

Fire Support in the Jungle

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"If you want to keep alive in the jungle, you must live as the jungle does."

– John Wyndham

Introduction

Dense vegetation, limited visibility, thick canopy, and highly restricted mobility corridors create significant challenges for the integration of fires in a jungle environment. The 25th Infantry Division (ID) trains and experiments to effectively overcome these challenges and integrate fires into the combined arms jungle fight. As light fighters tactically traverse the jungle floor to secure an objective, the thick, tangled, overgrown vegetation limits mobility and places a heavy emphasis on support from indirect fire and combat aviation units. Division Artillery (DIVARTY) and Combat Aviation Brigade (CAB) units across the 25ID understand and embrace the requirements to deliver integrated surface-to-surface and air-to-surface fires, to include:

- Proper positioning of ground and aerial observers in locations that offer line of sight on priority targets and enable effective tactical communications;
- Locating mortars, howitzers, or rocket systems in unmasked locations that can range enemy targets and penetrate jungle canopies effectively;
- Employing munitions that penetrate/burn canopy and then destroy targets within that opening; and
- Appreciating the relentless impact the jungle environment has on metal and the intense maintenance required for helicopters and fire support systems.

While jungle Soldiers are faced with physically demanding, austere, and rugged terrain that limits both target observation and communication from sensor-to-shooter, 25ID Soldiers consistently train in this harsh environment to be best prepared for fighting and winning throughout the Indo-Pacific. This article will discuss this training, environmental considerations, employment methods, and training opportunities for DIVARTYs and CABs with a jungle mission.



A Soldier in Alpha Battery, 2nd Battalion, 11th Field Artillery Regiment, 25th Infantry Division, pulls security during training as part of Joint Pacific Multinational Readiness Center 23-01 on the island of Oahu, HI, on 2 November 2022.
(Photo by SFC Sean K. Harp)



Soldiers from the 25th Infantry Division's 3rd Battalion, 7th Field Artillery Regiment, fire an M777 howitzer during training at Pohakuloa Training Area, HI, on 7 November 2022. (Photo by 1LT David Block)

Environmental Considerations for Artillery and Aviation

While challenging, the effective integration of combined arms fire remains as necessary in the jungle as in all other operational environments. Maneuver commanders must synchronize towed artillery, organic mortars, rocket artillery, close air support, and aviation assets to suppress hostile adversaries and enable ground force freedom of maneuver. Based on years of training together not only in the jungles of Hawaii, but also in partner nations such as the Philippines, Indonesia, Malaysia, Thailand, and Australia, 25ID fire supporters, aviators, and maneuver Soldiers have become adept at fires integration.

The Indo-Pacific is dominated by thousands of hot and humid islands, open oceans, rugged mountains, and densely packed urban centers. This environment is challenging but also presents opportunities. One often assumes that artillery and aviation assets are limited by jungle and archipelagic operations; however, the challenging terrain features can be mitigated through careful preparation, training, and integration of the targeting process.

The difficulty in locating and observing jungle targets makes dynamic targeting much more common than deliberate targeting. Dynamic targeting involves the process of finding, fixing, tracking, targeting, engaging, and assessing the enemy — requiring the audio and visual identification of tire or boot tracks, broken brush, human intelligence (HUMINT) and signal intelligence (SIGINT) collection, open area oversight, and effective signal support to communicate these efforts. Quickly acquiring accurate target data in the jungle can be challenging for both ground and air elements.

Flying in the jungle is also a significant challenge with unique risks to the pilots in command. The dense foliage of the jungle severely restricts flight visibility, making it difficult for pilots to navigate and identify potential hazards.

The biggest challenge for an Apache pilot is putting sensors and eyes through the canopy. The reduced visibility also hampers situational awareness, increasing the risk of collision with trees or other obstacles. Two key strategies for mitigating risks include staying proactive in mission planning and maintaining effective communication with ground forces during operations.

Employment of Artillery in the Jungle

The jungle is extremely conducive for light, towed artillery. The maneuverability of the M119A3 (105mm) howitzer makes it the ideal weapon system for soft jungle floors, tight maneuver corridors, and the air assaulting of howitzers deep into restricted jungle terrain. Similarly, organic 120mm, 81mm, and 60mm mortars are tremendous indirect fires assets within the challenging confines of jungle terrain, and while they lack the range of the M119A3, they prove to be outstanding in the close fight. The M777A2 (155mm) is effective for increased engagement range, but due to weight and the requirement to be towed by M1083/1084 Light Medium Tactical Vehicles (LMTVs), it lacks the nimbleness of the M119A3 in jungle operations. Self-propelled M109 Paladins (155mm) are even heavier, less maneuverable, and lack the air assault capability of an M119A3 or M777A2 and therefore are not suitable for jungle operations.

