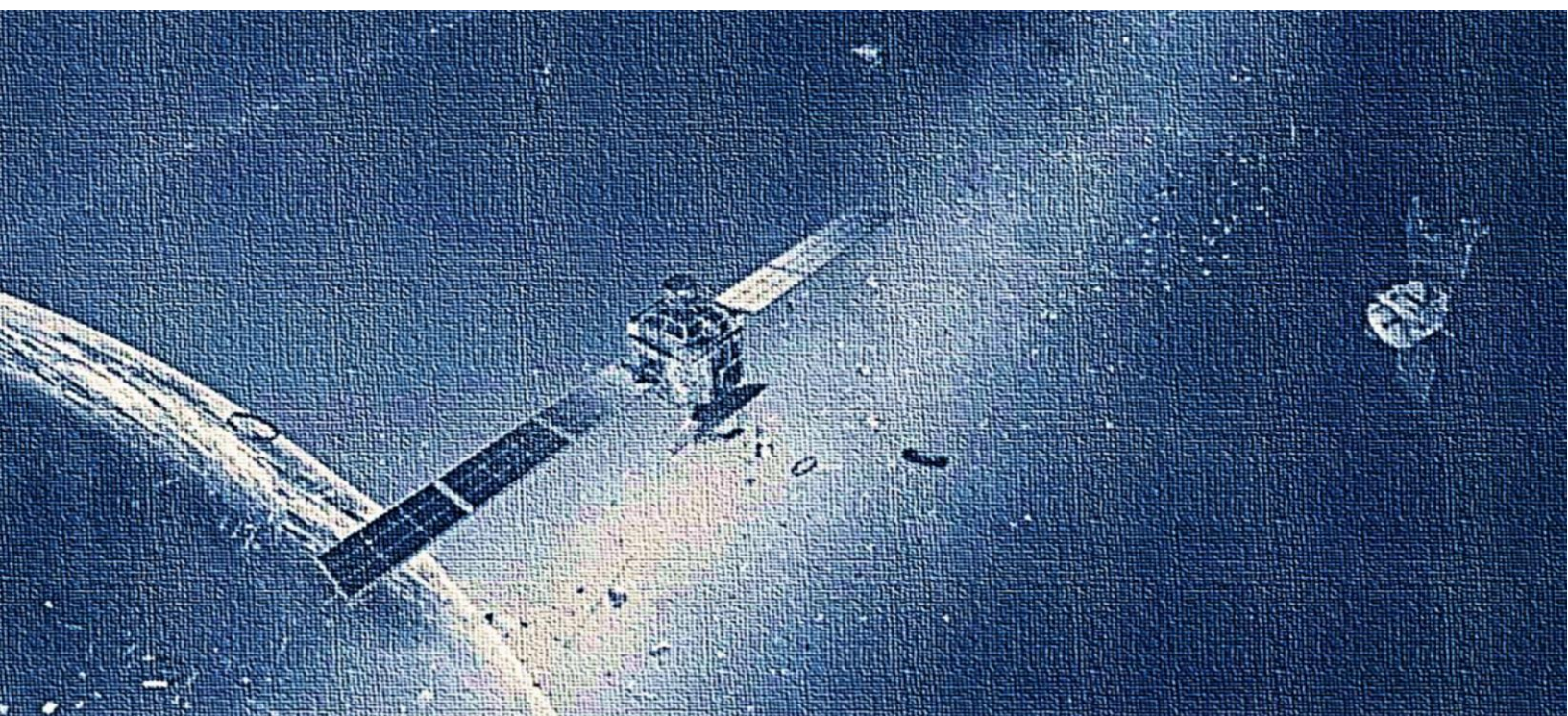


P1: POLARIS POSITION

AN ASSURANCE ASSERTION



JACOB SIMMONS, Chief Master Sergeant
Guardian, United States Space Force

P 1 : P O L A R I S P O S I T I O N

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Mode Push ... Mode Push!

General Stephen Whiting's reminder at the 39th Space Symposium regarding "*Winning in Competition and Conflict*" still reverberates like a pre-race briefing echoing off pit walls: "*Space is a team sport.*" The assertion is simple, but the scene is not serene or serendipitous. Space warfare will not be the straightforward, drag-strip sprint of the first Space Race. The course is changing. It will be a slewing, dragged-out slalom. Conviction to convey and converge at the confluence of contemporary conflict and combat is common to the cannonball competition and commotion of a *Constructors' Championship* ... won collectively, lost consequently.

The United States must bridge the team mentality and technical mechanics of tactical maneuver and build *maintainers* of timing and *masterminds* of tempo to triumph *if ever tested* in the most modern theater of military trial. Applying the art of alliteration to amplify precision, projection, performance, and partnership at the apex of aerodynamic and astrodynamics advancement, this anecdote of assurance in two state-of-the-art areas of operation articulates that space should adopt an asymmetric ability to *outmaneuver to outmatch*. This imagery-filled compendium uses creative illustrations from *congested* and *competitive* racing opposition to illuminate the immense and imminent implementations, and impartial and imperative implications of *contested* and *combative* rendezvous operations.

