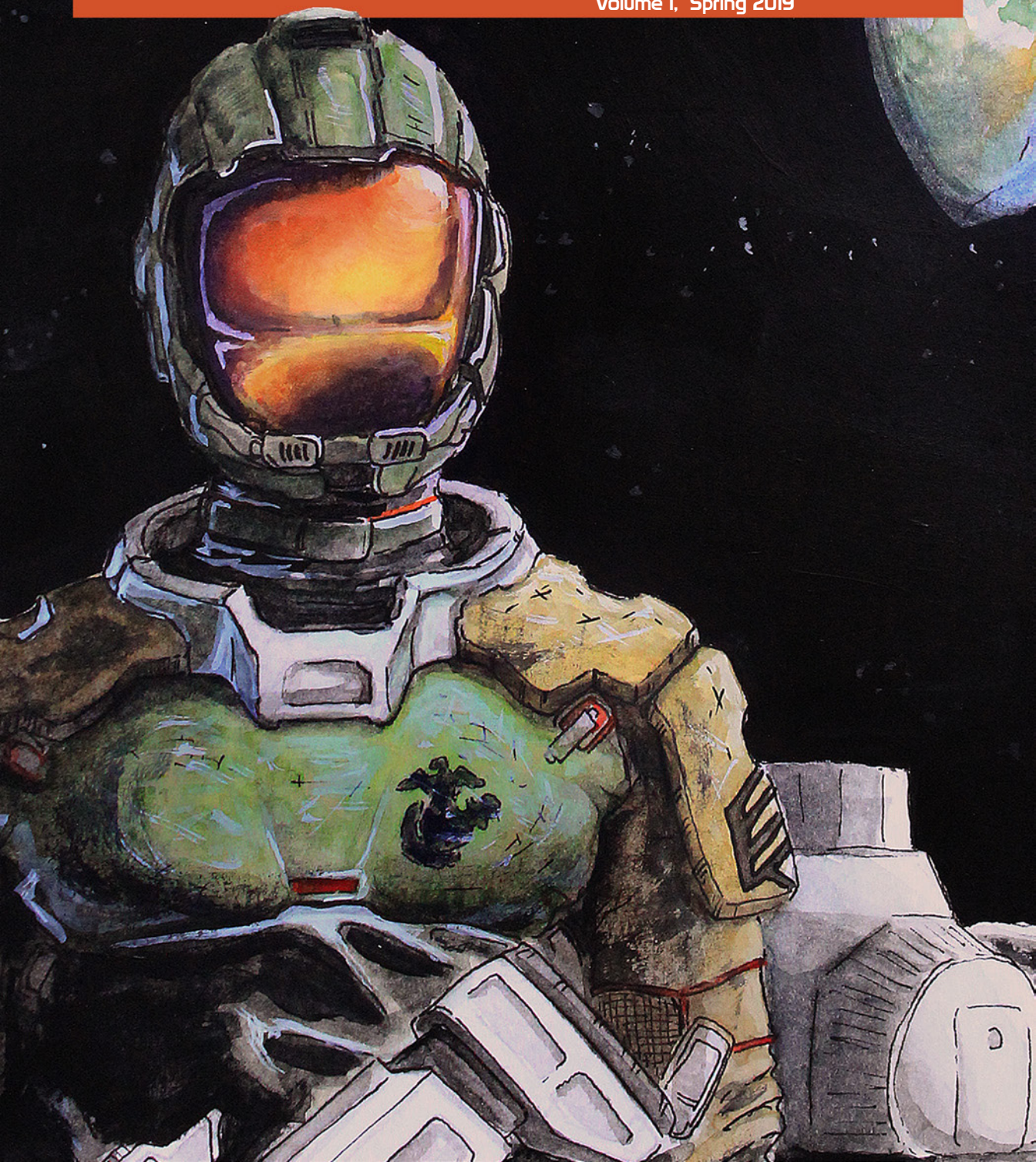


DESTINATION UNKNOWN

Volume 1, Spring 2019



**DESTINATION
UNKNOWN**

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FOREWORD

“Our ability to win battles boils down, as it always has, to the individual Marine.” I said this nearly 25 years ago in my *Commandant’s Planning Guidance*, and I believe, wholeheartedly, that these words still ring true today. Because our Marines are the key to our combat success, we must train like warriors, think like philosophers, and be ready to make the right decisions in the most difficult times.

But these words are not simply words of encouragement or snippets of empty motivation. It is a challenge we make to ourselves and a promise we make to our nation. There is no easy road to ensuring our force is ready, relevant, and capable, and there are no crystal balls that will show us tomorrow’s challenges. This is why we must continue to turn to our education and creativity to maintain our warfighting edge. We must remember that training is preparation for the expected, but education is preparation for the unexpected. We live today and will live tomorrow in an age of the unexpected.

We are now at a critical inflection point and we need every Marine to take notice. Look back and learn from the greats such as Carl von Clausewitz and Alfred Thayer Mahan, but do not forget the bloody lessons of our most recent wars. Look around and strengthen your mind, body, and spirit. Take this seriously, because the price of complacency is always paid in blood. Now, put your hubris aside and look forward with an open mind, an innovative spirit, and an understanding that yesterday’s answers may not solve tomorrow’s problems.

By understanding our past, our present, and the chaos of the future, we stay relevant in a world that is constantly evolving. The strength of our Service is not just the combat power we muster from the air, land, and sea—it is also our ability to adjust our plans when we encounter fog, friction, and cunning adversaries.

Making a stronger warfighting organization depends on every Marine. Do not be afraid to look for answers in new intellectual or creative spaces. *Destination Unknown* and other graphic novels are examples of just that: a new horizon that may inspire innovative thought and generate unexpected insights. Have faith in yourselves and your brothers and sisters in arms. Sometimes, it only takes a spark to light our path to victory.

—General Charles C. Krulak (Ret), 31st Commandant of the Marine Corps

ON WAR AND COMICS

There is a long tradition of cooperation between the military and the arts. The close cooperation between Hollywood and the armed forces dates back to World War II. More recently, organizations such as the Atlantic Council's Art of Future Warfare project have brought members of the creative, military, intelligence, and policy making communities together to help envision the future of conflict.

Comic books and graphic novels are no exception. Artists such as Jack Kirby, who created Captain America and the Avengers, fought in the Second World War. Will Eisner, father of the graphic novel, wrote and illustrated manuals in comic book form to help make maintaining weapons like the M16 rifle easier. My own work as a comic book writer has often focused on the military. *Graveyard of Empires*, my comic about Marines fighting zombies in Afghanistan, was a metaphor for the difficulties of counterinsurgency.

What the Marines of Ender's Galley have done with *Destination Unknown* is wholly unique, however. This is the first graphic novel used to explore the future of the Marine Corps written and illustrated by Marines.

The stories in this graphic novel explore such topics as Marine-manned satellites, laser communication, and artificial intelligence (AI) selecting potential recruits and assisting Marine Corps Special Operations Command (MARSOC) operations in real time. By doing so in fictional comic book form, the results are far more accessible, inventive, and engaging than any white paper could be.

As a storytelling mentor for this project, I saw the Marines use fiction to think outside the box. As a reader, the visuals, dialogue, and characters drew me in deeply. It is one thing to read an article about potential space-based weapons and AI. It is another to have writers and artists put you in the boots of a space-based Marine guiding ground troops below while dealing with deadly orbital debris above.

My hope is that if you are picking up this graphic novel, you will feel similarly immersed and that you will see the value in these stories as what *Ghost Fleet* author August Cole calls *FICINT*: fictional intelligence. That is using fiction—in this case the Marine Corps' first graphic novel—as a new way to think critically about the future of conflict.

Like the protagonists of their stories, *Destination Unknown's* Marine contributors are disciplined but capable of improvisation. Working with them, it was impossible not to be impressed by how quickly and effectively they brought these scenarios to life on top of their demanding roles as active duty Marines.

It was a true honor to help facilitate this special collaboration between military and creative minds. That those minds were one and the same speaks volumes about the Marines and makes this work a must-read.

—Mark Sable

LETTER FROM THE EDITORS

Professional military education consists of some combination of military history, security studies, international relations, leadership, strategy, tactics, drill, and a variety of wargames. These subjects and activities are designed to shape our minds, sharpen our thinking, and expand our problem-solving abilities. Nevertheless, we still ask ourselves: Are there other ways we can stretch our creative boundaries, challenge our conventional modes of thinking, and validate our warfighting assumptions? Is it possible to create space for novel perspectives and ideas?

Well, you are holding our vision to achieve these goals in your hands or reading it on your screens right now. Admittedly, the graphic novel is nothing new. However, past treatments of this medium by other Services and organizations are (typically) professionally constructed. We wanted something organic, homegrown, and raw. This assemblage of art and ideas is a passion project created by the warfighter for the warfighter.

This first edition of *Destination Unknown* takes place around the year 2075. We felt that this time horizon is well past our best forecasts at the Pentagon—far enough in the future to show a contrast between conditions of then and now, but close enough to still feel familiar to readers today. We energized the authors with loaded writing prompts (see page 9) on hot topics in national security, such as artificial intelligence, space operations, and information; however, we challenged them to expand the discussion to new horizons. We asked the authors to consider scenarios that did not necessarily align with current conceptions of warfighting and to consider the evolving character and perhaps the nature of war.

Equally crucial, the artists were afforded the opportunity to define the environment by bringing the authors' texts into a visual reality through a second layer of conceptualization. The interplay between author and artist provided new insights and deeply shaped each piece. In the end, we hope these stories continue to illuminate the art of warfighting by contributing to the dialogue in new ways.

This project could not have come to fruition without the support of the many leaders, mentors, teachers, and servicemembers who supported it along the way. We also want to extend a special thanks to Dr. Jeffrey Nadaner, Dr. Benjamin Jensen, Dr. Joseph Torigian, Dr. Susan Shepler, August Cole, Mark Sable, Major General Mick Ryan (AUS), the Krulak Center, and the Marine Corps University Foundation for encouraging us to think and act beyond our comfort zones.

Now, onward into *Destination Unknown*.

PROJECT WRITING PROMPTS

- Marine Corps regiments have mastered distributed warfare. Regimental staffs, battalions, and formations down to the squad level live, train, and fight in distributed positions across hundreds—even thousands—of miles. Most Marines never meet their company commanders in person. How do Marine commanders maintain morale and unit cohesion in garrison or in combat?
- You are a Joint Task Force commander about to engage a highly technical adversary in Asia. Your planners and analysts have mapped out your area of operations across all seven warfare domains and sent their results to the School of Advanced Artificial Intelligence (AI) Warfighting. You just received two courses of action (COAs) from the most advanced warfighting algorithm the DOD has in its possession. COA 1: 87 percent chance of mission success, but will incur 65 percent casualties. COA 2: 42 percent chance of mission success, but will incur 23 percent casualties. You received warning that the enemy is advancing on your position in 36 hours. What now, General?
- You are a Space Marine Detachment commander deployed on Joint International Space Station 37 orbiting the earth. You are on a highly classified six-month assignment observing/exploiting/defending/attacking/communicating (choose one or two activities). Report your observations to the Joint Space Mission Command Headquarters.
- You are a Marine Corps recruiter and the AI recruiting system used across the DOD indicates that Amanda Lopez (17 years old) is a less-than-optimal candidate. In fact, she only has a 65 percent chance of completing her first enlistment, but the Marine Corps is willing to give her an AI waiver due to [fill in the blank].
- Unmanned air vehicles have almost entirely replaced the manned fighter community. Your class is the second-to-last cohort that will ever be trained on the legacy Lockheed Martin F-35 Lightning II platform. You are sitting at your graduation ceremony and the guest speaker just walked to the stage. Tell us about the speaker's graduation speech.



THIRD EYE


Story and illustrations by
Staff Sergeant William Bradley

The scene:


The setting is northern Iran. Multiple intelligence reports indicate the enemy is using a centralized facility to stockpile weapons and train fighters. Uncorroborated reports also suggest the enemy may be kidnapping children to train them as terrorists before dispatching them to the front lines. Thankfully, a new human intelligence (HUMINT) source has a lead on the location of a potential enemy compound.

HHQ has tasked 3d Light Armored Reconnaissance (3d LAR) Battalion to raid the enemy training facility immediately. Sergeant Weaver, squad leader for Wolfpack Bravo 2-1, 3d LAR, is in charge of the mission and just completed his mission brief. His squad of two light armored vehicles (LAVs) departs friendly lines heading southeast to Battalion Objective A (OBJ A).

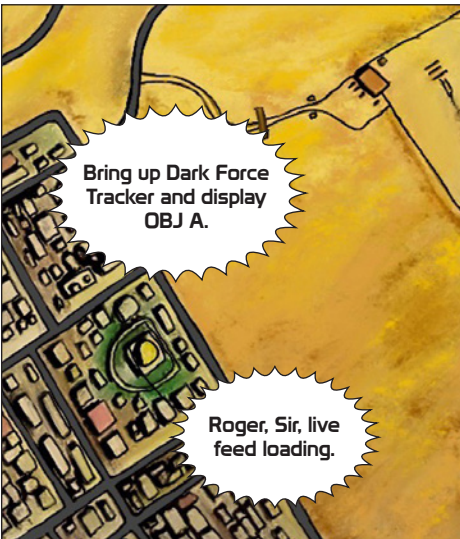
Simultaneously, Joint Space Station 37 (JSS 37) dispatches a manned satellite—Third Eye—in support of Wolfpack Bravo 2-1. The manned satellite is designed to drive operations from afar by streaming live-feed footage of the battlespace, paired with unmatched signals intelligence and electronic warfare support. Third Eye is also complemented by a high-tech suite of artificial intelligence (AI) to provide predictive analysis. Thanks to hover mode, Third Eye can also synchronize flight data with the Earth's speed of rotation to provide persistent observation for an unlimited period of time. Third Eye falls under the U.S. Space Force but is commanded by a Marine. The commanding officer is Captain Rodriguez, and he is assisted by Space Sergeant Deanes, who controls the video feed and assists in communication with other units.



J55 37, this is Wolfpack Bravo 2-1 departing. Two vics, 15 pax. En route to Wolfpack OBJ A.



Roger, Wolfpack B 2-1. Third Eye dispatching. Oversight Wolfpack OBJ A.



Bring up Dark Force Tracker and display OBJ A.

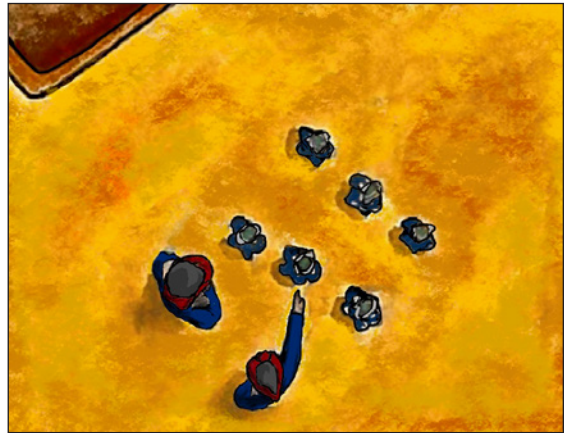
Roger, Sir, live feed loading.



Zoom times three.



Are those . . . ?



I see. Patch me in.

Kids, Sir!

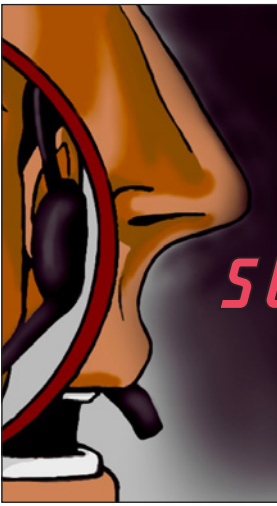


Wolfpack B 2-1, halt and stand by for updates.



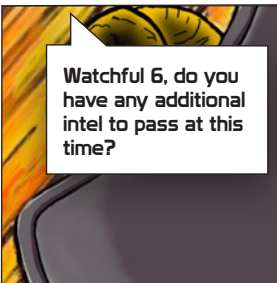
Third Eye is telling us to halt.

You have six children positively identified on the objective.



SWOOOSH!

