

UNITED STATES ARMY INFANTRY SCHOOL

Fort Benning, Georgia 31905

30 June 1972

THE BATTLE OF TARAWA:  
A STUDY IN FIRE SUPPORT  
(RESEARCH).

Captain R. A. Arena, U.S. Marine Corps

Infantry Officer Advanced Course 4-72

Roster Number 006, Faculty Advisor Group 1-1

## TABLE OF CONTENTS

INTRODUCTION -----	1
Overview -----	1
Scope -----	1
Objectives -----	1
Method of Development -----	1
BODY -----	1
Geography and History -----	2
General Situation -----	2
Concept of the Operation -----	2
Fire Support Plan -----	3
Execution of the Fire Support Plan -----	4
ANALYSIS AND CRITICISM -----	7
EFFECTS AND IMPLICATIONS -----	9
APPENDIXES -----	11
A - Tarawa Atoll November 1943 -----	12
B - Scene of Battle 1943-1944 -----	13
C - Betio Island, Main Japanese Defenses -----	14
D - Japanese Garrison and Weapons -----	15
E - U.S. Command Structure and Forces -----	17 <sup>b</sup>
F - Betio Island Situation 1800 20 November 1943 -----	18 <sup>i</sup>
BIBLIOGRAPHY -----	19 <sup>B</sup>

THE BATTLE OF TARAWA:  
A STUDY IN FIRE SUPPORT  
(RESEARCH).

I. INTRODUCTION

A. Overview. On 20 November 1943, the 2d Marine Division made an amphibious assault on Betio Island, Tarawa Atoll. The assault was the first time in the Pacific Theater the landing force encountered a heavily fortified beachhead that had to be seized if the attacking force was to achieve its objective. The island was secured after 76 hours of fierce fighting during which the landing force suffered more than 3,000 Marine casualties.

B. Scope. This monograph is concerned with the naval gunfire, air, and artillery fire support planned for and executed during the assault of Betio Island.

C. Objectives. I shall examine the fire support plan from the position of what support was planned and what support was actually fired on the target. I shall try to determine how the results of the fire support of this operation influenced fire support planning in future amphibious operations.

D. Method of Development. I shall conduct this study in the chronological order of events.

II. BODY

Doc ✓  
A. Geography and History. Tarawa Atoll is part of the Gilbert Islands in Micronesia. The atoll is located in the center of the Gilberts and is 2,085 miles southwest of Pearl Harbor. The atoll is made up of 25 small coral patches which form a reversed "L". These patches are connected by a coral reef passage which is dry at low tide. An underwater reef connects the extensions of the "L", completing the triangle and inclosing a lagoon. The lagoon is navigable to vessels through a deep passage in the reef (See Appendix A)(9:33),

Betio Island, the most important island of Tarawa Atoll, is located on the southwest corner of the atoll. The island is only 600 yards wide and 3 miles in length. The maximum elevation is 12 feet and the average elevation is only 6 feet.(10:14),

The tide in the lagoon recedes as low as 4 feet over the reef during neap tides.(9:31),

The Gilbert Islands fell to the Japanese in December 1941 but they were not occupied in strength until months later. The initial Japanese force consisted primarily of coastwatchers observing American activity in the South Pacific. The vulnerability of the Gilberts was realized after the 2d Marine Raider Battalion conducted a successful amphibious raid on

Makin Island on 17 August 1942. Construction work for the defense of Betio was started soon after the raid. (9:49)

B. General Situation. By late summer of 1943 the Japanese offensive movement toward Australia had been checked. The Allies were on the offensive and the Joint Chiefs of Staff considered the time to be right for an attack into the Central Pacific. The Gilbert Islands were selected as the first objective. More specifically the nerve center of the Japanese defenses, Tarawa, was selected as the main objective (See Appendix B). (2:197, 9:13, 11:110).

Betio Island, the target for the amphibious assault, was heavily fortified. The island was organized as a series of strongpoints with the spaces between strongpoints covered by fire. Integrated within the defensive plan was a wide array of weapons ranging from coastal defense guns and howitzers to small arms. Around the island the defenders constructed a maze of obstacles. A coconut-log seawall girdled the landing beaches (See Appendixes C and D). (9:50, 12:17)

The Japanese defenders were commanded by Rear Admiral Keiji Shibasaki. His plan for defense was to:

Wait until the enemy is within effective range (when assembling for landing) and direct your fire on the enemy transport group and destroy it. If the enemy starts a landing, knock out the landing boats with mountain gunfire, tank guns, and infantry guns, then concentrate all fire on the enemy's landing point and destroy him at the water's edge. (2:236)

The 2d Marine Division was designated as the landing force for the amphibious assault. The division had been recuperating in Wellington, New Zealand after participating in the victory at Guadalcanal and was commanded by Major General Julian C. Smith, U.S. Marine Corps. The division was transported to the objective area by Rear Admiral Harry W. Hill's Task Force 53 (TF 53) (See Appendix E). (6:99)

