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TENTATIVE MANUAL
FOR
DEFENSE OF ADVANCED BASES

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MARINE CORPS SCHOOLS
QUANTICO, VIRGINIA

June, 1936

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FOR
DEFENSE OF ADVANCED BASES

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CHAPTER I

DEFENSE OF ADVANCED BASES
NAVAL FEATURES

MARINE CORPS SCHOOLS
QUANTICO, VIRGINIA

June, 1936

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DECLASSIFIED AFTER 12 YEARS
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DEFENSE OF ADVANCED BASES

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PREFACE

This Manual has been prepared primarily for instruction in the Marine Corps Schools and contains matters of a confidential nature that are indispensable to a clear appreciation of the subject.

Chapter I of the Manual contains many purely Naval considerations, strictly outside of the realm of the defensive features of advanced bases. To understand the inportance of bases and their defense, it is essential to comprehend not only the organization, administration and operations of the forces that are assigned to their defense, but also the organization and operations of the naval combatant forces, that may depend, wholly or in part, upon the support of these bases during the projection of a naval overseas campaign.

The operations incident to the seizure, occupation and defense of advanced bases, used in the strictest sense of the term, is comparatively new in naval thought. Not until these Schools undertook the study of the defense of advanced bases was any serious, coördinated and continuous thought devoted to the means, measures and matériel involved in such operations. The subject is by no means exhausted and requires further study and research.

While the tactical doctrines and methods of combat enunciated herein are believed to be sound in principle, they do not pretend to cover all the conditions of the defense of advanced bases in a future naval war. They are but a beginning and require further elaboration and expansion in order to keep pace with the development of armament and the modern trend of warfare.

The defense of advanced bases will involve the combined employment of land, sea and air forces. Depending on the nature of hostile attacks against a base, one arm or service may play the major role, but in the event of a general landing attack, the land forces will constitute the basic element of the defense. In any case, the ultimate success of the defense will depend upon the closest coöperation and coördination between the naval defense forces, the shore defense forces and the aviation forces.

Lastly, in the defense of bases nothing is so essential to success as unity of command and singleness of purpose.

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DEFENSE OF ADVANCED BASES

CHAPTER I

DEFENSE OF ADVANCED BASES—NAVAL FEATURES

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SECTION I

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1. **THEATER OF OPERATIONS.**—A Theater of Operations in a naval campaign is an extensive geographical area in which contact with enemy naval forces is to be expected. It may be divided into the Principal Theater of Operations with one or more Secondary Theaters.

2. **PRINCIPAL THEATER OF OPERATIONS.**—The Principal Theater of Operations is generally designated in the basic plans for a specific naval campaign and is that area within which the operations of the Fleet will be conducted against the enemy, either at sea or on shore.

3. The Principal Theater of Operations is generally divided into three zones.

a. **The Fleet Zone.**—The Fleet Zone is the zone within which the aggressive campaign against the enemy is carried out by the combatant elements of the Fleet. It extends from an inner limit, designated generally by the Chief of Naval Operations, in the direction of the enemy, to an outer limit designated by the Commander-in-Chief of the Fleet. The authority of the Commander-in-Chief is supreme within the Fleet Zone, and if and when the Fleet Zone includes either or both of the other zones, the Commander-in-Chief will have complete control of all naval activities therein. If the Fleet Zone includes within its limits any of the Naval Districts, the Commander-in-Chief has general control of the movements of all naval vessels, and of offensive and defensive action against the enemy within such districts.

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b. **The Naval Transportation Zone.**—The Naval Transportation Zone is the zone within which are located the lines of communication with the home country for the transportation of supplies to the Fleet. It extends from the inner limit of the Fleet Zone to the outer limit of the Coastal Zone. In this zone the vessels of the Naval Transportation Service operate under orders of the director of that service, but upon their entry into the Fleet Zone, the control of all such vessels passes automatically to the Commander-in-Chief.

c. **The Coastal Zone.**—The Coastal Zone is the zone within which are conducted the operations necessary for local defense and for the protection of coastal shipping. It extends from the shores of the home country to seaward to cover the coastwise sea lanes. In this zone the activities of all naval units are under the control of the respective commandants of the naval districts, or of the Commander, Coastal Force, if such force is organized.

4. **SECONDARY THEATER OF OPERATIONS.**—This is a geographical area in which naval operations directed against enemy forces will probably be necessary, but in which it is not expected that results decisive upon the outcome of the war will be obtained. There may be several such secondary theaters of operations.

SECTION II

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5. **THE FLEET.**—The Fleet includes all the forces afloat of the United States wherever acting.

6. **NAVAL COMMAND.**—The Naval Command of the United States consists, basically of the following units;

United States Fleet,
Naval Transportation Service,
Shore Establishment and Local Defense Forces.

7. **THE UNITED STATES FLEET.**—a. The United States Fleet is composed of four major forces:

The Battle Force,
The Scouting Force,
The Submarine Force,
The Base Force.

b. Additional fleets, forces, squadrons or detachments, separate from the United States Fleet, may be organized, by the Chief of Naval Operations, in peace or war, dependent upon the necessities of the situation. Ordinarily, in time of war, these would be organized for operations in areas so distant from the Principal Theater of Operations that direct coördination of the activities of such forces with the United States Fleet would be impracticable.

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c. During a naval campaign, the United States Fleet will be subdivided by the Commander-in-Chief into such task forces as may be required for the conduct of operations, and these task forces may be further subdivided into task groups for the particular operation.

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8. **NAVAL BASE.**—A naval base is, generally, a center from which men-of-war can operate and be maintained, and may be of a permanent or temporary character, depending upon whether its constructed naval accomodations are of a fixed or transient nature. The character, composition, and strength of naval bases will depend upon the necessities of service at all times.

9. **CLASSES OF NAVAL BASES.**—Naval bases are divided geographically into two classes, home bases and outlying bases, and these are themselves divided by their facilities into main bases, subsidiary bases and bases for particular types of naval craft. (Destroyer bases, submarine bases, aviation bases, etc.)

10. **MAIN HOME BASE.**—A main home base is one within the continental territory of the country, from which the fleet can operate at all times and which is designed to maintain the Fleet in all respects both in peace and war.

11. **MAIN OUTLYING BASE.**—A main outlying base is one without the continental limits of the country, having as many of the attributes of a main home base as practicable, and designed to be a strong point of support for the fleet and from which it can be maintained for limited periods in war.

12. **SUBSIDIARY BASE.**—A subsidiary base (home or outlying) is one that contains some of the fixed elements of a main base and which, while not capable of supporting and maintaining the whole fleet, may so care for portions of it.

13. **SPECIAL TYPE BASE.**—A destroyer, submarine, aviation, or other base for particular types of naval craft is one from which the type in question can operate and be maintained. It may or may not form part of a main or subsidiary base.

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14. ADVANCED BASE.—An outlying base of a temporary character established in war for the fleet or portions of it is termed an advanced base.

15. NAVAL STATION.—A naval station is the location of a particular form of naval activity, and may or may not form part of a naval base.

16. NAVAL DEPOT.—A naval depot is the location where naval materiel is stored and delivered, and may or may not form part of a naval base.

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17. THE BASE FORCE.—The Base Force, United States Fleet, comprises those auxiliary vessels of the Fleet not assigned specifically to other forces, together with such combatant vessels, aircraft, and land forces as may be assigned thereto for the service of the Fleet or for the defense of Fleet bases. In time of war, the Base Force will include normally:

The Fleet Train,
The Base Defense Forces,
The Base Utility Forces,
The Escort Force.

18. THE FLEET TRAIN.—a. The Fleet Train comprises those auxiliary vessels operating with the Fleet in the Principal Theater of Operations for the purpose of providing facilities, supplies, services and troops, necessary for the conduct of the campaign to be undertaken.

b. The types of auxiliary vessels that may be included in the Fleet Train are:

AC—	Collier	AD—	Destroyer Tender
AE—	Ammunition Ship	AF—	Provision Storeship
AG—	Utility Ship	AH—	Hospital Ship
AK—	Cargo Ship	AO—	Fuel Oil Tanker
AP—	Troop Transport	AR—	Repair Ship
AS—	Submarine Tender	AT—	Ocean Going Tug
AV—	Aircraft Tender	AW—	Distilling Ship
AKV—	Aircraft Supply Ship	AOG—	Gasoline Tanker
APA—	Animal Transport	APV—	Aircraft Transport
ARS—	Salvage Ship	AWK—	Water Tanker
ASR—	Submarine Rescue Ship	ASV—	Aircraft Rescue Ship

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NOTE: The letter "X" preceding any of the above designations indicates a merchant vessel taken over for Naval use.

c. Merchant vessels of suitable types and characteristics will be taken over by the Navy in time of war for use with the Fleet Train and may be manned by merchant marine compliments. They will be so manned initially and therefore will require the addition of such naval personnel as may be required for purposes of indoctrination and coördination.

d. For purposes of administration and for more facile operation in service to the Fleet in time of war, the Fleet Train will be organized into train squadrons comprising any one or more of the various types of auxiliaries. These train squadrons may, or may not, comprise tactical units in the formation of the train for an overseas campaign, dependent upon the requirements for the safety of certain types throughout the voyage.

e. For peace time operation, certain types of auxiliaries such as destroyer tender, submarine tenders, mine craft and rescue vessels are assigned to forces other than the Base Force; while certain others, including some oil tankers and cargo ships, are assigned to the Naval Transportation services.

19. **THE BASE DEFENSE FORCES.**—The Base Defense Forces comprise such Naval Defense Forces, Shore Defense Forces and Air Defense Forces as may be assigned for the defense of Fleet bases in the Principal Theater of Operations.

20. **THE BASE UTILITY FORCES.**—These forces comprise those naval forces engaged in the activities for the maintenance, supply and repair of the Fleet at fleet bases in the Principal Theater of Operations.

21. **THE ESCORT FORCE.**—This force is composed of combatant vessels of the Fleet assigned for the escort of convoys operating under the orders or control of the Base Force Commander.

22. **WAR MISSION.**—The mission of the Base Force in time of war is:

"To establish and maintain the service of base facilities and supply within the Fleet Zone in order that the Fleet may operate therein unhampered by lack of facilities."

23. **PEACE MISSION.**—The mission of the Base Force in time of peace is:

"To maintain the service of supply and utility, and of upkeep afloat, in order that the Fleet may be kept in condition and readiness for war, and to plan for the expansion of the force in time of war in order to carry out the war mission."

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24. **THE NEED OF ADVANCED BASES.**—a. Except for the base now under development in the Hawaiian Islands and the base in the Panama Canal Zone, the United States is entirely lacking in Fleet bases for any type of distant overseas naval operations.

b. In the movement of the United States Fleet into any theater of operations distant more than a thousand miles from a well equipped home base, it will be essential for the success of the naval campaign undertaken that adequate base facilities be established within the Principal Theater of Operations at the earliest practicable moment.

c. Generally speaking, therefore, there should be a main Fleet base in the Principal Theater of Operations and subsidiary bases connecting this main Fleet base to the homeland at intervals not exceeding one thousand miles.

25. **THE MISSION OF FLEET BASES.**—a. The mission of a Fleet base is:

"To make readily available to the combatant elements of the Fleet all those materials, supplies, facilities, and personnel required by the Fleet, so as to enable the combatant elements to operate against the enemy naval forces unhampered by the possibility of having to return to a point distant from the theater of operations for any reason other than tactical or strategical."

b. This mission is applicable to the Main Fleet Base and to any temporary base established to serve as a main base. To a lesser degree, it is applicable to any subsidiary base, dependent upon the specific purposes of such subsidiary base.

26. **BASE COMMANDERS.**—a. The Commander, Base Force, United States Fleet, will probably be designated as Commander, Main Fleet Base, at least while such base is in a temporary status, and will be charged, therefore, with the establishment of that base.

b. It is to be expected that subordinate commanders of the Base Force, United States Fleet, will be designated as Base Commanders of any subsidiary bases to be established.

27. **PRELIMINARY PLANNING.**—a. The preliminary plans for the establishment, and for the defense of the designated bases should be prepared in all practicable detail as much in advance of the departure from home ports as may be possible, in order that all essential needs may be supplied, and a clear understanding had of the maximum initial operations that can safely be undertaken by the Fleet as a whole due to logistical restrictions.

b. The general features of the locations of the designated bases, with such detailed information as may be available, should be studied thoroughly by all concerned so that every natural advantage may be employed for the defense for the initial location of

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temporary shore facilities, and for the system of anchorage for the various types of vessels, to provide both safety from the enemy and efficient service to the combatant elements of the Fleet, particularly in matters of repair and fuel.

c. Initially, the base facilities that will be available and the defense forces that can be provided are such as can be transported by the Fleet in its initial movement overseas, and the operation plan of the Commander-in-Chief, United States Fleet, will include:

(1) The location and types of bases, main and subsidiary, that it is desired to establish initially within the active theater of operations, with the order in which they are to be established.

(2) The facilities, supplies and shore forces it is desired to transport with the Fleet in its initial movement into the Principal Theater of Operations for the establishment of the contemplated bases.

(3) The composition of the task forces that will reconnoiter the proposed base locations in advance of the Fleet; that will seize the area or areas to be occupied; clear the immediate vicinity of enemy naval forces; and establish a temporary defense until the arrival of the Fleet.

d. The Base Force, United States Fleet, is charged with the maintenance of the naval forces in the Principal Theater of Operations by establishing and operating the service of supply and of other necessary facilities and with the defense of temporary bases in that theater.

e. The Fleet Train that will accompany the Fleet in its overseas movement may be composed of any of the various types of auxiliary vessels; the number and type depending upon the extent of the campaign to be undertaken; the availability of natural or artificial facilities at selected base locations; the availability of suitable vessels at the time of initiating the overseas movement of the Fleet; and upon the initial intentions of the Commander-in-Chief regarding the rapidity of the advance of the Fleet into an area probably under control of enemy naval forces.

SECTION VI

BASE ORGANIZATION

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28. BASE ORGANIZATION.—a. A main fleet base, temporary or permanent, should be so organized as to operate initially as a self-contained entity for such a period of time as may be requir-

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ed for the Fleet to gain and maintain such control of the sea between the base and the home country as will permit additional supplies and facilities to be convoyed safely to the occupied area.

b. It is evident, therefore, that no permanent naval campaign can be undertaken in a distant theater of operations unless the forces proceeding to such a theater include sufficient auxiliary vessels of the requisite types to permit the establishment of a main fleet base of considerable size, capable of self-containment for several months.

c. A subsidiary base should be so organized as to operate as an auxiliary to the Main Fleet Base for outlying minor naval forces that are operating at some distance from the Fleet itself. In the advance of the Fleet into a theater of operations, subsidiary bases should be established along the general lines of advance, in which case they are generally auxiliary to the nearest home base.

d. In the establishment of any base there are two distinct functions to be borne in mind; one primarily military, pertaining to defense, and the other industrial, pertaining to maintenance and supply; these functions require separate organizations within the forces under the Base Commander.

e. The organization of a Fleet base, therefore, consists essentially of:

Base Commander and Staff,
Base Defense Forces,
Base Utility Forces.

29. **BASE COMMANDER'S STAFF.**—a. The Commander of a main fleet base, whether temporary or permanent, should have a staff consisting of the following officers, as primarily requisite for efficient administrative purposes:

Chief of Staff,
Personal Aide,
Secretary,
Operations Officer,
Communications Officer,
Intelligence Officer,
Personnel Officer,
Material Officer,
Supply Officer,
Medical Officer,
Public Works Officer,
Marine Officer,
U.S. Army Liaison Officer.

In addition, such assistants in engineer, construction, ordnance, aviation, legal matters, and other functions, as available, should be provided. The number and duties of such assistants are dependent upon the size and types of base facilities and the scope of the base operations.

b. The staff of the commander of a subsidiary base need not be so extensive because the requisite functions can be readily carried out by combining two or more under one staff officer, and the essential staff can be reduced to:

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Senior Aide,
Secretary,
Communications Officer,
Material Officer,
Supply Officer.

Additional assistants as required for particular functions peculiar to the needs of the subsidiary base to be established must be provided.

30. **BASE DEFENSE FORCES.**—a. In order to free the Fleet as a combatant unit from responsibility regarding the safety of the base established within the Principal Theater of Operations, each base should have such sea, air and land forces definitely assigned thereto as will permit an adequate defense against probable enemy raids by sea, air or land.

b. When it is not practicable to definitely assign defense forces to a base, the combatant elements of the Fleet occupying the base or operating therefrom must provide the necessary defense. In any case, all forces within the area of the base must be available to assist in the defense thereof.

c. The Base Defense Forces for a main fleet base, temporary or permanent, will comprise:

Shore Defense Forces,
Naval Defense Forces,
Air Defense Forces.

31. **SHORE DEFENSE FORCES.**—a. Although normally supplied by the Fleet Marine Force, these forces may comprise troops of both the Marine Corps and the Army, in which case the Commander, Shore Defense Forces, will be designated by the Base Commander in accordance with existing law, and the control of such combined forces by the Base Commander will be exercised under the Principal of Unity of Command.

b. The Shore Defense Plan will be prepared by the Commander Shore Defense Forces and submitted to the Base Commander prior to departure from the last home port, if practicable, and certainly before arrival in the theater of operations. The Commander Shore Defense Forces may take passage in the ship of the Base Commander.

c. One of the primary requisites for defense of any base will be adequate antiaircraft guns which should be additional to those on vessels of the Fleet. However, careful consideration should be given to the advantages to be gained by removing some or all of this type of gun from those auxiliary vessels occupying the base and placing them in positions on shore where their employment would tend to more efficient defense for the base as a whole.

32. **NAVAL DEFENSE FORCES.**—a. Where naval forces are assigned to the base for defense purposes as separate from any fleet unit, they will comprise the Local Naval Defense Forces. These forces will consist of various types of surface vessels and aircraft and, for a main fleet base, should be organized into:

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The Offshore Patrol,
The Inshore Patrol,
The Attack Force,
The Mine Force,
The Harbor Force.

b. For a subsidiary base, the composition and organization of the Local Naval Defense Forces, if required and assigned, will depend upon the nature and extent of the operations to be conducted therefrom.

33. **AIR DEFENSE FORCES.**—Where aviation units are assigned to the base for defense purposes, as separate from any fleet unit, they will comprise the Local Air Defense Forces. These forces will consist of various types of aircraft.

34. **BASE UTILITY FORCES.**—a. The Base Utility Forces for a main fleet base comprise all the depots, stations and offices requisite for the repair, maintenance and supply of the Fleet in the Principal Theater of Operations. The facilities for these services may be afloat or ashore, and will of necessity be afloat upon the initial establishment of any base within an active theater of operations, unless the material for the erection of shore facilities can be transported in the convoy accompanying the initial advance of the Fleet overseas.

b. In the organization of the Base Utility Forces the same principles apply whether the facilities available are afloat or ashore, and the initial facilities, however restricted, should be so organized and designated as to fit readily into the organization upon expansion to future shore activities as such are set up and their operation inaugurated, so that every facility may be utilized to its utmost in the mission of usefulness to the combatant elements of the Fleet.

c. The Base Utility Force for a main fleet base should comprise essentially the following administrative units:

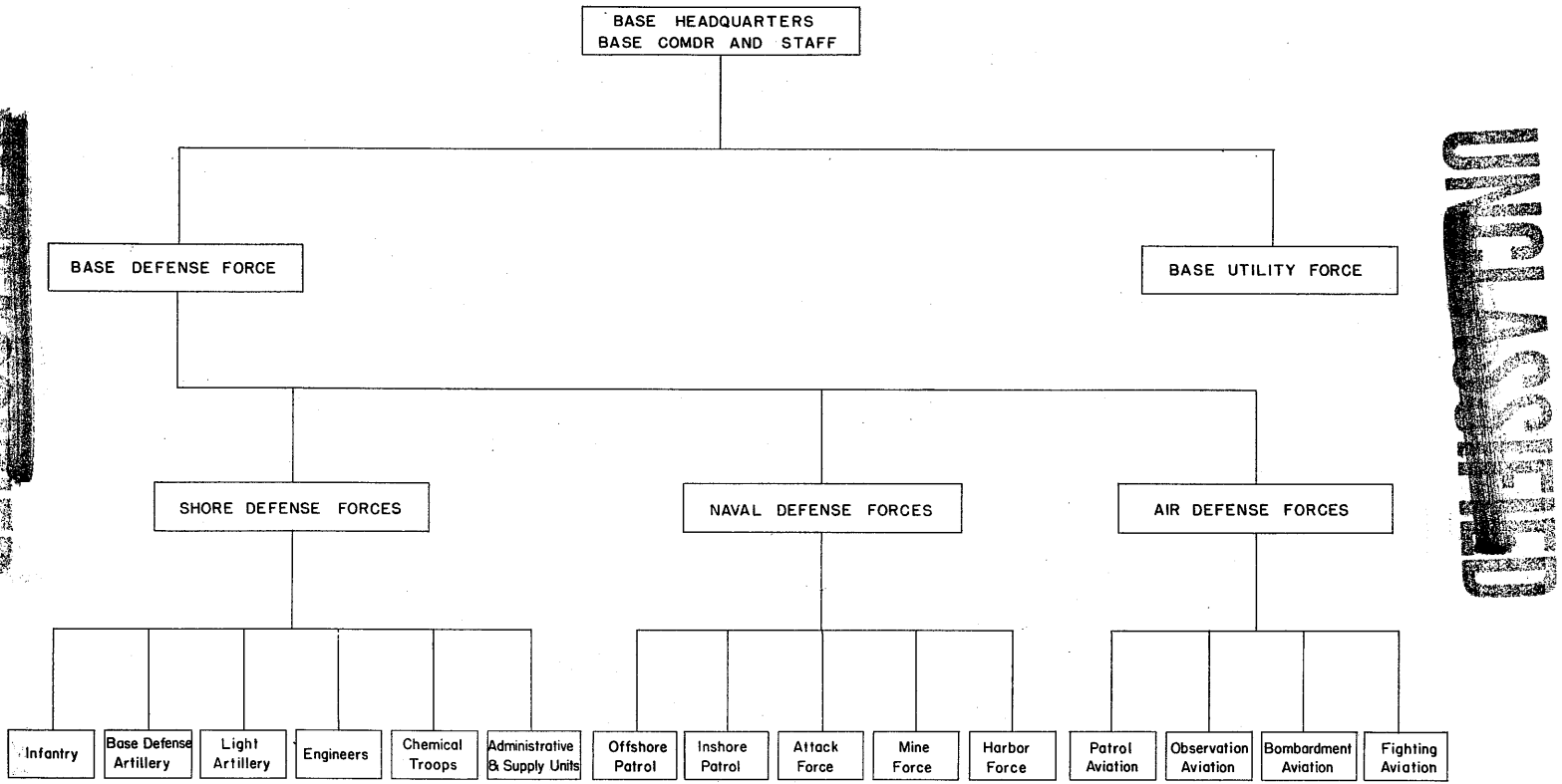
Naval Repair Depot,
Naval Supply Depot,
Naval Personnel Depot,
Marine Barracks,
Base Hospital,
Submarine Depot,
Naval Ordnance Depot,
Naval Air Depot,
Public Works Depot.

d. Other depots, stations or offices may be required for effective service to the Fleet, dependent upon the requirements for a specific campaign to be undertaken, but in most cases such additional activities will fit into the organization as above outlined.

e. At a subsidiary base, the Base Utility Forces can be naturally curtailed both as to number and size and should be so organized as to best serve the specific purpose for which the subsidiary base is to be operated.

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f. **The Naval Repair Depot.**—(1) The Naval Repair Depot at a main fleet base will comprise all fleet repair activities, afloat and ashore, except such as may be specifically excepted by the Commander-in-Chief, United States Fleet. However, special types of fleet tenders, such as aircraft tenders and submarine tenders, may be diverted to other depots for special services in the discretion of the base commander.

(2) The mobile facilities that should be provided at any time for the repair and upkeep of the Fleet, should be such as will maintain all vessels of the Fleet, including auxiliaries, present in the Principal Theater of Operations, in good material and operating condition, except for dry-docking, for a period of six months.

(3) Upon arrival at the designated location for the Main Fleet Base, the fleet repair ships and fleet tenders should be berthed in such manner and location as to permit them to take alongside without delay any units of the Fleet requiring urgent repairs.

(4) The permanent repair facilities to be established on shore at a main fleet base for an extensive naval campaign include one or more dock yards. Each dock yard will comprise one-third of the repair facilities required by all vessels of the Fleet operating in the Principal Theater of Operations and will be a self-contained administrative unit of the Naval Repair Depot. Each dock yard will be equipped eventually to effect the overhaul and major repairs, including dry-docking, of any surface or submarine vessel of the Fleet.

g. **Naval Supply Depot.**—(1) The Naval Supply Depot at a main fleet base will comprise all fleet supply facilities ashore, except for ammunition, ordnance, medical and Marine Corps supplies and personnel. Initially and until empty, all fleet auxiliaries for supply purposes, present at the Main Fleet Base will be included in the Naval Supply Depot.

(2) The permanent supply facilities to be established ashore at a main fleet base for an extensive naval campaign include one or more of each of the following stations:

Naval Supply Station,
Naval Fuel Oil Station,
Naval Coaling Station.

(3) **Naval Supply Station.**—A Naval Supply Station should be such as to be capable of receiving, storing and issuing one-third of all articles, supplies and materials, other than fuel, ammunition, medical stores and Marine Corps stores, required by all the naval forces in the Principal Theater of Operations for a period of ninety days.

(4) **Naval Fuel Oil Station.**—A Naval Fuel Oil Station should be such as to be capable of receiving, storing and issuing about 75,000 tons of fuel oil, or about ten percent of the monthly requirements of all the Naval Forces operating in the Principal Theater of Operations.

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(5) **Naval Coaling Station.**—A Naval Coaling Station should be such as to be capable of receiving, storing and issuing about 25,000 tons of coal, or about one-fourth of the estimated monthly requirements of coal for the Principal Theater of Operations.

(6) The Fuel Oil Tankers accompanying the Fleet in the initial movement overseas should be so berthed upon arrival at a base as to permit them to refuel all combatant ships of the Fleet as expeditiously as possible; while the gasoline tankers should be berthed where aircraft and vessels carrying aircraft may be promptly filled to capacity.

h. **Naval Personnel Depot.**—(1) The Naval Personnel Depot at a main fleet base will be the "receiving ship" for all the naval forces operating in the Principal Theater of Operations, as well as the naval barracks for all naval personnel attached to the base. The housing and messing facilities have been standardized for a type Naval base battalion.

(2) The Naval Personnel Depot will be required only at the Main Fleet Base and should be established as soon as practicable after the facilities for material upkeep and maintenance have been provided for. Additional personnel for replacements, for labor and clerical work on shore, and for other purposes ashore and afloat, will be transported in subsequent convoys from the home country.

i. **Marine Barracks.**—(1) The Marine Barracks at a main fleet base will be the Marine Corps Personnel Depot for all Marine Corps Forces operating in the Principal Theater of Operations and will include:

The Marine Guard for the internal protection of the Base;
The Marine Personnel in the Base Shore Defense Forces;
The Marine Personnel for replacements and casuals of the Fleet Marine Force;
The Marine Corps Supply Depot for all Marine Corps forces in the Principal Theater of Operations.

(2) The size of the Marine Guard for the protection and patrol of the base and its facilities will depend upon the extent of the base and the number of base facilities requiring protection; while the strength of the Marine Corps forces detailed to the base shore defense will depend upon the requirements for defense against attacks by land and is dependent upon local conditions at a specific base. The personnel for both of these will probably be detailed from the Fleet Marine Force accompanying the Fleet.

j. **Base Hospital.**—(1) The Base Hospital at a main fleet base will be such as to afford hosptial service for all personnel of the base and evacuation service for all naval forces in the Principal Theater of Operations. It will consist of one or more hospital units, each with a capacity of five hundred beds, and each

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with a Medical Supply Depot capable of providing one month's medical supplies for all Naval and Marine Corps personnel operating in the Principal Theater of Operations, and for the Naval personnel at the Main Base. The Base Hospital will probably consist of at least four hospital units.

(2) The hospital ships accompanying the Fleet in its initial advance overseas should have a capacity of approximately three hospital units and will comprise the base hospital upon arrival at the Main Base and until initial suitable facilities can be procured and erected on shore.

k. **Submarine Depot.**—The Submarine Depot at a main fleet base should include such facilities as are peculiar to and required only for submarines when operating from the base or when under repair at the base. It will consist of one or more submarine bases, each with berthing facilities, and each designed and equipped to maintain in operating status, four submarine divisions.

l. **Naval Ordnance Depot.**—The Naval Ordnance Depot at a main fleet base will supply ammunition to all Naval and Marine Corps forces in the Principal Theater of Operations. It will consist of one or more combined naval magazines and naval gun parks to be designated naval magazines, each to have the storage capacity for one month's expenditure of ammunition for all Naval and Marine Corps forces in the Principal Theater of Operations.

m. **Naval Air Depot.**—(1) The Naval Air Depot at a main fleet base comprises the facilities for the receipt, assembly and tests of aircraft; for holding in readiness organized squadrons of all types of naval aircraft, including personnel for transfer to the Fleet; and for the repair and overhaul of Fleet aircraft. It will consist of one or more naval air stations, each designed and equipped for operating and maintaining at least thirty-six aircraft of the VT or VP type.

(2) One of the first requirements upon arrival of the Fleet at a main fleet base is the laying out of flying fields capable of accomodating the entire number of carrier-based aircraft present with the Fleet, and the utmost effort must be put forth to expedite these flying fields so that the aircraft carriers may not be exposed to attack inside the harbor with their aircraft on deck and incapable of flying off.

(3) Another important requirement to be provided as soon as practicable is a suitable runway for hauling out seaplanes on to the beach, as it will be exceptional if any beaches available will be sufficiently hard and firm to permit seaplanes of any size to be hauled clear of the water.

n. **Public Works Depot.**—The Public Works Depot at a main fleet base comprises the administrative offices and construction personnel of the Base Public Works Officer and the depot of supplies for all public works at all bases in the Principal Theater of Operations. It should be established as soon as a suitable location for such a depot can be designated at the Main Base, and will be ampli-

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fied as necessity and arrival of facilities permit. It will be designed to accommodate a pool of public works tools and equipment for the construction and maintenance work at all depots, as well as additional equipment for which prompt need may develop in the construction of important facilities for the base in its mission of maintaining the combatant elements of the Fleet in operating condition.

o. **Expeditionary Forces.**—(1) In view of the fact that any extensive overseas campaign will undoubtedly require the employment of land forces, either initially or eventually, the Main Fleet Base must be capable of accomodating certain activities of such expeditionary forces of both the Marine Corps and the Army.

(2) These activities will be located within the defense lines of the Main Fleet Base, but will not be under the command of the Base Commander. They may comprise:

United States Army Expeditionary Force, and all other Army forces in the Principal Theater of Operations held at the Main Base as a reserve, while awaiting initiation of further operations, and not assigned to the Shore Defense Forces of the base;

The Fleet Marine Force and all other Marine Corps Forces in the Principal Theater of Operations held at the Main Base as a reserve, while awaiting initiation of further operations, and not assigned to the Shore Defense Forces of the base.

(3) In planning the arrangement of shore activities at the Main Fleet Base, consideration must be given to the following depots connected with the United States Army Expeditionary Force:

Army Port of Debarkation,
Army Personnel Depot,
Army Depot of Supplies,
Army Ammunition Depot,
Army Air Base,
Army Base Hospital.

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TENTATIVE MANUAL
FOR
DEFENSE OF ADVANCED BASES

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CHAPTER II

DEFENSE OF ADVANCED BASES---GENERAL

MARINE CORPS SCHOOLS
QUANTICO, VIRGINIA

June, 1936

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CHAPTER II

DEFENSE OF ADVANCED BASES—GENERAL

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SECTION I

SELECTION OF BASES

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1. STRATEGIC VALUE.—The selection of an advanced base will depend primarily on its strategic value in the projection of an overseas campaign. The strategic value of a base is determined by its geographical position in relation to the theater of operations of the fleet, its military strength, resources and the operations required ashore, afloat and in the air to seize and hold the base.

2. GEOGRAPHICAL POSITION.—a. In the selection of a base, its geographical position is the most indispensible consideration. A base to be of value must be located within the operating area of the fleet, or on or near the line of communications. As the operating area is advanced from home ports or main bases, advanced bases serve as connecting links and strong supporting points along the line of communications. When a base is established beyond the limit of control of the protective forces of the line of communications or beyond the area commanded by the fleet, it is likely to become a liability. If in addition such a base is located in an area vital or critical to the enemy, it is quite probable that the enemy will attack it with major forces. The security of a base so situated may require the detachment of a considerable portion of the fleet for its immediate defense. This would violate the principle that no base should be established that is going to necessitate the de-

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tachment of portions of the fleet for its defense. While the presence of the fleet, or its command of the sea area in which a base is located, confers on the base a large measure of security against major attacks, the base must be provided with sufficient defensive strength to insure its withstanding attacks during the absence of the fleet.

b. A base located on a long line of communications may be difficult to defend as it may afford the enemy an opportunity to isolate it. However, a base so located may be more readily reenforced by sea and air than a base situated beyond the control of protective forces of the line of communications. Futhermore, the line of communications of a major hostile force attacking the base may in turn become vulnerable and subject to interruption. So long as the protective forces remain undefeated, the base is not likely to be the objective of a major force, but rather to attacks by raiding forces which have evaded the protective forces.

3. MILITARY STRENGTH.—a. The military strength of an advanced base resides in its defensive and offensive attributes. A base to have defensive strength must have protection against attacks from the sea, land and air. The defense of a base may be greatly augmented because of natural causes. The land area on which a base is located may be accessible with great difficulty to landing attacks, due to hydrographic conditions, created by barrier and fringing reefs or other navigational obstructions. The terrain on which a base is located may lend itself advantageously to fortification and thus offer an economical means of strengthening the powers of the defense.

b. On the other hand a base may be defensively weak, because of the nature and extent of the adjacent and surrounding land area, which may afford easy passage or ready lines of operations to hostile land forces, or permit unopposed landings at distant points. Similarly a base may be defensively weak if it is within easy flying distance of hostile air bases. This may be particularly true if the adjacent or surrounding land areas do not favor the establishment of a communication system well beyond the limits of the base, for the purpose of alerting base defense aviation forces in sufficient time to intercept hostile air forces.

c. The offensive strength of a base may be said to consist in its capacity:

To provide adequate anchorage for combatant ships, transports and train, and suitable ground on shore for the establishment of repair, maintenance and storage facilities.

To permit the safe and ready egress of surface and subsurface vessels from the harbor.

To provide suitable terrain and sheltered sea areas for fleet and defense aviation forces.

To insure continued support to sea and air forces operating from the base.

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4. RESOURCES.—The strength of a base may be enhanced, because the land area on which it is located possesses natural and artifical resources. The latter consisting of those developed by man during peace time and those created immediately and solely for war purposes. It is not to be expected that within areas selected or seized for the establishment of bases, natural resources will be found in abundance. Such resources will probably be limited to water and timber. There will be practically no artificial resources and war material will have to be transported into the base defense area. Labor will probably be obtainable only in small numbers.

5. OTHER FACTORS.—a. In the selection of bases other factors than those noted will have to be considered. An area difficult to defend, requiring large numbers of troops of the different arms and services, numerous combatant ships for the composition of the naval defense forces and large numbers of airplanes of the different classes, may have to be rejected for a region less adapted both geographically and strategically. Likewise the seizure of a base already occupied by strong hostile forces, difficult of approach from the sea or which limits the initial employment of aviation and whose attack would entail great losses may have to be renounced for an area less strongly defended and less suited for the establishment of a base.

b. It is apparent that rarely will any land area selected for a base satisfy all conditions, that is, situation with respect to strategic lines, possession of great military strength and resources, and ease of operations incident to its defense or seizure. A base may be well situated strategically, but may be defensively weak and without resources.

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LOCATION OF BASES

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6. BASES LOCATED ON MAINLANDS OR LARGE ISLANDS.—A base located on a mainland or large island will increase the difficulties of the defense due to the vulnerability to attack on the land side. The full preponderance of the enemy's combined force may be developed for an attack via the land side without becoming involved in an opposed landing. The defender must prepare for an all around defense of the entire base. A defense on the periphery of a base defense area would oblige the

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defender to disperse his force and efforts with a possibility of concentration in these particulars for the assailant. Positions of defense would have to be selected at distances greatly removed from the base in order to place it well beyond the effective range of the attacker's heavy ordnance. The defense of a base so situated may demand effectives and armament well beyond the logistic limitations imposed by a movement overseas at the beginning of a naval campaign.

7. BASES LOCATED ON SMALL ISLANDS.—With adequate means and favorable terrain, a small isolated island can be converted into a stronghold. Where there are a limited number of probable landing places, the defender will enjoy all the advantages of interior lines, and with good communications, reserves can be moved expeditiously to threatened points. Artillery may be emplaced in a central position to cover all possible landing beaches.

8. BASES LOCATED ON GROUPS OF ISLANDS.—a. A base located on a group of islands will be more or less difficult to defend, depending on the size, form and number of islands and the intervening distances between the islands.

b. Islands forming a group within supporting distances of each other will serve an attacking force with:

Stepping stones in an advance toward the ultimate capture of the base;
Possible supporting bases for aviation;
Possible bases for submarine operations;
Locations for isolated guns or batteries capable of bringing direct fire on the base and defensive installations or in support of landing operations against the base itself.

To the defender, a group of islands may offer:

Convenient channels for laying mine fields;
Bases for submarine or air operations;
Positions for guns or batteries to support the defense or by denying landings and bringing enemy ships under surprise fire.

c. Rarely will the defender be in sufficient strength to justify dispersing his troops and local naval defense forces among all the islands that it may be desirable to defend. The defender must concentrate his force on one or a few islands. He must depend upon his aviation, local naval defense forces, long range artillery and the use of chemical agents to deny and oppose landings on islands other than those he actually decides to defend.

9. BASES LOCATED ON ATOLLS.—a. In the selection of advanced bases, the greatest benefit will accrue to the defender in exploiting the element of surprise by creating for the assailant an unknown quantity as to wherein lies the real strength of the defense. This can only be accomplished by giving the defense depth whereby it can create new situations for itself, by flexibility of action that resides within the mobility of its reserves, the intelligent

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use of a varied terrain and natural cover, and its ability to shelter itself under-ground against the assailant's combined and concentrated ships' guns and aërial bombardments.

b. A rigid defense, which freezes troops and armament to restricted localities without cover and shelter, exposed to hostile observation from sea and air, will make the life of the defender extremely precarious when the assailant releases the full preponderance of his attack on decisive points. The defense of atolls may in many instances admit of this situation.

c. Before venturing the defense of atolls as advanced bases, full consideration should be given to the many difficulties of their defense. Due to the peculiar formation of an atoll, where the shape is that of a partly submerged dish with a broken rim, forming a ring of islands of very limited extent and more or less widely separated, an assailant will enjoy complete liberty of action at sea and in the air for the concentration of his efforts against the small low lying and uncovered islands.

d. The following advantages and disadvantages of the defense of atolls are listed below as applied to the various task groups of the base force:

(1) **Naval defense forces:**

(a) Advantages:

Calm anchorage, furnishing refueling and repair facilities;

Affords good protection from submarine and torpedo attack;

Affords good all around observation for visual communications and other purposes;

Few, if any, landing beaches;

(b) Disadvantages:

No masked protection by land afforded to vessels;

Limited entrances, easy to bottle up ships;

Limited maneuvering room for ships inside of lagoon;

Open to attack by ships' gunfire from all directions, depending on size of atolls;

Areas to be mined very extensive and usually in too deep waters;

Difficult to protect vital base facilities from sea attack;

Demands large guns for adequate defense;

Requires excessive number of patrol vessels and submarines for defense;

Naval vessels would have to be 100% ready for action at all times as they could not depend on an inadequate shore artilley for protection;

In most atolls, anchorage facilities limited by poor holding ground and presence of coral heads.

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(2) **Aviation in defense:**

(a) Advantages:

Smaller land area to protect;

May be beyond radius of action of hostile land based aircraft;

As supporting base furnishes sheltered harbor for operation of patrol planes and other types of seaplanes.

(b) Disadvantages:

Suitable landing fields improbable;

Probably require carrier for landplane operations;

If confined to use of seaplanes, disadvantages incident to their operations such as: less performance, difficulties of water handling, and probable lack of beaches suitable for hauling out;

Difficulty of concealing planes;

Hostile vessels afforded unlimited avenues of approach, requiring much greater number of planes for reconnaissance and defense;

More liable to surprise air attacks due to absence of advanced observation posts;

Defensive installations and airdromes offer more open and concentrated targets from air;

Airdromes exposed to observation and fire of surface vessels.

(3) **Artillery in defense:**

(a) Advantages:

Few entrances through outer reef afford good targets;

Fields of fire within and without the atoll limited only by range of guns;

(b) Disadvantages:

Probable lack of defilade and cover;

Difficulty of constructing concealed emplacements.

Small area of islands affords few alternate positions on any single island;

Difficulties of artillery communication and supply between units of different islands;

The greater number of possible landing places would require a large amount of artillery, widely scattered and very difficult to coördinate. No natural elevations for artillery observation;

Difficulty of landing and installing heavy artillery.

(4) **Antiaircraft defense:**

(a) Advantages: None.

(b) Disadvantages:

One ring of defense; defense should be in depth.

Location of defensive ring fixed; defender unable to locate AA defensive ring properly in relation to areas to be defended;

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Uneven spacing of batteries, probably resulting in gaps in defensive fires;
Necessity of placing units (guns, searchlights, sound locators, machine guns) on isolated and perhaps undefended islands;
Difficulty of communication and supply between units;
Difficulty or impossibility of placing searchlights and sound locators in proper relation to gun batteries and fleet anchorage;
Probable lack of concealment;
Probable lack of defilade from sea bombardment;
Difficulty of constructing a suitable landing place on each island on which guns would have to be located.

(5) **Chemical warfare.**—From a chemical warfare viewpoint the defense of an atoll is difficult if not impossible. The disadvantages far outweigh the advantages.

(6) **Communications.**—The defense of an advanced base on an atoll would affect communications from the point of view of material. Otherwise, communications in the defense of an atoll present no particular problem.

10. **BASES LOCATED ON PENINSULAS.**—The defense of a peninsula will present certain defensive advantages and disadvantages. Many peninsulas or promontories from their very geological formations offer many obstacles to landing attacks. The rockbound shore makes landing, even in ordinary weather, extremely dangerous. In the case of narrow peninsulas, even though successful landings are concluded, maneuver room is limited and the enemy may have to restrict his operations to purely frontal attacks. The necks of peninsulas are easily defended, provided the assailant's naval supporting ships can be prevented from enfilading the defender's position. A small peninsula may lend itself favorably to zone defense. The assailant has the advantage of attacking from several directions, on both sides, at the waist or at the neck of the peninsula. In this case, the position of the defender may become precarious if he relies upon land communications for his source of supplies and reinforcements.

