

Trickle Research

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



Initiating Research Coverage



COMSovereign Holding Corp.

(NasdaqGS: COMS)

Report Date: 07/19/21

12- 24 month Price Target: \$9.00

Allocation: 4

Closing Stock Price at Initiation (Closing Px: 07/16/21): \$1.92

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Trickle Research

Disclosure: Portions of this report are excerpted from COMSovereign's filings, website(s), presentations or other public collateral. We have attempted to identify those excerpts by *italicizing* them in the text. **On 07/16/21, COMSovereign announced the acquisition RF Engineering & Energy Resource. The acquisition was announced just prior to this initiation. As a result, we chose to initiate the coverage without covering this new portion of the Company. However, our model does reflect the impact of the acquisition in terms of cash and capital structure. We will cover the acquisition in more detail in future updates.**

Company Overview

COMSovereign Holding Corp. (“COMS”) is a provider of technologically-advanced telecom solutions to network operators, mobile device carriers, governmental units and other enterprises worldwide. They have assembled a portfolio of communications, power and niche technologies, capabilities and products that enable the upgrading of latent 3G networks to 4G and 4G-LTE networks and will facilitate the rapid roll out of the 5G and “next-Generation” (“nG”) networks of the future. They focus on special capabilities, including signal modulations, antennae, software, hardware, and firmware technologies that enable increasingly efficient data transmission across the electromagnetic spectrum. The Company’s product solutions are complemented by a broad array of services, including technical support, systems design and integration, and sophisticated research and development programs. While they compete globally on the basis of their innovative technology, the breadth of their product offerings, high-quality cost-effective customer solutions, and the scale of their global customer base and distribution, COMS’ primary focus is on the North American telecom infrastructure and service market. They believe they are in a unique position to rapidly increase their near-term domestic sales as they are among the few U.S.-based providers of telecommunications equipment and services.

COMSovereign Holdings, Inc. has assembled a portfolio of industry-leading, disruptive communications and power technologies as well as niche companies capable of rapid integration and expansion. The Company focuses primarily on businesses or products to which they can apply new and unique spectral efficiency capabilities including signal modulations, antenna, software, hardware and firmware technologies. They enable connectivity across the entire data transmission spectrum. COMS is a US-based pure-play communications provider able to provide LTE Advanced and 5G-NR telecom solutions to network operators and enterprises world-wide.

COMSovereign manufactures and sells their portfolio of telecommunications-related products on a global basis to over 3,000 customers, including 700+ telecommunications network clients. Their customers include a large percentage of mobile cellular carriers, large international corporations, governments, and private network users. Some of the relationships with customers, such as within the DragonWave unit, typically date back many years. Management believes their diversified customer base provides them an opportunity to leverage their skills, experience and varied product lines across markets and reduces their exposure to a single end market. Additionally, they believe the diversity of the customer base is an important strength of the Company. That customer base includes the following:



Empowered by the collaborative leadership of their acquired companies, COMS will continue to develop revolutionary products within the telecom, aerial platform and battery backup and power supply markets to

become a pure-play provider of LTE Advanced and 5G-NR telecom technologies to network operators and enterprises world-wide.

As we will attempt to illustrate throughout this report, 5G is a concept/term/technology, that we think many people have at least heard by now, but few have a good understanding of. The reality is that 5G holds immense promise in terms of delivering communication, data and other functionality across a variety of industries, enterprises and organizations both public and private. In short, if it lives up to its potential, 5G will play a major role in the development, evolution and maintenance of the economies of the future. The trouble is, there is much that has to happen for that potential to be realized and that includes a confluence of government policy, industry standardization, commitments of capital to build out the network, further advances in technology to make it all work and a host of other complex issues. To be clear, in the best scenarios, the “5G revolution” will take years to complete, although that is not atypical since prior platform generations (2G, 3G, 4G) also evolved over respective decades. We would add, while 5G is the *next generation*, we expect 4G to continue to grow as well as to continue to play a significant role in delivering communications and data well into the future. We think that is an important distinction because COMSovereign is not only positioning itself to take advantage of the coming growth of 5G but is also positioned to continue to providing products and technology into the 4G market, which brings us to our investment thesis.

