EPISODE 20

[INTERVIEW]

[0:00:05.5] IP: On this episode of AvTalk, we head to Stockholm to go inside FlightRadar24. We sit down with cofounder Mikael Robertsson to learn how FR24 got started, and we talk to chief technology officer, Sean Atkinson to learn more about how FR24 works. We also check-in on a volcano in Bali, the world's largest turboprop aircraft, and our favorite new airline, Joon.

Hello and welcome to a special episode 20 of AvTalk. I am Ian Petchenik and I am literally here…

[0:00:37.1] JR: In the flesh.

[0:00:37.5] IP: In the flesh in Stockholm, Sweden with —

[0:00:40.2] JR: Jason Rabinowitz. Hello.

[0:00:42.1] IP: Welcome to episode 20.

[0:00:43.3] JR: Where are we?

[0:00:44.1] IP: Well, I just said we're in Stockholm, Sweden.

[0:00:46.2] JR: But where in Stockholm?

[0:00:47.8] IP: We're in the economy class conference room, which is a glorified closet, really, but it has a window. So that's important. We're recording today from the offices of FlightRadar24.

[0:00:59.3] JR: That's right.

[0:01:00.0] IP: We ventured to Sweden for a little bit of elucidation as to what we do here and how we do it. So a little bit later in the show we're going to talk to cofounders of FlightRadar24, Olov and Mikael about how this whole business got started and —

[0:01:17.9] JR: How it works.

[0:01:19.1] IP: And then we're going to talk a little bit later in the episode, we're going to talk to our CTO, Sean Atkinson, about how FlightRadar24 actually works.

[0:01:28.5] JR: We'll get a little more in depth, then it's magic, and there might actually be some technical talk involved.

[0:01:34.6] IP: Some technical. We'll put up a warning on the podcast. Not an explicit warning, but a technical warning.

[0:01:40.6] JR: That's to say it's a witchcraft.

[0:01:41.9] IP: There's a little bit of witchcraft involved. That's certainly true. But first things first, let's talk about a few things that have been going on in the aviation world this week. Everyone's been following — I want to say everyone, because I've been riveted to it, so I'm projecting here.

[0:01:57.3] JR: You equal everyone.

[0:01:58.1] IP: Yeah, I'm projecting here. The Antonov An-22, which if you haven't heard the aircraft, we'll play you a sound of the aircraft.

Okay. Isn't that the coolest thing in the world?

[0:02:19.6] JR: So I didn't actually get to hear it just now, because magic of editing, we'll put that in later. Did I spoil that for you? But I listened to it last week and it's pretty freaking amazing. The sound it makes, it has four counter-rotating props, and any counter-rotating aircraft sounds ridiculous. Counter-rotating basically means that for each engine, it has two sets of propellers that counter-rotate against each other I think is how to best explain that.

[0:02:52.9] IP: One rotates clockwise, the other rotates counterclockwise.

[0:02:56.6] JR: The sound it makes is just absolutely ridiculous, and this is the largest prop aircraft in the world?

[0:03:02.6] IP: It is. The An-22 is the largest turboprop aircraft in the world.

[0:03:06.3] JR: What was it doing? Why was it flying?

[0:03:08.1] IP: Well, like all good charter cargo airlines, they were helping out another airline. A Thomas Cook A330 in Holguin, Cuba had some engine trouble, and so they flew over to Manchester — Well, they were doing something else in between Prestwick and Helsinki. I'm not sure what was in the plane there, but then they came back to Manchester and flew Manchester-Gander, down to Holguin for — I'm mispronouncing that —

[0:03:37.8] JR: Probably.

[0:03:38.4] IP: Yeah. That's okay.

[0:03:39.0] JR: Close enough.

[0:03:39.4] IP: We'll get there eventually. But the moral of the story is they were carrying an engine for an A330. So we're recording a bit today the 4th of December and they're on their way back later in the day and they should be back in Ukraine later this week. That will be a fun thing to follow a few more flights this week. They're going to go from Cuba, back to Gander, back to Manchester, and then back to [inaudible 0:04:00.7] in Ukraine.

[0:04:01.8] JR: Long way to go to deliver a single engine.

[0:04:04.5] IP: Oh! You got to bring the broken one back too, I guess.

[0:04:06.4] JR: That's true.

