

# Third Squad/ Lima/3/3 in 2033

A look into the future

by Col Matthew Rau & Gunner Craig Marshall

Sgt Sloan called up the plan of the day as he strode to Lima Company's barracks from the chowhall. He scanned the sky and ground with vigilance bordering on paranoia—an effect of his experience with semi-autonomous sensors and weapons. His artificial intelligence (AI) ticked off times and events in his head; his stomach tightened as the even voice filled the day.

Third Squad was scheduled to be in MarineNet all morning to familiarize themselves with the latest updates to their systems. They then worked through a series of tasks to introduce themselves to the trending hacks and countermeasures on the global network. Tech training, like physical training, was a perpetual struggle against atrophy. The accelerating rate of innova-

tion quickly rendered offline Marines obsolete. In their world, obsolete meant dead.

Sgt Sloan winced as his AI completed citing the plan of the day and reminded him of the company night march out of Camp Mattis and around the north end of Guam. Training was continuous, and the days were never long enough, especially when battalion chose the squad for the Division squad competition next month. The squad leader did not have enough time to put together the scenario for the

afternoon's training session for the squad competition. He tasked his AI to craft a short series of scenarios based on the Division's field craft guide. He directed that the training exceed the squad members' expertise, pushing the Marines to the point of failure. To win the weeklong squad competition, they had extra skills to perfect and no spare time.

Sgt Sloan referred to his AI assistant as "RTO," similar to the radio telephone operators of the twentieth century. RTO was strongly encrypted and resided in his service implant, issued to him when he earned his eagle, globe, and anchor. The AI gained functionality as the Marine was promoted. RTO eased the sergeant's cognitive load, accumulating and locally storing information and skills that the sergeant required. From the implant, RTO could interact with Sgt Sloan aurally as a calm voice in his head or visually in the display of information overlaying his eyesight. RTO's collaboration improved over time as the sergeant and the AI grew accustomed to each other's strengths, weaknesses, and peculiarities.

"Lance Corporal Brown, get over to the S-1," barked Sgt Sloan as he entered the squad bay, "Your credentials dropped off your audit, and they need an old-fashioned signature."

The Marine infantry billeting was old-fashioned in design. The complexity and variety of skills in modern

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>>Gunner Marshall was the 3d MarDiv Gunner and is retired.



**Marines physical and technical skills will be an ongoing requirement to prevent atrophy.**  
(Photo by Cpl Francisco Diaz.)

warfare demanded greater cohesion in small units. The Marine Corps had abandoned the dormitory scheme and reverted to the cot- and bunk-lined bays of the mid-twentieth century; the old became new again. Each company was housed in a self-contained, five-story building. The roof shimmered with meta-material panels that absorbed a wide spectrum of electromagnetic energy. The panels gathered solar radiation for energy and satellite broadcasts for network access. The mattresses incorporated magnetic induction to charge the Marines' implants when they slept, while equipment lockers on the opposite wall held their armor and augmentation rigs in fitted compartments for charging. The arrangement corresponded closely to berthing aboard the newest high-speed, modular amphibious ships at anchor nearby.

"Corporal Garcia," the sergeant called out to his assistant at the far end of the squad bay.

Cpl Garcia leaned forward on her cot and looked up slowly with dark, squinted eyes and responded, "Yeah, Sergeant?" "Gear inspection before we get online," he ordered, "Check the squad's and mine; I'll check yours." "Aye, Sergeant," Cpl Garcia replied. Looking up and down the squad bay, she growled, "Twenty minutes, Marines. Have your kit fully charged and packed for the hump." Her gaze stopped on a fresh-faced girl, the newest member of the squad, "PFC Walters, don't give me that look. If you're confused, look up the packing list I sent you yesterday." Cpl Garcia paused, "Okay, it's highlighted on your left display. I swear, you better be charged up! If your rig can't carry you, then you'll carry it." She tasked her AI to monitor the PFC's preparations so she could know just how much of a pain in the neck the newbie would be that night.

