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Advanced Base Operations in Micronesia



U.S. Marine Corps

PCN 14012460000

DEPARTMENT OF THE NAVY
Headquarters United States Marine Corps
Washington, DC 20380-0001

21 August 1992

FOREWORD

1. PURPOSE

Fleet Marine Force Reference Publication (FMFRP) 12-46, *Advanced Base Operations in Micronesia*, is published to ensure the retention and dissemination of useful information which is not intended to become doctrine or to be published in Fleet Marine Force manuals. FMFRPs in the 12 series are a special category: reprints of historical works which are not available elsewhere.

2. SCOPE

Most of this reference publication was written by Major E. H. Ellis in 1921 when he perceived the coming war with Japan and made this effort to describe where the conflict might be fought and the manner in which it would be carried out. Included in this reference publication are a short biography of Major Ellis, the text of the original manuscript, and other war plan papers that seem to have been written at about the same time. The volume is priceless as it shows very clearly Major Ellis' thoughts and his extraordinary accuracy, especially in the light of a 20-year-gap between his writing and the actual outbreak of hostilities. Extremely fascinating, this volume is essential to understand what was evolving in the Marine Corps before World War II to prepare for that conflict.

3. DISCLAIMER

Alcoholism was not Ellis' only defect. In parts of his writings, there is a racist tone that is as undeniable as it is regrettable. It accurately reflects the sentiments of a substantial, if not predominant, segment of American society in the early 20th century. These racist views had tragic

consequences. They helped precipitate the diplomatic climate which contributed to the outbreak of war in the Pacific. Further, a belief in an innate racial superiority made military strength seem less critical from a national perspective, and that fostered the lack of preparedness for war against Japan. That belief also caused many Americans – in and out of uniform – to experience a rude shock when U.S. forces encountered first-hand the genuine fighting abilities of the Japanese armed forces. In short, it must be realized today that these racist attitudes helped to cause the war as well as probably to raise the number of American casualties in the early months of the Pacific War.

The important thing, however, is that this manuscript is not being printed to advance or support the racial biases of Ellis. Instead, we seek only to *learn* and to gain professional military knowledge from his writings despite their reprehensible aspects. From that perspective, a little analysis reveals some useful gems. While the U.S. did not prevail because of a race-based “superiority in the use of hand weapons and in staying power,” it did win because of a superior use of the tools of war and also because of a greater national staying power based on the huge American industrial base and a larger population. These strategic advantages allowed the U.S. to survive its initial defeats and go on to victory.

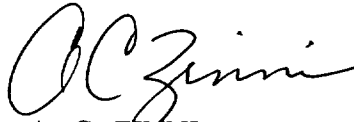
If Ellis’ views on the Japanese were a reflection of his time, so were his views on gas warfare. Ellis’ statements regarding the use of gas reflect both American experience with gas in World War I and the prevailing laws of war. During the fighting in France, American forces had used gas freely against their German enemies, and frequently they had been on the receiving end of German gas weapons. Based on that combat experience, Ellis assumed Americans would use gas in any war against Japan. In the event, however, that did not occur for the U.S. abided by its policy against being the first to use gas on the battlefield.

The key point to note is that Ellis’ text clearly lays out the real reason gas has not been used in wars between modern armies. Since 1918, no army has used gas against an opponent which could respond in kind. Gas is simply too much of a double-edged sword – it cuts both ways and can be as dangerous to the using army as to its opponent. Ellis lays out the case well, and it is these problems with gas – not international law – which have been the real grounds for not using gas. International law once prohibited the use of the crossbow in warfare, but it remained on the battlefield until supplanted by firearms. The weapon was simply too useful and effective for armies not to use it. Gas, the double-edged sword, does not meet those criteria.

4. CERTIFICATION

Reviewed and approved this date.

BY DIRECTION OF THE COMMANDANT OF THE MARINE CORPS

A handwritten signature in black ink, appearing to read "AC Zinni".

A. C. ZINNI

Brigadier General, U.S. Marine Corps
Deputy Commanding General
Marine Corps Combat Development Command
Quantico, Virginia

DISTRIBUTION: 140 124600 00



Major Earl H. Ellis

MAJOR EARL H. ELLIS, USMC

Major Earl H. Ellis was a brilliant Marine officer whose superb skills as a planner helped forge the modern Marine Corps and its Fleet Marine Force. Though Major General Commandant John A. Lejeune was the guiding light, he trusted Ellis with the job of translating concepts into concrete plans.

Ellis' brilliance in planning was only one aspect of a complex personality. He served the Marine Corps with a single-mindedness which left no time for marriage and which damaged his health and ultimately cost him his life. Ellis frequently worked on assignments around the clock, without sleep, until physically and mentally exhausted. This proclivity, plus alcoholism, put him in the hospital with mental breakdowns on more than one occasion. (In an era of promotions by seniority, these problems did not end his career as they would today.) His death in the Japanese-controlled Caroline Islands probably resulted from the effects of excessive drinking.

Ellis, who was not a college graduate, enlisted in the USMC in 1900. His talents earned him a commission just over a year later. His service prior to World War I involved the assignments typical for officers of the era. He became a first lieutenant in 1903, a captain in 1908, and a major in 1916. During World War I, Ellis received a temporary promotion to lieutenant colonel but reverted to his permanent rank after the war. During the war, he served as a principal staff officer to Lejeune when the latter commanded the 4th Marine Brigade and then the 2d Division in France. The close relationship, which actually began in the Philippines in 1908, continued after Major General Lejeune became Commandant of the Marine Corps.

Service at the Naval War College as a student and faculty member (1911-1913) was a turning point in Ellis' career. This tour of duty came during the period when the Naval War College was a major participant in the development of the Navy's war plans. One of these was War Plan Orange, which grew out of the need to defend the recently acquired Philippines and from the perception that Japan was the most likely enemy in a future war in the Pacific. War Plan Orange served as the basis for a groundbreaking paper by Ellis on the theoretical basis for doctrine covering the defense of advance bases.

After World War I, the naval services again turned their attention to War Plan Orange and the problems of a naval campaign against Japan. Study was necessary because the strategic situation had changed radically. Japan, which was on the Allied side in World War I, had captured islands previously occupied by Germany. These islands provided Japan with bases suitable for launching attacks on the Philippines and other American possessions in the Pacific. The altered strategic situation meant that a war with Japan would have to include amphibious assaults for capturing island bases for subsequent fleet actions. This reality served as the basis for the Marines' development of amphibious warfare doctrine and for the formation in 1933 of the Fleet Marine Force.

The first tangible step by the Marines came from Ellis. Working virtually around the clock during early 1921, he developed Operation Plan 712, *Advanced Base Operations in Micronesia*. This plan stood the test of time; 20 years later, during World War II, the actual American campaign for Micronesia diverged from Ellis' plan only in areas affected by technological advances.

The effort to develop Operation Plan 712 was not without cost to Ellis. He suffered several reoccurrences of his earlier mental and physical problems. He was under medical supervision and treatment for much of the time he worked on the plan.

At the completion of his plan, Major Ellis received permission to travel to Japanese-held Micronesia in the guise of a civilian. En route, he had to be hospitalized in Japan for alcohol poisoning and nephritis, a disease of the kidneys. He managed to get to Micronesia but was under close Japanese surveillance. In May 1923, the Japanese authorities announced that Ellis had died on the Micronesian island of Korrör. While there was some speculation that the Japanese had killed him, the most likely cause of death was alcohol poisoning and nephritis.

Major Earl Ellis' writings and plans made him a major architect in the development of the modern Marine Corp. Ellis Hall, the home of the Marine Corps' Command and Staff College at Quantico, VA, pays tribute to his memory and contributions.

Notes on Presentation of this Document

The material entitled “War Portfolio – U.S. Marine Corps” seems to be a draft or working document dating from around 1921. The text refers to charts which appear to be missing. Readers should use or quote this material with care.

The paper appears in this volume solely as an example of the planning undertaken to support Marine Corps operations expected during execution of the then current version of “War Plan Orange.”

To make this historical work more readable, minor grammatical and structural changes have been made:

A table of contents has been added.

In the “War Portfolio,” handwritten changes of uncertain date have not been incorporated. Unclear references to charts, curves, and graphics are unaltered.

The index has been moved to the end. Its page numbers now agree with this publication.

Typographical errors have been corrected. Minor capitalization and punctuation changes have been made. Some clearly legible sentences do not make sense, possibly because words were omitted. Words added are in brackets.

Those who wish to study the original documents may apply to the Marine Corps Research Center, Quantico, VA, 22134.

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U. S. MARINE CORPS

712H Operation Plan

ADVANCED BASE OPERATIONS

IN

MICRONESIA

1921

Approved by the M.G.C. 23 July 1921

- Contains:
1. War Portfolio, U.S. Marine Corps.
 2. Work Sheet to Accompany War Portfolio.
 3. Advanced Base Operations in Micronesia by Major Earl H. Ellis, U.S.M.C.

INTELLIGENCE SECTION

DIVISION OF OPERATIONS AND TRAINING

U.S. MARINE CORPS

SECRET
AO-41-cel.

July 23, 1921

The attached War Plans are approved.

JOHN A. LEJEUNE.
Major General Commandant.

WAR PORTFOLIO—U. S. MARINE CORPS

INTRODUCTION

Section A: Purpose of War Portfolio, U. S. Marine Corps —

(a) To set forth for the information and guidance of those concerned:

(1) War Plans based upon existing conditions which can be put into effect immediately.

(2) Development Plans, i.e., plans for development of the Marine Corps beyond that now authorized as may be required to insure a satisfactory condition of readiness for the prosecution of effective and economical war against our most probable enemies.

(b) To serve as a guide for the coordination of all the peace activities and training of the Marine Corps towards reaching and maintaining the prescribed condition of readiness to execute the War Plans.

The War Plans to be used in case of threatened war (Orange only completed) [are] included in Book I, Part I, and in Book II. [Note: No Book II is in this document.]

BOOK I - PART I

Organization of the U. S. Marine Corps upon which the War Plans are based:

Strength: Strength of Corps authorized by law 27,400
Average strength permissible under
appropriation fiscal year 1922 21,000

Organization: The Corps is organized into detachments, companies, battalions, regiments and higher organizations as demanded by existing conditions. No unit is necessarily permanent, though many companies have been in existence for a long period of time. Officers and many different units have been trained in the duties of Field Artillery, Heavy or Army Artillery, Ships' batteries, Signal duties, Engineer duties, aviation, etc.; in brief, all duties necessary to make the Corps an independent fighting force on land and in the air.

Stations: The Corps is stationed as indicated in Navy Register 1921.

Those organizations now in existence which must be expanded for war are as indicated on Chart "A."

This chart also shows navy yard detachments which will be relieved in time to join the organizations indicated at the place and on the date specified.

CONDITIONS OF READINESS FOR WAR DURING PEACE

1. It will be observed that only those forces under head "Availables" [in] Chart "A" are in readiness to take the field (if not already there), immediately; that no greater condition of readiness can be maintained until an increase in the strength of the Corps over that now appropriated for is authorized by the President; and that in time of peace the President can authorize an increase up to 27,400.

Showing men who become available, for organizations (not join organizations) in time of peace should President authorize.

27,400

<u>Name of Force</u>	<u>Condition "C"</u> <u>Present Strength</u>	<u>Condition "B"</u>			
		<u>Days</u> <u>10</u>	<u>Days</u> <u>20</u>	<u>Days</u> <u>30</u>	<u>Days</u> <u>40</u>
1st Brigade	1,696		5,000 Recruits)		
2nd Brigade	2,153		with 5 weeks)		2,653
3rd Brigade	1,453		training)		3,433
4th Brigade	2,283		added)		4,783

For condition "A"—see Chart "A"; time required to fill organization after war has been declared.

ORANGE PLAN FOR PRESENT CONDITIONS

PEACE POLICY

1. Under normal conditions, the 3rd Brigade and 4th Brigade of Advanced Base Force will be maintained at Quantico, or San Diego or both places, as noted under "Available," Chart "A." The 1st and 2nd Brigades in Haiti and Santo Domingo are subject to change of station with changing political conditions. They will be maintained, however, either on active service in the field or, during periods of quiescence, at Quantico or San Diego, or both.
2. When [a] tense diplomatic situation develops and war in the near future is considered possible, men for these brigades may be obtained as noted under Condition "B."
3. When war has been declared, the mobilization scheme as for Condition "A" in Chart "A" will be carried into effect.

PREPARATORY MEASURES—MOBILIZATION PLAN

The execution to be commenced at least 30 days prior to D. Day:

1. Prepare and have ready to send out orders to (1) active officers; (2) retired officers; (3) reserve officers. These officers to fill vacancies in the war organization, or to relieve active officers for that purpose. Number required shown in Officer Requirement Curve on Organization Curve "B."
2. Prepare and have ready to send out orders to reserves to proceed to station previously determined to meet requirements shown in Curve "C," Increase Marine Trained Personnel."
3. Prepare and have ready orders to desirable civilian officer material, to report at training center. The number to be sufficient to meet the requirement of Officer Requirement Curve on Organization Curve "B."
4. Accumulate stores and supplies other than war organizational equipment at ports of departure to meet Requirement Curves_____.
5. Request assignment of ships to ports for transfer of personnel as shown in Graphic "D," and to transport the material and supplies shown in Requirement Curve "F," Ordnance, Material and Technical Supplies.
6. Provide housing accommodations to meet recruit reserve and reenlisted flow Mare Island and Parris Island, Curve "E." Provide housing accommodations to meet organizational requirements in U.S., Curve____. Provide for purchase and transfer of material for construction of housing facilities for organization in Hawaii, Graphic_____.

PLAN D. DAY

1. Put into execution all measures prepared for above.
2. Induct reserves, re-enlist men and recruits, as shown in Curve "E."
3. Assign and transfer trained personnel to organizations 1st, 2nd, 3rd and 4th Brigades as shown in Curve "C" Chart "A."
4. Transfer organizations or parts thereof to Hawaii as shown in Graphic "D."

1st Phase: Mobilize 1st, 2nd, 3rd and 4th Brigades in Hawaii. Conduct intensive training, etc. (Detailed study Enclosure 1) [Note: Enclosure 1 is missing.]

2nd Phase: (a) Be prepared to accompany Fleet and reduce enemy resistance in Marshall Islands; to hold there a temporary base for our fleet and to deny the use of the remaining available island[s] or atolls suitable for bases to the enemy.

(b) Be prepared to reduce Caroline and Mariana Islands in like manner and to recapture Guam, if it has fallen to the enemy.

(c) Be prepared to capture and hold suitable base or bases from which our Fleet can exert decisive pressure upon Japan and can take advantage of every opportunity to bring the enemy's naval forces to action.

To accompany War Portfolio

Work Sheet.

Keep posted, as different departments complete work assigned.

Charts, Curves and Graphics—covering Mobilization Plan—
with notation of work based on same which must be completed
by various Staff Departments.

<u>Designation</u>	<u>Function Performed</u>	<u>Work to be done and information to be obtained</u>	<u>By</u>
Curve E	Shows point of entry of Reserves, reenlisted men and recruits from D. Day.	Housing facilities to meet. Individual equipment to be supplied.	Q.M.
Curve F	Requirements in Rifles, Pistols, Machine Guns, Automatic Rifles, etc. Based on Curve 1 and Chart 3, Curve 4.	Amount on hand and possibilities of meeting requirements.	Q.M.
Chart A	Shows—Organizations in existence to be expanded for war, with number of units and men on hand—the number of units and men to fill up, the class of men who will fill up, with time and place of joining up. Basis for all Curves.	Complete equipment including reserve stores which must be assembled and transported—cu, contents, weight, ships necessary, etc.	

<u>Designation</u>	<u>Function Performed</u>	<u>Work to be done and information to be obtained</u>	<u>By</u>
--------------------	---------------------------	---	-----------

Organization Curve

Curve B	Shows process of building up 1st, 2nd, 3rd, and 4th brigades.	Organizational equipment necessary on dates when organizations are increased—showing amount on hand and possibilities of meeting requirements. Show cu. contents and wgt. of same for ship transport.	Q.M.
---------	---	---	------

Trained Personnel

Curve C	Shows time, locality and rate that trained men are made available for organizations	Housing facilities to meet same—cu. contents, wgt. [of] material to be transported and when.	Q.M.
Curve B	Requirement in Officers, based on Chart 3, Curve 4 and 5.	Means for meeting requirements. Letters to Reserve officers, Retired officers and to ex-officers to fill same. Letters to civilian material to fill requirements.	A.&I.
Graphic D	Shows time and place of departure of organizations or parts of same for Hawaii with time of arrival.	Requirements in shipping to be requested of Navy showing date of departure and arrival at Hawaii, place for transports and amount of stores to accompany troops—weight, cu. contents, etc.	