As we will also delineate throughout the report, COMSovereign has assembled a group of companies under one umbrella that it believes will make the Company an integrated player in 4G,5G and the future and on multiple layers. On one layer, the Company has developed and is selling products that address the current market, however, through the acquisition of certain cutting-edge technology pieces, they are also developing technologies and products that they believe will both enhance the current product base, but also provide a basis for new products and offerings that will enable the proliferation of 5G in the future. From another angle, aside for direct technology companies, the Company has also acquired and integrated some periphery enterprises that will enable some of their efforts in the telecom space as well as into additional markets. Those assets include drone companies, backup power supplies, and others. Further, the Company recently acquired a 140,000 square foot manufacturing facility in Arizona. This facility will provide the Company with domestic manufacturing capability. As we will also illustrate below, we believe that for a variety of security and other related issues, the U.S. government is more likely than not to develop policies and programs that favor/support domestic producers in the industry, which we think could prove to be a marked advantage for domestic players like COMS. Moreover, surprisingly, the U.S. does not have an abundance of domestic players in the space.

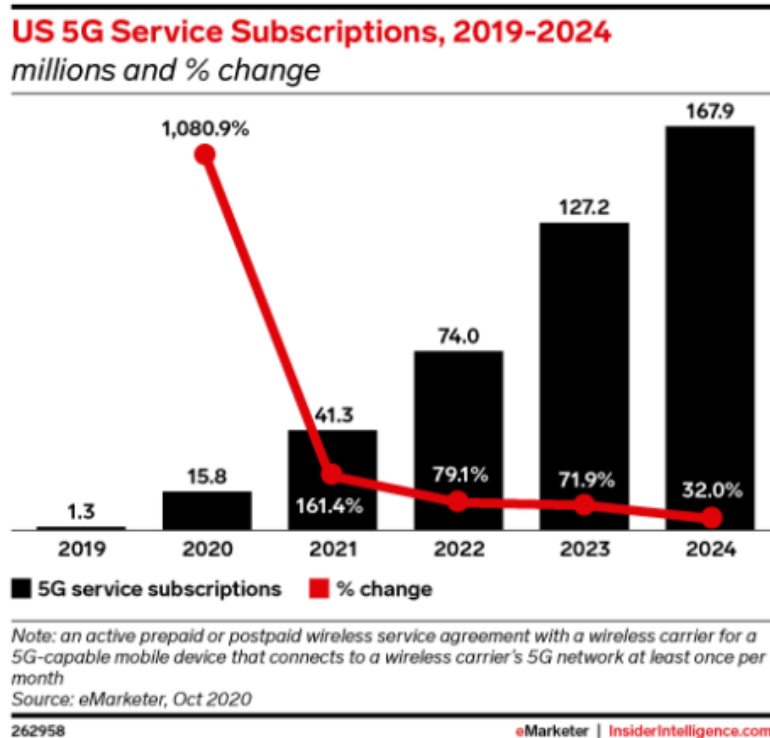
We submit, COMS is a little fish in a big *lake*. We recognize the risk associated with that posture, but we also think it is the basis for their considerable opportunity. In short, 5G is coming and its buildout is likely to accelerate over the next several years. If COMS is successful in capturing even a small piece of that proliferation, we believe it will lead to *markedly better* valuations of the underlying shares. Moreover, while the Company has spent the past few years assembling their vision of an integrated technology player in the space, those efforts as well as their pace, have been constrained by capital. However, in the first half of 2021, the Company has completed equity and convertible financings of nearly \$50 million in net proceeds, which have both cleaned up the balance sheet and provided the working capital to begin accelerating the business. As a result, as we will illustrate, we believe the Company is poised to generate extraordinary breakout financial performance in the second half of 2021 and as well into 2022 and beyond. We believe those results will be driven by a host of factors that include sales from existing business units, the ramp of sales provided by products coming online in their new manufacturing facility, and the introduction of product enhancements and new products from its considerable R&D efforts, which is expected to continue advancing products from its research and development organization to commercialization on a regular basis going forward.

