CURT CHAN: Good morning. Testing. Can you hear us OK? John, how's your mic? Good? All right, we'll go ahead and get started.

Good morning. My name is Curt Chan. I'm one of the technical evangelists here at Autodesk.

Just a couple quick introductions, too, from the Autodesk CAM side. We have Al Whatmough, who is our oldest intern here at Autodesk. No, he is the man behind the scenes. You see him a lot. He leads all of our and manages all of our HSM products here, as well as Rene straight from Copenhagen, on part of our product development team as well. So if there's any questions around just direction and so forth, these two gentlemen are here to help us out.

Before I jump in to John and talk about him a little bit, just a show of hands, who here owns a lathe? OK, so really only an eighth of the people here. Who here wants to own a lathe? OK, OK.

JOHN GRIMSMO: That's so nice of you.

CURT CHAN: So for the people that didn't raise their hand at all, then why are you here? Why don't you share with me what brought you here to listen to John today?

JOHN GRIMSMO: Was there anybody?

CURT CHAN: Anybody.

AUDIENCE: Even if you don't want to own a lathe, your boss might.

CURT CHAN: OK. I was talking to a lot of people in the hallway. And even they don't know anything about CAM or lathe or even CAD. They came to see his product and how he went from start to finish and hear his story. And I think that's one of the biggest things that I came here and why I wanted him to come and present was to share his story of the why.

And I look at a lot of his products of what he's making on his $200,000 Nakamura. And I look at it and I could go order something off of McMaster-Carr. And I was talking with Amish yesterday about why is he making all these screws and so forth when he could just go order it out of China for a lot cheaper. And he'll talk about that.

But it was interesting, because it's all about control, right, and all about the quality he wants to

have. And when you have pride in a product that starts at $1,000, it's great to see that everything he's done is made by himself. And that was just interesting to hear. Because when you think about production, you think about costs and how much it's going to cost you long-term. And today, to him, it's more about the quality.

I know we have a couple knife makers in here too. And I talked to Ken, for example. And I visited his shop. And he has that same story of it's all about the quality of the product you want to deliver.

So I'm honored to have John talk today about his story. I think you notice this year at AU, what we're trying to do is something different is you're not going to hear Al or myself or Rene or a lot of the foundation CAM guys do the presentations. We thought it's key to have the customer talk about what they're doing.

Because we can make it look all glamorous and sexy, but they will just keep it real. I told John. To keep it real with us. Tell them what he loves, what he doesn't love, where he sees the struggle. Because at the end of the day, it's about getting your feedback to how he can make a better product, right?

Anyone here own one of his products?

JOHN GRIMSMO: Cool.

AUDIENCE: Is there a giveaway or anything?

JOHN GRIMSMO: Yeah!

CURT CHAN: There is. It's for a LEGO man, not a knife.

JOHN GRIMSMO: You'd have to have a pretty good answer.

CURT CHAN: Yes, yes. But with that said, I want to introduce Mr. John Grimsmo. Yeah, it's great to call him a personal friend and hear his story through YouTube as well as Instagram. So definitely follow him. Definitely check him out. And we'll be here all day and tomorrow chatting it up. So John, off to you.

JOHN GRIMSMO: Hello, everybody. Thank you, Curtis. I'm here because of Curtis. So I really appreciate that.

So in this presentation, it's not going to be a lecture. I just want to walk you through how I use

Fusion and CAM and CAD and post processors and everything to make the products that I make.

Quick backstory. Who here doesn't really know anything about me? Excellent. Good.

AUDIENCE: You still have to turn this one on.

JOHN GRIMSMO: Did I not record? I turned it on. You're right. On, but not recording. Thank you.

All right. So I am a knife maker. But primarily, I'm a CNC machinist, completely self-taught. For the past eight years, I've been immersing myself into CNC machining. And once I found it, I was like, oh, my goodness, this is my Holy Grail. This is what I love to do.

So nowadays, I only have two things in my life, my family, with my wife and two kids, and work. And I don't have friends, parties, anything like that. That's all it is. And all my friends are in the industry, too, whether it be knife makers or other machinists as well.

Yeah, so I'm 33 years old now. And always been an entrepreneur. Always tried to do something. Worked with my dad doing websites and computer stuff. And I liked the technical aspect, but I didn't like everything about it.

And then I got into cars. So I'd be making parts, making them faster. I learned how to weld and fabricate and grind. So an angle grinder was a prized tool when you're a car guy.

And then I learned about the world of CNC machining and making car parts. And I was like, holy cow, you can make anything with this. But that was in 2005. And they were way out of my price range. I had zero money at the time.

So I got a cracked version of SOLIDWORKS and figured out how to learn it. And then from there, I started making-- a lathe was my first kind of dream purchase, because I wanted to make a shifter for my car. So a shifter's kind of round parts and everything.

And then I ended up borrowing $5,000 from my father-in-law to buy a Grizzly mini mill and a mini lathe and accessories and tooling and stuff, which at the time was more money than I've ever had.

So from there I was able to buy these manual machines and then eventually convert them to CNC. That was kind of the plan. So I bought stepper motors and plans and brackets and mounts and everything. And I converted these two machines to CNC. And literally figured it out

the entire step of the way.

YouTube was my teacher. I didn't have a mentor. I didn't have a friend or a teacher or anything like that. So watching YouTube videos back in 2008 on how to do this stuff. And that's what started my passion for it.

So my lathe now, I've sold to another guy who's now making these desk lamps with it. And it's really cool to see my first tool move on to the next level and allow somebody else to build up their business.

Yeah, so I make pocket knives. Very expensive, Curtis said. They usually start at about $600. But I've sold them up to $3,000.

Premium materials. Titanium handles. Swedish stainless steel blade.

And now we make every single component. This is about two or three years old. So we used to buy the pivot and modify it. We used to buy the screws. But now we make every single component from raw materials.

Typically, knife makers are forging and grinding and all that stuff. And when I first got into the industry about five years ago for knives, I wanted to do it based on machining, based on CNC machining. Because 2008 to 2011, I've had CNC machining experience.

So then I got into knives. And I was like, now I can finally apply this knowledge that I've learned as a hobby into a business, because I found this world where people are charging $500 or more for a pocket knife. And I was a Boy Scout since I was 11 years old. And I've always carried a pocket knife ever since.

So knives and machining, once I put the two together, I stayed up all night that one night when I figured it out. And I stayed up all night and researched and everything. And I told my wife in the morning. And I was like, this is it.

And then two months later, I'm on a flight to Vegas here to a knife show. And that's what started it all for me. And I made connections and just went after it.

And the past five years has been this kind of like exponential growth. Like three years of this. And then, finally, now we're on the upper curve of getting really good recognition among the industry and among my peers and really making a top-notch product. And I'm really, really

happy and proud with what we do.

Yeah, it's amazing to be able to-- it's play for me. It's a hobby that I do nonstop.

Let's talk about lathe CAM. Now, showing my knives around to people at the show and I talk about I'm here for a lathe CAM, they're like, what do you need a lathe to make a knife for? It's a blade and two handles, right?

