tank piquets required on their

company fronts, the position of these, what obstacles should be made, what patrolling by day and night is required, the position of company headquarters and the use and position of close support tanks.

The company commander will select covered routes back and must take every opportunity of allowing his personnel to reconnoitre the ground in rear.

The use of wireless, except in emergency, must be prohibited, but all sets must be tuned and ready for instant use.

All ranks must be warned against unnecessary movement. Special precautions must be taken against aeroplane observation.

CHAPTER 8

TANK VERSUS TANK ACTION

1. Gaining of information.

(a) Tank versus Tank actions may vary from combats between light tank sections and patrols to action between complete formations such as the Tank Brigade.

(b) When such an action is imminent, the first requirement of a commander is early and accurate information as to the enemy strength and movement.

The provision of this information will be the duty of :—

- (i) Aircraft. Tac/R aircraft, under the control of the Tank Brigade Commander, must be made available. These must operate at considerable distances ahead to give the Commander time to act on the information received and make a plan avoiding or accepting battle. The task of the aircraft will be to obtain information of the strength and direction of movement of the enemy's main forces. One of the difficulties is likely to be that of distinguishing, from the air, between our own and hostile tanks.
- (ii) The Light Battalion. This must be deployed on a wide front to confirm and amplify the information gained by the air. The information required by the Commander from the Light Battalion is the location and direction of movement of the hostile medium or heavy tanks. Light Tank Battalion patrols, must, therefore, endeavour to penetrate the hostile protective troops and, having located the enemy medium tanks, keep them under observation.
- (iii) Light tank patrols from Mixed Tank Battalions. As the opposing forces draw closer, patrols from the light sections of Mixed Battalions will usually be required, pushed out farther afield than is the normal custom, to obtain detailed information of the enemy from the local commander's point of view. Special patrols, drawn from the Light Sections of the Mixed Companies, may be required to act under control of the Mixed Battalion Commander for this purpose, although no company must be denuded of all its light tanks ; at least one sub-section must be left with a Company for its own protection and local reconnaissance.

2. The object of the commander.

(a) Acting on the information received from the above sources, and as a result of a careful study of the map and a personal reconnaissance of the ground, the Commander will make a plan.

(b) Tank versus Tank actions are won by FIRE. The object of a commander will, therefore, be to manœuvre his command so that superior fire can be brought to bear on the enemy under the most favourable conditions, and, if possible, from more than one direction.

The conditions which will produce the greatest degree of fire superiority are :—

- (i) Delivery of fire from a stationary platform.
- (ii) Numerical superiority.
- (iii) Favourable ground.
- (iv) Superior gunnery.

3. Stationary platform.

Greater accuracy can be obtained if the tank is stationary. The object of a commander will be, therefore, to deploy his tanks so that they can bring fire to bear from stationary, concealed positions. This may not always be possible, and ability to shoot accurately on the move is an essential part of training.

4. Numerical superiority.

(a) A general numerical superiority will seldom be obtainable. The shape of the ground and the natural and artificial obstructions will impose restrictions which will seldom enable more than one or two medium sections to deploy on a single feature. The action of a battalion, and even more of a brigade, will therefore be likely to take place over a wide area and to take the form of a number of separate local combats.

Local and temporary superiority in numbers can, however, be obtained :—

- (i) By surprising the enemy in areas where the ground does not allow him to adopt a formation which enables him to bring all his available guns into action. e.g. in a defile or as he is in the process of crossing an obstacle.
- (ii) By using light tanks and smoke to attract the enemy's attention in a misleading direction, draw him into unfavourable ground and, possibly, to cause him to make detachments.
- (iii) By superior control and fire discipline ; all available tanks fully deployed and opening fire simultaneously.

5. Ground.

The following factors will be taken into account by a commander in making his appreciation of the ground prior to a tank versus tank action.

(a) A ridge is a vital piece of ground in tank versus tank fighting, as it offers opportunities to occupy "hull down" positions (i.e. positions in which tanks can move just below the crest so that the commander can observe and the gunner can engage the target whilst only exposing the turret to the enemy) ; tanks can move freely under cover of the crest, disappear and re-appear at different places ; the enemy is unable to observe

his fire, except shorts, whilst conversely, conditions favour accurate observation of fire by the tanks in possession of the ridge ; and finally, if it is desired to close the range, the run of the ground favours rapid movement.