11. **BASES LOCATED IN PROXIMITY TO ENEMY TERRITORY.**—These bases may become objectives for immediate attack. The enemy may be in a position to conduct aerial attacks and bombardments with marked superiority in force. At or about the time of occupation, the enemy can be expected to attempt submarine and surface raids from bases nearby. The time for preparation of the defense therfore may be limited by the reaction of the enemy. If the base is seized as a result of a successful operation it may never be free from some form of attack, even when the fleet has gained

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control of the sea and air. To render a base secure under these circumstances, may necessitate the occupation of adjacent territory, which, if secured by the enemy, would menace the safety of the base. Bases thus occupied and maintained will require strong aërial and naval defense forces.

12. **BASES LOCATED IN PROXIMITY TO FRIENDLY TERRITORY.**—The presence of friendly forces within the local theatre of operation may materially alter both the time the base defense forces may have to defend and the force necessary for the defense during a limited period. This assumption is based on the fact that such friendly forces are available as reinforcements or as a relief to take over the established base.

SECTION III

TOPOGRAPHY, HYDROGRAPHY AND METEOROLOGY

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13. **THE RELIEF, CONFIGURATION AND SIZE OF A BASE AREA.**—The relief, configuration of the coast line and size of the land area on which a base is located will materially affect the system and method of defense, and will determine in a large measure, the suitability of a locality as an advanced base.

14. **THE TOPOGRAPHICAL RELIEF.**—The topographical relief of a selected area for a base is extremely important in estimating its defensive characteristics or value. Mountains, hills, ridges, valleys, ravines, plains and plateaus must be studied in their relation to the base and to each other. They either obstruct or facilitate the enemy's landing and subsequent attack, and may serve as successive objectives to his advance inland. A low flat island furnishing little or no cover or observation, is extremely difficult to defend. Beaches can be readily swept by ship's gunfire, and troop movement is rendered hazardous by day. An island of marked relief lends itself conveniently to the concealment and protection of troops and the defensive installations, and affords excellent observation to seaward. High ground usually will overlook the landing beaches at comparatively short distances, and the terrain farther inland will dominate the entire area to the water's edge. Tropical islands of extremely rugged character usually are fringed by reefs with few openings to the sea and beaches are few and difficult for landings.

15. **THE CONFIGURATION OF COAST LINES.**—a. Coast lines will generally be found irregular in outline, clearly defined by water reëntrants and land salients, great and small. These will be in the form of great bays and gulfs, small bays and inlets, large

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peninsulas and promontories and small land projections. The irregularity of coast lines often can be attributed to the character of the terrain which borders the sea. When the terrain is mountainous and rocky with precipitous coasts, landings must be confined to indentations such as bays, gulfs, coves, and inlets.

b. When the coast line assumes the form of a large bay or gulf, the assailant operating from the sea can land his forces on either side or at the end of the great reëntrant. He enjoys the advantage of interior lines. This threat alone, to strike on one or the other side, or at the head of the reëntrant may constrain the defender to divide his forces. If a river flows into the bay, the defender, in moving his forces to a threatened point, may become involved in a river crossing.

c. Considering small water reëntrants such as bays, harbors, coves, and bights, the situation is entirely changed when compared with larger water reëntrants. Interior lines no longer obtain. In many instances, small bays and harbors possess the material facilities sought for in landing operations. On the other hand, they readily lend themselves to strong beach defense with limited personnel. The defender can emplace his armament to dominate all the beaches included within a small coast line indentation. Troops charged with its defense can be disposed readily in mutually supporting positions. Reëntrants facilitate the concentration of fire of the defender. By emplacing automatic weapons in flanking positions at or near the heads of bays or coves and on the small land projections embracing them, each adjoining beach and the opening to the water-reëntrant can be swept by cross and enfilade fire. Artillery fires of sufficient duration and frequency can be put down at the opening and head of these reëntrants to make landings exceedingly hazardous.

d. In principle, the occupation of small land salients should be avoided. They will become the targets for heavy concentrations of ships' gunfire and aerial attack. They will, however, provide localities for observation and emplacements for automatic weapons. The defense of these points of land can best be furnished by machine-gun fire sweeping their shore lines from positions inland and by obstacles placed across their bases.

e. Where the coast line extends for great distances in comparatively straight lines, affording landings on a broad front, the defender is at a disadavntage. Flanking fires are difficult to obtain from positions at or near the water's edge. In this case, it usually will be advisable to increase the number of automatic weapons and emplace them farther back from the shore line, in order to secure satisfactory cross fires and observation.

16. **HYDROGRAPHY.**—a. Hydrographical conditions will greatly influence the place of landing. The hydrographic essentials of a good landing place are unobstructed deep water off shore and a smooth, broad beach with a rapid shoaling at high tide. The nature of the beach, such as hard and firm ground, or soft sand or mud, will indicate whether a landing at any particular point would

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be easy or difficult, especially with reference to the practicability of the attacker landing and moving artillery, wheeled transport, tanks and supplies. The presence of barrier or fringing reefs may offer insuperable obstacles to landings on a broad front or may restrict landings to narrow passages through these coral obstructions. The exposure of mud flats at low tides may cause the grounding of boats well off shore and necessitate long and laborious approaches by the landing troops.

b. Variations in the tide may affect landings to a considerable degree not only as to place but as to time. A high tide may made it feasible to pass over navigational obstructions, which at low tide would not permit landing on favorable landing places. Strong currents along shore may make the navigation of small boats difficult, and at night may carry small boats off their courses and away from their designated landing places.

17. **METEOROLOGY.**—Meteorological conditions will affect the time of landing. The occurrence of dry and rainy seasons, fog, mists and moonlight may enable the defender to foresee the need of greater vigilance and a higher state of readiness at some times than others. Prevailing winds may make exposed coasts unapproachable for long periods of time, setting up strong surfs and shore currents. These winds may make dangerous the debarkation of troops from transports into small boats and even cause serious ground swells on the lee side of small insular formations.

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TERRAIN

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18. **IMPORTANCE OF THE TERRAIN.**—a The character of the terrain will exercise a decisive influence in the course of landing operations. The commander of a force attacking a coast line against opposition cannot base his effort primarily on strategical and tactical considerations, but is limited at the beginning by the availability of landing places. Moreover, the further course of his operations will be determined largely by factors outside his control, that is, by the places on shore at which he can assemble his forces, by the lines of operations indicated by terrain features, and by routes of communication.

b. The defender of a base, therefore, may be enabled through proper appreciation of the terrain to predict with a greater degree

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of accuracy the intentions of the attacker than would be possible in a purely land situation. He can establish a defense which is more likely to meet the requirements that will be imposed upon it, thus robbing the attacker of a large part of the advantage of surprise. Hydrographical studies should enable him to determine where the assailant can initiate his landings. Studies with reference to meteorology may indicate when and from where the attack most probably will occur.

c. A knowledge of the terrain is recognized as one of the advantages of the defender, but this knowledge must be gained through study since it is not an advantage which is inherent in the mere fact of being on the defensive. The defender's initial advantage in landing operations consists in the greater opportunity he has to acquire knowledge of the ground, and upon the use he makes of this opportunity will depend the success of his defense.

d. Essential dispositions are indelibly written on the ground for the defender. Even such readily ascertainable characteristics as the width or diameter of an island answer important questions as whether artillery displacement or dispersion will be necessary to fire on all parts of the coast, or whether attacking ships can fire on all parts of the base or can enfilade certain positions; while, at the other extreme, so minute a thing as the slope of a cliff face may determine whether the attacker can gain a foothold on the shore. The study of the terrain is important for the commander of the smallest beach defense sub-group as well as for the commander of the shore defense forces.

19. THE SHORE DEFENSE COMMANDER'S STUDY OF THE TERRAIN.—a. The commander of the shore defense forces studies the terrain in order to determine:

The proper form of defense to adopt;

The most suitable and economical division of the base defense area into sectors, in order to apply the strength of his forces in proportion to the relative vulnerability of the various parts of the base defense area;

The location, composition and strength of mobile reserves.

b. The information so obtained is evaluated in terms of defensive positions, beach areas and lines of operations.

20. INFLUENCE OF TERRAIN ON THE CHOICE OF POSITIONS.—a. The study of many base areas, discloses that very frequently there is dominating terrain which commands the base. This may be a ground feature from which the attacker can render the base untenable, usually by the employment of observed artillery fire. Again there may be terrain in the form of a commanding locality of great natural strength, which the defender can organize as a stronghold and from which he can, by fire on the base, deny its free use to the attacker even though all other parts of the base defense area are captured. Whether these two characteristic types of terrain be the one and the same, or are found in separate localities, the defense plan must be built around them.

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b. When these areas are located inland, the defense will be organized in considerable depth. If they are located near the beach areas, reliance must be placed on decisive beach defenses or upon mobility and counterattack. The presence of dominating ground near the harbor entrance becomes important when it serves to cover the emplacement of heavy harbor defense artillery, thus controlling the harbor entrance and the base itself.

c. The commander designates those massifs or important crests, the possession of which he wishes to conserve as the final position of the defense.

d. The commander next considers those controlling terrain features of less major importance. These will be of various types. There will be terrain which the attacker must secure in order to cover his initial landing against the fire of beach defenses or infantry weapons. This ground, which the attacker must gain initially in order to continue his landing and advance inland, is readily recognizable as it will, in most instances, overlook the beach at short distances, either directly inland or from the flanks. Then there will be commanding terrain farther inland which the attacker must secure in order to deny the beach to the defender's artillery fire so that he can land and emplace his artillery and other means in support of the attack. Finally, after determining those localities which are natural objectives of the attack, the commander of the shore defense forces selects positions from which the advance may be most effectively opposed. These may be positions directly across the lines of operations of the enemy or on his flank. The latter are particularly important in view of the usual weakness of the attacker's flank. Tactical localities that bar or flank the attacker's advance becomes logical objectives for counterattacks or points on which to orient reserves.

e. Obviously, defensive installations cannot be maintained simultaneously on all the positions selected, and their ultimate use may depend on the progress of the attack, but prior selection assists the defender in meeting promptly the developments of the situation.

21. BEACH AREAS.—a. Having selected the important tactical areas, the commander next considers the various beach areas available to the attacker with a view to determining the most probable points at which the attack will be initiated and the defensive arrangements required at each.

b. The capacity of a beach area for receiving troops and materiel is governed by its extent, and its suitability to the attacker in this respect depends on the protection it affords from the fires of defense artillery by reason of its location and the conformation of the ground immediately inland.

c. The relation of a particular beach area to other beach areas determines its value in affording coördination and mutual support. The determining factors are as follows:

The distance between beach areas;
The character of the intervening ground.

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d. The rapidity with which the attacker can move inland from a beach area depends on the character of avenues of advance, the existence of tactical localities commanding the interior, and the terrain features affecting the movement of artillery and supplies such as roads, trails, bridges, and natural obstacles. For example, a good landing place may be but lightly defended or merely observed for the reason that impassable mountains, swamps, or other natural obstacles bar further advance.

e. Such will be the considerations indicating the relative necessity for the denial of a particular beach area to the attacker. It is finally determined by considering the ease or difficulty of defense which, in turn depends on fields of fire, existence of commanding tactical localities, cover and concealment afforded by natural obstacles and the particability of effecting control by artifical obstacles.

22. **LINES OF OPERATION.**—The shore defense commander must examine the natural avenues of approach, which, together with roads and trails, lead inland from the beach areas toward the base, in order to determine their value and probability of their use as lines of operation for the main effort of the attacker. The relation between lines of operation and the attacker's objectives indicates the successive positions which must be considered for defense or localities on which to direct reserves. Such positions may either block or flank the lines of operation. In the latter case, if carefully chosen, they may divert the attack in a less dangerous direction, or may expose the assailant's line of communication with the sea.

23. **OBSERVATION AND COVER.**—The commander also studies the terrain in order to procure good observation for command purposes and for the mass of the artillery, and natural cover for defensive installations and troops, particularly reserves in assembly areas. Where troops are distributed over wide areas and where long stretches of coast line are to be defended and observed, command observation may be difficult to obtain. Reliance must be placed on sector commanders and on an excellent system of communication to provide the necessary information, which ordinarily would be secured by terrestrial observation from commanding points inland. The commander further examines the terrain with the object of providing a good installation for the artillery as a whole. He seeks to mask the displacement of his reserves by the hill masses or crests which would provide cover for movement. It will be necessary to seek covered routes, which permit the movement to positions for troops supplies, ammunition and materiel.

24. **SECTOR COMMANDER'S STUDY OF THE TERRAIN.**—a. The study of the terrain by the sector commander is similar in nature and purpose to that of the higher commander. It is more detailed and is based to a greater degree on reconnaissance rather than map study. While the sector commander is greatly interest-

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ed in the controlling features of the terrain and the avenues of approach within his sector, he is more concerned with how to fit the defense to the terrain. This is particularly true with respect to sub-sector commanders.

b. The attacker requires three things of a landing place:

That the landing be practicable;

That the terrain immediately inland from the shore permit ample room for deployment and the rapid expansion of the landing force;

That the landing place be so located with respect to the objective that troops once established there may be profitably employed along a suitable line of operation.

c. The sector commander will, therefore, study the foreshore, the beaches and the terrain in rear of the beach areas in order to anticipate the attacker's probable course of action on his front. The entire shore will be minutely investigated to ascertain the most likely places of approach for small boats; such investigation includes the depth of water in front of the beaches, passages through reefs, water currents and other features that will affect the landing. The sector commander will also consider the type of beach, its width, length and conformation and how the land immediately in rear and on the flanks lends itself to beach defense. Where beaches are in close proximity to each other, they will be examined collectively to determine whether they are mutually supporting and whether the terrain between them favors flanking action.

d. A flat beach has an advantage for the defender in that the use of ships' gunfire is somewhat restricted because the fire must lift while the approaching boats are still a considerable distance from shore; this condition will be modified when ships are able to fire from a flank. However, this kind of beach does not permit of strong defensive measures because of the lack of cover and dominating ground.

e. Commanding ground is essential to the defender both for observation and the application of fire power. Covered terrain that is slightly elevated above sea level and close to the water's edge is advantageous to the defender. It provides some degree of command, whereas naval gunfire must be lifted early.

f. Naval gunfire is most effective against ground rising rather sharply and uniformly from the water's edge, for not only may it be maintained until the boats are near the shore, but the observation of hits afforded will result in greater accuracy. To be forced to occupy such slopes is therefore a disadvantage.

g. The best type of ground for beach defense is rugged and broken terrain. Such ground will have occasional commanding sites for observation and at the same time will provide defiladed space behind small crests and in ravines in which the defender is protected, but from which he can also deliver effective fire. Moreover, such ground assists in confusing and breaking up the coördination of the attack. The occupation of reverse slopes may be advantageous in beach defense for the purpose of concealment, protection and for delivering surprise fire.

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h. As a result of his survey, the sector commander arrives at conclusions as to the relative value of the beach areas in his sector, both for the attack and for defense, and can determine the proportion of force to employ in the defense of each. In addition, the terrain will also indicate, in any particular case, whether emphasis shall be placed on the defense of the beach itself, of the area immediately inland from the beach, or at some place along the probable line of operation of the attacker.

i. The higher commander will fix only the general trace of positions or tactical localities in the rear of beach areas that must be occupied or prepared for defense. The sector commander, from his more detailed examination of the terrain, will specify exactly the trace of these positions. The terrain will frequently disclose that one of these tactical localities literally forms the pivot of resistance in support of the beach defense; that it will cover withdrawals, facilitate delaying actions, block or flank the attacker's advance, and readily admit of the intervention of local reserves.

j. Observation for the sector commander takes on a particular significance. The problem complicates itself for the sector commander, because it is necessary to see without being seen. As the attacker's ships' gunfire will be especially intense during the initial landing and will consist of heavy concentrations and interdiction fire, protection is sought in the intelligent use of terrain and natural cover to conceal troops and their defensive installations. Observation for the sub-sectors holding wide fronts of beach area will become essential. Dominating points overlooking the beaches will be sought. In many cases, observation will have to be extended to advanced points or promontories where adjacent beaches or beach areas may be observed. This will be necessary where smoke is employed to cover the landing, for the land projections may be free of the blanketing effect of the screen while the beaches are still obscured.

25. GENERAL CONCLUSIONS.—a. The following general conclusions assist commanders in evaluating the terrain as a whole. Ridges and valleys generally parallel to the front of advance constitute obstacles to the progress of an offensive and offer natural lines of resistance for defense. Valleys generally perpendicular to the general line of defense constitute natural corridors of penetration; valleys which slope in the general direction of the attacker's probable advance are most favorable to sustained offensive by reason of the commanding observation afforded by the heights on either side. Defiles in the major terrain features parallel to the defender's front (bridges, fords, mountain passes) are important objects of offensive operations.

b. Rivers and smaller streams, and sometimes lakes and lagoons, have a special importance to amphibious operations because their openings to the sea frequently afford facilities for landings and may obstruct maneuver near the shore line. According to their direction, they may be avenues for movement or obstructions to movement. The river valleys which stretch from the interior

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to the sea and which end in bays, harbors or stretches of beach will usually be routes of invasion from the sea. However, a river's course is not necessarily a route of approach. The features existing in each particular case must be carefully studied and the relative weakness of the defender from this cause must be determined. Marshes and lakes may exist, tributaries may cut across the valley making a series of obstacles and defensive positions.

c. The general characteristics of the ground, that is, whether it be flat, gently rolling or rugged, will indicate the probable effects of fire. Rugged ground will afford considerable protection against the naval gunfire of the attacker and may, in this respect, be considered an advantage. The nature of the weapons to be employed by the defense may be largely determined by this feature. For instance, where the slopes are favorable, a large number of flat trajectory weapons may be provided, while in rugged country, the defender will prefer to be well equipped with howitzers, mortars, and grenades. The defender also considers in this connection the possibility of the extensive use of tanks both by himself and by the attacker.

d. In conclusion, and in emphasis, knowledge of the terrain is the foundation upon which the defense is built and such knowledge must be **detailed, complete** and **absolute.**

SECTION V

GENERAL AND FUNDAMENTAL FACTORS OF THE DEFENSE

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26. ADVANTAGES AND DISADVANTAGES OF BASE DEFENSE.—a. The main advantages will be:

A distinct superiority of position, in view of the difficulties of attack from the sea against a prepared position;
Knowledge and choice of terrain with excellent fields of fire;
Highly organized fires employed in conjunction with obstacles especially at the water's edge;
Excellent observation;
Assailant's lack of information and the difficulty of conducting preliminary reconnaissance while still at sea.

b. The main disadvantages will be:

Surrender of initiative;
Limitations imposed on maneuver;

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The assailant's superior mobility prior to landings;
Difficulty of distinguishing between enemy's main and secondary landings;
Dispersion of forces as differentiated from the forms of defense normally employed in land warfare.

c. The time fatcor will operate to the advantage of the defense dependent upon when the attack is made.

27. GENERAL FACTORS OF THE DEFENSE.—Many factors will influence the class, form and methods of the defense adopted by the shore defense forces in the defense of advanced bases. The following are the main governing considerations:

Size of the area to be defended;
Strength of forces available (troops and armament);
Fighting value of troops;
Character and type of armament;
Topographical and hydrographical features of the area;
Number of probable and possible landing places;
Determination of objectives for offense;
Avenues of approach leading to base area (lines of operation);
Time for preparation and duration of defense;
Estimate of enemy's probable plan of landing and attack.

The methods of defense will be materially affected by the development of new weapons adaptable to landing operations both for the defense and offense.

28. FUNDAMENTAL FACTORS OF THE DEFENSE.—a. As the shore defenses will usually be the basic and ultimate defense, which will continue to operate after the possible defeat of the sea and air forces, a careful estimate should be made of the minimum strength of troops and armament that will be required to insure the base against capture.

b. In the defense of advanced bases, situations will be extremely variable; variable with reference to the mission or task assigned, tactical and strategical considerations, forces and armament available, size of area to be defended, probable period of defense, time of preparation for the defense, size and location of harbor with respect to the total area to be defended, nature of the coast line, and character of the terrain. Therefore, all plans and decisions for the defense must be made to fit the problem, and each particular situation will require a special study and a special decision. There can be no type solution.

c. The defense of advanced bases, usually being weak in means in comparison to the areas to be observed and defended, will require the highest order of skill and ingenuity in economizing, organizing and disposing the forces for the purposes of presenting an insuperable front to a landing force.

d. The strength of the defense of an advanced base lies in an excellent system of observation; in a good system of fire, infantry and artillery, meticulously coördinated; in the opportune and sagacious employment of aviation and the naval defense forces; and in the rapid play of reserves.

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e. In many defensive situations, the sea and cliffs will combine to form a formidable obstacle which, due to the character of the coast line, will force the attacker to confine his efforts to forcing a defile without the initial prospect of surmounting the dominating heights. The entrance to these defiles, which are the beaches themselves, must be covered and swept by fire based on a definite plan and which must act instantaneously under all conditions; conditions imposed by the enemy in form of gas and smoke, and by nature in the form of darkness, mist and fog.

f. The assailant will be particularly vulnerable during the time his transports are standing in and preparing to transfer the landing troops to boats, while passing from ship-to-shore in small boats, and when debarking and forming up for the attack at the water's edge. The defender should utilize his combined efforts to strike the enemy the strongest blow practicable during these critical periods. While it is doubtful that the defender's aërial and submarine attacks directed against the transports and supporting ships and the fire of machine guns, antiboat guns, and artillery will decisively defeat the main landing at the water's edge, it should so weaken and disorganize the assaulting troops that they will be unable to withstand a determined counterattack.

g. The beach remains exceptionally dangerous to the attacker even after he has established himself on shore, for supports, reserves, supporting weapons and supplies must all cross this open and uncovered area, exposed to the fire of the defense. A peculiarity of landing operations is that the attack is **weakest at its inception** and as the attacker advances inland his strength, through the landing of reserves and supporting weapons, **increases** with the distance by which he clears the shore.

h. Every effort should be made to stop the enemy at the water's edge, but this should not lead to the commitment of too many troops to purely beach defense or to the premature employment of the commander's reserve.

i. Beach defense dispositions are based upon the organization of small tactical localities composed of mutually supporting points occupied with minimum personnel, but strongly reinforced by automatic weapons. The maximum density of fire in combination with under-water and land obstacles will be developed to cover the water approaches by flanking fires delivered from positions at the extremities of the beach, close to the water's edge, and by oblique and frontal fires from positions farther inland.

j. Where beaches are adjacent, but separated by cliffs or high ground at the shore line, the beach defense must provide protection against the attacker's outflanking action, by the use of obstacles swept by automatic gunfire installed on the intervening ground between beaches.

k. As the attacker's entire tactical plan will be based upon passing more troops ashore than the defender can collect on his front, an excellent system of observation and communication will be of primary importance, in order to facilitate the movement of reserves to the threatened front.

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l. The commander [redacted] defense forces intervenes in the defense by maneuvering the fires of the artillery and by employing his reserves.

m. The commander must reserve great liberty of action in the employment of the general reserve. He must not be unduly governed by the necessity of occupation of inland positions in rear of the beach defenses or previous estimates as to where the enemy must confine his main effort. His mind must be **more flexible than his plans,** in order to meet or create new situations favorable to himself.

n. As the enemy will attempt to gain fire superiority in the early phases of landing operations by the fire of supporting, accompanying and grounded ships, and of air forces, the defender's best protection will lie in the intelligent use of cover, artificial and natural, to conceal both the defensive installations and troop assembly areas.

o. Once the enemy appears in force off the coast, he should be kept under constant surveillance.

p. In the defense of an advanced base involving the observation and defenses of long stretches of coast lines, the flanks are likely to be extremely vulnerable to land attacks strongly supported by ships' gunfire and air forces. Flanks should, when possible, rest on impassable obstacles or be refused should the terrain be favorable for defense or as a base of departure for counterattack. The employment of persistent chemical agents is particularly adapted for denying regions on the flanks.

29. CLASS AND FORM OF DEFENSE.—a. The task of the defender will always be to secure an area for the use of the fleet, or to deny it to the enemy for one reason or other. Viewed in its entirety such defensive operations tend to a fortified form of defense, characterized by depth with fixed defensive installations. Such rigidty of form does not necessarily develop into fixed disposition of troops, for the degree of tactical mobility will depend upon the relation of the strength of the command to the size of the area, upon the means of communication, terrain, landing beaches, avenues of approach inland, and time for preparation of the defense.

b. In most defensive situations of advanced bases, the troop disposition is designed to gain a tactical victory by containing and developing the enemy's landing at or near the water's edge and then striking a decisive blow. This is an **active defense,** based on the use of reserves for strong counterattacks, delivered at the appropriate time and place. The main factor in this class of defense is mobility and speed. Success will depend on timely recognition of the enemy's real intention as to the main landing, secondary landings and demonstrations; on quick, certain and accurate information; and the speedy dispatch of troops to the threatened points.

c. Opposed to the active defense, is the **decisive defense** at the water's edge, which is entirely passive in character. The use of this class of defense presupposes that the strength of the reserv-

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es and the occupation of rear positions are sacrificed to beach defense. Such a defense is based on the assumption that it is feasible to so defend at the shore line that a landing can be made impossible, in view of the many disadvantages that the attacker suffers at the water's edge in effecting his landing and attack. If, in a defense involving the shore line, a rigid defense at the beach is broken, the decision is final, for there is no adequate force in rear to control the situation. Even if such a defense appears justifiable, it cannot be expected that sufficient strength will be available for the occupation and defense of the entire coast line. Moreover, a passive, rigid defense of the coast line increases enormously the difficulties of command, control and supply and tends to keep the troops constantly on observation duty. However, a decisive defense at certain beaches is often advisable and justifiable. In fact, it will be necessary in some instances to defend decisively at the water's edge, especially where important objectives are so close to the beach areas that the enemy's initial success there will almost certainly cause such objectives to fall into his hands.

d. If the strength of the command in relation to the area to be defended is great and the landing places comparatively few, is it evident that the beach defense can be strong, assuming the form of a position defense.

e. In such an extreme situation, the exclusion of an active defense based on the employment of mobile reserves for counter attacking may not be warranted, as the assailant should always be able to concentrate superior forces and means before a particular landing area.

f. When an advanced base is located on a peninsula and where no landings are available except at the neck of the peninsula, or where the attacker would have to approach the peninsula from the mainland, the defending troops would be disposed in considerable depth. The defense should be made upon more than one organized position. However, the form, size and nature of areas on which advanced bases ordinarily will be situated will seldom permit of a zone defense of this character.

g. On the other hand where the forces for defense are relatively weak with respect to the area to be defended, and the landing places numerous, the beaches can only be lightly defended or observed. The greater part of the forces will have to be held as mobile reserves. This might be assumed as a case where adequate strength is not assigned to the defense of the base from the beginning. In this situation the defender would be forced to leave to the attacker an unlimited choice of landing points and complete liberty of movement. This last would be increased in an almost ideal manner by the speed of maneuver at sea of the enemy's supporting ships and where initial landings are made from destroyers and fast cruisers.

30. **ALL AROUND DEFENSE OF A BASE.**—A base must be defended from an advance from the sea and from any direction by land. While the defense has been discussed primarily from the

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viewpoint of [redacted] from the sea, it will be important to consider the defense of bases from an attack by land. This is especially true when bases are situated on vast extents of land. In such cases, the assailant is allowed more latitude in the selection of his lines of operation. Landings may be made unopposed or only slightly so, thus permitting the enemy to take advantage of land routes of communication and favorable terrain by which he can concentrate his forces for an attack on the landside of the base. The defender must now be prepared to dispose his forces for the defense of any part of the periphery of the base defense area and will be constrained to make initial dispositions of part of his forces to cover important routes of communication leading to the base. Due to the extent of such an all around defense, the defender is compelled more than ever to hold out a large reserve.

31. ENEMY METHODS OF ATTACK.—a. The enemy may employ any of the following methods of attack against the base:

Attacks by aircraft based on carriers, tenders or nearby land bases;
Attacks with gunfire, torpedoes and bombs upon shipping by surface vessels, submarines and aircraft;
Mining operations;
Bombardment by naval gunfire;
Use of obstructions to block passage into the harbor;
Penetration into the anchorage area by submarines or destroyers for the purpose of torpedo attacks;
Landing force attacks;
Attack by forces from overland;
Blockade.

b. These attacks may occur singly or in combination and may be delivered with the added support of combatant naval vessels which will provide a measure of security for the attacking forces. or they may occur without such assistance.

32. BASE AND BASE DEFENSE AREA.—a. In the defense of an advanced base, the base will be known as the area including the anchorage within the harbor and the amount of land adjacent to the harbor essential to and on which the fleet shore establishments are located.

b. The base defense area is the total area to be defended which must be denied to the enemy in order to insure the security of the base against a hostile landing attack or an attack overland. It includes the base.

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TENTATIVE MANUAL
FOR
DEFENSE OF ADVANCED BASES

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CHAPTER III

SHORE DEFENSE FORCES

MARINE CORPS SCHOOLS
QUANTICO, VIRGINIA

June, 1936

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SECTION I.

STRENGTH, COMPOSITION AND DISPOSITION

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1. GENERAL CONSIDERATIONS AFFECTING STRENGTH AND COMPOSITION.—a. Ordinarily the shore defense forces will consist of infantry, artillery, (light, heavy and antiaircraft), engineers and chemical troops. The strength and proportion of the various arms will depend upon many factors, but will be primarily affected by the naval plan, the importance and probable permanency of the base, its location with respect to hostile territory, its vulnerability to attack and the nature and extent of the area adjacent to and surrounding the base.

b. It may be possible to determine the strength and composition of the shore defense forces from the strategical or campaign plan of the commander-in-chief of the fleet before the actual initiation of operations. This plan may contemplate the seizure and defense of certain land areas as bases within the prospective theater of operations. For the purpose of economy, both in personnel and material, the strength and composition of the shore defense forces should be carefully calculated beforehand whenever practicable.

c. The necessity of possessing a highly mobile land force to accompany the fleet soon after mobilization will affect the strength and composition of the forces assigned to the defense of a base. Logistical limitations in the initial movement overseas will impose certain definite restrictions on the size and composition of these forces. The landing force, which accompanies the fleet to assist in the seizure of a base, will almost invariably be required to occupy and defend the base at least temporarily until relieved by forces especially equipped for defense. This may influence considerably the composition of the force for the shore defenses. It is apparent that to encumber a striking force especially organized

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seize a base may result in reducing its strength if included within its composition are forces that are essentially adapted to base defense.

2. INFANTRY.—a. The infantry is the basic element of the shore defense forces, as the ultimate security of the base rests upon its action. If the extent and nature of the terrain and shore line of the base defense area is known its strength can be determined within reasonable limits. For the defense of beach and inland positions the infantry should be strongly reenforced with automatic weapons.

b. Infantry is assigned to both the general reserve and sectors. Based on the defense plan the infantry strength of the general reserve may vary from a small to a large part of the defender's force. Infantry is assigned to sectors in accordance to their size and relative importance and the general defense plan.

3. ARTILLERY.—a. The strength, composition and disposition of the artillery, light, heavy and antiaircraft, in relation to the shore defense forces depends on the area to be defended, the plan of the harbor defenses, the number of probable sea approaches to the more favorable landing places and the land operations likely to be involved in case of an actual landing.

b. It is entirely probable that in some operations involving resistance against landing attacks, very limited use can be made of the various types of artillery other than light artillery. On the other hand, in operations involving considerable large areas and numerous sea approaches and landing places, all types of artillery will be essential to success.

c. The artillery of the shore defense forces should be composed of each class of artillery in the minimum amount considered necessary to provide for an adequate defense of the base. It should be so disposed that each class of weapon can be efficiently employed on its secondary as well as its primary missions. For maximum results, due to the inherent limitations of the amount of armament available, artillery of all classes should preferably be of a mobile type.

d. In operations involving the seizure of a base followed by its defense, the subsequent requirements for defense should be considered at the same time the attack requirements are determined.

4. LIGHT ARTILLERY.—The light artillery should be sufficient in strength to provide for the direct defense of the various sectors assigned the defense of the base. It is probable that in some situations both the pack howitzer and the gun will be available for the defense. The gun is the superior weapon for defense and should be selected when a choice exists.

5. HEAVY ARTILLERY.—The heavy artillery should be sufficient in strength to provide for the defense of the base proper and the anchorage against effective attack from the seaward. The defense should provide against effective bombardment by naval light

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forces and against naval raids. Both the 155m/m mobile gun and the 6″ 47 naval gun, mobile or fixed, will probably be available. The mobile type should preferably be chosen if any choice exists.

6. ANTIAIRCRAFT ARTILLERY.—Hostile aviation with its great striking power, large radius of action and its mobility will ordinarily present the greatest potential threat to the security of the base. A careful estimate of the enemy air strength, including bases, both carrier and land, will have to be made before any intelligent estimate may be made of the requirements in antiaircraft artillery. Ordinarily sufficient antiaircraft artillery, both guns and machine guns, must be assigned the shore defense forces to assure a reasonable defense to the most vital facilities of the base at least during the temporary occupancy of the base.

7. ENGINEERS.—a. In view of the innumerable tasks that engineers will have to perform in base defense, such as the construction of landing fields, wharves, shelters, roads, trails, bridges, the development of water supply, organization of the ground, obstacles, demolitions, camouflage, etc., their strength should be carefully calculated. The proportion of engineers with a well balanced defense force, operating at a distance from its home base, should consist of at least twelve per cent of the strength of the shore defense forces.

b. In principle, the engineers should be held intact. As the duties of the engineers are multifarious, better results are attained by having the engineers function directly under their commander. During the preparation and organization of the defense it may be necessary to attach small units of engineers to the sectors and artillery, but this detail is temporary.

c. In accordance with a directive from the commander of the shore defense forces, the order of priority of work for the engineers is prescribed. The plan of work for the engineers will include the following:

Organization and fortification of the ground;
Camouflage of defensive works and gun emplacements;
Construction and maintenance of routes of communications;
Supervision of preparation of airdromes and landing fields;
Development of water supply;
Installation of a system of demolitions;
Reconnaissance of terrain and water approaches;
Construction of temporary wharves.

d. The work of the organization of the defensive positions is incumbent almost exclusively on the other arms, especially the infantry. Except for highly specialized tasks, such as demolitions and water supply, engineers are employed only as supervisors or technical advisors.

8. CHEMICAL TROOPS.—a. Strength.—The strength of chemical troops required will, in every case depend upon the size of the area to be defended, the existence of a road-net, the number

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and size of good landing beaches, and the terrain forms within the defended area. As a general rule, one chemical company for each infantry brigade may be considered as the minimum requirement.

b. **Composition.**—Each chemical company is organized as a mobile hand-drawn cart unit and is composed of a company headquarters and two platoons. Each platoon has three 4.2″ chemical mortars and is organized as a fire unit. The platoon is composed of platoon headquarters, three mortar squads and nine ammunition squads. When mobility is not required, the company is organized as a hand-carry unit and is composed of a company headquarters and three platoons. In such case, each platoon is composed of platoon headquarters, three mortar squads and three ammunition squads. (The extra platoon is organized by withdrawing six ammunition squads from each of the hand-drawn cart platoons. Three extra 4.2″ chemical mortars are carried by company headquarters for this purpose). There is no increase in personnel when the company is so organized. Its mobility is, obviously, much restricted.

c. **Disposition.**—Chemical troops are charged with making all static installations required within the base defense area. During the "Reconnaissance" phase they make daily inspection of such installations. During the "Alert" phase they make hourly inspection of all installations and are prepared to detonate, on order, installations more than 1,000 yards from local command groups. During the "Final Defense" phase all chemical troops are with their respective mortar platoons except a few individuals, who may be left to detonate static installations. Platoons are prepared to put down chemical fires (CG, HS, M-1, CNS, and WP) on call. Normally, platoons are assigned, initially, to support beach defense positions, covering beaches on which it is estimated the enemy may attempt to land. Each platoon prepares several alternate positions and prepares fire data, well in advance, for all probable target areas. Successive positions are organized in like manner along lines of withdrawal of the final defensive position; all fire data being prepared for each position.

9. **COMBAT VEHICLES.**—a. Combat vehicles are of special importance in base defense, because they increase the mobility and flexibility of the reserve and the speed with which force can be concentrated at a critical point. These features eliminate many of the disadvantages of dispersed reserves and allow the commander to wait longer for definite development of the attack before committing his reserves to action.

b. The extent to which combat vehicles will be effective depends on the number available, their speed over roads and across country and the nature of the terrain over which they are to operate. These vehicles will probably consist of the light types, and their number is likely to be small due to limited amount of overseas transportation at the beginning of a naval campaign.

c. Fast tanks and armored cars are ordinarily retained with the general reserve, but may be attached to the sectors in small

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numbers. Their primary task is in support of the counterattack. They may accompany and enter the action with the foot troops using their speed to strike a blow at the attackers, in order to gain time for the remainder of the reserve to arrive. Since they will be more effectively used in conjunction with the rest of the reserve, the latter task should only be given when the attacker may otherwise seize an important tactical locality or pass through a defile, and in similar situations where delay is more essential than additional force in the counterattack. Secondary tasks are reconnaissance and observation of outlying and undefended beach areas, and in support of outpost troops in delaying a landing and advance inland. Cross-country armored cars would be particularly valuable for these tasks. At the same time their speed permits them to assemble in support of counterattacks.

d. Where the sectors are large or at some distance from the base, it may be advisable to attach a few armored cars to the sectors for the purpose of assisting in reconnaissance, and as a means of furnishing an immediate reenforcement to beach defense forces.

e. Slow tanks may be assigned to sector reserves so that lack of speed will not retard their intervention in support of beach defenses by counterattack, protecting a flank, or covering withdrawal. In determining whether to distribute slow tanks or to retain them in general reserve, the commander of the shore defense forces must arrive at a proper conclusion as to the effectiveness of each method of employment in the particular situation, based on such factors as the number of beaches to be defended, the distance between various parts of the base defense area, and the necessity for defense or delay at the beaches, contrasted with the value of force in the counterattack delivered at a later stage of the operations. The decision to employ slow tanks on secondary tasks should be carefully made, remembering that lack of speed will usually prevent their concentration for the primary task of counterattack.

10. COMBAT CARRIERS.—a. If combat carriers are available in sufficient numbers they can be employed to move a large part of reserves at greatly increased speed. They may carry reconnaissance patrols to distant beaches, assist the withdrawal of outposts, carry machine guns and crews to seize important terrain before the intervention of the general reserve, to reinforce sector and beach defenses or cover a threatened undefended landing front, and to bring up rear units of reserves.

b. The ideal combat carrier is a high speed, cross-country vehicle, but any class of transport vehicle may be profitably used for this purpose.

c. The movement of combat carriers will be difficult to conceal except under cover of reduced visibility and may thus serve to give warning of troop movements, but their increased speed will reduce their vulnerability to attack.

11. LOCATION OF TACTICAL VEHICLES.—a. Tactical vehicles should be initially disposed with reference to:

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The probable tactical use;
Concealment;
Road net;
Protection by defilade or distance from light and medium artillery fire;
Necessity for firm ground and ample water supply.

b. The shore defense commander's plans for the employment of groups of tactical vehicles for all contingencies should be made and transmitted to such units as early as possible in order that necessary reconnaissance for routes, deployment points and assault positions may be made.

SECTION II

GENERAL DISTRIBUTION OF FORCES

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12. **GENERAL.**—In the shore defense of advanced bases, the troops are ordinarily disposed into beach forces, sector reserves and a general reserve. The proportionate strength of these forces varies considerably with each situation of base defense. No definite rule can be prescribed as a guide for the determination of their strength.

13. **BEACH FORCES.**—a. There should be no tendency to assign too many troops to purely beach defense. The strength of the beach defense troops is dependent on the number of probable landing places; the greater their number, the less the defender can afford to defend them all, and the more he will be constrained to increase the strength of the reserves.

b. However, the strength of any particular beach defense will depend on its mission. If the necessity exists for a decisive defense at certain beaches, then adequate personnel and armament must be assigned to their defense. To give the beach defense insufficient means with the mission of preventing the enemy from gaining a foothold on shore would be to give it a task beyond its strength. However, within the mission or directive given by the commander of the shore defense forces, the sector commander should balance the need of furnishing the beach defense with sufficient effectives to develop the enemy's real intentions by a stubborn resistance, compared with that of temporarily delaying the enemy until the intervention of the local reserves.

c. Where the beach troops are merely to cover a landing place with no intention of determined resistance, then a few combat groups with a section of machine guns may suffice for the task.

d. The strength of the beach forces can be roughly estimated by the number of men required to man the machine guns, mortars

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and antiboat guns. Adequate personnel will also have to be provided in order to furnish these guns with local protection. Certain combat groups will be required to defend important tactical localities and to cover the main avenues of approach inland. The strength of the latter should be reduced to a minimum compatible with a reasonable defense.

e. As machine guns will form the framework of the beach defense, their number should be carefully calculated after a study of the beach areas.

f. The number of antiboat guns will depend on their caliber, and their rapidity of fire and range, the extent of landing front, the estimated rapidity of landing of the attacking force, and the size, number and character of the attacker's boats. The beach defense should be well supplied with mortars.

14. SECTOR RESERVES.—The sector reserves should have sufficient strength to repel small penetrations in the sector areas, to reenforce the beach defenses, and, in the case of a main landing, to so delay the enemy that the reserves of the next higher unit can arrive on their prearranged base of departure before the enemy can reach that area. Sector reserves will ordinarily occupy defensive areas established across the attacker's probable lines of operation.

15. GENERAL RESERVE.—a. The strength of the general reserve cannot be made the subject of any definite rule. However, the size and composition will depend on several factors. If the landing places are few, the terrain for beach defense and the resistance to the attack is favorable, and the extension of front by the attack is restricted to narrow limits, the strength of the reserve can be smaller than if the reverse case were true. The size of the general reserve also depends upon the defensive scheme of maneuver. If the defensive system is to make possible at some point and phase of the struggle the designed full strength of the defending forces in a decisive counterattack, then the general reserve must be strong. The time available for the preparation of defense and the degree of perfection of the defensive organizations are factors that will contribute to the strength of the general reserve.

b. The general reserve is generally centrally located, but never concentrated in assembly areas. It will be necessary to divide it, due to the large area to be defended, and as protection against aerial attack. Its dispositions should permit its rapid concentration at any of the several localities where its intervention may be foreseen. Too much initial concentration may block movement and impose delays. Parts of the general reserve may be withdrawn from unengaged or lightly engaged sectors, when the enemy's real intentions are disclosed.

c. The general reserve is composed mainly of infantry, reinforced by tanks and armored cars, if the situation permits the employment of the latter. Whether artillery should be included in the general reserve is decided primarily by the size of the defensive

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area. If the area is so small that all the artillery may be initially disposed for support of advanced echelons, and yet also be available for concentrations of fire in the decisive counterattack, no artillery should be held out. However, if the defensive area is so large that artillery support of the counterattack will suffer by initial dispersion of the artillery, some artillery must be held mobile. The counterattack must be strongly supported by artillery fire.