Well, yeah, I have a mill for the blade and the handles and the pocket clip. But all the screws and there's ball bearings inside and there's pins that, of course, I want to make myself, because I don't want to buy the $0.10 ones from McMaster, which I did for many years. But now I want them custom sizes and custom stepped offsets and all that.

So there's, I think, 11 different machine turned components in a knife. This has seven different screws, or seven of the same screws, and then the pivot and the bearings and the thumb stud up top.

And so I want full control over all of those processes. And I want them to be my size. I want them to be from titanium. I could contract it out to a Swiss machine shop. I've talked to Swissomation back there. But in the end, I'm like, we're so close to making everything in-house.

I had a Tormach lathe for the past three years, which worked quite well. But it didn't quite-- as we're elevating our processes, I now have a Mor Seiki mill, which is a Japanese, very high quality, very tight tolerance machine. And to make the round parts on the Tormach lathe wasn't meeting my tolerance standards.

So we just invested in the Nakamura. Got it about two months ago. And I've literally invested the past two months of my life, nonstop, learning about lathe stuff. And I felt like I already knew a lot before that, because I've been doing lathe stuff for eight years now.

CURT CHAN: Would it be OK if I could pass one of them around?

JOHN GRIMSMO: Yeah.

CURT CHAN: OK, great.

JOHN GRIMSMO: Just don't cut yourself. They are very, very sharp.

CURT CHAN: So we'll start with this. This is the one that's up, right, on the screen?

JOHN GRIMSMO: Yeah, yeah, that is called the Norseman.

CURT CHAN: Awesome. And then I know, too, John, we've talked about a custom Fusion 360 knife.

JOHN GRIMSMO: I have a demo. I have a cool little demo we'll show at the end.

CURT CHAN: OK, awesome.

JOHN GRIMSMO: Yeah, so I work with my brother. And currently, we're a two-man shop. We're near Toronto, Ontario.

And I'm going to show you guys some pictures. So my Tormach lathe is a gang tool two-access lathe, which allows you to mount a whole bunch of tools in the gang position. And it's not a quick machine, but it's quick to move between tools, because you can just move from one to the next.

Here's an example of some of the tool holders that I used to have. I made all of these three holders, because I wanted them specific. I want to be able to turn on this insert and on this insert to do back turning. So I made these. And I used to buy this, but I crashed so many of them that I just ended up making my own. And then this is the same back turning kind of solution.

And it's really sweet to be able to make your own tool holders, to go on the machine, to make the parts that you want.

Yeah, and here's just another picture. This lathe is now currently sitting unplugged in the corner of my shop waiting to be figured out what to do with. I'd like to think that I'm going to use it again. But honestly, the Nakamura is so wonderful that I don't think it's going to happen.

So picture of the Nakamura is there. So this is now a 6-axis CNC lathe, where it has X, Y, and Z, so I can do literal milling on it. And then the C-axis, the spindle rotation on both ends, they're individual. And then the B-axis is the sub spindle that will come in and grab the part and do part off.

And at the end of the presentation, I've got some videos I'm going to show you guys of how I make some of the parts.

So in the learning process, we definitely have some scrap parts. And it could be anything from-- I use a 20/1,000 end mill. That's, like, four human hairs put side by side-- to mill the torques pattern, to do the screw drive.

And then that could break. I can see on this one it broke. That could break very easily-- it's super delicate-- or the threads could be wrong or the thread tool broke or whatever. So as I'm learning the machine and learning how fast I can push things and how long the tools last, that's common.

I have this bag, which I'll pass around. This is all the scrap parts that I've made in the past two months. So they're garbage to me. Feel free to open it up. Look inside. Take one if you want.

But it's really weird. I've got this huge machine that's like nine feet long to make little tiny stuff. And it's kind of weird. I debated getting a Swiss machine, which is arguably a lot faster and better for small parts. But it was a toss up between versatility and usability and all that. So I'm quite happy now, now that I've invested the two months into my machine.

CURT CHAN: John, really quick, what do you consider bad? Because your definition of bad, it could be good to a lot of other people's tolerance.

JOHN GRIMSMO: Exactly. My definition of bad is not perfect. I'm not a trained machinist. I never went to school. I never learned from experts. So I want it to be what I want it to be. My tolerance value is on point and not, like, a 2,000 range. I want it to do what I want it to do.

So sometimes they just don't work. Sometimes I can be like, yeah, it's good enough. And to me, that's painful to do. But to everybody else in the world, it's totally fine. But yeah, my standards are extremely high, because I set them high. And I have to live up to my own expectations.

On this machine, I have a [INAUDIBLE] tool setting probe. So I can touch off tools in any direction. There's my little 20/1,000 end mill That's what the tool turret looks like with the tool setting probe.

You can see my fancy parts catcher, my pill bottle there. Making these tiny parts, usually this basket comes out and catches the part. It's about, like, yea big. But the tiny parts would just fly all over the place or bounce out of the basket or not make it into the door or whatever. So I developed this Tylenol bottle with a hole in it, so the sub spindle will just-- that'll move to the sub. And it'll just eject it into there. And it catches hundreds of little screws. And it's kind of

amazing.

It's just zip tied in place. And it's fantastic. There it is.

And they don't fall out. Because when the turret rotates, they just kind of go around the outside. And it's amazing. It's like one of those zero cost, five-minute things that's just like yes.

CURT CHAN: That wasn't an option.

JOHN GRIMSMO: No. Well, that was probably like a $10,000 option. So no, thank you.

Here's a bunch of the-- they're little 4-40 screws. These are the ones that we use seven of per knife. And the finest little details bug the crap out of me. If there's a burr at the front end of the thread, that annoys me. If the threads are too sharp, if they're too deep, if the screw doesn't fit, you know, if it's got too much slop.

Because, essentially, I'm charging $600 to $2,000 for a knife, I feel obligated to make it the absolute best that I possibly can, even if that pile is scrap and the next pile is good. So it's not like I don't have an ROI that I work with. I make what's good. And then I keep making it.

I finally just got-- who knows what a Noga base mount indicator thingy is? I finally just got some of them. They're amazing. They're the best thing in the world. They basically allow me to hold an indicator in any position.

So here I'm dialing in the run out of my tiny end mill. Because if it spins out of center, even just the tiniest-- a few 10,000ths of an inch, it could break prematurely. So I measure it every time I put it in.

Emergency collets. These allow you to machine and bore whatever you want, the custom sizes. I just got those last week. And I've been using the brass one now for these little bearings. This is a plastic ball bearing that we use. They're really, really cool.

So here's one of the ball bearings that we make, including a little Harvey Tool $100 lollipop end mill that likes to break very easily.

Yeah, so for reference, this is a half inch diameter Delrin rod. And we put the engraving on it. Nobody's ever going to see it unless they take a knife apart. But you know what? Our customers do take the knife apart. We actually include a screw with the sale of every knife, because I encourage them to keep it clean, dismantle it.

Some people don't like that at all, some knife makers. But I'm like, you know what? They're going to open it anyway. So let's allow them to do it. And let's put little Easter eggs inside, so that they can enjoy the process too.