Precept of a Precipice

We need a vision decision ...

As a preface, our pioneering predecessors were once paired against a precedent-setting space peer. In the prelims, our pragmatic poise was pushed around by a prolific provocateur. At a pivotal point of preeminence, our *patriotism* promised, pulsed, and pressed to put a person on the Moon, propping the pendulum in place for our protracted but not permanent period of promotion, prosperity, *and power*. Presently, our unparalleled persuasion is under pervasive pressure, putting us in a previous *pace-poor* position: passed by, picking parts and pieces off the pavement, and paying the price for practical procrastination.

"Space is a team sport."

*We need a vision
decision ...*

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In the world of motorsports, Formula One (F1) is the highest class of international competition. The Prix's **Pole Position** refers to the premier place at the start of a race. It is the coveted spot on the grid for the driver who qualified fastest. Pole Position offers a significant advantage, as the driver starts ahead of the entire field, giving them a better chance of leading the race from the start. Once a race begins, drivers are no longer described as being *on the pole*. Instead, they are referred to by their present position in relation to peers. We are *currently P1**. Today's Space Age has been supercharged with *Team America* in the position of prestige. The concern is, comprehension of counterspace composition *and compromise* is creating a 3-body competition.

Precursor of Projection

While the Soviets entered the initial Space Race on the **Polaris Position**, they squandered the lead and swiftly fell toward the back of the pack ... *resource retired*. Recently, *Roscosmos Racing* returned to the roster, rising in the rack-and-stack ... raising havoc like a *red bull* in a *China shop*. Not rookies to reinvention, they have rebranded from revolutionary rocketeers and reasonable rovers of a remarkable renaissance - to - renascent renegades and non-reversible ramrods at RAAN (Right Ascension of the Ascending Node). Restarted to reclaim regional relevance *and rest-of-world* respect, their rogue recklessness is revising the rule book of the regime; overtly overturning the rules-based order on-orbit. Reportedly ready to risk it all ... *and us all* ... on roulette, they are role-reversing their once-revered reputation as a frontier forerunner to be formally recognized as a formidable front. Same as single-seater setups are stiffened to swerve or absorb a session-ending shock, strategic space systems should now not only be shielded: surefooted to absorb a single event upset, but also sighted: surefire to abort a season-ending shockwave. *"Russia's position as a leader in space gradually unraveled in the early 2000s ... Russia is developing a new and potentially devastating antisatellite weapon. The capability appears to use a nuclear explosive to generate a powerful energy wave called a space electromagnetic pulse. If true, this capability could damage or destroy thousands of satellites ... More broadly, this capability marks Russia's near-complete transformation from a responsible*

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Reportedly ready to risk it all ... and us all ... on roulette ...

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leader in space to a **street bully**.ⁱⁱⁱ – Lieutenant General John Shaw, former Deputy Commander, US Space Command

Commencing in 2007, the People's Racing Club (PRC) crashed onto the constructor's circuit with a *catastrophic* collision ... causing countless cascading conjunctions and consequences for civil, commercial, and coalition commuters. For a quarter-century, they have chased, challenged, cheated, chipped away, and changed the chalk lines. Over the last five laps, the space pacer has sent up snares and sneak attackers. stringing together technologies across the space spectrum. In short order, it has seized slots and surrounded sectors with sophisticated sidecars and side arms: spoofers and sprayers, spears and spaceplanes, spotters and snipers ... a tailored toolkit to track down, target, and take out theater space support. To our chagrin, their chop shop of carbon-copied and cannibalized counterspace chariots has checked out co-planar. They are certifiably combat-crafted, capable of crippling the competition ... a kill chain of chicanery at every choke point. *In a generation, they have closed the gap.* Whiting warns us to be wary, *"China is moving at a breathtaking speed. Since 2018, China has more than tripled its on-orbit intelligence, surveillance, and reconnaissance satellites, and with these systems, it has built a kill web over the Pacific Ocean to find, fix, track, and yes, target United States and allied military capabilities."*ⁱⁱⁱ

Our presupposed prominence and presumed perpetual presence are no longer promised. Peers are pressing, and outperforming opponents may pass us. Possession of the *Polaris Position* is neither predestined, preordained, nor promised. Past perennial placement is pending provisional. Practicing at full potential, placing first in the preliminaries, pace-setting the pack from the front, pressing the field for preeminence, and then protecting the points each pass must be the foremost priority to prevail in a fight for the podium ... full out to the finish ... to the pinnacle of performance. Without the resolve to *rev-olutionize* the rendezvous, we *risk* regressing in the rankings ... where *risk to our mission is risk to the entire joint force.*