Note: 1. Department charged with meeting requirements will prepare statement as follows:

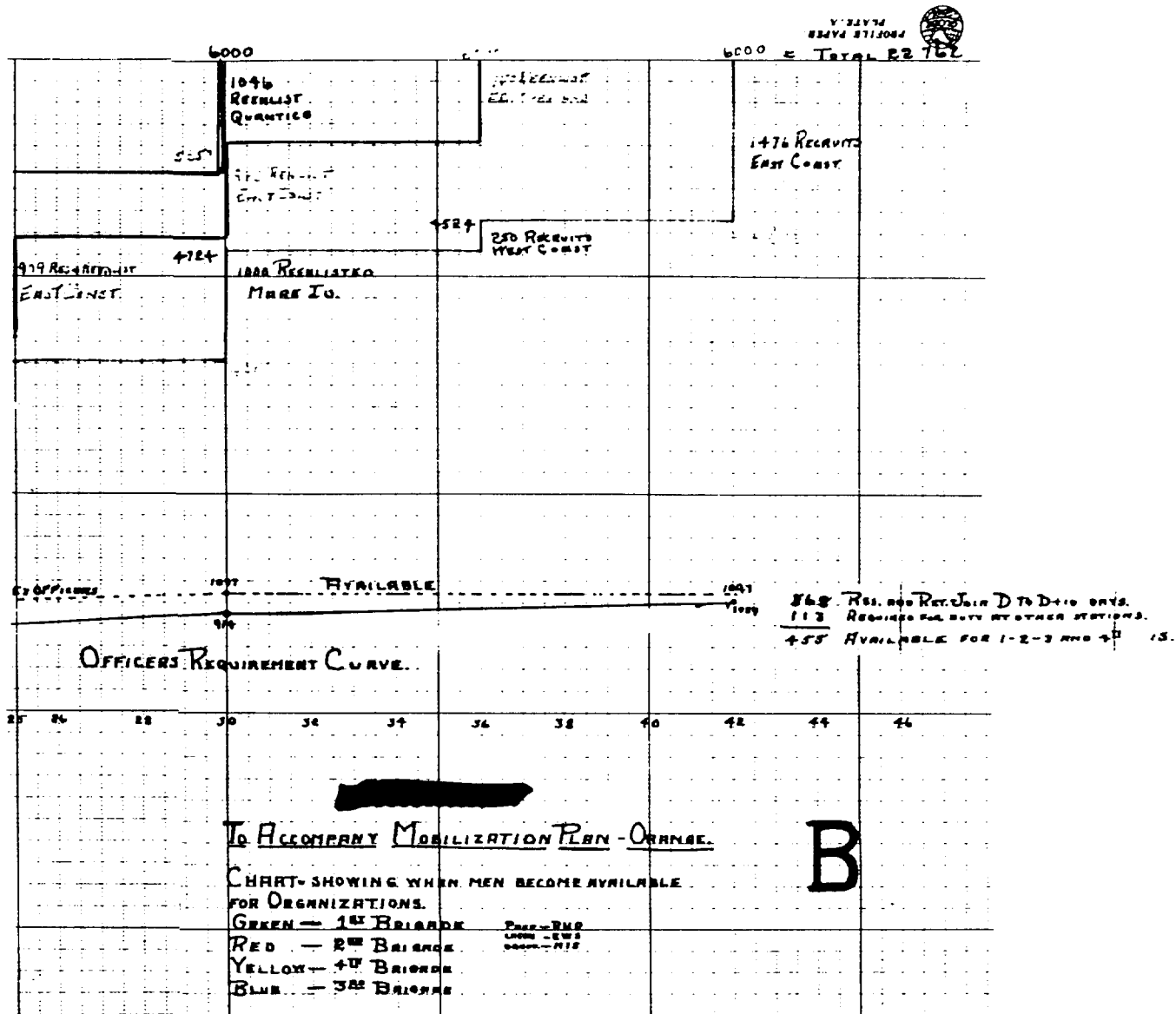
- (a) Amount or number on hand.
- (b) Amount or number that can be procured with existing facilities.

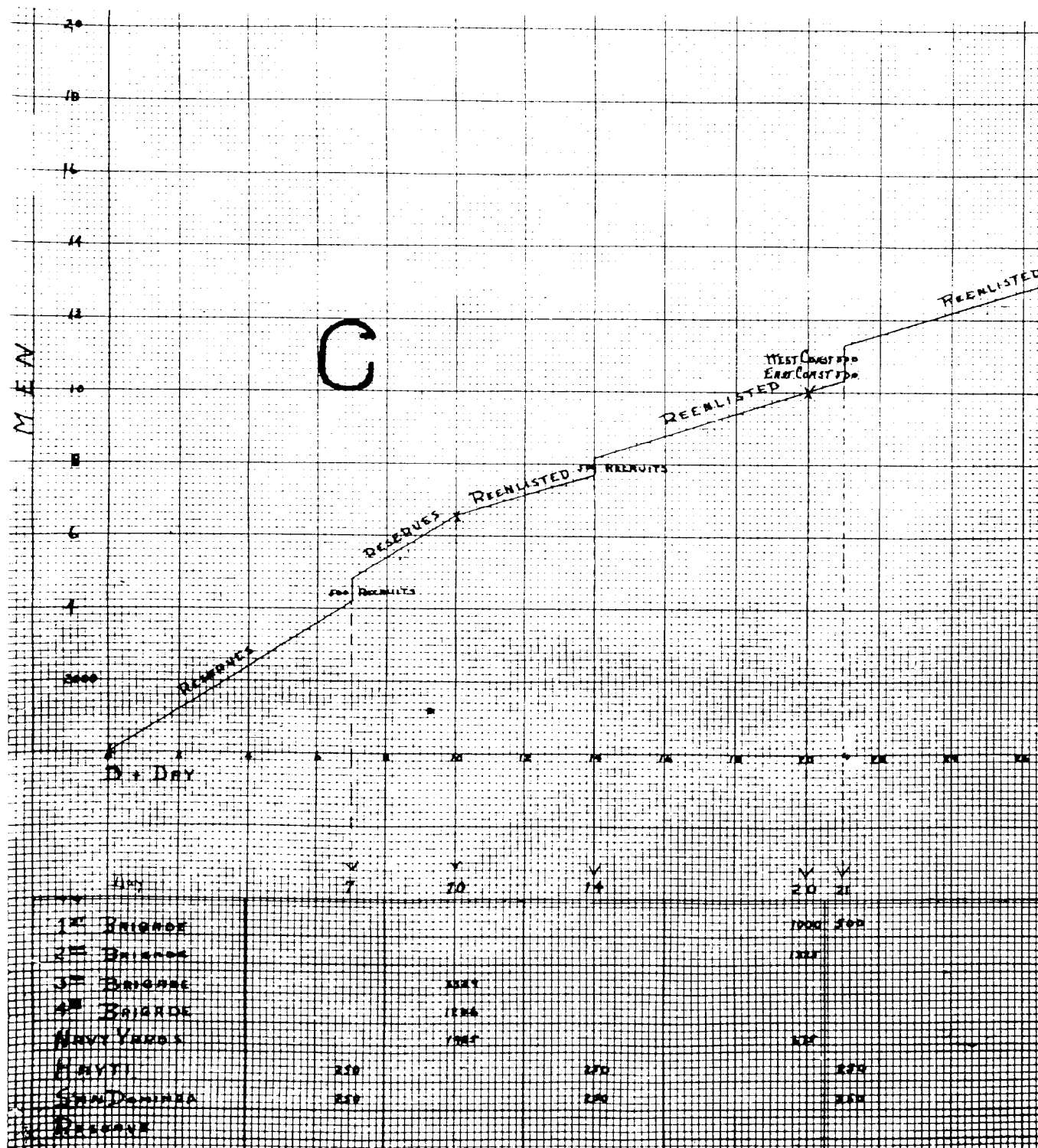
- (c) Amount or number that must be provided by accumulating reserve in time of peace and amount that will have to be procured by utilizing civilian agencies. In all cases it will show the method of meeting the requirement, or, if this is not possible, the amount which can not be procured.

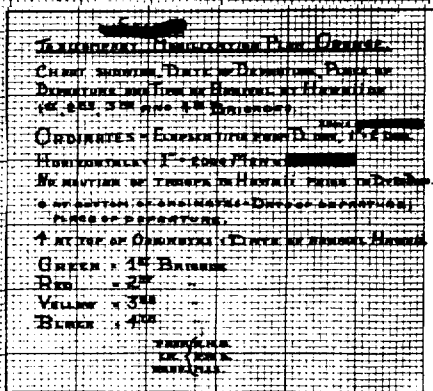
2. In meeting the Officer Requirement Curve, A.&I. shall have all letters and telegrams necessary for its accomplishment prepared in advance and in like manner orders for mobilization of reserves should be prepared in advance.

AVAILABLE				REQUIRED				REPLACEMENTS - REINFORCEMENTS									
CO.	NUMBER	MEN	LOCATION	CO.	NUMBER	MEN	LOCATION	STRENGTH	CLASS	MOBILIZATION	INSTRUMENT	DESTINATION	ROUTE	ISS.	TIME OF ARRIVAL		
1st BRIGADE																	
1st Regt.	1	45	HAWAII			80											
Service Co.	1	45				80											
Mach. G. Co.	0	0															
Howitzer Co.	0	0															
12 Inf. Co.	6	585				145											
2nd Regt.	1	45	HAWAII			80											
Service Co.	1	45				80											
Mach. G. Co.	0	0															
Howitzer Co.	0	0															
12 Inf. Co.	7	681				174											
3rd Regt.	1	45	HAWAII			80											
Service Co.	1	45				80											
Mach. G. Co.	0	0															
Howitzer Co.	0	0															
12 Inf. Co.	2	250				1250											
		1674				3547											
2nd BRIGADE																	
1st Regt.	1	45	San Diego			80											
Service Co.	1	45				80											
Mach. G. Co.	0	0															
Howitzer Co.	0	0															
12 Inf. Co.	6	585				145											
2nd Regt.	1	45				80											
Service Co.	1	45				80											
Mach. G. Co.	0	0															
Howitzer Co.	0	0															
12 Inf. Co.	8	753				297											
3rd Regt.	1	45				80											
Service Co.	1	45				80											
Mach. G. Co.	0	0															
Howitzer Co.	0	0															
12 Inf. Co.	6	585				145											
		2153				3547											
4th BRIGADE																	
1st Regt.	1	45	San Diego			80											
Service Co.	1	45				80											
Mach. G. Co.	0	0															
Howitzer Co.	0	0															
12 Inf. Co.	9	603				185											
2nd Regt.	1	45				80											
Service Co.	1	45				80											
Mach. G. Co.	0	0															
Howitzer Co.	0	0															
12 Inf. Co.	9	603				185											
3rd Regt.	1	45				80											
Service Co.	1	45				80											
Mach. G. Co.	0	0															
Howitzer Co.	0	0															
12 Inf. Co.	7	575				165											
		2153				3547											
5th BRIGADE																	
1st Regt.	1	45	San Diego			80											
Service Co.	1	45				80											
Mach. G. Co.	0	0															
Howitzer Co.	0	0															
12 Inf. Co.	9	603				185											
2nd Regt.	1	45				80											
Service Co.	1	45				80											
Mach. G. Co.	0	0															
Howitzer Co.	0	0															
12 Inf. Co.	9	603				185											
3rd Regt.	1	45				80											
Service Co.	1	45				80											
Mach. G. Co.	0	0															
Howitzer Co.	0	0															
12 Inf. Co.	7	575				165											
		2153				3547											
6th BRIGADE																	
1st Regt.	1	45	San Diego			80											
Service Co.	1	45				80											
Mach. G. Co.	0	0															
Howitzer Co.	0	0															
12 Inf. Co.	9	603				185											
2nd Regt.	1	45				80											
Service Co.	1	45				80											
Mach. G. Co.	0	0															
Howitzer Co.	0	0															
12 Inf. Co.	9	603				185											
3rd Regt.	1	45				80											
Service Co.	1	45				80											
Mach. G. Co.	0	0															
Howitzer Co.	0	0															
12 Inf. Co.	7	575				165											
		2153				3547											
7th BRIGADE																	
1st Regt.	1	45	San Diego			80											
Service Co.	1	45				80											
Mach. G. Co.	0	0															
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Howitzer Co.	0	0															
12 Inf. Co.	9	603				185											
3rd Regt.	1	45				80											
Service Co.	1	45				80											
Mach. G. Co.	0	0															
Howitzer Co.	0	0															
12 Inf. Co.	7	575				165											
		2153				3547											
8th BRIGADE																	
1st Regt.	1	45	San Diego			80											
Service Co.	1	45				80											
Mach. G. Co.	0	0															
Howitzer Co.	0	0															
12 Inf. Co.	9	603				185											
2nd Regt.	1	45				80											
Service Co.	1	45				80											
Mach. G. Co.	0	0															
Howitzer Co.	0	0															
12 Inf. Co.	9	603				185											
3rd Regt.	1	45				80											
Service Co.	1	45				80											
Mach. G. Co.	0	0															
Howitzer Co.	0	0															
12 Inf. Co.	7	575				165											
		2153				3547											
9th BRIGADE																	
1st Regt.	1	45	San Diego			80											
Service Co.	1	45				80											
Mach. G. Co.	0	0															
Howitzer Co.	0	0															
12 Inf. Co.	9	603				185											
2nd Regt.	1	45				80											
Service Co.	1	45				80											
Mach. G. Co.	0	0															
Howitzer Co.	0	0															
12 Inf. Co.	9	603				185											
3rd Regt.	1	45				80											
Service Co.	1	45				80											
Mach. G. Co.	0	0															
Howitzer Co.	0	0															
12 Inf. Co.	7																



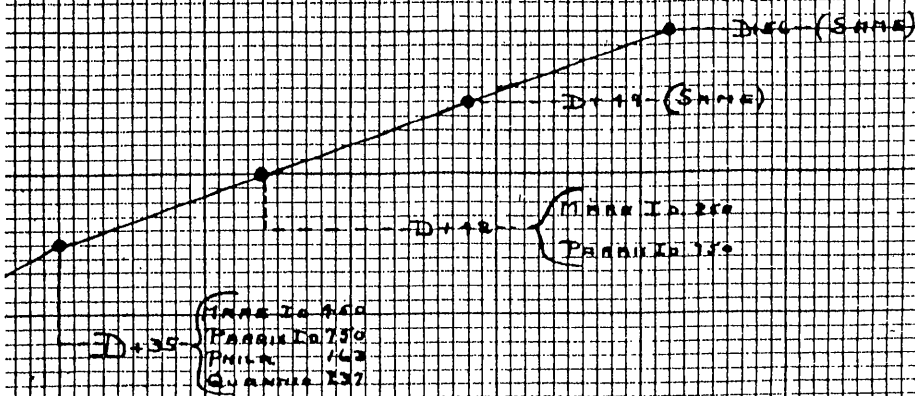






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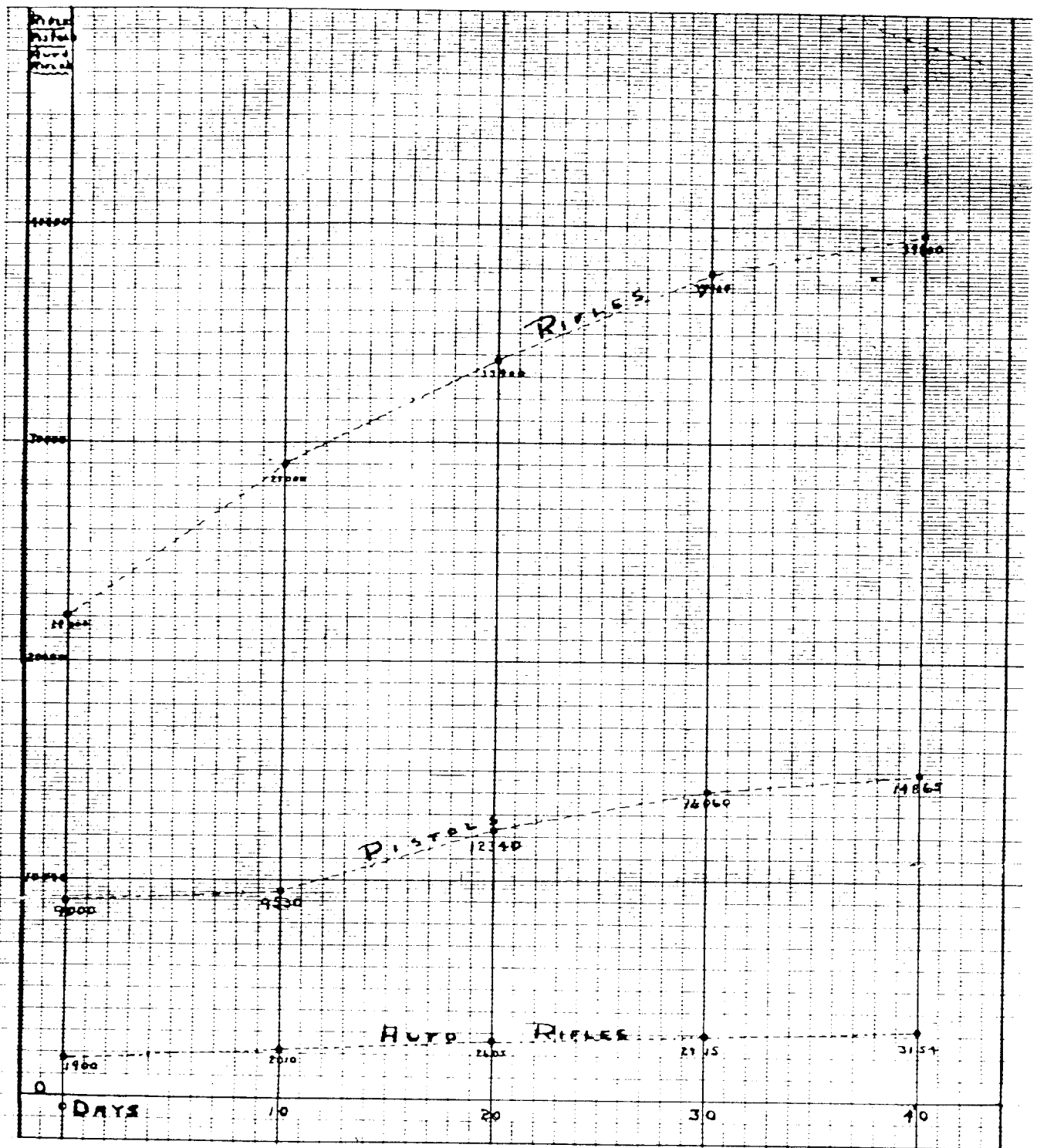
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PHANNA To 750
PHILIP 744
QUANTITY 700

