Architecture of Disappearance

The Kill Cloud's Dispersal of Violence and the Erosion of Sovereignty

Cian M. Westmoreland
Whistleblower, Former US Air Force Drone Technician



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Cian Westmoreland specialized in C4ISR technologies in the United States Air Force, serving at Kandahar Airfield, Afghanistan in 2009 with the 73rd Expeditionary Air Control Squadron, where he helped network air and space assets with ground operations and distant command centers. After receiving an award and conducting research into civilian casualties connected to his unit's operations, he left the military to study International Relations. He became an outspoken critic of the U.S. military's overreliance on remote killing in the Global War on Terror, citing its lack of accountability and the strategic blowback it generates. His current research focuses on the networked and diffused decision-making processes in modern warfare, particularly as they converge in the development of autonomous weapon systems (AWS).

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Research-paper version, drawn from my forthcoming book, The Architecture of Disappearance, and prepared for the Disruption Network Institute, Berlin. The testimony, the analysis, and the verification are my own.

This paper argues that the Kill Cloud, the distributed socio-technical architecture that fuses ubiquitous sensing, artificial intelligence, and autonomous weapons into a planetary apparatus of force, does not merely complicate accountability for lethal violence but structurally dissolves it. Drawing on my direct participation in building one node of that architecture at Kandahar in 2009, and on open-source doctrinal, technical, commercial, and governance evidence, it traces the system from terrestrial command-and-control networks to an orbital substrate of proliferated constellations, laser mesh, on-orbit compute, and multi-agent autonomy.

It advances a foundational claim, and four consequences that follow from it. The foundational claim: the Kill Cloud does not merely observe reality, it constructs it. It acts on an approximation of the world, built for targeting, before anyone meets the world itself, so the person on the ground never arrives as a person, and no one ever meets the one they would answer for. First, accountability erosion proceeds through three distinct mechanisms (decision-cycle compression, algorithmic substitution, and commercial fragmentation), each sufficient on its own and compounding where they meet. Second, emergent behavior in multi-agent systems produces authorless acts: harms with no author at the moment of effect, which individual liability law cannot reach even though responsibility for setting them loose remains real and shared. Third, the commercial operators who now govern the kill chain function as "invisible generals," exercising infrastructural sovereignty without the obligations of combatants. Fourth, the orbital layer reproduces colonial extraction as "orbital apartheid" and a cosmotechnical monoculture.

The Ramstein litigation in Germany, the most international-law-bound state in the architecture, demonstrates the result: accountability that does not fail for lack of a forum but dissolves at the seam between the state that hosts the relay and the

state that fires the weapon. The paper establishes that the problem is architectural, the diagnosis on which any remedy must build. It does not offer the remedy. What it offers toward one is where a remedy would have to reach: accountability built into the architecture rather than layered above it, kept on the record, and made hard to switch off.

> *Note on the title. The phrase "architecture of disappearance", and the theme it names, have independent precedents, which I acknowledge while distinguishing my use. Kengo Kuma's anti-object writings pursue a kindred idea, the dissolution of the building as object (Kuma, 2008); Jordan H. Carver maps the spatial infrastructure of US rendition in Spaces of Disappearance: The Architecture of Extraordinary Rendition (Carver, 2018); and Sofia Karim's ongoing work An Architecture of Disappearance renders the experience of the politically disappeared under authoritarianism (Karim, n.d.). Where these address, respectively, the erasure of the object, the site, and the person, this paper uses the term for the erasure of accountability: the dispersal of agency across a distributed sociotechnical system until no node bears the weight of the act.*

A note to the reader. This paper is about killing and what it does to those who carry it out, and it is written in part for them. If you are a veteran or service member in crisis, or afraid for someone who is, the U.S. Veterans Crisis Line answers at any hour: dial 988 and press 1, or text 838255; outside the United States, findahelpline.com lists free and confidential services by country. You do not have to carry this alone.

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Abbreviations

Military and technical initialisms used in the paper. Each is also spelled out where it first appears.

AOR	Area of Responsibility
AWACS	Airborne Warning and Control System, the airborne radar and battle-management aircraft
BACN	Battlefield Airborne Communications Node, the airborne relay that carries radio traffic into terrain where line of sight fails
C2	Command and Control
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance
CCW	Convention on Certain Conventional Weapons
CJADC2	Combined Joint All-Domain Command and Control, the cross-service version of JADC2
COP	Common Operating Picture, the shared rendering of the battlespace
CRC	Control and Reporting Center, the ground radar and air-control node; a weapon system in the Air Force's own designation
DGS	Distributed Common Ground System, the network of ground stations where sensor feeds are exploited
EACS	Expeditionary Air Control Squadron
EPR	Enlisted Performance Report
HUMINT	Human Intelligence
IFF	Identification Friend or Foe, the interrogation that tags a radar track as friendly

IHL	International Humanitarian Law
ISR	Intelligence, Surveillance and Reconnaissance
IVAS	Integrated Visual Augmentation System, the Army's augmented-reality soldier interface
JADC2	Joint All-Domain Command and Control
JSTARS	Joint Surveillance Target Attack Radar System, the ground-watching surveillance aircraft
JTAC	Joint Terminal Attack Controller, the person on the ground who calls in air support
LAWS	Lethal Autonomous Weapons Systems
LEO	Low Earth Orbit
Link 16	the tactical data link that carries the shared air picture between aircraft, ships and ground nodes
LOCAAS	Low Cost Autonomous Attack System
OODA	Observe, Orient, Decide, Act; Boyd’s decision- cycle model
RIC	Regional Interface Control cell, which assembles the correlated air picture
RRSVS	Remote Radio Secure Voice System
SATCOM	Satellite Communications
SIGINT	Signals Intelligence
TOC-L	Tactical Operations Center-Light, the deployable command-and-control cell
TPS-75, TPS-77	the long-range, trailer-mounted air-surveillance radars a Control and Reporting Center is built around
UNAMA	United Nations Assistance Mission in Afghanistan

On Method and Sources

This paper is written from inside the architecture it analyzes, and it treats that standpoint as evidence rather than only as testimony. The method is auto-ethnographic and multi-modal: firsthand participant-observation of one node of the system, read against open-source doctrinal, technical, commercial, and legal documentation and the contemporaneous public record. One discipline governs throughout: documented fact, firsthand testimony, and reasoned inference are kept visibly distinct, because a critic uses the weakest inference to discredit the strongest fact. Where a claim rests on what I saw, I say so; where it rests on the public record, I cite it; where it rests on inference from both, I mark the inference as such.

The standard objection to a paper of this kind is that personal testimony and systems analysis belong in separate publications. The argument that follows denies it. The thing to be explained, the disappearance of the author of a killing, is precisely what the participant can see from inside and the external analyst cannot. Where the public record is silent, that silence is itself part of the evidence, since the architecture is in part built to resist attribution.

What has been written about remote killing has come mostly from outside the machine, or from the operator's seat at the trigger end of it. That work named the problem, and I owe it the ground I stand on, but my account mostly departs from it rather than adds to it. It moves off Chamayou's and Gregory's operator to a seat further back, and it takes what Sparrow called a responsibility gap and finds a dissolution instead. Where I lean rather than depart, it is on the tools I use in what follows, and on Mbembe, whom I carry up to orbit. This is written from the seat none of them occupied: the one that builds the machine and holds it open, further back than the trigger and rarely heard from. Departures and debts are marked where they fall.

The argument builds in one arc, from the node I built to the orbit it now climbs into to the account it leaves open. It runs the length of the machine, the maintainer's hands, the doctrine, the technical frontier, the commercial and orbital layers, the law, and back to the oath, and it means the weld of testimony and analysis to be evidence, not decoration. Where the first-person thread thins through the middle, it is because the architecture there is furthest from any single pair of hands, mine included, and that distance is itself the point.

A note on disclosure. Lisa Ling and Thomas Drake, whose accounts this paper draws on, serve respectively as an advisory fellow and a member of the advisory board at the Disruption Network Institute, where this research project was carried

out. Where their own cases appear in what follows, the account stands on the public record and is cited to it.

1. The Node and the Work of Maintenance

Seemingly non-violent technical acts we were trained to do came to a head when we started hearing battle managers coordinating airstrikes from within the Operations Modules. Radios and servers patched into distant ends, transferring enormous amounts of encrypted Command and Control data, enriched with surveillance, passing unimpeded through airwaves, like invisible nervous systems for a larger organism with many moving parts across a globe, culminating in the destruction of human histories at the push of a button by some nihilistic kid drinking a Monster in a Ground Control Station in Sin City, Nevada.

The work comes first, and then what I take it to mean. The claim this section arrives at is that nothing in the chain is violence on its own and every part of it is a trigger pull, mine included. Each hand in a killing is a thread. What lets the weave be made at all is the loom, and the loom stands behind every thread that runs through it, for as long as it stands. That is what I built, and it is why the distance between my hands and the dead is not the distance it looks like.

People will sometimes say that those of us who maintained these systems could not have known what we were part of. I knew. Before Kandahar there was Spangdahlem, Germany, the 606th Air Control Squadron, whose whole mission was preparation for exactly the kind of deployment that came, whose roles had merged radio and satellite and the full communications stack, and which had been to Kandahar before. Before that there was my first duty station out of tech school, the 51st Communications Squadron at Osan Air Base, Korea, forty-eight miles from the DMZ. Second week in, they briefed us: in the event of war, more than a million civilians would die in the first two weeks, and the survivors were to hold the base until the Navy arrived. Then we went back to work. I maintained radios and communications equipment across the base, including relay sites on Korean mountaintops that extended the tactical air control net over terrain that killed line-of-sight signals in the valleys. The 5th Reconnaissance Squadron there flew the U-2 “Dragon Lady”, and I maintained their radios. I understood what that mission produced and where it went downstream. I was there a year. By the time I left I knew the air picture, what it was, what it fed, what happened when it worked. The 606th deepened that knowledge and trained me to stand up exactly the kind of site we built at Kandahar. This was my trade in the fullest sense: I sat at the radar, made the tracks myself in the training picture, and knew the mission cold before I ever ran it at Kandahar. I arrived in late March 2009 knowing what the architecture did. I was not placed at that node by accident. I had already made Senior Airman below

the zone, promoted ahead of my year group; years of training and assignments had built someone who could do exactly this, and then I was put to work.

In the spring of 2009, I arrived at Kandahar Airfield as part of a small team, roughly thirty at first and about seventy at full strength, tasked with standing up the 73rd Expeditionary Air Control Squadron site from nothing. We landed at the end of March, into early April, during a rocket attack, and for the next five and a half months, until we flew home to Spangdahlem on 16 September 2009 (USAFE, 2009), we built the communications backbone that would allow air operations to function across southern Afghanistan through a remote operations center in real time. The work was initially physical, repetitive, and relentless: digging trenches in choking dust and heat that climbed into the hundred-and-tens at its worst, the work held to the rest cycles the heat rules set, laying fiber-optic and copper cable runs between radar vans and command shelters, mounting satellite dishes, stringing RF antennas high enough to clear the haze, installing generators that ran day and night with constant refueling, terminating fiber connectors in the field with portable fusion splicers, testing continuity under power surges and sandstorms, configuring datalink nodes, loading cryptographic keys into authentication servers, and being there to troubleshoot equipment failures all under a barrage of daily rocket attacks, eventually under the shadow of a radar's sail. We never lost connectivity. Had we, the work would have stopped being invisible, because a network is only ever noticed when it fails. We had deployed some three hundred short tons of equipment to build it (USAFE, 2009). We moved equipment by hand, ran power lines across dirt, built out the repeaters and vehicle radios, secured shelters against the sandblast, and gradually turned a patch of desert on a remote part of the base next to the perimeter into a functioning air control hub.

If you had only been to the boardwalk, the shops and restaurants, the dining halls and gyms, the bazaar on the weekends, you would have called it a cushy assignment, cushy at least next to a FOB, a forward operating base. It was not. We were on the far side of the base, where the radar made our site a big target, and the base took rocket fire daily. Two weeks before we landed, a rocket had cut a contractor in half in a dining facility; the record counts him as one civilian killed (DVIDS, 2009), and to us he was the briefing, the reason we were told to stay down when the rockets came. Early on, a few of us spent some minutes arguing over which chow hall to eat at, Niagara or Cambridge, put it to a vote, and drove to Niagara. On the way a rocket came in and we ran for cover, and we heard afterward that it had blown the leg off a British soldier, a woman. In the first weeks we set up our work shelters and fortified the site ourselves, and the concrete barriers did not arrive until the second week. What did not change, in the comfort or under the rockets, was that you would never know you were killing people.

There was one place the distance closed to a few feet, and the fence held it open anyway. Along the perimeter by our site, children would come up to the wire in the heat and ask for water. We were ordered not to give them any; the Romanian troops who patrolled past them did. A mile behind me sat the boardwalk, the McDonald's and the Tim Hortons and an ice machine that never stopped. I stood on the near side of that mile with a loaded magazine, body armor, ballistic Oakleys, and a cold drink I could have walked to, and the one thing I was not permitted to do was hand a thirsty child water through the fence. They could not see our eyes. The order was not cruelty; it was policy, and the Romanians proved daily it was a choice. Everything the war had was stacked on my side of that wire, the water included, and I kept it there. It felt absurd, a child's thirst a few feet in front of me and a mile of ice at my back, and absurd is the small word for it: it was profane, and I stood in it and did as I was told. The architecture would spread the same profanity across the whole earth, refined only so that no one in the plenty would ever have to see the need again.

Walk around the base, play a game, shop the PX, and you were in a sea of faces, some of them there for years. On any given day the man next to you might have just finished bombing something he was not sure of, or botched a raid and killed civilians, or been the directive backup crew on a night raid by the Afghan zero units, the CIA-backed strike forces (Billing, 2022), or loaded the missiles onto a fighter and watched it come back without them. Or he might have been having the time of his life, banking the extra pay, getting jacked, eating for free. You met a lot of people in the chow hall. It was a certain kind of realization, that every one of you was living a different war. Mine was no exception. I got in incredible physical shape, saved money, took CLEP tests, invested the pay I was earning from the work. I let myself become numb in public and tried to keep the darkness at bay in private, and I played the role to avoid retribution.

People enlist at an age when they are still malleable, raised inside a framework in which they could not possibly understand the people they are sent to fight, full of belief systems instilled in them by training, by peers, by the social and psychological forces that settle what a person takes for real long before he can weigh it. They are told little of the real reasons, because the real reasons are made upstream where they cannot reach them. Then the technology is compounded on top of all of it. Whether a person formed this way ever truly chose what was done through him is a question of fact, and it is the one worth asking before the law assumes the answer.

I leave that question open and turn to what I can be exact about. What we were building was a nervous system for the air war, and like a nervous system it was useless the moment any part of it went dark. Among airmen the rule was blunt: no comms, no bombs. Each piece solved one part of the same problem. Short-range

radios kept the men who call in strikes, the Joint Terminal Attack Controllers on the ground, talking to the aircraft overhead while the two could still see each other. When mountains or distance broke that line of sight, satellite communications relays, SATCOM, carried the signal up to orbit and back down somewhere else, so the conversation never stopped. Tactical datalinks, the radios that let dissimilar systems share one feed, took the separate streams, a radar track here, a drone's track there, a position report from a friendly jet, an intercepted enemy signal (a signals-intelligence, or SIGINT, hit), and fused them into one moving picture of the sky, the common air picture, that everyone could read at once. Cryptographic authentication made sure no one could listen in or feed the network a lie. And underneath all of it ran the fiber-optic cable we had buried by hand, the high-capacity, low-delay links that tied the radar sites, satellite shelters, drone detachments, command cells, and headquarters together and carried the whole flood of data across the airfield without it choking. None of these acts is violence by itself. The easy picture, that this was just plumbing, gets it wrong, because plumbing is passive and this was not. Water needs no skilled hands to keep flowing; the encryption did, the satellite links did, the datalinks did. I did not open a valve and walk away. I stayed, and kept the chain intact under fire, because I was good at it. The work was deliberate, and so was what it carried: it is what lets a decision reached in one country become an explosion in another.

This is not my reading alone. The Kandahar air-control seat is a rotating expeditionary billet, the 73rd Expeditionary Air Control Squadron, that one home squadron after another deploys to fill. An American squadron, the 603rd, out of Aviano, held it before the handoff; a Royal Australian Air Force detachment then took it in August 2007 and ran it until July 2009 as "Taipan" on a TPS-77 radar, not as an air-traffic desk but as a Control and Reporting Centre, a weapons node; and in 2009 it came back to us, my own home squadron the 606th deploying in its turn as the 73rd (Nautilus Institute, n.d.). Under the European base consolidation of 2015 the 606th would relocate to Aviano and take the inactivated 603rd's place there (Stars and Stripes, 2015), so my own squadron came to occupy the home, and take up the mission, of the one that had held this seat before me. That earlier squadron deployed with an intelligence officer on its manning, a billet an air-traffic-control service has no use for, and it described its own work without euphemism. Its director of operations said the unit gave ground forces the air support to "prosecute targets at will"; its operations superintendent put it more plainly, that the job was "putting bombs on the bad guys"; and its intelligence officer described the mission as coordinating air support for forces "engaging remnants of the Taliban," with air control itself, the same account noted, only one part of what the unit did. A squadron manned for intelligence and on the record about putting bombs on people is not plumbing, and it never claimed to be (Gregory, 2007). And

the earlier squadron was not the whole of it: in 2009, the year I was there, the 73rd's director of operations said the picture we built was what let aircraft "put bombs on target" (Smythe, 2009). And a later commander of the 73rd drew the line from air traffic control himself: 'we are similar to air traffic controllers but instead of keeping planes away from each other we bring planes to the fight' (Skinkle, 2012).

By mid-summer the site was fully operational, and the 240-nautical-mile radar air picture finally snapped into clarity, as if the sky itself had been drawn into sharp focus for the first time. The two TPS-75 long-range radars, massive, trailer-mounted systems with their enormous, slowly rotating antennas mounted on towers that were eventually placed under radomes, the weatherproof shells that cover an antenna without blocking what it sends and hears, began sweeping uninterrupted arcs across the horizon, capturing every aircraft, every drone, every fleeting blip of motion within that vast radius. The radars were three-dimensional, reading range, bearing, and height, and they sorted the moving aircraft from the stationary return of the terrain. That primary picture traveled to our operations modules over the fiber we had buried (Kurle, 2006). The air picture was not a static map; it was a living, updating mosaic: primary radar returns painting the blips, secondary Identification Friend or Foe (IFF) interrogations tagging friendlies, datalink overlays adding altitude and velocity, and SIGINT cues flagging emitters.

The picture was more than ours. The other services fed their radar into it, the Army's air-defense radars, the Marine air-control net, the AWACS early-warning aircraft overhead, and we tied in the civilian air-traffic radars too, so that what we compiled and sent back out was not one squadron's view but a single correlated picture of everything in the sky: the SIGINT collectors, the A-10s and F-16s, the Predators and Reapers and the U-2, the KC-135 tankers and the C-130 transports, the helicopters, the AWACS and the ground-watching JSTARS overhead, friend and unknown alike, each track tagged by its IFF, the no-strike sites drawn on top. In one of our own technicians' words, the other services "each send radar information to us, and we compile it into a total air picture and send it out to everyone again in a continuous 24-hour loop" (Skinkle, 2012). We were, in the squadron's own phrase, "the eyes of the warfighter in RC-South" (Saldukas, 2013). That combined picture was targeting data. It was what a battle manager cleared a shot against and an A-10 or F-16 put a weapon on. Our own interface-control officer put it plainly: "leaders are basing their critical decisions on our data link pictures" (White, M.B., 2010). The object, in the words of the reachback crew at Al Udeid, was to "shorten the kill-chain" (White, K., 2010). Their commander named what that reachback ran on: the aircraft over Afghanistan were controlled "through radars and radios piped into us from Afghanistan," the ones we kept open, used "to control aircraft, moving them from point A to point B" (White, K., 2010). The command and control at Al Udeid was our picture, worked from a thousand miles away.

We were covering a battlespace that stretched from the Pakistan border crossings near Spin Boldak in the east where trucks and fighters slipped across the Durand Line, deep into the river valleys and poppy fields of Helmand and Farah in the west, up toward the high plateaus and mountain passes of Uruzgan and Zabul in the north. Our area of responsibility, the AOR, represented roughly 250,000 square miles of contested, unforgiving terrain (Saldukas, 2013), where line-of-sight communications died quickly against ridges and dust, and ground forces depended on airpower not just for support but for survival. The picture was worth something only if it could be trusted, and keeping it true was the work: let it fill with ghost tracks, let the controllers stop believing it and fall back to talking blind, let the radio reach die in the valleys where terrain breaks line of sight and a patrol's call for help never clears the ridge. Take the node out and the air war over the south does not go dark, it degrades, the air arriving slower, or in the wrong place, or not in time, and in a firefight that gap is counted in minutes. It was not support laid alongside the war; it was structurally required, and the killing and the saving both ran through whether it held.

At Kandahar we operated as the 73rd Expeditionary Air Control Squadron, callsign Double Dagger, two radar sails at two sites on Kandahar, doctrine built on overlapping coverage and no single point of failure (Smythe, 2009). The name was not decorative. It described how the unit was designed to operate: distribute across two nodes so the air picture holds even when one goes down. In Afghanistan in 2009 the 606th Air Control Squadron and the broader network it belonged to went everywhere the architecture was: traversing the country, building communications infrastructure including cell towers whose dual civilian and military use was understood by everyone involved. At Kandahar that footprint took the form of the 73rd, building the air picture from nothing, and at Al Udeid in Qatar the form of the 71st Expeditionary Air Control Squadron, callsign Pyramid, the node that received what Kandahar sent and translated it into the daily Air Tasking Order, the airspace deconfliction, the strike authorizations (Eidson, 2009; 71st EACS, 2014). But Kandahar was more than the eyes. We ran our own controllers in the operations modules on site, so the airspace could be worked from the forward edge and not from Qatar alone; the picture and the control both lived forward as well as in the rear, so that if the long reach-back to Al Udeid dropped, the air war over the south did not drop with it. The British ran their own equivalent at Al Udeid, No. 83 Expeditionary Air Group of the Royal Air Force, inside the same coalition command (No. 83 EAG, n.d.). Their Reapers made the dispersal plain. A single airframe was launched and recovered by a small British team at Kandahar, then flown on its mission by an RAF squadron sitting at Creech in Nevada, inside an American wing, and tasked through the coalition's command in Kabul and the Gulf: one aircraft, its work scattered across the globe, and no single hand on the whole of it. My career

field spanned the chain from the ground up. I was one node in that. I knew what the other nodes were for. I knew the people in them: combat-communications crews at Ramstein, our own at Al Udeid, men who had shared our office back at Spangdahlem coming through Kandahar on their way out to the FOBs.

Every cryptographic key I loaded authenticated the continuation of those flows, placing me and my squadron silently within a distributed decision-making loop that extended far beyond the dimly lit container where we sat. This was evidenced in the Meritorious Unit Award my squadron earned, in the Firewall 5 performance reports I carried, the top rating the system handed out as a matter of routine and good enough for several individuals in my unit to use in obtaining promotions, and in the squadron's Airman of the Month, which I was given for July 2009 (Smythe, 2009). That was the month the 73rd site took full control of the mission from the Royal Australian Air Force on Palomino. Ground forces on patrol would call for support over secure voice nets; unmanned platforms like Predators or Reapers loitered at altitude and fed streaming video and metadata; analysts at distributed fusion cells combined radar tracks with SIGINT and HUMINT (human intelligence); air battle managers in the ops shelter deconflicted airspace and prioritized targets; and pilots, sometimes sitting in climate-controlled trailers in Nevada, sometimes in cockpits overhead, executed "effects", the bland word the system used for the strike itself. The loop was not linear; it was a web of partial responsibilities, each node dependent on the others, each link vulnerable to failure yet resilient through redundancy. I could hear the radio chatter spike when a JTAC called "enemy in the open," see the radar scope light up with new tracks, watch the chat windows scroll with target coordinates and clearances[1], watch the datalink confirm a Reaper's sensor feed aligning with the ground report, but I never saw the final moments that found their way into my nightmares. That, for me, was what the system produced: the lethal act came to feel like a distant consequence of someone else's decision, even as every key load, every relay check, every fiber termination I had personally overseen kept the chain intact.

That same report carried another number. Over two hundred enemy killed. To my unit it was a line of merit, the kind of figure that helped several of them make rank. I could not read it that way. Coming home from work at Spangdahlem in late 2009 I broke down and could not stop crying, and I told my girlfriend that my

[1] The medium was Internet Relay Chat. mIRC was the dominant client, one of several (with MS Chat and Jabber) running on the CENTCOM chat servers, Al Udeid among them, and was shareware written by a single developer. A study of military chat places it inside the sensor-to-shooter loop, recording a soldier "in mIRC Chat talking to Air Force FAC … verifies grid and confirms target. Air force destroys target," and notes of that authorization that "this does not mean the risks were mitigated, but only accepted" (Eovito, 2006). The multiservice tactical-chat manual credits the medium with having "reduced the kill chain" by consolidating airspace coordination into a single room (Air Land Sea Application Center, 2009).

performance report said I had helped kill more than two hundred people. I had already been waking from nightmares I could not place. I did not know what to do with any of it, so I kept it inside and punched walls. The architecture had entered the dead in one column as an achievement and handed me the tally as a reason for promotion. I received it as a body count, and I have never since been able to receive it as anything else.

