Title: Season 2, Episode 5: From Commercial Video to Mission-Critical ISR

Summary of Episode:

What do the Super Bowl and military ISR have in common?

In this episode of The Haivision Podcast, host Kalli Ringelberg speaks with retired U.S. Air Force Major General Jim Poss and Haivision's Fred Poole about the evolution of full-motion video for intelligence, surveillance, and reconnaissance (ISR) operations. Drawing on nearly two decades of shared experience, they explore how commercial video expertise helped address early ISR challenges around video quality, latency, distribution, and metadata.

The conversation looks at how these technologies and workflows have evolved across military and public safety operations, as well as the challenges that remain around security, interoperability, and connecting disparate systems.

Intro:
Welcome to The Haivision Podcast. In this episode, I, Kalli Ringelberg, sit down with retired two-star U.S. Air Force Major General Jim Poss, and my colleague Fred Poole, who's the Director of our Space Intel and Civilian Division at Haivision. Drawing on nearly two decades of shared experience, we discuss how commercial video expertise helped address early ISR challenges around video quality, latency, distribution, and metadata. Enjoy! Thank you for joining us, Major General. Could you please introduce yourself to the public here?

Jim (01:12)
Yeah, sure, Kalli. I'm Major General Jim Poss. I retired from the Air Force way back in 2013 as a Major General, as a two-star general, and my last job in the Air Force was as Deputy Chief of Staff of the Air Staff for Intelligence Surveillance and Reconnaissance, but that's not what we're going to talk about today. We're going to talk about when Fred and I met way back in the mid-2000s, about when I was one of the folks that helped the Air Force figure out how to do remote split operations, which is to put pilots downrange in Afghanistan, put the aircraft downrange in Afghanistan, put the pilots back in the States, and distribute the video to about 30 different locations around the world. We hadn't done that before in the Air Force.

Kalli (01:52)
Amazing, and I also have Fred here with me, who is from the Haivision team. He is our Director of Space, Intel, and Civilian. So as Major General mentioned there, you guys have known each other for quite some time, so maybe give a little bit of that background, Fred, to us.

Fred (02:06)
Sure. Being in the broadcast community, going into the ISR community was kind of an interesting transition, but a lot of what the broadcast community was offering at time or the commercial marketplace was to have high quality video that didn't have things like on and off switches, for example, and you're supposed to turn it on and it's supposed to run and supposed to give you low latency and

high quality video, and that's what we were presenting at that time, and a way to store and mark this so those missions could be retrievable and you could find and explore different capabilities inside of that. So that's how we first met, as General Paz had mentioned, they were trying to figure out how to move the video and do all kind of analytics on it. That's what we were enabling from the broadcast community because we were doing that on a daily basis.

Kalli (02:53)
And General, how easy was it to start the process with Fred? I'm not going to have you say anything about your background, about everything. I know Fred very well, but how did the experience go for you? It was a few years ago?

Jim (03:09)
Well, that was 2006 or 2007, right, Fred? Wasn't it about 10 years?

Fred (03:12)
Yeah.

Jim (03:13)
I wasn't convinced that we fixed it yet. It's so hard. And, you know, the issue that Fred and I dealt with was kind of video 101, and Fred was very patient with us because we were all, you know, hardened intelligence officers, but we really hadn't dealt with video a lot. So we dealt with what I call snapshot sensors. So we'd have a very high resolution camera on the U-2, and it would take a snapshot of one thousandth of a second of time, and it's about, I don't know, about a 30 meg file. And we figured out how to get that file in really quickly. Latency didn't matter an awful lot. And then we got into video, which, you know, once we started flying Predators, MQ-1s and Reapers, MQ-9s, we had to get starting with just one stream of, I believe, 720p resolution video to get that from Germany to Langley, Virginia and California.

Towards when Fred and I started to work together, we were moving, I think, 30 different streams of video at times that double the resolution. And it was a huge shocker to us, who'd been used to dealing with systems we didn't have to worry about latency so much, that, gosh, if you don't really have that video stream engineered, you're going to drop frames left and right, you're going to lose resolution, which, of course, we were doing, and we really didn't have the expertise that they had in the broadcast industry to figure out why it was. And, gosh, Fred can probably talk to it better than I can. There were just so many problems that the good folks at, you know, ESPN or CNN or CBS didn't deal with, that we had to deal with. You know, security, the fact that we were dealing with aircraft that really, and sensors that really weren't designed to have video distributed everywhere, it was all kinds of problems.

