

## **NASM AirSpace Season 3 Ep. 1 Soviet Shuttle Final Transcription**

[MUSIC]

Emily Martin: Welcome to AirSpace, from the Smithsonian's National Air and Space Museum. I'm Emily.

[MUSIC]

Nick Partridge: I'm Nick!

[MUSIC]

Matt Shindell: And I'm Matt.

[MUSIC]

Emily Martin: We finally have Season Three for you! Brought to you from our homes still, as we continue to distance, just like everyone else.

[MUSIC]

Matt Shindell: Today, we're talking about a lesser known chapter in space history. It's the story of the Soviet Space Shuttle Program, Buran. A lot of people stumble across this story through photos on the internet of leftover space shuttle bodies and rockets that have been abandoned in a warehouse in Kazakhstan, or so it seems.

[MUSIC]

Nick Partridge: Because a lot of people don't know about this program, many of the articles that you do find online focus on breaking the news that there was a Soviet shuttle to begin with and leave a lot of mystery surrounding the program, which was developed in secrecy in the first place and it didn't fly for very long. So, there's a lot here that even space experts don't know about.

[MUSIC]

Matt Shindell: It's a story that will take us all the way from the Space Center in Kazakhstan around the world, exactly twice; and finally, to the Rhine River in Germany. Coming up next, on AirSpace.

[MUSIC]

Nick Partridge: First off, did everyone know that there was a Soviet Space Shuttle? Emily?

Emily Martin: No. I had no idea. Um, and I barely had any idea about, you know, the other space shuttles that existed here in the United States.

Nick Partridge: That's fair. Um, and I think that's an important point that some people do know a lot about Buran. Some people don't. Some people vaguely remember it. I think there are cyclical

waves of people discovering it for the first time. I remember being surprised for the first time I had heard about it and um, you felt the same kind of casual interest, but didn't really want to read a 6,000-word article on the topic at that moment. So, we're going to hopefully break it down and make it a little bit more engaging.

Matt Shindell: (Laughs).

Nick Partridge: But Matt, I think this was originally your idea, so why don't you tell us about your interest in it.

Matt Shindell: I mean, my interest, I think, started the way that a lot of peoples' does where I saw a picture on the internet of the Soviet Space Shuttle that looked so similar to the U.S. Space Shuttle. That looked like it could have been built in the same factory out of the same parts practically. And then, to realize that it was actually built by the Soviet Union, and you start to ask these questions: Well, why did they want to build something that looks so similar to the Shuttle? And, you know, what exactly were they trying to do? So, to me, I found that story fascinating. And then, like you were saying, even more fascinating is the fact that these photos keep getting kind of rediscovered by new people and posted up on the internet every few years like it's a brand new discovery. And I think it's a, just kind of cool that people keep finding this story fascinating.

Emily Martin: So, in the '70s, the United States was working on what would become the Space Shuttle Program and made their first launch in 1981. The Soviet Space Shuttle Program was only able to make just one flight and they had spent most of the '80s building and testing the Buran and it wouldn't launch until 1988.

Dr. Cathleen Lewis: So, they built this, this Shuttle... this, "chelнок/челнок," as the Russians called it, during the 1980s. And it had its maiden voyage on November 15<sup>th</sup>, 1988. It was flown in what the Russians referred to as an automatic mode, uncrewed, with no crew, but automated in its launch and landing.

Nick Partridge: That's Dr. Cathleen Lewis. She's the Curator of International Space Programs and Spacesuits, here at the museum. Growing up in the 1980s, the elementary school student understanding of the Space Shuttle was this point of national pride, this scientific laboratory, this peaceful space plane that was, um, that was what we had instead of watching astronauts walk on the moon. It was, it was, it was peaceful in our understanding of it. Why were the Soviets so concerned about the Shuttle Program? In what ways did they perceive it as a threat?

Dr. Cathleen Lewis: The Shuttle Program was.... Everyone understood that it wasn't entirely a civilian program. It was going to have its military aspects and one thing that was a great deal of concern to the Soviets was the capacity that the Shuttle might have had to remove enemy competitors' satellites from orbit and take them back down. And they were very concerned with that capability. They were concerned with the capability in being able to deploy satellites while in orbit as opposed to having them launch, and having secrecy on those satellites. And there were a number of Shuttle missions that were classified and we still don't know which satellites they launched at those times. So, there was a great deal of concern that, that NASA, having this wonderful civilian overview and appearance, could cooperate with the Defense Department and really do what they would. And there was also a sincere concern that the Americans were outstripping them technologically. They needed to develop the, the Buran because they needed to catch up. The Americans had showed them up with the Apollo Program, with the Saturn 5, with the Apollo hardware and they just really wanted to find a way to catch up.