Warned with the words written by Marc Bloch in his 1968 war reflection, *Strange Defeat* dials-in on a dilemma of our day. *"Our own rate of progress was too slow and our minds too inelastic for*

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*us to ever admit the possibility that the enemy might move with the speed which he actually achieved.”^{iv} Normality and neutrality at this nexus are non-starters in national security. Navigating the niche, novel, notional, and next-gen are the needed next steps. Space forces will be expected in expanded roles ... from the extrinsic to the existential to the extremis. The marketplace is mainstreaming with modern *maneuvering* marvels: *motoring mini-sats, massive motherships, mega-constellations ... and monopolistic moonshots for all mankind*. At minimum, our modus operandi must mobilize mass and muster momentum into multi-modal movements, maxing mission management. Deriving a *Dunkirk* demeanor, debuting dynamic DOTMLPF-P, and driving a *dogma of dogfighters* will decide the delta. Shaw emphasizes, “*Mobility is not a supporting function in space ... it is the function that enables every other one.*”^v*

Space warfare, like F1, is based on balance *AND* brute force, bespoke builds *AND* black ops blast-offs, bridging the breach *AND* breaking through the boundaries. *Assurance* begins with *Access, Agility, Acceleration, Action, and Asymmetric Advantage*. We can no longer look to luck out with what former Vice Chairman of the Joint Chiefs of Staff, General John Hyten, labeled as: “... *large, big, fat, juicy targets ... We are going to go down a different path. And we have to go down that path quickly.*”^{vi}

To deliver, defend, and defeat ... *on demand* ... we must have the **drive to survive**.

ASSURED ACCESS: REFUEL, RETOOL, ... RELOAD

Box ... Box

Paddock Padlock: The Power Projection Platform

“*Every dream needs a team.*” - Mercedes-AMG Petronas F1 Team Slogan

The blocking and banging are brutal in our breakneck *BattleSpace*. Beltways are filling. Bombardments are forming. Bullets are flying. Being able to bring it in for *battle damage assessment* should be a basic function ... not *out-of-the-box*.

“We are going to go down a different path. And we have to go down that path quickly.”

Beltways are filling. Bombardments are forming. Bullets are flying.

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In F1, the paddock is the pulse ... a precision-powered pit where engineers, drivers, and data unite in a symphony of speed, strategy, and split-second synchronization. Every bolt tightened, every tire changed, every telemetry tweak tells the tale of a team chasing perfection at the edge of endurance. It is where competition converges into control ... and control determines who crosses the line first.

In space warfare, our "paddock" looks different, but the demands are the same ... flawless fusion of focus, force, and foresight. Our racetrack wraps the world. Satellites spiral through sectors of space in seconds ... slingshotting slivers of silver and silicon silhouettes. Our pit crews wear patches instead of sponsorships. Here on our oval of overwatch, *spacecar* techs tune electromagnetics instead of electronic fuel injectors, aligning assets for orbital overmatch rather than podium prestige.

Yet, in this "constructor's competition," we have learned that the paddock now needs a padlock. The once-open arena of access and ambition has become a contested compound. Interference and imitation threaten to infiltrate innovation. Adversaries lurk in the lanes of our launchpads and linger in the loops of our logistics. To preserve pace and position ... protect the paddock.

Securing space superiority, like sprint supremacy, is not only about speeding up. It is now as much about synchronization, some secrecy, and staying ahead. As Shaw cautioned, "If we cannot assure access when and where we need it, nothing else matters."^{vii} The differences are this: the waving flag we seek to secure is the *Stars and Stripes* ... and the cup is the quiet confidence that when conflict comes, our engines will ignite, our systems will synchronize, and our team will triumph.

Pace, Parts, and Persistent Peer Pressure

"I tell this story to illustrate the truth of the statement I heard long ago in the Army: Plans are worthless, but planning is everything."^{viii} - Dwight D. Eisenhower, 34th President of the United States

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"If we cannot assure access when and where we need it, nothing else matters."

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F1 is more than a motorsport; it is a movement of meticulous logistics. While the world watches drivers duel at daring velocities, victory was conceived and constructed in commercial hubs, cargo holds, and component high bays. Space warfare, though fought far above the asphalt, depends on disciplined delivery, decision, and durability. The parallels between F1 racing logistics amid competition and sustaining space operations on-orbit during conflict are profound ... and pointed.

The pace of peers on the pavement and progression on the orbital path are pre-calculated, but in practice, proportionally less predictable when provoked. Containers of carbon fiber, calibrated components, and carefully cataloged kits crisscross continents weeks ahead of race day. Every wrench, wing, and Pirelli-wrapped wheel has a purpose, a place, and a pathway to perform under pressure. In common, the combination of close approaches, collision avoidance, and closing angles of attack against a counterspace actor is compelling cause for prepositioned preparedness. Bragging rights will belong to those who bring the best bench stock of boosters *and* bolt-ons to the *BattleSpace*. Orbital orders, much like a manifest, must anticipate anomalies, attenuate attrition, and adapt to adversity.

