Adam Kress:

Hi everyone, and welcome back to another episode of Aerospace Unplugged. I'm your host, Adam Kress. On today's episode, we're going to dive into the defense side of aerospace. Now, most everyday flyers probably don't think about it very much when they're on a plane to their favorite vacation destination. But militaries around the globe are some of the largest operators of aircraft on the planet. Many maintain huge, complex fleets that perform a wide variety of missions. And to accomplish those missions, connectivity is of growing importance. Now, while you may like to catch up on email or stream a movie on your flight, defense operators have very different tasks on their minds.

In today's episode, we'll explore connectivity in modern defense, diving into how it plays a crucial role in enabling mission resilience across all domains, and why staying connected is vital for success in today's complex operational environments. Joining me on the podcast today for this discussion is Tom Konicki. He's the Director of Business Development for Defense and Space at Honeywell Aerospace Technologies. Tom, thanks for joining me today.

Tom Konicki:

Thank you for having me.

Adam Kress:

No problem. All right. I'd like to ask each guest, first off the bat, how did you get into aerospace? Were you always an AV geek, an aviation person when you were young, or how'd you get into it?

Tom Konicki:

Yeah. Great question. I am a retired Air Force Colonel. I did 23 years in the Air Force. My first 10 years in the Air Force, I was launching satellites, controlling them, testing them, a lot of communication satellites for military use. The other 13 years I got into the international relations side of the government. I was interfacing quite a bit with our foreign partners, helping them procure things from the United States, F-15s, F-16s, the weapons that go along with them, and the communications that also go along with them. So after my time in the Air Force was up, I had a friend of mine that had joined Honeywell, and he reached out to me and said, "Hey, we're looking for some good people and couldn't find any, so would you like to join?" And I said, "You betcha." And so here I am and happy to be here. And it's fun to be still involved with the international and the government side of things, helping not just the US, but our international warfighters obtain connectivity and satellite communications for their platforms so they can complete their missions.

Adam Kress:

Yeah. Very cool. I know the technology in the space just continues to advance, and I'm sure over the past couple decades you've seen that and you're still right in the middle of it. So why has connectivity become such a central focus in modern military operations?

Tom Konicki:

Sure. Coalitions are out there. The US is not going at it alone anymore. They're just not. Every operation out there has an international presence to it. So to coordinate across all facets of the battlefield, not just within the US but our international partners, you consider the ground, sea, air, all of that requires precision, precision of communication and connectivity. So it really has become a central focus in

modern military operations. These communications, the connectivity has to be resilient. It has to be secure. They use it to coordinate all the different assets. We share intelligence and we also respond to threats in real time using this connectivity in the satellite communications

Adam Kress:

Is pretty much all of the connectivity between, say, air, sea, ground, anywhere on the battlefield, is it all dependent on satellites?

Tom Konicki:

No. Some of it's line of sight. There's a system that the US and NATO uses called Link-16. That is a line of sight communication node, if you will, or a common operating picture. But sometimes our foreign partners maybe are not allowed to access that network. So in other ways they can connect is through the satellite communications. So again, Link-16 is limited to the line of sight. So once you get beyond line of sight it requires a satellite communication system to be able to connect.

Adam Kress:

Okay. If you look at the past decade or so, when it comes to connectivity in the defense space, what's changed the most?

Tom Konicki:

Right. So there's been a definite shift towards smarter, more connected defense platforms, and SATCOM is truly a game changer for the warfighters. I'll give you an example. So within the US government, we have some traditional platforms like the KC 135, the KC-10, the KC-46, those are all tankers. They're doing air-to-air refueling. And those have typically been just outside of the range of any harm's way. It is outside of the fight. The fighters will go in, do their mission, and then come back and refuel with the tankers and then get back into the fight again. And what the US government and their allies and their coalition partners are realizing is why can't we outfit these tankers with satellite communications and help extend the range? Because again a lot of the fighters do not have satellite communications on their aircraft they're using the Link-16 and the line of sight things. So why not allow that tanker to become a communications node in the sky? And so that is one of the shifts that we see happening now to allow these military commanders to receive and send real-time data so that they can make informed decisions, especially when mission success is on the line.

Adam Kress:

When the US government or other allied operators start to secure this connectivity or new types of connectivity, what are the current big needs and what are the challenges that they're trying to overcome?

Tom Konicki:

You bet. So the needs, they need easy communication and navigation to make informed decisions. That is crucial for mission success. They need resilience to not lose this connectivity. They cannot rely just on one network to do this. The challenges that they face, they will be operating in hot spots around the world. These are contested environments where there's active jamming and spoofing going on. So you need to make sure you have options to communicate. If for some reason that communication, your primary communication goes down, you need to have an alternate communications. If that one goes down, you need to have a contingency. If that one goes down, you need to have an emergency. The

primary alternate contingency emergency, that's what the government refers to as PACE, and that is something that Honeywell certainly provides and continues to provide to our warfighters.

Adam Kress:

So from a technical perspective, you mentioned PACE. Take me through what actually happens if you're on a KC-35. It has connectivity, but something drops.