(b) Parallel ridges, or a main ridge with tributary spurs, offer opportunities for bringing converging fire to bear from two directions.

(c) Valleys and low ground (if overlooked by higher grounds) are to be avoided.

(d) Rivers, railways, or a series of woods or villages which create defiles which will force the enemy to bunch or divide his forces, should be turned to account by covering the exits.

6. Gunnery.

Apart from individual skill in the use of his weapon by the gunner, i.e. accuracy of aim, a high standard of judging distance, and ability to maintain a rapid rate of fire, superior gunnery can be achieved if the commander has manoeuvred his tanks to obtain the best conditions. Thus :—

(a) Accurate head-on shooting is extremely difficult. Every effort must be made, therefore, to manoeuvre so that a broadside shoot is possible.

(b) The position of the sun must be taken into account ; it is disadvantageous if the sun is in the gunner's eyes.

(c) Background is important with a view to accurate observation of fall of shot.

(d) Fire should be opened at ranges which make full use of the accuracy of the gun. At close ranges good gunnery is at a discount. The 2-pdr. is an extremely accurate weapon and from a stationary platform effective shooting up to 1500 yds. is possible.

(e) Efficient control is essential, producing simultaneous opening of fire by all guns that can bear and ensuring that fire is distributed over the whole target. On occasions it may be desirable to concentrate the fire of all tanks, e.g. when hostile tanks appear piecemeal, or when the enemy H.Q. tank is recognized.

7. Control.

Commanders must concentrate on directing their units and avoid becoming involved in the fire fight.

(a) The Brigade Commander cannot control the action in detail. Having made his plan and deployed his units, he will exercise general control, check excessive dispersion, rally units after an engagement, influence the battle by the use of his reserves and plan the next move.

(b) A Mixed Battalion Commander, similarly, having deployed his companies, will ensure co-ordination between companies, disseminate information, but will seldom interfere with the executive action of the companies.

He will generally retain control of the majority of the close support tanks as the danger of an indiscriminate use of smoke in a tank versus tank action is a very real one. He may also retain a proportion of the light tanks under his own hand for reconnaissance and protective duties, thus enabling the Company Commander to concentrate on the control and deployment of the medium tanks.

(c) A Company Commander's object will be to manoeuvre his medium tanks so that they come into action in the most favourable gunnery conditions. He will use the

light sub-section or sub-sections remaining under his control to reconnoitre ground ahead, to gain information of the enemy and to screen his movement. When the fire fight opens, the light tanks will clear the front and watch the flanks; opportunities may occur for the light tanks to engage the enemy with their A/T weapons, but their role is not that of engaging hostile medium tanks.

The Company Commander will use any Close Support Tanks left under his Command to smoke parts of the enemy force whilst the medium tanks concentrate on the remainder. He may also use them to deceive the enemy by attracting his attention in a misleading direction or to cover his own movements, always providing that he does not use his own smoke in a way which may interfere with the action of neighbouring companies.

Finally, the Company Commander will move himself so that he can best observe and control the action of his command, and ensure that its action is timed and is in co-operation with units in his vicinity.

CHAPTER 9

TANK BRIGADE TRANSPORT

1. Composition of Brigade Transport.

(a) The following transport is provided to maintain the fighting portion of the Brigade :-

- (i) Unit Transport of Brigade Headquarters and Tank Battalions. This comprises unit reserves of petrol, oil, grease, ammunition and spare parts; food, water, cooks and cookers; and a certain number of cars of various types.
- (ii) Unit Transport of Tank Brigade Signals. This carries Signals mechanics with stores, charging plant and spare batteries.
- (iii) Tank Brigade R.A.S.C. Companies (2nd Line) consisting of sections carrying supplies, petrol and ammunition.
- (iv) Third Line R.A.S.C. Companies comprising a Supply Section, and Petrol and Ammunition Parks.

(b) The above organization is designed to function when there is a protected line of communication from railhead to troops which allows a system of daily replenishment to be operated.

(c) When the Tank Brigade is engaged on active operations such a system will be impracticable. A transport echelon, consisting of the minimum number of vehicles and carrying essential commodities only must, therefore, be organized.

