JAPANESE PACIFIC ISLAND DEFENSES 1941–45

GORDON L ROTTMAN

ILLUSTRATED BY IAN PALMER

FORTRESS • 1

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Series editors Marcus Cowper and Nikolai Bogdanovic

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Introduction

Hundreds of books relate the many Pacific island battles of World War II and the resolve of the Japanese defenders. All affirm the skillfulness of Japanese camouflage, the tactically-sound positioning of defenses, the effective use of terrain, the ability to develop mutually supporting positions, and the fortifications' ability to withstand massive firepower. While the war in the Pacific was a war of vast distances and maneuvering on a grand scale, the island fighting saw little movement of large, mobile forces. The nature of combat was slow and grueling: it was fought yard-by-yard over rugged terrain in a harsh environment against a determined and resourceful enemy. It was brutal almost beyond description with no quarter given by either side.

This study focuses on the defenses and field fortifications constructed on Pacific islands by the Japanese combat troops defending them. Large, permanent fortifications are beyond the scope of this work. This book will thus concentrate on temporary and semi-permanent crew-served weapons positions and individual and small-unit fighting positions, constructed with local materials and some supplied engineer construction materials. Obstacles and minefields incorporated into the defenses are also discussed. While wartime intelligence studies and reports provide detailed information on Japanese island defenses, little postwar study has been undertaken. This is largely due to the temporary nature of the defenses, their remoteness and the fact that little survives of them today.

Concrete blockhouses such as this one on Saipan were used for command posts, radio stations, and to shelter various support facilities. Often little effort was made to camouflage them as they were purely bomb shelters and not intended as fighting positions.

Japanese island defense doctrine

Every Japanese manual from 1909 focused on the importance of offensive action to achieve victory. What the Japanese lacked in firepower and *matériel* was to be made up for by spiritual power, superior martial values, and total dedication to fulfilling one's duty, even if it meant attacking a superior force with bayonets or defending a position to the death. An officer corps evolved which loathed defense and fixed fortifications. However, the Pacific War became nothing more than a series of defensive battles for the Japanese, a war of attrition that they did not have the resources to win, nor even to achieve a stalemate.

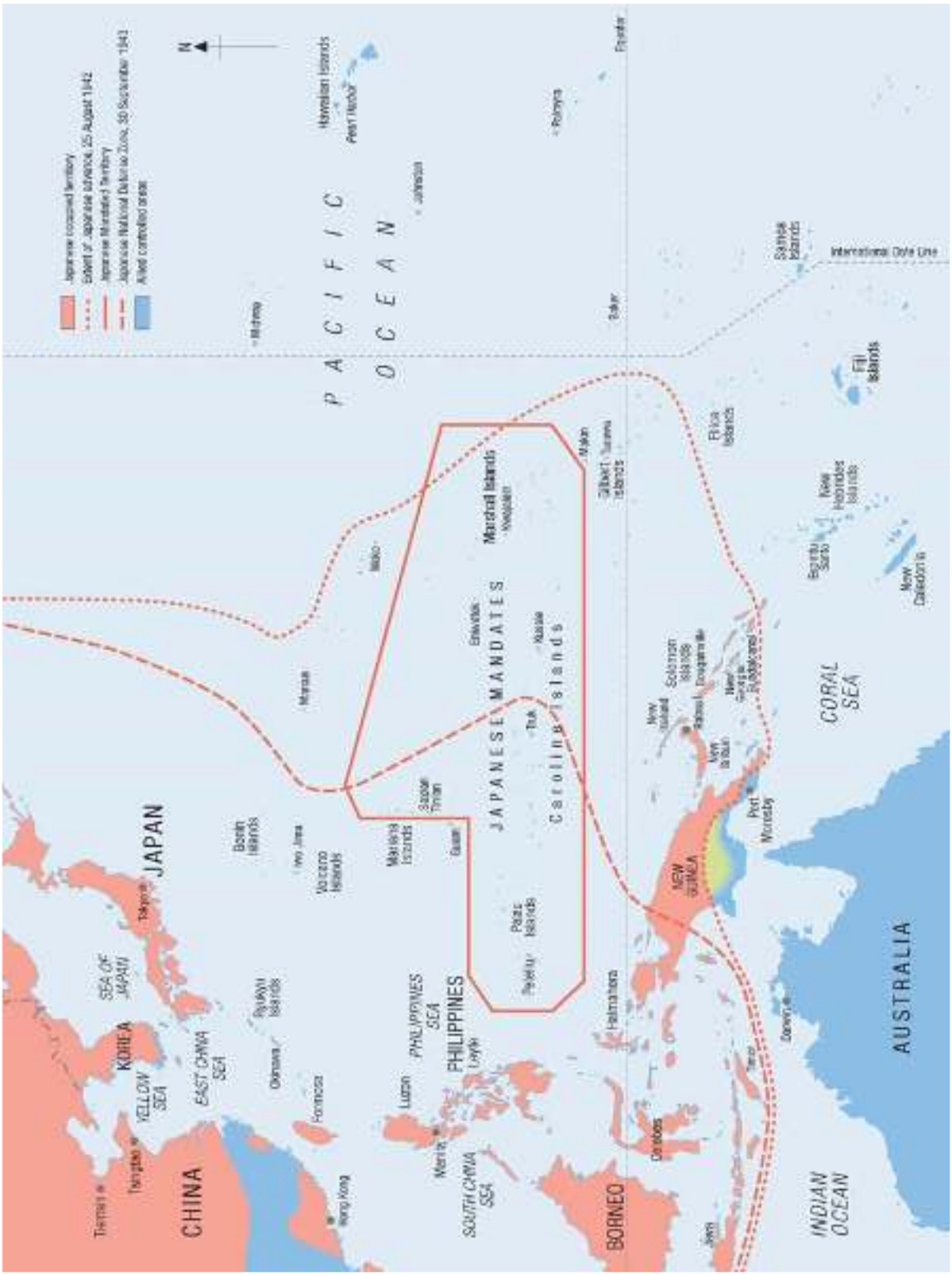
The US Army's 1944 *Handbook on Japanese Military Forces* describes the Japanese attitude toward defense. "The defensive form of combat generally has been distasteful to the Japanese, and they have been reluctant to admit that the Imperial Army would ever be forced to engage in this form of combat. So pronounced has been their dislike for the defensive that tactical problems illustrating this type of combat is extremely rare."

The 1938 Combat Regulations (*Sakusen Yomurei*), still in effect at the beginning of the Pacific War, called for passive defense in the face of overwhelming enemy superiority (unyielding resistance until additional forces arrived to resume the offensive): prior to this the Japanese had adhered only to the concept of active defense. Active defense was only to be adopted when the enemy gained local superiority and continued until operational initiative could be regained and the offense resumed. In reality, because of the previous schooling and aggressive nature of Japanese officers, the conduct of the defense on Pacific islands was essentially active defense. Their goal was to halt the enemy at the water's edge, and if unable to decisively defeat him there they sought to reduce his strength, and conduct immediate counterattacks to keep him disorganized until mobile reserves could annihilate him.