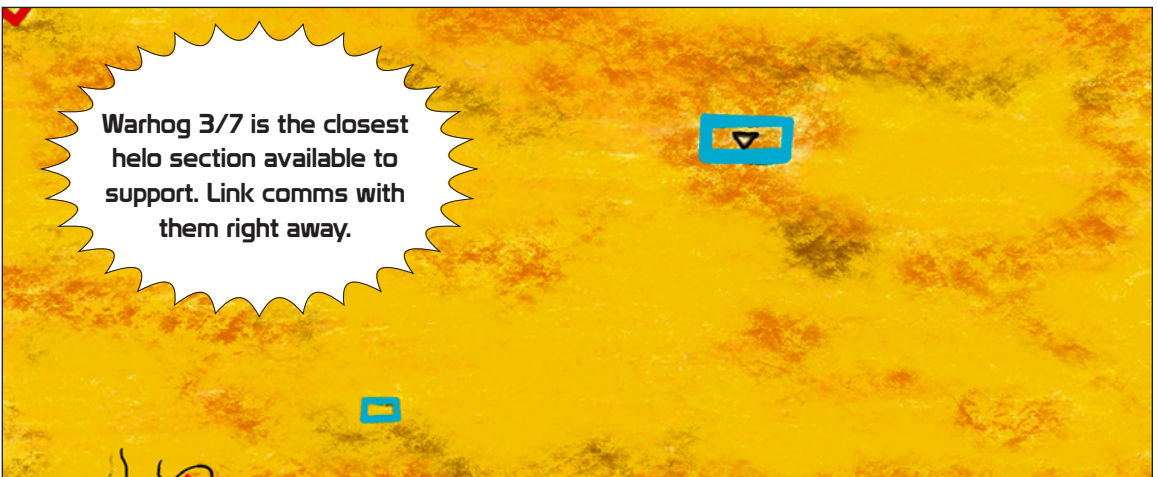
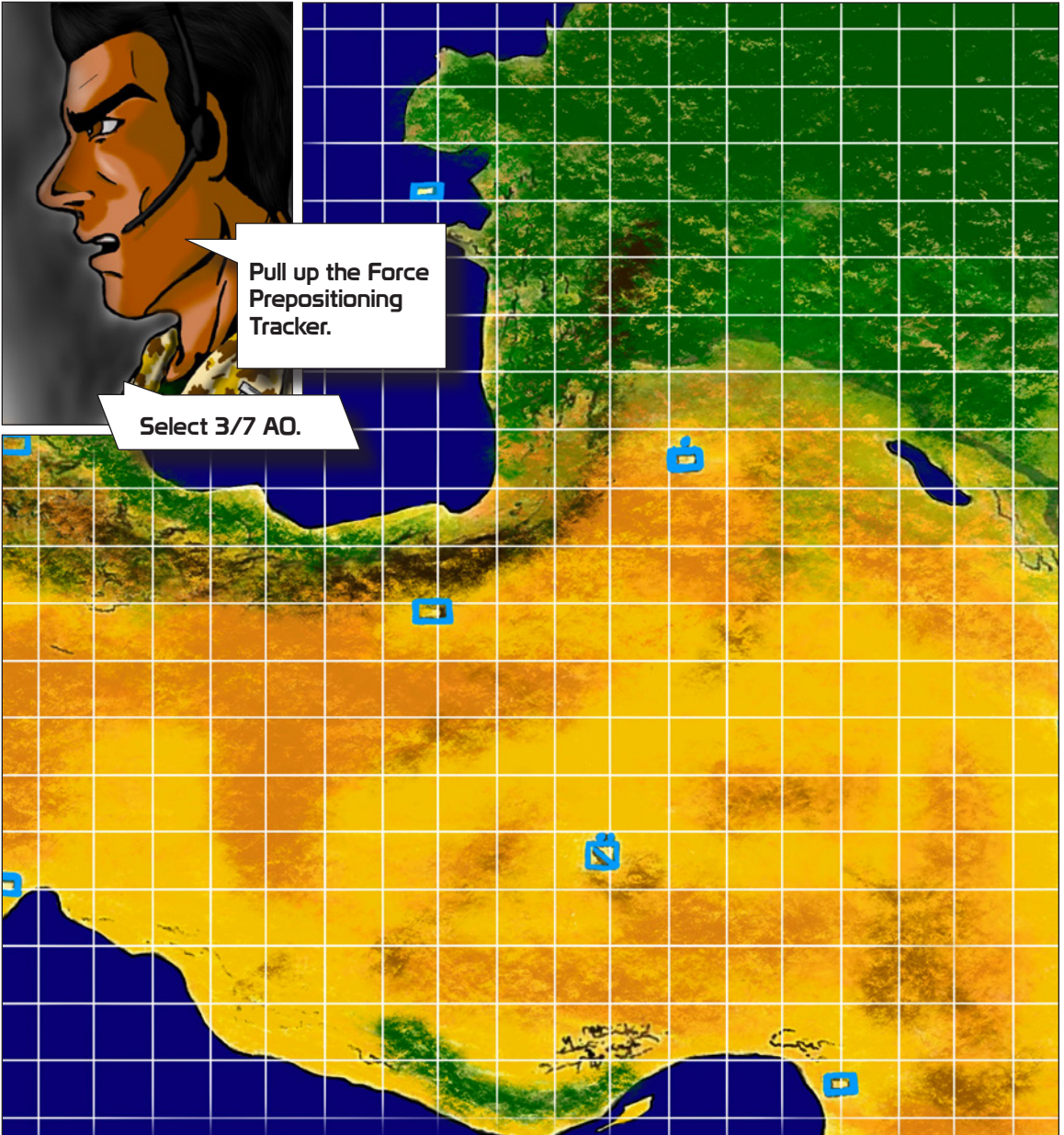
Third Eye, we have confirmation of an enemy convoy departing from the north heading in the direction of Wolfpack OBJ A.

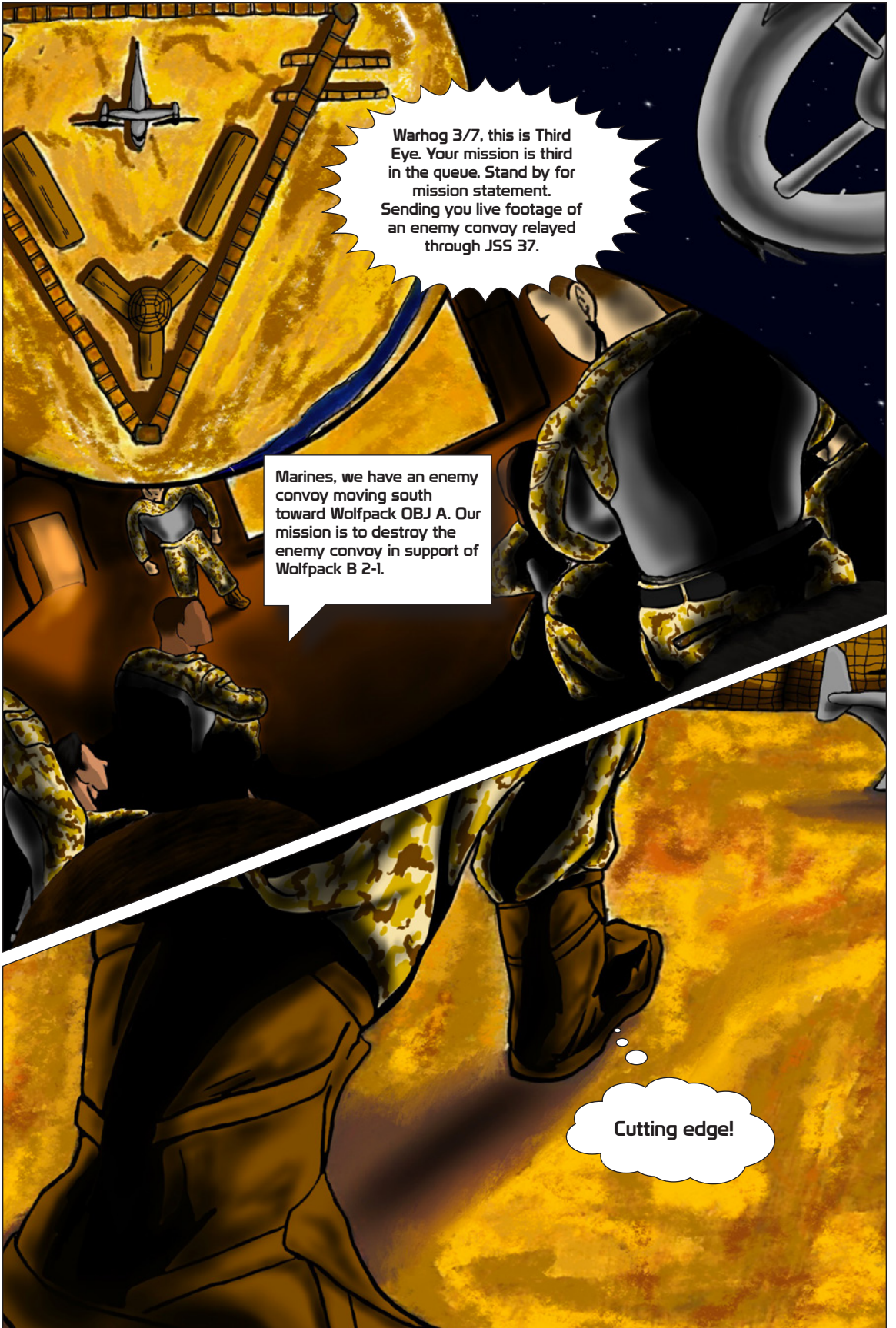


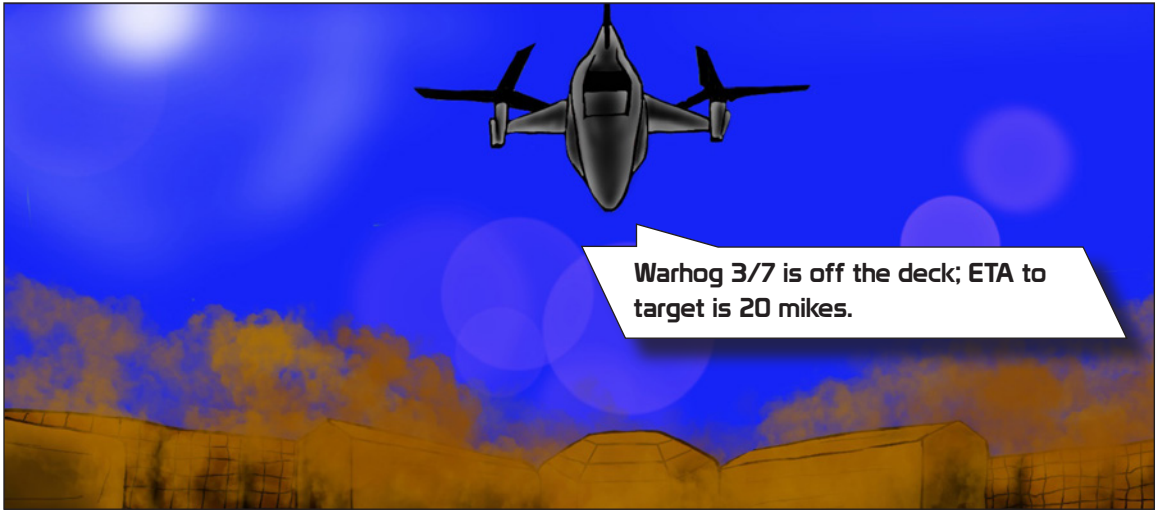
Watchful 6, do you have any additional intel to pass at this time?



Confirmed! Four vics . . . one appears to be a transport vic.



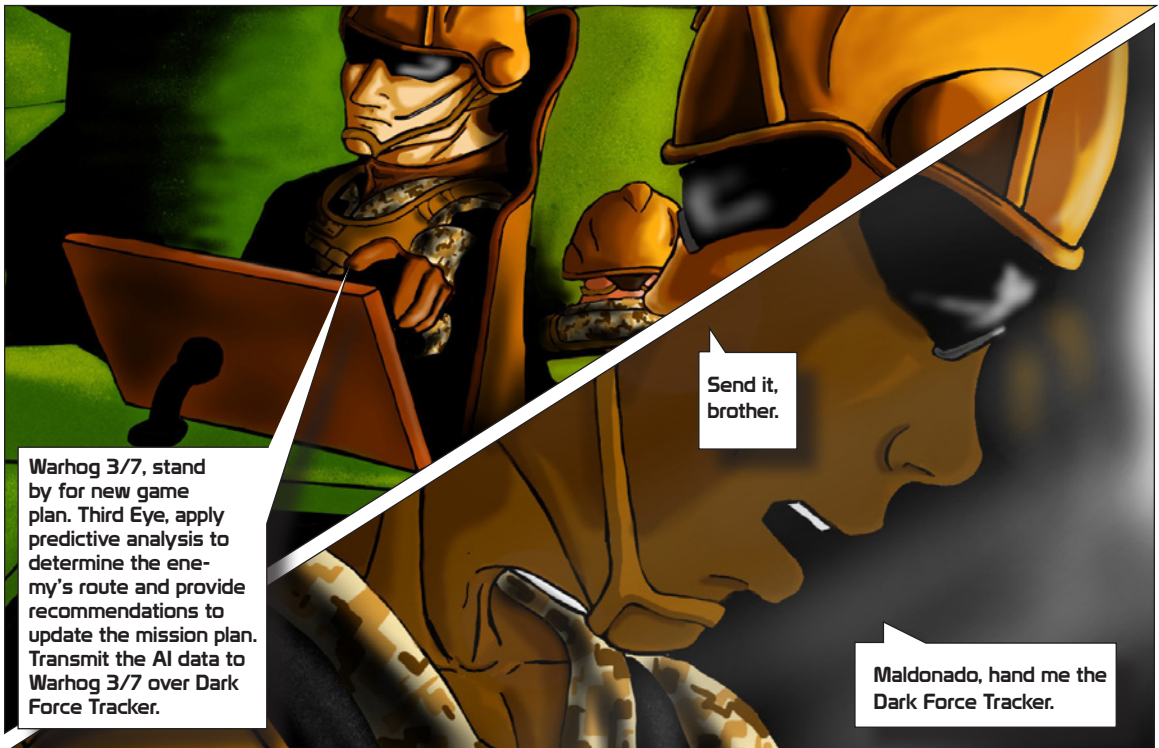




Warhog 3/7 is off the deck; ETA to target is 20 miles.



Solid copy. Connecting communications with Wolfpack B 2-1.



Warhog 3/7, stand by for new game plan. Third Eye, apply predictive analysis to determine the enemy's route and provide recommendations to update the mission plan. Transmit the AI data to Warhog 3/7 over Dark Force Tracker.

Send it, brother.

Maldonado, hand me the Dark Force Tracker.

Okay, Warhog 3/7, from the enemy's location, it'll take them approximately 20 miles to get to Wolfpack OBJ A.

Intercept and destroy the enemy convoy. We will wait until you complete BDA and pass the pro-word *wolverines*.

Understood, Wolfpack B 2-1. What happens after that?

Thanks to Third Eye's recommendations, I will utilize the enemy convoy's planned route from the north-northwest to approach the objective and mask our movement.

Wolfpack B2-1, once Warhog 3/7 destroys the convoy, I need you to establish a blocking position south of OBJ A and prevent the enemy from exfiltrating south.

Roger, Watchful 6, I will send half of my security team to establish a blocking position west of the compound to contain. I will breach with my assault team from the north.

Wolfpack B 2-1, that's a solid copy, and I will advise and update on all.



Final attack heading.
ETA 2 miles.

Eyes on target. Begin
descent.



BBARRRRRRRRRTTTT!!!



Wolfpack B 2-1, this is Warhog 3/7. Four vics destroyed.



This may work.

The trucks will be arriving soon. Go gather your belongings, children.



Copy! Wolverines! Okay, Watchful 6, we got this now.

WOLVERINES, we are wolverines at this time!

Roger, B 2-1, standing by.



Swoosh!

Move out!

Baam!!

Breach team, shift left!

Eyes on six kids and five men!

Henderson! Move your team to the west and contain!



Warhog 3/7 ETA 2 mikes.



Warhog 3/7 wheels on deck!



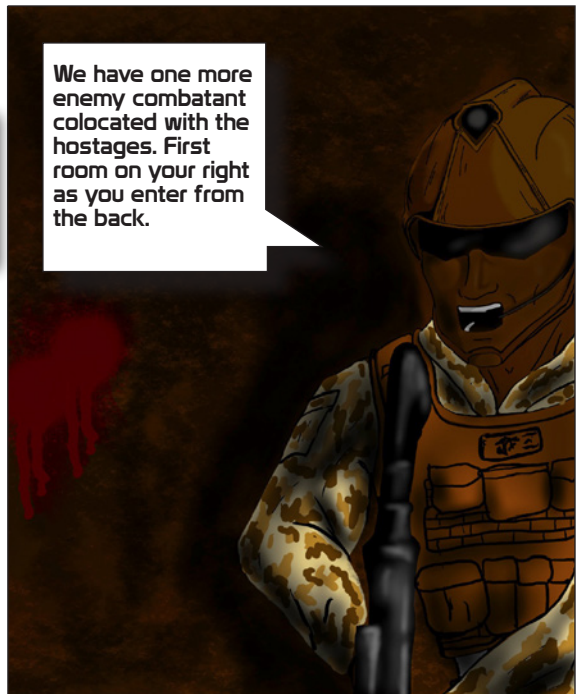
Section split right and left!



Contact! 2d deck 100 meters!



Suppress at rapid rate! Maldonado, breach!!





U.S. Marines!!!
Get on the
ground!!!

Surrender! Surrender!

Sergeant Baker, we are going to take the
EPW in the LAVs. Need you to take the
additional six on the bird.



Third Eye, we have the EPW and six pax secured. We are staged and ready for transpo back to Warhog 3/7 patrol base.

SITREP is as follows: 1920 zulu, 072070. Five enemy KIA. One EPW. Six rescued hostages en route to PB Warhog. Break. . . . We need you to coordinate with an adjacent unit to turn over the EPW and rescued pax along with a resupply of ammo . . . and rip-its. We will conduct a debrief upon arrival of the PB. Wolfpack Bravo 2-1 actual, out.