Bearing in mind the conditions in which the Tank Brigade is likely to be situated when replenishment takes place, it is essential that this transport echelon should be organized so that it can join the Brigade in Harbour without the necessity for prior redistribution or re-shuffling of vehicles, and so that vehicles can proceed rapidly and without confusion direct to each unit and sub-unit for which it is carrying supplies. This

demands an organization on a unit basis, as opposed to one on a commodity basis. An organization on these lines is given in Appendix VIII ; This has been tried out extensively by the Tank Brigade. It will be noticed that :—

- (i) No food or cookers are included. Rations for three days are carried on fighting tanks, and each sub-unit is provided with a portable cooker.
- (ii) A certain number of motor cars and motor cycles are included for purposes of command and control.
- (iii) The commodities carried are :—

Petrol	}	Mixed lorry-loads, giving 100 per cent. refill.
Ammunition		
Fitters.	}	
Spares.		
Tools.		
Signals Stores.	}	
Spare Batteries.		

A proportion of spare crews can be carried in load-carrying vehicles. A medical van per unit is included.

- (iv) The organization consists of self-contained battalion groups, divided into sub-unit groups.

2. Movement of Brigade Transport.

(a) The method of movement depends on the conditions in which the Tank Brigade is operating, viz. :—

When the Tank Brigade forms part of the Mobile Division. In this case, transport will be controlled by Division H.Q.

When the Tank Brigade is operating independently. In this case the transport may :—

- (i) Follow closely behind the Brigade, thus gaining a considerable measure of protection. This method will, however, tend to hamper the freedom of manoeuvre of the Brigade and absorb a portion of the fighting units in protective duties.
 - (ii) Move by bounds from one harbour to another behind the Brigade.
 - (iii) Remain in its original harbour and move, when ordered, direct to a harbour to which the Brigade has withdrawn, or will later withdraw, after the completion of a phase in its operations.
- (b) An adequate number of A/T Rifles and L.M.Gs. is carried on the vehicles of the Brigade Transport for local protection. These are mounted on the vehicles for instant use in movement and will be mounted on the ground at halts or for the protection of harbour.

(c) Movement through a hostile area should be made rapidly in dispersed formations using every available route. Wireless communication between groups is essential for control.

3. Harbours.

(a) During periods of rest the Tank Brigade occupies a harbour. When operating with other troops the Tank Brigade harbour may be protected by other troops and the Brigade will be responsible for its local protection only. When acting independently the Tank Brigade will be entirely responsible for its own safety.

(b) In the selection of a harbour the first requirement is concealment from observation; the second that precautions must be taken against attacks by aircraft or land troops; the third is that personnel should be given the maximum of rest. Dispersion over a wide area in unit or sub-unit harbours minimizes risks from air attacks but increases the numbers required for protective duties against attack by land troops and so diminishes the amount of rest obtained. The Commander must strike a balance between these two conflicting considerations.

(c) Cover should be sufficient to enable maintenance to be carried out by night with lights. The entrances to the harbour should, if possible, be by metalled roads in order to avoid showing tracks leading into the harbour to hostile aircraft observers.

In order to reduce the risks of attack by land troops, the fewer roads leading into the harbour area the better. There should be no extensive cover close to the harbour in which hostile land troops can form up or through which they can infiltrate unobserved.

(d) Unit and sub-unit harbours must be large enough to allow tanks and transport to park alongside each other so that the process of refilling can be carried out with the minimum of movement.

(e) Harbours should allow of quick evacuation in emergency and alternative harbours should be selected.

(f) The following terms are used in connection with harbouring:—

Harbourmasters	Senior representative from battalions.
Guides	Company representatives.
Harbour-Rendezvous .. .	A selected locality where harbourmasters meet a representative from Brigade H.Q. prior to the reconnaissance of a harbour.
Harbour-Meeting Point	A selected locality where guides meet harbourmasters.
Harbour-Regulating Point	A selected locality where guides meet the Brigade Transport. At this point transport is marshalled into the most convenient order for harbouring. This point must be a sufficient distance from the harbour to avoid giving away the location of the latter.
Harbour-Stragglers' Post	A selected locality outside the harbour where vehicles which have been delayed on the line of march collect and from where they are guided into harbour.

(g) In order to assist in concealment, entry into harbour must be made quickly; there must be no halt outside in the open. The location of a harbour must not be subsequently revealed by movement inside it, by personnel or vehicles on the edge of the cover, by movement of late arrivals or by use of headlights and fires at night. Units must be able to enter and break harbour by day and by night (without lights) without delay and confusion. Harbouring must therefore be carried out as a definite procedure with which all ranks are familiar.