The squadron's infrastructure, built on what we established, carried the operational tempo of the air war after I flew home: in a documented thirty-day period that autumn, once I had rotated out, the site supported close to 1,050 unmanned aerial support missions, some 770 intelligence, surveillance and reconnaissance (ISR) sorties, 700 transports, more than 470 close air support operations, nearly 400 air-refueling missions, up to 190 troops-in-contact engagements, around 60 special operations missions, and two combat search-and-rescue missions (Smythe, 2009). The drone flew on a satellite link back to its crew in Nevada, but it did not coordinate with the war over that link. To sit in the common air picture, to be deconflicted, to pass and take tracks over Link 16, the tactical data link, to get the clearance to fire, it had to be on theater comms, the same backbone we held open, reaching the aircraft through the airborne relay, the BACN, the Battlefield Airborne Communications Node, whose equipment, though my performance report never listed it, was wired directly into our site. Airborne communications gateways like the BACN platforms operated and maintained by Northrop Grumman, housed in high-altitude Bombardier Global Express jets carrying agnostic relay pods, orbited overhead for hours at a stretch, bridging formally unconnected tactical datalinks across valleys and ridges where terrain swallowed line-of-sight signals and created dead zones that would have isolated units otherwise (Air Combat Command, 2023a). Those platforms took the fragmented feeds from ground patrols, drones, and manned aircraft scattered across the AOR and stitched them into a seamless, coherent whole, extending our effective coverage far beyond what the ground-based radars alone could achieve. The drone's own satellite link was no exception: it came to ground on theater soil and merged there with everything else. There was no private drone channel sealed off from the rest; the coordination lived on the network we ran. The rear node's commander described the drones in exactly those terms: "We've got UAV pilots in theater we're in contact with 24/7 in chat rooms. Their UAVs are flying around in this airspace and they're not always aware of who's around them," so his squadron built them a shared airspace picture to fly by (White, K., 2010). Manned aircraft integrated into the same air picture for deconfliction and close air support.

The architecture dispersed responsibility across roles, technologies, and distances. I helped create the pathways that carried the signals; others interpreted them, others decided, others acted. The moral friction that should exist between

intent and consequence was attenuated by the system's architecture. Mediated perception, divided labor, and physical separation made it possible to participate in lethal acts while remaining at arm's length from their human reality. Hannah Arendt identified this structure in a different context and gave it a name: the banality of evil, her finding that atrocity is enabled not by monsters but by ordinary people performing routine tasks without moral reflection, each node in the chain doing its job while the aggregate produces an outcome no single node would choose alone (Arendt, 1963). Loading a cryptographic key is not an act of violence. It is an act of maintenance. The Kill Cloud is built from acts of maintenance.

That same network carried the night raids. They were escalating sharply while I was there, from about twenty a month in the spring toward ninety by the fall, and RC-South was among the heaviest ground for them in the country (Porter, 2010; Billing, 2022). My node did not order them or run them; it made their air component possible: the air picture that kept the gunships, Reapers, and F-16s deconflicted over a raid in progress, the retasking that turned an aircraft toward a compound on a moment's notice, and the BACN relay a controller on the ground used to call air down through mountains where line-of-sight died. By UN and Afghan estimates those raids caused more than half of the civilian deaths coalition forces inflicted in Afghanistan that year (Porter, 2010). The home invasion in the dark, the most hated thing the war did to Afghans, took its air support from the same node that carried everything else.

I had seen the shape of all this before I had any way to say it. I wrote the following in a notebook in my cot that summer, a week after we were told the system was operational and that we were killing bad guys now.

The Nightmare Box

Who is he that stands,
in this place of
blazing sun and parched land,
for which men play cowboy to their perils
in ignorance and futility?
The man who stands between executioners and the accused...

misguided men with the power of God,
with such oracles built unto them that enable swift judgment
for alleged crimes based on hearsay and happenstance...

Through lights flickering in the absence of illumination, he witnesses darkness.
With unseen hands writing commands like hoodoo priests
They curse lands with spells that deprive heaven of its sanctuary.
The destruction of worlds.
Brought forth by legions of faceless mancers provoking heartless flying beasts.
They rain fire from hell down on the unsuspecting.

Intermediary to the child and the shadow
The man listens as the echoes of unknown voices coldly reverberate
Target locked, Rifle, Splash....
And the child beckons for a savior but...
Transfixed, yet choosing
He panders to the malevolent
The child disappears and he is left in darkness

Senior Airman Cian M. Westmoreland,
Kandahar Airfield, Afghanistan 2009

I did not have the argument then. I had the box, the voices in the headset, and the child who disappears. The pages that follow are only what I have since made of what I had already seen.

It begins with a question I could not put down: along a chain of hands, where does a killing actually sit? Take the plainest hard case, an air-dropped landmine, where the death comes years later as a footstep on a charge scattered and left, never buried. It earns that name because there is no hand at the end to point to: no one is near it when it kills, and still every hand behind it helped make it. Walk the chain back looking for the one hand it belongs to, past the crew who loaded the canister, the pilot who let it go, the planner who drew the dispersal box, the engineer who shaped the fuse, the authority that bought and approved the program; there is no principled place to stop. None of those acts was the violence itself, and not one of them stood outside it; each was constitutive of the killing, part of what it was made of. That is the position this paper is written from: not the hand that executes, not the bystander who stands clear, but the one the killing was built out of, however far back along the chain he worked.

And the same is true at the other end of the chain. The pilot who pushes the button to release the weapon is, in that instant, doing nothing different from pressing any other button; the gesture carries no violence of its own. What makes this press a killing is everything behind it: the picture that found the target, the judgments that classified it, the chain that cleared the shot. Strip that away and the button is just a button.

The obvious objection is that this proves far too much. If the killing is not in the pilot's act, and not in mine, and not in any single act along the chain, then on this account no one killed at all, which is both absurd and the exact dissolution I mean to expose rather than excuse. Worse, it seems to hand every triggerman the oldest alibi there is: I only pushed a button. The objection is right about the danger and wrong about the point. The claim is not that the pilot is innocent; he is not. It is a claim about where the killing sits as an act, not about who answers for it. The pilot answers fully, and not because his finger did something a finger does not otherwise do. He answers because he knew what the button was for and pressed it anyway, as a knowing participant in the chain that gave the gesture its meaning. That is the point turned around. If even the pilot, the one act everyone is certain is the killing, is responsible through participation rather than through the bare nature of his gesture, then the maintainer and the analyst and the rest are responsible on exactly the same ground, only further from the effect. The argument does not level everyone down to innocence. It levels everyone up to the pilot. The alibi fails for him for the same reason it fails for me at the key: we both knew what the gesture was for.

That levelling has a second edge, and it cuts harder than the alibi it answers. Set down plainly what makes any of these gestures a killing. It is never the motion itself.

Depressing a trigger is a finger closing on a lever, a thing the body does a hundred times a day with no harm in it; loading a cryptographic key is a string entered at a terminal; terminating a fiber is a connector seated in a port. Not one of these is violence in itself. Each becomes violence through one thing only, what it is constitutive of, the harm it brings into being and without which that harm could not have occurred. That relation, and nothing nearer the body, is what made the pilot's press an act of war, and it is the only criterion there is. We grant it to him without noticing: we do not say he moved his finger, we say he killed the man, redescribing the small motion by the large effect it was constitutive of. The refusal to carry that same redescription back along the chain, to the key, the relay, the picture, is not a discovery about the world. It is a habit of attention, and it is the habit the whole dissolution leans on.

Carry it back honestly and the chain stops looking like one trigger and a file of bystanders. It is trigger pulls the whole way down. The crypto load was my trigger pull, and the keys were the NSA's to make and control, so the trigger I pulled was one the NSA had armed. Standing the link up was my trigger pull. The air picture the RIC, the Regional Interface Control cell, assembled was its trigger pull, and the battle manager turning aircraft toward the fight pulled one too; the crew at Creech and the pilot overhead pulled the last in a long sequence, and theirs carried lethal meaning only because every earlier pull had already been made. The press we all picture, the finger at the end, has its violence conferred on it, in advance, by the work that found the target, drew the box, cleared the airspace, and carried the order; strip that work away and the finger closes on nothing. The man at the end is not the author of the killing. He is the last to touch it.

Once each act is seen as the trigger pull it actually is, the scale we trust turns over. One trigger pull is one bomb on one house, in one engagement the pilot weighs case by case and can still refuse target by target. One crypto load is a trigger pull across the whole AOR: every box, every clearance, every aircraft vectored to a target, for as long as the link held, against people I would never see and could not have named, on days I would never hear about, riding on a single act I performed once and walked away from. By the one measure that makes the trigger an act of war at all, the standing work that conditions a thousand strikes reaches further into the killing than the hand that fires once. The oldest intuition we hold, that the nearer the hand sits to the blast the deeper its part in the killing, does not simply fail here. It runs backward.

And even that understates it, because proximity is the wrong axis. I was not a distant version of the trigger-puller; I was the condition of the trigger's existence in that configuration. The analyst has a review, the operator a read, the pilot the release, and each is a thread in the weave. What I provided was the loom. The image is exact, not decorative, because the apparatus depends on the threads and

the loom being confused: a thread is placed into a weave already made possible; the loom determines what weave can be made at all.[2]

I have to be exact about the one thing the far hand does not have, because it is the only true asymmetry and it does not rescue the trigger. The pilot, in principle, has the encounter. He has the person in the reticle, the last look, the chance that the world breaks through the model and he lifts the weapon away. I had a key, a terminal, and a target set I never met. But that absence is not my innocence. The distance that gives the architecture its reach is the same distance that takes the person away. My act was made the most far-reaching and the most blind in one stroke, and the recognition that might have stayed my hand was not removed to free my conscience but simply never laid on the path my work ran along, a path that only grows longer as the architecture grows. The same lengthening is reaching the pilot's seat now, through the kill box and the pre-sorted scene that settle what he sees before he looks. The single distinction the trigger ever stood on is dissolving from both ends at once.

The word carries a second meaning here, the one the laws of war are built on: distinction, the duty to tell the target that may be struck from the one that may not. The pilot can in principle perform it, target by target, because he has the target in front of him; it is the same encounter, read now as a legal duty. I had no target in front of me. I had the whole flow, and my node offered one choice only, to keep it open or to shut it down, never to sort the lawful strike from the unlawful one inside it, because where I sat the two were the same signal. My reticle was the whole of Afghanistan, and a reticle that wide cannot discriminate at all. The only sense in which my participation was discriminate is that I trusted the man at the trigger, and every process that fed him, to discriminate for me. Which is to say that it was not, because I did not. I had no way to test that trust, and I was being given reasons to withhold it: that precision did not reliably mean precision, that the thing being matched was at points as crude as the color of a man's clothes, that the appetite higher up was for cameras on the warheads, to watch the last seconds of the fall. I kept the flow open anyway. That is the whole of what my discrimination came to. A bomb does not discriminate who gets hurt in the explosion.

What is left when that distinction goes is the production itself, and no one standing in it who is the author of the whole. The killing is made the way a film is made, entirely by human beings and by not one of them alone; take out any role, the relay, the picture, the battle manager, the crew, the jet, and there is no killing,

[2] The philosophy of drone war has mostly stayed with the man at the controls, Chamayou's hunter at the joystick, and with the hunted beneath him (Chamayou, 2015; Gregory, 2011). I was neither. This runs the other way along the chain, to the node that conditions the strike before an operator is ever at a screen, and there the intuition those accounts leave standing, that nearness to the trigger measures nearness to the killing, turns over.

and yet none of them made it the way a painter makes a painting. Each of us was a performer, only ever that, and the architecture lets every one of us rest in the truth of it, and the truth is real. A killing that everyone performs and no one authors alone is a killing with no one left to answer for it. That emptiness where a single author should be is not a fault the system has yet to fix. It is the shape the system takes when nothing in it has failed.

The production runs deeper than the roles. Not one act in the chain is a hand laid on a body. The release that drops the bomb is a circuit closing, a signal sent; the jet that carries it flies and fights on what it is fed. The wiring is a nervous system and the weapon is the muscle that moves only when the impulse reaches it, and the impulse ran on the links I kept open. Even the blast is a production. It was built and armed and shaped by hands that were never there, set off by a signal, finishing itself in the half-second after the trigger on settings someone else had dialed. Nowhere along the whole length of it does the killing stop being made and become one person's act, not even at the explosion. But the wire cannot refuse, and the bomb cannot refuse. We could. We could step off, at a price most would not pay, and mostly we did not. That is the one place the people in the chain are not like the parts.

None of this was a failure of conscience in the ordinary sense, and the architecture depends on the inexactness of that word. I had understood since boot camp that my own decisions were no longer simply mine. I could still decide; what I could not do was decide against the institution, because a choice that performed the tasking was permitted and a choice that diverged from it became a problem to be dealt with. That is the first thing the institution does, before any skill: it conditions a fear of its own reprisal that outranks the fear of the battle, or of death itself. Refusal was never impossible; people have paid with their lives for refusals far smaller than the one available to me. But it was rare, and the system renders even the rare one weightless. Redundancy, designed so that no single point of failure can bring the architecture down, absorbs a refusing human the same way it absorbs a failed relay: a node lost, routed around, the seat filled by someone willing. The system cannot tell a conscience from a malfunction. Both are a fault to be covered.

The redundancy runs past the seat to the room it sits in. The ground stations that fly and fire are scattered across the country, active-duty and Air National Guard alike, so a strike can lift from any of a hundred rooms and no single one of them is where the war is. I was as replaceable as the newest airman, and so was any refusal I might have made: the system does not read a principled refusal differently from a personnel gap. It fills the seat, and the war flies from all the other rooms whether I am in mine or not. You cannot refuse a network by walking out of one of its rooms.

This is not only the refuser's account of himself. The operators who defend the work describe the same fungibility without alarm. In what he calls an authorized account of the sensor operator's job, a former Reaper crewman tells of a troops-in-contact call arriving during his training, before he was qualified to shoot: the instructor behind him tapped his shoulder, said one word, "Swap," took the seat, and he stood and watched it happen. The seat was filled the instant it had to be. What passing the bar later proved, in his own words, was that he "could be called on to do it again." The interchangeability of the hand in the seat is not a grievance invented by the ones who left. It is how the ones who stayed describe the work.

It is tempting to read that replaceability as exoneration, and most of us did. If the strike happens whether or not I am in the seat, what is my refusal worth, and what is my participation? But replaceability is a property of the role, going forward. It says nothing about the death that actually occurred, which was produced not by a role but by one specific configuration of people and machines at one moment. That configuration had a lineage, and everyone in it participated in what it produced, each in their own measure and none of them in the whole. The seat being fillable later does not unmake the hand that was in it then. The architecture trades on confusing the two, so that the fungibility of the role is felt as the innocence of the person.

There is a difference, too, between operating a system and building the one that others go on to operate, and it is the part that implicates me most. To lay the relays, terminate the fiber, load the keys, and stand up the radar picture is to set the conditions under which any strike at all becomes possible, before a single target is named, and it is the hardest agency in the system to feel, because it looks like infrastructure and not like agency. What I built outlasted me. I had assumed it ran on for years after I left; only recently, from historical satellite imagery, did I learn it did not go dark until November 2014,[3] more than five years past my rotation, the relays carrying the kill chain through the surge and the drawdown for the rotations that inherited them. That is what establishment carries: not the five and a half months I stood the watch but the five years the thing I stood up kept the air war running after me. I will not put a single number on the dead who passed through it in that time, because no honest count can be drawn to one node, and the attempt would be its own evasion.

That refusal is not the smaller claim; it is the larger one. Establishment does not divide into shares. To build the thing that made the air war workable is to stand

[3] The basis is historical satellite imagery read against my firsthand knowledge of the site. In the dated Google Earth frames the two radar radomes and the dish farm are in place through late 2014 and gone afterward; anyone can open the same coordinates and dates, and the identification is my own expert read of equipment I built and maintained. The date fits the regional drawdown: the 71st Expeditionary Air Control Squadron at Al Udeid, the rear node my site fed, deactivated in November 2014, and the ISAF combat mission closed at the end of that year.

behind the whole of what it did, not a slice of it, and what it did is on the record. Across the years the site ran, 2009 through 2014, the United Nations Assistance Mission in Afghanistan (UNAMA) documented 1,065 Afghan civilians killed by coalition airstrikes, more wounded than its early reports counted, and, in 2012, the one year the toll was broken down, fifty-one of the hundred and twenty-six killed from the air were children; the deadliest of the six years was 2009, the year I stood the site up (UNAMA, 2009a, 2010, 2011, 2012, 2013, 2014). I cannot count how many of them ran on what I built, and I will not invent the fraction. But the loom stands behind every thread, and I built the loom.

And it is not mine to gatekeep. The whole of it is there for anyone who served beside me to take up as their own, and I would want them to; one man carrying all of it takes nothing from another who does the same. What I will not do is set it down. I take it whole, in myself.

And it is not only what is built that outlasts the act; what is analyzed outlasts it too. An analyst flags a building, a vehicle, a pattern of movement, a name, in one context and for one purpose, and the flag does not expire when the context does. It is stored, and it can surface years later in the intelligence feeding a strike the analyst never contemplated. Outdated data of just this kind reached the Shajareh Tayyebeh school in Minab, in southern Iran, on 28 February 2026, the war's first day. A US strike destroyed it. The counts differ: 156 by the forensic investigation that reconstructed the strike, 165 by the Revolutionary Guard's final tally, near two hundred in American reporting. Most of the dead were children. A preliminary US military inquiry concluded that American forces were responsible, that Central Command had built the target coordinates from Defense Intelligence Agency data still coding the building as the Revolutionary Guard base it had been years earlier, before it was walled off and turned into a school, and that commanders had overridden the targeting system's own warnings that the intelligence was out of date (CNN, 2026; NBC News, 2026; Just Security, 2026). The formal Army Regulation 15-6 investigation remained open; UN bodies, Human Rights Watch, and Amnesty International called the strike a grave violation of humanitarian law and examined it as a possible war crime (UNESCO, 2026; Human Rights Watch, 2026; Amnesty International, 2026; Al Jazeera, 2026; Reuters, 2026a). The system retains everything, and so a judgment made once, in one frame of mind, stays available to outcomes its author would never have authorized. The lineage of a death runs backward in time as well as outward across roles. It gathers in people who long ago stopped thinking about the thing they once flagged, or built, or maintained, and who would be astonished, and some of them destroyed, to learn what it finally became part of.

This attenuation of the tie between act and consequence became a fundamental part of my moral injury.[4] I could no longer trust that my everyday activities weren't killing people, and I have pathologically interrogated every piece of technology I have touched since. The 73rd EACS site was one tactical node in a vast distributed architecture, not the backbone of the global command and control (C2) system, but a concrete, documented instance of the same pattern that now operates at planetary scale. The accountability problem I have been describing is not located in any single node, including this one. It is structural. The networks I helped stand up enabled violence whose full weight fell on others, while the ledger of accountability remained fragmented and deniable.

That a person loading a cryptographic key over a morning coffee can enable more harm than the best-trained sniper is something about modern warfare nobody likes to think about. It's not expedient for commanders to give credence to the moral weight of keeping a signal path open to bomb people, it's not consonant with any warrior ethos, and people would rather dismiss this convergence as hyperbole than accept it as a fundamental departure in human accountability, especially with regard to claims of trauma.

My primary motivation in making my role known was not to garner sympathy for my resulting mental health crisis, but to make visible what was intentionally made invisible, to warn the world, to take responsibility for what I did, and to fight for the Supremacy Clause of the Constitution I swore an oath to, binding my nation to International Law (U.S. Constitution, Article VI, Clause 2).

I have often thought about that ledger: we think we know more than death, that we can sort it as it happens into murder or self-defense, combatant or child, effect or killing, in support of abstract pretenses and socially constructed entities. But those are the only things in it that are constructed. The death is not. Death takes the combatant and the child the same way and recognizes none of our headings, and the certainty that we can tell them apart, especially from a screen, is the same certainty that keeps the two columns of the ledger from ever being read on one page.

[4] Günther Anders called this the Promethean gap, the lag between what our hands can make and what our minds and hearts can take in of what they have made (Anders, 1956). The architecture does not merely suffer that gap; it engineers it, cutting the deed from the feeling of the deed and then filing the feeling, when it comes late, as the operator's private disorder rather than its own design.

2. Two Columns at One Node: A Documented Case

The ledger of the dead had two columns, and I stood at the edge of both. One of them was ours.

The Vigil

A call for arms raised to our brows
To stand in rows for fallen men

Carried on the shoulders of crying friends
In flag draped pinewood boxes

Bagpipes hum the sullen songs
Of countries from which we belong
Like the Pied pipers that lead children to their deaths
They march ahead and we follow them

In our youth we fought evil within our dreams
And lead green figurines against monsters
One day as soldiers we'd be hardened men
Fighting in wars in which we'd mythologically transcend
The dullness of obscurity

Yet here we stand only frozen by each other
Watching broken souls hold back bitter tears
For the heavy weight that they will always carry

The student, the son, the brother, and the husband
who'd never marry

The officer in command reads a man's eulogy
A rare display of appreciation
Words of bravery and selflessness
The last statements of those with whom he served
A name that will never be forgotten
One soldier dies as a hero is born

To give purpose to the loss which they'd mourn
The Chaplain mans his oaken podium

Imparting his prayers and lessons of faith
A bugler raises his horn as we raise our wavering hands
The haunting song that ends our days
Minutes of silence follow as they raise the ramp
In a day, a family will receive their only son
A father retreats into silence, and curses himself
The mother will rip out her hair in grief
His younger brother will lose his mentor
A fiancée after months of waiting…
Will rather kill herself than go on one more day
I watched seventy one sons
I watched seventy one brothers
I watched seventy one lovers lost
I watched an untold number of children left without their fathers

And seventy one best friends gone
For what?
A fantasy overshadowed by the reality of war
My eyes demanded my inner humanity to emerge
To pierce through my military lens

Within these pinewood boxes, we are never alone…

Cian M. Westmoreland,
Kandahar Airfield, Afghanistan 2009

I stood in the corridor of formed personnel for fifteen of those ceremonies across the deployment, and not one was for a single man. The poem counts caskets, not ceremonies: seventy-one across the fifteen, never fewer than four at a time and as many as ten. After about the fourth ceremony I began to zone out, and by the fifteenth I was trying not to think about what we were doing. I stopped seeing the grief in the troops around me and started seeing blank faces like my own. The number is my estimate, drawn from the multiple caskets I watched carried past at every ceremony.

Their photographs the country had forbidden for eighteen years, a ban lifted only weeks before I deployed (CNN, 2009). Stryker Brigade soldiers came home through those ceremonies; their brigade, the 5th Stryker, lost thirty-two men in its first months at Kandahar (DVIDS, 2010), and one of its battalions, the 1-17 Infantry, counted twenty-two dead and some seventy wounded over the year (NBC News, 2010). An entire squad of them would be killed by a single buried bomb in the

Arghandab that October, weeks after I flew home (Military Times, 2013). My fifteen were a fraction of what the airfield held; the squadron's own tallies run into the hundreds across those months.

2009 was the deadliest year of the war to that point, 521 coalition dead across Afghanistan (iCasualties, 2009); July that year became the deadliest month of the war for coalition forces so far, a record August then broke (iCasualties, 2009). In the months I was there, of some three hundred coalition dead in the country, more than half fell in the southern region the airfield served (iCasualties, 2009). The fallen who passed through Kandahar were not all American. Canada's Task Force Kandahar lost more than thirty that year (iCasualties, 2009), almost all of them in the same province whose air picture we were building, and the corridor I stood in was as often Canadian or Dutch or British as it was ours. And every ramp ceremony required our links to fly those soldiers home.

No single politician or general was there saluting these men; it was people like us. I do not want to downplay the horror I witnessed in every one of those caskets, or the horror my own mother would feel were I in one of them. Their names, all one hundred and sixty-five, are set down in Appendix B.

Not every death passed through that corridor. A contracted helicopter, a Russian-built Mi-8, crashed on takeoff and burned; sixteen died (Stars and Stripes, 2009). I was on my morning run around the base, out by the flightline, when it came down, and I saw people on fire. Our squadron medic ran to them, and several of us gave blood for the wounded. They were contract crew and passengers, not soldiers, and they got no ramp ceremony, no corridor, no salute.[5]

The other side of the ledger looked like this. During the months I was there, April to September 2009, the same infrastructure, one node among many in the southern Afghanistan command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR) architecture, supported airstrikes that produced documented civilian harm in the provinces we covered. The fraction attributable to our specific site is difficult to quantify; the pattern of which it was a part is documented, and had been for years before I arrived (Human Rights Watch, 2008). In the southern provinces whose air picture we held, several airstrikes in those months killed civilians in numbers the record still carries. On 28 July, in the Mizan district of Zabul, an ISAF helicopter chased fighters on a motorcycle into an

[5] The same corridor, and the same sight from it, are on the record from another man. Chris Antal served as an Army chaplain in Afghanistan and attended the transfers at Kandahar Airfield, where the fallen soldier's name was read out and Taps was played, and his work there was to keep the men able to go on. Behind the corridor he watched the drones taking off and landing. The contrast between the ceremony and a campaign whose dead had no names jarred him. "I felt something break," he said. In April 2016 he resigned his commission, writing to the president that he could not support a policy of "unaccountable killing" that granted the executive the right to "kill anyone, anywhere on earth, at any time, for secret reasons". The record dates his resignation and not his tour, so it does not place him in these fifteen (Press, 2018).

orchard where villagers were working and killed six people, two of them children, wounding six more; ISAF acknowledged the strike, and UNAMA set it down (UNAMA, 2009a). On 27 April, outside Lashkar Gah in Helmand, a house collapsed under a strike close by, and two people died inside it (UNAMA, 2009b). And on the night of 23 September, in the Nagahan area of Kandahar's Arghandab, gunship helicopters bombed a cluster of houses for an hour; by morning six bodies had been pulled from the rubble and seven wounded had been carried to Mirwais hospital in the city. The residents said there were no fighters among them; the provincial police called the dead insurgents, five Taliban killed and fifteen wounded; and the foreign forces at Kandahar said nothing at all (Pajhwok Afghan News, 2009). These are a sample and not a census, only the ones open sources happened to keep; how much of the wider toll ran through any single node, mine among them, cannot be recovered from them.