[0:04:07.0] IP: They'll do that. I mean just — We'll post some video on the show notes of the plane flying over Manchester. It's just — That incredible sound. I'm mean it's even more incredible when you see it.

[0:04:17.2] JR: Sounds more like a fleet of aircraft than a single aircraft.

[0:04:20.8] IP: It really does. It really, really does.

We also have in the news this week, or continuing in the news this week is the eruption of Mt. Agung in Bali.

[0:04:32.1] JR: Is that how you pronounce it?

[0:04:33.4] IP: I hope so.

[0:04:33.8] JR: Maybe. I don't know. I honestly don't know if it's right or wrong.

[0:04:36.9] IP: We're going to have to start a second podcast of how to pronounce the words that we're mispronouncing.

[0:04:40.2] JR: Not go to Iceland then.

[0:04:41.7] IP: No. The eruption didn't initially affect the airports, but as the ash cloud spread, it closed the Denpasar airport in Bali for a few days.

[0:04:55.5] JR: Days.

[0:04:56.8] IP: They're getting back into the swing of things, but I guess now the warning is that the eruption could increase and close the airport yet again.

[0:05:06.0] JR: Which is bad news.

[0:05:07.0] IP: It is bad news, but you know what's worst news? Flying through an ash cloud.

[0:05:10.5] JR: Yes, you shouldn't do that.

[0:05:12.1] IP: You definitely shouldn't.

[0:05:13.2] JR: You shouldn't do that. If you fly a modern jet-powered aircraft into an ash cloud, it will break the engines and they would stop working pretty quickly. Was it BA9 back in — What year was this?

[0:05:26.5] IP: The 80?

[0:05:29.8] JR: 1982, June 24th. A BA 747-200 back in the day, before they really had any way to, I guess, detect ash clouds or really knew how just bad they were to fly into. A BA 747-200 flew right into an ash cloud and promptly broke all four engines, which is not something you want to have happen. Basically, when you fly to an ash cloud, the ash hits the hot engines and almost solidifies on to the core of the engine, I believe, and kind of just kills it temporarily. Until it has time to solidify, cool down and basically break off, and I'll probably going to be yelled at for being wrong in some way, but that's my grasp of it.

The captain, Eric Moody, had one of the most epic quotes of any pilot on any aircraft ever. Ian, read it out loud here.

[0:06:25.9] IP: Okay. They're flying through the ash cloud and the captain gets on the public address system and addresses the passengers after all four engines have failed.

[0:06:39.5] JR: And they think they're going to have to ditch into the ocean at this point.

[0:06:42.3] IP: But they're working on the problem. He comes on the public address system and says to a cabin-full, a 747 cabin full of people, "Ladies and gentlemen, this is your captain speaking. We have a small problem. All four engines have stopped. We are doing our damnedest to get them going again. I trust you're not in too much distress."

[0:07:02.8] JR: See, you didn't say it with a British accent, so it's not quite as coming as a British accent would have had, but I don't think all four engines stopped working is a small problem. I think that's a big a problem as you can possibly have on a 747. Thankfully they flipped enough knobs and they got, I think, two of the engines working. I bet two — Three or four.

[0:07:27.2] IP: Yeah. I think they eventually got three going again and then continued on.

[0:07:32.9] JR: It turned out their windshield was so sandblasted by the ash cloud that they couldn't even see where they were flying, so they had to land an instrument and basically glare.

[0:07:42.4] IP: The whole story is ridiculous and rather incredible.

[0:07:45.7] JR: Don't fly into an ash cloud. That's the moral.

[0:07:47.8] IP: The moral of the story is absolutely do not fly into an ash cloud, and we'll post a link in the show notes to kind of the whole story, because we didn't do a justice and you have to read the sequence of events and how things worked out. Like all aviation events, the real moral of the story is that it helped meteorologists and pilots and just better understand what ash clouds do to aircraft and why they're so important to avoid. Which is why when the volcano erupted in Iceland in — What was that? 2010. It shut down Atlantic flights for days. That's one of those things that a bad thing led to increased knowledge.

[0:08:34.1] JR: Which is really good.

[0:08:35.1] IP: Reopened Iraqi airspace.

[0:08:36.9] JR: Yes.

[0:08:38.0] IP: How about that?

[0:08:38.4] JR: Middle-eastern shortcut.

[0:08:40.3] IP: In 2014, with kind of some issues with ISIS and other threats to aircraft in the area, airlines stopped flying over Iraqi airspace.