The company made decent time on the hump with their lightweight mobility rigs. Keeping an even tempo with their combat loads was not a major tax on power. However, the Marines did not know how far the company commander would take them, nor did they have the sun to recharge on the move. Consequently, they put more physical

effort into the uphill portions, conserving system power. The captain put them through their paces, and the lieutenants took the opportunity to teach lessons. The platoon commanders designated random Marines to experience gear malfunctions, causing fire teams to distribute gear according to an individual's power availability. The Marines sucked it up but hoped none of the officers got the idea for a unit-wide systems failure, especially when they were this far from the barracks. Humping all their powerless gear meant they might not return until after sunrise.

As the company stopped for a short rest below the crest of a hill, Sgt Sloan called up augmented visualization from his hyper-spectral sensors. Colors differentiated frequencies, brightness indicated amplitude, and wave shapes denoted polarization. The patterns gave clues to activity, but he did not have the skill to interpret what was being communicated. Looking back at his squad, he could see the Marines shimmering faintly with low-power tactical systems (TacSys) communications, while tight personal connections linked some. They were awash in a dim glow from the weak signals of distant cell towers and the cascade of broadband satellite broadcasts. A microwave beam of point-to-point communications passed nearby. The air traffic control radar at Andersen Air Force Base swept a broad beam in quick circles as the navigation aids pulsed regularly. A couple of airliners high in the northern sky blinked in apparent response and sent out occasional flashes of radio communications. The satellite dishes to the southwest transmitted bright columns with high-capacity laser cores toward points of corresponding color in orbit.

The next few weeks were a blur for Sgt Sloan's squad as they kept pace with the battalion's preparation for an upcoming deployment and worked through higher level skills and tasks for the squad competition. They spent afternoons and weekends on the ranges honing cybercraft and fieldcraft, stripping down sensors and weapons, troubleshooting augmentation and communications, and drilling protocols and tactics. Sgt Sloan and Cpl Garcia

were daunted by the variety of events and locations devised by the Division Gunner for past squad competitions.

Gunner Crandall might be as old as dirt, but he was notorious for finding ways to mess with TacSys and setting up unexpected twists and turns in live training. His combat experience and creativity more than compensated for his outdated knowledge technology. The Gunner had a knack for demonstrating that nothing was new under the sun and that technology was still subject to human nature and the fundamentals of warfare. He could be expected to prepare locations ranging from mountainous environments requiring the squads to focus on basic tactical movements and minimize their electronic signatures to sprawling urban areas where their electronics proved invaluable.

Sgt Sloan approached GySgt Hendrix, the Company Gunny, for tips on narrowing the focus, since Gunny came from battalion operations earlier in the year. Gunny Hendrix had little advice beyond being ready for anything—the curse of modern Marines to be masters of all skills in all domains.

Squads representing the battalions from Guam and Hawaii assembled at Camp Mujuk for the initial briefing. The Korean Peninsula was chosen for its contrast of high-tech south with the anachronistically low-tech north. The urban areas were ideal for their array of dense technologies, and the rural mountains provided complex terrain for the Marines' sensors and infantry equipment. The 3dMarDiv Commanding General gave opening remarks via video and promised to be at the closing ceremonies to congratulate the Marines on what he was sure would be an outstanding display of the Division's skills. Division operations gave environmental and range safety briefs, important since the competition was being held within the *mostly* cleared Demilitarized Zone (DMZ).

Finally, the Division Gunner, ramrod straight and silent at the back of the conference room, unfolded his arms and walked to the podium. If a Marine with an impeccable high-and-tight haircut and utilities could be considered grizzled, Gunner Crandall was that

grizzled, old Marine. The furrows in his forehead and deep crow's feet at the corners of his eyes were at home on his leathery face. With his gravelly voice, he gave an overview of the week's schedule and how the squads were to be observed and assessed. The Gunner revealed that this year's squad competition consisted of a single, long-range mission with the squads departing in twelve-hour intervals. His tone told the NCOs that he knew they would come to curse him. The squad leaders then came forward to draw numbered chits to determine their order.