Among the key problems Japan faced were the vast distances involved, limited shipping, brutal climate, and numerous health hazards. She was compelled to defend islands in widely varied terrain and weather conditions – from barren, rocky, sub-arctic outposts to vast, mountainous, rainforest-covered islands.

The initial Japanese defense concept in the South Pacific was to establish a series of airfields and naval bases throughout the dense island chains. These would serve to launch further conquests, to protect the

A double-bay bunker housing two HMGs, each with an individual sector of fire. Such a position would be well camouflaged with growing vegetation. The bunker was divided into two compartments to prevent both weapons from being knocked out by a single satchel charge or bazooka rocket.



The Pacific Theater at the extent of the Japanese conquest and the subsequent establishment of the National Defense Zone.

This machine gun pillbox is provided with a rough-appearing firing port, but was difficult to detect from the ground. Built beneath a tree, it was virtually impossible to detect from the air. Camouflaging palm fronds had been pulled away so that the position could be photographed.

flank of Japanese forces in the Southwest Pacific and to provide an outer guard to the inner defense zone in the Japanese Mandated Territory. The Battle of Midway (June 4, 1942) halted the Japanese conquest.

The Allied offensive in the South Pacific began on August 7, 1942 when the Marines assaulted Guadalcanal and adjacent islands. The massive air, naval, and *matériel* power that the Allies brought to the battlefield meant that the Japanese could not engage maneuver warfare or launch counter-offensives. No Allied amphibious assault was defeated: once an island was secured by the Allies, no Japanese attempt was ever made to retake it. In the South Pacific the "island hopping" strategy was developed, the concept of attacking where the Japanese were weak and bypassing the most strongly-held islands. These would be cut off or allowed to evacuate.

An early-war Japanese report, *Concerning Defense Against Enemy Landings*, stated that enemy forces must be annihilated on the shore, and that, "therefore the second or third line of defense positions ordinarily will not be established very far to the rear." However, most of the islands on which the early South Pacific battles were fought were quite large, hilly and thick with jungle. It was impossible to defend the many miles of beach-lined coasts.

The Japanese were taken by surprise at Guadalcanal. The Marines landed unopposed and the construction troops fled into the jungle allowing the Allies to secure a valuable forward airbase. It was a different matter on tiny Tulagi and Gavutu islands across the Slot from Guadalcanal. Special Naval Landing Force (SNLF) troops fought a vicious battle on those hilly, cave-strewn islets. Although not nearly as extensive or well prepared as cave defenses tackled later in the war, they were the first such caves to be encountered. The Japanese funneled in significant reinforcements, and after the initial Marine defense of the Henderson Field perimeter, Army and Marine units began a slow, creeping offensive westward along the north coast. The Japanese established repeated defense lines on ridges and small rivers running inland perpendicular to the coast. The hill and ridge sides were forested, but the open crests were covered only by high kunai grass. They also employed the area's few caves. However, most of the defenses were hasty field fortifications prepared as the Japanese were forced toward the island's west end, from where survivors were evacuated in February 1943.

Later operations on New Georgia, Bougainville, and New Britain found the Japanese better prepared. Lookouts and small detachments were positioned to cover the most likely landing beaches on these sizeable islands, aimed at delaying the enemy until large units could respond from the island's main bases. The Japanese were able to accomplish this as the dense jungles and numerous tracks allowed large units to move relatively unmolested by the Allies' inadequate airpower. The US occupation of New Georgia began in June 1943 with multiple small unit landings scattered about the island to eliminate many of the Japanese detachments. It culminated in a brutal pitched battle at Munda Point where the Japanese wasted themselves defending an unusable airfield.

Bougainville and New Britain (November and December 1943 respectively) were similar in that the Marines established beachheads where airfields were built. No effort was made to clear the entire island. The Japanese battered themselves against well-defended Marine and Army perimeters until forced to withdraw to the opposite end of the island and dig in. No effort was made to dislodge them and they sat out the war while the Allies continued to use their new airfields. Rabaul, the massive Japanese naval and air base on the east end of New Britain, was completely cut off from the outside by a major Allied air and naval effort: it surrendered at war's end.

The war took a new turn in November 1943 when the Army and Marines descended on the Gilbert Islands, and the nature of Japanese defenses changed too. On the Gilberts, Marshalls and Carolines, which comprised dozens of atolls, only a few atolls were developed and defended by the Japanese, namely those with islands large enough to support airfields, and seaplane and naval bases. Usually only key islands were developed as bastions, with lookouts and small detachments being placed on some islets. Their defense was the responsibility of the Imperial Japanese Navy (IJN), but some Imperial Japanese Army (IJA) units were involved in this. While IJN Land Forces employed their doctrinal defense at the water's edge, IJA units in the islands were forced to do the same. The islands were simply too small for any form of maneuver or subsequent lines of defense.