C. Concept of the Operation. The general scheme of maneuver for the assault of Betio was a frontal attack on the northwest lagoon beaches. The first three assault waves were to land in amphibian tractors (LVTs). Combat Team 2 (2d Marine Regiment reinforced by 2d Battalion, 8th Marines) commanded by Colonel David H. Shoup, U.S. Marine Corps was to land on Red Beach 1, 2, and 3. Three battalions were to land abreast to seize the three beaches. The 6th Marine Regiment (minus) was the 2d Marine Division reserve. The 6th Marine Regiment was the V Amphibious Corps (VAC) reserve. With the exception of two minesweepers and two destroyers that would lead the assault waves into the lagoon, the first support ships would lie to off the western coast of Betio and place

enfilade fire on the northwest landing beaches, (See Appendix F),(2:214, 9:35)

D. Fire Support Plan. It was agreed during the planning stages for the attack on Tarawa that speed was the primary consideration because the amphibious task force represented a vulnerable target for the Japanese fleet. The need for strategic surprise ruled out a lengthy preliminary concentration of aerial bombing and naval gunfire prior to the arrival of the amphibious force in the transport area. To gain surprise, preparatory fire was to be distributed throughout a wide geographical area while TF 53 steamed towards Tarawa. During the early hours of D-Day, naval support ships and aircraft would concentrate the greatest possible volume of fire on the island in the brief period before H-Hour.

The D-Day preparatory fires were to begin at 0545. At that time, carrier planes would bomb and strafe enemy troops and installations. After 30 minutes, fire support ships would begin a two-phased bombardment of the island. First they would deliver 75 minutes of pre-arranged neutralization and counterbattery fire, moving as near as 2,000 yards from the beach in order to neutralize the coastal defense guns. The first phase was to be followed by 45 minutes of increasingly heavy bombardment of assigned areas. The combined purpose of the second phase was to destroy emplacements along the invasion beaches and neutralize enemy defenses throughout the island. Once the assault troops were ashore, the warships and aircraft would support the attack by calls for fire from the naval gunfire and air liaison parties. (9:36)

There were several aspects of the fire plan that Marine and Navy planners did not agree upon. The first was the fact that the naval bombardment was to fire into "areas" rather than at strong points previously pinpointed by reconnaissance. By firing destruction fires simultaneously with neutralization fires, the 2d Marine Division staff thought these strong points could not be destroyed. The Navy would not approve of time consuming, sustained, accurate fire necessary for the destruction of the strong points. They were determined to deliver as much ordnance as possible over the entire island in as short a period as possible. (9:36)

In planning the frontal attack of Betio, Major General Julian Smith, U.S. Marine Corps, the 2d Marine Division Commander, knew that he was confronted with the most costly of operations. He considered the 3 hours of naval gunfire and air support inadequate to insure the success of his landing. Without the use of the artillery organic to the 2d Division, he was deprived of a sizeable amount of firepower that he alone could control. He proposed to emplace his artillery, at first light, on a small, adjacent atoll from which the artillery could support the assault. Time considerations and the requirement to divert naval gunfire ships and portions of the landing force from the main objective were factors that

overruled his plan. His apprehension was summarized by his chief of staff, Colonel Merritt A. Edson, U.S. Marine Corps:

- . . . the relative superiority of strength with the troops now available to us as opposed to the hostile strength on Betio alone, which is our primary objective, does not permit the detachment of any part of the 2d Marine Division for secondary landings. Reliance must be placed on supporting air and naval forces to neutralize or destroy hostile weapons which may successfully interfere with our landing on Betio. (2:215)

The commanding general was severely restricted in his freedom of action. He requested that the corps commander make this clear in the operation order. Lieutenant General Holland M. Smith directed the 2d Marine Division to: "land on Betio Island, seize and occupy that island, then conduct further operations to reduce the remainder of Tarawa Atoll." (2:205)

Another portion of the fire support plan that was requested by the Marines was for the 7th Air Force to drop "daisy-cutters" on and beyond the invasion beaches. The use of this type bomb was to destroy the enemy on the beaches and shatter buildings that might provide cover for snipers. Although this request was approved and listed in the air operations plan, the bombs were not dropped. (9:39)

The naval bombardment of Betio was planned to be the greatest concentration ever fired on a single objective. The naval task force planned to fire 2,000 tons of explosives ranging from 16-inch battleship shells to 5-inch destroyer shells. Carrier aircraft were to drop another 900 tons of high explosives. (13:51)

#### E. Execution of the Fire Support Plan.

1. Air and Naval Gunfire. The preinvasion bombardment of Tarawa began on D-4 when B-24 bombers conducted the first bombing flights in support of the assault. Japanese airfields within range of Tarawa were also attacked, in order to cripple enemy air support and to gain and maintain air superiority. These air attacks effectively localized the target area and reduced the Japanese air capability to just minor harassments. On D-3 and D-2, carrier planes concentrated on Betio. On D-1, cruisers and bombers from TF 53 moved in to begin their attacks. (2:214 and 13:51)

