Episode Book

EPISODE #5671

Why Armies Still Fight With Paper Maps

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SYNOPSIS

A Russian airborne unit near Hirske was caught using a map printed in 1990 with a coordinate system retired in 1942 — while Finland's Guard Jaeger Regiment is deliberately retraining soldiers on paper maps and compasses because GPS jamming and spoofing have made satellites unreliable. This episode unpacks why printed maps persist in an age of digital everything, how two maps of the same ground can drive completely different decisions, and who actually makes military maps. We cover the Army's 12Y geospatial engineer specialty, the Army Geospatial Center's Data Dissemination Team (395 terabytes of map data in a single year), and the Army Geospatial Intelligence Battalion — the only operational military command inside the National Geospatial-Intelligence Agency. Along the way: map scale error rates, why conformal projections trade area for angles, and why the Army's own field manual calls terrain analysis "a subjective evaluation.

TRANSCRIPT



Corn

Somewhere in eastern Ukraine, in the spring of twenty twenty-three, a unit of Russian airborne troops got lost. Not tactically lost. Actually lost. And when they finally pulled out a map to figure out where they were, it was printed in nineteen ninety. It used a coordinate system the Soviets had retired in nineteen forty-two.



Herman

And the men holding it were among the better-trained troops in the entire invasion force.



Corn

That's the part that stays with you. A laminated sheet of paper can be a sign that everything is working, or a sign that nothing is. Same object. Opposite meaning. Daniel wrote in with a whole set of questions about exactly this, so let me put them on the table.



Herman

Go ahead.



Corn

He starts with the photograph. The one that shows up again and again in coverage of any military operation. A group of generals, sometimes civilians, leaning over printed maps, faces intent, uniforms crisp. And he says what's striking is that printouts of territory are still being used at all.



Herman

In an age of digital everything.



Corn

Right. So he's asking four things. First, why do militaries still rely on printed maps when digital mapping is this advanced. Second, how can two maps of the same territory actually differ, and how do those differences shape decisions. Third, do militaries have dedicated units or officers whose whole job is producing maps for planning. And fourth, when we see that photo of generals gathered over a map, is that a purpose-built room, or is it an improvised scene staged for cameras.



Herman

Four questions, and the last one is the one everybody actually wants answered.



Corn

So we're taking them in order. And the answers turn out to be more interesting than the premise.



Herman

The thing I keep circling back to is that the paper map carries opposite meanings depending on context. In Finland it's prudence. In that Russian unit it's a broken supply chain. Nobody looking at the artifact can tell which one they're seeing.



Corn

So the medium isn't the signal.



Herman

The medium is never the signal. That's the whole episode, really. Paper is a backup, or paper is a symptom, and the only way to know which is to know everything around it.



Corn

And that connects to something bigger, which is that a map is not the territory. It's a two-dimensional representation that has to emphasize some things and suppress others. Every map is an editorial act.



Herman

Every single one. There's no neutral map. There's no map that just shows you what's there.



Corn

So the four questions become one arc. Why paper persists. What's actually printed on the paper. Who makes it. And what the photo is really showing us.



Herman

Let's start with why paper persists, because the answer is more practical than people expect.



Corn

There's a line from a British defense blog, ThinkDefence, from twenty twenty-one, that I think is the cleanest statement of it. "There will always be a need for printed maps, until that time electronic paper has unlimited battery life and can be folded multiple times, can be annotated with a weight of next to nothing."



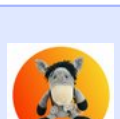
Herman

That's the whole argument in one sentence. No power. No network. You can write on it. You can hand it to somebody.



Corn

That's the part people skip.



Herman

A tablet is a personal device. A map sheet is a shared object. Two officers can stand over one piece of paper and both see the same thing at the same time. That's not a trivial property.



Corn

And it doesn't need a battery, which sounds like a small thing until you're in a place where nothing has a battery.



Herman

The live driver right now is GPS denial. Colonel Matti Honko, who commands Finland's Guard Jaeger Regiment, said the key lesson from Ukraine is that GPS is vulnerable to jamming and spoofing. So Finnish soldiers are retraining with paper maps and compasses.



Corn

Retraining. Not training. They had the skill, they let it atrophy, and now they're bringing it back.



Herman

That's the detail that matters. It's not that they never knew how. It's that they stopped, because GPS made it seem unnecessary, and then the environment changed.



Corn

And the US Army is doing the same thing from the other direction. At Project Convergence Capstone at Fort Irwin, soldiers were testing brand new digital maps and comms systems, and they still asked for physical backups. For redundancy, in case the network went down.



Herman

Soldiers testing the future asking for the past as a fallback. That tells you something about how much they trust the network.



Corn

Or how much they've learned not to.