We believe the Company has integrated a robust group of companies to address what will likely be one of the world’s fastest growing industries through the coming decade. To reiterate, if we are correct in some of our assessments herein, we believe those results will lead to *markedly better* valuations of the underlying shares as milestones are achieved and visibility improves.

Industry Overview

By now we think it is fair to say that many people have at least heard the term “5G” and in fact many people in the U.S. have also purchased or plan to purchase 5G phones and associated plans in the coming months:

Table 1.



While many people may have some familiarity with the term, far fewer have a good understanding of what the “5G rollout” really means and/or portends for businesses, industries and economies going forward. Simply put, 5G is about far more than faster cell service. In our view, a better understanding of *those* issues is paramount to understanding COMSovereign’s strengths and opportunities therein. That being the case, some history/backstory might be helpful. To that end, as with Table 1 above, we have supported portions of this Industry Overview with information from various industry reports from various companies/sources. We have attempted to provide appropriate references in those instances.

As the Company’s recent 10K filing describes it: *The term “5G” is misunderstood by most consumers who believe it is simply another layer of technology over the top of current 4G LTE infrastructures. However, this is not the case. While 4G LTE Advanced is a part of a large platform upon which 5G rests, according to many industry studies, significantly more 4G LTE/A will be required before 5G becomes a reality. 5G is an entirely new infrastructure that must be standardized for widespread adoption and must be agile enough to accommodate wireless devices of all kinds, not just cellular smartphones. This new 5G “IoT” (Internet of Things) will enable the connection of the internet to telemedical devices, gaming, video and television, smart-home devices, such as thermostats, alarms, lighting and garage doors, smartphones, driverless cars and traffic signals, laptops, desktops, Wi-Fi, logistic reporting devices on semi-tractor trucks and trains and a plethora of other use cases. It must do so seamlessly and with a fraction of the current “round-trip” response time of data. This requires that data centers be closer to this “edge” where the devices connect to the wireless small cells. As a result, data*

centers and many of the other functions will require virtualization and eventually artificial intelligence (AI) algorithms and machine learning to route data requests to these virtualized data centers to keep latency to a minimum. https://www.sec.gov/Archives/edgar/data/0001178727/000121390021018749/f10k2020_comsovereign.htm

According to Accenture, “5G will transform industries and change the way consumers use mobile technologies, generating substantive benefits beyond previous generations of connectivity technology, driven by three defining differentiators: **enhanced mobile broadband (eMBB)**, **mission critical services (MCS)** and **massive Internet of Things (mIoT)**. 5G will apply these benefits to transform industry landscapes, provide value to consumers and generate economic value throughout the economy in the form of new output, GDP and jobs. 5G will have a transformative impact on both consumers and businesses that is only being accelerated for a post-COVID world. As the effect of 5G cascades throughout the U.S. economy, it will drive up to \$2.7 trillion in sales, create or transform as many as 16 million jobs and contribute up to \$1.5 trillion to U.S. GDP between 2021 and 2025. As with the original digital revolution sparked by the advent of the Internet, this advancement will lead to the creation of industries not yet imagined. There are tangible and realizable business opportunities to speed up the deployment process and maximize the benefits—driven by tremendous market opportunities”. https://www.accenture.com/_acnmedia/PDF-146/Accenture-5G-WP-US.pdf#zoom=50

