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Hello everybody and welcome to the max frequency podcast I am your host max roberts and I am joined this time at the distinct pleasure of being joined by John, let him in from digital foundry.

Hi John.

How are you?

Why hello there max.

Thanks for having me on today.

I'm excited to be here because Yeah, I like what you're doing over there with the podcast.

I listened to it recently with Cory Yeah on there from my life and gaming good friend of both of ours, I guess, you know, so yeah It's my turn now it is I've been It's it's been a it feels like a long time because it I asked you to be on the show Right before I had to go on a work trip, which probably wasn't the smartest my end and then you had gamescom and you know a trip to Japan so it was just been it's just not been a It's not been the best time so far so now right before Probably one of the busiest October's in a long time.

I'm been able to get you on So I really appreciate you taking the time to talk to me.

Oh, absolutely my friend.

I'm happy to be here.

So Let's get into it.

Yeah, I In doing and digging into to you and your work.

I've been watching gosh I don't know how long I've been watching digital foundry.

It feels like a very long time But your your voice has always been a constant that I've been listening to and it makes sense because you started back in May May of 2013, so it's been 10 years which anniversary.

Yeah Yes, thank you.

Thank you.

Yes, it has been a long time and I noticed that it seemed at least the first Article I couldn't even find a video So I guess it was an art of the puppeteer a tech analysis.

Yeah, I can't I can explain that it's simple I mean when I joined DF, well, we weren't really doing videos like this, right?

You remember the the turn of phrase pivot to video that was all the rage during that era Well, that's kind of what I helped do in 2015 was you know Like it's time to pivot to video Richard wanted to do it as well and we just did it But before that everything was mostly just articles written out with supporting video files as in just here's the raw data In a video check it out not very interesting, but it shows the work so to say great Like the real meat was in the article, which is so interesting to think of that that was how a very technical information was covered instead of it just being a video because when you think of a frame rate analysis or Resolution or you know pixel counting or whatever you were doing reading about it doesn't sound like the Logical place to dig into it.

Well, I mean, you know, the internet was a different place back then I would say Yeah, and like consuming video content, especially high-fidelity content wasn't even really It wasn't very good on YouTube I would say in fact most of the videos we did post during that era were hosted locally on Eurogamer servers Because we could actually spit out higher quality video files through that on-site player as opposed to YouTube itself Which you know that was useful for us But I mean, that's just how it was that's how Richard started it when he when he really kicked off the whole DF thing Although DF itself started out as something else first before it turned into this sort of game tech analysis Whatever it is now kind of channel but Yeah, it was pretty much just a site based thing that you read about and I was a fan by the way I I read digital foundry.

That's that's the whole reason I'm here really it's like oh I like this stuff and it was it resonated because this was the kind of stuff I was actually doing on my own or with a friend of mine where we would like Load up games across multiple formats and just compare Including especially the retro stuff actually we would have multiple CRT's out and just like hooking up all this stuff and like literally directly comparing it in real time and I love doing that stuff.

I always have and so it was a natural fit It does it sounds like it.

I remember I don't remember when you specifically shared this There was the first video on your YouTube channel you recently I think tweeted about it and recently could be months I don't know, but it was a project Gotham racing loading times And it's just this pure video of just this is how long it takes for this game to load and I I?

It's distilled digital foundry Yeah, so I'm I can't remember the exact circumstances, but I suspect I was in a conversation on a message board Probably neo gaff or if it was just regular gaff back then.

I don't know But we were probably talking about loading times And I probably made a point about it and filmed it and it was like here This is how long it takes for the full grid of cars Yeah, I remember being annoyed by that Yeah, exactly the description is just pgr3 loading times.

Yeah, it's like It's and I you know I watch it so it's a minute and ten seconds just because it's it's so goofy I'm thinking about it today in today's context of the SSD and you know a game like God of War Ragnarok loads in like two seconds and it's in you know so much more detailed and larger than project Gotham racing or Comparing it to a car game.

I haven't played for a horizon yet But if it's anything like Gran Turismo 7 in regards to load times, I mean That's pretty mean for a motorsport not horizon, correct for it's actually noticeably slower than it is with seven, but it's still pretty fast.

I would say okay Perfectly acceptable, but not like instantly gt7 is but it's pretty crazy still they're both They're both real fast compared to prior games.

I would say honestly ps3 360 That era was one of the worst for loading times outside of the old disc floppy disk days or the tape cassette days That was bad.

That was real bad that era loading times were not good in so many games.

Yeah, it was They were because they weren't they reading off the disk and then sometimes There was a bit of that but it's just by that point The amount of memory in those consoles grew to be too much where you couldn't actually pull the data off the disk fast enough Right like the ps2 era loading times even though people sometimes complain.

They actually not very long in most cases Most games load pretty quick.

I would say and it's also true of PlayStation Saturn era as well Loading times are not that long.

They're slower than cartridges, but they're really not that long It really was this ps3 era when you're having to fill Significantly 256 megs of system RAM or 512 total on the 360, you know It takes a long time if you're running off an optical disc.

Yeah I'm kind of it's similar issue in this vein of Thinking about it from 10 years ago where things were running off the blu-ray disc and hard drives and And loading and things like that games movies DVDs That's right.

Yep.

I forget I always forget that But thing it feels like things have changed a lot and maybe they haven't maybe they've been like this on PC for for a lot longer because it feels like things trickle down just from PC specs to the consumer level on consoles, but a lot of things have changed on the tech front and I've imagined I've increased the scope of what you have to know about and cover when you're looking at a game for digital foundry from Oh resolutions to now we've got ray tracing and loading and sound and Frame rate ranges out the wazoo right now with VR are being in the mix so things are fluctuating but being covered up like I'm curious how you stay on top of it because I feel like it's a lot for me to read and learn about it, but you have to almost Be an expert in a way or at least know who to ask to find out That's right.