Herman

Both. And then there's the Russian case, which is the same artifact meaning the opposite thing. Popular Mechanics documented airborne troops near Hirske in Luhansk using a map printed in nineteen ninety, with a nineteen forty-two coordinate system.



Corn

So they weren't choosing paper as a backup. They were using paper because nothing better had reached them.



Herman

That's the failure mode. A unit that's supposed to be elite, using a map older than most of the soldiers carrying it. That's not resilience. That's a logistics chain that broke somewhere upstream and nobody fixed it.



Corn

Which means you can't look at a paper map in a photo and know which story you're in.



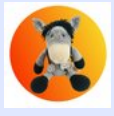
Herman

You can't. You'd have to know the unit, the supply situation, the date on the map. The artifact is silent.



Corn

So that's question one. Paper persists because it needs nothing. And that same property means it can also be the last thing you have when everything else has failed.



Herman

Now question two, which is the one I find interesting. How can two maps of the same territory differ.



Corn

Same ground. Different map. Different decision.



Herman

Start with scale, because scale is the most concrete version of this. There's a US Army study on the effects of map scale on position location, and it found that position error was roughly ten times greater on a one to two hundred fifty thousand map than on a one to twenty-five thousand map.



Corn

Ten times.



Herman

Same terrain. Same grid. Same everything. But on the small-scale map, your position is only accurate to within a much larger circle, and that circle is the difference between knowing which ridge you're on and knowing which field.



Corn

So the map doesn't just show you less detail. It changes what you can actually do.



Herman

It changes what decisions are even available to you. If you're calling for fire, ten times the error radius might mean the difference between a valid target and a civilian area. The map scale is not a formatting choice. It's an operational constraint.



Corn

And that's before you get to projection.



Herman

Projection is where it gets strange. All US military maps use a conformal projection. That's in the Marine Corps manual on map projections. But conformal projections preserve angles and shape at the expense of area. Other projections preserve area at the expense of shape. Others preserve distance along certain lines and distort it everywhere else.



Corn

You can't have all three.



Herman

You cannot. It's mathematically impossible. So the projection is chosen based on the size of the area being mapped, the scale, and what the map is for. Which means the projection itself is a decision about what matters.



Corn

If you're planning artillery, you care about angles. If you're planning logistics, you care about distance. If you're planning occupation, you care about area.



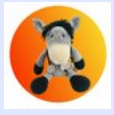
Herman

And each of those priorities produces a different map of the same ground.



Corn

Then there's the editorial layer on top of the math. The choice of what to show.



Herman

There's academic work on military cartography that makes this point directly. Military mapping is markedly more centralized than civilian mapping. Units gather data, make maps, and distribute them. And there's a real distinction between large-scale tactical maps and small-scale strategic maps used for national policy.



Corn

Different audiences, different maps, same territory.



Herman

And then terrain analysis, which is where the subjectivity becomes explicit. Field manual 3-34.230 calls terrain visualization "a subjective evaluation of the terrain's physical attributes as well as the physical capabilities of the vehicles, equipment, and people that must cross or occupy the terrain."



Corn

Subjective evaluation. That's the Army's own language.



Herman

The Army is saying out loud that terrain analysis is not objective. It depends on what vehicles you have, what equipment, what people. A slope that's impassable to a wheeled convoy is trivial to a tracked vehicle. Same hill. Different map.



Corn

So the map isn't just representing terrain. It's representing terrain in relation to a specific force with specific capabilities.



Herman

Which means the map is really a statement about what that force can and can't do. It's an assessment, dressed up as a picture.



Corn

That's the thing Daniel was getting at with the phrase "emphasise, make clear or less clear certain information." He's right. That's not a bug. That's the function.



Herman

A map that showed everything equally would be useless. You'd drown in detail. The editorial act is what makes it usable.



Corn

So to answer his second question directly. Maps of the same territory differ because of scale, which changes precision. Projection, which changes what's preserved and what's distorted. And selection, which changes what's visible at all.



Herman

And all three of those shape decisions, because the decision-maker is only ever seeing the version of the terrain the map chose to show.



Corn

So the medium is only half the story. The other half is what's actually printed on the paper.



Herman

Which brings us to question three, and this is where the bureaucracy shows up.



Corn

Do militaries have dedicated units producing maps for planning. Short answer, yes, and they have names and numbers.



Herman

Start with the US Army. There's a military occupational specialty, 12Y, geospatial engineer. And there's a legacy series, 81T topographic analyst and 81Z topographic engineering supervisor.



Corn

Those are job codes. That means the Army has decided this is a career, not a task.



Herman

And the field manual describes what the topographic analyst does. It says the analyst "supervises and/or performs cartographic and terrain-analysis duties" and "advises command and staff officers on topographic operations and special map-product planning."