(h) As soon as the Brigade Commander decides to harbour, he will select from the map, supplemented by reports from air and ground reconnaissance which have been received :—

- (i) The general area in which the harbour is to be.
- (ii) The rendezvous (and time) at which harbourmasters are to meet the brigade representative.
- (iii) Meeting points.
- (iv) Regulating points.
- (v) Stragglers' posts.

These locations are sent out to all units in a brigade order.

(j) The Brigade representative will meet the harbourmasters at the Rendezvous and the party then proceeds to the harbour area and selects unit harbours. To enable this to be done it will usually be necessary to send out this party at least three hours before it is intended to harbour units.

(k) Each harbourmaster is responsible for the lay out of his own area and for, subsequently, making proposals to his Commanding Officer for the protective measures required. The Brigade representative is responsible for the co-ordination of protective arrangements and for reporting to the Brigade Commander any special protective measures which he considers necessary.

(l) Having carried out his reconnaissance, each harbourmaster returns to his unit meeting point, picks up the guides of either the fighting portion of the Brigade or the Brigade Transport, whichever is to harbour first, and takes them to the harbour.

Having seen their sub-unit areas, guides proceed to meet their units and lead them into harbour.

The first echelon (fighting or transport) reaching harbour is responsible for providing guides to meet and lead in the other echelon.

(m) The light battalion, if it has been actively employed all day, should be relieved of protective duties in harbour. Local protection will be provided by harbour guards and outlying picquets.

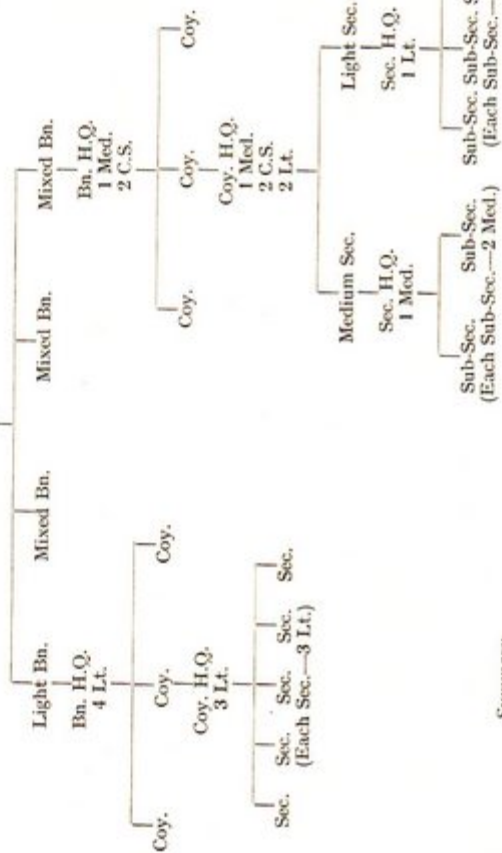
Harbour guards consist of guard tanks posted for close protection of unit areas. These should be medium tanks, as the size of the crew allows of reliefs for sentry duties. Outlying picquets will usually be required to watch all routes leading into harbour; they should normally be about two miles from the harbour. They will consist of medium tanks, usually in pairs; a light tank may be added for message carrying.

(n) Fighting aircraft will be of great value in preventing hostile aircraft from locating a harbour during its occupation.

(o) Wireless silence should be observed as units approach the harbour area, and must be strictly observed in harbour. Intercommunication in harbour will then be by runner, motor cyclist or officers in cars. All headquarters down to Company Headquarters will be marked by an illuminated sign.

ORGANIZATION OF THE TANK BRIGADE

Bde. H.Q.
6 Med.
4 Lt.



Summary.

	Lt.	Med.	C.S.
Bde. H.Q.
Light Bn.
Mixed Bn.	..	6	..
Do.	8
Do.	..	23	8
Do.	..	23	8
Do.	..	19	8
Do.	..	19	8
	131	63	24

APPENDIX II

MAIN FORMATIONS USED BY A TANK BATTALION

LINE AHEAD

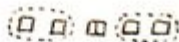
Example: LT. SEC. of a MIXED COY.

