

0:00:00.000,0:00:04.380

Absolutely yeah! If you can show the CAD drawings, that will be great.

0:00:05.706,0:00:10.000

Yep, let me do that.

0:00:15.686,0:00:20.000

So let me just run through it quickly

0:00:20.280,0:00:29.040

So this is the baseboard PCB. And this is the main custom component that we're using.

0:00:29.700,0:00:35.460

The reason we wanted to do this custom board is so that we can put the motors on the connectors.

0:00:35.460,0:00:42.300

And everything, so, like the FC - no soldering is required. It can be replaced just with a plug.

0:00:43.140,0:00:46.440

That's this separate board right here it's just a board-to-board connector.

0:00:47.400,0:00:52.200

All of the cameras, like the two cameras in the front — they're just plugs. There's no soldering required.

0:00:52.200,0:00:58.740

VTX's the same thing. Just plug — no soldering. We're gonna have cables that are

0:00:58.740,0:01:04.260

already properly, you know, of a proper length, proper connector and no splicing them together.

0:01:05.340,0:01:09.840

So the whole thing should...
besides the battery lead

0:01:10.680,0:01:16.560

which right now is just going to solder on the ESC here and will run back - besides the battery lead.

0:01:16.560,0:01:24.300

There's really no soldering [required] to put this thing together. So when we're gonna get all of the

0:01:24.300,0:01:31.440

components here, and then we'll assemble them, we'll do our testing our tuning.

0:01:33.600,0:01:41.160

— Sorry, what's going on?

— No problem.

— Was it somebody's microphone, or?..

0:01:42.780,0:01:49.140

Hello. Yeah. Sorry, Søren. I guess it was just somebody's navigation or whatever

0:01:51.780,0:01:58.680

Yeah. Nope. No worries. So that's the baseboard, which is custom...

0:01:58.680,0:02:05.640

The flight controller, which is custom. The ESC is just a standard Holybro [Tekko32] 50 amp ESC.

0:02:05.640,0:02:10.440

It just basically screws onto the baseboard and then you hit the little solder joints

0:02:11.160,0:02:18.360

but we're gonna do all of that stuff before we send it out.

0:02:18.360,0:02:23.520

So we have dual cameras up front this way. You know, you can have a normal flight camera and one facing down

0:02:23.520,0:02:28.980

or a normal flight camera and a very high angle one — whatever's needed for the particular mission.

0:02:29.880,0:02:34.680

I figured that having two would be useful, and that is just on a switch.

0:02:34.680,0:02:41.100

You can set it up in Betaflight Pinio [see the URL in video description] and flip the switch

0:02:41.100,0:02:45.840

It will flip instantly. There should be no delay in between switching cameras when you're flying.

0:02:46.740,0:02:52.860

These are just Foxeer [Predator] Nano cameras: Predator v5-es or whatever

0:02:52.860,0:02:57.480

the Nano camera you want. But I think we'll use the Predator v5 for the ones we provide.

0:02:58.500,0:03:05.880

Then we're going to use... I like the Rush VTX that you have in the procurement document [that is bit.ly/VDProcurementList]

0:03:06.660,0:03:09.120
and I think the active cooling
that's built-in is great.

0:03:09.960,0:03:15.960
We gonna do the Foxeer VTX and then add a fan to the bottom plate, but having it built-in is
easier.

0:03:15.960,0:03:24.060
It's less part count. So we'll be using that VTX as well and then a standard [TBS] Crossfire.

0:03:24.060,0:03:29.820
Really, you can use whatever receiver on this [that] you want, but we're gonna source Crossfire

0:03:29.820,0:03:34.440
because that's what we can get the easiest. And I think it's the best performing [device]

0:03:35.280,0:03:42.240
Here you can run the crossfire antenna vertically or horizontally. I think horizontal will

0:03:42.240,0:03:47.520
be better for training because you don't have it sticking up, and you can also...

0:03:47.520,0:03:52.980
See, the reason I like SMA is that you can easily... we can easily replace this with a very short
antenna.

0:03:52.980,0:03:57.540
That's really strong, like a stubby antenna for training and then [you can] replace it with a long
antenna

0:03:58.200,0:04:05.940
for other missions very easily. And then the Crossfire again, you can put it

0:04:05.940,0:04:12.780
horizontal or vertical. So these are
eight-inch arms. Right now actually these are

0:04:12.780,0:04:18.540
seven-inch props on this model, but it supports eight-inch props. We can easily make it bigger

0:04:18.540,0:04:26.100
if that is something that you require or want. But I think with this motor spec[ification], ESC spec,
and propeller spec —

0:04:26.100,0:04:32.160
eight-inch is going to be nice. I think it will be a good size for this first version.

0:04:32.940,0:04:36.840

But yeah, [we will be] happy to play around with bigger ones — it's very, you know, very modular.

0:04:36.840,0:04:44.100

We can continue to change things and upgrade things. So that's the general overview.

0:04:45.000,0:04:53.340

I think the only thing we're working on now really is just wrapping up the PCB.

0:04:54.120,0:04:57.960

All of the placement and everything is done, we're just doing routing and ordering.

0:04:58.740,0:05:01.860

So that's where the drone [i.e. Neros-1] sits right now.

0:05:05.220,0:05:13.080

Thank you. It's very impressive and especially the no-soldering solution.

0:05:14.100,0:05:19.680

Friends, does anybody have questions? Oleksiy? Vlad? Olena?

0:05:20.640,0:05:34.020

[Vlad:] What do you think about the cooling? This whole PCB it's covered with

0:05:34.020,0:05:38.040

with carbon fiber, as I understand. It's entirely covered, and...

0:05:40.080,0:05:44.640

[Søren] So we have these coin slots here on the ESC.

0:05:45.840,0:05:50.160

Obviously that's something we're gonna test aggressively.

0:05:50.940,0:05:58.080

From my experience: I think this cooling on the ESC is the main important factor, and then

0:05:58.080,0:06:04.080

the VTX has active cooling in it, and that will have a hole for the VTX fan here.

0:06:04.920,0:06:09.300

That was one advantage of having the separate fan. So that everything would get

0:06:09.300,0:06:15.420

active cooling. But I think this is going to be okay, I'm going

0:06:15.420,0:06:21.480

to add additional cooling holes to the top and bottom plate before we send it out to get cut.