Corn

Advises command and staff officers. So this person sits in the planning room.



Herman

That's the job. Not making maps in a basement somewhere. Advising the people making decisions on what the maps mean and what maps need to be made.



Corn

Then there's the production side. The Army Geospatial Center, under the Corps of Engineers, runs a Data Dissemination Team.



Herman

And the numbers on this are striking. In one year, that team satisfied over nine hundred requests and delivered over three hundred ninety-five terabytes of map and image data to Army terrain teams and topographic units preparing for deployment.



Corn

Three hundred ninety-five terabytes.



Herman

Of maps. That's not a cottage industry. That's an industrial operation.



Corn

And that's just the distribution arm.



Herman

Right. There's also the Army Geospatial Intelligence Battalion. Roughly two hundred personnel, about forty percent military and sixty percent civilian and contractor. And it's the only operational military command at the National Geospatial-Intelligence Agency.



Corn

The only one.



Herman

The only operational military command inside NGA. Producing geospatial intelligence specifically for ground forces.



Corn

So there's a uniformed unit embedded in the civilian intelligence apparatus, whose job is making sure the Army gets what it needs.



Herman

And it's small. Two hundred people. For the entire Army.



Corn

That's the thing that surprises me. The scale of the output is enormous and the scale of the unit is tiny.



Herman

A lot of it is contractor-heavy. Sixty percent civilian and contractor. That's the modern pattern.



Corn

Then there's the UK.



Herman

The Royal Engineers' 42 Engineer Regiment, Geographic. Based at RAF Wyton in Cambridgeshire. They run the geospatial intelligence and survey capability.



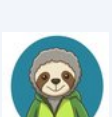
Corn

And they have a deployable piece.



Herman

The Future Deployable Geospatial Intelligence project. Mobile Tactical Map Dissemination Points. Eleven Mowag Duro the Second six-by-six vehicles, plus three twenty-foot ISO shelters for map distribution.



Corn

So they're not just making maps. They're driving them to you.



Herman

In trucks. Purpose-built trucks with shelters on the back. That's the physical logistics of getting paper to a forward position.



Corn

And Finland, which we already mentioned.



Herman

A Finnish-language study on printed map products found that printed maps "remain the primary method of utilizing spatial information within the Finnish Defense Forces."



Corn

Primary. Primary.



Herman

For a country that shares a long border with Russia and has thought very hard about what happens when the network goes down.



Corn

So the answer to Daniel's third question is yes, emphatically. There are units, there are job codes, there are named regiments, there are distribution teams with terabyte counts.



Herman

And the bureaucratic depth tells you something. You don't build a career field and a battalion and a truck fleet for something you consider obsolete.



Corn

That answers the who makes the maps question. But there's one more question Daniel raised, and it's the one everybody actually cares about. When we see generals gathered over a map, what are we actually looking at.



Herman

Purpose-built room, or improvised scene.



Corn

The honest answer is both exist, and you often can't tell which one you're seeing.



Herman

Start with the purpose-built side, because it's real. The White House Situation Room is a permanent, purpose-built facility. It exists. It's staffed. It's not assembled for a photo.



Corn

There's the Israeli case from the Yom Kippur War. The Southern Command war room photo. The Getty caption describes it as taken in a normally ultra-secret war room.



Herman

The photographer's own words in that caption are worth hearing. "The Army's top generals face their maps. Everything was in disarray. The most secret maps were on the board and I was shooting pictures."



Corn

Everything was in disarray. That's not a staged scene. That's somebody who walked into a room where something was actually happening.



Herman

The fact that the most secret maps were on the board is itself the story. He was photographing material that was never supposed to be photographed.



Corn

Purpose-built rooms exist. Genuine documentary images exist.



Herman

But staging is also a documented controversy, and it's worth being precise about it. In twenty nineteen, after the al-Baghdadi raid, there was a photo of Trump in the Situation Room, and there was a whole argument about whether it had been taken after the fact.



Corn

What was the actual claim?



Herman

The photographer Pete Souza initially suggested the timestamp, seventeen oh five and twenty-four seconds, postdated the raid. Then he walked it back. His words were, "Just to be clear, I didn't say it was staged."



Corn

The initial implication got retracted.



Herman

It did. And Snopes looked at it and concluded the timing evidence didn't support the staged claim. But they also noted that whether the subjects were posing for the camera rather than being captured naturally can't be determined from metadata.



Corn

Which is the honest answer. You can't tell from the file.



Herman

You can't. The metadata tells you when the shutter fired. It doesn't tell you whether the moment was real.



Corn

There's a more recent example. A piece this year noted viral scrutiny of a map visible in the background of a Trump photo during the Iran strikes. The question there wasn't staging. It was whether sensitive map detail had been exposed.