DISCUSSION QUESTIONS

1. Who is the supported unit and who is the supporting unit in this story? Is it possible that the Space Force could be the supported unit by ground forces in the future? Explain a scenario.
2. Despite the high-tech nature of Third Eye and a Space Force, are you surprised that ground forces are still conducting such a familiar and conventional missions against low-tech adversaries? Why or why not?
3. Are future battlefield leaders likely to trust technology such as Third Eye even if it potentially conflicts with what they are observing on the ground? What if the recommended actions do not make sense to us tactically but the algorithms suggest the likelihood of success is very high?
4. If a Space Force and satellites can easily observe ground movements and communicate in real time, does that improve or inhibit the ground commander's ability to command and control forces? Is there a point where there is too much overwatch?
5. Would a Space Force enhance or inhibit distributed operations? Explain.



A MATTER OF INSTINCT

Story by
Major Timothy Riemann

Illustrations by
Corporal Jerrod Moore

The scene:

It is 2070 and the United States and China are currently engaged in hostilities on the island of Taiwan. After months of civil unrest and threats by Taiwan to form a separate and independent country, China invaded key cities and facilities. The United States' response was swift: as so many times before, it sent the Marines.



MajGen Campbell, USMC

- VMI graduate (2054)
- Career aerial / straight leg infantryman
- PhD in Greek philosophy
- Married; one daughter
- Veteran of 2061 Japanese War
- Battalion executive officer at Battle of Haru Ridge



Gen Li Wei, PLA

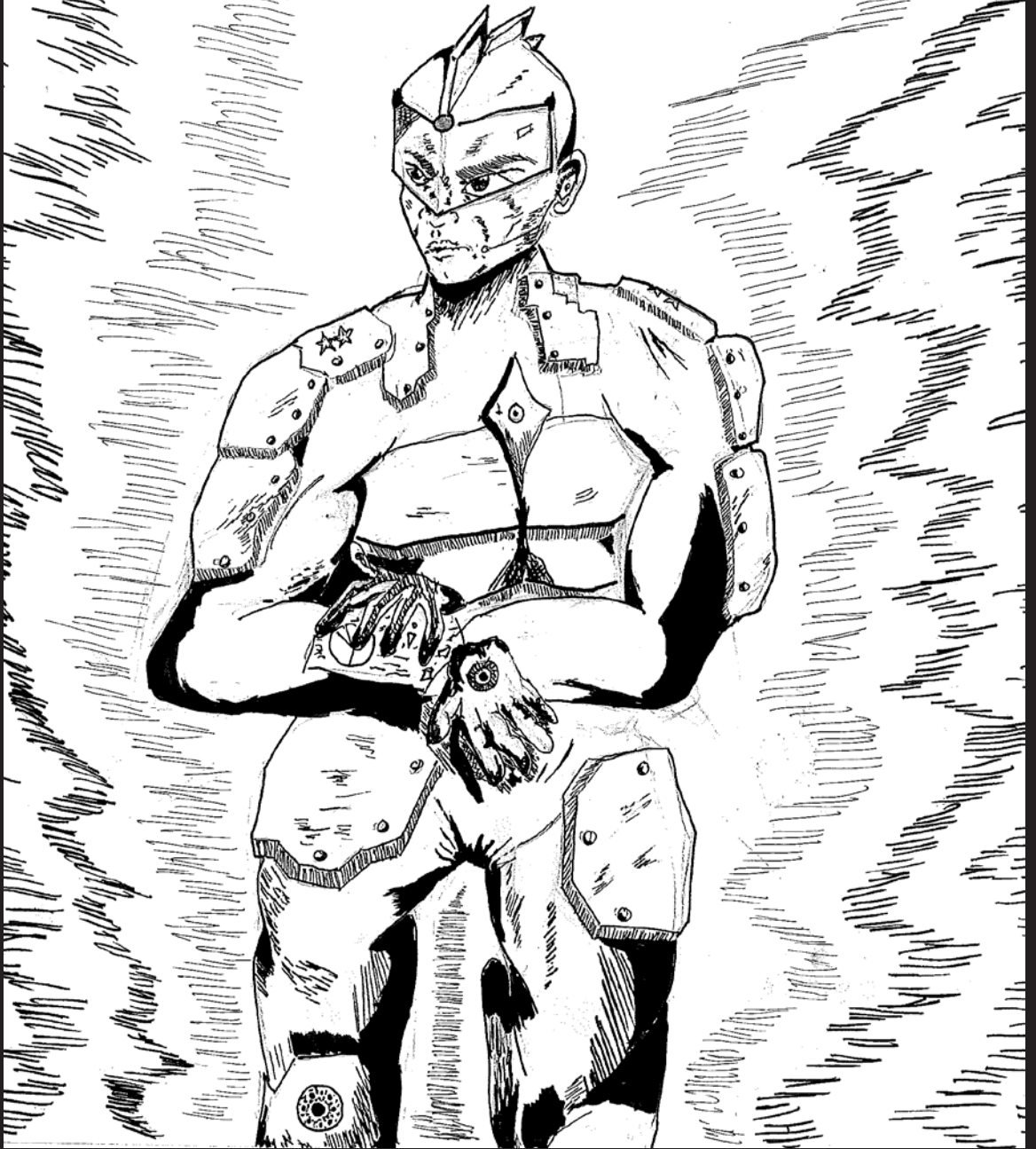
- PLA National Defense University (2052)
- UAS developer, recon and infantry training
- PhD in Chemistry
- Married; two sons
- Veteran of 2061 Japanese War
- Lion of Haru Ridge

Four days ago, Task Force Angel (TF Angel) gained a foothold following an aerial insert and secured Keelung City with ease. The aerial infantry proved too fast and stealthy for the People's Liberation Army's (PLA) detection, resulting in a successful insert with minimal casualties. It did not hurt that the aerial infantry flew in from nearly 2,000 miles away, far outside the PLA's focus area. The Singapore and Yurkavich Tactical Artificial Intelligence Network, or SAYTAIN, proved vital yet again, recommending the aerial infantry insert as the highest probability of success with the fewest casualties. The SAYTAIN was right; nobody remembers a time when it was not.

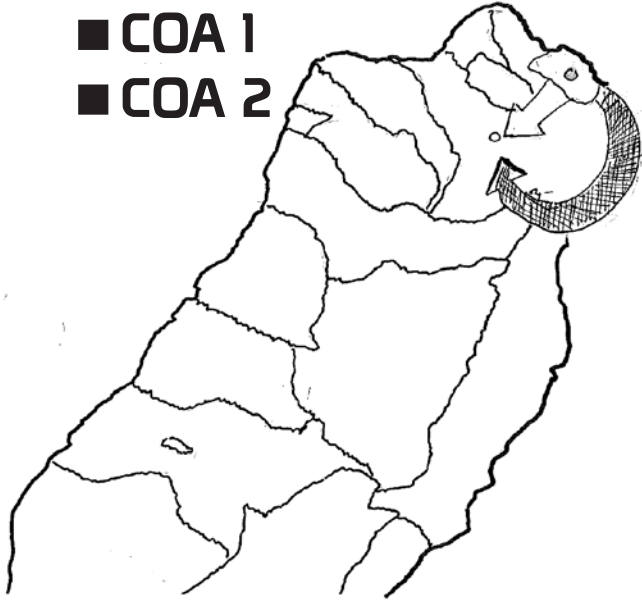
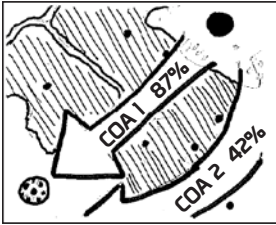
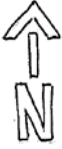
TF Angel is tasked to secure Keelung City, a city center 45 miles northeast of Taipei, and to await follow-on orders. Comprising more than 25,000 Marines and commanded by Major General Shane Campbell, TF Angel has a wide array of robotics, AI-enabled tools, and human-augmentation gear; the science finally caught up to all of the science fiction novels from the early 2000s.

Currently, 12,553 members of TF Angel, including Major General Campbell, are on the deck and consolidating gains. The remainder of the TF is expected to continue arriving during the coming hours. Due to initial success, Major General Campbell and TF Angel have been tasked to secure Jingtong in order to prepare for an attack, if necessary, on Taipei. As per the Department of War (DOW)—previously Department of Defense, changed after the 2061 Japanese War—protocol, Major General Campbell's staff of AI Marines have input all necessary data to conduct earnest calculations to secure Jingtong. Once again, they turn to the SAYTAIN for recommendations. The SAYTAIN runs 1×10^{18} battle simulations per second for two minutes and develops two (sometimes three) courses of action for the humans. The poor PLA; its AI equivalent can only do 1×10^{13} simulations per second.

...EARLIER TODAY, TF ANGEL CONDUCTS A
SUCCESSFUL AERIAL INFANTRY INSERT



■ COA 1
 ■ COA 2



Sir, SAYTAIN is finished. Here are your two COAs.

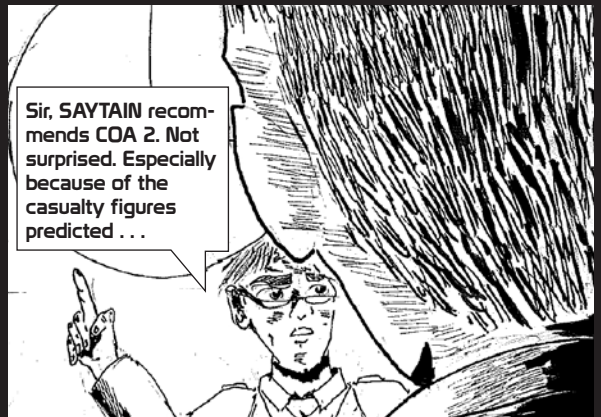
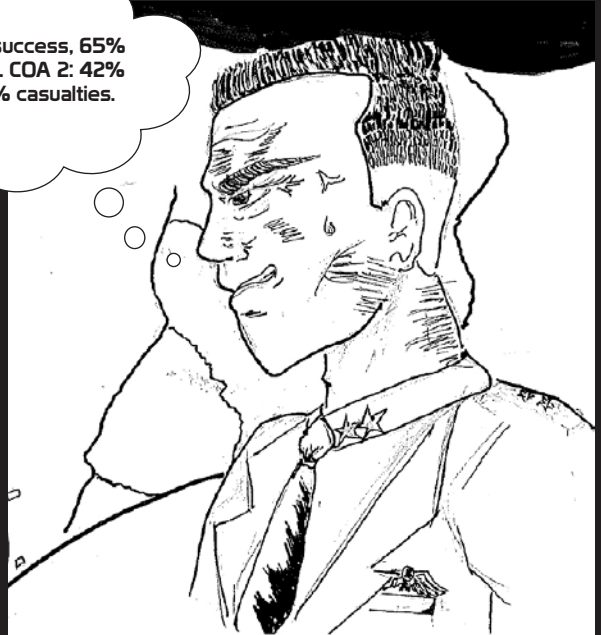
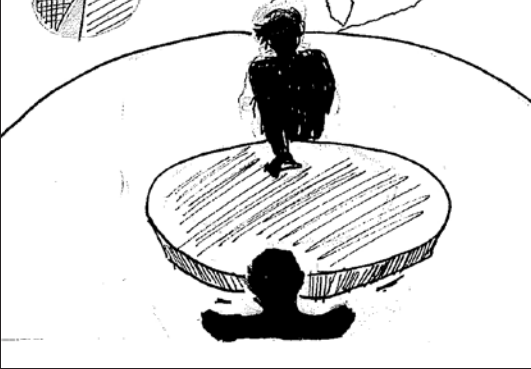
COA 1: 87% success, 65% casualties . . . COA 2: 42% success, 23% casualties.



87% mission success
 65% casualties



42% mission success
 23% casualties

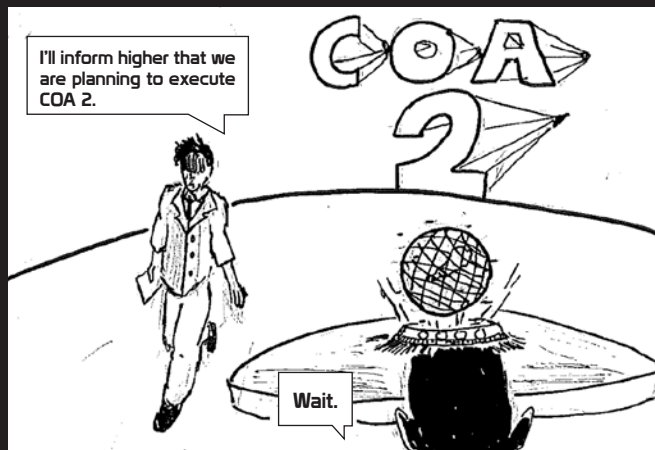


Sir, SAYTAIN recommends COA 2. Not surprised. Especially because of the casualty figures predicted . . .

... and because of who is commanding the PLA units we'll face.



I'll inform higher that we are planning to execute COA 2.



Hmm.



- Gen Li Wei, PLA
- PLA National Defense University (2052)
- UAS developer, recon and infantry training
- PhD in Chemistry

General Li Wei is in command? Reports prior to our landing had him commanding forces south and east of Taipei. What the hell? Is this correct?



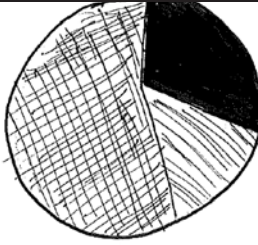
Heh!



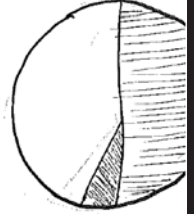
Is it correct?

Sir, it's SAYTAIN. Of course it's correct. Our AI-2 assumed that the PLA transferred "The Lion of Haru Ridge" to the Jingtong command to directly oppose us after the success of our aerial landing. I guess they are hoping he can pull off another miracle and save their sorry PLA asses again.





87% mission success
65% casualties



42% mission success
23% casualties

Sir? Is there anything else? Higher is waiting on confirmation, per DOW directive, that we are going with SAYTAIN's COA. Stupid formality. Waste of time and-

No. No we are **not** going with COA 2. Inform higher that we are going with COA 1.



Sir! I really thin-

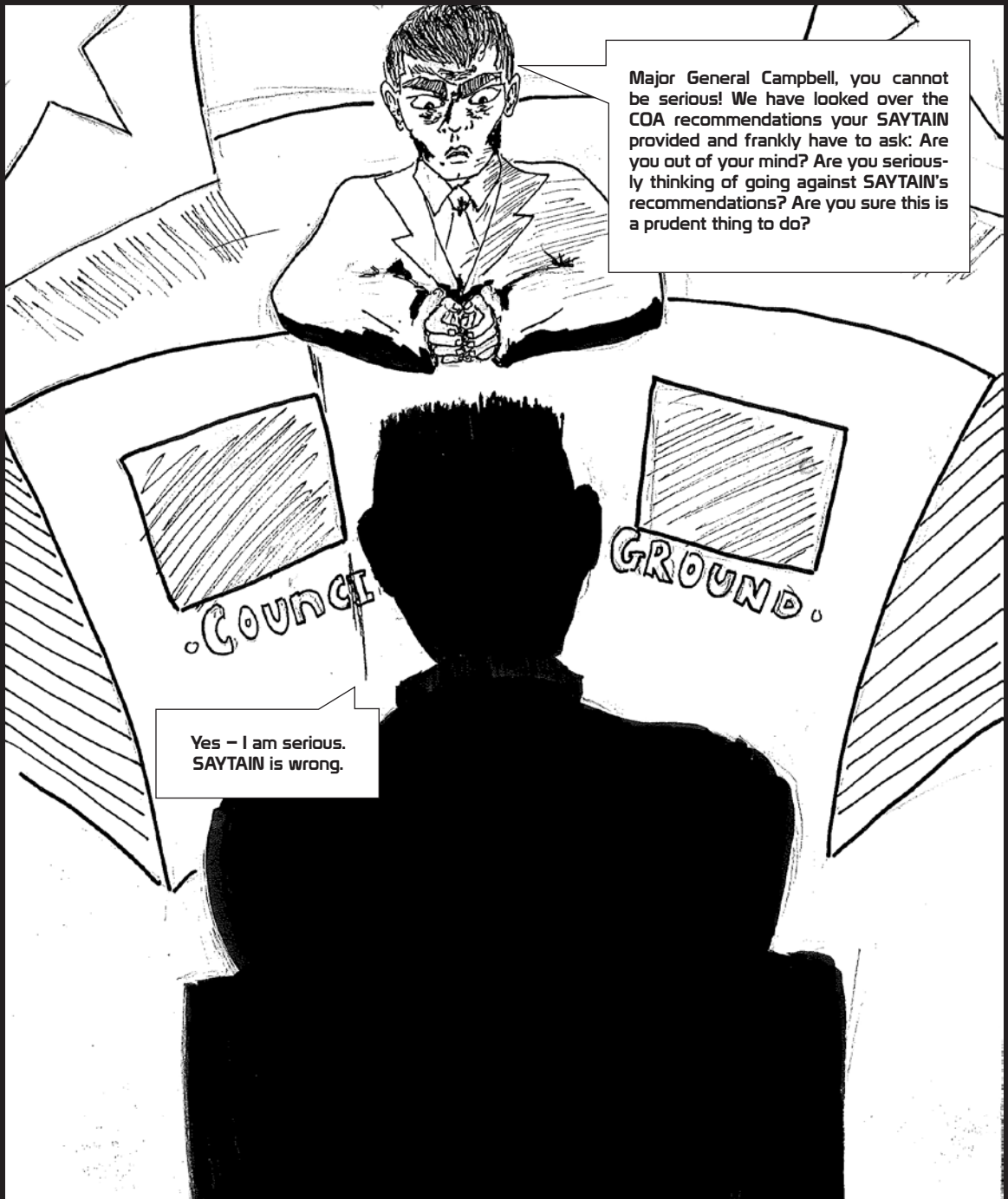
NOW. Move! I'll be ready in 10 minutes.