16. **NAVY PERSONNEL AND LABOR TROOPS ASHORE.**—a. In the operation of the base, the base commander will employ on shore the services of a large number of naval artificers, communication details and labor troops.

b. In case the base is attacked, provisions should be made for the combat employment of these men. Some of them will be used as engineers and others as combatant troops. Whatever may be their prospective use, it is necessary that weapons be assigned to them, and that plans be prepared for their combat employment during the final defense phase. They will more than likely be employed in the close-in-defense of the base. The plans should include a short program of combat training.

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TENTATIVE MANUAL
FOR
DEFENSE OF ADVANCED BASES

[redacted]



CHAPTER IV

ORGANIZATION OF THE SHORE DEFENSES

MARINE CORPS SCHOOLS
QUANTICO, VIRGINIA

June, 1936

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CHAPTER IV

ORGANIZATION OF THE SHORE DEFENSES

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SECTION I

FRONTAGE AND DEPTH

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1. FRONTAGE.—In the land defense of advanced bases, the frontage to be defended may be great. Whereas for a given coast line, observation is continuous, there is never continuity of occupation by defensive means. The frontage actually defended is restricted to those beach areas where landings are probable and possible, and to the avenues of approach emanating from them. It may be further limited because certain beach areas are not suitable for landings in force or because they do not constitute favorable bases of departure for the exploitation of initial successes. The defense does not consist of a continuous system of trenches or positions, but rather of a series of organized tactical localities at or in rear of the beach areas, across the more probable lines of operation of the attacker.

2. DEPTH.—The depth of the defensive organization will be measured from the beach areas inland, and may consist of one or several positions, which may or may not be occupied prior to the enemy's landing. Depth varies for different sectors. The following are the main considerations in determining depth:

Dominating and controlling features of terrain with respect to the base and probable objectives of the enemy;

Retention of sufficient room in rear of the beach areas to give the defender time and space to dispose his forces after the enemy's main landing is disclosed;

Position selected sufficiently far from the base to prevent the enemy from attaining his final objective in a single coördinated attack;

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Ability of artillery emplaced in rear areas to fire on sea approaches and landing places;
Distant observation, particularly for artillery;
Good fields of fire for infantry;
Establishment of a well protected system of lateral communication;
Protection from hostile ships' gunfire;
Necessity of confining enemy maneuver room to narrow limits in rear of the shore line;
Necessity of forcing the enemy to displace his artillery forward from initial emplacements ashore in order to continue his attack.

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3. THE OUTPOST LINE OF OBSERVATION.—a. The outpost line of observation extends along the entire coast line, covering the base defense area, and to such other regions as are designated by the commander of the shore defense forces. It covers in particular beach positions and positions in rear of the probable and possible landing places. It provides the following needs of security:

Protects troops on beach positions and rear positions against landings by surprise.
Assures troops on beach positions and in rear, time to man their defensive installations.
Alerts local and general reserves, assuring them time to make their initial dispositions.
Informs the commander of the general attitude of the enemy on various landing fronts.

b. The forward limit of the outpost line of observation is restricted to the shore line itself. Where beaches are defended the outpost line of observation is included within the beach position. Within the area of the beach position the functions of outpost troops are performed by personnel manning the observation posts located on promontories and high ground overlooking beaches. At night these posts are supplemented by listening posts and patrols.

c. Exterior to the beach defenses, the outpost consists of a series of outpost supports, which send forward small groups (at least one semi-automatic weapon) sufficient to furnish a single observer by day and a patrol of at least two men by night.

d. Subsector commanders charged with the defense of beach areas provide their own observation and security needs. The sector commander furnishes the outpost supports outside the limits of the subsectors, but within the sector. The responsibility for maintain-

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ing observation [redacted] at the boundary line between subsectors, or at the shore line [redacted] ribed by the sector commander. Where it is necessary to observe the coast line or other areas outside of the sectors, the outposts are furnished or designated by the commander of the shore defense forces.

e. To coördinate the activities of the outpost troops, the commander of the shore defense forces or sector commander designates the outpost line of observation. Troops on this line have the mission of observing seaward, day and night, reporting correctly all they see or hear respecting the enemy. During daylight, they will be particularly vigilant for hostile aerial activity. Such troops do not have a primary mission of resistance, except at the less important beaches where their strength may be increased for the purpose of temporarily delaying or developing the enemy's initial landing. Within beach positions the resistance ordinarily afforded by an outpost position of resistance is performed by the beach defense forces.

f. Outpost troops are provided with pyrotechnics for night signalling. This demands the establishment of pyrotechnic observation posts by the subsector and sector commanders. As visual signals are not visible under conditions of fog or smoke, telephonic communication should be extended to the outpost suports and outguards.

g. Outpost troops operate in close liaison with inshore patrol craft in accordance with a predetermined plan. Boats of the inshore patrol, bearing a distinguishing mark and operating within definite areas, communicate by radio with the subsector and sector commanders and by visual methods with the outpost troops.

4. BEACH POSITIONS.—Beaches will be strongly or weakly defended depending on their relative importance. In a decisive defense at the beaches, the organization assumes many aspects of a position defense; less important beaches may be covered by light detachments or only observed.

5. INLAND POSITIONS.—a. In rear of beach positions or areas and on the main avenues of approach to the base, inland positions or areas are prepared for defense. An inland position may bar directly one or several approaches. Again the position may be on the flank of an avenue of aproach, forcing the enemy to face to the flank with respect to his line of communication to the sea. The location of an inland postion can be only so definite as is the complusion upon the enemy to attack along a definite line. The commander of the shore defense forces may have to foresee the use and preparation of several positions or areas, depending on the development of the enemy's main landing and attack. They should be located as far from the base as justified by existing conditions and yet at such distances from the probable landing places as to give the defender time and space for disposing his forces. With due consideration to favorable terrain, too much maneuver room inland from the shore line should not be conceded to the attacker. These positions should cover the mass of the defender's artillery and should, in par-

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ticular, insure to the artillery a line of observation posts that will enable it to cover mine fields, sea barriers, sea approaches and beaches with effective fire and to fire on hostile ships.

b. In the event that long lengths of coast line, affording numerous landing places, must be defended with comparatively weak forces, inland defensive positions may be viewed in the light of final withdrawal positions. Hence the success of the defense is based on extreme mobility and the ability to predict early the enemy's real intentions. The general reserve, covered by lightly-defended beach fronts, will have the role of acting in any of several directions. Victory is more likely to be attained by delivering a strong counterattack upon the enemy in the midst of his main effort than one delayed until he has gained a beachhead.

c. Inland defensive positions may be occupied and organized for defense by sector troops. They may be used as bases of departure for counterattacks or as positions to which advanced troops withdraw.

6. FINAL DEFENSIVE POSITION.—a. On the land area adjacent to or surrounding a base there will often be found dominating terrain, which gives control of the base to the defense forces. If the base itself is considered as the vital area, this dominating terrain or area may be regarded as the critical area in base defense. The role of this area, which is frequently centrally located with reference to the base defense area, but not always so, is illustrated by the conception that such a small area is organized for an all around defense and fought as a "keep" or stronghold. Such, in principle at least, is the notion and purpose of the position, known as the final defensive position.

b. Whereas the base itself may be attacked and rendered untenable without the capture of the dominating area, the base cannot be used by the attacker while the defender maintains himself in the final defensive position. Until this position is captured, it serves as a menace to the attacker by fire and counterattack and denies to the attacker the use of the base. The retention by the defender encourages efforts for relief.

c. In most advanced base situations, success will depend on an active defense, that is, on the counterattack by a large mobile reserve. If this action fails, the defender will feel particularly constrained to consider other favorable courses of action still open to him. Compelled to withdraw, he will be forced to accept battle from some position commanding the base and from where the base can be denied to the enemy. Such a position is considered as the final defensive position around which the defense plan is built. Lines of withdrawal from beach and inland positions must be carefully studied and designated. This will permit commanders of subsector and sector troops and of artillery and antiaircraft units to take the proper action at the desired time in the event the commander of the shore defense forces is compelled to issue orders for withdrawal after the failure of the general counterattack.

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7. **FORTIFICATION, GENERAL.**—a. The fortification of the ground is an art little known and studied. In the shore defense of a base, commanders must take into account the many advantages to be drawn from fortification of the terrain, in order to strengthen the powers of the defense and thereby economize both in personnel and matériel. This necessitates a perfect knowledge of the employment of the different arms and a thorough understanding of ground forms as it applies to the defense.

b. The defense employs two inseparable and yet quite different obstacles against a hostile landing attack; the material obstacle, natural and artificial, and the obstacles of armament. Both are only efficacious when they are well protected against every effort at destruction. Before and during the landing, the defender will be subjected to a heavy naval and aérial bombardment, which will reach its maximum intensity just before the assailant's troops reach the shore line. The accuracy and effectiveness of this fire will depend almost exclusively on what the enemy sees and observes from his ships and airplanes. Therefore, the defender's best protection lies in perfection of concealment and shelter against the enemy's shells, bombs and small arms fire.

c. Defensive works are constructed to protect personnel and installations against hostile gunfire and aérial attack, to delay and defeat the hostile landing, to facilitate the employment of weapons, and to assist observation, command, communication, movement and supply. The initial efforts are directed toward securing good fields of fire and observation, cover and shelter for troops and weapons, and obstacles along the avenues of approach to defensive positions. The work consists of artillery, machine gun, mortar, and antiboat gun emplacements; bomb and gas proof shelter for troops; trenches, obstacles, observation and command posts, aid stations; routes for supply, evacuation and signal communication.

8. **FORTIFICATION OF BEACH POSITIONS.**—a. As the enemy's ships gun and aërial bombardment will be particularly violent at the water's edge and directly inland, beach defensive in-

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stallations must be skillfully concealed and sheltered. If time permits and material is available the machine guns at the water's edge should be emplaced in bomb proof shelters, and made invisible from sea and air. Other machine guns, mortars, and antiboat guns assigned to the beach defense can be emplaced in the ordinary splinter proof shelters, provided they are well concealed. As an additional means of protection, each of these guns should have an alternate emplacement. If weapons are not furnished with shelter, then every effort should be made to secure flash and mask defilade and overhead concealment.

b. The beach defense troops organize small tactical localities, mutually supporting, consisting of combat groups not larger than a platoon, and more frequently much smaller. These groups construct fire trenches of the standard type. When natural cover is lacking and it is difficult to conceal the trenches, dugouts may be provided for the groups.

9. FORTIFICATION OF INLAND POSITIONS.—If inland defensive positions are to be occupied and defended, especially for an all around defense, then they should be strongly organized. But if, on the other hand, it is contemplated that they may be used as bases of departure for counterattacks, then the position should not be so highly organized as to interfere with the mobility of the troops occupying them. In the latter case, the position may consist merely of a system of squad trenches and emplacements for machine guns and mortars. The greater part of the troops will be held under cover in rear, prepared for any eventuality.

10. FORTIFICATION OF THE FINAL DEFENSIVE POSITION.—a. The final position is organized for an all around defense and consists of a well arranged system of parallel and communication trenches, strongly obstacled and provided with bomb proof shelters and dugouts. Magazines are constructed for ammunition and provision made for the storage of supplies and water. Unobstructed fields of fire are prepared to cover the more probable avenues of approach and emplacements made for machine guns, mortars and artillery. Particular attention is given to antitank and antiaircraft machine gun defense. In the organization of the position careful consideration is devoted to observation and communication within all parts of the position, and the use of camouflage because the defense may be contracted within narrow limits.

b. The actual organization of the final defensive position will probably be assigned to the troops of the general reserve, assisted by the engineers. The fortification of the position should not be delayed, although the position is not actually occupied except as a last resort.

11. OBSTACLES.—a. The tactical value and location of terrain, and the mission of troops of each sector will indicate the advisability and extent of employment of obstacles within any sec-

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tor. Extensive use of obstacles may be used to deny certain areas to hostile forces, in order to make them fight over ground unfavorable to their advance, or where it is not contemplated to use reserves in counterattacks. Obstacles may consist of barbed wire, mines, cheveaux de frise, abatis, etc. Of these, barbed wire gives the best results for the least expenditure of time, material and labor, but must be transported to the theater of operations.

b. The clever use of obstacles adds materially to the strength of the defense. The infantryman will usually install his own obstacles, although the engineer may assist in the construction of the more elaborate types. As obstacles serve tactical requirements, the infantryman, whether he installs them or not, directs their location in order to secure the greatest effect from their installation.

c. Obstacles are installed to delay the attacker under the fire of the defender and to guide and restrict his movement into channels where the defender's fire will be most devastating. Thus, the siting of obstacles and weapons are interrelated; the obstacles serving to deny entrance into defiladed areas.

d. Obstacles will find their greatest use and importance at the shore line, where a profusion of obstacles will compensate in some degree for the paucity of personnel. These obstacles constructed of barbed wire will consist of two lines: the first immediately in front of the beach, submerged in the water, and the second located on the beach not far from the water's edge. Their presence prevents a concerted rush on the machine guns delivering the greater part of the normal barrage. The submerged entanglement should be firmly anchored in place with heavy rocks or concrete blocks; and the barbed wire entanglement on shore should be erected so that the lower strands of wire do not permit the attacker to crawl under the obstacle. Shore obstacles should not be laid out in regular straight bands as this will serve to reveal the emplacements of the machine guns at the water's edge.

e. Routes of approach and defiles leading from the beach into the beach defenses, and terrain between adjacent beaches should be denied by the erection of obstacles, preferably of barbed wire.

f. Submerged barbed wire in front of beaches may be supplemented by floating or submerged booms.

12. CHEMICAL BARRIERS.—These barriers may be created by the use of persistent chemical agents, dispersed either statically or by means of airplane bombs or spray. Barber wire obstacles are of great value in forcing the enemy to remain in a chemical barrier long enough to become a certain casualty. Chemical barriers are usually constructed in triple bands, the several bands being from 50 to 100 yards apart. Land mines may be interspersed within the chemical barrier to assist in the demoralization of the hostile troops.

13. DEMOLITIONS.—a. A systematic plan of demolitions may be prepared by the defender for the purpose of stopping the enemy or at least delaying his progress from the time he lands and advances toward his final objective. Demolitions may consist of

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the methodic destruction of routes of communication, roads, trails, etc., in order to render difficult the enemy's supply arrangements and to hinder the forward displacement of his artillery and other supporting weapons. Demolitions will produce the best results when they are installed at points of passage that the enemy is obliged to use for all the elements of his force, infantry, artillery, tanks, supply convoys, etc. Bridges, fords, and defiles come within this category.

b. The employment of demolitions may also be foreseen in front of defensive positions. These destructions will be used principally for the purpose of retarding the emplacement and the forward displacement of the enemy's supporting weapons. They may be prepared in front of the position and covered by artillery fire, or within and in rear of the position. In the latter case, it is apparent that demolitions would only be used where it is intended to withdraw and delay the enemy.

c. The actual preparation and placing into operation of a systematic plan of destructions will require a great deal of material (explosive), time and labor; making demands probably well beyond the facilities and means of the defender of an advanced base. However, consideration should be given to the preparation of a system of destruction to be employed at the more important landing places. Demolitions in the form of contact or controlled mines can be used advantageously to deny favorable sea approaches to beaches. Land mines such as trip, pressure or controlled mines can be employed near the water's edge, to put out of action bodies of enemy troops, who have succeeded in getting through the obstacles. Mines may be used within the beach defense position to deny certain areas, or to cover ground over which the enemy must pass.

14. **CAMOUFLAGE.**—a. The enemy will conduct preliminary aërial reconnaissance, visual and photographic, for the purpose of locating defensive positions and works, troop assembly areas, gun emplacements, obstacles, etc., on which to base the details of his attack and from which he can secure data for ships' gunfire and aërial bombardment. In order to escape this aërial investigation, it is highly important to conceal the exact emplacement of all weapons, defensive positions and works. When natural cover does not provide such concealment, then access must be made to the construction of artificial cover, indistinguishable from surrounding natural objects. Machine gun, antiboat gun, mortar and artillery emplacements should be carefully camouflaged, and entrenchments and defensive works made to blend in with the natural features of the ground.

b. Such measures as the construction of dummy fortifications, gun emplacements, trenches, tracks, air fields, etc., should be utilized in order to deceive the enemy as to the real strength and location of the defenses.

c. All camouflaged defenses should be made with the assistance of observation by the defender's aviation and they should be subjected to even more severe tests than the methods employed

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by hostile aviation. Positions and emplacements should be photographed from the air until they give no indication of their presence. It is only in this way that valuable information can be secured on which to base a scheme of camouflage that will deceive the enemy's aérial explorations. Defensive works should likewise be concealed against observation from sea and land.

15. ILLUMINATION.—a. To guard against night surprise landings, provisions must be made for the illumination of certain important water areas, mine fields, sea barriers, sea approaches, and landing fronts. This illumination is provided by mobile searchlights, pyrotechnics or flares fired from shore, dropped flares from airplanes and star shells.

b. Mobile searchlights are particularly valuable in picking up enemy ships and small boats and holding them under observation. As the enemy will make every effort to destroy searchlights, they should be used sparingly. In principle, searchlights should be kept out of action or "occulted" until it is definitely known that hostile craft are operating within their effective radii of illumination.

16. PRIORITY OF WORK.—a. The commander of the shore defense forces will prescribe a priority of work for the organization of the shore defenses. This program and priority of work may vary considerably for different advanced base situations. Much will depend on the time that the organization can be reasonably free of enemy interference and the availability of natural and artificial resources and native or civilian labor that would lessen the amount of labor entailed in the organization. Ordinarily, the work incident to the close-in defense of the base (base installations, mine fields, sea barriers), will take precedence over the work entailed in the organization of the final defensive position and sector defense. However, under favorable conditions the work may proceed simultaneously.

b. In most cases it will be essential first to emplace the anti-aircraft and heavy artillery, erect airdromes and prepare landing fields, establish the command posts of the higher units and install a system of communication to serve the above units. The organization of the sectors and the emplacement of the light artillery may follow later.

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PLANS OF FIRE

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17. GENERAL.—Since the utilization of coördinated fires is the

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principal mode of action in the defense of a base, calculating and organizing the plans of fires will be the chief concern of the shore defense forces during the organization of the defense. As landing attacks are not restricted to any time of the day and may be made under cover of fog, darkness or smoke, fires for all positions and artillery missions must be delivered accurately and instantaneously under the most adverse conditions.

18. BEACH DEFENSE FIRES.—(See Section V, Chapter VI, BEACH DEFENSE).

19. FIRES FOR INLAND DEFENSIVE POSITIONS.—a. When inland defensive positions are occupied and defended by sector troops, the plan of fire consists of distant fires (machine gun and artillery), normal barrage fires (infantry and artillery) in front of the position, and fires in the interior of the position to be put down in event the enemy penetrates the position. If the position is prepared for an all around defense, flanking fires become of vital importance, especially fires delivered from reverse slopes within the defended area.

b. When the sector plan of defense contemplates protecting the withdrawal of the beach defense forces, then the distant fires must be delivered to cover the withdrawal of the troops along predetermined routes.

c. The amount of light artillery actually attached to the sector may be slight in proportion to the extent of sector front. It has the mission of covering sea approaches, contributing its fire to the normal barrages in front of the beach and inland positions and interior fires within these positions. In the area between the beach and inland positions, its fires consist of a series of concentrations put down on the more sensitive points of the enemy's advance.

d. Depending upon the gravity of the situation, the sector artillery fires will probably be reinforced by artillery in general support or artillery from adjoining sectors. Where the enemy succeeds in rupturing beach positions on important landing fronts, artillery in general support will be prepared to interdict the beaches so as to render impossible, or at least very difficult, subsequent landing of enemy troops, artillery and ammunition. These fires will have to be carefully planned and combined with the sector defense fires.

20. FIRES FOR THE FINAL DEFENSIVE POSITION.—a. The final defensive position expresses the idea of a fortified zone wherein the limits of the position are restrained to correspond to the terrain and the diminished numbers of the defender. Like most strongly fortified areas, the defense is passive in character, except in so far as it may be necessary to employ movement to expell the enemy from the position in case of hostile penetration. Fire action is then the principal method of combat. As the defender must be prepared to deny all approaches to the position by which the enemy may attempt to continue his success, it may be

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necessary to organize the position for an all around defense by fire.

b. Enhanced by excellent observation and means of communication, the fire plan can be carefully prepared and put into operation by elements of the shore defense forces that may ultimately occupy the position. The fire plan will include the distant fires for both the artillery and machine guns, and the continuous (normal barrage) fires immediately in front of the position; whose maximum densities should be put down to deny the more probable approaches to the position. As the position may be organized in some depth, effective interior fires should be provided to cover those areas where hostile penetrations are most favorable.

c. As the position may be occupied during a withdrawal, the distant fires, both for artillery and machine guns, are particularly important. If the lines of withdrawal to the positions are previously designated, these fires can be put down accurately and effectively by those elements already in occupation to cover the withdrawal of troops from distant subsectors or sectors.

21. **FIRES IN SUPPORT OF LOCAL COUNTERATTACKS.**—Local counterattacks made by the sector reserves should be supported by the fire of all available weapons. The sector commander, by previous study of the terrain, can decide the points or localities that it will be necessary to recapture, or where it will be essential to stop the enemy's advance. Such a study will determine tentative attack directions and objectives, and in turn permit the selection of positions for machine guns, mortars and artillery in close support of the counterattack. Plans of fires based on these premises will enhance the prospects of the counterattack being launched without delay and in good order.

22. **FIRES IN SUPPORT OF THE GENERAL COUNTERATTACK.**—A counterattack of these proportions is prepared, conducted and supported like any ordinary attack. Here again, previous studies will determine the fronts on which the enemy can land in force and his probable objectives. The result of these studies will permit the selection of bases of departure and the choice of direction of attack. Artillery held mobile ready to move to previously selected positions and artillery in general support (heavy calibers) will be prepared to support the counterattack by prearranged fires.

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DEFENSIVE MEASURES FOLLOWING A LANDING

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23. **DEFENSE FOLLOWING AN OPPOSED LANDING.**—a. Where the occupation and defense of an advanced base must be organized after a successful landing against enemy opposition, and where casualties to personnel and losses in matériel and armament have been heavy, a complete reorganization of the landing force

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will have to be undertaken before any extensive defensive measures can be instituted. One of the first considerations will be the prompt replacement of personnel and armament.

b. If the landing operations have resulted in the complete capture or destruction of the enemy forces, the problem of defense is simpler than when enemy detachments still remain free to harass the occupying forces. The latter situation may well occur if the landing operation has been conducted in territory of considerable extent and where it is not deemed advisable to continue operations beyond the security limits required to insure the safety of the base against hostile artillery fire. In this event a large portion of the land forces will have to be disposed immediately for the land-side defense of the base. Such defense may necessitate the holding of light mobile forces to operate against enemy marauding detachments.

c. The local naval defense forces will have the immediate task of preparing the anchorages and harbor facilities for occupancy. This will require the sweeping of the harbor and its approaches for mines and the laying of defensive barriers.

d. The commander of the shore defense forces should immediately institute extensive reconnaissances, beginning first with the harbor area and extending to the probable limits of the proposed base defense area. As the enemy may have prepared a systematic destruction of his own base defenses and installations, a thorough search should be made for mines or other unexploded devices left to cause casualties. The exact location of all enemy installations, emplacements, and defensive works should be definitely determined before the commander of the defense forces ashore makes dispositions of his armament.

24. A HASTY DEFENSE FOLLOWING AN UNOPPOSED LANDING.—a. Where a hasty defense of an advanced base must be prepared following an unopposed landing, first consideration must be given to the close-in defense of the base, and the security measures necessary for the protection of the preliminary establishment of the base defensive installations.

b. In a situation of this kind, it is assumed that enemy opposition will first appear in the form of aerial and sea reconnaissance or raids.

c. The laying of mine fields, the construction of sea barriers, and the emplacement of antiaircraft and heavy artillery will proceed simultaneously. At the same time, it will be necessary to place the defender's aviation in a state of instant readiness. This will mean the erection of airdromes and the preparation of landing fields.

d. The greater part of the infantry may be held initially in general reserve, with strong covering detachments defending the more favorable landing places at or near the harbor entrance, with light detachments observing the more distant beaches. It is quite probable that these initial dispositions may be made irrespective of any system of sector defense; the latter only appearing with the development and completion of the base installations.

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e. The entire base defense force ashore may be landed within the harbor and the dispositions for the land defense made directly from the harbor area. On the other hand, if the extent of territory to be defended and observed is great, and poor in communications, then it may be advisable to land the troops and armament together with their supplies directly from the sea, on the beaches or localities for which they will be defensively responsible.

f. Where communications are lacking, roads and trails leading from the base to occupied beaches will have to be constructed without delay.

g. In a hasty defense of this character, where speed is an essential requisite, it is very probable that heavy demands will have to be made on foot troops for labor in connection with the fortification and organization of the base installations. This will be true in case native labor or labor troops are not available.

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25. TROOP ANTIAIRCRAFT DEFENSE.—a. Hostile aerial observation and attack, augmented by aviation's ability to lay smoke screens and disseminate chemical agents, are dangers that the shore defense troops must bear constantly in mind.

b. As the weapons of the regularly organized antiaircraft units are installed for the defense of the base proper and airdromes, troops defending distant beaches and inland positions or occupying bivouacs and assembly areas must furnish their own antiaircraft defense. Therefore, the technique of fire against low-flying airplanes must become as familiar to all arms, especially the infantry, as fire against ground targets. To increase the effectiveness of this fire, machine guns should be fitted with adapters or provided with satisfactory all-purpose mounts.

c. However, in view of the limited means available in the hands of troops for the purpose of protecting themselves against hostile aerial activities, the commander of the shore defense forces must forsee the vital necessity of extending a regularly organized system of antiaircraft defense to the main landing places and to troops occupying assembly or bivouac areas. Antiaircraft defense will be particularly efficacious at or near the water's edge, especially against hostile low-flying planes approaching from seaward. A distribution and allocation of .50 caliber machine guns should be made to the beach defenses whenever practicable for antiaircraft defense.

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PASSIVE MEASURES OF AERIAL DEFENSE.—a. Prior to the appearance of hostile airplanes in the local theater of operations, all measures should have been taken for the concealment of defensive installations and works.

b. The normal movements of troops and supplies must be reduced to a minimum, and when possible be effected at night. When circumstances impose movements during the day, natural concealment and covered routes are to be utilized and the strictest march discipline observed. On roads and trails units of troops and vehicles are marched in small fractions at well-separated intervals.

c. Careless feeding of too many fires in bivouac areas, and the making of trails leading to bivouacs and assembly areas soon reveal the presence of troops to aerial reconnaissance. Troops in bivouac and assembly areas provide themselves with short deep, narrow trenches, well camouflaged, in which to seek refuge against aerial attacks and bombardments.

27. **DEFENSE AGAINST AIRPLANES BY FIRE.**—a. From the tactical point of view, it is obligatory to train troops to take, automatically, certain dispositions for protection against hostile low-flying planes.

b. For troops in bivouacs or assembly areas, machine guns, well camouflaged, are emplaced exterior to the area and at least 500 yards from the point to be defended. For this defense a platoon of machine guns is emplaced to protect a battalion in an assembly or bivouac area.

c. If it is necessary to move troops or supplies during daylight, it may be advisable to furnish permanent protection by placing machine guns at the rate of one section of machine guns for every 1000 yards along the route of march. If the length of the march column is not too long, machine guns organized into echelons of protection can proceed alternately by bounds along the route of advance. In this case machine guns must be tractor drawn or mounted on motor vehicles to increase their rate of march.

d. If the means are not always available to take these precautions, then the sensitive points of attack along the route of march, such as bridges, defiles, villages, etc., are to be guarded.

28. **PROTECTION DURING MOVEMENT OF RESERVES.**—At that very crucial moment when it becomes necessary to move reserves (sector and general) preparatory to counterattacks, provisions must be made to protect the troops against low-flying attack planes from the time the troops leave their assembly areas until contact is gained with the enemy. In each battalion, at least one platoon of machine guns, progressing by echelons of sections and by bounds, is charged with the mission of firing on low-flying planes. These guns will have to be provided with some form of motor transportation. In addition, the battalions will adopt a very open approach march formation in order to render aerial attacks less dangerous.

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29. SECTOR ANTIAIRCRAFT DEFENSE.—a. In the sectors, it will be essential to organize with machine guns, a more or less continuous defense against low flying planes, commencing with the beach defenses, to include inland positions or sector reserve assembly areas. If sufficient machine guns are available, a triangular system of defense, analogous to that of antiaircraft artillery, can be organized in depth, which should give fairly satisfactory results against low-flying attack planes.

b. In the beach defenses, certain machine guns (.30 caliber) emplaced near the rear limits of the position should be charged with the mission of antiaircraft defense. For antiaircraft defense these guns fire from alternate positions, that is, from positions other than those from which they deliver their primary ground fire missions.

c. In principle, hostile observation planes should not be taken under fire, if it is certain that all troops and defensive works of the beach defenses are invisible from the air. Hostile observation planes may fly low for the express purpose of drawing the defender's fire, thereby causing the defender to reveal his defensive positions. However, sector and subsector commanders must decide if hostile attack planes and planes spraying chemical agents or smoke are more dangerous to the defense and promise greater results than ground and sea targets, and deliver fire accordingly.

30. INSTRUCTIONS FOR FIRE OF .30 CALIBER MACHINE GUNS.—a. When .30 caliber-gun fire is employed against low-flying planes, the following rules should be observed:

The fire must be controlled and executed in bursts of 15 to 20 rounds;

The normal unit for defense is the platoon;

The fire is conducted by sections under the command of their chiefs;

Hostile aircraft is not to be taken under fire beyond ranges of 3,000 feet;

Reasonable care should be exercised not to endanger friendly troops, when firing on low-flying planes.

b. Machine guns should be liberally supplied with tracer ammunition for fire against airplanes.

31. ANTITANK DEFENSE.—a. If it is estimated that the enemy may employ tanks in considerable numbers during his landing operations, then the defender must take measures to protect himself against tank attacks. With the advent of amphibious tanks and fast armored vehicles, capable of operating over difficult terrain at high rates of speed, the defender may find it difficult to quickly adjust himself to unexpected tank attacks. The initial defense must be made at the beaches, based on gunfire and tank obstacles. In case of rupture of the beach defenses, other sector troops must be prepared to resist tanks.

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[illegible] tanks landing with or immediately in advance of the attacker's leading boats, will seriously menace the machine guns emplaced at or near the water's edge, and would destroy or cut through the shore barbed-wire entanglements. Certain antiboat guns, especially the heavier calibers, should have the primary mission of taking such tanks under fire, particularly at the moment they are grounding or leaving the water. An effective means of defense against tanks will reside in the clever use of obstacles, such as submerged or floating booms, and contact mines immediately in front of the beaches, and on shore, mines, tank traps, heavy abatis, etc. Important avenues of approach leading inland from the beaches should be denied to tanks, both by gunfire and obstacles.

c. Sector commanders will be particularly charged with the proper and efficacious defense against tank attacks.

32. **ANTIBOAT DEFENSE.**—(See Section IV, Chapter VI, BEACH DEFENSE).

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CHAPTER V

SECTORS AND SECTOR DEFENSE

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CHAPTER V

SECTORS AND SECTOR DEFENSE

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SECTION I

DIVISION OF THE BASE DEFENSE AREA INTO SECTORS

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1. **DEFINITIONS.**—a. **Sector.**—A sector is a portion of the base defense area assigned to a larger reinforced unit of the shore defense forces.

b. **Subsector.**—Portions of the sector assigned smaller units are called subsectors.

c. **Beach area.**—A beach or series of beaches which, when considered with the terrain immediately inland, constitute a single tactical locality within which the elements of either the attacker or the defender may be mutually supporting.

2. **DIVISION OF THE BASE DEFENSE AREA INTO SECTORS.**—a. The larger the area to be defended, the greater will be the difficulties of command, control and supply. The defense plan will usually be based on dividing the area into sectors in order to share responsibility, insure unity of action, coördinate effort and decentralize the many details of defense.

b. A careful appreciation of the situation, from the viewpoint of both the attack and the defense, is required before determining the division into sectors. Important factors will be the tactical considerations relating to the terrain and to the troop organization of the defender.

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Terrain:
Beach areas, number, location and their tactical importance;
Location of the base or terrain dominating the base;
Avenues of approach emanating from the various beach areas;
Defensive positions covering the lines of operation.
Troop organization:
Strength and defensive value of the infantry units;
Supplementary means available for allocation to the sectors (extra infantry weapons, antiboat and antitank weapons, chemical agents, artillery, combat vehicles, etc.)

c. The division of the base defense area into sectors must support the fundamental defense plan. This plan may be regarded as having two aspects. The primary one is the protection of the base so that its use may be continued by the defender; such protection must relate to the dominating terrain, the loss of which would immediately imperil the safety of the base installations and vessels in the anchorage. The secondary aspect is the retention, as a last resort, of a final defensive area of great natural strength from which the defender may deny the use of the base to the attacker even though it be lost to him; this aspect will not always exist separately, for frequently the areas which must be held for the protection of the base will also be those most suitable for retention as final defensive areas.

d. Ordinarily, an important beach area is not divided between two sectors. The defense of a particular beach area is more effective by one sector than if two sectors share the responsibility of the defense. A single sector may, however, include more than one beach area.

e. The organization into sectors should avoid the division of important topographical features which are to be organized for defense and the sharing of responsibility for the defense of important avenues of approach. Boundaries should so define sectors as to provide depth and a suitable succession of defensive positions in the direction of the final defensive area. Sector boundaries are designated from inland toward the sea and prolonged to sea to the limit of the range of weapons under the command of the sector commander.

f. Certain parts of the base defense area which may be impossible for landings, impenetrable, isolated by chemical agents or otherwise specially defended need not always be included within any sector.

3. **STRENGTH OF SECTOR GARRISONS.**—The strength of the garrison assigned a sector will depend upon both the size of the sector and its tactical characteristics, considering both its importance to the attacker and its natural strength. Splitting of units must be avoided wherever possible. Variation in strength between one sector and another is accomplished chiefly by the at-

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tachment of extra and supporting weapons and, in some cases, by the assignment of part of the general reserve, subject to limitations imposed by the commander of the shore forces.

4. COORDINATION BETWEEN SECTORS.—a. It is essential to utilize the defensive features of the terrain to the greatest advantage and to insure that, in the event of successful landing by the attacker, the efforts of the defense will be concentrated in the direction affording most effective protection for the base. For this reason, sector boundaries may make radical changes in direction. They may tend to become radial in the case of a small island or peninsula. The width of the sector may be increased or decreased at various points. These conditions require a high degree of control and coördination.

b. To attain coördination, the commander of the shore defense forces designates successive defensive positions inland from the beach areas to the final defensive area. Such positions indicate a route of withdrawal for the beach defense forces. They may be used as bases of departure for counterattacks or may be occupied defensively by reserves.

c. The designation of defensive positions is not always part of the initial order of the commander of the shore defense forces but may evolve as a result of coördinating the defense plans of the sectors. However, the initial order should indicate the location of the final defensive area.

d. As an additional measure of coördination, the commander of the shore defense forces examines the sector fire plans. He also arranges for mutual fire support and any other special supporting measures between adjacent sectors, including supplementary defensive positions.

5. ASSIGNMENT OF ADDITIONAL SUPPORT.—In addition to attaching to sector garrisons a suitable proportion of supporting and extra weapons and special troops, the commander of the shore defense forces may provide additional support from those means which are retained under his own control. Such support may be in the form of fire from artillery in general support or machine guns in reserve, special use of chemical agents, operations of aircraft and inshore patrols, and fire from ships attached to or present in the base as designated by the base force commander.

6. HARBOR DEFENSE.—The defense of a base includes the defense of a harbor; and in many cases, it will be found advisable to create a special harbor defense sector, distinct from the other sectors, provided the harbor area is not too great in extent.

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SECTOR AND SUBSECTOR DEFENSE

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7. **THE SECTOR DEFENSE.**—a. The sector may include one or more beach areas. Within the sector, one or more defensive positions may be designated in order to assure coördination with adjacent sectors.

b. For the defense of the sector, the sector commander has a garrison of one or more battalions of infantry, extra and supporting weapons, and, in some cases, additional fire support from outside sources. Some light artillery is usually attached to the sector.

8. **DIVISION INTO SUBSECTORS.**—a. The sector will be divided into subsectors according to the tactical characteristics of the terrain and with particular reference to the beach areas. Each subsector should, where possible, comprise a single beach area. When a battalion garrisoning a subsector must defend two landing fronts, separated by difficult terrain, it will suffer from the disadvantages of divided control and dispersion. On the other hand, where the beach area is of such an extent that two or more battalions must defend it, subsector divisions will be necessary. A beach area defended by a single battalion should not be further subdivided.

b. The proportionate number of troops and weapons assigned a subsector is based upon the tactical importance of the locality to the attacker and its natural defensive strength. The tactical importance includes the facility and rapidity with which troops can be landed, the relation of the locality to the objective, and the avenues of approach leading thereto. Areas of natural defensive strength require fewer defensive installations than those which present features of weakness. In considering the probability of attack on a particular beach area, it should be remembered that the attacker may, in order to gain a foothold on the shore, choose to land in a locality less favorable to the prosecution of his further effort, than in one of prime importance where his landing may be so strongly opposed as to be impossible of execution. He may also attempt to land in an area unimportant in relation to the objective in order to assist a landing at another point.

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9. **CHARACTER OF THE DEFENSE.**—a. In general, the defense within the sector presents three features: beach defense, defense of inland positions, and reserves. The emphasis placed on each varies with the circumstances of each particular situation. If the beach be strongly defended, the inland defense measures may consist solely of the preparation of positions; the beach may be lightly held and the greater part of the force disposed in inland defensive positions; or the beach may be unoccupied. The sector commander always retains a reserve.

b. The sector commander prescribes where the concentration of effort shall be made. It should not be forgotten that the attacker is extremely weak when approaching and landing on the beaches, and that due to the landing of reenforcements increases in strength as he advances inland. There must be very cogent reasons for locating the concentration of effort elsewhere than at or near the shore line.

c. In considering this question, there are four factors to be examined in detail:

The distinct disadvantages of the attacker at the beach;
The advantages he enjoys after establishing his force on shore by the seizure of suitable beachheads;
The natural advantages and disadvantages of the defensive position at the beach;
The natural advantages and disadvantages of the defensive position inland.

d. The above factors should be carefully weighed. The beach should be left undefended only if it is found that the advantages of the defensive position inland more than compensate for the advantages allowed the attacker landing without opposition. The defense should make its effort where it has the greatest degree of superiority over the attacker.

e. The defense established within the sector must fit the terrain. There are three general types of terrain with relation to the beach area which affect the dispositions in general:

(1) Where commanding ground dominates the beach within range of small arms fire, it will be proper for the defender to concentrate his efforts at the landing places. Such concentration of effort is in the form of fire power. The beach defensive position is supported by inland defensive positions and by the sector reserves. There will be three main features of such a beach defensive position:

A normal barrage at the water's edge, furnished primarily by machine guns and augmented by mortar, artillery, and reserve machine gun concentrations;
Distant and interior fires delivered by weapons located inland from the beach;
Combat groups holding localities of tactical importance.

(2) Where the beach area leads on to a flat plain surround-

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ed by hills, the nearest commanding ground being at a greater distance than the range of small arms fire, the beach is more lightly held. A few machine guns may deliver a normal barrage, and several anti-boat guns may be located on the flanks to deliver distant fire. Combat groups and the majority of the weapons are located at important tactical localities on the hills from which the plain below may be commanded.

(3) Where the beach area leads on to a more or less flat area, surrounded by difficult mountains or hills through which one or two narrow defiles give access to the interior, the beach may be but lightly defended or observed and the defense concentrated at the defiles.

f. The above considerations determine the location of the main effort of the defender, but they are modified by variations of the terrain in any particular locality and should not be adhered to blindly. Each sector presents a different problem which must be solved on its merits.

10. **BEACH DEFENSE.**—The main features of the beach defensive position have been mentioned above. While it is desirable to reduce the personnel to the bare minimum required to man weapons and form the combat groups, and to strengthen the defense to the utmost by increased fire power and obstacles, the number and extent of beach areas and the limited number of troops will generally result in the entire subsector garrison being employed in such a position.

11. **INLAND DEFENSIVE POSITIONS.**—a. The sector commander selects such inland defensive positions, in addition to those prescribed by the commander of the shore defense forces, as may be desirable. These positions should be on ground naturally suitable for defense and should command the avenues of approach.

b. The preparation of inland defensive positions will be as complete as time permits after the beach defenses have been fully organized. Thus they may comprise a complete system of trenches, emplacements, etc., and stores of ammunition and supplies; the minimum requirement is that they be reconnoitered and that information necessary for their occupancy be disseminated.

c. In addition to positions prepared to cover approaches from the beach areas to the interior of the sector, supplementary defensive positions should be prepared to strengthen the resistance against attack from any probable direction. These supplementary positions are the chief reliance of the sector commander for protection of his flanks in case an adjacent sector is penetrated.

12. **RESERVES.**—a. The sector commander retains such reserves as will enable him to make a decisive counterattack in the event of minor success by the attacker or, in the event of a major penetration, to execute sufficient delay to give freedom of action to the commander of the shore defense forces. At the same time,

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reserves should not be strengthened at the cost of excessive weakness in the beach defense forces merely to meet a contingency which would not be likely to occur had the latter not been so reduced.

b. Reserves should be centrally located in regard to time and the importance of the various areas to the sector defense. Complete plans should be made for their employment to cover the more probable contingencies.

13. COORDINATION OF FIRE PLANS.—The sector commander coördinates the fire plans of the subsectors, attached artillery, sector reserve and fires furnished him from arms outside the sector. In conference with adjacent sector commanders, he arranges for mutual support. He submits his plan of fires and defensive installations to the commander of the shore defense forces.

14. SPECIAL TROOPS.—Where troops of other arms or services are furnished, the sector commander assigns them to subsectors or employs them directly.

15. FIELD FORTIFICATION.—The sector commander directs the extent of field fortification to be performed by subsector garrisons in the preparation of the beach and inland defensive positions, and for the protection of the reserve. He is especially interested in demolitions and special obstacles. In conformity with instructions from the commander of the shore defense forces, the sector commander prescribes a program and priority of work. Work on field fortifications and defensive installations is continuous .