Yeah, it is some it's a challenging situation, especially because the focus our coverage has changed When digital foundry first started it really was just mostly about the resolution in the frame rate, right?

That was the main thing and Hasn't been that way for a long time We started shifting away from that back when I was pretty new and we were still doing articles.

I remember doing those Big pieces on like the order 1886.

I did one for rise son of Rome you know where you kind of look more closely at the visuals themselves beyond just The resolution of frame rate and you know with modern games that stuff I think has become largely Irrelevant in many cases although With the rise of Unreal Engine 5 and its heavy demands.

We're starting to see some pretty low resolutions again So maybe resolution is becoming slightly more important again but you know For I have to keep up all of us We have to keep up with just like what's going on and that that requires reading a lot of white papers like looking at all The GDC and SIG graph presentations that developers are giving Talking to developers wherever we can, you know, the ones that are open we can ask some questions, you know I dabble a lot still and in unreal engine myself just to familiarize myself With how certain things work and kind of gain an understanding of what it takes to do certain things although I'm not building large-scale projects mind you just small things but it gives you an idea of how certain things are implemented or the performance costs or what it takes to make this work and Trying to take all that knowledge and then distill it down into an entertaining video presentation It's really hard I try my best I think It's it's yeah, it's tough, you know, I do what I can but I always I feel like I'm not doing enough But I still I try to get all that information in there without It being too much because it's not a it's not a tech presentation and furthermore in a lot of cases We're still have to hypothesize things because we don't especially pre-release We don't have access to all this information, right?

They haven't shared how things are done yet So you can have to look at other things and kind of extrapolate from what one developer a certain type of technique is using and Figure it out from there or you just get used to certain telltale signs of like oh, yeah this This type of effect or this style of reflection or this type of thing looks a certain way that is reminiscent of this other thing And it sends you down that road.

So yeah, there there is a lot of research that goes into writing the script I would say in many cases I was just thinking about Because you mentioned unreal but then my brain started going to proprietary engines in-house engines, you know and That I that's got to be even more guesswork.

So out my brain as I'm a huge fan of NautiDocs games I've read a lot done a lot of research and things and so my brain goes to How do you how do you dig into that?

And I guess you're you're looking at previous releases.

So on the last of us part one comes out, right?

so then you're looking back at part two and charted four and I guess you're Sort of yeah, but there's also just there's you can see even if you don't understand how something is done yet You can still point it out and recognize Oh I rec this thing that they're doing here is really interesting and or impressive and even if we don't yet know how they've Accomplished it it's worth pointing out and basically highlighting it for the viewers to say like, okay Take note of this thing because this is actually really interesting and here's why it's interesting Mm-hmm, even if you can't explain How it's not doing it or why it's doing it.

Yeah, exactly in a in a proprietary engine in a pre-release state You can you can hypothesize and point stuff out, but you won't necessarily know a hundred percent how it works I mean and usually, you know, I've gotten pretty I Think one of the better examples is remember the spider-man puddle gate.

Yes Right.

I Was happy to learn that I laid out my hypothesis of what was happening And then I think quite some time later in a presentation somebody from Insomniac confirmed that it was exactly right So I was I was happy That's I feel like that's a thing that does this happen a lot when you go back to say a GDC presentation about a game years later where the developers finally opening

up about well, this is how we did certain Puddles and reflections or ray tracing in spider-man, you know, what was that was 2018?

Spider-man, yeah, that would have been the ps4 one, right?

So Say there's a GDC talk about that years later.

Is that is that something then you go back?

You'll end up watching and retroactively realizing Absolutely.

I love to go back and watch those Yeah One of the more interesting ones recently was actually Final Fantasy 16 because they were doing something really wild with the shadows They kind of behaved like ray traced shadows But at other times they didn't and I was like wait are they are they using ray tracing or not?

Like what are they doing?

And it was some some really weird.

I can't remember exactly what it was, but It's not actually ray traced shadows, but they're doing something to allow them to produce close range shadows on characters and stuff that actually Behaves a lot like a ray traced shadow would so they get this super fine shadows on like, you know small details on the character model So, you know and they they finally shared a whole presentation just about that which was great.

That's so cool That sounds so Niche right to dig into just the way a shadow works in Final Fantasy.

Yeah, but It also sounds really cool from a tech perspective by not tapping into ray tracing which is I would imagine more technically expensive like tax always Okay, absolutely.

Sometimes it is sometimes it's not it usually is more expensive, but there are certain operations Where One example if we're still talking spider-man, it's fresh in my brain since I just covered that In spider-man 2 for instance in my video.

There was a section about building interiors So they did this wild thing where if you look inside any of the skyscrapers like the buildings or the the rooms inside the buildings I have actual 3d space now Before it was just a cube.

It was just a cube map, right?

There's a flat texture that was designed to be decorated like it was an interior like an in like Basically a projected cube map inside the buildings and there was a clever parallaxing trick but you could tell the limitations pretty easily where here it's like you look at every room and Not only are they actually moderately detailed But there's sometimes animated characters inside the rooms and the shadows from outside the room are projected perfectly into the room Like exceptionally clear and you're just like what the heck like, how are they doing this?

But if you look really closely you can actually spot some artifacts and I noticed wait a minute.

There's like these checkerboard style patterns Inside there, which look a lot like the the same checkerboard pattern with the ray traced reflections, right?

So what I think they're doing there is actually Drawing these rooms in the BVH structure the acceleration structure, which is where you know, they would trace the rays into right?

That's how ray tracing is feasible.

They're using like a facsimile of whatever the scene is like the whole city world and trace into that And it's simplified versus the at what you actually see I think they're tracing into boxes that are then projected onto the textures on the sides of the buildings and I think that's actually faster in this case because If they were to actually do real shadow maps and all the stuff through transparent glass and all this all that geometry rendered I think it would be super freaking expensive and then more traditional way like using like portals and stuff like that So I think by using the ray tracing features that they already have implemented for reflections They found a really fast way to generate create the illusion of there being real rooms behind all the glass That's so dope.