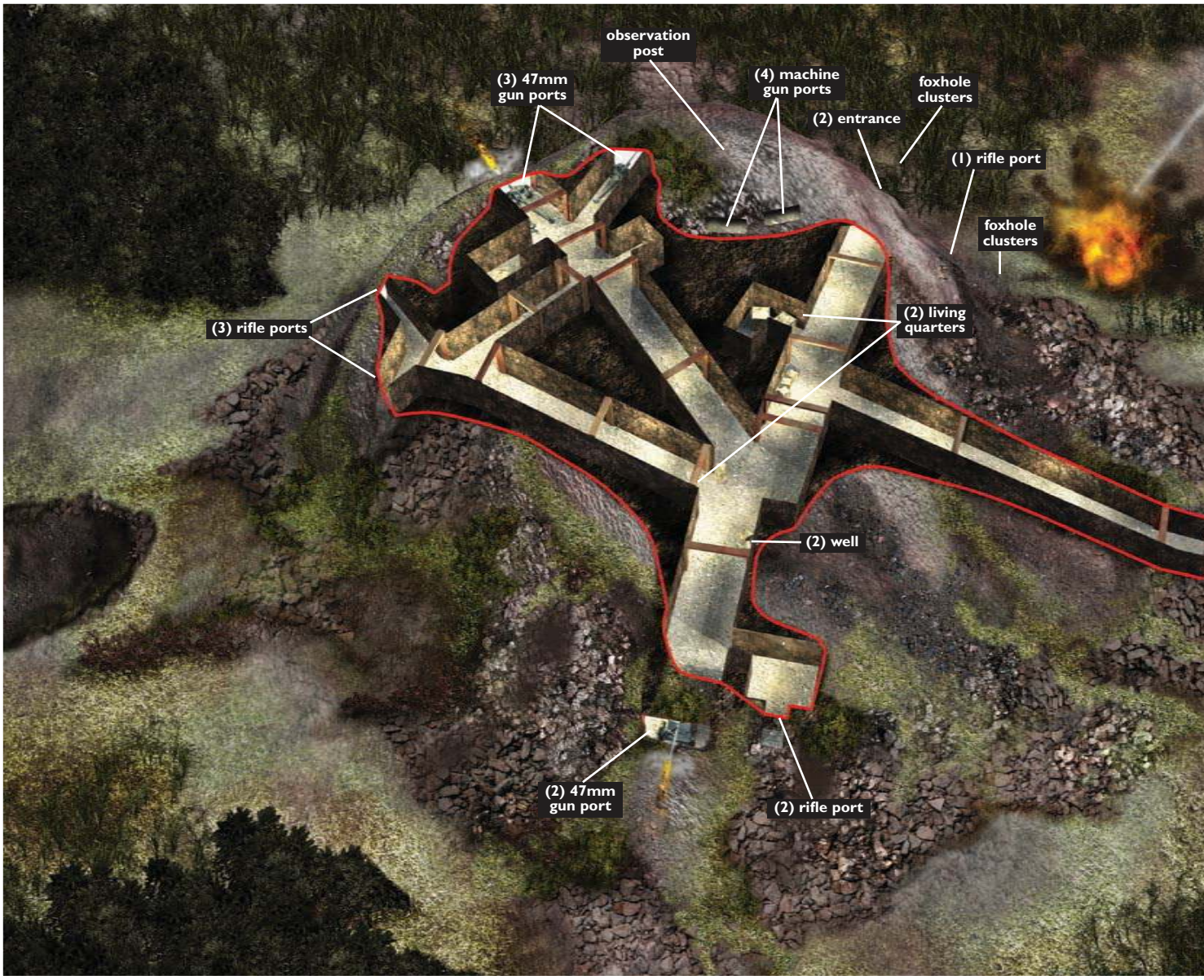
A simplified sketch of an HMG pillbox encountered by the Marines on New Britain. Construction varied greatly, but such pillboxes were among the more frequently found Japanese fortifications.

The defended island was ringed with trenches, rifle pits, machine guns, anti-boat guns, and coast defense guns. Anti-aircraft guns were generally positioned on or near the shore to double as anti-boat weapons. Most positions were covered, except for larger AA and coast defense guns. All artillery was incorporated into the beach defense for direct fire: space was not sufficient to position it far enough in the rear to allow indirect fire. Usually the only "field artillery" on these islands

Japanese fortification thickness standards					
Japanese classification	**Standard of strength (offers protection from)**	**Reinforced concrete**	**Rock and coral**	**Rock and brick**	**Sand and soil**
Special A	1 ton bomb or 16in. shell	9.75ft	16.5ft	–	–
Special B	500 lb bomb or 8in. shell	5ft	8.25ft	–	–
A	250 lb bomb or 5/6in. shell	2.6ft	5ft	6.5ft	26ft
B	100 lb bomb or 3in. shell	1.66in.	2.66ft	4ft	16.5ft
C	25 lb bomb or large live fragments	1ft	1.66ft	2.33ft	6.5ft
D	13.2mm and smaller bullets or small live fragments	2.5–4in.	9in.	9in.	3.25ft

comprised light infantry guns. Strongpoints were spaced along the shore as well as inland, especially around command posts, space permitting. Even if all or most of the island's perimeter could be defended, the defenses were sometimes concentrated in interconnected defended areas, essentially large strongpoints, with light defenses in between them. Antitank ditches were dug to block the passage of armor into key areas. The airfield occupied much of the island, but even it was incorporated into the defense as it provided an exposed field of fire deadly for the attackers to cross. Defenses were established along its edge to cover the far side. If the island was too large for the entire shoreline to be defended by the available forces, a central defended area was established with both strong beach defenses and cross-island defense lines. The Japanese tended to deploy the

Soldiers examine an IJN 120mm Model 3 (1914) coast defense gun knocked out by a destroyer on Hauwei Island, Admiralty Group. Such gun positions were often a simple circular pit dug in the sand, often without interior revetting. Most coast defense guns were originally designed to be mounted on ships. They retained their steel pedestal mount and were fitted to heavy timber and concrete platforms for shore duty.


observation post
(3) 47mm gun ports
(4) machine gun ports
foxhole clusters
(2) entrance
(1) rifle port
foxhole clusters
(3) rifle ports
(2) living quarters
(2) well
(2) 47mm gun port
(2) rifle port

An early type of rifle position encountered on Butaritari Island, Makin Atoll by Marine raiders in September 1942. Suited for combat in China, such above-ground positions were ill-suited to the islands because of American heavy direct fire weapons as well as indirect fire (mortars, artillery, naval gunfire).

balance of their defenses on the seaward side of the islands, believing that the Americans would want to beach nearer to shore on the reef's edge. On the atoll's lagoon side the coral reefs were wider meaning landing craft were forced to discharge their troops further out.

At Tarawa, full-tracked amphibian tractors (amtracs), originally intended as supply carriers, were successfully used for the first time to deliver assault troops ashore by carrying them across reefs that landing craft could not cross even at high tide. The Japanese were slow to respond to this threat and often continued to bulk their defenses on the seaward side. It was not until the Americans moved through the Marshalls that efforts were made to reorient defenses toward the lagoon side, but it was too late.

The Japanese still hoped to lure the American fleet into a decisive battle as they attempted to seize islands. The Combined Fleet, air attacks launched from other islands, and submarines would hit the US fleet and, as hoped in earlier operations, drive it off as the assault troops were defeated at the water's edge. As on the larger islands in the Solomons and Bismarcks the Japanese established mobile reserves, but this time they were an amphibious reserve supported by landing craft and situated on a centrally located island within the group, to be deployed to a threatened island or to conduct a counter-landing.