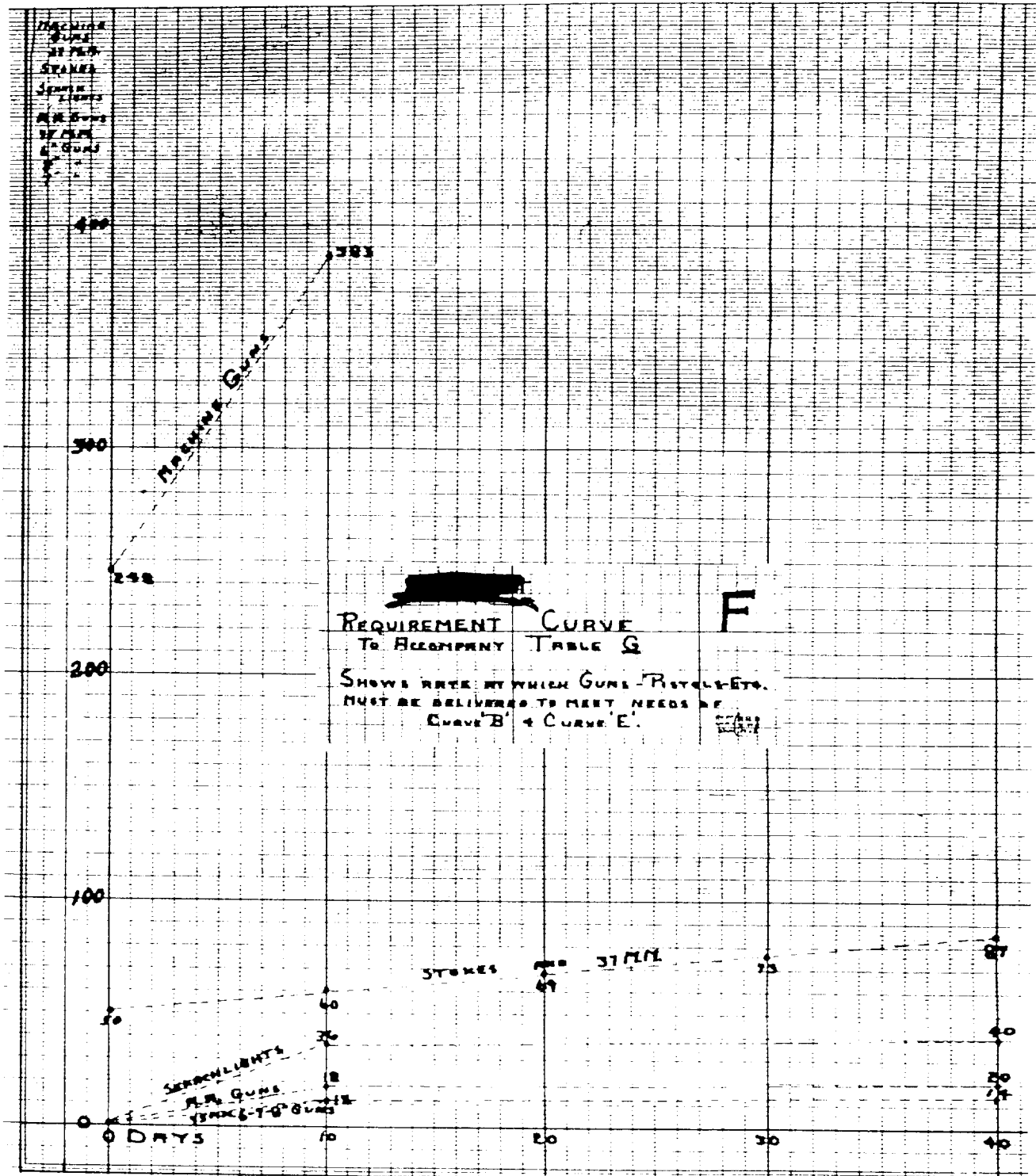
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To ACCOMPANY MOBILIZATION PLAN - ORANGE

CURVE OF ESTIMATED STRENGTH OF THE MARINE CO
SHOWING POSTS TO WHICH ACCESSIONS WILL BE
ASSIGNED.

PREP BY
ANALYST
ON 1947





AMMUNITION IN ACCORDANCE WITH ATTACHED TABLE TO BE SUPPLIED IN PROPORTION WITH
 REQUIREMENT OF DELIVERY OF GUNS - RIFLES AND PISTOLS.

1st - 2nd - 4th Brigade (3 Regiments each)

REQUIREMENT TABLE. ORDNANCE - AMMUNITION

Total Cos in 3 Brigades	Rifles	Pistols	Auto Rifles	Machine Guns	57 mm	Stokes	Rifle & Auto Rif- le Am @ 1000 & 3000 per	Pistol Am 200 per	Machine Gun Am @ 5000 per	57 MM 1000 per
9 Mgrs Cos	954	533	-	-	-	-	984000	64800	-	-
2 Serv Cos	954	533	-	-	-	-	984000	64800	-	-
1 M.G. Cos	-	1125	-	244	-	-	-	225000	720000	-
2 Mortar Cos	-	1125	-	-	54	54	-	225000	-	54000
102 Inf. Cos.	10152	5966	1944	-	-	-	5,832,000 10,152,000	799000	-	-
2nd Brigade										
3 Regiments.										
3 Mgrs Cos	518	111	-	-	-	-	518000	22200	-	-
3 Serv Cos	518	111	-	-	-	-	518000	22200	-	-
3 Sig Cos	518	111	-	-	-	-	518000	22200	-	-
3 Eng Cos	518	111	-	-	-	-	518000	222000	-	-
3 Air Serv Cos		359	-	-	-	-	-	67800	-	-
3 S.A. Cos	518	111	-	-	-	-	518000	22200	-	-
3 M.L. Cos	518	111	-	-	-	-	518000	22200	-	-
3 A.A. Cos		375	-	-	-	-	-	75000	-	-
3-75 MM	-	375	-	-	-	-	-	75000	-	-
3-4 in Tractor	-	375	-	-	-	-	-	75000	-	-
3-7 in Tractor	-	375	-	-	-	-	-	75000	-	-
6 in Tractor	-	375	-	-	-	-	-	75000	-	-
Sub Total	15,968	9,762	1,944	244	54	54	18,862,000	1,957,000	720,000	1000
Reserve	1,397	962	194	15	5	5	18,862,000	1,957,000	720,000	54000
Total Force	15,968	9,762	2,138	259	59	59	37,724,000	3,914,000	1,440,000	1000
1st 300 mm 114 Cos.	11,872	4,244	1,328	224	28	28	14,328,000	828,000	1,128,000	12000
FINAL TOTAL D-BAY	27,237	14,006	3,466	283	67	67	52,052,000	4,742,000	2,568,000	13000

NOTE:

37000 - REPRESENTS ONE (1) RIFLE FOR EACH MAN IN ORDNANCE WHICH PROVIDES SUFFICIENT RESERVE OF RIFLES.

A. FIGURES IN THIS LINE SHOW REQUIREMENTS FOR ALL MARINE ORGANIZATIONS OTHER THAN THE ADVANCED BASE

FORCE MODELING AT THE HAWAIIAN ISLANDS EXCEPT GUAM. THESE ARE ESTIMATED AT 14000MM.

WATER TRANSPORTATION REQUIRED BY MARINE CORPS TO CARRY OUT PLAN AGAINST GRANGE.

ORGANIZATION	PORT OF DEPARTURE (EAST COAST)	DATE OF DEPARTURE	ENLISTED STRENGTH	COMBINED STRENGTH
HAITI AND SANTO DOMINGO REPLACEMENTS	CHARLESTON S.C.	D + 7	800	
SAME.	CHARLESTON S.C.	D + 14	800	
4TH BRIGADE (PART) AND FORCE HEADQUARTERS	HAMPTON ROADS VA	D + 20	2104	
2ND BRIGADE (PART)	PHILADELPHIA PA	D + 20	1225	
HAITI AND SANTO DOMINGO REPLACEMENTS	CHARLESTON S.C.	D + 21	800	
1ST BRIGADE (PART)	HAITI (PORT AU PRINCE)	D + 22	1721	
2ND BRIGADE (PART) 909 1ST BRIGADE (1 MO. CO) 78	HAMPTON ROADS VA	D + 25	907	
2ND BRIGADE (ENTIRE)	HAMPTON ROADS VA	D + 25	4787	
2ND BRIGADE (PART)	SANTO DOMINGO	D + 27	2178	
1ST BRIGADE (PART)	(West Coast) MARIE ISLAND CAL	D + 28	2000	
1ST BRIGADE (PART)	MARIE ISLAND CAL	D + 30	2000	
4TH BRIGADE (PART)	SAN DIEGO CAL	D + 30	2000	
4TH BRIGADE (PART) 2ND BRIGADE (PART)	MARIE ISLAND CAL	D + 30	2000	
1ST BRIGADE (PART) 2ND BRIGADE (PART)	MARIE ISLAND CAL	D + 43	2000	
1ST BRIGADE (PART)	MARIE ISLAND CAL	D + 49	2476	

NOTE: Fuel for airplanes is not included as it is assumed special transportation will be provided for all motor fuel.

SUPPLIES, EQUIPMENT & AMMUNITION				DESTINATION	ROUTE	DES IRED DATE OF ARRIVAL	REMARKS
SPACE REQUIRED(CU. FT)		WEIGHT (TONS)					
Supplies Eqpt. etc.	Ammunition	Supplies Eqpt. etc.	Amm.				
44,800	2076	815.4	20.8	HAITI AND SAO DOMINGO	ATLANTIC OCEAN	D + 15 and D + 16	The weights and measurement do not include MG, 37 MM and Stokes Ammunition.
14,300	2076	148.4	20.8	HAITI AND SAO DOMINGO	Atlantic OCEAN	D + 22 and D + 23	DO.
89,820	9525	938.7	194.7	HAWAII	PANAMA	D + 50	The weights and measurement include MG, 37 MM and Stokes Am. for 3 Regiments
37,675	4784.5	391.5	80.5	HAWAII	PANAMA	D + 50	The weights and measurement includes MG, 37 MM and Stokes Am. for 1 Regiment.
14,300	2076	148.4	20.8	HAITI AND SAO DOMINGO	ATLANTIC OCEAN	D + 29 and D + 30	The weights and measurement do not include MG, 37 MM and Stokes Ammunition.
50,360	7686	525.4	110.6	HAWAII	OCEANIA MO AND PANAMA	D + 50	The weights and measurement include MG, 37 MM and Stokes Am. for 2 Reg.
20,644	2050	297.8	53.9	HAWAII	PANAMA	D + 55	The weights and measurement include MG Ammunition 1 MG Company.
203,640	120,781.7	2036.6	2977.3	HAWAII	PANAMA	D + 55	
63,040	8069	655.5	14.2	HAWAII	PANAMA	D + 56	The weights and measurement include MG, 37 MM and Stokes Am. for 2-3 Regt, 2- Stokes and 1 MG CO
23,750	4128	593.6	62.5	HAWAII	PACIFIC OCEAN	D + 51	The weights and measurement includes MG, 37 MM and Stokes Am for 1 Regiment.
20,560	2152	296.8	57.6	HAWAII	PACIFIC OCEAN	D + 41	The weights and measurement do not include MG, 37 MM and Stokes Ammunition.
57,120	4404	593.6	115.2	HAWAII	PACIFIC OCEAN	D + 42	DO.
54,821	4116	567.6	120.1	HAWAII	PACIFIC OCEAN	D + 49	DO.
42,040	3228	444.	86.4	HAWAII	PACIFIC OCEAN	D + 54	DO.
42,500	3122	435.	84.6	HAWAII	PACIFIC OCEAN	D + 60	DO.

ADVANCED BASE OPERATIONS IN MICRONESIA

PREFACE

The following study of advanced base operations in Micronesia has been made for the purpose of crystallizing ideas as to the future operations in that area, thus obtaining a sound basis for the preparation of plans of operation and mobilization, training schedules and materiel programs.

The problems which will confront the advanced base force in the theatre of operations considered are essentially similar to those which will be met with in any theatre of operations in which the Advanced Base Force is likely to operate.

INTRODUCTION

In order to impose our will upon Japan, it will be necessary for us to project our fleet and land forces across the Pacific and wage war in Japanese waters. To effect this requires that we have sufficient bases to support the fleet, both during its projection and afterwards. As the matter stands at present, we cannot count upon the use of any bases west of Hawaii except those which we may seize from the enemy after the opening of hostilities. Moreover, the continued occupation of the Marshall, Caroline and Pelew Islands by the Japanese (now holding them under mandate of the League of Nations) invests them with a series of emergency bases flanking any line of communications across the Pacific throughout a distance of 2300 miles. The reduction and occupation of these islands and the establishment of the necessary bases therein, as a preliminary phase of the hostilities, is practically imperative.

The fact that our fleet is projecting itself into enemy waters denotes that it will have considerable superiority in gun and torpedo carriers. This being the case the enemy will, during the first phase of the operations, hold his main fleet in home waters, and endeavor with torpedo, mine and air craft to reduce our superiority to a limit where he believes he can safely risk a main fleet action. The fact that more or less extended operations are necessary in order to secure our Pacific line of communications gives the enemy an unusually good opportunity for executing his plan.

The extent to which the Marine Advanced Base Force will participate in these operations will very likely depend upon the number of Marines available—*and their military worth in advanced base operations*. If skilled in ship-shore operations and inculcated with a high morale and offensive spirit, they will doubtless be used to the limit—if only for the sake of general economy of lives.

THE THEATRE OF OPERATIONS

The Sea

The Marshall, Caroline, and Pelew Islands form a "cloud" of islands, stretching east and west between the parallels of 4° and 12°30' North, and the meridians of 134° and 172°30' East. The Marshall Islands consist of two chains of low coral atolls composed of about 30 atolls or groups. The Caroline Archipelago, including the Pelews, comprises about 48 groups, of which 43 are of low coral formation, the other five being of high (basaltic) formation and encircled by fringing reefs (extending from the shore-line, practically bare at low tide).

Perhaps there is no other area in the world where navigation is more difficult than in that under consideration. Not only is it a veritable "cloud" of islands and reefs, but it has never been accurately charted. Oftentimes navigation is dependent entirely upon the eye. Stationed at the mast-head, preferably with the sun high and aft, the navigator directs the course amidst the patches of discolored water, light brownish in about three feet, clear green to darker at a fathom or more. Numerous vigias (reported reefs of which the existence or exact location is doubtful) have not yet been verified. One particular difficulty in clearing up charts has been that Nature here practices unusual deceptions in the way of cloud reflections, volcanic disturbances and movements of marine animal life, all causing discoloration or movement of the water surface similar to that caused by reefs. Another danger to navigation is that the islets and reefs usually rise abruptly from great depths, and most of the islands, being low, are very difficult to see at night.