That's a case where I think ray tracing is faster than You know some traditional rasterize techniques which that rules I love that stuff Yeah, that's so it's so neat and it's interesting to see what?

In the context of spider-man which at least spider-man 2 at least at this time is a ps5 only game I imagine within two years it will come to PC which seems to be the current cadence for For PlayStation exclusives, maybe even less time.

I think horizon was only 18 months or so, but it's interesting to see what they come up with to work within the limitations of the console hardware which At least currently for PlayStation are all the same across the board until some sort of pro model comes out given the rumors exactly It's cool to see what they come up with within these Restrictions which is crazy to think about restrictions for a what are we three three four years under the console's lifecycle?

I Mean yeah, but yeah, it's 20 it was 2020, but you know, it's just the with the way hardware is You know what they're trying to do.

There's always gonna be limitations But a lot of the best stuff comes from working around those limitations so another aspect of Your work at Digital Foundry is like the whole retro.

It feels like the whole retro section of DF retro.

This is very John That's that's mostly me.

That's right.

It's John's baby Alex likes to dip his toes in there with some some time capsule PC stuff, which is awesome But I got I like I convinced I convinced him to get it back into the CRT game and I think he he's very happy Everyone should come back to the CRT game.

Let's keep him alive.

I agree.

I agree so In looking at this because I've been you know, I want when the new ones come out and stuff But I don't remember watching DF retro from the beginning So I went back to find out what the beginning was and it seems to been quake on Saturn which is a port but then a little digging deeper you actually had like the the port corner with Yes that game called Hexen hexen on your own shadow.

Yes, so clearly a lot of love for the Saturn here in the early What would become DF retro and then is DF retro and it was like a five-minute video?

but today a DF retro video is an hour if not longer and you're You said in the beginning of the quake one?

It's a great way to archive clean direct footage from classic games running on real hardware Yes, but now it's so much more than that with you filming the products and magazines and CRT shots and giving like deeper historical context for the game you're covering and Why it is the way it is and what that means and implications later on so You're basically a documentarian Yeah, that's well, that's my goal.

Anyway, yes how I There's so many questions of you know from how you capture it which I want to talk about a little bit later to just how do you sit down and you you plan out a video like you're You're like I want to cover this and it seems to me to balloon up to Way larger than yeah, I would imagine I love it.

I love watching it, but I how do you just approach a DF retro video?

Yeah, it has actually kind of changed because it did start out fairly simple and focus on like single games and But yeah now it's more when I when I talk about something it's mainly because I'm also obviously very interested in that topic and Once I start researching or if I already have knowledge from prior research there's just so much there and I find that stuff so interesting and My idea is like when I talk about a game series a type of game, you know Whatever topic I want to present.

I want to take the viewer on a journey to try to help them Experience that feeling of being there at the time and sort of recreate some of the emotions around it you know build the ephemera if you will around it and Then eventually it's like alright once you once you've got that It's like now we need to go into like the nitty-gritty about about the game itself And then we look at the versions and I just want to be this like complete I want to provide a complete experience to answer all the questions that I would want answered about certain topics Basically Like the road rash video Which I spent way too long making for a couple different reasons That'll come out in public soon.

I know it's just Richard waits because of scheduling and I haven't had time to do more big DF retro is but That started out as like a simple thing like yeah, this won't be too much and then it just kept growing like the more I investigated this stuff and the more I really dug into like and it turned into this whole retrospective looking back at like the grunge scene in Seattle and like kind of comparing that to how the rise of EA on the Sega Genesis with their yellow tab and I kind of tried to link the two together where it's like EA rebelling against the publishing giant Sega which is funny to say from 2023 of course, but at the time, you know EA was smaller and That was like their way of rebelling and doing something different with their unlicensed They're not truly licensed you know games in the Genesis and Tried to like link all this stuff together like the the attitude of the grunge era and like EA's and play into the Genesis space and then what eventually gave rise to Road Rash and Then that loops back around when you get to the 3do era and like all those kind of like bands come together Within Road Rash on Road Rash 94 and like the whole aesthetic it's just like this perfect fusion of all that stuff and You know and then eventually you got to take people through through the whole thing into the 90s as the as the series changed and shifted and explore why I mean I get into some of the 3do history itself and why it is the way it is and and what they were trying to do there and It just becomes this whole story thing Cuz if I just jump like oh, yeah, and then Road Rash came out for the 3do and I start

talking about it I also want to provide the context of like What the 3do is but also more like what?

Why is it interesting put what what was going on at the time?

I want to put people in the headspace of it It's not just about saying this is what the 3do is It's about this is what?

It was like to be around at that time when those games were coming out and try to create that not that you needed to be You can still do awesome stuff without actually being there but I do like to leverage my own memories as well as you know, Data that I've since learned to create that experience And I don't know.

I find that stuff really fun to make myself And I think people like like it.

So that makes me happy.

I like it so you at least know one person does I I think context is so vital to Understanding the why and the how of something I Have a journalism degree So naturally just telling the story and getting to the truth or anything is built in to the way I am but you know the 3do is a really Interesting example just because it was this console that was trying To do something different and I honestly don't know a whole ton about it I just bought my own 3do actually because of way of the warrior naughty dog again, and I picked up a copy of that that was super clean and was like well now I need a way to play it.

So that was so I'm excited to dig into that and learn even more about it, but then you understand that Why you know what consoles were doing and what markets were they trying to tackle or features?

They were trying to leverage Another game that I just learned was a 3do game was this the plumbers was it plumbers don't wear ties.

Oh Yes But I just learned about that because limited run is doing a re-release of it I know I'm in the I'm in the documentary I saw you in the trailer and my good buddy Audie is one of the main producers on that Yes, I can't believe that exists see and then but I feel like if you just look at this is a Bad game, you know really cheesy bad type of game at the time and you just without the context of why it is The way it is how it entered into this meme Pop-culture II state, you know the things like the angry video game nerd which are then I was watching that video So it's like my own rabbit hole journey yet.