Gen.
Li Wei

COA 1?

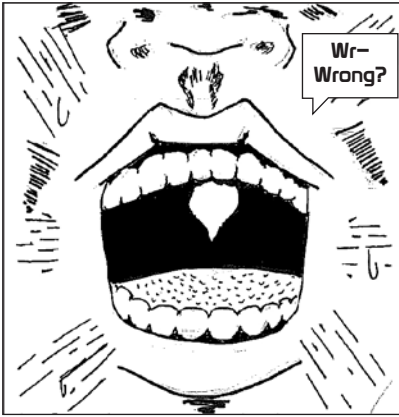
Council of Ground-Tactics 14

Anytime a commander decides to go against the SAYTAIN-recommended COA, they must justify their decision and gain the approval from the Council on Ground-Tactics 14 (CG-14).



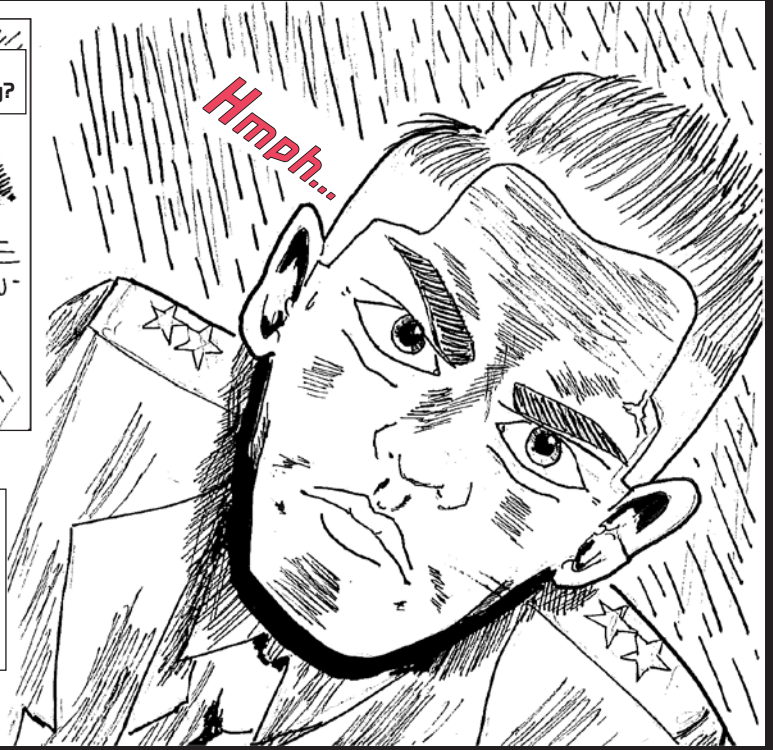
Major General Campbell, you cannot be serious! We have looked over the COA recommendations your SAYTAIN provided and frankly have to ask: Are you out of your mind? Are you seriously thinking of going against SAYTAIN's recommendations? Are you sure this is a prudent thing to do?

Yes - I am serious. SAYTAIN is wrong.



Wr-
Wrong?

The same SAYTAIN that recommended you conduct an aerial landing only a few short days ago now, somehow, miraculously, is wrong. You do know how many battle simulations it runs per second, right?



Hmph...



Yeah, I do. Super impressive.

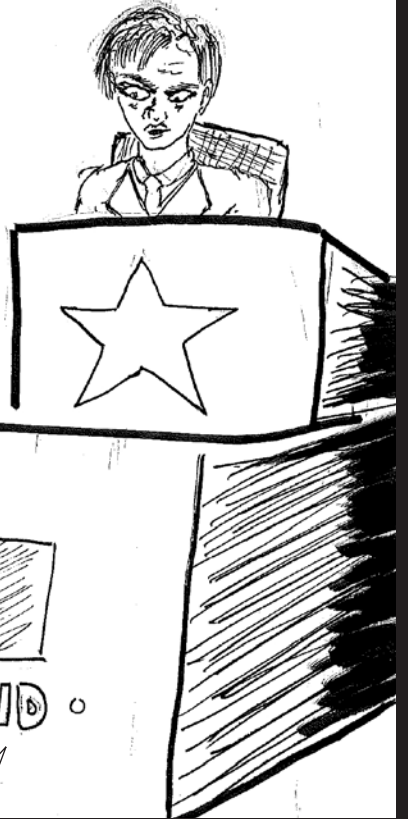
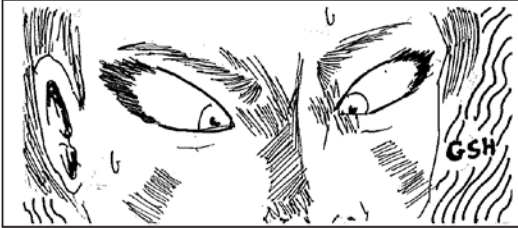
Major General Campbell, we would hope your attitude would be a bit more serious considering what, exactly, is at stake, here. The last time someone sought the override permission from CG-14, it ended in absolute disaster for our forces. You know this. You were there. You served under Lieutenant General Meadows and your men suffered greatly because he trusted his "intuition" and "gut feeling" about the tactical situation at Haru Ridge. The SAYTAIN's recommended COA was sound and the best available option. Lieutenant General Meadows thought otherwise. He pleaded with us and, God help us, we approved his decision to attack Haru Ridge. Thank goodness we were saved by the PLA forces. Now we are facing the same PLA forces that saved our ass against the Japanese. If we lose that ridge, we lose the war!





I know the story.

Now, you know Li Wei is in command of the PLA forces, right? He is the tactical genius that saved you and all of us from Lieutenant General Meadows's foolishness. And you want us to grant you permission to go against the SAYTAIN?

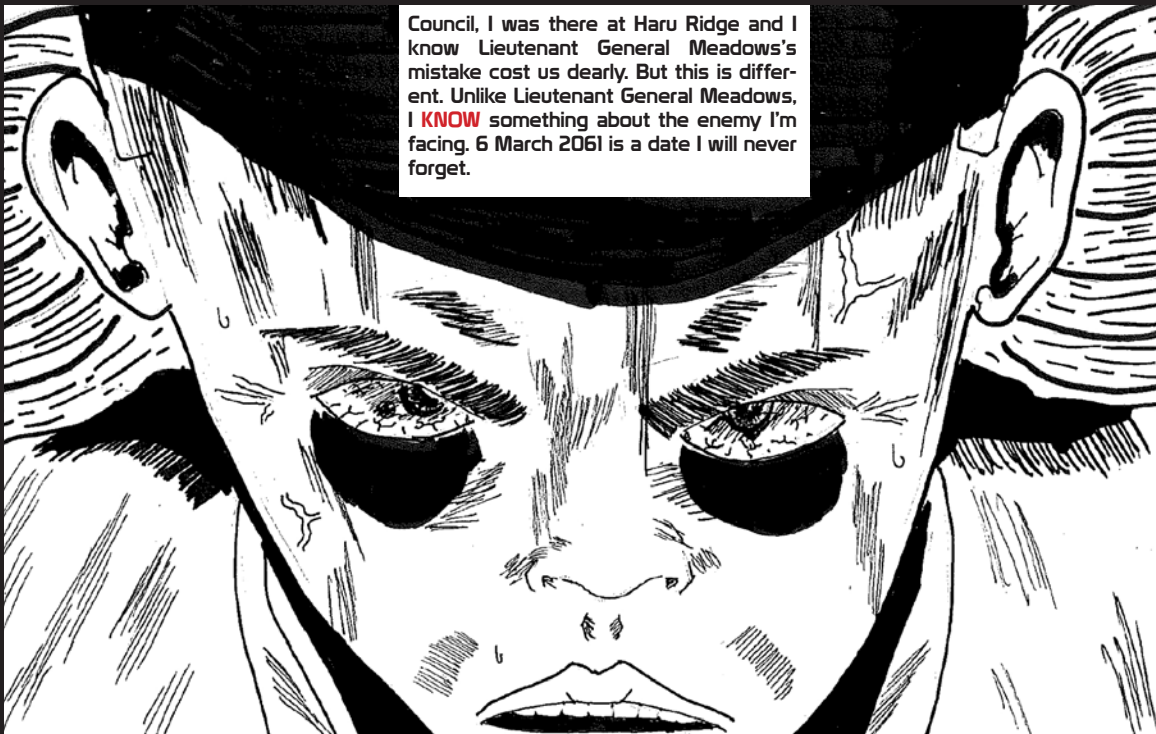


Yes, I do. Because you and the SAYTAIN are all wrong.

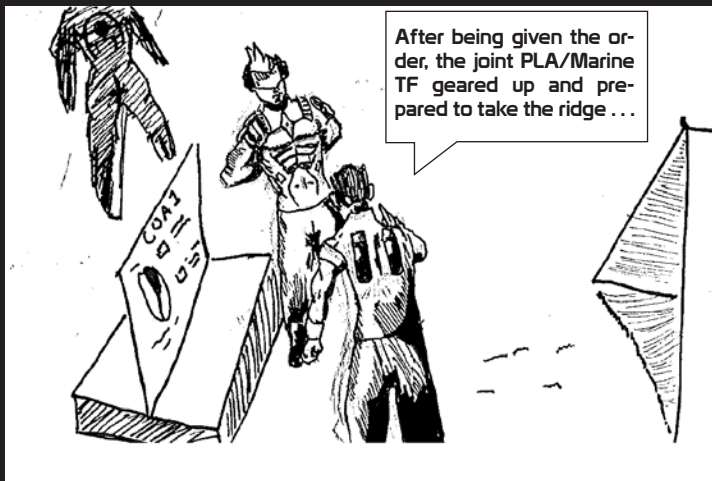
COUNCIL on GROUND

How do you figure that?

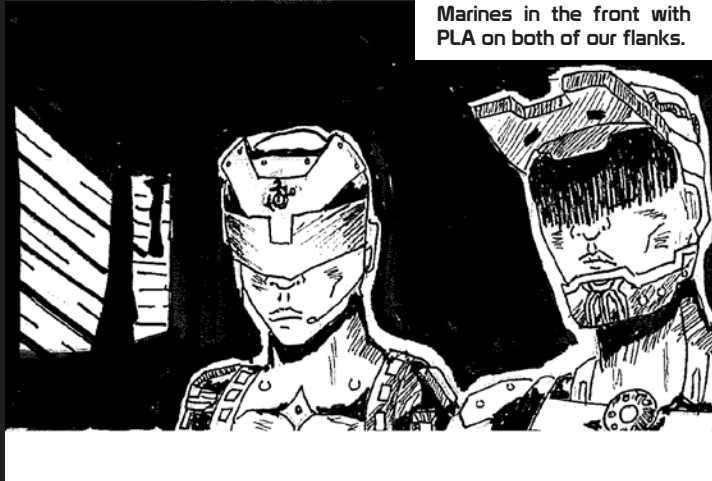
FLASH BACK



Council, I was there at Haru Ridge and I know Lieutenant General Meadows's mistake cost us dearly. But this is different. Unlike Lieutenant General Meadows, I **KNOW** something about the enemy I'm facing. 6 March 2061 is a date I will never forget.



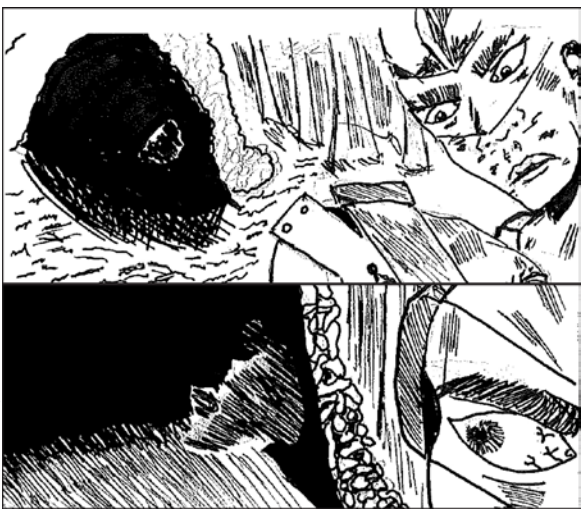
After being given the order, the joint PLA/Marine TF geared up and prepared to take the ridge ...



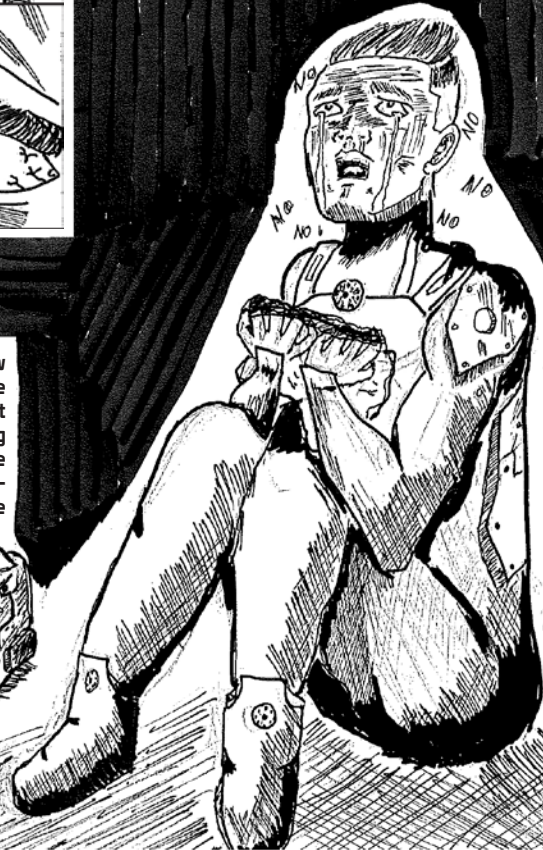
Marines in the front with PLA on both of our flanks.



It was a shit-show from the beginning. Japanese unmanned positions, undetected by our microsats, inflicted thousands of casualties and halted our advance.



As I addressed my wounds, I looked over and saw then-major Li Wei. He was hiding in a small cave with his helmet off. He was gripping a white shirt or cloth in his left hand and had tears streaming down his face. This was the first major battle he ever participated in and he was completely overwhelmed. He was all alone and, I swear to God, he was preparing to surrender his men.

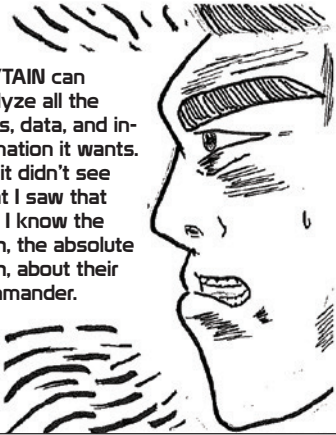


Our eyes met and he didn't even try to look away. The PLA soldiers were fine warriors and fought valiantly, but they did so despite him, not because of him.

He is no "lion." He is no "hero."



SAYTAIN can analyze all the facts, data, and information it wants. But it didn't see what I saw that day. I know the truth, the absolute truth, about their commander.

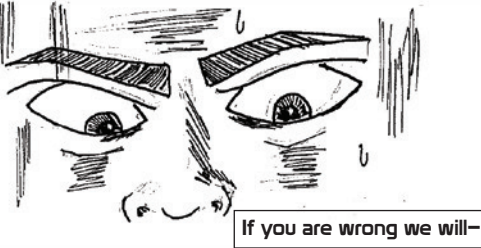


And the truth is that he is soft. He is a coward and a charlatan. After Haru Ridge, he was made a hero by the PLA and the Chinese government.

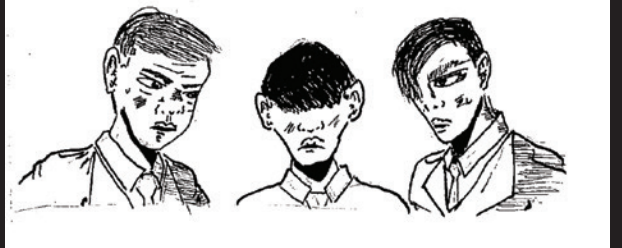
General Wei has not been in a fight or battle since '61 and has filled staff jobs and worked in military procurement for the last decade. I guess the Chinese actually convinced themselves that he is a warrior and believe he can fight. I know he can't.