Sgt Sloan unfolded the slip of paper and nodded. His squad had little time to prepare, as they were first in the chute. While the other squads were sequestered away in the barracks, Sgt Sloan and his Marines received the mission brief. Given only the range boundaries, their starting point, and general location of the final objective at the far end of the DMZ, they were to navigate undetected through a network of observation posts (OP) in the mountains on the eastern end of the old demilitarized zone. Once they had bypassed the OPs, active patrols would then seek to intercept them on the long haul across the peninsula. Careless squads should expect to be amped by an electronic barrage and defeated by a large opposing force. Should they avoid or survive ambush, they were to advance and take control of or disable an enemy retransmission station.

Back in their temporary squad bay, Sgt Sloan's squad focused on programming their TacSys with intelligence on the training area. The squad leader had established relationships between RTO and AIs at the MAGTF intelligence center (MIC). Given the squad's mission, the MIC AIs pushed intelligence from throughout the intelligence enterprise. RTO was already picking out OPs and activity in the designated area; full-spectrum, high-resolution coverage from demining operations revealed micro-terrain, old fortifications, and potential covered routes. Sgt Sloan and Cpl Garcia traced the planned route for the squad with rally points and time hacks before ordering each Marine to memorize the course in relation to key terrain.



*The Osprey took the Marines across the eastern shore toward the designated LZ. (Photo by LCpl Joseph Atiyeh.)*

Third Squad's H-hour approached, and the Marines began to snap on their rigs—the Hoplite model and standard issue for Marine infantry. It was lighter and more agile than the Army-issued Berserker model—a nearly enclosed powered suit of armor. The molded carbon lattice was powered by electro-active polymers, framing their arms and legs, and joining with their body armor and boots. With fully-charged cells and weapons, they passed Cpl Garcia's final inspection and followed Sgt Sloan out to the landing zone.

As soon as the controllers gave the go-ahead, an Osprey took the squad feet-dry across the eastern shore, and they leapt from the hovering birds a few clicks inland. As the aircraft's advance sensors withdrew, LCpl Brown, the semi-autonomous systems assaultman, launched from his pack a single multi-mission sensor with instructions to fly low in passive mode to scout the locations and activities of the OPs. His assistant assaultman, PFC Walters, dropped several more from her pack to weave along their planned route and snoop out adversaries, booby-traps, sensors, and any residual ordnance. The fused information from the cigar-sized drones refined the map overlays for the squad and alerted them to any activity beyond line-of-sight, ignoring the oc-

casional contact with exercise controllers and evaluators.

The squad moved quickly along their preplanned route in a tight formation—mostly within sight of hand signals—to reduce their electronic signature. The intelligence they prepared on the terrain allowed them to pass through the network of OPs unchallenged. Sensors snaking through the heavy underbrush in a narrow valley detected the approach of enemy sensors. LCpl Brown immediately recalled all sensors but one. The remaining sensor shadowed the approaching patrol. The aerial sensor was reassigned overhead in stealth mode to return inverted enemy scans and conceal the squad as they laid an ambush. The sensors on the ground arranged themselves in an omega perimeter, awaiting the command to engage. The sensors also monitored the Marines for anything that might give away the squad's positions.

RTO assisted Sgt Sloan in conducting second-phase analysis of sensor data—quick wargames and what-ifs. The information provided stand-off distances and penetration information to assist Sgt Sloan in improving the squad's disposition and synchronization of weapons. The rules of engagement settings in their weapons and multi-mission semi-autonomous sensors

carried the training caveat, disabling all destructive and lethal functions. However, the squad was to be assessed on the engagements and fire plans in the TacSys.

The opposing force's patrol entered the kill zone, and Sgt Sloan cued squad members with the best angles to hit them with tight-beamed amping and jamming pulses<sup>1</sup> from the phased-array antenna panels integrated into their helmets. As they overloaded and confused enemy systems, semi-autonomous systems in notional warhead mode stormed from ports in LCpl Brown's and PFC Walters' packs like angry hornets, seeking out any enemy. The firefight was eerily silent with only the thump of drones harmlessly tagging their targets.