0:06:22.260,0:06:26.880

Those are just some final weight saving

0:06:26.880,0:06:31.740

and cooling holes that I have
not modeled into the carbon yet.

0:06:37.440,0:06:43.260

[Oleksii] What weight do you expect from the build?

0:06:44.520,0:06:50.400

[Søren] The frame right now is quite heavy.

0:06:51.420,0:07:02.040

It's a 200-gram frame, so that with
3008 Motors, prints, everything...

0:07:02.040,0:07:04.980

I don't have the exact weight, I should have. that. I can give that to you afterwards.

0:07:06.600,0:07:15.840

[Oleksii] And also the props choice — whether it corresponds to what weight it will have?

0:07:17.520,0:07:23.400

[Søren] Yep, the ones I have picked out right now... Let me actually just pull them up...

0:07:27.660,0:07:30.660

These! [Gemfan Cinelifter 8046]

0:07:34.080,0:07:41.400

Gemfan props are glass fiber nylon. So they're made for drones that are up to 4.8 kilograms,

0:07:42.360,0:07:48.180

maximum takeoff weight. So that should be... you know, our drone with a significant payload

0:07:48.180,0:07:56.580

should still be under 4.8 kilograms.

[Oleksii] That's a good choice.

0:07:58.380,0:08:03.600

And the pitch is seven by...

0:08:04.140,0:08:10.680

I just missed it. Okay: eight by six. Oh, 4.6.

0:08:11.200,0:08:15.060

[Søren] Yeah!

0:08:18.600,0:08:26.700

[Oleksii] and motors, it's not defined yet what it would be, right?

0:08:27.480,0:08:33.660

[Søren] Right now I'm looking at these

0:08:35.880,0:08:43.620

Avenger, 3008 motors. I can get these cheaper than this. Which is nice.

0:08:43.620,0:08:51.120

So I think these will match well with the propeller

0:08:52.020,0:08:58.380

and I can get them at a good price.

[Oleksii] so what I'm pointing here about the weight

0:08:58.380,0:09:07.800

and the motor and the prop — it's important. So if you want [your drone] to have a long flight time

0:09:07.800,0:09:17.880

with a heavy payload — you need to balance the payload, the battery, and all the stuff.

0:09:17.880,0:09:27.180

So you will definitely like to be in the efficiency spot for the model, that's basically

0:09:29.400,0:09:34.680

somewhere around 50 to 70 percent of it.

0:09:35.700,0:09:49.740

Maybe that helps you
in some way. And you said

0:09:49.740,0:09:59.040

that now you are in the design phase, or you already started doing some production?

0:10:01.560,0:10:09.960

[Søren] So we've ordered some components and now we're sending out the baseboard

0:10:09.960,0:10:17.760

PCB for an order for manufacturing. Basically, we're wrapping up all the design stuff

0:10:17.760,0:10:24.360

at the end of this week. So I guess basically it's today or tomorrow and we will be sending it out.

0:10:27.000,0:10:35.820

[Oleksii] I see. So could you... oh, I didn't turn on the camera. Okay. I think I can do that. Thank you. Hi

0:10:35.820,0:10:44.940

So basically what I'm trying to understand is what are the next steps and the

0:10:44.940,0:10:56.580

milestones of this process. So yep, you have design, then you have to assemble

0:10:57.180,0:11:03.457

some batch of N-1 [drone]...

0:11:03.457,0:11:07.380

[Søren] I can run through that.

0:11:08.160,0:11:16.920

We're ordering 10 parts for 10 N-1 drones. But that's assuming

0:11:16.920,0:11:22.200

that there's no... Assuming that, you know, the PCB works from the first batch.

0:11:23.280,0:11:28.980

Then we're about three weeks out from receiving those PCBs.

0:11:28.980,0:11:36.000

By the time I get the PCBs, everything else will be here and assembled. So we'll be able to drop those in and start

0:11:36.000,0:11:43.380

our testing and tuning. I think that can be done in a couple days.

0:11:43.380,0:11:51.180

I can fly 100 packs a day (that's not a problem) to ensure this is solid and tuned well.

0:11:51.780,0:11:58.200

So right now, the optimistic timeline is basically one month and we'll have 10 [drones] ready to go,

0:11:59.040,0:12:04.440

ready to be shipped. And then, in terms of shipping, that's where we need your input

0:12:04.440,0:12:13.140

on the best ways of getting them to you and whatever that timeline is, but

0:12:13.140,0:12:17.940

I think that's our optimistic timeline.

All the ordering has started,

0:12:17.940,0:12:22.380

the custom stuff is going in today, and then we'll be putting it together and testing it.

0:12:25.320,0:12:30.540

[Oleksii] So this particular step pretty much makes sense.

0:12:30.540,0:12:42.600

When you're using the builds for training purposes, then most of them break. So if they live more

0:12:42.600,0:12:51.120

then three weeks through maybe more — four weeks with the training process,

0:12:51.120,0:12:59.760

that's very great because we are really pushing it and it's hard way

0:13:01.140,0:13:14.640

So you did also mention that you want the footage or something like that from the usage of,

0:13:16.380,0:13:21.600

you know, drones

0:13:24.300,0:13:30.840

That's probably an idea behind this, yea? So then you will do something with that footage.

0:13:30.840,0:13:35.160

Can you share something about it? So what is the plan basically?

0:13:36.000,0:13:36.500

[Søren] Yeah, so basically, the way we can get more investment or,

0:13:36.500,0:13:51.780

you know, people donating or any type of funding is, basically, by showing that our drone is being used

0:13:52.560,0:13:59.100

and it's working in the training. But the ideal situation would be

0:13:59.100,0:14:05.880

to show it working on the battlefield. I mean, obviously, you

0:14:05.880,0:14:11.760

know, these videos are all over the place with lots of, you know, lots of drones but

0:14:12.420,0:14:18.240

to actually show our drone doing it would be a massive step forward in getting the funding,

0:14:19.200,0:14:27.480

to keep, to let us provide you with more drones. That's

0:14:28.080,0:14:34.860

kind of the necessary step that we see — to be able to do that. [Hennadiy] So I've a quick practical question —

0:14:34.860,0:14:39.183

may I ask?

[Søren] Yeah, absolutely.

0:14:39.183,0:14:43.440

[Hennadiy] What we've seen until now: many people from the West are actually

0:14:44.400,0:14:51.480

running away from any combat use of their equipment, or they do not want it to be mentioned

0:14:51.480,0:15:00.600

[that they are] donating it to the battlefield. So you are now actually asking for the opposite.

