

Trickle Research

Every raging river, every great lake, every
deep blue sea starts ... with a trickle



Initiating Research Coverage

Summit Wireless Technologies, Inc.

(Nasdaq Stock Symbol - WISA)



Report Date: 09/28/18

12- 24 month Price Target: \$9.25

Allocation: 4

Closing Stock Price at Initiation (Closing Px: 09/28/2018): \$4.30

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Disclosure: Portions of this report are excerpted from Summit Semiconductor Inc.'s filings, website(s), presentations or other public collateral. We have attempted to identify those excerpts by *italicizing* them in the text.

Company Overview

Summit Wireless, Inc. (“Summit”) is a San Jose, California based high-fidelity wireless audio technology company.

We were introduced to Summit about 18 months ago, which included a demonstration of their wireless audio technology. Since that time, the Company has made considerable progress on several fronts, which we will attempt to delineate throughout this report. Further, our interest in the Company was recently enhanced when in late July (2018) in conjunction with a \$12 million equity financing, the Company filed an S-1 registration statement and entered the public markets.

In short, the Company’s technology allows users to experience multichannel wireless high-fidelity audio across a variety of mediums (television, mobile and gaming for example) in an easy-to-setup, and increasingly affordable platform. The Company believes its technology provides multiple advantages over current wireless standards such as Bluetooth® and WiFi for certain applications that those legacy platforms currently address but are perhaps not well suited for.

When we first heard the Summit story, the company was a co-owner of WiSA LLC, which in turn operates the WiSA Association. WiSA is an acronym for “Wireless Speaker and Audio”, and its purpose is to develop and maintain standards around Summit’s associated wireless intellectual property and in turn promote interoperability across the devices and brands of those utilizing the technology. Since our introduction to the Company, Summit has managed to acquire 100% of WiSA. As we will delineate further in this report, while we believe the Company’s ability to monetize its IP will be the primary driver of its valuation, we also think their ownership of the WiSA Association will represent an additional valuation leg that could become quite valuable on its own if the technology is able to establish adoption in the wireless “immersive sound” industry.

Summit was formed in 2010 and its initial, albeit limited adoption, came in the form of its technology being embedded in a small number of SKUs of largely high-end audio brands. For example, we believe that Aperion Audio provided the first WiSA enabled speaker in 2012, and since that time, other manufacturers such as Klipsch, Bang & Olufsen, Harman Kardon and Enclave have also provided products that incorporate Summit technology. In addition, in 4Q 2017, WiSA added X-Box to its association, which we think represents Summit’s entry into the gaming industry.

Currently, Summit offers a handful of products that can be integrated and/or attached to a variety of consumer electronics (“CE”) devices (TV’s, receivers and speakers for example). Our expectation is that, as we move forward Summit will increase adoption of its technology amongst existing customers, as well as adding new OEM’s and brands resulting in a larger number of CE products in the marketplace utilizing Summit technology and by extension growing Summit sales of the current hardware product mix. Further, as the Company continues to develop software-based offerings, we expect future sales to include technology licenses, which should ultimately carry software margins. To translate, if the Company is successful in executing its plan, we think future revenue growth could be accompanied by markedly expanding gross margins.

Succinctly, the Company believes its technology provides superior wireless audio quality that addresses several growing CE markets/products, in a format that is easy and quick to install. Moreover, while early adoption has been focused on high-end audio products, they also believe that they can scale the technology to support price points that will address larger portions of the applicable CE markets/products. We believe that will be especially true as they develop more software-based solutions. As a result, we expect calendar 2019 to be a breakout year for Summit, in terms of product adoption and ultimately sales growth, and we expect that success to accelerate as the Company moves towards more software-based solutions in 2020 and beyond.

Product/Technology Overview

We're not sure how much time our readers have spent trying to understand audio technology in general, and *wireless* audio technology more specifically. Most who have, will likely attest that those discussions can quickly include a great deal of technical industry jargon that includes terms like “phase control”, “pairing”, “multichannel”, “audio video bridging”, “frequency response”, “gigahertz”, “synchronization” “latency” and several others. While we submit there are likely many smart people who work for the companies developing and selling consumer electronic products who actually understand all of these terms and how they interact, we suspect most people, including many who pretend otherwise, don't really know what most of this means. Consequently, analyzing competing platforms and/or technologies is exhausting and to be honest beyond our aptitudes. As a result, we are going to try to keep the technology overview here on a high level and try to provide a simple but salient overview of the technology's advantages, as well as some ultimate conclusions regarding why we believe the Company is positioning itself to monetize the technology across various platforms and adopters.

The Company's “high level” view of their technology reads like this; *“Management believes that Summit is the only company with the technical capabilities of transmitting high resolution, low latency, and speaker synchronization of wireless audio capable of supporting up to 8 channels of uncompressed audio directly to the speakers in 24 bit and up to 96 kHz sample rates. This means that a consumer can experience audio exactly as it was mastered in the studio. Premium consumer brands, like Bang and Olufsen, have begun to adopt our technology as a valued feature in performance products”*.

Given the above here is some edification that may help illustrate the value of the Company's technology in the context of today's audio environment. We will start with the term “channel”. When audio (music for instance) is recorded, it is typically done on separate tracks. Each track might represent a single instrument in the song. So, there might be a single track each for the vocals, the guitar, the drums, keyboards etc. Once each of those tracks is recorded, they are then “mixed” together by an engineer. That process may include adjusting the tracks for volume, and/or other audio related tweaks. From there the mixed tracks are “mastered”, which involves another layer of adjustment to the final recording. We will revisit this in a moment.

The term “channel” refers to an audio signal that gets sent from a source (your stereo receiver for example) to an output (a speaker). Ideally, the mastered recording we noted above could be delivered/transmitted through multiple channels, for example a channel for each track, or put another way, a speaker for each instrument on the recording. The problem is, most audio equipment today is not built to deliver an individual channel for each recorded track. You may recall, a “mono” (single channel) recording and/or output, cannot separate any of the tracks since it is transmitting only on a single channel. As a result, if you play music through a single channel into multiple speakers, each speaker will be making exactly the same sound. Thus, mono capabilities more or less negate much of the value of the mixing and mastering that goes into the recording in the first place. With only mono output capabilities, all the separate tracks are effectively mixed back together.

In contrast, “stereophonic” sound, which was invented in the 1930's, provides for the output of two channels, which is often reflected as left and right. Perhaps the best example of that capability is a set of headphones. If you listen to a stereo enabled recording with a pair of headphones (or two “stereo” speakers for that matter) you will notice that the sounds coming from the left side are not the same as those coming from the right. That separation of sound (and frequency) is what gives the stereo output dimension, or the initial elements of “surround sound”.

As an extension to the above, when an audio system advertises “5.1 surround sound”, it means the system can provide 5 channels (five speakers) each delivering portions of the recording (generally separated by frequencies). When the speakers are (properly) set up around the room, those different sounds/frequencies coming from different directions create the “surround sound” effect most of us are familiar with. Just to edify, the “.1” in the “5.1” moniker, refers to the subwoofer in the audio system. The subwoofer is generally responsible for playing

the low frequency (bass) portions of the mix. So then, a 5.1 system would include 5 channels/speakers, each providing a unique portion of the recording, and a subwoofer playing the lower frequencies. Again, to extend the thought, Summit's technology supports systems providing 7.1 audio, or 7 speakers plus one subwoofer, which further enhances the sound dimension. That is perhaps why the "new" generation of audio is now referred to as "immersive sound" as opposed to "surround sound". In short, just as 2 channels were better than one, 8 channels are better than 5, and Summit is capable of delivering 8.

The above noted, the Company's 8 channel capability is quite relevant in today's *wireless* audio world. To put that into perspective, while we will address this a bit further in the Industry Overview of this report, the broad wireless space is currently addressed largely by two familiar platforms; Bluetooth and WiFi. Recognize that neither of these two were designed to address the markets we believe Summit will address, but rather, were originally developed to connect various devices to one another, which would include applications like wireless keyboards, cell phones etc. On the other hand, as Bluetooth and WiFi have become more ubiquitous across devices and platforms, there has been a natural tendency (because of lack of better alternatives), to try to extend that ubiquity to other applications like high-end audio, audio-video and immersive sound that those platforms were simply not designed to address. For example, Bluetooth transmits *a single channel of audio*. That means it essentially provide "mono" (not even "stereo") sound. Those who have tried to use Bluetooth speakers to create "stereo" sound will likely know what we are saying here. To reiterate the point, neither Bluetooth nor WiFi were designed to address "immersive sound" or even "surround sound" for that matter, but Summit's technology was/is.