Here's a picture of the sub spindle coming in and grabbing the part with a part off blade going through. I've got a video of that at the end I'll show.

More of that. A GoPro on a Noga base. Works awesome.

Lathe picture. Turret picture.

This turret has 12 stations. But it can half index, so it can actually have 24 positions. So I could probably put 50 tools on there if I really optimized it. Which, in theory, if I spend enough money, because each of these is many thousands of dollars, I could have all of my tools on there all the time at any one time. So I'm just changing out collets and material and bar liners, which takes two minutes, so to switch between different parts.

Here's an example of multiple tools. Here's an internal threading tool as well as a part off played with an angle to it and a threading tool there. So I've got three different tools in the same turret position. And if I really optimize my code, my part could go in here and then zip to here and then zip to here in milliseconds.

And then I've got the coolant blast coming around with the copper pipe to keep it cool.

So this lathe is much more complicated, much more interesting, and time-consuming to learn and figure out than my Tormach lathe was. But it's what I like to do. That is my scrap bucket, which is in the bag being passed around right now.

This is an example of-- what was it? If you run out of bar and you didn't calculate how many pieces would actually fit into that bar, this is what happens when the sub spindle pulls it out and it's not being held on anymore. And it's just nice. It's just being held on by the threads. And the parting tool went in and just destroyed it.

There we go. And then here's an internal threading tool that I'm also using to do an ID contour into this part.

So let's jump into Fusion 360. I was using SOLIDWORKS and HSMWorks before. And about a

year ago, I switched fully to Fusion and haven't looked back since. It does everything I need it to do.

And people think Fusion is a toy, but it's totally not. It is growing. It's got the learning curves. It's got bumps along the way, because it's a relatively new software. I mean, it's been around for years and years. But they're always changing it. And one of the things is, I make the suggestion, it might actually get implemented fairly quickly.

So this product here is a lock bar stabilizer. And it allows the lock bar, which keeps the knife locked. When you bend it away, this stops the lock bar from over-bending, overextending. And the threads on this are super short and super tiny. But I don't know why I design things like this, but I do. And it's a lot of fun.

So here you can see, I've got a roughing and a finished turning pass. I do a pretty heavy first pass. Let's do a simulation here. Turn it down. So it'll come in and it'll do just clear it out and then leave a little finish pass. And I might even be able to do it just one pass.

The other option is to do 50 little 5,000 passes. But it seems like a waste of time. And I look at this insert that has half an inch of cutting edge. And I'm like, why can't I just use as much of the cutting edge as I can?

And then here is the threading operation. One thing I've learned with threading is that it's good-- there's probably rules of thumb. But it's really good to start with a pretty good lead angle in front to allow everything to have time to kind of like sync up. Because it's not complicated, but the rotation has to be matched and synced to the feed rate.

So if I started here, it might not sync up fast enough to do it. So I don't know if it's necessary, but I've heard people suggest it. So that's what I'm doing now.

But this allows me to do my threading pass in multiple passes. Fusion has a really solid threading parameters. You see how it tapers in on the side right there? It allows you to get just the front edge of the tool.

And then I have-- oh, that's my finish pass. So I like to do a finish pass after the threads as well. Just in case there's a little burr on the top of the threads, I can do a finish pass over top.

Now, in the CAD environment, it's really cool to be able to design and machine completely in

the same program.

And real quick, I'm going to just run over a few-- the simplest ways to design a part. And I'm just going to do it beside this one. So I go create a sketch, pick a plane.

One simple way-- I'm going to do it on this opposite plane-- is just to draw a circle. Hit Push/Pull. Where'd my circle go? Sketches are hidden. There we go. Push/Pull. And then I can extrude it like that.

Let's do it on the same plane. Yeah, and you can choose the size of 0.25. And then you can extrude it like that. And then if you want, you can go back and you can edit your sketch. I like to name my sketches, so that I know what I want them to be, not delete it.

But you can edit the sketch. I can put another circle in here. And then once I stop it, I can go back down here in the design tree and then choose if I want this to be a tube. That is a super easy way to design round stuff. And then you kind of just play with that until you get exactly what you want.

The other way, which I do use kind of often-- I can then hide this body that we just created to kind of get it out of the way. The other way is if I just wanted to create a shape, like, let's eyeball this screw that I'm making here. And I'm doing a half contour, like a-- I don't know, what do you call that? A revolve is what it's going to be.

CURT CHAN: Profile.

JOHN GRIMSMO: Yeah. And you need an access on the centerline there. So then I can go Create, Revolve, choose my profile. And then I go choose my axis. And then it revolves it around 360. And this is how I tend to do it, mostly. If I want to do like a specific screw with a relief angle, pass the threads like that.

And then I've also got-- these are that pivots that I use for the knife. So one is a screw very similar to what we saw. And the other one is a pivot. So it's got a very tight tolerance shaft diameter with a threaded the hole on the inside.

So once you design that, and you can do-- like, on my lathe, I can do milling. So I can engrave the my Viking head logo. And I can mill the torques pattern and do as much detail or as little detail as I want.

So once you design it in CAD, you can then go into the CAM part, just by clicking your little menu up here. And you can hide the bodies. You can hide just one or the other or show all kinds of stuff. Like, I made this weird thing to test tolerance on my Tormach. And actually, on my Tormach, I was doing these two concurrently in one setup

So the bar would be sticking out about this long. And then I would turn this one and then part it off. And then it would fall off into my little bucket or something. And then it would immediately go and turn this one, because this is an assembly and it gets turned kind of in one operation. So I kind of wanted a pair to come off every time. And it was it was stiff enough material that the length didn't cause any deflection or anything like that.

So this worked pretty well. But on the Nakamura, it doesn't matter. So I just do them-- like this one sticking out probably just a tiny bit from the chuck and then it'll pull them out. But it is kind of cool to be able to just kind of daisy chain them together if you want. Or put as many parts in your one design as you want, because each one's going to have its own coordinate system. So it doesn't matter if there's more than one in the operation.

And they all use very similar operations anyway, so why have a different file for each part when all the operations are similar anyway? The only downside is you get so many operations you got to sort through. That's why it's good to name everything. But yeah.

And feel free to ask any questions if you want to stop me and you know pipe up. I'm totally open to that.

So I'm going to run you through, real quick, the operations that I use for this screw. Very similar to the other one. I faced the end off, leaving just a few thou. And then I do a rough turning operation. I make this from a hardened stainless steel, a 17-4 pH at 45 Rockwells. It's fairly hard material, but it cuts just gorgeous.

So as my roughing tool, I've got a very large radius, a 30 thou radius insert there. And then I rough it out, leaving probably 5 thou. And then I come in with my tighter radius tool. And I pick away at this little section first.

AL WHATMOUGH: Are you going to explain--

JOHN GRIMSMO: Please.

AL WHATMOUGH: --the going home or not going home? Because I see--

JOHN GRIMSMO: OK. A lot of it is-- so what you're referring to is this retract line. And that's probably not something I've optimized too much, But I do sometimes.