Fred (05:03)
When we came into the ISR space, we were very video centric. So the idea of marrying video up with, you know, different types of intelligence that were, you know, time synchronized, it was very challenging. So our learning process was happening from, guess what, we can improve your video, but

my God, how do you go through this process that you guys go through? It was really tough. So, I mean, it was a, it was a joint learning experience. And from, you know, from my perspective, personally, it was very rewarding because we were helping do something that, you know, the ISR community was struggling with at the time, and we were able to try to help solve them those problems.

At the same time, we were being challenged to do more, like in terms of the distribution capability that was required and the networks that were available too. So a lot of what we had to do was not only understand the requirements for getting quality video, low latency video, but then how to transport that over links that weren't necessarily as robust as the way commercial broadcast was. It was a challenge, but one that we, I think we both grasped the challenge and took it on from the perspective that we were improving what each other were doing. And it was a good relationship that we had.

Jim (06:11)
Well, and Fred and his team were a breath of fresh air because up until that point, you know, you'd have vendors that would want to come in and fix something with a something that they built, you know, fantastic 4K video, TV screens, or, you know, some new methodology for distributing the video. But, you know, the problem wasn't signal segments. It was the whole thing from, you know, when sensor operator turned the camera onto the target to where it landed on the ground in Europe, to where it went to our fiber network, to where it went back to near Las Vegas, to where it went to Langley, Virginia, and then God forbid, where it went directly from the aircraft, you know, down to the special operations guys that were using a completely different sensor.

And until Fred and his troops came in, we were just, what's the analogy of, you know, the blind men trying to feel an elephant. You touch its leg, you think it's a tree. You touch its trunk, you think it's a snake. But we needed someone to realize that we had an elephant in the room and how to deal with it there. And that was the first time that we found someone that helped us with that.

Kalli (07:12)
So you mentioned, obviously, broadcast, Fred, and our experience in broadcast. I don't think a lot of people truly understand that, you know, as much as video seems quite obvious, streaming and everything for like live events and things like broadcast, we watch it as an average person every day. I don't think people really see the connection to something as serious, let's call it more intense, as like the military defence industry or aerospace or intel. And you've been able to bridge the gap, Fred, there. Let's talk about that industry a little bit. General, how would you define the industry where you are right now and where this came from?

Jim (07:47)
So you're talking about on the Air Force side or the corporate side?

Kalli (07:52)
If it's both, even more questions I have as a follow up.

Jim (07:56)

So, yeah. Yes. On the Air Force side, it's, you know, we have a very interesting hybrid problem that is once you get the right industry partners in the room with you is easy to solve using their experience and methodologies. But until you can get the Air Force to recognize this or there's a better way of doing things out there, it gets to be very difficult. So obviously, industry has got, you know, stuff that's, you know, a thousand times better than what we're using in the Air Force. And, you know, you see it every day, you know, you see the Super Bowl and wonderful 4K, I guess, 8K resolution soon. You never miss a frame.

It's always in perfect resolution. You get multiple camera angles. I still don't know how they do it, but you get that first line thing put down there. And, you know, until we found the right partner, we didn't realize, you know, it sort of the way the Air Force exploits video is a lot more like how ESPN broadcasts the Super Bowl than we realized. For example, they organized a trip for us to go out and see CNN do a NASCAR race. So we spent a lot of time following cars in the Air Force, but it's usually just one at a time. And, you know, you follow it down the street and, you know, make a strike on it and all that.

And they were dealing with, you know, what, 50 at a time. And the methodology they were using was they had automatic recognition for the numbers and they had automatic recognition for the type of car that they had. So they didn't have to worry about having a human say, you know, that's number three and, you know, it's an orange car. The other thing was every time somebody did something, they would have some intern somewhere that would log it. So number three, you know, has gone into the pit and he was in there for, you know, 15 seconds or number 15, you know, blew a tire. And it was always amazing that whenever somebody blew a tire, you know, during a NASCAR race, they could show you every time that guy had ever blown a tire in his careers because they had tagged all that.

And we weren't doing that in the Air Force. So you guys are always going to be ahead of us on the civilian side from industry. But on the other hand, you guys are always going to have techniques and methodologies and equipment that you can easily transfer to us if you can go past the hard part, which is getting us to pay attention to and to realize that there's a better way of doing stuff out there than the way we're doing it.