[0:08:54.7] JR: With good cost.

[0:08:56.4] IP: With good cost. So that was one of the outcomes three years ago. Recently, United Emirates Aircraft — Basically, Emirates and Fly Dubai and I have started flying over Iraqi airspace again, and it's a shorter route. Looking at the map, and we'll put kind of a description map in the show notes so that you can look at it and kind of follow along. Basically, it's not incredibly shorter depending on where you're going. But from what we're understanding is it's now much cheaper than flying over Iran.

[0:09:35.7] JR: Because the overfly pretty much are a lot cheaper.

[0:09:39.7] IP: More expensive in Iran. So we've got that to sweeten the deal to bring flights back to Iraq.

[0:09:45.6] JR: No, thank you.

[0:09:47.0] IP: Well, I mean the FAA has been working on a revised kind of procedure. So we'll see. That was supposed to go into effect in October, I think, but didn't because of U.S airlines stuff.

[0:09:57.9] JR: You know, no U.S. airlines have taken up on this.

[0:10:00.3] IP: No U.S. airlines flies in the area, so it's kind of a moot point. It might be a cargo issue.

[0:10:05.8] JR: Even so, if you're a U.S. passenger, you're not going to fly over Iraq. If you have a technical issue and you need to make an emergency landing, you're not going to want to land anywhere in Iraq. They're never going to put themselves in that position. It's a moot point for the U.S.

[0:10:19.0] IP: Well, I mean I can only say what the FAA is thinking about doing.

[0:10:22.4] JR: I guess so.

[0:10:23.0] IP: I can't speak to the wisdom of it or its utility.

[0:10:26.2] JR: No.

[0:10:26.5] IP: But that's what they're doing. That's what's going on there. It's an interesting story, I thought.

[0:10:32.1] JR: Yes. You're United flight will not be stopping to refuel in Baghdad anytime soon.

[0:10:38.2] IP: That's a fair play.

[0:10:38.9] JR: Yeah.

[0:10:40.3] IP: All right. How about we take a quick break and we will come back with Olov and Mikael and talk about how FlightRadar24 got started? Sound good.

[0:10:50.8] JR: It does sound good.

[0:10:52.1] IP: We'll be right back.

Joining us now is Mikael Robertsson, who is one of the cofounders of FlightRadar24. Olov was going to try and join us, but he unfortunately was unable to. So we'll settle for 50% of the cofounding duo. Mikael, thanks for joining the podcast.

[0:11:17.4] MR: Thank you.

[0:11:18.7] IP: Tell us how FlightRadar24 grew from two people and a few receivers to over 16,000 and dozens of employees. Tell us how things got started.

[0:11:32.6] MR: Yeah. Me and Olov installed the first two receivers in Stockholm about 10 years ago and we put the screenshots from the SBS1 as the first receiver was called on a webpage and it's got popular very fast and people from Europe and Scandinavia started to contact us to ask how we did this, and we started to send out receivers to initially Sweden, later Norway and then Poland and after about a year or two we had a ton of receivers and at that time we found out the way to get the data from the SPS1 receiver and put all the data into a database. In 2009 we were able to plot everything on a Google map instead of the screenshots from SPS1. Then it became even more popular, so we started to send out this software to people all around Europe and later the rest of the world.

[0:12:37.6] IP: The network kind of expanded from Scandinavia on out, and then at what point did you decide — Because this began as kind of a side project.

[0:12:49.2] MR: Yeah. We're running a price comparison service for the Swedish market, and this was like an easier search engine optimization project to get more links to this price comparison service, but then the flight tracking became much bigger thing that [inaudible 0:13:08.2]. So we had to put it on a separate domain as a separate service and this was in 2009 when we got this database and started to draw everything on Google maps.

[0:13:21.5] IP: At what point did you realize that it was becoming bigger than the price comparison side or were people saying, "We're coming for the flight tracking" instead?

[0:13:34.4] MR: Yeah. In 2009 it started to become this — FlightRadar24 started to become bigger than Swedish price comparison. Then in April 2010 we had the Icelandic ash cloud, and that was the first time that we got media coverage. Many of the biggest TV stations were showing — Or the air traffic disappeared over Europe. One day in April 2010, we got like 4 million visitors.