You have these options here to don't go home or to go home at the beginning of the code. And home for my Nakamura's like way up in the middle where it does a tool change. And if you're using the same tool over and over again, you don't want to go home, right? But for a tool change, I have to go home. Well, I could probably program it to not have to go home, right?

AL WHATMOUGH: Yeah.

JOHN GRIMSMO: Just move out just a little bit.

AL WHATMOUGH: Well, most of this [INAUDIBLE] use the same tool and won't go fully home--

JOHN GRIMSMO: Right.

AUDIENCE: [INAUDIBLE] well. But now you're moving not through home position just in front the bar position where you're setting the setup.

JOHN GRIMSMO: Yeah, it's in the setup. Yeah.

AL WHATMOUGH: This program starts in the home position where the red arrow is. And then it ends in the green arrow, because you're next operation is very close to the green arrow where you don't want to go back, to start there.

JOHN GRIMSMO: Right. So you're talking about in the-- this is the setup, which I'll walk through in a minute. You're talking about this position. The clearance position. And sometimes I've set this to zero and I've had crashes.

AUDIENCE: Yeah, that's really true.

JOHN GRIMSMO: So basically, what this position does is at the beginning or the end, depending on what option we chose, it'll move the tool to here first and then it'll wrap it to your clearance plane, whatever that may be. So now I have 0.2 of an inch, which is just under a quarter of an inch, which is probably good for my part. So it'll move it there first and then start to do the operation.

If I set it to zero, I've had the tool come in and just start cutting immediately on a rapid move,

which is not something that you want to do.

This is the setup. So for a new job, pretending I'm doing a new one here, you would go setup with this button. And then it automatically selects the three bodies that are in my model here. But if I want to just select this one body, I'm going to do turning or mill turn. It is on the primary spindle, not the secondary spindle.

And then I like to go, I choose the rotational axis, which makes it now in the right direction. And then the x-axis, well, I want the x-axis pointing the other direction. So I go flip x-axis and it points it away from the part.

And then I can choose the origin, which is at the front of the stock currently, because the stock is your big cylinder on the outside. And let's move into the stock thing. I can do a fixed sized cylinder. I can do a relative size cylinder. Let's say, if I want to do a fixed size cylinder and I want it to be not 7 and 1/2 inches, but 0.375, OK? And the part length is automatically set to 10 inches. Let's say I just want it to be 1 inch.

Or I could model my bar. Let's say I have a 10-inch bar. But I don't want the model position to be in the center, I want it to be offset from the front.

And then I got to go back here. And I got to go not stock front, but model front, which still didn't do what I wanted. Offset I'm missing something here.

AUDIENCE: Select the model.

JOHN GRIMSMO: What's that?

AUDIENCE: Select model.

CURT CHAN: Oh, you got to select model. Yeah, very good.

JOHN GRIMSMO: Oh, there you go. Boom. So then if you want the stock to be 0.01, 10/1,000 in front, notice how there's modeled in a little bit of extra room, but you're Z0's still at the front of the part.

AUDIENCE: [INAUDIBLE] part shifted. So if you stop using model front, you get the wrong [INAUDIBLE].

JOHN GRIMSMO: OK, excellent. Yeah, so that now allows me to have a pretty much set up setup with a 10-inch bar just for visualization purposes. And then in the post-processor, I don't really-- I do use this if I have a sub spindle. If it's transferring to the sub spindle, I will use it as a number 2, I

believe, which will give me a G55 work offset, which is my sub spindle work offset.

So then going in here, I have my finish pass. You can see the Z0 is modeled properly.

And it's kind of cool. You see the yellow box around the outside? You can see as you're going through operation what is happening and what is left. So you can see the yellow is still-- there's a little bit of stock left, which is excellent.

You see a big heavy area in here. So if I'm doing a 5 thou finish pass and then it dives into here, my theory says that the tool could break, because it's excess tool load right here. So that's where I like to pick it away with the next semi finishing operation. I don't know if it's necessary. But as a self-taught machinist, you just kind of go by what your gut tells you, even if it takes an extra five seconds or something.

And then a finish pass. And you notice how I'm coming around the outside here and I'm finishing this chamfer on the main spindle, so that it's all concentric and it's all perfect. And then when I part it off on the sub spindle side, all it has to do is a finished face pass. It doesn't have to worry about the chamfer or anything like that.

And then my threading operation, which for some reason doesn't generate properly. Like, doesn't visually generate. But on this one, it did. So I don't know why that is, Al.

Yeah, on this one, you can see all the threading lines. But on this one--

AL WHATMOUGH: If you regenerate it, it will probably do it right.

JOHN GRIMSMO: All right. Generating. Ah! Even though it wasn't ungenerated?

AL WHATMOUGH: No, you just need to [INAUDIBLE]. Save that and reopen the part.

JOHN GRIMSMO: Ah, OK, OK.

AL WHATMOUGH: So go to--

JOHN GRIMSMO: Is solid, Yeah.

AL WHATMOUGH: Sometimes the visuals go.

JOHN GRIMSMO: There you go.

CURT CHAN: That'll be interesting. Because we have the red little explanation meaning you regenerate to

give you the visual.

JOHN GRIMSMO: Right. And for this tool, in one of the pictures that I showed, which was this one, this isn't actually an ID threading insert or an ID threading tool, which normally does internal threads. But I'm using that tool, even though it's modeled completely wrong, I'm using the tool from the picture for this operation.

And I come in-- normally, you thread from front to back. But this time, I'm threading from back to front. But it doesn't give me that kind of lead that I talked about before. So maybe theoretically my threads might not be as perfect or as synced as they could be. So I ended up switching to a different style of threading. But this can work.

And another thing I wanted to talk about was designing these tools, a lot of times it doesn't make sense to do it the way you think it's going to work. So you just kind of brute force try different tools and make it work. So as you can see, this threading tool kind of looks nothing like that threading tool, but it does the exact same thing. As long as you verify that your spindle rotation is in the correct direction and you kind of have to look at the code and learn how to read it and understand what's actually going on.

So if I were to-- let's go in here. And we're going to edit this tool. Because this is my finished turning tool. You can see how it's upside down, which is accurate on my machine.

Go in here. And I've got my tool table here. So I've got tool 1 is my main spindle turning tool. And tool 2 is my sub spindle turning tool. And you can see, they're pointing in different directions.

And then I also have another tool number 2, which is one of-- actually, it's this one. So I have this on my Nakamura as well. And it kind of faces in a different direction and it looks kind of different. And I had to make it work to do what I want it to do.

So you can see how the tool holder looks completely different. It doesn't look anything like those. But that is what I need it to do it to get the insert pointed in the right direction with the right orientation and spindle rotation.

AUDIENCE: John, [INAUDIBLE] you got two tool 2's that you're using for--

JOHN GRIMSMO: Exactly, yeah. So if we edit this tool 2 in the post-processor, I've got 2-52. And for my lathe, you put 5 in front of it and that means a sub spindle tool.

Whereas what Al was saying was this tool 2 is now a 2, 2. So it'll read T0202.