Rocket artillery is effective in jungle operations, not because of its maneuverability, but because of the significant range it offers and the ability to engage targets within the jungle from a significant distance away. The M270 Multiple Rocket Launch System (MLRS) and M142 High Mobility Artillery Rocket System (HIMARS) are capable of engaging targets within the jungle canopy from hundreds of kilometers away — with the Army Tactical Missile System (ATACMS) missile ranging to over 400 kilometers and lesser munitions still providing at least 32 kilometers of range per rocket. The MLRS and HIMARS artillery systems are great for the division and higher to shape deep targets prior to maneuver forces entering the jungle. And while precision munitions such as the GMLRS reduce target error, these rocket systems do have significant danger-close restrictions that can limit their employment as maneuver forces progress through the jungle and into the close fight.

Regardless of the indirect fire system utilized, the heights and density of vegetation, limited lines of sight, poor signal quality, and lack of Global Positioning System (GPS) accessibility will have significant impacts on achieving first round fire for effect (FFE). As maneuver forces establish extended security halts (ESH) or a hasty patrol base, forward observers (FOs) must maneuver into positions that provide optimal line of sight to identify accurate target location and size. The masking of trees, thick vegetation, and intervening crests often limits the effectiveness of observation and necessitates adjust fire missions.

When adjusting fire in a jungle environment, FOs may leverage a technique known as adjustment by sound. While lacking the precision of standard observation and needing to be clearly approved in the rules of engagement, this method allows suppressive fires on a hostile enemy when that enemy is concealed by dense vegetation or jungle canopy. Similar to utilizing resection during land navigation, the basic concept for adjustment by sound is with a known distance and direction to the enemy target, the FO calculates the distance and direction to the sound of the explosion from their impacting round. The FO then compares the impacting point to the target location and makes the subsequent adjustment for the next round (see Figures 1 and 2 from Army Techniques Publication 3-90.98, *Jungle Operations*).