They sit inside a wider pattern the numbers make plain. Across those same months, UNAMA attributed seventy civilian deaths in the southern region to pro-government forces (UNAMA, 2009a). How many of those seventy came from airstrikes specifically the report does not break out by region; applying the share airstrikes held of pro-government killing nationally puts it on the order of forty, but that figure is an inference of mine, a reasoning from the numbers and not a count, and I hold it loosely.[6] But the seventy is only the southern region UNAMA draws, and our radar swept wider than that. Its two-hundred-and-forty-nautical-mile reach ran west into Farah, where, inside my window, an American bomber killed sixty-four at Bala Baluk on 4 May, or nearer a hundred and forty by the Afghan government's own investigation, ninety-three of them children; Farah UNAMA files as western, so those dead sit outside the seventy (UNAMA, 2009a; Pulitzer Center, n.d.). Counting the south and that western reach as one, the documented dead inside my own radar footprint run past a hundred and thirty. And the picture we compiled and sent up reached past the radar itself, over the sky of all Afghanistan in the squadron's own account (White, M.B., 2010), as far as the German-ordered strike that killed seventy-four at Kunduz in the north on 4 September, by the villagers' count as many as a hundred and forty-two dead, at least eighty-three of them civilians (Amnesty International, 2009). Across the whole country UNAMA counted three hundred and twenty-four civilian deaths at pro-government hands in those months, on the order of two hundred and forty of them from the air, the year's two deadliest airstrikes among them (UNAMA, 2009a). What fraction ran through my node is past

[6] Nationally, UNAMA attributed 359 of the 596 civilian deaths caused by pro-government forces, 61 percent, to airstrikes and close air support. Applying that share to the seventy southern deaths in the deployment window gives roughly forty. A top-down pro-rating of the national airstrike toll to the 45 percent southern share and across five of the year's twelve months gives a higher figure, but the deadliest airstrikes of 2009, at Bala Baluk in the west and Kunduz in the north, fall outside UNAMA's southern tally, which inflates that estimate and argues for the lower, bottom-up number.

recovering, the same as in the south; the reach is not. Nothing that entered the network stayed inside the regional-command lines drawn on the map: the architecture was federated by design, and a track, a picture, a datalink message went where the theater needed it, not where my AOR ended.

What can be documented about the node itself is narrower and firmer. The 73rd EACS site was the principal air command, control, and ISR node for southern Afghanistan through those months, in the region where nearly half of all the civilian dead UNAMA counted that year fell (UNAMA, 2009a), and the strikes in the provinces it covered ran on the categories of networked air-ground coordination it enabled. Which of them ran through my equipment is not recoverable, and the diffusion of roles that makes it unrecoverable is the same diffusion that let each of us call the work facilitation rather than participation.

The consequences continued after I rotated out in September 2009. The site we established remained operational, and the same networks, now maintained by follow-on rotations from the squadron, supported operations into 2010 and beyond. One of the clearest examples came just five months after I left: on 21 February 2010, near Khod in Uruzgan's Shahidi Hassas district, OH-58D Kiowa Warrior helicopters firing Hellfire missiles and rockets, cued by a Predator drone crew at Creech Air Force Base in Nevada, opened fire on three vehicles mistaken for insurgents, killing twenty-three civilians, among them women and children, and wounding twelve (Cloud, 2011). The incident illustrated the same pattern: multi-aircraft coordination enabled by persistent networks, roles divided across ground spotters, drone operators, helicopter pilots, and command nodes, and obfuscation through technology and distance.

The mechanism is worth naming exactly, because it is the clearest thing the air picture we built actually did. Our work at Kandahar was to assemble and hold the radar picture for southern Afghanistan and feed it up the chain. Battle managers at Al Udeid worked from that same picture to move aircraft and clear fires, the brain center, in their own public description, for every air asset supporting ground units in the theater (Stratton, 2013). The drones needed that management most of all. A pilot in a cockpit can see the airspace around him and avoid what he is warned about; the crew flying a Predator or Reaper sat in a trailer on another continent, watching through one narrow camera with a lag on every movement, with almost none of a cockpit's sense of what else was in the sky. They oriented themselves instead from the common operating picture, the COP, the shared rendering of the battlespace assembled in good part from the radar and sensor feed we produced. The world a drone commander could see and act within was, to that extent, a thing we built: the friendly positions, the airspace, the boxes drawn on the map, all of it reaching the crew as a picture rather than as sight. His own camera showed him the ground; our picture told him what the ground meant and what he was permitted

to do there. The remotely piloted aircraft, the one sold as autonomous, in practice required more battle management than the manned aircraft beside it, not less, because for its crew the network was not an aid to perception. It was perception.

The Khod strike ran through one of those boxes on the map. A kill box, in the military's own language a fire support coordination measure, is one of the things painted onto that picture: an area drawn on the shared map, for a set window of time, inside which aircraft may engage without seeking approval case by case from a higher commander. It pushes the authority to kill down to a lower level and ties it to a place rather than to a proven threat. The box over Shahidi Hassas had been drawn earlier that day into the airspace control order, the daily document that sets who may shoot where, by a duty officer on the floor of the air operations center, for a separate operation it was meant to support. The investigation that followed described that authority a second way, and both belong here. In its account the measure over that ground was a restricted operating zone the fires officer at the special operations task force had set up, so that once aircraft were on station they answered to the controller on the ground and the commander he served, and the whole of it sat within that commander's authority. He cleared the strike himself, as self-defense, and never sent it up for the deliberate approval a planned engagement would have required, the approval an officer at the task force said afterward he would have refused: had the commander asked to engage the convoy, we would have stopped that (Cloud, 2011). The people in the three vehicles did not know it was there. They were not judged one by one; they were judged by where they were and when. Being inside the box was enough to move the default from restraint to engagement, so that the grainy feed, the analysts' inexperience, and the crew's leaning toward action met no higher check that might have caught the error.

The strike became more widely known through the documentary National Bird (Kennebeck, 2016), which interviewed survivors and three whistleblowers from inside the system: Heather Linebaugh, an imagery analyst who screened feeds from DGS-2, one of the distributed ground stations where the drone video was watched and analyzed (Linebaugh, 2013); Daniel Hale, a SIGINT analyst based in Kabul (Devereaux and Hussain, 2021); and Lisa Ling, a technician who built out C4ISR architectures for remote warfare (Ling and Westmoreland, 2021). They were not in some other machine. Linebaugh and Hale read the screens and the intercepts, Ling built the C4ISR, I held the air picture and the links, and it was one kill chain seen from different seats.

The aircraft that did it ran on equipment I had set in place. The picture was not the only thing we made: the long-range command-and-control radar, the ground-to-air radios, and the datalinks the air war ran on were ours. The radar was the only one of its kind in the country, apart from the airborne AWACS, which did not fly our

airspace. So the helicopters that fired, tasked back through Regional Command South at my own airfield, and the jets overhead, were moving on the link I built and the radios I maintained, and the drone that watched the convoy was a track in the air picture my node held. I connected that radar myself. I set the satellite terminal, the radio-frequency-to-digital conversion, and the secure-voice encryption that turned a controller's voice into ciphered bits before it crossed the air and back into speech at the far end, and I kept the link up the whole time I was there. By February 2010 I had rotated out, but the equipment had not, and someone I know was holding it. The drone was flown by a crew in Nevada, but the link they flew it over came down on our own field, at the reconnaissance squadron we patched into, where the Predator's primary satellite link sat. The crew sat in Nevada; the link did not. Everything came through Kandahar, through what I had built and left running.

3. The Category and the Face

When I got out, I crossed the world overland, without a phone, reconnecting with a humanity my privilege had let me go and find.

My travels are what made me study international affairs. The year between the air force and university took me across the world, through one violence after another, no two of them the same. At Zaporizhzhia I walked the ground, played volleyball, put my feet in the river; the war has since soaked that ground with Ukrainian and Russian blood. I stood on the roses of Sarajevo, the scars the mortars left in the pavement where people had died, filled in red. I walked the fields of Gallipoli, where Churchill's scheme left a quarter of a million Allied casualties, among them the Australians and New Zealanders shipped across the world to die for a plan drawn in London. I saw the buildings the bombing left standing in Belgrade and in Gori, one of them ours. I stood in Tiananmen Square and saw Mao's corpse under glass. I watched the sun go down over a sea the Soviets had drained for cotton, and in Aralsk I watched young people cough on the dust it left behind. Astronauts describe an overview effect: from orbit the national borders vanish, and the sight of the whole earth changes them. I came to it from the opposite extreme, on the ground and unprotected. Everywhere I went, whoever had done it, I met people who would never deserve any of this. That is what the road taught me, and I have not been able to unlearn it: war cannot be just, because it always hurts people who never made the choice to carry it out. The framework may justify it. Nothing is just about hurting innocent people.

Two years after I left Afghanistan, a classroom in Brussels first tested whether any of it had reached me. In the autumn of 2011, in a European Peace and Security Studies course, Professor Joachim Koops played the Collateral Murder video, released by WikiLeaks in 2010 from the files Chelsea Manning disclosed, of the

Apache attack in Baghdad that killed the Reuters journalists Namir Noor-Eldeen and Saeed Chmagh and wounded two children who were in the van that stopped to help them (WikiLeaks, 2010). He asked the class what was wrong with it. The room stayed silent: young adults from a dozen or so countries, visibly disturbed, none of them sharing the frame I carried. I should be honest about what that hour was like from the inside, because it set the tone for everything I have written since. I knew the footage, not the event but the world of it, the chatter, the cadence, the flatness of the voices, the procedure underneath. I had also seen footage like it before. Downrange there was a sneakernet, hard drives passed hand to hand for movies and anything else to pass the time, and when I flashed several people's drives I found a bank of airstrike footage, the kind that gets cut into slideshows. I do not still have it, and trading that material was ordinary. This was before the saturation that came later, when a war like Gaza could be watched in real time on a phone; in 2011 footage like this was not yet everywhere, which is part of why it still moved hand to hand on drives. The room was recoiling at something I had helped run that had already become background to me, and I was the only person in it who had been inside. Even before he turned to me I could feel a defense assembling itself without my choosing it, the trained explanations queuing up, while some part of me stood off to the side and watched the reflex run. Underneath everything sat the number, the document that carried it. What I felt was not an argument but an overwhelming need to respond that I could not yet put into words, and beneath it a feeling of responsibility, and beneath that a question I had no answer to: whether I was even the right person to carry it. The estrangement from the rest of the room was already there, palpable, from the plain fact of my service.

Into that silence he turned to me. Cian, you were in the military, what was wrong with this video? My first instinct was to defend it. He was probably tired, I said; it could have been a gun. Koops let me finish, then asked one question: what about the Geneva Convention? I had no answer. The defense I had run addressed intent and perception; the Geneva Convention addresses obligation, and the first does not answer the second. At the door on the way out he asked whether I would speak for Armistice Day about what I had done in the military. Half choked, I told him I had received a document saying I helped kill over two hundred people, and that I would need to get back to him. I went home and lay down to sleep beside my girlfriend, the tears rolling silently down my face. From that point university stopped being a way to move on with my life and became a reckoning with the consequences of my existence, made concrete by that year on the road. The only reason I was able to sit in that room at all was that I had met a service obligation that left blood on my hands. My education was being paid for by the destruction I had helped perpetuate. That overshadowed everything, and it has underlaid everything I have written on the subject since.

On that same long road out of the service, I met the other half of the lesson in a hostel in Tbilisi. Two of the travelers there were couchsurfing hosts from Iran, former members of the Revolutionary Guard, the Islamic Revolutionary Guard Corps, and they invited me to sit with them; they had no idea what I had been part of, or that the night would change my mind. We talked until morning about God, and I could not find a radical bone in either of them. They did not try to convert me and I did not try to convert them; they told me, without heat, what had been done to their country in 1953, when an American and British operation removed an elected prime minister, Mohammad Mossadegh, after he nationalized the country's oil, and put the Shah back on his throne (National Security Archive, 2013), and they made me understand that their situation was far more tangled than the cartoon I had been handed. They bore no wish for death to America. They wanted, like anyone, what the wider world had to offer, my own country included. To travel overland without a phone, across one national story after another, is to keep meeting people who blow up your misconceptions instead of targets; and to sit with a man from the country my own government had named in its axis of evil (Bush, 2002), and placed, by a retired general's later account, on a list of seven nations to be taken out in five years (Clark, 2007), and to find a human there, all of it was healing and devastating in the same motion. I have lost the exact words one of them said to me that night, but not the thing it did. What I carried out of that room was a recognition: that the enemy a war requires is manufactured somewhere upstream, the same way a target is, and that the people it is made from were, up close, reaching for the same good I had been taught to think was mine alone. A nation is a collection of people who share a tradition and a way of seeing, carried in individuals, and everywhere I went the thing that made a life worth living was the same. We are all human, and we are all bound by what we are permitted to know, which sets the dispositions that harden into what we call reality. My Christianity, as it had been handed to me, had no room for any of this; it could not account for a traveler who kept finding as much goodness, and sometimes more, in people of other faiths who spoke the same golden rule and carried the same hope about what none of us can know until we die. What I understood that night, and could not unlearn, is that the category is never the face. It is only an approximation, fixed by the capacity of whoever draws it and the use they mean to put it to, and a nation, like a target, is one of its cruder kinds.

Farther along that same road, in a beer tent in a market in Karaganda, in Kazakhstan, I got to talking with a Russian who had fought the Soviet Union's war in Afghanistan a generation before mine, and we spoke in the Russian I still half-kept from Armenia. I told him I meant to go south, to hitchhike the Wakhan corridor into Pakistan the way I had watched European cyclists do it, because I wanted to meet Afghans, to understand them, to know what they actually thought and felt. He warned me off the road, and then he told me: people like you and me are more alike

than you and Bush, or me and Putin. We are pawns for the rich man's game. I laughed, and said he might be right.

In April 2016, I was in Westminster with Reprieve, the British legal charity that acts for people targeted by drone strikes, at an All-Party Parliamentary Group meeting when Malik Jalal, a tribal elder and peace worker from North Waziristan, testified that the United States was trying to kill him. Jalal had survived four separate drone strikes. He had come to London to ask British parliamentarians to ask the British government to ask the CIA to remove him from the kill list he believed he was on. The Home Secretary and Foreign Secretary both declined to meet him. Their offices said they did not comment on intelligence matters. Jalal was a mediator with the North Waziristan Peace Committee, a man whose professional purpose was reducing violence between the Taliban and the Pakistani government. If the targeting was a misread, the behavioral signature the algorithm would have been reading was the signature of a peace negotiator: regular contact with people the system had designated as threats, travel to areas the system had flagged, a network of associations that looked, to a training dataset built on prior strikes, like operational involvement. His actual role would have been invisible to the architecture. In that room in Westminster there were two people who had been inside the system that was hunting him, and one person it was hunting. The accountability mechanism available was a parliamentary petition with no enforcement power, sent to a government that would not answer it.

Sitting in that room I found myself thinking through what the architecture was actually doing to him, and I was not certain the targeting was an error. Jalal's deradicalization work required him to be maximally connected to exactly the population the targeting system was designed to find: radicalizing youth, Taliban-adjacent networks, people moving between legal and illegal pathways. His function was to pull people toward legal paths. But the algorithm cannot read function. It reads the graph. And in the graph, a node that is deeply connected to a population of interest in order to bring people out of it is structurally indistinguishable from a node that is deeply connected to it in order to provide operational support. Network centrality in a dangerous population looks identical whether the purpose of that centrality is peacemaking or facilitation.

I speculated then, and I am still uncertain, whether the United States was using Jalal's connectivity deliberately, treating his network position not as a targeting ground but as a surveillance asset, following his movements and contacts as a method of mapping the networks he was embedded in. If that speculation is right, the strikes were not precision failures. They were a method of managing an asset who had not consented to being one, and who was being periodically reminded of his dependency through near-misses. That is a different category of violation from a targeting error. It is not the system failing to see who he was. It is the system

using who he was for purposes he had no knowledge of and no mechanism to contest. I do not know which account is true. The architecture is built so that I cannot know (Jalal, 2016; Reprieve, 2016).

4. How Responsibility is Shared: The Social Connection Model

That a system can be built so that even its own operators cannot finally know what they took part in is not a flaw in it but a consequence of how it is built, and that structure has a history older than the technology that perfected it. The Kill Cloud is not an anomaly in the Arendt tradition. It is its technological completion. Arendt's framework identifies the psychological mechanism, the thoughtlessness a division of labor makes available to everyone inside it. Iris Marion Young's social connection model provides the philosophical defense of the moral claim that follows from it. Young distinguishes between the liability model of responsibility, in which you are answerable because you caused a specific harm, and the social connection model, in which anyone who participates in structural processes that produce harm shares responsibility for it, not because they caused it but because they chose to continue participating (Young, 2011, p. 95).[7] On the liability model, the person who terminates fiber and loads cryptographic keys at a relay node is off the hook, not because his act made no difference, since the strike could not have run without it, but because the law looks for the hand at the end of the chain and reads the standing condition that made the chain possible as background. On the social connection model, participation in the structure that produced the harm is the condition of responsibility. The choice to keep showing up, to keep the system running, to accept the promotion and the enlisted performance report (EPR), these are the choices the social connection model holds to account. This paper is written from inside that model.

There is an objection to leaning on Young, and it is a serious one. If everyone who takes part in a harm-producing structure shares responsibility for it, and the structure is the whole supply chain of a war, then responsibility spreads until it grounds nothing. The cook feeds the pilot, the miner digs the cobalt, the voter funds the budget, the writer types on a device built from the same extraction; if all of them are responsible, the word has stopped sorting anyone from anyone, and the model collapses into the very result this paper exists to expose: everyone implicated and

[7] Young's account is structural and forward-looking; its individual counterpart is Christopher Kutz's, on which a person is complicit in a collective harm through his participatory intention to take part in it, whatever his causal contribution (Kutz, 2000). I draw on both: Young for why keeping the system running is a shared responsibility, Kutz for why the knowing participant answers for the whole act, not the slice of it he touched.

therefore no one answerable. And Young herself meant the social connection model to look forward, as a ground for the shared duty to change an unjust structure, not backward, as a ledger of blame for a particular death. To turn it on my own part in a specific killing may be to ask it to carry what it was not built to carry.

The objection is right that the model needs a measure, and the paper has been supplying one all along. Responsibility on the social connection model is not flat. It scales with two things: how much you knew of the function your part served, and how freely you kept serving it. This is why the cook is not the technician. Food sustains the man and not the act, and the cook has no knowledge that his work feeds a given strike and no way to keep it from one without starving everyone; the airman who loads the keys knows the link he opens is the path a strike will run on, and he can stop. Knowledge of function and freedom to refuse are what turn participation into responsibility, and they come in degrees, which is why the measure is real and not a slogan. Held this way the model does not flatten into everyone-and-so-no-one. It ranks us. It places me, who knew what the gesture was for and kept making it, above the conscript who did not and below the officer who drew the box. The architecture works to keep knowledge of function from reaching the hands it runs through, and the people who make a strike possible have no say in who it falls on, so they slip the measure they would otherwise carry and pass the work on without friction. As for looking backward: the knowledge condition that lets the model do so is not borrowed from outside it. It is the oldest rule we have for these cases, the one Nuremberg settled, that tending the machine is no defense once you know what the machine is for. Where that knowledge is present, structural participation grounds a backward answer as well as a forward duty, and I claim no more than that for myself.

There is a reason the architecture keeps that knowledge from the hands it runs through, and it has nothing to do with accountability, though it is what erodes it. Every person who knows what his part is for is friction: he can refuse, he can hesitate, he can testify. The fewer people who have to be in the know for any given strike, the less friction the strike meets, so a system built for reach and speed drives that number down as far as it will go. It is not trying to erase accountability. It is trying to shed friction, and accountability is what it sheds.

The diffusion of moral responsibility through technology is not new. It has been the direction of travel since the first siege engine required a crew of twelve to operate, distributing the act of killing across enough hands that no single one felt its full weight. The telegraph allowed the British Empire to administer a realm where the sun never set by establishing the capability to give orders that ended lives in Bengal from offices in Whitehall, essentially turning distance into deniability long before anyone had a word for it. The landmine industrialized the diffusion of harm across time. A combatant could kill a child in Laos sixty years after the war ended

and thousands of miles from where they ever stood (Legacies of War, n.d.). The Kettering Bug, an unmanned aerial torpedo developed in 1918 under Charles Kettering's direction with consultation from Orville Wright, took the detachment one step further: the operator set the parameters like heading, distance, engine cut-off, and then the machine determined the moment and place of impact, with no further human input possible after launch (Werrell, 1985). Fewer than fifty were built and none were combat-deployed, but the architecture was already present: a human who authorized without executing, and a machine that executed without deciding. Bombers required crews. Missiles required launch teams. Each technology extended the chain between intent and consequence, and at each extension the moral weight at any single link diminished.

And the diffusion was never only technological. Representative government had long spread the same moral weight across the body politic, the soldier deferring to command, the commander to civilian doctrine, the president to an electoral mandate, the voter to an aggregate will too dispersed to answer for any single act it authorized. That was not a failure of democracy but a design feature: authorization distributed widely enough that responsibility for the war, and the restraint meant to come with it, would be shared by every citizen in whose name it was waged (Walzer, 2006); what it did not anticipate was authorization uncoupling from consequence, the voter's tie to the acts done in their name thinning as steadily as technology thinned the executioner's.

What changed with networked warfare, and what the Kill Cloud represents in its most advanced form, is the velocity of that diffusion, its scale, and ultimately its completeness. The trebuchet distributed responsibility across twelve hands. The Kill Cloud distributes it across continents, corporations, algorithmic processes, and emergent behaviors that no human intended, until the chain stretches beyond sight and then past being an answerable object at all.

The law is not silent on the one who helps from a distance. It has a doctrine for exactly this, aiding and abetting, and it makes you answerable if your assistance substantially contributes to the crime and you know what it is for. That is the legal cousin of the argument I have been making. But the law cannot hold it steady. In 2013 the appeals chamber of the Yugoslavia tribunal acquitted Momčilo Perišić, an officer who had armed and supplied forces that committed atrocities but stood far from the killing, on the ground that a remote enabler is liable only if his help was "specifically directed" at the crimes and not at activities that might have been lawful (Perišić, 2013). A year later a differently composed bench of the same court threw that test out; the Special Court for Sierra Leone rejected it in convicting Charles Taylor; and the doctrine fragmented so far that whether a distant enabler is guilty came to turn on which judges heard the appeal (Šainović, 2014). The precise question the architecture poses, whether the one who keeps the machine

running shares in what it does, is the question the law itself cannot settle. And where a court did hold the reach, it let it go: the International Criminal Court, the only forum with jurisdiction over American conduct in Afghanistan, won authorization to investigate it in 2020 and then, in 2021, set the American and Afghan-force part aside to pursue the Taliban and the Islamic State alone (ICC, 2020; ICC Office of the Prosecutor, 2021).

5. The Automated Battlefield: Lineage and Doctrine

I did not come to the automated battlefield from the outside. It runs in my own family, and through the ground I was raised on.

I should say something about the name. The Westmoreland most people know is General William C. Westmoreland, Commander of Military Assistance Command, Vietnam, from 1964 to 1968, architect of the war of attrition, the body-count doctrine, the search-and-destroy campaigns (Encyclopaedia Britannica, n.d.). He is a few cousins removed from my direct line. Growing up in a military family with that name meant the question was ambient: are you related to the general? I did not think much about what that meant until a university history class, and then a longer encounter with what that war had actually produced. In 2010, after hitchhiking through Europe and parts of Asia, I rode a bicycle south through Laos. Near a provincial road, roughly 32 kilometers from the nearest town, a man asked me to help him practice English and assist with lesson plans. His parents had been killed in the war. He had been sent to a monastery as a child, where he had learned English from GIs, and was trying to recover it. The village was within range of the bombing corridor. Before leaving Laos I visited the UXO (Unexploded Ordnance) Lao Visitor Center in Luang Prabang, the cluster submunitions on display, the survivor photographs, the casualty record still accumulating from ordnance directed at targets during operations General Westmoreland commanded. I do not carry personal guilt for a cousin's strategy. The name is a coincidence of descent, not causation. What it is not is neutral. I grew up hearing it in a context of institutional honor, which is a form of pre-conditioning, and it worked in the same direction: toward enlistment, toward the architecture, toward the nodes I helped build. That the war those nodes extended had its direct technical predecessor in the first automated kill chain deployed over Laos in 1968 is something I understood fully only later, in the same way the people inside every node understood fully only later, if at all, what the whole thing was for.