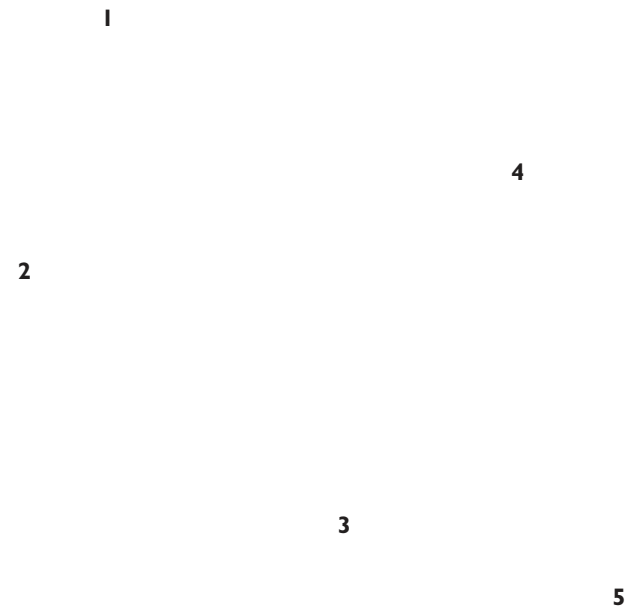
The plan was doomed. Once an island group was targeted, the Americans pounded area islands with long-range bombers, neutralizing the airfields. Submarines would hunt down Japanese shipping in the area. Battleships and cruisers bombarded the islands without fear of air attack. Adjacent islets would be cleared of lookouts, then the first waves of Marine or Army troops would land on the lagoon side of the island's central portion, turn in opposite

LEFT **A hill strongpoint**
This is an approximation of the internal defenses of Hill 130, what the Americans called the "Chocolate Drop," 1,500 yards northeast of Shrui, Okinawa. It is typical of multi-level hill strongpoints with an all-round defense. The US 77th Infantry Division, approaching from the north, took from May 11–17 to capture it, losing ten tanks and so many infantry that a regiment was reduced to a battalion. There are four levels, connected together by inclined passages: each level is indicated here by the number before a particular feature on that level. The hill's surface was rocky and partly covered by low scrub brush. Foxholes and trenches were scattered about the hill to protect the well-camouflaged firing ports and entrances along with the observation post on the peak, especially on the reverse slope. The three 47mm AT guns and four HMGs defending the hill could be shifted to different embrasures and between the second and third levels.

directions, and fight their way to the island ends. The island was declared secure when organized resistance ceased, but mop-up operations might last for weeks. The conventional island perimeter defense was proven ineffective when attacked by a force possessing superior naval and air power. A defense of considerable depth was necessary, one that would provide flexibility and elasticity.

The next islands marked for assault offered the Japanese that opportunity. The Mariana and Palau islands were larger, ruggedly hilly, and thick with vegetation. A completely different kind of defense was established on these islands in the summer of 1944. The Japanese goal was still to defeat the invaders at the water's edge, but a more realistic appraisal had been considered. Positions in depth were prepared on most islands with units (regiments and battalions) assigned sectors in which defense lines and strongpoints were constructed. A mobile reserve with tanks was positioned in an area away from the expected landing beaches. This force was to conduct a counter-attack and destroy the landing force in a decisive battle. Sea and air attacks were still contemplated. A significant change in doctrine was the virtual disappearance of *banzai* charges. Though these occurred on Saipan and smaller ones were experienced on other islands, the Japanese had realized that such suicidal attacks only hastened the garrison's end.

American air and naval power made the mobile reserve virtually undeployable though. Movement was all but impossible except at night. When



Examples of small Japanese individual fighting positions.
1. 7.7mm aircraft machine gun modified for ground use. **2.** 7.7mm HMG. **3.** 7.7mm LMG. **4.** Rifleman.
5. 50mm grenade discharger.
Such positions, often dug beneath trees, were difficult to detect and offered protection from grenades, small arms, and mortar fire.

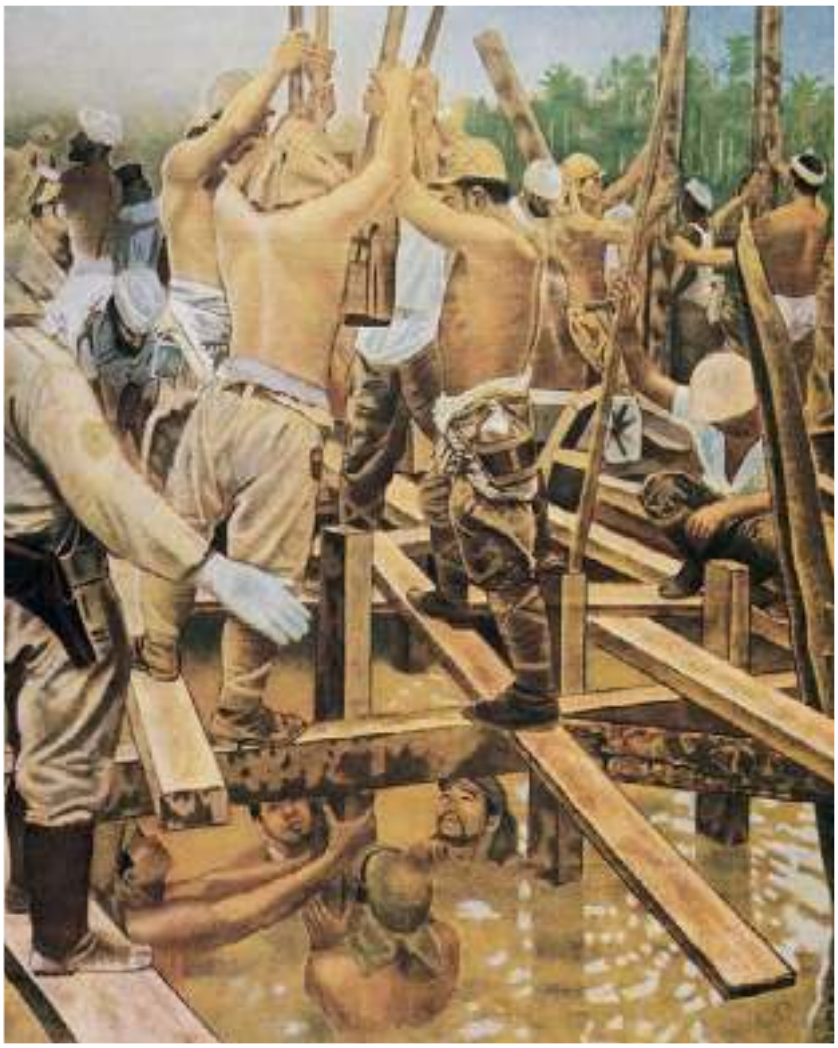
the counterattack was launched, it was too little, too late. The Americans were capable of landing such massive, well-supported forces in a surprisingly short period that the reserve was too small to have any effect. By the time they attacked, much of the supporting artillery had been destroyed and the armor was easily dealt with. Local counter-attacks were equally unsuccessful and even a large counter-offensive on Okinawa failed dismally. External reinforcement was seldom possible.

A dense trench system prepared for water's-edge beach defense on Kwajalein Atoll, January 1944. Individual rifle and LMG pits are connected by unrevetted 2- to 2.5ft-wide, 3ft-deep trenches. Small coconut log bunkers were provided for each section for protection from naval bombardment.