The ocean currents to be met with are irregular and uncertain and are much influenced by the winds. South of 8° N. the currents run between east and NNE from one-half to two knots per hour. North of that line the currents will generally be found running to the westward at the rate of 1½ miles per hour. When near the island groups, the currents are sometimes deflected and always accelerated. The tidal streams in atoll and reef passages are generally very strong and cannot be calculated upon to turn with high and low water.

The tide undulation among the islands is of small elevation, having a mean height of about four feet, and varying from 1 to 7 feet.

The Air

The climate is considered very good, for the tropics. The temperature is extraordinarily uniform, the average annual temperature being about 80°. Clouds, decreasing through the day, are very prevalent, as is also rain, which falls generally throughout the islands on about 20 to 25 days in every month. Thunder storms are rare. Most rain falls during the months of June to October. The rainfall increases from north to south; droughts are prevalent in the northern islands.

In the Marshall Islands the NE trade blows from December to April, although in some years it blows very lightly or not at all. In these cases a SE variable wind blows. During the NE trade the weather is often squally, the wind shifting to E. and S. and back again. East winds blow from May to November, but are irregular as to force and duration. From August to November these winds are at times interrupted by strong SW winds (storms) and calms.

In the Caroline and Pelew Islands the NE trade blows with tolerable freshness and steadiness from about October to May. The SW monsoon blows from June to August, frequently broken by short spells of easterly trades. Strong S gales (storms) may blow in August or September. This is also the season for light winds and calms, the ban[e] of sailing craft.

Hurricanes or typhoons are unknown in the area under consideration, although typhoons in the China Sea are sometimes felt in the more westerly groups during the months from August to November. Yap has been subjected to several severe storms or typhoons.

By reason of prevalent clouds, rainfall and shifting winds, the air conditions do not seem to favor aerial navigation. These disadvantages are somewhat neutralized, however, by the numerous island groups where landing refuges may be available.

The Land

There are two distinct types of islands in the theatre of operations, as follows:

(a) The Coral type (including all but five of the islands):

These islands have formed on strips or rings of barrier reef surrounding a central lagoon, thus forming atolls. Their formation is due to constant and long continued disintegration of the barrier reefs, combined with the piling up of drifting seaweed and littoral vegetation, followed by a growth of the latter and ultimate decay. The shape of these islands, or keys, is generally long and narrow, the usual elevation not exceeding 40 feet.

The terrain of the coral islands is remarkably uniform. On approaching from the sea, one strikes first the gray barrier reef, rising abruptly out of the water; then, traversing coral shallows of varying width, one comes to a white sand beach extending up to high water mark. Then, proceeding inland, one finds coarse creeping grass and vines which bind the coral sand-soil with their matted roots, and also "flame," pondamus and hibiscus trees and the usual tropical growth, or cultivated areas — coconut trees, bananas, taro, yams, etc.

Water for drinking purposes is obtained by storing rain water, or from green coconuts (almost always to be found); for washing and bathing purposes by digging holes or wells in the center of the island. Well water on some of the larger keys is sometimes used for drinking purposes, but it is more or less brackish.

Coral formations are always well drained, and good camp sites may be found. It is probable that the beaches form the only available landing fields for land airplanes.

The lagoon anchorages formed by the atolls are sometimes of vast extent — up to 75 square miles. In many cases, however, they are so badly fouled by coral heads as to render their use by capital ships very hazardous. In other cases only certain portions of the lagoon are foul, there remaining in addition extensive stretches of clear anchorage space for ships of any draft.

Passages or breaks in the barrier reef, generally narrow and varying in depth, connect the encircled lagoon with the open sea. In the case of the small lagoons, the passages may suffice only for the passage of small boats, but the larger atoll anchorages always afford at least one navigable passage for the largest ships.

(b) The Volcanic (basaltic) type (including the islands of Kusaie, Ponape, Truk (or Hogolu), Yap and Babelthuab (all with detached inlets)):

These islands, with the exception of Yap (which is similar in formation to the volcanic section of Guam), are high masses of basaltic formation projecting from the sea and surrounded by fringing and, in some cases, barrier reefs. The islands are irregular in shape and vary in area from 35 to 150 square miles and in elevation from 1000 to 2900 feet. In places there are lagoons between the barrier and fringing reefs which permit of the navigation of the largest native boats at all stages of the tide. The fringing reefs are dotted here and there with volcanic islets, coral keys and flower-pot islets (so called from their profile).

The terrain of all the volcanic islands is practically the same. As one approaches from the sea, he probably strikes a barrier reef and a lagoon before coming to the fringing reef. Crossing the latter reef brings one to a belt of mangrove trees, interspersed with narrow, tortuous waterways, the extent of the belt evidently depending upon the alluvium deposit which has been washed down on the coral reefs from the volcanic slopes in the rear. Passing through the mangrove belt, one strikes a belt of nipa and betel-nut palms, tree-ferns and other jungle growth, or cultivated areas: coconut and bread-fruit trees, taro, yams, kava, etc. Proceeding up the mountain slopes, one finds good timber trees and jungle, together with grassy plateaus among the heights. In the case of Yap Island, the country is more open, and the mangrove belt practically disappears, being replaced by a belt of coconut trees about half a mile wide.

Interior communications are generally few and poor, the principal communication being via small native boats and coastwise schooners. Population and activities are concentrated in the coastal plains and lower valley stretches.

There is good and plentiful potable water on the larger islands as a rule, although the people of Yap have to depend upon stored rainwater to some extent in dry years.

Good camp sites are to be found. The availability of landing fields is not known, but it is probable that they are few and that more or less labor will be required to put them in condition for use.

The anchorages formed by the indentations in the islands, together with the [island] reefs, although comparatively numerous, are limited in area and suffice only for a few large vessels.

Besides, the passes connecting them with the open sea are generally narrow, tortuous and shallow. They would, however, form excellent bases for the light draft of a fleet, as they are generally protected from both wind and sea.

The Native Population

All islands and islets (excepting bare rocks) are inhabited, at least in certain seasons. The native inhabitants, numbering about 70,000, are a combination of the black, brown and yellow races: the remnants of successive waves of population rolling outwards from Indonesia. They were formerly fearless navigators and bold fighters, with high physical endurance and intelligence. This is amply proven by old legends and by certain ancient stone constructions yet to be seen. However, with the advent of the vices of the whalers, the ingrown fanaticism of missionaries and of bungling European colonization methods, the native gradually exchanged both barbarous vices and virtues for western vices and the more or less lazy and deceitful qualities of the usual native convert. All tribes are now supposed to be Christianized, although it is well known that there are occasional lapses back to old practices and many superstitions indulged in through remembrance of their former religion; a combination of ancestor worship and native spiritism. The opening up of trade, with its stimulus to industry, has also had a tendency to quiet the people and atrophy their native fighting propensities.

By reason of the mental upheavals caused by the outside influences mentioned, the natives are now in a transitory state. Lately their mental indigestion has been further complicated by the occupation of the islands by the Japanese, who have initiated an extensive educational program designed to loyalize the people to Japan. This probably includes a change to the Japanese religion, which somewhat resembles the former religion of the islanders. These widely varying influences have not only tended to alienate the natives from their former methods of life, but also have confused the native mind and broken up racial and tribal unity. It may be said that the tribal characteristics of today are in the main varying characteristics of the individuals who, for the most part, give trust and loyalty to none but themselves.

During our operations, a wise dispensation of money and preferment and a recognition of native leadership and customs will be the main factors in ensuring tranquility. Native resistance at the outset will depend mainly upon the ability of the Japanese to gain the friendship of the people and bring them to war temper. In some cases it is likely that they will be loyal and traces of the oldtime military morale will flash out in ambush, rushes, massacres and obstinate palisade defense in the jungle, and surprise landings or boardings among the reefs.

The dialects spoken among the islands are practically as numerous as the island groups themselves. Most root words can be traced to Asia, but they have been so modified by more modern influences (Malayan in particular) as to be almost unrecognizable. The dissimilarity in dialects has also been enhanced by long isolation from the mainland and between groups. The dialects spoken in the Marshall Islands are quite different from those spoken in the Carolines (due to the influence of the island groups to the south and east), and the Caroline dialects differ considerably from those of the Pelews and Yap, the latter islands being more influenced by the later Malays. Many natives throughout the islands speak English, having been taught by British and American whalers, traders and missionaries. It is probable that interpreters are plentiful; their loyalty depending upon the amount of their salaries.

The foreign population of the islands is probably about 2000 at the present time, this estimate including Japanese civilians but not troops.

The Economic Conditions

The general industries of the people include the cultivation of coconuts, bread-fruit, bananas, taro, yams, sugar cane, kava, etc.; the raising of goats and pigs and a few cattle (in the Western islands); and fishing. The chief families are the owners of the land, the ordinary natives being only tenants. The principal exports are copra, beche-de-mer (dried seaslugs) and tortoise-, turtle- and pearl-shell. The principal imports are cotton goods, canned food, sheet iron, cutlery, fishing tackle and novelties. The widespread and extensive fishing industry, together with general water-transportation needs, has brought into being a vast "native merchant marine," composed of outrigger canoes and praos. In addition, there are a number of inter-island and ocean-going schooners (sail and power), owned by white and Japanese traders, plying among the islands. These schooners take care of the main export and import trade. At the present time the Japanese traders have practically a monopoly on the trade, the Japanese military government having imposed such restrictions upon foreign vessels as to make competition well-nigh impossible.

Trading headquarters are generally established in the main island of each group, together with substations on adjacent islands. Exports are more or less concentrated by the native craft and then picked up by schooners. Stores are maintained on board ships or on shore, where the bartering is done. The peonage system of credit prevails more or less. Practically all of this business is carried on by whites, Japanese and Chinese (storekeepers). Rough rock landing stages for light craft, and rough warehouses have been constructed at many of these trading stations.

There are certain trading steamers (mostly Japanese) which visit the islands, particularly Anguar Island in the Pelew group, which has a regular line of steamers plying for the removal of the phosphate deposits. The only cable communications are at Yap Island, which is connected with Guam, Japan and Menado (Celebes). There are, of course, military radio stations on several of the islands.

Health conditions are considered good, for the tropics. Fevers and catarrh are common in or near the swampy belts and areas of the volcanic islands during the rainy season. Consumption, ring-worm and elephantiasis are also quite common among the natives. Leprosy and venereal diseases are rare. Epidemics of measles and small-pox have visited the islands from time to time, with very deadly results. While the native population has decreased rapidly during recent years, it is believed to be holding its own at present.

The main factor in the preservation of the health of our troops would be their encampment under their own shelter on high, well-drained ground open to the winds, especially the cleansing north-east trades.

The Enemy

Japan is a World Power, and her army and navy will doubtless be up to date as to training and materiel. Considering our consistent policy of non-aggression, she will probably initiate the war; which will indicate that, in her own mind, she believes that, considering her natural defensive position, she has sufficient military strength to defeat our fleet.

As previously stated, upon our entry into the theatre of operations, the enemy will endeavor with his torpedo, mine and bomb craft to reduce our superiority in gun and torpedo ships. In support of these operations he will defend with all arms certain points as bases for his sea forces and will mine or garrison others. On account of the fact that the enemy's main hope of victory lies in the defeat of our fleet, it is to be presumed that he will use land forces freely in connection with his sea operations. By a universal shore resistance the enemy will not only complicate and delay the course of our operations, but will create unusual opportunities for his own attacks. The points of resistance will, of course, be those upon which his own ships are based and those which would be of the most value to us. It is not likely that he would, as a rule, strongly fortify atoll anchorages for his own use, except those of the volcanic type, which afford ample facilities for his light forces. The atoll anchorages, best adapted to fleet use, he would probably deny by land forces and mines: using them until reduced only as emergency refuges and fuel depots.

The Japanese have had a great deal of experience in offensive ship-shore operations, and have always done well. It is expected that they will do equally well on the defensive, and will have ample time, both before and after the beginning of hostilities, to plan and perfect any defenses they desire. They are cunning and resourceful, besides being good organizers — good qualities for the execution of the work in hand. They will have perfect knowledge of the land, sea and air in the theatre of operations.

Our advantages over the enemy will be those generally common to the Nordic races over the Oriental; higher individual intelligence, physique and endurance. These superior qualities will manifest themselves directly in our superiority in the use of hand weapons and in staying power. The Japanese sometimes reach a high peak of morale, but react quickly and, being excitable, they become rapidly disorganized — not only in defeat, but often in victory. The key of our tactics should therefore be to get his individual “goat” and keep it.

THE REDUCTION OF THE ISLANDS

The Strategy

The theatre of operations, with its checkered intersupporting island groups, defended and used as bases for the projection of sea attacks, presents in its reduction much the same problem as do modern deep defense lines on land. The reduction of a single group and the projection of our fleet thereinto would be analogous to the assault and occupation of a single center of resistance, thus subjecting the holders to concentrated attacks from both sides. Therefore, the proper procedure would be to reduce all groups in any defined sea area, or line, simultaneously; the limits of any objectives, including, if possible, base facilities for the pursuance of our operations in areas beyond.

Base facilities for our fleet require an anchorage of such extent as can be found only in the atoll lagoons. On the other hand, if proper facilities are to be provided for light craft, a volcanic island anchorage should be available. The ideal sea objective would be one which included an atoll anchorage for the fleet with a salient volcanic anchorage for light vessels.

The seats of local government and the principal centers of population and trade are located on volcanic islands, with the exception of those in the Marshall Islands, which are all of the atoll type. Enemy bases will also probably be located in volcanic islands. In any event it will be necessary to reduce and occupy them in considerable force whether we use them as bases or not.

In view of the foregoing, the reduction of the theatre of operations would naturally divide itself into a series of phases somewhat as follows:

- | | |
|---------------|--|
| First Phase: | Reduction of the Marshall Islands, if possible, plus Kusaie Is., or Ponape Is., or both; |
| Second Phase: | Reduction of the Caroline Islands west to, and including, the Lamutrek group; (if possible, Yap Island); |
| Third Phase: | Reduction of remainder of Caroline Islands, and Yap and the Pelew Islands. |

Of course, the exact extent of objectives will be determined, more or less, by the resistance to be encountered at the time of reduction. It is very desirable that we reduce the volcanic salients of Kusaie and Ponape during the first phase, although the resistance at these points may be such as to force us to make their reduction an entirely separate phase. It is also very desirable that we take Yap Island in the second phase, owing to its relative position with regard to Guam, which, it is expected, will be strongly held by the enemy as a base.

For the sake both of economy and efficiency, the plans for the reduction of a sea objective should take cognizance of two types of operations, viz:

- (a) Special Objectives: Those points where special resistance is to be encountered—as at enemy bases and at those which we intend to use as bases.
- (b) Occupation Objectives: Those points where little resistance is to be encountered and our object is merely one of occupation, search, observation, police, and denial to the enemy.

The best troops and facilities should be assigned to special objectives and the forces should proceed direct and attack at all necessary points in force. The occupation forces should be assigned sub-sectors (or groups) and proceed to occupy and search out the various islands; not necessarily simultaneously, except that they should begin operations in their respective areas at the same time.

The Tactics

In effecting a landing on any type of island, or island groups, it is always best to land or make feints at landing, at several points, the relative position of the latter depending upon the ease and celerity with which the forces can join in a common movement after landing. These tactics confuse the enemy and lead him to disperse his resistance.

It is to be expected that we shall encounter strong resistance in the volcanic islands (Kusaie, Ponape, Truk, Yap and Babelthuab) which have strong natural defense characteristics and are of particular value to the enemy. This defense will, at least in some cases, be regularly stacked up from the coastline; generally in accordance with the following plan:

- (a) Mines;
- (b) Beach and reef obstacles;

- (c) Coastal patrols and observers, searchlights and flares;
- (d) Line of machine-gun nests, supported by infantry with special weapons;
- (e) Line of sub-sector supports (counter attack troops), infantry, machine guns, field artillery;
- (f) Line of sector reserves; infantry, machine guns, field and heavy artillery;
- (g) Grand reserves, all arms.

Atolls have not the naturally strong defensive characteristics of the volcanic islands. If "stacked up" with a regular defense, the string of keys around the lagoons will form, in effect, a line of redoubts, supporting each other, when possible, by machine gun and artillery fire. The defense of each key will be laid out on the same plan as that outlined for volcanic islands, except that, on account of its small area, special provision will be made for a stronghold (enclosed redoubt) of greatest possible strength.

In the case of either type of island the enemy will be at a disadvantage in the movement of his supports and reserves; this on account of the generally poor communications in the jungle-clad volcanic islands and the water passages in the atolls. This will result in the mass of the enemy troops being practically on the beach to meet an attack, but it will, on the other hand, enhance our chances of effecting a superiority at any given point.