16. RECONNAISSANCE AND OBSERVATION.—a. The purposes of reconnaissance and observation are:

To assist the commander to determine dispositions and plan maneuvers;

To maintain security and obtain continuous information of the situation.

b. The sector commander must supplement the information obtained by higher units. Personal reconnaissance and appreciation of the ground in detail form the foundation upon which the defensive organization is built. In addition to knowledge of the ground, a thorough understanding of the water areas in front of the beaches is necessary to arrive at a proper estimate of the more probable course of action of the attacker. The sector commander must determine the likely places for the approach of small boats, depth of water, passages through reefs, water currents and other features. It is dangerous to assume that certain places are impossible for landing. Reconnaissance and observation should also be made from seaward.

c. In making this reconnaissance, the sector commander has the assistance of inshore boat patrols in addition to that of his subsector garrisons.

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d. All information obtained by reconnaissance and observation should be disseminated to interested superior and subordinate commanders.

e. The attacker will make every effort to accomplish surprise, and unceasing vigilance is necessary on the part of the defender. The sector commander examines the observation systems established by the subsector garrisons, coördinates them, and provides additional facilities if necessary. Observation should extend to all parts of the coast within the sector.

f. Information obtained decreases in value as its transmission is delayed. Emphasis should be placed on reliable communications in this connection.

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CHAPTER VI

BEACH DEFENSE

MARINE CORPS SCHOOLS
QUANTICO, VIRGINIA

June, 1936

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CHAPTER VI

BEACH DEFENSE

(See Beach Defense Charts I, II, III and IV at end of chapter.)

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1. GENERAL.—Where the terrain permits, the initial effort of the defender is concentrated at the beach (see Chapter IV—Sectors and Sector Defense). This chapter describes a system of beach defense to be employed in such a situation. The details of application vary in particular cases, and may be modified as the nature of the shore and the terrain inland require concentration of effort to be shifted to a point in rear of the beach.

2. DISPOSITIONS AND ORGANIZATION.—The beach area to be defended is comprised within a subsector, with the general line of beach defense prescribed by the sector commander. The commander of the beach defense forces is usually the subsector commander.

3. STRENGTH.—The main source of strength of the beach defense force is a large number of extra and special weapons, and some support from weapons of higher units. Troops are few, relative to the frontage assigned for defense, and are limited to the minimum required to man the beach defense weapons, to organize combat groups for the defense of commanding tactical localities and to provide observation.

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4. DEFENSIVE METHOD.—a. Successful beach defense is sought primarily in the complete exploitation of fire power and its application to the beach terrain and the sea approaches. Fire is the principal mode of action of troops assigned to the beach defense. The maximum density of fire, in combination with obstacles, is developed to cover the water approaches immediately in front of the beach area and at the water's edge by enfilade fiires delivered from positions close to the water's edge at the extremities of beaches and by oblique and frontal fires from positions farther inland.

b. Terrain permitting, the depth of the beach defense does not usually exceed 1500 yards from the water's edge, for a greater distance denies the support of small arms fire from combat groups to the forward installations. The disposition of beach defense elements does not take the form of a series of lines or positions but is based upon the organization of small combat groups, disposed in depth, mutually supporting, and occupying the important tactical points. There is continuity of fire but not continuity of occupation. The density and continuity of fire is great or moderate, depending on the strength of the automatic weapons assigned to the beach defense force.

c. The beach defense normally has the task of breaking and disorganizing the efforts of the assailant at the water's edge and denying or delaying the advance inland. To permit the beach defense to accomplish this task, it is necessary to construct a framework of fires of which depth and continuity are the two main characteristics. By depth is meant that the beach defense must present a complete network of powerful fires in the meshes of which the attacker will sooner or later be stopped or find it exceedingly difficult to progress. By continuity is meant that the fire must, in so far as practicable, cover without interval all the foreshore and sea approaches, and that once the enemy is taken under fire he must never be free from its effect. A continuity of obstacles at the water's edge should be realized as soon as possible in order to increase the effect of fire at this point.

5. WEAPONS EMPLOYED.—a. The characteristics of the .30 caliber machine gun make it the primary weapon to be employed in beach defense. Consequently, the beach defense force must be furnished with a sufficient number of extra machine guns to compensate for the small number of troops. Not only is this necessary, but it is desirable since the liberal use of machine guns results in tremendous fire power while exposing a limited number of personnel to the fire of the attacker.

b. The fire power of machine guns is supplemented by antiboat guns of various types (individual 75 mm. guns, 6 pounders, 37m/m guns, 1.1 caliber guns, .50 caliber machine guns and similar weapons), and by mortars, grenades, automatic rifles and rifles. In addition, the beach defense force may be assisted by the fire of artillery and reserve machine guns of the sector and general reserve.

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6. UNIT DEFENSE OF BEACH AREA.—The elements employed in the defense of a single beach area are closely knit into a completely coördinated whole. This principle should be borne in mind even though in the following text they are divided into various groups for convenience in discussion.

7. PROTECTION OF FLANKS.—The protection of his flanks is of grave concern to the commander of forces defending a beach. The most dangerous condition that can confront him occurs when the attacker has occupied an adjacent beach and endeavors to expand by attacking towards the flanks from the high ground between beaches. The liberal use of obstacles, the prior preparation of supplementary emplacements for weapons and positions for combat groups, and complete plans to meet attack from any direction are the essential measures to be employed.

8. COOPERATION.—Forces defending adjacent beach areas coöperate to the greatest possible extent. Such coöperation usually takes the form of exchange of fire.

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APPLICATION OF FIRE POWER

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9. FIRE SUPERIORITY.—a. Fire superiority cannot be obtained solely by the amount of means at the disposal of the defender. The maximum yield of fire of all weapons is developed by utilizing the various advantages of any defensive situation. The defender depends for fire superiority on the excellent observation of the conduct of fire, the accurate knowledge of ranges and terrain, the concealment of defensive installation, the development of a systematic scheme of fires, particularly enfilade and flanking fires, and the disintegration caused in the attacker's formations by movement and accessory defenses.

b. The weapons which provide the fire power of the beach force may be divided into groups:

Individual weapons: automatic rifles, rifles and grenades; .30 caliber machine guns;

Antiboat and antitank weapons: individual 75 mm. guns, 6 pounders, 37 mm. guns, 1.1 caliber guns, .50 caliber machine guns, and similar types;

Mortars and artillery.

c. The fires which will be delivered by these various weapons may be classified as normal barrage fire, distant fire, and interior fires.

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10. NORMAL BARRAGE.—The normal barrage is a dense, continuous band of fire across the landing places at or near the water's edge. Its proper and timely delivery is extremely important, particularly under conditions of limited visibility, for it is the main reliance of the defender in defeating the landing. The enfilade fire of the .30 caliber machine guns, delivered from emplacements near the water's edge, is the basis of the normal barrage; it is supplemented by the fire of mortars, artillery and some of the distant and interior fire weapons.

11. DISTANT FIRE.—Distant fire is the system of fires designed to cover the sea approaches to the beach area by firing on the attacker's boats. These fires are delivered principally by antiboat guns and the .30 caliber machine guns emplaced on commanding ground in rear of the beach. The support of artillery fires may be employed at the longer ranges.

12. INTERIOR FIRES.—Interior fires are those delivered on the attacking troops who penetrate the normal barrage. These fires begin with the defense of normal barrage machine guns and follow the attacker until they are applied for the close-in defense of combat groups, thus serving to limit or delay the attacker's advance to his first objective. These fires are delivered principally by individual weapons, by mortars and artillery, and by some of the weapons initially engaged in distant fire.

13. NUMBER OF WEAPONS.—a. The number of extra and special weapons to be furnished the beach defense forces is a question that should be carefully calculated in planning the operation and must be worked out from a map study of the area to be defended. It is first necessary to determine which beaches are to be defended and which merely observed or denied by gas or other means. For the beach areas to be defended, there must be calculated the number of .30 caliber machine guns required to place a continuous or nearly continuous band of fire along the water's edge. There should be provided additional guns for distant and interior fires, for on the usual front assigned to beach defense forces the organic machine guns of the infantry units will be inadequate. Possibly half as many guns as are required for normal barrage should be added to the beach defense forces for other purposes.

b. Additional mortars should be provided in the number suitable to the extent of front and the character of the terrain.

c. The number of antiboat guns which can profitably be employed in beach defense is practically unlimited. One gun of this type for each 1000 yards of front may be considered an absolute minimum.

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SECTION III

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14. IMPORTANCE OF THE NORMAL BARRAGE.—The application of distant fire will not, no matter how effective, stop a determined attack. It is upon the normal barrage that the defense depends to deny the attacker a foothold on the shore. It is here, in placing this band of fire at the water's edge, that the fire power of the defense should be most intensely and thoroughly applied with all available suitable weapons. It is manifest that the normal barrage must not be too rigid a system of fire but should have a certain degree of flexibility. However, the degree of flexibility depends upon the conditions under which the fire is being delivered, the chief factor being visibility.

15. SITING AND EMPLOYMENT OF NORMAL BARRAGE MACHINE GUNS.—a. Machine guns whose primary task is the delivery of the normal barrage are sited along the beach near the water level at such intervals as will provide, as nearly as possible, a continuous band of grazing fire across the landing places. The most effective method is to employ guns in pairs, so sited that they are mutually supporting; that is, so that each pair of guns is covered by the normal barrage fire of at least one other pair. Where an insufficient number of guns is available to employ in this manner, it will be better to employ the guns in pairs without mutual support; in this case, greater attention must be given to their protection by cover, obstacles, and the fire of guns sited farther inland. Where the number of guns is further limited, there are two possible methods of employment: one, to employ the guns singly; the other, to leave some part or parts of the landing places without this fire. If the guns are employed singly, their fire is ineffective, intermittent and very liable to cease completely either through mechanical misfunctioning or through being put out of action. The defender, then, must expect some of his normal barrage machine guns to fail to perform their allotted tasks but will not know where the failure will appear. It is therefore considered better to employ the guns in pairs on the more important or more vulnerable sections of the beach area, leaving the remainder to be denied by obstacles or by the fire of other weapons.

b. Due to the irregularities of the beach, part of the normal barrage may be over water and the fire of enfilading machine guns will be very effective against troop struggling in the water against submerged obstacles. It should be noted, however, as a condition affecting the number of machine guns necessary, that the danger space of 800 yards over level ground will be materially reduced in

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many cases, either by reason of the fact that guns are not sited at the water level or because attacking troops are partially immersed. A lesser number of guns will be required if the normal barrage line is sited entirely over the beach near the water's edge, rather than over the water.

c. The effect of normal barrage fire is increased by underwater and beach obstacles so placed as to hold the attacking troops under fire.

d. Protection for normal barrage machine guns is given by siting them behind sand dunes or other irregularities in the ground which afford defilade from fire from the sea, by careful camouflage of positions, by surrounding them with obstacles, by the construction of dummy emplacements, by the use of alternate positions, by not occupying positions until ships' gunfire has lifted, by not opening fire until attacking troops have begun to debark from their boats, by covering with the fire of other weapons, and by the construction of emplacements of concrete or other material of sufficient strength to withstand bombardment.

e. In order not to disclose their positions prematurely, normal barrage machine guns will not participate in the distant fire. When there is visibility, they open fire as soon at attacking troops appear on their part of the normal barrage line and continue this fire as long as they have targets. When visibility is limited, they fire on receipt of the normal barrage signal at the rate and for the length of time prescribed in the fire plan.

f. These weapons do not withdraw. If the attacker is not stopped by the normal barrage, they are lost to the defender. Guns are manned by the minimum personnel necessary to operate the weapons and to maintain observation. They should be supplied with adequate stores of ammunition, with the necessary fire control instruments, and with at least one automatic shoulder weapon, such as a submachine gun, for each pair of guns to assist in close-in defense.

16. **OTHER WEAPONS IN THE NORMAL BARRAGE.**—a. **Antiboat guns.** In general, antiboat guns cannot effectively participate in the normal barrage because their characteristics limit their fire effect to a small area, because they are so sited as to be able to deliver only plunging and frontal fire, or because their fire is more valuable against the boats of succeeding subwaves. In some cases, however, .50 caliber machine guns located on the flanks may be able to deliver effective normal barrage fire and they may, especially when poor visibility precludes distant fire, be assigned such tasks.

b. **.30 caliber machine guns** sited for distant and interior fires are not usually able to deliver grazing enfilade fire across the landing places, but they are given the important normal barrage tasks of firing across the front, flanks or rear of machine gun emplacements at the water's edge. When there is no visibility, they are laid for this fire and deliver it when the normal barrage is called down.

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c. **Mortars** are especially useful in providing parts of the normal barrage by placing concentration in areas defiladed to other fires or at particularly important points. A normal barrage task is assigned each mortar.

d. **Artillery and reserve machine guns.** The fire of one or more batteries of artillery and of reserve machine guns may be available to the beach defense force. Concentrations augmenting the normal barrage are planned and recommended for these weapons.

17. **DELIVERY OF THE NORMAL BARRAGE.**—a. It is essential that the defender be able to apply the normal barrage promptly and with all designated weapons at the required time. This must be considered under two conditions: when there is visibility and when there is not.

b. When there is visibility, distant fire weapons continue to fire, covering their normal barrage tasks, if any, as the attacker appears in that area. Normal barrage machine guns open fire as soon as targets appear on their parts of the normal barrage line. All other weapons perform their normal barrage tasks on receipt of the prescribed signal. Normal barrage machine guns continue to fire until attacking troops have penetrated the normal barrage when they shift to interior sectors assigned. A signal must be given to cause weapons firing by indirect means to cease; they then perform subsequent tasks as ordered or requested.

c. Under conditions of no or limited visibility, the commander of the beach defense force or some other designated officer gives the prescribed signal immediately on receiving information that the attack is on or near the normal barrage line. All weapons fire on their normal barrage tasks for a specified period and then suspend firing. Additional firing is called for by repetition of the signal. Obviously, if normal barrage machine guns discover the attacker they do not wait for signal nor do they suspend fire if a target remains within their sector.

d. The normal barrage signal must be unmistakable and must reach all weapons. Pyrotechnics alone are of doubtful value and should be supplemented by all other means of communication. The normal barrage signal has priority and is mandatory.

e. Provisions for reconnaissance and observation designed to assure prompt information of the attacker are described in Section VI, below.

SECTION IV

INTERIOR AND DISTANT FIRES; COMBAT GROUPS.

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18. ANTIBOAT WEAPONS.—a. Antiboat weapons are sited in rear of the beach in such positions that they can command the water approaches to the beach, the beach itself and routes of approach inland, as well as give close support to the combat groups. Not all the weapons available can perform all these tasks from primary positions but they should be so distributed that all these tasks can be accomplished, partly by dividing tasks among the weapons and partly by the use of supplementary positions. Several conflicting factors govern the exact location of each weapon; it must have sufficient command to afford observation of fire, if sited near water level it will be earlier relieved from the effects of naval bombardment, but if too close to the beach may be captured by troops who penetrate the normal barrage. The best position is in sight defilade behind a low false crest or near a covered route to the rear, such as a ravine, through which it may withdraw. If sited on a promontory, an antiboat gun has the advantages of being sooner uncovered from smoke and of increased fire effect by reason of the better targets presented by broadsides of boats or lines of boats. Such positions must, however, be selected with care; they should be restricted to land projections at the extreme flanks or beach areas on which the terrain affords both protection from bombardment and a covered route of withdrawal.

b. The primary task of antiboat guns is to engage approaching boats and they concentrate on troop boats, armored boats, amphibious tanks, and lighters. They are not, in general, suitable for participation in the normal barrage. Some of them continue to fire on boats which are debarking their loads, on troop concentrations, and on such supporting weapons (machine guns, mortars, light artillery, tanks) as the attacker succeeds in landing. Others return to distant fire by engaging succeeding subwaves. The sectors of fire of these guns and the tasks which they will perform in various stages of the action are prescribed in fire schedules. The beach defense commander should be able to communicate with some of these weapons and direct their fire, but complete control will be difficult over the extended fronts which will be the normal condition.

c. There should be a sufficient number of these weapons to cover the sea approaches across the entire front. Where there is an insufficient number of weapons, they are sited to fire on the more probable routes of approach as their primary tasks, supplementary tasks being given to cover the remainder of the approaches. In any case, each gun should have a contingent sector in which it will fire if no targets appear within the primary sector.

d. Antiboat guns and .30 caliber machine guns sited for distant fire engage approaching boats at the extreme range permitted by the weapon and existing conditions of visibility.

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e. Under poor conditions of visibility, the use of antiboat guns will be greatly restricted. They must be alert to take advantage of illumination provided at night, to engage targets instantly on the lifting of smoke or fog, and to fire at the flashes of attacking weapons.

19. **MORTARS.**—Mortars are not suitable for firing at moving targets on the water. In addition to normal barrage tasks, they fire previously planned interior concentrations. Their fire will be particularly effective against grounded ships employed by the enemy.

20. **ARTILLERY.**—Artillery will be of particular value against targets on the water when the approaches are narrow. Interior concentrations are planned for these weapons.

21. **.30 CALIBER MACHINE GUNS.**—a. The .30 caliber machine guns sited inland from the beach take part in distant firing, their principal targets being open boats, and are assigned primary and contingent sectors of fire for this task. They also participate in the normal barrage by covering normal barrage machine guns.

b. It is in the delivery of the interior fires against attacking troops, who penetrate the normal barrage, that they will be employed with the greatest effect. In this task, the relation between machine guns and combat groups is so intimate that it will be convenient to consider them together.

22. **COMBAT GROUPS.**—a. Combat groups are so located as to provide, by a coördination of their own fires with those of machine guns, an effective defense of tactical localities of outstanding importance, the retention of which requires not only their occupation but also the occupation of others, less important in themselves, but valuable because they are points from which fire can be delivered across the front and on the flanks of the primary positions.

b. The fire power of automatic rifles, rifles and grenades in combat groups cannot usually, on account of the limited range, be employed until the attacker has penetrated the normal barrage, although in particular cases they may assist in the close defense of normal barrage weapons and other weapons sited nearer the shore. Their task is to limit the penetration of the attacker and to prevent him from seizing the tactical localities adjacent to the beach which are essential for his continued advance.

23. **COMBINATION OF MACHINE GUNS AND COMBAT GROUPS.**—a. The machine guns are so emplaced that they can produce a complete system of enfilade fire across the front and flanks of adjacent combat groups and on routes of approach into the position. Spaces which are defiladed to the fire of the machine guns are covered by the individual weapons of the combat groups

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and, on the other flank, space allocated to the latter can be covered from the flanks by machine guns.

b. Thus there is built up, on the most suitable ground immediately inland from the beach, a coördinated system of combat groups and machine guns, the fire of each supporting and supplementing the other, taking the fullest advantage of enfilade fire, together with surprise as to the direction of fire and the location of the weapons. Such a system can only be evolved from a detailed study of the ground.

c. The first consideration in siting the machine guns will be to provide the fields of fire necessary to the performance of their tasks. Most, if not all, of the machine guns will be on commanding ground, exposed to the observation and fire of the attacker, because they must employ direct fire against boats, in support of normal barrage machine guns, covering routes of approach, and supporting combat groups. The question of protection for these guns therefore becomes of importance secondary only to their fields of fire.

d. Whether to place machine guns in combat groups must be decided on the merits of each particular case. Within the combat group, both will be subject to the same concentrations of fire and the capture of the combat group ends the service of the guns within it, a matter of importance when it is remembered that the guns support not the combat group in which they are located but another at some distance away. Location within the combat group, however, affords better protection under conditions of poor visibility when individuals may infiltrate and approach the gun sufficiently close to destroy it with grenades; it also simplifies command and supply. The best location, once the requirement for adequate fields of fire is satisfied, is probably outside the combat group but sufficiently near so that close support by the group can cover the gun in conjunction with obstacles.

e. Over the large frontage assigned to beach defense forces, the problem of command and control is extremely difficult and must be solved by emphasizing liaison and communication, and by thorough understanding by each element of the part it is to perform as the course of the attack assumes its varying phases.

24. **PROTECTION.**—Protection is afforded all distant and interior fire weapons by emplacements, crew shelters, camouflage, dummy emplacements, alternate emplacements, obstacles and the fire of adjacent weapons.

25. **SUPPLEMENTARY EMPLACEMENTS.**—Supplementary emplacements with complete fire data for their use should be provided for all weapons.

26. **DETERMINATION OF RANGES.**—The effectiveness of fire is greatly increased by prior determination of ranges and by test firing. On the sea approaches, ranges may be noted with reference to landmarks on the promontories, by changes in the characteristics of the water due to reefs, current or depth, and by buoys.

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27. **AMMUNITION.**—Ammunition requirements should be carefully calculated and an ample supply be at all primary, alternate and supplementary emplacements prior to the commencement of the attack. This results in economizing the scant personnel and in avoiding the difficulties of movement for supply during the action. Where the supply is limited, the fire plan must prescribe the proportionate amount to be expended for each task.

SECTION V

THE FIRE PLAN

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Par. 28 The Fire Plan ..... 79 - 80

28. **THE FIRE PLAN.**—a. A complete fire plan is prepared for all weapons to cover all anticipated phases of the combat. The plan must include data for primary, alternate, and supplementary emplacements, and for combat groups.

b. The preparation of the plan is initiated by the beach defense commander who, with the assistance of his staff and of the commanders of the weapons or groups of weapons, causes the preparation of the data for all weapons under his command and for such supporting fires as may have been assigned him. Only those details of the plan showing location of weapons, sectors of fire, and recommended fire for supporting weapons are submitted to the next higher commander for coördination.

c. The details of the plan include sectors of fire, tasks, fire data, time and duration of fire and ammunition supply.

(1) Sectors of fire may be shown on a map or be given by azimuths. The arrangement of sectors may be simple or complicated. For instance, the sector of a normal barrage machine gun may be a single line, the normal barrage line on which it fires. For a machine gun located inland, there may be a sector of fire on the sea approaches, one on the normal barrage line and another for interior fires. In the latter case, the plan must prescribe the time or conditions under which fire will be shifted from one sector to another. In addition to giving sectors of fire from supplementary positions, there may be supplementary or contingent sectors of fire assigned for primary and alternate positions to be covered if the situation requires or on order of the commander. There may be several weapons firing in the same or overlapping sectors of fire.

(2) Tasks within each sector are assigned in the order of importance.

(3) Fire data is prepared for each weapon for all conditions of visibility.

(4) The time to open fire, the rate and duration of fire must be prescribed. It may be given in the form of a direction to open fire when the attacker appears within range in the sector of fire, or on receipt of a prescribed signal.

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(b) Attention is again directed to the necessity for adequate ammunition supply. The piling up of successive subwaves on the beach and the uncertainties of the situation during conditions of poor visibility may require normal barrage firing over extended periods of time. Where there is any doubt about the adequacy of the supply, the fire plan must prescribe the amount to be expended on each task or prescribe for each weapon an amount to be held as a reserve to be expended only on orders of the commander.

SECTION VI.

RECONNAISSANCE AND OBSERVATION

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29. **PURPOSE.**—Reconnaissance and observation for maintaining security and continuous information of the situation is one of the primary defensive measures of the beach defense forces. The attacker will make every effort to conceal his landing and the defender can only hope for incidental visibility; for example, where lost or delayed boats arrive at the beach after daylight, where the boats are visible at long ranges before smoke is laid, where boats are exposed by searchlight illumination or by unexpected lifting of fog. Furthermore, the attacker will attempt to adapt conditions so that poor visibility obscures his approach to and landing on the beach, but will not hinder further advance. Thus he will try to land just before daylight, or will use smoke only on the shore or during the period of debarkation from boats.

30. **REGULAR OBSERVATION POSTS NOT SUFFICIENT.**—A system of observation must be established to give early warning of the presence of the attacker under all conditions. Regular observation posts within the beach defensive position will suffice only after the attacker has penetrated the normal barrage. Since attack may be expected when visibility is limited, observation at and forward of the water's edge is vital.

31. **INSHORE BOAT PATROLS.**—Inshore boat patrols established by the forces afloat and operating across the entrances to beach areas can give warning by pyrotechnics or radio of the distant approach of the attacker and considerable reliance may be placed on such a system when it is established in detail.

32. **ADVANCED OBSERVATION POSTS.**—Advanced observation posts may be set up on headlands or promontories which flank the beaches; at night they will be in good position to use the illumination which may be provided, or they may detect the approach of

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boats by sound. When smoke is laid, the promontories may not be covered or, if they are, may be free from the effects of smoke before the beaches. In such cases, the advanced observation posts may be able to communicate the exact moment when boats reach the beach. It is important that such observation posts be thoroughly concealed and covered in the hope of escaping bombardment and especially counter-observation measures. Usually they will not be able to withdraw but will be lost if the landing is successful.

33. **OBSERVATION AT THE WATER'S EDGE.**—Observation at the water's edge is provided largely by normal barrage machine gun crews who, in this respect, constitute advanced listening posts. They may be able to detect the approach of boats silhouetted against the sky or illuminated. In fog and smoke, they must depend largely upon sound and close observation. The chance of attacking troops penetrating the intervals between guns without detection is remote because the attacker will be even more confused by the lack of visibility than the defender and is as likely to land where the guns are located as between them. However, where the intervals between guns are great, special listening posts must be established. In some cases, the personnel will be able to withdraw after giving warning; in others, they will have to remain and should be provided with rear cover against the fire of the defender.

34. **LISTENING DEVICES.**—The use of listening devices may be of assistance. These may consist of such improvised means as tin cans strung on a wire or simple horn-type amplifiers and may, in important cases, extend to elaborate electrical detectors.

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DENSE JUNGLE

GACTUS & GAS

TROOPS AND WEAPONS USED IN
BEACH DEFENSE CHARTS I, II, III, IV.

1 Inf Bn
3 Rifle Cos. (each 3 platoons)
1 M.G. Co. (8 guns)
1 How. Plat. (1 mortar 1 37 mm gun)
42 .30 cal. mgs (additional)
5 Mortars (additional)
7 Anti-boat guns (additional)
Fire of 2 btrys. arty

I. DEFENSE OF BEACH AREA — Normal Barrage.

MGs. length of line shows danger space.
Mortar.
Mortar Concentration.
Arty Concentration of one btry.
x x x x Obstacles XXXX Heavy obstacles
Note: Interior mgs. cover forward mgs.
Obstacles shown in part only.

SCALE 0 500 1000 YARDS

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450

469

385

350

GACTUS & GAS

5 5 5 5 5 5 5 5 10 10 10 10 10 10 10 10 15 15 15 15

II. DEFENSE OF BEACH AREA — Distant Fire

≒ Anti boat gun

Sectors of fire

Guns fire at nearest targets. if no targets appear in own sector.

SCALE 0 500 1000 YARDS

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430

460

385

300

8 5 5 10 5 10 5 10 15

5 5 5 10 10 5 10 10 15 15 15 10

III. DEFENSE OF BEACH AREA

MACHINE GUNS & COMBAT GROUPS

Machine guns

Combat Group, Platoon

Combat Group, Section

SCALE 0 500 1000 YARDS

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IV. DEFENSE OF BEACH AREA – Observation

Machine Guns

Observation & listening post.

Note: Each pair of normal barrage machine guns maintains observation.

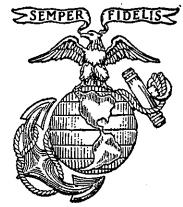
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TENTATIVE MANUAL
FOR
DEFENSE OF ADVANCED BASES

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CHAPTER VII

NAVAL DEFENSE FORCES

MARINE CORPS SCHOOLS
QUANTICO, VIRGINIA

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DEFENSE OF ADVANCED BASES

FOR

TENTATIVE MANUAL

CHAPTER VII

[redacted]

NAVAL DEFENSE FORCES

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1. **COMPOSITION AND ORGANIZATION.**—a. Where naval forces are assigned to the base for defense purposes, as separate from any fleet unit, they will comprise the Local Naval Defense Forces. These forces will consist of various types of surface vessels and aircraft, and for a main fleet base should be organized into:

The Offshore Patrol,
The Inshore Patrol,
The Attack Force,
The Mine Force,
The Harbor Force.

b. For a subsidiary base the composition and organization of the Local Naval Defense Forces, if required and assigned, will depend upon the nature and extent of the operations to be conducted therefrom.

2. **THE OFFSHORE PATROL.**—a. The Offshore Patrol will comprise such types of surface vessels assigned to the Base Defense Forces as are fitted for distant scouting and should be high speed ships, if available. The numbers and types assigned to the Offshore Patrol will be designated by the Base Commander in his initial operation plan. The plan for the stations and operations of the Offshore Patrol will be formulated by the Commander, Offshore Patrol, and submitted to the Base Commander prior to departure from the last home port.

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b. The initial task of the Offshore Patrol upon arrival at the outer limits of the base defense area will be to take over the patrol from the task force temporarily defending the base and to establish the permanent offshore patrol so as to systematically cover the outer zone of the base defense area beyond the limits of the defensive coastal areas.

c. The Offshore Patrol should be disposed primarily with the view of obtaining information of enemy forces approaching or entering the base defense area in sufficient time for the base defense force to take such action as may be required.

d. The disposition of the vessels in the Offshore Patrol with respect to each other should be such that an enemy surface vessel cannot pass through the patrol in prevailing daylight visibility without being detected.

e. To prevent enemy forces from penetrating the patrol in darkness or low visibility the vessels may be disposed in two or more lines, with an interval between the lines sufficiently large to prevent surprise contacts between our own vessels in the different lines.

f. Every effort should be made to provide all vessels of the Offshore Patrol with efficient aircraft detectors.

g. Fuel should be conserved as much as possible, compatible with the efficient operation of the patrol.

h. The duties of the Offshore Patrol include:

To report contact with enemy forces;

To challenge immediately any vessel whose character is uncertain;

To endeavor to secure and transmit information of strength and movements of enemy forces;

To take the offensive when relative strength in contact justifies such action and when this will not disrupt the patrol to such an extent as to permit enemy forces to penetrate the base defense area undetected;

To support the mine laying or mine sweeping detachments and to patrol mine fields outside the defensive coastal areas.

i. The Commander, Offshore Patrol, should be ordinarily on board one of the units of the patrol, but may be at the base ready to proceed to any critical point.

3. **THE INSHORE PATROL.**—a. The Inshore Patrol should be composed of the smaller and slower types of vessels assigned to the Base Defense Forces, and specific vessels will be designated for this duty by the Base Commander in his initial operation plan. The Commander, Inshore Patrol, will formulate his plan for the establishment and activities of the Inshore Patrol and submit it to the Base Commander prior to departure from the last home port.

b. The initial task of the Inshore Patrol upon arrival at the outer limits of the defensive coastal areas of the base will be to take over the patrol duty from the task force temporarily defending the

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base and to establish the permanent Inshore Patrol in accordance with the initial operation plan.

c. The duties of the Inshore Patrol include:

To report contact with enemy forces;

To challenge immediately any vessel whose character is uncertain;

To develop information of enemy forces sighted;

To attack enemy submarines;

To maintain a guard ship at or near the harbor entrance to verify the identity of vessels entering the defensive coastal areas and to regulate shipping;

To establish barriers or nets outside the harbor defense area;

To establish and maintain a buoyage system and other aids to navigation beyond the entrance channels to the harbor;

To patrol areas of fixed underwater defenses outside the harbor;

To pilot vessels through mine fields and other obstacles outside the harbor entrance;

To assist in salvage of vessels in case of collision, breakdown, or other accident, within defensive coastal areas;

In absence of Shore Defense Forces, to establish and maintain a coastal lookout system;

To maintain efficient communication with the observation posts of the Shore Defense Forces.

d. The Commander, Inshore Patrol, should have his headquarters as close as practicable to the Headquarters of the Base Commander and in close communication with the Headquarters of the Commander, Shore Defense Forces, so that he may be in constant touch with the situation afloat and ashore.

4. **THE ATTACK FORCE.**—a. The Attack Force should include such combatant types of vessels as are available at the base for this duty. In so far as practicable, this force should be held in constant readiness for attack upon enemy forces located and reported by the patrols. The location and readiness will depend upon the most advantageous concentration areas against probable enemy attacks.

b. Plans for the employment of the Attack Force should be prepared to cover all probable contingencies and should be kept continuously revised so as to include the employment of all vessels of the Fleet at the base that are in condition to operate.

c. The Commander, Attack Force, should be the Senior Naval Officer present in the forces at the base who is so situated as to be ready to proceed to sea in command of the Attack Force.

5. **THE MINE FORCE.**—The Mine Force will be composed of such mine-craft as may be assigned to duty at the base by the Commander-in-Chief, United States Fleet, and should be of a size sufficient to lay required mine fields and to sweep the entrance channels and approaches thereto. While the laying of mine fields as

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part of the defenses of the base may be readily accomplished by employment of mine-craft with the Fleet and not definitely assigned to the Base Defense Forces, the continual necessity for sweeping operations to keep entrance channels and their approaches clear of mines and to clear any mine fields that may be laid by the enemy, makes the presence at the base of sufficient mine-craft an essential requirement for base defense. If considered advisable, or desirable, the Mine Force may be included as part of the Inshore Patrol instead of a separate force, but the advantage of having the Mine Force separate should be carefully considered.

6. **THE HARBOR FORCE.**—a. The Harbor Force will comprise such tugs and other small craft as may be assigned by the Base Commander for harbor and channel patrol, for other duties as required, and from the forces designated for the Base Defense Forces.

b. In the establishment and operation of a fleet base of any extent it is necessary that close supervision of the movements of vessels and boats within the harbor area be instituted and maintained. To this end a port director, who is Commander Harbor Force, should be designated, and he should be kept continually informed of the prospective movements of all vessels entering or leaving the harbor, and particularly of the intended movements of any craft, large or small, within the harbor area during the hours of darkness.

c. Amongst the duties of the Harbor Force will be included:

To establish barriers and nets in the harbor entrances;
To patrol barriers and nets, in the harbor defense area;
To establish and maintain a channel and harbor buoyage system and other aids to navigation in the harbor defense area;
To patrol the harbor systematically, particularly at night;
To pilot vessels through entrance channels;
To assist in berthing vessels within the harbor and in shifting berths;
To assign anchorages to vessels entering the harbor;
To render floating service to vessels in the harbor for removal of garbage, etc.

7. **BASE ANCHORAGE.**—In planning the anchorage system for a main fleet base advantage should be taken of every natural barrier against torpedo fire from seaward such as shoals and islands within the harbor. The system should be such as to permit all vessels to enter and to leave the harbor freely. Heavy combatant ships should be anchored, or moored, farthest from the harbor entrance, or from barriers protecting the anchorage area. Auxiliary vessels such as repair ships, fuel oil tankers, and supply ships, should be located where they are least exposed to enemy gunfire from seaward, while at the same time they can be promptly and effectively employed in service to the combatant ships.

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8. **ESCORT FORCE.**—In addition to the Base Defense Forces mentioned, it may be necessary to organize an Escort Force, for the purpose of escorting convoys arriving within the waters of the base defense area after the initial establishment of a main fleet base. Such a force will be required ordinarily as an antisubmarine screen, but its actual composition at any time will depend upon the type of enemy forces likely to be encountered, and it will be necessary to depend upon the detail of combatant units of the Fleet when the escort must include any real fighting strength. In the early stages of an active campaign it is to be expected that the escort provided for the voyage of the convoy from the home country will accompany the convoy directly to the base, and that such escort will be augmented even beyond the base defense area by the combatant units of the Fleet already operating in the Principal Theater of Operations.

9. **GUNFIRE AND TORPEDOES.**—a. The assignment of anchorages to ships within the base will depend to a great extent upon the form of naval support such ships are capable of rendering the base defense by virtue of their availability, maneuverability, offensive and defensive qualities. In the event that major combatant vessels are present, their anchorages should be assigned with a view to utilizing their offensive gun power to the best advantage commensurate with proper antisubmarine protection. In the event of an enemy naval raid it may be advisable under certain conditions for available vessels of the proper type to stand out of the anchorage prepared to engage the enemy in the open under direct fire. Their anchorages should be assigned with this possible contingency in view. As a general rule, combatant vessels in the harbor which are capable of following up and destroying enemy raiders may be very profitably employed to this end.

b. Consistent with other requirements, available vessels equipped with powerful antiaircraft defense weapons should be assigned prime sectors for observation and firing. They should occupy berths where they can best assist the base defense against aircraft. Vessels not so equipped should be assigned berths where they will receive protection from the permanent antiaircraft defense shore batteries, supplemented by the protection offered by ships carrying antiaircraft defense weapons. A vessel should observe and fire primarily in its assigned prime sector. Pending the approach of a target in this sector, a vessel should fire at any target within range. Ordinarily fire should be opened on targets in the following order of precedence:

Bombers in the prime sector;
Bombers within range;
Planes other than bombers in the prime sector;
Planes other than bombers within range.

c. Vessels equipped with torpedoes as part of their armament should use these weapons in the manner best adapted to meet the requirements of the particular defense situation. Consideration

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should be given to the possibility of using shore-based torpedo tubes in the scheme of defense when conditions will permit the effective employment of torpedo fire from the shore.

SECTION II

HARBOR OBSTRUCTIONS

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10. **PURPOSE.**—Barriers, obstacles, or obstructions, are employed to close entrance channels of harbors, either partially or completely; to deny direct approach to channel entrances; to provide security to anchorage areas against torpedo attacks from seaward; to deny the use of definite areas to hostile vessels; or to force enemy naval forces to maneuver so as to give an advantage to friendly naval forces.

11. **TYPES.**—Obstacles may be permanent or temporary, depending upon their desired purpose and upon local conditions affecting their use; when permanent they are termed obstructions and may consist of dolphins, hurdles, sunken ships, or heavy chains. When of temporary nature they are termed barriers or obstacles and may comprise booms, nets or mines.

12. **OBSTRUCTIONS.**—a. The type of obstructions described in this section are to be employed when a channel, or approach thereto, is to be blocked against the passage of all vessels, hostile or friendly. In general, there should not be provided any passageway or gate through these obstructions, as such will tend to defeat the object of the barrier and weaken its effectiveness.

b. **Dolphins.**—These obstructions are constructed by driving heavy piles, or clusters of piles, about sixty feet apart, with the tops of piles about five feet above high water, and by connecting these units by suspending heavy jackstays, nets, or drag ropes, between them. This type of obstruction is efficient only in shallow water. Dolphins have been planted successfully in depths up to four feet at low water with a rise in tide of twenty feet at springs.

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c. **Hurdles.**—Hurdles are a modification of the dolphin type of obstruction suitable for depths of water not exceeding one hundred feet. They consist of triangular pryamids of steel rails, or bars, about seventy-five pounds per yard run. These pyramids may be spaced sufficiently close to deny the passage of submerged submarines, or the intervals between them may be closed by jackstays or nets, as with dolphins.

d. Hurdles can be constructed and placed with greater rapidity than dolphins where construction facilities are available. They are constructed more readily on cradles running on slipways near the site selected for the barrier. These slipways should terminate in a depth of water sufficient to enable the hurdles to be lifted off the cradles by the vessels that are to plant them. Hurdles are not suitable where there is a soft mud bottom as they will probably sink so deep as to render them ineffective as a barrier.

e. **Sunken Ships.**—Ships are generally loaded with rock or cement before they are placed to obstruct a channel. Difficulty in sinking ships in the exact location desired is to be expected and it is better to moor the vessel in place before she is allowed to settle on the bottom.

f. **Heavy Chains.**—Heavy chains consisting of large sized anchor chains secured to floats, barges, or piles, form an obstruction that is more generally available to naval forces in an emergency. Excess chain cables should be carried by the vessels of the Fleet Train in any overseas expedition in order to insure the availability of some form of obstruction. These chain barriers should be suspended at verying depths in an effort to obstruct the passage of submarines where the channel is deep enough for these vessels to attempt to run submerged. However, chain barriers are not an efficient form of obstruction and should be employed only as temporary expedients until some other form of barrier can be placed.

13. **BOOMS.**—a. Booms consist of heavy flexible steel wires, about five inches in circumference, supported as near the surface as possible by means of floats or buoys attached at short intervals. The ends of the wire should be attached to rendering winches on shore, since the effectiveness of this type of barrier depends largely upon its resiliency.

b. Booms are purely a surface form of obstacle, of value primarily against light surface craft attempting to enter the harbor at high speed. To increase their efficiency they should be laid in pairs about ten feet apart. They should be placed to seaward of any net type of barrier.

14. **NETS.**—There are two general types of nets that may be used as barriers for the protection of naval vessels, anchored in a harbor or in an open roadstead:

a. **Torpedo-defense Nets.**—Torpedo-defense nets are used to prevent the penetration of torpedoes fired from seaward into an anchorage area.

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Anti-submarine Nets.—Anti-submarine nets are used to prevent the entrance of hostile submarines into a harbor or within torpedo range of an anchorage.

15. TORPEDO-DEFENSE NETS.—a. Torpedo-defense nets are made of flexible steel wire about one-half inch in diameter. The mesh should be about twelve inches square. They are made up, generally, into sections of two hundred yards length and a twelve foot depth. The sections may be secured together to increase either length or depth.

b. Unless the nets are provided in readiness for use prior to departure from a home base, they will be found difficult to make up on board ship on account of the space required to lay out the lengths of wire and to secure these lengths together to form the desired mesh. Therefore, where this type of net is to be made up by the forces afloat it is better to make the lengths shorter, as they can be secured together without difficulty when laying them out in the desired location.

c. The ends of the nets should be secured to the shore or to heavy dolphins at the edge of shallow water. The nets should be supported throughout their length by buoys or floats at intervals of fifty to one hundred feet, dependent upon the weight of the net and the buoyancy of the supports. While steel buoys are best for this purpose, wooden floats made by strapping, or bolting, heavy timbers together are satisfactory. Oregon pine is the best wood for floats.

d. The use of torpedo-defense nets is restricted, generally, to the protection of the inner harbor area if such area is exposed to torpedo fire from seaward and if no other effective means of protection can be devised. They should be laid to within two feet of the depth of the channel up to a maximum depth of forty feet. This form of obstacle should be located inside of all other types of barrier.

16. ANTI-SUBMARINE NETS.—a. Anti-submarine nets are constructed of heavy flexible steel wire made up into sections six hundred feet long with a mesh of twelve feet. The sections are arranged for assembling a net of any practicable length for depths varying from twenty-four to one hundred ninety-two feet, in increments of twelve feet. The upper sections below that depth are made of five-eight inch wire. All sections are fitted to shackle together.

b. The mooring arrangements consist of first class can buoys at each end of a new section secured by a span at right angles to the direction of the net. Each leg of the span is anchored by a concrete anchor backed by a mushroom anchor. For depths up to forty-eight feet the anchors are thirty-six hundred pounds weight. For greater depths they are five thousand pounds. The moorings are of galvanized plow-steel wire, with chain at all connection points, and are cut to correspond to the various depths of net. A heavy

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jackstay of one and five-eights inch wire forms the upper support of the net and is shackled to the buoys at each end of a section. The weight of the net and jackstay is supported by twelve buoys equally spaced along the jackstay. These buoys are sphereo-cylindrical for depths of thirty-six feet, and for greater depths are of a special drum float type possessing great strength and buoyancy.

c. The Navy has a number of this type of net on hand available for use. On account of their size and weight, and the lack of flexibility of the wires, it is not practicable to assemble these nets on board ship, and they must be made up on shore at the locality where they are to be used.