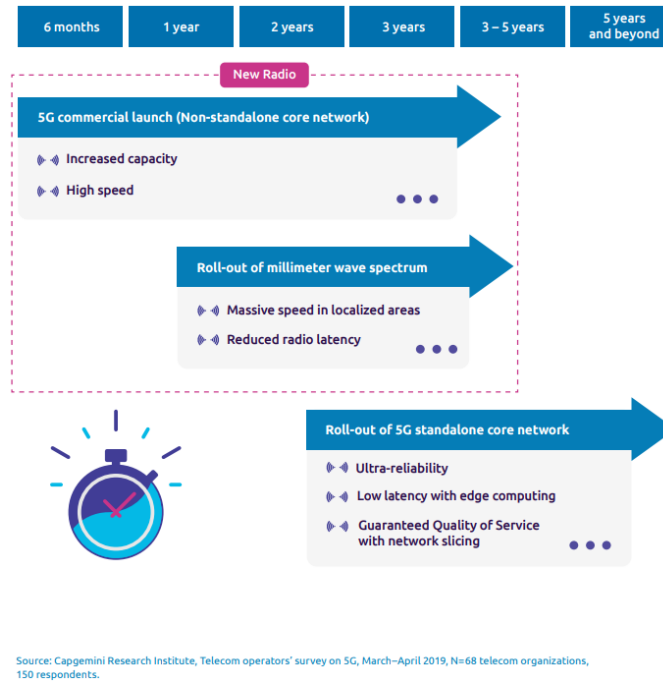
To reiterate, 5G, will include “an entirely new infrastructure”, and as we sit here today that infrastructure is not fully developed, tested, or standardized, so obviously, it is far from deployed. Further, that infrastructure involves considerable complexity, and in our view that complexity include *technological holes* the need to be filled before the infrastructure can achieve its expectations. In addition, in some instances the infrastructure will require entirely new approaches with respect to how information is generated, gathered and shared. Moreover, as recent news events like the hacking of U.S. energy pipelines and others have demonstrated, the infrastructure will require robust security protocols that can better protect information and processes, and those protocols may also include scrutiny regarding where (and by who) these technologies are developed and supported. Bans of technology from companies like Huawei and ZTE, as well as “buy American” mantras provide salient examples of how that might play out.

In our view, the 5G rollout will involve a wide array of variables and complexities including technological, strategic, economic, political, and other nuances. Frankly, in our view, the visibility concerning how this will all ultimately look and work and how long it will take to get there remains opaque. More topically, as generalists that analysis is certainly beyond our paygrade (although at this point, our *guess* may be as good as any), so we will not try to predict that path. That said, we think there are some identifiable industry elements worth noting/considering and we think at least some of these will perhaps prove constructive for COMSovereign’s opportunities in the space. Below are a few of the more applicable elements we see, as well as some color regarding each.

1) 5G is in the nascent stage of development and deployment, and the rollout will likely include phases that will occur over the next decade or more.

According to the Information Technology and Innovation Foundation (<https://itif.org/publications/2020/04/27/us-national-strategy-5g-and-future-wireless-innovation>): “At one level, 5G is simply the next generation of wireless infrastructure. New generations of mobile come in waves, requiring changes throughout the network. The first generation of mobile telecommunications was focused purely on basic voice service. The next generation, 2G, was still focused on voice, but made the switch to digital standards and enabled text messaging. 3G then introduced data services, expanding the functionality beyond voice to include multimedia and limited Internet access. It was not until 4G that a full specification based on Internet Protocol allowed for functional mobile broadband, in turn serving as a platform for dizzying innovation in mobile applications. These waves of technological changes have come in roughly decade-long cycles: 1G mobile voice in the 1980s, 2G in the 1990s, 3G basic data in the 2000s, and 4G LTE data in the 2010s”.

Table 2.



