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<<Matthew D. Ramsay, Analyst, Cowen and Company>>

Hey everybody, good afternoon. My name is Matt Ramsay, the semiconductor analyst here at Cowen. And we're excited to welcome you to the TMT Conference and also really excited to have Jason Rhode, the CEO of Cirrus Logic here to have a chat about his business and all things audio. So Jason, thank you for making the time to come and if you have any introductory remarks you'd like to start with state of the union or whatnot, please and then we can dive into Q&A, that's cool.

<<Jason P. Rhode, President and Chief Executive Officer>>

Sure. Glad to be here, appreciate it. Great day so far. Yeah, we always appreciate the opportunity to tell the story. We're excited about our business. We think we're really a pretty remarkable time in the audio and voice world. There's a lot of – the bulk of what we do as the company is innovation in and around audio and voice applications, voice market has been a bunch of years over to my career where it didn't always feel like there were that many customers that were interested in differentiating on audio and voice just everywhere in your life today.

And then with our move into voice and voice processing in doing interesting things with voice as a noise over time. It's things that we grew up watching on The Jetsons that should have been here a long time ago, but we're there now or it feels like voice as an interface is really just it's exploding and only going to go up from there and a lot of what we're doing, whether it's voice biometrics or any number of other investments the company has is – are really pivotal to making that interface a lot more useful, lot more natural.

So we've got a lot of great businesses that are already engaged in the day and things like voice biometrics and voice is an interface that we expect to see curious well into the future. So it's exciting times for the company and some time we'll be doing, what we're doing.

<<Matthew D. Ramsay, Analyst, Cowen and Company>>

It certainly seems like as not just in the mobile market, which might be the most prevalence that. Folks are looking for different ways to interface with electronics, right, vision, touch is obviously one some of the different biometrics in addition to voice. But maybe you could talk a little bit about the proliferation of – and diversity of the potential customer base for voice. I know there's potentially financial applications, there's device security applications or some things in the automotive market. Maybe you just talk about that breadth and what that means for the company going forward.

<<Jason P. Rhode, President and Chief Executive Officer>>

Sure. We're heavily focused on mobile on handsets of course, the great thing about that for us is that it's outside of handsets, there are plenty of interesting things to invest, but it's not always obvious what the next big thing will be.

<<Matthew D. Ramsay, Analyst, Cowen and Company>>

Right.

<<Jason P. Rhode, President and Chief Executive Officer>>

The great thing for us with audio and voice for handset, so it's a great proving ground for technologies that ultimately will be useful in whatever the next other big thing is. So whether it's microphones, whether it's the audio conversion capabilities that we have noise cancelling. But as then especially the voice biometrics, where we're aiming not to be the folks who figure out what you said or e-mail it to your random contact list through other things we especially aspired or not to be those people.

But we do aspire to validate the EUR, the enrolled user of the device. And we feel like that with all what's going on in voice interface. That's the missing ingredient. That's the piece that takes it from being a novelty in a toy to being really useful, because and tell – I can say, read my e-mail, which I'm not – even if the device has that capability. I'm not going to –legally I'm probably not even allowed to enable it and certainly our IT department would take a dim view of it.

The device needs to know that you're the enrolled user. We can do that built with text dependent speech such as some passphrase opens with me or whatever, but we can also further refine the estimate that you are who you say you are just to be a random free speech. And in particular, in the use of any sort of voice interface, where there's a trigger phrase and then you're always going to say something order me an Uber or read my e-mail. We can continue to validate a much longer speech segment, which as you'd imagine makes it easier to have a longer amount of speech to validate that you're the enrolled user.

We think that's what takes it to the next level on let these devices become a lot more real and participate in real use cases. So, again the great thing as we can target that handsets because that's huge today. We don't anticipate that removes the need for fingerprint or face printer or whatever the existing modality of biometric is. But in the hands free use case, it's the only biometric you can use, because the only one you don't have to touch oriented or aim that you face or do whatever, it's just you.

Now I don't ever want to be on an airplane for the people, who can only unlock their phone with their voice that would be super annoying. But in the case, where you're driving along in your car and you got in your earbud in or you're just – the phones on the seat of the car next year, you heard the ding or read my e-mail that may be a secure app.