0:15:00.600,0:15:07.320

Do you have some lawyers or somebody who can give you advice on what you can do and what you can't?

0:15:07.320,0:15:15.300

Because, I guess, you cannot fundraise in America for military purposes. You can't just, you know, go on

0:15:15.960,0:15:25.680

Indiegogo or Kickstarter.

[Søren] Yeah, that's the right issue.

[Hennadiy] Did you research this issue?

0:15:26.240,0:15:33.960

[Søren] Yes, we have experts, like ITAR [International Traffic in Arms Regulations] and compliance people

0:15:33.960,0:15:40.860

that we consult with. Our funding goal is mainly private capital. We are raising it as a

0:15:40.860,0:15:47.640

defense company. So we have a legal entity. It's set up to be a defense contractor.

0:15:48.600,0:15:54.900

We want it to be involved in the battlefield. That is our goal.

0:15:55.680,0:16:00.120

But obviously, there's the legal implication there and we know it.

0:16:00.120,0:16:04.920

We've done the research but we're still also working on that side. We want to make sure everything's good there.

0:16:04.920,0:16:10.380

[Hennadiy] Generally speaking: thank you so much. You're the first Westerner

0:16:10.380,0:16:15.780

who just says: "we will supply you the drones, and we will be happy to see them killing Russians." 😊💕💀

0:16:18.960,0:16:25.620

[Søren] Interesting. Yeah, that's really what they're for.

[Hennadiy] Yes, thank you!

0:16:27.840,0:16:33.600

Okay, we're done with this question. Oleksii, colleagues, [do you have] any further questions?

0:16:33.600,0:16:36.590

[Oleksii] Let's answer what had in my letter [Signal message actually].

0:16:36.590,0:16:45.120

[Olena] Yeah. So actually: hi. Of course, I joined exactly when you said "So, that's it about our drone." I

missed everything,

0:16:45.120,0:16:50.220

and I will have to watch the recording to understand more about the making of the [N-1] drone. However, I have a couple of questions

0:16:50.220,0:16:54.660

so one: you brought up a critical point ,and you already answered some questions that I

0:16:54.660,0:16:59.760

had regarding the entity. And you said that this is a defense contractor, who has some expertise.

0:16:59.760,0:17:05.040

And [that there are] some people who can consult you in questions of ITAR, which is great.
Would you have anything

0:17:05.040,0:17:11.280

that we can look at (about the entity) so that we can understand what kind of entity it is. Just to make sure

0:17:11.280,0:17:16.740

there is an understanding of the legal form, number one. Number two: if you want it to be noticeable it

0:17:16.740,0:17:20.640

has to be branded so it means maybe you should consider some logo so it's easily recognizable,

0:17:20.640,0:17:26.400

then it would be much easier to connect the dots. And number three: actually there's a compromise

0:17:26.400,0:17:32.400

which you can choose. It doesn't necessarily have to be a military route.

0:17:32.400,0:17:37.260

maybe it could be some certain rescue or something else, which is much easier. It is not 100% humanitarian

0:17:37.260,0:17:43.860

But it also offers you a different kind of use, which is also very demanding.

0:17:43.860,0:17:49.560

So maybe that could be considered as an option, and then another thing I wanted to ask: if you have

0:17:49.560,0:17:56.520

an opportunity to test that specific makeup of equipment in a temperature of about minus 45 Celsius?

0:17:58.440,0:18:00.660

Is there a way for you to test that in the low temp?

0:18:02.400,0:18:11.580

[Søren] in a low temp... That might be tricky. Minus 45...

0:18:11.580,0:18:15.300

Everything's pretty hot here in the US. But [Olena] I know

0:18:18.600,0:18:25.140

[Søren] that one might be tricky right now, in, you know, few months in Vermont, then I can definitely do that.

0:18:25.140,0:18:30.180

But you know it's peak summer right now so that's a little bit trickier.

0:18:30.180,0:18:32.700

[Olena] It could be -30

0:18:32.700,0:18:38.940

Sorry, go ahead.

[Søren] I'm just saying that generally, electronics is going to be happier

0:18:38.940,0:18:44.640

in the cold versus the heat.

The heat is probably more of a concern than cold

0:18:45.540,0:18:49.500

Except, obviously, battery performance is not very great in the cold.

0:18:50.520,0:18:55.200

[Olena] That's exactly what I was thinking. Because that could impact the length and the duration.

0:18:57.060,0:19:04.800

[Søren] Yes. So actually I have a couple questions on batteries, but to go back to your points

0:19:04.800,0:19:09.840

Yes, I can provide more information on the entity, basically it's just

0:19:09.840,0:19:16.860

C-corporation formed in Delaware, but we're working with compliance people and

0:19:16.860,0:19:24.600

all of our outward-facing people. We want to present ourselves as a defense company.

0:19:24.600,0:19:29.400

We're a startup. So we don't have a long track record but part of the advantage of doing this right now

0:19:29.400,0:19:36.000

is building a track record which is where most defense startups fail. So I'm happy to

0:19:36.000,0:19:40.920

provide more information on that after the call. Sorry, what was your second Point?

0:19:42.120,0:19:49.260

[Olena] It was just the specific kind of use. Which is less...

0:19:51.060,0:19:58.500

[Søren] Yeah. I'm open to suggestions and if we're going to put it

0:19:58.500,0:20:02.460

on the battlefield or for search and rescue or something like that —

0:20:02.460,0:20:07.320

that's where I need your help to connect those right people.

0:20:08.280,0:20:14.520

I would say that you know we're gonna send 10 of these, I think if we could allocate some

0:20:14.520,0:20:21.960

number of them to try and go and get that real-use video — that would be great.

0:20:23.040,0:20:30.120

But that's what I think we can think about that more and then come up with ideas.

[Olena] Thank you.

0:20:30.120,0:20:34.200

And another thing, I apologize — just one more thing before I forget. If you ever

0:20:34.200,0:20:40.560

considered doing some moisture ceiling because wet weather like fog and similar [issues]

0:20:40.560,0:20:46.440

are an issue. So did you consider maybe adding some features that would allow sealing for moisture.

0:20:47.520,0:20:54.900

[Søren] So yeah we can, we can do conformal coating on all components, which makes them resistant to water.