To effect a landing under the sea and shore conditions obtaining and in the face of enemy resistance requires careful training and preparation, to say the least; and this along Marine Corps lines. It is not enough that the troops be skilled infantry men or artillery men of high morale: they must be skilled water men and jungle men who know it can be done—Marines with Marine training.

Landings can be made over the barrier and fringing reefs in good weather, especially on the lee sides of islands; more often, however, weather conditions prevail that force landings through the reef passes.

In the case of atolls it is doubtful if all of the keys will be occupied, thus allowing of a more or less free boat passage within the lagoon; but, even if occupied, in most cases passages will be found which are not directly covered by enemy fire and through which an entrance can be forced. Once

inside the lagoon, all keys occupied by the enemy should be attacked simultaneously so as to limit enemy inter-supporting fire to the minimum. The extent of some lagoons will permit of troop ships entering and disembarking troops inside, if navigation hazards and enemy mines do not prevent. It should be done if possible.

In the case of volcanic islands there is a natural landing obstacle in addition to the reefs; the mangrove belt with its narrow tortuous waterways (which may be easily closed) with bottom of black mud. When the mangrove belt does not exist, the landing conditions are practically the same as those in Guam. The best procedure would be to land at high tide on the lee side in fair weather. Stretches may be found where the fringing reef is unusually low and where the mangrove belt does not exist. If an open coast landing is impossible, then the reef passages to land indentations must be forced.

There are two peculiar water hazards which may be met with in landing on a coral coast, which are worthy of mention. They are:

- (a) Lagoons formed by depressions inside the barrier reef or inside the outer edge of the fringing reef, and
- (b) Lagoons formed by the forcing of underfit (sluggish) rivers along the beach, through the action of the sea in throwing up an ever lengthening sand bar at the river mouth. When a freshet comes in, the river breaks directly through the bar and the water backs up in the former bed, thus forming a lagoon parallel to the beach front. The process is repeated over and over.

The extent of the hazard (a) may be developed by peacetime reconnaissance, but that of the hazard (b) can only be determined by land or air reconnaissance at the time of landing.

In addition to the physical features of the coast, the choice of landing places will also be governed by the clearness of the approach for transports, the probable enemy resistance to be met with, and the relative position of ultimate land objectives.

The greatest elements of success in effecting a landing are surprise and rapidity of execution. The former generally depends upon the latter. From the time the transports start to position there should be no delay until the "boat-head" is occupied and consolidated. The movements, ship to boats, boats to beach and beach to covering objectives, must be continuous. The practice of delay in making up tows, occupying positions on the beach and shifting of troops on the beach must be eliminated. Most

important: quick offensive action from the beach inland not only confuses the defense in general but the counter-attack forces in particular.

The question of the time of landing is most important. The approach of the transports to position should undoubtedly be made under cover of darkness, and ordinarily the landing should be made at daybreak, so as to permit of the fullest use of all weapons and give the landing force a full day in which to pursue its operations on shore. Night landings in force are dangerous unless the coast conditions and the enemy defenses are well known. Small parties, however, might go ashore at night for the purpose of seizing positions preparatory to a landing in force, provided there is small chance of discovery. In this connection the matter of the use of smoke screens in effecting landings must be considered. Theoretically, the use of smoke except as a purely defensive measure is incorrect if it neutralizes the use of weapons with which the attackers have been particularly trained. That is, while it may well mask the attackers from enemy supporting forces, it should never mask the enemy being attacked from the attackers — the best defensive of the latter being the unhampered offensive of their weapons. We may conclude then that a smoke screen over the transports during the disembarkation of troops and over small boat formations until near the beach is good tactics, provided it can be controlled and does not materially interfere with the fire support of escort ships and aircraft and leaves the beach and its background clear to view. This would normally restrict the use of smoke screens to occasions when there is either an offshore wind or no wind. It may, however, be used well to the flanks with an inshore wind, if it is desired to obstruct distant enemy observation.

Great care should also be exercised in the use of gas, in order not to hamper the action of our troops after landing. As a rule, its use would be restricted to hindering the action of enemy supporting troops in areas through which we do not intend to operate.

The principal dangers to transports will be mines, torpedoes, aerial bombs and artillery fire. As a rule, deep water (too deep for mining) extends close up to the fringing reefs, and barrier reefs if present. If the barrier reef lies far off the coast, however, and it is necessary for transports to proceed through reef passages to the landing points, the passages may have to be cleared. The probability of torpedo and bombing attacks depends considerably upon the rapidity with which the troops are disembarked; that is: the time during which the enemy is permitted to act. However, escorting destroyers and air craft may be counted upon greatly to neutralize torpedo and air attacks and the sea demonstrations against enemy bases to hinder the action of both torpedo and air craft in general. As to artillery fire, it is probable that the further the landing point is from the main sea base of the island, the fewer will be the guns which can be brought to bear on transports. Such as are present may be more

or less neutralized by special fire from escort vessels, or, if the artillery fire is especially dangerous, the disembarkation of troops into small boats may be carried out beyond artillery range.

The first land objective is a "boat-head," which, like a "bridge-head," is essentially a covered stretch of masked shore line. The attainment of this objective will enable us to land our entire force with the least loss and fight the enemy on equal terms. The ideal "boat-head" would be a retired beach with high flanking spurs and rear heights located within good striking distance of the ultimate land objective: enemy sea-base and troop-center.

In working out preparations for a landing, the following particular points must be carefully considered and provided for:

- (a) Preliminary Reconnaissance: This should be by air, this method being the most efficient, and its execution not necessarily leading an enemy to expect a landing.
- (b) Land Objectives: The limits of the "boat-heads" should be clearly outlined by terrain features visible from the sea.
- (c) Land Sector Boundaries: These boundaries should be clearly outlined by landmarks on the beach and inland, visible from the sea. They not only serve as a guide for troops after landing, but for small boats in the approach; boat formations may be more or less "messed up" and troops should fight in the sector in which they land, no shifting of troops on the beach being permissible during the first stage of the landing. It is the function of rear lines to rectify errors in distribution.
- (d) Disembarkation from Transports: This plan should provide for troops leaving transports as rapidly as possible, the integrity of units in small boats and the proper order of troops in tows.
- (e) Boat Formations: The formation provided should be that which is least vulnerable to probable enemy fire (artillery, machine guns, 37mm, aerial bombs) but at the same time permit of the placing of adequate forces on the beach without confusion of boats or troops. The following formation or a modification thereof would ordinarily be used:

Successive Lines of Tows:

First Line

Two waves of tows, each tow composed of not over 3 boats with 25-yd. interval; the tows in each wave at least 100-yds distance

(depending upon the number of men in each tow; the interval between waves of tows at least 50-yds, the tows of rear wave in rear of intervals of those in front wave.

Second and Successive Lines

The same general formation obtains as in the first line; interval between lines about 300-yds. The approach being partially covered by the fighting of the first line on shore, tows may be heavier and distances and intervals decreased.

- (f) Troop Formations on Shore: Considering the probable enemy fire, the action of his counterattack troops and the usual thick vegetation back of the beach, the dash from boats to cover and then on to the covering objectives should be made in waves of combat groups.
- (g) Composition of Landing Force and Its Weapons: Infantry with special weapons, machine-gun troops, field artillery, pioneers and signal troops should be included. Power boats of tows should be equipped with 37mm and machine guns for use on the beach in approach. The infantry should be well supplied with rifle and hand grenades, particularly for use in clearing the beach just prior to and during disembarkation from the boats and in mopping up machine-gun nests. Pioneers with wire-cutters, bolos and explosives must be at hand for breaking up obstacles.
- (h) Aerial Support: This should include reconnaissance prior to landing, and pursuit of enemy planes, observation, and strafing afterwards. The observation and strafing of enemy counter-attack troops and machine-gun nests is of particular value to the landing force in the initial fighting.
- (i) Ship Support: If possible, the supporting ships should take position on the flanks of the landing force, so as to sweep the beach and the flanks of projecting spurs and to enable the landing force to approach close to the beach before fire must cease or be raised. Special fire objectives (counter-attack troops, batteries, machine-gun nests, and obstacles) and fire zones for searching fire, ending with a box barrage, if practicable, should be assigned. A battle chart should be prepared for designating fire zones and special fire targets, or at least arrangements perfected whereby targets may be designated by transmitting bearings and ranges from pre-arranged reference points.
- (j) Communications: A careful and complete plan of communications must be provided. Immediately upon the landing of the 1st line, shore headquarters should be established, communications

opened up with the sea and air forces by pyrotechnics, flags and radio, and "drop message here" stations and available landing fields marked. These measures must be taken at once if the full value of ship and airplane supporting fire is to be obtained. Inter-communication between units of the landing force would be principally by pyrotechnics and runner until field telephones were advanced.

- (k) **Administrative Measures:** Provision should be made for a prison pen on the beach and for the transfer of prisoners on board ship as soon as they are examined. The beach space should be organized and the landing points for reserve and special troops and for materiel and supplies plainly marked with large placards or flags.

The Occupation

Upon the occupation of any enemy territory, the forces of occupation must proceed immediately to carry out the following measures:

- (a) Capture and confine all enemy troops and civilians and all pro-enemy natives;
- (b) Search out and take over or destroy enemy base facilities, particular attention being given to hidden fuel depots. (The vast number of native boats capable of inter-island traffic, together with trading schooners of shifting nationality, renders the secret supply of fuel very easy unless all islands are carefully searched out and observed.)
- (c) Seize native water-transport required for the forces of occupation and arrange for the necessary native personnel to handle it.
- (d) Establish provost organizations to ensure thorough police.
- (e) Publish and explain to native population a proclamation of occupation.

If the island or group occupied is to be used as a base for our sea forces, the installation of the fixed defense and mobile land defense should be proceeded with at once and with maximum effort.

In the case of island groups occupied for denial to the enemy, as an emergency base of operations and information for us and for the police of the inhabitants, it may not be necessary that all islands be occupied by troops in place, but that (for instance) a garrison be established at

the main protected anchorage, trading post or seat of local government, and the remainder of the islands be patrolled by combat groups in native boats. These groups of islands, by reason of position, are in reality outguards for the fleet bases and the troops have a fighting function of observing and reporting enemy movements in addition to denying the groups to enemy use and holding them for our own.

In view of the foregoing, the forces of occupation of such groups should be charged with carrying out the following particular measures:

- (a) Clear and mark landing fields or areas for land and sea planes.
- (b) Establish "Drop Messages Here" ground; erect signal and observation tower; install radio.
- (c) Seize and segregate native water transport and personnel required for inter-island patrol and for supply.
- (d) Construct palisade redoubt (masked from sea) enclosing or covering the facilities named in (a), (b) and (c), adjacent boat passages and landing places, and as much of the inhabited portion of the island as possible. Provide storage space in redoubt for ammunition, food, water, fuel and other supplies. Machine-guns and several pieces of artillery should be provided for these posts, guns to be sited inside or out, as conditions demand.

Reduction Forces Required

To arrive at the fighting forces required to take a sea objective, let us take a concrete case. We will presume that the enemy has occupied the Marshall Islands with auxiliary sea- and air-craft and land troops in force; that he has "stacked-up" Wotje Atoll (the best anchorage salient to our approach) as his principal base; that he has "stacked-up" Eniwetok and Jaluit Atolls (the best anchorages salient to himself and most suitable for the use of our fleet) for use as emergency bases and to deny them to us; and that he has occupied the other anchorages with sufficient troops and mine defenses so as to forbid our use of their passages and anchorages without landing and sweeping operations.

In other words: The enemy has stacked-up the sea objective with military strength of little or no in a fleet action, to force us to subject our fleet units to the attacks of his auxiliary craft for the greatest length of time and under the best conditions for himself.

We have the following missions to perform:

(a) Primary Mission: To secure a suitable base (Eniwetok Atoll for instance) for the fleet and project it therein with the least danger and as soon as possible after its approach to the theatre of operations.

(b) Sub-Missions:

- (1) Reduce the enemy base;
- (2) Reduce the enemy emergency bases: those denied to us;
- (3) Reduce all other anchorages which the enemy might use as emergency bases.

We might first concentrate on the primary mission and, after its attainment, proceed to the execution of the sub-missions; but this, however, is exactly what the enemy would wish us to do, permitting, as it does, his concentration on our fleet action units, with all his bases available for the projection of his attacks. We should therefore endeavor, by the use of our land troops and auxiliary craft, to contend for immediate control of all parts of the sea objective at the outset, thus removing the advantages held by the enemy, gaining them for ourselves and befogging the enemy's mind as to the movements of our fleet in general.

Our action must be to drive in force simultaneously on a base for our fleet, the enemy's base and his emergency bases (denied to us) and begin the occupation of the other groups. Considering the geographical location and military importance of the groups to be reduced, we may properly divide the sea-objectives as follows:

Sea Objective: Marshall Is.

Special Objectives:

- (1) Eniwetok—Ujelang Atolls;
- (2) Wotje Atoll;
- (3) Jaluit Atoll.

Occupation Objectives:

- (1) Mille—Arhno—Majuro—Aurh—Maloelab Atolls;
- (2) Likieb—Ailuk—Mejit—Taka—Utirik—Bikor—Taongi—Rongerik—Rongelab—Ailinginae—Bikini Atolls;
- (3) Elmore—Namu—Lib—Kwajelinn—Lae—Ujae—Wottho Atolls.

In the reduction of an atoll any one of the following missions may be the immediate one, depending upon the general strategical and tactical conditions:

- (a) Occupy land masses necessary to control landing fields and anchorages and thus prevent their use by the enemy;

- (b) Occupy land masses necessary to control landing fields, anchorages and passages thereto, thus permitting their use by our forces;
- (c) Occupy entire atoll for our unrestricted use and entire denial to the enemy for any purpose whatsoever, including observation.

When the reduction forces are limited in strength the operations would, as a rule, be carried out by phases in the order named, provided enemy resistance and natural landing conditions permitted (for instance, it might be necessary to first attack and occupy keys flanking a passage in order to obtain access to a lagoon).

In the reduction of any key of an atoll, the covering position to be attained will be the key itself, or at least a water front hooked up with one or more short flank lines. The landing will entirely succeed or fail practically on the beach.

The minimum forces required to take the various objectives named above are those necessary to:

Special Objective (1): Ensure without fail in a single phase the reduction of the entire atoll of Eniwetok, our intended fleet base.

Special Objectives (2) and (3): Ensure the reduction, in the first phase, of the land areas controlling the passages and anchorages of Wotje and Jaluit Atolls.

Occupation Objectives (1) and (2) and (3): Ensure in the first phase the denial to the enemy of the passages and anchorages in the atolls of greatest relative military importance, the control of the remaining atolls being secured in order of relative military importance.

In view of what has been stated regarding the tactical employment of personnel and materiel and in order to make a simple and intelligent statement of forces, it is deemed necessary to cut loose from authorized organization and equipment tables and use an improvised unit suitable to the conditions. It is also very important that each transport carry a unit complete in itself for normal reduction operations; there can be no forming of special forces on blue water without great waste of ships, troops and time. (It is not meant that the proposed unit should be a permanent unit in the Marine Corps, as it is believed that the permanent formation of any unit higher than a company is most uneconomical. Company units, numbering among them, in proper proportion, all of the arms and services which will be required in war and temporarily organized into commands for training and economical duty in peace time are considered much the best for many reasons.)

Proposed Landing Regiment:

Headquarters Company (Pioneers; 4 radios)	125	officers and men		
Supply Company (including boatmen)	125	"	"	"
Gun Company (12 37mm)	125	"	"	"
(8 75mm)	125	"	"	"
Machine-Gun Company (30 guns)	125	"	"	"
3 Battalions riflemen (500 each, minimum)	1500	"	"	"

Total: 2000 Officers and Men.

With the foregoing as a basis, it is estimated that the following fighting forces are required for the reduction of the sea objective in question:

Assignment

(a)				
Special Objectives				
(1) Eniwetok	...	...	... 2	Regiments
(2) Wotje	...	...	... 2	"
(3) Jaluit	...	...	... 1	"
(b)				
Occupation Objectives				
(1) Mille, Etc.	...		1	Regiment
(2) Likieb, Etc.	...		1	"
(3) Elmore, Etc.	...		1	"
Reserve afloat	...		... 1	Regiment
TOTAL: 9 Regiments, 18,000 officers and men.				

Organization

Technical Advanced Base Force		
Floating Force Reserve		
1st Brigade:	3 Regiments,	Wotje-Mille area;
2d Brigade:	3 Regiments,	Eniwetok—Likieb area;
3d Brigade:	2 Regiments,	Jaluit—Elmore area.

Force Reserve: Technical Advanced Base Force and one landing regiment.