<<Matthew D. Ramsay, Analyst, Cowen and Company>>

No. I mean there's a lot of these things that are going to proliferate I think in – as you said starting in mobile, where you have a billion plus unit opportunity to not only get revenue from, but the validate technologies before they're going to go in other places makes a ton of sense.

What's always sort of drive me to your company and the work that we've done together over the years is that, you guys have the whole sort of value chain in audio. Maybe for some of the audience that might not be as familiar. Maybe you can walk through what the pieces of that audio chain are and how, I guess, you can differentiate in each one, but also putting them all together makes for a more compelling solution for what you're doing.

<<Jason P. Rhode, President and Chief Executive Officer>>

Sure. Yeah, we think there's a lot of value in offering a full portfolio of audio products, starting on the input side from a microphone to audio to digital – analog to digital conversions, some signal processing capabilities there in the middle of that, maybe this audio stream that you now recorded goes off – beams off to the cloud to do something useful, maybe it just gets stored as an audio file, maybe it's you're speaking to somebody on the other end of the phone, but you could do signal processing things and so for example, for a handset that uses are noise canceling technology, you hold the phone up really close to your hear and you put your finger in the other ear and actually cancels off the noise in the room you're in. So you can hear the phone conversation you're having better. So we're in handsets that do that today for example. That's just an example of the kind of signal processing that we've kind of put in the middle of all this.

From there, then you have the other side of things, which is to play that audio or that voice back. So digital to analog conversion increasingly amplification, that's a big business for us or perhaps in the case of a digitally connected headset that gets transmitted out through one of the prevalent digital interface standard such as USBC or one other one that some people are fond of. And then gets converted to analog in the headset itself maybe noise additional, noise cancellation could be done out there.

And then a variety of other voice processing techniques that can be done in the middle of that, whether it's far-field beamforming. So if you're in a noisy environment, your handsets a few feet away you talk it knows that you're the speaker and it's trying to cancel off the noise, so whoever is on the other end, can focus on the conversation rather than whatever background noise on the bottom end or whatnot.

Things like that lately, so the differentiating capabilities of the company, there's always areas of audio and voice that are lower margin people that are focused on just making sound come out the cheapest, that's rarely of interest to us. It's – we need to be able to see a real diversification that is in our companies. We will have some of that tends to mean things like very low power and also very low latency. So it's a lot of applications noise canceling is a good one. The most tangible example of latency that you can think of from a use case that you're familiar with as maybe talking on the phone on, either on the handset or a headset, and there's an important thing that we're all just sort of take for granted, which is what's referred to as side tone.

So, you speak into a handset, the microphone records you and it plays a little bit into your ear and it feels very strange if you talk on a phone and you don't get excited or not. It also feels very strange if you hear yourself delayed. And in fact that would not a whole lot of delay and most people would kind of walk out. It's very confusing in the footprint. So that latency of that amount of time between we've measured something with a microphone, we've got a bunch of processing and then we played it back into your own ear.

That's of kind of a cornerstone of things that we're good at getting a lot of processing done with a very lower kind of delay. It turns out that actually is also really useful in haptic device. So increasingly people are using our audio amplifiers and now we've specialized some of our audio amplifiers to be even more purpose built for doing haptic, but that's another area where we need low power. We need always on and we need to be very rapidly responsive to somebody presses on a phone or take some sort of action and then the device reacts to that and gives you some sort of tactile sensation. So another good example where latency and low power matter or what, we can throw some signal processing techniques that kind of application and offer our customer so meaningful differentiation.

<<Matthew D. Ramsay, Analyst, Cowen and Company>>

That's a great walk-through sort of the product breadth on portfolio. I just wanted to maybe we could start to walk through some components of the business will be a little bit sensitive around talking specifics about your largest customer, but you've had some very strong content gains over the last two or three years with that customer and then they tend to take things and bundle and then you have a bit of time where maybe the revenue per device flattens out. But those same components are very applicable into a very large volume Android market. Maybe you could just talk about whether it's some of the stuff you're doing around amps for haptics or microphones in a longer-term and even the rest of the value chain in the Android market today where you're out in that growth trajectory. And can that be – investors have been waiting for sort of growth outside of your largest customer to be a material driver of the entire company. And are we getting closer and closer to that now and what are going to be the drivers of that as it happens.