Kalli (10:13)
Yeah. So, Fred, talk a little bit about that, because obviously you had a lot of experience in broadcast. But was that something that clicked right away that you thought it could transfer to this industry easily or was it a bit of a learning process for you as well?

Fred (10:26)
So it was a learning process. That's a great question, because with one exception, we've all experienced commercial broadcast from a user perspective. You go home, you turn on the TV, you stream video, you watch it over the air. However you get your video, you get it and it comes in. And when it doesn't, you change the channel, which every broadcaster on the planet does not want you to reach for that remote control. He wants you to keep on watching that channel, watching their commercials, getting their revenue as high as possible. So the concepts of the always on type of technology was something that everybody was understanding right away. Most of the people we were working with had seen a football game, an American football game, multiple cameras with data that was on the screen that show you

what down it was, what yard it was, how many yards to go, what the score was, what the time was, information that would give you immediate recognition of where you were when you turned on that game and you watched even if it was in the middle.

Without that kind of information overlaid, when you turned on a game that didn't have sound or it didn't have any of the overlays on it, you would know one team had the ball because there was a guy standing behind him with the ball or a guy holding the ball and you know that was a defensive team and you knew which direction they were going. You might get lucky enough to see a yard marker and you'd know he was on the 20, but you didn't know if it was the 20 with 20 yards to go or the 20 with 80 yards to go. A lot of that that we take for granted is instant knowledge about its intelligence about what's happening at that point in time and that's kind of where we made the connection that said we can do this from a video perspective and give you the visual perspective of being able to see what you want to see.

We work very diligently with the community in order to get latency reduced because you can't fly an aircraft with two and a half or three seconds of latency except for by waypoints, but when you have to take control over it, it's going to be two seconds before the aircraft responds to what you do with a stick. So trying to reduce that time frame for not only air force control, but then what's happening on the ground, those were things that we were learning about, like how much does this have to work in conjunction with what you're doing in a mission versus when we're just watching a football game. It's a big difference. So those were the learnings that we did that took us back closer to the community and the broadcast market had already done a lot of the football type or sports type events.

So we were able to transmit and see that and understand how that works and give you really good quality video and now we had to crush down the bandwidth because it was going over very small pipes and we had to reduce the latency because it was the most time sensitive thing you can imagine and that's exactly what we were working to do and I think we accomplished that in a lot of different ways. To General's point, we still have some ways to go in terms of improving that, but I have a question for you General because I know you've spent most of your career in the ISR community, but you've also had some work with ISR ideas in the past, I guess, 10 years or so. Do you see a connection between ISR and public safety or the federal law enforcement communities as well?

Jim (13:32)
Well, I have to tread very carefully asking an intelligence officer that kind of question because we operate against foreigners overseas under very different rules than our brothers and sisters in law enforcement do, but no, that's actually a fairly frequent request I get from clients is how do we take what the military has been using for ISR and apply it for civilian law enforcement, state, local, tribal, territorial law enforcement and a lot of that, if you're talking about using aircraft unmanned or has been, it's a polite way to say that, not helped along as quickly as it should have been by the FAA. They're doing a lot better now and as a matter of fact, state and local law enforcement are really leading the way and figuring out how to fly drones safely beyond visual line of sight, which is a big deal in the civilian world and how to do it safely in a very congested area because if you can imagine having a fire or some kind of shootout or something like that, the airspace coordination alone that you have to figure out when you

got a bunch of drones going is pretty gnarly.

On the other hand, there's probably some stuff that I'm not smart enough on law to figure out whether it's appliable and I'll give you an example. We have a system called Gork and Stare, which essentially it's a lot more sophisticated than this, but it's a whole bunch of cell phone camera back planes that are put on a single array and the MQ-9 flies in a circle around a city and software stitches together all those shots and it nulls out the motion of the aircraft and gives you about a 10-kilometer wide area in which you can see cars moving and even people moving and you can keep that for as long as you've got video space. Great if you're doing that over Baghdad and you're trying to stop people from firing mortars at soldiers. I don't know if I want them doing that over DC, so you have to exercise caution.

Fred (15:33)
I'm assuming a lot of those higher level tactics would apply to that marketplace because they're doing a lot of the same mission. I have two sons that are police officers and they talk about when the drone gets on the scene, they have the ability to see what the drone sees and I know for them it's been very helpful, so it's not the same as what you did with the ISR community, but it's similar in the activities of the drone and the kind of information it's able to provide on the ground to, you know, in this case law enforcement and the other case the warfighter is pretty important.