The primary targets for these attacks were the coastal defense guns which had to be destroyed before troop transport and cargo ships could operate adjacent to the atoll. Because they received weak anti-aircraft fire, the pilots of the attack aircraft falsely concluded

that all worthwhile targets were destroyed. (2:214)

At 0250 on 20 November 1943 (D-Day) the invasion fleet arrived off the western shore of Tarawa. At 0441, a red star cluster arched up from the southern shore of Betio. At 0505, a shore battery commenced firing on the task force flagship, U.S.S. Maryland, at a range of 11,000 yards. As the enemy shells splashed around the battleship, Admiral Hill gave the command to commence fire. The Maryland's second salvo from her 16-inch guns hit an enemy ammunition magazine which sent a sheet of fire 500 feet into the air. This direct hit had a favorable effect on the morale of the landing force, but the concussion from the main-batteries damaged the Admiral's radio equipment. The problems of D-Day were about to begin. (13:57)

The naval gunfire bombardment continued until 0542 when Admiral Hill ordered a cease fire. Carrier aircraft were to launch a strike at 0545. The fleet waited silently for 20 minutes. At 0602, Admiral Hill signaled the support ships to commence firing again until the planes arrived. This delay was caused by a misunderstanding between the carrier commander, who thought that he was to attack Betio at sunrise (0615), and the invasion fleet commander, who had requested the strike at dawn (0545). (13:62)

The planes from three aircraft carriers finally arrived at 0615 and attacked Betio for 7 minutes. The planes left the island obscured by smoke and flame. The naval gunfire support ships immediately resumed their bombardment.

At 0715, the minesweeper near the line of departure reported that the initial assault waves, carried in LVTs were 24 minutes behind the scheduled 0830 H-Hour. Admiral Hill, therefore, postponed H-Hour until 0900. He was able to contact his control ship; but due to the damaged radio equipment, he was not able to contact the carrier aircraft that were scheduled to attack just before H-Hour. At 0823, the aircraft reappeared over Betio for the last-minute attack. Although radio communication was erratic, cease firing of the main batteries enabled the flagship to contact the aircraft and postpone the air strike until 0855. While the planes waited their turn, the task force naval gunfire support ships moved in to point-blank range to continue the bombardment of Betio.

With the exception of the two destroyers and the two minesweepers within the lagoon, Admiral Hill ceased the naval gunfire at 0855 for fear of hitting the LVTs that were nearing the beach and to allow the air strike to move in. (2:228 and 9:55)

The bombardment of Betio led observers to remark that, "it seemed almost impossible for any human being to be alive in Betio Island . . . ." (2:234) Others recalled Admiral Hill's promise "to obliterate the island." (13:64)

But the assault landings on Red 1, 2, and 3 did not occur until 0910, 0917, and 0922 respectively. (9:59)

The preliminary bombardment did not meet the Navy's optimistic expectations. Many of the big guns were silenced but most of the smaller caliber guns and machineguns survived both the airstrikes and the naval gunfire. The gun emplacements, protected by layers of concrete, coconut logs, and sand, had to be destroyed by frontal attack. (9:55 and 11:122)

After an inspection tour of Betio, General H. M. Smith, VAC commander, stated:

I entered every pillbox and blockhouse on the western end of the island and found only one had been even hit by naval gunfire. Not one had been destroyed. All of them had to be destroyed by Marines with explosive charges and hand grenades. Dead Japanese lay everywhere but they were killed by Marines, not naval gunfire. (11:131)

Of major importance was the effect of the preliminary bombardment on Japanese wire communications. Japanese prisoners related that the shelling ripped up the wire and forced them to use messengers. Not only were many of the messengers killed, but the entire coordinated defense of the island was affected by the loss of communications. (9:55)

2. Artillery. The first assault waves, under a hail of enemy machinegun and antiboat fire, landed on the beaches in LVTs with relatively few casualties. The following waves in landing crafts, vehicle, personnel (LCVPs) and landing crafts, mechanized (LCMs) were not as fortunate. The reef was a barrier to these landing craft. Therefore, the Marines had to transfer to LVTs or wade the one-half of a mile to shore. The exposure to enemy fire during this time resulted in many casualties. The first artillery units to land came ashore under these circumstances.

Because of the uncertain situation on Red Beach 1, Colonel Shoup decided to land the artillery batteries on Red Beach 2 instead of Red Beach 1, as originally planned. One gun section from Battery A and one section from Battery B transferred to LVTs and finally got ashore at dusk on D-Day. Three gun sections from Battery C were landed at the edge of the pier that extended towards the reef. There the artillerymen dismantled their pack howitzers and waded ashore. By the evening of D-Day, Lieutenant Colonel Presley M. Rixey, U.S. Marine Corps, commanding officer of the 1st Battalion, 10th Marine Regiment (artillery regiment), had formed a composite firing battery. On the morning of D+1, the battery was ready to support the infantry with artillery fire. (1:33)

The artillery was successful in destroying Japanese blockhouses that had survived the naval bombardment. These blockhouses held up the advance of the infantry and were costly in terms of casualties when attacked frontally. By firing high explosive ammunition with delay fuzes at a range of 125 yards, the howitzers successfully penetrated these log and coral structures. (9:72)

The artillery battery was also credited with breaking up two strong Japanese counterattacks. One counterattack occurred on the night of D/2 and the other on the morning of D/3.