Tom Konicki:

Right. And what I'm about to tell you is something that I'm happy with. Honeywell is able to actually demonstrate for these warfighters. We are not power point deep when we tell you we have a capability, we bring our warfighter customers on board, our test aircraft, and we show them this in the air. So what happens is maybe you connect to a primary network. A lot of the warfighters are using the Global Express or GX for short network. And they're up and operating on that. They're receiving information, they're sending data to the folks that they need either back in their operation center or on the ground. And then if that goes down the way that we have it set up with our Honeywell connectivity solutions, there's an automatic failover between that. So if we're doing it right, the user's not even going to notice that they've lost their primary network. It'll connect or reconnect to a different network within just a few milliseconds to the point where the data maybe a half-second blip. You may miss a word in the voice communication, but you'll be able to continue on and conduct your mission along the way.

And again, if that alternate link goes down, then you have a contingency. And if that one goes down, you have an emergency. And we have all of that set up board so that ... Again, it's almost unknown to the operator that they lost that primary link, and we want to make sure that we have enough data throughput to meet their needs. So if they're conducting intelligence, surveillance, reconnaissance missions, that whatever those next alternator contingency or emergency networks are can bring in and push out the data at the data rates that they're expecting.

Adam Kress:

Yeah. I know you mentioned that Honeywell has its own 757 testbed aircraft where you can do these connectivity demonstrations. When you've brought on different members from Defense Ministries or the Department of Defense and you run through this scenario, what's their general reaction to it?

Tom Konicki:

Oh, it's always positive. And a lot of times they say, "We've heard people come in and tell us about it. We've just never seen it." We've had the US Space Force on board. We've had Army operators, Navy, international, we've had them all. And seeing is believing. They are always surprised that it happens so quickly. They're surprised that they're able to maintain communications along the way. I remember one of the folks we had on board recently was from the Space Systems Command from US Space Force, and we invited him to connect. He had his iPhone and he FaceTimed his daughter, and we had him connected to a particular network that he'd never used before. And we said, "Okay. Well, you're going to ..." He was on the phone talking, FaceTiming her up at 30,000 feet on the Honeywell 757. And we said, "Okay. We're going to switch networks and three, two, one." And he didn't even realize. The connection stayed on and he was able to communicate, and he was like, "Holy cow. I couldn't believe that, seeing that it actually works." And so it's a very pleasantly surprised response that we typically get out of our customers when we're on those flights.

Adam Kress:

Yeah. That's excellent. I'm thinking about cybersecurity and all these different networks. How do you ensure ... Especially in a defense environment, that all of this is actually secure?

Tom Konicki:

You bet. So a couple of things. One, the end users, they're the systems that we offer, these are the bent pipes. These are the data pipes, if you will, that are transmitting the data back and forth. So the end users will often bring their own encryption on board to secure the data. They'll encrypt it with what they call it type one encryption. But even without that, securing the sensitive data against the evolving threats like cyber attacks, that certainly remains a concern of ours. So when you consider the all domain environment that we operate in, land, sea, air, and cyber, we have to be vigilant about who has access to what information. So ensuring that not only authorized personnel can access the critical data that is vital, but we must also use robust encryption methods to protect the data while it's in transit or at rest. So trusting the information that we send and receive, that's also another big concern in this area and this era where misinformation can spread rapidly, especially through digital channels. We need to ensure data integrity within our systems.

So we have emerging technologies. For instance, Honeywell offers a quantum key distribution capability. That where that comes into play. That QKD allows us to secure communication channels against interception. We make sure that the information that's shared is not only private, but it's also verifiably trustworthy. We need to consider the access of this information. In a high stakes situation the people on the ground, they have immediate needs and access to the real-time data to make informed decisions. And this means we have to develop systems that are secure, yet user-friendly and striking that balance is essential, and our teams must be able to rely on this information without the cumbersome barriers, but it also must protect against unauthorized access. And again, that's where the Honeywell quantum key distribution comes into play, as well as the other type one encryptors that I mentioned earlier.

Adam Kress:

Yeah. Without revealing any state secrets here, tell me about the data that's actually being transferred back and forth. I'm looking for one or two real world examples. No offense to it, FaceTiming your daughter, but I would think in a real world mission, the data that's being transferred is critical. I'm just trying to better understand positional data or what are we talking about?

Tom Konicki:

Right. So there are military operations occurring around the globe every single day, and these are vitally important to our national security. In the different hotspots of the world the military is always conducting intelligence, surveillance, reconnaissance. Perhaps they're taking that information and using it in targeting for which assets they're going to take out, whether it's a high value target, a person or perhaps a facility or something along those lines. Perhaps we have some troops that are in contact, so maybe we have friendlies that are getting fired upon and they need help. They need someone to come help them and save them. So it really runs the gamut in terms of the information that is going onto the platform and coming off to the platform. So the need to have real-time data transfer, whether it's the voice, the data, perhaps everybody needs to see the same common operating picture to give situational awareness to what is happening on these missions. All of that comes into play. So it's information coming onto the airplane and going off of the airplane.