Jim (16:10)
They do very well with within visual line of sight small UAS stuff and that's currently what's legal under FAA rules. Everybody wants to go to the way the Air Force does it, which is flying drones from beyond visual line of sight of the pilot and I think once we get rules for that, that's really going to be a tremendous opportunity for a lot of folks out there because you go from having to have one policeman with one drone and one car, you know, and going out to the actual crime scene and then launching the drone to, you know, maybe having half a dozen drones on call over, you know, Boston or someplace like that and you get them in there very quickly, have them look at your problem and then they, you know, drop copy and go on to another problem, which makes it a heck of a lot more efficient.

It also allows you to do what we did with the Air Force drones, Fred, which is, you know, create a central network where you can route the video very quickly to wherever you need to. Much more difficult to do that with these small drones that are really just talking point to point to the law enforcement professionals that are controlling it, maybe the guys in the scene, but we got to wait till we get beyond visual line of sight rules before that happens.

Fred (17:24)
Yeah. Let me just put it in a larger scale. Is it a problem for both communities in terms of video distribution of a lot of different sites of video capture or visual capture and being able to distribute that where it needs to go? Is that still a problem?

Jim (17:40)
Yeah, I mean, so my impression is law enforcement and I'll pick on London, who's got the highest per capita camera density in the world. They do great, you know, for the street cameras and stuff that

they've got, and those get exactly to where they need to go. And they've, you know, figured out how to, they don't give the picture to the individual policemen, but they tell them over the radio where to go and all that. And that works really well. No one has been able to really solve the problem of, you know, bringing that up in the air, you know, except for those municipalities that can afford, you know, police helicopters, which are very expensive and, you know, large enough to have the video links that you need to get that to a central node to distribute.

And obviously these handheld drones don't do that, which kind of gets back to my point is once we get better rules and we can fly drones beyond visual line of sight, and you can afford to put a decent sized drone up that, you know, doesn't have to fly below 500 feet and does have, you know, all the links you need to distribute that. But ground to ground stuff, they're doing great. Point to point, small drones are doing great. What we did in the Air Force, not legal yet. Sort of in the UK, but they're still working on it.

Kalli (18:49)
Okay. So I want to go back a little bit to the conversation. I think a lot of people are probably surprised to hear that Air Force or military is not sort of at the forefront of a lot of the video stuff, just purely because of resources. And not to say that they aren't in other places, but hearing something like broadcast and live sports just being so advanced. It's whether we call it object detection, which you would see a lot more in ISR situations or mission critical, we forget how important it is to have redundancy and not lose visibility. I know we all have watched a playoff game or a final of some version that if there was even a second delay, we would all panic a little bit and not to say that that's equal to a life or death situation.

It is very interesting, I think, for anyone at home to hear that you're paying attention to the commercial advancements as well. And you did mention that you're not as maybe far ahead as you'd like to be with some of the video and how to bring that together. So let's talk a little bit about trends today, and maybe something that you've observed over your years of experience. And in the 20 years even you've been working together, what stuff you see today that where video, obviously, a lot of sources, if I were to guess, probably a lot of sources, we have social media, we have AI, we have a lot of video coming in. So what's something you've seen today that you kind of wish had been either solved years ago, or you see it's still a problem today?

Jim (20:16)
Well, I mean, the basic problem in military versus civilian realm is, you know, whoever's director for ESPN for the Super Bowl owns every bit of that. You know, he owns the camera operator, he owns the camera, he owns the connection from the camera to the central place, and how that goes out. And, you know, he can fire anybody that doesn't like it. And he, where there aren't industry consensus standards, you know, like how the video format is going to be, they make them up in ESPN and enforce them. On the Air Force side, oh my gosh, you're just dealing with so many different organizations that have so many disparate architectures and standards and ways of doing things.

And I'll give you an example. We all wanted to go to the idea of having information layers that we would broadcast with the video, which is essentially how ESPN does it. So ESPN, you can turn on the first down marker, you can turn on the, you know, how many minutes left, that kind of stuff. And as a technician, this switches that on and off. You know, in the Air Force, because of the way that the sensor was set up to do this, we had to burn that data into the video as it was going. And it was the stuff that, you know,

pilots want to know. And you can, you know, geographic coordinates of where the aircraft is, what the altitude is, what the speed is.