Hastily, the squad scanned notional dead and evaluated mock wounded. Marines "felt" the magnetic fields of power sources and retrieved several full cells. While the "dead" enemies were

silent and the "wounded" uncooperative, RTO hacked enemy electronics. On order, the squad moved quickly to a designated rally point. Cpl Garcia brought up the rear, setting a Red Cross beacon on a 30-minute delay to transmit the position and status of the enemy casualties, in accordance with the latest Geneva Conventions.

Sgt Sloan analyzed the information recovered by RTO and updated their course to avoid other patrols. He frowned as he read several strings of chat about the unusual preparations on the objective. The Gunner had certainly introduced some twists. A full-on assault might get a couple of Marines to the objective, but a lone squad was unlikely to seize control of or destroy the facility. He had another idea.

They moved quickly at full power over masked terrain and crept carefully where they might be observed. Constant movement made recharging critical. Once the sun rose, they rested

for short periods under chameleon panels in the open to collect solar energy. The irregular shapes were efficient solar collectors and concealment, morphing matte surfaces to mimic the surroundings.

In this lurching fashion, they traced a path over the old demilitarized zone. Farmers, whether desperate or indifferent, encroached into the DMZ with rice, soy, and ginseng fields where mines were once planted. RTO alerted Sgt Sloan to the danger zone ahead—a wide swath of planted farmland. The squad leader flashed a short message to each squad member's display, and they immediately performed the drill they had rehearsed numerous times. LCpl Brown put a second sensor to flight and sent both aerials far out to the flanks while the ground sensors zipped across the cultivated fields to scout the wooded hills beyond. With assurances from the sensors, the Marine on point dashed across fields, and

## Call For Papers

Marine Corps University and the Marine Corps Association & Foundation are pleased to announce a call for papers on a topic that is vitally important for our country and the Navy-Marine Corps Team. The contest challenges participants to think holistically about how our Nation employs naval expeditionary power now and in the future operating environment.

### Essay Topic

*Within the context of rapidly changing strategic, operational, and technological environments, how must the traditional concepts of naval expeditionary operations be adapted and expanded to be successful in the future?*

Essays should be at least 1500 but no more than 3000 words in length. Essays are due by 15 February 2019 and must be submitted via email to Ms. Angela Anderson, Senior Editor, Marine Corps University Press at [angela.anderson@usmcu.edu](mailto:angela.anderson@usmcu.edu). Winners will be announced in April 2019.

## Prizes

### Overall Winning Essay

Invitation to attend the Annual Symposium of the National Museum of the Pacific War, Fredericksburg, Texas in September 2019.

### Winning Essay in Each Category

- Cash award and plaque provided by the Marine Corps Association & Foundation
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Two Honorable Mentions in Each Category with a cash award provided by the Marine Corps Association & Foundation.

### Contest Categories and Eligibility

Active Duty and Reserve E5 & Below  
Active Duty and Reserve E6 & Above  
Active Duty and Reserve O3 & Below  
Active Duty and Reserve O4 & Above



then the squad spread out and silently crossed.

As Cpl Garcia brought up the rear she had noted a private access point at a nearby farm. They had kept off reachback communications, except for the safety net, so she analyzed its link protocols. She determined it was old hardware with outdated firmware. Satisfied that it was not likely a malware trap or programmed to give away their position, she established a low-level link with the access point. Her AI cracked it and determined it posed no threat. The AI covertly picked up an encrypted package from a public site. The enclosed open-source reports gave Cpl Garcia insight into the opposing force's activity. Division was advertising the squad competition with regular public affairs updates and interviews. The videos were particularly revealing, and Cpl Garcia's AI scanned and summarized them. Once across the danger zone, Cpl Garcia passed the intelligence to Sgt Sloan with a grin; his idea would work.

After ten hours and several hundred kilometers, Third Squad arrived just beyond the range of a sensor string. The squad improvised a strange device from pieces of their kit under Cpl Garcia's supervision, while Sgt Sloan crept to the crest of a low rise. Beyond this point of observation sprawled an antiquated complex with the bright transmissions from the objective at its heart. Several broadcasts alerted his TacSys defenses to probing cyber-attacks. He sensed unusual activity, as expected, and RTO confirmed a large amount of unencrypted communications.