In addition to its multichannel capability, Summit technology offers some additional advantages. (as described by one of Summit's current customers) Summit *utilizes the Dynamic Frequency Selection (DFS) channels between 5.2 and 5.8 GHz. These channels are unlicensed, but not unregulated. The DFS channels were previously reserved for weather and military applications. Consumer devices can use these DFS channels, as long as conflicts with these important services are actively avoided. There are rules that the channel in use must be monitored for interfering with radar, a new channel must be selected in this event, and a channel must be free of radar for one minute before being selected.* The technology monitors the available channels for problems, automatically switching to open/clear channels. In contrast, WiFi generally operates over more congested 3 or 5 channel spectrums. As a result of Summit's utilization of DFS's greater number of channels, the technology is far less impacted by radio frequency interference, which is a marked problem for lesser channel spectrums. Further, the technology does not rely on the local area network, thus avoiding Wi-Fi traffic altogether.

Further, unlike other wireless protocols, Summit does not utilize compression technologies. Compression is generally complicit in both the degradation of audio quality and the latency of the same. The latency issue is particularly important in applications that involve both audio and video (gaming or movies for example) where decompression latency causes the audio to desynchronize or lag the corresponding video. We suspect latency has been a major impediment to the adoption of wireless technologies in the (video) gaming industry, which incidentally we view as a considerable opportunity for Summit, although that may be true for most audio/video opportunities in general.

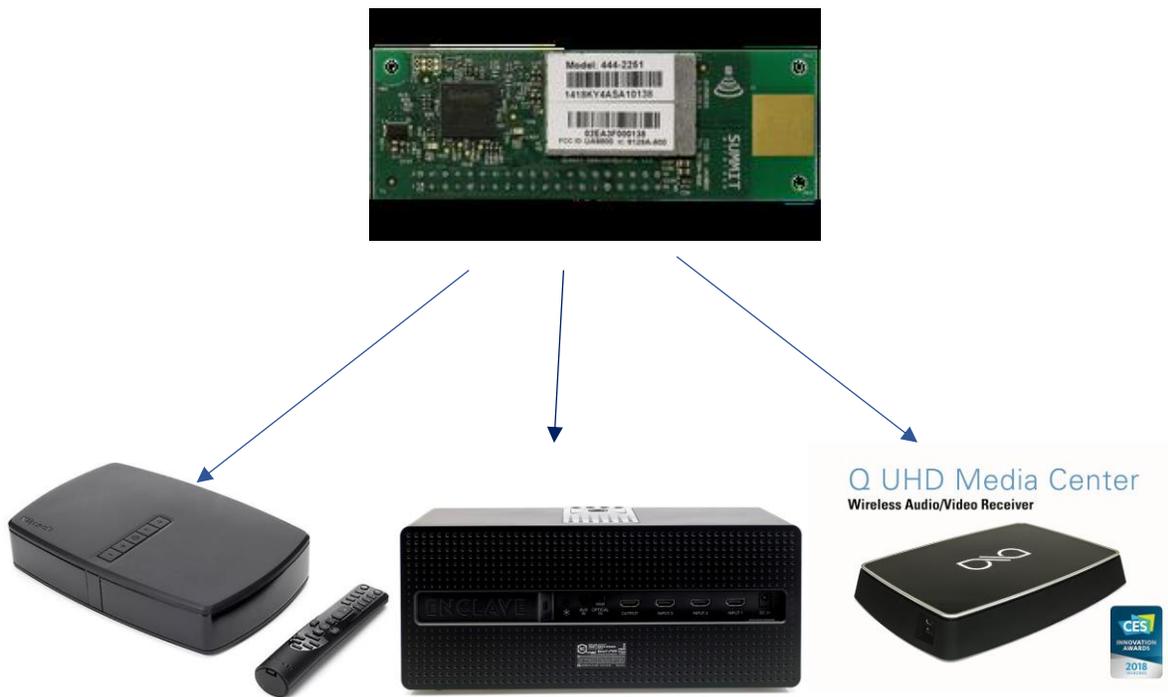
In addition to the a fore mentioned features, the Company also notes that an entire Summit/WiSA enabled system can be set up in less time than it takes to play Beethoven's 5th Symphony (estimated 25-30 minutes, "including unpacking").

The stated advantages aside, we think it is important to note that Summit should not be viewed as some sort of Bluetooth or WiFi alternative, but rather as a superior alternative for *particular applications* where the use of these legacy technologies has been akin to forcing the proverbial square pegs into round holes. We believe Summit's advantages will afford them adoption by segments of the wireless audio market that other wireless technologies simply cannot effectively penetrate because of the shortcomings we noted above.

As we addressed above, the Company currently offers its technology in a number of form factors that audio OEMs can integrate into their own products to provide high quality wireless audio functionality to their brands. The photos below are from Company collateral and provide some examples of the existing products:

- **Summit TX-SD**

Summit's transmit module is perfect for in room applications such as TV's, AVR's, and other audio solutions. The TX-SD transmits wireless audio signals from a source (a stereo receiver for example). The module is purchased by OEM's who develop branded transmitters (sometimes referred to as "hubs") around the module. Each of these hubs has its own design (differing inputs, outputs and interfaces), but largely they accomplish the same task of transmitting the wireless signal to the speakers. Typically, the purchasers of these modules (and developers of the hubs) have been home theatre/speaker manufacturers. The three hubs below are made by (left to right) Klipsch, Enclave and Axiim. Each of these products are in the market today and are generally purchased as part of these companies' respective immersive sound offerings.

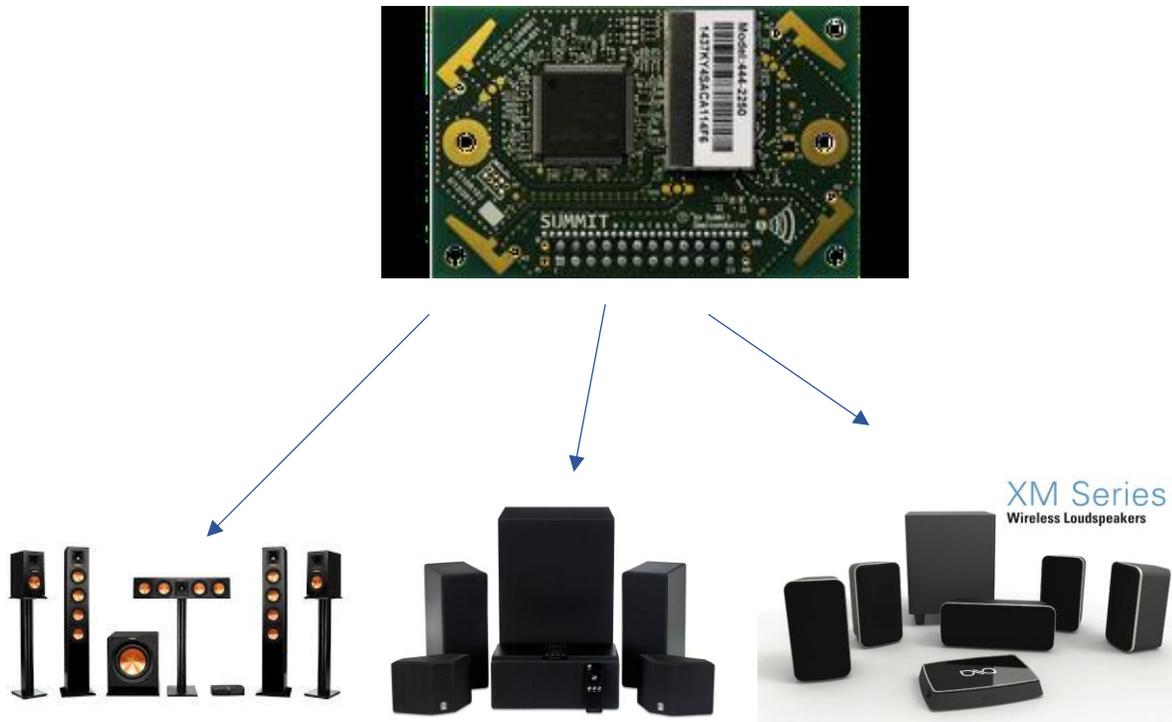


While most of the products developed around the TX-SD can be classified as hubs, we have seen some other from factors developed as well. For example, the product below is a USB transmitter (the Company sometimes refers to it as a "dongle") by LG, which the Company demonstrated at CES 2018, plugging it into an LG television and transmitting to Summit enabled speakers as well as to a Windows Surface Pro connected to a Klipsch immersive sound system. They also demonstrated an Axiim dongle with an X-Box. We think the breadth and depth of the companies and respective products they are capable of enabling are telling.