And in the setup page, you can see-- let's do a normal looking tool. So this one, you can choose your boring bar, your turning tool, grooming tool, threading tool, carbide inch. You can choose any different style of insert, whether it's a V-shaped insert or a square insert or a diamond.

So basically, you go through all your parameters. And you set up the tool to be exactly what you want it to be. And set up the holder to be in the direction, whether it's a round shank holder or left-hand or right-hand. You can choose which direction it is.

And then at setup, you can choose which way it gets oriented or if it's clockwise or counterclockwise. Notice how the tool flips over if you go clockwise or counterclockwise, because visually that's kind of what works out. And then you can also modify the orientation if I want it to be a 45-degree.

So there's a lot of power to do what you want it to do. Sometimes it's not the most intuitive, but maybe that's just me.

And then you set up your speeds and feeds here.

AUDIENCE: John, I'm sorry.

JOHN GRIMSMO: What's that?

AUDIENCE: It's not just you, John.

JOHN GRIMSMO: Well, there you go. But when you're self-taught, you're just constantly figuring it out. You're like, I don't care if it's right or if I'm doing it right or whatever. I just need it to work. So I'm just going to keep brute force try everything until it works.

And here you can set your speeds and feeds for this particular tool. You can go as a surface feed per minute. Or if you uncheck that, you can do an RPM, like a 2,500 RPM or something. And the surface feed will be based on the material that you're cutting.

And then same for feed rate. You can do 8 thou per rev, which is a lot, or you can do inches per minute. Or if you're in the metric system like the rest of the world, this'll automatically be metric.

Let's cancel all that.

And then in the turning dialog here, you can override your feeds and speeds if you want to tweak it and have it be different for that particular operation. You can do an outside turning, inside turning.

You can choose, like we talked about, to go home at the beginning or don't go home. If you're using the same tool over and over again for different operations, which happens a lot on the mill, but doesn't actually happen a lot on the lathe, you don't necessarily want it retracting all the way home just to do the same tool over again, like for a finish pass. I'll do a rough and then finish with the same tool. And if I have my go home set, then it'll actually waste a lot of time and go home. Not necessary.

So then in these operations, the turning takes hardly any time. This takes a little bit of time. Threading takes a little bit of time, maybe 30 seconds or a minute or so, whereas the turning could take five seconds.

Since my lathe has two turrets and it can actually go in and transfer the stock. There is a transfer option in Fusion, but it has to be properly set up in your post-processor. And my Nakamura lathe did not have a post-processor yet for it, so I kind of had to use a HAAS post-processor and kind of make it do what I needed it to do. So the transfer that I'm using is kind of what Nakamura suggested what it tells me to do.

So basically, I'll go through, I'll do my main spindle turning operations, and then I'll separate. And these are my sub turning operations. So I'll do a face and then it goes into the milling of the torques pattern, which is really sweet to be able to do turning and milling on the same machine in basically the same operation.

So I'll do a clean up face. And then I'll drill a hole. And then I'll go in and I'll do these 2D adaptive tool paths to use that tiny little end mill and come in and make this torques pattern. And then a finish pass, finish pass, and then a chamfer.

AUDIENCE: How deep are you running this?

JOHN GRIMSMO: 45 thou.

AUDIENCE: And end mills--

JOHN GRIMSMO: I've broken probably 30 of them. And for a $20 tool. But I've got it pretty figured out now.

AUDIENCE: Does the 20 thou mill and--

JOHN GRIMSMO: Yeah, it's a 60 thou long end mill. So it's not even full depth.

AUDIENCE: The end mill is 20?

JOHN GRIMSMO: Yeah.

AUDIENCE: What is the width of the cut?

JOHN GRIMSMO: What's that?

AUDIENCE: What's the width?

JOHN GRIMSMO: Width of cut is about 2 thou, I think? After breaking so many, I eventually just called Harvey Tool even though they're Lakeshore Carbide end mills. I called Harvey Tool. And I'm like, so I'm using your tool. And what do you suggest for speeds and feeds? And they gave me a few little fine-tuning parameters, which really helped me figure it out.

And I'm spinning this tool at-- I have a speeder. Normally, all my live tools are 6,000 RPM. This tool's now spinning at 18,000 RPM, which really helps you kind of move a little bit faster.

AUDIENCE: [INAUDIBLE]

JOHN GRIMSMO: Yeah? Excellent. I should probably try them. Yeah, this operation is probably the most time-consuming operation. And one of the things I love about Fusion, although I really want to point out is the machine time estimation. So it estimates four to three seconds for this operation.

But what I really don't like, Curtis, is how Clear Tool Path is right next to Machine Time, something I click all the time, Machine Time and Clear Tool Path is right above it. And I end up clicking that. And then it takes a while generate or whatever.

AUDIENCE: Uh-huh. Click on it now.

JOHN GRIMSMO: Click Unclear?

AUDIENCE: Do an Undo.

JOHN GRIMSMO: An Undo. I didn't know about Undo. Thank you.

AUDIENCE: Or you can just look at the simulation.

JOHN GRIMSMO: Yeah. Yeah, that too. Yeah. So another way is to, once you simulate it, yeah, in the info screen.

AUDIENCE: Hey, John, [INAUDIBLE].

JOHN GRIMSMO: Yeah, absolutely.

AUDIENCE: The panel?

JOHN GRIMSMO: There you go.

AUDIENCE: No, the part.

JOHN GRIMSMO: Yeah, yeah, absolutely. Yeah, and that's another thing is I've got the two parts modeled here. And you can just hide the one.

AUDIENCE: And just as a quick trick. If you want, you can right-click the one you want to isolate [INAUDIBLE].

JOHN GRIMSMO: OK, yeah, yeah, yeah. Yeah, so if we had both and then we go in here. Can you do it in the CAM?

CURT CHAN: I don't know if you can do it in the CAM.

AUDIENCE: Nope. Should be able to do it with the part.

JOHN GRIMSMO: Oh, like here?

AUDIENCE: [INAUDIBLE] is your isolate on it?

AUDIENCE: You need to add it.

JOHN GRIMSMO: What did I just do?

CURT CHAN: Yeah.

JOHN GRIMSMO: Yeah, because it seems like usability is different between CAM and CAD, but that's fine.

CURT CHAN: It's not OK.

JOHN GRIMSMO: So I can click on the setup here. And I can go Simulate. And that will allow me to simulate the whole run at the default speed. So face, turn. We're going to speed it up a bit.

CURT CHAN: Nice that you own a scrub bar, right? You can hover it at any time.

JOHN GRIMSMO: Yes.

CURT CHAN: Exactly what time.

JOHN GRIMSMO: Yeah, and you can go back. And I can start from that operation or I can skip ahead or I can just hold it and just go through the whole thing. And like, oh, OK, yeah. Yeah, OK, that one.

AUDIENCE: Did you have a-- so there's a tool part like here? What it would do is it would click with the left mouse button on the model view. And then it would drag left to right. So try that.

JOHN GRIMSMO: Just anywhere?

AUDIENCE: Yeah.