The squad split into two formations and moved under strict emissions control around the objective toward polar opposite positions. Sgt Sloan took PFC Walters and the machine gunners, while Cpl Garcia led LCpl Brown and the remaining Marines.

Sgt Sloan set the machine gun teams 200 meters apart in a saddle on a ridge with wide fields of fire and instructions to open up in coordinated bursts on his signal. He huddled with PFC Walters and the lanky LCpl Kim between the machine guns, drawing in the dirt and whispering, instead of linking with the TacSys.

"Walters, an enemy sensor is sitting 200 meters directly in front of you. Another sits about 70 meters to either side of that one," Sgt Sloan whispered and indicated the azimuths, "Program three of your sensors to engage them when I give you the signal. Set the rest to fly through the perimeter and seek military targets about 500 meters beyond. I want them to create maximum confusion, but be careful not to engage any civilians, and there are plenty. Once they are away, put your rifle to use against anyone coming up this ridge."

Sgt Sloan turned to LCpl Kim, "We're going to cover the gaps with amps and gunfire." He handed LCpl Kim a couple of the extra power cells they had seized at the ambush. "Keep firing long-range electromagnetic bursts until these are drained. Try not to hit any of our sensors but fry anything coming this way. Be prepared to engage by fire any enemy who respond. Move around; I want them to think the entire squad is coming from here."

Cpl Garcia heard the chatter of the machine guns and "felt" the tingle of far off power discharges from the diversion. After several long minutes, she lifted and launched the improvised payload, nodding to LCpl Brown to send the wave of sensors to seek and destroy armed personnel and enemy sensors. Cpl Garcia bounded up the ridge to a vantage point where she could see the transmission tower. With the sizzle of enemy bolts of electronic energy passing nearby, she watched the hunter-killers race ahead to clear a path. Ten sensors carried the payload, which looked like a banshee on a vendetta that rose just as it neared the tower. The thick sheet of meta-material enveloped the transmission dish. The material absorbed the radiating energy, and the communications module attached to it converted the signal to repeat, "Oo-rah, Third Squad." The surviving hunter-killers orbited the target in a defensive swarm. The squad had control of the objective, and the only way the enemy could get it back was to destroy it.

Over the next few days, Sgt Sloan and his squad recovered, observing the other competitors handle in their

own ways the same scenario. They compared improvisations and tactics. A couple of squads were detected and defeated among the OPs. Another was ambushed. Still, all showed flashes of genius, and a few assaulted the objective. Sgt Sloan was unsure who would be judged the winner of the Squad Comp.

RTO assured him, *The odds are in our favor.*

Sgt Sloan sat at a table in the back of the enlisted club with GySgt Hendrix. At a nearby table were several members of Sgt Sloan's squad quietly drinking their beer.

"The controllers were just looking to mess with us," Sgt Sloan said evenly. "It wasn't f—," he abruptly stopped as GySgt Hendrix cocked an eyebrow. "Yeah, Gunny, I know, 'Fighting isn't fair,'" Sgt Sloan offered in response to GySgt Hendrix's look, "But mixing kids in the industrial park like human shields and letting them hack into our TacSys? Really?! I have the equivalent of degrees in information technology, electronics engineering, and wireless communications, in addition to all the grunt skills. They throw ROTC cadets at us and boast about it in interviews?!"

"Well," Gunny replied, "if you had not gone silent around the perimeter, those ROTC cadets might have taken you apart." Gunny chuckled, "You scared them when you fried their personal electronics and then opened up with the machine guns. That got their attention! Gunner Crandall even made some comment about how you twisted the mission from 'seize control of or destroy' to 'seize control of or make them destroy it.'" He paused, "Technology offers an advantage, but Marines accomplish the mission."

#### Note

1. These are their only "ballistic" weapons. The machine guns fire programmable, semi-autonomous rounds. Even carbines and side arms fire homing rounds with limited in-flight maneuverability.