In the 76 hour battle for Tarawa, the artillery battalion fired a total of 2,366 rounds at an average range of 1,500 yards. More than one-half of these rounds were fired in order to repulse the enemy counter-attack attempts. (1:36)

### III. ANALYSIS AND CRITICISM

In analyzing the fire support employed in the assault of Betio, it is evident that there were many difficulties. It was the first operation involving the assault of a well defended atoll. Great results had been expected from the naval bombardment. It was the largest bombardment ever fired on any amphibious objective, but the bombardment failed to destroy enough positions and kill enough of the defenders. The critical period between 0855 and 15 minutes later when the first landings were made, very little fire fell on the landing beaches. This delay allowed the defenders to shake their dazed minds free of shock, leave their underground shelters, and man their beach defenses. The coordinated Japanese defense continued to function long after the landings, and the enemy had the ability to place effective fire in any area.

The following points of discussion are considered to have had a significant bearing on the fire support employed at Tarawa.

A. The objective area was effectively isolated from enemy threat. In the fall of 1943, the United States was not assured of air and naval superiority. This was an important consideration during the planning stages of the operation and one of the reasons time was so important. The bombing raids on Japanese bases within range of Tarawa, prior to the assault, contributed largely to reducing the enemy air threat.

B. The disapproval of Major General J. C. Smith's proposal to emplace his artillery on an adjacent island proved to be critical. If the artillery had been employed as the division commander desired, it would very likely have provided fire support during the critical period between 0855 when Admiral Hill ceased firing the majority of his support ships and 0910 when the first assault troops landed. This artillery could have been

controlled by forward observers in the assault waves and could have continued to fire on each of the respective beaches until the last minute before landing. After the landing, the artillery batteries would have been more responsive to the landing force. The results of the disapproval of this plan was that a large part of the artillery battalion never got into the action, and the composite battery didn't enter the battle until D+1.

C. To successfully destroy the fortifications the Japanese had constructed, sustained destructive fire should have been required. The primary objective of pre-D-Day naval gunfire is physical destruction of vital enemy and ground installations to prepare the landing area for the assault. Destruction fire requires deliberate, pin-point accuracy. The Japanese strong points, gun mounts, and emplacements that survived the bombardment required destruction fire. This is the type of fire support the Marine planners requested from the Navy during the planning stages of the operation. What was considered to be a paralyzing amount of fire was actually inadequate and only partially completed the job.

D. The influence of the Navy planners did not always contribute to a solution that would result in the best chance for success. Naval gunfire experts were overly optimistic of the destructive power of their weapons. The requests and recommendations made by Marine planners were often not considered or were disapproved. The Marines had studied and observed the effects of those guns in combat. They were in a position to make realistic and astute fire support recommendations that were often disapproved by their Navy superiors.

E. Loss of communication aboard the flagship had a significant affect upon the shortcomings of the fire support plan. From that time on it seemed everything went contrary to schedule. Admiral Hill was unable to contact his air support at critical times. Throughout the operation, communication between the landing force commander aboard the flagship and his commander ashore was hampered. This situation emphasized the need for an alternate means of communication.

F. The fire support reflected a lack of flexibility and coordination. Deviation from the planned schedule introduced confusion that lasted until the objective was secured. The planned air strike at 0545 on D-Day failed to appear as scheduled because of a lack of coordination and communication between the carrier commander and the amphibious force commander. The support ships were silent for 20 minutes rather than continuing to fire until the aircraft arrived. The initial assault waves were without the preponderance of the supporting fires when it was most critical to keep the defenders dazed and in their holes. This situation could have been largely prevented by proper coordination and by flexible planning.

G. The insufficient number of armor piercing and base-fuzed projectile contributed to the inadequacy of

the naval bombardment. The super-quick fired shells impacted on, but were unable to penetrate, the Japanese strong points. These shells gave a false impression of the situation and obscured the island with smoke and dust created by the surface detonations.

H. The geography of Betio made it a poor target for naval gunfire. The low elevation was not suited for the low-trajectory, high-velocity projectile fired by naval warships. There were many ricochets and a miss of a target often meant overshooting the entire island. For naval gunfire to be effective, targets should present an appreciable vertical surface. Since the island was so flat, the only way to attain the desired angle of impact would have been to increase the range and fire high angle fire. This technique was not possible because the rounds were being spotted by direct observation from the ships. If the range was increased, the observers would not have been able to observe accurately.