[0:14:04.3] JR: One of the biggest moments in your early history was literally a map with no planes on it. That's all sorts of ironic.

[0:14:11.8] MR: Yeah. I think we used to track like before an ash cloud like about 1,000 aircraft over Europe. During the ash cloud, when media started to show in the map, we had like 7, 8

aircraft over like Spain or Italy. That was actually quite good luck, because we had quite bad server capacity back then. If we would have 1,000 aircraft you wouldn't be able to serve that to 4 million visitors. Just because we only have 7 aircraft, we couldn't serve to all these 4 million visitors. After that we realized that this is like — There's some big potential going global with this.

[0:14:48.9] IP: At what point did you kind of make the decision to move over and say, "Okay. Now, we're going to try and go from tracking flights in Europe or Scandinavia," to "Let's start sending out receivers." How did that process work?

[0:15:04.5] MR: After the media coverage, there was a lot of people from all around the world contacting us both to get the software so they could share the data with us or to get that free receiver. So we were sending out quite small amount of receivers back then, 2010, '11, and down in 2012, we decided to separate the two companies to price comparison and the flight tracking and put the flight tracking a separate company, and that's when we really started to focus on the flight tracking and sending out big numbers of receivers.

I think when we started in 2012, we had like 400, 500 receivers and just in one year we grew to, I think, 3,000, 4,000. Yeah, really big increase in numbers started in 2012.

[0:15:58.3] IP: Now, we're up over 16,000 receivers in total between the once that FlightRadar24 sends out in complete kits and the ones that people can build at home with their own antennas and share the data. Now, it's almost a global network from showing a thousand planes over Europe and 2010 to showing 16,000, 17,000 flights globally. It's a pretty big growth.

Thanks for taking the time to talk to us today, and we really appreciate it.

[0:16:28.2] MR: Thanks.

[0:16:28.8] IP: Thanks.

[0:16:37.3] JR: If we talk about how we got here, I feel like we actually flew on airplanes.

[0:16:41.0] IP: We did fly on airplanes.

[0:16:42.1] JR: And we should talk about that, I feel like.

[0:16:44.3] IP: We should.

[0:16:45.0] JR: Yeah. You go first.

[0:16:46.9] IP: Well, I flew direct Chicago nonstop, directly nonstop.

[0:16:52.9] JR: Yeah, there you go.

[0:16:53.6] IP: I invented a new term. Nonstop from Chicago to Stockholm aboard SAS, their A330-300, 242-tonne maximum takeoff weight. Yes.

[0:17:08.6] JR: Not that there's any difference on the inside, but you could haul more stuff.

[0:17:11.8] IP: You can haul more stuff.

[0:17:13.1] JR: That's good.

[0:17:12.9] IP: I brought more deep-dish pizza.

[0:17:15.0] JR: And popcorn.

[0:17:15.3] IP: Yes. No. It was a quick flight. 7 hours.

[0:17:20.0] JR: That's quick.

[0:17:20.2] IP: 7 hours from Chicago to Stockholm. We had good wind.

[0:17:24.3] JR: You kind of rather the flight be longer so you can get sleep, but you didn't sleep anyway.

[0:17:27.4] IP: I didn't sleep anyway. I've never been able to really get good sleep on a plane. So I was glad that the flight was quick. You had more of an adventure.

[0:17:35.4] JR: Yeah. This is my first time flying Norwegian. I was flying also JFK in New York to Stockholm directly nonstop is we're calling it now. Unfortunately, our inbound aircraft was about two hours late taking off from Stockholm. It also came from Stockholm. By the time it got to JFK, it had missed its gate assignment at terminal, because it's always a disaster at that terminal. So they shushed it off to the cargo complex for about an hour or maybe an hour and a half. By the time we actually boarded my flight that was supposed to depart at 10:30, it was more like 1 a.m., and that was kind of sucky, because Norwegian schedule such tight turns. That aircraft three days later is still running almost two hours behind. It still hasn't caught up. Since that time it's been Stockholm-JFK, Stockholm-JFK, London-JFK, and I think there was actually Bangkok in there somewhere in the mix. The plane has been all over the world, still late, but flew up in premium, which is pretty good actually. It was impressively nice. Nice deep reclining seat, decent entertainment, okay flight crew. I'd do it, I just wish it wasn't serving dinner at 2 in the morning.

[0:18:53.6] IP: Three hours late.