17. **MINES.**—a. Anchored mines are laid in rows, or series of rows, to prevent the passage of vessels through the area mined. They may be employed in any area, restricted or other-wise. When used to secure a channel against enemy use they should be planted to seaward of the channel entrance.

b. The types of mines, the methods of laying them and of sweeping for them, and other pertinent information will be found in Mine Laying Manual, United States Navy.

c. The use of controlled mines, which are operated from shore, is comparatively safe to shipping; but this type requires rather extensive equipment to be erected which would preclude their use in the initial defense of a fleet base.

d. Fields of contact mines, or of magnetic or acoustic mines, are dangerous to all vessels in the vicinity, and their exact location and extent must be very definitely known by all friendly shipping. Where such mine fields are laid off entrance channels to harbors, or in areas to be traversed by friendly vessels, passageways must be left and must be marked accurately by means of buoys or other navigational aids. Such passageways must be swept continually to keep them clear of drifting mines.

e. Mines used as barriers to a harbor entrance should be planted outside of all other types of obstacles. Where used to reinforce other barriers they should be laid at a distance from such barriers sufficient to prevent damage to them by an explosion.

18. **BARRIER GATES.**—a. In those forms of barriers that are not designed to close a channel or harbor entrance completely, but which must cover the channel to be effective, it is necessary to provide a gate, or gates, to permit the entrance and exit of friendly vessels. While such gates may be placed in almost any type of barrier or obstruction, they are confined in general to the net type of obstacle. In any case they should not exceed two hundred yards in width.

b. **Swinging Gate.**—A swinging gate is an unanchored section of net, one end of which may be towed or hauled, so as to swing the section parallel to the channel. For this purpose, a vessel may be used to tow the free end clear in opening and closing the gate,

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or a heavy buoy may be moored to which the gate may be hauled out by a steel hawser. The use of a ship is more efficient and should be employed where there is any amount of traffic.

c. **Sinking Gate.**—A sinking gate is a section of net that is not buoyed, so that when the ends of the section are released from the rest of the net, it will sink of its own accord. In this type, there is danger of vessels fouling the sunken gate in passing, and the protection afforded when the gate is closed is not as effective as with a swinging gate.

19. **GATE CONTROL.**—a. It is advisable to have gate vessels permanently moored on each side of the gate through a net, in order to mark the limits of the gate, to protect it and to control traffic. There should be an examination anchorage inside the net. All traffic must be adequately controlled, and gate vessels, traffic control stations and signal stations should all be connected by telephone if at all practicable.

b. Special signals, day and night, must be provided to indicate whether the gate is open or closed to traffic in either direction, and these signals should be visible only from the direction of approach of vessels to the gate. Signals should be established to allow the gate to be used in fog or low visibility, with the inward-bound signal clearly distinguishable from the outward-bound signal.

c. Where tidal currents are strong the gate should be so arranged as to open in either direction to facilitate the prompt operation of the gate at all times. In general, vessel proceeding against the current should wait until those proceeding with the current have passed clear the gate. Vessels should be required to use slow speed in passing through the gate.

20. **LOCATION OF BARRIERS.**—a. The most effective location of any type of barrier can be determined only by local conditions. The topography and hydrography of the approaches, of the channel and of the anchorage area, must be studied, so as to take advantage of every peculiarity that will assist the defense, while at the same time making the necessary barriers as short as possible.

b. Nets are primarily obstacles to an attack by hostile vessels whether on the surface or submerged and are not to be considered as permanent or positive obstructions. Their principal object is to prevent surprise attack by enemy vessels carrying torpedoes.

c. Where depth of water permits, antisubmarine nets should be located at such a distance from the anchorage area as to prevent torpedoes that may be fired through the net from reaching that area. When practicable, a torpedo-defense net should be placed inside of an antisubmarine net if there is any question as to the adequancy of the latter for protection of the Fleet.

d. To make more positive the security of an anchorage area, it is advisable to use two separate lines of obstacles to reinforce each other, under all conditions.

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e. In locations where the water is shoal for a considerable distance offshore in the approaches to the harbor entrance the possibility of the enemy blocking the entrance channel, or channels, by sinking ships of his own therein, must be considered in the location of nets and other barriers.

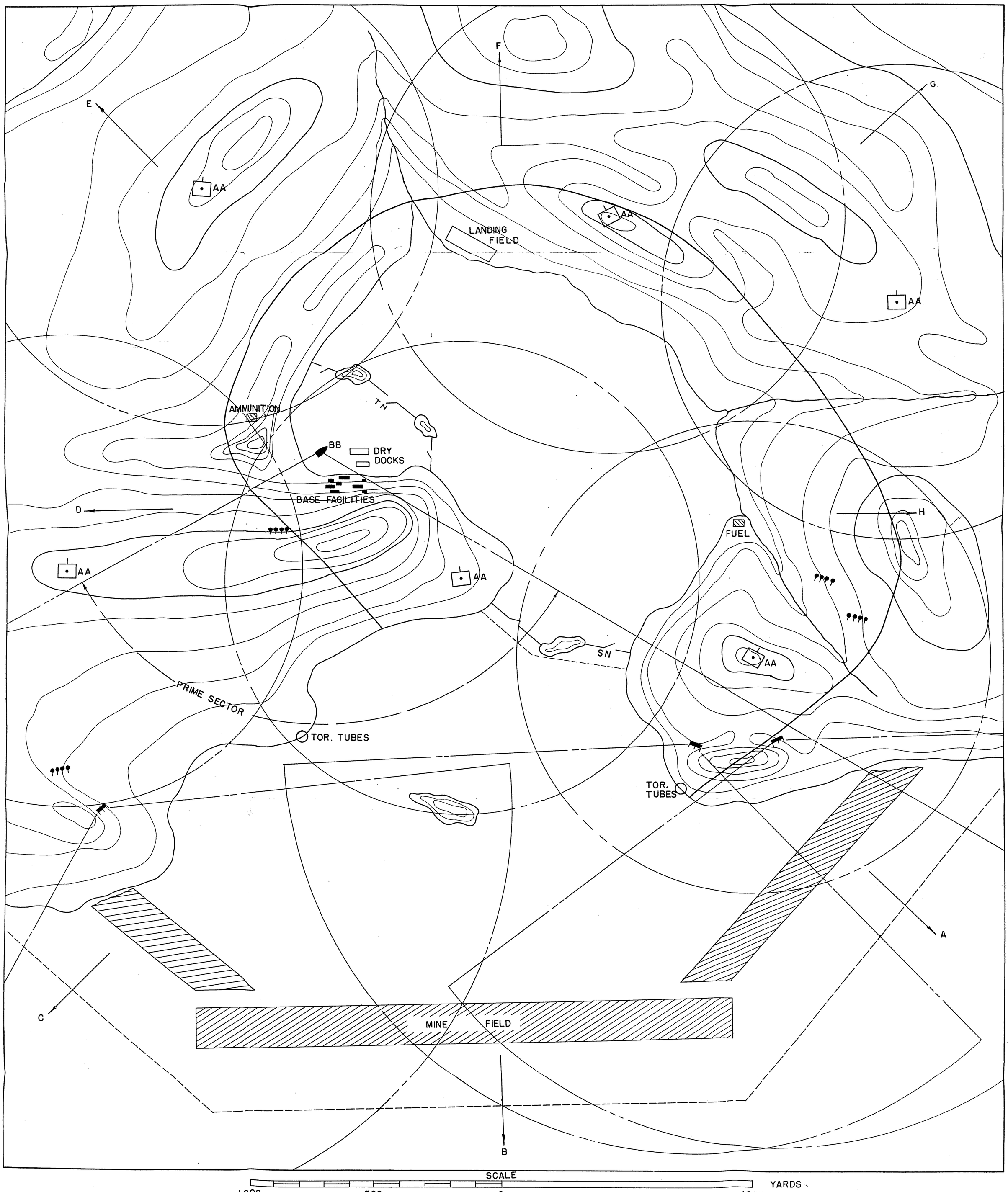
21. **PROTECTION OF BARRIERS.**—a. All barriers, or obstructions, whatever their nature, require defensive measures to prevent their penetration, destruction, or removal by the enemy. The requisite defense consists primarily and essentially of a continuous patrol of the seaward approaches to such barriers, day and night, by fast, well-armed, surface craft. In addition, all channel obstacles should be patrolled by armed small craft during darkness and low visibility.

b. The inclusion of shore-emplaced guns in the defense of barriers depends upon the local conditions that may tend to the effectiveness of this method of defense. If employed, they should be in addition to, and auxiliary to, the floating defense. This method comprises the emplacement of minor caliber guns to cover the barrier, or barriers, and the approaches thereto, with a rapid, effective fire.

22. **ILLUSTRATION OF A BASE.**—a. The attached diagram illustrates some of the defensive installations and base facilities of an advanced base.

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BB BATTLESHIP
TN TORPEDO NET
SN SUBMARINE NET

AA 3-INCH ANTIAIRCRAFT GUN BATTERY (MOBILE MOUNT)

3-INCH GUN BATTERY (MOBILE MOUNT) ASSIGNED PRIMARILY TO MINE DEFENSE

6-INCH 47 CALIBER BASE DEFENSE GUN BATTERY, MOBILE MOUNT AND ALL-AROUND TRAVERSE

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TENTATIVE MANUAL
FOR
DEFENSE OF ADVANCED BASES

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CHAPTER VIII

AIR DEFENSE FORCES

MARINE CORPS SCHOOLS
QUANTICO, VIRGINIA

June, 1936

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CHAPTER VIII

AIR DEFENSE FORCES

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GENERAL

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1. MISSION.—The mission of the Air Defense Forces in the defense of an advanced base is to assist the Shore Defense Forces and the local Naval Defense Forces to the limit of its capabilities by conducting reconnaissance flights to deny the enemy strategical and tactical surprise, by protecting the base from hostile air attacks, by executing battle and close combat support missions for the Shore Defense Forces, and by attacking those objectives beyond the range of other weapons and agencies which constitute the most important and vital threat to the security of the base.

2. COMPOSITION OF THE AIR DEFENSE FORCES.—a. The composition of an Air Defense Forces to assist ground and naval forces in the defense of an advanced base will vary with every situation, and can be determined only after a very careful estimate of the situation is made. Some of the factors which influence the composition of an air force are: the size, location and importance of

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the advanced base, accessibility of the base to air attacks, the number of sea and land approaches, and the maximum number of hostile airplanes and surface vessels which may attack.

b. A sound aerial defense should include long range patrol and scouting planes for strategical and tactical reconnaissance; heavy bombardment units possessing great radius of action; dive bombers and attack planes for close in defense against hostile surface vessels and landing parties; observation planes for infantry, artillery, command, reconnaissance and photographic missions; and above all an ample strength in fighting units for the adequate support of other classes of aviation provided and for the interception and neutralization of hostile air efforts. Torpedo planes would be extremely useful in attacking hostile vessels under conditions of low ceiling; their tactical employment hereinafter will be considered as supplementing operations of bombardment aviation. If patrol, heavy bombardment and attack classes are not provided, additional dive bombing and observation units must be included. The use of fighting squadrons as attack aviation should not be contemplated when estimating requirements. Attack aviation constitutes the backbone of the aerial defense against the actual landing of hostile troops, but its effectiveness may be nullified unless protection for its operations is furnished. Utility planes, including amphibian types, for the transportation of personnel and materiel, ambulance service, and rescue work, messenger service and other special missions, will contribute materially to the solving of logistical and administrative problems.

c. If available, lighter than air units consisting of kite ballons and dirigibles should be used to augment the observation facilities of the air force. The kite balloon requires little maintenance and is well fitted for carrying out spotting missions for artillery and keeping certain areas under constant surveillance. Dirigibles are especially adapted for long distance reconnaissance. All lighter than air craft are extremely vulnerable to machine gun and bombing attacks by hostile aircraft and they may have to be put out of operation when the hostile air force comes within operating range.

d. Enough auxiliary units must be assigned to the air force to insure that such activities as supply, maintenance, repair, transportation, ordnance, photographic, communications and chemical warfare can be efficiently performed. In those situations, where the air force is called upon to furnish its own airdrome protection, additional auxiliary units must be taken for that purpose.

e. An air force engaged in defending a base in a distant theater of operations must be largely self dependent. Once the enemy has committed himself to the attack there will be little opportunity for reenforcing the air component of the defender. Because of the possibility of distant fleet operations, no dependence can be placed on fleet air units. The necessary tactical units must be assigned initially, and provided with adequate auxiliary units,

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repair facilities and a reserve of airplanes, personnel, and supplies, sufficient for self sustained operations in accordance with the logistical policies of the base force.

3. ORGANIZATION OF THE AIR DEFENSE FORCES.—When the composition of the air force has been decided upon, it must then be organized so as to give the base defense the maximum support possible. This result will best be obtained by placing all aviation allotted to the base in one task organization, which may then be subdivided into task groups in accordance with the duties performed. Aviation units assigned the same general mission are put into the same task group even though they may be equipped with different types of airplanes. Such a tactical organizaiton will provide efficient and coördinated operation with the maximum economy of force.

4. CONTROL OF THE AIR DEFENSE FORCES.—If the aviation units assigned to the defense of an advanced base are to be used most effectively, they must be under a single command, and their control vested in that headquarters which has knowledge of the whole situation and is directing all the forces with an ultimate objective in view. Centralized control bestows a unity of command by which the relative importance of various tasks can be determined and orders issued accordingly, thus avoiding duplication of effort and the dissipation and diversion of air strength on inconsequential missions which might result in a fatal inferiority of air power at some critical stage.

5. THE AUTHORITY OF COMMANDER AIR DEFENSE FORCES.—a. The air commander should not be hampered in the execution of his air operations by rigid and fixed orders. His authority should be limited only by general instructions, which should include definite missions arranged in order of priority.

b. The air commander must be kept thoroughly acquainted with all the plans of the Base Commander for the defense of the base as well as all of the latest information about the hostile forces. Aerial targets are often fleeting, vulnerable one moment and strongly fortified the next, changing with such rapidity that momentous decisions must frequently be made on the spot if full advantage is to be taken of the fleeting opportunities offered in air actions. These fleeting opportunities must be acted upon at once if effective results are to be obtained, and if the necessary authority is not vested in the air commander, and if he is not in possession of the latest information of the enemy, the fullest capabilities of the air force will not be realized. In some situations, it may be necessary to delegate some of this flexibility in authority to aviation task group and subordinate commanders.

6. GENERAL PRINCIPLES OF EMPLOYMENT OF THE AIR DEFENSE FORCES.—a. **Principle of the Objective.** Air force objectives are those which have a decisive bearing on the final outcome of the defense operations.

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(1) **Hostile Air Force.**—In order that the defending air force may operate with some freedom of action, the first objective is the hostile air force. If the friendly air force is to be of major assistance to the shore and naval defense forces, the hostile air force must be destroyed at least in part during the preliminary air operations. The destruction of hostile aircraft will continue to be an objective of varying importance throughout all phases of the defense.

(2) **Strategic Objectives.**—The air force, because of its long range, should attack those vital objectives which are beyond the effective range of other agencies.

(3) **Tactical Objectives.**—Operations against the hostile air force are tactical. At the outset, the defense has one marked advantage, in that destruction of the enemy's floating bases might force the withdrawal of the landing force without the necessity of defeating that force in a land battle. To retain this advantage, every effort should be made to prevent the opponent from successfully establishing supporting air bases ashore. When a hostile landing threatens, the air objective is troops in transports and small boats.

b. **Principle of the Offensive.**—Although the primary function of an air force is to protect the advanced base from hostile air attacks, it cannot operate on the defensive in the sense that ground forces do. Even though the air force is used defensively, it must act offensively, if decisive results are to be obtained. In preventing hostile air attacks upon the base, friendly fighting aviation must attack the hostile aircraft in order to carry out its mission.

c. **Principle of Economy of Force.**—There will always be a multiplicity of targets for an air force during the various stages of the defense. The full effectiveness of this arm will only be realized by its prompt and judicious employment against objectives which constitute the most immediate and vital threat to the security of the base. Otherwise its strength will be frittered away without obtaining maximum results.

d. **Principle of Security.**—While airplanes are on the ground, security from hostile air attack is gained by the dispersion and concealment of airplanes, and by antiaircraft artillery. In order to secure an advanced base from surprise air and naval attacks, daily flights are made by observation, patrol and fighting planes even though there be no enemy forces to observe.

7. **PROPER EMPLOYMENT OF EACH CLASS OF AVIATION.**—Each class of aviation is designed for a certain purpose and loses much of its effectiveness when diverted from its primary purpose. Only in cases of military necessity should airplanes be assigned missions which they are not suited to perform.

8. **CONTROL OF THE AIR.**—a. Initially, the enemy is presupposed to have air superiority. Therefore, preliminary air operations must be judiciously conducted so that full advantage of every

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opportunity is taken to destroy hostile aircraft, for only by attrition can the relative combat strength of the defender's air force be improved. Every conceivable ruse should be employed to draw out the enemy's air force on fruitless missions; to entice him into situations unfavorable to himself; to make him reveal the location of his bases so that his aircraft can be destroyed. After one adversary has gained local control of the air, the operations of the other may be restricted largely to night operations.

b. Even though the attacking air force gains control of the air in the preliminary air operations, the defending air force must be prepared to operate to the limit of its capabilities in the final defense phase against hostile transports and small boats en route to the beach.

9. COORDINATION AND COOPERATION.—Through planning and liaison, coördination and coöperation must be developed to a high state of perfection between aviation and supported arms. General plans should include mutual support and coördination between the Air Defense Forces and air activities of the Fleet operating in the vicinity of the base. Aviation on vessels temporarily present should be made available for utilization in emergency. To obtain the best coöperation, liaison between all units should be close and every opportunity grasped to promote mutual understanding and support.

SECTION II

AERIAL OPERATIONS DURING THE RECONNAISSANCE PHASE

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10. STRATEGICAL RECONNAISSANCE.—Strategical reconnaissance, for strategical reasons, may be conducted daily, periodically, or when information indicates that attack is imminent. This mission is designed to gain information of the enemy before he arrives within striking distance, and requires patrol planes or types possessing great radius of action. Normally, except where hostile approach is limited to restricted areas, considerations of matériel and supply will definitely limit the scope of these operations over long periods of time. When patrol planes operate at extreme range, full use should be made of suitable beaches as temporary advanced bases. Much time and fuel will be saved, particularly when the area to be searched daily is at considerable distance from the base defense area.

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TACTICAL RECONNAISSANCE.—Tactical reconnaissance should be conducted to seaward daily at dawn and dusk. The most vital area to be covered lies within the line from which an invading force could reach the base during the hours of darkness. For a large expedition carrying troops a night's run would scarcely exceed 180 miles. If this area is thoroughly covered by a systematic search by scouting planes, surprise attacks will be limited to raiding forces aboard vessels of high speed. To meet this situation, the air force must be prepared to illuminate definite suspected areas during hours of darkness by means of parachute flares. Additional reconnaissance should include observation of land approaches, search for submarines, advanced air bases within striking distance, impending air attacks, and such other evidence of hostile activities as may effect the security of the base.

12. GENERAL SUPPORT.—General support by fighting aviation will normally consist of patrolling the air at dawn and dusk or at such times as may be considered most favorable for hostile air attacks, and in being prepared at all times to take the air immediately to intercept and engage enemy aircraft whenever warning is received. The latter requires an unfailing communication system and the closest coöperation from reconnaissance planes, patrol vessels, advanced observation posts, and the Antiaircraft Intelligence Service.

13. DESTRUCTION OF HOSTILE AVIATION.—a. The destruction of hostile aircraft during this phase of the defense constitutes the most effective means of reducing the air menace both prior to and during the landing. At this time, hostile airplanes will be on carriers or airdromes, in depots or cargo vessels. Every effort must be made to locate hostile air bases, aircraft carriers and advanced landing fields so that the attacker's planes and equipment may be destroyed on the ground in a determined effort to forestall and counteract his aerial operations. The location of hostile airdromes and aircraft carriers will be facilitated by having certain planes of the defending air force designated to trail enemy air units after they have attacked the base.

b. In certain situations, the enemy may confine his operations against a strongly fortified base to air attacks alone with the intention of demolishing the base installations, rendering the area untenable or making its occupation costly.

c. In such a situation, air atacks upon the hostile airplanes and base facilities should be intensified, and the Base Commander should tighten the local air defense by extending observation, maintaining a large force of fighting aviation in a state of readiness, and should coördinate all antiaircraft defense measures, so that the air force and antiaircraft artillery may effectively repel any hostile air attack.

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14. DESTRUCTION OF HOSTILE SUBMARINES, SURFACE VESSELS AND RAIDING PARTIES.—Hostile submarines, surface vessels and raiding parties constitute important targets for aviation. The air force should be prepared to attack and destroy them whenever and wherever encountered. In making aerial attack upon surface vessels raiding the base, sufficient air forces should always be left behind to protect the base from surprise air attacks. In repelling a hostile raid, strongly supported by aircraft, the defending air force must use its fighting planes to repel the hostile aircraft, with bombardment and attack units held in readiness to attack and destroy the hostile aircraft as soon as observation units have definitely located the hostile carriers or airdromes by search or by trailing operations.

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15. OPERATIONS OF OBSERVATION AND RECONNAISSANCE GROUP.—During the alert phase, strategical and tactical reconnaissance missions are carried out by observation, scouting and patrol planes until the full strength of the hostile expedition has been developed. Contact with the hostile convoy once having been made, the air force is alerted and every effort is made to keep it under continuous surveillance. During the approach of the convoy, full and complete information regarding its strength, composition, speed and disposition of carriers is obtained. Observation aviation also assists the base defense artillery in guarding the mine fields protecting the base by promptly reporting any hostile mine sweeping activities. In some situations, it may be called upon to illuminate the mine fields so that the base defense artillery may bring the hostile mine sweepers under fire.

16. OPERATIONS OF FIGHTING AVIATION.—During this phase, fighting aviation is constantly on the alert, prepared to intercept and destroy hostile bombers. It must also be prepared to deny the enemy aerial observation so that accurate knowledge of the location and character of friendly airdromes as well as detailed information of the base and of suitable landing beaches will be difficult to obtain. In some situations, fighting aviation must furnish protective escorts for bombardment and attack units making their attacks on the hostile convoy.

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17. OPERATIONS OF BOMBARDMENT AND ATTACK AVIATION.—These two classes of aviation must perform many varied operations during the alert phase. When the hostile convoy is first sighted they may be employed as follows:

(1) They can be ordered to attack the hostile convoy as soon as it comes within range of the planes.

(2) The bombing attacks may be delayed, the air units kept carefully concealed, placed on the alert and thus be ready to attack targets of opportunity.

(3) Attacks can be delayed until hours of darkness. The course of action to be followed can only be determined after a careful estimate of the situation. However, it must always be borne in mind that hostile carriers and land based aircraft are the primary objectives at this time; that the hostile transports are secondary objectives and that every effort must be made to gain air superiority during this phase while conserving sufficient aircraft to support the defense in the final defense phase.

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18. AERIAL OPERATIONS DURING HOSTILE DEBARKATION AND MOVEMENT.—a. Hostile debarkation into small boats offers a highly concentrated and profitable target for aerial attack. Transports and small boats become temporarily the primary objectives and nothing should divert air efforts from repeated assaults on these targets, for at no other time during the entire operation will troops again be so vulnerable to air attack. Bombardment and attack squadrons, under strong protective escort by day and by single planes at night, should exert every effort to take full advantage of this situation. Observation aviation continues tactical reconnaissance, paying particular attention to location and movement of the floating reserve and during the hours of darkness may be called upon to furnish additional illumination for bombing operations.

b. During the movement from ship-to-shore, attack aviation should maintain a vigorous and continuous offensive against the small boats; bombardment units continue their attacks on transports, neutralize ships' gunfire and attack definitely located carriers. Fighting aviation, if in sufficient strength, will be called upon to furnish protection for these operations, and to protect beach de-

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fenses, airdromes and other vital stations, to prevent hostile air observation and deny smoking operations. Hostile air activities will be especially intense when the ships' gunfire lifts. This eventuality must be foreseen and plans made for the rendezvous of a strong force of fighting aviation to neutralize hostile air operations during the final stages of the approach to the beach or beaches. It may become advisable as a last resort to employ all types of planes to prevent the assault battalions from getting a foothold on the beach. If the enemy attempts to beach transports, they should be subjected to intensive bombardment aimed at destroying personnel and boats, lighters, ramps, and other equipment for getting ashore. During the hostile approach, reconnaissance is continued in the endeavor to obtain early evidence of the main effort. Observation of other areas must not be relinquished; surprise landings at distant beaches must be guarded against, and the location, movement, and activities of the floating reserve are of particular importance.

19. **AERIAL OPERATIONS DURING HOSTILE LANDING AND ADVANCE INLAND.**—a. Shore line combat, during the struggle for physical possession of the beach, requires a high degree of coördination between the activities of aviation, ground troops manning the beach defenses and the artillery. Aviation should assist the ground troops by filling in the gaps not covered by other defenses; attacking troop concentrations with bombs and machine guns; executing infantry, command, artillery and reconnaissance missions and by denial of hostile air activities.

b. Should the enemy succeed in gaining a foothold on shore, the primary objectives of the air force revert to those targets still on the water, or on the beach, which are supporting or will support the force ashore. The attacker's small boats, transports, supporting ships, communications, troop concentrations and artillery are appropriate targets for attack. Above all, the floating reserve must be prevented, through its delay, destruction or immobilization, from participating in the action or exploiting initial successes at other beaches. Repeated attacks against all the invader's floating bases will seriously threaten the support of his troops ashore. Lines of communication, especially those of the ship-to-shore movement, are vulnerable and susceptible to disruption. Attempts of the enemy to establish his aviation on shore should be met with combined effort of all weapons available.

20. **AERIAL OPERATIONS IN SUPPORT OF A COUNTERATTACK.**—One of the missions devolving upon the air force, after the enemy has established himself ashore, may well be close support of counterattacks. All classes of aviation should coöperate with the other arms; attack aviation assisting in breaking the enemy's resistance; bombardment destroying command, communication and supply establishments; fighters neutralizing hostile air activities, and observation executing infantry, command, recon-

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naissance, artillery and photographic missions and furnishing additional planes for ground strafing. When the commander of the shore defense forces decides to employ the general reserve all planes must contribute either directly or indirectly to the support of the ground troops participating in the combined counterattack.

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21. THE MAIN AIRDROME.—The main airdrome, including major overhaul and supply facilities, should be so located as to take advantage of maximum antiaircraft protection. Normally, air force administration will be conducted from this airdrome, but auxiliary command posts should be provided, prepared for emergency use.

22. AUXILIARY, ALTERNATE AND DUMMY AIRDROMES.—Auxiliary, alternate and dummy airdromes should be established in considerable numbers, the number being limited ordinarily only by availability of suitable terrain. Airdromes must be provided so that aviation units of naval vessels and carriers temporarily present may become land based.

23. ADVANCED LANDING FIELDS.—Advanced landing fields should be provided near command posts down to and including the brigade, and lower units when possible. Other fields, within or without the base defense area, may be necessary from which air units can temporarily operate in extending their radii of action against approaching hostile fleets or enemy supporting bases.

24. FACTORS INFLUENCING LOCATION OF AIRDROMES.—a. Aircraft on the ground will be subjected to relentless attack by the hostile air force in its attempt to gain local air control. Therefore, as many airdromes as possible should be placed within areas defended by antiaircraft artillery installations. If the terrain is available, every attempt should be made to scatter the airdromes so that the hostile air forces will have difficulty in locating them. The general location of airdromes is, therefore, a compromise between the above mentioned factors. In general, the airdromes should be so located that the losses from enemy aerial attack will be kept at a minimum.

b. Airdromes for fighters will be located so that the fighting aircraft can furnish maximum protection to the base and be able to intercept and attack hostile air formations attacking the base or

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its defending air force. Due to the fact that such a large percentage of the aircraft assigned to the defense of a base are fighters, the largest area will of necessity be assigned them.

c. Bombardment aviation needs vast amounts of gas, oil and bombs if it is to operate effectively. Its airdromes should, therefore, have adequate transportation facilities available. They should be located near hard surfaced roads and navigable streams. Heavily loaded bombardment airplanes need a long run to take off, and areas having longest runways should be assigned.

d. Observation airdromes should be in the vicinity of the headquarters of the unit which it is supporting.

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25. AIR-GROUND COMMUNICATION.—Air-ground communication is prescribed in Section VII, Tentative Landing Operations. Antiaircraft artillery units should indicate to fighting squadrons in the air, the direction of approach of hostile aircraft, using shell bursts by day and searchlights at night.

26. INTER-PLANE COMMUNICATION.—All aircraft should be individually equipped with radio capable of being used in a two way telephonic and telegraphic air-ground and inter-plane communication.

27. GROUND COMMUNICATION.—Ground communication will be established in accordance with plans and policy laid down by Force Communication Officer, who will be responsible for laying and maintaining all wire not of a purely interior or local nature. Air Force Communication Section will be charged with the installation and operation, including switchboards, of all communications on each airdrome. Direct wire connection between the Antiaircraft Intelligence Service and air units, especially fighting squadrons, is highly important. Distant observation posts performing air guard duty should be provided with radio.

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28. DEFENSE AND PROTECTION OF AIRPLANES ON THE GROUND.—a. Planes of the defending air force may be on the ground at their respective airdromes as much as eighteen hours

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during every twenty-four. During this time, they are very vulnerable to air attacks. The first consideration for the protection of airplanes on their airdromes is the selection of airdromes which are most likely to escape the eyes of hostile aviation. Dummy airdromes may be used to deceive the enemy as to the actual location of operating airdromes.

b. After the airdromes have been located by the hostile air force, airplanes thereon may be protected by machine guns and antiaircraft gunfire, and by security measures such as dispersion, concealment and shelter.

c. The area in which the airdromes are located should be covered by the fire of machine guns, and antiaircraft guns, if available, so that hostile airplanes are prevented from making leisurely and repeated attacks from high or low altitudes without suffering losses.

d. Dispersion is effected by distributing air units on several auxiliary airdromes, and further providing these units with one or more alternate airdromes to which they may move from time to time. The airplanes of each squadron should be parked around the edges of the airdrome so as to present a poor target for an aerial attack.

e. Concealment is effected through the use of all natural cover, such as trees and brush, sandbags revetment for housing planes, and if time and material permit underground hangars should be provided. Full use of camouflage nets should be made. The use of salvaged and damaged airplanes may misdirect hostile air efforts. Static installations of smoke may be used to blanket the airdrome area in case of a hostile air attack.

f. In addition to protecting the airplanes, provision must be made to protect the personnel of the air force. Gas proof dugouts and individual fox holes close to the working areas must be provided for the mechanics.

29. **COORDINATION OF AERIAL ACTIVITIES WITH ANTIAIRCRAFT ARTILLERY.**—a. Airplanes of the defending air force should approach and leave the base along well defined air lanes which should be designated daily by the Air Force Commander. The antiaircraft artillery is thus able to fire on hostile aircraft with the minimum of delay without fear of endangering friendly aircraft.

b. The Air Force and Antiaircraft Artillery Group must have careful coördination plans so that maximum losses will be inflicted upon hostile air formations attacking the base with the minimum of danger to the defending aircraft.

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TENTATIVE MANUAL
FOR
DEFENSE OF ADVANCED BASES

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CHAPTER IX

ADVANCED BASE DEFENSE PHASES

MARINE CORPS SCHOOLS
QUANTICO, VIRGINIA

June, 1936

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1. **THE DISTANT RECONNAISSANCE PHASE.**—This phase marks the period from the time a direct threat against the advanced base becomes possible until the time that the enemy arrives within striking distance of the base. Striking distance may be assumed as the steaming distance from dusk until dawn for those surface vessels capable of transporting troops.

2. **PURPOSE OF OPERATIONS.**—a. During this phase operations will be conducted with the following object in view:

Deny strategical surprise to the enemy;
Prevent the enemy from gaining aerial superiority;
Inflict losses in enemy ships before the assailant can begin his landing attack.

b. During this phase it is paramount to determine at the earliest practicable moment the composition, strength, armament, location, speed and course of the hostile expeditionary forces. Contact once gained must be vigorously and continuously maintained. All intelligence and communication activities (sea and air) are intensified and closely coördinated.

c. Information may be furnished by friendly vessels or the operating fleet during this phase, as the logistical considerations

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and information in the possession of the commander of the operating fleet will determine the earliest date on which the enemy can attack.

d. Information may be furnished by friendly intelligence agencies within and outside the theater of operations.

e. Information collected prior to and during the occupation of the base may indicate whether or not enemy operations are practicable or contemplated, and can be expected within a definite period of time after the opening of hostilities.

3. CONDUCT OF THE NAVAL AND AIR DEFENSE FORCES.—a. The naval and air defense forces of the base will be prepared to operate in accordance with the base defense plans and their assigned tasks.

b. During this phase, the enemy's light fast forces, particularly destroyers and cruisers, will be kept under close observation in anticipation of surprise landings and raids.

c. During this phase, the enemy may resort to the seizure of an air base or a supporting base from which to start preliminary operations. Aerial and submarine operations will be conducted against attempts on the part of the enemy to establish such bases within the local theater of operations.

4. THE ANTIAIRCRAFT ARTILLERY.—The antiaircraft artillery will be prepared to protect the base establishments, surface craft in the anchorage areas, airdromes, and important defensive and industrial installations against hostile air attacks during this period.

5. CONDUCT OF INSHORE PATROL.—The opertion of inshore patrol craft will be initiated in liaison with the shore observation groups and in accordance with a predetermined plan. Sea approaches to important landing areas will be covered.

6. SECTOR ACTIVITIES.—a. Sector and subsector commanders down to and including company commanders will continue their reconnaissance and the development of the defensive positions. The work on fortifications and organization of the ground will be continuous.

b. Prior to and during this phase, front line units (beach defense troops) will be relieved and rotated in order to afford the maximum amount of rest to troops.

c. The training and instruction of troops will be continued, but personnel will be given the maximum amount of rest consistent with security measures. The same rule applies to troops held in general reserve.

d. Necessary shelter and cover for troops in assembly or bivouac areas will be perfected.

7. SUPPLY AND COMMUNICATION.—All arrangements for supply and communication will be verified and perfected. Roads

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and trails will be improved, in order to facilitate the movement of troops and supply. A general alarm system will be instituted and installed.

8. DEFENSE PLANS.—During this phase the defense plans for all group and task organizations must have been completed to meet the enemy's more probable courses of action in the attack.

9. CONCLUSION.—As the distant reconnaissance phase may develop quickly into the alert phase due to the ever increasing speed and range of action of aviation and sea-borne craft, all agencies charged with observation and the collection of intelligence data will operate continuously.

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10. THE ALERT PHASE.—This phase marks the period from the time that the enemy arrives within striking distance of the base until he occupies transport area or areas, preparatory to a general attack.

11. PURPOSE OF OPERATIONS.—Operations during this phase will be conducted with the following object in view:

Deny tactical surprise to the enemy;
Prevent the enemy from gaining aerial superiority;
Inflict losses in enemy ships before the enemy can begin his landing attack.

12. CONDUCT OF THE NAVAL AND AIR DEFENSE FORCES.—The naval and air defense forces of the base will be especially active in maintaining contact with the enemy, and in attacking and tracking surface and subsurface vessels of the enemy's covering forces and convoy.

13. THE ANTIAIRCRAFT ARTILLERY.—The antiaircraft artillery must be prepared on a moment's notice to protect the base establishments, anchorages, airdromes and important defense and bases installations against repeated hostile air attacks.

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14. CONDUCT OF INSHORE PATROL AND SHORE OBSERVATION.—a. The inshore patrol craft will maintain continuous observation over the sea approaches, covering all probable and possible landing places.

b. Shore observation in liaison with the inshore patrol will be maintained to the seaward to guard against the surprise of rapid descents on landing areas and to watch for hostile air approach.

15. SECTOR ACTIVITIES.—a. All beach defensive installations will be manned and intensive patrolling initiated along the more important portions of the probable and possible landing areas. Other units and combat groups of beach positions will be alerted, prepared to occupy their positions. All observation and listening posts will be occupied.

b. Sector reserves will be alerted.

c. All sector and subsector commanders continue their reconnaissances and make final preparations for a stubborn resistance at or near the water's edge; to deny and delay the enemy's advance in force on important landing fronts.

16. ARTILLERY.—The artillery will be prepared to cover sea approaches, mine fields and other sea barriers, to fire on enemy ships and to support the action of sector commanders. Searchlight batteries will be manned, but as a rule, will not be employed until it is definitely determined that enemy vessels are operating within the effective radius of their illumination.

17. MOVEMENT OF TROOPS AND SUPPLIES.—a. During this phase the movement of troops and supplies will be reduced to a strict minimum and will be made preferably at night.

b. Troops will be given the maximum amount of rest, particularly during daylight, consistent with security measures.

c. All supply and communication details will be completed and the alarm systems verified and tested.

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THE FINAL DEFENSE PHASE

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18. THE FINAL DEFENSE PHASE.—The final defense phase marks the period from the time the enemy occupies his transport area or areas, preparatory to a general attack, until he has actually landed his forces or until he withdraws his forces.

19. PURPOSE OF OPERATIONS.—a. Operations during this phase are designed to prevent the enemy from landing and in case he gains a foothold on shore, to eject him.

b. In this phase, all the task groups are disposed and operate in accordance with the base commander's predetermined and coördinated plan of defense. The full power of the defense operates to resist a hostile landing attack.

20. ACTION OF BEACH DEFENSE FORCES.—a. Beach positions are fully occupied and all gun emplacements manned, ready to disorganize, disintegrate and deny or delay the leading waves of the enemy's landing attack, and thereby affording to the sector commander adequate time to employ his reserves in accordance with the development of the situation.

b. In conformity to the sector plan of defense, the beach forces will hold their position at all costs and withdraw only on orders of the sector commander or designated superior.

c. Ordinarily, the beach forces act by fire power alone and in conformity with a carefully predetermined plan of fire; to counterattack will be the exception because of the minimum amount of personnel assigned to the protection and operation of a large number of automatic weapons emplaced on a wide front. When, for example, a battalion is assigned a subsector with an extensive front of more or less continuous beach on which the enemy can land several battalions simultaneously, the holding of a local reserve for counterattacking is not justified by the results that should be reasonably expected. If the enemy succeeds in landing his covering forces on a broad front, a local counterattack by a part of the beach force can only have a transitory effect on a very limited front, and will not suffice to reestablish the beach defenses or delay the enemy. Such a counterattack must be purely frontal and with both flanks exposed, the unit counterattacking would immediately find itself isolated and subjected to the encircling action of the enemy. Under this situation, better results could be attained by employing the fire power of the counterattacking unit.

d. However, if the front assigned a battalion, strongly reenforced by automatic weapons and covered by beach obstacles, is restricted to narrow limits, the holding out of a mobile reserve for counterattack may be warranted. In this situation the enemy may succeed only in breaking through on a narrow part of the front. This will probably permit employing the counterattacking unit in a converging attack on the flank of the enemy while he is still in a linear formation. Here the local counterattack is not an isolated act for it will be able to count on the coöperation of the beach defense forces still intact.

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21. ACTION OF SECTOR TROOPS.—The sector reserves, based on previous defense plans, but modified by subsequent events during the final defense phase, will either defend an inland position and cover the beach defense forces in case of their withdrawal, or reinforce the beach defense forces or counterattack. Its action, in any case, is based on developing the situation within the sector by a stubborn defense and affording to the general reserve sufficient time to intervene in case of a successful landing by strong enemy forces within the sector.

22. COUNTERATTACKS BY SECTOR RESERVES.—a Counterattacks by the sector reserve are employed to restore the integrity of the sector defense, especially when the enemy has ruptured the beach defenses or has succeeded in gaining a foothold ashore.

b. The sector commander will formulate plans for coördinated counterattacks, based on previous study and which will meet the more probable contingencies arising from the enemy's landing. This will permit the counterattack being launched without delay and supported by fire.

c. The sector reserves are used promptly to counterattack. The sector commander must keep in close and continuous touch with the situation on the different beach fronts, in order to foresee the necessity for counterattack. He is then able to anticipate the forward movement of all or such part of the sector reserve as may be advisable to employ before the counterattack becomes imperative.

d. If the beach defense is ruptured, even when the position is organized in depth, the breach may widen quickly, due to the outflanking action of the enemy and the landing of subsequent waves opposite the already ruptured front. The principal danger in this case lies in the instability of the situation, which may change to a marked degree between the time the reserve moves and the moment the counterattack is actually launched. The counterattack must then be foreseen, and the reserves moved with maximum rapidity, otherwise the reserves may arrive in front of their objective too weak for the purpose of restoring the equilibrium of the beach defenses.

e. The action of the counterattack is more or less subordinated to the action of the enemy. It is not wholly free to strike where it wishes. However, where the beach position is ruptured, the direction of the counterattack should be delivered against one flank of the penetration, preferably on that flank which will permit the best utilization of the fire power in support of the counterattack, and which will offer the best advantages of the terrain from the viewpoint of concealment and observation.

f. The counterattack is not an isolated action. It is supported on the flanks by the fire action of the beach defenses remaining intact on the two sides of the breach. At the same time, the counterattacking troops are strongly supported by the fire of infantry accompanying weapons and artillery. The machine guns and mor-

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tars, in view of their limited range, may place their fire on the apex of the salient created by the enemy, while the artillery may more profitably place its fire at or near the water's edge to prevent the landing of enemy reinforcements. If the sector commander has attached tanks or armored cars, he employs them in the counterattack.

g. It is preferable to launch the counterattack when the hostile landing attack is temporarily checked, but this may not be possible. In any event the enemy should not be given the opportunity to reorganize and establish himself on his initial beachhead, preparatory to a coördinated advance.

h. When the beaches are only lightly defended, with the beach defense installed solely at the water's edge, a rupture of this line will necessitate the counterattack being launched before the enemy can reach his initial beachhead inland.

23. REINFORCEMENT OF THE BEACH DEFENSES.—In case the beach defenses are echeloned in considerable depth, the capturing or destroying of part of the installations at or near the water's edge does not disrupt the entire beach defense system. In order to cause serious consequences, the enemy must break the beach position throughout its depth. However, in the first case, the sector commander must reinforce the beach defense at the endangered locality. Such reinforcement must be made before the enemy is on the point of reaching the rear limits of the beach position. The reinforcement of the beach defense is a normal task of the sector commander for the purpose of replacing losses and worn-out troops.