<<Jason P. Rhode, President and Chief Executive Officer>>

Yes, we expect so. We've made good progress in the rest of the Android community over the past handful years. We're shipping more models of handsets whenever in that space. We don't break out our numbers in gory detail for a number of reasons but that does make it a little bit difficult to see the progress we've made elsewhere in Android because there has been some abs and flows with our customer in Korea, which is sort of life in that market. But we've made good progress penetrating more and more accounts. There's – we've seen smart codecs and amplifier shipped in an increasing number of Android accounts.

One thing that we expect to really be a needle mover though we're shipping already and really expect it to be meaningful this time next year with this new amplifier product that we've got out. We've been shipping amps for a long time, so big and growing business largely with our largest customer, Android is mostly new for us for the amplifiers. But starting last fall, we've introduced a 55-nanometer amplifier that basically brings all the signal processing capabilities puts it

actually in the amplifier itself to do speaker protection, battery protection, coordinating those capabilities in a stereo application in some cases.

And it's really was directly targeting the Android space it's a lot more signal processing capability than our competitors have put in those products. And it's just – I mean, the team did a phenomenal job of defining the right product, the engineering team to cover up the ball and getting early silicon that work great. I think every customer has shown it to has have nothing but good things to say about it's lower cost then the competitor from a total system cost, lower bill of materials overall, smaller on the board, lower power with better performance. So it's been a complete win and it's great to have – so our competitors are in that space, so Maxim and NXP primarily.

I guess there's probably funnier places to work than some of those at the moment. So we've certainly hired some good employees over the last little while and that's a real compelling product strategy. So we expect good things from that product line over the next couple years. It's of the various things we're plugged into an Android, which – all of which we're excited about that's probably the one that's – the most here now from a growth perspective.

<<Matthew D. Ramsay, Analyst, Cowen and Company>>

And what about sort of haptic amps for the Android market, I think many of us are used to sort of hitting the screen and getting some tactile feedback from phones, right. But there's also – all the buttons that go around the periphery of the phone that can be haptic supply to and an individual amp basis. How big is that market when you start to think about it holistically and how quickly can that become meaningful?

<<Jason P. Rhode, President and Chief Executive Officer>>

Well, the bulk of that in the Android space, I mean, I turned out, I don't carry an Android phone. But when you play with – even recent ones that are pretty expensive they still or most of them still have a rotational vibration mode or a little eccentric things and it's like – it's really old school feel and it's not great. And so there's a lot of desire in that community to have a solid feeling haptic feedback either when you press harder on something that looks like a button that make it feel like it moves even though it actually doesn't you're right. People think about the home button consumer – as consumers, we think about the home button.

But the power switch anything that moves this is going to be a strong point of returns and the failure mechanisms. And so if you can have consolidate all that capability on just one linear actuator and create this really solid feeling product that's really desirable. So similar ASP from us, call it \$0.50 whether it's an audio amp or haptic device. But across the board even in the mid-tier customers were talking about going from no external lucid amps to two for stereo to potentially another one for haptics. So it's a really strong opportunity, not everybody is going to go all in the three right out of the gate but we do see really good opportunities for that product line.

<<Matthew D. Ramsay, Analyst, Cowen and Company>>

I think one area that continues to be in focus is the headset market, both wired and the potential for wireless headsets. I guess how do you see that mix going forward and are you guys in the position now where you see the wireless headset market as a catalyst that's maybe nearer term than folks think or we still sort of away from that? I know there's been some Bluetooth standard movements and things like that that have maybe kept you guys a little bit on the peripheral of that market, but...