JOHN GRIMSMO: Ah, I've heard of that, but I haven't actually tried it. That's really cool. But you don't have full range.

AUDIENCE: No, you have the pixel resolution now. So the distance you move the mouse is the distance you're moving all the tool parts.

JOHN GRIMSMO: OK, so if I zoomed out, it would be a lot faster?

AUDIENCE: Yep.

JOHN GRIMSMO: That's cool. Yeah, I'm here to learn, too, guys. That's great. Threading doesn't generate properly.

AUDIENCE: Rene likes to hide little things inside of it.

JOHN GRIMSMO: Yeah, little Easter eggs. Yeah, I like that.

AUDIENCE: John, do you hide your body--

JOHN GRIMSMO: Yes.

AUDIENCE: --with extension threads?

JOHN GRIMSMO: No.

AUDIENCE: Just show as the normal 3D.

JOHN GRIMSMO: Right. But that's OK. I don't mind. I don't need to visualize the threads, although it could be handy, I guess.

AUDIENCE: I mean, it is better for people who like some kind of visual-- in the thread-- and that would be good. But visualizing the actual threads [INAUDIBLE].

JOHN GRIMSMO: Yeah, Amish brought up a really good point, though, of something that I do all the time is when I simulate a model-- if you can see, if we just scrub to the end, it still shows the part, even though it cut the threads. So I often like to hide the part and even like to hide the tool path, because I don't really care all the time what the tool path shows. I just want to see what's going to happen.

So aside from the threads being undercut, I can see here that I've got my back chamfer. It looks really awesome. I've got my undercut for the back of the threads. The front chamfer looks awesome. There's a little radius in the front. So it all looks pretty darn good.

And then my part is still hidden. So I come in and I hit the little light bulb. This is something that was really hard to do in SOLIDWORKS was to quickly and easily hide components. So I love, love the light bulbs.

CURT CHAN: I wish you could isolate over it and make it faster.

JOHN GRIMSMO: Yeah. Yeah. And then for all the milling, let's real quick simulate what that looks like. We're going to, again, hide that. Hide that. And you can make the tool transparent if you want. You can see with the tool pass is going to look like. I can even make the stock transparent.

And there's all these different options for seeing the tool path. You can do a tail, where it just kind of like remembers the last few lines, or you can show everything. And you can come in. And depends on what you want to look at. If you want to see the tool path, you show that. Or if you just want to see what's going on, you might even hide the tool and now you see.

Now, notice how there's this big clover leaf right here, which looks wrong. But that's because of my facing pass. We didn't simulate both of those at the same time.

So now I can select both of these folders, which will select all of those and all those. And then I can simulate that. And you can see here, the first facing pass, boom, finishes it, and then it does everything else. So that's what it's going to look like at the end with a little 2 thou chamfer.

And there's so many learning curves to a machine like this. Because it's really sweet to be able to move all the tools in XYZ, but everything has to be so dialed in perfect that I made a whole ton of parts where the chamfer was offset like 1 thou or something, like hardly noticeable. But I noticed, because I look at everything with a loop. And I'm stupid like that.

And every little detail, like, the chamfer could be heavy over here and nothing over here. And I'm like, ah, that's scrap. Make a new one. So once everything is totally dialed in, it's awesome.

Any questions so far?

AUDIENCE: [INAUDIBLE]

JOHN GRIMSMO: Yeah. Yes, there is.

AUDIENCE: [INAUDIBLE]

JOHN GRIMSMO: OK.

AUDIENCE: So I could cap out.

JOHN GRIMSMO: I'm pretty sure in the tool settings and this spindles piece setting.

AUDIENCE: [INAUDIBLE]

JOHN GRIMSMO: Oh, right. Right. There you go. Maximum. Yeah.

AUDIENCE: Usually, during your post-processor, there's also a value. So you can give a value [INAUDIBLE] like the absolute maximum allowed for that--

JOHN GRIMSMO: For that operation, that tool.

AUDIENCE: --setup you're doing. But you can also limit special operations like this. So you're saying I want to do facing with a maximum of 1,500 RPM, but the rest of it is allowed to go 2,500.

JOHN GRIMSMO: Right.

AUDIENCE: You can make it--

JOHN GRIMSMO: Yeah, and there's a lot of learning to it.

AUDIENCE: Could you back up one step? Does everybody understand what they're talking about, [INAUDIBLE]? Because I think there's a lot of people that didn't have lathes yet.

JOHN GRIMSMO: Yeah, but that's not what this class is about. No, I mean, got we've got 10 minutes left. And I don't want to bore you guys too much. But there's some videos that I want to show real quick in a few minutes.

Another thing I really, really like is how you can do-- so if I add a new operation, so I go right-click, New Operation, there's a manual NC, which is very powerful, but also sort of could be kind of dangerous if you do it wrong. But there's all these options. Most of them don't work, but they could work if your post-processor read them properly. But the pass through option, which I don't think works with the normal post.

AUDIENCE: Can you post that in the--

JOHN GRIMSMO: There's like four lines of code.

AUDIENCE: Dangerous.

JOHN GRIMSMO: Yeah. Yeah, I like it anyway. Sometimes you want the lathe to do something that you can't find a tool operation to do or you want it to insert an M code that turns on your high pressure coolant or your whatever. Like for example, this is from milling.

AUDIENCE: [INAUDIBLE]

JOHN GRIMSMO: Right.

AUDIENCE: --directly as opposed to code. You can save that as a template, too, so [INAUDIBLE].

JOHN GRIMSMO: Right. That would be cool. So for example, I have this code in brackets at the top of the code. So set stock out 0.515 inch, which was a note. So there's brackets, which means that it won't do anything and it won't alarm out or anything, but it'll be at the top of the code as a little note to yourself. Oh, that's what I got to do.

AUDIENCE: [INAUDIBLE]

JOHN GRIMSMO: Yeah. Not necessarily notes.

AUDIENCE: In a note you can't pass. It sends code directly. You could type G0 then Y0.

JOHN GRIMSMO: Yeah so like here is my next line of code if you guys can read that. On my Nakamura, if I type G354, A54, and then coordinates, that will rewrite my G54 work offset.

So each part is a different length, right? So if I want the front of the part to always be X0 for this part and then for the next part, it's a little bit longer, instead of touching off every time, I just have to figure it out once and tell Fusion that my negative 21.8 inches from home position is exactly how far the front of the part is for this exact operation if it's sticking out this much and if all these variables are true.

So at the top of every code, I will rewrite the fixture offset, because every part's going to be different. And same thing for the sub spindle A55, which will overwrite. Notice how it's only negative 2.9, not 22.8, because that controls the sub spindle.

Right. So there's the sub spindle if it goes all the way in the home position that way. So it'll be from home of the Z here to negative 2 inches to negative 22 inches.

Any other questions so far?

AUDIENCE: Was that path [INAUDIBLE]

AUDIENCE: Manual.

JOHN GRIMSMO: Where's my thing? There we go.

AUDIENCE: The stock [INAUDIBLE]. So if you ask on the forum, we'll show you how to do it.

JOHN GRIMSMO: What's that?