A heavily constructed troop bunker on Betio made of double coconut log walls filled with sand. The sand-bagged roof was over 4ft thick. While the landward side wall was only partly banked with sand, the seaward side had over 6ft of sand piled up. The Japanese made extensive use of blast barriers to protect the entrances of even one-man rifle positions in the seawall, but this bunker lacked such protection.

Building and manning the island defenses

The basic design of the island fortifications was based on the dictates of prewar manuals, but there were many variations and exceptions in the field. Such variations were provoked by the need to blend the fortification into the terrain (requiring its size, shape, and profile to be modified), locally standardized design induced by material shortages, types of material available, weather conditions, preferences and concepts of local commanders, and the ingenuity and imagination of the officers and NCOs supervising construction. A Japanese manual on field fortifications notes: "It is most important not to adhere blindly to set forms in construction work, but to adapt such work to fit the tactical situation." Dimensions, even for positions housing the same type of weapon, varied considerably and could be of irregular shape: local initiatives were the rule rather then the exception. Despite very different appearances, the common, basic design can be seen in many examples.



The Japanese had little access to mechanized engineering equipment and power tools. Muscle, sweat, and long hours were demanded of troops to build defenses and facilities. Here soldiers bridge a Pacific island stream. An effective road system was essential to the defense. In the upper left are two turbaned individuals, possibly Indian prisoners of war. (Original painting by Toshi Shimzu)

Japanese troops and local laborers cutting hardwood logs for revetting gun positions. Local laborers were used extensively for constructing support facilities, wood-cutting, and transporting materials, but the troops themselves constructed most of the fighting positions and defenses. (Original painting by Manjiro Teracuchi)

Establishing the defense

A unit was assigned a specific sector of defense and several factors were considered. Firstly came the direction from which the enemy would approach: the defenses were principally oriented in that direction. Avenues of approach into the sector from the flanks and rear through adjacent unit areas were also considered and some defenses, even if only supplementary positions, were oriented in those directions. While unit boundary lines were specified, with coordination, fields of fire from one unit's sector into an adjacent unit's were permitted to cover gaps. Weapons were also emplaced to cover avenues of approach into a unit's flanks regardless of the adjacent unit's dispositions. Key terrain features, which the enemy might attempt to occupy, were identified as were routes of advance through the defense sector, and defenses and obstacles established there.

Secondary defensive positions were selected to provide depth to the defense. This was a critical aspect to the Japanese and a factor that made it so difficult and slow for the Allies to break through. Defenses established in the depth of a unit's sector were not necessarily emplaced as continuous lines. Although they might seem to be randomly selected, they were not haphazardly chosen: they were emplaced to cover other defensive positions, movement routes, key terrain, and dead space not covered by the primary position. They were often emplaced to engage the enemy from the flanks or even the rear as they advanced. Individual fighting positions were scattered throughout some areas requiring the assault force to clear each. Often the assault troops would clear only the most troublesome, leaving reserve units to mop up bypassed positions: sometimes these were reoccupied by stragglers and infiltrators.

Inaccessibility was another factor affecting the choice of fighting position. For example, placing a position high on a steep hillside made it difficult for the enemy to approach while under fire. It is apparent that the concealment and inaccessibility of positions often took precedence over other considerations. The key aim was to establish crossfire from several directions and all-round protection from attack from any direction.

The actual selection of position, especially regarding crew-served weapons, was often determined by a commander one or two levels above the unit possessing the weapon. For example, a battalion commander might specify to his company commanders where every crew-served weapon was to be

Inland defenses were situated to provide an all-round defense. This section position comprises one-man foxholes, individual dugouts, an LMG pillbox and a log sleeping shelter all connected by shallow, narrow communication trenches.

emplaced to ensure mutual support, the elimination of gaps between subunits, and sufficient depth to the defense. He or even the regimental commander might stipulate the location of obstacles and artillery concentration areas.

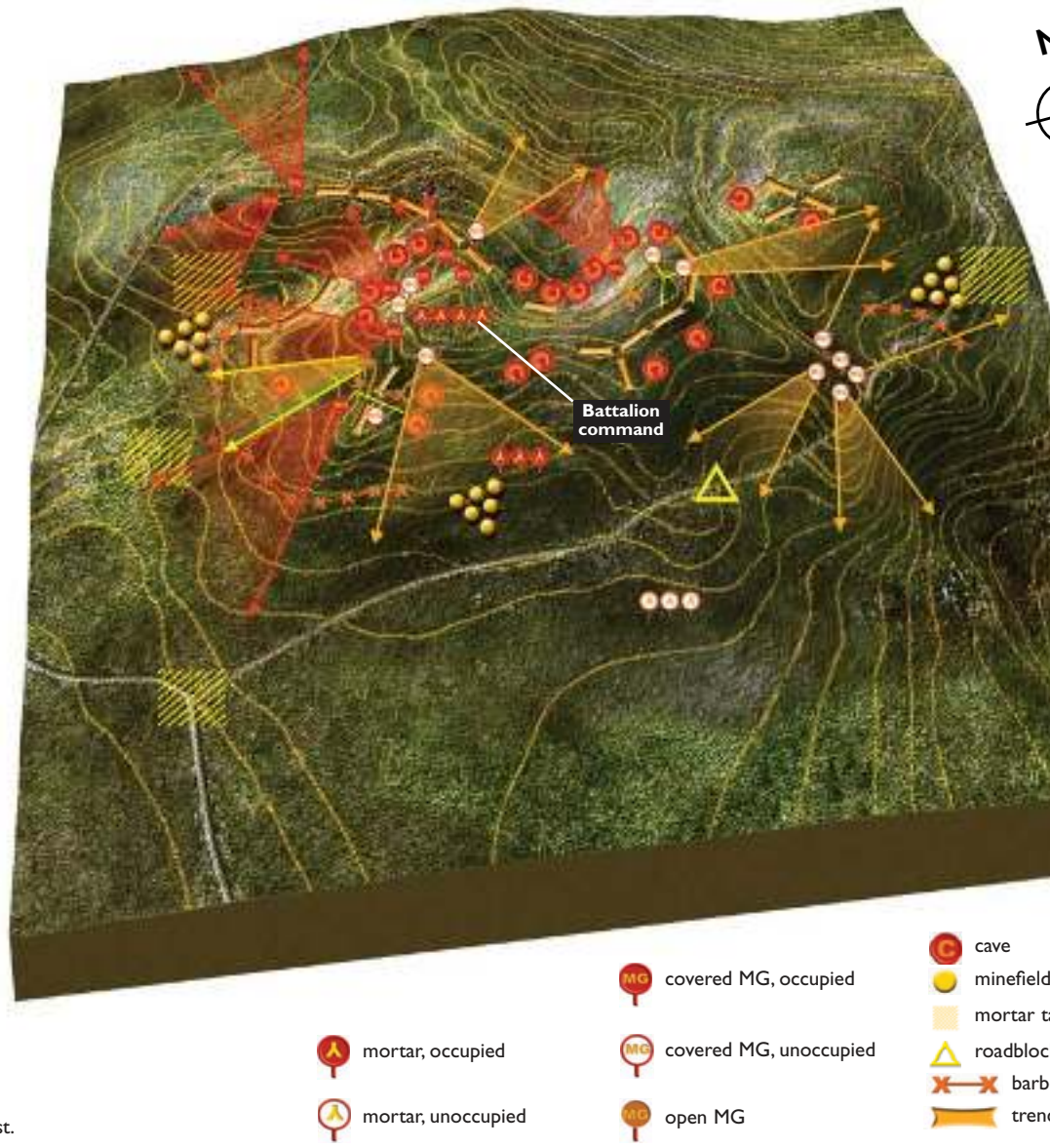
Terrain was carefully studied for incorporation into the defense, another key aspect of doctrine. Every cave, ravine, gully, ridge, hill, knoll, and fold in the ground was considered as either a defensive position or obstacle. Swamps, marshes, streams, rivers, dense vegetation, and broken ground could be reinforced with manmade obstacles or mines. If not covered by direct fire, obstacles were kept under surveillance and indirect artillery and mortar fire could be placed on them when the enemy approached. The Japanese emphasized the use of AT ditches and mines to reinforce their marginally effective AT guns.