I think context is very important So I appreciate that you you take the time to take a viewer on there because you could just throw up This is what Road rash looks like on the Genesis This is what it looks like on the 3do and so on and so forth But you even go into the book the novelization of it, which I think is really silly.

So yes Context is right.

I like it.

Keep it up Thank you That's what makes it worth doing for me at least because I I love going through that stuff as well Mm-hmm, because I learned a lot of things while researching this stuff as well I just like to go down these deep rabbit holes and it just I love that stuff.

So it's just me sharing what I find interesting about game history, basically Do you do you ever have to pull yourself out of the rabbit hole and go I can't go that deep for this video Or do you just go as deep as you you end up going I'm actually trying to work to reduce to to pull back a little bit in some ways It doesn't always work.

But like I think I realized I went It was a little bit of a different project, but there was a time when I was like, you know what?

I should just do the do a video covering all the games that were 1080p on the ps3 That would be fun the PS triple baby.

I actually thought this would be a pretty easy video But then because I was like, oh, yeah beyond 3d has a list of games that are 1080p except for it turns out that list is Hasn't been updated very much for a while and it was great, but it's missing so much so it turned out there was a lot more games than I expected that were 1080p and the figuring out all of them like I probably missed some but the amount of work I did to like try to figure stuff out was Super time-consuming.

I think I ended up covering 88 games in one video It was like four hours long I remember that that went way too long and I should have known better, but I was happy I did it because It turned out to be a very fun rabbit hole to go down.

But my goodness that That was definitely one I was like, yeah, I may have gone too far this time.

I Trying to cover 88 games in in a video and also doing things like frame rate analysis and version comparisons on every one of them It really was like making 88s If I look back in my early DF videos from like 2015 was actually doing videos It was literally like doing 88 of those in one video No, rich wasn't like maybe this is too much Well, he's he really he supported that one and he actually helped me with capture a few of them It was great get some frame rate data where I needed it.

So It was you know, it was the was the ps triple we had to go all the way That's the silver way to go for the ps triple for Chad daddy, you know, what are you gonna do?

Well Speaking of the ps triple and capturing 1080p games and stuff, you know I was telling you and and listeners may will know that I just had try and quarry on from my life in gaming back-to-back episodes and you know talked about their setups and and all that stuff and your setup is quite It's quite the thing.

I was trying to analyze this picture that you shared of the the tink 4k and how you were matching the brightness with your CRT and your BBM and stuff and I was I was trying to figure out what you had and all this stuff and What was this I spy I wrote it down.

There's a lot of consoles in here I see like an analog NT and the Wii U I assume there's a dock a switch dock somewhere and your Tower of Power Oh, yes, is you can't see the switch dock cuz it's on it's on the other wall to the left of the modern TV Okay, we're gonna rollers it you know, I see a ps1 and Your Xbox and all this stuff.

So I met you have quite the setup, but it's it's just one of the setups, too That's the thing.

I got three or four setups in the house My wife does not like that, but she tolerates it My my wife didn't really care for it either when we were in our apartment because I had everything in the office and some stuff Out in the living room, but now I have a detached garage.

That's I've turned into the office and game room.

So everything Except her switch and dock is out here.

So I have a dock in the house and then everything else outside Which is nice.

It's been pretty great but capture is so vital to what you do and Yeah, and I've just rewired everything.

I'm preparing the way for the tink 4k I just got like an extra on switch and all that stuff.

But like how how do you do it because I feel like your setup has to be so I Complicated maybe not the right word, but there's got to be a lot of stuff going on.

I Tried to make it pretty elegant it's not as complex as Corey who has more space than I do and The man just went insane and I love I love his setup.

It's great.

Yeah, but yeah, so The main thing is I kind of have to split it between modern consoles and retro consoles.

Okay that they're both Important to capture and they kind of work a little differently So I guess you could say see here So the heart of everything really is my AV receiver Because that splits out all the HDMI inputs or that accepts all the HDMI inputs and sends it to where I need it to So I guess you could say so obviously started that end of the chain so you get the AV receiver It has multiple outputs on it.

One of them goes to my main TV the other runs to an atomos ninja 5 Which then has its own output which then runs into?

My one of my PC capture cards which then has its own output which then runs into another sort of a preview monitor as well so that's also basically Everything gets fed into the receiver and then it's fed through those multiple capture devices And I can capture either on my PC which is what I need for frame rate analysis or just directly on the ninja 5 if I Just want b-roll So it's all about piping it there the ninja 5 captures video.

I'm looking at it right now Absolutely does it's like a little screen Yeah HDMI input and output and you use SSDs in the in the back you slice slide them in And you just capture in ProRes which is perfect for editing.

Oh my gosh, this seems amazing.

Oh, no That seems really so does the the AV receiver it does simultaneous output then What it would be the way you do.

Yes.

Yeah, it has zone one zone two and like a third just like secondary output.

So You can output three different You can clone the signal basically three times if you want So that your receiver, okay, that feels like it answers one of my questions like that I've had in my that I was thinking about which was how how do you tap into?

Using modern features like VRR or black frame insertion or something like that without messing it up the capture end of it Well, that's because this this AV receiver the way it the way it works is that You know it auto Automatically limits the input based on what current displays are turned on so when I fire up the receiver in my OLED TV and Leave the ninja 5 turned off I get full HDMI 2.

1 120 Hertz 4k VR all that as soon as I turn on the ninja 5 However, the receiver knows that and that then sends a signal to the device So like if I'm if I got a ps5 is running VRR is on everything turn on the ninja 5 it'll literally instantly switch back to a HD to an HDMI 2.