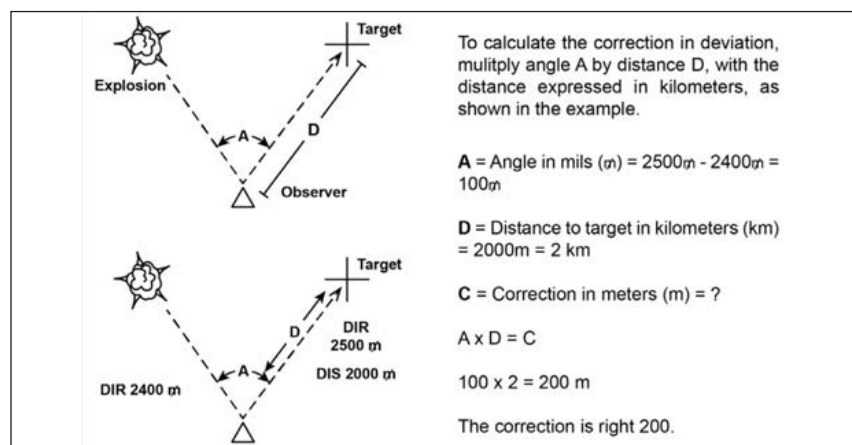


Figure 1 — Computing the Correction in Deviation

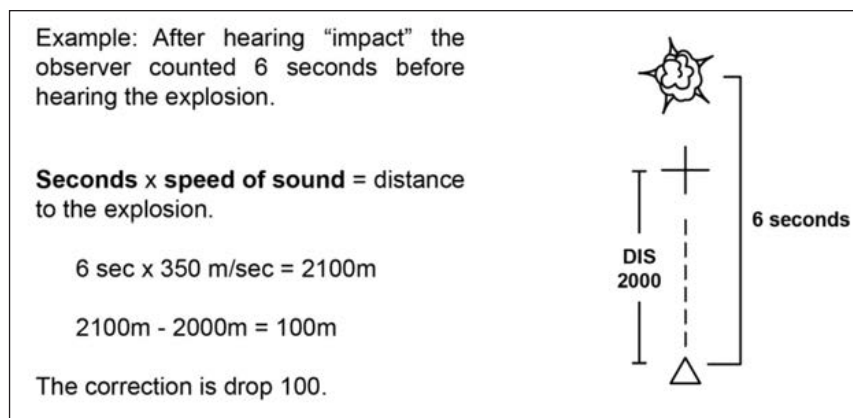


Figure 2 — Computing the Correction in Range

Additionally, utilization of appropriate ammunition for a designated target is vital in jungle operations. With enemy forces often utilizing heavy canopy for cover or concealment, FOs must consider the employment of proper shell/fuse combinations to penetrate or burn obstructive canopy. This includes airburst and delay fuses coupled with high explosive (HE) rounds to open windows within the canopy, followed by destructive HE to inflict casualties and damage below to achieve the desired effect on the target. Airbursts can also cause havoc with shrapnel raining through different canopy levels, increasing enemy casualties. Delay fuses enable munitions to detonate after entry through the canopy, exploding right above the target through synchronized time and sensing.

Sustainment of Aviation in the Jungle

Preventive maintenance is required to ensure the function and longevity of the aircraft in a jungle environment. For example, the presence of saltwater in archipelagic and jungle environments demand increased maintenance to prevent corrosion on aircraft. According to SFC Keith Sallee, a maintenance supervisor in the 25ID CAB, corrosion inspections of aircraft occur every 90 days. After each flight, the aircraft undergoes a freshwater rinse, known as the "bird bath." Before shutting down the aircraft, an "engine flush" is conducted to remove any saltwater contaminants that may have settled on the engine. Through combining these various approaches, maintenance operations can be optimized, even in demanding operational environments. These are important maintenance considerations that maneuver units must understand and consider because they affect aircraft readiness and availability for operations.

In a jungle environment, there are unique challenges and logistical considerations involved in supplying aircraft fuel. Depending on sea port of embarkation, roads, or rail systems, aerial bulk fuel delivery may be the only viable option. This problem is exacerbated when operating on smaller islands. To ensure a supply of aircraft fuel in resource-limited island environments, coordination and planning are vital. Department of Defense petroleum planners work closely with the division supply and operations sections to determine the requirements for location, equipment, fuel grade, and quantity. They also collaborate with the Defense Logistics Agency-Energy (DLA-E) Southwest Pacific representative which assists in identifying local fuel vendors or contracted airports for military-grade aviation fuel supply. In remote locations, U.S. Army fuel equipment such as tanks and fuel bags are deployed to store and distribute fuel. Additionally, military petroleum pipelines and pumps can be set up to receive fuel from Navy fuel barges or civilian vessels.

Artillery and Aviation: A Symbiotic Relationship

This symbiotic relationship between ground-based artillery and aerial support enables the division to maneuver and adapt to dense jungle settings, gaining a significant advantage over adversaries. Being able to air assault the M119A3 or M777A2 through the jungle via Chinook or Black Hawk helicopter gives us reach in the jungle that our adversaries don't possess. Additionally, the firepower of Army Attack Aviation has the lowest risk estimated distance (RED) compared to artillery, mortars, or rockets, and with most engagements being at close proximity, this brings a significant advantage in the combined arms fight. Attack and lift aircraft each enable the division to maintain tempo in the jungle while maintaining fires capability.



A CH-47 Chinook from the 25th Combat Aviation Brigade carries a sling-loaded M777 howitzer during a training mission on Pohakuloa Training Grounds, HI, on 7 November 2022. (Photo by SPC Wyatt Moore)

The aforementioned efforts require continuous training to overcome numerous challenges. The dense foliage of the jungle can make it difficult to navigate and locate suitable landing zones for aircraft. Chinook pilots possess extensive training in navigating complex environments, allowing them to identify clearings or areas suitable for helicopter landings. Their expertise in assessing landing zones is crucial in ensuring the safe and efficient transport of heavy artillery. Once a suitable landing zone is identified, Chinook pilots use their exceptional flying skills to maneuver the aircraft in tight spaces. The agility and versatility of the Chinook helicopter enables it to hover and land in confined areas, accommodating the limited clearings in the jungle. This capability is particularly important when moving large artillery pieces like the M777A2 and M119A3 howitzers, which are heavy and require adequate space for loading and unloading. By working hand-in-hand, DIVARTY and CAB ensure that 25ID maintains a dominant and agile presence in the jungle, ensuring success in their mission and securing victory on the battlefield.