24. DEFENSE OF INLAND POSITIONS.—The sector troops may occupy and defend previously prepared positions inland if the beaches are left undefended, or if the defense resolves itself into the holding of a defile, or where the terrain affords to the attacker avenues of approach of a restricted nature leading inland from broad flat beaches difficult to defend at the water's edge. Such positions may be difficult of approach and attack, while still affording good observation and fields of fire for the defender. Likewise, if the enemy, due to a great preponderance of force, succeeds in quickly overrunning the beach positions, precluding the successful use of the reserves in a counterattack, the sector reserves may be forced to defend a previously prepared inland position. The occupation of inland positions must always be foreseen to meet such contingencies.

25. ACTION OF SECTOR TROOPS DURING DAYLIGHT AND DARKNESS.—a. The employment of the sector troops in opposing a daylight landing will differ radically from that in resisting a night landing. In a daylight landing, except where the enemy uses smoke, the defender can discern clearly and precisely the enemy's action while the latter is still at sea and on and after his arrival at

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landing places. Sector troops can be moved with greater freedom and dispatch and with less confusion as movements are not restricted to routes of communication. In other words, the plan of defense can be executed during daylight with greater mobility, flexibility and power, than at night.

b. The fires of the beach defense will operate regardless of the degree of visibility, but with less facility and accuracy during darkness or when the enemy employs smoke. During night, the beach forces will be particularly vigilant, especially during the early hours of the morning when the enemy is likely to commence his initial landings.

26. EMPLOYMENT OF THE GENERAL RESERVE.—a. Where the enemy has broken through the beach defenses on a broad front and threatens the disruption of any sector defense, the offensive action of the defense is the combined counterattack, prepared and thoroughly coördinated as to time, direction and place.

b. In the active defense, the intervention of the general reserve is the determining factor on which rests the security of the base. In advanced base situations, the general reserve is composed of more than the mobile force of infantry held out from the sector defenses. The plan for employing the reserve in a combined counterattack includes all the available power of the defense in a concerted effort. This plan governs the size, composition, and location of the mobile reserves. All available artillery, tanks, armored cars and aviation support the counterattack. It is reinforced by other units already assigned to tasks in the defense. When it is apparent that the enemy has definitely committed his general reserves to the landing attack, troops are withdrawn from unengaged or lightly engaged sectors and assembled and moved in support of the counterattacks.

c. The commander of the shore defense forces will be relieved of many anxieties as to the time, direction and place of the combined counterattack, if he can correctly determine beforehand the enemy's plan of landing. This may be determined rather accurately by a knowledge of the essential enemy elements which marks the difference between a main and secondary landing and a demonstration. These elements are to be found in enemy information gathered and analyzed from the time the assailant appears off the coast until he actually commits the greater part of his force to a landing attack.

d. The combined counterattack, by its size and weight, paralyzes the offensive strength of the enemy. It aims at a deep and lasting effect by immobilizing and destroying the enemy before he can gain his ultimate objective ashore. It is not wholly dependent on the action of the enemy, but can, within the zone of action of the enemy's main effort or landing, choose the direction and point of application.

e. The direction and point of application of the counterattack is based on the following considerations:

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(1) When possible, the terrain over which the counterattack is conducted must have no obstacles which will render difficult the putting down of supporting fires. The necessity for rapidity of action will demand that the fires be executed promptly and accurately.

(2) The counterattack must enable the commander to retain possession of positions that would be particularly favorable for use by the enemy in the continuation of his offensive. These may be in the form of terrain features, constituing successive beachheads inland, or such as would afford the enemy good artillery observation posts.

(3) The counterattack is directed toward the flank of the zone of the enemy's advance. Ordinarily, from the viewpoint of terrain, observation and supporting artillery fires, one flank may be preferable to the other. Moreover, the flank attack profits by the support of defensive organizations still intact in adjacent sectors or not attacked by the enemy. The artillery in these sectors has all of its means at its disposal: communication, observation posts, ammunition, and fires that have been carefully registered. Again, this artillery may be able to move to alternate positions from where it can more effectively support the attack. Finally, an attack making progress against the flank of the enemy's penetration will not only result in immobilizing his advance, but will probably force his hasty withdrawal along the entire front of the advance if he does not wish being caught in a too narrow salient.

f. In order to coördinate the combined counterattack it will be essential to select a base of departure. A base of departure will serve to give the attack the proper orientation with respect to its objective and facilitate the employment of artillery in putting down its fire. The base of departure should furnish shelter and cover to the counterattacking troops and possess good communication to the rear and front. In rear of it should be sufficient material and ammunition to sustain the attack.

g. The flanks of the counterattacking troops will need protection, particularly that flank which may still be exposed to the enemy's advance. This protection may be provided by artillery fires, perferably by artillery in adjacent sectors. The exposed flanks may be covered by tanks if present.

h. The decision as to the exact time to launch the counterattack is a delicate matter, and is dependent on the study of the step by step development of the situation once the enemy begins his landings. Broadly speaking it will be based on the detailed information of the enemy and the determination of what constitutes his main effort. However, there are many factors which will bear directly on indirectly on when the commander must be ready to commit the general reserves in a combined counterattack. The following factors and considerations will materially influence this time:

(1) The strength of the forces available to counterattack. The stronger the force, the longer the defender can afford to wait the development of the enemy's main effort.

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(2) The time required for the defender to collect his reserves for concerted action. This will be an important consideration in case the various parts of the general reserve are widely separated.

(3) The mobility of the reserve and the distance to a suitable base of departure.

(4) The character of the enemy's attack; whether an isolated action without following reënforcements, or an action strongly supported by additional troops for the purpose of holding gains. In the first case, the defender might allow the enemy to penetrate to a considerable depth and then when the assailant is flushed with success strike him a crushing blow that would annihilate him. In the second case, the penetration must be stopped as soon as the direction of the attack is definitely determined, and enemy supporting troops disorganized and destroyed by concentrations of fire from every available source.

(5) In general, the counterattack should be made before the enemy has the mass of his artillery ashore and emplaced, otherwise it may permit the enemy to employ a large part of his artillery in counter-battery fires, which might materially reduce the effectiveness of supporting fires so essential to the success of the counterattack.

(6) Depending on the accuracy of the information of the enemy's main effort or landing, it may be stated in conclusion that the earlier the counterattack can be launched the greater will be its effect. For instance, if conditions are particularly favorable, the counterattack may be made at that very critical time when the enemy is in the midst of his landing. A combined counterattack launched at this time may be more fruitful than one deferred until the enemy has organized and established a beachhead inland, under the shelter of which he could land artillery, ammunition, and supplies in comparative safety.

i. In general, the combined counterattack is executed during daylight. During darkness the situation is too uncertain and obscure to render practicable coördinated attacks by large units. This does not preclude the forward movement of reserves at night to previously selected bases of departure or assembly areas. If the enemy lands at night, sufficient reliance must be placed on the sector defenses to stop or delay the enemy until reserves can be employed under conditions of fair visibility.

j. The defender's aviation should be prepared to intervene rapidly and powerfully during the first part of the counterattack. It should prevent the counterattack preparation being observed by the enemy air forces and then should accompany the ground troops at low altitudes in adding its fire effect by the use of machine guns and bombs. At the same time, it will be essential to maintain continuous aerial reconnaissance over the enemy's land and sea areas during the attack.

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k. While the employment of the general reserve in counter-attacks is purely the decision of the commander of the shore defense forces, it is mandatory that each participating task organization commander note his role in a complex operation that requires perfect timing, coördination and support.

27. ANTISMOKE MEASURES.—a. If landing attacks are made during daylight the assailant will, in all probability, cover his initial landings by smoke screens. These screens will materially interfere with shore observation and all kinds of aimed fire, but will have little or no effect upon the normal barrage fires, although the time to put down the normal barrage will be indefinite. As the smoke may be only a ruse, it may be unwise to call down the normal barrage and thereby expose to hostile observation planes the extent of the defensive installations.

b. The best method of combating and counteracting the operations of smoke laying airplanes is to provide antiaircraft installations of .50 and 1.1 caliber weapons, located at a distance of from 3,000 to 8,000 yards to windward of the beaches, at advantageous points inshore, on outlying promontories, or on small islands offshore; such installations being charged with the mission of firing on all hostile airplanes. These guns may be part of the normal antiaircraft installation or additional guns. Observation posts should be provided in similar localities. By providing a large number of such posts, it is to be expected that the enemy's use of smoke will not entirely eliminate terrestrial observation of his airplane operations, movements of his naval support, and the progress of his small boats in their ship-to-shore movement. Whenever smoke is laid by enemy aircraft, all organizations to a distance of at least 8,000 yards down wind of the cloud should, if possible, be warned immediately.

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TENTATIVE MANUAL
FOR
DEFENSE OF ADVANCED BASES

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CHAPTER X

ARTILLERY

MARINE CORPS SCHOOLS
QUANTICO, VIRGINIA

June, 1936

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CHAPTER X

ARTILLERY

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SECTION I

ARTILLERY IN BASE DEFENSE—GENERAL

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1. COMPOSITION OF THE ARTILLERY IN BASE DEFENSE. The artillery employed in the defense of a base comprises the "Marine Artillery Brigade", composed entirely of light artillery and the "Base Defense Artillery", consisting of the heavy and anti-aircraft artillery of the Force.

2. MISSIONS, GENERAL.—In base defense, as in all other types of action, the artillery does not play an independent role. It is disposed and employed to the end that its particular characteristics may be utilized to the best advantage of the base defense force as a whole. In general, its missions may be summed up briefly as follows:

To deny to the enemy the sea and land areas, within range of its guns, in which he may obtain lodgement to employ his ships and artillery in fire upon base installations and anchorage areas;

To prevent the enemy from launching an attack of any character upon the base; or to interfere with the progress of an attack; if launched;

To furnish fires for the close support of defensive positions.

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3. **CONSIDERATIONS AFFECTING THE EMPLOYMENT OF THE ARTILLERY.**—a. The gunfire of enemy ships and shore artillery, and bombing by enemy aviation may interfere with or prevent the defender's use of the base as such by damaging or destroying the base facilities and ships present in the anchorage area. They will not, however, gain a decision for the enemy who seeks to capture the base; he must land a combat force to defeat the defender's land forces.

b. The artillery fire of the defender, on the other hand, may be made so effective by proper planning and coördination as to prevent or break up a hostile attack and thereby gain a decision for the defender.

c. The real threat to the security of a base is the hostile landing force; the activities of hostile aviation and supporting ships usually being designed to pave the way for the landing force by reducing the power of resistance of the defender.

d. The difficulties to be encountered by hostile ships in searching reverse slopes by gunfire and of executing indirect fire against defiladed shore batteries should be fully appreciated and exploited by the defender in emplacing his artillery for the defense of the base.

e. Hostile troops approaching the beach in small boats are unable to take an effective part in the combat and offer a particularly vulnerable target to the defender's artillery.

f. The artillery should be so echeloned, as is commensurate with the characteristics and missions of the different types, so that the maximum continuous fire support may be rendered in the event of a successful landing by the enemy at one or more of the beaches.

4. **DETERMINATION OF THE REQUIREMENTS IN ARTILLERY.**—The requirements in artillery for the defense of any base may be determined from a map reconnaissance and a study of the general defense plan of the Base Commander. In formulating an estimate of the needs in heavy, antiaircraft and light artillery, the requirements to accomplish the primary missions of each type should be the guiding factor.

5. **DETAILED MISSIONS OF THE ARTILLERY.**—a. In determining the detailed missions of the artillery, the operations are considered in the three phases of base defense.

b. **Distant Reconnaissance Phase.**—In this phase the antiaircraft artillery has the mission of protecting the works of the defender, base installations, anchorage areas and airdromes from hostile air attacks and of preventing an effective reconnaissance of defensive dispositions by hostile aviation.

c. **Alert Phase.**—Artillery missions appropriate to this phase are:

To prevent a reconnaissance of beach defenses by enemy ships;
To protect the base against raids by enemy ships;
To counterbattery enemy supporting ships;
To deny to the enemy those areas, within range of its guns,

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in which he might obtain lodgement and further an advance upon the base;
To protect mine fields and other barriers;
To prevent control of ships' gunfire by enemy planes;
To continue antiaircraft protection of base installations.

d. **Final Defense Phase.**—For the purpose of facilitating fire control and of assigning missions to artillery units, this phase may again be divided into three phases as follows:

(1) First Phase.—The period covering the debarkation of enemy troops into small boats for the landing and the approach to the beach. Artillery missions appropriate to this phase are:
To fire on enemy transports;
To counterbattery enemy supporting ships, with particular attention to inshore supporting ships;
To continue protection of mine fields and other barriers;
To fire on smoke laying destroyers;
To fire on assembly areas of landing boats;
To fire on the approaching waves of landing boats;
To continue antiaircraft protection of base installations;
To continue to prevent the control of ships' gunfire by enemy planes;
To counterbattery enemy batteries already landed in adjacent areas.

(2) Second Phase.—The period covering the hostile landing, the assault of the beach defenses and the advance of the attack to the defender's inland position or positions. Artillery missions appropriate to this phase are:
To fire on the landing boats as they beach;
To fire on the hostile troops as they deploy from the landing boats;
To fire in support of the beach defenses;
To interdict the routes of approach inland;
To fire on the succeeding waves of landing boats;
To fire in close support of the main line of resistance;
To fire on enemy tanks and targets of opportunity;
To continue to counterbattery enemy supporting ships;
To continue antiaircraft protection of base installations, paying particular attention to the protection of sector and general reserves;
To continue to prevent the control of ships' gunfire by enemy planes;
To continue to counterbattery enemy batteries, if landed.

(3) Third Phase.—The period covering the enemy's assault of an inland position, the defender's counterattack, the defender's withdrawal to a final defensive position. Artillery missions appropriate to this phase are:
To fire on advancing enemy troops to limit a penetration;
To interdict the routes of approach;
To fire on enemy tanks and other targets of opportunity;
To fire on enemy assembly areas;
To fire on landing beaches;

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To continue to counterbattery enemy batteries;
To fire in support of counterattacks;
To continue antiaircraft protection of base installations;
To continue counterbattery fire on enemy supporting ships;
To continue to prevent the control of ships' gunfire by enemy planes.

6. **POSITIONS.**—The emplacement of the artillery is in an extremely important consideration in the defensive installations of any base.

a. **Factors affecting the Determination of Positions.**—The relative importance of the defensive sectors having been determined, the lines to be defended having been designated, the locations of mine fields and barriers having been selected and the areas to be given special antiaircraft protection having been indicated, the artillery is placed in positions best adapted to carry out the defense plan of the Base Commander. The selection of positions is based upon a study of the probable missions and the adaptability of the terrain for artillery purposes.

b. **Reconnaissance for Positions.**—The ground reconnaissance for positions is undertaken by all artillery commanders after a map reconnaissance to determine the general areas within which the various units must be located to accomplish their tasks. In general, artillery positions are selected with respect to the following:

The maximum and minimum range limits required to be reached;
The lateral limits required to be reached;
The accessibility to the position according to the type of weapon and the means of transport;
Ease of ammunition supply;
Availability of suitable observation;
Defiladed routes for withdrawal;
Availability of natural cover and concealment.

c. **Emplacements and Concealment of Batteries.**—In locating batteries, full advantage should be taken of the defilade afforded by terrain features that preclude observation from enemy ships and of the overhead concealment afforded by isolated trees, scrub brush and other foliage from hostile aviation. It should be standard practice to emplace the pieces of the battery at irregular intervals, and to echelon them irregularly in order to reduce vulnerability. When emplacements are constructed, artificial means of camouflage must be employed. Each piece must carry with it a standard camouflage net on which are to be hung strips of burlap, stained or painted in shades to harmonize with the color of the local vegetation. Regardless as to whether natural or artificial means of concealment are employed, strict camouflage discipline should be enforced by all artillery commanders.

d. **Defense of Battery Positions.**—All batteries are equipped with machine guns for the close antiaircraft protection of battery positions and should be provided with automatic rifles for the close

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ground defense of battery positions. Artillery battalion commanders should coördinate the fires of the antiaircraft machine guns so as to afford protection to the battalion position areas as a whole.

e. **Alternate Positions.**—As soon as the regular positions to be occupied by batteries have been selected, reconnaissance for alternate positions should be initiated. Such positions should be prepared so that a battery whose position has been discovered by the enemy may avoid the effect of hostile fire by moving to an alternate position.

f. **Dummy Positions.**—Dummy positions should be prepared to simulate an occupied position so as to deceive the enemy either as to the amount of artillery present or as to the positions of firing batteries.

g. **Rear Positions.**—Battery positions to be occupied in the support of rear or inland positions should be selected and organized along the routes of withdrawal in accordance with the defensive plans of the supported infantry.

h. **Displacement.**—Initial positions should be selected, within the range limits prescribed, with a view to providing for a displacement of the minimum number of batteries at one time in the event of a successful landing by the enemy at one or more beaches. This will obviate a reduction in the volume of firing caused by displacement.

7. **OBSERVATION.**—a. **Selection of Observation Posts.**—Observation posts are primarily selected by artillery units with a view to obtaining commanding observation over the terrain and sea areas in which they are responsible for delivering their fire. Full use is made of artillery liaison officers for the establishment of auxiliary observation posts. Observation posts for rear or inland positions, to be occupied in the event of a forced withdrawal, should be selected and organized. For terrestrial observation seaward, the height of a point of observation above sea level should at least equal, in feet, six-tenths of the square of the range in miles.

b. **Observation of Fires.**—Artillery units should be prepared to deliver fire when and where desired, under all conditions of weather and visibility. No opportunity should be overlooked to utilize observation to improve prepared fires. Planes should be assigned to spot the fire of artillery units in the proportion of one plane for each battalion.

8. **COMMUNICATIONS.**—The importance of communications to the artillery in base defense cannot be emphasized too strongly. The system of artillery communications, although coördinated with the general communication plan, should be free from interference by other units, and should provide for the maximum flexibility of fire control and fire direction. While telephone circuits provide the primary means of fire control communications, they should be paralleled by radio and visual systems to insure continuous communications in the event of a failure of one or more of the means.

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9. **PLANNING AND COÖRDINATION OF FIRES.**—a. **General.**—It is only by the utmost efficiency in the planning and coördination of fires that the defender may hope to overcome the handicap of the initiative retained by the attacker. For this reason all defensive fires should be planned and coördinated in great detail. These plans should be prepared in advance to cover the use of the artillery in the most probable contingencies, and should include all positions, the use of which can be foreseen. The higher commanders prescribe the conditions under which the fires may be executed and are responsible that the long range and the flexibility of the artillery are utilized to secure the maximum results.

b. **Fires of Artillery in Direct Support of a Sector.**—It is the duty of the commander of an artillery unit assigned a mission in direct support of the defense of a sector, to plan the scheme of artillery fires for the defense of the sector. He should assign the most important fires to the artillery in direct support of the sector, and request from the next higher artillery commander the reenforcing fires desired from the artillery in direct support of adjacent sectors, the artillery in general support, the antiaircraft and the heavy artillery.

c. **Fires of Artillery in General Support.**—These fires normally consists of the fire of the light artillery held in general support. It is the mobile reserve of fire power held at the disposal of the Commander of the Shore Defense Forces; its employment is directed by the light artillery brigade commander. The reenforcing fires of the artillery in general support, to be fired in the support of the defensive sectors, are based upon the request for such fires from the commander of the artillery in direct support of the sectors.

d. **Fires of Antiaircraft and Heavy Artillery.**—The base defense artillery commander is responsible for the assignment of missions to the heavy and antiaircraft artillery regiments and for the coördination of effort on the part of the base defense artillery with the naval defense and aviation forces. The fires desired from the base defense artillery to reinforce the fires of the light artillery in support of the close defense of positions and in support of a general counterattack, other than fires on targets of opportunity, should be requested by the light artillery brigade commander from the base defense artillery commander. The reasons for this procedure are:

That light artillery units have the primary mission of furnishing close support to the infantry;

That the mission of the base defense artillery does not require the close liaison with infantry units that exists between light artillery and infantry units;

That light artillery units have regularly organized liaison sections for maintaining close contact with infantry units;

That light artillery units and infantry units form a natural combat team and are accustomed to working together;

That the suggested method of requesting and coördinating fires follows the chain of command.

e. **Fires in Support of Local Counterattacks.**—Fires in support of local counterattacks are arranged for by the commander of the artillery in direct support of a sector in conference with the

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sector commander. The commander of the artillery in direct support of a sector plans the close supporting fires to be fired by the artillery in direct support, and requests from the next higher artillery commander the reinforcing fires desired from the artillery in direct support of adjacent sectors, the artillery in general support, the heavy and antiaircraft artillery. The infantry plans should be completed early in order to permit the maximum time for the planning and coördinating the artillery effort.

f. **Fires in Support of a General Counterattack.**—A general counterattack implies a supreme effort on the part of the defender to eject the enemy from that portion of the defender's position in which he has obtained lodgement, and which endangers the security of the base. The fire of all the artillery should, therefore, be employed in support of a general counterattack. The Commander of the Shore Defense Forces would direct such an action and the coördinated artillery support would be rendered under the direction of the designated Force artillery commander. The fires to be furnished by the heavy and antiaircraft artillery would be requested by the light artillery (brigade) commander from the base defense artillery commander, to conform with the infantry scheme of maneuver. The infantry plan should be developed early in order to permit the maximum time for the planning and coördinating the artillery effort.

10. **TIME OF OPENING FIRE.**—The time when the different units of heavy and light artillery should open fire must be decided for each situation. It must be remembered that initial close contact is gained suddenly in base defense. Prior to the time of close contact there should have been no need for firing by all the heavy and light artillery, except to register one piece per battery; so the telltale blast marks which mark the location of batteries in land warfare will, therefore, be absent. The enemy will employ many ruses in an endeavor to cause all shore batteries to open fire and disclose their positions prematurely. Many tempting targets may, therefore, present themselves and artillery commanders will have to exercise keen judgement in deciding to what extent they shall be attacked. The opening of fire by antiaircraft units will be governed by their missions and the activities of hostile aviation.

11. **ORGANIZATION OF THE ARTILLERY.**—a. **Responsibility for Command.**—The principles of base defense require close coöperation between the base defense artillery and the light artillery. Hence, it will be necessary to designate the artillery commander, who is to be responsible for the coördinated artillery effort.

b. **Direct Support Artillery.**—An appropriate amount of light artillery should be placed in direct support of each sector. The artillery so assigned has the primary mission of arranging its fires in support of the defensive plans of the sector commander. It may be assigned certain definite missions to accomplish within its normal zone by higher commanders, and it may be required to place its fire in adjacent sectors in certain emergencies.

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c. **General Support Artillery.**—Some of the light artillery should be held in general support in order that the commander may utilize its fire to influence the action as the situation develops, without the necessity of interfering with the basic defense plans of sector commanders, except in extreme emergencies. The artillery held in general support should be assigned certain definite missions to accomplish in the early stages of the final defense phase. It should have plans of fires prepared to reinforce the normal defensive fires of the artillery in direct support of sectors, in order that it may be able to rapidly concentrate its fire as may be required by the development of the situation. The base defense artillery is normally employed in general support of the base as a whole.

d. **Attached Artillery.**—The employment of attached artillery in base defense will be exceptional. Artillery should be attached to subordinate units only when the subordinate unit is assigned a separate mission, or when the occupied portion of defensive sectors are so widely separated that artillery emplaced in one sector could not fire in defense of an adjacent sector.

e. **Antitank and Antiboat Guns.**—(1) The number of artillery pieces to be detailed as antitank an antiboat guns must be determined for each situation according to the nature of the terrain to be defended. Each piece so detailed is just that much less fire power available in the mobile fire power of the artillery. Fire on hostile tanks and boats is opened at ranges of 1500 yards or less by antitank and antiboat guns. Fire on hostile tanks and boats at greater ranges is the mission of supporting artillery. When other weapons such as the 50 cal. machine guns or 37 m/m guns are available for use as antiboat guns, artillery pieces should not be detailed for that purpose; more effective results will be obtained by employing the concentrated fire of supporting artillery, as units, on the landing boats approaching the beach.

(2) The main differences between tanks and boats, to be considered when determining the artillery defensive measures to be employed against them, are: that hostile tanks can approach by defiladed routes and override the defender's position; while hostile boats must approach over the open sea and can only go as far as the beach. When the enemy employs tanks, and when defiladed routes of tank approach are present from the front or flanks of a position, artillery pieces should be detailed as antitank guns as required by the situation. For the close defense of artillery positions against hostile tank attack, each artillery battalion commander plans the antitank defense of his battalion position area and assigns definite areas of responsibility to his batteries. Light and antiaircraft artillery units should be assigned the responsibility for the antitank protection of heavy batteries.

12. **AMMUNITION.**—a. **Requirements.**—An estimate of the number of units of fire required for the various type of artillery for base defense purposes should be based on the estimated needs for a period of one month.

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b. **Ammunition at Battery Positions.**—(1) Reserves of ammunition should be stored in the vicinity of each battery position for the various types and calibers. In the absence of more accurate data upon which to base an estimate of battery needs in a particular position, the following table may be used as a guide. These reserves at battery positions are essential since deliveries after the enemy launches his attack will be difficult, if not impossible, to make.

(2) At initial battery positions of all calibers:

Heavy batteries	3 units of fire;
Antiaircraft batteries	5 units of fire;
Light batteries as follows:	
Forward batteries	2 units of fire;
Intermediate and rear batteries	3-4 units of fire.

(3) Battery dumps should also be established at the rear positions selected for forward light artillery batteries. These dumps should consist of about two units of fire.

c. **Ammunition Distributing Points.**—The location of distributing points will naturally depend upon the dispositions made of the artillery. In general, one distributing point per regiment or defensive sector will be ample, in view of the amount of ammunition initially stored at battery positions. They should be located well to the rear of the area occupied by the units they serve and should have defiladed routes of approach to them.

d. **Force Ammunition Dumps.**—The force ammunition dumps for all calibers should be located well inland to facilitate serving the massed artillery in support of a general counterattack.

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LIGHT ARTILLERY

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13. **ORGANIZATION.**—The light artillery brigade comprises two regiments of two battalions each. Each battalion consists of three gun or howitzer batteries of four pieces each. Both gun and howitzer units are tractor drawn. The battalion is the smallest tactical unit and the battery is the firing unit. The brigade commander is responsible for the disposition of the light artillery to the end that the maximum degree of effectiveness will be obtained from its fire in conformity with the plan of defense.

14. **TACTICAL EMPLOYMENT.**—The normal method of employing the light artillery brigade is to assign an appropriate amount of artillery in direct support of the various sectors and hold a suitable proportion in general support. Light artillery should be

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attached to subordinate units only when they are assigned independent tasks to accomplish, or when, on account of an unusual extension of the front, batteries emplaced in one sector would not be able to fire in support of the defense of an adjacent sector.

15. **Missions.**—The missions of the light artillery include all fires appropriate to the close defense of the base. These missions are:

To fire on the assembly area of landing boats;
To fire on the landing boats as they approach the beach;
To interdict openings in the reefs through which the hostile landing boats may approach;
To fire on the enemy troops as they deploy from the landing boats;
To fire in close support of the beach defense;
To cover the withdrawal of the beach defense forces;
To fire on succeeding waves of small boats as they approach the beach;
To fire in defense of the main line of resistance;
To fire in support of local counterattacks;
To fire on smoke laying destroyers;
To protect mine fields and other barriers within range;
To be prepared to place fires within the defensive position to limit a penetration;
To be prepared to fire in support of a general counterattack;
To counterbattery enemy shore batteries, when heavy artillery is not available for this mission;
To fire in protection of the positions of antiaircraft and heavy artillery and to cover their displacement;
To fire on hostile tanks and other targets of opportunity.

16. **COORDINATION WITH INFANTRY UNITS.**—As it is the mission of the light artillery to furnish close support to the infantry in the defense of its positions and in support of counterattacks, it is essential that close liaison be maintained between the two arms and that the artillery plan of fires be coördinated with the infantry scheme of defense. Light artillery commanders are also charged with the responsibility for planning and requesting the reinforcing fires desired from the base defense artillery in the defense of positions or in support of counterattacks.

17. **POSITIONS.**—In general, the light batteries should be echeloned in depth in order that the maximum continuous fire support may be rendered in the event of a successful landing at one or more of the beaches. All batteries should be able to fire in close defense of the beach defenses and should be able to concentrate their fire on the more important beaches from their initial positions.

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SECTION III

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18. ORGANIZATION.—The heavy artillery regiment comprises three battalions of two batteries each. Each battery has four guns; two searchlights, mounted on trailers, for illumination of targets at night and one director mounted on a trailer. All units are tractor drawn. The battery is the firing unit.

19. TACTICAL EMPLOYMENT.—In view of the long range of heavy artillery, it is seldom attached to subordinate units. The exception to the rule would be a situation where the defensive areas were so widely separated that the heavy artillery emplaced in one sector could not fire in defense of another sector. The missions to be accomplished by the heavy artillery are assigned by the base defense artillery commander. It is primarily employed in long range fire against ships and land targets, and secondarily in close defense of the base.

20. PRIMARY MISSIONS.—The primary missions of the heavy artillery are:

To protect mine fields and other barriers;
To fire on enemy transports;
To fire on smoke laying destroyers;
To counterbattery enemy ships;
To protect base installations against raids by enemy ships;
To prevent the blocking of channels by enemy ships;
To deny to the enemy the sea and land areas, within range of its guns, and within which the enemy might obtain lodgement and continue his advance on the base.

21. CONTINGENT MISSIONS.—The contingent missions of heavy artillery are:

To reinforce the fire of the light artillery in the close defense of defensive positions;
To reinforce the fire of the light artillery in support of counterattacks.

22. PROTECTION OF MINE FIELDS AND OTHER BARRIERS.—Mine fields and other barriers play an important part in the general scheme for the defense of a base, by denying to enemy ships certain sea areas and routes of approach. To be effective, mine fields and barriers must be protected by the defener's gunfire, otherwise the enemy may sweep or remove them at will. The loca-

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tion of mine fields and barriers must be considered as one of the determining factors in emplacing the heavy artillery.

23. **POSITIONS.**—a. On account of the flat trajectory of the 155 m/m gun and similar guns with which the heavy artillery may be supplied, heavy batteries will usually have to be emplaced either close to the beach or well inland in order to reduce dead space to a minimum. The configuration of the base to be defended will greatly influence the disposition of heavy batteries.

b. **Protection of Positions.**—In addition to the machine guns and automatic rifles employed by heavy batteries for the close defense of positions against hostile air and ground attack, light artillery should be prepared to protect heavy artillery positions and cover the displacement of heavy batteries.

SECTION IV

ANTIAIRCRAFT DEFENSE

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24. **ANTIAIRCRAFT ARTILLERY IN BASE DEFENSE.**—a. **General.** Antiaircraft artillery in base defense includes antiaircraft guns of 3″ caliber or larger (both fixed and mobile), the intermediate guns, 37 m/m or 1.1 caliber when available and the .50 caliber antiaircraft machine gun, together with the necessary accessories and material such as directors, searchlights and sound locators. The antiaircraft armament in the defense of a base may include all of the weapons enumerated above or any combination of these weapons together with the necessary accessories.

b. The **mission** of the antiaircraft artillery in base defense is:

(1) To provide the antiaircraft artillery defense of the base, including the anchorage, airdromes, base installations and facilities, and troops, both by day and night, against attack or molestation by hostile aviation.

(2) The protection of personnel is in general an incidental mission. It may be provided for within the coördinated antiaircraft defense or special provision may be made for this protection, when the situation warrants or where the amount of armament permits such protection. Ordinarily, infantry and artillery will have to provide their own antiaircraft defense with the means at their disposal.

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c. In base defense, the antiaircraft artillery has important contingent missions, such as fire against hostile landing troops, boats, ships and in the support of counterattacks. The tactical disposition for defense must be based, however, on its primary mission, the defense against aircraft.

d. An effective antiaircraft defense must employ all of the weapons available and be a closely coördinated defense. In the execution of its mission, it must work in the closest coöperation with the friendly air force. Units of the shore defense forces having organic antiaircraft weapons will be required to coöperate with the antiaircraft artillery. This coöperation may take one or two forms, either by the inclusion of the organic antiaircraft weapons in the general coördinated plan of antiaircraft defense or by furnishing the local antiaircraft defense of their own units. The antiaircraft fire of naval units occupying the base must be coördinated with the antiaircraft fire of the antiaircraft units ashore.

e. The disposition of the **fire units** and priority of the defense of areas and base establishments are decided by the base commander after consultation with and recommendation by the interested parties.

25. TACTICAL FACTORS AFFECTING THE USE OF ANTIAIRCRAFT ARTILLERY IN BASE DEFENSE.—a. There are many factors affecting the disposition and amount of antiaircraft artillery in base defense, among the most important being:

Characteristics, powers and limitation of antiaircraft artillery weapons and material available;

Character of the base, its size and shape, surrounding terrain, approaches and the relative disposition of the various elements of the base;

Characteristics, strength and tactics of the hostile air force.

b. The characteristics and powers of the antiaircraft artillery must be such that these weapons can effectively cope with the hostile air force. Any increase in the effectiveness of the hostile air force must be met by a corresponding increase in the effectiveness of the antiaircraft weapons and material in order to successfully counter this threat. If the antiaircraft defense cannot meet the hostile air menace either by an increase in the effectiveness of the present armament or a corresponding increase in the armament, the defense will prove inadequate.

c. A base is usually located on or adjacent to a sea frontier. Such a location precludes the extension of the antiaircraft defense to the seaward. This condition generally favors the approach of the hostile air attack from the seaward; this approach will generally assure the enemy the advantage of the surprise element and also freedom from fire until he reaches the zone of fire of land based batteries.

d. The size of the base depends on the extent and importance of the base facilities, anchorages, harbor and adjacent terrain. The shape of the base will depend on the topography and hydrography, and the dispersion of the base facilities.

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e. The [illegible] directly affects the antiaircraft defense of the base. It may afford favorable approaches for air attacks or conversely it may favor the defender by providing unfavorable approaches with the consequent lack of surprise to the attacker, thus enabling the defender to effectively combat the air attack.

f. The relative dispersion and dispositions of the base establishments and anchorages will vitally influence the antiaircraft defense. When these base elements are concentrated in a relatively small area, the antiaircraft defense should be relatively much simplier than if the elements of the base are dispersed over a relatively large area.

g. The characteristics of the enemy aircraft are most important. The characteristics of each type of hostile aircraft should be known, such as speed, radius of action, service ceiling, armament and bomb load. Information of hostile aviation should be sought with regard to the number of each type of land and seaplane and in what numbers aircraft can be operated from carriers or nearby air bases, in order to estimate what air force the enemy may employ in an attack against a base. This information will also permit determining whether the hostile air force is well balanced. The size of the enemy air force will be an indication of the offensive capacity of that force.

h. The tactics employed by the enemy air force will indicate the method to be employed by the antiaircraft defense to counter these air attacks.

26. ANTIAIRCRAFT DOCTRINE.—a. Antiaircraft doctrine may be stated in substance as follows:

(1) The effectiveness of antiaircraft defense is measured by the amount of destruction or neutralization fire delivered on hostile planes.

(2) Antiaircraft artillery fire units should be disposed to fire the maximum number of rounds on any form of air attacks, premised on a disposition of such fire units for the most probable form of hostile air attacks.

(3) If more fire units are available than are required to cover the critical zone with the minimum number of fire units, the volume of fire should be increased over the critical zone rather than extending the defense to cover more area.

b. Due to the rapid advances being made in the speed, service ceiling and other characteristics of present day aircraft no definite rules can be given regarding the disposition of fire units to combat every form of attack by the different types of aircraft. The amount of neutralization and destruction fire depends not only on the disposition of the antiaircraft fire units but also on the form of attack, the speed of the aircraft, the altitude and tactics of the hostile air force.

c. The disposition of the fire units for antiaircraft defense can only be made under the assumption that the hostile air force will use the most effective types of his air arm at speeds, altitudes and tactical dispositions that are most favorable to himself. The

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antiaircraft defense disposition will have to be based on such an assumption. If any of the elements considered prove in error adjustment will have to be made in the disposition to obtain the most effective defense.

d. The minimum coverage of the critical zone by antiaircraft fire units is that the entire critical zone should be covered by the fire of at least one fire unit. This minimum coverage cannot be considered effective. Each fire unit is limited to fire on one target at a time, be it a single plan, a flight or a flight element. With such a disposition of antiaircraft artillery units, the hostile aircraft are under fire by only one antiaircraft fire unit at a time. If the antiaircraft defense is extended beyond the critical zone, the attacking planes will be favored as they can maneuver and fly at altitudes favorable to themselves. By thickening the defense over the critical zone, the antiaircraft defense is afforded the opportunity to produce a greater volume of fire in the area where maneuver is restricted and at the same time take under fire more than one target at a time if necessary.

27. **GUN DEFENSE.**—a. The standard antiaircraft artillery gun in the Marine Corps is the 3″ gun, M-3, on mobile mount, M-2.

b. The mission of the antiaircraft gun in base defense is primarily the attack of high altitude hostile aircraft, particularly bombardment and observation planes. However, they should attack all hostile aircraft entering their zone of fire in accordance with the tactical demands of the moment.

c. The fire unit is the battery consisting of three or four guns depending on the organization. This unit is also the fire control unit. Its fire is controlled by a single director, with the necessary accessories, such as height finder, fuze cutters and other auxiliary gear.

d. The effective range of the present 3″ AA gun is 6,000 yards, measured by the horizontal range from the gun. While this range is not the limit of the capabilities of the gun, it is limited by the present type fuze, which has a maximum effective time of flight of 20 seconds. With a time flight of 20 seconds and a horizontal range of 6,000 yards, the maximum effective altitude of the gun is 17,000 feet. Therefore the field of fire of a gun battery may be considered to be a cylinder, whose maximum radius is 6,000 yards, and whose altitude is 17,000 feet, with the battery placed at the center of the base. If the service ceiling of the hostile aircraft is increased beyond 17,000 feet the horizontal effective range of the guns will be correspondingly decreased and if the service ceiling of the hostile aircraft is decreased the effective horizontal range of the guns will be correspondingly increased.

e. **Bomb release line.**—The bomb release line in antiaircraft gun defense is the line around the defended area within which a bomb dropped by a bombardment plane flying at its service ceiling, may strike inside the defended area. The location of this line will vary with the altitude and speed of the plane and the size and shape

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of the objective. The distance of the bomb release line from the defended area may be determined by multiplying the speed of the bomber in yards per second by the time of fall of the bomb. For tactical purposes this line should be measured from the outer edge of the objective or defended area.

f. **Critical zone.**—With the present bomb sight the attacking airplane is required to fly a rectilinear course for from 30 to 60 seconds in order to effectively manipulate the bomb sight, before releasing the bomb at the bomb release line. For practical purposes this time is taken as one minute of flight. Therefore, the critical zone is the zone enclosed between the bomb release line and a line surrounding the bomb release line equal in width to the distance traveled by the attacking airplanes in one minute of rectilinear flight. It is within this zone that the defense must be capable of delivering a maximum volume of effective antiaircraft fire.

g. **Disposition of gun batteries.**—(1) No rule can be given for the distance gun batteries should be placed from the objective to be defended. This factor can only be determined by analyzing all of the factors influencing the disposition of gun batteries in each situation.

(2) The basic principal of antiaircraft defense is that the defense must provide for attack from any direction of approach and therefore provide all around defense. The terrain or approaches may limit these attacks on a single objective to one or more probable directions of approach due to limitations of terrain or the location of adjacent antiaircraft defenses.

(3) A study of day and night operations of mass bombardment aviation has disclosed the most practicable and favorable forms of attack. For the daylight attack of bombardment, the attacking ships may approach the objective or defended area from several directions over a wide sector of the critical zone, drop their bombs in flight elements of three ships or more simultaneously.

(4) For night operations or during periods of low visibility these simultaneous attacks from several directions are impracticable and the attacks are usually limited by the operation difficulties of the planes to a single attack by not more than three planes, approaching from one direction over a narrow sector of the critical zone.

(5) These forms of attack are known as the "wide sector attack" and the "narrow sector attack". The former is only practicable at present for day operation of aircraft while the latter is practicable for both night and day attacks.

(6) With an average size objective, the closer the batteries are to the objective the greater number of rounds that can be fired against the most probable form of attack known as the "narrow sector". Batteries located too close to the objective and to one another are highly vulnerable to neutralization by smoke and bombs. The loss in rounds fired is not great where the batteries are moved out to 2000 yards beyond the objective, but at

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4000 yards the loss of fire effect is considerable. Therefore for "narrow sector" attacks the gun batteries should be from 1500 to 2500 yards from the objective.

For all around defense of "wide sector attacks" an extended defense is indicated. The batteries being located about 6,000 yards from the objective with mutual support between the adjacent batteries.

28. **INTERMEDIATE GUN DEFENSE.**—a. No standard intermediate gun has yet been adopted by either the Army or the Navy. The 37 m/m automatic gun is being developed by the Army. The 1.1 caliber automatic gun is being developed by the Navy for installation on ship.

b. The mission of both of these guns is primarily the attack of medium altitude bombers, dive bombers and attack planes at ranges beyond the effective range of the present machine gun. However, they would attack all hostile planes within their zones of fire in accordance with the tactical demands of the moment.

c. The method of fire and fire control have not been definitely established. The Navy is mounting the 1.1 in nests of two or more guns for shipboard use, but it is doubtful whether this type of mount would prove satisfactory for use on land except for fixed mounts.

d. No further details of these guns are available, but the early adoption of some type of intermediate gun with a satisfactory fire control unit is believed to be vital for defense against low flying bombers, dive bombers and attack planes in base defense.

29. **MACHINE GUN DEFENSE.**—a. The standard Marine Corps antiaircraft machine gun is the .50 caliber Browning, M-1. This gun at present has an effective horizontal range of 1500 yards for use against aerial targets due to the limitations of the tracer whose burn out point is 2100 yards from the gun.

b. **The Mission.**—The mission of the antiaircraft machine gun in base defense is primarily to attack low flying attack, bombardment, dive bomber, observation and all other types of hostile aircraft within their effective zones of fire. These forms of aerial attack are delivered at high speeds, 200 miles per hour or over and at altitudes of from 0 to 3000 feet.

c. **The Fire Unit.**—The fire unit of antiaircraft machine guns is the platoon of four guns or the section of two guns. The use of the platoon with an officer commanding is preferable when the situation and number of guns will permit. At present no satisfactory fire control equipment has been adopted for use by antiaircraft machine guns and lack of such satisfactory equipment greatly handicaps the effectiveness of antiaircraft machine guns. The present fire control methods involve a combination of verbal orders and signals.

d. **Bomb Release Line.**—The bomb release line for antiaircraft machine gun defense is an imaginary line around the defended area or objective within which a bomb dropped or effective machine gun fire delivered by a hostile plane flying at a given altitude may strike the objective or within the defended area.