But General Wei's command is over five times bigger than he had at Haru Ridge and this battle promises to make Haru Ridge look like a tiny skirmish. COA 1 will be a heavier fight and will produce more casualties on both sides. When the fighting gets intense, General Wei will show who he really is. He will buckle. We don't have an 87 percent chance of mission success. We have 100 percent. I guarantee it. And we will suffer nowhere near the 65 percent casualty figure SAYTAIN predicts.



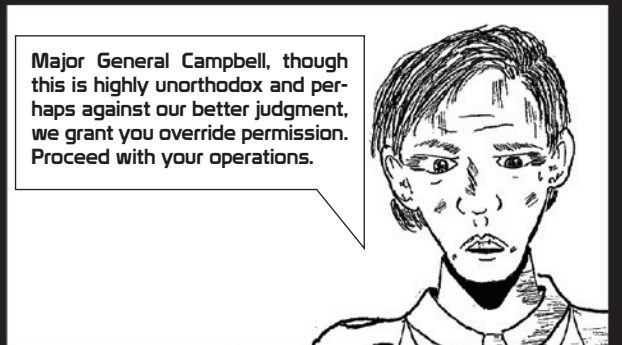
If you are wrong we will—

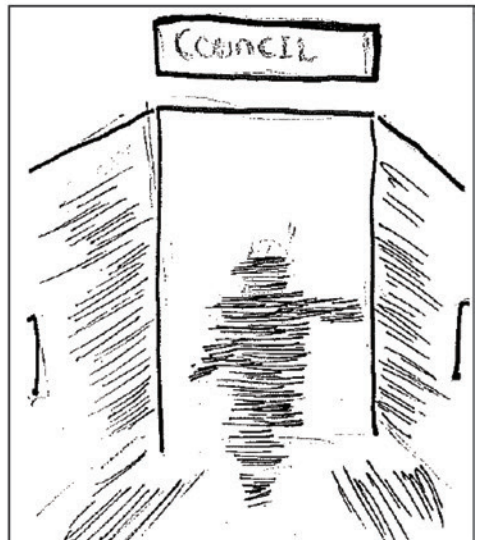
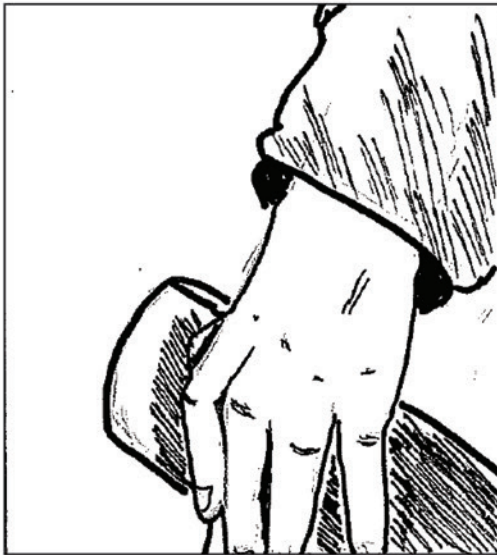


You don't have to tell me. I know the risks. But I know I am right. And you will see too after you grant me the override permission.



Major General Campbell, though this is highly unorthodox and perhaps against our better judgment, we grant you override permission. Proceed with your operations.





BATTLE OF JINGTONG

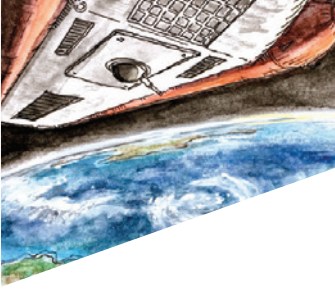
After Action Report: Battle of
Jingtong, 18 August 2070

.....
overwhelming success.....
.....

.....
frontal assault for TF Angel.....
enormous victory for TF Angel.....
less than 8,000 casualties suffered
.....
captured PLA commander..... found
hiding..... Fully cooperative with TF
Angel.....

DISCUSSION QUESTIONS

1. If you were the U.S. commander in this story, which course of action would you choose? Is it reasonable to choose the course of action with a lower probability of success? Why?
2. What is the role of the commander's combat instinct if combat decision making is outsourced to AI planning systems?
3. If future wars and their (percentage) outcomes are calculated by AI systems, what would be the impact on the forces who are responsible for executing those missions? Are they likely to trust the orders? Is it much different than receiving orders from higher headquarters today?
4. Under what circumstances would we override and neglect the best course of action provided by an AI planning system? Do ethics and law play a role? How much risk is acceptable?
5. Should we pursue creating AI systems with superior abilities to make decisions for warfighters? What happens if these systems fall into our adversaries' hands?



“THE BEST SEAT IN THE HOUSE”:

A Testimony for the Second Sino-American War Commission

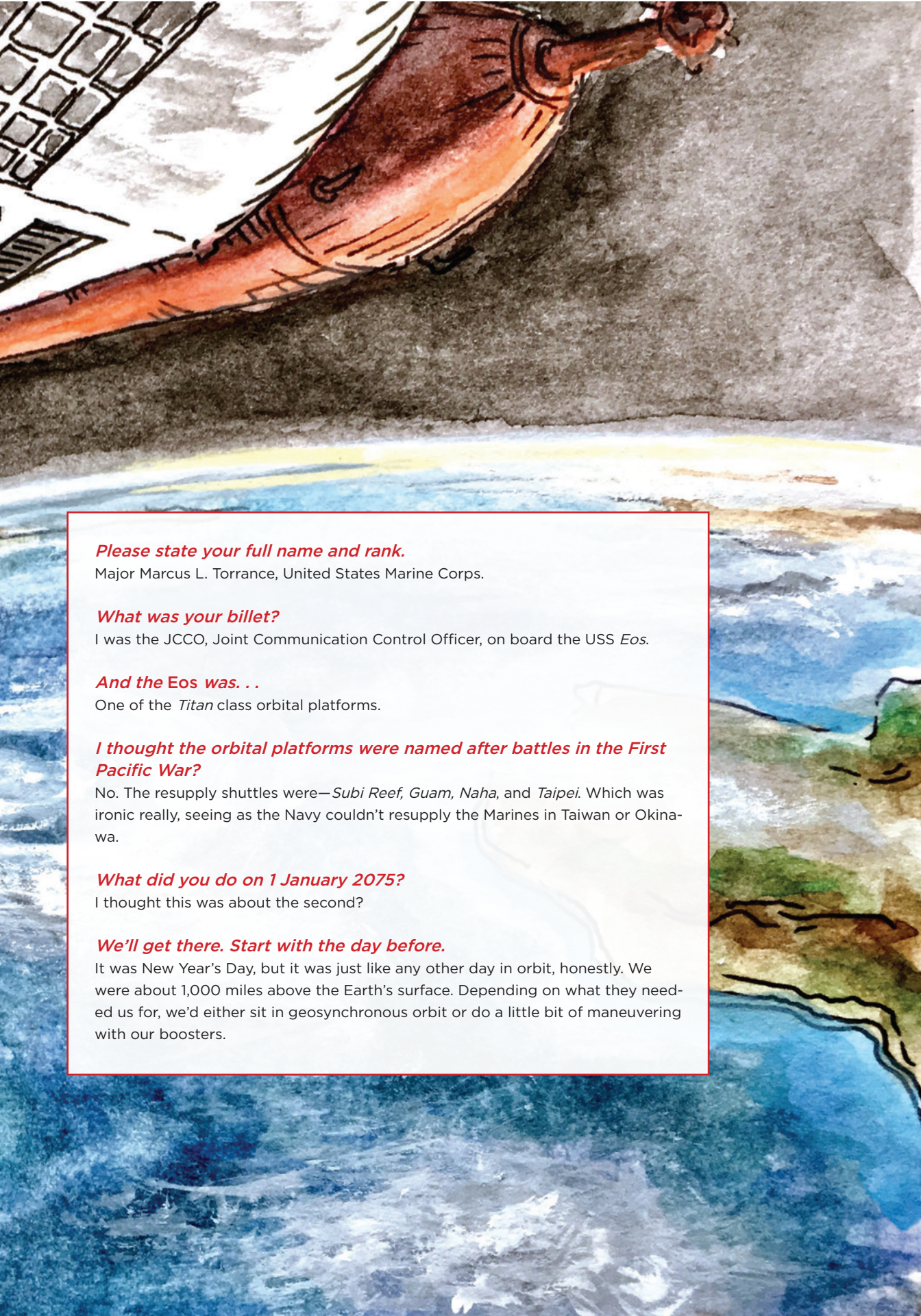
Story by
First Lieutenant Walker Mills

Illustrations by
Captain C. J. Baumann

A watercolor illustration of a ship's deck. The deck is light grey with various pieces of equipment, including a large circular hatch cover, several rectangular vents, and a grid-like structure. A red-bordered text box is overlaid on the lower right portion of the deck. Below the text box, the illustration shows a view of the ocean with a small island circled in red. The island is green and brown, with a red circle around it and a red line pointing to the text box.

19 June 2078. INDOPACOM HQ,
Alcatraz Island, Naval Station San Francisco.

Naval Board of Inquiry into the ***Eos* incident** is in the second day, part of the larger inquiry into the onset of the Second Sino-American War.



Please state your full name and rank.

Major Marcus L. Torrance, United States Marine Corps.

What was your billet?

I was the JCCO, Joint Communication Control Officer, on board the USS *Eos*.

And the Eos was. . .

One of the *Titan* class orbital platforms.

I thought the orbital platforms were named after battles in the First Pacific War?

No. The resupply shuttles were—*Subi Reef*, *Guam*, *Naha*, and *Taipei*. Which was ironic really, seeing as the Navy couldn't resupply the Marines in Taiwan or Okinawa.

What did you do on 1 January 2075?

I thought this was about the second?

We'll get there. Start with the day before.

It was New Year's Day, but it was just like any other day in orbit, honestly. We were about 1,000 miles above the Earth's surface. Depending on what they needed us for, we'd either sit in geosynchronous orbit or do a little bit of maneuvering with our boosters.



What was it that you were doing up there?

We did data transfer and ISR. So that meant I spent most of my day staring at the screen. Back in the 2060s, they built a set of quantum computers under the Pentagon—as you know. Supposedly these new computers had as much processing power as the rest of the DOD systems put together. The Marine Corps called our system OPHA. Oriented Processor Housing Assembly, I think—you'll have to look that up. Most people just called her "AI." Being named after the first female Marine, you'd expect a female voice—but no, the Corps decided a realistic voice was an unnecessary cost so she spoke like a kid learning English, putting the stresses in all the wrong places. I usually kept her on mute.

We fed her data from collectors and units all around the world. Every weapon and every system was a collector—collecting data on itself, how it was used, and the environment. Every bullet was a statistic, every optic a flood of information.

How much detail do you want? A lot of this stuff is still classified.

Anything you think is important. We'll stop you if it's too much.

[Sigh] Okay. Data was the most important resource of the twenty-first century, surpassing fossil fuels and rare earth elements. Some people said it was even more valuable than human capital. The AIs were relatively simple algorithms backed by lots of computing power, able to look at data sets larger than any human could imagine. For example, they could sift through millions of photos almost instantaneously—useful for finding Chinese carriers in the vast expanse of the Pacific or stalking your ex on Facebook, not that we ever did that . . .

But all that computing power and data storage had to be cooled. In the early parts of the century, people thought they could actually lower the amount of energy the planet was consuming. In 20 years, we doubled it. Then it doubled again. But all that electricity wasn't just for the computers, it was for the cooling systems—miles of underground processors that ran everything. We lived in a digital world.

Right, and that demand for energy led to the Arabian situation. Can you please explain to the committee how you were able to support operations on the ground from Eos?

Of course. What was so cool about it was that we did it all with lasers. Not like the old *Star Wars* lightsabers or blasters but communication lasers. Line of sight light-based communication, or LOSLBC, was what they decided to name it. It was like running fiber optic cables to satellites and back, except no cable, if you can imagine that. And we could point them wherever we wanted. We were kind of like a giant switchboard—constantly connecting different networks and data banks.

After the First Pacific War, we couldn't trust the undersea cables anymore, not for something that needed to be secured, like military traffic. Not everyone remembers when we found out Chinese submersibles tapped into the cables under the Pacific. It was news but not front page. What a headache. We probably should have gone to war then, when we had just cause, but no one wanted war at the time. Everything changed when the war started and the cables were cut. Half the internet—just gone.

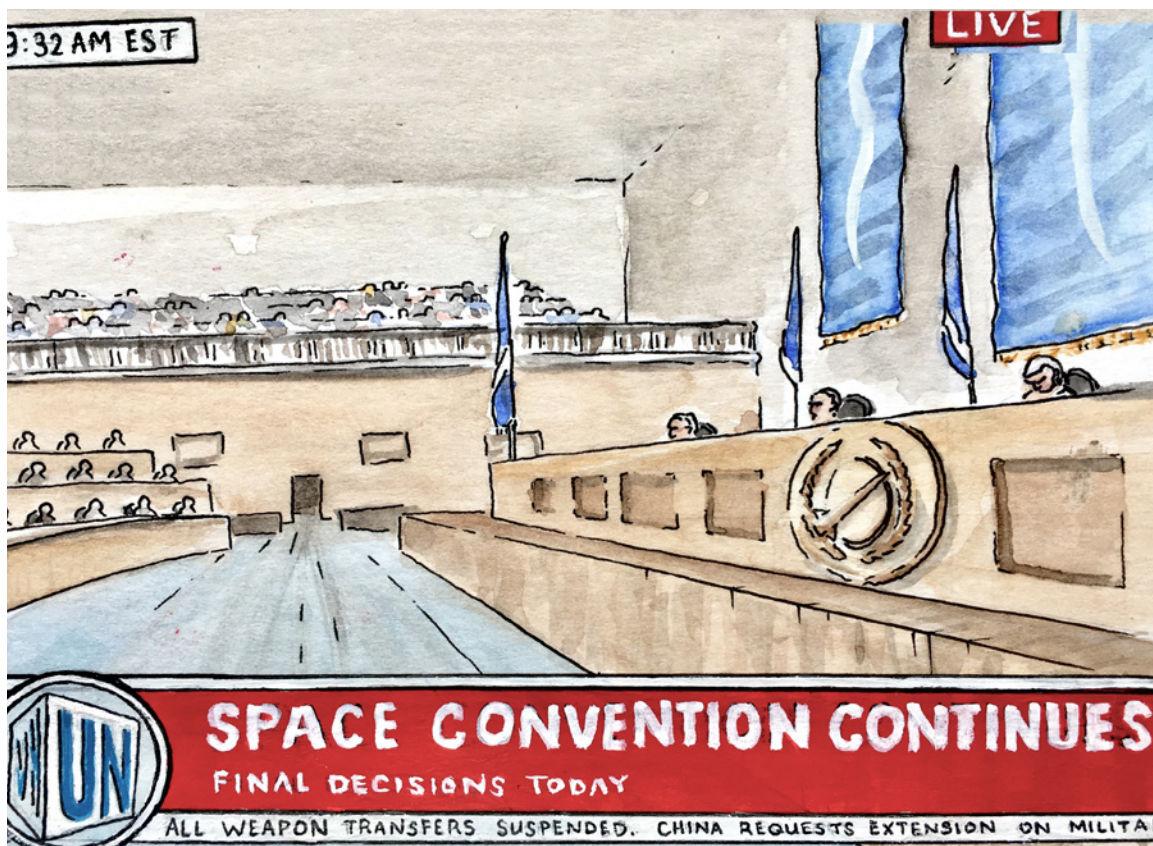
We remember the First Pacific War, Major, please stick to Eos.

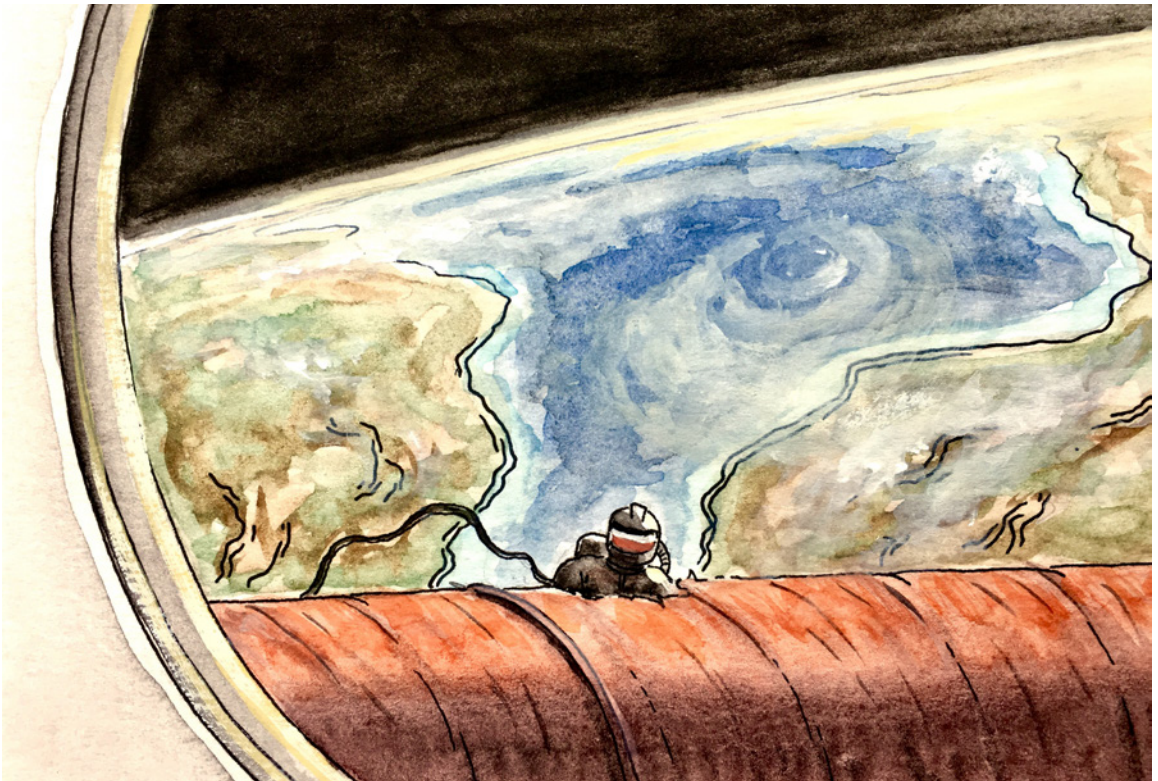
Of course. I got carried away.