0:20:54.900,0:21:00.780

There's like a balance of having ventilation airflow cooling and then sealing it off.

0:21:00.780,0:21:07.860

I do like how like mainly sealed off this is, with the ventilation right on the ESC, and then

0:21:07.860,0:21:13.920

the ESC and everything will be conformal-coated. So it should have no issues with water.

0:21:16.080,0:21:18.692

[Olena] Thank you a lot.

[Oleksii] Vlad, please.

0:21:18.692,0:21:26.346

[Vlad] So I can ask? Okay, gonna ask you about the stiffness of the frame.

0:21:26.346,0:21:35.940

As I can see it's like one arm is a kind
of made of two arms, or it won't be like that?

0:21:37.800,0:21:45.540

[Søren] Yep. The reason I did that is that a lot
of the time it is harder to get eight millimeter

0:21:45.540,0:21:52.320

carbon parts, but four millimeters are super easy and
super cheap... The same thing is in the way here.

0:21:52.320,0:22:01.680

Let me hide this... So this is a design that I've tested before on seven-inch racing drones. It
works

0:22:01.680,0:22:08.040

really well, it's incredibly stiff. You basically
have two sets of thinner arms that overlap.

0:22:08.040,0:22:12.360

They're milled out in the center so they intersect and
then you run a screw through that, and it's highly

0:22:12.360,0:22:17.640

compressed, and then the motor screws out on the
end are also squeezing it together. So this

0:22:17.640,0:22:23.940

arm is in total eight millimeters thick and
that's not the right, but I think

0:22:25.740,0:22:33.840

it's 13.6 millimeters wide at the narrowest point. So these are very strong

0:22:33.840,0:22:39.660

arms, they should be really stiff. A lot of this, the design consideration for

0:22:39.660,0:22:44.700

the frame was: this thing's going to be used in training, it needs to be really tough and

0:22:44.700,0:22:49.380

when it does break, it needs to be easy to repair. But I think this frame should

0:22:49.380,0:22:56.340

be significantly stronger than any of the normal hobbyist frames that you'd see otherwise.

0:22:58.080,0:23:03.600

[Oleksii] And also combining it from the two pieces, you can use a different carbon direction,

0:23:03.600,0:23:09.420

if it is needed. [Vlad] Basically... [Søren] Also, in terms of the difference:

0:23:10.320,0:23:16.500

these are vertical carbon plates which, in my experience sandwiching vertical carbon plates

0:23:16.500,0:23:21.900

along the lengthwise of the drone, — it's going to be very stiff...

0:23:21.900,0:23:27.060

I expect this thing to fly very well. Actually, because it's it's basically a carbon brick,

0:23:27.060,0:23:32.460

it's not going to move once you have all the plates locked together.

0:23:39.960,0:23:47.640

[Hennadiy] Okay, who is next with the question? We have Vlad, who had his hand raised for quite a time.

0:23:49.560,0:23:59.040

[Vlad] Yeah! How about the stiffness between the front and rear arms, so I see that between the left and

0:23:59.040,0:24:09.060

right arms... The design looks really

solid, but how about the front and rear arms

0:24:10.500,0:24:14.760

[Søren] Yep. So that's part of the reason why do we have the vertical carbon plates

0:24:15.960,0:24:19.140

and also these are three millimeters each

0:24:19.980,0:24:26.220

these plates right here, also there'll be some more cutouts, but I actually prefer

0:24:26.220,0:24:32.760

minimal cutouts to improve stiffness. The whole body of this drone

0:24:33.480,0:24:39.900

— I expect it to be extremely stiff. The vertical plates help a lot with like the torsion

0:24:40.620,0:24:48.840

and using dual three-millimeter plates, t700 carbon, I think you know we'll have to

0:24:48.840,0:24:54.840

test it but from all my experience I think this is going to be a very, very stiff frame

0:25:02.400,0:25:05.820

[Hennadii] Amazing! Do you think we should go to the next item on the agenda?

0:25:06.480,0:25:14.760

[Oleksii] Sure, maybe one more thing to add. So regarding Olena's [idea]

0:25:17.880,0:25:19.380

like "other applications" [besides combat use] —

0:25:21.540,0:25:32.160

so you're using, what basically flight controller you're using? Is it able

0:25:32.160,0:25:42.840

to be flashed with the ArduPilot or something like that? And does it have a barometer or

0:25:42.840,0:25:52.680

something like leveled flight altitude hold.

[Hennadii] Yeah. So a housekeeping note: Oleksii

0:25:52.680,0:25:58.140

you were a little bit late and Søren mentioned the name of the FC in the very beginning...

0:26:00.240,0:26:04.860

[Søren] Well, so the FC is custom and very easy to swap out so

0:26:04.860,0:26:10.740

right now because it's cheap and quick, and we already have the design, we're doing just an

0:26:10.740,0:26:17.760

F4 Betaflight controller [see the URL in the video description]. It's very simple. However, I can show it:

0:26:18.600,0:26:25.140

here the FC is just a board-to-board connector, it can be replaced very quickly. So something that

0:26:25.140,0:26:31.800

supports, say, ArduCopter and also if we want to add a GPS to the back of the print —

0:26:32.700,0:26:38.640

those are both things that we can do, but right now it's just the most simple Betaflight

0:26:38.640,0:26:45.480

setup to get this thing going.

[Oleksii] Yeah, thank you! So let's move on to the next topic.

0:26:50.820,0:26:54.960

[Hennadiy] As an author of the agenda, Oleksii — can you guide us to the next one?

0:26:57.540,0:27:11.220

[Oleksii] I hoped somebody else would do that 😊 Okay, so what we have here? So we did talk about MVP delivery and

0:27:11.220,0:27:22.560

the testing here. So the feedback — it will be the video of use.

0:27:22.560,0:27:29.520

So what we have here is that: the more videos we have, the more fun we can get.

0:27:29.520,0:27:42.300

It works that way as I understand. Maybe you have some kind of specific things you think will work better

0:27:42.300,0:27:48.720

for finding, maybe some kind of rescue operation?
Because now what we have currently it's a

0:27:50.400,0:27:56.820

kamikaze and bombing delivery, maybe
delivering some stuff using the same

0:27:58.860,0:28:08.640

way of doing things. Maybe we can
think of something else that people will like to see.