The Defense of Fleet Bases

Characteristics of the Island Anchorages. In view of the recent developments in certain types of sea power, and as a basis for comparison, it will be well at the outset to enumerate the natural military characteristics generally desirable in a modern advanced base. In general terms they may be stated as follows:

- (a) Anchorage space for main body and train — about 20 square miles with depth of 8 fathoms.
- (b) Smooth water, for the refuge of a large number of light vessels and seaplanes.
- (c) Land and water areas suitable for the operation of land and water planes.
- (d) Defilading anchorage, to prevent view from sea as a primary protection against enemy attacks.
- (e) Shallow, narrow, defiladed entrance, to afford protection against the entry of enemy submarines and torpedoes and facilitate the sudden surprise exit of our own craft.
- (f) Shore line and adjacent terrain suitable to a reasonable separation (aerial bomb and gun salvo distance) and defilading of shipping, aircraft and base facilities — so as to offer the most difficult targets to enemy gun fire and aerial bombing.
- (g) Suitable terrain salient to the harbor entrance — to facilitate wide and distant sea observation and to extend the effectiveness of the fixed defense.
- (h) Deep water approaches to the base — to restrict enemy mining operations as far as possible.
- (i) Sea bottom in the vicinity of the base unsuitable for submarine resting grounds — to make enemy operations as arduous as possible.
- (j) Natural resources in the way of materiel, food and water.

After a consideration of the foregoing, it may be seen that the anchorages in the theatre of operations in question are not very satisfactory from a military point of view.

In the case of the atoll anchorages, the principal disadvantages are as follows:

- (a) They are open to practically all-round view from the sea, being masked from vision only by distance or by island vegetation not over 100-ft. in height, in limited arcs.
- (b) They offer practically no protection from the winds except in limited areas directly under the lee of coconut islands.
- (c) They are salient to the sea. The advantages of a retired harbor can be gained only by a shift of anchorage—seldom practicable without placing ships in the same relative position in another direction.
- (d) Dangers abound, in the way of foul water and strong and uncertain currents.
- (e) The adjacent terrain, by its conformation, renders the masking and defilading of facilities very difficult, and also restricts the command and projection of the fixed defense elements.
- (f) The reef passes are sometimes quite distant from islands, thus making their observation and defense by a fixed defense almost impossible in certain cases.

In the case of the volcanic island anchorages, the principal disadvantage is, of course, that they are too small in area. Being partially formed by reefs, they have also some of the disadvantages (navigation hazards, visibility and saliency to the sea) common to the atoll type, but not to the same degree. On the other hand, the adjacent terrain (mainland and detached islets) favors natural protection for base facilities and fixed defense elements and permits of the latter's projection and of good observation.

None of the anchorages in the theatre of operations afford natural resources to any extent. There will be no reserve food supply, and even a water supply cannot be depended upon in the atoll type. For construction work there will generally be available rough timber of some kind which will answer the purpose, also concrete material. But it must be realized that the timber on the atolls consists of coconut trees and other spongy growths, and the concrete material of coral sand and coral heads, not fit for use in gun plugs or similar constructions as it will disintegrate upon shock.

Harbor facilities, roads and housing facilities will be practically nil, and those that are needed must be constructed by troops upon occupation.

Enemy Attacks

As stated heretofore, it is not probable that the enemy will employ large fleet units in the theatre of operations under consideration. Even his battle cruisers, although particularly adapted for wearing-down operations, will be husbanded for the final fleet action, their preliminary employment being limited to non-hazardous morale demonstrations and possibly the destruction of train vessels and isolated fleet units in blue water. As a matter of fact, the use of these ships will not be necessary to furnish gun support for his operations, as he has a number of old type battleships and cruisers armed with guns up to 12" in calibre which can be used to especial advantage in this case. The numerous close-linked island groups lying in close proximity to any bases which we may have are particularly favorable to the best use of gun vessels of slow speed and small steaming radius as well as to all auxiliary forces. Attacks may be projected and withdrawn swiftly under such conditions — a single night may suffice for a complete operation.

We may therefore look for the following forms of attack against our bases:

- (a) Bombardments by gun vessels of lesser types.
- (b) Torpedo attacks by destroyers, submarines and airplanes.
- (c) Mine attacks by surface vessels and submarines.
- (d) Blocking attacks by small vessels.
- (e) Bombing and automatic-gun attacks by airplanes.
- (f) Raids by landing parties.

Whatever the objectives of such attacks may be: fleet units, train vessels, fuel tanks, hangars, radios, supply, depots, dock facilities, or fixed defense elements, they will always be made with the aim of lessening, directly or indirectly, our power in the ultimate fleet action. The enforcing of undue activity of our fleet units for train protection, scouting, mine sweeping, etc., may produce just as much damage to fleet efficiency as the actual destruction of fleet units.

Before proceeding further it will be well to outline briefly the general characteristics and tactics of the various elements of enemy military strength which will be likely to be employed against us:

Gun Vessels. These vessels, firing up to 18,000 yards, may be used to good advantage in direct or indirect bombardments and in supporting sea or land raids and in blocking attacks. Gun fire in itself is well worth

while where an enemy has been in possession of the scene of action and has had ample time accurately to plot target areas, reference points and firing positions and to arrange with pro-enemy natives (or his own troops which may be at large in the bush) for the setting of range marks or lights. Gun vessels would, ordinarily, carry out bombardments at night, if firing on known territory, and would be supported by submarines.

Mine-Layers. These vessels, other than destroyers and submarines specially equipped, will probably consist in the main of light converted vessels up to 2000 tons, with moderate speed. In addition to these there will be a limited number of regular minelayers of about 350 tons, with 12 knots speed, carrying 120 mines which can be laid in about thirty minutes.

Owing to the fact that water too deep for ordinary mining extends directly up to reefs encircling the islands, enemy mining will be restricted generally to reef bound areas and passages. These areas are very favorable to mining on account of their restricted and more or less tortuous channels, little known, strong tidal currents and the general flow of current eastward (toward us).

The enemy has never bound himself to restrictions in mine warfare, and he will probably use both floating and anchored mines in great numbers. The principal attacks will be by the projecting of floating mines into anchorages on the tidal currents and the direct laying of anchored mines in passages and anchorages. In the latter attacks, a delayed-action mine, similar to the "Monday-Tuesday-Wednesday" mine, will probably be used. All mine operations by regular minelayers will probably be carried out at night.

Destroyers. These vessels will have the following characteristics: Tonnage up to 1300 tons; speed up to 40 knots; guns up to about 5-in. calibre, some with triple barrels; torpedo tubes up to 12 in number; mines, when specially equipped, up to 75.

The conditions being favorable to mining operations, it is probable that a number of the older enemy destroyers will be fitted as mine layers and operated as such. Bombardment by destroyers, unless it be against radio stations, etc., of outlying occupied islands and groups, will be rare, owing to the insufficiency of gun range. Night torpedo attacks against shipping at anchor may be expected wherever there is a chance of success – this principally by discharging torpedoes through passages or over reefs of the atoll anchorages at those stages of the tide which give sufficient depth of water and range (aid of current).

Submarines. The characteristics of these vessels will be substantially as follows: Tonnage up to 1800; speed, surface, up to 18 knots, submerged, 1½ to 10 knots; radius up to 60 hours, submerged; guns up to 6-in.

calibre, with high-angle fire up to 14,000 yards; torpedo tubes up to 8; mine-laying equipment for laying mines while on the surface or submerged, up to 30 mines.

As indicated above, submarine attacks against bases may occur during night or day and will consist of long-range or other attacks as follows:

(a) Long range (up to 14,000-yds.) bombardments; direct or indirect fire;

(b) Close attacks with guns and torpedoes (the latter against ships in refuge);

(c) Mine attacks against anchorages and their approaches.

Submarines being a most dangerous enemy and comparatively little known to Marines, it may be well to consider their peculiar habits somewhat in detail.

Submarines prefer to remain on the surface, for better observation and for fuel economy. When patrolling on the surface by day, they will probably have a little of the upper deck showing and will steam slowly—6 or 8 knots. In this condition they can submerge in from 30 to 40 seconds. If in sight of the coast or near hostile patrols, they will remain submerged, diving about and periodically showing a good length of periscope in order to obtain range of vision. They take every opportunity to recharge batteries and, if on diving patrol or engaged in action during the day, they will come to the surface after dark and recharge, if conditions permit. They keep under weigh while recharging, moving away from probable hostile areas. When attacking, submerged, submarines must show their periscopes for a short time, at intervals, in order to obtain firing data, and must show their periscopes when actually firing. After firing, a large alteration of course is made to get away from the position indicated by the beginning of the torpedo's track. When attacking with gun-fire, submarines may execute a long-range bombardment (direct or indirect) or, when water conditions permit, approach submerged and come to the surface and deliver a close attack. When attacking with mines, they may approach submerged, expose the periscope to verify position, and then dive and lay their mines.

Submarines on the surface are sometimes disguised as other types of vessels. When submerged, their presence may be indicated by an outline of the shape, by the wake or by an oil track. They are very difficult to spot when approaching up a searchlight beam or in the direction of the sun. When attacked, submarines may proceed to the bottom and rest, if the depth of water is not too great (200 feet) and the bottom is reasonably firm and smooth.

In the theatre of operations in question, the submarine will have the advantage of deep water and knowledge of it for an attack approach, but the disadvantages of exceptionally clear water on the approach and of foul ground, shallow water and strong currents on the scene of action. This combination will tend to restrict his operations to the hours of darkness, when he may run a-wash or may use his periscope freely.

Airplanes. The development of airplanes is proceeding so swiftly that their characteristics and method of attack can only be foreseen in a limited degree. However, the following is probable in the case of bombers, the type which is of particular interest to us: speed, up to 100 miles per hour; radius, 7 hours' fuel, about 200 miles from base; personnel, about 5 men; bombs, up to 2000-lbs, in charges suitable to targets; guns, up to 6 machine-guns of largest calibre with arc of fire of 360° except for small dead angles.

In addition to bombers, planes will probably be developed for launching torpedoes in the water against ships and for carrying large automatic or quick-fire guns for employment against ships, shore facilities and the land forces, with the object of firing materiel or strafing personnel.

Attacks by dirigibles will also be possible, but their strength will probably not exceed that of the bombers.

Bombers normally attack up and down the wind. They may attack during the day or on moonlit or starlit nights. The normal altitude for day attacks is about 15,000-ft., for night attacks from 5000 to 6000 feet. At night the machines attack singly, departing from their base at several minute intervals. During the day they generally proceed in formation, 7 to 9 machines. Bombers prefer line targets, so that they may plane over them lengthwise. Having an all-round defense, bombers may proceed to the attack, especially at night, unattended by other types of aircraft.

Attacks with machine guns may be made by any type of airplane against materiel and personnel (using incendiary bullets on the former) during the course of any air attack, it being merely a question of the appearance of a suitable target, combined with a good opportunity.

While the weather conditions are none too good and the terrain is generally thick, the theatre of operations in question greatly favors enemy air operations, in that the numerous islands and reefs, if known, form good navigational marks, the size and shape of atoll islets enforce restricted land targets for airplanes, and the terrain being practically virgin, the fact of occupation or work at any point will be fairly easy to spot.

Blocking Vessels. These may be any old type suitable for closing reef passages. The vessels to be sunk will be escorted by auxiliary craft of all types and possibly accompanied by a land raiding-party for effecting shore demolitions. These attacks, being close attacks, would ordinarily be effected at night, or at least in thick weather or under smoke.

The anchorages under consideration lend themselves in many cases to blocking attacks by reason of their narrow, tortuous and comparatively shallow passages; but this advantage is partially offset by the uncertain and strong tidal currents which flow through them and their general obscurity under bad visibility, thus making the approach and placing of block ships difficult.

Land Raiding Parties. These parties, of comparatively small strength, will consist of foot troops with explosives whose object will be to destroy important base facilities or elements of the fixed defense at our bases, or possibly radio plants, etc., on islands which are simply occupied by our mobile troops. The development of demolition explosives, both in form and power, enables an enemy to carry out these operations with great speed.

Land raids will nearly always be possible only at night, and will probably be carried out in conjunction with other forms of attack.

The deep passages into volcanic island anchorages render land raids by these routes very difficult, and a landing on the open coast would necessitate a comparatively long march on shore to the objective. In the case of atoll anchorages, facilities will also, in most cases, be a considerable distance from the reef passages, which would make a land raid difficult; the facilities would, however, always [be] closely adjacent to the open sea and thus favor land raids, providing sea conditions permit of a landing on that side.

GENERAL PRINCIPLES OF ADVANCED BASE DEFENSE

The principles covering the defense of advanced bases are identical with those governing permanent bases, but, owing to the conditions under which the defending force is operating, they cannot be applied to the same degree. This, however, is counterbalanced by the fact that the advanced bases will always be protected to a greater or less extent by the strategic disposition of a superior fleet and therefore enemy attacks will not occur with such frequency and in such strength. For instance, a bombardment in force or an attempt forcibly to force entrance into a harbor by a large force when the waters are controlled by a stronger fleet will be extremely improbable. We have to deal only with harassing forces.

In considering the artificial defense necessary for an advanced base it is well to keep in mind the following:

- (a) The defense must be such as to leave the greatest possible mobile sea and air force free for its legitimate work: the destruction of enemy sea and air power.
- (b) The primary object of the base defense is to prevent the enemy from damaging property within a certain area (anchorage, port facilities, etc.), *not* necessarily to destroy enemy craft. The defense required is only that necessary to render an enemy attack so dangerous as to be unreasonable, taking into consideration the conditions under which the enemy is operating.
- (c) In order to simplify training and supply and to maintain mobility, the material used should be light standard Army, Navy or Marine Corps and be capable of the widest use.
- (d) The defense considered must consist of the materiel which we now have or which we may reasonably be expected to have at the outbreak of hostilities.

Fixed Defense

Experience has shown that the best fixed defense against all types of sea and air power is generally good observation, quick communication and rapid, accurate gun-fire. The fixed defense should particularly concentrate on these three elements.

Observation

Surface vessels, submarines and aircraft may all be located either by sight or sound. By reason of the great speed of modern sea and air attacks and the utilization of cloud effects, thick weather, darkness and smoke in their execution, location by sound is becoming of extreme importance: in fact, warning of attack may not be possible otherwise.

Good observation in a base defense should, therefore, include a complete system of listening-in devices, as well as salient visual observation stations. Tripod sea-phone installations (or magnetic loop), aircraft sound locators (paraboloid, 1300-lbs.) and radio compasses should all be thoroughly investigated, types most suitable secured and the personnel trained in their use. It is understood that, by reason of methods employed and noise conditions, all listening-in devices installed on shore have much greater efficiency than those installed on or towed by sea and air patrol craft.

The principal factor in realizing a good visual observation system is the training of observers. The importance of this factor is seldom appreciated, and it is high time for a change in attitude. No man can be considered a reliable observer until he understands the best positions from which to observe under the various light conditions (including artificial light), how to use his glasses to search accurately and without undue eye fatigue, the characteristics of searchlights and flares, the natural characteristics of the various states of the sea and air, and the types and habits of possible targets (with methods of camouflage) during all the conditions of visibility.

Visibility conditions in the theatre of operations in question are only average, on account of prevalent clouds and rainfall. However, it is said that the sky generally clears toward evening, giving fair evening and night visibility, which is most important.

The peculiar reef and water conditions obtaining in the theatre of operations will doubtless also tend to lessen sea sound-locator efficiency, by reason of the chafing of cables over coral ground, and the difficulty of

securing suitable depths of water and resting ground for the tripod and other installations. Moreover, if suitable water and bottom is found it will probably be at the expense of lengthening or unduly shortening base lines.

To sum up: It is believed that "listening-in" devices are of rapidly growing importance in base defense and that no time should be lost in making arrangements for their use in future advanced base operations.

Word Communications

Communications for command, fire-control, observation, etc., should be by wire when possible, but always supplemented by radio, visual and sound systems. A sound system is absolutely necessary in case of attacks during darkness and thick weather. It is well to equip observation stations with machine or light guns for use against submarines and aircraft when sighted. By opening fire with tracer ammunition, the fact of sighting an enemy and his approximate location are instantly transmitted to the adjacent defenses. Within the restricted limits of a fixed defense, pyrotechnics and large dial shapes (with pointers to register bearings) will have their widest use in speedy visual communication.

The field telephone will, of course, be the standby. In addition to the land equipment, however, there should be provided a limited amount of submarine telephone equipment for use in linking up vessels, when necessary, and elements of defense located on detached islets. In the theatre of operations here considered the elements of the defense will always be more or less separated by water. Armored cable will be necessary on account of the coral bottom and strong seas and currents.