Example of the defense of a small island, here Shemya Island in the Aleutian Islands off Alaska, defended by the 303d IIB, August 1942. The island measures 2.25 by 4.25 miles. The drawing is adapted from a captured Japanese sketch found on Kiska Island.

Often a key position was protected by clusters of smaller positions ranging from riflemen in foxholes, to light machine gun nests, to heavy machine guns and AT guns in pillboxes or caves. These too were protected by other covering positions. An enemy force attacking a large fortified cave position on one side of a gorge would find itself under fire from positions flanking the main position, from the opposite side of the gorge, and from the ridge above. In order to clear the gorge another assault force may have had to fight its way to the ridge top from another direction, secure the crest, and then assault covering positions from above while the first assault force provided suppressive fire from below.

This schematic demonstrates the comparative ranges and trajectories of the most common Japanese infantry weapons. Extracted from a US 1943 Intelligence Bulletin, the characteristics have been corrected from the wartime publication.

Weapon	Weight (lbs)	Effective range (yards)	Rate of fire (rpm)
1. 8mm Model 14 (1925) pistol	2	17	8–16
2. 7.7mm Model 99 (1939) LMG	21.36	1,500	850 (cyclic)
3. 7.7mm Model 99 (1939) rifle	8.8	600	10–15
4. 6.5mm Model 38 (1905) rifle	9.4	400	10–15
5. 50mm Model 89 (1929) grenade discharger	10.25	175–710	10–20
6. 7.7mm Model 92 (1932) HMG	122	1,500	450–500 (cyclic)
7. 20mm Model 97 (1937) AT rifle	140	1,100	12 (semi)
8. 37mm Model 94 (1934) AT gun	714	2,500	10–20
9. 47mm Model 1 (1941) AT gun	1,660	2,500	10–15
10. 81mm Model 99 (1939) short mortar	52	3,280	15
11. 81mm Model 97 (1937) mortar	145	3,100	18–30
12. 70mm Model 92 (1932) battalion gun	468	1,500	10
13. 75mm Model 41 (1908) regimental gun	1,600	2,100	10
14. 13.2mm Model 93 (1933) twin HMG	87 each	3,000	450 (cyclic)
15. 20mm Model 98 (1938) machine cannon	836	2,000	120



after a two-day fight. Frontal attacks were attempted, but the assault that carried the hill fought up the west flank draw, through the trench system and then on to the crest.

The interior of this bunker provides examples of vertical support posts, log side revetments, and roof support stringers. Steel staples were used to fasten revetting logs together.

Once most of these covering positions were destroyed, the original force could attack the main position with the second force providing covering fire.

The Japanese also established strongpoints in the form of clusters of mutually supporting positions on defensively favorable terrain. The positions and approaches would be covered by artillery and mortar fire. They usually possessed all-around defenses and fields of fire and were themselves covered from positions outside of the strongpoint. They were usually established on hills, ridges, or any available elevated ground, even if only a few feet higher than the surrounding terrain (see illustration on page 18). It was especially desirable if the ground within the strongpoint was laced with gullies and ravines to provide concealed positions and allow covered movement within the strongpoint. Such features also made it difficult if not impossible for tanks to enter the position. Trenches and tunnels were dug to allow movement within the strongpoint. Larger areas and terrain features possessing concentrated defenses were called "defended areas."

Japanese defensive firepower

A discussion of Japanese units, their weapons, and their integration into the defense is necessary at this point. Many Japanese weapons were relatively short range. The Japanese fully appreciated that Allied weapons had longer range and that heavy use would be made of artillery. Defensive positions were often emplaced on reverse slopes and in locations screened to the front by higher ground. This forced Allied assault troops into exposing themselves as they advanced over this terrain, and made it more difficult for them to employ long-range direct-fire weapons and adjust indirect fire.

An example of the effective use of short-range fire is the fighting at Sugar Loaf Hill on Okinawa. This small, bare hillock was heavily fortified on its forward slope by tunnel-connected machine gun positions with interlocking fire. The reverse slope too had machine gun positions, connected to each other and to those on the front by tunnels, and was seamed with trenches full of riflemen, light machine gunners, and grenadiers who covered the approaches, forward slope, crest, and flanks. Marine assault companies gained the crest on at least six occasions only to be driven off with heavy casualties by the fire from the reverse slop and from adjacent low hills to its rear and flanks. It was finally secured, but eight Marine rifle companies were decimated in the process.

This LMG pillbox on Okinawa demonstrates the layered logs, rocks, and earth principle of construction. It was typical of those built on ridge sides and virtually impossible to detect until it opened fire. This one's firing port was blasted open by bazooka hits, which also blew away the camouflage. The port was originally only a few inches high. The 36in.-long M1 carbine to the port's left was inserted for scale.

While the Japanese were totally oriented to offense, infantry units were well armed with weapons complementary to defense. Japanese infantry regiment organization varied depending on when and where it was raised. A regiment could contain 3,800 to 5,600 troops depending on its strength allocation. A typical infantry regiment organic to a division consisted of:

Regimental Headquarters with Train	
Regimental Signal Company	
Regimental Infantry Gun Company	4 × 75mm regimental guns
Regimental AT Company	6 × 37mm or 47mm AT guns
Infantry Battalion (×3)	
Battalion Headquarters with Train	
Rifle Company (×4)	(see following discussion for weapons)
Battalion Machine Gun Company	4 or 8 or 12 × 7.7mm HMGs
Battalion Gun Platoon or Company	2 or 4 × 70mm battalion guns, 0 or 8 × 20mm AT rifles

The entrance of this supply dugout on Okinawa is well protected by rice-straw sandbags, former rice shipment bags. A camouflage net, with most of its intertwined vegetation blown away, concealed the entrance.