We didn't use the radio spectrum because it was too busy for the data we were trying to move and traditional communication satellites were too vulnerable to jamming and interference. LOSLBC was theoretically unjammable and could not be intercepted unless you put yourself between the transmitter and the receiver. So we were always moving, and the locations were classified above my level. I didn't even get to know where we were up there.

Did you do anything else up there?

We had to maintain the ship. Maintenance was, well, maintenance. I had to do a little, but the bulk of it was done by the Space Force techies. There were eight of them, and Garcia, the other Marine on the team. His MOS was 9914, space craft repair Marine. Some things I'll never understand. The Marine Corps sent him to school for four years in a PhD program, but made him a corporal when he graduated. At least he got paid a hell of a lot more than me. Most of the maintenance was automatic. *Eos* could do a lot of stuff herself, but not everything.





What kind of maintenance were you doing?

After the Pacific War, space was a minefield—we had punctures about once a week. At the beginning of the war, the Chinese and Pakistanis thought they could handicap us by targeting our satellites. Luckily, we had the launch capacity to put them up faster than they could shoot them down. The problem was, all that debris meant space was nearly useless unless you had a hardened platform; none of the legacy craft could survive. We had armor on *Eos*—steel and ceramics, just like the tanks of the old days. That's why it was so damn expensive. We had to get all this metal into orbit. If we ever figure out asteroid mining, that'll change. The race to weaponize space inspired the *UN Convention on Space* and the Shanghai Accords. After the war, weapons were banned from space. I can't even take my service pistol up there. *Eos*, the most expensive DOD platform ever built, carried no weapons.

Were the reports you sent back to Earth always accurate?

The SITREPs? Of course.

Let me remind you that we have them here.

I mean—we couldn't put everything in there. But they were pretty spot-on. For instance, if they knew Garcia patched the mid-layer puncture with duct tape, they'd probably have recalled my ass and thrown me in front of a courts martial. But what was I gonna do? I couldn't exactly send him down the block to JoAnn's for some carbon weave fabric. If they hadn't sent up more ceramic armor in the next shuttle flight, he was going to have to start bolting pieces of the interior to the armor plating. We'd already decided the toilet seat would be the first to go. On his last spacewalk, Garcia was taking some measurements, and he calculated the seat would cover three different punctures.

How were the living conditions?

The food was horrendous. I know everyone and their grandpa thinks the food they had to eat during the war was the worst; the rationing on Earth was bad. I'm pretty sure ours actually was the worst. It was measured in calories, and not like on the back of a milk carton, which states the number of calories. The Human Sustainment System, or HuSSy, would dispense a gruel three times a day measured out for your specific caloric needs. It was kind of like that old 2D movie *The Matrix*. Some engineer at Boeing realized they could cut the weight of our food in half if they fed us engineered gruel. If I ever find that guy . . .

The Air Force techies had their own food, though. Something about Service-specific show standards. I think they justified it to Congress as part of their recruitment plan. "Join the Air Force: Better food, better pay, less work," or something like that.

You can leave out the jokes, Major.

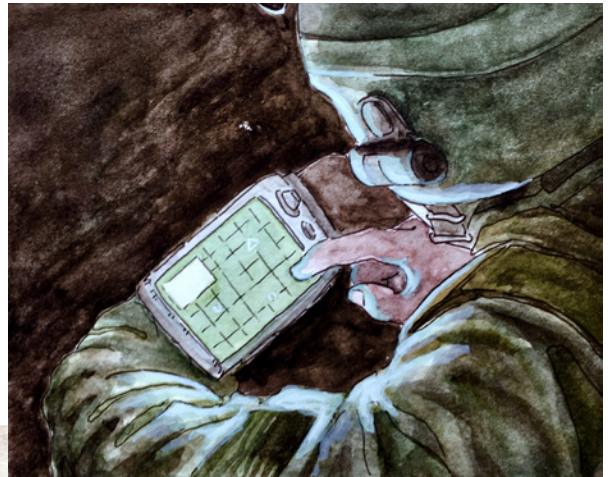
[Chuckles] Well, we did get packages once a month or so. They called them "solid-state mail." Garcia and I always asked for food. Everything else we wanted we could get digitally. I used to keep just one hard-copy book with me: *Ender's Game*. I read it so many times the pages were falling out. I guess that's kind of anachronistic; the only hard-copy book I had in space was also about space. Garcia brought his family Bible; I guess that made more sense.

Did you support any nonroutine terrestrial operations that day?

Yes, we had three that day, actually. It was pretty exciting. We supported a MARSOC raid, a troops-in-contact request for support, and a missing personnel request for support. Sometimes we'd go days with just routine ops.

Tell us about the MARSOC raid first.

The MARSOC guys were pros. It was all scheduled and we had their plan long beforehand. We knew exactly when to make link-up and where we had to be in orbit to cover their AOR. When they hit the ground, we connected to the team and OPHA would give them some guidance—probabilities on where the bad guys were, the best routes to take, areas to avoid, likelihood of mission success, stuff like that. They had good gear too. We could send them the live video on their wrist computers with overlays and everything.





And the mission went as planned?

Almost. The laptop they were looking for wasn't in the building they thought, so OPHA updated her calculations and sent the team a new target location. They breached it with their Tarantula and some plasma explosives. After making entry, they found the laptop and connected it to their own tac net. We were already connected so *Eos* pumped OPHA right into the laptop. With her quantum computing, the Chinese encryption lasted less than a second. She copied all the data, left a few nasty tricks in the code, and the team left on their helos. Easy. I think their mission was gathering intel on the rare earth mining negotiations.

So that was pretty normal?

Yup. Like I said—they knew what they were doing. And they had assets layered in case anything went south.

What do you mean “layered?”

Okay, let me give you an example. Let's say they were going to blow a bridge . . . in an urban area, and no one can know it was them.

Was this the . . .

[Interjects] Don't ask. I can't tell you. Ask my boss.

But we were obviously watching them with OPHA in support. Our SOP was to have two platforms in support for something like this, compartmentalized, so I never saw or heard the other Titan, but the team could talk to us both. Then we had strike drones waiting in hover, high-altitude gliders—basically in the stratosphere, bots with the team, their extraction helos obviously in standby. Additionally, we had QRF Condition 1, and a sub on the coast with the coordinates if the operators couldn't get it done. That's what I mean by layered. More DOD eyes on the objective than a high-school football game in a one-light town on homecoming.



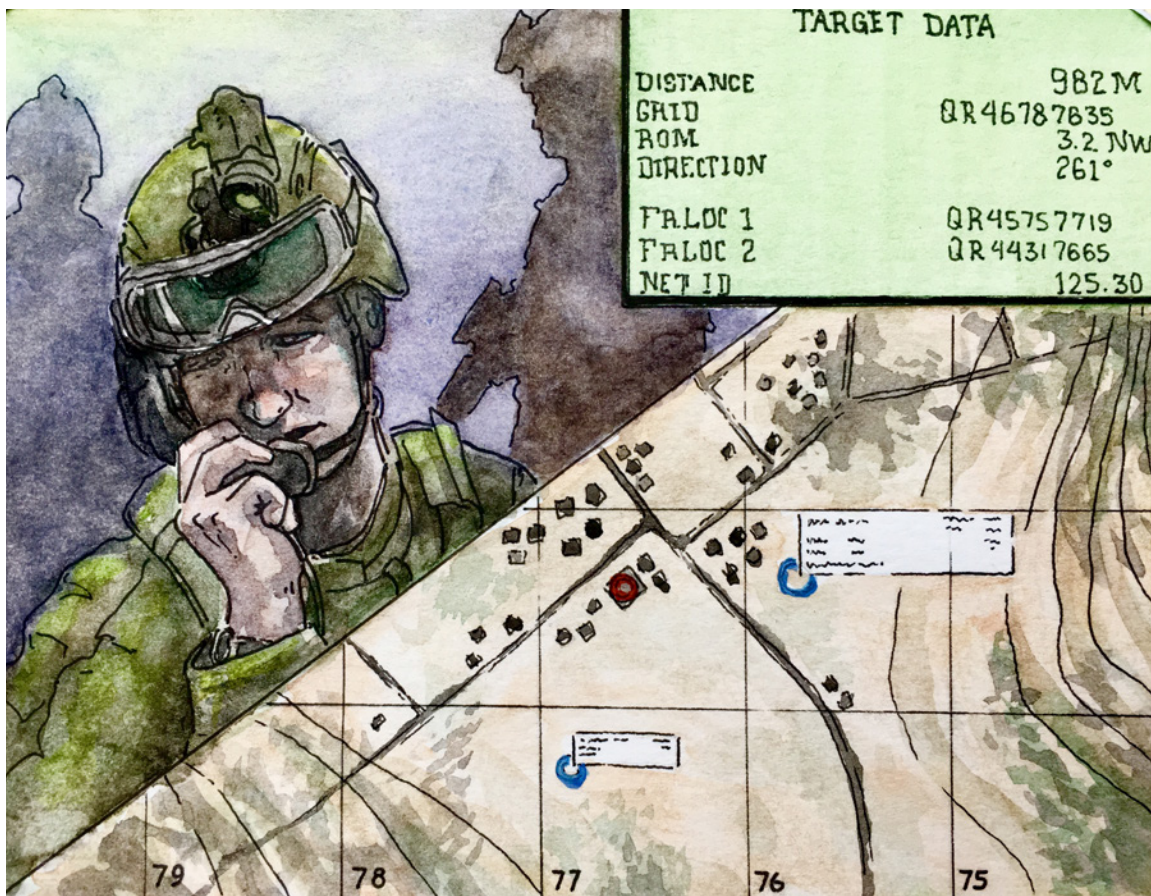
Brazzaville—that was us? Jesus.

I didn't say that.

And the TIC support request?

Nairobi, geez. [Shakes head] It started out as no big deal. Some days, we got a few dozen TIC requests. The reports weren't even submitted to us, technically. OPHA would flag them in the traffic and route them to us. But this one went downhill fast. An eight-man patrol was ambushed in Nairobi, in the mega-slums. It was a classic complex ambush initiated with an EMP and a comm blanket. That meant a total blackout on radio, wifi, and the patrol's tac net. Thankfully, the Navy did their job with the blockade, so the African tech was outdated. The patrol was at least able to get their SALUTE report out. And of course, we didn't have a problem connecting to them. Like I said before, *Eos* could punch through that interference easily once we knew where to connect to.





What were they requesting from you?

The squad leader was asking for the works. He wanted comm pathways so we would reconnect them to their higher headquarters via our LOSLBC; route guidance so OPHA would run her algorithms and give them the best way out; enemy analysis that required local imagery analysis, signals intercepts, and local surveillance cam analysis; and targeting packages.

And that was your job?

Exactly. That was my specialty. I deployed in space mostly to be the man-in-the-loop for the targeting, or I guess it was more of a man-on-the-loop. I was essentially a space JTAC, except OPHA did all the work. I just hit approve and *Eos* would route the targeting package to a weapons platform on the surface. It would have been a little faster if OPHA did it all herself, but Congress passed laws after the Karzai incident that mandated a human remain involved for all offensive targeting.

They said they like grunts in space because we can communicate better with the guys on the ground when they need *Eos* and OPHA. I guess that's true, I always considered it a slogan that sounded good on a briefing slide, like "Every Marine a Rifleman." When Congress asked the Commandant who were the first Marines he wanted to put in space, he said, "Just a couple of grunts."

So, you saved them?

It wasn't enough. The Africans got the squad leader with a couple of hand grenades. A skinny little lance corporal tried to throw them back, but they were some of the Mod 2s that explode as soon as they stop rolling, poor kid. We lost link when the squad leader went down, but I kept sending ordnance. Eventually, they all went down. All I could do was route the QRF and the med-drones to the last few survivors.

I'll never get over that feeling. You're watching these guys fight for their lives. I'm literally talking to them, working through the 9-line, making sure they understand that once we start firing the kinet-



ic energy penetrators, they can't be aborted like the cruise missiles. Yes, QRF is on the way. Yes, the MEDEVAC is en route. Yes, we are coming to get you. No, you aren't alone.

You can see the sweat dripping off their digi-goggles and the little plastic bits on the ground from the caseless rounds. And the blood. Mixing with the sand. Splashed on the concrete. You're listening to the team leaders getting frantic on the tac net. Then the medevac comes and OPHA is giving me data on the kid's vitals. OPHA's cameras are literally reading his lips and transcribing his last words as they carry him to the helo.

But you're 100,000 miles up in the most expensive orbital platform ever built and there isn't anything you can do.

That must have been quite an experience. I understand you recommended some of those Marines for awards.

Yes, ma'am. I recommended Lance Corporal Jeremy E. Tang for a posthumous Bronze Star. That was the big one.

Do you know that it was approved?

No, I um . . . have been in the dark for a while.





That's right. Well, they upgraded it to a Silver Star. The SecDef watched the video himself. The third operation, it was up north, no?

Yes, former Russian Federation territory. We had these disappearances about once a week. Usually drones, but sometimes manned aircraft; there just weren't that many left now. They'd just vanish. Sometimes they were shot down by the Russians, but more often they'd get hacked. Either on the ground or in the air—it didn't matter. Sometimes the aircraft's local AI could fight off the intruder or would just bring the bird down in a hard landing. But this one had a pretty soft landing—it was one of the old F-35s. OPHA said it was a Russian AI that did it, which made sense because it was near the DMZ. After the jet lost link, the life support systems asphyxiated the pilot, the internal drives were raided, and the AI got out before we got OPHA in there. She saw the digital fingerprints, though, and destroyed what was left. Hard to believe the Europeans still fly manned aircraft. I guess they must just like the idea of it. No one even pretends like they'd stand a chance against the new unmanned fighters.

Did they send anyone to retrieve the pilot?

No. They stopped doing that. I mean, we didn't have pilots ourselves, and if the Dutch wanted to bring back his body, they'd have to go get it themselves. We just sent a flight of the Revolver missiles to destroy the remains.



Before we talk about the hijacking, I want to circle back.

Ok.

Can you tell us what attracted you to the Space Marines?

What attracted me to the Space Marines? Um, if I'm going to be honest, it was the triple pay—tax-free too. I actually saw it in the paper first, if you can believe that. I knew they didn't take married guys and you had to have a background in tech. I was fit as hell after deploying stateside, so I applied. I went to selection, then passed the Space indoc. I thought I was gonna save the world. But the joke is on me. I became a prisoner on my own ship. Three years in space. The zero gravity and solar radiation deteriorated my body; I'm just a shell of the guy I was when I left. But I had the best seat in the house to watch the invasion. I didn't think we had a chance.

After all that, do you regret it?

[Pauses] . . . No. I'd go back in a heartbeat. But I'd probably bring a gun this time.

DISCUSSION QUESTIONS

1. In the story, China and Pakistan shot down U.S. satellites. Is that possible today, both technically and politically? What are the implications of militarizing space?
2. OPHA has a comprehensive view of multiple domains and physical battlespaces simultaneously. It is seemingly all-knowing. Can an adversary still achieve strategic surprise against forces guarded by OPHA? Explain.
3. Will technologies such as AI and quantum computing eliminate the unpredictability of human nature and chance that is prevalent in war today? Based on historical trends, is predictability increasing or decreasing?
4. Should the Marine Corps pursue a space force? The 9914 space craft repair Marine in the satellite had four years of training. What does this part of the story imply about the future Marine force? Is it easier to train a Marine for space operations, recruit them from prized educational institutions and programs, or rely on industry partnerships?
5. Can the DOD budget support a space program? Should more money be allocated to DOD to support space operations or should that responsibility rest with a different agency?