[0:18:55.5] JR: Yeah. You could have done it without that. Just late enough to be annoying, but late enough where I could get a EU compensation out of them. Damn.

[0:19:00.9] IP: Boo!

[0:19:01.5] JR: I know, right? Why even be late at that point?

[0:19:04.1] IP: Exactly.

Let's take another quick break and we'll bring in Sean Atkinson to discuss a bit more in-depth how FlightRadar24 works and what goes in to getting the data from the aircraft to your screen.

[0:19:24.1] SA: We are back sitting here with Sean Atkinson, the chief technology officer here at FlightRadar24, and what we wanted to do is sit down and talk a little bit more about how FlightRadar24 works. You can go on the website and go to the how it works page to get kind of a basic overview. But we wanted to dig in to some of the technology and some of the numbers and some of the processes behind that basic how it works. So Sean, thanks for joining the podcast and thanks for taking today.

[0:19:56.0] SA: Great to be here.

[0:19:58.2] IP: We've got basically this network of receivers all around the world and they're seeing aircraft radio signals. So tell us a little bit more about what those receivers are doing and how that begins the process of transferring aircraft positions from the aircraft to FlightRadar24 web app, partner feeds and things like that.

[0:20:22.9] SA: Sure. The how it works page is probably a good place to start. That will give you some of the terminology that we can refer to here. But in essence we have both our own hosted receivers where we control the hardware that supply to us and the software that runs on it. This is a little ARM CPU basically running Linux. Very small and low power, but it does the job. And you connect your power and the antenna or on GPS into that. Plus, we have a network of volunteer hardware. So that different hardware similar to what we ship, but running its own software typically. Together these flight radar own hardware and volunteer feeders as we call them combine to give us a network of well over 10,000 receivers around the world.

They're receiving broadcasts on the 1090 MHz frequency that's reserved for usage in Mode-S and ADS-B, and that includes regular updates from suitable aircraft equipped with the ADS-B transponders several times a seconds down to ground stations. This includes the unique identifier for an aircraft, which is the 24-bit Mode S address, and from that we can map this on to set of properties for that aircraft in a database that we maintain.

[0:21:41.8] IP: Let me just jump in for anyone who doesn't know what that the hex address is. So each aircraft's transponder is programmed with what we call the Mode-S hex address, and that's a unique identifier to the transponder across any aircraft.

[0:21:57.5] SA: Correct. Globally.

[0:21:58.2] IP: And those numbers are assigned through ICAO and you can map these down to almost a single aircraft. You can map it down into a single aircraft. But in general, you can map country code based on the hex address, how ICAO blocks them out.

[0:22:13.1] SA: That's correct. It varies a little bit per country, but yeah, among the information we can expect from these addresses is including the country that it originates from.

[0:22:21.0] IP: So each transponder basically is mapped so we know exactly which aircraft that transponder belongs to.

[0:22:28.0] SA: Absolutely. In addition to that unique identifier which lets us map things like the tail number or registration and the model code so we can tell what type of aircraft it is. That's all maintained in the mapping of our database from these addresses on to the information for that aircraft. Pilots are also punching in a call sign that's transmitted to us, which we can probably talk a bit about later, For the common case, that would indicate the airline code at the beginning. For example, BAW for British Airways, and then a numeric suffix, 1,2, 3, 4 for flight 1234, but it's not always that simple to map on to the flight numbers. But that's one way that we can identify what route this aircraft is actually taking, because that information is not directly transmitted to us. We get the speed. We get the altitude, the heading, and what's called a Squawk code, which is used for the local ATCs, but we do not get the root or the flight number.

[0:23:26.8] IP: There's different bits of information that come directly from the aircraft via the ADS-B signal, and then what we're doing is synthesizing that information with outside sources and our own historic database to provide a bit more information, because when you look at an aircraft from the ADS-B, the aircraft is not telling you where it's coming from or going to. That's information that we have to kind of put together. How does that kind of go about?

[0:23:53.7] SA: Right. That can get a little bit complicated, because we might not have full coverage over the entire duration of the flight's route. Normally, we do over Europe. For example, we would have coverage down to ground both the originating and destination airport, but if we don't then we have less information to go on. So if we got the takeoff event at low

altitude from the originating airport, that's a very big hint. That combined with the call sign can give your very big clues to what flight number is being operated.