I. Progress in developing shore fire control parties and air liaison parties was made during the battle of Tarawa. Plans for the use of these groups were more advanced than in any other operation. Despite the difficulties in maintaining communication ashore, these parties proved to be effective.

#### IV. EFFECTS AND IMPLICATIONS

Tactically, Betio became the textbook for future amphibious landings and assaults. Lessons learned were widely disseminated. The necessity of coordinating the supporting arms and timing everything around the moment the first troops actually touched the beach was recognized by all. Air and naval gunfire support observed their errors and emerged the stronger. (2:251)

Errors in fire support were made in subsequent landings in the Pacific, but the Tarawa experience was the dividing point between marginal fire support and its successful employment. Planners no longer thought of preparatory fires in terms of hours. Days of intense air and naval gunfire became the rule rather than the exception. The bombardment of Guam in July 1944 lasted for 13 days prior to the landing.

The feasibility of placing artillery on the islands near Betio proposed by General Julian Smith gained attention as early as January 1944 in the Marshall Islands Campaign. The ability to support the main attack outweighed the considerations that prevented the use of this technique at Tarawa. Orders to the assault divisions in later Pacific campaigns directed occupation of surrounding islands before launching the main attack.

The difference between neutralization fires and destruction fires ~~was~~ also clearly recognized. The plans in the future specified these two types of fires and received rigid adherence. Innovation of the improved

tactical area designation system, which became a standard tool in coordinating fire support, contributed to removing many fire support problems.

To prevent repetition of faulty communication aboard command ships, later operations employed new vessels specially designed for command and control operations. The new class of ships served as a flagship for the amphibious force commander and a command post for the landing force commander. Additionally, the ships contained the necessary communications equipment to coordinate all supporting arms. Two vessels of this type were used in the Marshall Islands Campaign.

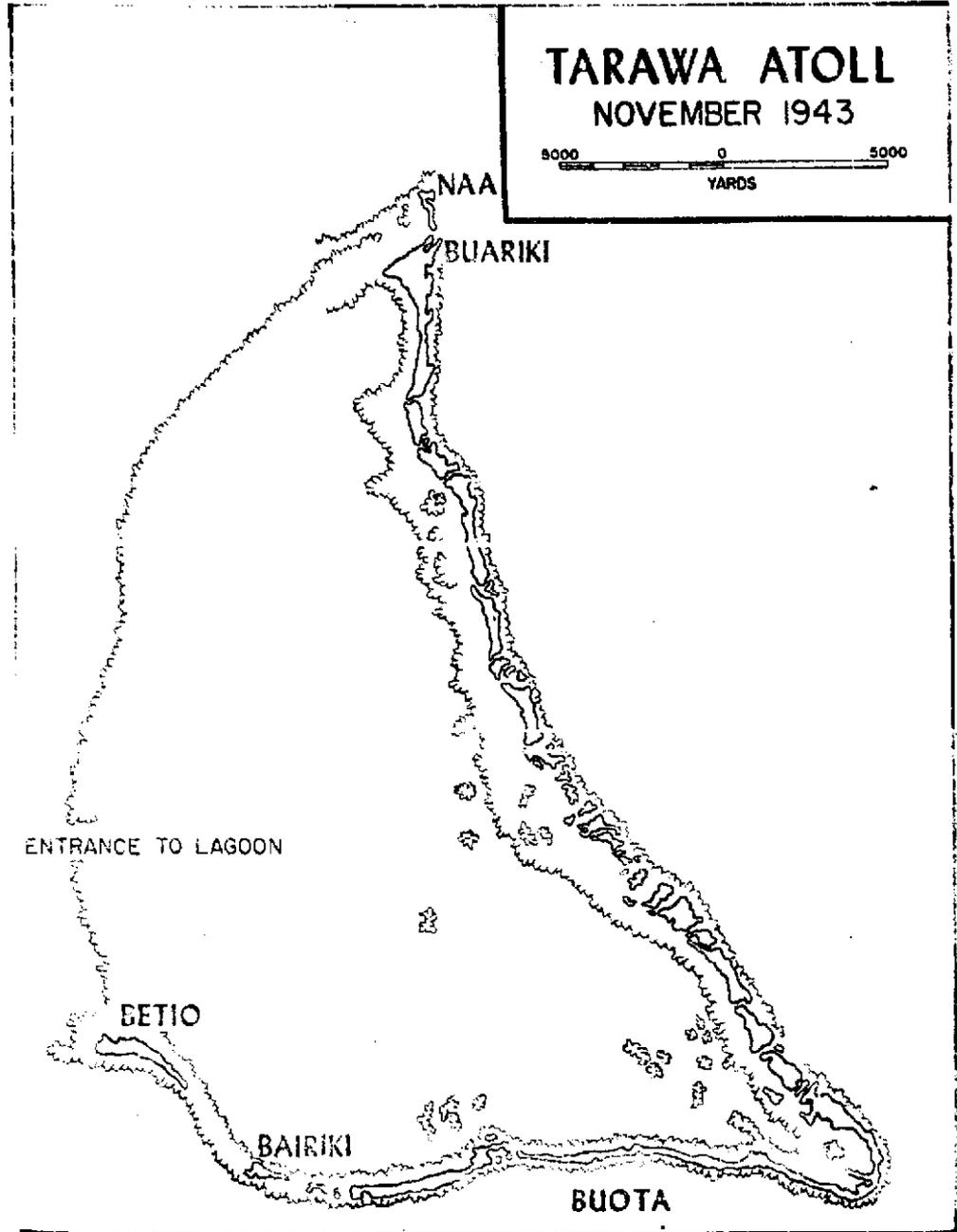
From the experience gained at Tarawa, new interest arose for well experienced communications personnel for assignment to shore fire control and air liaison parties. Signal companies were formed and trained by V Amphibious Corps, and one company was assigned to each division.