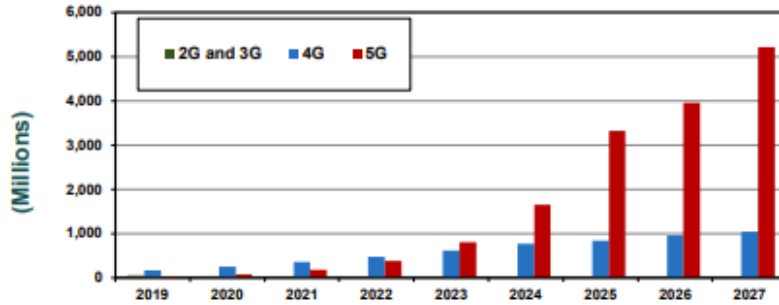
We think the observation from the narrative above, as well as the associated chart for that matter is/are spot on. That is, the rollout of 5G and manifestation of its promise and potential will play out over several years as opposed to several quarters. Moreover, we provide some added color to this notion further in this report, but the reach and breadth of 5G in terms of its application across and within industries will likely be far more significant than past generations, which brings up to our next bullet point.

2) 5G is NOT an extension of 4G.

Part of the reason that the 5G “rollout” will occur in stages and over a period of several years, is that 5G will require an “entirely new infrastructure” as opposed for instance, to being built on top of existing 4G technology. To illustrate, **Table 3.** below is from Global System for Mobile Communications (“GSMA”), which is an industry group representing “the interests of mobile network operators worldwide.” As the table reflects, their expectation is that mobile traffic will grow substantially in the coming years as 5G expands. However, they also forecast that 4G will also continue to grow. To be clear, for a variety of reasons, 4G will continue to carry a substantial and growing load of mobile traffic, which is beneficial to COMS.

Table 3.

Figure 3. Cellular Mobile Traffic per Year by Technical Generation Split



[wireless-backhaul-spectrum.pdf \(gsma.com\)](#)




To extend the thought, COMSovereign’s most recent 10K provides the following observation, which we think is insightful:

5G is an entirely new infrastructure that must be standardized for widespread adoption and must be agile enough to accommodate wireless devices of all kinds, not just cellular smartphones. The 5G enhancements specific to “IoT” will enable the connection of the internet to telemedical devices, gaming, video and television, smart-home devices, such as thermostats, alarms, lighting and garage doors, smartphones, driverless cars and traffic signals, laptops, desktops, Wi-Fi, logistic reporting devices on semi-tractor trucks and trains and a plethora of other use cases. It must do so seamlessly and with a fraction of the current “round-trip” response time of data. This requires that data centers be closer to the network’s “edge” where the devices connect to the wireless small cells. As a result, data centers and many of the other functions will require virtualization and eventually artificial intelligence (AI) algorithms and machine learning to route data requests to these virtualized data centers to keep latency to a minimum.

Further, as Table 4. From Accenture reflects, while 4G has certainly provided a major step from 3G capabilities, the potential for 5G is magnitudes greater, and its proliferation could significantly change/improve countless industries:

Table 4.

Gearing up for a 5G Connected World

Technology	3G	4G	5G
	 Connecting humans	 Connecting humans+devices	 Connecting the world
Latency	300ms	-55ms	<10ms
High Bandwidth	1hr 3GB movie download	18min 3GB movie download	55sec 3GB movie download
Scale	Millions of devices	Billions of devices	Trillions of devices

Source: Accenture Analysis, OpenSignal

Select Findings



Manufacturing

5G-enabled factories can see up to **20-30%**⁶³ in overall productivity gains, including improvements of **50%** in assembly time, **20%** in asset life, and **90%** in defect detection.⁶⁹



Retail

5G can enable rich video streaming experiences in the store, enabling up to **50%** increase in sales growth when combined with human-focused processes and XR visualizations.⁶⁹



Healthcare

5G will allow more post-acute care to transition to remote, home-based models, where cost savings are greater than **30%** and drive better patient outcomes.¹⁰⁹



Auto & Transport

New connected vehicle technologies have the potential to reduce the severity of non-impaired crashes by **80%**¹²⁷, save **\$3.6 billion** in collision costs¹³¹, and reduce traffic by **25%**.¹⁴¹