The infantry battalions' four 180–200-strong rifle companies had a 19-man headquarters, three rifle platoons, and sometimes a weapons platoon. The 50–60-man rifle platoons had a small platoon headquarters and four sections. The three light machine gun sections (equating to a US rifle squad) had 13–15 men armed with a single Nambu 6.5mm Model 11 (1922), 6.5mm Model 96 (1936), or 7.7mm Model 99 (1939) light machine gun (LMG) plus a 50mm Model 89 (1929) or Model 10 (1921) grenade discharger. The grenade discharger section was essentially a rifle squad with two or three grenade dischargers and lacked an LMG. The 50mm grenade discharger ("knee mortar") fired hand grenades with propellant charges attached, mortar rounds, flares and smoke signals. Bipod-mounted LMGs, fed by a top-loading 30-round magazine, provided the section's base of fire and afforded close-in defense for heavy machine guns (HMGs) and other crew-served weapons. The Arisaka 6.5mm Model 38 (1905) and 7.7mm Model 99 (1939) rifles were as reliable and rugged as any bolt-action in service. Even in the close confines of defensive positions the Japanese soldier often fixed his characteristically long bayonet. He was amply supplied with hand grenades, although these were unreliable and of moderate effect. Each section normally possessed a rifle grenade launcher for firing fragmentation and smoke grenades.

The battalion machine gun company was armed with four, eight, or twelve Nambu 7.7mm Model 92 (1932) HMGs or a lightened version, the Model 1 (1941). The similar 6.5mm Model 3 (1914) was also encountered. These tripod-mounted weapons were a mainstay of sustained defensive fire. Even though fed by 30-round metallic strips, a high rate of fire could be maintained. Eight or twelve guns per battalion machine gun company were the normal allocation, with four guns per platoon. The four-gun company had two two-gun platoons. In this case other HMGs were assigned to rifle company weapons platoons, though this was not a normal fixture. This weapons platoon might also have two 20mm Model 97 (1937) AT rifles. Capable of semi- and full-automatic fire with a seven-round magazine, they were surprisingly effective against light tanks and personnel. An 11-man section manned each HMG and AT rifle. In battalions lacking rifle company weapons platoons, the eight 20mm AT rifles were assigned to four two-gun platoons in the battalion gun company allowing them to be attached to rifle companies as necessary. Few units were issued this expensive weapon though.

The battalion gun company had two platoons each with two 70mm Model 92 (1932) infantry guns (a.k.a. battalion guns): some battalions had only a single

Japanese Army artillery and anti-aircraft guns

Field artillery
The 75mm and 105mm pieces were usually found at division level while 150mm pieces and 105mm guns were in army level artillery units. Obsolete models (those pre-dating 1930) often remained in use in second-line units and fixed island defenses.

75mm Model 38 (1905) (Improved) field gun
75mm Model 94 (1934) mountain gun
75mm Model 90 (1930) field gun
75mm Model 95 (1935) field gun
105mm Model 38 (1905) field gun
105mm (a.k.a. 100mm) Model 14 (1925) field gun
105mm (a.k.a. 100mm) Model 92 (1932) field gun
105mm Model 91 (1931) field howitzer
150mm Model 38 (1905) field howitzer
150mm Model 4 (1915) field howitzer
150mm Model 89 (1929) field gun
150mm Model 96 (1936) field howitzer

Anti-aircraft guns
20mm Model 98 (1938) machine cannon
20mm Model 2 (1942) machine cannon
20mm Model 4 (1944) twin machine cannon
75mm Model 88 (1928) field AA gun (also IJN)
88mm Model 99 (1939) heavy AA gun
105mm Model 14 (1925) heavy AA gun

Narrow communications trenches on New Guinea connect pillboxes, one can just be seen in the background. Such small trenches, often covered with palm fronds, were difficult to detect from the ground and air.

two-gun platoon. This gun could deliver close-range direct fire or longer-range indirect fire. The Japanese relied on it for indirect fire support as few mortars were assigned to infantry units. Independent mortar battalions with 81mm, 90mm and 150mm pieces were non-divisional assets. The advantage of the 70mm was that it was extremely compact, making it easy to conceal and emplace in fortifications, light enough to be easily manhandled over rough terrain, and man-packed in ten loads. It had high explosive (HE), shrapnel, smoke, and less-than-effective armor-piercing (AP) rounds. Later in the war, faster and cheaper to produce 81mm Model 97 (1937) or short-barreled Model 99 (1939) mortars were issued to some units in lieu of the 70mm.

The regimental gun company possessed four 75mm Model 41 (1908) infantry guns (a.k.a. regimental guns) to provide direct and indirect fire. Comparatively compact and light, this gun could be broken down into six pack-horse loads. Like the 70mm, it was easy to conceal and to build a position for. It was provided HE, shrapnel, AP, AT shaped-charge, and white phosphorus rounds. Some regiments were provided with a regimental gun battalion (a.k.a. "unit") with two four-gun companies.

Japanese foxholes were usually small, simple one-man holes, but sometimes more elaborate one- and two-man positions were constructed depending on time available. Such a position could house an LMG or grenade discharger. The actual position would be well shrouded with foliage. The inset diagram shows a plan view of the position.

Japanese AT guns were of outdated and ineffective design. There was little serious armor threat in China and even though the Japanese had faced Soviet armor in Manchuria in 1939, they had been lured into a false sense of security when their (even then) outdated 37mm guns managed to destroy some obsolescent Soviet T-26 and BT-series light tanks. Nonetheless the Japanese were defeated by the Soviet ability to rapidly maneuver cross-country supported by armor. The Japanese also believed that the use of armor would be limited on Pacific islands and that the Americans could only employ light tanks. This was true through late 1943 when only US M2A4, M3-series, and M5 light tanks were employed. The November 1943 Marine assault on Tarawa saw the first use of the M4 Sherman medium tank: from that point onwards, the Japanese had only limited capacity to defeat US armor. The 75mm gun and 105mm howitzer-armed M4-series Sherman tanks, 105mm M7 Priest self-propelled howitzers, M3A1 halftrack-mounted 75mm guns, 3in. M10 Wolverine and 76mm M18 Hellcat tank destroyers, and various flamethrower tanks proved to be difficult to stop with available AT weapons. M5A1 light tanks continued in limited use in a support role. In 1945 on Okinawa the causes of US tank losses were mines, AT guns, artillery, and suicide attacks with magnetic hand mines and satchel charges – in that order.