AUDIENCE: I said if you ask in the forum how to add it to your post, I'm sure [INAUDIBLE] will answer how to do it.

JOHN GRIMSMO: Right.

AL WHATMOUGH: And most of the options are [INAUDIBLE]. So very different for each machine, even if you've got the same tool. So those are usually very easy to turn off. You just got to know how to do it.

And if you ask that in the forum, there's probably someone within a day that's going to tell you how to do it.

JOHN GRIMSMO: So I could talk about this stuff for another three hours. But Ken, if you want to take a picture. What am I looking at? Pass through. That.

AUDIENCE: Pass through.

JOHN GRIMSMO: So that line of text.

CURT CHAN: [INAUDIBLE]

JOHN GRIMSMO: Yeah, but it's very literal. If you type G0 X2 and it's going to crash. It's going to crash. Or whatever.

AUDIENCE: I have the G50 [INAUDIBLE] so I got to put in, basically, [INAUDIBLE].

JOHN GRIMSMO: Perfect.

AUDIENCE: For stuff that you're doing all the time, there's also Action. And then you create an action that does something hardcode.

JOHN GRIMSMO: So would you write it here, on action or something?

AUDIENCE: Yeah, on action and then call action, something like that.

AUDIENCE: And parameter.

AUDIENCE: That's a little bit more tricky.

JOHN GRIMSMO: Yeah, and you can go as deep as you want with editing. This is real quick, here's the post-processor. This is what tells all the code that Fusion outputs is gibberish, but it has to be filtered through this for the machine to be able to read it. Every machine is different. Your machine could have a totally different requirement than my machine.

But there's thousands of line of straight up Java code here. And it can kind of make sense if you start to, like, OK, it's cooling to air, turn on M7. And if I make a note, I'll make a note, like, my name, so I can just search John Grimsmo. And then I know all the places where I've screwed with it. Sometimes it makes sense. Flood M equals 8 and 7.

AUDIENCE: If you want to start doing some [INAUDIBLE]

JOHN GRIMSMO: Yeah.

AUDIENCE: And then there's some benchmark parts in all [INAUDIBLE].

JOHN GRIMSMO: Nice.

AUDIENCE: All the different operations and how they look post.

JOHN GRIMSMO: Cool.

AUDIENCE: It's a great way to get started if you want more.

JOHN GRIMSMO: Yeah, because there's a few things I still need to edit with mine. In a perfect world, the post is solid. Like for my Mori Seiki mill, it's got a FANUC controller. And the FANUC post just works. Does everything I need, everything I want. I just post the code once. And the machine reads it. And it just runs it fine.

Whereas the Nakamura, I'm still kind of hand editing code to do what I want it to do. But that's just how it is. Or if I had a Swiss, I'd be hand editing from the start.

AUDIENCE: Well, lathes, there's so many different designs. It's not as easy to nail a code--

JOHN GRIMSMO: Yeah.

AUDIENCE: Almost all the lathes end up having to tweak it, because this lathe will have this option--

JOHN GRIMSMO: Exactly.

AUDIENCE: --and not have this option [INAUDIBLE].

JOHN GRIMSMO: Yeah, OK.

AUDIENCE: You should have asked that question, how many people have lathes [INAUDIBLE].

JOHN GRIMSMO: He's got more than all of us combined. So I'm not sure if audio will pass through.

AUDIENCE: If you're using it--

JOHN GRIMSMO: I am using.

CURT CHAN: Yeah, audio.

JOHN GRIMSMO: Or maybe mine's got to turn up.

CURT CHAN: Oh, right here. [INAUDIBLE].

JOHN GRIMSMO: So the part we're making right now is this bearing. So this is how we do the turning operation for this bearing. And also, the milling of each of these holes, they're not straight drilled holes. They're like cups inside. So they capture the ball, so it doesn't fall out, but still has enough clearance to do it.

So if we go-- do we have sound yet?

CURT CHAN: Yeah, we have sound.

JOHN GRIMSMO: Sweet.

So now it's going to a milling tool. And it's going to do this for about four minutes. And I've got some closer ups. We'll get to that in a second.

It's hard to get the focus. There we go. Here's a close up of the transfer. We got an air blast on it. Really close tolerance.

And you see that little move it just did where it did like a really slow little-- it's a safety move. So it says, I'm going to move 60 thou. But if there's any force involved in that, that means it didn't part off all the way. So it's like my applications guy says, I'm just going to tug on it just a little bit and see if it's clear. And then if it is, I'll zip out.

And then on the sub side here, I just do a quick facing pass. And then we're done.

AUDIENCE: [INAUDIBLE]

JOHN GRIMSMO: Yeah, not yet. I haven't optimized that. If you saw it, it kind of stuck to the ejector pin. So I haven't figured that out yet. It's such a delicate little plastic part.

AUDIENCE: [INAUDIBLE]

JOHN GRIMSMO: I don't have air blaster with a spindle. It's a $4,800 option. And And I'm like, I'd rather get a $300 spring ejector.

Yeah, here's another view of the whole assembly doing the same thing.

AUDIENCE: Is the y-axis on an angle?

JOHN GRIMSMO: It's at an angle, yeah.

AUDIENCE: So it's like x--

JOHN GRIMSMO: x and y, yeah.

And then the transfer goes in, does the same thing we just saw, and then faced it off. So the turning on this part takes no time at all. It's the milling that takes forever.

You like that? That was a good little crash there. So what happened was I had this tool at the bottom here, that double-ended tool, was in the way. And the camera was super close.

So I'm using X-Y milling here to interpolate these holes. And that's kind of what that code looks like. It's just kind of spiraling down.

AUDIENCE: You would actually be able to do this with a machine that only has x.

JOHN GRIMSMO: Yes, you would. And it would look really cool to do it that way. I might try it just for fun. But in this way, I'm using the lathe just like it's a milling machine.

AUDIENCE: Yeah, we could actually even make the main spindle becomes the rotational axis and a lot of these [INAUDIBLE].

JOHN GRIMSMO: And then I go in and I do the engraving with the same tool.

AUDIENCE: [INAUDIBLE]

JOHN GRIMSMO: What's what?

AUDIENCE: Or actually [INAUDIBLE].

JOHN GRIMSMO: Yeah.

AUDIENCE: [INAUDIBLE]

JOHN GRIMSMO: So yeah. That's that. And you can see the part without finish kind of looks terrible. So I go in and I finish it with a very sharp tool meant for aluminum. Come in real close. And that leaves an awesome finish.

And you can see the little chamfer on the inside. I like to see that glisten. And yeah, I basically get to obsess about all these little details. That's my job.

Yeah, any questions? Please feel free.

AUDIENCE: What's the software you use to see that on the background?

JOHN GRIMSMO: Oh, this is an HSMWorks software, which I would love to see with Fusion. HSM edit? It Is it going to be in Fusion yet or available?

AL WHATMOUGH: No. This is Windows-only, unfortunately.

JOHN GRIMSMO: Oh, OK. Is that why?

AL WHATMOUGH: Yeah.