That kill chain had a name. Operation Igloo White[8] seeded the Ho Chi Minh Trail through Laos with some twenty thousand acoustic and seismic sensors, air-dropped to listen for trucks and for footsteps; their signals were relayed to the Infiltration Surveillance Center at Nakhon Phanom in Thailand, where Task Force Alpha's IBM computers turned the readings into coordinates and handed them to aircraft to strike, run from the biggest building in Southeast Asia (Correll, 2004). It is the architecture I would help run four decades later, in prototype: sensor to relay to computer to shooter, the human attenuated to a node that confirmed what the system had already proposed. And it failed in the way the architecture still fails. The sensors could not tell a truck from a trick, and the North Vietnamese learned to feed them one, driving animals up the trail and hanging buckets of urine in the trees. Seventh Air Force reported twenty thousand trucks destroyed or damaged in the 1970-71 dry season alone, a figure congressional staffers noted "greatly exceeds the number of trucks believed by the embassy to be in all of North Vietnam"; the CIA and the Defense Intelligence Agency answered with a formula that discounted seventy-five percent of pilot claims outright (Correll, 2004). Correll weighs it evenly, operations claiming too much and intelligence validating too little, and an Air Force historian has since argued the claims track closely enough against the trucks the North Vietnamese imported to be worth taking seriously. My objection is not that the numbers came out wrong. It is what they were for. A figure the Air Force's own intelligence services discounted by three quarters, and that its defenders can rescue only by matching it against how many trucks the enemy bought, is not doing the work of a measurement. It is doing the work of a justification, and I say that from inside the same institution four decades on, where a count of the dead was still what earned a unit its rank. The man who ran the war those sensors served had already given it its prophecy. In October 1969, as Army Chief of Staff, General William Westmoreland told the Association of the United States Army that "on the battlefield of the future, enemy forces will be located, tracked, and targeted almost instantaneously through the use of data links, computer assisted intelligence evaluation, and automated fire control," that no more than ten years should separate the Army from what he called the automated battlefield, and that the country would "welcome and applaud" the developments

[8] Igloo White began not as an operation but as a proposal to McNamara. Disillusioned with the bombing of the North, the defense secretary commissioned the JASON group, several dozen physicists convened for the Pentagon, whose summer 1966 study judged the bombing militarily ineffective and proposed in its place an electronic anti-infiltration barrier: an anti-personnel line below the demilitarized zone and, along the Ho Chi Minh Trail in Laos, an air-sown field of battery-powered sensors and mines to interdict the traffic by machine. Adopted and announced in 1967 as the McNamara Line, it passed through the code names Practice Nine, Dye Marker, and Muscle Shoals before the surviving Laotian sensor system became Igloo White. The automated battlefield Westmoreland prophesied from a podium in 1969 had, in its electronic form, already been decided three years earlier, by a defense secretary and a summer study group of scientists who never saw the ground it fell on (Correll, 2004).

that would “replace wherever possible the man with the machine” (Westmoreland, 1969). He was wrong only about the timeline. What I stood inside at Kandahar was the part of it that had arrived, the datalinks and the computer-built picture he named; the automated fire control, the man replaced by the machine, was the part still to come, and it is coming now. The name he carried is the one I was raised under.[9]

That lineage runs through a single place, and I was born in it. Eglin Air Force Base, on the Florida panhandle, has been the country’s principal proving ground for autonomous munitions across the whole arc the Kettering Bug opened. The Sensor Fuzed Weapon, whose submunitions independently scan, identify, and strike armored vehicles in the terminal phase with no human in the final loop, was in full development at Eglin’s munitions directorate by the mid-1980s (Air Force Magazine, 1998). The Low Cost Autonomous Attack System (LOCAAS), an explicitly autonomous loitering munition that used laser radar to recognize its own targets, was developed and tested there from the mid-1990s and never entered service (Parsch, n.d.; GlobalSecurity.org, n.d.b). The reasons were mixed, cost and technical limits among them, but one of them was an unresolved discomfort with letting a weapon search for and destroy targets with no person in the decision. That discomfort was real and it was documented. It was also never settled. And then the architecture to direct such weapons came home to the same base. In December 2019 the Air Force ran the first on-ramp of its Advanced Battle Management System at Eglin, wiring sensors directly to shooters across services to detect and engage a simulated cruise-missile attack; the second on-ramp the following September added live fire and AI generating the targeting recommendations a commander is there to approve (U.S. Air Force, 2020); SpaceX’s Starlink was wired into the same live-fire effort, linking a terminal to an AC-130 gunship (Air Force Times, 2020). The discomfort that had helped keep LOCAAS on the ground, about a machine choosing the target with no person in the decision, had not been answered in the years between. It had been engineered around: the machine now recommends and the human approves. As I write this, the bombing from Eglin rattles my house.

The networks I helped stand up at Kandahar were early instances of a pattern that doctrine has since tried to master. By the late 2000s the U.S. Air Force already recognized that distributed sensing, persistent connectivity, and rapid decision loops were essential to their strategy for air dominance, but the architecture was constrained by latency, bandwidth, and human bottlenecks. The 73rd Expeditionary

[9] Manuel DeLanda told this as one long machinic evolution, war folding more and more of its own decision into the machine across centuries (DeLanda, 1991). His is a genealogy seen from above; this section is one strand of it seen from inside, and carried, by accident of descent, under the name of the general who prophesied it.

Air Control Squadron site was one small, concrete example of those constraints in action: a tactical hub fusing radar tracks, sensor feeds, and datalinks in real time, yet still dependent on human air battle managers and vulnerable to single points of failure in contested environments. The doctrinal attempt to master this problem had already been formalized as network-centric warfare, built explicitly on Boyd's tempo logic.[10] What that theory formalized, General Westmoreland had named as the automated battlefield in 1969 and Igloo White had fielded in crude form over Laos; the contribution of the 1990s was the doctrine, not the ambition. JADC2, Joint All-Domain Command and Control, is its successor, extended from the terrestrial network to the orbital substrate, and over the following decade the doctrine moved commercial platforms to its center.

The U.S. JADC2 strategy, published in 2022, defines this approach as the capability to sense, make sense, and act upon information across the battlespace by linking sensors directly to effectors at speeds relevant to machine-paced operations (Department of Defense, 2022).[11] Sense, make sense, act. I built the sensing and kept the path open that carried the act; making sense of what flowed between them happened in rooms I never saw. The strategy makes space foundational, and names, as its own design goal, the speed that closes the space for human judgment.

Distributed lethality is the result (Ellman, Samp and Coll, 2017): a mode of warfare in which effects are generated through networks of sensors, processors, and effectors that no single human or state fully owns, directs, or can be held solely accountable for. Agency begins to diffuse across doctrinal intentions, commercial infrastructure, and algorithmic processes. The thread that once visibly connected human authority to lethal consequence begins to fray, not through oversight or accident, but through features that are now common across the major powers. This diffusion is not a side effect of doctrine; it is the necessary entailment of doctrine's core design objective, which is speed. JADC2 demands "speed of relevance" (Department of Defense, 2022). NATO demands "converging effects" (NATO Allied Command Transformation, 2023). China demands to "control the enemy's thought"

[10] Network-centric warfare theory was developed in the late 1990s by Alberts, Garstka, and Stein for the U.S. Command and Control Research Program: robust networking yields shared situational awareness, self-synchronization across forces, and the ability to cycle inside an adversary's decision loop at scale (Alberts, Garstka and Stein, 1999). The doctrinal evolution that followed fused sensors, AI-supported decision tools, and effectors across air, land, sea, space, cyber, and electromagnetic domains (Department of Defense, 2022).

[11] The strategy organizes operations around three functions, collecting data across domains, fusing it into actionable understanding, and delivering synchronized effects, at what it calls the 'speed of relevance,' inside an adversary's decision cycle. Its enabling layer is a mesh of proliferated low-Earth orbit (LEO) constellations: the Space Development Agency's Transport Layer, satellites connected by optical inter-satellite links, provides the jam-resistant backbone, with persistent global sensing and assured positioning, navigation, and timing (PNT) named foundational (Lockheed Martin, 2025).

(NIDS, 2021). Every one of these formulations prioritizes compression of the decision cycle, and every compression of the decision cycle is a compression of the space available for human judgment. This distributed lethality has a doctrinal name and a figure, both supplied by the agency that has driven the architecture from the start. Unveiling the concept at DARPA's sixtieth-anniversary symposium, Tim Grayson, then director of its Strategic Technology Office, called the legacy force a "system of systems … like jigsaw puzzles" whose pieces are "carefully engineered to fit," and proposed breaking it into many cheap, interchangeable tiles, sensors, effectors, and command nodes, recomposable into kill webs faster than an adversary can respond; the doctrine's name for this is Mosaic Warfare (Grayson, 2018). The figure was already literal at my node. The air picture I helped build at Kandahar was itself a mosaic, radar returns, IFF tags, and datalink overlays assembled into one image no single sensor held. Mosaic Warfare only generalizes what that node already was, from a picture made of tiles to a force made of tiles, and it states half the design intent in the builders' own word, an architecture composed so that the whole acts; that no single tile decides is the half they do not say. That is the Kill Cloud named from the supply side.

6. Technical Anatomy: The Compressed Loop and the Authorless Act

The doctrine described a machine. This section opens it, and finds two ways the author of an act goes missing: accountability thinned by design, and behavior that no one wrote. Three interlocking mechanisms define the shift to distributed lethality: decision-cycle compression, in which the deliberate targeting cycle that ran 24 to 72 hours had given way to dynamic targeting in minutes by 2009 and now collapses toward machine speed; algorithmic substitution, in which tasks once performed by human analysts are increasingly executed by models running in real time; and commercial fragmentation, in which critical sensing, data transport, and compute are owned and operated by private entities outside any military chain of command (Fyfe, 2005; Defense Science Board, 2009; U.S. Army, 2010; Vassilev et al., 2025; Army University Press, 2025).

The architecture is not a neutral conduit but a relational field. No single layer works without the others, so describing it takes a frame built for interdependence rather than a list of parts. The anthropologist Tim Ingold offers one. Against the network, a set of points joined by connectors, he sets the meshwork: not inert wiring but a weave of living threads, lines along which human and more-than-human lives are bound together (Ingold, 2011). The Kill Cloud is built as a network and inhabited as a meshwork: the maintainer's morning, the analyst's hours at the screen, the family under the pattern-of-life are threads in one weave, which is why an order to

kill does not just pass through it but depends on it. Every layer of the Kill Cloud, from the fiber optic run to the orbital inference engine, is not peripheral support but part of the weave through which distant lives, moral worlds, and consequences are bound together in relations of complicity and harm.

The middle of that path, from my node to what it became, is written into my own performance report. The Air Force credited me there with building the 606th Air Control Squadron's first Remote Radio Secure Voice System (RRSVS) and the line-of-sight, long-range, and satellite links that carried the air war to the air and space operations center at Al Udeid; my second rater put it more plainly still, crediting me with integrating that remote radio system into the battlefield command-and-control equipment that supported the period's two thousand four hundred close air support missions and its two hundred-plus enemy killed. Those bullets sat on the same page as the rest of the tally: thirteen thousand combat sorties, and fifteen ramp ceremonies where I offered the final salute. The institution drew the line itself, between the communications I built and the killing they carried, and counted my link in the outcome. That link did not stay still. The rear node it reached, the battle control center at Al Udeid, is the system a contractor, Booz Allen,[12] had already been rebuilding since 2005, four years before I plugged into it, into the kit that became the Tactical Operations Center-Light, the deployable cell the 606th, my home squadron, fields today (Booz Allen Hamilton, 2024). Its builders describe what they made in one phrase: it turns "the kill chain into a kill web, a mesh," connecting "sensors, decision makers, and shooters" (L3Harris, 2024; Booz Allen Hamilton, 2024). My report called it a chain and credited me with a link in it; the same unit now runs the web, rebuilt by a private company. And the reach of it is leaving the ground, the satellite link I helped stand up becoming part of the proliferated constellation that broadcast Link 16 from orbit for the first time in November 2023 (Air and Space Forces Magazine, 2023). The institution wrote down where I sat in the kill chain. It is the same seat, renamed the kill web, owned now by contractors, and climbing into orbit.

That claim can be walked through, because every segment of it is on the public record. In November 2024 the 606th took TOC-L to the field for the first time, flying from Aviano to Camp Lemonnier in Djibouti to run that same control-and-reporting-center mission, the one I did, for the Horn of Africa, taking it from a U.S. Marine air-control squadron (Sudolcan, 2025). What changed from my hands to that kit is not the fusion but the reach. Its builder, Booz Allen Hamilton, describes the

[12] Booz Allen Hamilton was also Edward Snowden's employer: he was a Booz Allen contractor assigned to the NSA when he disclosed the mass-surveillance archive in June 2013 (Greenwald, MacAskill and Poitras, 2013). The same firm sits on both sides of the architecture traced here, building the deployable kill-web node and holding the surveillance access from which that disclosure was drawn, an index of how deep inside the classified apparatus the commercial layer already reaches.

kit as able to “correlate any sensor data with any weapon system to simultaneously take on any target or multiple targets,” on software that can “use data from any source, government or commercial, or from a partner nation” (Welch, 2025; Casimiro, 2025). The RIC fused the sensors the theater owned and fed the shooters the theater controlled; this fuses any sensor with any shooter, from any source, the commercial world included. The shooter at the end now includes the semi-autonomous swarm, which takes an engagement envelope, the kill box by another name, and allocates the killing among itself with no human present when it fires, by the emergent behavior I take up below.

The same loop has an orbital branch. I did not work the space side, but its paper trail is public and it runs the same logic: a space command-and-control program fuses any-source data, military, allied, and commercial, into one picture and lets a commander find and disable a threat, the same any-source logic the kit applies to the air picture.[13]

In 2024 that effort took its current form. The Space Force stood up the Joint Enterprise Integrated Federated C2 for Space to build the networks that would close the kill chains for four classified weapon systems, and it is being wired into the same Department of the Air Force Battle Network, through the same program office that fields TOC-L (Hitchens, 2024). The head of Space Systems Command put the goal in one line: the focus is “on the C2 and closure of the kill chains to actually use the effectors.” Effector is the same word I worked under: effect, the architecture’s bland name for the thing that kills, carried now from my air picture to a weapon in orbit.[14] Every segment of the path has a name. The node I built and ran by hand at Kandahar, the one the Afghanistan air war was controlled through, is now TOC-L, mass-produced, sixteen fielded worldwide by 2024 and hundreds planned (Welch, 2025); it feeds the Department of the Air Force Battle Network, the Air Force’s share of CJADC2 (the combined, cross-service version of the same), which is being federated, through a single acquisition office, with the systems built to identify orbital targets and close the kill chains that strike them. The same

[13] The effort ran as Space C2, building Space Domain Awareness (a real-time read of what every object in orbit is and whether it is a threat) and ESBMC2, Enterprise Battle Management Command and Control, which lets a commander “avoid, if possible, a threat to a US space asset, or find another way to disable that threat” (Hitchens, 2019). ESBMC2 fuses National Reconnaissance Office data with military, allied, and commercial sensor data in a shared Unified Data Library; its product feeds the National Space Defense Center and the Combined Space Operations Center, whose mission is to “deter aggression, defend space capability, and when directed, defeat adversaries.” It was meant to deliver what a failed predecessor, the Joint Space Operations Center Mission System, never did, and that in turn was to replace a 1980s mainframe called SPADOC (Hitchens, 2019).

[14] The word has an author. Effects-based operations, the doctrine that reorganized air warfare around ‘effects’ rather than destroyed targets, was built in large part by David Deptula out of John Warden’s theory of systemic paralysis, and first ran at scale over Iraq in 1991 (Jackson, 2011). It is the same Deptula who appears below, drawing the lesson of the 2026 strike on the operations center. He made the killing an effect; this paper only translates it back.

Unified Data Library underlies both ends. None of this is a forecast. It is the published architecture, and the node I built by hand is wired into the whole of it.

In the opening weeks of the 2026 war with Iran, Iranian missiles struck the air operations center at Al Udeid, the same rear node my link had reached, and destroyed it. For more than twenty years that room had run the American air war from the Red Sea to Afghanistan. Its destruction did not stop the campaign for a day, because the work had already been lifted off it: the war was run from Shaw Air Force Base in South Carolina from the start, the function moved before the node was lost (Air and Space Forces Magazine, 2026). The retired general who drew the public lesson from the strike was David Deptula, the man who built the modern air-operations-center concept and spent years promoting the wider system under a friendlier name, the combat cloud. Any facility above ground is vulnerable now, he said, and the critical nodes of the future have to be built underground (Air and Space Forces Magazine, 2026). The combat cloud and the Kill Cloud are the same architecture seen from opposite ends, one named by the men who build it and one from inside the act it carries out, and the answer its builders are reaching for is more final than burying the hub: dissolve it, push the work across so many nodes and so far off the ground that there is nothing left worth striking. The brain center I helped feed is being abandoned not as an argument in this paper but as a fact on the ground, because a hub can be hit, and a constellation, spread across orbit, has no single node whose loss would stop it.

The reply begins with a change of altitude, and its logic is resilience through numbers: hundreds or thousands of small satellites make it difficult for an adversary to disable the entire network with a single anti-satellite strike without risking a cascade of collisions that threaten every space asset. That is the enabling layer. Unlike geostationary satellites at 36,000 kilometers, low Earth orbit (LEO) platforms orbit at 500-1,200 kilometers (ESA, n.d.), providing round-trip latency measured at 20-100 milliseconds against 600-3,000 milliseconds for a geostationary link, in a six-month study of live terminals under tropical rainfall (Abdul Shukur et al., 2025), and frequent revisits over the same area. These constellations are already operational, commercial and military alike, carrying transport, Earth observation, and jam-resistant relay, with a parallel Chinese build-out racing the same way (Hybrid CoE, 2024).[15]

[15] SpaceX's Starlink, more than 10,000 satellites as of 2026 (SpaceX, 2026), provides resilient broadband and command-and-control connectivity in contested environments, as shown in Ukraine under Russian electronic-warfare attack (Belfer Center, 2023). Planet Labs, Capella Space, and Iceye deliver high-resolution Earth observation on demand, with synthetic aperture radar (SAR) that penetrates cloud and darkness (Planet Labs, n.d.; Capella Space, 2025; Iceye, n.d.). The U.S. Space Development Agency's Transport Layer, a jam-resistant mesh linking sensors to effectors, is operational from Tranche 0 (2023), with Tranche 1 (2024-2025, optical inter-satellite links) deploying and Tranche 2 (2026-2027)

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John Boyd's OODA (observe, orient, decide, act) loop framework, developed from his analysis of kill-ratio disparities in Korean War air combat and formalized through his unpublished briefings of the 1970s and 1980s, held that victory flows from cycling inside the adversary's decision loop, and that the physiological floor of human reaction time, approximately 200 milliseconds, marks the boundary below which no deliberation can occur, only reflex (Hammond, 2001). Boyd intended this as an argument for tempo. The Kill Cloud converts it into an argument for replacement: when the loop that ends in a strike runs at machine speed, the 200-millisecond human floor is not approached, it is lapped, and what remains of the human role at the instant of the strike amounts only to the physical gesture of non-interference, the real decision having been made upstream, when a person authorized the system to act inside this envelope without them. And the lapping is not the software's alone. The orbital round-trip just named, twenty to a hundred milliseconds, is itself a fraction of that floor: a command can reach a satellite and return between two and ten times in the span of one human reaction, and most of even that is routing, since the light-travel to orbit and back takes only a handful of milliseconds. The layer the war now runs on is faster than the body meant to oversee it, not by engineering that could be tuned away but by physics. Even at the speed of light, the trip to orbit and back is over before the synapse fires.

This compression was not introduced by AI. Christopher Aaron, a drone imagery analyst who worked live ISR feeds at the Counterterrorism Airborne Analysis Center from 2006, described a relay-to-strike window of approximately 60 seconds, the final step from an analyst's report to a launched missile: report what you see on screen and 'sixty seconds later, depending on what we would report, you would either see a missile fired or not' (Press, 2018). The architecture's compression of human deliberation predates the autonomous systems that now complete it. The targeting data flowing through these networks was frequently not identity-confirmed. Investigative reporting based on the NSA documents Edward Snowden disclosed established that drone targeting in Yemen and Afghanistan routinely relied on geolocation of SIM cards rather than confirmed identification of the person carrying the device, meaning the signals relayed through infrastructure like that built at Kandahar were used to locate phones, not people, and the classification error was baked into the data before any operator made a decision (Scahill and Greenwald, 2014).

The one act still open to the operator is the interruption, and it must be made in seconds, under cognitive load, with incomplete information, and against the

adding tactical edge processing, the program building toward four to five hundred satellites across successive tranches (Lockheed Martin, 2025). China's Qianfan, launching from 2024, projects 14,000 satellites by 2030 for broadband and ISR in military-civil fusion (GlobalSecurity.org, n.d.d), and a second state constellation, the state-run Guowang, is filed for a further 13,000 (Jones, 2021).

institutional pressure of tempo. What is left is supervision, not deliberation, and the erosion of the one into the other follows a documented gradient. When latency allows seconds of response time, human-in-the-loop control remains intact, each decision is a genuine deliberation. When latency compresses to 100-500 milliseconds, the human role shifts to human-on-the-loop: nominally present, supervisory in name, but unable to interrogate individual decisions as they occur, reduced to monitoring outputs that have already been determined. When latency drops to tens of milliseconds, the loop closes entirely without human participation. These are not points on a spectrum of efficiency. They are thresholds of accountability, each one marking a category of operation in which a different set of legal and moral frameworks loses its purchase, its preconditions no longer met (CCW Group of Governmental Experts, 2025). Meaningful human control is not only diminished at machine speed. It is redefined into something that resembles endorsement more than judgment.[16]

What compression forecloses is not only deliberation but surprise, and surprise is morally load-bearing. Surprise is the moment the world exceeds the model, the instant the target box fails and the person breaks through it: the wedding that was not a convoy, the child where the system expected a combatant. The architecture cannot remove the conscience of the people inside it; conscience is the residue of a lifetime of encounters and does not switch off when no one is in the room. What it can do, and does, is keep that intact conscience from meeting this person while there is still time to act on the meeting. It pre-classifies the scene before recognition can occur and severs the encounter from the moment of the act. The conscience is not abolished. It is exiled from its hour. And because the faculty survives the exile, the encounter it was denied does not vanish but arrives late, out of the loop and in the body, as the moral injury, which the architecture then files as the operator's private failing rather than as its own design. A war on latency is, at its limit, a war on the encounter, and the architecture wins it in the only way it can: not by destroying the witness but by making the witness arrive too late to stay a hand.[17]

The war on the encounter did not begin with latency; it began with the screen. Pilot or maintainer, we all agreed to interface with technology in a way that was

[16] 'Meaningful human control' is the term of art the governance debate keeps reaching for (Santoni de Sio and van den Hoven, 2018; Roff and Moyes, 2016). My point is about what happens to it at machine speed: the control is not merely weakened but redefined, from judgment into non-interference, so that a system can meet the standard on paper while the human kept in the loop is doing none of what the phrase was meant to require.

[17] Two lines of thought meet here. Madeleine Elish named the moral crumple zone, the human kept in the loop to absorb blame a machine cannot take (Elish, 2019); this goes a step past it, leaving no crumple zone, because at the moment of effect there is no author for the blame to reach. Paul Virilio saw that speed is a war on perception (Virilio, 1989); what I add is the mechanism and the exact interval, two hundred milliseconds, where the encounter that might stay a hand is engineered out.

designed to make kill decisions through a technological medium that removed us from witnessing the face of the lives we were taking, and that medium is now moving inward. Augmented-reality soldier interfaces like the Army's Integrated Visual Augmentation System (IVAS) overlay the fused, AI-classified picture onto the eyes of the soldier who is physically present, so that even standing on the ground he meets objects the system has already detected, tracked, and classified rather than the scene itself (Anduril, 2025). Brain-computer interfaces take the last step and wire the medium into the nervous system. The first patient of one such company, moving a cursor by thought, called the result an "aimbot" in his head and expected it would need its own gaming leagues (Arbaugh, 2024); military neural-interface research proceeds on the same premise (DARPA, n.d.).

Set against the two-hundred-millisecond floor, the point is exact, and it is easy to state wrong. That floor is reaction time, and reaction time is mostly the body: light to the retina, signal to the cortex, the command run back down the nerve to the hand. A neural link removes the last of those legs, the run back down the nerve to the hand, so the cursor answers faster than a hand ever could. That is the aimbot. What it cannot touch is the interval where judgment happens, because judgment is slow for a different reason, not nerve lag but the time it takes to weigh a life, seconds where the machine already works in milliseconds. So the link does not give the human faster judgment. It removes the body between his intention and the act and leaves him quicker only in reflex, the one faculty already too fast to hold a conscience. It keeps him in the loop by fitting him to the loop's speed, and nothing moves at that speed except reflex. That is the human-in-the-loop perfected, present, wired in, sure he is deciding. He still says fire; what the interface takes is the weighing behind it, the seconds in which he might have caught that the target was wrong. Where latency alone would have dropped the human, the interface holds him in place instead, to the same effect: fast enough to authorize the strike, far too fast to have judged it.

The builders give the acceleration a reassuring name. Pressed on a military now killing at far greater speed with these models, the head of the leading company answered that the stronger capacity does not cause wars but deters them (Amodei, 2026). Deterrence names the gain and says nothing of the price. The instant just described, the one in which the world outruns the model and a hand can still lift the weapon away, is the first thing speed at that scale removes. What is called deterrence is, when the strike comes, the closing of that instant: the speed meant to keep the peace is the same speed that takes the last place a person could refuse.