Radio equipment need not be very powerful but should be plentiful. It will be of great value in any case for communicating with ships and as a supplementary means to wire lines which will generally lead through jungle and thus will be difficult to protect from enemy fire and sabotage. It will be of particular value in linking up the islets of atoll anchorages. Needless to say that the islands occupied by mobile troops as emergency bases and for observation should be provided with radio. Equipment with a sending radius of about 500 miles would suffice for the more important stations and of 100 miles for the lesser stations. The distribution would, however, be such as to ensure complete communication throughout the area occupied. Considering the radio communication that may be required, at least 3 large and 6 small sets should be included in the fixed defense materiel.

But, however good the means of communication may be, true efficiency cannot be maintained without proper battle charts, communication plans and personnel trained in message forms. (How many Marines can, upon sighting a periscope, report briefly and fully the necessary information for best gun action, or accurately identify and intelligently report the movements of sea and air targets?)

Gun Defense

In considering the number and calibre and location of guns, it is well to remember that when a ship hits a shore battery it puts out of action only what it hits, but that when a battery ashore hits a ship it puts out of action what it hits *plus* almost everything else; also that in close attacks it is not necessary to sink a ship in order to prevent its executing its mission, but only so to impede its movements as to cause a miscarriage of the attack. The proper use of searchlights and flares (to render navigation difficult) and of field and machine-gun fire may very well play a part in this respect. Searchlights are particularly effective in confusing air-pilots.

The gun defense should include guns in sufficient numbers and of sufficient calibre, or should be so projected, as to cover all base approaches and render hazardous any attempt to bombard or to closely approach the base area. Owing to the fact that the configuration of harbors renders uncertain the projection of guns, the gun should be as large as can be handled under the enforced conditions of rapid unloading and installation. This gun is considered to be the 7-inch gun, a number of which are now on hand. For the sake of economy and time, the main gun defense must consist of direct rapid-fire guns, preferably with tractor mounts, so emplaced as to be capable of all-round fire. Such guns can be installed quickly, become effective immediately and can be well served by simply trained personnel. These guns should be provided with alternate emplacements as a measure of security.

The number of guns required depends more or less upon the distance they are projected from the base area, the ease with which they may be masked and their possible arcs of fire. It is considered that under average conditions all water approaches to the base should be covered by at least four heavy-calibre guns. The mission of these guns is to resist all forms of sea attacks.

For the general support of the main defense guns, the covering of dead angles and the resisting of close attacks by submarines or by surface vessels which may attain close position by reason of adverse visibility conditions, a secondary close defense of lesser calibre guns (with the same characteristics as the guns of the main defense) is required. The work

of this defense might be performed by an increased number of heavy guns or by utilizing some of the heavy field artillery of the land defense, but not so efficiently. The likelihood of the close attacks above mentioned demands provision for a rapid, effective fire being delivered on short notice, which can only be done indifferently with the same weight and personnel in the alternative types. About a 5-in., high-powered, rapid-fire gun, preferably on a pedestal mount, is desirable for this use. At least four guns are required to command an entrance and its near approaches, the guns being sited particularly to cover water and areas well in advance of any mine or other barrier defense which may be provided. We should procure from the Navy and keep on hand a sufficient number of these guns for use as set forth.

Any additional gun defense against sea attacks (for instance, to cover defiladed water areas along the coast line from which enemy ships might conduct indirect bombardments) should be required from the artillery of the mobil land defense. We have now on hand a number of 8-inch howitzers, suitable for sea-coast defense in general, which would be satisfactory.

In the theatre of operations in question, sea defense guns will be required in unusual numbers by reason of the saliency of the anchorages and the numerous and sometimes wide passages in the anchorages of the atoll type, which probably cannot be securely barred with mines, owing to the swift tidal currents and the counter-mining operations of enemy sea and air craft. The ship, shore and terrain conditions of the atoll anchorages offer few difficulties to the landing and installation of sea defense guns, unless it be in the construction of emplacements owing to the lack of suitable material on the ground. Spongy timber or coral sand concrete can be used for the tractor-mount platforms, but pedestal mount platforms of timber or steel must be carried with the guns; coral and sand concrete cannot be depended upon except as anchor weight, and suitable platform lumber is not to be found on coral islets.

Considering the defense required as modified by the natural characteristics of the harbors under consideration, it is estimated that a minimum of twelve 7-inch and twelve 5-inch guns should be included in the fixed defense materiel.

The question of anti-aircraft gun defense is not very well crystallized at present. Many articles have been published recently, questioning the value of this defense, in which statement is made repeatedly that ten thousand shots are required to bring down one plane. There can be no doubt that some of these articles are simply propaganda to secure additional pursuit planes for the air services. In considering the value of anti-aircraft guns for an advanced base defense, the question is really not as to how many air attacks may be frustrated by ten thousand shots. As a matter

of fact anti-aircraft guns of present and probable calibre cannot prevent aircraft from attaining a bombing position, but, if in sufficient numbers and properly controlled, they can force the enemy to such a high altitude or compel him so to deviate from his course when lining on a target as to render the success of the attack very doubtful. This is what the anti-aircraft gun defense of an advanced base should be in effect.

The idea being mainly to obtain a moral effect on the pilot that will cause him to worry over danger and thus distract his mind from his bomb projection, the fire should be made to appear dangerous and of uncertain system as well as having as much accuracy as the equipment will permit. This effect, it is believed, will be best obtained by surprise zone fire, the extent of the zone depending upon the number of guns available.

As to calibre, the tendency now is to increase to six inches primarily for high targets, lesser calibres being in support for resisting low bombers. Of course, the greater the calibre without loss of volume of fire, the better. In any case we must use the types supplied by the Army or Navy, preferably the latter.

The main anti-aircraft guns are generally employed in groups of six, well advanced (up to 10,000 yards from air-objectives) along the most probable air routes of approach, up or down wind, along roads, streams, coastline, etc.. The lesser calibre guns are normally emplaced in rear support of main guns to cover aerial sectors which the main guns cannot cover owing to grave danger to one's own personnel, materiel and shipping, and to resist the close attack of aircraft which may have passed through the first defense zones or approached unobserved by reason of adverse visibility. In case of shortage of guns, or when strafing is to be expected, the anti-aircraft defense should be supplemented by the heaviest-calibre machine-guns available, sited at least burst-beaten-zone distance away from air objectives.

As the effectiveness of an adequate air defense depends upon the efficiency of the fire control, every effort should be made to perfect it, especially for the fire tactics to be used.

In the theatre of operations under consideration the terrain adjacent to anchorages does not permit of any extended projection of guns from the area to be protected, thereby necessitating a greater number of guns than might otherwise be required. Considering the extent of the anchorages, as also the lack of communications, it is believed that no less than 24 guns of largest calibre, supported by 12 of the same or lesser calibre, would be required under ordinary conditions. As communications will be lacking and as fixed guns permit of better fire control and more accuracy of fire, these guns should be provided with fixed mounts.

Searchlight Defense

Both the sea and the air defense must be supplemented by artificial light: searchlights and star-shells. The latter, which are being developed for all Navy secondary batteries and anti-aircraft guns, will be a valuable supplement to the searchlight defense and may, when they are fully perfected, replace it in part. At present their action is limited to about 3000 yards and beyond (a low velocity being necessary to ensure functioning of the parachute). It is believed that these shells, in themselves, afford sufficient illumination of water areas outside of their minimum limit (3000 yards) and that the searchlight equipment need not necessarily be of greater power than is required to illuminate targets efficiently up to that range. In determining the calibre of fixed defense guns and their siting, the function of shell illumination should be considered.

The sea searchlight defense, to be adequate, should cover thoroughly all water approaches and barrier defenses. The normal allowance would be one searching light, one battle light and one belt light for each battery group—or a distribution that would ensure a searching light, at least one battle light and a belt light being in readiness for action on any targets that might approach. The light control and tactics are all important in order to ensure continuous searching of all areas, to avoid dead angles, and to ensure the battle illumination of all targets which may be spotted.

If star-shell illumination proves as efficient as expected, a modern 30 or 36 inch light should be of sufficient size. These, being mobile, should be provided with alternate emplacements as a protection against special attacks which might be made against them preparatory to a night attack in force. The distant automatic control of lights is desirable if it is reliable and does not require a too delicate or too bulky apparatus.

Floating flares, anchored in advance of barriers, when fired, form an excellent auxiliary light defense against blocking or other forms of close attack.

Air-defense lights must be both plentiful and powerful (say 36-in. or over). As a rule each battery should be provided with at least two lights: one pilot light (direction indicator) and one (preferably two) searching lights. They should be emplaced on the flanks of batteries in such a manner as to cover the sky within 30° of the horizon. The searchlight, gun and pursuit-plane air defense requires very careful planning and training with regard to control tactics in order that each weapon may function properly. The searchlights should be supplemented by star-shell illuminations.

In the siting of searchlights particular care must be taken to avoid their forming a location point for the targets they are designed to protect and to ensure the best observation of the target by observers and gunners. Low advanced positions on the flanks of batteries or observation stations are considered the best. In the theatre of operations in question, the siting of searchlights will be particularly difficult owing to the general saliency of the harbors and the restricted land masses of the atoll anchorages. These disadvantages can only be compensated for by furnishing sufficient lights so that they may be used in various combinations, or possibly by constructing a large number of alternate emplacements.

Considering the dispersement of batteries (both sea and anti-aircraft) that will be likely, a minimum of 18 searchlights, medium or larger calibre, would be required.

Barrier Defense

A mine barrier defense is very desirable under conditions which may permit of submarines or surface vessels approaching unobserved close to a harbor entrance in readiness to run by or permit of submarines approaching and passing through a harbor entrance while submerged. The general custom heretofore has been to close harbor entrances with observation mines, except for an echeloned passage left free for one's own craft. However, conservation mines require such a vast amount of equipment and numbers of trained personnel to ensure their effective use that their inclusion in an advanced base defense has always been considered in the light of a necessary evil. Added to these disadvantages there was also a decided premonition of danger to our own ships (considering the type of mine available and the haste necessary in laying it). During the World War the Navy developed a type of defensive contact mine which proved effective against both surface vessels and submarines within operating depths. This mine (300-lbs.) is fitted with antenna extending 60 feet above and 100 feet below and can be laid in depths of at least 1000 feet. A number of vessels have been equipped with apparatus for laying this mine, and it is intended hereafter to have such vessels lay such fields as may be necessary at an advanced base. This type of mine field will probably have a straight-away passage for ships which must be considered in arranging the gun defense.

Owing to the strong tidal currents prevalent in the entrances to the anchorages herein considered, effective mining may be somewhat difficult, these currents not only causing uncertain displacements of the mines in depth but also causing them to drag anchors unless the latter are unusually heavy. In many cases it will probably be found that gun defense alone must be relied upon. Also it will be impossible to project the mine fields very far in advance of the anchorages on account of the great water depths close off the reefs.

Since the development of bombers, a mine field gun-defense to prevent counter-mining must be considered in locating anti-aircraft guns as well as in locating the guns of the sea defense.

An effective type of barrier defense against torpedoes which may be fired through the harbor entrance from the outside is not known at the present time, the ordinary torpedo net being often ineffective against torpedoes fitted with cutters.

A boom and possibly net defense to prevent the running-by of floating mines on currents may sometimes be necessary — especially under the conditions obtaining in the theatre of operations under consideration. A simple boom defense may be improvised on "location." Where mines can be observed, they may be destroyed by gun-fire.

Total Fixed Defense Required

Radios:	
500 miles radius (average conditions)	... 3
100 " " " "	... 6
Guns:	
7-In. R. F. Gun, tractor mount	... 12
5-In. R. F. Gun, pedestal mount	... 12
A. A. Pedestal Mount)	(... 24
3-In. A. A. Pedestal Mount) interchangeable	(... 12
Searchlights: 30-In. and 36-In.	... 18

Mobile Air Defense

For the sake of general economy this defense should consist only of that land aircraft necessary for the immediate security of the base; any water-aircraft required under special circumstances being supplied by the Navy as in the case of the mobile sea defense. Land machines based on land are more efficient for the work required than either water machines or land machines based on carriers, on account of the comparatively restricted and slow maneuvering powers of the former and the comparative slowness and greater liability to accident in getting under weight from the latter. Moreover the diverting of water machines and carrier land machines from their primary duty of fighting enemy sea and air power in blue water areas to purely defensive work at a base is not only wrong in principle but very uneconomical.

The duties of the mobile air defense at an advanced base are threefold: to observe, to bomb, to pursue. At an average advanced base these duties would include the following:

- (a) Ensure a continued observation of the harbor entrance or entrances and approaches for enemy submarines and other craft within a radius of 20 miles during daylight;
- (b) To ensure at least one hour's warning of any surface attack on the harbor or coast-line during daylight;
- (c) To resist ordinary sea-raids and landings by bombing enemy vessels and observing our own gunfire at any hour;
- (d) To supplement the anti-aircraft defense in resisting enemy air attacks by engaging in combat with enemy bombing and pursuit planes, especially the former, at any hour.

The fewer the types of planes necessary for the performance of the functions outlined, the better, as in the case of all advanced base materiel, and it is the present policy of Marine Corps Aviation to hold the number of types down to two if possible: one for observation and bombing and one for air-combat (pursuit planes).

The number required of each type will depend principally upon the enemy building program and the probable strength of the enemy attacks. Considering the probable operations in Micronesia we may expect sea attacks by auxiliary craft and air attacks in comparative strength considering the total strength of the enemy. In the ordinary small island or atoll anchorage, the functioning of the aircraft would require at least three scout-bombers being in the air throughout the day, or, with reserve, a total of 12 machines. To resist enemy sea attacks during day or night, there should be available at least 12 more bombers. For aerial pursuit (combat) of enemy planes, there should be at least 24 planes, the least number that could be expected to break through the enemy pursuit plane escort and inflict damage on his bombing formation. We thus have as a total mobile air defense: 24 pursuit planes and 24 bombers. This defense has already been arranged for by the Marine Corps.

The question of landing facilities may be rather difficult in the theatre of operations under consideration, as the only natural landing fields seem to be reef encircled beaches and high mountain plateaus. A field at least 30 by 500 yards, with borders formed of high vegetation and extending preferably in the direction of the prevailing wind, and a surface permitting of the unobstructed running of an automobile at the rate of 40 miles per hour, is required. Occupying troops must in all cases be prepared with tools to put landing fields in condition for use.

Mobile Sea Defense

When the advanced base fixed and mobile air defense does not effect the degree of security desired on account of natural harbor characteristics or other reasons, a mobile sea defense as needed must be assigned to supplement them. Needless to say, this defense must be as small as possible consistent with the security necessary and must be composed of craft least valuable in the fleet operations — units which have undergone hard service or have suffered war damage. The defense would normally consist of the following types:

- (a) Patrol boats with light guns, anti-aircraft guns and depth bombs;
- (b) Mine sweepers;
- (c) Destroyers, submarines and aircraft assigned for counter-attack work.

Mobile Land Defense

The main object of the land defense is to protect the base sea and air defense, which, in turn, protects the base facilities, and to cover any enemy objectives not covered by those defenses: defiladed bombardment positions, natural aircraft landing-areas, etc.

If it is the intention of the enemy to capture the harbor for his own use, it will be necessary for him completely to reduce, with infantry, all defenses that bear upon the harbor and its approaches. If the enemy's intention is only to destroy materiel in and around the harbor or to deny the use of the harbor to our fleet, it will be only necessary for him to secure and maintain a position on land from where siege gun fire can be brought to bear on the base area. Siege guns of a suitable type may be used effectively at a range of ten miles. Therefore, in the case of small island positions, an enemy might have to advance only a short distance inland in order to carry out his mission. For these reasons, together with the fact that in all cases the coastline will be unusually favorable to the defense and unusually unfavorable to the offense, the governing factor in the land defense of any island position (at least up to 500 square miles in area) should be the necessity for preventing a landing.

But, while the main line of defense should follow the sea coast, a most stubborn inland defense should be provided for; the enemy being forced to take successive secondary and switch lines and finally a stronghold. The latter should contain elements of the fixed defense bearing on the harbor and approaches so as to deny the latter to the enemy and maintain a foothold for recapture to the last.

In view of the foregoing considerations, the ordinary system of land defense would consist, in the main, of a first line (line of resistance: sea-coast), occupied in force; a second line (land-line enclosing base facilities and sea and air defense), and a stronghold (enclosing certain elements of the fixed defense); the latter two lines being occupied in force only in event of the defenders being forced to retire from the line in advance. A detailed outline of this system follows:

First Line

This line follows the seacoast and defends all possible landing places; and it should be planned regardless of weather or sea conditions at the moment. The disposition of armament and personnel should be made with the following objects:

- (a) Hold the transports off as far as possible, thus delaying the ship-shore transport of troops;
- (b) Bring artillery, 37-mm and machine-gun plunging fire to bear on boat formations to inflict personnel losses and to disorganize formations;
- (c) Bar the advance of the small boats inshore by water obstacles and the advance of troops inland from the beach by land obstacles;
- (d) Deliver surprise fire of all arms on troops at water and land obstacles, or, in the absence of obstacles, when troops are disembarking from small boats and forming for the advance inland;
- (e) Contest the advance inland by counter attacks and the defense of switch lines on the flanks of landing places (necessary to covering forces of the enemy);
- (f) Protect the defenders against enemy sea and air supporting fire; and
- (g) Ensure a safe retirement of the defending force to rear lines in the event of necessity therefore.