AUDIENCE: If anyone wants history lesson, Rene was part of the team. But he just [INAUDIBLE].

JOHN GRIMSMO: Right. Yeah, my apps guy was like, that looks like CIMCO.

AUDIENCE: So Tom, who started HSMWorks [INAUDIBLE]

JOHN GRIMSMO: Nice. OK, well, will there be something like a back plotter? Because I love Backplot. It's amazing.

AUDIENCE: Backplot is [INAUDIBLE].

JOHN GRIMSMO: OK. Well, that'd be cool too. Yeah, so this allows me to run through it and see what it's actually going to do. Yeah, any other questions? No? Awesome.

CURT CHAN: Awesome. Good job.

[APPLAUSE]

We do have the "Under the Knife" right up here.

JOHN GRIMSMO: Yeah, I do have another model.

CURT CHAN: If you want to see the difference between both of them.

JOHN GRIMSMO: Did the other one disappear?

AUDIENCE: No.

JOHN GRIMSMO: Oh. It's already on eBay.

AUDIENCE: How many times did you forget you had it in your backpack when you went on a plane?

JOHN GRIMSMO: I am pretty good about that. I checked the bags. Yeah.

But yeah, so we've got the two models here. They're a different size, different shape. This one's more aggressive, kind of weird-looking, but people like it now. This one's more kind of standard-looking. And now that we've made the standard one, people like this one more. So it really works out.

But the bearings that we make inside allow the blade to drop freely, which 99.9% of knives don't do. And yeah, tolerances are as tight as we can make them while still doing what we want.

CURT CHAN: What's the wait time right now in general if someone wanted to go and--

JOHN GRIMSMO: Yeah, if someone ordered this knife-- this is available for preorder, but it's about a nine-month wait.

AUDIENCE: About nine month.

JOHN GRIMSMO: Nine month. Yep. Because I'm spending all my time hand editing G-code.

AUDIENCE: And why are you here? In

JOHN GRIMSMO: Yeah, exactly. Because my brother is at home crunching out knives.

AUDIENCE: Oh, that's fine.

JOHN GRIMSMO: Right. Yeah.

AUDIENCE: [INAUDIBLE]

JOHN GRIMSMO: Yeah, so I get to be here and have fun. But yeah.

AUDIENCE: No, but actually, you've got it all planned out [INAUDIBLE].

JOHN GRIMSMO: That's what?

AUDIENCE: You've got it planned out, the way you're doing well.

JOHN GRIMSMO: I think so. I mean, there's so much learning experience. We just got the lathe two months ago. And now it's not making scrap. Now it's making good parts. So I feel like I can literally go home now and start making good parts, because I've programmed all the 11 different parts. There's codes for them now. So I can go home and do it. It's a lot less learning experience than up till now.

AUDIENCE: Now we've just got to fix your post.

JOHN GRIMSMO: Yeah, there's minor things.

AUDIENCE: Do you do a lot of completely custom now?

JOHN GRIMSMO: A completely one-off would take me forever.

AUDIENCE: It took you nine months.

JOHN GRIMSMO: No, I'm taking nine months to produce something that's already perfect.

AUDIENCE: But aren't most of your knives kind of one-offs?

JOHN GRIMSMO: They're kind of one-offs. But it's still the same code, just different textures, different colors, patterns, options, which are a lot easier. If I were to do something completely new, completely one-off, which I have other models I want to do, and now the theory is now I know the process, so I can skip that whole learning curve. Like making new lathe parts now is easy, not time-consuming and difficult.

AUDIENCE: So you personalize.

JOHN GRIMSMO: Yep. I love doing personalized knives, because it tells me that they're going to keep that forever if their name is on it. So yeah, I can do simple engraving. I've done logos before.

Patterns. And yeah, I'm usually up to cool stuff. Yeah.

AUDIENCE: Are you doing heat treating also?

JOHN GRIMSMO: Yes, we are. Yeah, we were sending out our heat treat for quite a while. But quality would come back. They'd all come back with a different color and different hardness. And some are gross. Some are nice. Some. are ugly.

So we've got our own oven now. And Eric, my brother, is now kind of a heat treating expert. He does what I do here, but for his processes. So I do all the machining. He does all the hand finishing, the sharpening, the assembly of the knives, the anodizing, putting the colors on them, and the heat treating as well. And acid etching, the Damasteel, Damascus steel on this one.

So yeah, we're both not afraid to call people if we have a question, if we're stuck. So I've got other knife maker friends who are expert heat treaters. And I'm like, so why are the blades coming out purple? Oh, well, because of this or this.

Yeah, so we've got all these little secrets. Like we have these foil bags that protect the stainless steel from the atmosphere in the oven, so they don't turn back. But there's still a little bit of oxygen inside the baggie. So people put a little piece of paper in there or something to burn up the oxygen. But it doesn't always work, because it leaves little char spot.

So we found these laser welded bags. So instead of folding your own foil with the seams and everything, it's got three sides that are laser welded and you're just making one clean fold, which is amazing. And they cost quite a bit more. It's like $4 or $5 per knife that we're heat treating. But we're like done, because the results-- the blades come out like light bronze, all even, gorgeous.

And he lines the inside, like, he sprays some baby powder, talcum powder inside. And that keeps the blade from sticking to the foil.

So all these little tips and tricks that we pick up. And essentially, we're learning all of our processes, so that we can make knives faster, eventually, which is, hopefully, now very soon. And then at that point, we can just take off like a rocket and make tons and tons of knives. But up until now, it's been process, process, process.

I'm such a nerd about this stuff. And I just want to do it the right way, the best way, the fastest

way. And then I can make-- or hire somebody to do production. Any other questions?

AUDIENCE: What's your present capacity right now? How long does it take to make one of these?

JOHN GRIMSMO: I really don't know. Because it's spread around so many-- through so many things. And I don't track it as well as I should.

CURT CHAN: You have to do lean manufacturing.

JOHN GRIMSMO: I try. I'm working towards it. But absolutely. There's hours and hours in every knife. And that's about as close as I can tell you.

AUDIENCE: How did you determine nine months for a backlog?

JOHN GRIMSMO: Because we have X many knives to make. And I need to tell the customer something.

[LAUGHTER]

Yeah, it totally-- it gives me a deadline. So work your butt off and get this done in nine months.

AUDIENCE: So actually, you say it could be done in three months.

JOHN GRIMSMO: It could be. Yeah.

AUDIENCE: So if they get it early, then what happens?

JOHN GRIMSMO: What's that?

AUDIENCE: If you get it done early, they're really happy.

JOHN GRIMSMO: Totally. Exactly, yeah.

AUDIENCE: Make them pay more for getting it delivered early.

JOHN GRIMSMO: Right, right. Yeah, a little bonus.

AUDIENCE: If you said six months, you wouldn't have been here though.

JOHN GRIMSMO: Exactly. Yeah, no, it's a lot of fun.

CURT CHAN: All right, guys. Thanks again.

AUDIENCE: Thanks again.

JOHN GRIMSMO: Yeah, thank you so much, everybody, for coming out.

[APPLAUSE]