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e. **Critical Zone.**—The critical zone for machine gun antiaircraft defense may be defined as the zone enclosed by the area between the bomb release line and the effective limit of the antiaircraft machine guns.

f. **Disposition.**—The machine gun defense of an area or objective implies an all around defense by which the adjacent fire units are mutually supporting. For effective mutual support these fire units should not be farther than 1500 1200 yards apart. The minimum adequate defense in the machine gun defense requires the ability on the part of the fire units to engage simultaneously two adjacent targets with the expectation of obtaining at least one destructive hit on each before either reaches the bomb release line. The method of mutual support provides a uniform defense when the number of machine guns in a fire unit is proportional to the intervals between the fire units. The defense is usually in the form of a ring or a continuous line entirely enclosing the perimeter of the objective or defended area.

g. When sufficient guns are available this defense will take the form of several concentric rings entirely enclosing the objective or defended area. In addition, a few guns should be located within the boundaries of the objective or defended area. To differentiate between these several rings, they are called the outer, intermediate and inner rings. The outer ring should be located about 600 yards outside of the bomb release line for the maximum altitude, about 3000 feet. The area to be covered varies as the square of the radius, therefore, no machine guns should be placed outside of this line.

h. For defense against very low attack planes, the **outer** ring of guns should be placed about 1000 yards from the outer edge of the objective or defended area. In order to take care of attacks that may penetrate the **outer** ring and reach the objective and to take care of dive bombing attacks, an **inner** ring should be located centrally within the boundaries of the objective. In most cases an allotment of about one sixth of the available guns will be sufficient for this purpose. Where the distance between the **outer** and **inner** rings is in excess of 1500 yards, an **intermediate ring** of machine guns should be established between the **outer** and **inner** rings. An **intermediate ring** should mutually support fire units on both the **outer** and **inner** rings. The guns on both the **outer** and **intermediate** rings should be divided and disposed so as to have a uniform number of yards per machine gun on each of the rings.

i. When the allotment of machine gun fire units is insufficient to furnish an area defense of the entire defended area or all of the objectives, a choice will have to be made regarding the part of the area or the more important objectives that will be given this protection. Often some portions of the defended area or some of the objectives within the defended area will be heavily defended, others only lightly defended and still others will have no machine gun defense at all.

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30. **SEARCHLIGHT AND SOUND LOCATORS.**—a. The standard antiaircraft searchlight is the 60″ drum type, 800,000,000 candle power, either mobile or portable. The sound locator consists of four expotential horns mounted on a steel frame which in turn is mounted on a light four-wheel portable truck. Two of these horns indicate azimuth of airplane while the other two indicate angular height. The maximum range of the searchlight under favorable conditions is 12,000 yards. Under average conditions the effective range may be considered from 6,000 to 8,000 with the lower limit the dependable range. The maximum effective range of the sound locator may be considered as 10,000 yards. Under average conditions the range is decreased to from 2,000 yards to 8,000 yards depending on the throttling and muffling of hostile planes and the extraneous noise existing in the vicinity of the locator.

b. The mission of antiaircraft artillery searchlights is: To discover and illuminate hostile aircraft operating during hours of darkness in order that antiaircraft artillery may fire on them effectively. The priority of illumination will generally be:

Principle Gun-battery targets.
Principle Machine-gun targets.

A secondary mission of searchlights may be to illuminate hostile aircraft so that our own aircraft may attack them.

c. The mission of sound locators is: To discover the presence and determine the position of hostile aircraft during hours of darkness or poor visibility. In carrying out their mission during hours of darkness they will operate with searchlights. During periods of low visibility, during daylight hours, they will operate directly with the antiaircraft artillery guns in the execution of barrage missions.

d. Hereafter the searchlight unit, consisting of the searchlight and sound locator, will be referred to as **the searchlight.**

e. The tactical unit for searchlights consists of a battery of ~~nine~~ 5 lights and ~~nine~~ 5 sound locators. Each searchlight and its sound locator are electrically synchronized. The battery is divided into three platoons of three lights and sound locators, under an officer.

f. **Tactical Factors Affecting Employment of Searchlights.**—Important tactical and technical factors determine the number and location of searchlights in base defense such as:

Air tactics of the enemy and characteristics of hostile planes, including speed and operating ceiling;
Ability of sound locators to pick up targets;
The number and disposition of gun batteries;
Maximum distance at which searchlights can render mutual support;
Character of the base, its size and shape, location, surrounding terrain and approaches.

g. The remarks concerning the tactical factors affecting the employment of gun defense in base defense apply equally to the searchlight defense. The basic principle in searchlight defense is that the hostile airplanes must be illuminated at such a distance from the gun batteries that effective fire will be delivered on the hostile aircraft at the maximum effective range of the fire unit.

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Another principle is that the maximum use must be made of alternate lights in order that the target may be continuously illuminated in case one of the lights is neutralized by the use of smoke, bombs or other methods of attack. It may be necessary at times to illuminate two or more targets simultaneously, and, in addition under certain conditions, the height finder may require the illumination of each target by more than one light in order to obtain a correct reading.

h. **Disposition of Searchlights.**—In the searchlight defense of an area, against air attack at night, the maximum effective illumination should be for an all around defense of the area. In order that the searchlight defense may be employed to its maximum efficiency, it must be able to illuminate the target at the maximum effective range of the fire unit. To accomplish this the searchlight illumination must begin well beyond the effective range of the fire units, used in the antiaircraft defense. The distance that the illumination must extend beyond the fire unit depends on the following factors:

Speed and altitude of hostile targets;
Maximum effective range of fire unit;
Distance covered by target during time of flight of projectile;
The distance covered by the target during the dead time consumed at the sound locator, searchlight and gun. This dead time is indicated as follows:
Time consumed at sound locator, for application of wind, sound lag and parallax corrections;
Time consumed at searchlight in picking up target;
Time consumed at director for fire data computations.

i. For a target travelling at a speed of 200 miles per hour at an altitude of 15,000 feet, illumination to be effective, should begin at a distance of about 10,000 yards horizontally from the gun battery. In order to insure an effective illumination, the searchlight defense should consist of several rings of lights with the **outer ring** of lights approximately 10,000 yards from the gun battery position. To take over and carry the target, an **intermediate ring** of lights between the outer ring of lights and the objective should be placed from 4,000 to 6,000 yards inside the **outer ring.** If the gun batteries are located more than 2,000 yards from the objective a third or **inner ring** should be located near the objective.

j. For an area defense of an objective with the gun batteries not over 3,000 yards from the objective, the searchlight defense will require 24 lights while if the batteries are moved 6,000 yards from the objective 34 lights will be required.

k. It is obvious that in the defense of a base defense area having a sea frontier on one or more sides, all of the above discussed conditions cannot be fulfilled. This does not mean that the number of lights can be reduced in proportion to the area of the sea frontier, but rather the searchlight defense to the seaward should be thickened by the use of additional lights.

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31. OBSERVATION POSTS.—a. In any antiaircraft defense it will be necessary to establish a ring of observation posts around the defended area or objective. The observation posts should be placed from about four to seven miles beyond the outer ring of searchlights and about five to eight miles apart. These observation posts will generally be manned by personnel from antiaircraft units. These posts are connected by telephone through the searchlights to the antiaircraft command posts. They are used primarily by day for alerting the antiaircraft artillery defenses and by night to indicate the approach of hostile planes to the searchlights. At night the information regarding the approach of hostile planes should be conveyed directly to the searchlight commander.

b. In situations confronting antiaircraft defense in base defense with a sea frontier, every advantage must be taken for the extension of the observation posts to the seaward on adjacent outlying islands and by coöperation with the naval inshore patrol.

c. In base defense close coöperation and coördination must be provided between observation posts established by the infantry and other arms with the antiaircraft artillery for the purpose of reporting enemy aerial activity.

d. The mission of antiaircraft observation posts is to furnish the necessary information for the proper functioning of the antiaircraft artillery defense. The information that it furnishes other services is only incidental. This system of antiaircraft artillery intelligence should not be confused with the antiaircraft intelligence net.

32. ANTIAIRCRAFT INTELLIGENCE NET.—a. In addition to the observation posts established by the local antiaircraft defense forces an antiaircraft intelligence net (distance intelligence net) should be established. The establishment of the net is a function of the base commander.

b. The function of the net is to furnish timely reports of the approach of hostile planes in order that friendly aviation may be alerted in sufficient time to meet the expected attack. It will also provide sufficient time for base defense installations to take the necessary passive defensive measures to counter the attack, alert the antiaircraft artillery to meet the attack, and for non-combatants to seek shelter.

c. The difficulties of establishing, maintaining and operating this net on comparatively isolated and small insular areas are innumerable. Great dependence for such information will have to be placed on air reconnaissance and patrol planes, submarines and surface ships of the naval defense forces.

d. To be effective this net should extend to such a distance beyond the base as to allow the base defense aviation forces sufficient time to take off, gain altitude and intercept the hostile formation beyond effective antiaircraft gun range of the base. If this is impracticable it should be at such a distance from the base as will allow the planes to be run into their underground hangars or other passive means taken for their protection.

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e. The only other means of countering this surprise element in hostile air attacks would be by the employment of continuous air partols in sufficient strength to discover and report any hostile aerial threat. This is a most uneconomical and ineffective method for the employment of aviation and cannot be maintained for any length of time or over any extended area.

33. **COOPERATION AND COORDINATION BETWEEN ANTIAIRCRAFT ARTILLERY AND AIR FORCE.**—a. The ideal antiaircraft artillery defense presupposes an effective defense against hostile air attack over the objective or area around which such a defense is established. Such a defense does not preclude the hostile air force from attempting such attacks or in fact even pushing some of their air force through to the objective. It does mean that the chances for a successful and effective attack are remote and that the damage to be inflicted by the hostile air force is not commensurate with the losses to be expected from the antiaircraft artillery defense.

b. With such an antiaircraft artillery defense established, the task of the defense air forces is greatly lightened; the latter will be relieved to considerable extent of the onus of providing an air defense against air attack and enabled to concentrate on their primary mission that of the offensive. It will be very difficult in many situations in base defense to accomplish the end sought, due to limited antiaircraft armament available for the defense in many situations and other causes.

c. In any antiaircraft defense the closest coöperation must at all times exist between the two antiaircraft defense services, the air force and the antiaircraft artillery.

d. On the part of the two arms, this means the prompt and efficient and mutual exchange of all information bearing on hostile air activities. Changes in tactics, methods of operation, and types of aircraft discovered by one arm should promptly be reported to the other arm.

e. It goes without saying that both the air force and the antiaircraft artillery must have a thorough and intelligent understanding of the tactics employed and the difficulties to be overcome by each of the arms. This will require study on the part of the antiaircraft artillery of the type and characteristics of our own aircraft. On the part of our own aircraft, a detailed knowledge of the location and mission of the elements in the antiaircraft artillery defense.

f. The friendly air force should notify the antiaircraft artillery of all expected flights over areas defended by antiaircraft artillery units giving the details of the formation, the time of departure, the course the formation will fly and its expected hour of return. In addition a system of signals, either radio or visual, must be arranged between the two services. These signals are especially vital for the operation of aircraft during hours of darkness.

g. The closest coördination must exist between the antiaircraft artillery and the air force in any defense. This coördination

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is vital when the antiaircraft defense consists of a combination of air force defense and antiaircraft artillery defense. The lines should be strictly drawn to differentiate the areas of responsibility of the two arms. Only by closest coördination between the two arms will confusion, and in many cases actual casualties to our own air service, be avoided. The combination defense consisting of both aircraft defense and antiaircraft defense will probably be the rule rather than the exception in base defense situations, due to the inherent difficulties in most situations of this nature

h. The difficulties attendant upon an air attack, especially on the part of friendly aircraft and antiaircraft artillery, can only be avoided if the closest coördination as to spheres of responsibility exist and are maintained by each service.

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TENTATIVE MANUAL
FOR
DEFENSE OF ADVANCED BASES

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CHAPTER XI

CHEMICAL AGENTS AND SMOKE

MARINE CORPS SCHOOLS
QUANTICO, VIRGINIA

June, 1936

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CHAPTER XI

CHEMICAL AGENTS AND SMOKE

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SECTION I

GENERAL

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1. **PLANS FOR EMPLOYMENT OF CHEMICAL AGENTS.**—Accurate knowledge of local weather and terrain conditions will enable the Shore Defense Forces to take full advantage of chemical agents. Agents of the vesicant type, both persistent and semi-persistent, will be found of considerable value. Tentative plans for the employment of chemical agents and smoke should be made prior to departure of the Shore Defense Forces from the continental limits of the United States. Actual occupancy of the advanced base will enable the Shore Defense Forces to make exact and detailed plans for the employment of chemical agents and smoke.

2. **PERSISTENT AGENTS.**—In general, persistent casualty agents should be dispersed by static installations when the target is a land area, but consideration should be given the fire of such agents by mortars, artillery weapons, or airplanes, in case static installations are impracticable. The dispersion of persistent casualty agents on water-borne targets is most effectively carried out by means of airplanes using the spray method of projection or chemical bombs, supplemented, in some cases, by the chemical fire of long-range artillery.

3. **NON-PERSISTENT AGENTS.**—Non-persistent agents are dispersed most effectively by means of candles, but it will frequently be found more practicable to disperse such agents by means of mor-

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tars or artillery weapons, principally because of their mobility of fire when compared with candles.

4. **TACTICAL EMPLOYMENT.**—a. **General Uses.**—Chemical agents are employed to secure one or more of the following effects:

Casualty,
Harassing,
Screening,
Incendiary.

Although light concentrations of a casualty agent may be used for harassing effect, it will frequently be found to be more economical to use an agent that is primarily designed for harassing. White phosphorus, although usually classified as a screening agent, has valuable properties both as a casualty agent and as an incendiary agent.

b. **Targets.**—Examples of chemical targets likely to be encountered in the defense of an advanced base, together with the object of the chemical fire against them, include:

(1) Enemy aircraft carriers—airplane use of persistent casualty agents to cause casualties and to hamper operations of enemy aircraft.

(2) Enemy transports and small boats loaded with personnel—airplane use of persistent casualty agents to cause casualties and to disorganize scheduled operations.

(3) Ships of the hostile naval support—airplane use of persistent casualty agents to cause casualties and to stop or hamper naval gunfire support. Artillery weapons may be used for this fire against ships that approach close to shore.

(4) Shore line along good landing beaches—dispersion of persistent and semi-persistent casualty agents by static installations, mortars, artillery weapons or airplane to secure casualties and to deny beaches to the enemy by threat of casualties.

(5) Groups of enemy troops on shore—fire of persistent casualty agents and harassing agents by mortars or artillery weapons to cause casualties and to hamper movement.

(6) Important areas on flanks of beach defenses—dispersion of persistent casualty agents by static installations, mortars, artillery weapons or airplane to secure casualties and to deny areas to the enemy by threat of casualties.

(7) Enemy observation posts on shore—fire of casualty, harassing and screening agents by mortars or artillery weapons to cause casualties, hamper operations and deny observation.

(8) Ravines and routes of approach inland from the shoreline—dispersion of persistent casualty agents by static installations, mortars, artillery weapons or airplane to cause casualties and deny their use to the enemy by threat of casualties.

(9) Enemy artillery positions on shore—fire of persistent casualty agents by artillery weapons or mortars to cause casualties and to neutralize.

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(10) Enemy lines of communication on shore—dispersion of persistent casualty and harassing agents by mortar or artillery weapons to cause casualties and to stop or delay movement.

(11) Peninsulas, promontories, cays, and outlying small islands—dispersion of persistent casualty agents by static installations, artillery weapons or airplane bombs to deny their use to the enemy through threat of casualties.

(12) Enemy airdromes within operating distance of the advanced base—dispersion of persistent casualty agents by airplane bombs or spray to cause casualties and to hamper movement of aircraft. Used in conjunction with large bombs, containing high explosive, to make repairs to runways difficult during the persistency of the agent.

(13) Enemy troops in small boats within 3,000 yards of a leeward beach approaching the beach for a landing—dispersion of a non-persistent harassing agent by means of candles to cause masking or, in the case of troops slow in masking, to cause severe casualties upon reaching a beach contaminated with a persistent vesicant. In the latter case the lung-irritant effect of the vesicant will be more fully realized.

(14) Occupied enemy positions on shore—fire of non-persistent casualty agent by mortars (and in some cases projectors) to secure casualties immediately prior to a planned counterattack.

(15) Occupied enemy front-line positions on shore—fire of smoke by mortars and artillery weapons immediately prior to, and during, a counterattack over open terrain to reduce the effectiveness of aimed small-arms fire.

SECTION II

METHODS OF DISPERSION

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5. CANDLES.—Candles filled with an irritant such as Adamsite may be used to generate a cloud on lee shores. Clouds effective for a distance of 3,000 yards downwind may be generated in this manner and a high degree of gas discipline among troops in small boats will be required in order to provide protection against them. If the enemy has employed smoke on the beach to cover the close approach of his small boats, the irritant cloud may be released within the smoke if the wind is blowing from the direction of the land. It is obvious that irritant clouds cannot be used when

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flank winds are blowing or when the wind is blowing from the direction of the water. Troops that have been slow in adjusting masks, when reached by an irritant cloud, will be unable to wear the mask for periods varying from several hours to a day or more. If the beach on which the small boats ground, is covered with a liquid vesicant, troops will immediately become subject to the lung-irritant effect of the vesicant and will become casualties almost immediately. White smoke clouds (non-toxic) may be used to make the approach through reef-openings difficult for approaching small boats and, in many cases, positions will be found on flanking terrain from which the smoke may be generated by candles (smoke pots) fired statically or ignited separately. Since the weapons of the organized beach defense will already have registered on known reef-openings, such use of smoke should not materially interfere with planned fires on such targets.

6. GRENADES.—Both hand and rifle grenades are supplied with chemical fillings but such fillings are limited to smoke (HC) and the non-lethal agents (CN) and (DM). In advanced base defense the dispersion of smoke (HC) and of irritant smoke (DM) is much more efficiently carried out by using smoke pots and irritant candles (see preceding paragraph). When infantry troops occupy a position upwind of an attacking enemy, local command groups may take advantage of the wind direction to generate a tear gas cloud by means of hand or rifle grenades to force masking and hamper movement of assaulting troops. The decision relative to the use or non-use of such grenades should be left to the discretion of the commander of the local group, who should always assure himself, prior to generation of the cloud, that friendly troops will not be adversely affected. If the commanders of local groups take care that tear gas is released only when the enemy is directly downwind, there is no likelihood that the plans of higher commanders (counterattack, etc.) will be interfered with, inasmuch as tear gas is nonpersistent.

7. MORTARS.—a. Provided the enemy succeeds in securing a foothold on shore, the mortars (both 4.2″ chemical and 81 m/m) become extremely important in augmenting the fire of other weapons of the Shore Defense Forces. The 4.2″ chemical mortar may be called upon for the fire of persistent vesicants to cover areas on which it has been impracticable to place static installations or, in some cases, to cover areas on which static installations have been made but have not been detonated because of mechanical failure. A normal missoin of the 4.2″ chemical mortar is the fire of a nonpersistent casualty agent on occupied enemy positions one-half hour prior to a scheduled counterattack, such fire to be put down within two minutes. Another normal mission is the fire of smoke during a counterattack to protect friendly troops from aimed small-arms fire during the assault over open terrain. The same mortars may be called upon to fire both missions (non-persistent casualty and smoke) since screening smoke is usually not required until troops

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have advanced to within about 800 yards of the position being assaulted. The fire of a semi-persistent harassing agent may be required on areas occupied by enemy troops and which friendly troops may occupy after a limited period of time Fire of incendiary agents on enemy matériel may also be considered a normal mission for the 4.2″ chemical mortar. It is readily apparent that a large number of mortars would be required to carry out all the missions likely to be assigned, since the range of 4.2″ chemical mortar is limited (2400 yards—maximum and 600 yards—minimum). Missions should therefore be assigned which will not interfere with the principal employment of the mortar—the close support of organized defensive positions. By using alternate positions the mortars may be able to cover additional fire tasks but when the range is over 2400 yards artillery weapons must be relied upon for chemical fires. The Chemical Platoon (3 mortars) is organized as a fire unit and missions are assigned to single platoons. In some cases, several platoons may be called upon to fire on the same target, but fire control continues as a platoon function and is not taken over by the commander of the Chemical Company. Single platoons are placed, initially, to fire in support of organized beach defense positions. Positions are selected for successive occupation in case beach defense positions are temporarily vacated. Fire data for initial and successive positions are compiled in advance, and ammunition of the type and amounts estimated as likely to be required is cached at each position. In this manner, only the mortars themselves and the personnel to operate them are moved when displacing from initial and successive positions. Ammunition should be withdrawn when vacated positions are likely to be overrun by the enemy.

b. As a chemical weapon the 81 m/m mortar is limited to the fire of white phosphorus (WP). It is normally fired as a single weapon assigned a definite task and employs WP-filled shell together with HE-filled shell against indefinitely located machine guns, etc., for casualty as well as screening effect. It may, however, be fired in batteries, and a battery of either 3 or 4 mortars may be employed for the fire of smoke in the same manner as the Chemical Platoon firing 4.2″ chemical mortars. Consideration should be given the fact that, due to the much smaller capacity of the 81 m/m shell, a considerably greater number of rounds of smoke shell is required to screen a target as compared with 4.2″ chemical mortar.

8. ARTILLERY.—In the defense of an advanced base the fire of chemical shell by artillery weapons shows little, if any, departure from normal procedure in such fires. Ships of the hostile naval support that approach within range of artillery weapons may be fired upon by artillery using a small percentage of vesicant-filled shell interpersed with armor-piercing and high-explosive shell. Direct hits, on exposed decks and within the superstructure are necessary for casualty effect, and the fire of chemical shell may, therefore, be considered practicable only when the hostile supporting ships ven-

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ture close inshore. The use of chemical shell by artillery weapons against targets on land has been covered exhaustively in other treatises and is omitted here.

9. **AVIATION.**—a. **General.**—Because of its wide radius of action and its effectiveness in the dispersion of chemical agents the airplane may properly be considered one of the most important weapons for the offensive employment of chemical agents in the defense of an advanced base. Although aviation may be comparatively free to carry out its assigned missions prior to an actual threat against the continued occupancy of the base, it should always be borne in mind that when an actual landing attack is attempted the enemy will expend every effort to gain local control of the air and that many of our planned missions may not succeed. Chemical missions for aviation should, therefore, be limited to those likely to succeed in the face of an aggressive enemy having, at least temporarily, local control of the air.

b. **Targets.**—Following are some examples of chemical targets:

(1) Enemy airdromes on islands or mainland within range of our bombardment aviation. Enemy aircraft based within operating range of the advanced base offer a continuous threat to the installations of the base. As soon as enemy airdromes have been located it is the immediate task of bombardment aviation to destroy the planes on the ground and to bomb the runways in order to prevent enemy planes from landing and taking off. For destruction of planes and blowing craters in runways, bombardment aviation employes HE-filled bombs. For casualty to personnel and to make the repair and leveling-off of the runways difficult, airdromes should be sprayed or bombed with a liquid vesicant. In tropical climates greater persistency of the agent will result from the use of chemical bombs than by employing spray, and too much reliance should not be placed upon the latter method even in cooler climates, unless there is an opportunity to reach personnel as well as matériel.

(2) Enemy aircraft carriers. These are a most serious threat and are of extreme importance to the enemy in carrying out has attack against the base. They are the principal target of aviation during the initial stages of the "Final Defense" phase. Large bombs containing HE will make up the greater part of the bombs used against the carriers, but small bombs (containing a persistent vesicant) and chemical spray will supplement the high-explosive bombing, in order to cause casualties among personnel as well as to render the task of repair to flight decks and matériel more difficult.

(3) Enemy transports and small boats loaded with personnel. If sufficient casualties can be caused among the enemy's forces, his superiority (if he is actually carrying out a landing operation, it may conservatively be estimated that he has at least a 3-to-1 superiority) may be so reduced that he may be forc-

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ed to withdraw without act[illegible] ports occupying transport areas preparatory to a hostile landing operation become the principal target for aviation. At no other time during the attempted landing will there be such a concentrated personnel target for aviation. Fast, low-flying planes spraying a liquid vesicant immediately upwind of a smoke blanket which has been laid well upwind of the transport area and allowed to drift down upon it, will cause enormous casualties among the personnel reached by the spray. If this spray can be laid by a number of planes(one or two sections) during the debarkation of troops into small boats and during the time the small boats are making up into tows, a high percentage of casualties may be expected in spite of any protective measures that may be taken. Depending upon the type of liquid vesicant used, troops reached by the chemical spray will become casualties within 15 minutes to 1 hour. Small boats proceeding from transport areas toward shore may be sprayed with a liquid vesicant at any time until they actually ground, provided the wind is blowing from the land. If the wind is blowing from the water toward the land, chemical spray should not be employed after they are within 3,500 yards of shore, in order to avoid casualties among friendly troops occupying beach defense positions.

(4) Ships of the hostile naval support. These ships are an appropriate target for chemical bombing and spraying by aviation but are, of course, of lesser importance than the aircraft carriers and transports and small boats carrying personnel. They must not be entirely disregarded, however, for it is upon these vessels that the enemy depends, in a large measure, for his preparation fires on the beaches as well as fires in general support during his planned advance to the beachhead line.

(5) With the exception of the targets for aviation listed in the four preceding subparagraphs, other weapons available should be employed if possible, when the dispersion of chemical agents is required. For the denial of large land areas, particularly, static installations should be made well in advance and detonated when necessary, instead of calling upon aviation to do the task during a critical time when other targets are so much more important. Aviation should be requested to employ chemical bombs and spray against land targets within range of artillery weapons of the Shore Defense Forces only when the latter weapons are unable to accomplish the task.

10. STATIC INSTALLATIONS.—The dispersion of liquid vesicants by means of static installations is the most efficient method yet developed for the even dispersion of such agents over an area it is desired to deny to the enemy by threat of casualties and is employed, whenever possible, in preference to all other methods of dispersion. In advanced base defense, static installations of liquid vesicants should be employed, if practicable, on all areas which it is desired to deny by threat of casualties. Wind direction must be

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are in consideration in order that friendly troops may not be affected by vesicant vapor after detonation. In the case of small land areas surrounded by the open ocean, it is often possible to predict wind direction with great accuracy over a period of months and in such cases it may be possible to make static installations of persistent vesicants directly in front of occupied defensive positions. Static installations may be made within a defensive position and detonated upon withdrawal. Such installations will normally be located along favorable routes of approach for an enemy penetrating the position. To secure the maximum casualty effect of static installations they should be covered by the fire of automatic weapons in order to force the enemy to crawl through the contaminated area. High-explosive fires on such areas should also be planned in order to complete demoralization. Barriers should be erected to detain vehicles in such areas long enough for personnel to become casualties.

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CHAPTER XII

COMMUNICATION

MARINE CORPS SCHOOLS
QUANTICO, VIRGINIA

June, 1936

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CHAPTER XII

COMMUNICATION

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1. COMMUNICATION IN BASE DEFENSE, GENERAL.—a. Signal communication in base defense differs from that employed in the attack, in that the complications incident to landings and the movement of command posts in the advance or retrograde movements are lacking. The situation in base defense is stabilized and the communication installations are more elaborate. The wire communication installation resembles that employed in the attack, with the addition of lateral lines between the smaller units and special lines for fire control and alarm purposes. Where practicable, measures are taken to protect the lines from interruption by hostile fire and landing raids. The number of local telephones at command posts is increased as the necessity arises and as time and equipment permit.

b. In some instances telephones are installed in the command posts of companes in beach defense. Visual communication is employed more extensively than in the offensive, and may be developed into an effective auxiliary means of signal communication, especially for emergencies. Extensive use of radio by the defense force enables the attacker to collect valuable information relative to its composition, size and disposition. Communication systems in base defense operations, particularly in the infantry and mobile artillery, must be simple and elastic. All systems of communication must be easily controlled and used intelligently if they are to function efficiently. The Tables of Organization and Equipment for signal communication personnel and equipment provides reasonable means for communication in normal situations. However, the Base Force Commander must be prepared to meet situations that are not normal. The operation and supervision of non-military agencies of communication and the coördination of the tactical organizations

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and the naval industrial establishments at the base necessitate the employment of communication personnel and equipment in excess of the normal requirements. In addition to the foregoing, the Base Force Commander must be prepared to collect information of the enemy by means of radio intercept service. He must also be prepared to supplement the information obtained through his reconnaissance agencies by establishing observation stations equipped with adequate communication facilities at points sufficiently distant from the vital area to furnish timely warning of hostile plane movements, in order that antiaircraft personnel may take adequate measures for passive defense, and to afford the friendly air forces opportunity to disperse their planes on the ground or to intercept and attack the hostile planes in the air.

2. RESPONSIBILITY.—Each unit headquarters is responsible for the installation, maintenance and operation of its own interior communication and for communication down to, but not including, the headquarters of its next subordinate units. In addition, the higher headquarters provides lateral wire communication between the headquarters of its next subordinate units when parcticable, unless that responsibility is delegated to those units. Artillery and other supporting units install and maintain direct communication with liaison detachments and sector defenses that the artillery and other units are required to support. They are likewise responsible for direct communication with their own forward observation posts, supporting airplanes and with adjacent units and groupments.

3. MEANS EMPLOYED.—a. The following means are normally employed in base defense communication:

Message centers and messenger service;
Wire systems, embodying both telephone and telegraph;
Voice and telegraph radio;
Air-ground communication, including panels, and drop and pick-up methods;
Various forms of visual communication, including pyrotechnics.

b. Forward of the infantry battalion, the messenger is the primary means of communication, although telephones may be installed as far forward as the company and platoon, and in special situations, to smaller combat groups. The wire system is the method upon which the artillery places its chief reliance for all communication purposes, except for communication with airplanes. Messengers, visual, voice and other means that can be installed rapidly, are employed by the artillery pending the establishment of wire lines. Provisions are made for paralleling signal communication agencies, even though certain agencies may be installed and functioning properly.

4. COMMUNICATION OFFICER, BASE DEFENSE FORCE.—The Communication Officer, Base Defense Force, normally a naval officer, is charged with the installation, operation and maintenance

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of the base defense communication system in accordance with existing regulations and instructions governing naval communication and such other regulations and instructions as may be received. He is responsible for the preparation of communication plans, orders and instructions for the base defense force. He is responsible also for establishing exterior communication in accordance with instructions promulgated by the Commander-in-Chief, and for the installation and operation of the communication intelligence service of the base, including the interception of enemy radio, wire and cable despatches, and also for direction-finding work incident thereto. In addition, he is responsible for the installation system, including the industrial area, and for the coördination of the communication systems of the defense forces, both afloat and ashore. He recommends the disposition to be made of non-military communication facilities existing in the area at the time. He establishes a messenger service to serve the Base Headquarters and the industrial establishment. He likewise establishes a telephone central at Base Headquarters with requisite lines and telephones for serving the headquarters and the industrial area, and where practicable, vessels in the harbor. The wire system established should be planned with the idea of its employment in fire control as one of the governing factors. He exercises a strict censorship of communication traffic in accordance with the general naval communication policy.

5. **BASE DEFENSE FORCE COMMUNICATION PLAN.**—The base defense force communication plan contains provisions for the employment of communication agencies as enumerated below.

a. **Radio.**—This subparagraph covers the uses of radio in exterior communication; interior communication, both afloat and ashore; radio intelligence, including enemy plane reports from inshore and offshore patrol vessels; communication between air and ground and in fire control. The instructions given in this subparagraph also cover the special allocation of radio call signs and frequencies. (See Plate "E").

b. **Wire Communication.**—Instructions for wire communication cover the operation of the telephone switchboard at Base Headquarters and such other switchboards as may be required to serve the headquarters, the industrial area, and vessels anchored in the harbor (when practicable). The instructions also include sufficient detail to insure proper coördination between the base wire establishment and the tactical wire net of the defense forces ashore. (See Plates "A". "B", "C", and "D").

c. **Visual Communication.**—Visual communication in base defense is employed between ships in the harbor and shore stations, ships at sea and shore stations, as well as between vessels of the inshore patrol and those vessels and shore forces in sector and subsector defense, and within and between elements of the shore defense forces. (See Plates "A" and "C").

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d. **Airplane Communication.**—Airplane communication with ground forces is effected by visual means such as panels, light signals and pyrotechnics, and physical delivery and receipt means as the drop and pick-up system and by radio. This subparagraph contains information relative to front line marking, challenge and reply, indentification markings and other matters pertaining to communication between planes and the ground forces. Communication between planes is effected by means of voice and telegraph radio, arm signals and maneuver of the planes.

e. **Base Defense Force Communication Office and Messenger Service.**—(1) This combined system is charged with the receipt, the recording and the delivery or forwarding of all despatches and correspondence turned over to it for the above purposes. The details of codes and ciphers are placed under the supervision of the communication office. Usually there will be a group of officers organized as a coding section.

(2) In order to have communication function efficiently, the system must be highly intergrated, and uniformity must prevail in such matters as pyrotechnic signals, radio and visual calls, radio frequency assignments, details of challenge and reply for air and water borne craft and recognition signals; otherwise, confusion will result. However, care must be exercised in the preparation of the base defense force communication plan so as not to trespass unduly upon the prerogatives of the subordinate commanders in the matter of communication. The lower unit commanders are given enough information to enable them to comprehend fully the general communication plan of the Base Force Commander and no more. The details of interior communication of tactical units are left to the subordinate commanders.

6. COMMUNICATION OFFICER, NAVAL DEFENSE FORCES.—The communication officer of the naval defense forces performs his duties in accordance with the provisions of existing regulations and instructions, with the base defense force communication plan, and with other orders and instructions in force at the time or issued subsequently. He prepares special plans and instruction to meet the specific requirements of the naval defense forces, coördinates the communication activities within the naval defense forces, and establishes communication with the shore defense forces in accordance with instructions from the communication officer of the base defense force.

7. COMMUNICATION OFFICER, SHORE DEFENSE FORCES.—The communication officer of the shore defense forces is responsible for the installation, operation, maintenance and supervision of the communication system within those forces. He prepares the communication plans, orders, operation instructions and appendices for the shore defense forces, assuring himself that his plans and orders are in no way contradictory to those of the base defense force communication officer, in order to insure that the latter makes provision for the communication needs for defense not normally encountered in naval operations.

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8. COMMUNICATION PLAN, SHORE DEFENSE FORCES.—a. In addition to the task organization, paragraph 1 with its informatory matter, paragraph 2 with its general statement of plan, paragraph 3 with its outline of operation, paragraph 4 with its details of supply and equipment and paragraph 5 with its time and reference matter, there are specific detailed instructions of operations that may be called appendices and appended to the plan. These appendices may be in the form of overlays, telephone circuit diagrams, details of codes and ciphers and other matters of communication interest. A detailed discussions of the various paragraphs and appendices is not within the province of this chapter, hence only such matters as pertains to the agencies treated in paragraph 3 will be discussed in the following sub-paragraphs.

b. **Radio.**—Radio communication is installed at all headquarters down to and including battalions. The radio stations are grouped into nets that coincide normally with the tactical organization, each net operating on a separate frequency. Provisions are made for direct radio communication between such units as may be considered necessary in the particular situation. When combat is not imminent, radio stations may be permitted to operate on prearranged schedules, maintaining continuous watch on their normal frequency or frequencies. Antiaircraft intelligence service should be provided with sufficient radio equipment to establish constant watches on radio frequencies used by aircraft on reconnaissance missions. Where this is impracticable, radio stations in the infantry organizations may be detailed to this duty during the distant reconnaissance and alert phases. The employment of radio between aircraft and the ground forces is governed largely by the types of radio equipment available.

c. **Wire Communication.**—The principles governing the installation of wire nets in base defense are normal. The installations, being of a somewhat permanent nature, are made as complete as possible, and are rendered as secure from hostile injury as time and other factors permit. Military buzzer telegraph is superimposed on the telephone wire lines wherever practicable, thereby obtaining a maximum service from lines so employed. The wire lines laid by a landing force in the capture of a base are used wherever practicable in the establishment of the defense wire communication system. The various landing fields in base defense are connected by telephone direct with air defense force headquarters where practicable. However, it may be necessary in some cases to connect some of the landing fields through other switchboards, due to distance and other factors. Since the telephone personnel of the air defense forces is inadequate for other than interior airdrome wire installations, the laying of inter-airdrome wire lines is delegated to the signal company. Direct wire communication is established between fighter airdromes and the antiaircraft intelligence service. The artillery installs its own interior wire communication and established and maintains wire communication with the head-

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quarters of supported units. The wire communication established in the sectors, subsectors and beach defenses is governed by the situation, the decision of the commander of the shore defense forces, the time, the equipment and the personnel available.

d. **Visual.**—Visual communication in base defense is subject generally to the same limitations as are encountered in other types of operations. However, visual signalling may serve as an effective auxiliary means of communication if employed properly. Advantage can be taken of terrain features to shield visual stations from hostile observation and fire, while screens can be prepared for the same purpose. Visual communication between the shore defense forces and craft of the inshore patrol may be effected by semaphore, flag hoist, blinker tubes, pyrotechnics and other forms of light signals, employing the prearranged codes in use between sectors and other subdivisions of the shore defense forces. Visual signals are of value in transmitting identification, challenge and reply signs between the ground forces and vessels afloat and aircraft.

e. **Airplane Communication.**—Airplane communication instructions in the communication plan of the shore defense forces are identical with those issued by the base defense force communication officer, except for minor additions, that are required to cover specific land force needs. Visual signals, including pyrotechnics, identification and marking panels and drop and pick-up facilities are used in air-ground communication.

f. **Message Centers and Messenger Service.**—Message centers and messenger service are established at all headquarters of units comprising the shore defense forces. These agencies are charged with the receipt, transmission and delivery of messages, orders and other forms of communication placed in their charge. In brigades and above, a communication office is normally established. In the regiment and below, the message center serves as the communication office. Unless otherwise prescribed, the communication office, or in case none is established, the message center, handles such matters relative to codes and ciphers as are entrusted to the enlisted personnel. The care and employment of the more secret means of communication are duties assigned only to officer personnel.

9. **COMMUNICATION IN SECTOR DEFENSE.**—Communication in sector defense comprises the employment of any or all communication agencies normal to the units assigned to the sector, supplemented by such additional agencies as are of value and available. The sector headquarters establishes direct radio and visual communication with the headquarters of its next subordinate units, with adjacent sectors, subsectors, artillery groupments, with the next higher headquarters and with the vessels of the inshore patrol. The immediate employment of the sector communication system is the chief consideration governing its initial installation. The installation is then improved wherever practicable. Wire lines are re-routed to avoid routes of heavy traffic and areas that are particu-

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larly vulnerable to hostile fire. They are also entrenched or buried when time and conditions permit. Bombproof shelters are provided for the personnel operating the communication agencies; alternate messenger routes are prescribed. Facilities for visual communication are increased and the use of pre-arranged messages is stressed. Stations are prepared for panel and drop and pick-up service.

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CHAPTER XIII

INTELLIGENCE

MARINE CORPS SCHOOLS
QUANTICO, VIRGINIA

June, 1936

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CHAPTER XIII

INTELLIGENCE

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1. GENERAL.—This chapter deals with the probable information which may be dsired by the defense, regarding a potential or actual hostile force which may or does attack the defended base by a landing operation. The information desired by the base defense force and the sources of information which may be available to them will vary depending on the phase of the defense. The dependence by the defense on sources not under its control for information, regarding a hostile force, will vary directly with the distance the hostile force or threat is removed from the base. The information that will be desired by the defender and the sources which may be at his disposal to obtain this information are therefore listed under each phase of the defense.

2. DISTANT RECONNAISSANCE PHASE.—a. The information desired during this phase will include:

The presence or absence of enemy land, sea, or air forces beyond striking distance of the base, but within the theater of operations;

Location, course, speed, strength, and composition of any enemy forces approaching by land, sea, or air;

Location and size of any enemy bases established beyond operating range of the base, but within the theater of operation;

Forecast of weather conditions;

Terrain, shore line and hydrography as they affect the enemy.

b. The sources of information which may be available to the defense to obtain information during this phase are:

Friendly ships, especially those on reconnaissance missions,
Operating fleet commander,
Friendly intelligence agencies,
Aerial reconnaissance,
Radio intercepts,
Adjacent and distant friendly bases.

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Inhabitants,
Enemy documents,
Meteorological section of aviation,
Hydrographic charts and tables,
Intelligence agencies within the advanced base force.

3. ALERT PHASE.—a. The information desired during this phase will include:

The presence or absence of enemy land, sea, or air forces within striking distance of the base;
Location and size of any enemy bases established within operating range of the base;
Location, course, speed, strength, and composition of any enemy forces approaching by land, sea, or air;
Location of enemy supply establishments;
Enemy's knowledge of the base defense force situation;
Forecast of weather conditions;
Tides and currents.

b. The sources of information which may be available to the defense to obtain information during this phase are:

All sources enumerated in paragraph 2. b. above;
Offshore and inshore patrol;
Antiaircraft intelligence service;
Observation posts on shore;
Prisoners taken in hostile raids.

4. FINAL DEFENSE PHASE.—a. The information desired during this phase will include:

Location and number of enemy aircraft carriers and naval accompanynig ships with their number and type;
Location of enemy transport areas with the number of transports and their approximate tonnage in each area;
During the enemy ship to shore movement: the time of debarkation of troops into small boats and their departure from the transport areas with the approximate size and number of the small boats and the number of troops in them; the number of boats and boat waves approaching any beach area with the time of arrival of the leading wave on any particular beach; the presence of machine guns and other accompanying infantry weapons with the troops; the presence of amphibious tanks or tanks transported ashore in boats, with the number of each type; the number of pieces and caliber of artillery transported in boats and the location in the boat formation of the boats transporting them;
Intensity of ship's gunfire on any beach front, with direction of fire;
Employment of grounded ships in support of any landing;

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their number, kind of armament carried and number of troops transported;

Amount, kind and method of dispersion of chemical agents, including the location of smoke screens used by the enemy in covering the landing and the location of areas gassed by the enemy, with the time the gas attack took place or was discovered;

Location and intensity of aerial attack together with the number and type of planes used by the enemy;

Location and extent of front on which the enemy lands together with the strength and composition of his forces and their rate of advance inland;

Location and direction of enemy main effort;

Number, location and caliber of hostile artillery batteries ashore;

With regard to the hostile general reserves: their location and strength in the transport area; their time of embarkation into small boats with point of rendezvous and approximate strength and composition; time of departure from rendezvous area with course of boat flotilla, beach on which landed and disposition made of the general reserve after reaching the beach;

Enemy supply system, with amount of stores, munitions ashore and their location;

Number of casualties suffered by the enemy;

Location of any enemy entrenchments or wire entanglements, together with the time, place, type, and degree of completion;

Enemy's knowledge of the defender's situation;

Forecast of weather conditions;

Tides and currents.

b. The sources of information which may be available to the defense to obtain information during this period are:

All sources enumerated in paragraph 3. b. above;

Enemy materiel, found or captured;

Patrols and scouts;

Units in contact with the enemy;

Prisoners and deserters from the enemy.