And we could add more information later, but you couldn't subtract it. And that took us forever. And it's still not solved. And even if we solve it for the Air Force, you know, talking the Navy, Marines, and Army into doing it is hard. And then you got to talk, you know, usually talk the Brits into it next, and we talk NATO into it, and then we've got to get the Japanese and the Koreans. You know, it's a big problem. And no one owns that process from end to end. And if you don't really want to cooperate and spend the extra $10,000 to have a layer of data that's turned off and on from your sensor, you don't have to. So it's a big problem. And it's dealing with the sheer mass of players involved, the types of equipment involved, the requirements for those players, and then the standards that the guys either have or don't have.

Kalli (22:17)
And I'm sure we're all sort of aware of that, especially Fred, understanding like when you have to talk to a lot of different groups, and then they'll tell you, oh, the drone person isn't the same as the operations center person. And you have a lot of sort of opinions in it. And you look at something like law enforcement, and maybe they're not even fully sold on the technology in the increase of technology intervention that we have. And maybe they have a community that they have to respond to and make sure they're bought in on how the technology is being used. So there's struggles across the board. And I think anyone can relate to that.

So Fred, from a sort of stance of someone trying to navigate how many people sometimes you have to talk to and bring into the room and get consensus, what's that experience like trying to talk to so many different perspectives and getting everyone sort of on the same page?

Fred (23:05)
Yeah, well, when I got to the general, we were kind of done, but found out that there was a lot more organizations involved in, to the general's point, that have to be included in this. And it becomes very difficult to get, you know, from our perspective to get that messaging across. It has to be handled internally by the government quite a few times. And it's a challenging process. And I, you know, anybody who's gone through years of service with the government, I respect what they've had to do. And the challenges from actually managing that process has got to be nightmarish. I mean, in the commercial world, you can go to somebody and make a point of this technology or capability is going to save you money.

And the other side of it, it's not saving you money, it's saving lives. How does it fit into the architectures? How does the army use this? How do the airports use it? How does the intelligence community use it? How far does it go where other people need to have access? How do you get that content to them? Every one of those points becomes another contact point that you have to work with either through security, through approval, through ATO, through authority to operate, through different capabilities like that, that you don't realize exist. And when you're learning that process, it's daunting. I mean, it's just, it's just really daunting. So finding some people that care and want to make change is an important aspect when it comes to how do you get into the government and how do you work with them.

And, you know, your expectations have to be tempered in terms of, golly, we can fix this for everybody. And everybody doesn't want to be fixed necessarily the same way somebody else does. So it's a very challenging environment, but if you want to work through it, it can be done. That's what we've done here and what we've done in the past, and it's been very successful. So I wish it was easier. If you have any suggestions, Saram, I think everybody who's listening will be glad to hear that.

Jim (24:51)
Actually, I don't. It's a daunting problem. I mean, only time I've seen it really work is if you point a czar, you know, somebody that's in charge of this from end to end, which is pretty much, you know, what we did back in the mid 2000s to fix the problem of earlier predator stuff. But, you know, even with somebody that's empowered for an end to end thing, you're still dealing with dozens of program offices that have, you know, conflicting things. And the reason that we weren't able to get the MQ-9 Reaper guys to stop burning the data into it was because, you know, that was expensive and they had about 15 other things, you know, such as making sure that the aircraft didn't fall out of the sky from icing on the wings to making sure that they could geolocate the stuff on the ground. And when you're looking at really important stuff like that, you know, we'd like you to spend three million dollars to be able to turn the overlay off and on. I don't think we ever fixed that problem.

Fred (25:53)
I was just out of NAB last week and National Association of Broadcasters conventions where everybody who's in the commercial broadcast industry is out there and there's a lot of video. I know that you've been out there in the past and I've seen a lot of, you know, the capabilities of the broadcast industry broad. I was surprised to see the focus on AI this year and some of the AI capabilities that have to do with video. Have you looked at that in the recent times in terms of, from an analyst perspective, what can be done with some of the AI capabilities? I don't know.

Jim (26:29)
Oh yeah, no, absolutely. We've been on that since, I don't know, 2010 in a very formal way. It's Project Maven. It was, you know, we were able to use AI to be able to recognize objects in Predator and Reaper video streams. You know, we were able to recognize moving cars, you know, 99.99% of the time. It's, again, harder for us. I mean, I, you know, I got an iPhone. I can log on with my face and any kind of, you know, lighting and any, you know, sunglasses on, hats off, but I'm still using a very high resolution camera that's my face, which has great input into your AI machines. But, you know, you do that and you're in a cloudy day over the Hindu Kush mountains and, you know, the aircraft is vibrating.