Matt Shindell: So, it is possible to see the Buran today. There's a test vehicle, the OK-GLI, that eventually ended up in a museum in Germany and I got to talk to the curator responsible for bringing that shuttle there and who knows pretty much everything about it.

Gerhard Daum: My name is Gerhard Daum and I am the Curator and the Director of Europe's biggest space exhibition for manned spaceflight. It's called, "Apollo and Beyond" at the Technik Museum in Speyer, Germany.

Matt Shindell: So, the U.S. and the Soviet Space Shuttles look pretty much identical from the outside. And I think when most people look at them, they assumed that they were built to do the same things, but what was the actual purpose of the Buran?

Gerhard Daum: The Buran space shuttle had two purposes. The one, flying through the Mir Space Station and also fly science missions in low Earth's orbit, but also was supposed to fly some military missions. Like in the early Space Shuttle days of NASA, we had also so-called, "DoD" missions, Department of Defense missions, and this is what the Buran was also supposed to be.

Nick Partridge: There were a lot of differences in these two systems. So, let's kinda break that down and explore what the difference was in the capabilities, the intent, the launch systems, the whole nine yards.

Matt Shindell: So, if you've seen our shuttle or any of the American Space Shuttles, our shuttle is Discovery that we have on display at the Udvar-Hazy Center in Virginia, you know that on the back of the Shuttle, there are these really big rocket engines. And when the Shuttle launched, it was actually attached to a large external tank that provided all of the fuel that those rocket engines burned; and then, off to the sides, were two booster rockets as well. It actually took a pretty large stack to launch that shuttle out into space. Well, the same thing was pretty much true for Buran, except that Buran didn't have the engines built into the Shuttle. Instead, it launched on the side of another stack of rockets that pretty much worked independently of the Buran.

Nick Partridge: One thing that would have been an advantage had the Soviet system reached full maturity, the rockets that launched Buran could be used for other things. The system that launched the Space Shuttle could really only launch the Space Shuttle, but there was a little bit more versatility in the launch system for the Buran, or the one intended for the Buran that only flew once. And speaking of only flying once, the first flight of Buran in 1988, the only flight, didn't have any crew aboard. It was a fully automatic flight because they didn't need to have a crew for the test flight. They could launch, fly and land the vehicle on automatic mode. Now, the Space Shuttle had looked into an automatic landing mode, but no serious, um, no serious investigations, to my knowledge, were ever carried out to see if our space shuttle, the American Space Shuttle, could be 100% autonomous, like the Buran was from the word, "Go."

Emily Martin: You also make a good point, Nick in that the one 1988 launch of the Buran was uncrewed, but the first launch of the U.S. Space Shuttle was, in fact, crewed.

Nick Partridge: Yes.

Emily Martin: And in part, because of this issue that you sort of raised, which is that they hadn't gotten to a point in the U.S. Space Shuttle Program, where that Space Shuttle could land itself.

Nick Partridge: And I don't honestly know how far down that path they went, but I do know that it is, to paraphrase a very astute observation, "bananas" that...

Emily Martin/Matt Shindell: (Laughs).

Nick Partridge: ...the Space Shuttle launched for the first time with people on top. And I'm not saying it was necessarily (laughs) a bad idea because clearly it worked and they had two great astronauts on that mission, but it was the first time, to my knowledge, that any spacecraft has ever launched on its maiden voyage with people on board.

Matt Shindell: Although, we should say, that's not to say there weren't a lot of preparations made and tests done before those humans flew, right?

Nick Partridge: Yes.

Matt Shindell: And in fact, they had been doing piloted tests of the Shuttle and the landing system without even launching it into space, just by lifting it up with aircraft and then detaching.

Nick Partridge: That's absolutely correct. It's a really good point to know that they did that on both sides. There were atmospheric test drops and approach and landing tests on the American side. The Soviets did something similar, which led to the most incongruent video that I've ever seen of a space program. We all know that space shuttles don't take off on runways. That's not how they work! But Buran, for atmospheric testing, actually you could, and they did, attach jet engines to the back and make it take off like an airplane. Didn't go to space that way, but if you spend some of your time like I do explaining that space shuttles don't take off like airplanes, it's almost disappointing and deeply confusing to see one take off like an airplane.

Matt Shindell: (Laughs).