0:28:08.640,0:28:20.400

[Søren] And in my experience, I think the
the most, like "best" reactions, that I see are

0:28:20.400,0:28:30.600

Kamikaze videos. I think that is
kind of what our products aim to

0:28:30.600,0:28:38.100

do in the long run, so I would say —
to me, a Kamikaze video would be ideal. Now I'm

0:28:38.100,0:28:44.220

sure, that is probably harder to get than other
things. And you know there's

0:28:44.220,0:28:49.560

restrictions around that, right? But in
my ideal I think it's Kamikaze video.

0:28:50.880,0:28:59.460

[Hennadii] Your drone can be used both as a
bomber and as kamikaze, right? [Søren] Yeah!

0:29:03.000,0:29:10.020

[Hennadii] Sorry, one more point on feedback. We will actually upload this video internally to our

0:29:10.020,0:29:16.140

Signal group of all people who are FPV
trainers, and probably you'll have additional

0:29:16.140,0:29:21.420

questions and feedback [from them]. I don't think we should do a separate video call. We can just

0:29:21.420,0:29:27.120

do it on Signal. If people speak English — we'll just add them. If not — they will be

0:29:27.660,0:29:31.890

asking via somebody who will translate.

0:29:31.890,0:29:33.120

[Søren] Yeah, sounds good!

0:29:36.360,0:29:46.260

[Hennadiy] Oleksii?

[Oleksii] Okay okay. So then the next [question] is supporting and the way of supporting.

0:29:46.260,0:29:53.340

Basically, the easiest way of support is to give somebody money. But it's not the only option here.

0:29:53.340,0:30:04.380

So we're also looking for suppliers, who have a large batch of components and,

0:30:04.380,0:30:15.300

possibly, some payment options.

Because having the supplies,

0:30:18.660,0:30:30.000

the components, it's also a big issue on our side. So, well, maybe

0:30:30.000,0:30:37.620

do you have something for that?

[Søren] Yeah, so I have thoughts here for sure.

0:30:38.520,0:30:43.860

First thing is: you know, personally I've been flying drones for like eight years, maybe longer.

0:30:43.860,0:30:48.780

I have a lot of components that I don't really use anymore. But those are perfectly good components

0:30:48.780,0:30:53.520

and I know other people who have this as well. So they're not

0:30:53.520,0:30:58.800

optimized for anything.

They're usually, like, five-inch drone

0:30:58.800,0:31:04.200

components, but if that stuff is helpful — I can put together all the stuff

0:31:04.200,0:31:08.640

that I already have and send it like they're basically, just spare parts that I don't use.

0:31:09.540,0:31:13.620

And I think you guys mentioned you train people on smaller drones,

0:31:14.520,0:31:22.380

so that could be helpful. The other thing is: I run a company called FPV Supply Co [see a description for this video],

0:31:22.380,0:31:29.640

where a drone racing company and I have a dealer accounts and relationships with most of

0:31:29.640,0:31:37.800

the FPV suppliers and companies. So all of our resources that we have to give stuff

0:31:37.800,0:31:43.140

for free basically is going into this batch of drones that we're trying to build.

0:31:43.920,0:31:51.540

But if you need components and if you need to buy components — we can do that through

0:31:51.540,0:31:58.380

my accounts, my company. They'd be shipped to the US first, but then I can ship them to you,

0:31:59.160,0:32:04.440

basically buying things at a dealer pricing and then sending them

0:32:04.440,0:32:08.040

to you. It would have to be a little bit of... you know,

0:32:09.420,0:32:14.580

"under the table thing" where we would put some of the parts on our store

0:32:15.480,0:32:21.120

because we need to maintain our dealer accounts. But from what I can tell, mostly

0:32:21.120,0:32:25.920

some of the FPV companies — they don't want to be directly involved in this stuff. But they

0:32:25.920,0:32:31.920

also know that their components are being used and so they're not really stopping people.

0:32:31.920,0:32:38.880

But if that's helpful — that is something, we have pretty great access to all of

0:32:38.880,0:32:49.320

the FPV companies.

[Oleksii] Can we do some kind of exercise: just grab our regular procurement

0:32:49.320,0:32:56.841

spreadsheet and make a calculation — Hennadii, Olena, what do you think?

0:32:56.841,0:33:01.251

[Olena] I think it's a great idea and, actually, as an example, US has a standard and regulations

0:33:01.251,0:33:12.120

on the video transmitters. So you cannot buy more than two channel Matek Systems transmitter

0:33:12.120,0:33:17.220

in the US. So if you buy it directly from China and ship it to a neighboring country — you can

0:33:17.220,0:33:24.600

get, I think, nine channels, if I'm not mistaken. Which is more "asked for," than two channels.

0:33:25.680,0:33:34.620

So the question is: can this be resolved? Let's say because the wider capabilities, which are

0:33:34.620,0:33:39.960

not allowed on the US market, but are more wanted on the Ukrainian Market, how can that be resolved?

0:33:39.960,0:33:44.700

That's one. And then yes: figuring out the logistics... and also you have to consider

0:33:44.700,0:33:52.080

the fact that with purchasing there are certain restrictions on the funds movement,

0:33:52.080,0:33:59.220

so there's another thing to really put it on the paper and see it through the flows.

0:33:59.220,0:34:05.160

[Søren] In terms of video transmitters, usually all of those restrictions are just software and

0:34:05.160,0:34:11.100

they're designed to be turned off like most pilots in the US are not listening to those restrictions.

0:34:11.940,0:34:17.700

So you can unlock the video transmitters and they usually tell you how to do it very simply.

0:34:18.600,0:34:23.220

If that's what you're referring to, I think that's what you're talking about there,

0:34:23.820,0:34:28.140

so that's easily resolved. It's the same hardware. It can be unlocked really easily

0:34:29.640,0:34:33.000

[Olena] Yeah, I was wondering about it, actually, because it didn't seem to be that there was physical

0:34:33.900,0:34:37.920

difference when they compared the nine-channel and two-channel ones

0:34:37.920,0:34:41.460

They didn't seem to be too different. But you obviously need

0:34:41.460,0:34:45.120

to know how to do this, and some companies explicitly write on their website:

0:34:45.120,0:34:49.860

"cannot be turned into nine channels from two," but maybe it's just because they have to say that.

0:34:51.900,0:34:58.020

[Oleksii] Yeah, it's FAA regulations. So it's not the physical. [Olena] Yeah, exactly that's the one.