- **Summit RX-SD**

Summit's receive module is perfect for in-room speakers or amplifiers. The RX-SD's are integrated with each individual speaker enabling it to receive the wireless signal. Here again the offerings below are Summit enabled systems for each of the (respective) labels noted above.



In addition to the TX and RX modules the Company also sells a handful of other form factors (RX and SX development kits for example) but the bulk of the business is/will be concentrated on TX and RX installs. as we have illustrated, we know of several products on the market today that are Summit/WiSA enabled. Our expectation is that the Company will continue to add brands and SKU's within brands to their list of adopters.

While today the Company sells modules, recognize, that they anticipate ultimately providing embedded software-based solutions that will replace some of the module firmware. Obviously, that would provide a more scalable, much lower cost and much higher margin offering than the current model. We believe that solution has been developed and tested, and we think that broad commercialization could occur in 2020. In our view an embedded solution will change the game here on multiple fronts.

- **WiSA**

We are not exactly sure where the WiSA discussion belongs in this report, but this spot seems as good as any so here we are. They describe this quite well so we have included much of the Company's narrative on the subject:

Located in San Francisco, California, WiSA Association was formed in 2011 and is comprised of brands, manufacturers, and influencers within the consumer electronics industry, all of whom agree that a standardized method of interoperability between wireless audio components should exist, and most of whom believe that products should be brought to market with this goal in mind. The WiSA Association creates, maintains and

manages specifications for wireless interoperability that are available to all association members. For products with a WiSA Association certification, the WiSA Association also creates, maintains and manages testing criteria and specifications for all products to be listed, marketed and sold. WiSA Association certification is an industrywide “stamp of approval” certifying that a product is interoperable with other WiSA-certified products and has passed several high-performance tests ensuring low levels of latency and tight channel synchronization. As the sole owners of WiSA, LLC, we certify all WiSA Association products. We do not actually sell any WiSA-certified products, however, we do distribute the technology to enable products to meet the WiSA Association’s certification test specifications”.

Summit was a founding member of the WiSA Association. There are currently over 30 brands participating in the WiSA Association.

The following illustration from Summit provides an overview of some of WiSA’s high profile members, which includes some of the more influential names in the home audio/entertainment space. Importantly, some of these brands share a parent, which we think may prove telling to their ability to penetrate different (and larger) portions of the CE market.

WISA™ Expanding Membership
WIRELESS SPEAKER & AUDIO

Supporting interoperability standard, creating the ecosystem around Summit’s technology with consumer electronics brands, ODMs and consumers: 30+ brands including

LG
 XBOX
 Windows 10
 harman/kardon by HARMAN
 Klipsch
 BANG & OLUFSEN
 Axiim
 ENCLAVE AUDIO
 ONKYO
 JBL by HARMAN
 ELECTROCOMPANIE
If music really matters...
 Pioneer
 GoldenEar Technology
A Passion For Sound Technology
 mark LEVINSON by HARMAN
 EC LIVING BY ELECTROCOMPANIE
 almando
 Jamo
 ENERGY
 Infinity by HARMAN

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WiSA operates in a similar fashion to the Bluetooth Special Interest Group (“SIG”), which was formed to provide a basis of standards and interoperability for Bluetooth and its respective OEM users. Members pay annual fees to belong to the SIG, and those fees act much like a technology license. As of 2017 The Bluetooth SIG reportedly had over 33,000 members and fees ranged from \$0 to \$35,000. As the keeper of the Bluetooth keys, we think the SIG is likely quite valuable. By extension, as a wholly owned subsidiary of Summit, we think WiSA could ultimately represent a valuable asset to the Company if they are successful in establishing WiSA as a wireless standard as we suspect.

Industry Overview

Summit's recent S-1 filing notes the following:

“The wireless audio market is expected to grow from \$16.13 billion in 2016 to \$31.80 billion by 2023 according to a June 2017 report by Markets and Markets™ research firm. The primary growth segments for in home entertainment have been “Bluetooth” stereo accessories which include single speakers, headsets, and more recently, “multi-room” stereo speakers that use your home’s Wi-Fi network to stream audio throughout the house. According to a September 2017 article available at www.dealerscope.com the recent emergence of the latter component audio system has presented issues in latency and quality among wireless devices, which Summit’s technology aims to fix”.

The same Markets to Markets report referenced above notes the following as well:

Home audio held the largest size of the wireless audio market in 2016.

The growth of the market for home audio applications can be attributed to the continuous technological innovations in home audio devices and growing consumer demand for high-performance home theater experience owing to increased disposable income. In addition, developments in Wi-Fi and Bluetooth speakers, and dedicated speaker docks are expected to increase consumer spending on audio equipment to enhance audio quality. Suppliers and manufacturers of such equipment are increasingly focusing on expanding in the market by making these systems user friendly and visually less intrusive.

The wireless audio market in the Americas is likely to be driven by the increase in sale and installation of home entertainment devices. The growing population of music listeners, increasing digital music sales, and popularity of the audio & video entertainment segment are expected to influence the regional market positively over the next decade. The US is at the forefront of installing and buying the upcoming technologies such as wireless speakers and home entertainment systems.

We think that view provides a powerful backdrop for our enthusiasm regarding Summit's potential to be a major force and perhaps a new standard in the growing wireless immersive home audio market. More specifically, we think there are other emerging themes that are likely to drive immersive audio adoption and we believe Summit is positioning itself to capitalize on those themes.

Here are a few of those themes as we see them, as well as some color on why we think these themes support our thesis regarding Summit:

- **Thinner Televisions**

Technology is allowing manufacturers to make TV screens larger but at the same time thinner and lighter. In most cases, that combination has led to some compromises on sound quality because thinner TV's don't leave much room for speakers. In turn reduced television audio quality has led to the emergence of another growing consumer electronics product; the soundbar.

A 2016 article from www.hometheatreview.com summed up the growing popularity of soundbars quite well:

“Soundbars couldn't have arrived at a better time. After all, they were designed to take advantage of the growing popularity of flat-panel TVs and the inherent weakness in the audio performance

of those displays. Today's flat-panel TVs tend to have mediocre sound quality (at best) because manufacturers and consumers tend to be more concerned with video quality. Plus, the sets have become so thin that there's little room for any good audio components to be placed inside them. Soundbars are often an inexpensive way to resolve that issue. Soundbar sales have been growing for several years, said NPD analyst Ben Arnold, who also pointed to their unique form factor as a reason for their ongoing popularity. "They're minimally intrusive in the living room," he said. Multichannel audio setups and all the wires that go along with them "can be a little bit daunting" at least to some consumers, but "my mother can install a soundbar," he said".

There are a number of industry research reports that address the rapid growth of soundbars over the past few years and project that growth to continue over the next several as well. We think it is fair to suggest that the consensus on the subject is for double digit CAGR through the 2017 thru 2021 time frame. For instance, a recent report from Zion Research titled **“Soundbar Market by Type (2, 2.1, 5.1 and Others) for Music Players, TV Sets, Computer Systems and Other Applications: Global Industry Perspective, Comprehensive Analysis and Forecast, 2015 – 2021.”** pegs the global soundbar market at \$2.3 billion in 2015 and is expects it to reach \$4.9 billion in 2021, equating to a CAGR of 10.6% between 2016 and 2021. In terms of volume, the global soundbar market stood at 12.2 million units in 2015, and they expect that number to triple over the same relative period.

We think the popularity of the soundbar is the manifestation of consumer demand for better audio performance (from audio deficient thin TV's), without the install complexities associated with traditional wired speakers and at reasonable price points. Given those criteria, the sound bar has proven to be a simple “fix” to poor thin TV audio. However, we believe Summit's wireless solution will prove to be the next step up in the confluence of high-quality video **and** high-fidelity audio into the home without wires and at what we believe will be broadly affordable price points. Frankly, we think the adoption of WiSA enabled products will come at the expense of the soundbar market because we believe it represents a higher quality and more elegant solution to the original thin screen trade-off. In fact, we have modeled our revenue projections around assumptions that assume (almost exclusively) the company capturing an increasing portion of industry projections for the soundbar market.