The move to orbit does not stop at the link; it takes the thinking with it. High-performance compute is migrating directly onto the satellites, shifting data fusion and inference off the ground and into space. In 2009 that processing happened in buildings you could name and reach, ground stations like the DGS, the Distributed

Common Ground System, limited by power, cooling, and bandwidth. Those hubs were DGS-1 at Langley Air Force Base in Virginia and DGS-2 at Beale in California, with DGS-3 at Osan in South Korea, DGS-4 at Ramstein in Germany, and DGS-5 at Hickam in Hawaii (U.S. Air Force, n.d.; GlobalSecurity.org, n.d.a). Each node was regionally aligned to a theater, but the enterprise was built so the sites cover for one another: the Air Force's own account is that their globally networked capabilities let other sites run missions beyond their own numbered air force's area of responsibility (U.S. Air Force, n.d.), so that when a tornado or a cut cable takes one center down its tasking is picked up by another (Mola, 2016). Even on the ground, no single site was where the work had to happen. Orbit shifts those physical constraints rather than dissolving them, trading grid power and cooling water for abundant solar and the harder problem of shedding heat to space. China, in fact, reached operational orbital AI compute first in the open (Jones, 2025; Xinhua, 2025; China Daily, 2025), ahead of the U.S. proofs-of-concept (CNBC, 2025; Google Research, 2025; NVIDIA Blog, 2025); and because the classified programs that fly the most capable payloads disclose nothing, the public record marks the floor of the capability, not its ceiling.

The final layer of this architecture is the one that completes the accountability problem rather than merely contributing to it. Multi-agent systems across networks of drones, satellites, loitering munitions, and autonomous ground sensors operating under decentralized control can produce collective behaviors that no single designer wrote and no single operator authorized. Emergence of that kind is a documented property of multi-agent systems, not a hypothetical risk, and the autonomous selection and killing of human targets has now crossed from the laboratory into combat. The fully coupled cascade this section traces is the frontier that threshold opens onto, not yet a fielded fact.

The mechanism is emergence, and what it produces is a killing pattern no one wrote. When individual agents follow simple local rules like maintain separation, preserve mesh connectivity, prioritize targets by assigned value, adapt to jamming by switching to onboard inference and then interact at scale, the collective produces behaviors that were never explicitly programmed. The arXiv safety analysis is direct: emergent effects can arise in multi-agent systems where execution is decentralized and reliant on local information, and these effects may range from minor deviations in behavior to catastrophic system failures (Altmann et al., 2024). Emergence occurs specifically when global specifications misalign with local approximations such as when the reward function an agent optimizes locally produces a collective outcome no one at the system level intended.

A 2025 Scientific Reports study on multi-agent pursuit-evasion games in bounded environments provides the clearest available simulation evidence of what emergent coordination looks like in controlled conditions. Trained agents

converged on cooperative strategies no one programmed, including a “lazy pursuit” in which one agent conserves effort while complementing another, a tactical role-specialization that arose from interaction alone (Xu et al., 2025). That is simulation; what has crossed into the field so far is the simpler and graver act, a single machine choosing and killing on its own, not yet the coupled emergence modeled here.

There is a further turn beyond emergence. Emergence is what one system does when its parts interact; cascading is what happens when whole systems interact, when the output of one autonomous network becomes the input of another and the feedback runs between them faster than either can be audited. A swarm acts on a picture an orbital model produced from a feed another model curated, and its action changes what the next picture shows. Such coupled systems have tipping points, where a small shift in one local rule swings the whole collective behavior discontinuously, so that even the people who set every condition upstream cannot say what behavior they have set in motion. Emergence makes the single act authorless; cascading makes the system itself unforecastable. This is categorically different from the other forms of distributed responsibility I have described. Commercial intermediation disperses accountability across corporate structures, but a CEO still made a product decision, a commander still authorized deployment. Doctrinal diffusion distributes it across roles, but a chain of command still exists and can in principle be traced. Emergence breaks the link the other two preserve. When a swarm executes a strike pattern that no individual agent was programmed to perform, the question of who decided has no clean answer, because no human formed the specific intent that produced the specific harm. This is not the same as saying no one is responsible. The people who deployed the swarm, authorized its engagement envelope, and curated the data it learned from are responsible for setting it loose, exactly as the social connection model holds. What dissolves is not responsibility but its legal handle: their decisions were made upstream, at design and training and authorization, never at the moment of effect, which is the one place the law of armed conflict knows how to look for a decision. The responsibility is real; the liability is unreachable. The harm emerged from physics, topology, and code interacting at millisecond speed, with every answerable human placed at a distance the law cannot cross.[18]

There is a further loss past authorship, and it is the act itself. The systems I have described still run inside operations, things with a start and a stop, a launch someone orders and a return someone logs. Persistent autonomy dissolves that

[18] The ethics of autonomous weapons calls this a responsibility gap: when a machine kills, no one, not the programmer, not the commander, not the machine, can properly be held (Sparrow, 2007; Matthias, 2004). I mean something more exact. A gap is an absence; what I have traced is a dissolution, a killing with too many real authors to collect from, not none. Emergence adds what the gap does not reach: a harm no human formed the intent for at all.

frame. The pieces already exist: munitions that loiter, swarms that engage on their own in the final seconds, standing rules that say what may be struck. Assemble them and you have a condition someone leaves running rather than an operation anyone begins, watching an area for as long as its power lasts and striking whenever the conditions it was given are met.[19] The kill box was a place; this is a place held open in time, a box that never closes. There is then no strike to point to, because the strike is not an event but a setting, and lethality stops being something done and becomes something present, like weather, that now and then kills. Accountability needs an act it can name and a moment it can return to. This offers neither: not a death anyone decided, at a time no one can mark, inside an operation that never quite happened.

International humanitarian law was not written for this. IHL's foundational requirements like distinction between combatants and civilians, proportionality in attack, precaution in planning, all presuppose a human actor who can exercise judgment at the moment of decision (ICRC, n.d.). When emergence produces a targeting outcome, that judgment was exercised at system design, at training data curation, at deployment authorization, never in the act itself. A reader trained in the law will object that IHL is not in fact silent on upstream conduct, and the objection deserves its strongest form. The law already holds three instruments that reach behind the moment of effect: command responsibility, which makes a superior liable for a subordinate's crime he knew of and failed to prevent; state responsibility, which attaches an internationally wrongful act to the state itself; and Article 36 of Additional Protocol I, which obliges a state to legally review a new weapon before it is fielded. Each reaches upstream, and each fails here for a structural reason rather than a want of will. Command responsibility requires an identifiable subordinate who committed the underlying act, and emergence supplies an outcome with no such actor present when it occurs. State responsibility can name the state but not the human, and it dissolves at the very boundary the Ramstein case maps. The relay is run by one state, the model owned by a private firm, and the act crosses between them into no one's jurisdiction. An Article 36 review certifies the weapon as designed, but cannot anticipate the specific behavior that weapon will produce in concert with others, because that behavior is a property of the deployed system and not of the reviewed object. The doctrines that look

[19] A documented instance. In June 2025, off Port Hueneme, a global autonomous reconnaissance craft under test switched into autonomy mode while still under tow, after an operator on the dock inadvertently disabled the safety lock. Holding itself to a standing rule to keep eighty metres from all objects, it accelerated, crossed repeatedly in front of the towboat and capsized it, throwing the captain into the water. It then turned back toward the boat and advanced. The reporting is plain about the part that matters here: "The captain of the towboat had no way of taking over control of the automated vehicle". Three minutes passed between the autonomy engaging and a third towboat pulling him from the water. The safety investigation found a mistyped command and no fault in the software. No adversary, no enemy, no operation, and nobody able to reach the switch (Bloomberg, 2026a).

upstream find a state, a design, and an authorization. They do not find the one thing individual liability is built to locate: a person who decided this death, here, now.

The law's objections all looked for a decision and found none; the systems engineer objects that there is too much to find, not too little. I have called the chain untraceable, and he will object that the reverse is true: an autonomous system is the most traceable killer there has ever been. Every input, every weight, every message between the agents is logged, and given the record the whole cascade can be replayed to the millisecond. The objection is correct, and it should be conceded without reservation, because it changes nothing that matters. What the log preserves is the mechanism, not the decision. The replay shows the math resolving, weights meeting inputs, the box forming; it does not show a person weighing this death and choosing it, for the reasons just given, because no such person was present when the act occurred. Traceable was never the same as answerable. The act can be reconstructed in full and still answer to no one, because the trace leads everywhere except to a judgment a court could charge.

7. Commercial Drivers: The Invisible Generals

Militaries did not build this architecture alone. Commercial forces have shaped and accelerated it, transforming space from a domain of state-led experimentation into one dominated by private capital, reusable launch vehicles, and proliferated low-Earth orbit constellations. This commercial momentum is the primary engine behind the architecture's rapid deployment, and it introduces a structural ambiguity that doctrine alone cannot resolve: the same technologies that enable civilian broadband, Earth observation, scientific research, and everyday connectivity are routinely integrated into military operations, often without clear public attribution, binding oversight, or mandatory transparency.

The commercial substrate is not new, and its history is a single line. In 2009 the Pentagon had the kill chain over Afghanistan ride capacity owned by a publicly traded company (The Intercept, 2015), and by 2016 the Air Force's own staff college was documenting that drone ISR ran exclusively on commercial satellite bands the Department of Defense could not control: the Predator flew on Ku-band, which had no military-satellite option at all, and the DoD could not dictate a single change to the commercial constellation it depended on (Baghal, 2016).

By early 2026 the dependency had become leverage. After the United States opened its assault on Iran in late February, SpaceX argued that the Pentagon, paying about five thousand dollars per terminal, was in fact using a higher tier of service worth closer to twenty-five thousand, and the Pentagon, ramping up its strikes and without an alternative, agreed to a price increase that nearly doubled

the cost of each LUCAS loitering munition running on SpaceX's Starshield service[20] (Reuters, 2026b). Read in sequence, Galaxy-26 in 2009, the exclusively commercial finding in 2016, and the pricing leverage in 2026 are one continuous line: the kill chain has run on privately owned orbital capacity from the start, the dependency has only deepened, and it has reached the point where a single provider can set the price of a strike campaign and the state must meet it. The February 2026 Starlink whitelist made the private kill-switch undeniable as a capability. At Kyiv's request SpaceX deactivated every unauthorized terminal across Ukraine, and battlefield momentum shifted (BBC News, 2026). It is the same fact in sharper form: the entity that owns the orbital infrastructure does not only toggle a war (Reuters, 2025; The War Zone, 2026), it has supplied one since 2009 and now meters it. The privatization of the kill chain was not announced. It was leased, one transponder at a time, and the public record of it is mostly the military's own procurement documents. And it is no longer only leased. At Ramstein, an Air Force communications squadron has built an in-house transport that braids military and commercial satellite, including Starlink, with cellular and fiber into a single mesh carrying the kill chain to forward forces, by importing the commercial sector's own architecture wholesale.[21]

Connection is one half of it. The other half is what can be seen, and the same private hands hold that too. During the Iran campaign, on a request from Washington, the commercial imaging firm Planet Labs restricted access to its satellite pictures of the region, extending its publication delays and releasing images of the designated areas only case by case (Bloomberg, 2026b). The request was put as a voluntary one, and the provider that sells persistent overhead monitoring agreed to look away from a war on being asked; control of the connection and control of the image sit in the same private hands.

[20] Starshield is SpaceX's government and military variant of Starlink, publicly announced in December 2022, built on the same satellite bus and ground backbone but hardened with encryption and government-cloud integration. Its military footprint has grown quickly. The National Reconnaissance Office signed a contract of roughly 1.8 billion dollars in 2021, deploying from 2023, to build a proliferated low-Earth-orbit reconnaissance network on the Starshield bus (Roulette and Taylor, 2024). And in May 2026 the Space Force awarded SpaceX a 2.29-billion-dollar contract for a military data network, the Space Data Network Backbone, built from Starshield satellites but operated by the Space Force; the Pentagon restructured the effort before Tranche 3 to shift emphasis toward it, concentrating under one provider the procurement the Space Development Agency had spread across several (Erwin, 2026). The provider that meters the kill chain is also building the reconnaissance and transport layers above it.

[21] The 1st Air and Space Communications Operations Squadron's BlackNet braids military satellite, commercial satellite (including Starlink), commercial cellular, and fiber into one mesh; its commander describes it as applying "real world ISP configurations on a DoD enterprise" to "simulate what AT&T, Verizon, Viacom or whomever do, created just for the Air Force." The unit imported the commercial "colorless core" that lets a civilian carrier run any service over any transport, accredited it for operational use in July 2022, and runs Starlink as one of those transports for forces in Europe (AFCEA, 2023; Air Force Historical Research Agency, 2024; Kadrovach, 2023).

The blurring of civilian and military use is not accidental; it is a feature of the economic model that has made proliferation possible. Commercial providers have no incentive to restrict dual-use applications when governments are willing customers. Military planners have every incentive to leverage the cost and speed advantages of commercial systems rather than building bespoke alternatives. Under the economics sits a harder question. Is the dual-use a trait of these particular products, or of the requirement itself, since surviving where nothing supports you and projecting force where nothing supports you may be the same engineering problem? If it is the requirement, the blurring is a property of the tools rather than a market habit that regulation could correct, and no line between civilian and military use has a seam in them to follow.

The result is a system in which agency diffuses across human roles and beyond them, into corporate entities, algorithmic processes, and orbital infrastructure. Bruno Latour's actor-network theory offers the precise formulation: nonhuman actors such as the satellite, the laser link, the protocol stack, and the targeting algorithm are not passive instruments of human will, but active participants that enroll states, corporations, and populations into configurations of power and harm (Latour, 2005). When a Starlink terminal enables a strike, the terminal is more than a tool. It is a node that has assembled an alliance, distributed agency, and produced an outcome. Accountability frameworks that begin and end with human decision-makers will always miss the nonhuman participants that make the decision possible. But this is description, not absolution. The satellite and the algorithm redistribute the appearance of agency, not the responsibility, which a thing cannot hold because it answers to no one. Latour explains why the act resists attribution; he does not lift the obligation off the people who assembled the network and set it running. The theory flattens the field; the kill chain does not, for a distributed network still has parts it cannot run without, and whoever owns one holds, inside that flat field, a commander's power over the act: the power to permit the strike or to deny it. SpaceX has already exercised exactly that veto: asked to extend Starlink over Sevastopol so Ukraine could strike the Russian Black Sea Fleet, Musk refused, and the attack could not proceed (Isaacson, 2023). The power cuts both ways, and neither way leaves an order anyone signed: the owner can override the state, as here, or serve as its deniable hand, the government issuing through a private platform a command it never has to put its name to.

The commercial actors whose platforms govern the kill chain, namely SpaceX, Palantir, Anduril, and Google, function as its invisible generals: exercising infrastructural sovereignty without bearing the legal or moral obligations of combatants. The merger of commercial and military authority has since been made explicit. In June 2025 the U.S. Army commissioned four senior technology executives as lieutenant colonels in the Army Reserve, none of them required to

recuse from their companies' ongoing Pentagon contracts (DefenseScoop, 2025b; Military.com, 2025). The line between the chain of command and the supply chain now runs through the same person.

The supplier's defense for bearing none of a combatant's obligations is that the tool is neutral. Pressed on whether he should refuse particular operations, Anthropic's chief executive reached for the analogy the arrangement depends on: the government uses Microsoft Excel, and you cannot tell it which operations it may use Excel for (Amodei, 2026). But a spreadsheet computes what a person enters; the system in question generates the target list and ranks the people on it. The analogy is the same redescription this paper began with, the one that turns loading a key into mere maintenance, performed now from the top of the chain: a thing constitutive of the killing recast as a neutral instrument, so the one who builds it owes nothing for what it builds.

The Kill Cloud's accountability problem does not begin at the moment of targeting. It begins in the mines. The chips that power orbital AI inference, the rare earth magnets in satellite guidance systems and drone motors, the solar panels on orbital compute platforms, all trace back through supply chains whose labor and environmental conditions are structurally opaque. China makes more than ninety percent of the world's permanent magnets and dominates the refining of the critical minerals these systems run on, the rare earths in radar and missile guidance among them, and the United States has linked parts of that supply to forced labor (U.S. Department of Labor, 2024).

But to file the labor problem under China is its own evasion. The minerals are pulled from many hands and many places, north and south, the cobalt and tantalum of the Congo, the lithium of the Andes, rare earths dug and refined wherever it is cheapest to do it, and the country that points at China runs coerced labor of its own, in a prison system its constitution still exempts from the ban on involuntary servitude (American Civil Liberties Union and Global Human Rights Clinic, 2022; U.S. Constitution, Amendment XIII). The opacity is not one nation's. It is the condition of the whole supply chain, and it complicates attribution and remedy for everyone who buys from it. No individual engineer who designs a targeting algorithm, no operator who authorizes a strike, and no voter who funds the defense budget chose to participate in those conditions, but all of them are downstream nodes in a supply chain whose accountability gaps precede and mirror the targeting chain's own. The diffusion is the same: too many steps, too many jurisdictions, too many intermediaries between the act and the actor.

The pattern is older than any of its operators, and it has never once stopped. The Congo has been bled for a distant market since Leopold II held it as his private possession and worked it for rubber, killing and starving Congolese by the million, by some estimates half the territory, without setting foot in it (Hochschild, 1998). It

did not end when Belgium took the colony, nor when two-thirds of the uranium for the first atomic bombs was dug out of the ground beneath it, the highest-grade ore on earth (Williams, 2016), nor when the first elected leader was killed with Belgian and American hands in it and a dictator kept in his place for the copper, nor through the wars that have killed millions more since. Only the operators and the commodities have changed. The form holds: a faraway power organizing mass death at arm's length, through private hands, for a material the world wants and will not look at. The same ground that fueled the first atomic bomb now yields the cobalt in the batteries the Kill Cloud runs on, and the wealth of that first bleeding still stands in the monuments of the European capital where I studied international relations. It stands here too, in every capital that grew rich the same way. And the men who run the extraction now are not a different kind of man from Leopold. He owned his Congo and could be named for it; they own nothing a court will let their names be attached to, and the difference is not conscience but structure. What he did by holding the country, they do by holding none of it and letting the market hold it for them: a low price cannot be paid except in that exploitation, so to demand the price is to guarantee the cost, a thing willed by everyone together and by no one alone. Leopold had a name for Casement to put to the crime. This is the same crime with the name dissolved.

And the pattern is not only the Congo's, and not only cobalt's; it runs on the ground I come from. At Thacker Pass in Nevada, the place the Paiute call Peehee mu'huh, rotten moon, the site of an 1865 U.S. cavalry massacre of a Paiute band, lithium is being cut from Native land for the batteries this architecture runs on (Nevada Current, 2022). A friend of mine fought it. Myron Dewey, of the Walker River Paiute, had taken the drone, the aerial eye I helped build a war around, and turned it into an instrument of witness, flying it over Standing Rock to record what was done to the water and the people when the cameras looked away. He aimed the eye overhead at guarding a place; I had helped aim it at emptying one. He was killed in a head-on collision on a rural Nevada road in 2021 (ICT News, 2021). The extraction that begins in a foreign pit ends on a massacre ground at home, and the same eye that hunts from above is the one he turned to keep watch.

The enrollment of commercial platforms into state intelligence operations is not a recent development. The PRISM program, operational from 2007 and revealed through documents published by the Guardian in 2013, established that the NSA was compelling Google, Apple, Microsoft, and Facebook, the foundational companies of the commercial internet, to hand over user communications from their servers without public disclosure (Greenwald and MacAskill, 2013). The Kill Cloud's commercial layer did not create the condition in which civilian infrastructure serves military intelligence ends. It inherited and scaled a condition that had already been deliberately constructed. The Kill Cloud does not create

supply chain opacity. It inherits it, and the inherited opacity becomes one more layer through which moral responsibility diffuses until it disappears. When I write that this machinery began in a clay pit between the fingers of an enslaved child, I am not writing metaphor. Its cobalt runs back through refiners to Congolese mines where children are recruited to dig, and die when the tunnels collapse. When the families of the dead and maimed sued the five firms at the end of that chain, Google among them, one of the kill chain's own suppliers, the court found the harm real and the plaintiffs entitled to sue, then held that buying cobalt through the global supply chain is not participation in the venture that enslaved them (Doe v. Apple, 2024; U.S. Department of Labor, 2024; Walk Free, 2023). This is the structural precondition for everything that follows (U.S.-China Economic and Security Review Commission, 2025; CSIS, 2025). The dispersal that unmakes accountability at the trigger unmakes it at the mine.

8. Orbital Apartheid: Living Inside Someone Else's Machine

Here the architecture leaves the ground, and the account goes with it, from the node I stood in to the planetary system it climbed into. Orbital infrastructure is not distributed evenly across the planet. While major powers and their allied industries drive its design, deployment, and control, large portions of the world, particularly in the Global South, are positioned as consumers, data sources, or subjects of observation rather than co-authors, owners, or beneficiaries. This asymmetry is structural, rooted in historical patterns of technological dependency, unequal access to orbital infrastructure, and the way commercial proliferation replicates older forms of extraction under new guises. The architecture that promises information dominance to some actors simultaneously deepens exclusion and vulnerability for others, producing harms that are both physical and epistemic, immediate and long-term.

Orbital dependency manifests in a persistent form of disparity that can be described as orbital apartheid when viewed through the lens of historical analogies of exclusion and extraction. The word is deliberate, and it should be defended rather than thrown. The analogy is not to the racial law of any particular state but to its structure: a single space partitioned into those who design, own, and move freely within it and those who are observed, extracted from, and barred from entering it, the partition enforced not by anyone's animus but by the built environment itself. Four features have to hold for the term to be earned, and this section establishes each. The exclusion is structural rather than incidental, fixed by the cost of launch and manufacture rather than by any single choice. It is extractive in one direction, taking data and raw materials out while returning priced access.

It imposes a perceptual and legal order the excluded had no part in making and cannot contest. And it offers no exit: the dependency is the condition of connection itself, and the one response available to the excluded, building observation and data-ingestion capacity of their own, is enrollment in the same logic rather than escape from it. Where those four hold together the comparison is doing analytic work rather than rhetorical work, and the burden shifts to the objector to say which of the four is false.[22]

The exclusion is not only economic, it is cosmotechnical. The philosopher Yuk Hui argues that there is no single, universal Technology, only many technologies, each one a particular culture's way of joining its tools to its picture of the world and its sense of how people should live (Hui, 2016, pp. 18-19). The orbital layer excludes the Global South from ownership and, in the same move, installs a single planetary ordering system, whose logic is extractive optimization, as if it were the only way to be technical, foreclosing the many that Hui insists remain possible. Their territories become raw data sources; their lived environments are rendered as training pixels; their sovereignty is exercised in a perceptual register they did not build and cannot contest. Orbital apartheid is therefore also a cosmotechnical monoculture: the imposition of one way of being technical on populations who had others.

The disparity is not in how much of the world is watched. Ambient commercial observation is by now close to universal, and in raw terms it is heaviest in the wealthy world, where an ordinary person sheds more data through more devices, accounts, and sensors than almost anyone in the regions this section describes; the machinery of data brokerage, behavioral advertising, and always-on telemetry was built in the North and turned first on its own populations. Those four features are not four places to look. They show up in three, which the sheer volume of observation tends to hide. The first is ownership: the people of the South are watched by orbital and platform infrastructure they did not build, do not govern, and cannot opt out of, while the states and firms of the North own the apparatus that watches everyone, themselves included, and set the terms on which it runs.

The wide-area surveillance that learned to watch a whole city at once in Iraq and Afghanistan came home. By 2016 it was flying over Baltimore, and it took a court to ground it.[23] At home, drawing a box over a population is a constitutional fight.

[22] This carries two arguments up to orbit. Achille Mbembe's necropolitics is the power to decide who may be killed and who let live, exercised most freely on the colonized (Mbembe, 2003); orbital apartheid is that power given an altitude and a subscription. Keller Easterling showed that infrastructure has itself become a form of governance, an extrastatecraft (Easterling, 2014); infrastructural sovereignty is extrastatecraft with a trigger.

[23] The capability is wide-area motion imagery, a sensor that images an entire city at once and records it, letting analysts rewind and track every vehicle back to its origin. It matured across the wars, from

continues on next page

The domestic version even has a name, the geofence warrant, a circle on a map that sweeps in everyone inside it, and it needs a judge, and the courts are split on whether even that is allowed.[24] In war the same box is drawn by default, with no warrant, no notice, and no appeal. And it is one collection. A deputy police chief called what the geofence dragnet gives his investigators "the whole pattern of life," the very phrase the kill chain uses for how it finds a target (Valentino-DeVries, 2019). The location data that draws a circle around a bank at home is the location data that fixes a person abroad, and the only thing that changes is whether a judge is asked.