0:35:05.160,0:35:09.600

[Søren] And then, I guess, for moving funds and those types of restrictions —

0:35:09.600,0:35:15.000

that is not something I've dealt with before in Ukraine.

0:35:15.540,0:35:21.300

So I need your guidance there, and I can look into that

0:35:22.200,0:35:26.820

as well, but we'd have to obviously approach that carefully and figure out how to do that.

0:35:26.820,0:35:32.820

[Olena] Yeah, well we just really need to do it as a step-by-step process and

0:35:32.820,0:35:39.300

schedule. Actually, having Delaware companies is a good thing which means that your purchasing

0:35:39.300,0:35:44.640

will be cheaper, and then there is also shipping I think it is a Meest [Express] there, so if you would

0:35:44.640,0:35:49.500

happen to have a non-profit registered to the same Delaware address, you can ship at the good rate

0:35:49.500,0:35:55.560

through Meest. That's the benefit of having a Delaware-registered entity. And then what

0:35:55.560,0:36:01.500

was the cost of the make? Did you uh calculate what was the cost of the prototype?

0:36:03.000,0:36:08.580

[Søren] Yes, so we're around \$500 right now, just a little bit under.

0:36:09.360,0:36:13.620

I'm trying to get that down. That's basically, buying everything at MSRP.

0:36:14.460,0:36:19.020

You know, using dealer accounts, — that will be lower than that but [still] about five hundred dollars.

0:36:20.160,0:36:24.840

[Olena] So then, if you buy from dealers, it will be about minus twenty percent, something like that...

0:36:26.460,0:36:31.560

[Søren] -ish. I mean, we're not going to save. We can't save anything on the custom components,

0:36:31.560,0:36:38.100

you know, the frame, PCB... But yes — there's cheaper motors that I'm working on sourcing.

0:36:39.360,0:36:42.900

I understand cost is definitely a big thing here so

0:36:43.680,0:36:47.400

that's going to be something next iteration, especially where we'll try and get that down.

0:36:47.400,0:36:52.680

Also, we'll be doing a custom ESC integration. That was actually going to save [us] a lot of money.

0:36:53.520,0:36:59.580

I think we can get it probably below 400, as we work forward. [Olena] this, actually, is the rate

0:36:59.580,0:37:07.080

available right now in the country. It's below 400, yes. And then another question I had...

0:37:07.080,0:37:13.080

Do they have to be shipped assembled? Are they assembled, and you cannot take

0:37:13.080,0:37:18.540

them apart? Or can they be shipped disassembled and they are relatively easy to put together?

0:37:20.040,0:37:25.560

[Søren] Whichever one you prefer. We can send them in parts and they're really easy to put together.

0:37:26.640,0:37:32.580

That's the beauty of the design [of it]. The drone will go together in minutes as opposed to

0:37:32.580,0:37:38.100

soldering things and probably, taking a couple hours. If [sending in] parts is better — we can do that.

0:37:38.700,0:37:43.740

[Olena] Parts is definitely better from the shipping standpoint — it takes less space, and you can split

0:37:43.740,0:37:46.680

the shipment into a variety of things and then you don't have to say that you're

0:37:46.680,0:37:50.760

shipping drones with your shipping components. So it could be treated differently if need be.

0:37:52.200,0:38:00.120

[Vlad] And then we can better understand the parts and how they assemble. [Olena] Aha. We have plenty

0:38:00.120,0:38:04.920

of qualified people plus frames actually could be made locally too. So frames, as long as we

0:38:04.920,0:38:09.900

know requirements, frames are relatively all mechanical components, which are non-electronic.

0:38:09.900,0:38:14.880

I think it could be made cheaper by making them locally, as long as there are specifications.

0:38:16.860,0:38:22.080

[Søren] Okay, interesting. Yeah, we can provide the frame files, and the [3D] print files.

0:38:22.800,0:38:25.500

I think that's a great idea, yeah!

0:38:35.340,0:38:40.680

[Oleksii] Okay. I think we

0:38:43.440,0:38:52.200

completed this topic. What about the sync-ups, the weeklies? Maybe we need some

0:38:52.200,0:39:02.220

kind of collaboration environment. [Hennadiy] Oh, Signal is ok! [Oleksii] Just to make it easier

0:39:02.220,0:39:09.120

to schedule... [Olena] We can
do maybe weekly stand-ups, if you guys are

0:39:09.120,0:39:13.260

available. We can maybe do [it], I don't think we need more than 30 minutes. And we can pretty

0:39:13.260,0:39:17.640

much run through the items on the list within
30 minutes. For me 12 o'clock Eastern [time] works

0:39:17.640,0:39:21.480

the best because it's my lunch time, so I can
get away. Or I can do it before 8 AM Eastern.

0:39:21.480,0:39:25.980

But I'm not sure if it will work for you, because
you're on PST. So for you that would be quite early.

0:39:27.300,0:39:35.040

[Hennadiy] Friends, do we really need all these weekly
stand-ups? I mean, we have Signal.

0:39:35.040,0:39:39.660

[Olena] Yes, the majority of it could be resolved there. Exactly, I agree with you. And then we
can get

0:39:39.660,0:39:45.240

together if we need to discuss something. But
yeah, sure, we can do that in writing — no problem.

0:39:45.240,0:39:50.700

[Hennadiy] Usually here, because of the war, we are
the most agile, you know, because we need to

0:39:50.700,0:39:59.460

survive... [Olena] Haha, for sure. [Hennadiy] Not bureaucratize the system: "Let's create a
committee — the steering committee,

0:39:59.460,0:40:08.520

weekly stand-ups and something else".

[Søren] Well, I'm happy to keep using Signal,

0:40:08.520,0:40:14.700

going to the meeting, just when we need to. I think that's fine. The least meetings

0:40:14.700,0:40:20.340

that are scheduled — the better in my eyes.

[Oleksii] Okay, so no Jira, no Confluence, that's great!

0:40:23.220,0:40:28.680

[Søren] But, you know, we can send you updates on a regular schedule.

0:40:29.460,0:40:34.920

We can pick a weekly time to give you progress updates or something

0:40:34.920,0:40:40.260

like that, just to keep that cadence going. [Hennadii] We probably should set up some

0:40:40.260,0:40:47.820

Google Drive folder or any other "folder" not to send the files back and forth

0:40:47.820,0:40:53.040

with Signal. And I saw you have Notion. So if you have, like some, you know, guest access

0:40:53.040,0:40:58.200

or whatever and if you want to do please do it for some part of your project —

0:40:58.200,0:41:13.140

I will be happy to join [that Notion folder]. But if not — we have enough stuff going on here, besides it.