<<Jason P. Rhode, President and Chief Executive Officer>>

Yes. We were – and we will see how the unfold there's certainly plenty of application for our devices in Bluetooth headsets. We're shipping in Bluetooth headset today. There – we'll see there is potential for this Bluetooth Low Energy to adopt, to add audio, to the capabilities of that standard, which drives the power down makes things like these untethered earbuds easier to implement. But at the same time, the power for implementing Bluetooth Classic has come down every year. And so maybe it doesn't – maybe we don't have to wait until BTLEs fully ratified for audio to see more volume in that area.

But at the same time, from a cost perspective, there's a strong place in the world for wired headsets. You don't want to charge them. There's a lot of value to the once you've gone to a USBC or similar kind of interface. You can get power out of the thing to do interesting stuff like noise cancellation, fitness headsets all sorts of different things. And that's certainly going to be – we think less expensive to maintain a wired headset. And again, just from a use case factor, even when I certainly have Bluetooth headphones and not a small number of them. But I still always keep a few wired headsets around because not everybody that fly a lot had the experience to get on a plane and perhaps charge your headset, that's not cool.

<<Matthew D. Ramsay, Analyst, Cowen and Company>>

So there's a couple longer term opportunities that I wanted to talk about a bit in microphones and biometrics. But before I jump into that, I think one of the big questions that I get from investors is maybe over the next 18 to 24 months maybe puts and takes on top line growth for the company overall. There is – as we talked earlier, there was a big revenue per unit growth at your largest customer and that flattened out a bit, which is natural but – and then there's growth in Android and some other areas. But maybe you just walk us through – I know you put out some guidelines for – guidance for folks on the next fiscal year. But just kind of talk about puts and takes and drivers of growth on the top line in the next maybe 24 months.

<<Jason P. Rhode, President and Chief Executive Officer>>

Sure. Yes, I mean, it'd be great. If life was a straight line up...

<<Matthew D. Ramsay, Analyst, Cowen and Company>>

Yes, of course.

<<Jason P. Rhode, President and Chief Executive Officer>>

We'll not make anyone's life more peaceful than mine. That would be great. But we've done a great job growth in the revenue, grow in content over time on average, hence we see good opportunities to continue to do that again on a long-term basis, doesn't always going your favor on any given cycle. But we're still excited about the opportunities. This isn't a great growth year, but we did say in the same shareholder later that we expect to return up to more meaningful growth early next year.

So that's driven on the back of the kinds of things that we've just been talking about. Amplifiers are kind of here and now and being designed in and we're excited about that. We see good opportunities for continued for the smart codec product line headsets. And then as you mentioned, longer term was biometrics and microphones, but amplifiers probably in the one to two-year kind of timeframe probably the soonest and biggest. We're in a position, where it's not – we're not too far from be in an billion unit a year run rate for amplifiers, which is not bad.

<<Matthew D. Ramsay, Analyst, Cowen and Company>>

No, I mean it's – I think the longer term though, to contrast that I think folks are fairly excited about where growth opportunities can come from I think, secondarily, in microphones, then we can talk about sort of the time horizon of how you think about the microphone opportunity for Cirrus. But then maybe you could spend a little bit of time on the biometrics program. I know that that team done some tremendous work at spin, pushed you on to a new silicon node. There's a myriad of applications, where you can have security overall voice interface be prevalent and just talk about the progress you made on the products maybe any timelines about realistic revenue and what do you think the competitive landscape is there? I've not heard folks doing what you guys are doing specifically?

<<Jason P. Rhode, President and Chief Executive Officer>>

Yes. We haven't either. It's the sort of thing that customers, if they can would likely want to own it themselves, so I think primarily the folks trying to do what we're doing and specifically do so embedded, right. The applications that we're interested, the places where we think we have a lot of value are where we do this voice processing embedded in the device rather than, send your data off to the cloud and figure it out over there from a latency perspective, from a security perspective, that's really just kind of a nonstarter for the applications we're trying to enable.

There may be coupled to somebody, who was then also doing that in the cloud for other sometimes in the various purposes. But we're the ones just trying to be the gate keeper for your device. So it is what – kind of exactly what it sounds like we're just trying to validate that you are an unrolled user you have a little script that you run through to train your device that that's why it sounds like and ideally, it can get smarter when you – here is what it sounds like when I have a hangover or a cold, or whatever it might be and get better and better over time.