After Tarawa, amphibious warfare planners realized that the secret to success was the concentration of forces and firepower and the careful coordination of all elements timed to the decisive moment of the landing. The landing could not be put on a timetable. It had to be referred to in terms of an H-Hour and all other functions had to fluctuate around that moment.

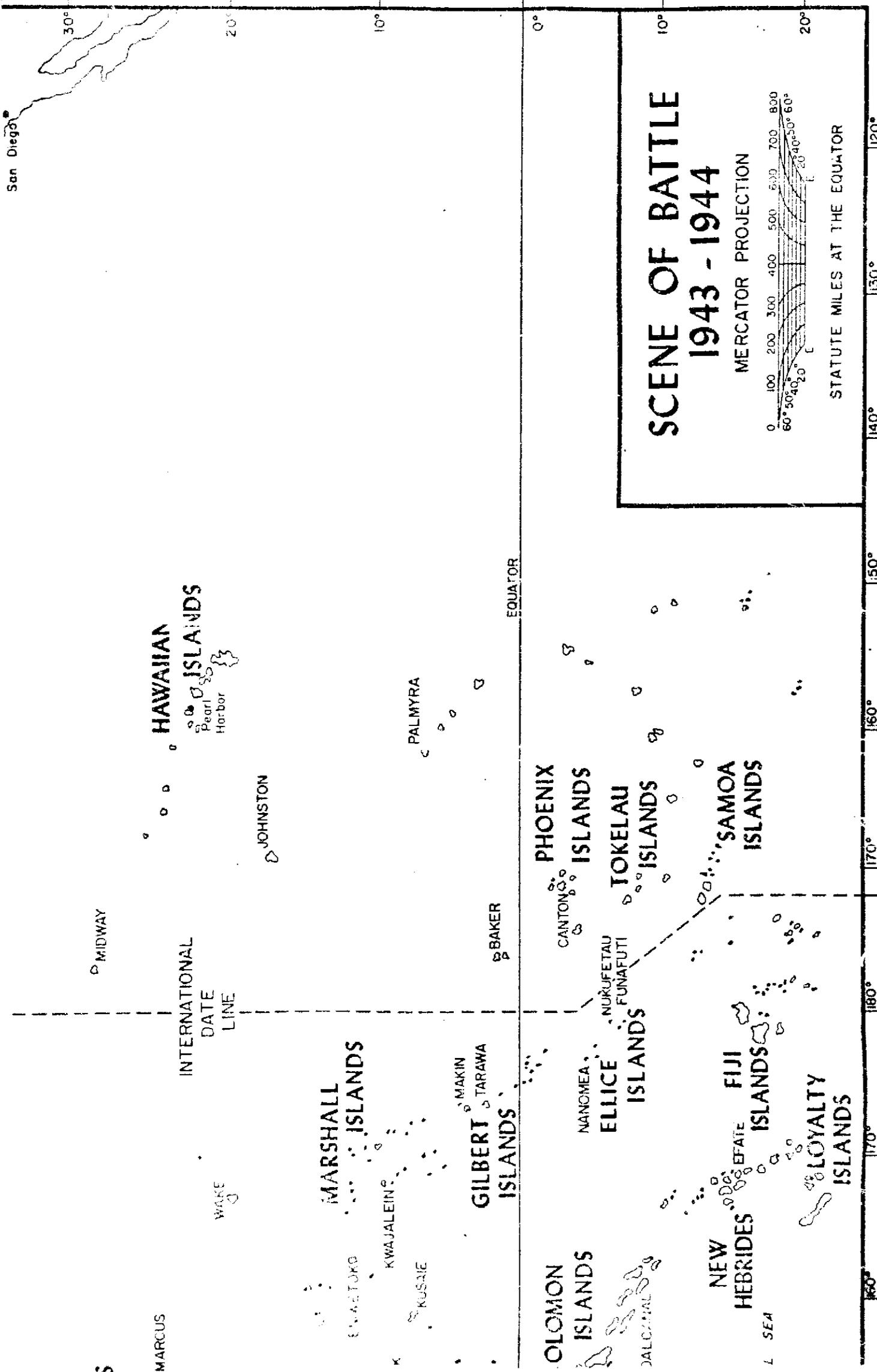
For all its shortcomings, the fire support at Betio was significant, and it contributed measurably to the outcome of the battle. The most noteworthy accomplishment was its effect on Japanese wire communication. This fact is recognized by General Julian Smith when he stated, "Admiral Shibasaki lost the battle by failing to counterattack on the first night, for never again would the beachhead be so vulnerable. Shibasaki's failure was probably due to a collapse of his communications." (9:71)