0 Mode so like the ps5 then changes itself to be just 4k 60 VRR goes off all that stuff Right and it's all automatic based on which monitors are turned on so basically anytime I need to capture it is turn on the ninja 5 and everything just sort of Jumps over to work properly Right.

It just like downgrades this the signal output to be what it needs to be for the capture device And when I turn it back off Everything goes back and that's thankfully the consoles auto-detect It used to be more annoying with the PlayStation 4 because it would always Reset itself and you had to go in every time and manually choose the settings but with the new consoles, they're pretty good about not doing that so They just kind of adjust themselves based on what the receiver is telling them Because basically when I turn on the ninja 5 then the AV receiver is basically reporting that hey I can't do HDMI 2.

1 right now and the console then would know that and it'll it'll see that Oh, this thing doesn't support HDMI 2.

1.

So it sends the lower signal Gotcha, right.

That's so smart.

It's it's pretty elegant now, I think so I don't have to do any fiddling or cable changing or anything so then what about your retro stuff so then that also feeds into the AV receiver by way of The tink 4k right now, which is I'm still using I'm using a prototype unit at the moment.

Mm-hmm and To get to that So I have a G scart sw and a G comp as well and You know with my shelf I don't have every console and I have some upstairs as well but I have most of the consoles I would care about on that setup and They're either running SCART or they're running component And it goes to one of those From there then the the output splits so for the SCART G SCART, of course has dual SCART outputs I Have the older one so it has an in DE 15 output and a full-size SCART okay, and the way I split that is The full-size SCART goes straight to my B&O of the banging oliveson screen that I recently added It's good that just has direct SCART input.

So that's just SCART to SCART and for the the the BVM and the tink However, I have one of a small I got a small version of one of the extra on distribution amps I didn't want the gigantic one because it takes up so much space So I found a smaller one that they sell and I run the DE 15 from the G SCART into the extra on and then the extra on then outputs To both the BVM and then to the tink 4k Okay, that makes sense and then you can get it on This the CRT's or the PBM and then and onto the OLED and on the tink I'm actually not using the SCART input now I'm actually using a BNC to HD or H Whatever the DE 15 yeah connector so it's like the VGA style plug.

I have a cable that runs that to that and that talking with Bob and all them I actually wanted to make sure of this because with the way a BNC is like sometimes it's like the voltages or whatever.

It can be a little bit too high things are Depending on what it's intended for and the extra on does a good job It's sort of regulating all of that and sending out a signal that's safe For the retro tink as those pro monitors you can send you can send some crazy stuff into them and they're fine But like more consumers hardware you can fry it if you're not careful So the extra on device does exactly that and it sends a nice clean signal to the tink 4k which then outputs its own thing for HDMI which you know for capture and Then to so I have both of those CRT's running and if I wanted and I've done it before I can then daisy chain more CRT's in via BNC on on the pro monitor or also through the last extra on output But I don't have enough room here for that.

So I only have the two the two CRT's currently and I think that's enough Yeah, and could component video works similarly Where I actually don't send component video to the BNO because that does not support component That's RGB SCART only and I've not found a way.

I Haven't actually bothered with exits.

It's fine.

If I'm using component video, it's usually Sending it to the tink and then the BVM and that's fine.

Anyway, so right That is I love it.

I love because I just With the extra on that I got and I got the I got an eight four.

So it's got eight.

I have components so just up to eight component in and I think four out and I'm I used to be daisy chaining and just unplugging and replugging in, you know swapping these cables all the time And so it's it's such a relief to just have it work And they go into I have a I have the 5x tink and hoping I'm saving up to try and for the the 4k as well So then I could have it go to the TV but also stream with the five.

It's a it's gonna hopefully be great so I'm just I love hearing about how people hook all their stuff up because it's Interesting.

I learn a lot and it's it can be tricky It is tricky and but it's fun.

I like doing that and the way I would set up now I can just turn on any device and it just works.

I don't have to turn any change any settings It's all automatic.

I mean, I guess if I want to switch between component in RGB I have to press one button on the medium to select the input and that's fine The B&O is all automatic detection via SCART.

So when it detects a SCART signal just goes That's great.

And then upstairs.

I also have more so in the in the one area I have two more Sony PVMs up there one is in vertical mode for tatte and the other is yoko and horizontal and they are side-by-side And that allows that's mainly where I use the mister, okay, but I also have a couple other things up there like laser discs the CDI is up there the Nuon is up there You know important stuff like that the real I also have one of my super guns the super gun The main super gun is up there and I have like a table so I can use arcade boards Directly through that super gun.

So that all goes to that setup and then in the other room in the guest room, I have another setup where I have the FW 900 hooked up with a VGA input and right now I just have the modded Xbox 360 on there But you can use other stuff as well because obviously that's you know, you get native output 720p right to the to that monitor.

It looks amazing It's the best way to play like 360 and ps3 And then if you turn around I also have another PVM up there with just it's got a twin Famicom on it and a PC engine This it's just like an extra place to chill if you want And it's there for any guests that stay Staying at your place sounds like a lot of fun Yeah, you got that and then I have other I have two other 20 inch PVMs and two nine inch ones That are not currently like in use and they're like in the area But one of them needs repair actually two of them need repair and just you know, I have enough I can't I don't have more room for more setups There's their basic backup.

I don't know if your wife would sounds like maybe not allow more setups No, there's no There's no more room to go from that point So between all of that and then you know, I even have like another second portable mister setup mounted on my wall Where I had some extra space just because why not?

Is that where you have a little the arcade stick?

Yeah, I have an arcade stick there and now I'm using a an OLED screened with a magnetic back so I can rotate it just by you know pulling it off the magnet and That's pretty cool That's also pretty good for mister because yes, I have two misters in here rocking them out I'm using upstairs.

I'm actually using the mister multi system that retro man cave and the company I'm forgetting on the name put together and That is so awesome Consolizing the mister experience into something like that Is a huge huge deal and it makes it much easier to deal with because the the standard old-school mister case is just like yeah You got ports on every side of this thing and it just looks horrible Yeah, that's someone of my I have I have a traditional mister like that I do have it in the aluminum case for the heat.