- **Interoperability**

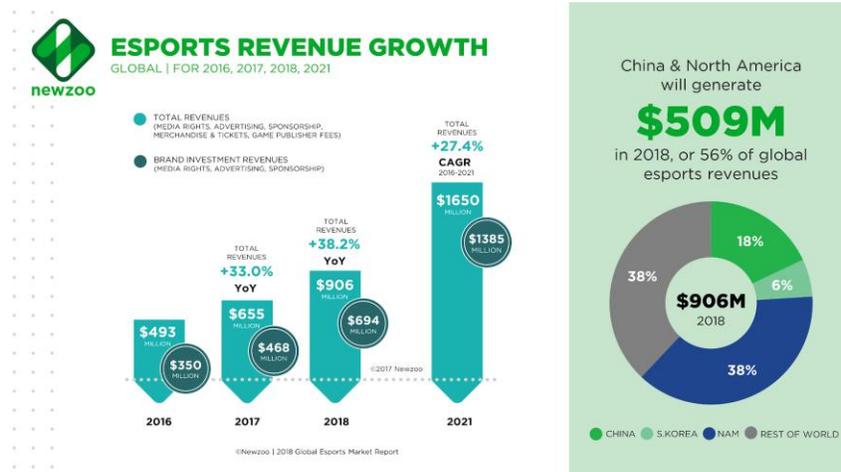
The Company recently announced its “WiSA Ready” designation for devices that become WiSA enabled, which we believe will include televisions, game consoles, PC's, tablets etc., and ultimately cell phones. We believe that interoperability will play a large role in the adoption and perhaps standardization of the technology. That standardization will ensure users that all WiSA enabled devices will work with one another regardless of manufacturer.

- **Content Providers - 5.1 and Beyond**

Perhaps this is anecdotal, but we are intrigued by the notion that many content and even hardware providers are developing more offerings around multichannel audio protocols. Dolby's new Atmos is all about this issue. As an additional example, Netflix is expanding their ability to provide more multichannel (5.1 and 7.1) content while many cell phone manufacturers are providing more iterations with multichannel audio functionality as well. Why is that? We think it is because these providers recognize that consumers are demanding higher quality audio from their overall CE experiences. Again, we think Summit's wireless, uncompressed, studio quality capabilities may represent the “last mile” in the delivery of much of that content. Given the multichannel limitations of current wireless properties (Bluetooth and WiFi) it may look as if these providers are putting the “cart before the horse”. After all, what is the point of providing 8 channels of audio if most of your audience lacks the systems necessary to utilize it? We think these providers recognize and perhaps anticipate the proliferation of better multichannel delivery technology. (Perhaps they are familiar with WiSA and/or have seen Summit's demonstrations at CES).

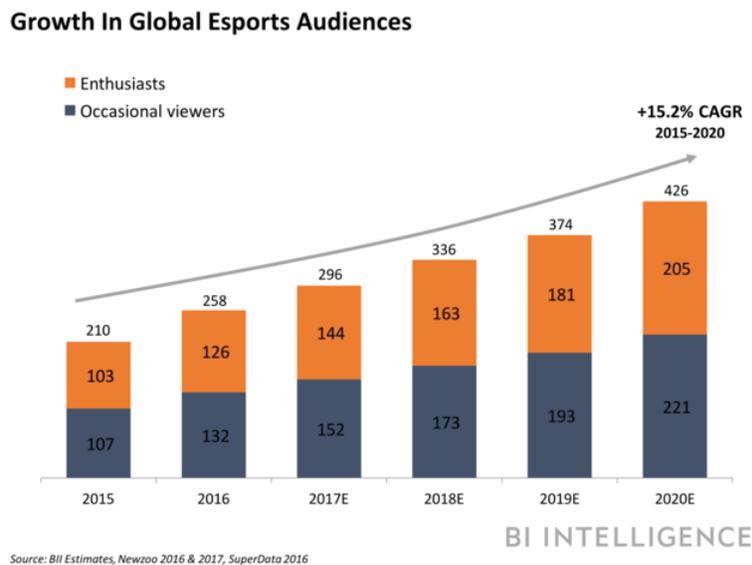
- Gaming & eSports

The gaming and “esports” industry is exploding and all indications are that it is going to get much bigger:



A recent Forbes article addressing the growth of eSports had this to say about Twitch.tv which is the premier eSports online service: *“Twitch, an Amazon subsidiary, primarily focuses on broadcasting eSports competition along with providing a platform for video game streamers. In the last three years, it has seen a 21.3% compound annual growth rate in viewership. In 2017 alone, viewers watched almost 6 billion hours of content on Twitch”.*

The number of people watching eSports events online is almost incomprehensible:



We believe that the online viewing of gaming and eSports events is tailormade for the convergence of hi-definition video and (wireless) hi-fidelity audio that WiSA enables and we don’t think that requires much imagination. As we noted above in January (2018) Summit/WiSA teamed up with Axium, Xbox and Windows10 at CES 2018 to demonstrate *“the first wireless home theatre solution for the Xbox One family of devices and Windows10 PC’s”.*

In October (2017) Xbox became the first major gaming brand to join WiSA. Here again, we think that is telling and we suspect this segment will provide Summit/WiSA considerable attention as well as opportunity going forward. We would add, we believe the recent board addition of gaming industry veteran Michael Howse is indicative of the Company's belief that its gaming opportunities are considerable.

- **Improving Perception and Price Point**

We think the wireless speaker, surround, immersive et al. space has largely been compromised by unreasonable expectations. We have described some of the limitations of existing wireless technologies in terms of their inability to provide multichannel audio as well as other important attributes. To reiterate, neither Bluetooth nor WiFi were designed to provide the type of functionality required to deliver studio quality and video synchronized audio. However, we don't think that has stopped the industry from trying to pound that proverbial square peg into the round hole, and unfortunately that has left a bad impression on many industry pundits and CE consumers who expected better results from prior wireless offerings. We tend to think that skepticism (borne out of collectively bad experiences and poor reviews) has negatively impacted the adoption of viable wireless technologies like Summit/WiSA. However, we believe that WiSA's ability to garner the attention and participation of some of the major players in the audio space (and the performance of their WiSA products) is changing that perception. As we illustrated some of these major players have WiSA products in the marketplace today, and we believe that number could increase significantly over the next 12, 24 and 36 months.

As with many new technologies, the early adopters of WiSA enabled products have been high-end audio manufacturers (and by extension their customers). In short, consumers with less price sensitivity tend to be earlier adopters of new CE technologies because they can afford to be. The goal is for early adopters to have positive experiences that help drive positive awareness and new demand accelerating additional adoption and eventually to scale on various levels. In turn scale provides the opportunity for better cost/price points, which attracts additional demand from more elastic consumers. We believe that is the path that WiSA adoption is on.

We know that high end CE manufacturers are currently selling SKU's with WiSA enabled functionality. We also know that the industry reviews of those products have been quite favorable certainly in the context of the comparable experiences with legacy wireless platforms like Bluetooth and WiFi. Moreover, we also know that adoption is broadening in terms of manufacturers, platforms and SKUs. (The number of WiSA enabled brands has grown 60% in the past 12 months). In addition, we are beginning to see some of these manufacturers reach down to more elastic consumers with lower priced offerings. For example, while some of the original WiSA enabled Klipsch systems were/are priced at several thousand dollars, The Enclave 5.1 CineHome HD system (illustrated above) lists for \$999.00 and can be purchased on Amazon for \$799.00. We believe sub \$500.00 WiSA enabled systems could come out of CES 2019, and we think that type of price point will attract a considerable audience. Further, if the Company can transition to an embedded solution (which we believe they will) the "WiSA inside" will be less relevant to the overall cost of any associated system, which could pave the way for its de facto adoption as the standard for wireless immersive offerings.

As we described, while technology advances have been improving video resolution some of those same advances have actually compromised audio to the point where *the relative qualities* of the two are diverging. That is, we would argue that in at least some instances, while video is getting better, audio is getting worse. We think consumers are demanding more, and we think Summit/WiSA is delivering the solution.

Operating Overview

If it is not clear by now, we expect most aspects of Summit's business to be dramatically different over the next 24 months than it has been the past 24 months. That is another way of saying that their past operating results are not likely to help us develop a projected operating model. The operating results will be quite fluid over the next few quarters as they attempt to build sales momentum on the revenue side and work to facilitate the sales process and complete the next generation embedded solution on the expense side. Nonetheless, we have attempted to provide an operating model framework based on some data points we think we have our arms around, as well as others we will refine as operating visibility improves. Here are some of our assessments in that regard.

The Company's primary products are the TX and RX modules. We believe they sell these modules in the \$10 to \$13 per unit range, depending on the customer and order size. Our understanding is that their costs in those modules run somewhere close to \$7.25, which we suspect will improve at scale. As a result, we are assuming 30% to 35% margins through 2019. Thereafter, we are modeling a transition to embedded solutions that we think will result in lower per unit revenues, but also higher margins. Specifically, whereas module sales may run \$10 per transmitter or receiver (speaker), we suspect an embedded solution may only result in lower per unit revenues but also higher margins as some portion of the embedded solution should result in licensing (software margin) revenue. Here again, we don't think past financials are much help in terms of modeling ongoing results because we really view the Company as having been in a sort of "pre-commercial" stage to this point, and frankly, we are modeling the same through the balance of 2018. Also, the Company utilizes a handful of contract manufacturing arrangements, that they believe will be adequate to support their anticipated sales levels.