Nick Partridge: So, what are some of the other differences. Um, there were slight variations in the crew capacity. Buran would have flown with a slightly smaller crew, maybe six cosmonauts versus the seven astronauts that we usually see aboard the Space Shuttle. But, at this point, we're getting into kinda speculation since no Buran was ever fully finished to the point where you would put a crew aboard.

Matt Shindell: One of the things we might point out too is that, why did the U.S. and the Soviet Union both want to lift a bunch of stuff up into space, right? What were their goals? And in the case of both of these space programs, they were in the early years of sort of initiating their space stations. So, for the Russians, the big project was the Mir Space Station, right? And this Shuttle was meant to do, at least one of the tasks it would perform was carrying astronauts to Mir, just as the Shuttle for the U.S., not only did it carry astronauts to the International Space Station once that was completed, but it actually brought up many of the materials that were used to build that space station.

Nick Partridge: So, on the one hand, there was plenty of cool science that happened on board the American Space Shuttle when it was operational, but both of these, at the end of the day, were space trucks, right?

Matt Shindell: Yes. Yeah. They were basically 18-wheelers for space.

Nick Partridge: Nice! That makes it sound somehow very romantic and also, down to Earth.

[MUSIC]

Emily Martin: So, the Buran launched in 1988 and it only made that one uncrewed launch. Like, what happened? Like, why... I mean, it seemed like it was successful enough. Why didn't they put people in it? And why didn't the Soviet Space Shuttle Program keep going? I mean, the Soviets know a lot about space.

Nick Partridge: So, approaching the end of the 1980s, the beginning of the 1990s, looking back, it's important to know that the Soviet Union sort of dissolved in the midst of both a political and an economic crisis.

Matt Shindell: Yeah. I asked Gerhard why the Buran was not built into its final form.

Gerhard Daum: Mikhail Gorbachev, the former President of the Soviet Union, canceled that program in the early '90s. This was after the Iron Curtain fell, and the Berlin Wall fell and, and the Soviet Union broke apart. And this is why Gorbachev stopped the program because it was too expensive and the Buran never got to fly to the Mir Space Station or to any military mission in low-Earth orbit.

Nick Partridge: When you don't have money to pay all of your soldiers and scientists and you don't have money to staff all of your military installations, as I have heard they did not towards the end, let's just also consider how mind-breakingly expensive a space shuttle program is.

Emily Martin: So, by the end of the lifetime of the U.S. Space Shuttle Program, we're looking at the hundreds of billions. And so, you've got to imagine that just getting to that point of the first launch was excruciatingly expensive.

Nick Partridge: I don't know what the conversion of hundreds of billions of dollars was to Rubles in 1988, but it wasn't a good time to be doing that math on the other side of the world.

Matt Shindell: Well, and one thing I think that is a big difference between the U.S. Shuttle Program and Buran was that the U.S. Shuttle Program was eventually supposed to also start turning a profit. When it finally came into existence in the '80s with the Regan administration, it was part of a push to get more commercial development in space and have companies pay for spots on the Shuttle. But with Buran, there was not that incentive. You are just going to keep putting State money into that program. And, you know, one of the sad things, I think, at least from the Soviet perspective, about the Space Race is that if we're gonna say that they lost the Space Race, it wasn't because they had inferior technology. It was really because we were willing to outspend them.

[MUSIC]

Nick Partridge: The Space Shuttle in the United States was very public. There were t-shirts. There were posters. Hundreds of thousands of people came out to watch significant launches. How aware was the Soviet public of the Buran program? Was it the same, was it the same mentality? Did it have the same position in the national consciousness? Were they aware of it at all?

Dr. Cathleen Lewis: They were really not aware of it until that launch in 1988. November 1988. And, you know, it's somewhat upside down in terms of the public celebration. As I said, the program was mothballed as opposed to cancelled, but then, by mothballing, they just simply hauled it back into its launch prep hangar. So, in May 2002, the roof collapsed on to that mothballed spacecraft that it'd flown around the Earth in automatic mode. The remarkable thing is that the roof collapsed and the bodies were, were extracted from the collapse, but nothing was done with the building. It remains there in Baikonur, to this day. Its adjacent to the, the launch prep facilities for the Soyuz and Progress, the spacecrafts that are still used to this day, and it sits there.

Emily Martin: So, there's a lot of information we don't have about the Soviet Space Shuttle Program, including we don't know exactly how many were created and how many prototypes there were. There is kind of a short list of shuttles that we do know about.

Matt Shindell: Yeah, I mean, we know what happened, for example, to the one that flew. We know that it was destroyed in a hangar collapse in Baikonur at the Cosmodrome in 2002. And tragically, people actually died in that collapse. It wasn't just the loss of that piece of hardware.