So I don't have a fan or anything, but that's good at least.

Yeah the The like one side is up against the the shelf.

So there's just no USB I think that's where I put all the short little USB dongles for like Wi-Fi or Bluetooth kind of so that they're but it's you know, I've got the the cord going to my keyboard like it's just out and dangling and if I hook up the Snack adapter and it's just yeah, it's not very elegant No, miss not at all mister's very Just DIY in that way of just like it just exists I Mostly just use it for arcade stuff at this point.

That's that's my favorite use case by far that and x68000 and MSX because I don't have originals of those so that's That's really great.

It's been my tool for playing analog consoles that I don't have digital solutions for and it just feels like the mister is getting better all the time with the PlayStation core from what's that a year or two ago?

And now we're getting the n64 core, which yeah, I believe that's that's honestly nuts.

It's bonkers, so that's that's been a nice just fun thing to have as another way to play these things or play stuff because I don't for example, I don't have like a ODE for the PlayStation so I can just play things that I don't have necessarily that way and things like that so the mister's great mister's fun, I wanted to ask quickly just how's the tink for cable and I talked to try about it a little bit but you're the second person I've been able to talk to that's able to you know has a prototype and is you using it?

I'm just how has it been to have a true?

4k scaler like that.

Um, I would say for the lower res 240p consoles it's very nice for the masking and everything you can do and the black frame insertion that has built in I mean, it's it's really really good but I won't say it's a complete game changer on that over the 5x.

The 5x is still great yeah where it really makes a difference for me is its support of things like VGA input and HDMI input because it allows for much very flexible high quality scaling of the types of sources the tink 5x really wasn't designed for so like, you know retro PC capturing for instance is something that's really important to me and the tink 4k does it beautifully it's a huge it makes a big difference it's really really useful and then being able to scale like, you know, 720p games from like older HD consoles nearest neighbor scaling them to 4k.

It's gorgeous.

It's exactly what I've wanted TVs don't do it, but man is it good yeah, I'm I'm looking forward to it for things like the PS TV or the Wii U or the PS yeah, so basically all of that stuff it basically covers a broader range of use cases that weren't possible on the tink 5x and I've wanted for a very long time and now it's here which is phenomenal but yeah I mean even if you are using it for the same stuff as the 5x like just the upgrade in terms of output quality and when you add in stuff like there's all the the new masks and filters and the tweak ability of all of that.

It's pretty nuts.

It's a really great device so far Mike just really he's up.

He's outdone himself.

It's truly the man is a genius he is it's absolutely absurd to see this stuff that he's been able to pull off and even the things that he's been able to retroactively go back and add to the 5x even before the 4k started full development just he what he's been able to squeeze out of the 5x and beyond that he also picks the right people to work with like he brought in Mark from blur busters to help out on several features and mark is an absolute expert when it comes to anything motion related on displays nobody knows more about the stuff than him and Mike went right to him and they helped he helped share some of his algorithms and techniques for things like implementing black frame insertion the pulldown the 2x2 pulldown technique which actually allows like say 30 frames per second interlaced content to behave as if it were actually progressive in a very simple explanation, but yeah break it way down but it's it's really really cool all those features.

So the tink is just in a great spot Yeah, I'm looking forward to it.

I'm very very excited to Save up and get one eventually and add it to the setup and then have it For now be what I want until I get something else that makes me want to do Something it's hard to imagine like them going much further than this though.

That's the thing the scaling side Yeah, I can't It's gonna take something else to Like there's not much more you can do.

I think the only thing I would add on top of it is what uh?

Dan and them are doing with the direct HDMI mods.

Yeah on Consoles like that stuff is combining that actually is really interesting.

But basically being able to get that perfect Digital output from a console that I like you eliminate eliminating the analog from it completely is really awesome I remember you shared a Picture of Metal Gear Solid 2 you were using the jam on the ps2 into the yes And it's actually I think you'd shared that right around the time that Konami confirmed that it was Basically just 1080p I think for America saw two and three in the collection.

It's seven 720.

Oh, it's 720 I thought that was just switch.

It's 720 across.

No word.

It's 720.

It's scale.

They actually have a little asterix where it's a scaled up to 1080p Okay, so that was I've seen the foot.

I've seen direct capture from ps5 and it's just 720.

Oh boy It's the same as the ps3 and 360 HD collection, which sells me that they you know They just had what blue point produced and they couldn't modify it much Yeah, and maybe they just built a wrapper around that port Makes me that makes me wonder what they're going to do with four Assuming there is a master collection volume two and it's as Metal Gear Solid 4 in it What how they would Get that off ps3, I guess it's the only one exactly But anyway the Metal Gear Solid 2 screenshots that you shared off of a ps2 Pure digital signal into a 4k up scare.

It looks immaculate.

It's amazing So, I guess that's what's next digitize everything absolutely, oh man there was kind of one more ranging topic I wanted to talk to you about because I I think I feel a lot the same way as you do I think and I've been a little frustrated lately and I think you have been too, but it just the physical media feels like it's going away and Just more and more stories come out and happen and bum me out like Alan Wake 2 or the like a dragon guiding games.

Those are digital only So they're gonna be straight digital to home consoles without physical releases Up until limited run for example just announced their physical versions of persona 3 & 4 those were digital only from Atlas, but then We have console shutting down digital stores like the 3ds and Wii U just shut down this year 360 I think is next year things are just disappearing it feels like and I Don't know.

Yeah, how do you feel about all this?

I Mean, I don't like it.

Obviously, it's not I mean I think so the thing about It's more than just preservation, right?

I wouldn't say physical media really by itself is actually what I would consider true preservation true preservation is actually digital but a Non DRM version of the game that can be saved and stored and archived Yeah, that is what we need for actual preservation But of course, I'm not gonna get that with console stores because they are proprietary Unless the console is hacked.