So again, we can do that with text dependent and then further refine that with a text independent. We validated that with this chip we have back you mentioned, move this and do in advance.

Now, this is a lot of signal processing capability forced us down to 28 nanometer node, probably it could have gone further than that. but we also see the opportunity to integrate our mix signal into that and kind of recombine that in with the smart codecs roadmap somewhere in time. So, we've demonstrated that the algorithm on its own, but now the algorithm in the device achieves fingerprint level security. so, call it one in 10,000 false accepts coupled with one and say 20 false rejects, that's kind of the target.

The goal then is to make it work better and better and noise, which it actually already works well in a fairly surprising amount of noise. but that's one of those specs. there's no such thing as done.

<<Matthew D. Ramsay, Analyst, Cowen and Company>>

Right.

<<Jason P. Rhode, President and Chief Executive Officer>>

And then the additional challenge is just to do an increasingly good job of detecting any sort of spoofing attempt. So, if I remember when the fingerprint sensor thing was new immediately, they also have on the watch of a phone some crafty, I think he is a German guy, who have created a rubber thumb with a fingerprint on it and then marked upon and it's kind of an – we're not trying to protect against the ultimate somebody has your phone and we'll have in there, the NSA gets all to your phone and probably going to get in it, but good enough recording your voice. but it's really if it's just an arms race or somebody stole your phone or more likely for most of us your friends in a bar or messing with you, you want to create some barrier, but still enable access to things like e-mail or call me and over or whatever the transaction might be.

So, our goal there with the spoofing is just make it harder and harder and harder over time. and certainly, by implementing it in a way that is very similar to a fingerprint sensor architecturally via the vital security alliance in connections to the trust of the execution environment so forth and so on. Make sure that we're not susceptible to some class Hackworth, suddenly every device that fused this biometric chip is like unlocked all at once, that would be bad.

<<Matthew D. Ramsay, Analyst, Cowen and Company>>

When you talked at all the revenue per unit opportunities for biometrics maybe what you guys could support at the margin structure that the companies have today. and hopefully, there would be first-mover advantage in some pricing, I'll access to see above that, but any kind of revenue targets we should think about as this product rolls out over the next few years?

<<Jason P. Rhode, President and Chief Executive Officer>>

Well, I mean it it's – there's a lot of innings left between us and revenue. but we think it's a tremendously valuable technology. it's really transformative to the way you can use a device. So, it should be worth a lot. that said we can easily support a couple of dollars from an ASP perspective and how it'd be a reasonable margin. So on the one hand, we're certainly fond of all

the traffic will bear as much as the next person. but at the same time, we'd also like the thing to get off the ground and ship a lot of units, and make customers feel like we're taking advantage of meter. So, there's always a balance in-between there and we'll see how that goes.

<<Matthew D. Ramsay, Analyst, Cowen and Company>>

Got it. And just a little bit on the financials. It just occurred to me where the stocks being valued today that the business is generating a ton of cash. And I don't think sometimes gets the credit for the cash generation you have even when the relatively benign cycle as far as you're a largest customer. So, use of cash are you guys really ramping up returns to shareholders, and others unauthorized by back and things like that, but also new areas to look at for the company, I would imagine anything software oriented in the security realm around audio is interesting, but it's uses of cash and just the amount of cash that you're generating now, how do yourself and Thurman in the board think about that?

<<Jason P. Rhode, President and Chief Executive Officer>>

Yeah. Well the highest and best use from our perspective would be successful acquisitions, the key being successful in a lot a lot of cases in our industry is being a lot less work to just take the money out in the parking lot and burn it. I mean, it's a very much – and I think to make an acquisition work in the long term, in our industry the engineers really do want to support it, and that means they need to look at it and go. Yeah, if we put this and – if we put ourselves in them together we can do something that we wouldn't been able to do on our own and then they'll try to make it work. Anything short of that they'll try to make it not work and engineers are pretty good at both of those things. I say that, as I can say that I'm an engineer.

