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ADVANCED BASE DEFENSE DURING THE PRESENT WAR.

by

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SITUATION.

The occupation of an advanced base during the present war-- or at least for some time to come--will have as its primary purpose the extending of anti-submarine operations. The base will be used as a supporting point for hunting groups, mine layers, patrol vessels, submarines, aircraft and attendant train vessels-- also, in certain cases as a convoy base or refuge for general shipping.

Except in the case of bases which may be established on or near enemy territory (which will liable to all forms of attack in force) attacks on a base will be carried out almost entirely by submarines and aircraft (bombers). Their principal objectives will be shipping, aircraft and supply facilities (train vessels, fuel tanks, hangard, radios, depots, etc.).

Our own forces will have command of the sea surface and therefore attacks by surface vessels will be very unusual except perhaps by single raiders whose gun power is not likely to exceed that of submarine cruisers. If enemy raiders are at large they will probably avoid bases (for safety reasons) and concentrate their efforts upon the distruction of lone shipping. Land attacks except in small force, need not be expected.

ENEMY ATTACKS.

Characteristics of Enemy Submarines including submarine cruisers:

- Tonnage:- 400 to 1800 tons.
- Speed:- Surface, up to 18-1/2 knots. Submerged 1-1/2 to 10 knots.
- Radius:- Up to 20,000 miles surface. Up to 60 hours submerged.
- Armament:- (a) New sub-cruisers are armed with 2-5.9" and 2-22 pdrs.; or 2-5.9" and 2-4.1"; or 4-4.7". High angle fire, range up to 14,000 yards.
(b) Up to 8 torpedo tubes.
(c) Mine laying equipment for laying mines while on the surface or submerged--8 to 30 mines.

Tactics of enemy Submarines:-

Submarines prefer to remain on the surface for better observation and for fuel economy. When patrolling on the surface by day they will probably have a little of the upper deck showing and will steam slowly--6 to 8 knots. In this condition they can submerge in from 30 to 40 seconds. If in sight of the

coast or near hostile patrols they will remain submerged, diving about and periodically showing a good length of periscope in order to obtain range of vision.

Submarines take every opportunity to recharge batteries and if on diving patrol, or engaged in action during the day, they will come to the surface after dark and recharge if conditions permit. They keep underway while recharging, steaming away from probable hostile areas.

When attacking submerged submarines must show their periscopes for a short time at intervals in order to obtain firing data and must show their periscopes when actually firing. After firing a large alteration of course is made to get away from the position indicated by the beginning of the torpedo's track. When attacking with gun fire submarines may execute a long range bombardment (direct or indirect) or, when water conditions permit, approach submerged and come to the surface and deliver a close attack.

When attacking sea approaches with mines, the "Monday-Tuesday-Wednesday" mine is generally used. This mine is an anchored contact mine fitted with a delay device which may be adjusted to delay the mine rising to the surface until after a certain period of time has elapsed.

Submarines on the surface are sometimes disguised as other types of vessels. When submerged their presence may be indicated by an outline of the shape, by the wake or by an oil track. They are very difficult to spot when approaching up a searchlight beam or in the direction of the sun.

When attacked submarines may proceed to the bottom and rest if the depth of water is not too great (200 feet) and the bottom is reasonably firm and smooth.

Submarine Attacks:-

As indicated above submarine attacks against bases may occur during night or day and will consist of:-

- (a) Long range (up to 14,000 yards) bombardments - direct or indirect fire.
- (b) Close attacks with guns and torpedoes (the latter against shipping in refuge).
- (c) Mine attacks against approaches to base.

The type of attack will depend more or less upon the distance from home bases. Gun fire is the most economical and therefore most likely, especially when the enemy is operating a considerable distance from his source of supply. Mines can be carried only in small quantities and their use is restricted to certain water areas. Torpedoes will be carefully conserved for use against shipping when other forms of attack are not practicable.

Characteristics of Bombing Machines:-

Speed:- Up to 80 miles per hour.

Radius:- 7 hours fuel - about 200 miles from base.

Personnel:- 3 Men.

Armament:- (a) 3 machine guns, arc of fire 360° - except for small dead angles.
(b) Up to 1800 lbs. of bombs, in charges suitable to work in hand. Effective radius against material up to 200 yards - depending upon size of bombs.

Tactics of Bombing Machines:-

Bombers normally attack up and down the wind. They may attack during the day or on moon light and starlight nights. The normal altitude for day attacks is about 15,000 feet, for night attacks 5000 to 6000 feet. At night the machines attack singly--departing from their base at several minute intervals. During the day they generally proceed in formation - 7 to 9 machines. Bombers like to have line targets so that they may plane over them lengthwise. Having an all round defense, bombers may proceed to the attack unattended by other types of aircraft. Attacks with machine gun fire may be made, especially against searchlights with night bombing attacks. Attacks by dirigibles are possible but their strength will not exceed those of bombers.