Pit stops parallel proximity ops. In F1, a pullover is a perilous pause: milliseconds matter, mistakes maim momentum, and missteps multiply misery. On orbit, sustainment is similarly surgical and synchronized. Maneuvering movers to refuel, reconfigure, or reposition ... *under rapid fire* ... requires precision planning, practiced procedures, and perfect timing. There will be no timeouts in the tempo for thousands in the warzone; only tight windows ... and whether we take them or waste them.

Ultimately, F1 logistics and space maneuver sustainment share a singular stance: competitiveness crushes complacency. Fait accompli is found not only in the fastest sprint car or the "*fattest*" satellite, but in *the fundamentals* that make the most of maintaining momentum when margins are microscopic ... and mistakes are merciless. Whether in the pit or at perigee, victory is about more than speed ... it is about sustaining it. Motivated by a 2027 mandate to methodize, mobilize, and militarize, many mission and materiel managers have messaged mainstreaming

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maintenance ... *in minutes not months* ... as a main tenet for first mover mastery in a modern fight. *"We must have the logistics and sustainment necessary to enable fighting when and where we need to ... now."*^{ix} From track lanes to transport layers, the logistics of lethality ... *the leverage to last through the last lap* ... will be the leader's lynchpin or the loser's long pole.

Pit Next Pass

Large-scale combat operations ... in the pit and in the pass window ... live or die on logistics. Those at the top of the leaderboard have learned to leverage *mass, layout maneuver, and lean on the laws of motion ... inertia, force and acceleration, and action-reaction*. Space-savvy sentinels frequently ponder the profound power of preparation, particularly when propelling precious payloads into the perilous paths of space. However, it is worthwhile to look Earthward again for a mirror check, to a spectacular spectacle of speed and spectrum synchronization: the F1 Pit Crew. Their phenomenal feats of fluidity, flawless focus, and fervent fortitude offer fantastic parallels to the aspirations for agile, advanced, and audacious space logistics. Stellar systems echo: *"Start your engines!"*

Meeting on the mark, the pit performs to pressure-perfection. Turning in two seconds: treads traded ... *reds to whites to blues*; petrol pumped; flaps fixed to flow and force fluidly. Down to the detail: deliberate, decisive, dexterous ... *driven*. Beyond a ballad, *"If ya ain't first, you're last"* is our basis for *BattleSpace* burden-sharing, deeming it our duty and due diligence to deliver dominance. This rapid response, this real-time replacing while racing, is precisely the tried-n-true tactics, techniques, and procedures perfectly timed and tuned to set the pace of space.

The meticulous mechanics of mid-flight refueling mirror this mastery. Just as a race car is refitted to return to its rivals in road war, our reconning, relaying, and reporting revolvers desperately demand reservoir refilling and residual retooling to prolong productive performance, protect against projectiles, and pursue perpetrators in perpetuity. Pre-positioned depots and strategically staged servicers promise the potential of *planning with plenty* in place of a strategy of *scrutiny of scarcity*. Pivoting to platforms that permit decreased fuel requirements

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for primary missions, significantly slash transit times, increase invaluable revisit rates, and unlock novel flight paths and low-energy orbits would remap a myriad of mission requirements.

With multi-mode propulsion becoming more prominent, these depots will decrease launch mass and dictate cost cuts, fostering a "*fast and furious*" operational tempo for the fleet. Add in augmented maneuver, robotic repair, and responsible disposal ensure assets don't die on the side of the domain.

This is Assured Access ... not to space, but in and through it.

ASSURED AGILITY: THE HARD TARGET

Midfielder Moves ...

Turn and Burn

Space is all-domain. During a double-decade, a once-dominated dominion has been defined as dual-use, then diversely distributed, and now danger-close ... from a demarcation to democratization. While some nations prefer to mask their intentions through dual-use technology and the blurring and blending of bright lines between their state and commercial enterprises, crowding is complicating concealment. Counterintuitive to camouflage, high-value assets grow harder to hide. As reconsidered for commercial, space forces roles ranging in crisis and conflict may need to be rethought ... perhaps redefined.

In the long counterinsurgency wars of Iraq and Afghanistan, ground forces talked about a '*3-block war*,' first prophesied by US Marine General Charles Krulak in the late 1990s. Essentially, maneuvering through the midfield, the military might be conducting humanitarian operations such as building a school on one block, on the next block providing stabilization and foreign military development, and on the third block waging direct combat operations against an aggressor. So too, management of offensive and defensive space missions must be malleable to multitask ... to maneuver through the minefield of the midfield. Like the *3-block war* on Earth, space forces must

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pivot fluidly ... humanitarian on one orbit, hotspot on the next, high-end on the third. Agility is not our agenda; it is our agency.