DOUBLE LINE AHEAD

Example: A MIXED COY.

LINE

Example: MED. SEC. of a MIXED COY.

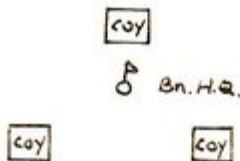
COLUMN.

Example: A MIXED COY. (Sub-units in LINE)

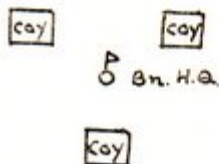


ONE UP

Example: A MIXED BN. A tactical formation, therefore, Coy formations at discretion of Coy. Comdrs.

TWO UP

Example: A MIXED BN. (See note above)



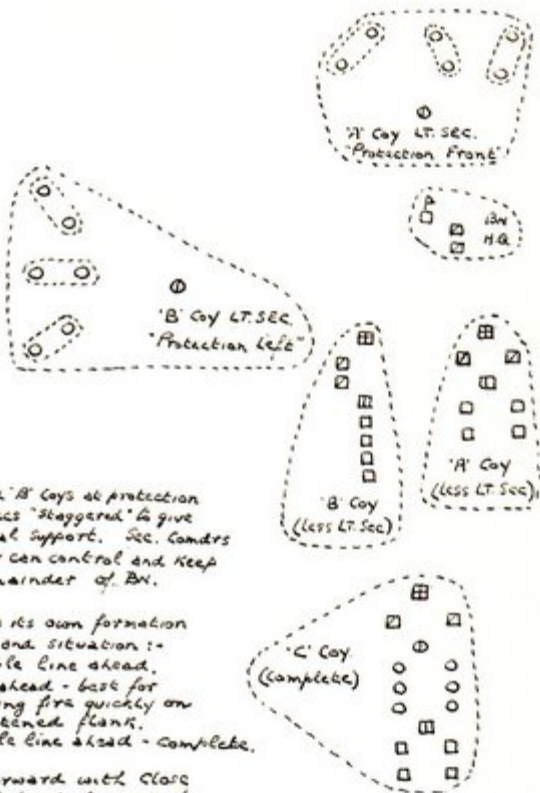
Legend:

Lt. Tank	○
Med. Tank	□
C.S. Tank	▣
Lt. Sec. Comdr.	⊙
Med. Sec Comdr	▣
Coy. Comdr.	⊞

APPENDIX III

DIAGRAM SHOWING A MIXED BATTALION DEPLOYED

Direction of
Movement.