That's also a problem So like the Xbox stuff Xbox one for instance and up it has not been hacked As far as I know which you know good on their security, but for the future It could be bad yeah, but yeah, that's I Do worry about that kind of stuff just disappearing the closure of These sort of like bespoke console stores like so far.

It hasn't been a disaster simply because of well the pirates You know, they've had to once again save save the day as always and in terms of you know Downloading this stuff and making it available It sucks that that's the only way that we can kind of get there, you know.

Mm-hmm, but that's kind of where we're at right now And it shouldn't have to be that way and but there's a risk of that becoming more difficult as we go forward And that's that's the concern Yeah it There are Some like at least temporary glimpses of hope Recently PlayStation just revealed the revision to the ps5 Slim I suppose I guess it's ps5 slim is what the community will call it.

I suppose but the I I think maybe everyone assumed this.

I'm not sure I assumed at least that that detachable drive that was rumored Was going to be external and in fact, it seems to be an internal sort of You just kind of plug it in on the inside and then put a plate over it Which turns it into a ps5 with the disk drive, which seems really cool.

Yeah but You know, they clearly it's just one ski that they're producing and stuff, right?

And I in this case after seeing the way they implemented it I get the feeling it's more about simplifying Manufacturing than anything else like they just went ski.

They're making yeah, they make one one box And one drive and you can either sell them together or not But like there's no it's not two separate machines that need to be made They and I think that is obviously going to be a money saving on the manufacturing side We'll see what actually happens because it is still effectively being sold the same way the current ps5 is Where you have the the the main version with the disk drive built in?

Only it's you know now detachable but it's effectively built in and then you have the digital one and the difference now is you can Add the drive to the digital one so I Have some concerns, but it doesn't seem as bad as I had feared We compare that to the leaks from Microsoft with

the FTC files and there's at least at one point a vision of digitizing the series acts completely And making it adorably all digital Making it look like just a cylinder there was a quote in those slides.

I went through them yesterday and Obviously, this is just internal marketing speak It's not actual quote from a user but it's the quote was Xbox has made buying games digitally as easy and affordable as disk Plus I can play those games on multiple devices.

I already own X cloud streaming blah blah blah.

I don't miss my disk drive at all Which I don't feel like Don't feel like anyone would talk like that in the sense of no people been able to buy their collections digitally Basically from the dawn of the ps4 and Xbox one so if someone wanted to go digital all the way They've been doing that for the last decade I don't know about as affordable as dis it would I would think be It depends on the timing I guess because eventually digital games just get so cheap and on sale all the time I don't believe that you don't know I We on steam maybe you sometimes just crazy sales, but on the console space Not the big ones that's fair like you don't see that many like and this is probably why they would want them physical to go away because these things get cheap you know basically Physical console games sort of have this like curve to them where they start out expensive They sink down to like dirt cheap, and then they get expensive again in many cases not all of them right but like you buy a lot of these things used or just you know after they've been out for a while and it's super low price and you go to the actual official store and The price is not so good.

I just saw Someone post it was actually just cordon a post that battlefield 2042 is 69.

99 on the Xbox store right now my gosh and bad for 2042 is seven dollars on Amazon right now I Mean that you're you're absolutely right about that physically the physical disk version right so like why is that still?

69.

99 on the Xbox store Like you it's not gonna happen with the in-game disk version It's it's it has been sold that's obviously on sale right now, but it's been sold for so much less for so long and Like if you take that away, and what incentives do they ever have to really drop prices outside of very specific sales This right this is true.

Yeah So about that though these you know these physical Physical games being cheaper right at for certain periods and then years later It'll become more expensive like I saw a copy of Wii Sports for \$40 one day.

It's like what?

Why?

So they were everywhere But then you have examples I think of Halo Infinite, and I'm actually very curious if forts a motorsport is actually on the disc all the way But it's not see so then Then you're still dependent on a digital version essentially and the disc is just acting like a key Yeah, so frankly at this point.

I'll just say like when it comes to Xbox.

I feel like the battle is lost Yeah, they are their services company Most of the fans that are into Xbox they don't care about discs, and they push back against it anyway They're happy with game pass.

They're happy with with everything else there, and that's totally fine.

I have nothing against that at all But given that that is the primary audience it seems on the Xbox I don't think there's that many people left that actually even care about this stuff They have successfully made it so that most people aren't gonna really care about getting discs on their platform Which is you know I think that's what they wanted.

You know that's they'll make more money that way for sure.

Oh, yeah, but I Think it's a you know it does suck and it definitely for some of us like I have a lot of You know Xbox Xbox 360 Xbox one games on disk you know things like backwards compatibility most of my backwards compatibility Play time it's dependent on these discs right so like all of their platform suddenly goes all digital It's like well.

I can't use this anymore Which feels like a step back?

It's just I?

Understand them not focusing on it, but getting rid of it entirely Really annoys me And I think that's gonna have an impact because I do still think to some degree at least having a presence in stores does matter Like it does sort of color people's impressions of these things in a way that I think is important If you're completely digital when you basically get chased out of stores or barely present in them I don't know.

I don't think that that's gonna be great for them either Especially you know just coming back from Japan where like physical media is huge, and it's not about collecting.

It's just availability and pricing More than anything I would say because games are everywhere They are really easy to find and and you know the prices do drop more on the physical stuff pretty quickly Especially if you buy used you know Japanese used this basically like you know American GameStop Well, it's actually but it's a Japanese uses better than the unshrink wrapped GameStop new I would say but I can imagine but um Yeah, like I don't know I feel It just feels like cutting off some of their audience for no reason like yes the majority are probably happy with digital but I don't know it's Once they get on this path it feels like that's it There's no going back and the discs are just dead for the Xbox at that point if that happens But thankfully this was a leak this thing you know it's three years or four years however long ago this thing was Being discussed.