The principal Japanese AT gun was the 37mm Model 94 (1934) infantry rapid-fire gun. Originally intended to deliver direct fire on machine guns, it was provided with HE ammunition. Even though an armor-piercing (AP) round was issued, it performed dismally as an AT gun owing to its low velocity and poor penetration. It could knock out a US light tank with multiple hits, but the Sherman was impervious. Aware that the Model 94 was inadequate, the Japanese produced a limited number of the 37mm Model 97 (1937) guns, a copy of the German Pak.35/36. From late-1942 the 47mm Model 1 (1941) AT gun began to appear. While not as effective as similar contemporary weapons,

An elaborate LMG position with three firing ports. While the position covered a wide sector of fire the weapon had to be moved from embrasure to embrasure to cover it. This position's roof is lightly constructed. More typical would be two to four layers of logs and perhaps a layer of rocks.

it could knock out a Sherman, but not always with a frontal shot. This shortcoming though did not hinder the Japanese as they strove to emplace AT guns in well-concealed flanking positions. Besides AP projectiles the 47mm had an HE round allowing it to serve as an anti-personnel weapon. The regimental AT company had three two-gun platoons. Even late in the war these were still often armed with 37mm pieces. Most 47mm guns were found in non-divisional AT battalions.

Besides the significant organic firepower (albeit lighter than delivered by US divisions) Japanese units were augmented by non-divisional assets in the form of independent machine gun, mortar, AT, and machine cannon battalions. Machine cannon units were armed with 20mm Model 98 (1938) machine cannon and 13.2mm Model 93 (1933) HMGs. Both were capable of marginally effective AA and AT fire, but were especially effective as anti-boat and anti-amtrac guns. All of these non-divisional, regimental, and battalion-level weapons were attached down to company-level, causing quite a thickening of the line in the way of firepower.

Besides three-regiment infantry divisions, the Japanese employed independent infantry and independent mixed brigades with anything from three to eight independent infantry battalions. Mixed brigades were augmented with organic artillery, engineer, and minimal service units. While intended as garrison and rear area security forces, they were frequently pressed into manning defenses alongside divisions.

For the most part the Japanese squandered their few tanks committing piecemeal and poorly timed massed armor counter-attacks, too late to have any impact on initial landings: these were easily defeated by the Americans. More frequently they dug-in their 37mm gun-armed Model 95 (1935) Ha-Go light

Japanese Navy coast defense and anti-aircraft guns

Coast defense guns
Most of these were of standard naval design intended for deck mounting on steel pedestals aboard ships. They were issued to guard forces and emplaced on concrete and/or timber mounts. These and other shipboard guns were often recovered from grounded ships and emplaced as coast defense guns. The more modern dual-purpose guns could engage both surface and aerial targets.

100mm Model 98 (1938) twin dual-purpose gun
120mm Model 3 (1914) gun
120mm Model 10 (1921) dual-purpose gun
120mm Model 11 (1922) dual-purpose gun
127mm Model 89 (1929) twin dual-purpose gun
140mm Model 3 (1914) gun
200mm Model 3 (1943) short gun
200mm Vickers Model 38 (1905) gun (British-made)

Anti-aircraft guns
Besides being mounted aboard ships, the 80mm (actually 76.2mm) gun was also provided with a mobile mount for land use. The others were originally shipboard weapons mounted on steel pedestals fitted to timber and/or concrete foundations.

25mm Model 96 (1936) single, twin, triple AA guns
40mm Model 91 (1931) AA gun
40mm Model 1 (1941) twin AA gun
80mm Model 3 (1914) AA gun

and 57mm gun-armed Model 97 (1937) Chi-Ha medium tanks, the most common models, in hull enfilade revetments for employment as pillboxes. They were seldom actually buried though as it was still desirable for them to be mobile. Japanese tanks found buried up to their turrets on Guam led to speculation as to why by postwar newspapers. The reality is that they had been emplaced in open revetments with entry/exit ramps. Rain eroded the sand parapets over the years, filling the emplacements. Often criticized for what many deem to be an inappropriate use of armor, it was probably the most effective means of employing them, considering their small numbers, their vulnerability, and overwhelming US firepower.

A bewildering mix of weapons was encountered on many islands, especially with regard to artillery and AA guns. As the Allies approached closer to a region, its islands were greatly reinforced. New units arrived to supplement the garrison and with them came different allocations of weapons. Additional weapons, sometimes obsolete, were sent from depots aboard supply ships sailing from island to island. Crews to man them were drawn from existing units augmented by service troops and they were incorporated into the defense. Once the Allies landed there was little service troops could do to support operations. Ammunition, rations, and water had been stockpiled in positions as movement in the open was virtually impossible. Caches of weapons, ammunition, medical supplies and rations were often hidden about islands in bunkers and dugouts. Up to six months of supplies were stocked on most islands. While a few small service elements were retained, most were reorganized into rifle battalions with few if any crew-served weapons. In some instances otherwise unarmed Korean, Okinawan, and Formosan laborers were armed and told to fight the Americans to the death. Many did, but the few prisoners taken were mainly laborers. These units defended coastal areas in the rear to prevent additional landings, secured flanks, prepared and often manned additional lines of defense, thickened the frontline by attachment to divisions and brigades, and were used as a source of replacements for frontline units. The Allies were often astonished at how the Japanese rebuilt shattered units by feeding in service troops. All Japanese soldiers were taught to be riflemen first and then were only required to defend a position to the death.

The IJN possessed a significant Land Force involved in island defense. Base Forces provided command and service elements to operate naval bases. Guard Forces or Defense Forces of varied size defended naval bases. No two were organized the same and they manned varied numbers of coast defense, AA, and infantry-type crew-served weapons. Special Naval Landing Forces comprised hand-picked sailors trained in infantry tactics. They were responsible for seizing numerous islands early in the war. SNLFs were initially large battalions trained in amphibious landings, but it is incorrect to refer to them as "Imperial Japanese Marines." After Japan lost the operational initiative, the SNLFs were transitioned to island defense units with up to 2,000 men manning light coast defense, AA, AT, and crew-served infantry weapons. All had a varied number of large rifle companies and some possessed light tanks. Many of the weapons were the same as used by the IJA, but they made extensive use of single and twin 13.2mm Model 93 (1933) HMGs in the AA and anti-boat roles as well as a few other unique weapons.

Construction materials

The Japanese made extensive use of local materials to construct fortifications and obstacles; it was often all they had. Issued construction materials were insufficient and went to priority installations such as command posts, communication centers, and coast defense gun positions. The use of local materials was also caused by shortages of concrete and steel that were diverted to fortifications in the Home Islands and Mandated Territory. Also, shiploads of material and equipment en route to the islands were sunk by Allied aircraft and submarines.