Normally we would expect considerable seasonality in the business focused around typical consumer electronics calendars. That is, we would expect greater activity in the June-October time frame as OEMs are preparing SKUs for the holiday season. However, we anticipate that adoption will likely trump seasonality for the next several quarters as brands add WiSA enabled products into their offerings, but not necessarily around holiday launches. Here again, this issue will be quite fluid, but conceptually, we think that is how this may work initially.

The Company's S-1 notes that approximately \$4 million of their recent IPO is allocated to Research & Development. We have modeled that notion, but frankly, we anticipate *ongoing* research and development expenses in line with the \$1 million+ per quarter pace going forward.

Since the Company's "customer" are typically large CE brands the sales function generally occurs at a relatively high level. However, we do think WiSA provides a fair amount of support to enabled brands in various capacities. We also expect WiSA to be more active in terms of expanding the education and visibility of the standard, for example, we could see WiSA representatives dispatched to large retailers to educate salespeople about the advantages and features of the technology. To that end, it is worth noting that currently the Company essentially consolidates WiSA activities in its own financials, and it does not provide any detail as to the amounts and/or specific line items of these costs. At this point, we don't think these numbers are material, however, again, we would expect the Company to engage in more street level or even gorilla marketing of the WiSA label and standard in an effort to improve visibility and adoption at the consumer level.

We expect general and administrative expenses to increase on a dollar basis with sales, but we also expect them to decrease on the margin. Certainly, the Company's new public status will require a level of expenses they did not have in the past. We have adjusted the model for those factors, however, given the nature of the business, we suspect there to be considerable leverage in G&A at higher assumed sales levels.

The Company has \$141 million of accumulated deficit, so we suspect the associated tax carry should insulate them from most income tax well into the foreseeable future.

Management

- **Brett Moyer - Chief Executive Officer, President and Director and Chairman**

Brett Moyer is a founding member of the Company and has served as the President and Chief Executive Officer of the Company and as a member of its board of directors since August 2010. From August 2002 to July 2010, Mr. Moyer served as president and chief executive officer of Focus Enhancements, Inc., a developer and marketer of proprietary video technology. From February 1986 to May 1997, Mr. Moyer worked at Zenith Electronics Inc. a consumer electronic company, where he had most recently been the vice president and general manager of its Commercial Products Division. Since June 2016, Mr. Moyer has also served as a member of the board of directors of Alliant International University, a private university offering graduate study in psychology, education, business management, law and forensic studies, and bachelor's degree programs in several fields. From 2003 to December 2015, he served on the board of directors of HotChalk, Inc., a developer of software for the educational market, and from March 2007 to September 2008, he was a member of the board of directors of NeoMagic Corporation, a developer of semiconductor chips and software that enable multimedia applications for handheld devices. Mr. Moyer received a Bachelor of Arts in Economics from Beloit College in Wisconsin and a Master's of Business Administration with a concentration in finance and accounting from Thunderbird School of Global Management.

- **Gary Williams - Chief Financial Officer, Secretary and Vice President of Finance**

Gary Williams has served as Secretary, Vice President of Finance and Chief Financial Officer since the Company's founding in August 2010. In addition, Mr. Williams served as the Chief Financial Officer of Quantum3D, Inc., a training and simulation technology company, from November 2012 to September 2016. Prior to joining the Company, Mr. Williams served as secretary, vice president of finance and chief financial officer of Focus Enhancements Inc., a developer and marketer of proprietary video technology, from January 2001 to July 2010, when the videography and semiconductor businesses of the company were purchased by VITEC Multimedia, Inc. and the Company, respectively. Mr. Williams served as controller, vice president of finance, chief financial officer and secretary of Videonics Inc., a publicly traded company in the consumer electronics business, from February 1995 to January 2001, when Videonics merged with Focus Enhancements, Inc. From July 1994 to January 1995, Mr. Williams served as controller for Western Micro Technology, a publicly traded company in the electronics distribution business. From January 1990 to June 1994, Mr. Williams worked in public accounting for Coopers & Lybrand LLP. Mr. Williams is a Certified Public Accountant, inactive, and received a Bachelor's Degree in Business Administration, with an emphasis in Accounting, from San Diego State University.

- **Ed Green - Vice President of Operations**

Ed Green is a founding member of Summit Semiconductor serving as Vice President of Operations. Currently reporting to Mr. Green are the Production & Test Engineering, Quality and Reliability, and the IT departments. Prior to joining Summit Semiconductor Inc., Mr. Green held several positions at Network Elements Inc., Beaverton, OR. Most recently, Mr. Green was Product Line Manager for NEI's 10 Gigabit Ethernet group. Mr. Green was the driving force behind NEI's XENPAK, X2 and XFP programs. Over Mr. Green's four year career at NEI, he was responsible for all design-for-test (DFT) on NEI's 10Gb/s SERDES IC, and validation of NEI's first multi-protocol ASIC. In 2000, Mr. Green served as Chief Operating Officer for Sunhoo.com based in Shanghai, China. There, Mr. Green was responsible for the development and implementation of the company's business model and plan for a financial web portal in China. For the seven years prior to Sunhoo.com, Mr. Green operated a small chain of family entertainment centers. Mr. Green was responsible for all design, construction,

implementation, management, and financial and corporate matters involving the company's five stores and 70 employees. Mr. Green earned his BS in Electrical Engineering in 1983, and his MBA in Accounting in 2004.

- **Tony Parker - Vice President of Business Development and Strategy**

Tony Parker is a founding member of Summit Semiconductor serving as Vice President of Business Development and Strategy. Mr. Parker has 25 years of experience in semiconductor marketing leadership, with extensive expertise in wireless markets, including WiFi and UWB. Prior to joining Summit Semiconductor he was director of marketing with Cirrus Logic for ARM system-on-chip solutions and audio DSP products for decoding and post processing of sound effects targeting AVR, DTV and automotive applications. Prior to that, he was senior manager of corporate strategy and technology for Agere Systems, directing and leveraging company-wide resources across multiple product families including data networking, mobile, and storage businesses. Parker also has a proven track record of developing and delivering the right products to semiconductor markets while working in key product management and marketing management positions at Texas Instruments, AT&T, and Lucent Technologies. Mr. Parker holds a BS degree in Electrical Engineering from Bradley University, Peoria Illinois, as well as an MBA degree from Syracuse University, Syracuse, NY.

- **Keith Greeney - Vice President of Engineering**

Keith Greeney is a founding member of Summit Semiconductor serving as Vice President of Engineering. Mr. Greeney manages five groups within Summit Semiconductor; Research and Development, System Testing, FW Development, Application Development, and Reference Design Development. Mr. Greeney has over 25 years of experience in Firmware, Hardware, Digital Signal Processing (DSP) and ASIC design. He began his career as a system configuration manager at Applied Research Laboratories while pursuing a BSEE from the University of Texas at Austin. Prior to joining Summit Semiconductor, Mr. Greeney was a key contributor to Tektronix' Federal Systems, the group responsible for developing the world's first real-time digital spectrum analyzer, the Tektronix 3052. Along with algorithm design and design-for-test (DFT) responsibilities for the 3052, Mr. Greeney developed and implemented the production line. At Summit Semiconductor, he is responsible for the successful design and implementation of over 10 ASICs ranging from scan converters, alpha blenders, UWB and Wireless Audio for key customers including Bang & Olufsen, Intel, and Microsoft Xbox.

- **Tony Ostrom - President WiSA**

Tony Ostrom is the President of the Wireless Audio and Speaker Association (WiSA). His 25-year career in the consumer electronics industry has been focused on product planning and development, consumer research, technology integration, go-to-market planning, marketing, training and sales. Prior to joining WiSA Tony was the Vice President of Product Development at Klipsch Group where he managed multiple categories including Wireless Home Theater, Wireless Distributed Audio, Bluetooth and Powered Audio Solutions. Prior to Klipsch, Tony played key roles in the global launches of Powermat Wireless Charging as well as the House of Marley audio and lifestyle brand. Tony was Director of Product Development and Marketing at Klipsch Group where he drove the Mass Retail and Personal Audio categories and started his career at JL Audio where he was a Technical Director. Tony has a BA in Music Engineering and a Minor in Physics from Ball State University, Muncie Indiana.