We can also include information, like the tail number that can be supplied to us from third-parties. Like you mentioned, the history. Sometimes the history can be useful. But there are some very, very complicated cases where the call signs got, frankly, very little to do obviously with the flight number, and so we have to do some pretty sophisticated processing to figure out what flight this is.

[0:24:42.4] IP: We can address the sign for a bit, because we actually got a question about this on Twitter last week where the call signs look like a random assortment of numbers and letters and they have absolutely no bearing on a flight number. So we'll stick with British Airways just for an example.

British Airways could have a call sign, BAW48C.

[0:25:04.1] SA: Correct.

[0:25:04.7] IP: That could map to British Airways flight 2322.

[0:25:09.2] SA: Absolutely. But hopefully what we could do is look at the recent call sign history of if that flight had been operated in the previous days or weeks. We can look up that history and see the patent of which flight number is being associated with the call sign.

[0:25:23.2] IP: That's one of the ways that things get matched through outside data sources or things like that. So we've got all of these data, and how quickly is it moving? How much data are we really talking about about? It seems that — If you look — We're tracking between eight and 18,000 flights at any one time. You look at the screen and it's full of planes. So what level of data are we processing?

[0:25:51.2] SA: Yeah. Okay. That kind of various. Going into the receiver is the very highest rate. It depends a little bit walks the ground stations are querying from aircraft, because we only see the aircraft responses. Over busy areas such as Europe, there will be multiple updates per

second coming in from every aircraft into the receivers that are within its visible range, and that range is several hundred kilometers. It can be quite a lot of data coming through into an individual receiver, multiple frames per second.

But in order to not use a lot of the bandwidth of our hosts and stop them having normal Internet access on that shared line, we back off to around updates every five seconds. So we batch all of the aircraft that can be seen by given receiver being sent into our data center around every five seconds or so, and it's at that stage that we would then remove the duplicates and take the preferred data on to the set of receivers that are seeing any aircraft. The way that we would choose that preference would be, like I mentioned before, trusting our own hardware as a priority over third-parties, and in particular our own software actually. Because, for example, we find other software can drift in its time source. It might not have the most accurate time source from the hardware or have another software bug, and so wherever we have control of the hardware and software on our own receivers, we would tend to prioritize that as being the more accurate and authentic location for the aircraft.

[0:27:22.2] IP: So I guess the last thing that I want to talk about today is we've covered numbers coming in. What about numbers going out? How much data are we talking about being pushed to the site and being pushed out, saved into our global history or data pages? I mean the numbers to me seem incredible.

[0:27:41.5] SA: Right. It kind of depends how you slice things up. So I mentioned that we back off the data rate coming in. Once we've reduce the rate coming out of each receiver to this kind of five second batch, that adds up to around 100,000 positions every second coming into our data center. We can write almost all of that amount if people demand it.

For example, over the European region with what we're calling enhanced data that has some of the extended fills in ADS-B for customers interested in extra fields such as wind and some additional things that might not be available for free on the public site. That's compressing for the European region to over 100 GB per month. So that's a fair bit of data.

On the global playback without all of these additions for very, very high-frequency and extra enhanced fields in addition to the standard ADS-B, we're writing about 100 GB per month into global history.

[0:28:42.1] IP: I mean to me, it's an incredible number of planes and it's an incredible amount of data to just move around and store. The funny thing is it keeps growing.

[0:28:52.3] SA: Indeed. It varies seasonally a bit through the year, but yeah, year on year at least it's been growing.

[0:28:57.9] IP: As coverage goes, the amount of data —

[0:28:59.7] SA: Absolutely. Yeah.

[0:29:00.6] IP: Then we've got some growth to continue with. Sean, I want to thank you so much for taking the time to talk with us today.

[0:29:07.7] SA: Thanks very much.

[0:29:16.7] IP: Let's close out this show with a couple of quick updates, and I think the most important update we've ever issues is the launch of —

[0:29:25.4] JR: Joon!

[0:29:27.0] IP: Joon!

[0:29:27.7] JR: Everyone's most favorite rooftop bar —

[0:29:31.9] IP: My favorite state of mind.

[0:29:32.5] JR: Yeah, state of mine. Definitely not an airline.

[0:29:35.0] IP: No. It's also an airline.

[0:29:37.0] JR: Is it though?

[0:29:37.7] IP: Well, that's what the website says.

[0:29:39.1] JR: Oh, it is now.