So we look there's not a lot of quality properties out there, that are actionable. So in lieu of finding something, then we do like buybacks, I mean we get the occasional question about dividends or whatever we consider them from time to time. But it we'd be aware stock payment dividend frankly and given that we are likely to be a volatile stock, because of the markets that we're into the customers that we have. Then, I mean we can take advantage of that volatility via there's opportunistically implemented buybacks, the way we've done for many years, spent very successful for us. So as of the last call we saw a \$200 million authorization out there. We don't do program trading. So, we just, in the open periods of the quarter, buy stock back from time-to-time, and just report on that the next earnings call, we're not that be it or just demonstrate our confidence type of buyback people.

<<Matthew D. Ramsay, Analyst, Cowen and Company>>

I just open it up for anybody from the audience if you – if there's any questions out there, I can certainly fill the time with some more my nonsense, but if there's people in the audience that have something. Please.

Q&A

<Q>: [Question Inaudible]

<A – Jason P. Rhode>: Sure. I mean I think that's a risk in any business, whether it's your customer or whether it's the big giant processor, you're connected to absorbing some fraction of the digital that you've provided historically. For as a customer relationship thing, we just try to take do a great job of taking really, really good care of our customers and not give them a lot of motivation or incentive to be creating either their own capabilities or looking for other suppliers to be able to do the same kind of thing we do.

I think to it highlights the – we get a lot of feedback about customer diversity, but at the same time, I think the product diversity within the existing customer base is really remarkably so amplifiers and as such chips in smart codecs you know it somebody would have to wake up one day and just decide they're going to get good at whole lot of things, and also just hate us all the sudden for some reason. So there's always some risk of that, but I don't know that it's any bigger now than it's ever been.

<Q>: [Question Inaudible]

<A – Jason P. Rhode>: I mean, it tends to be our most expensive devices are the smart codec product line, so for flagships, it's a couple of dollars versus amplifiers that are \$0.50, but in a high-end handset, we're typically selling about three of them – and then the headset chip for an adapter device. So, it's even within the same endproduct, we've got quite a bit of diversity of devices that we're selling in there.

<Q>: [Question Inaudible]

<A – Jason P. Rhode>: The pieces that we intend to sell the differentiation in the software are all ours. most of our products with processors, we do enable customers to program their own things on there, and also we work with a wide variety of third parties to enable our customers to have things that we just don't offer, but as it relates to the voice biometric functionality itself, that's all internally created.

<Q>: [Question Inaudible]

<A – Jason P. Rhode>: They certainly would have to. most customers when we're selling a processor, they will have, okay, here we're buying it, because you've got X, Y, and Z thing, but also, we've got this internal library of stuff, somebody – some companies have their own special EQ parallel that they send think sounds amazing. So for them, we have a set of tools that customers can program their own thing on or our engineers can discuss it with them and port their code over to – port their code base over to coexist with whatever it is that they're buying our chip.

<Q>: [Question Inaudible]

<A – Jason P. Rhode>: So we have the device today. It's a pretty complex design in process and just even decision-making process from a customer of – like do we want this, whatever I want to give it access to, how can it go wrong, that kind of thing. So, we think it takes while; it's out

there a year or so before we expect it to be a meaningful revenue. But it's the device given is really remarkable that given the extraordinary complexity of it and the algorithm that runs on it. the revenue of silicon came back and works really, really well more than good enough to demo to customers and have them get pretty far down the road, which is great, because we need that there will be a lot of layers of learning and this is getting over.

just how do you – we've improved to a customer that one in 10,000 false accept rate, was that even me, I mean we have 10,000 people that are trying to sound like me or just random people or Korean people speaking English or it's all of those things actually matter. So it's really, really interesting endeavor. And we think it's got the potential to be if we're successful to be potentially transformative to the company.

<<Matthew D. Ramsay, Analyst, Cowen and Company>>

Well, thank you everybody for your attention. We're getting the red light hook here. but thanks Jason so much for coming in and sharing your thoughts. and if anybody has any feedback or questions just follow-up with myself or Jason or Chelsea can certainly help you out. thanks very much.

<<Jason P. Rhode, President and Chief Executive Officer>>

Thank you.