Racers are reordered, and some are rapidly retired ... but the race is rarely won in *Turn One*. Championships are claimed in the long laps ... the grueling, gas-gauging stretches where patience punishes impatience and endurance eclipses episodic explosiveness. A strategy of surplus ... *afforded by Sustained Maneuver* ... allows assets to move at will, and decommissioning at end-of-need rather than end-of-life. We can dynamically dictate the time and place for orbital assets, creating uncertainty through complexity for any potential challenger.

Plan C is for Combat

"We have become more fires-centric, and because we have pivoted away from counter-insurgency operations to now be prepared for peer adversaries and large-scale combat operations, our footprint has become smaller, more agile, and more maneuverable." - Lieutenant General Richard Zellmann, Deputy Commander, US Space Command

Doctrinal for the space domain, duration and durability are defense by design. In the film, *F1*, the seasoned *Sonny Hayes* knew the secret to success was cornering speed: *"Our shot is battling in the turns. We need to build our car for combat."* This is the essence of the chase to exhaustion. In racing, as in war, domination is determined by more than dramatic overtakes; but by forcing an opponent to spend faster than they can replenish ... to burn fuel, degrade systems, and exhaust crews until withdrawal becomes inevitable.

In space warfare, the parallel is unmistakable. Orbits are circuits. Fuel is finite. Thermal margins, power budgets, and maneuver windows dictate how long a platform can compete. The side that can sustain presence, reposition persistently, and impose continuous cost and decision-making pressure will eventually dictate the tempo ... or end the race altogether.

Rationally, *road warriors* are required on the *road to war*.

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"Our shot is battling in the turns. We need to build our car for combat."

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ASSURED ACCELERATION: PACESETTING AND PURSUING TO PREVAIL

Hard targets don't hesitate; they haul astrographically ...

Overtake with Overdrive

DRS moments matter. "Mode Push" musters more. The Drag Reduction System (DRS) overtake mode, the boost in an F1 race car that allows a driver to open a flap on the rear wing, reduces aerodynamic drag and increases top-line speed for easier overtaking in designated "DRS zones" ... our operations payload and weapons engagement zones (PEZ/WEZ). This timing and tempo function flexes flow to feed the "need for speed."

There is a method to the mechanical madness. Making the most of the moment and momentum and taking into task the time and tempo sensitive targeting to overtake, the "Mode Push" surge setting provides maximum power for a period of time, usually activated during a push lap. This allows the race car to use more energy and is used to gain an advantage when attacking or defending. Though it empties reserves and cannot be used for the entire race, it is perfect for passing maneuvers ... not meant for position management. The thrust gains a temporary speed and performance advantage for a crucial moment, such as attempting an overtake or defending a position. While *DRS* works by reducing drag to increase speed on specific straight sections, "Mode Push" provides a boost in engine power anywhere on the track.

Like short-lived satellites, sprinters launch and live with the gas given to get onto the grid. Countering the clutches of constant acceleration, consumption and cooling are closely monitored by the crew but controlled manually from the cockpit through extension efforts such as energy and exhaust recovery, engine modes and mapping, and making the most of momentum: *coasting* into the corners to conserve the tank, conditioning the brakes, and cooling down the tires. While racecars are routinely refitted and refueled after each roadshow, our rocket-thrusted rovers are regrettably *retired* and removed from the rotation when they run out of reach; relegated to a remote realm of remnants. On rare occasions, a reusable research or

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reconnaissance ship is recovered and recycled. More regularly, regiments of remains are returned to burn in reentry.

Sustained Space Maneuver frees assets from being frozen in fuel fatalism and severs static ties to station saturation and staging stagnation. Modular upgrades, bolt-on performance, and strategic repositioning ensure superiority adapts faster than the threats evolve. Imagine maneuvering and repositioning assets with impunity, protecting and defending US government, civil, and commercial interests without hesitation. This would permit truly persistent assets and transitional platforms throughout each orbital regime, allowing us to "put the pedal to the metal" at the point, to the place, and for the period of our preference. This is the premium of premier power projection.

Modularity and modifications, bought to be bolted on, could make space systems as adaptable as a single-seater's active aero. Modding and manipulating motors, fabricating fluid and fiber functions, enabling high-performance processing upgrades, swapping components and sensors with ease, and evolving capabilities in direct response to evolving missions and threats would ensure superiority. Understanding the upside of updating chassis structures, upgrading power units, and up-armor protection packages embodies the *spirit of the sprint*, combining diverse elements for ultimate effectiveness.