R. A. ARENA  
Captain, U.S. Marine Corps  
544-1450



APPENDIX B - Scene of Battle 1943-1944



# SCENE OF BATTLE 1943 - 1944

MERCATOR PROJECTION

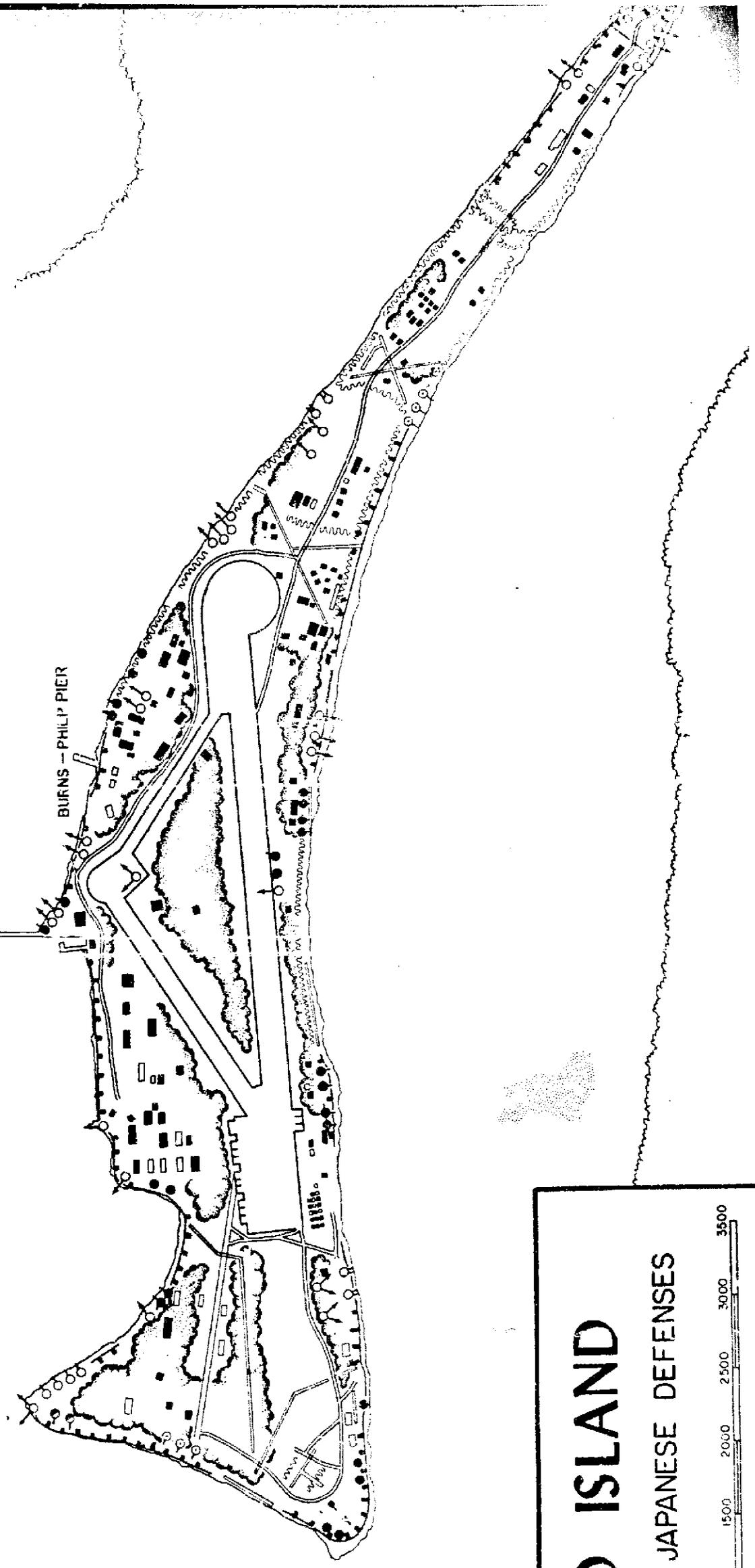


STATUTE MILES AT THE EQUATOR



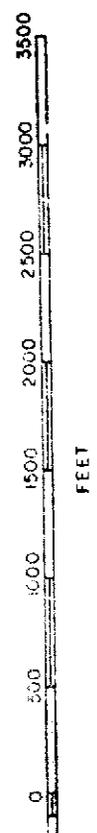


- ⊙ 80 mm. GUN
- 75 mm. MOUNTAIN GUN
- 70 mm. SINGLE MOUNT
- 70 mm. HOWITZER
- 37 mm. REPAIR FIRE
- 15 mm. MG. TWIN MOUNT
- 13 mm. MG. SINGLE MOUNT
- LOG BARRIAGE WITH MG EMPLACEMENTS
- AND RELE. BITS INSIDE IN OR BEHIND IT
- FIRE AND COMMUNICATION TRENCH
- ANTITANK DITCH