- **Michael A. Fazio – Director**

Michael A. Fazio has been a member of the Company's board of directors since May 2017. Since its inception in August 2012, Michael A. Fazio has served as the chairman of MARCorp Financial LLC, a private equity firm

located in Illinois. Mr. Fazio was granted a seat on the Company's board of directors pursuant to a securities purchase agreement, dated as of May 17, 2017, between the Company and MARCorp Signal, LLC, a wholly-owned subsidiary of MARCorp Financial LLC, pursuant to which the Company issued MARCorp Signal, LLC a \$5,882,353 senior secured original issue discount convertible note and a warrant to purchase 2,614,380 shares of our common stock. Previously, from 2003 to December 2016, Mr. Fazio held various senior management roles at Houlihan Lokey, a global investment banking firm, most recently serving as managing director and co-head of the European Financial Institutions Group. Mr. Fazio also served as president, chief financial officer of Comdisco Inc. and chief executive officer of Comdisco Europe a multibillion equipment leasing company, from 2001 to 2002. Prior to Comdisco, Inc. from 1999 to 2000, Mr. Fazio served as executive vice president and chief operating officer of Deutsche Bank of the Americas, a global banking and financial services company, and from 1983 to 1999, he was employed at Arthur Andersen and served in various leadership roles there, including as Partner in Charge of the Financial Institutions Industry program in New York. The Company believes that Mr. Fazio is qualified to serve on its board of directors because of his over 30 years of experience in advisory services in connection with acquisitions, divestitures, corporate strategy, operational oversight and restructurings. Mr. Fazio received a joint BBA/MBA, with honors, in accounting from Pace University.

- **Jonathan Gazdak - Director**

Jonathan Gazdak has been a member of the Company's board of directors since June 2015. Mr. Gazdak has served as managing director and the head of investment banking at Alexander Capital L.P., an investment banking firm based in New York, since April 2014, concentrating in the technology, digital media, media and entertainment industries, as well as specialty finance vehicles. He has worked on a broad range of transactions, including public equity and debt financings, restructurings, mergers and acquisitions and special-purpose acquisition company (SPAC) transactions. Prior to Alexander Capital L.P., Mr. Gazdak served as head of the technology group at Aegis Capital Corp., a mid-sized broker-dealer firm, from November 2011 to April 2014. While at Aegis Capital Corp., he helped complete over 40 public and private financings and merger and acquisition transactions. Prior to Aegis Capital Corp., from June 2009 to October 2011, Mr. Gazdak worked in the media and entertainment group at Oppenheimer & Co. Inc., an investment banking and financial services firm. Prior to his career in investment banking, Mr. Gazdak was an entrepreneur who owned and managed an international IT consulting and services firm for 10 years, selling it in 2005. From May 1996 to May 2006, Mr. Gazdak was a national board member and regional president of the TechServe Alliance, which promotes the growth of hundreds of IT-related business around the nation. Mr. Gazdak received his MBA from Columbia Business School with Beta Gamma Sigma honors and received a degree with honors in mechanical engineering from the University of Florida. The Company believes that Mr. Gazdak is qualified to serve on its board of directors because based on his deep experience as an entrepreneur as well as his broad experience in the finance and technology industries.

- **Dr. Jeffrey M. Gilbert – Director**

Dr. Gilbert has been a member of the Company's board of directors since April 2015. Dr. Gilbert has been working in the Research and Machine Intelligence and Project Loon teams at Google, Inc. since March 2014, and from January 2014 to March 2014, Dr. Gilbert worked for Transformational Technology Insights LLC, a consulting company, where he served as the sole principal. Previously, from May 2011 to December 2013, Dr. Gilbert was chief technology officer of Silicon Image, Inc., a leading provider of wired and wireless connectivity solutions. Dr. Gilbert was responsible for Silicon Image Inc.'s technology vision, advanced technology, and standards initiatives. Prior to joining Silicon Image Inc., Dr. Gilbert was chief technical officer of SiBEAM Inc., a fabless semiconductor company pioneering the development of intelligent millimeter wave silicon solutions for wireless communications, from May 2005 to May 2011. Before SiBEAM Inc., Dr. Gilbert served as director of algorithms and architecture and other engineering and management positions at Atheros Communications, a semiconductor developer, from May 2000 to May 2005, where he led the development of that company's 802.11n,

802.11g, eXtended Range (XR), and Smart Antenna technologies. Dr. Gilbert received a Ph.D. in Electrical Engineering from the University of California Berkeley, an M.Phil. in Computer Speech and Language Processing from Cambridge University, and a B.A. in Computer Science from Harvard College. The Company believes that Dr. Gilbert is qualified to serve on its board of directors to advise the company on technology developments and management based on his long-standing experience in the wireless and technology industries.

- **Brian Herr – Director**

Brian Herr has been a member of the Company's board of directors since February 2018. Mr. Herr is Chief Investment Officer and Co-Head of Structured Credit and Asset Finance for the Medalist Partners platform (f/k/a Candlewood Structured Strategy Funds) and serves as a co-portfolio manager for the Medalist Partners Harvest Master Fund, Ltd. and Medalist Partners Opportunity Master Fund A, LP (collectively, the "Medalist Funds"). Prior to working for the Medalist Partners platform in October 2010, Mr. Herr worked at Credit Suisse as a portfolio manager within its structured credit effort since August 2006. Prior to that, Mr. Herr worked for two years in the structured products department of Brown Brothers Harriman and Co. as a Structured Products Sector Manager, where his primary responsibilities included trading and sector management for the ABS and RMBS sectors with approximately \$2.5 billion in AUM. Prior to that, Mr. Herr, while employed at Brown Brothers Harriman and Co., served in a variety of positions within its institutional fixed income division since 1999. Mr. Herr graduated Boston University in May 1999 with a Bachelors Degree in Economics and a minor in Business Administration. The Company believes that Mr. Herr is qualified to serve on its board of directors because of his extensive financial experience with both large and small cap companies.

- **Michael Howse – Director**

Michael Howse has been a member of the Company's board of directors since April 2018. Mr. Howse has served as founder and general partner of Eleven Ventures since 2015, a venture capital firm focused on the consumer technology, digital gaming and VR/AR markets. Previously, from 2013 to 2014, Mr. Howse served as Advanced Micro Devices, Inc.'s Corporate Vice President of New Ventures, where he was responsible for defining cloud GPU platforms and strategies. Prior, from 2008 to 2012, Mr. Howse served as chief executive officer and president of Bigfoot Networks, the creators of the Killer™ branded game networking technology, which was acquired by Qualcomm. Mr. Howse was integral in creating the 3D graphics category for mainstream consumers while serving in senior executive roles at Creative Labs, S3 and 3dfx Interactive. Mr. Howse received his undergraduate degree from UCLA in 1986 and completed the Executive MBA Program at Stanford University in 1995. Since 2013, he has served on the Executive Committee of the UCLA Venture Capital Fund and previously worked at U.S. Venture Partners from 2001 to 2003. Mr. Howse has received numerous industry awards, including "Marketer of the Year" from Marketing Computers Magazine/Brandweek, PC World's "50 Best Products of All Time", Fierce Wireless "Fierce 15" as well as an Academy of Interactive Arts & Sciences award for his pioneering work at Total Vision. He has also been a featured speaker at CES, E3, Churchill Club, Digital Hollywood, and Game Developers Conference (GDC) amongst others. The Company believes that Mr. Howse is qualified to serve on its board of directors because of his technology and managerial experience as well as his knowledge of the gaming industry.

- **Helge Kristensen – Director**

Helge Kristensen has been a member of the Company's board of directors since August 2010. Mr. Kristensen has held high level management positions in technology companies for the last 25 years and for the last 18 years, he has served as vice president of Hansong Technology, an original device manufacturer of audio products based in China, and as president of Platin Gate Technology (Nanjing) Co. Ltd, a company with focus on service-branding

in lifestyle products as well as pro line products based in China. Since August 2015, Mr. Kristensen has served as co-founder and director of Inizio Capital, an investment company based in the Cayman Islands. Mr. Kristensen has been involved in the audio and technology industries for more than 25 years. His expertise is centered on understanding and applying new and innovative technologies. He holds a master's degree in Engineering and an HD-R, a graduate diploma, in Business Administration (Financial and Management Accounting) from Alborg University in Denmark. The Company believes that Mr. Kristensen is qualified to serve on its board of directors because of his technology and managerial experience as well as his knowledge of the audio industry.