Control ... *while under fire* ... is the character of a war-winner. As in F1, not being able to steer without skidding and stop a satellite in seconds is a non-starter. The art of *aerobraking* (gently tapping the brakes repeatedly to slow down in traffic) and *aerocapture* (slamming on the brakes at the last possible second to make a sharp turn) is an asymmetric avant-garde. These approaches allow an apoapsis advantage ... and appreciably when applied without apology. In this sense, as Special Operations Forces say in survival situations, "*Slow is smooth - smooth is fast.*"

That quoted, without question, quickness ... like quantity ... has a quintessential quality. Idling is not our identity or our ideology. Our first impulse must be ... *more impulse.*

Afterburners ought not be an afterthought.

Sustained Space Maneuver frees assets from being frozen in fuel fatalism

"Slow is smooth - smooth is fast."

Our first impulse must be ... more impulse.

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ASSURED ACTION: ENGAGING THE ENEMY

Let's Go Hunting ...

Caught in the Crosshairs

History is a harsh herald with a heavy hand. The First World War was a grand prix of attrition ... a continental *chase to exhaustion*. The Race to the Sea resembled frantic jockeying for track position. Both sides pushed beyond safe operating limits in pursuit of a breakthrough ... each side seeking the advantageous line before the course narrowed into trenches. Germany's *Spring Offensive* was an all-in push lap ... maximum power, minimum margin ... attempting to win outright before Allied reinforcements arrived. The Somme and Passchendaele ran on shredded tires and overheated engines. When the fuel ran dry, the race was over. The Allied response ... *the Hundred Days Offensive* ... was not reckless acceleration, but refined racecraft. Combined arms acted like synchronized systems: tanks for traction, airpower for awareness. Mobility mustered, momentum multiplied, and Germany was forced to defend every corner, every straight, every remaining reserve. The result was not a single decisive pass, but systemic failure. Manpower drained. Morale degraded. The car did not crash ... *it could no longer continue*. It found itself captive to its consumables.

The same dynamic played out in maritime. At the Falklands in 1914, the British and German navies engaged in a literal chase governed by speed, spacing, and sustainment. The British possessed the faster chassis, heavier firepower, and ... critically ... the fuel to be formidable. The German force could neither disengage nor endure. Like a competitor trapped on worn tires with an empty tank, the German squadron was hunted down and hammered by a team that was fresh out of the box. Logic, logistics, and logarithmic scales decided the lap. In space, the currency of movement is the denomination of delta-v ... the total change in velocity a spacecraft can achieve. The *BattleSpace* budget is baselined at blastoff; there are no pit stops ... or plug-n-play ports ... to pour in power projecting propellant.

A twin theme is taking turn ... *with a twist*. "The People's Republic of China (PRC) is the only competitor to the United States with

It found itself captive to its consumables.

Logic, logistics, and logarithmic scales decided the lap.

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the intent and, increasingly, the capacity to reshape the international order ... the PRC seeks to achieve 'national rejuvenation' by its centenary in 2049.^{xi} Our nearest nemesis, number **49** on the nose, is trailblazing theatrics and techniques to take tankers onto the track. They are teaming transfers of thrust and tow, in tandem with tactical torque ... all while tarrying in top gear. They are tooling and taxiing without taking a toe off the throttle or a tire off the track. This fundamental *fuel-it-and-fix-it-on-the-fly* factor is the formidable formula to fight full-out ... more far-reaching and far-ranging. In a future faceoff, it would be a fatal flaw to flee from the front of the fray ... forced from the fast lane; fouled frequently by fatigue, fragility, or frugality ... forfeiting a first-place finale.

Chase to Collapse

Competitive Endurance calls for a higher calibration of competence, capability, and capacity to credibly out-choreograph any counterspace outcome. It assures access, fortifies freedom of action, and ensnares the enemy. It counts on confidently conducting operations (orbital, electromagnetic, cyber) to deny adversary use of space, and counterattacks and measures like hardening, deception, and mobility to reduce vulnerability. In theory, *"If you complicate targeting, you get resiliency, you raise the threshold for attack, which equates to deterrence."*^{xii} - General B. Chance Saltzman, Chief of Space Operations, US Space Force

F1 is often remembered for daring dives, dramatic DRS passes, and deadly debris-delivering *disassemblies*. Yet, season titles are secured by teams who manage tires, temper engines, take care of components, and tenaciously tune into today's and tap into tomorrow's technologies to tilt timing and tempo on the track. Modern F1 cars leave the line with limitations ... *tires, temperatures, tank* ... that prevent drivers from pushing at 100% pace for the entire race. Going too hard too early can consume too much. Successful strategy involves managing stress and strain, rather than struggling to finish strong. Victory belongs to those who understand that the race is more than a sprint, it is a sustained stride. To triumph will take traction for protraction. On the other hand, the overzealous are overblown by their overcut. The overrated are overpowered by their overreach. And, the

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overextended are off-ramped from overheat. *Overlapped by overmatch; the overwhelmed ... overcome by events.*

Much like an F1 team meticulously calculates tire wear, race strategists in space warfare must manage their orbital mechanics with extreme prejudice. An F1 driver might push their tires for a fast lap, knowing a pit stop is coming. In contrast, a satellite operator who expends propellant on an aggressive maneuver has permanently reduced their platform's operational lifespan and future options. They have *worn out their tires* with no replacement on the rack. The impact is the imperative: immediate tactical efficiency or immutable strategic endurance.