Air attacks:-

As indicated above air attacks may be made against bases (within 200 miles of enemy air stations) during day or on starlight or moonlight nights and will consist of:-

- (a) Bombing attacks - up to 15,000 feet altitude by day and 6,000 feet at night.
- (b) Machine gun attacks in connection with night bombing.

The development of aircraft is so rapid that the types and strength of air attacks can only be foretold in a general way.

Attacks by surface craft:-

There will be nothing unusual in these attacks. Long range bombardments will be the rule. If enemy bases are near blocking attacks may be attempted if the channel conditions are favorable and the importance of the base warrants it.

Land Attacks:-

These attacks (except of course, in the excepted areas stated) may be combined with sea raids and will consist principally of demolition squads whose object will be to destroy important base facilities such as docks, fuel tanks, radioplants, batteries, etc. The use of explosive and in-

condiary grenades will enable the enemy to carry out these operations with great speed.

DEFENSE REQUIRED.

The first defense, of course, will be to choose a base with good natural defense features - provided a choice may be had. The characteristics formerly desirable for an advanced base still obtain but several may be accentuated and others added as follows:

- (a) Smooth water - for the refuge of a large number of light vessels and seaplanes.
- (b) Land and water areas suitable for the operation of land and water airplanes.
- (c) Defiladed anchorage - to prevent view from sea as a primary protection against enemy bombardment.
- (d) Shallow, narrow, defiladed entrance - to protect against the entrance of enemy submarines and torpedoes and facilitate the sudden surprise exit of our own craft.
- (e) Shore line and adjacent terrain suitable to a reasonable separation (aerial bomb and gun salvo distance) and defilading of shipping, aircraft and base facilities - so as to offer as difficult targets as possible to enemy gun fire and aerial bombing.
- (f) Suitable terrain salient to the harbor entrance - to facilitate wide and distant sea observation and to extend the fire effectiveness of medium calibre fixed defense guns.
- (g) Deep water approaches to the base - to restrict enemy mining operations as far as possible.
- (h) Sea bottom in the vicinity of the base unsuitable for submarine resting grounds - to make enemy operations as arduous as possible.

In considering the artificial defense required it is well to keep in mind the following:

- (a) The defense must be such as to leave the greatest possible mobile sea and air force free for its legitimate work - the destruction of enemy submarines.
- (b) In order to simplify supply and maintain mobility the material used should be standard Navy or Marine Corps and be capable of the widest use.
- (c) The primary object of the base defense is to prevent the enemy from damaging property within a certain area (anchorage, port facilities, etc.) not to destroy enemy submarines, raiders and aircraft. The defense required is only that necessary to render an enemy attack so dangerous as to be unreasonable - taking into consideration the conditions under which the enemy is operating (his mission, distance from bases, etc.)

Experience has shown that the best fixed defense against both submarines and aircraft is good observation, quick communications and rapid, accurate shooting. The fixed defense should concentrate on making sighting and shooting as nearly simultaneous as possible.

Observation:-

Both submarines and aircraft may be located by sight or by sound. Good observation will therefore include a complete system of salient searching stations and "listening in" devices. Various types of hydrophones ("K-Tube" and "Magnetic loop") have been developed during the present war and experiments with several types are now being made by our Navy Department. One type registers bearings accurately and is a good answer to submarine mine layers - as though it the location of submarines cannot only be detected but the number of mines laid can be counted. They are especially desirable for the defense of water approaches to convoy or offensive bases and as sentinels for defensive mine fields and anti-submarine nets. "Listening in" devices for the detection of aircraft have been put to good use abroad and are deemed most necessary especially at night. Radio direction finders have also proved effective and are being widely used.

Communications:-

Communications for command, fire control, observations, etc., should be by wire (or radio) when possible but always supplemented by visual and sound systems. A sound system is absolutely necessary in case of attacks in smoke screens and thick weather. Large dial shapes with pointers to show bearings may be used to good effect. It is well to equip coastal observation stations with machine guns for use against submarines when sighted. By opening fire the fact of sighting an enemy and his location are instantly transmitted to the adjacent defenses.

Gun Defense:-

Against submarines:-

It is not necessary to sink a submarine to prevent him from using guns against an objective - this is especially true of close attacks. The proper use of searchlights and flares, to render navigation difficult, and field artillery and machine gun fire against personnel will go far toward rendering close attacks unsuccessful. The high-powered guns should be placed well forward or be of sufficient calibre to well outrange those of the enemy, and be backed, if necessary, by lighter guns (fixed, field and machine) emplaced to cover barriers and resist close attacks. Water approaches and sea areas from which the enemy may bombard should be covered by at least two high-powered guns of 5" calibre or above. In siting the gun defense particular care must be taken to leave no dead

close attack positions which may be attained by the enemy submerged or in smoke screens and thick weather must be well covered

Against Aircraft:-

Anti-aircraft guns cannot keep hostile aircraft out of bombing range but if in sufficient numbers, they can make it very dangerous for an enemy to attack or force him to such a high altitude as to render his attack very doubtful of results. Aerial gunnery is difficult and volume of fire is necessary to compensate for lack of accuracy. Ample numbers of rapid fire guns are necessary. Although greater calibres are used, the 3" A.A. gun is the standard. They are generally emplaced in groups of 4 to 6 each, well advanced (up to 10,000 yards) along the most probable routes of approach (up and down prevailing wind, along well defined roads, etc.).