I guess it wouldn't it would be less than that given when the series X came out but Maybe this gives them pause Yeah, they haven't officially announced it right like maybe they like oh, maybe we should actually not do the all digital thing who knows but We'll see I'm hopeful that they can pivot at least in some way Maybe maybe an external detachable drive at the very least like provide an option it for now This is supposed to we'll see I am kind of I am happy to see Sony at least for now Sticking with it.

You know horizon forbidden west is coming on to diss the complete version of it and Final Fantasy 7 same deal so They're at least Keeping the disk based versions alive, which is yeah at least when they release the disc version.

It's uh It's like a complete game that you can install and play and yeah some games need patches Absolutely, but yeah, that's actually not true for the majority like the patches can be like quality of life things But what you have on the disc is perfectly fine And if years later you need to get back into it and play play it.

It's it's ready to go Yeah, I hate dealing with the digital stuff on if you had a console in a closet for like two or three years And you pull it out.

It's just a nightmare.

Oh, I can't The updates alone probably are Obnoxious.

Yeah, it ain't good I was surprised to hear you you remark that Physical scene is very alive over in Japan.

I just oh, yeah, I always hear about it I've never been but I always hear the space is so valuable So I guess I've just inferred that Physical would be less popular.

Oh and in that market, but you were just there and it sounds like stuff was everywhere yeah, the the sheer number of them it's uh, It's it's impressive and like I said, I don't think it's mostly about collecting games.

I think it's more about like Availability because it's like you just walk you just walk anywhere You're just gonna pass a shop that has a game that you might want like it's all over the place it's very easy like even the day I flew out is when East 10 came out and Sure enough is that the game comes out that morning?

I just go to a store at the airport and they had it and all the versions they had the extra merch all that stuff It's like alright You normally don't find that at airports in the US where you just can find all the like a game comes out and on release Day, it's at the airport store, right?

You can barely find that at Target here That's what I mean So like that that's how it goes on that front and I think it really is just that availability factor And then that's why there's a big use market there as well Because people are buying games selling them back and you know, it's cheaper in the long run than just buying digital and eating the cost Yeah, I'm hopeful that It'll stuff will stay around for Maybe another generation, but it does seem like it's we're just staring down the barrel of a an all digital platform going for it I hope I hope whatever switch to super switch.

I hope it has a physical component I do see I think Nintendo would be extremely dumb to Get rid of that Because they're their physical market is big They're the when I go to a target for example the the Xbox and PlayStation part of those aisles are pretty barren Not just the consoles but the games on the shelves or whatever, but the Nintendo section is always full You know, I found it's interesting how that varies like, you know because I visited these shops in Japan Europe and multiple countries in Europe and the US and the US is the worst in this regard or like the console sections are are Mostly pitiful a switch has the most for sure, but there's barely anything left.

It feels it's it's really like shocking Europe the stores are still like here in Germany, especially like the stores are still pretty packed with stuff Switch and PlayStation definitely have the largest sections for sure Xbox has definitely shrunk in recent years with the rise of the digital stuff PCs has a surprisingly large retail presence here Germany's like one of the only countries left where PC games have a big retail presence.

That's cool That's really cool.

Like it's really wild like it's it's surprising actually how much has going on Now, you know some of them are special German disc versions others are just codes in a box But either way there's still retail stuff happening, which is cool.

Yeah Makes me happy to hear it.

At least it's in other places and if you like Zimmi ladders, you know bow Zimmi ladders You like your farming Zimmi ladders all that kind of stuff Like they it's no joke.

They actually do have like dedicated sections just for that stuff It's they're very popular here Okay, this explains those Nintendo directs where it was just farming simulator after farming simulator Well, those are more like farming games like harvest moon.

I'm talking about the hardcore like oh your simulators like the simulator like, you know the Farming simulator construction simulator train simulator, you know, like fire truck simulator all that kind of stuff like Airport simulator It's that type of thing.

Oh, that's the sim sim the big That's so so are there like rigs and stuff to you to buy with it like here's your tractor controller or your semi trucks Yes, 100% They do they they do have the the the farming simulator controller It's got like a wheel with the little peg sticking out so you can kind of wheel it around quickly It's straight up has that those are actually in the shops and it's it's it's hilarious and awesome That is so cool.

That's basically the German equivalent of like denture to go You know where it's like you got the training controller there.

It's like here.

We've got the the farming simulator controller That's so cool.

I never would have thought that or done that That's that feels like a story like someone should explore It's big enough where I've been to like a media mark before they had a giant multi-screen setup and like a big cockpit chair to sit into and then they have the tractor controller and like You climb in and basically driving their giant tractor setup at the store.

Wow, that's That's so cool.

I would totally hop in that if I was at the shop I would definitely sit down and try it out because I'm not gonna have that at home.

I don't have the room for that That's so neat Well, thank you so much John for for taking time out of your day to talk to me about all this stuff I've had a real blast Chatting with you today.

So thank you so much.

Oh I'm happy to join.

It was a good time Where can the people I mean the people can find your work at Digital Foundry.

I mean, that's not really a question Correct.

Spider-man video just came just came out.

I came out Other things so yeah, I mean, you know, I'm on all the social medias at the dark 1x still Also be sure to go on Steam and wishlist our zett the jewel affair more yes the CDI looking game Yes, I got to do some some design work on that and that's my buddy Seth's first full big game production And it's really cool.

Okay, so show some love people.

All right, we need to make it a success Well there there will be links to that and everything else in the show notes if you'd like to Find more of my work.

You could have over to max frequency dotnet for my writing You could check out my other show chapter select where we take a series and bounce back and forth through its entries Exploring their evolution design and legacy right an hour and season 6 which is covering the mainline Pokemon games So those episodes are coming out and then we've got Metroid Prime and Castlevania coming up for next year as well So you can go check that show out as well.

But until next time thank you all so much for listening and adios