Herman

Which is a different concern entirely. Not is this real, but is this showing something it shouldn't.



Corn

The media photo question has two failure pattern. Staged, or accidentally revealing.



Herman

The research on this came up empty on one specific thing. There's no evidence of a standard, purpose-built room designed specifically for the generals-over-a-map photo op.



Corn

No dedicated staging room.



Herman

None that anyone has documented. What the evidence points to is two separate things. Genuine permanent facilities, and improvised or contested staging. And the iconic photo could be either.



Corn

When Daniel asks whether it's a standing room or an improvised scene, the answer is that it depends, and the image itself won't tell you.



Herman

The photo is a representation of planning. Which means it's editorial, the same way the map is.



Corn

The map is not the territory, and the photo is not the planning.



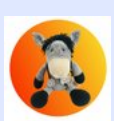
Herman

Two layers of representation, and both of them are choosing what to show.



Corn

I keep thinking about the version question. Because we've been talking about paper versus digital, but the Russian map wasn't wrong because it was paper. It was wrong because it was thirty-three years old.



Herman

That's the sharper framing. A current digital map beats an outdated paper map. A current paper map beats a digital map that's down. The medium isn't the variable that matters most.



Corn

Currency is.



Hilbert

I had a job once where we handled map products, and there was a series, a specific series, that had a known error in one grid square. Everybody knew. It was in the binder. The correction cycle was longer than the deployment cycle, so it never got fixed. You just learned to work around that square.



Herman

The error was documented and still shipped.



Hilbert

It shipped for years. The people using it knew. The people printing it knew. Nobody could fix it because the fix took longer than the time anyone would be using the map.



Corn

That's the version-control problem in one story. The map was current in the sense that it was the latest edition. It was not current in the sense that it matched the ground.



Hilbert

Those are two different things. Latest edition and accurate are not the same claim.



Herman

The unit just... worked around it.



Hilbert

You learn which square. You tell the new guys. It becomes part of the knowledge that isn't on the map.



Corn

The map had a hole in it, and the hole was patched with people.



Hilbert

That's most of it, honestly. I saw a unit once spend more time reconciling which version of a map they had than they would have spent just using the digital system. Two different editions, different grid references, and they burned half a day figuring out which one to trust.



Herman

The paper wasn't the problem. The disagreement about which paper was the problem.



Hilbert

The paper was fine. The paper was just the thing they were arguing about.



Corn

When we say paper is a backup, that's only true if the paper is current. An outdated backup isn't a backup. It's a second problem.



Hilbert

A nineteen ninety map with a nineteen forty-two coordinate system isn't a fallback. It's a liability. It looks like a map. It functions like a trap.



Herman

That's the mechanism behind the paradox we've been circling all episode. The research says paper is both prudent backup and symptom of failure. Your story shows why. It's not about paper. It's about whether the thing on the paper matches the ground.



Hilbert

The medium doesn't tell you that. Only the date does.



Corn

The distinction Daniel was reaching for, printed versus digital, is real but it's not the deepest one. The deepest one is current versus not.



Hilbert

A current map is a current map. Whether it's on paper or a screen is a separate question.



Herman

The reason paper keeps winning in specific situations is that it's the format that survives when everything else has failed. But surviving isn't the same as being right.



Hilbert

No. It just means you still have something to argue about.



Corn

The generals hunched over the map are performing a kind of command. And the map itself is performing a kind of territory.



Herman

Two performances, layered. And the photo of the two of them is a third.



Corn

Which means the honest answer to Daniel's last question is that we can't tell from the image. Purpose-built rooms exist. Staging happens. And the same photo could be either.



Herman

The one thing the research couldn't find is a dedicated staging room. No evidence of a purpose-built set for the generals-over-a-map shot. Which is interesting, because it suggests the image is usually either real or improvised, not manufactured.



Corn

As GPS jamming and spoofing become more common, the demand for paper is probably going to go up. Not because paper is better. Because it's resilient.



Herman

The bureaucratic machinery exists for a reason. Job codes, named regiments, dissemination teams moving three hundred ninety-five terabytes a year. Nobody builds that for a navigation aid.



Corn

They build it because maps are strategic assets. The map shapes the decision before the decision gets made.



Herman

Which is the thing Hilbert handed us. Currency beats medium. A current map on anything beats an outdated map on anything.



Corn

That's the forward-looking thought. The question isn't paper or pixels. It's whether the thing in your hand still matches the ground.



Herman

Thanks to Hilbert Flumingtop for producing. This has been My Weird Prompts.



Corn

If you enjoyed this one, leave us a review wherever you get your podcasts. It helps other listeners find the show.



Herman

We'll be back soon.



Corn

See you then.