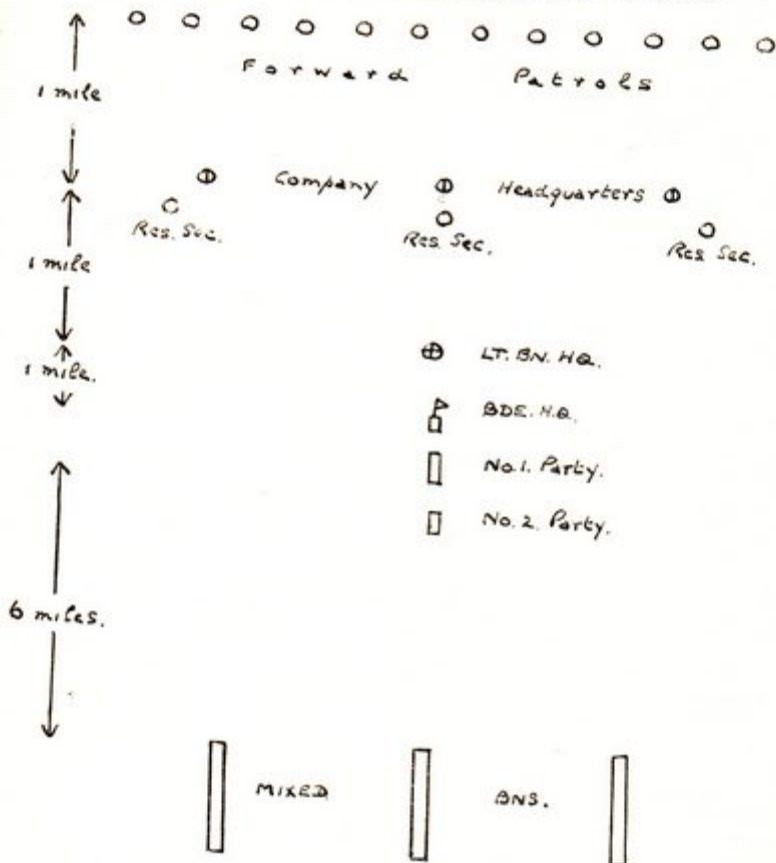


NOTES

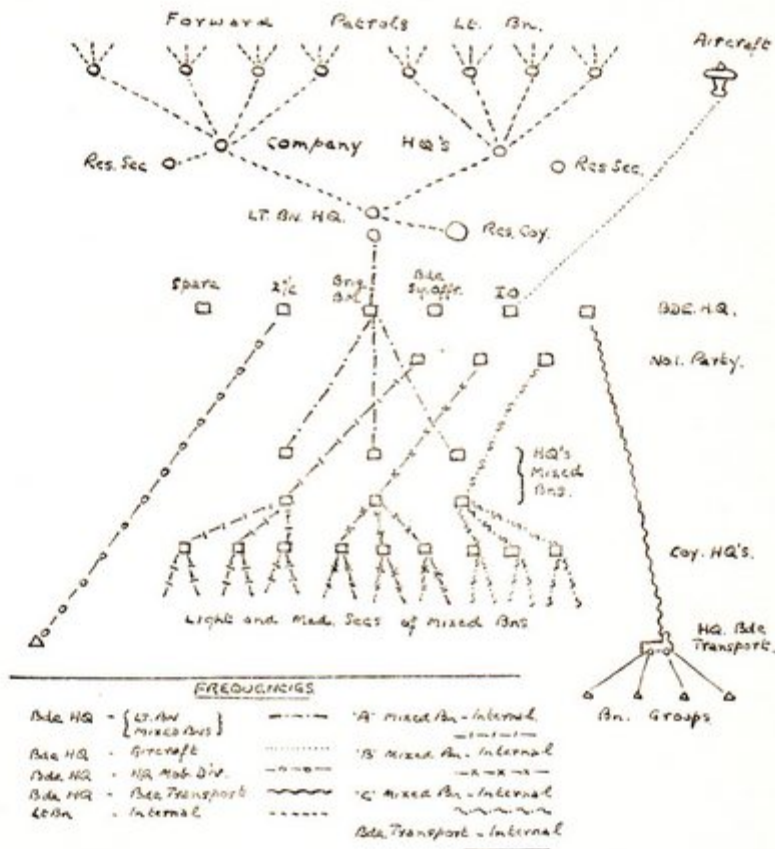
- (i) Lt. Secs of 'A' and 'B' Coys at protection stations. Sub-Secs staggered to give depth and mutual support. Sec. Comdts move where they can control and keep touch with remainder of Bn.
- (ii) Each Coy adapts its own formation to suit ground and situation :-
 'A' Coy - double line ahead,
 'B' Coy - line ahead - best for bringing fire quickly on threatened flank.
 'C' Coy - double line ahead - Complete.
- (iii) Bn H.Q. well forward with Close Support Sec. at hand to support Lt. Secs, if required.