Attrit the Adversary

An aggressor has an advantage. An enemy's own energy can be weaponized against them to force a series of untenable decisions. By presenting multiple, dispersed dilemmas, an attacker can compel a defender to execute numerous costly course corrections. Each evasive action or repositioning burns precious propellant, analogous to a driver locking up their brakes and creating a flat spot on a tire, accelerating its wear. The strength of this strategy is in the bias for action, to box in the adversary and *bleed the enemy dry*. This is a war of attrition fought on the spreadsheet of orbital mechanics long before it becomes a visible conflict.

Victory is achieved when the defending satellite can no longer maintain its required orbit, reposition to counter a threat, or hold its station, effectively becoming a disabled piece of space debris on the side of the track. It is mission-killed without a single shot being fired in the traditional sense. The race is over because one car has run out of resources. The real engagement was the strategic exhaustion of the capacity to continue the contest ... *from a cast aside car to a component out of commission.*

Space warfare is stability *and* sustainability. Bringing boldness and budget into balance. Subscribing to Shaw, *"Responsible behavior in space is not restraint ... it is resilience."*^{xiii} Victory will belong to those who force opponents to spend faster than they can replenish. Before overdrive is operationalized, endurance must be endowed. Before the pedal is pressed to pass, the

The strength of this strategy is in the bias for action, to box in the adversary and bleed the enemy dry.

"Responsible behavior in space is not restraint ... it is resilience."

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striker must have a strategy of strength on the straights. The *chase to exhaustion* is how races and rivalries are won.

Readiness is reviving, revamping, revealing, and rewing up to revisit *without regret*. *Not running on fumes*.

ASSURED ASYMMETRIC ADVANTAGE: FORMULA WON

Fight From the Front ...

Catching the Grid Off-Guard

"Think about worst-case scenarios."^{xiv} - General Saltzman

As we activated and acclimated to autopilot on the astrographic autobahn, adversaries are approaching and alerting us ... *flash-flash* ... arraying alongside to attack our asymmetric advantage on the axis. A drama is unfolding in our domain, undercutting decades of domination in the darkness. Threading through hairpins at hyper-speed, a sporadic spark or single shard can sink a ship. Absolute awareness, anticipatory action, and an almost artistic appreciation for acceleration, angles, and adversity are the all-in-all aim point. Where F1 teams fear lockups, lift-offs, and late-lap lunges, we are fascinated by loss of link, loss of lift, and lethal leftovers of long-forgotten launches. Dodging through a deluge of drifting debris is a doppelgänger of dipping, and diving into the *Chicanes*: crowded, contested, and constantly courting calamity.

F1's fiercest foes read, react, and rewrite their tactics in real time. That cutting-edge cunning in a crucible will characterize the coming combative circuit ... *all the way out to cis-lunar*. Counterspace capabilities, contested communications, and clandestine commandments from competitors create a cockpit of continuous complexity. And like any championship chase, the contest in space is as much about cunning as it is about capability. The most serious dangers may not be set in the spectacular spinouts but in the subtle sabotage. A tire-touch at 200 miles per hour ... or being torpedoed at 17,000 miles per hour. A targeted tug-of-war attests to a twin-like truth: catastrophe can come confidentially. The wrong sensor shimmer, the wrong signal, at the wrong second, can turn

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IT'S LIGHTS OUT!

P 1 : P O L A R I S P O S I T I O N

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sportsmanship to sponsorship to spartanship. Under the veil, as victors and victims visit in vicious vicinity, coveted *chequered flag* finishes may come down more to the wire ... with competition, crisis, conflict, and combat as carbon-copies ... more commonly considered too close to call.

Finally, on the far side, the Moon may be the future Monaco ... famous, unforgiving to the field, few finishers, and feasibly a fortress. Looking out to Lunar, a Lagrange GP (a Grand Prix of gravitational points) is less than a leap away. The turnabout may not be fair play. *"It is a fact: we're in a space race. And it is true that we better watch out that they [China] don't get to a place on the moon under the guise of scientific research. And it is not beyond the realm of possibility that they say, 'Keep out, we're here, this is our territory.'"*^{xv}- Bill Nelson, former NASA Administrator

Lead, Follow, or Get Out of the Way

Showcased over successive suspenseful seasons, the secretive world behind the wheel has surfaced. Shockingly, so has the surge of weapons to wield space warfare. Our OODA (On-Orbit Defense and Attack) Loop must outpace the opponent's ability to *observe, orient, decide, and act*. Looking back *and down* on land-based limitations, losses, and lessons learned, launch tranches may lack the leeway to be lethal.