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TENTATIVE MANUAL
FOR
DEFENSE OF ADVANCED BASES

[redacted]



CHAPTER XIV
LOGISTICS

MARINE CORPS SCHOOLS
QUANTICO, VIRGINIA

June, 1936

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CHAPTER XIV

LOGISTICS

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SECTION I

GENERAL

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1. **DEFINITION OF LOGISTICS.**—Logistics pertain to the supply and movements of troops and matériel during all phases of operations. It includes procurement, storage, shelter, transportation, distribution, labor and replacements. For information relative to the application of logistics to the landing attack, reference should be made to Chapter IX, Logistics, of the Tentative Landing Operations Manual.

2. **SOURCE OF SUPPLY.**—Headquarters Marine Corps is responsible for the procurement of all matériel of the Fleet Marine Force prior to embarkation except medical, aviation, and subsistence while on board ship en route to destination.

3. **CLASSIFICATION OF EQUIPMENT AND SUPPLIES.**—a. Marine Corps Expeditionary matériel is divided into two general classifications, namely; (1) Equipment; (2) Supplies. **Equipment** includes all articles prescribed by the equipment tables for **initial issue. Equipment** is subdivided into nine groups as follows:

Group 1 Individual Equipment,
" 2 Baggage,
" 3 Office Equipment,
" 4 Organization Combat Equipment,
" 5 Supplementary Equipment,
" 6 Mess Equipment,
" 7 Camp Equipment,
" 8 Transportation,
" 9 Special Equipment.

b. **Supplies** include those articles required for the maintenance of organizations such as ammunition, subsistance, replacement for initial equipment and articles sold by the Post Exchange. The

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quantities of supplies will vary according to the nature of the duty and should be prescribed in each particular case. **Supplies** are subdivided into four groups as follows:

Group 10 Ammunition,
" 11 Automatic Supplies,
" 12 Replacements,
" 13 Post Exchange Supplies.

c. Normally all initial equipment listed in the Groups 1 to 5 inclusive and Group 8 is issued to companies, batteries or squadrons as indicated. The following groups of **Equipment** and **Supplies** are normally retained in the custody of Force, Regimental or Battalion Quartermasters, as directed, until actually required by the company, battery or squadron:

Group 6 Mess Equipment,
" 7 Camp Equipment,
" 9 Special Equipment,
" 10 Ammunition,
" 11 Automatic Supplies,
" 12 Replacements.

Group 13, (Post Exchange Supplies) is under the custody of the Post Exchange Officer.

d. **Grouping of Equipment and Supplies.**—The following instructions indicate the types of articles included in the various groups of Equipment and Supplies.

e. **Group 1, Individual Equipment.**—This includes equipment needed in field operations and combat which is issued to the individual officer and man and is normally carried on his person. In this group, in the Equipment and Supply Tables, figures in parenthesis indicate the articles of standard equipment which will be brought to the mobilization point by the individual. Figures not in parenthesis indicate additional equipment issued at the mobilization point. At certain times it may not be found advisable to issue to the individual all the articles of equipment listed under Group 1, as for example; the rifles of machine gun and artillery units when not acting as infantry and such articles as brassards, extra field message books, etc. Such articles are listed under Group 1, but may be actually stowed in chests proveded under Group 5 (Supplementary Equipment).

f. **Group 2, Baggage.**—This includes trunk lockers, clothing and bedding rolls, sea bags, and clothing in the hands of individuals. A part of this baggage (blankets and clothing) may be carried on the individual.

g. **Group 3, Office Equipment.**—This includes organization records, stationery, field desks, typewriters, etc. The quantities listed under initial issue in the Equipment and Supply Tables are estimated as sufficient for 90 days.

h. **Group 4, Organization Combat Equipment.**—This includes equipment essential in combat but not issued to individuals such as machine guns, 75-m/m pack howitzers, airplanes, ammunition carts, signal and medical equipment. It includes hand-drawn vehicles

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but does not include any motor vehicles which are classed as transportation. Articles are arranged for convenience under the following headings: Medical (Bu. Med. and Surg.), medical (Marine Corps), machine gun, 37-m/m gun, Stokes-Brandt mortar, signal, 75-m/m pack howitzer and miscellaneous. Under miscellaneous are included articles common to two or more of the other headings. Articles are arranged alphabetically under each heading, except that in each case the weapon heads the list.

i. **Group 5, Supplementary Equipment.**—This includes miscellaneous company, battery and squadron property such as a limited quantity of spare parts and cleaning material, repair kits for weapons, surveying instruments, lanterns, tool chests, etc. While this material is not absolutely essential in the early phases of combat, a part of it will be needed and should be made available during a period of active operations. Attention is invited to the last paragraph in Group 1, above, for information pertaining to other articles sometimes stowed with this group.

j. **Group 6, Mess Equipment.**—This includes equipment required to run a mess in the field such as ranges, water cans, mess chests, etc. It does not include fuel and rations, which are classed as Automatic Supplies (Group 11).

k. **Group 7, Camp Equipment.**—This group is divided into Sub-group A and Sub-group B. Sub-group A includes articles which will normally be needed and issued for the establishment and upkeep of a camp. Sub-group B includes articles which are not needed immediately for the establishment of a camp. The issue of the articles of this sub-group will depend upon the conditions imposed by the operation. Therefore, all articles of this sub-group will be retained by the Quartermaster for issue when required and the total quantities are shown only in the column marked "90-day Replacement."

l. **Group 8, Transportation.**—This includes motor cars, trucks, tractors, trailers, ambulances and motor-cycles. Spare parts for these vehicles are included in this group and may be loaded on the vehicle. This group does not include hand-drawn vehicles, such as Cole Carts, which are classed as Organization Combat Equipment.

m. **Group 9, Special Equipment.**—This group includes material, the need for which depends upon conditions imposed by the operation. Included are such articles as barbed wire, construction materials, gas masks, steel helmets, etc., which are only issued upon specific authority. Every article of this group in the Master Table of Tonnage Data and Basic Allowances must be considered separately for each organization and orders issued as to the amount, if any, to be furnished as initial equipment and replacement therefor. In the Equipment and Supply Tables for each organization, the articles of this group that may be required by the organization, for any operation, are listed. This provides a space for conveniently entering the quantity, if any, after decision is made of the requirements.

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n. **Group 10, U. S. Ammunition.**—(1) This group includes all types of ammunition, including chemical ammunition, pyrotechnics and demolition explosives. It also includes additional empty magazines for automatic rifles and Thompson sub-machine guns, and similar material which should be supplied in the quantities indicated at the same time as the ammunition in order to replace articles damaged or lost in combat. All figures in this group indicate "One Unit of Fire."

(2) Articles are divided into two sub-groups, **Normal** and **Special. Normal** articles are those supplied for any type of operation, decision being necessary only as to the number of Units of Fire to be taken. **Special** articles are those which may or may not be supplied, depending on the contemplated operation. Orders will be issued in any operation covering the number of Units of Fire of Normal ammunition and the articles and Units of Fire of each type of **Special** ammunition to be carried.

(3) In the Equipment and Supply Tables for each organization the articles of **Special** ammunition in this group that may be required by the organization are listed, thus providing a space for conveniently entering the quantities, if any, after decision is made of the requirements.

o. **Group 11, Automatic Supplies.**—This includes supplies which are consumed at a fairly uniform daily rate in every type of operation such as subsistence, kerosene, gasolene, and oils. Articles in this group are, for the purpose of stowage, listed under two headings, **Inflammable** and **Non-Inflammable.** Articles under each heading are arranged alphabetically, except that under the heading **Non-Inflammable** rations head the list. The amounts listed in the Equipment and Supply Tables are for 90 days supply. The bulk of the tonnage under this group is composed of rations, gas and oil, and the amount of these aritcles may be varied according to the theater of operations and availability of transportation. It will not be found economical to take less than 90 days supply of the remaining articles of this group such as candles, matches, etc.

p. **Group 12, Replacements.**—(1) This group includes replacements for articles of equipment for Groups 1, 2, 4, 5, 6, 7, and 9. No emplacements are provided for Groups 3 and 8, as the initial issue is estimated as sufficient for 90 days. The amount listed under replacements are for a period of 90 days. Due to the desirability of utilizing unit packing it is not economical to assemble replacements for periods of less than 90 days.

(2) Individual articles of replacements are shown in a column marked "90 day Replacements" in Groups 1, 2, 4, 5, 6, 7, and 9 of the Equipment and Supply Tables in order to avoid a repetition of these articles in group 12. Replacements for Groups 1, 2, 4, and 5 will normally be packed separately and retained in the custody of the Quartermaster for issue when required. For Groups 6 and 7 the initial requirements and the replacements therefor may be packed together and carried by the Quartermaster until required by the organizations. Replacements in

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Group 9, if authorized, will be packed separately and maintained in the custody of the Quartermaster for issue when required.

g. **Group 13, Post Exchange Supplies.**—This includes articles intended for sale by the Post Exchange based on a 90 days supply. The financial arrangements will be governed by the provisions of the Marine Corps Manual.

r. **Unit of Fire.**—A Unit of Fire is a measure of munitions for purposes of supply. Total amounts of ammunition and pyrotechnics are calculated for every type of weapon in an organization based on a definite allowance per weapon.

s. **Plans.**—The administrative plan for a defensive operation is based on the requirements of the defensive tactical plan and on the administartive plan of the Naval and Air Defense Forces, particularly with respect to water supply, evacuation and traffic. It must be adapted to the character of the terrain in the area of operation, and it must permit flexibility of execution. The scope of the plan includes the determination of the logistical requirements, evacuation and hospitalization, evacuation and safe-keeping of prisoners of war, control of traffic, and the maintenance of health and of order. The Administrative Plan is prepared by the Fourth Section which is responsible that provisions pertaining to other Staff Sections are included therein.

SECTION II

SUPPLY IN DEFENSE

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4. **GENERAL.**—The phases of supply in a defensive operation correspond to and support the tactical phases. Supply of the defensive operation requires, for each phase, a determination of the following:

Kinds and amounts of supplies needed,
Sources, initial and reserve,
Where and when delivered,
Routes and means of transportation,
Special construction needed,
Organization of dumps,
Labor involved,
Shelter and cover from enemy fire,
Provisions for failures in execution.

5. **SUPPLY SYSTEMS IN THE DEFENSE.**—a. The system of supply necessitated by defense conditions and the means required

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to inaugurate [illegible] such a system is perhaps similar to no other type of supply situation. An advanced base may or may not be the final development of a scheme that includes the necessity of a forced landing against organized opposition. When the former is true, there is present the need for supply plans that include consideration of the tactical features both of attack and defense. It is, however, with the supply and transportation essentials in their application to the defensive situation that this chapter will deal. The greatest single controlling feature in the inauguration of a supply system for this type of defense, is the time factor involved. Th necessity for defense naturally contemplates being attacked. The time within which attacks are logically to be expected will be widely different in various situations. But it is a fact that in all such situations, it will demand primary consideration. Moreover, it will be the direct cause for the modification or elaboration of all supply planning. The fact that the defense of an advanced base contemplates holding out against different forms of attack, naval air and land, greatly influences the system of supply involved. The need for organization of the ground for proper defense is still another important factor that must be taken cognizance of in planning supply. There is more than one way in which supply can properly meet base defense requirements. No one scheme could ever be evolved that would work under all conditions. There are, however, certain conditions that will practically always be encountered, and these will be the basis for what follows.

b. It is believed safe to assume that there will always be necessity for beach defense and that there will be a strongly organized defensive positions near the beach; that there will be sites selected for inland and final defensive positions; that there will be positions selected for reserve units and plans for their employment which will include counterattack; that this entire plan will include support by base defense artillery; and that the site of the base itself will be chosen with defensive and security considerations uppermost. All of these tactical requirements must be thought of in making decisions relative to supply.

c. When an attack has preceded the seizure and defense of a base the flow of supply has been from ship to shore and inland.

d. When defense considerations follow such an attack supply must build up inland and reverse its direction of flow. When no attack has taken place before the defensive stage is entered, supply naturally will be less difficult to establish. During the time that organization of the ground for defense is taking place, and in fact up to the time of anticipated attack, supply can best assist in the general plan by being conducted in a manner which will free all combat activities from the necessity of participating in the system of supply. In other words, by the employment of a system that will be as nearly a direct route or channel from base to consumer as is possible. The first step towards this achievement would be the inauguration of daily automatic supply. This contemplates furnishing by means of Force transportation to the various organizations

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and even to small isolated details of men [illegible] necessary all items that are consumed at a fairly uniform rate daily, and for which no requisition is needed.

e. The second step is to build up within each tactical area or district a series of supply points or "dumps" from which units may supply themselves when, because of enemy activity, they can no longer be supplied from the base. To meet such conditions, and in order to insure proper supply coördination, the division of the area to be supplied into supply districts with a supply officer responsible for each district, would prove of benefit. The more nearly the supply district embraces and supplies a complete tactical area, the easier will be the problem involved. Ordinarily, the supply officer responsible for the district should be the senior supply officer within the district serving with troops. To him should be entrusted all matters of supply and transportation within the district and he should be given every opportunity of proving his capabilities of administration. The early inauguration of an automatic supply schedule will assist in this respect. In a force of considerable size such automatic supply system should be carried out either by the depot or the Force Service Company assisted by the Force Train. With truck transportation and good roads a round trip daily of 50 miles is not considered excessive. In most cases the actual milage involved will, it is believed, be much less. Dumps should be established and built up to required levels with as little interference with the work of ground organization as possible. Near beaches, small amounts only should be stored. If the enemy attack is only partially successful, all stores near his landing points are almost sure to be sacrificed. Further inland, somewhat larger quantities of food, (except perishables), water, ammunition, etc., may be built up at selected dump sites. At or near the inland and final defensive positions should be placed a quantity of everything required in order to insure the proper supply of units involved for the period during which they are expected, by the tactical plan, to hold out. This is true of reserve assembly areas or positions also. The actual sites selected for such dumps in reserve assembly areas should be controlled by the reserve's mission and the direction of contemplated counterattack.

f. The question of how much can be done in any specific period of time is controlled by the amount of supply coördination accomplished, the length of hauls involved and the conditions of available roads.

g. The types of transportation required depend naturally upon conditions of terrain in the theater of operations and the network of available roads and their condition. The ideal combination is one including both trucks and tractors with trailers. Existing Tables of Organization provide for certain types of trucks, tractors, trailers, etc., to be basically assigned to various units. Quantities of the various types so assigned, however, are the minimum requirement and do not contemplate either an extensive operation inland or the supply of widely separated units. This point should be kept constantly in mind. To what extent transportation should be pool-

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ed, in order to acquire the best results can only be decided after a study of the problem has been made and the recommendations of all district supply officers have been submitted. Economy in this respect, to the detriment of proper results, should not be permitted. War is rarely economical. If ultimate success means doubling the amount of transportation involved the price is still cheap. Distribution and storage of water is usually the function of the Force Engineer Officer, but organizations should recommend sites that are believed to be the best for this purpose. And this is true also of food and ammunition. The best results can only be obtained by getting ideas from everyone concerned. The munitions officer will have the task of placing ammunition and the supply officer will be concerned with supplies of all description, but there is another viewpoint, and a most important one, that can come only from those who are to be supplied.

6. SUPPLY IN SECTOR DEFENSE.—a. It is customary to consider the division of any large area that is to be defended, into sectors. Such a plan calls for definite boundaries between sectors and the assignment of sector and, in some cases sub-sector, defensive forces. This arrangement often results in the necessity for reorganization of command because sector and sub-sector commanders are often placed in command of a defensive group consisting of mixed elements.

b. When this occurs, it is not unusual to re-allocate the duties of service units in order to meet this particular condition. Supply districts are often established and district supply officers assigned and placed in charge of supply therein. There should be no hesitancy in making such supply changes as sector defense requirements would apear to indicate. Grouping of units into Supply Groups is often necessary and desirable and a re-assignment given to service units and officers.

c. The important consideration is to establish a system that will further the commander's tactical plan. Care should be taken to avoid too elaborate a plan of supply division, particularly one that might result in superimposing a greatly different division of area for supply purposes on the division made by the commander for tactical purposes. If supply districts are desirable, first consideration should be given to the use as such of the tactical division of area made for defensive purposes.

d. Tactical defensive requirements ordinarily prohibit any distribution from base to troops after the anticipated enemy attack is imminent. It follows, then, that supplies for use during this period, and that of actual defense, must be so placed that defending units may supply themselves without difficulty. To be able to accomplish this requires the closest coöperation between the third and fourth sections of the staff to the end that no doubt exists on the part of the supply officer as to the estimates of the operations and training officer regarding time and place factors.

e. Full use of all transportation facilities should be made during the period of organization of the ground for defense. The

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amount of ammunition required by heavy artillery and antiaircraft organizations is a serious hauling problem from a tonnage viewpoint alone and roads used for this heavy traffic must be constantly kept under observation by the engineers in order to insure proper maintenance.

f. Transportation may have to be shuffled about somewhat. It should be done immediately as soon as the need occurs and without hesitation or fear of breaking up this or that combination. Organizations moving into position for ground organization should be, insofar as possible, freed from every consideration except their immediate job at hand. Their transportation should be left intact until they or the district supply officer recommends a change. Supplies should be brought to them for immediate consumption and placed close-by for their use when daily distribution is compelled to stop. Plans should be made for the withdrawal of all unneeded transportation as the situation develops and for the assembling of all remaining transportation at pre-arranged bivouacs when the attack breaks.

g. Where customary lines of command has been designated to permit proper defensive groupings for tactical purposes, full use should be made of the supply officers of these organizations. In a Force of one or more brigades, there is no reason why B-4's and R-4's should not be placed in charge of supply in supply districts in order that F-4 may be assured of proper contact, liaison and supervision throughout the entire area involved. If a Force supply depot accompanies the Force, it would be proper to place all units in and about the depot in a group that would be supplied and cared for through the supervision of the Depot Quartermaster. If the Force Service Company carries the bulk of replacement supplies, the same would be true of the Force Quartermaster.

h. The requirements of a supply system that will meet any given tactical defensive situation are many and varied. Each is it's own problem and requires special study. There is, however, one statement, in this connection, that applies to the supply of any or all defense situations. As supply officer, you have men, vehicles and supplies at your disposal. Forget about how you saw it done somewhere ten years before and use these means to further the PRESENT tactical requirement.

7. CLASSES OF TRAINS AND TRANSPORT.—Trains are classified as Force trains, Brigade trains and Combat trains. The Force train or Brigade train will ordinarily be composed of one or more motor transport companies. Combat trains include the personnel and vehicles employed by regiments and smaller units for transporting combat and automatic supplies and water. These trains may operate in two sections; the ration section and ammunition section. Their control may be retained in the regiment or allocated to battalions or a combination of these methods may be employed. The balance of transport assigned to various units, not included in the train, is known as Unit Transport. In this group are found those vehicles usually assigned basically to units and rarely operating as trains. In this classification are such vehicles as

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artillery repair trucks, lighting unit trucks, stock-room trailers and similar vehicles for which the necessity to refer to as a "train" rarely occurs.

8. **ECHELONS OF SUPPLY.**—a. Depending largely upon the nearness to home ports, the amounts of the reserve echelon supplies may vary. Usually this echelon comprises all classes of supplies for a designated period, generally 30 to 90 days, which will accompany the Fleet Marine Force. The extent of this period depends upon the length of the line of communications to home ports, expected losses en route, available shipping, kind and amount of supplies to be obtained from the Fleet Base Force, the available resources in the theater of operations, and the resources and attitude of, and communication with, neighboring neutrals. The number of Units of Fire and the amount of other special supplies carried depends upon the preceding considerations and the anticipated tactical needs over the period in question. To minimize the chance of serious loss en route and to facilitate early landing of a part of reserve supplies, should such prove necessary, these supples are distributed both in kind and amount throughout the convoy.

b. **Force Supply Depot.**—Force Supply Depot, comprises the reserve echelon of supply accompanying the FMF, and constitutes the main source of supply for the landing force when operating ashore after conditions permit or require the landing of large quantities of material. It is operated by Force Supply Depot personnel.

c. **Time of Establishment.**—The amount of supplies constituting the echelon loaded on vessels with troops determines the time limit within which Force depots must be established. The manner of loading these supplies, the available landing and transportation facilities and the preparation of shelter will determine the time required for the establishment of the depot and the date on which a final decision must be made as to its location. Considerations of shipping and the guarantee of a constant flow of supplies will tend towards an early establishment.

d. **Location.**—These depots may be set up on the original landing beaches; at some other more sheltered part of the coast; within the harbor of an advanced base after its possession has been realized; or as an alternate plan, Force dumps may be established at some or all of these places successively or in combination. The large amounts of supply in the Force echelon render shelter from the sea and docking facilities, most desirable. In the selection of sites due consideration must be given to the plan of operation, landing facilities, system of communications, methods of distribution, traffic requirements, security, and the location and requirements of other naval installations. To minimize damage from air attack each group of supplies should be distributed among a number of widely separated localities.

e. **Distribution.**—Distribution to units is effected by Force Supply personnel at the depots and at distributing points inland within a radius of action of unit trains as required. These points

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should be located off main traffic routes and should provide defilade, overhead cover, and space for trains and turn around.

f. **Allocation of Distributing Points.**—Force will establish distributing points generally as follows:

Automatic supplies and water: by grouping trains at bivouacs. Two to four distributing points facilitate distribution.

Infantry ammunition: one for each brigade or for each sector in defense.

Artillery ammunition: minimum of one; the distance between artillery regiments may require a distributing point for each regiment. A widely extended defensive organization may require for units, including heavy artillery units and for sector reserves, an initial provision of 2 to 5 Units of Fire, and 10 to 30 days of other special and automatic supplies.

Signal: one with the signal company at Force headquarters.

Engineers: according to conditions, engineer tools and material; to reduce the hardship on troops, material should be advanced as far forward as conditions of cover permit and if possible distributed on, or close in rear of, the line on which the work is to be done.

9. WATER.—a. Troops will require a minimum of two gallons per man per day over a short period; ten gallons per day over an extended period. Supply of water and its issue to troops may present a vital problem. Knowledge of conditions with respect to water supply in localities where military operations are contemplated is a basic item of administrative intelligence which should be included in any study of the locality prepared by the Second Section. Plans for the provision of an adequate water supply for the FMF when serving ashore are the responsibility of the Fourth Section of the Staff. They must include provision of means for obtaining water from sources on land and for its distribution and issue.

b. In the attack, responsibility for the provision of water and its delivery to the distributing points on the beach rests with the Commander of the Naval Attack Force until an adequate supply of water from sources on land can be obtained. Thereafter, responsibility for its provision shifts to the Engineer Officer of the FMF, who is charged with the installation and operation of all means for its supply.

c. In the defense of a base, responsibility for water supply remains with the Commander of the Base Force, though allocation thereof, in part, may be made to the Engineer Officer of the FMF for supply in designated areas providing adequate sources.

d. The Marine Corps type of water purifier weighing 7000 pounds has a capacity of 35 gallons per minute of chlorinated filtered water or 75 gallons per minute of filtered water. It can force water 175 feet vertically. Gasoline consumption is one gallon per hour.

e. Water is obtained at designated distributing points, distributed to subordinate organizations and issued to troops by the appropriate unit supply officers. The same method of distribution is applicable to defensive situations.

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10. **TONNAGE TABLE.** The following table shows the tonnage (long ton) involved in the consideration of supplies. These figures are primarily for use in shiploading and for that reason include items that may not necessarily have to be hauled to organization dumps. These figures may, however, be considered the maximum quantities involved. They are based on War Strength Organization Tables and Tables of Equipment in effect in the Marine Corps at the time this Manual was originally compiled. No unit below the company or battery has been listed.

	ONE DAY (Group 11) AUTOMATIC SUPPLIES		Group 10
Organization	Rations Long tons	All other Long tons	One unit of fire Long tons
INFANTRY			
Rifle Company	.47	.004	1.16
Machine Gun Company	.52	.007	2.45
Battalion	2.22	.239	6.08
Regiment	7.49	1.26	18.46
ARTILLERY			
75 m/m Battery (PH)	.46	.32	16.57
75 m/m Battalion (PH)	1.77	1.07	49.60
75 m/m Regiment (PH)	4.1	3.3	99.63
155 m/m Battery	.51	.08	26.38
155 m/m Battalion	1.23	.25	52.84
155 m/m Regiment	4.06	.97	158.71
ANTI AIRCRAFT			
Gun Battery	.36	.13	17.27
Machine Gun Battery	.54	.09	9.20
Searchlight Battery	.29	.05	.23
Battalion	2.56	.69	67.95
Regiment	5.56	1.52	141.98
AVIATION			
Hdqtrs. Squadron	.28	.005	.22
Service "	.81	.20	.76
VJ "	.44	4.88	14.86
VO "	.59	3.67	26.69
VB "	.53	3.67	26.20
VF "	.53	3.67	26.20
ENGINEERS			
Company	.38	.18	1.70
Battalion	1.32	.79	5.57
CHEMICAL COMPANY	.50	.06	8.16
LIGHT TANK COMPANY	.35	.92	2.44

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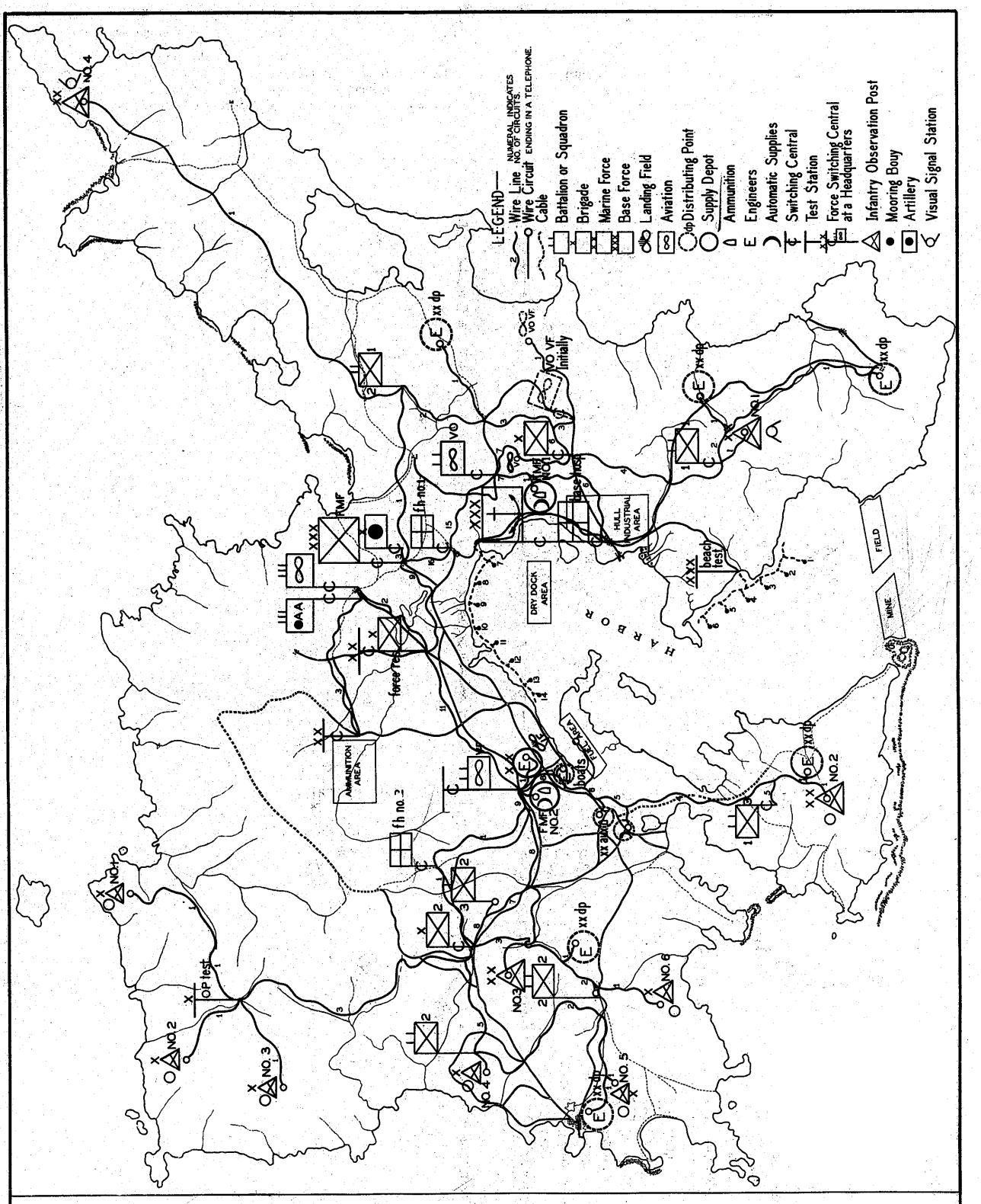


PLATE "A"

Line-Route Map of a base defense wire installation. Only trunks and long locals are shown. Of the Naval Base Force Headquarters installation only circuits to ships at bouys are shown. All artillery circuits are omitted. All antiaircraft circuits are omitted except one to the ammunition area. All battalion circuits are omitted except to distribution points for engineer supplies located in the battalion sub-sectors.

For artillery communications see artillery chapter.

For antiaircraft artillery communications see antiaircraft artillery chapter.

For illustration of a battalion sub-sector wire installation SEE PLATE "C."

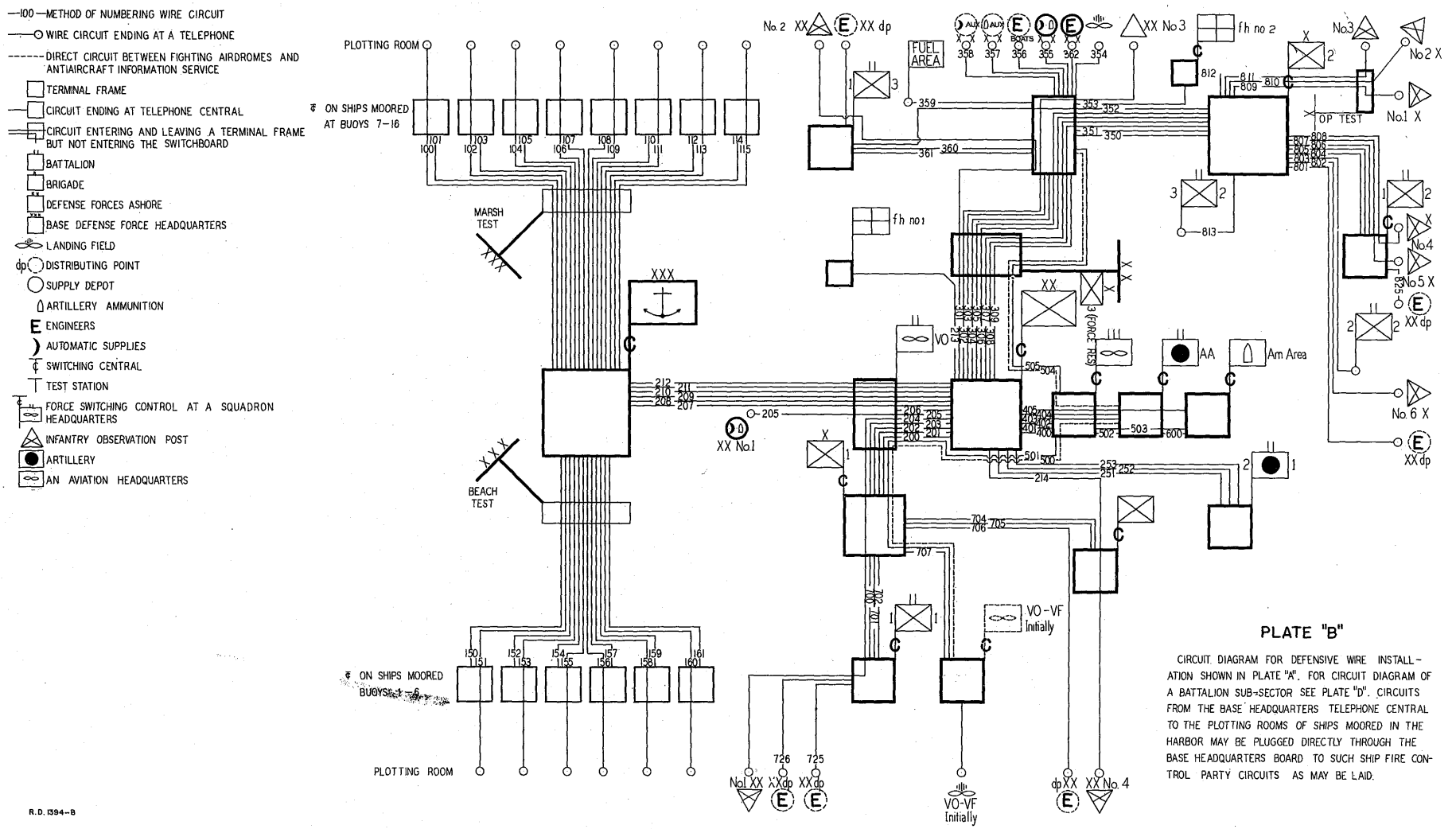


PLATE "B"

CIRCUIT DIAGRAM FOR DEFENSIVE WIRE INSTALLATION SHOWN IN PLATE "A". FOR CIRCUIT DIAGRAM OF A BATTALION SUB-SECTOR SEE PLATE "D". CIRCUITS FROM THE BASE HEADQUARTERS TELEPHONE CENTRAL TO THE PLOTTING ROOMS OF SHIPS MOORED IN THE HARBOR MAY BE PLUGGED DIRECTLY THROUGH THE BASE HEADQUARTERS BOARD TO SUCH SHIP FIRE CONTROL PARTY CIRCUITS AS MAY BE LAID.

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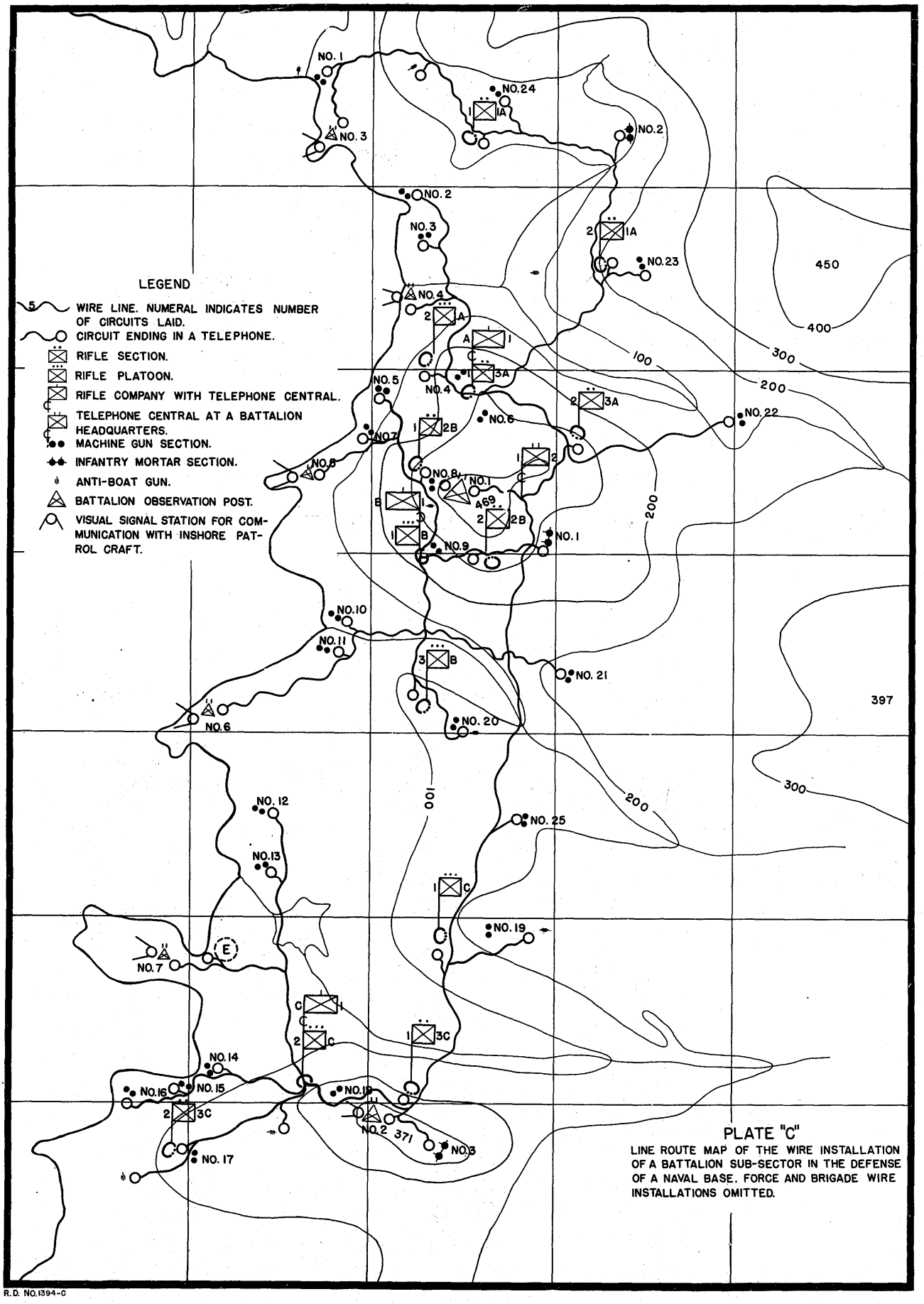


PLATE "C"

LINE ROUTE MAP OF THE WIRE INSTALLATION OF A BATTALION SUB-SECTOR IN THE DEFENSE OF A NAVAL BASE. FORCE AND BRIGADE WIRE INSTALLATIONS OMITTED.

R.D. NO. 1394-C

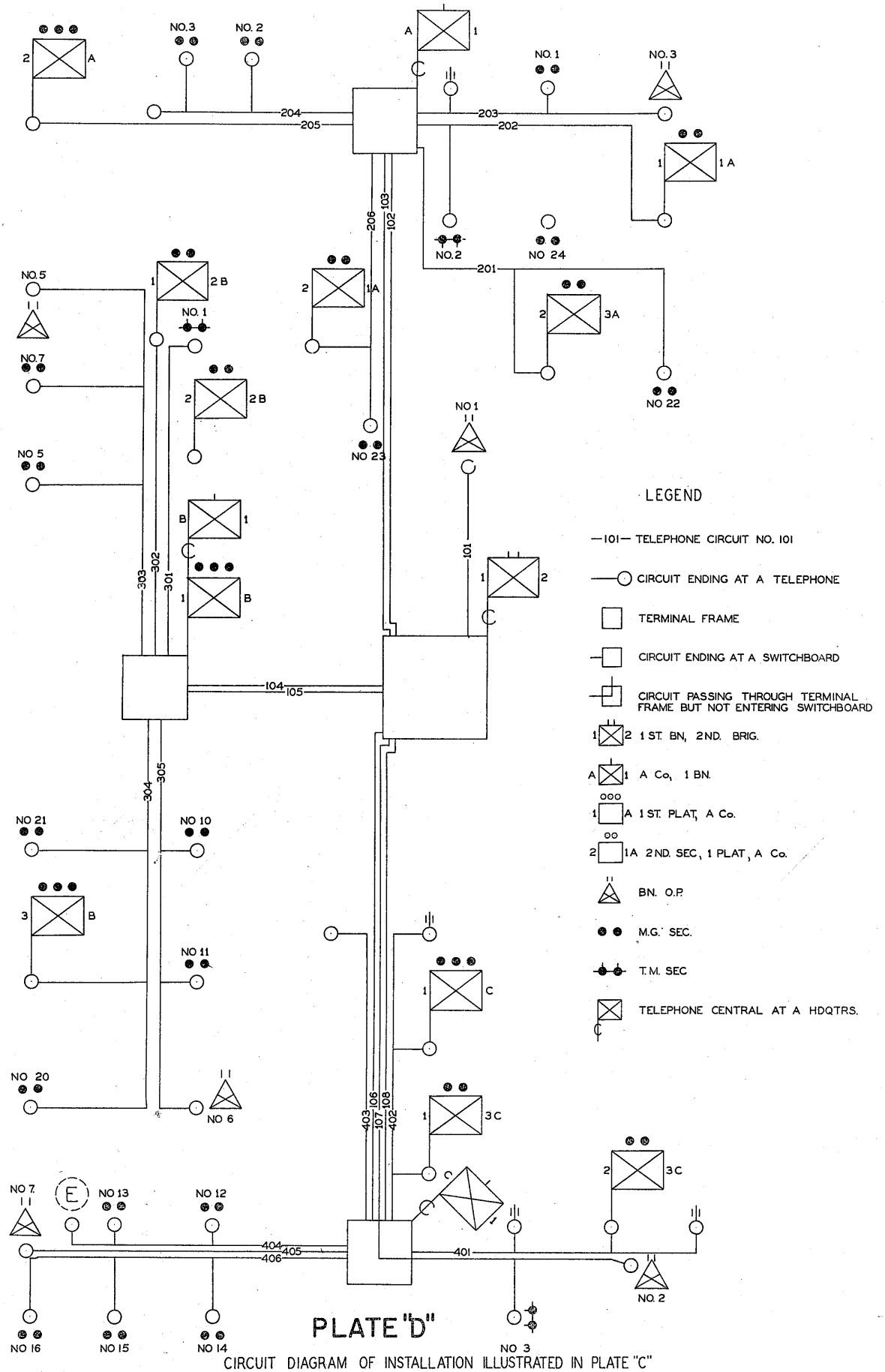


PLATE "D"

CIRCUIT DIAGRAM OF INSTALLATION ILLUSTRATED IN PLATE "C"

R.D. NO. 1394-D

ORGANIZATION	FREQUENCIES
Comdr. Base Force	X X
Comdr. Land Def. Force	X X X
Inshore Patrol Craft	X X X X X X
1st. Brigade	X X
Bns.	X
2d. Brigade	X X
Bns.	X
O.P's.	X
3d. Brigade Reserve	X X
2d. & 3d. Bns	X
1st. Bn. 3d. Brigade	X
A.A. Group	X X X X X
Artillery Group	X X X
Airons	X X X X
V.O. Airdrome	X
V.F. Airdrome	X
Inf. Liaison Planes	X X X X
Artillery Planes	X X X
Command Planes	X X
Tactical Recon.	X
Distant Recon.	X
Land Def. Force O.P's.	X
Ship Fire-cont. Parties	one per party, as required.

PLATE "E"

Distribution of radio frequencies in a Naval Base Force. —— Normal naval frequency requirements omitted.

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