Adam Kress:

As these defense missions become more and more data-driven and there's more capability to exchange data back and forth, how does SATCOM technology and other connectivity technology need to evolve to keep up for the demand?

Tom Konicki:

So for satellite communications, the US government and our international partners, they continue to ask for a single terminal that can be multi-orbit multi network. And that's where one of our solutions JetWave X is really shining. It's coming out later this year and will be offered to the international and to the US customers that are out there. They want the ability to connect to the different networks. So right out of the box, JetWave X will connect to both the GX, the Global Express Network that was Inmarsat, now Viasat. And it also connects to the new Viasat-3 network, which is exciting because it offers greater throughput.

The other thing that JetWave X offers, which is really nice, is an open architecture system that allows the end user to bring their own modem. So what does that mean? That means if GX and the Viasat-3 networks are not meeting their needs, or perhaps in a particular part of the world, they want to use a different network, they can bring their own modem and connect to their own network. And so we give them that flexibility to connect to those different orbits. JetWave X will connect to the medium earth orbits, the highly elliptical and the geosynchronous orbits. And so those are the things that SATCOM has to adapt to and continues to adapt to and that's what Honeywell's adapting to.

Adam Kress:

So as we look toward this next generation of connectivity, as things continue to evolve, JetWave X is really positioned as essentially bring whatever other hardware you have, we can work with it all. Right?

Tom Konicki:

Correct. And so again, right out of the box with those two networks that you connect to, that's inherent resilience immediately. One of the other things that we offer with the JetWave X is the ability to connect to the anti-jam capabilities that are out there. We've worked very closely with some of our other industry partners who have developed modems that are frequency hopping and can connect through our system and provide access to that are free from being jammed because it's constantly frequency hopping along the way, so it makes it anti-jam. So it is a very good asset to have, especially in those contested environments that I mentioned earlier.

Adam Kress:

Yeah. Looking ahead a decade or two, as you see all this technology involve, where do you think or what other trends do you see or areas where you think it might be headed next?

Tom Konicki:

Sure. So with the emergence of Starlink, certainly we need to get into the game of where we're able to connect to the low earth orbit networks as well. So Honeywell historically has done very well in medium earth orbit, highly elliptical and geosynchronous. So we need to offer a solution that can also connect to the low Earth orbit as well. But if you're really looking down the road, what is the real game changer? That's going to be a needle mover across the board, whether it's a Honeywell product or not? That is migration to what I call a 5G non-terrestrial network, which offers open protocols for satellite communications. That is going to be a game changer. So these non-terrestrial networks, these are satellite-based communications with standard terrestrial 5G networks that provide a pervasive global

connectivity for areas beyond the reach of traditional cell phone towers. It will use networks like Starlink, starshield, OneWeb, Amazon's Kuiper, Telesat's, Lightspeed, Spinlaunch's Meridian, along with other airborne platforms. And so this 5G non-terrestrial network that will offer enhanced coverage to remote regions. It'll support emergency services, it'll enable new internet of things, applications, and a direct-to-device satellite connectivity that we just haven't seen yet. So that's about 10 years down the road, but that is going to be a mover and a shaker and will really open up things for military as well as civilian operators.

Adam Kress:

Yeah. Very cool. Very cool to think where it's all headed as we all get more and more connected, I guess, whether we want to or not. It's inevitable. And with militaries, it's no exception. Tom, I want to thank you so much for joining me on the podcast today. Super interesting discussion. As you know, we call the podcast Aerospace Unplugged. So I wanted to ask you, as I do all our guests, when you unplug and you're not thinking about satellites and military operations, what do you do to kick back?

Tom Konicki:

I'm an avid pickleball player, believe it or not. It's a sport that I took up a couple of years ago. My sister, she said, "Hey, let's go play this game called Pickleball." And I said, "I'm not going to play a game. That's a silly name. Why would somebody name something that?" And she knew that I had a racquetball and a tennis background. She's like, "Just come try it once, and if you don't like it, then I'll never ask you to come back out to it." And so I said, "Okay. Fine." So I come out and play it, and I was like, "Oh boy. This was a lot more fun than I thought it was going to be." And so that was in Houston that she took me out there. And then when I got back to Virginia where I lived now, I looked around to see if there's anybody that was playing, and sure enough found a group. Just a pickup group. That was a couple of years ago. Fast-forward to today, I am now the vice president of the Woodbridge Pickleball Club. We have 300 paying members. We host tournaments and all sorts of things. So it's one of the things that I enjoy doing in my time off.

Adam Kress:

That's very cool. One of my sisters who lives down in the Orlando area in the past, yeah, maybe three ish years or so she never did anything athletic in her life, but has completely fallen in love with pickleball. Plays in leagues all the time. And then actually my sister-in-law too, in the Dallas area past couple years, again. It sounds like you get bitten by that bug and off you go. So very cool. Thanks again, Tom, for joining me. I appreciate it. And thanks again to all our listeners out there for tuning in.

Adam Kress:

Make sure you check out Honeywell's website for more information on all the connectivity technologies we talked about today. Thanks again for listening, and we'll catch you again on the next episode of Aerospace Unplugged.