Taking the threat out onto the space track, traditional terrestrially-tied transportation may not be the trusted source that translates into time-sensitive triumph. Not to be last, least, or left behind, lengthy lead-time and lift latency may leave us loitering, in limbo, or late to need. Launch vehicles are a luxury we cannot afford to lose, but logically, that lifeline may be a lofty long shot in a longstanding lockdown. The locus of space control cannot be left at last century's lackluster level of logistics.

Done are the domestic days of the drifting dirigibles. The dynamics of the domain are doomed to be demonstrated by the dominoes who dominate the switchbacks and *"drive it like they stole it!"* Forging the follow-on fight will be all about the form, fit, and function to finish first. The championship cup will be carried

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away by the crew and chassis that can close the door on the competition in the corner.

Unrivaled or Unraveled

"To win in a protracted conflict we must maintain space capabilities beyond the initial stages. Sustained space operations require the right mix of responsive launch, sustained maneuver, and logistics to allow for the operational availability, movement, and maneuver required to achieve a position of advantage in space over an adversary. Our ability to sustain combat capability in space across a wide range of scenarios, conditions and threats is essential to our resilience and lethality and accomplished by the mobility and endurance of our integrated space enterprise."^{xvi} - General Whiting

Revisiting the *vision decision*, our PACE Plan (primary, alternate, contingency, emergency) cannot be *pace poor*, predicated on past practicalities. Our peace through strength proponency, pursuant to predicted POCAs (point of closest approach) should prioritize proactiveness to prepare in the pit for protracted proficiency. Persistent power projection ... *not peer parity* ... is preferred to prevail. Steady state surrenders a sustainable state. We will stall if we stick with our starting standard.

It is Go/No-Go time! Rivals are racing right up to the red line. Remaining on plan and reversing risk requires rapid reaction and reallocation teams ready to respond to requests for forces ... retune, resupply, reconstitute ... to be race-worthy. At the essential moment that matters most, we must make every meter-per-second mission effective, not meter to meet a measure of most efficient; safe but settling for second. Perching at **P1** ... *the Polaris Position* ... rests on more than our relished rolling start to retain, retake, or retaliate. Shaping the showdown is set with a *show-of-force* shift.

For the greater good, we cannot grind in first gear. To win, at "Go" on our grid, we should take the corners, then the sides, and finally close on the center. We have to gather up the gumption, guard the gap, and *give it all we've got!*

Steady state surrenders a sustainable state.

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Final Lap - The Last Tactical Mile

From F1 to F2T2 ... *find, fix, track, target* ... flying and flexing through the field, the fog, the friction, and the FOD (foreign object debris), and the fidelity to function, fortify, and forge on *under fire* will factor into our formidability. In a snap-glass event chain supporting synchronized navigation and neutralization on the *Nine-Dash-Line* circuit (the *South China Sea* island chain), on-standby satellite tool *kit chains* spanning synthetics, solar arrays, subsystem suites, sensors, and space-to-space/space-to-surface shooters should already be spread out to speed up our *kill chains*. For the sake of all joint forces and partners, our sustained superiority strategy should be to strap on jet packs juxtaposed to being stuck on jack stands ... out of mission or out of commission. *It is time to add fuel to the firepower.*

The *trials of the track* and the *trails of trace* teach us the same timeless tenet of trajectory and tragedy. Space domain superiority, like the summit of the drivers' standings, is seldom secured by speed alone. It is engineered for endurance, ensured by experts, and extended to the edge of the envelope extremes by excellence. As in the Grand Prix Championship, the *grit of the pit* should be geared to Great Power Competition.

Coming out of the curve, China has undercut the counterspace chase ... outcornering the contemporary competition. Russia is ramming into the rules of radiation and routinely racing with road rage. This is the backdrop of *buzz-by* bookends. Bespoke builds and bunker bays. Barracks and backshops. Bystanders and baron benefactors. Bests of breed and breathtaking speed ... *break - break* ... Bold banter and bad behaviors. Barricades and besieged blockades. Bogies and bandits. Blackouts and black ops. Breakdowns, breakups, breakaways, and breakaparts. The brevity on both billboards: "*BattleSpace.*"

The separation is shrinking. *The Space Race is on ... again.*

"If you no longer go for the gap that exists, you're no longer a racing driver."^{xvii} - Ayrton Senna da Silva, Formula One Champion

IT'S LIGHTS OUT AND AWAY WE GO!

It is time to add fuel to the firepower.

The Space Race is on ... again.

IT'S LIGHTS OUT!

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IT'S LIGHTS OUT!