Nick Partridge: And there are two other test articles, full sized Buran shuttle vehicles that didn't fly, but they remain in storage in a separate warehouse at Baikonur and you can find photos of some of these other shuttles pretty easily online. Another one is on display in Moscow now. It was once on display in Gorky Park. It was once even used as a restaurant, but the story of this one is that it kind of ended up being a theme park attraction.

Dr. Cathleen Lewis: The celebration of the Buran seemed to start when the actual end of the flown Buran began. There are several on public display and what has been remarkable in the last several years is that the Buran, that had been at Gorky Park in Moscow, and used as a restaurant, was refurbished, was hauled across town through the city to the opposite side of town to the Exhibition for Economic Achievements and was left adjacent to the Cosmos Pavilion at the Exhibition for Economic Achievements as this monument to Soviet and Russian technological capability, even though it represents a failed technology.

Nick Partridge: And then of course, there's the one in Gerhard's museum in Germany.

Matt Shindell: Yeah, so I'm curious, how did a Soviet Space Shuttle end up in a German museum, rather than on display in Russia or in one of the countries that used to be a part of the Soviet Union?

Gerhard Daum: This, this is a very, very long story. The company who built the Buran is called Molniya, like Rockwell for the U.S. Space Shuttle. And Molniya made a contract back in 2000 with a company in Hong Kong for some kind of a space exhibition tour where the Buran would be the big piece with a lot of other artifacts. And then, the Buran was on the Olympics in Sydney in 2000. And after the Olympics, there was this exhibition tour planned like to Malaysia to Bahrain, to a lot of Asian countries. So, when the Buran was shipped to Bahrain, then it got stranded there because the company from Hong Kong never paid Molniya the amount of money from the contract. Yeah?

Matt Shindell: Hmm.

Gerhard Daum: And this is why the Buran got stranded. And then a German TV team discovered the Buran when they were in Bahrain for the Formula One Grand Prix back in 2003.

Then, the museum in Sinsheim got notice about the Buran and then we contacted Molniya and then we made a contract with Molniya. And then, it took us five years and after 28 successful court cases, we were ready to bring the Buran off the country of Bahrain in the big sea on a ship. And then, we shipped it to the Suez channel [canal] to the Mediterranean Sea, Atlantic Ocean, up to Rotterdam. And then, we put it on a smaller ship, and then we went down the Rhine River to Speyer because Speyer is on the Rhine River and we had two million spectators. Only in Germany, when the Buran came down the Rhine River and this is a very, very interesting story. And the reason why the Buran got stranded and then, with all these court cases, the company in Hong Kong got a lot of money from some countries like Malaysia and other countries for this exhibition tour and this is why they could always spend money to get to the next case and the next case. And this is why it took five years with 28 cases.

Emily Martin: Moving space shuttles is a whole thing. Right? It's not only that they're big, but people are still fascinated by them. And moving the space shuttle to Gerhard's museum was a whole thing.

Matt Shindell: Oh yeah. So, like Nick, I think you're the only one of the three of us who were here in D.C. when the museum got it's shuttle, Discovery.

Nick Partridge: Yeah. It was my first day at work.

Matt Shindell: You probably remember, you remember how people kind of, you know, tried to observe that occasion, either from their front yards as it was flying in or at the Udvar-Hazy Center for the fly in.

Nick Partridge: Or pulled over to the side of the highway, everywhere in between. Yeah.

Matt Shindell: Yeah. So, I mean, imagine, imagine a similar scene in Germany, but instead of being flown in, the thing is basically on a barge on the Rhine River, floating to the museum. It sounds like it was a very exciting moment, one in which, you know, the, the banks of the Rhine were packed with people watching this thing come to the museum.

Nick Partridge: The space shuttle program in the Soviet Union, the Buran Program, was mothballed and then eventually cancelled around the economic collapse and then political disillusionment of the Soviet Union itself. But, it would be kind of incorrect to think that this was a symptom of terminal disfunction in the Russian Space Program or that they were not up to other things in this era. Matt, what was some of the other stuff? Emily, what was some of the other stuff? They did a lot of space stations, planetary exploration. What were some of the Russian greatest hits of the space program in the 1990s?

Matt Shindell: (Laughs). Well, the Russians have been, you know, one of our biggest partners on the International Space Station. They've basically built their own module for the ISS and they collaborate with U.S. astronauts on conducting space science experiments on the ISS.

Nick Partridge: And until very recently, were responsible for launching all ISS participants.

Matt Shindell: Right. That's right. We were buying, we've been buying seats on the Soyuz to send our astronauts up to the International Space Station.