0:41:15.360,0:41:21.540

[Vlad] Sorry, I'm still wondering about the frame. Has it ever been manufactured and tested?

0:41:21.540,0:41:34.380

If yes or no — maybe we can start trying it out much earlier. It's the frame itself.

0:41:34.380,0:41:40.860

[Søren] This frame has not been made yet. It's just using

0:41:40.860,0:41:45.480

techniques that we've used very successfully in the past. But this frame — no.

0:41:52.560,0:41:57.000

Okay, was the suggestion there — to potentially start

0:41:57.000,0:41:59.520

making them now and testing them?

0:42:02.520,0:42:06.360

[Olena] Maybe we could actually make. If you want to share the files — we can make one and test it

0:42:06.360,0:42:11.940

here in Ukraine, and you'll make yours and test yours there, and then just compare the notes — is that

0:42:11.940,0:42:18.420

something that you consider? [Søren] Yeah, that sounds good to me. [Olena] Definitely we have

0:42:18.420,0:42:23.460

a workshop that can do it too. The design — what kind of CAD system you're using?

0:42:24.900,0:42:31.980

[Søren] So I'm using OnShape.com, but I can export, you know, whatever file is needed for the shop.

0:42:32.640,0:42:38.220

[Olena] So that would work for sure. And another question I had out of curiosity: as long as you have

0:42:38.220,0:42:45.900

a dealer account — what would be the wholesale price you can get for the VTX for Matek 1.2/1.3 (GHz)?

0:42:46.620,0:42:56.700

[Søren] Actually, I'm talking to Rush, so we're using the Rush VTX. I'm talking to them right now.

0:42:57.540,0:43:03.300

I've checked on the Foxeer VTX. It's somewhere around \$45. Most things are

0:43:03.300,0:43:09.120

going to be like 30% off of MSRP, it's the standard dealer price.

0:43:10.020,0:43:14.220

So I think it'll be similar for The Rush VTX as well — probably, around \$45.

0:43:15.120,0:43:18.240

[Olena] There will be the wholesale price on what kind, and what number of units?

0:43:20.040,0:43:25.980

[Søren] I don't know what their MOQ is yet. I'll find that out today. That's probably around

0:43:27.540,0:43:33.540

50 units in China. [Olena] Yeah, okay. In China.

Yeah, 50. I was thinking more like 500 —

0:43:34.740,0:43:39.480

what would be the price for the amount, yeah, okay.

0:43:42.000,0:43:45.720

[Søren] They're pretty supportive of smaller orders typically. There's a lot of like small

0:43:45.720,0:43:52.560

FPV stores that order very, you know, low numbers of units so they generally support that.

0:43:54.060,0:43:58.920

[Olena] Thank you! [Oleksii] [We are] most likely to be ordering much-much more.

0:43:59.820,0:44:06.960

[Vlad] Okay, can we know what type of carbon fiber you will use for this frame?

0:44:06.960,0:44:16.680

Because if you send us the file, we might make a frame of another type of carbon fiber.

0:44:18.180,0:44:30.660

[Søren] So yes. So my factory uses t700 carbon, I guess. I can check it.

0:44:40.920,0:44:47.640

I mean t700 is the main... [Vlad] Can you write this type

0:44:47.640,0:44:56.160

of carbon in our Signal chat, so we don't forget? [Søren] Yes, I can include this with, you know, if we're

0:44:56.160,0:45:02.580

sending the frame files and all the specifications for cutting — I'll send it along with that as well.

0:45:11.100,0:45:21.120

[Oleksii] Sounds like we still need the Google Drive... Okay, good. Do we have

0:45:21.120,0:45:27.480

any other major questions? It's great this meeting is being recorded, because I

0:45:27.480,0:45:34.080

didn't make meeting notes. [Hennadiy] Yeah, I will send the link to Signal, as usual.

0:45:36.120,0:45:40.320

Is it okay if we share this one (as I mentioned)

0:45:40.320,0:45:44.340

with our team who are learning English?

0:45:45.000,0:45:53.880

You will be their English-speaking FPV tutor, so to say. [Søren] Sure! Yeah! That's fine with me.

0:45:55.740,0:46:04.440

So I guess I have two questions: 1) what is your preferred shipping

0:46:04.440,0:46:12.360

method to get components from us in the US to you [in Ukraine]?

0:46:13.500,0:46:18.960

Yeah, so let's start with that one. [Hennadiy] So there are two options: 1) the official channel

0:46:18.960,0:46:24.780

2) the unofficial channel. The official channel is Meest Express, as Olena mentioned.

0:46:24.780,0:46:31.680

It's a Ukrainian American delivery service, it's run by Ukrainian expats. So it specializes in

0:46:31.680,0:46:39.120

delivering goods from the US to Ukraine and back and forth. Another option is that I use for another [drone] project.

0:46:40.620,0:46:51.600

I have people traveling each month and they bring us (probably you know them) these

0:46:51.600,0:46:58.620

software-defined radios [SDRs]. It's Nuand. They're also based in San Francisco. So we have people traveling

0:46:59.460,0:47:06.540

each month, and those are different people and so we can basically ask them to transport

0:47:06.540,0:47:13.560

some components, but obviously, it cannot be, you know, more than a regular bag.

0:47:13.560,0:47:20.820

So if we want "to go industrial" — then it's Meest Express. If we want to do it cheaper and in a more

0:47:20.820,0:47:31.620

reliable manner, then it's backpacking.

There is one more point. It's now better with the

0:47:31.620,0:47:39.960

foreign deliveries, but we used to have very strict and very capricious customs/border service.

0:47:39.960,0:47:47.280

It frequently stopped foreign deliveries. Now it's better, and we have kind of "our strings" to

0:47:47.280,0:47:54.600

to speed up the process, but it is another thing to be considered. [Olena] You also (if you can) should

0:47:54.600,0:48:00.300

indicate "used" on it when you ship, so that definitely helps. So you don't show that it's new but indicate as

0:48:00.300,0:48:04.560

"used" and you can actually maybe ship it to some kind of [teen] Robotics club or something like that.