- Sam Runco – Director

Sam Runco has been a member of the Company's board of directors since its inception. Mr. Runco co-founded Runco International, Inc. in 1987 and served as its chief executive officer until 2007. He also served as a director of Focus Enhancements Inc. from August 2004 to September 2008 and a director of the Consumer Electronics Association (CEA) and CEA's video division from 1996 to 2005. In addition, he played a leadership role in the consumer electronics industry as a member of numerous organizations and associations. From 1997 through 2001, Mr. Runco served as a member of the National Academy of Television Arts and Sciences (Emmy) Technical/Engineering Awards Nominating Committee, the Academy of Digital Television Pioneers. He served as member of the Board of Directors/Governors from 1998 through 2000 and again from 2003 through 2005, then as a member of the Board of Industry Leaders of the CEA from 2006 to 2008. He also served as a member of Board of Governors of the Electronic Industries Alliance from 1998 through 2000, and as a member of the Board of the Academy for the Advancement of High End Audio and Video. Mr. Runco is the recipient of the Consumer Electronic Design and Installation Association peer-selected Lifetime Achievement Award and elected to Dealerscope magazine's Hall of Fame. The Sound & Visionary from S&V Magazine selected him as one of the 10 Most Influential Leaders in the custom installation industry by CE Pro magazine. He was number 1 on the Most Influential Leader list in the custom installation audio/video industry, which was voted on by his peers six years after Mr. Runco sold Runco International, Inc. The Company believes that Mr. Runco is qualified to serve on its board of directors due to his solid reputation with the audio video dealer network and his ability to understand consumer desires and provide guidance on product development. The Company believes that his industry experience, including his knowledge base on dealers and their consumers, will be an excellent resource for the Company.

Risks and Caveats

While we believe Summit's technology represents a breakthrough in wireless audio, the consumer electronics business is a fluid and competitive environment that is often characterized by new innovation. Anyone who has spent any time at the annual Consumer Electronics Show will likely agree with that statement. Moreover, much of that innovation is introduced by large well-established brands that are entrenched in the industry. While we would argue that Summit's technology is unique and fills a noticeable void in the CE business today, and they have clearly garnered the attention of many of the industry's largest brands, there is no guarantee that other large players won't come up with an alternative that could make it difficult for Summit to succeed. At the very least, we suspect there are major CE brands that may never adopt a solution of this type that is not of their own creation. Recognize, there are other competitive offerings in the market and some of those are sold by well-established and well-known brands.

While the Company recently completed a substantial capital raise of \$12 million, there is no assurance that those funds will get them to a point of sustainable positive cash flow. If they do not, there is no assurance the Company will be able to raise additional funds to continue to advance the business plan. Further, if they do need to raise additional capital and they are successful in doing so, it is likely that financing will be dilutive to existing shareholders.

We have alluded to the Company's plans to develop embedded solutions that involve at least in part, high margin software solutions that will replace some of the existing firmware the Company sells today. Our model assumes the ultimate implementation of that embedded solution, however as far as we know, that solution is not fully developed and therefore they may find that they are unable to commercialize that iteration of the technology. In that case, our margin assumptions, cash flow assumptions and valuation assumptions will likely prove overstated. In addition, even if they are able to deliver the embedded solution, adoption of that approach may require more adoption and/or "critical mass" than they are able to build amongst individual brands. There again, that may inhibit their ability to exploit more favorable iterations of the technology.

Along the same lines as the above, the CE business is highly competitive and is often quite price sensitive. Adoption of the WiSA protocol may depend on price points that are lower than we are modeling or perhaps even price points that the Company cannot achieve.

The Company utilizes contract design and manufacturing arrangements for virtually all of their products. If those arrangements and/or agreements were terminated or changed materially, it could negatively impact the Company's ability to provide product in a timely manner or perhaps even at all.

The consumer electronics space is largely dependent on reasonable underlying economic conditions, and by extension, the disposable income(s) of consumers. Adverse economic conditions are often particularly difficult for the CE space, and we would expect that to apply to Summit as well.

The Company was founded and still today operates under the guise of a small handful of people. We would view the loss/exit of anyone of these individuals as likely detrimental to the Company.

Summit recently went public via the filing of an S-1 registration statement. A large portion of the shares (about 60%) are held by insiders. Since their public debut, the stock has been largely illiquid, and we suspect it will continue to trade thin into the foreseeable future. People should consider that factor in the context of their own investment horizons and goals, and they should consult their appropriate advisors with respect to that issue.

These are just some of the more obvious risks associated with Summit. There are most certainly others we have not identified and/or addressed here.

Valuation and Summary

As we suggested, our thesis here is that Summit has developed a technology that fills a void in the CE market and specifically the wireless audio space. While we do think they happen to be in the "right place at the right time", like many "next big things", they didn't just arrive here, rather, they have been at this for some time now. Recall, we noted that the Company was started in 2010 with WiSA following in 2011, and we also noted that they have accumulated \$141 million worth of retained earnings deficits along the way. To reiterate, the development and early adoption of the technology has been a process.

As we also alluded to, we don't think the opportunity here is all that obvious to many people, even those with a penchant for consumer electronics. We have spoken to a few CE junkies who had no idea what WiSA was/is, and in fact were really not aware of many of the limitations of things like Bluetooth and Wi-Fi in terms of things like delivering multichannel audio, RF drift and other common problems that people experience but really aren't sure why. Despite those limitations, we think the industry has continued to integrate these technologies into new CE offerings (our square peg in a round hole analogy) even though they knew they were woefully inadequate in terms of much of the functionality CE consumers were looking for in audio and in combined video/audio applications.

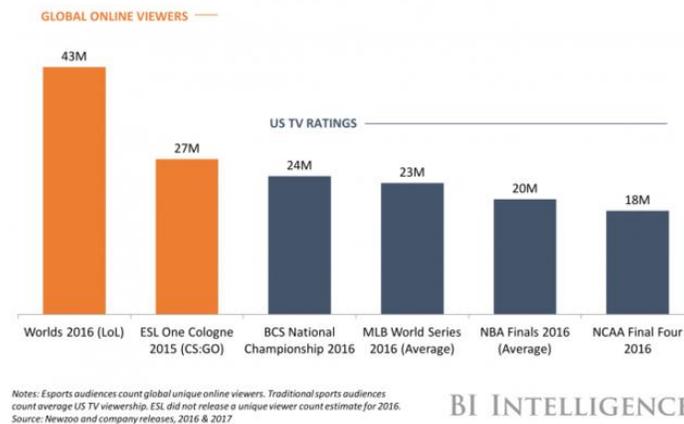
Moreover, the industry has actively proliferated products that sacrificed better audio for better video or at least more ergonomic video form factors (thinner TVs). On the other hand, the industry’s answer to *that* paradigm to this point has been the advent of soundbars, which have exploded both in term of units sold (industry estimates suggest 12 million units worldwide and \$2.3 billion dollars in annual sales in 2015 with those number doubling by 2021).

Inasmuch as soundbars have provided a reasonable fix for poor television audio, they still don’t address the multichannel and immersive sound options that we think many consumers want. Succinctly, it seems counter intuitive to us that content providers are beginning to deliver 5.1 channel programming to consumers that all own (or intend to own) soundbars. It’s like the tree that falls in the forest that doesn’t make a sound because no one is there to hear it. Does a consumer care if they receive 5.1 channel content if their system only supports 2.1? To that end, it is always very difficult to ascertain the ultimate adoption of a new technology both in terms of market penetration and the time it takes to get there. With that said, we have built our model around the assumption that we have a good idea of how many soundbars are being sold each year and we believe multichannel wireless is a natural progression (superior upgrade) to the soundbar. We submit, as a matter of methodology, our model is built around the notion of WiSA enabled products arresting market share from projected soundbar sales. To that point, as we noted above, some of the WiSA enabled offerings to this point have been provided by high-end audio brands so their price points have not been competitive with even high end soundbars. However, we also pointed out that there are WiSA enabled 5.1 systems on the market today at sub \$1000 price points and we have seen those same systems recently as low as \$799. The Company believes that 2019 could bring WiSA enabled 5.1 systems below \$500, which is a price point that is quite competitive with many reasonable quality soundbars. In our view, there is no comparison between the sound from a 2.1 soundbar and a 5.1 or 7.1 channel immersive sound system, and if the price points between the two do what we expect, we think our assessments about WiSA systems stealing soundbar market share will prove accurate.