[MUSIC]

Matt Shindell: So, our Space Shuttle, Discovery is one of the most popular artifacts in, you know, both of our museums: the downtown museum or the Udvar-Hazy Center. And I've seen countless visitors look at that Shuttle and have, you know, an experience while looking at it. So, I was interested in hearing how visitors react when they see the Buran on display in Germany.

Gerhard Daum: What the visitors see, we have about 800,000 visitors annually, yeah? But these people, they see in our Buran, and the U.S. Space Shuttle because as I mentioned, 30 years of Space Shuttle... this is more than one generation and, and a lot of our visitors, they were kids when they saw the Shuttle or they were 30 or 40 years old and they're now for example 70 and they see the Buran and they always see the U.S. Shuttle. Yeah?

Matt Shindell: Hmm.

Gerhard Daum: And it's interesting, a space shuttle or a flown orbiter you can see only in the U.S. The four orbiters: Enterprise for the ELT test, and the other three orbiters: Discovery, Atlantis, Endeavor, which flew the missions. And we're the only country, outside of the U.S. in the whole world, where you can see a flown space shuttle or a flown orbiter.

Matt Shindell: Hmm, mmm.

Emily Martin: Gosh! I think that's a little bit disappointing to be perfectly honest. I know, regardless of where you're from, there's so much national pride revolving around individual nations' space programs, right? There's so much of that going on. We certainly saw it with Apollo last year. Like, we're so stinkin' proud that we did that. At the same time, as a scientist, I'm so stinkin' proud of the amount of comradery and international participation that happens specifically in space, just because it has to! Space is expensive and if you don't team together, like, the dream doesn't work. So, you know, just in the sheer fact of like, we launched the Space Shuttle first. The Buran didn't have the same kind of lifespan that our Space Shuttle Program did, but then we cancelled our Space Shuttle Program. And then, the Russians continued to launch our people into low-Earth orbit. Like, it's just a huge bummer to me that this Soviet accomplishment of building a Space Shuttle Program essentially, even though it didn't last as long as ours did, gets identified as ours more often than not. Like, that's... to me, that's disappointing!

Matt Shindell: Yeah. It was a surprise to me too because I kind of expected that Germany, having this complicated relationship between the U.S. and the U.S.S.R. during the Cold War, of having, you know, been cut in half by the Berlin Wall for example, that they would have sort of a more complicated relationship to this Soviet shuttle, but turns out, they just see the U.S. Shuttle when they look at it, which really surprised me.

Nick Partridge: I kind of agree with Emily. It's heartbreaking in a way. On the one hand, yes, the two programs and the two vehicles did look a lot alike, but a lot of people worked on that program. And the idea that it was done largely in secret until the first launch and then didn't gain the same kind of foothold in the popular consciousness because the program atrophied and then was cancelled, but you're supposed to be puffed up about your country's Space Program. So, the idea that not only was it not successful in longevity and not only was it not well known as ours was, but the idea that it could be misattributed just gets you right here.

Emily Martin: Well and you know, maybe a part of that was attributed to the fact that it was not a civilian shuttle first, right? It was a secretive military operation first and then eventually was designed to become sort of a civilian, scientific exploration tool second. Maybe, as time goes

on, and more information gets declassified, maybe that opinion will start to change, but that's gonna take time. And so, yeah. It's still kind of a bummer.

[MUSIC]

Emily Martin: The new season of AirSpace comes with new social media. We're on Twitter y'all! Follow us @AirSpacePod. And we're still on Instagram, find us @AirSpacePod.

[MUSIC]

Matt Shindell: And we have some nifty bonus content headed to social media for this season. Follow us for behind the scenes moments; bits that were too long for the episode and other general oddities that were just too great to make it on to the podcast.

[MUSIC]

Emily Martin: AirSpace is from the Smithsonian's National Air and Space Museum. AirSpace is produced by Katie Moyer and Jennifer Weingart, mixed by Tarek Fouda, special thanks to Andrew Fletcher, distributed by PRX.

[MUSIC]

Nick Partridge: Hey Matt. You speak more than a word of Russian.

Matt Shindell: (Laughs)

Nick Partridge: What does the word Buran mean?

Matt Shindell: Well, it's an interesting thing. It actually is a very strong windstorm that occurs in Russia and Siberia that brings blizzards in the winter and hot dust in the summer. Or at least, this is what the internet tells me. (Laughs).

Nick Partridge: So, the most Russian thing imaginable.

Matt Shindell: Yes, yeah (Laughs). Very Russian.