The second is recourse, and here the gap is not that some states have modern privacy law while others lag behind. It is written into the law of the surveilling powers themselves, where the collection is not an abuse at the margins but a thing the statutes affirmatively authorize in the name of foreign intelligence. The layers can be taken in order, because each authorizes a different reach and the deepest decides who counts as a person under the law at all. The American authorities take the communications of non-citizens believed to be abroad directly from U.S. providers without individual warrants, run overseas collection on executive authority with no court involved at all, and rest on the older doctrine that what a person has handed to a company he can no longer claim as private (Executive Order 12333,

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Constant Hawk (the first operational US Army system, c. 2006, flown on turboprops over Iraq against IED networks) to Angel Fire (an Air Force Research Laboratory and Los Alamos system fielded over Iraq in 2007; GlobalSecurity.org, n.d.c), DARPA's 1.8-gigapixel ARGUS-IS (368 imagers), and Gorgon Stare, the pod on the MQ-9 Reaper that by its 2014 increment held roughly a hundred square kilometers at once (Holland Michel, 2019). By 2016 the same capability was over an American city. Persistent Surveillance Systems, founded by an engineer who had built the wartime versions, flew camera-equipped Cessnas over Baltimore, some thirty square miles imaged once a second, in secret, privately funded, with neither city council nor mayor informed (Reel, 2016; Simpson, 2020; Emmons, 2020). Its authorized successor was struck down by the en banc Fourth Circuit, eight votes to seven, as a Fourth Amendment violation, and the imagery destroyed under the ensuing settlement (Leaders of a Beautiful Struggle v. Baltimore Police Department, 2021). The Associated Press had already traced some fifty surveillance aircraft to the FBI, flying over thirty cities behind fictitious shell companies (Gillum, Sullivan and Tucker, 2015). Arthur Holland Michel, whose history of the technology is the standard one, wrote that it "opens our lives to a view from the heavens that had, from the dawn of civilization until not so long ago, been reserved for the gods and the stars" (Holland Michel, 2019).

[24] A geofence warrant specifies a radius and a time window and compels a company to identify every device inside it, sweeping the suspect together with every stranger who was there. Google answered these from an internal database it called Sensorvault, holding location records on hundreds of millions of devices, labeling each with an anonymous identifier before unmasking the names police selected (Valentino-DeVries, 2019). In late 2023 it moved location history to encrypted on-device storage, curtailing its ability to answer at all (Google, 2023). The Fifth Circuit has held such warrants categorically unconstitutional, "modern-day general warrants" (United States v. Smith, 2024). The deeper objection is the mosaic theory, the idea that data points each lawful to gather can, aggregated, become a search, because the assembled pattern discloses what no single point does. It is a framework named and pointedly criticized by Kerr (2012) and reflected in the concurrences in United States v. Jones (2012) and in Carpenter v. United States (2018). One warrant then opens a cascade of further searches, each in its own legal silo, that no judge reviews whole. The same logic reaches reverse-keyword warrants that would name everyone who searched a term (Congressional Research Service, 2026).

1981; USA PATRIOT Act, 2001; Foreign Intelligence Surveillance Act, 2008; USA FREEDOM Act, 2015). Beneath all of it sits the line that decides whom the whole structure is for: constitutional protection runs to the national community, and a foreigner abroad falls outside it, holding no privacy in the Fourth Amendment the law will recognize. A second doctrine closes the courthouse even where the right might reach. Because the surveillance is secret, a plaintiff cannot prove he was swept up, and without that proof he has no standing to ask whether he was. One doctrine withholds the protection; the other withholds the proof that would let anyone claim it. The citizen whose data is swept up keeps at least a thin and contested remedy; the man in Yemen or the Sahel whose phone is located under the same programs has none, by the design of the law and not by its failure. When Europe sought that protection for its own citizens it did not get it either. Its highest court twice struck down the frameworks for moving European data to the United States, naming these same American authorities as the reason it could not trust them (Court of Justice of the European Union, 2015, 2020).

The line drawn around the citizen is not as firm as it looks either, and one family shows how far it bends. Anwar al-Awlaki was an American, born in New Mexico, who studied engineering at Colorado State University and led a mosque outside Washington. In the months after September 11th he was treated as a moderate: he condemned the attacks, the press sought him out as a mainstream voice, and the Defense Department invited him to a luncheon at the Pentagon as part of its outreach to moderate Muslims. He was also, on the same days, under FBI surveillance and questioned over his contacts with two of the hijackers, contacts investigated for years and never resolved into a charge. He left the country in early 2002, in flight from the surveillance rather than from any charge, and came back that October to find the one warrant against him, for a false birthplace on a scholarship form he had filled out at nineteen, cancelled by prosecutors the day before he landed; immigration agents held him at JFK from a quarter past six that morning until the warrant was confirmed dead at nine, then released him and his family with thanks for their patience (ABC News, 2009). He left for good before the year was out. In Yemen he was arrested in 2006 and held for some eighteen months without charge and without trial, by his own account and others' at the urging of the United States, and it was over that imprisonment, he said, that his preaching turned from condemning al-Qaeda to open hostility toward the country that had watched him, courted him, pursued him, and pressed for his jailing. By 2010 that same country had put him on a list of its own citizens it meant to kill. Whatever he had become by then (the government's case that he had become an operational figure was serious, and was also never tested in any court), the architecture that killed him had a hand in making him, and it was answerable for neither the making nor the killing (National Security Archive, 2025).

On 30 September 2011 a US drone killed him in Yemen, the first deliberate killing of an American citizen by his own state in this war, justified by a Justice Department memo and never put before a court (U.S. Department of Justice, 2013). Two weeks later a separate strike killed his sixteen-year-old son Abdulrahman, an American boy born in Denver, as he sat at an outdoor meal; the boy had been charged with nothing and was not the target, and when Robert Gibbs, a senior adviser to the president's campaign and formerly his press secretary, was pressed on the killing that October, he answered that the boy "should have a far more responsible father" (al-Awlaki, 2013; Grim, 2012). His grandfather wrote: "The government has killed a 16-year-old American boy. Shouldn't it at least have to explain why?" In January 2017 the first raid of a new administration killed Anwar's eight-year-old daughter Nawar, an American child, shot in a village in central Yemen and left to bleed for hours (Bureau of Investigative Journalism, 2017). Three citizens of one family, across two presidencies, none of them tried, none of them ever able to ask a court whether their country was permitted to kill them (Al-Aulaqi v. Obama, 2010; Al-Aulaqi v. Panetta, 2014).

The third asymmetry is consequence, the one that bears hardest here, and the one the al-Awlaki deaths already begin to show. In the North the watching mostly ends in a transaction, or at its worst in policing; the lethal edge of the same architecture, the targeting and the strike, is turned outward, onto the South. The SIM-card tracking described earlier is the whole of this arrangement at once: collection licensed against non-citizens abroad, run through a country that was never asked or that will not admit it agreed, ending on a man whom the law of every party to it has placed beyond the reach of any remedy. For him the watching is far more likely to end in a strike than it is for anyone in the world that built it, and far less likely to leave behind anyone who can be held to account for it. The exclusion runs past the economic and operational. It is perceptual: a single planetary machine displaces local ways of seeing and being, perceiving, deciding, and acting in a register the observed population can no longer enter. The mechanism is architectural rather than exceptional. Across much of the Global South, surveillance is the default configuration of the network itself, requiring no targeted intrusion at all. It is written into SIM-registration, lawful-intercept, and data-retention law.[25] The act of connection is itself enrollment. Participation in modern communications life automatically feeds the data flows that pattern-of-life algorithms require for targeting. No hack is necessary. The infrastructure was built that way. The result is not just unequal access; it is unequal vulnerability, where the architecture extracts

[25] SIM-registration laws biometrically link citizens to their devices; lawful-intercept infrastructure, installed in switching centers under national law, duplicates traffic to security services as a matter of routine; and data-retention mandates turn commercial carriers into permanent state surveillance archives.

value from the South while concentrating the capacity to act and the capacity to escape accountability in the hands of a few.

The clearest state-on-state case had already been fought, twice, in the country of my own childhood. Over forty-four days in the autumn of 2020 Azerbaijan retook most of Nagorno-Karabakh from Armenia, and in a single day in September 2023 it took the rest and emptied the territory of nearly its entire population, and both wars were won in large part by an arsenal bought from two foreign suppliers (Global Security Review, n.d.; U.S. Naval Institute, 2022).

Turkey furnished the Bayraktar TB2, built by a private firm closely tied to its government, and shipped weapons; and by multiple accounts it moved Syrian fighters to the front as a deniable proxy force (Washington Post, 2020). Israel furnished the loitering munitions that did much of the killing, the Israel Aerospace Industries Harop and the Elbit SkyStriker, and much else besides: Hermes-450 and Orbiter reconnaissance drones, and LORA ballistic missiles (Mitzer, 2022); by various estimates Israeli firms supplied on the order of two-thirds of Azerbaijan's arsenal in the years before 2020 (Times of Israel, 2023; CNN, 2023). None of it was charity. Azerbaijan supplies close to half of Israel's oil imports (Reuters, 2026c) and holds Iran's northern border, so arms moved one way while oil and strategic position moved the other, a commercial exchange dressed as an alliance (Cohen, 2023). Armenia held a mutual-defense treaty with Russia and a Russian garrison on its soil, and found when the war came that the guarantee was hollow: Russia had sold to both sides for years, brokered the 2020 ceasefire, posted peacekeepers, and then stood aside when the 2023 offensive came, its peacekeepers letting the enclave empty before they withdrew (Middle East Institute, 2024).

The war that analysts call the proving ground of drone warfare, the death of deterrence, was also the same accountability problem at the scale of states. The decisive capability was owned by private firms and supplied by governments that bore none of the consequences; the killing was done by machines sold across borders; the proxy force held the suppliers at arm's length from the act; and when it was over there was no party the law could reach for what the weapons had done. The invisible generals were not only in Virginia and Hawthorne. They were in Ankara and Tel Aviv, and the country they helped empty was the one that taught me, as a child, what it is to live inside someone else's machine.

I was there because my father was enlisted support to the American defense attaché, in years the Armenian intelligence services watched us: our phones were tapped, the house was bugged. On my twelfth birthday, 27 October 1999, five gunmen[26] stormed the parliament and killed the prime minister, the speaker, and

[26] The five were the group's leader, Nairi Hunanyan; his brother Karen Hunanyan; his uncle Vram Galstyan; Derenik Bejanyan; and Eduard Grigoryan. They surrendered the following morning and were sentenced to life imprisonment in 2003 (RFE/RL, 2009).

six others,[27] and within the hour an angered mob was assembling outside our house while my father and mother were trapped in the embassy across from the parliament. That was the danger we lived inside.

But it was not what marked me. What marked me was quieter and everywhere. On my father's country drives, and on the streets where I wandered, I saw the other side of the late-1990s collapse: doctors working as street sweepers because their credentials no longer carried over; in Goris, a town in the southern highlands where people have long lived in caves, families coming down to beat on the windows of our armored car for supplies; an economy fallen to half of what it was. My school performed song and dance at the orphanages at Christmas. The children there were malnourished and neglected, some left in cribs. The war and the collapse that put them there had happened before most of them were born, and it was still in them, in the hunger and the sickness and the neglect. The nurses took the gifts we brought because they had nothing for their own children, and the embassy stepped in afterward. It was where I first understood what a war does after the bullets stop. It does not leave. It stays in the bodies of the ones who survive it, for years, for whole lifetimes. And it taught me the other thing too, that grief is total even when the dead have no face you will ever see. The children grieved parents I would never lay eyes on, and the grief was complete regardless; the face was missing for me, not for them. Nobody decided any of it. The system failed and moved on, and the cost fell on the people least able to refuse it. A child who never leaves his own town learns the enemy as a word, a flag, a face on the news he is taught to fear and will never have to meet. I met the far side of a war first, as its survivors, before anyone could teach me to call them anything else. Years later the same was true of the people my work helped kill: they had no face for me either, and the missing face took nothing from the weight of their deaths.

9. The Erasure of Accountability

One distinction has to be drawn before anything else can be argued. The question is not whether the war was authorized. A war can be lawfully declared and unlawfully fought, and a single strike can break the laws of war inside a war that broke none. What this section asks is the second question, not the first: whether the killings this architecture produced were lawful, and whether anyone can be made to answer for the ones that were not.

[27] The eight killed were Prime Minister Vazgen Sargsyan and National Assembly Speaker Karen Demirchyan, together with Deputy Speakers Yuri Bakhshyan and Ruben Miroyan, Minister Leonard Petrosyan, and parliamentarians Henrik Abrahamyan, Armenak Armenakyan, and Mikayel Kotanyan (RFE/RL, 2009).

Whether Anyone Can Be Made to Answer

Lethal autonomous weapons systems (LAWS) are proliferating along every axis at once: how accessible they are, how much autonomy they carry, how many tactical roles they fill, how many actors now build them. Their core weaknesses hold even so: short on robustness, hard to interpret, and open to adversarial attack. Major powers largely abstain from binding treaty proposals, leaving only non-binding guiding principles and urgent calls from the Global South and humanitarian organizations for regulation or bans (Heyns, 2013; Longpre, Storm and Shah, 2022). The Convention on Certain Conventional Weapons (CCW) discussions on LAWS, running since the 2013 mandate, have produced no legally binding outcome, with the United States and Russia opposing restrictions on autonomy in weapon systems (CCW Meeting of the High Contracting Parties, 2013; CCW Group of Governmental Experts, 2025; Longpre, Storm and Shah, 2022). The result is a free hand: lethal authority is being delegated to machines with nothing binding to stop it.

Proponents of JADC2-style architectures argue that distributed sensor fusion and AI-assisted targeting do not erode accountability, they improve it, by enabling faster discrimination between combatants and civilians, reducing decision errors through multi-domain data fusion, and minimizing collateral damage through precision that analog targeting could never achieve (Department of Defense, 2022). The empirical record does not support this claim. In Gaza, the Lavender AI system generated targeting recommendations with reported false-positive rates that translated into civilian casualties, with minimal human review between algorithmic output and strike authorization (+972 Magazine, 2024; McKernan, 2024). The civilian casualties from Afghanistan's networked operations, the seventy civilian deaths UNAMA attributed to pro-government forces in the southern provinces that the 73rd EACS covered, in a single five-and-a-half-month period, and the twenty-three civilians killed at Khod in Uruzgan five months after I rotated out, occurred not despite precision architecture, but within it, and without producing a single finding of individual accountability (UNAMA, 2009a; Cloud, 2011). The internal accounting was worse than the public record. Classified documents leaked by intelligence analyst Daniel Hale and published by the Intercept established that over one five-month period of U.S. special operations drone strikes, nearly 90 percent of those killed were not the intended targets, and that the military's standard practice was to classify all military-age males killed as "enemies killed in action" unless actively proven otherwise, systematically concealing the true civilian toll within the official record itself (Scahill, 2015).

The category did the killing before the missile did. The military-age male, in Sarah Shoker's account, is not a description but a produced category, a gendered visual identifier that turns an adult man into a not-civilian before anyone asks who

he is (Shoker, 2021). This is augury[28], the reading of signs to pronounce a death, and the only thing new is that it has forgotten that it divines and calls the omens intelligence. All of this still passes through a human, however thin the review. The emergent behaviors documented in multi-agent systems remove even that: the unpredictability that emerges from swarm interaction is a structural feature rather than a refinement failure, producing outcomes that no individual component was designed to generate and that no post-hoc audit can trace to a human decision (Altmann et al., 2024; Xu et al., 2025).

Precision reframes the accountability problem rather than reducing it, replacing visible human error with invisible algorithmic output, and substituting technical confidence for legal traceability. The strongest version of the precision argument, that autonomous systems will eventually discriminate better than exhausted human operators making decisions under cognitive load, does not resolve the accountability problem even if true. A system that kills fewer civilians but kills them without any traceable human decision has not improved accountability; it has eliminated it. I should be candid that I once ran this argument myself. The precision case was the institutional form of the defense I made in that Brussels classroom, and it was not insincere: it answered for intent and for care. What broke it was the same move that broke me there. Precision answers how well the system aimed; accountability answers who can be held to the aim. A system can aim better every year and still leave no one to answer for where it aimed, and once I saw those were two different questions I could not go back.

I do not think accountability is instrumental, and the whole paper has been an argument for why. Accountability for killing is not a tool we keep because it lowers the body count. It is the thing that makes lethal force by a state legitimate in the first place. A polity that authorizes killing constitutes itself, in the same act, as one in which a killing can be answered for, brought back to a person, weighed, and judged; that answerability is not added to the use of force to improve it but is the condition under which a death inflicted in our name is something other than murder. Strip the answerability out and you have not bought cheaper killing. You have changed what kind of thing the killing is, and what kind of sovereign does it. A state that builds un-answerable death into its infrastructure has not optimized its violence. It has stopped being the kind of state that can be asked, and that, not the body count, is the erosion this paper is named for.

There is a harder objection still, the one that underwrites all the others. We need all of it, the argument runs, because our adversaries are building it, and a state that falls behind cannot protect its people. Multiple kill clouds are being built now, and

[28] Augury and haruspicy were the divinatory arts of the classical world, reading the will of the gods and the outcome of a venture from signs, the flight of birds or the entrails of a sacrificial animal; the reading was commonly taken before battle and treated as authoritative.

not one of them belongs to a clean actor with clean hands. But the word protect is doing two jobs the technology has pulled apart. These architectures raise national power projection, the reach and speed of the state; they lower human security, the safety of the people who live beneath them (UNDP, 1994). The race is positive-sum for states and negative-sum for the humans the states claim to defend, so that every power building one is not the answer to this paper but the paper at its worst: a collective erosion of human security carried out in the name of national defense, which no state can halt by restraint alone, because restraint only hands the reach to the others. At the root the developments are anti-human.

The Person is Never Met

And this is where that erosion reaches its floor. I have traced it as the sovereignty of states, dissolving where one power owns the infrastructure and another owns the trigger. It erodes at a second level, and that is the one that makes the first matter: the sovereignty of the individual, and it goes at both ends of the strike. The person struck is dissolved into a signal and a heat signature, killed by a machine that never meets him and answered for by no one, stripped of the standing that holds that a life cannot be taken without someone to answer for the taking. The person who strikes is dissolved into a node, unable to decide against the institution, formed young and told little, a pawn in a game played over his head. The state gains the power; the individual, the killed and the killer alike, loses the sovereignty. Mbembe's necropolitics still had a sovereign at its center, the power to dictate who may live and who must die (Mbembe, 2003). What the architecture does is the departure worth naming: it keeps that power over life and death and dissolves the sovereign who was meant to hold it, enacting the exception with no one left inside it to decide, over people it has already emptied of their own. The machine secures the state by unmaking the person, on both sides of the strike.

The architecture does not merely observe the world, it constructs it.[29] Start from the screen. A commander inside the Kill Cloud cannot see the civilian child directly; he sees only what the system shows him, a pixel cluster an orbital model has already classified. Every creature perceives only the slice of the world its senses can reach, what the biologist Jakob von Uexküll called its Umwelt (von Uexküll, 1934), and the Kill Cloud does not widen the human Umwelt but replaces it with a machine's: multi-spectral, global, faster than thought, so that the system has filtered and pre-sorted the scene before the human can register it. This is the overview effect with the

[29] This is the terrain Antoine Bousquet mapped as the martial gaze, the long making of a way of seeing built to find and fix a target (Bousquet, 2018). Where his account traces how the eye of war learned to perceive, mine turns on what that perceiving forecloses: a scene resolved for targeting before any human meets it is not a sharper view of the world but a substitute for it, and it is on the substitute that the strike is made.

vulnerability taken out. The system is given the whole earth to see and is changed by none of it. The consequence is not that operators see less. It is that the architecture decides what can be seen before any human decides what to do with it, and a child pre-sorted into a heat signature never arrives as a child at all. This is what Heidegger named enframing: the turning of the world into a standing reserve of resources to be used, in which a person appears not as who they are but as what they can be made to yield (Heidegger, 1977), here a risk score, a movement vector, a target value. Antoinette Rouvroy calls the political form of this algorithmic governmentality, a power that no longer addresses the citizen who can answer for himself but only the profile to be modulated in advance (Rouvroy, 2013). And Byung-Chul Han names the civic mood that lets it pass unprotested, a transparency society that has put total visibility in the place of trust, so that being seen comes to stand for being answerable, and exposure for the deliberation it has quietly replaced (Han, 2015). That four traditions, ethology, phenomenology, political theory, and cultural criticism, sharing no method, converge on one event is what makes it a finding rather than a flourish. The person is not judged and found wanting. The person is never met.

None of this is only theory. The airmen who worked the feeds describe the same reduction in their own words. Michael Haas, who flew strikes from Creech, put it in the language of the screen: “Ever step on ants and never give it another thought? That’s what you are made to think of the targets, as just black blobs on a screen.” Children who came into the picture, he said, were called “fun-sized terrorists” (Pilkington and MacAskill, 2015), and the program’s culture did deliberately what the architecture does by design: “You did anything you could to remove their humanity, and in the process, you lost a bit of your own” (Walker, 2015). Brandon Bryant, a sensor operator, watched a small figure run around a compound in the seconds before his missile struck; when he asked afterward whether it had been a child, he was told it was a dog (Power, 2013). The feed could not tell a child from a dog, and the chain preferred that it could not.

They were a sample of individuals who spoke of their work, not a census; every person who pushes a button is different, and to say otherwise is to claim they are not human. To flatten them into a type would be to do to them what the architecture did to the child. They were doing more than implicating themselves; they were describing a culture in the workplace.

It comes down, in the end, to the child. The airmen had a phrase for what was done to them, “cutting the grass before it grows out of control” (Pilkington and MacAskill, 2015), the child rendered as growth to be cut back before it spreads. And if he survives the cutting, the war keeps one more category ready for him, the military-age male, a combatant by his age and sex before he is anything else, so that it has a name for him at every age and not one of them is his own. But a child

can be made into a soldier, and the law that knows this best calls the man who made him the criminal and the child his victim, and rightly so. I read Ishmael Beah in Brussels, a boy soldier's own account of being turned into a killer and coming out the far side a writer and a witness, and there is no page on which he stops being a child. Turning a child into a weapon does not make him not a child. And if that making were ever brought fully to a head, in a single moment, into a real threat, the threat would be the direct product of a war he never asked for, waged on land his family had tended for generations. There is no child, mine or theirs, whom a buried family and a ruined home could not turn. To see the enemy's child and fail to see your own in him is the whole error the war is built to keep you from correcting.

And that culture is no better than mine, and mine was no different. My culture was nonchalant about the gravity of what we were doing. I loaded crypto keys and went back to reading a book. I talked shit. I played games. I played pranks. I did not behave any more or less morally than those I worked with. I did not engage in philosophical discourse past debates over whether we hated shitting or pissing more on gate guard duty. I was tactful. I was performing, and I was becoming, and I did not like the man I saw shaving in the mirror. I did not like the man who could hear that we were killing people and just go on counting the days till I could get back to Spangdahlem, daydreaming of seeing my girlfriend, while maintaining an air war. I did not like waking up to explosions. My nerves were bad. I had GERD. I could not eat. I feared sleep, and I feared that my prayers before the deployment, to never have to kill anyone, had been knowingly naive.

That culture was the character from which I killed. My position was remote, so the discrimination in any strike was theirs, trusted forward down the chain, which is to say it was a discrimination I did not have and did not question. I allowed the killing to run through my position from that character, and I never questioned the authority structure that had placed me there. It placed me in what I can only call a Schrödinger's war crime[30]: a culpability the dispersal never lets collapse into a yes or a no, kept in superposition by the same structure that disappeared everyone else.

The reduction of a person to a heat signature removes something that has a name in moral philosophy. For Emmanuel Levinas, the ground of all obligation is the face of the Other: the encounter with another's exposed vulnerability that, prior

[30] Schrödinger's cat is the physicist Erwin Schrödinger's thought experiment: a cat sealed in a box is, until someone opens it to look, neither alive nor dead but both at once, what physics calls superposition. Schrödinger's war crime is my own phrase for the analogous condition, a guilt the architecture's dispersal keeps from ever collapsing into a definite yes or no, real and total at every hand yet never resolving onto one person the law can say did it.

to any law or calculation, commands “thou shalt not kill” (Levinas, 1969, p. 199).[31] The Kill Cloud’s epistemic regime is, in precisely these terms, the industrial erasure of the face. A child rendered as a heat signature, a family rendered as a pattern-of-life anomaly, present no face to anyone in the chain: the operator in Nevada, the analyst at the distributed ground station, the maintainer who keeps the link open, none of them is ever addressed by the vulnerability that would make the prohibition felt. The people who wrote our holiest texts could not have envisioned this. They set that commandment down for a world in which the face was always in front of you, where to kill was to stand near the killed; they could not picture a death dealt through a machine to a person the killer never sees. The letter of it was written for a nearness this architecture has dissolved. But in Levinas the responsibility precedes any particular meeting, so the obligation can be read as not depending on the encounter taking place. The face commands whether or not it is seen, and the responsibility it imposes is not canceled by distance, mediation, or abstraction; the architecture that removes the face makes the obligation more urgent rather than less, because the removal is itself a choice the system makes on behalf of everyone inside it. This is the ethical core of the same accountability problem that elsewhere takes technical, commercial, and legal form. The architecture does not only distribute the act until no one decided it. It distributes the face until no one is commanded by it, and the obligation the face would have imposed does not vanish with it. It accumulates, unanswered, in the ledger.