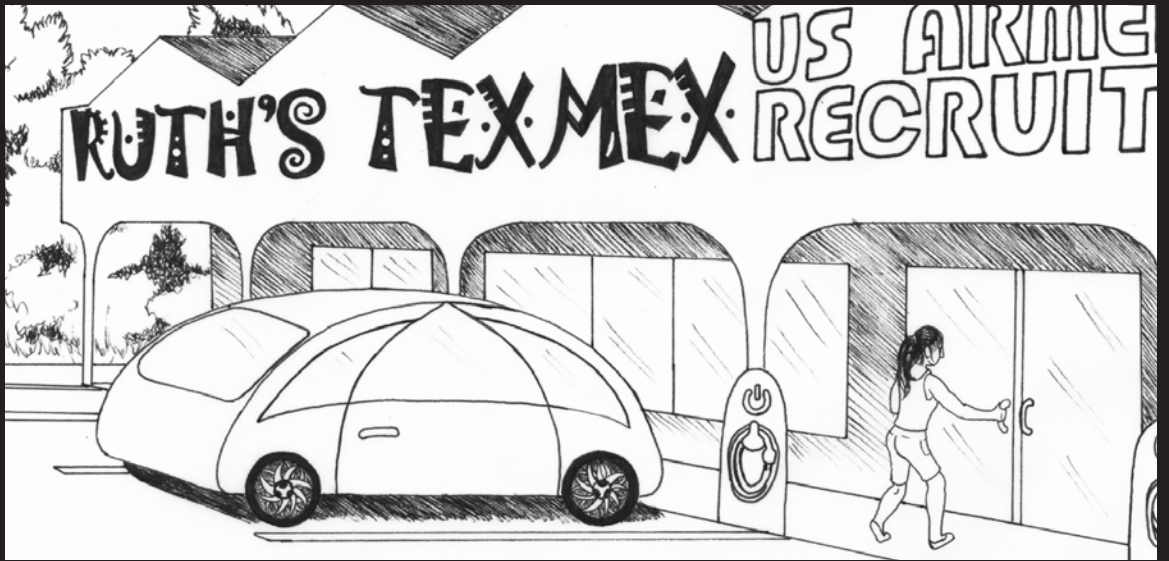
A SECOND CHANCE WITH ARIA

Story by
Major Adam Yang

Illustrations by
Sergeant Shannon Winslow

The scene:

Marine Corps Recruiting Station El Paso, Texas. The entire Department of Defense's recruitment system is guided by artificially intelligent algorithms that evaluate a candidate's value to the Service based on forecasted combat requirements and historical metrics. The system is called the Advanced Recruiting Initiative-Artificial, also known as ARIA. Staff Sergeant Johnson and Gunnery Sergeant Koech have been preparing Amanda's assessment package for the past six weeks.



Not Qualified

What does that mean? I thought I passed everything.

It's nothing personal, it's just not what the Corps is looking for right now. We can try again in six months.

Is this what the Marine Corps wants or what ARIA wants?

Unfortunately, it's the same thing.

NOT QUALIFIED

Can you take me home now?

Yeah, but first, we're supposed to review this together.

I'm sorry, Amanda. This doesn't mean you're a bad candidate. ARIA isn't a normal AI recruiting tool. It dynamically adjusts requirements based on Pentagon combat forecasts.

ARIA Comparative Combat Assessment Reference Number: 8675309

Physical Fitness Overall:

Cardio Performance:

Strength Performance:

Dexterity and Reflexes:

Medical / Dental Readiness:

Neural Stability:

Neural Eligibility

AI Basic Skills Implant:

AI Advanced Skills Implant:

Combat Bonus / Penalty:

Final Assessment:

91st percentile

84th percentile

87th percentile

93d percentile

Passed / Passed

Stable

Yes

No

+2% Awarded

ABOVE AVERAGE

Mental Aptitude Overall:

ASVAB Score:

Combined Engineering:

Combined Programming:

Combined Robotics:

Learning Curve Index (Basic):

Learning Curve Index (Advanced):

Space Isolation Fortitude:

Combat Bonus / Penalty:

Final Assessment:

62d percentile

71st percentile

52d percentile

32d percentile

45th percentile

Above Average

Below Average

No more than 33 days, Average

-21% Penalty

BELOW AVERAGE

Familial Background Assessment

Father:

Mother:

Familial Status:

Familial Earnings:

Final Assessment:

Alive (2 nonviolent felonies, no drugs)

Deceased (no felonies, drug history)

Widowed

Below average

BELOW AVERAGE

Service Forecast

Completion of Boot Camp:

Completion of First Enlistment:

Promotion Pace:

Reenlistment Potential:

Officer Ascension Potential:

Final Assessment:

78% likelihood

62% likelihood

43d percentile

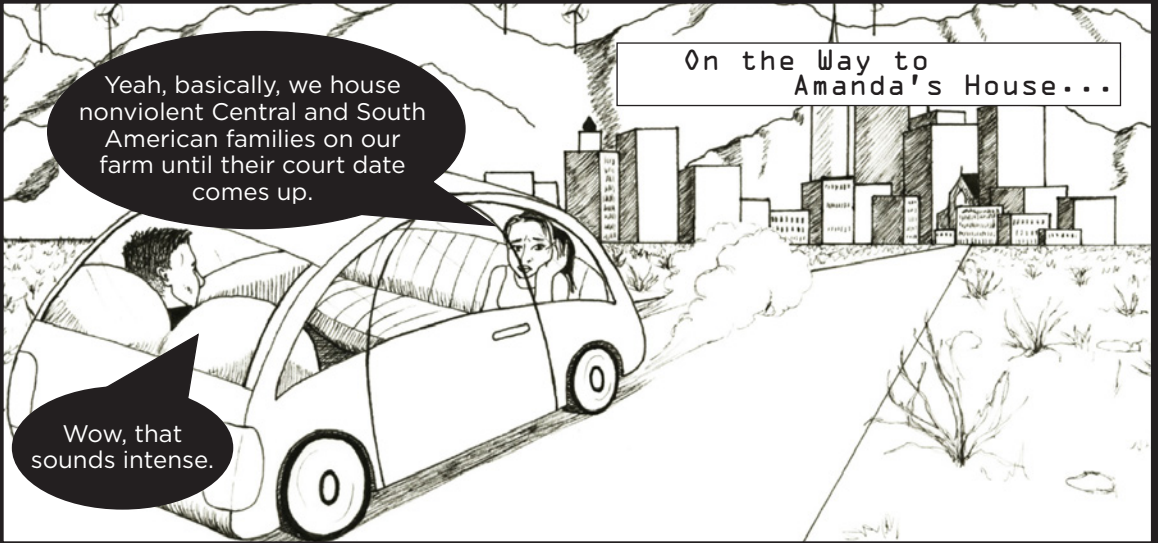
39% likelihood

26% likelihood

BELOW AVERAGE

Do you want a printout of
your assessment?

I don't want it. And I get
it, Gunny, but having ARIA
breaking down my life like
this makes me feel like shit.



On the way to
Amanda's House...

Yeah, basically, we house
nonviolent Central and South
American families on our farm
until their court date
comes up.

Wow, that
sounds intense.



Hi,
Papa.

Hey, Mandy, you okay?

I'm good. I
can try again
in six months.



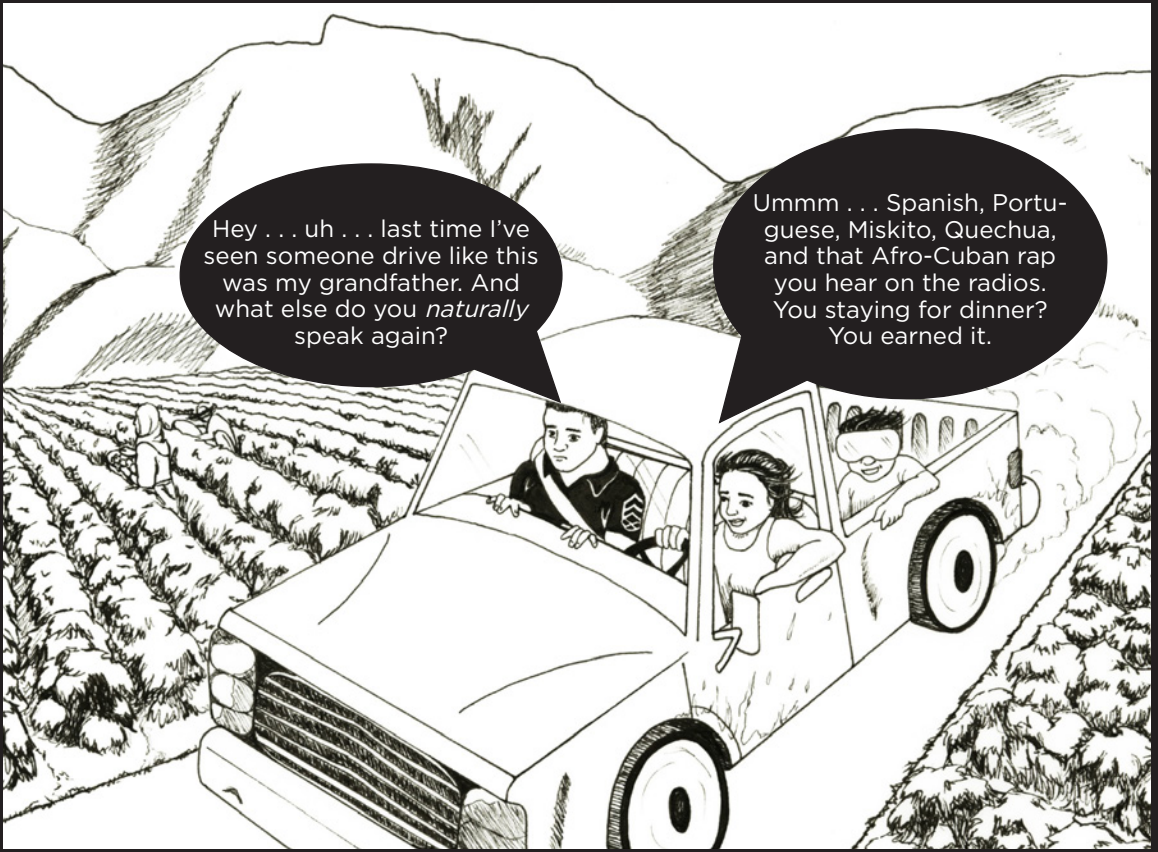
Great. Now,
go move the
trucks.



Can we play
Zombie Crisis
3 later?

Yeah, we'll
play after
supper.

Aren't you
too young
for that?



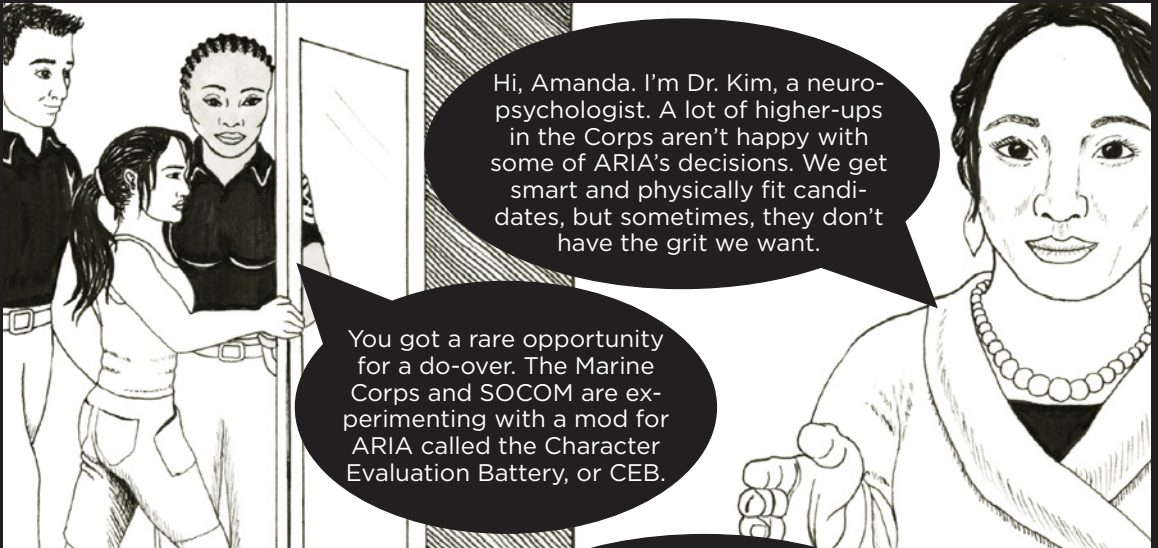
Hey . . . uh . . . last time I've seen someone drive like this was my grandfather. And what else do you *naturally* speak again?

Ummm . . . Spanish, Portuguese, Miskito, Quechua, and that Afro-Cuban rap you hear on the radios. You staying for dinner? You earned it.



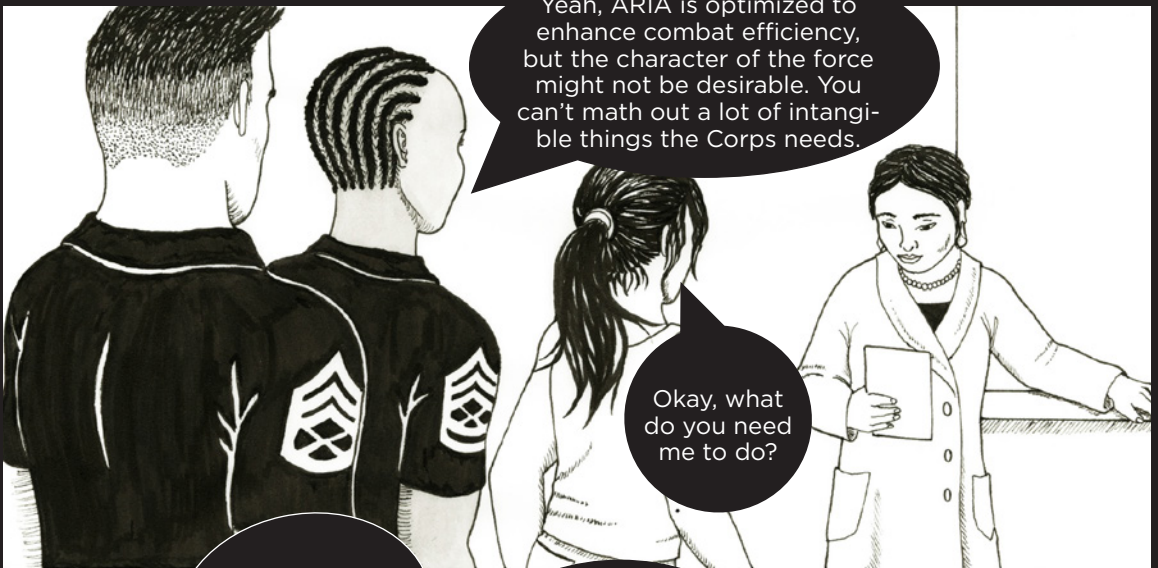
Everything okay?

Yeah. I just got off the phone with Gunny. I think we got a second chance.



Hi, Amanda. I'm Dr. Kim, a neuro-psychologist. A lot of higher-ups in the Corps aren't happy with some of ARIA's decisions. We get smart and physically fit candidates, but sometimes, they don't have the grit we want.

You got a rare opportunity for a do-over. The Marine Corps and SOCOM are experimenting with a mod for ARIA called the Character Evaluation Battery, or CEB.



Yeah, ARIA is optimized to enhance combat efficiency, but the character of the force might not be desirable. You can't math out a lot of intangible things the Corps needs.

Okay, what do you need me to do?

Cool, this reminds me of my brother's *Zombie Crisis 3* setup.



We're going to put you through a couple of virtual reality scenarios wearing this.



Dr. Kim explains: The Marine Corps and Special Forces community have jointly developed a series of intensely realistic scenarios that will evaluate you for several character attributes they want in their ranks. Think courage, integrity, leadership, teamwork, and empathy—stuff you can't study for. You're part of a pilot program, so fair warning: some of these modules could be glitchy, and they're designed to be emotionally intense. All the points you accumulate today will be factored in as additional points to your total score from yesterday.



Pretty damn good for a 19-year-old kid. She's tough as nails and thinks quickly on her feet. Her empathy levels are through the roof, and she's setting some records for the noncombat evacuation module.

How's she doing? She looks like she's sweatin' bullets.

Three hours later . . .