To attain the objects outlined, the first line should consist of the following elements:

- (a) Line of water obstacles. These should consist, preferably, of wire or cable entanglements, held in place by wooden or iron stakes and natural protuberances such as rocks, coral heads, etc. Their

anchorages should be sufficient to resist the bucking of power boats and thus force the disembarkation of troops. They should be well advanced and of a height (depending upon local beach characteristics) so that they would prevent the passage of boats but yet be covered at that state of the tide most suitable for landings.

- (b) Line of beach obstacles. These should be constructed of wire or material at hand and be located on the back beach where concealment may be possible. Extending at various angles to the rear, light spur lines of obstacles should be constructed so that the enemy may be unconsciously guided into prepared defensive zones of fire. (The Germans employed this system at Blanc Mont Ridge and, so far as known, none of the Marines advancing realized it.)
- (c) Line of observation posts and patrols with searchlights, beach flares and pyrotechnics. High and low positions for searching under various light conditions should be provided for. Beach flares and pyrotechnics, and infantry lights (up to 12 inches) would probably suffice in most cases; if not, the type of light used by the fixed sea or air defense should be used.
- (d) Line of machine-gun and 37-mm nests, permitting of plunging fire towards the sea and flanking the beaches and approaches to desirable enemy covering positions. If located on high projecting spurs, both high and low positions should be prepared; the former being used against troops in boats and the latter after they strike the beach.
- (e) Line of sector supports or counter-attack troops (infantry with special weapons) to meet the enemy with grenade fire on the beach and to execute counter-attacks. The supports should be located in nests or fortified posts echeloned in rear of and supporting the line "(d)" and defending desirable enemy covering positions.
- (f) Line of field artillery positions from which an effective fire may be brought to bear on transports or small boats, obstacles, the beach and the fronts of infantry positions. The position of these guns will depend upon the terrain and existing communications. At times they should be pushed practically to the beach.
- (g) Line of sector reserves or counter-attack troops (infantry with special weapons) having the same general mission as the sector supports, so located as to be able to counterattack before the enemy has taken or consolidated his covering positions.

- (h) Line of heavy artillery positions (direct or indirect fire) to be used primarily against transports and other sea targets and secondarily against the targets named for the field artillery in (f).
- (i) Grand reserve of all arms, so located as best to support line of sector reserves, or cover retirement of advanced forces and occupy rear lines as necessary.

The distribution of forces in the defense will depend upon the physical characteristics of the terrain and waters adjacent thereto and the following considerations: (1) The forces necessary for the initial defense of the various landing places in case the enemy attacks under favorable conditions; (2) the time necessary for the support and reserves to act; and (3) the provision of reliefs for the forces in permanently occupied positions.

Second Line and Stronghold

These lines should be prepared for defense on the same principles as the First Line. The location of the second line should ensure, if possible, that damaging enemy gun fire cannot be brought to bear on the more important parts of the base area.

Switch Lines

These supplementary defensive lines (connecting the main lines of defense at intervals) should be prepared for the following objects:

- (a) To isolate the base area from any outside landing places. (The second line may ensure this condition.)
- (b) To isolate the various landing places from each other, thus preventing the junction of enemy forces and permitting of his defeat in detail. At any landing place the switch lines and rear line which they join would normally coincide with covering and advanced positions desired by the enemy.
- (c) To delay the general advance of the enemy at strong natural defensive positions.

The foregoing outline of land defense organizations can seldom be adhered to completely, not only on account of natural conditions imposed but on account of the lack of time. However, the fact that it is expected to occupy the base only for a short time or that there will be insufficient

time in which to carry the work to completion MUST NEVER BE MADE AN EXCUSE FOR NOT CONCENTRATING EVERY EFFORT AND UTILIZING EVERY MOMENT TOWARDS MAKING THE DEFENSE AS STRONG AS POSSIBLE. Enemy attacks in unexpected strength and unexpected reversals to our own forces may always occur.

In the case of the theatre of operations under consideration the natural restrictions imposed at available base anchorages are rather extreme. The configuration and isolation of the coral atoll land patches enforce practically a beach line defense by all arms and render impracticable interelement support. Troops must fight in position and therefore the personnel and materiel should be that capable of resisting any likely enemy concentration on or near the beach. On account of the close proximity of base facilities to possible landing places, surprise raids, especially at night, will be likely. The best answer to enemy attacks under these conditions would be checkerboard strong point defense, combined with intricate obstacle construction from the beach line rearward.

At the outset, at least, conditions will be practically the same on the volcanic islands, owing to their rough jungle interiors and the lack of trails and roads. Troops and materiel for the defense will have to take position by sea and establish depth inland so far as the military situation demands or time and terrain conditions permit. Trails may be out for the use of infantry supports and reserves, but their action will be slow in any case. Artillery once placed in position inland will ordinarily fight in place throughout any operations. The mobility of the defense will depend wholly upon the roads which they build themselves. The use of water transportation for supporting troops during an action would be generally hazardous whether inside the barrier reefs of the volcanic islands or in the lagoons of the atolls.

Considering both the atoll and volcanic types of anchorages and the extent of their land masses, the usual sea and weather protection obtaining, the fact that not over fifty per cent of the coastline would be suitable for landings, and that the defense must practically fight in position, one arrives at the following conclusions as to the minimum armament required for the mobile land defense:

- 32 75mm. field guns (partly landing regiment materiel);
- 18 155mm. field guns*
- 12 8-in. howitzers*
- 8 medium calibre (38") searchlights*
(*Defense regiment materiel)
- 32 small calibre (12" to 18") searchlights, partly landing regiment materiel;
- 6 field radio sets, 100-mile radius, landing regiment materiel.

The Marine Corps has most of the above materiel on hand at the present time.

Auxiliary Defense—Personnel & Materiel

Always in considering the reduction, occupation and defense of advanced bases one is struck by their utter lack of local resources, not only of a military nature but of any kind. However, if these resources were present to a considerable extent at any point, an enemy would probably include that point in his main defense and it would not be available to us as a base. The suitable bases in the theatre of operations under consideration form no exception to the above rule. Rough timber, rock and small boat transport are the only resources of importance. The forces of occupation must provide the usual living facilities as well as a military defense. For this work, men with engineer training are needed in unusual numbers. In order even to start work, we must construct landing facilities and roads, and that work must be followed by an unusual amount of blasting, excavating and clearing.

Being dependent upon a successful landing in every case, and, after landing, being dependent upon water transport (except for land transport on the few roads which we ourselves may build), personnel trained to handle small craft (motor, sail or oar) will also be badly needed.

An unusual number of signal troops with equipment will also be necessary on account of the abnormal isolation of defense elements by thick terrain and by water passages.

In sea operations special organizations employed only as such must be as small as possible. Personnel may be given special training for emergencies without withdrawing them from fighting organizations.

In regard to auxiliary materiel or equipment, there has been in the past a tendency to overload with many articles neither necessary nor serviceable. Delicate or complicated equipment or that of special, limited use should not be included in advanced base materiel provided the service necessary can be approximately obtained otherwise. Only such equipment as can be reasonably depended upon to withstand rough handling, exposure to the elements and service by ordinarily trained personnel should be included. Whenever unusual equipment is added, weight, time-saving qualities and reliability in service should always be carefully considered.

Advanced base land transport is an item which deserves particular mention. In the operations set forth, it will be noticed that nearly all troops and defenses will be located near the sea coast and will fight practically always in position. The fact that there is ample small-boat transport and that they can be supplied by reef-bound water routes and that roads are now and will be very few, forces on[e] to conclude that land transport

will be of limited use. Not over 50% of the motor transport ordinarily required for the supply of mobile troops and movement of mobile guns and other units need be furnished.

Owing to the lack of local resources, all materiel and equipment absolutely necessary for the installation and maintenance of the military forces should be carried on transports. Among the items of importance are: Tentage, tarpaulins, water-containers for the storage of rain water, cement, construction railway, engineer tools and explosives, line and tackle, barbed wire, sand-bags, timber-working tools, wire net for camouflage, draft bolts and heavy spikes for dock, bridge and bombproof constructions, etc.

SUMMARY

Strategy

Governing Factors:

- (a) A main fleet action will decide the war in the Pacific.
- (b) Our fleet, on taking the offensive, will be at least 25% superior to that of the enemy.
- (c) The enemy will hold his main fleet within his defensive line and endeavor, during preliminary operations, with his lesser craft (old gun ships and torpedo, mine and bomb craft) and land forces to “wear down” our fleet to an extent where he believes he may reasonably risk a main fleet action.
- (d) Fleet fighting units, being comparatively unreplaceable in war, must be husbanded for action against enemy fleet units.
- (e) Operations preliminary to a fleet action must be carried out by (as far as possible) the minimum naval forces and those of least fleet value in fleet action.
- (f) Marine forces of reduction, occupation and defense must be of such strength and composition (so far as may be compatible with the conditions under which they must operate) as to require the least possible naval support.
- (g) An offensive projection into the enemy’s strategic front must be made in a series of well defined and rapid moves (sea objectives) in order to afford the battle fleet the greatest protection for the greatest portion of the time. (Long-drawn-out operations, with the fleet and its base subject to close attack by the enemy light forces, are to be avoided).
- (h) A sea objective must be more or less isolated and include an area that can be reduced practically simultaneously.

- (i) The sea objective should include an anchorage suitable for the fleet, so situated as to facilitate offensive operations against further sea objectives.
- (j) Sub-objectives in any sea-objective will be as follows, in order of importance:
 - (1) Reduction of a base for the fleet;
 - (2) Reduction of enemy bases;
 - (3) Reduction of any anchorages which may be used as enemy emergency bases;
 - (4) Reduction of other areas.

Tactics

Governing Factors:

- (a) The enemy will use land forces freely and by a universal shore resistance in strategic areas gain time and create opportunities for his "wearing down" operations.
- (b) The enemy defense of land areas will consist, in general, of a mobile land defense and a mine defense, thus enforcing extensive landing and sweeping operations for their reduction.
- (c) The enemy will have ample time in which to prepare his defense.
- (d) The main points of enemy resistance will be his own bases and those of greatest value to us.
- (e) In the reduction of any island position (island or group) the immediate mission may be any of the following, depending upon the particular strategical situation:
 - (1) Reduce land masses necessary to control anchorages and landing fields, thus preventing their use by the enemy;
 - (2) Reduce land masses necessary to control anchorages, landing fields and the passages thereto, thus permitting of their use by our forces;
 - (3) Reduce entire island or group, for our unrestricted use and entire denial to the enemy for any purpose whatsoever, including observation.

- (f) Depending upon weather and sea conditions and enemy resistance, the procedure in the execution of the mission may be:
- (1) Land direct on objective from open sea;
 - (2) Land on land masses controlling a reef passage, thus securing entrance for effecting a landing on objective from reef bound waters.
- (g) In landing on any land mass the immediate mission must be to secure and consolidate a "boat-head".
- (h) The choice of boat-heads must depend upon the ease and rapidity with which it can be obtained and its position relative to the objectives.
- (i) Owing to the restricted area of land masses, the jungle terrain which generally obtains, and the paucity of existing communications, the enemy's main line of resistance and the bulk of his resistance will be practically on the seacoast in all cases.
- (j) As a decision is to be reached by a very short advance inland, the enemy defense will consist of a closely linked and intricate obstacle and strongpoint system in the back beach jungle.
- (k) The greatest effort of our troops must be put forth at the time of landing.
- (l) The forces and weapons provided should be those best suited to beach and jungle combat: close, rapid fighting.
- (m) In order to effect a concentration on the enemy, operations must be carried out with surprise and rapidity.
- (n) In the defense of bases, the primary object of the defense forces will be to prevent the enemy from damaging property within a certain area (anchorage, port facilities, etc.), not necessarily to destroy enemy craft. The defense required is only that necessary to render an enemy attack so dangerous as to be unreasonable, taking into consideration the conditions under which the enemy is operating.
- (o) The base fixed defense must concentrate on good observation, quick communication and rapid, accurate gun-fire: the best fixed defense against all types of sea and air forces.

Materiel

Governing Factors:

- (a) Owing to the restricted ship space available, only articles of the widest use should be included. Articles of special, limited use have no place, provided the necessary service can otherwise be obtained approximately.
- (b) Delicate or complicated materiel that cannot reasonably be depended upon to withstand rough handling, exposure to the elements and service by ordinarily trained personnel, should not be included.
- (c) Whenever the addition of special materiel is effected, its weight, time-saving qualities and reliability in service should always be considered.
- (d) All materiel should be of sizes and dimensions favoring rapid transportation between ship and shore and quick installation on the latter.
- (e) Owing to the lack of local resources in the theatre of operations, practically all materiel absolutely necessary for the installation and maintenance of the military forces on shore must be carried on transports.
- (f) Owing to the fact that the bulk of troops will be located near the seacoast, that ample small boat transport will be available and that land communications are few and poor, not over 50% of the land transport usually required need be furnished.
- (g) In order to simplify training and supply, the materiel provided should be standard Army, Navy or Marine Corps.
- (h) The materiel considered for the advanced base force must be that which we now have or may reasonably be expected to have at the outbreak of hostilities.

Personnel

Governing Factors:

- (a) The greatest fighting (and losses) will occur in the ship-shore belt, and troops suitable and trained for combat in that area must be provided.

(b) In sea operations, where vulnerable, floating troop centers are necessary, specialist organizations (employed only as such) must be cut to the limit. Wherever it is possible troops must be given specialist training for emergencies without withdrawing them from the necessary fighting organizations.

(c) Owing to the conditions obtaining in the theatre of operations, the following specialist training among fighting personnel is particularly necessary:

Field Engineering: Dock, road and shelter construction, obstacle and trench work, pioneer work, transportation of heavy materiel.

Communications: All types for linking up isolated and dispersed forces.

Water Transportation: Motor, sail or car.

Organization

Governing Factors:

- (a) The number of transports must be cut to the efficient minimum in order to reduce as far as possible the activity of fleet fighting units for their protection.
- (b) The loss of one third of any particular floating force should not prevent the complete functioning of the remainder of the force in the performance of its normal task.
- (c) Personnel should not be subjected to such conditions on board as would tend to prevent their putting forth their highest effort at the moment of landing.
- (d) There must be no wastage in the employment of transports or of troops.
- (e) No shifting of troops or materiel between ships on blue water is practicable.
- (f) Task forces must be formed before leaving base port and must be embarked as such.
- (g) Personnel and materiel best adapted to perform the normal tasks must be provided.

- (i) All training in the performance of tasks must be carried out prior to leaving home ports.

Proposed Task Organizations

Force Headquarters Detachment	125
1 Base Defense Brigade	5425
3 Landing Brigades	18075
Total	23625

Base Defense Brigade:	
Brigade Headquarters Detachment	25
3 Regiments	5400
Total:	5425

Base Defense Regiment:		
Headquarters Company:		
(1) Operations & Intelligence		125
(2) Fire Command		
(3) Administration		
Supply Company:		
(1) Rations		
(2) Clothing & Equipment		
(3) Ordnance		
(4) Transport		
Heavy Gun Company: 4 7-in., tractor		125
Heavy Gun Company: 4 5-in., pedestal		125
Howitzer Company: 4 8-in., tractor		125
Field Gun Company: 6 155-mm., tractor		125
Field Gun Company: 8 75-mm., tractor		125
A-A. Gun Company 12 largest, pedestal		125
Searchlight Company (8 30-36 inch)	)	125
Searchlight Company (8 12-18 inch))	
Searchlight Company (Paraboloids))	
Sound Locator Co. (Magnetic Loops)	)	125
Sound Locator Co. (Radio Compasses))	
Engineer Company		125
Communications (1 large radio set)	)	125
(2 small radio sets))	
Air Detachment (8 pursuit)	)	300
(8 scout-bombers))	
Total:		1800

Landing Brigade:	
Brigade Headquarters Detachment	25
3 Regiments	6000
Total:	6025

Landing Regiment:	
Headquarters Company:	125
(1) Operations & Intelligence	
(2) Pioneers: 4 searchlights 12" & 18"	
(3) Communications: 1 large radio set, 3 small radio sets;	
(4) Administration	
Supply Company:	125
(1) Rations	
(2) Clothing and Equipment	
(3) Ordnance	
(4) Transport	
Gun company: 12 37mm., 8 75mm.,	125
Machine Gun Company: 30 guns	125
3 Battalions riflemen (500 men each, minimum)	1500
Total:	2000

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