Aside from the soundbar market, we also think WiSA enabled wireless is uniquely suited for the gaming/eSports market(s) and gaming/eSports are exploding. The fact that many gaming events are seeing higher winning purses and better online viewing audiences than many other traditional professional “sports” is hard to believe. Believe it:



Esports Audiences Versus Other Sports



With that said, we know that gamers are not shy about spending money on top shelf equipment. For a good example of that notion, go price an Alienware or comparable gaming computer to those designed for business or other non-gaming specific applications. We also know that the gaming opportunity is not lost on the Company and we think their recent board addition of Michael Howse, a gaming industry veteran, as well as their recent announcements regarding Xbox's entry into WiSA are telling. Make no mistake, Summit has its eyes fixed on opportunities in the gaming/eSports space.

Our expectation is that the Company will continue to gather interest from various brands that might ultimately enable their products with WiSA. That notion should be easy enough to gauge, as the Company has been regularly announcing such arrangements to this point, so we would expect them to continue to do so. Put another way, we would view further announcements about the addition of new WiSA members (brands) as further validation of potential future adoption. In the inverse, we will be disappointed if we don't see more of those announcements. On the other hand, the addition of WiSA members will not necessarily translate into the immediate addition of SKU's. That is, they need brands to join WiSA **and then** enable their products with the technology. We believe CES 2019 will provide us with some visibility to that end as well. Just to reiterate, their success will depend on their ability to attract brands, convince those brands to add WiSA to their products and then for those products to sell through to consumers. All of **that** on one level or another, will depend on the marketing and education of both brands and consumers as to the advantages of (and our assumed demand for) WiSA's wireless offerings. Although, it will also depend on the positioning of the brands themselves. For example, our understanding is that some of the large CE brands are positioning their audio divisions within/under their television divisions we assume because they are beginning to recognize audio as a natural upsell or perhaps bundle for video. WiSA clearly enhances that approach.

Lastly, with the above in mind, the valuation of Summit shares will depend on the breadth and the speed of the adoption we are suggesting. If those are substantially lesser and slower than we are assuming, it will likely negatively impact our valuation assumptions. However, as the model points out, we are not counting on significant revenue inflections through the balance of this year and we think even the 2019 projection comparables while **relatively** robust, are reasonable in the context of **the current brand relationships they have**. Further out, we are also convinced that the embedded solution will entail better margins, and perhaps more importantly, better retail price points which we think will be a key component to consumer uptake. To translate, we think that WiSA enabled products will ultimately be delivered at very competitive/comparable price points to (reasonable quality) soundbars, which we think will drive adoption/switching. We also think the wireless functionality will drive (new) immersive sound demand in both gaming and even traditional high-end audio offerings. In short, our current

valuations are limited to an assumption of what we think is modest penetration of the projected soundbar market (about 8% of that market alone by 2022). However, that sort of penetration would not in our view be commensurate with the “industry standard” status we think could emerge here. Put another way, there are still several things the Company has to get right in order to justify *even the current valuation* much less higher ones, however, we also think the story could be far more open ended than our current valuations imply.

As a result of the above, we are initiating coverage of Summit Wireless Technologies, Inc. shares with an allocation of 4 and a 12-24 month price target of \$9.25. We will reassess those assumptions as visibility regarding adoption and sell through improves.

Projected Operating Model

Summit Wireless Technologies, Inc.							
Projected Operating Model							
By: Trickle Research LLC							
	(Actual)	(Actual)	(Estimate)	(Estimate)	(Estimate)	(Estimate)	(Estimate)
	3/31/18	6/30/18	9/30/18	12/31/18	Fiscal 2018	Fiscal 2019	Fiscal 2020
Revenue, net	\$ 281,795	\$ 379,819	\$ 360,000	\$ 378,000	\$ 1,399,614	\$ 11,880,000	\$ 34,400,000
Cost of revenue	\$ 398,447	\$ 433,185	\$ 408,000	\$ 380,820	\$ 1,620,452	\$ 8,677,200	\$ 24,216,000
Gross profit	\$ (116,652)	\$ (53,366)	\$ (48,000)	\$ (2,820)	\$ (220,838)	\$ 3,202,800	\$ 10,184,000
Operating Expenses:							
Research and development	\$ 1,604,807	\$ 992,999	\$ 1,028,800	\$ 1,030,240	\$ 4,656,846	\$ 4,150,400	\$ 3,376,000
Sales and marketing	\$ 912,080	\$ 469,287	\$ 407,200	\$ 407,560	\$ 2,196,127	\$ 1,837,600	\$ 2,288,000
General and administrative	\$ 1,230,631	\$ 418,069	\$ 787,240	\$ 436,425	\$ 2,872,365	\$ 1,960,316	\$ 2,426,480
Total operating expenses	\$ 3,747,518	\$ 1,880,355	\$ 2,223,240	\$ 1,874,225	\$ 9,725,338	\$ 7,948,316	\$ 8,090,480
Loss from operations	\$ (3,864,170)	\$ (1,933,721)	\$ (2,271,240)	\$ (1,877,045)	\$ (9,946,176)	\$ (4,745,516)	\$ 2,093,520
Interest expense	\$ (8,737,900)	\$ 10,592,693	\$ -	\$ -	\$ 1,854,793	\$ -	\$ -
Change in fair value of warrant liability	\$ 109,000	\$ 4,358,000	\$ -	\$ -	\$ 4,467,000	\$ -	\$ -
Change in fair value of derivative liability	\$ (814,000)	\$ 2,572,000	\$ -	\$ -	\$ 1,758,000	\$ -	\$ -
Gain on extinguishment of convertible notes payable	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other income (expense), net	\$ 684	\$ 579	\$ -	\$ -	\$ 1,263	\$ -	\$ -
Loss before provision for income taxes	\$ (13,306,386)	\$ (19,456,993)	\$ (2,271,240)	\$ (1,877,045)	\$ (36,911,664)	\$ (4,745,516)	\$ 2,093,520
Provision for income taxes	\$ 2,000	\$ -	\$ -	\$ -	\$ 2,000	\$ -	\$ -
Net loss	\$ (13,308,386)	\$ (19,456,993)	\$ (2,271,240)	\$ (1,877,045)	\$ (36,913,664)	\$ (4,745,516)	\$ 2,093,520
Net loss per common unit/share - basic and diluted	\$ (40.96)	\$ (7.04)	\$ (0.13)	\$ (0.11)	\$ (3.89)	\$ (0.27)	\$ 0.12
Weighted average number of common units/shares used in computing net loss per common unit/share	\$ 324,934	\$ 2,762,594	\$ 17,441,343	\$ 17,441,343	\$ 9,492,554	\$ 17,441,343	\$ 17,441,343

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Rating System Overview:

There are no letters in the rating system (Buy, Sell Hold), only numbers. The numbers range from 1 to 10, with 1 representing 1 "investment unit" (for my performance purposes, 1 "investment unit" equals \$250) and 10 representing 10 investment units or \$2,500. Obviously, a rating of 10 would suggest that I favor the stock (at respective/current levels) more than a stock with a rating of 1. As a guideline, here is a suggestion on how to use the allocation system.

Our belief at Trickle is that the best way to participate in the micro-cap/small cap space is by employing a diversified strategy. In simple terms, that means you are generally best off owning a number of issues rather than just two or three. To that point, our goal is to have at least 20 companies under coverage at any point in time, so let's use that as a guideline. Hypothetically, if you think you would like to commit \$25,000 to buying micro-cap stocks, that would assume an investment of \$1000 per stock (using the diversification approach we just mentioned, and the 20-stock coverage list we suggested and leaving some room to add to positions around allocation upgrades. We generally start initial coverage stocks with an allocation of 4. Thus, at \$1000 invested per stock and a typical starting allocation of 4, your "investment unit" would be the same \$250 we used in the example above. Thus, if we initiate a stock at a 4, you might consider putting \$1000 into the position ($\$250 * 4$). If we later raise the allocation to 6, you might consider adding two additional units or \$500 to the position. If we then reduce the allocation from 6 to 4 you might consider selling whatever number of shares you purchased with 2 of the original 4 investment units. Again, this is just a suggestion as to how you might be able to use the allocation system to manage your portfolio.

For those attached to more traditional rating systems (Buy, Sell, Hold) we would submit the following guidelines.

A Trickle rating of 1 thru 3 would best correspond to a "Speculative Buy" although we would caution that a rating in that range should not assume that the stock is necessarily riskier than a stock with a higher rating. It may carry a lower rating because the stock is trading closer to a price target we are unwilling to raise at that point. This by the way applies to all of our ratings.

A Trickle rating of 4 thru 6 might best (although not perfectly) correspond to a standard "Buy" rating.

A Trickle rating of 7 thru 10 would best correspond to a "Strong Buy" however, ratings at the higher end of that range would indicate something that we deem as quite extraordinary..... an "Extreme Buy" if you will. You will not see a lot of these.