Too Far Apart to Gather

The architecture’s defenders have a powerful reply here, and it deserves to be met at full strength, because most of it is true. The system, they will say, is not blind but saturated with witnesses: the imagery analyst who watches a feed for hours and feels every minute of it, the controller on the ground who sees, the commander who weighs multi-source intelligence, the targeting cell whose work is cross-checked and reviewed. These are conscientious people, working from the best evidence any war has ever assembled, in a real kill-or-be-killed environment, under real civilian authority. To call this a system with no witness looks, on its face, false. Everything turns on what the word witness is doing. It can mean to see something, or it can mean to meet someone: to apprehend another person as someone you must answer to, the kind of recognition that can stay a hand. The architecture is drowning in the first kind, and the second it has no place for. Piling up more people who each see a fragment does not add up to one person who sees the whole, any more than

[31] Judith Butler calls this the work of frames, the schemes that settle, before any encounter, whose life registers as grievable and whose does not (Butler, 2009). This architecture is such a frame built down into the sensor: it decides at the level of the pixel who arrives as a person, doing mechanically and in advance what Butler describes as cultural and Levinas as ethical.

a letter torn into a hundred pieces still says what it said, though every word in it is still legible. The maintainer sees a signal path, the analyst a screen, the fusion cell a track, the commander a summary, the operator a reticle. Each sees faithfully. None of them sees the person, because no node holds the whole, and the division of labor leaves the piece each one holds precisely not the piece on which a life turns.

The institution describes that maintenance layer as part of the killing itself, in its own voice. The same Ramstein squadron states its mission, in its own public affairs, as delivering and defending its capabilities "to enable the kill chain, anytime, anywhere", a formulation the unit also renders as enabling "the kill-web anytime, anywhere", documented across command materials from 2023 through 2025 and carried in the squadron's official Air Force lineage history (Air Force Historical Research Agency, 2024; Ramstein Air Base, 2024; USAFE-AFAFRICA, 2025). The official reason for being of a communications and cyber unit, in the institution's own mission language, is the kill chain. That same commander draws the line between maintenance and lethality himself, calling the communications layer the "nervous system" of the military, the thing that enables "the muscle side, weapon systems, platforms and troops." And the doctrine goes further than a mission statement. The air-control node my own squadron operated at Kandahar, the control-and-reporting center, is carried by the Air Force not as support equipment but as a weapon system in its own right, one whose published functions include weapons control and whose operators the service trains and badges as weapons directors (Air Combat Command, 2023b; U.S. Air Force Weapons School, 2021). And the service's own breakdown of that weapon system settles where my trade sat inside it. Among its named subgroups are a Communications Group and a Tactical Data Link Group, the radios, satellite terminals, and datalinks I maintained; its crew is listed as maintenance, operations, and support personnel together; the weapon itself is always on another platform. And this was not doctrine read off a manual. The remote radios I stood up, I wired downrange into the Battlespace Command and Control Center, the 71st's control floor at Al Udeid, where the weapons directors sat in front of the remoted picture and the remoted radios and ran the aircraft. The voice they ran it on reached them through equipment my own hands had wired in. The radios and links I kept running were not support to the weapon. They were named components of it, at the level of discrimination my hands worked at. The conclusion I drew from a cryptographic key is therefore not a dissident reading imposed from outside. It is what the architecture says about itself.

A further structural mechanism has become visible in 2026: the deliberate political delegitimization of the governance project itself. When the Pentagon designated Anthropic a supply chain risk for maintaining ethical constraints on autonomous weapons, administration officials framed the company's position not as a legal or technical disagreement but as ideological obstruction, describing its

safety policies as “woke AI” and characterizing its CEO as having a “God complex” for refusing to grant unfettered military access (Axios, 2026b; CNBC, 2026b). The effect is to transform accountability mechanisms from legal obligations into political positions. Alexander Wendt’s constructivism holds that the rules of international life are not found but made (Wendt, 1999). The critical tradition names who makes them: written by the powerful, in Robert Cox’s sense that theory is always for someone and for some purpose, and defended as legitimate while any challenge is branded ideology rather than principle (Cox, 1981; Gramsci, 1971). When the Pentagon frames Anthropic’s ethical constraints as a vendor inserting itself into the chain of command, it is not making a legal argument. It is performing a constructivist move, redefining accountability as obstruction, and compliance as the only legitimate norm. When AI safety is framed as partisan, any binding constraint on autonomous weapons becomes ideologically contestable rather than legally required, and any company that maintains such constraints becomes a political target rather than a responsible actor. The governance deficit is no longer merely a coordination problem among states with competing interests. It has become a political conflict in which one side’s explicit interest is the elimination of the constraint entirely. This makes the accountability gap not just persistent but self-reinforcing. The more the governance project is politicized, the harder it becomes to build the coalitions necessary to close it, and the more the architecture advances without opposition.

The evidentiary asymmetry is itself structural: the documented record of insider testimony about the Kill Cloud’s costs exists almost entirely within the US system, because that system, however imperfectly, has produced legal and institutional channels through which insiders can speak. Comparable testimony from Chinese, Russian, or commercial satellite operator personnel does not exist in the public record, not because those systems produce no moral injury or civilian harm, but because they have built no infrastructure through which that testimony could emerge. The opacity is not incidental. It is designed.

In a single news cycle, the whole pattern surfaced at once. A private company briefly held the accountability line, was designated a national security threat for it, and within hours was replaced by a competitor who would not. The architecture consumed the constraint, punished its enforcer, and continued running. The political economy argument this section has built is now documented: the race penalizes the friction of accountability, and the market has just confirmed that an ethical limit is a competitive liability. A parallel sequence was documented at Google. A whistleblower complaint filed with the SEC in August 2025, reported the following February, alleged that Google breached its own published ethics policy which prohibited AI use for weapons or surveillance, by helping an Israeli military contractor apply its Gemini model to drone surveillance video footage in 2024

(Harwell, 2026). Google subsequently removed the weapons and surveillance prohibition from its public ethics policy entirely. The pattern is now documented across three companies: Anthropic refused and was designated a supply chain risk; OpenAI repositioned as the compliant alternative; Google quietly breached its own constraints and then erased them. The architecture does not merely reward compliance. It systematically eliminates the institutional capacity to refuse.

And the same is done to the people who hold the line. The machinery that could find no one to answer for nine in ten of the dead being the wrong dead found, with no trouble, the analyst who said so: Daniel Hale, whose count is cited above, was sentenced to forty-five months for the disclosure (Devereaux and Hussain, 2021) while no one was charged for the strikes it exposed. Individual accountability is not beyond this architecture. It is reserved for the one who tries to impose it. Reality Winner carried the same asymmetry in a single career. An Air Force cryptologic linguist, she was decorated for her part in the killing. Her commendation credited her signals work with aiding six hundred enemies killed, six hundred and fifty captured, and nine hundred high-value targets identified, the same merit-count that made rank for the rest of us (Atlanta Journal-Constitution, 2017). Years later, as an intelligence contractor, she leaked a single document, and it had nothing to do with any of that. It was a report showing that her own government already knew Russian military intelligence had tried to reach into the machinery of an American election, the kind of operation the powerful run against one another, hers among them, as a matter of course. For revealing what the state knew, she was made an example of: sixty-three months under the Espionage Act, which allowed her no public-interest defense, the longest sentence ever handed down to a civilian for a leak to the public (NBC News, 2018). The machinery that never charged a soul for the strikes she had helped enable reached her without effort.

Anthropic's chief executive holds the most careful position in the industry. He draws two red lines, mass surveillance and fully autonomous weapons, and refused the government's demand for unrestricted use rather than cross them, at real commercial cost; he governs by one faith, that the dangers climb a smooth curve and the controls can be ratcheted up in step with them (Bloomberg, 2026a; Amodei, 2026). Hold that against the school at Minab. His company's model had by late 2024 been merged into Palantir's Maven Smart System, the software that generates and ranks the candidate targets analysts work from. That model first ran in a live kill chain in the January 2026 raid that captured Nicolás Maduro, reported as the first confirmed use of a commercial AI model in a kinetic operation (Axios, 2026a); and by the first day of the Iran campaign the system was helping strike a thousand targets in twenty-four hours (Bloomberg, 2026a; Responsible Statecraft, 2026). The school was hit on that first day. Whether his own model touched that strike is not established; the Pentagon has not said whether AI was involved at all,

and the reporting attributes the coordinates to a missile run on out-of-date intelligence. It crossed neither line either way. No autonomous weapon chose it; a human made the final call. The safeguard he trusts most, a person in the loop, was in place and working as designed, and the person was reading coordinates the targeting system had itself flagged as years out of date, and waved the warning through. The architecture did not kill by breaking his rules. It killed inside them, on the smooth curve, with the human present. That is the thing this paper has been trying to name, said back by the one man with the most reason to deny it: the line is being drawn exactly where the killing is not.

This erasure of accountability is not the first time in history that architects of violence attempted to dissolve individual moral agency into systemic structure. The Nuremberg Tribunals confronted precisely this logic and rejected it: superior orders were held to be no defense, though they might mitigate a sentence (International Military Tribunal, 1947). The architecture offers the same plea in thinner forms, that I only processed the paperwork, that I only kept the infrastructure up. The tribunal insisted that responsibility could not vanish into the system, that a human being remained accountable for their node in a chain of destruction regardless of how many other nodes existed between them and the final act. That principle that the chain of accountability must remain traceable to human minds acting under law became the foundation of modern international humanitarian law. The Kill Cloud is, I argue, the first weapons architecture that threatens to make that principle unenforceable, not through bureaucratic diffusion of human decisions, which Nuremberg could address, but through emergent outputs whose human decisions sit so far upstream of the act, at design, at training, at authorization, that the law, which looks at the moment of effect, finds no decision there to judge. When a multi-agent system produces a targeting cascade that no designer programmed and no operator authorized, the Nuremberg question of “who decided, on what basis, with what authority” does not have a hard answer concealed behind classification. It has no answer of the kind the law is built to find: a person who decided this, here, now. The deciding people are real, but they acted upstream and in advance, so the particular act answers to no decision the law is built to charge. And that unenforceability does not wait on the emergent layer, which is not yet a fielded fact. It is already on the record: the strike routed through Ramstein that even the most law-bound court could not reach, the dead fixed by SIM card and entered as enemies with no one to answer, the remote-enabler’s liability the tribunals themselves cannot settle. In each, Nuremberg’s traceability fails now, not for want of a forum but because the hands lie scattered across too many states and firms and years for any forum to gather them.

The line that makes this a first, and not just a harder version of an old problem, is not that the killing has no author. It is that the evasion is finally complete. Every

hand here is real and answerable; the mine had a hand on it too. Someone dropped it, someone ordered it dropped on a place, and their hands set each death in motion for fifty years, every one of the dead with a name. That was never an authorless killing. It was a Schrödinger's war crime, the same kind I stood inside, a guilt real and total that the law could almost never collapse into a verdict, and it was the oldest trick industrialized killing knows: to arrange the act so that no single person has to hold the whole of it. The firing squad handed one man a blank so no one in the line would ever have to know he had fired a killing round. The Kill Cloud hands everyone the blank. What is new is not that the author vanished but that the not-looking, which a person used to have to perform, is now performed by the architecture itself, total and automatic, spread across time and space and roles and jurisdictions and down into the selection rule a machine now writes for itself. The responsibility does not thin. It stays real at every hand. The structure is simply built so that no hand ever closes on the whole of it, and no instrument ever made can gather it back to one answerable decision. Earlier architectures posed a problem of too many decisions to collect; this is the first in which the collection becomes impossible, not because the killing was no one's, but because it was everyone's, held too thin and too far apart for any single decision to carry.

In hypersonic intercept scenarios now planned across multiple major powers, removing the human is a genuine physical constraint: a threat at Mach 5 and above closes faster than any human can deliberate, and the fire-control loop that meets it has to cycle faster than the two hundred milliseconds a human takes merely to react. This is the strongest case for automation, and it should be conceded in full, which is exactly why it is so often borrowed. Shooting down an incoming warhead raises none of the questions that killing a person does; there is no who-did-we-kill in intercepting a missile. The danger is the generalization. Once machine-speed necessity is granted against objects, the same architecture and the same justification migrate to offensive targeting, where the speed is a choice and the target is a person. The architecture does not only compress the space for human judgment; in its most advanced contexts it eliminates that space, sometimes by real necessity and increasingly by an engineered choice that wears necessity as an alibi. The architecture is building toward what the bureaucrats of industrialized killing could only approximate: a system in which moral agency, which once merely felt diffuse, is engineered out of the moment of consequence. International humanitarian law was written to hold humans accountable for what humans decide. It was not written for a world in which the act can outrun every decision that authored it (Altmann et al., 2024; Fuzaylova, 2019).

This is no longer only a danger in prospect. In a test near Bakhmut in 2024, disclosed in 2026 by a Ukrainian drone manufacturer, ten autonomous drones were sent to destroy whatever they found; once they entered the attack zone no one was

connected to them, no one could watch the ground or call them off, and they selected and killed two soldiers on their own (New Scientist, 2026; Small Wars Journal, 2026). The account rests on that single source and was, by his own word, a one-off test, not routine practice, and current rules still keep a human at the final stage. But it is the thing itself, reported in combat: a killing the machine chose and no person could stop. The military's own analysts are blunt that this is not yet the norm: what Ukraine calls a swarm is still, in the main, human-planned mass on pre-programmed routes, coordinated salvos rather than self-organizing machines, and the decisive variable remains human-machine teaming, not autonomous lethality (Australian Army Research Centre, 2026). Routine war has not crossed that line. A test has, and the distance between them is no longer a technical generation but a policy that holds for now.

A prosecutor will reach past intent to recklessness: to set loose a system one knows can kill in ways no one can foresee is itself a culpable choice. That is true, and the choice to deploy is real and answerable. But recklessness reaches the deployment, which is general, not the death, which is particular, and the law of armed conflict is built to charge the particular death. The deployer can be held to the risk he ran; he cannot be held to the killing the system produced, because that killing was authored by no one.

10. The Erosion of Sovereignty

The dispersal does not stop at the node, the market, or the machine. It reaches sovereignty itself, from three ends at once: a new kind of private power that claims it, the constitutional state that can no longer hold it, and the person sworn to a law he is barred from keeping.

A new kind of actor sits between the state and the conventional non-state group, and it is no longer a thought experiment. Its proponents call it the network state, a sovereign-aspiring community defined by digital membership rather than territorial citizenship, organized around proprietary infrastructure and governed by terms of service rather than law (Weeks, 2025). Its instances are multiplying, from Balaji Srinivasan's Network School in Malaysia's Forest City to Praxis, which calls itself the world's first network state and raised five hundred and twenty-five million dollars in October 2024 to build one (Vasoyan, 2025). It has a conference of its own: three thousand had registered for the 2025 meeting in Singapore, where officials from Singapore, Dubai, Abu Dhabi and El Salvador spoke alongside the founders (Srinivasan, 2025). One venture fund sits behind several of these cities. Pronomos Capital, founded in 2019 by Patri Friedman, raised at least thirteen million dollars from free-market investors and backs Praxis, Próspera and Itana in Nigeria; nine million of it came at the founding from a group that included Marc

Andreessen, Balaji Srinivasan and Peter Thiel (Shugerman, 2023). Thiel co-founded Palantir, whose software, as this paper has shown, now generates and ranks the target lists. In the summer of 2026 he moved his family to Buenos Aires and bought a mansion there, in a country then preparing to sell citizenship outright to foreign investors (Osmonbekov, 2026). He has also given the exit its creed, lecturing through the autumn of 2025 that those who would limit the development of technology are "legionnaires of the Antichrist," the climate activist Greta Thunberg among them, and that the case against a coming "one-world state" can only be made from inside the biblical frame: "There are a lot of rational reasons I can give why the one-world state's a bad idea," he said, but "if you strip it from the biblical context, you will never find it scary enough. You will never really resist" (Washington Post, 2025).

The governance implications for the Kill Cloud are direct. A network state that operates its own orbital sensing, communications infrastructure, and AI decision-support is not subject to any existing treaty regime, it is not a signatory to the Outer Space Treaty, it has no obligations under international humanitarian law, and it has no electorate to which it answers. Where the commercial provider at least operates under the domestic law of a home jurisdiction, this actor is designed to exit that jurisdiction. It does not abolish surveillance, it privatizes it. The accountability deficit does not end either; design makes it structural, replacing citizenship with terms of service and consent with visibility (Weeks, 2025). The same stack can be owned three ways. In the American model it is fragmented across private vendors, and accountability dissolves in the seams between them. In the Chinese, it is integrated through the state, which for all its opacity still has a territory, a treaty signature, and a name that a claim can be addressed to (U.S. Department of State, 2020). This is the third case, the same integration without the state, the whole column in private hands that no jurisdiction reaches and no treaty binds.

And it is no longer only a projection. When Honduras moved to reclaim its sovereignty from a private charter city, its Congress repealing by a vote of 128 to nothing the law that had let Próspera, one of Pronomos's holdings, run its own courts, taxes, and police on the island of Roatán, Próspera did not accept the decision. It sued the country at the World Bank's arbitration center for close to eleven billion dollars, near two-thirds of the Honduran national budget, under an investor-state clause the host state could not escape (Próspera v. Honduras, 2023; Public Citizen, 2024). A private jurisdiction, told by a democracy that it could not govern there, answered by trying to bankrupt the democracy. That is the exit made litigable, and it is the same exit the orbital layer makes physical. As national communications reroute through privately owned constellations, the chokepoints a state once governed through, the telecom network, the banking system, the border itself, stop binding, and sovereignty follows the signal off the ground and out of

every room where it might be asked to answer. What forum is left to ask such an actor anything? That is one end of the spectrum, an actor built to owe nothing to anyone.

Sovereignty transfer looks different at the other end of the power spectrum, in the state whose constitution binds it most tightly to international law, and ends the same way. Germany hosts Ramstein Air Base, whose satellite-relay station is the indispensable conduit for U.S. armed-drone operations across Africa, the Middle East, and South Asia (The Intercept, 2015): strikes the German government neither orders nor controls but physically enables. That Ramstein plays this role is not only a reporter's inference. In October 2015 one of the program's own operators, Brandon Bryant, testified to the Bundestag's committee of inquiry that the base "handled all of our feeds" and "assigned us specific codes where we would connect to the relay," and that it was "enabling us to fly in countries where there is no declared warzone as well as declared warzones" (Bryant, 2015). The parliament heard the architecture named from inside the program itself. And what Germany hosts here is not neutral infrastructure. It is the function the institution now names the kill chain, the Ramstein communications mission whose squadron gives its reason for being as enabling it (USAFE-AFAFRICA, 2025). Nor is the relay the whole of what runs through German soil. At Wiesbaden, the National Security Agency operates what its own documents call its primary communications hub in Europe, intercepting and processing traffic and forwarding it to warfighters and partner services across Europe, Africa, and the Middle East (The Intercept, 2014). Germany holds both halves of the architecture at once, the relay that carries the strike and the hub that handles the intelligence behind it.

Unlike the commercial transfers above, this one runs through a constitutional order built, after catastrophe, around the primacy of international law. The Basic Law makes the general rules of international law part of federal law with precedence over ordinary statute (Article 25), declares acts undertaken to prepare a war of aggression unconstitutional and criminal (Article 26), and, through the Federal Constitutional Court's 1994 Parlamentsheer judgment, binds any armed deployment abroad to prior, constitutive approval by the Bundestag (Federal Constitutional Court, 1994, BVerfGE 90, 286).

The United States is bound in the same direction, if less tightly. Its Constitution makes the treaties it ratifies part of the supreme law of the land, binding on the courts and the states alike (U.S. Constitution, Article VI, Clause 2), so the laws of war the United States has joined, the Geneva Conventions among them, are not external constraints upon it but its own supreme domestic law; and the oath every service member swears is sworn to that Constitution, and so to the ratified law it makes supreme. That supremacy is not the same as enforceability. The Supreme Court has held that a ratified treaty is not enforceable in domestic litigation of its

own force unless Congress makes it so (Medellín v. Texas, 2008), and US courts have largely treated the Geneva Conventions that way, leaving a victim no claim he can bring into court. So the rule can be supreme and unreachable at once, the dissolution written this time into the treaty's own domestic standing. Germany binds itself harder, giving international law precedence over ordinary statute and adding the parliamentary reservation on top, which is what makes it the strongest test of whether this architecture can be held anywhere, not the only place it ought to be answerable. If the Kill Cloud's dispersed accountability can be re-anchored to a human authority anywhere, it should be bindable here.

Brandon Bryant had named the stake before any court did. He put it to the Bundestag as a question, "what does it mean for the German people as a country?" If they accepted it, he said, "that makes them complicit in all the strikes we've messed up" (Bryant, 2015). It was tested, in full, for more than a decade. In August 2012 a U.S. strike on Khashamir, Yemen, its signal relayed through Ramstein, killed Salem bin Ali Jaber, an imam who had preached against al-Qaeda days earlier, and his nephew Waleed, a policeman (Reprieve, 2021). The family sought accountability first in the country that fired the missile. Faisal bin Ali Jaber, Salem's brother-in-law and Waleed's uncle, brought suit in Washington against the United States and named the men at the top of it, President Barack Obama, Secretary of Defense Leon Panetta, and CIA Director David Petraeus. I filed a brief in that case as amicus, with two others who had served the drone program, Brandon Bryant and Lisa Ling, because the oath we had sworn compelled us to (Bryant, Ling and Westmoreland, 2016). The district court dismissed it for want of jurisdiction. In 2017 the Court of Appeals held that whether the strike was lawful was a political question no court could answer (Bin Ali Jaber v. United States, 2017), and the Supreme Court declined to hear it. The one forum with power over the men who ordered the killing refused to open the question at all. The family then sued the German government. The Higher Administrative Court in Münster ruled in 2019 that Germany bore a duty to ensure that strikes routed through Ramstein complied with international law; the Federal Administrative Court overturned that ruling in 2020; and on 15 July 2025 the Federal Constitutional Court dismissed the complaint while affirming that Germany holds "a general mandate of protection… including in cases which also involve foreign countries," extending to foreign nationals abroad. It failed only on the threshold, finding no "serious risk of a systematic violation" because the U.S. legal position "can be understood to be generally tenable under public international law" (Federal Constitutional Court, 2025, 2 BvR 508/21). The European Center for Constitutional and Human Rights, which brought the case, named the result: "individual legal protection remains a theoretical possibility without practical consequences" (ECCHR, 2025).

That sentence is the argument, spoken by the institution best placed to refute it. The most international-law-bound constitution on Earth, handed the clearest possible case (its own soil as the indispensable relay, named victims, six years and three instances of genuine adjudication), reached further than any other legal system has and still could not make accountability bind. Not because the forum failed, but because the act had already dissolved across the boundary between the state that owns the relay and the state that owns the trigger. This is dissolution, not impunity. The architecture had already answered its own dependence on any single host. In 2015 an operator could still tell the Bundestag that "the entire drone war of the US military would not be possible without Germany" (Bryant, 2015); the redundancy that would make that untrue was already designed in. As early as 2011 the Air Force had sought a second relay at Sigonella in Sicily, on the Ramstein model, expressly to "act as a back-up system to the Ramstein site to avoid single point of failure" (The Intercept, 2015), and Sigonella has since become exactly such a node. The U.S. Navy telecommunications station there carries the traffic for American, NATO, and coalition forces across three combatant commands (NCTS Sicily, 2020), on a field that now flies American, Italian, and NATO drones together. The engineering removes a single point of failure; it removes a single point of accountability in the same motion, and a node that can be routed around cannot be held. And yet the same arc lays down the materials of a counter-architecture: a precedent that a host state's protective duty can reach the victims of relayed strikes; a working model, in the Parlamentsvorbehalt, of force-authority bound to a deliberative body on the record rather than dissolved into an executive-commercial gradient; and, in Article 25, international law already operating as binding domestic law. Germany is the node where accountability came closest to attaching and slipped, and for that reason the place where the work of making it attach has the most to build on.

And the dispersal to Sigonella changed the act's jurisdiction without lifting it beyond a constitution, for the new one binds at least as tightly. Italy is not the passive relay Germany was. Armed strikes from Sigonella require the formal authorization of the Italian commander, granted case by case and, in the government's own terms, only as a last resort (Military Times, 2016); where German soil carried the signal in silence, Italian soil makes a decision, and a decision is a graspable act. It has already been tested on ground much like the German case. In 2018 a strike killed eleven Tuareg community members at Ubari in Libya; the European Center for Constitutional and Human Rights, the same body that brought the Yemeni families' case against Germany, ties it to Sigonella and has sued in Rome for the authorization records and filed a criminal complaint against the base's commander (ECCHR, 2022). The constitution behind that commander binds him as hard as Germany's Basic Law binds its own. Article 10 makes the generally

recognized rules of international law part of the domestic order, as Article 25 does in Germany; Article 78 reserves the resolution of war to Parliament; and Article 11 goes past anything in the German text, repudiating war outright “as an instrument offending the liberty of the peoples and as a means for settling international disputes” (Constitution of the Italian Republic, 1947). Dispersal means no single host can be bound to halt the war; it does not mean no host can be bound at all. It multiplied the places the act passes through, and with them the places that owe a duty to answer for it.

The phrase that holds all of this together, and keeps it from being looked at, is lawful force. It asks three things of one man at once, and they cannot all be true. He is bound. His oath runs to the Constitution, and through the Supremacy Clause to the international law the country has ratified, so the law of war is his own to answer to, not the institution’s to keep for him. Obedience to the chain reaches only as far as the chain is lawful. An order that breaks the law of war does not bind him, and a command that sustains the breaking has crossed, in the oath’s own words, to the side of the enemy it was sworn to defend against, foreign or domestic. He is disabled. He meets that law as a layer on a screen he did not draw. The box was drawn up a chain he cannot reach. The target was a SIM card, not a person. The coordinates were a decade old. By the system’s own leaked count, the dead were more often the wrong dead than the right (Scahill, 2015). He cannot test the legality he is sworn to uphold, and his refusal weighs nothing, because the system routes around a conscience the way it routes around a failed relay. He is also absolved before he begins. Lawful force tells him the process has already met the law, so his hand is clean by definition. Bound to a law, disabled from the only means of keeping it, and absolved of the failure before he starts: this is not a hard position but an impossible one, and it has a name. It is constitutionally untenable. He is sworn, through that oath and the Supremacy Clause, to uphold a law he is structurally barred from upholding, his refusal replaced like the newest airman, and no measure of good faith can make the three demands true at once.