0:48:06.180,0:48:10.980

[Hennadii] So let's solve this on a case-by-case basis. We have an installment or we do have

0:48:10.980,0:48:15.240

the parcel we need to send — you say that the weight is... I don't know [let it be] five kilograms

0:48:15.240,0:48:22.140

and the volume is the regular bag, and so we decide how we do it. So it's case-by-case.

0:48:23.820,0:48:35.820

[Oleksii] Starlinks get delivered to Ukraine by Nova Poshta and there's no issues at all.

0:48:35.820,0:48:42.360

[Hennadii] Actually, yes! And Nova Poshta. I have a friend who is CMO there. They just launched, several

0:48:42.360,0:48:48.780

weeks ago, the express delivery from the US to Ukraine. So we should use them as well.

0:48:50.940,0:48:58.140

Thank you, Oleksii, for mentioning it.

[Oleksii] I think they launched it pretty

0:48:58.140,0:49:02.700

much... Oh yeah it, was from Poland.

Now it's directly from the US, yeah.

0:49:03.300,0:49:08.400

[Olena] Where are they in the US? [Hennadiy] Who? [Olena] The Nova Poshta you've just mentioned.

0:49:09.120,0:49:17.160

[Hennadiy] I will find the link. So they had a big announcement about it.

0:49:17.160,0:49:19.620

[Olena] That's awesome! Thank you. [Hennadiy] Yes.

0:49:23.760,0:49:31.080

[Søren] And then my last question is: for trying to get video.

0:49:31.980,0:49:37.200

Is a Kamikaze video something that we could possibly do with?

0:49:37.200,0:49:43.740

Say, if we put set aside three of these drones, is that something that

0:49:43.740,0:49:51.840

might happen? [Hennadiy] Yes, sure. But these are great bombers! Why waste them for a Kamikaze video?

0:49:51.840,0:50:01.620

[Oleksii] You can have more tries with a bomber! 😊 [Hennadiy] Of course! In general: the Ukrainian Frontline

0:50:01.620,0:50:11.880

is starving for drones. So you will have no problem, trust us, having some of our alumni to do video for you.

0:50:11.880,0:50:22.860

[Vlad] But the main goal of this drone is bomber, not Kamikaze, right? [Søren] I mean, I think

0:50:22.860,0:50:28.320
it serves either purpose. I put the two cameras on because that makes it more versatile, but

0:50:29.100,0:50:38.940
it will work great as a Kamikaze as well. [Oleksii] It could be both and also a delivery platform.

0:50:40.320,0:50:46.440
It can take four kilos... [Hennadiy] It's just too good for a Kamikaze drone. [Søren] No no no.

0:50:50.040,0:50:54.900
[Hennadiy] Okay. Yeah, and more point. Thank you so much, Søren for being here,

0:50:54.900,0:51:02.340
for starting this project with us. We really appreciate it. I am expressing

0:51:02.340,0:51:08.640
(I guess) this on behalf of all of us in this chat and on behalf of Victory Drones

0:51:08.640,0:51:13.920
team in general. Thank you very, very much. We do really appreciate what you're doing for us.

0:51:14.460,0:51:21.960
[Olena] Absolutely. Thank you. [Vlad] Thank you so much. [Søren] Thanks for being willing to work with me. And

0:51:21.960,0:51:27.720
it's great when people can just, you know, connect over Signal and then start

0:51:27.720,0:51:35.040
making a project happen. It's really really great to do that and it's, you know, it can be

0:51:35.040,0:51:42.060
fun to just push forward a project that quickly. So, thank you for that.

0:51:44.580,0:51:54.000
[Oleksii] Okay, so it looks like we're all done. [Hennadii] The next big step for us is having the first

0:51:54.000,0:52:01.620
installment of the parcel from you, Søren. It's just, you know, for all of us to remember the next big step.

0:52:01.620,0:52:08.220

[Søren] Well, I think we can test the frame.
I actually really like doing that as kind of an

0:52:08.220,0:52:14.940

intermediate step because we'll order the
PCBs and everything but that's going to take like

0:52:14.940,0:52:18.960

three weeks so there's gonna be a bit of downtime, where there won't be much

0:52:18.960,0:52:24.900

updates happening. But I think we should try and get the frame manufactured there

0:52:24.900,0:52:33.660

and test it and I'll think about some other
things to be working on and also, if

0:52:33.660,0:52:40.680

it's helpful, I can send those like five-inch drone
parts, that I have, to you as well in that time.

0:52:43.440,0:52:49.560

[Oleksii] Yeah, so what I was also thinking is: we can test the delivery process. So it's basically

0:52:49.560,0:52:54.780

a lot of things here that should be discussed.
I think it would be useful for the

0:52:54.780,0:53:05.280

next meeting. However, let it be the testing process. So we have something in our mind

0:53:05.280,0:53:14.700

and it would be also great for you
to think about what data you need from the tests.

0:53:15.360,0:53:21.600

And also: delivery. We can try delivery

0:53:21.600,0:53:29.880

in various ways. Those ways [that] are available for us right now. What else?

0:53:31.860,0:53:34.620

I don't know, I think they're
going to come up right now.

0:53:36.780,0:53:37.500

so

0:53:40.260,0:53:49.980

Yes, the delivery and that's the procedure that Vlad mentioned — the way to make a frame here.

0:53:49.980,0:54:00.480

Because you're just basically cutting from the formula middle carbon.

0:54:00.480,0:54:07.440

I think we have hard cutting facilities here. They most likely will use

0:54:08.940,0:54:21.300

lesser grade carbon. Yeah, less quality. But we can try that, why not?

0:54:21.300,0:54:27.780

Because the frame will break first, that's most likely, yeah, maybe motors [as well]

0:54:29.100,0:54:31.920

Then something these people smoke. So, yeah!

0:54:34.620,0:54:40.800

[Søren] They're FPV drones — everything's gonna break, right? But I think the frame will be fine with

0:54:40.800,0:54:47.160

lower grade carbon. It doesn't need to be t700, or you know, whatever you have.

0:54:47.160,0:54:54.600

I think it's going to be a very strong frame either way. [Oleksii] I think we can try this as well.

0:55:00.060,0:55:07.740

[Hennadii] Okay, any follow-ups then here on Signal and I will send you the link to a video.

0:55:09.780,0:55:12.840

[Søren] Sounds good. Thank you very much.

0:55:13.440,0:55:16.680

[Everyone] Thanks. Bye