APPENDIX IV

DIAGRAM SHOWING THE TANK BRIGADE IN MOVEMENT



APPENDIX V
WIRELESS INTERCOMMUNICATION

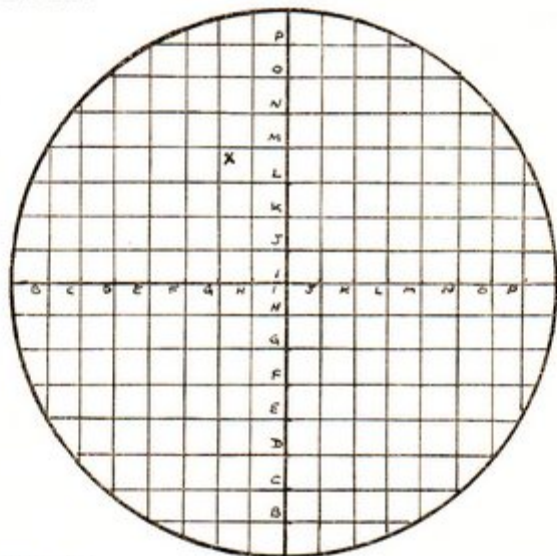


APPENDIX VI

1. Unit Code Names.

	<i>Bde. Hq.</i>	<i>Lt. Bn.</i>	<i>2 Bn.</i>	<i>3 Bn.</i>	<i>5 Bn.</i>
<i>H.Q.</i>	TIGER.	HUNTSMAN.	NERO.	CAMBRAI.	QUINTUS.
"A" Coy.		ANTELOPE.	AJAX.	AIREDALE.	ARGO.
"B" Coy.		BEAGLE.	BADGER.	BULLDOG.	BRUTUS.
"C" Coy.		CHEETAH.	CYCLOPS.	COCKER.	CATO.
<i>Transport.</i>	CAMEL.	BLOODHOUND.	BISTO.	BAKER.	GLAXO.

2. Protractor Code Disc.

*Explanation of Code Disc.*

A series of reference points (in pairs) is selected and given code names. The code names usually selected are the names of the months of the year, e.g. :—

<i>Reference Points.</i>	<i>Code Name.</i>
WARMINSTER CHURCH	} FEBRUARY.
OGBOURNE STATION.	
ANDOVER CHURCH	} MARCH.
BULFORD RLY. BRIDGE	

The code names are issued by Bde. H.Q. verbally before an operation.





The centre of the disc is placed on the first named place, e.g. WARMINSTER CHURCH ; the vertical axis is aligned on the second place, OGBOURNE STATION.

The squares on the disc are then read off like a map grid and the place it is desired to indicate is given in the form of a co-ordinate reference, e.g. a wireless message indicating point X on the sketch would be FEBRUARY G 2 L 7.

APPENDIX VII

DISTINGUISHING MARKS IN USE IN THE TANK BRIGADE

1. The comdr. of every unit flies a small coloured flag from his tank, as under :-

BRIGADE		Corps Colours with crest
BATTALION		Bn. Colours with Bn. number
COMPANY		'A' Coy - RED 'B' Coy - BLUE 'C' Coy - GREEN
SECTION		Company Colours

2. All tanks are marked with distinguishing marks, circles, triangles, squares etc., which enable coys, and bns to be recognized

Transport vehicles are marked :-



In Corps Colours with
Bn. Numbers

ORGANIZATION OF TANK BRIGADE TRANSPORT

Groups	M/C.	Cars		Medical Van	3-ton Lorries		
		2 Str.	Reece		Amn.	Petrol	Fitters	Sigs.
<i>Light Bn. and Bde. H.Q.</i>							
Bn. H.Q. Group ..	6	2	1	1	—	2	1
" A " Coy. Group ..	1	—	—	—	1	1	—
" B " Coy. Group ..	1	—	—	—	1	1	—
" C " Coy. Group ..	1	—	—	—	1	1	—
Bde. H.Q. Group ..	2	—	—	—	1	1	2
Totals ..	11	2	1	1	4	6	3
<i>Mixed Bn.</i>							
Bn. H.Q. Group ..	6	2	1	1	—	1	1
" A " Coy. Group ..	1	—	—	—	1	1	—
" B " Coy. Group ..	1	—	—	—	1	1	—
" C " Coy. Group ..	1	—	—	—	1	1	—
Reserve Group ..	2	—	—	—	4	3	—
Totals ..	11	2	1	1	7	7	1
<i>Summary</i>							
Bde. Transport H.Q. ..	6	2	2	—	—	—	—
Lt. Bn. and Bde. H.Q. ..	11	2	1	1	4	6	3
Mixed Bn. ..	11	2	1	1	7	5	1
Mixed Bn. ..	11	2	1	1	7	5	1
Mixed Bn. ..	11	2	1	1	7	5	1
Totals ..	50	10	6	4	25	27	6

APPENDIX IX
PARTICULARS OF TANKS OF THE TANK BRIGADE

The following details are liable to alteration and should be treated as approximate only :—

	<i>Medium</i>	<i>Light</i>	<i>Cruiser</i>
Crew	5 to 7	3	4
Weight (tons)	15	5	12
Circuit	100	115	100
Armament	1—2 pdr. 3—303 MG's.	1—5 MG. 1—303 MG.	1—2 pdr. 1—303 MG.
Speed (Max.)	15 to 20	30	40
Ammunition—			
Shell	96	—	50
.303	4250	2500	3750
.5	—	200	—
Armour	All types proof against A.P. .303 SAA.		