# BETIO ISLAND

## SHOWING MAIN JAPANESE DEFENSES



APPENDIX D - Japanese Garrison and Weapons

Garrison:

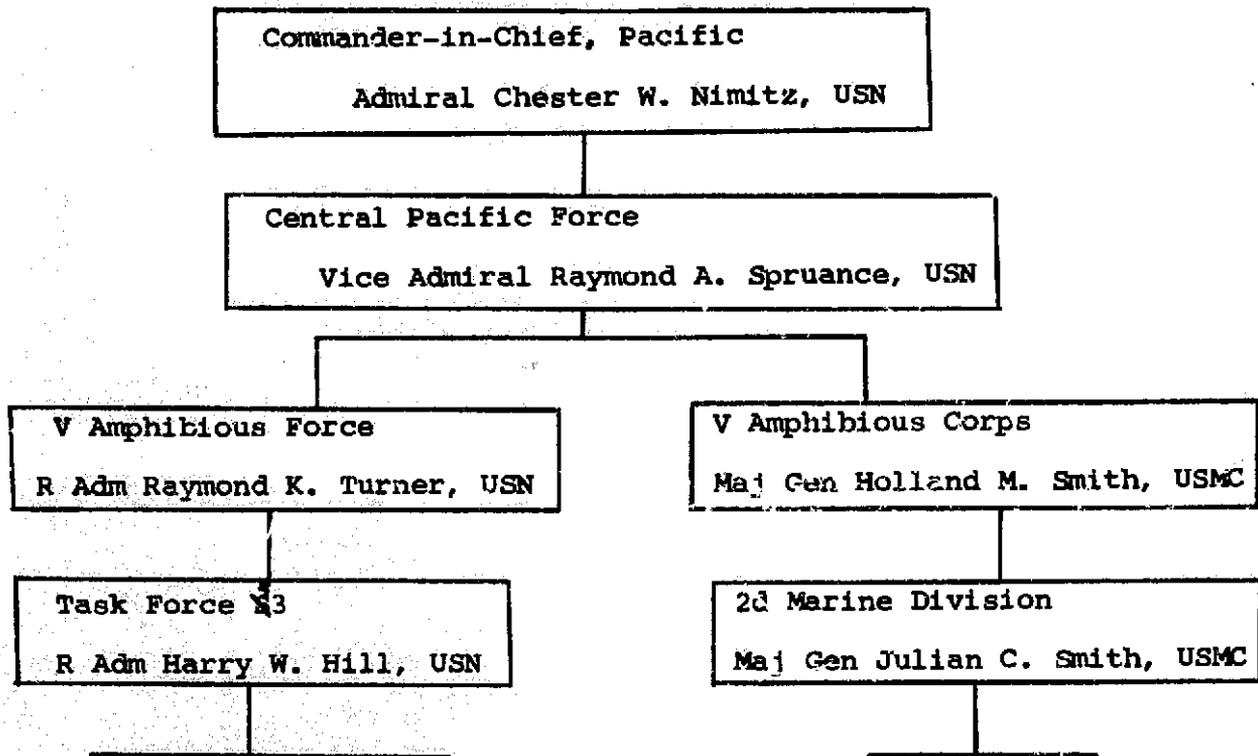
Commander: Rear Admiral Keiji Shibasaki, Japanese  
Imperial Navy

Imperial Marines:	2,619
Construction Troops:	2,217

Weapons:

80-mm to 8-inch coastal guns:	20
75-mm howitzers:	10
70-mm guns:	6
37-mm field pieces:	9
13-mm machineguns:	31
7.7-mm machineguns:	Unknown number
Antiaircraft weapons:	Unknown number
Light tanks with 37-mm guns:	7

APPENDIX E - U.S. Command Structure and Forces



Naval Forces

- 3 Battleships
- 2 Heavy Cruisers (Corps Reserve)
- 3 Light Cruisers
- 16 Destroyers
- 2 Minesweepers
- 13 Troop Transports (Artillery)
- 3 Cargo Ships
- 3 Tank Landing Ships
- 1 Dock Landing Ship
- 5 Escort Carriers
- 2 Heavy Fleet Carriers
- 1 Light Fleet Carrier

Marine Units

- 2d Marine Regiment
- 6th Marine Regiment
- 8th Marine Regiment
- 10th Marine Regiment