Aside from transporting equipment and personnel, the 25th CAB provides close combat attack (CCA) and close air support (CSA) to aid artillery and infantry troops during combat operations. While both mechanisms involve aerial assets, their roles and methods differ significantly. CCA involves close-range air support, typically provided by attack helicopters equipped with sophisticated weaponry. These helicopters are specifically designed to engage enemy forces near friendly troops. CAS missions focus on direct fire support, precision strikes on enemy positions, and engaging threats that are immediately threatening ground forces. The agility and versatility of attack helicopters allow for rapid response and flexibility on the battlefield.

Opportunities

Operation Pathways has given the DIVARTY and CAB a unique opportunity to train in the jungle environments of the Indo-Pacific, operating in countries such as the Philippines, Indonesia, Australia, Japan, and many more. Incorporating jungle training into Operation Pathways not only improves units' capabilities for specific scenarios but also enhances overall readiness and adaptability for jungle operations. Engaging with foreign allies who have expertise in jungle warfare can be mutually beneficial for all parties involved. Foreign partners may have years of experience navigating through dense (but familiar) foliage, understanding the local flora and fauna, and recognizing enemy tactics in the jungle environment. Sharing these invaluable insights and techniques enable improved home-station training and better preparation for future conflict in the Indo-Pacific region. Through joint exercises and training sessions, units can exchange knowledge, tactics, and best practices. This collaboration fosters cross-cultural understanding and strengthens military partnerships, increasing readiness for both nations.



AH-64 Apaches provide support to Soldiers during a capabilities exercise conducted by the 25th Infantry Division at Schofield Barracks, HI. (Photo by PFC Matthew Mackintosh)

Back in Hawaii, the local environment affords the 25th CAB with the unique opportunity of practicing what is known as “deck landings” to remedy the challenge of jungle terrain. Deck landings have become a powerful and specialized tool used to overcome some of the challenges posed by the geography and operational requirements of the region. Deck-landing capabilities enable Army helicopters to rapidly land and redeploy from naval vessels. As previously mentioned, the Indo-Pacific’s vast maritime expanses and diverse island terrain require rotary-wing aircraft to have extended operational reach. Deck-landing capabilities provide greater range and endurance to helicopters by allowing them to refuel and rearm at sea, without the need to return to land-based facilities. The 25ID utilized deck landings to maneuver ground forces aboard the USS Miguel Keith, a U.S. Navy Expeditionary Sea Base, which extended our operational reach during Exercise Balikatan in the Philippines. Operating with the USS Miguel Keith allowed the ground maneuver force to initiate operations much closer to a dispersed archipelagic island chain and mitigate terrain challenges.

Conclusion

Combat operations in a jungle environment are likely to be tough multidomain operations that rely heavily on ground and aerial fire support to be successful. Both artillery and combat aviation must consciously prepare for large-scale combat operations (LSCO) in a jungle environment by conducting training; studying tactics, techniques, and procedures; and procuring necessary equipment. As dense jungle terrain restricts the movement of many supporting vehicles, the mission success of maneuver forces will be highly dependent on the synchronization of indirect fire and air support. To do so, mortars and towed artillery will often rely on air movements for positioning and sustainment operations. FOs will need to know the type of jungle environment they are fighting in to use the correct shell/fuse combination. When observation is unavailable, FOs need to rely on adjustment of fire by sound. Due to its low REDs, attack aviation will remain tremendously effective during danger-close combat engagements. These tactics can be trained not only at home station but with allies and partners throughout the Pacific during Operation Pathways and beyond. Collaboration and teamwork between fires and aviation units are required to achieve success in any challenging operational environment. The jungle is certainly a challenging environment,

and the effective synchronization of fires and aerial maneuver will enable ground forces to overcome the diverse obstacles of the jungle and accomplish mission success.

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Soldiers from 1st Battalion, 27th Infantry Regiment and 25th Combat Aviation Brigade conduct a ship-to-shore air assault from the USS Miguel Keith during Balikatan 23 off the coast of the Philippines on 21 April 2023.

(Photo by 1LT Alex Choy)