The system isn't geostabilized quite. And then you're trying to get it to recognize a child versus an adult male and all of a sudden that gets very hard. But again, industry is really, really helping with that. And I'm not privy to the details that we're doing now. I hear through the grapevine that we've essentially solved most of those problems of what we call our automatic target recognition, you know, in there. So it's, it's been a tremendous help for us.

Kalli (27:42)
I was going to ask about AI as well in terms of trends, but I did want to bring something up that you mentioned very early on, which is the security layers. So I can only imagine that that is one of the big differentiators when it comes to video, when it comes to broadcast. If you leak a stream, not the end of

the world, if someone happens to log in and see a game that maybe they didn't pay for or something like that. But in terms of security on your end, that's a whole different, I don't want to say a whole different ballgame because I feel like I'm entering an analogy I'm not ready to take home, but tell us a little bit about the security, the differences there, and especially stuff that you see from maybe from commercial to your industry that you're covering now.

Jim (28:26)
Security is a big part of the problem. And security is a big part of the difference between, you know, us and I'll keep going back to ESPN. So when you start talking about security, the very minimum, we're going to classify these feeds as secret. And that means it's going to go over a network called CIPRANET, which is managed by the Defense Intelligence Agency. And what we were finding in the back, if he just wanted to encrypt this stuff, you know, the encryption devices that were approved by the National Security Agency really weren't set up for video. They were set up to be able to talk over the radio, to transmit email and stuff like that.

But continuous high resolution imagery without losing frame took a while to develop that. And then once it gets into the encrypted side, you've got to make sure that all of the components that it's going through, you know, modulators, demodulators, you know, you name it, are all able to operate on a classified network. You know, no Chinese chips. They passed all of these tremendous inspections. They have an authority to operate, which is a whole huge thing. Some of the drones, and if you see the famous picture of the UBL raid of Hillary and President Obama staring in the screen, they're staring at a drone feed. But that one was classified at top secret level, which has got completely different stuff.

And, you know, the top secret guys, you know, you kind of look at them and, hey, we need to broadcast, you know, 4K video without losing a frame over a 10 meg pipe. And it's just, you know, they ice over and, you know, we're not going to build a device that does that, which they have since, but still it's a tremendous problem. And that's just on the American side. When you start bringing, you know, the Brits in, that's fairly easy. You could do that whole different set of security stuff for the NATO guys. We've got some partners. I should imagine Israel that we haven't had those conversations to figure out how to swap our video around in a secure manner. So that's always probably going to be interested in Fred's opinion, probably the biggest adjustment for someone coming from the commercial side to try and work in the military side of security.

Fred (30:28)
Yeah, for sure. We don't have anything quite that extensive. Broadcasters do like to have a secure stream, so it can't be intercepted and reused or used by some other source. So the capability for them to be able to protect their content, again, which is where they make money, is extremely important. The difference between protecting money and national security can be slightly different. And the biggest challenge I think that we faced was how to pass some of the video that was unclassified into a network that became classified. And then what do you do with it from that point? I mean, it was probably one of the toughest challenges that I would imagine we faced back then.

Jim (31:05)
I would imagine we face today as well, just in getting and sharing, we'll call it data between different networks, even though it's video-based data, it's still data that's going at one security level to another.

And then sometimes you have to use it and you have to scrape things out. And it's crazy. I mean, you know that for a fact.

Fred (31:24)
And it was one of those, again, a learning experience. I was like, it's just video. I mean, seriously? And then it became to the point of it's important video that has stuff on it.

Jim (31:34)
You want to give drone video Canada to Canadian Armed Forces, it's a massive difference if you're doing it for NORAD purposes, North American Air Defense Command Treaty, which is you can give them everything. But if you try to give it to a Canadian under a NATO hat, completely different, different plumbing, different hardware, same Canadian ally. So it's interesting.

Kalli (32:02)
It is. This is great. Thank you so much to both of you, because this was really helpful. And I think sometimes we struggle with bridging the gap between, you know, where Haivision is so experienced with the broadcast side. And of course, we have a whole team that is so experienced on the mission critical side, but they don't always associate Haivision to that, especially seeing how, you know, it's a different marketing model, it's a different visual, like everything's quite different when we look at broadcast, but the challenge, and sometimes even the use case is actually quite similar.

Outro:
Thank you for tuning in to the Haivision Podcast. Make sure to subscribe for more exciting discussions with our experts.