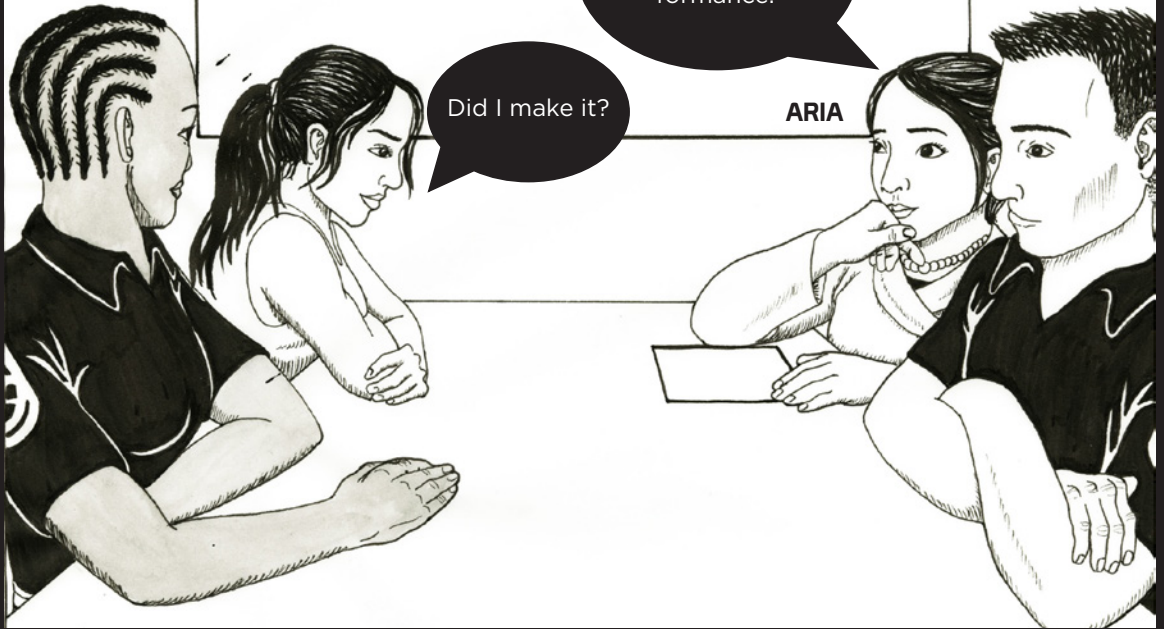
Amanda Lopez

Detailed Results Ready

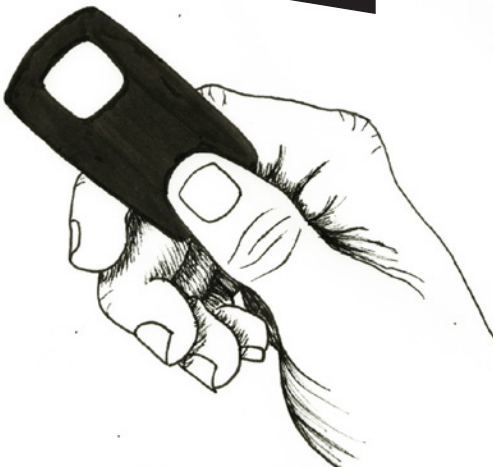
Did I make it?

Amanda, that was one heck of a performance.

ARIA



We'll see. Here, you do the honors.



CLICK

DISCUSSION QUESTIONS

1. How can the use of an AI system like ARIA benefit the military recruiting process? What type(s) of candidates would benefit the most?
2. What are some of the unintended consequences of using an AI recruiting system like ARIA? What type(s) of candidates would be hurt by such a system? Which types of candidates would the military be missing?
3. Can you envision a virtual reality system that can be used to evaluate potential military candidates? What are the pros and cons to this approach to evaluation?
4. What does the story mean by grit when they are talking about Amanda Lopez? Are humans good at measuring grit and similar qualitative attributes today? Is it possible that an AI system could measure grit using a more unbiased approach?
5. Considering the impact of technology on the battlefield and its increasing utility, what types of skills and training will enable future military recruiters to be successful? Imagine the best military recruiter you know today—would they still be successful 50 years from now? Why or why not?



THE LAST FIGHTER PILOTS

Story by
Major Sara Wood

Illustrations by
Sergeant Reilly J. Wade



2032

How It Began

The Ebola outbreak of 2032 caused an estimated 1.2 billion deaths worldwide and triggered numerous regional outbreaks of violence, resulting in U.S. military intervention over the next 25 years. United Nations-approved military operations, disputed by both China and Russia, resulted in thousands of civilian casualties in mainly poor countries, creating opportunities for Chinese humanitarian relief. False accusations of American involvement in the spread of the virus to the Asian and European continents strained relations between China and the United States, which was further exacerbated by Russian troll farms and the continual breakdown of the European Union and NATO.





The Rise of China and the Wars in the Pacific

In 2049, after China achieved economic dominance of the South China Sea, its leaders initiated plans to achieve their stated goal of Chinese reunification by invading Taiwan. The United States, Japan, and Australia joined forces in one of the largest air-to-air battles since World War II. The United States experienced pilot casualties of more than 50 percent, due largely to unmanned Chinese J-31 fighter jets with enhanced AI sensing capabilities, ultimately triggering the largest restructure of the U.S. military since the Cold War. In 2055, the DOD announced that its military would begin to phase out all manned fighter aircraft during the next 25 years and transition those pilots to space or transportation roles. The UN Space Treaty of 2058 prohibited attacking any manned spacecraft, space station, or colony.



The War of Resources and the Convergence of AI and Humans

2062 was marked by the War of Resources in Africa and the Arctic. This was the first war started by corporations partnering with the military from numerous countries to try and intervene. Based on enhanced cyberspace, electronic warfare, and space capabilities to overtake unmanned aircraft, manned aircraft became an important asset for the United States. The incorporation of artificial intelligence gave an edge to human pilots but caused serious discussions about the morality of such endeavors.

The year is now 2075 and the last Marine Corps fighter pilots are graduating as the War of Resources winds down.



Welcome, graduating class of 2075!

Class of 2075

The Last Graduating Class for Manned Fighter Aircraft, Marine Corps Air Station Beaufort, South Carolina



Well, we finally made it. Chan, I can't believe they're actually letting you graduate!



I know, I barely passed the last simulation test. These corneal implants make a huge difference.



Do you guys think we'll actually see any action? I heard a treaty is currently being worked at the UN now. This is probably our last chance to fly a combat mission before they force us to transition.



Class of 2075, you will be the last to carry on the tradition . . .

Many of you will be heading to Africa or the Arctic soon . . .



He fought in both the Taiwan and Resources War. I can't believe he's still in the Marines! I definitely would have taken one of those space transport gigs. That's where the real money is!



I heard he swore to stay in until our class graduated. He fought hard to keep the combat mission after the Taiwan War, and I guess he was right.



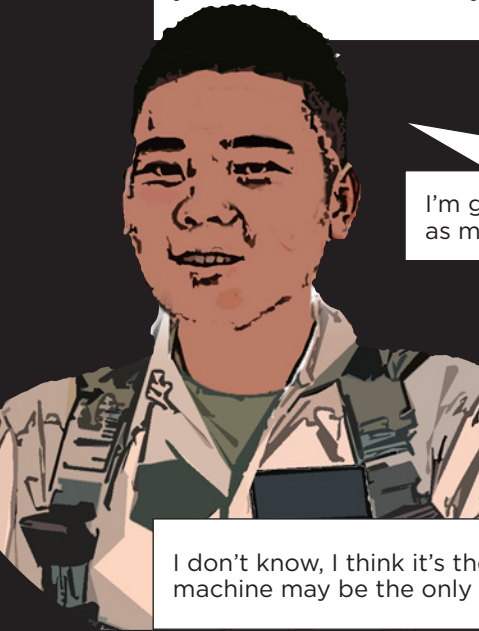
I don't know, I think we're still the biggest risk. Don't get me wrong, I love flying. But getting your aircraft hacked is the worst thing I ever experienced. Remember those videos they showed us of missiles randomly being fired and that one pilot crashing into the mountainside?



What do you guys think will happen when we're totally phased out? What if we can't defend against the cyberattacks and we all get called back in 20 or 30 years?



Can you even imagine what the implants will be like in 30 years? We would basically be machines.



I'm getting this thing removed as soon as my tour is over.



I don't know, I think it's the future. Integrating with the machine may be the only way we survive.



DISCUSSION QUESTIONS

1. Why would the military phase out manned-fighter aircraft? Do you think this choice is designed to improve lethality and functionality, or is it to spare the lives of pilots going up against smarter unmanned systems?
2. How does potential human-machine teaming change the character of war? Is it possible for things like fighter jets, tanks, and submarines to be fully automated? Do we need humans in the loop at that point?
3. Why would a state ever fight on behalf or as a result of decisions made by a private corporation? Could this ever happen today in the United States?
4. What would be the U.S. military's primary and secondary responsibilities in combating a massive biological/viral disease outbreak? Who is the enemy?
5. Should the United States pursue automating the most dangerous and lethal types of technology, such as an F-35? Where do you draw the line?

MEET THE TEAM

Major Rob Arant, USMC

Major Rob Arant grew up in Monroe, Louisiana, and El Paso, Texas. He enlisted in the Marine Corps immediately following high school and worked as an aviation electronics technician. He always kept his eyes to the sky because of his passion for aviation. He was board selected to attend college and then followed his passion and became a Marine aviator. Major Arant is a Lockheed Martin KC-130 tanker/transport pilot by trade, a graduate of the Naval Postgraduate School, and is currently serving as the technical information operations officer in the Brute Krulak Center for Innovation and Creativity at Marine Corps University.

Captain C. J. Baumann, USMC

Captain C. J. Baumann has been a practicing artist for more than 10 years in several different mediums, including pencil, watercolor, and oil painting. As a logistics officer, Captain Baumann currently serves as a warfighting instructor and staff platoon commander at The Basic School. Captain Baumann also helps spearhead the efforts of the Marine Corps Combat Art Program as a designated artist. As one of the only three combat artists in the Marine Corps, he has deployed in support of several Marine Expeditionary Units, a global NATO exercise, and a Special Purpose Marine Air-Ground Task Force (SP-MAGTF). With some of his work in the National Museum of the Marine Corps' archives, Captain Baumann continues to passionately combine his profession and talent to sketch the Marine Corps story. He can be found on Twitter and Instagram @cjbaumann_art where he shares his work and adventures.

Staff Sergeant William Bradley, USMC

Staff Sergeant Bradley is one of three brothers from Alanson, Michigan, who have joined the Marine Corps, all of whom are or were grunts. He was fascinated by superheroes and Marines and had murals on his bedroom walls to prove it. Staff Sergeant Bradley is currently the training chief for I Marine Expeditionary Force Support Battalion at Camp Pendleton, California. Due to previous work done for the Marine Corps, he was directly referred by Master Sergeant Johnathan Harris of the Staff Noncommissioned Officer Academy in Quantico, Virginia, to participate in the *Destination Unknown* project.

Major Austin Duncan, USMC

Austin Duncan is a Marine intelligence officer and an information operations planner currently

serving as a speechwriter on the Commandant's staff group. He is inspired by the continued pursuit of education and an innovative spirit. He cofounded Ender's Galley as a grassroots innovation platform rooted in the professional military education ecosystem.

First Lieutenant Walker D. Mills, USMC

First Lieutenant Walker D. Mills is a native of Philadelphia, Pennsylvania. He is a Marine infantry officer currently preparing for an exchange tour in Colombia. He enjoys reading and writing both fiction and nonfiction and has had his work previously published by the Center for International Maritime Security and West Point's Modern War Institute. He has also been recognized for his efforts at innovation within the Marine Corps. *Destination Unknown* is his first time working in a graphic novel format.

Corporal Jerrod K. Moore, USMC

Corporal Jerrod K. Moore is originally from Vero Beach, Florida, and his infatuation with animé and manga inspired him to tell stories and draw since childhood. He is a combat photographer in the Marine Corps and intends to further his education in English literature, with a chemistry minor, at Florida State University. As a photographer, he is drawn to the idea of capturing moments in time and works to leverage his photography skills into a greater knowledge of art.

Dr. Jeffrey Nadaner

Jeffrey "Jeb" Nadaner holds the Donald L. Bren Chair of Creative Problem Solving at Marine Corps University in Quantico. His focus is on technology and operational competitions and he also researches the innovation lessons of General Charles C. Krulak and Lieutenant General Victor Krulak. As vice president of engineering and technology for Lockheed Martin, he advanced research and development portfolios and led program restructurings. Before that he was director of business development and strategy. Earlier, Dr. Nadaner founded the successful consumer goods start-up Straight Trading. He has also served as the assistant secretary of defense for Partnership Strategy and Stability Operations and Special Operations/Low Intensity Conflict. On awarding Dr. Nadaner the Department of Defense Distinguished Public Service Medal, Dr. Robert Gates declared, "Put simply, Jeb has been one of this Department's most consequential leaders and thinkers over the past four years." During Secretary of State Colin Powell's tenure at the Department of State, Dr. Nadaner served as a member of his Policy Planning Staff and his senior speechwriter. Nadaner

earned his doctorate from Yale University's department of history with a focus on strategy; his bachelor of arts from Duke University; and his juris doctor from the University of Pennsylvania.

Gabriel Pons, artist

Gabriel Pons loves art, comic books, and skateboarding and since the age of 13 has been pushing his abilities in each of those fields. He and his wife, Scarlett Pons, own PONSHOP Studio and Gallery, a multifaceted retail store and art studio in downtown Fredericksburg, Virginia. They operate their business with the belief that creativity fosters a stronger community, and they share their passion by teaching classes for children and adults. See more at www.ponshopstudio.com.

Major Tyler Quinn, USMC

Major Tyler Quinn currently serves as the executive officer for 3d Law Enforcement Battalion in Okinawa, Japan. He has served with every Marine Expeditionary Force and at Marine Corps Recruit Depot San Diego. He deployed to Iraq in 2009 and to Afghanistan in 2010. Major Quinn is a graduate of resident Expeditionary Warfare School and Command and Staff College at Marine Corps University in Quantico. He holds a bachelor's degree in criminology from North Carolina State University and a master's in military studies from Marine Corps University.

Major Timothy Riemann, USMC

Major Timothy Riemann is originally from Houston, Texas, and is a graduate of Virginia Military Institute. He is an assault amphibian officer and has served as a staff platoon commander at The Basic School and as the staff secretary at Marine Corps Combat Development Command/Combat Development and Integration. He is currently the operations officer at the Krulak Center and will attend Marine Corps University's School of Advanced Warfighting in 2019.

Mark Sable, comic author and writing instructor

Mark Sable is a comic book writer and creator. His works like *Graveyard of Empires* and *Unthinkable* and the upcoming *Godkillers* and *the Dark* combine military and espionage fiction with horror and science fiction genres. He also teaches writing to graduate students at the School of Visual Arts in New York City. More recently, he has consulted as a futurist for the Atlantic Council's Art of Future Warfare Project, the National Intelligence Council's *Global Trends 2035 Report*, and the U.S. Air Force's Blue Horizons program, the Royal Australian Navy, and Johns Hopkins Univer-

sity's Applied Physics Lab, among others. Contact him at @marksable on Twitter or via email at marksable@aol.com.

Sergeant Reilly Wade, USMC

Sergeant Reilly Wade graduated from Montana State University in 2013 with a bachelor of arts in multimedia. He has been involved in digital design projects ever since and has applied this skillset to the Marine Corps Information Operations Center for the past five years.

Sergeant Shannon Winslow, USMC

Sergeant Shannon Winslow grew up in New Jersey, where she and her friends enjoyed many adventures of collaborative storytelling. She attended Wisconsin Lutheran College, where she double majored in art and European history and began her love affair with martial arts. During her time in college, she also became a scholar in the Chicago Swordplay Guild. She then joined the Marine Corps, where she had real adventures, some terrible and some awesome, including meeting her husband on the rifle range. She now lives in California with her husband and two cats and enjoys doing Brazilian jiu-jitsu in the evenings and swordfighting on the weekends.

Major Sara Wood, USMC

Major Sara Wood hails from Galesburg, Illinois. Her favorite comic book series is *The Sandman* by Neil Gaiman and her favorite science fiction television show is *Battlestar Galactica*. She is an intelligence officer in the Marine Corps Reserve and is currently a student at the Marine Corps University Command and Staff College in Quantico. She has worked in information operations for the past six years at the Marine Corps Information Operations Center.

Major Adam Yang, USMC

Major Adam Yang is a native of Brooklyn, New York, and his interest in science fiction and fantasy has extended from his childhood to the present. He is a communications officer and an information operations officer, and he currently serves as a doctoral fellow for the Commandant of the Marine Corps Strategist Program. As an advocate for grassroots innovation within the Service, he cofounded the #Ender'sGalley platform at Marine Corps University.

PARTNER MISSION STATEMENTS

Brute Krulak Center for Innovation and Creativity

Inspired by its namesake, the Brute Krulak Center for Innovation and Creativity enables an interdisciplinary approach to complex problem solving in an environment that enhances our collective warfighting capability and facilitates and encourages novel solutions to current and future warfighting challenges to expand the Corps' competitive edge and improve our warfighting effectiveness.

Marine Corps University Foundation

The Marine Corps University Foundation (MCUF) provides vital private resources that strengthen the education and training of Marine leaders, within Marine Corps University, the operating forces, and the supporting establishment. MCUF provides the "margin of excellence" to Marine Corps professional military education.

Ender's Galley

A student-led network of professionals focused on the information environment, dedicated to the art and science of warfare. Network - Think - Contribute.

Marine Corps University

Marine Corps University/Education Command delivers professional military education and training through resident and distance learning programs, while also preserving and presenting the history of the Marine Corps, to prepare leaders to meet current and future security challenges and inform the public of the Service's role in national defense.

Marine Corps Information Operations Command

The Marine Corps Information Operations Command (MCIOC) provides operational support to the Marine Forces and to the Marine Air-Ground Task Force and provides information operations (IO) subject matter expertise in support of the U.S. Marine Corps IO advocate in order to enable the effective integration of IO into Marine Corps operations.