In order to provide for an efficient anti-aircraft defense it would be well to have a certain percentage of the field guns carried with an expedition, mounted on howitzer (high angle fire) carriages or else carry aerial platform mounts (pivots) for a certain number. Several types of aerial mountings for field guns have been developed during the present war and are being used on the Western Front.

In making dispositions for anti-aircraft defense it will be found impossible in many cases to cover certain sectors-- especially at short ranges - with the regular anti-aircraft guns without grave danger to one's own personnel, material and shipping. For this reason and as a defense against enemy aerial machine gun attacks, the regular anti-aircraft guns should always be supplemented by machine gun units. This can be provided for by carrying aerial pivots for a certain percentage of the heavy tripods furnished.

Searchlight Defense:-

Searchlights should supplement both the sea and air gun defense. In view of the present development of star shells and flares, searchlights are not so necessary for the land defense.

In the sea defense the lights should cover thoroughly barriers and water approaches - especially those which by reason of depth and extent permit of submarines approaching submerged to close attack positions. They should be provided in usual numbers - at least a searching light, a battle light and a belt light for each battery group.

In view of the vulnerability of searchlights in the face of determined attacks (especially when the searchlights are not properly handled) every advantage should be taken of the use of floating and aerial flares. The Bureau of Ordnance, U. S. Navy, is now developing a shell flare which can be fired from standard ordnance. When this flare is perfected it would be well to supplant, or at least supplement, a portion of the searchlight defense with flares.

Floating flares (combustibles placed in condemned boat or lighter with large reflector), anchored in channels in advance

of barriers, when fired, form an excellent auxilliary defense against blocking and other forms of close attack.

Searchlights for anti-aircraft guns should be both plentiful and powerful. As a general rule each A. A. battery should be provided with at least 2 lights - 1 pilot light (direction indicator) and 1 searching light (preferably 2). They should be emplaced on the flanks of the batteries in such a manner as to cover the sky to within 30° of the horizon. As the use of searchlights may locate targets for the enemy they should be portable or else furnished in sufficient numbers for use in various combinations.

Barrier Defense:-

Barrier defense is necessary for the defense of shipping where the anchorage entrance is open to the sea or where waters permit of submarines approaching submerged. The barriers consist of anti-submarine nets and mine fields. A new type of defensive mine field has been developed during the present war. It is composed of unsweepable mines (anchored to bottom and having no projections) which are fired from sound (magnetophone) registry. Magnetophones are distributed throughout the mine field and are set to register at a certain distance - a little greater than the effective radius of the adjacent mine or mines. When a submarine approaches within the area of the magnetophone it registers at the mine position finder station and the proper firing key is pressed by the operator as in "fire by judgment". Mine fields (or an extra heavy gun defense) are especially necessary where surface raids and blocking attacks are probable.

Where the entrance to a harbor is such as to permit a submarine entering submerged an anti-submarine net must be provided. If a gun defense is provided and the water in the entrance is shallow a torpedo net across the entrance will suffice (protection against torpedoes fired from outside).

Mobile Land Defense:-

The rules of land defense have remained unchanged except in minor details due to the development of certain weapons. Infantry, machine gun, field artillery and signal troops should be assigned according to the special conditions existing - the main condition being extent and type of territory to be occupied in connection with the fixed defense. The less mobile the defense necessary the more materiel should replace men, and vice versa. The widest use should be made of machine guns, trenches, obstacles, flares, trench mortars and grenades - all especially applicable in defense against landings. Engineer and signal troops will generally be needed in greater strength - the former for fortification, railway and road work and the latter for the establishment and maintenance of the communication system necessary. Of course, in case a base is established on enemy or neutral territory the mobile land defense may be called upon to meet regular trench warfare conditions.

Mobile Sea and Air Defense:-

A certain amount of this defense will always be necessary as it is the only sure defense against enemy sea and air attacks. That needed may be diverted from the forces operating from the base but if an extensive defense is required special units must be provided.

Mobile sea defense:-

This will consist of :-

- (a) Observation patrol boats with light guns.
- (b) Offensive patrol boats with depth bombs.
- (c) One-man torpedo boats (now being developed).

Mobile Air Defense:-

This will consist of:-

- (a) Observation and Combat machines.
- (b) Bombers.

A special unit (composed of land and water machines) will almost always be required for general observation and service with artillery and infantry - always if the base is situated on a large island or on the main land.

Concealment of Defenses:-

While concealment of armament has always been important in connection with temporary base defense it is of extreme importance at the present time owing to the development of aircraft for observation. It is desirable that the sites of all work be camouflaged before the work is begun and that if possible alternate positions be provided for mobile armament.