The defense of this is always the same. Distributed force is meant to work this way; the judgment sits with the targeting cell and the legal officer; his one duty is to refuse what is manifestly unlawful. But that defense leans on the dissolution traced here. It says the duty was met upstream, in the rooms where the author of the killing already disappeared. And it asks him to catch the manifestly unlawful through a screen built so nothing unlawful is ever manifest where he stands. The duty was not handed up to someone who could hold it. It went up the chain, to the place responsibility for the act had already gone, and it did not come back. The duty is not gone. It is real, and binding, and out of reach.

There was, someone will say, the conscientious objector. There was, but not for this. The status is granted only to those opposed to war in any form (DoD Instruction

1300.06, 2017), and the Supreme Court shut the door on anything narrower: to object to a particular war, and not to all war, wins no exemption at all (Gillette v. United States, 1971). The man in this bind is not a pacifist. His oath commits him to a lawful war, and his objection is the opposite kind, specific and legal, to being made to take part in what he cannot verify is lawful. That is selective objection, the one form the law does not recognize. So the route that exists asks him to renounce all soldiering, which is not his position, and the route that would fit, the refusal of the manifestly unlawful, is the one this architecture has just been shown to close. There was no lawful way to keep the oath by refusing the unlawful, only a pacifist's exit that misnames him. When I swore, that was true of me: I would have served a lawful war. It is no longer quite true. I am a pacifist now in all but principle, holding only that some people will not be reasoned with and a person may defend himself and his community from an attack, not from a category, and never by striking first. But to fight a twenty-five-year war against a sentiment, one reinforced by every injustice we commit out of the hubris of the overview, is not that defense; it is the thing that manufactures the enemy it claims to answer.

One thing is left to him, the floor Nuremberg set: keep the oath by stopping. The system discounts that too. The seat fills behind him with someone willing, and a refusal it can route around is a refusal it need not answer. This is the cleanest form the erasure takes. It binds a man to a law, takes from him every means to keep it, credits the system with keeping it for him, and loses nothing when he walks out. He was not the only one in that seat, and most who sat in it never had the words for it. I could keep the work or keep the oath. I could not keep both. The day I understood that, there was no honest place left inside it. Others have found the same floor and gone past leaving. In February 2024 Aaron Bushnell, an active-duty airman who worked in software and cyber-defense for an intelligence support squadron, set himself on fire outside the Israeli embassy, saying he would no longer be complicit in genocide (NPR, 2024; Klippenstein, 2024). Whether his own work reached a strike is not a question the record can answer, and that silence is not evidence that it did not. It is the architecture doing what this paper says it does, cutting the line between a piece of code and a body so that no one can trace it. His complicity never depended on that line. He did not need a receipt from his hands to a killing to know he was inside the thing that kills, and he understood it so completely he could not carry it. The architecture had not managed to take the knowing from him.

And the institution is not a bystander to that bind; it built it. The same institution that administers the oath and decorates the mission is the one whose architecture makes the oath unkeepable, and that, when a person tries to honor it by attesting to what he was part of, converts him from a witness into a problem to be managed. The contract is breached by the party that demanded it. But I will not let that breach stand in for an innocence it does not give me. The choice was never taken from me.

I could have broken the link any morning, and I knew, in the abstract that is the only knowledge a node like mine is given, what the link was for. What the architecture took was not the choice and not the knowledge of the scope, but the compulsion to hold the two together while there was still time to act. It made not-looking the easier life. I lived it, and the lethal flow passed through my conduit every day I let it, into a future still running after I was gone.

I was both at once, and I cannot pretend I was only one. I kept the oath's outward form in the same years I was saying in public, with my name on it, that what I had served was a breach of the law the oath swore me to. Fidelity and betrayal were not two acts. They were one act, held in one body, and I have stopped trying to resolve them into something cleaner, because the refusal to resolve them is the only honest place left to stand.

One conclusion follows, and it shapes what any remedy can be. The capabilities traced here, low-latency orbital communication, on-orbit inference, multi-source fusion, are dual-use and civilian in origin. A state cannot ban broadband, or compute, or Earth observation, and no treaty will, so regulation cannot fasten onto the capability. It can only fasten onto the use: the delegation of lethal authority, the meaningful human control the governance debates keep reaching for. But legal instruments aimed at the use have already failed, and not for want of drafting. They failed at the CCW, where a decade of expert work produced no binding rule; they failed against the structural incentives that penalize the friction that accountability requires; and they failed in the one place built to make them succeed, Germany, whose constitution binds it to international law more tightly than any other and which still could not make a relayed strike answerable. Each is a different proof of the same proposition: law applied to this architecture from the outside, as oversight layered on top, is toggled off when tempo demands, or dissolves at the seam between relay and model where no single jurisdiction reaches. This is not an argument that law is futile. It is an argument about where law has to live. Accountability that can survive this architecture cannot sit above it as external review; it has to be built into it, on the record and resistant to being switched off[32],

[32] The gate is buildable, and its removal is why this argument does not stop at 'built in'. The same National Security Agency that produced the crypto in the kill chain I served had, before September 11th, built ThinThread, a mass-collection system the cryptographer William Binney and a small team designed to encrypt the identifying data of US persons the moment it was collected, readable only after a court order established probable cause. The accountability was inside the code, not in anyone's restraint, and it cost a few million dollars (Mayer, 2011). The agency shelved it for Trailblazer, a contractor program the public record, pieced together from incomplete government accounts, puts at more than 1.2 billion dollars; by the whistleblowers' reckoning the true cost, obscured by the agency, ran to several billion, on the order of 3.8 billion in all, before Trailblazer was quietly canceled in 2006 (Gorman, 2006; Mayer, 2011). Thomas Drake resurrected ThinThread that November as its executive program manager and led the team that upgraded it to a second version; running that version against the agency's main collection

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the way Germany's parliamentary reservation binds the use of force to a deliberative body that must answer for it. The problem is architectural, and an architectural problem will not yield to a purely legal solution; that is why nothing less will hold.

11. Conclusion: The Account is Still Open

The ledger of responsibility, already fragmented in 2009, has become a ledger of absence: acts are recorded, but actors are not. This is the distinction everything turns on, and the Ramstein case stated it first: what the architecture produces is not impunity but dissolution. Impunity is the killer who is known and goes free. Dissolution is the other thing, not a killing with no author, but a killing with too many authors to collect from. The responsibility is real and total at every hand; the hands are so many, so dispersed across rooms and links and years, that no instrument has ever been built that could gather them. The old problem was that the guilty went free. The new problem is not that no one is guilty. It is that everyone is, each of them in their real measure, and none of them reachable one at a time.

What I have come to understand is that keeping the gain and the cost apart is neither a personal weakness nor a personal strength. It is the work the architecture does. Every feature I have traced is, among other things, a device for holding the gain and the cost on separate pages. The division of labor means no one performs the whole act, so no one has to read the whole of it. Distance means the operator never meets what the analyst classified or what the maintainer kept connected. The euphemism, calling a death an effect, files the cost under a word that carries no weight. The promotion files the same event under merit. Dual-use civilian cover lets a company book the revenue and disown the use. Speed removes the instant in which the two columns might have been set side by side. None of this requires anyone to hide a number; the numbers are all there, in performance reports and procurement records and after-action files. The architecture does not conceal the ledger. It guarantees that no single person ever has to read both of its columns at once. That is the deepest thing it does, and it is why the books never balance even though nothing has gone missing from them.

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databases in early 2002, he found, by his account, actionable indications and warning of the September 11th plot already sitting in the data, including parts of it not previously known. The agency abruptly shut the program down that spring and buried the findings, and when Drake carried them to the congressional 9/11 investigators the disclosure was deep-sixed as well (Government Accountability Project, n.d.; Mayer, 2011). What the agency did not want known was what it had known, could have known, and should have known before the attack, and what the whistleblowers concluded a gate left running and shared might have surfaced in time to stop it. The choice was disclosed and the gate was still switched off, which is why building it in is not enough and it has to be made hard to remove.

A reckoning able to reach a harm produced this way would have to undo the architecture's deepest work: to bring the two columns onto a single page, and refuse to let anyone enter the dead as an asset and an abstraction at once. What that requires in technical, institutional, and legal detail is not my task here; here it is enough to name where it would have to reach. It would have to bind the institution and not the individual alone, since it is institutions that classify and, through the windows they build, kill; and it would have to keep a conscious human inside the decision rather than let the loop close over the last place a person can still reach in. It cannot stop at the people in uniform, because the same double entry runs the length of the structure. The budget that funds it, the devices and networks it shares with ordinary life, the vote cast and the silence kept are each a place where the gain is banked and the cost is written off by someone keeping the two apart without quite admitting it. I am not going to say what that makes anyone; the books are kept inward, and only the one who keeps them can bring the columns together. I can say what failing to keep them apart has made me: someone trying to help build the thing that could read the books whole. A reckoning has always been able to find a single guilty man. It has never yet been able to read a responsibility this divided, each share real and none of it the whole. Whether it can be built is the open question of the architecture, and the time is short, because the autonomous layer I have traced is removing, node by node, the last human who could be held to the books at all.

I killed people, and I will never know which of them were mine. Not for lack of a record. The machine keeps everything. The crew that killed the twenty-three at Khod in Uruzgan left a transcript of it, their own words waving off every sign the convoy was full of families, and it came out only because McChrystal had to apologize. Others keep the accounts my institution refuses to: the Bureau of Investigative Journalism named the drone dead one by one, the UN counted the civilians, and I named our own, all one hundred and sixty-five, in Appendix B to this paper, and saluted their coffins as they went home. My institution kept only the count it used to make rank. And still, with all of it written down, no record can point to one body and say that one was mine. My part was cut from its consequence so cleanly that the guilt can be whole and mine and never come back to me as a name.

But the word it kept was a lie. They were human beings in their own country. I cannot say how many of them were fighters and how many were not. The targeting did not go looking for a person; it went looking for a SIM card, a pattern of movement, a heat signature, and killed whoever was attached to the signal, and entered them all as enemies. We never, as Lisa Ling said, checked a single driver's license. My own government still does not: as I write, it is killing the men in boats

it calls cartel-linked in its own hemisphere, and admits it does not know their names before it fires.[33] How many times did we kill Baitullah Mehsud?

What I can say is that not one of them had anything to do with the attacks of September 11th that sent me there. I was thirteen when it happened, at a RadioShack with my mother, getting our computer fixed so we could reach my father in Kuwait, and every screen in the store showed the towers coming down, and it was on every radio station. The people I helped kill had never heard of it. I will not tell you I went to avenge them, because I do not know that I did. But revenge was a palpable emotion in those years, thicker in a family like mine, wrapped up in the security of the state, and it fell on people who had nothing to do with what caused it.

The war itself fell the same way, and I have to take it up here, because what I did inside it cannot be weighed without asking whether it had any claim on me at all. I arrived eight years into it, but it had shown what it was from the opening weeks. It began, in October 2001, by bombing a country already in famine: three years of drought had left some seven and a half million Afghans in desperate need of food aid, in what the agencies called a serious threat of mass starvation, and the FAO and the World Food Programme had already found what they called emerging and widespread famine conditions when the first bombs fell. The strikes hit the lifeline directly: on 16 October, in daylight, American bombs hit two clearly marked Red Cross warehouses two kilometres from Kabul airport and burned one of them to the ground, and the deliveries stopped through the few weeks that were left before the snow.[34] Foreseeable death by starvation, weighed against a military objective and chosen anyway, is a proportionality question of the plainest kind, and it was answered in the first days of the war.

And the country it fell on had itself attacked no one, whatever the law of self-defense allowed against the men who had. Not one of the nineteen hijackers was Afghan; fifteen were citizens of Saudi Arabia, as was bin Laden, whose stated grievance was the presence of American troops on Saudi soil. The state that produced the men who did it remained an ally, armed and untouched; the state that had only sheltered them was bombed and then occupied for twenty years. To make a whole people pay for what foreigners did on their soil is collective punishment, which the law of war forbids outright in the waging of a war, whatever it holds about the decision to begin one. Nor was the war a last resort. The Taliban had offered,

[33] On the U.S. strikes against alleged drug-trafficking boats in its own hemisphere, and officials' acknowledgment that the identities of those aboard are not confirmed before a vessel is struck, see CNN (2025) and Human Rights Watch (2025).

[34] On the famine conditions the campaign found, and the seven and a half million at risk, see FAO and WFP (2001); on the strikes on Red Cross warehouses and the suspension of aid convoys, Human Rights Watch (2001).

more than once and even after the bombing began, to hand bin Laden to a third country for trial, and the United States refused every version with "no negotiations".[35] Whether those offers were sincere or a stalling tactic can be argued either way. But a plan to move against al-Qaeda and the Taliban was already awaiting the president's signature on the day of the attack,[36] and between the demand and the bombing no lesser rung of coercion was tried. That last is my reading; the offers and the waiting plan are the record.

Just war theory is not a secular frame laid over the faith. It is the faith's own account of when killing is permitted, worked out from Augustine and Aquinas through the scholastics to hold the commandment against killing together with the state's sword, and it allows force only under conditions this war did not meet: a proportionate cause, a genuine last resort, and above all discrimination, the sparing of those who did no wrong. Applied without the assumption that my own country was the just party, the tradition does not clear this war. It condemns it. That does not make the Taliban just; their conduct was its own crime. It means only that even the faith's most permissive account of killing, the one that grants the soldier his sword, refused this war its blessing, and refused it in the opening weeks, before a single one of my keys was ever loaded.

And it was not only the faith I was handed that this war offended. The people it fell on held their own law of war, and it forbids the killing of the innocent as plainly as mine. The rule that comes down from the Prophet, and from Abu Bakr to his armies, is explicit: do not kill the woman, the child, or the old man; do not cut the fruit trees or burn the crops; do not slaughter the flocks except for food; leave the one at his devotions alone (Khadduri, 1955). A war that opened by bombing a famine, and that killed children in an orchard and a family at its meal, broke that law as clearly as it broke Augustine's. But I do not raise their law to set it against mine. I raise it because it is the same law, and it belongs to neither of us. Every faith that ever named the one God forbade the killing of the innocent, and the god called down to bless that killing, in whatever tongue and on whatever side, is a counterfeit of the one who forbade it. And none of it needs the god to land. Strike the word out and the shape holds. Whatever is raised up to bless the killing of the innocent, a god, a flag, a cold arithmetic of necessity, is a counterfeit of whatever it was that forbade it, and the conscience that forbids it with no god at all is standing on the same floor. This is not a charge one people can lay on another. It is the floor they stand on together, and the only ground any of us has to move from.

[35] On the Taliban's repeated offers to surrender bin Laden for trial and the United States' refusal, see ABC News (2001) and Al Jazeera (2011).

[36] On the plan against al-Qaeda and the Taliban awaiting the president's signature on the day of the attack, see National Commission on Terrorist Attacks (2004).

The hardest stance a human being can hold is empathy for the enemy. It means seeing in every death a soul lost, a mournful act, one you pray to God you judged rightly, that it was truly necessary, that these people truly threatened your family, your community, your home. And if there is time, it means owing the act the further question of why. If that why cannot be fixed to an actual threat to the people you were defending, the act is no different from murder. In my war there was no proportion in the cause, no discrimination in the conduct, and no just conclusion for those whom we “liberated”. And that stance, the empathy that sees a soul in the enemy, is the very thing the philosophy now building the exits has taken to naming weakness, or worse.

We are killing people in ways we cannot personally reconcile with our Creator in confession, because the architecture took that from us. What I will never know in this life, unless it is granted to me, a fuller ledger holds, in a hand no court reaches and no architecture can disperse, and the account this paper leaves open stays open where the system has no way to close it. That reckoning is the one place the dispersal cannot follow. There is no scripture that says the President, or the officers appointed over me, will answer for me there before the God I swore to. In the end we are alone with what we did.

I should be exact about the oath I swore, because the word we reach for flattens it. To swear is not to summon a witness. In the tradition I swore in, one the Abrahamic faiths hold in common, an oath carries a self-maledictory element: you call God to attest your sincerity, and you invoke God's judgment on yourself if you break faith. So help me God is the compressed form of exactly that: may God help me keep this, and may I answer to God if I do not. The conditional stakes your standing before God on your fidelity. That is accountability, not observation. Even witness carries it in that register. When Paul writes that God is his witness, he does not mean a spectator who happens to see, but the one who knows the heart and to whom he will answer. To call God as witness there is to stand before the judge. The state keeps the word deliberately thinner, because the law will not take a position on whether God judges; but that thinness is the law guarding its own agnosticism, not a description of what the believing oath-taker is doing. Every one of us swore it at intake in Montgomery, Alabama, the whole room at once.

I did what I did, and I cannot take it back. I did it well. I did everything right according to the United States Air Force, until the day my inactive reserve status ended, and everything wrong in supporting and defending the Constitution I was guided to swear an oath, before the God of the Universe and Everything Else, to uphold. And that Constitution reaches all the way to what I did, through the Supremacy Clause, which makes the treaties we sign the law of the land, and international humanitarian law is in it. From my vantage point, with my act, I killed people without exercising proportionality or distinction, and I agreed to actively

participate in killing from that position every single day I stood in Afghanistan. The faith I was handed forbids the killing that oath was bent to bless, and the God invoked to bless it was never the one I swore to. The God I swore to forbids the very thing the other was called to bless. I could not see that when I swore, because they had been handed to me as one, and I could not yet tell the God who forbids the war from the god called on to bless it. And the God I swore to is the same God the people I helped kill prayed to, the one God the Abrahamic faiths name; the war set God's own worshippers against each other and blessed the killing of them in a counterfeit of God. The oath bound me to support and defend the Constitution, and the law it makes supreme was broken in my hands; bearing witness to that is the last way left to defend it. This paper is what I have left to keep that oath with.

So help me God.

My Humanity

I fought for you with every breath
For you to look at me with those eyes
My soul laid nearly dead under blackened skies
Crimson red my hands and heart bled
From paper cuts of exploding shrapnel
Forced upon a future's head
...Children... you made me kill children...
For country, for profit, for yourself?
How can you smile?
Why don't you look at me when I talk to you?
I'm still here.
I gave you the green light over and over again
In radios, across networks and planes with bombs
Out of sight, out of mind
You just took your orders from someone else in the end
I fucking hate you... but please...
Lie down and learn what you did
Look at me when I talk to you.
I need to be released
Do you see me? I'm here.
You can't run away from me
I'll hide in the bottom of your glass of beer
Burn in your lover's eyes
I will haunt you until. you. die.

Go ahead and break that mirror
Through the cracks I'll stare
I will do everything I can to make you aware
Of everything you fear
Coward, now look at you.
Look how far you've run
Drank yourself poor
Can't eat so you flip a coin.
What is just one more life for you?
Blame is one of those funny things isn't it?
You can't bear to fault yourself so you put it on me
Thinking I'm the demon that perches himself on your shoulders?
Humanity, that vicious burden you carry
Go ahead do it, I'll still be there
Run away just one more time
Into those Hindu mountains
The suffering is everywhere
Or, you can look at what is here
Something you almost killed
You can submit yourself to loving what you see,
Forget yourself and release me.
Stand here with your feeble knees
I will make us stronger
In front of all we will speak
With each other through the mirror of nations

Cian M. Westmoreland,
Taos, New Mexico, 2015

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Appendix A. The Oath

The oath of enlistment sworn on entry into the United States Armed Forces (10 U.S.C. § 502):

I, Cian M. Westmoreland, do solemnly swear that I will support and defend the Constitution of the United States against all enemies, foreign and domestic; that I will bear true faith and allegiance to the same; and that I will obey the orders of the President of the United States and the orders of the officers appointed over me, according to regulations and the Uniform Code of Military Justice. So help me God.

Appendix B. The Dead Who Came Through Kandahar, April to October 2009

The coalition dead of the southern region the 73rd EACS air picture served, in the order they fell. One hundred and sixty-five, from fifteen nations, ages as recorded. The window runs a few weeks past my own rotation home on 16 September, because the picture we built kept serving the region after I left it.

Michelle Mendes (30), Tobie Fasfous (29), Sean Binnie (22), Adrian Sheldon (25), Ben Ross (34), Kumar Pun (31), Mark Lawrence Evison (26), Jason Mackie (21), Esau I. De la Pena-Hernandez (25), Carlie M. Lee III (23), Petero "Pat" Suesue (28), Brent S. Cole (38), Jordan Rossi (22), Robert Martin Richards (24), Kieron Hill (20), Stephen Bolger (30), Nigel Moffett (28), Matthew G. Reza (27), Cyrus Thatcher (19), Joshua R. Whittle (20), Alexandre Péloquin (20), Robert McLaren (20), Paul Mervis (27), Martin Dubé (35), Allain Tikko (30), Andreas Søgaard Brohus (26), Mads Lerche Rasmussen (21), Martin Abildgaard (23), Joshua Melton (26), Paul G. Smith (43), Sean Birchall (33), Rupert Thorneloe (40), Joshua Hammond (18), Charles S. Sharp (20), Nicholas Bulger (30), David Dennis (29), Robert Laws (18), Charles-Philippe Michaud (28), Dane Elson (22), Ben Babington-Browne (27), Tony Michael Randolph (22), Patrice Audet (38), Martin Joannette (25), Mark A. Garner (30), Christopher Whiteside (21), John Eric Hayes (36), Roger Gary Michael Hager (20), Michael C. Roy (25), Daniel Hume (22), John Brackpool (27), Joe Murphy (18), Daniel Simpson (20), Lee Scott (26), Jonathan Horne (28), James Backhouse (18), William Aldridge (18), Matthew Ryan Lembke (22), Pedro Antonio Barbozaflores (27), Jerome David Hatfield (36), Michael Wayne Heede Jr (22), David Shane Spicer (33), Sébastien Courcy (26), Aminiasi Toge (26), Benjamin Ranaudo (22), Benjamin Stephen Kopp (21), Joseph Etchells (22), Daniel Shepherd (28), Joshua James Rimer (24), Christopher King (20), Randy L.J. Neff Jr (22), Jeremy Scott Lasher (27), Nicholas George Xiarhos (21), Ryan H. Lane (25), Donald Wayne Vincent (26), Craig Hopson (24), Sean Upton (26), Phillip Lawrence (22), Jonathan Fulton Stroud (20), Gregory Alan Posey (22), Richard Kelvin Jones (21), Christian Bobbitt (23), Matthieu Allard (21), Patrick Scott Fitzgibbon (19), Jonathan Michael Walls (27), Anthony Lombardi (21), Kyle Adams (21), Dale Thomas Hopkins (23), Kevin Mulligan (26), Dennis James Burrow (23), Jason George Williams (23), Javier Olvera (20), Patrick Wayne Schimmel (21), Bruce Earnest Ferrell (21), Mark Hale (42), Daniel Wild (19), Matthew Hatton (23), William John Cahir (40), Joshua Matthew Bernard (21), Simon Valentine (29), Richard Hunt (21), Louis Carter (19), Simon Annis (18), James Fullarton (24), Leopold Fred Damas (26), Troy Orion Tom (21), Jonathan Christopher Yanney (20), Adam Frank Benjamin (34), Paul Edmond Dumont Jr. (23), Johnathon Young (18), Paul

McAleese (29), Andrew Thomas Lobosco (29), Raivis Kang (26), Eerik Salmus (26), Ronald Wayne Sawyer (38), Dennis Michael Williams (24), Cory J. Jenkins (30), John Louis Hallett III (30), Shaun Bush (24), Donald James Hogan (20), Lee Andrew Houltram (33), Kevin Elliott (24), Stuart Millar (40), Tyler R. Walshe (21), David R. Hall (31), Jordan M. Brochu (20), Jonathan D. Welch (19), Richard James Brandon (24), Benjamin P. Castiglione (21), Gavin Elliott (19), Christopher S. Baltazar Jr. (19), Kevin van de Rijdt (26), Yannick Pépin (36), Jean-François Drouin (23), Mark Leijsen (44), Christopher S. Fowlkes (20), Jason Dunn-Bridgeman (20), Patrick Lormand (21), David T. Wright II (26), Andrew H. McConnell (24), Demetrius L. Void (20), Joshua M. Mills (24), Brett Hall (21), Robert D. Gordon II (22), Shawn P. McCloskey (33), Bradley S. Bohle (29), Stuart McGrath (28), Jeremiah J. Monroe (31), Jonathan Couturier (23), Steffen Bloch Larsen (23), Damon G. Winkleman (23), Corey J. Kowall (20), Michael Lockett (28), William L. Meredith (26), John J. Malone (24), Joseph V. White (21), Edward Bernard Smith (30), Titus R. Reynolds (23), Jordan L. Chrobot (24), Kevin J. Graham (27), James Prosser (21), Marcin Wojtak (24), Roberto D. Sanchez (24), Alan H. Newton Jr. (26), Benjamin A. Sklaver (32), Kevin O. Hill (23).