[0:29:39.4] IP: Yeah.

[0:29:39.8] JR: I guess as of last week, it is an airline.

[0:29:42.1] IP: It's also an airline. They launch service from Paris to Barcelona, Lisbon and Berlin. They're getting started. They have aircraft in paint. They have interiors, which apparently are better than the Air France interiors.

[0:29:58.9] JR: Yeah, this is the crazy thing. Joon — It's nothing more than a 17-year-old Air France A320 with the new code of paint and a refurbished interior. The rest of Air France is getting just — Eventually, but it's ironic that the Joon aircraft have USB ports in every seat. They have streaming entertainment for free, which is nice, and these are things that Air France mainline for the most part does not have.

It's not like you really choose to fly Joon. If you're flying Air France and you want to go to Berlin, you fly on Joon. You don't have a choice. They have converted the entire route to this airline within an airline. If you want to fly Paris to Barcelona, too bad, you're flying Joon whether you want to or not if you're flying Air France.

It's not a state of mind. It's not a rooftop bar. I don't know what it is, because it's not a low cost airline. There's nothing low cost about it. The more I talk about it, the less I understand it.

[0:31:03.3] IP: All right.

[0:31:03.9] JR: Yeah. I don't get it.

[0:31:06.5] IP: How about this? If anyone thinks they understand what Joon is, please by all means email us at podcast@fr24.com. We would love an explanation.

[0:31:15.7] JR: The whole place of an airline within an airline is to reduce costs, but they haven't done that. If anything, they've increased costs.

[0:31:25.3] IP: But don't they have a different labor force in the cabin?

[0:31:27.0] JR: No. The cabin crew maybe, but the pilots are —

[0:31:30.2] IP: No, the pilots are the same, but I think that's where the cost is coming from, the cost reduction is coming from.

[0:31:35.2] JR: Incremental at best, but the fares are not any cheaper in Air France, but the whole thing is bizarre.

[0:31:43.2] IP: This is true. It's a bizarre state of mind.

[0:31:46.6] JR: Yes. It's something. Insanity is a state of mind.

[0:31:52.6] IP: I can't argue with you.

[0:31:53.1] JR: No.

[0:31:53.9] IP: What does make sense though and what is much easier to understand is the operation Puerto Rico Gift Lift is underway.

[0:32:02.6] JR: Many elves involved.

[0:32:03.3] IP: Many elves involved. Tons and tons of toys going down. This is an update from our discussion with Seth in our last episode about what he's working on with Operation Puerto Rico Care Lift after Hurricane Maria, and now Gift Lift for Christmas, bringing toys and gifts down to kids affected by Hurricane Maria in Puerto Rico. Spirit has flown too, I believe, of their

four — I'm calling them Spirit sleighs, but A320s full of presents. That continues. We'll toss a link into the show notes in case it's something that you want to get involved in. It's certainly a worthy cost and a way for kids that have been affected by a hurricane to have a little bit or normalcy in their lives. It's really cool to see that so many people have stepped up in Florida and Spirit and lifts tons of technique down Aguadilla to play host to kind of distribution of these things.

[0:32:59.3] JR: Yeah.

[0:32:59.9] IP: Very cool and glad that things are going well.

[0:33:02.0] JR: Good stuff.

[0:33:03.6] IP: You made it here, and probably you're off tomorrow. How are you getting home?

[0:33:07.1] JR: Tomorrow I'm flying through Oslo. I'm flying a 738 over to Oslo and then again Norwegian out of there back to JFK.

[0:33:15.8] IP: Hopefully everything goes a little bit smoother tomorrow.

[0:33:19.0] JR: Hopefully, but if I'm getting on that same plane, GCKNY, it's probably still going to be running two hours late. So I'm not too hopeful.

[0:33:28.4] IP: We'll see how it goes and we'll report back.

Episode 20, a special episode from Stockholm. We're going to go do some more Stockholmy things, I guess.

[0:33:39.5] JR: By that you mean get a burger and have lunch.

[0:33:41.0] IP: There you go. Thanks so much for listening, and we'll be back in a couple of weeks with episode 21 back from Jason in New York, we think, maybe.

[0:33:49.4] JR: Maybe.

[0:33:49.6] IP: Me in Chicago, and we'll talk to you then. Thanks so much for listening.

[0:33:53.8] JR: Thanks.

[END]