Utilities

Transmission line monitoring using smart sensors and drones can reduce wildfire risk, potentially **saving billions of dollars**.¹⁶⁹

Source: Accenture Analysis

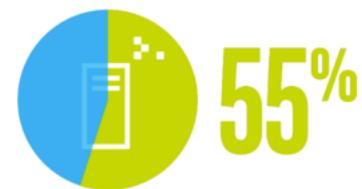
Accenture Strategy | The Impact of 5G on the United States Economy | February 2021

To summarize, there is much more to 5G than we think most people realize as its promise extends far beyond the reach of current 4G technology. On the other hand, getting 5G to its full potential will take extraordinary commitments of capital but also the development, commercialization and scale of technologies that do not exist, or at least are not fully functional today. To repeat a view we have mentioned throughout this report, we think those two characteristics of the emerging 5G rollout (money to be spent and technology to be developed) are key elements to our constructive views of COMSovereign.

3) The Internet of Things and Edge Computing

Certainly, one of the valuation propositions of 5G is its ability to support, emerging technology concepts like “edge computing” and the “Internet of Things” (“IoT”). These are each broad notions, that many may have at least some sense of, so for the sake of brevity we will stick to the high level of each.

First, much like the generations of and evolution to 5G, some of the other technologies 5G impacts include some evolution of their own. For instance, cloud computing has become a major technology cornerstone that drives the bottom lines of Amazon, Microsoft, Google, IBM and others. Cloud computing essentially takes much of the traditional functionality of a PC or an enterprise data center (storage, computing power, maintenance, etc.) and shifts it to a worldwide network of data centers (the “cloud”). By utilizing this approach users gain a host of benefits that can be utilized/scaled as needed. That said, cloud computing evolved in part from the proliferation of “big data”. In short, the ability to store, interpret, retrieve, and utilize increasingly larger amounts of data, has clear benefits to many enterprises. Facebook for instance would be far less successful if it could not collect, parse and sell the large amounts of data



55 Percent of All Data
Is forecast to be generated by IoT in 2025.*

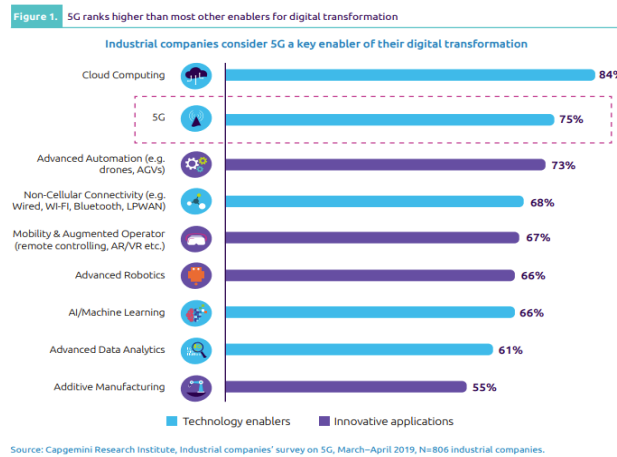
www.intel.com

it gathers from its users were it not for technologies that enable the management of that massive (big) amount of information. As an extension, cloud computing is the enabling “ying” to the big data “yang”. That is, the resources required to manage, store, maintain, etc. large amounts of data are substantial such that most enterprises much less individuals cannot afford or manage that functionality. However, by utilizing cloud computing, those same enterprises and/or individuals can, among other things, access (rent) large amounts of computing power when/if they require it. As we said, cloud computing (supporting big data) has become a corner stone of the information realm, and it remains topical to a variety of industries well beyond technology companies like Facebook. For example, Table 3. below references a survey regarding the importance of particular technologies that *industrial companies* ranked with respect to their own “digital transformations”. We would note, while cloud computing was at the top of the list, 5G and “advanced automation” (drones for instance) ranked 2nd and 3rd respectively:

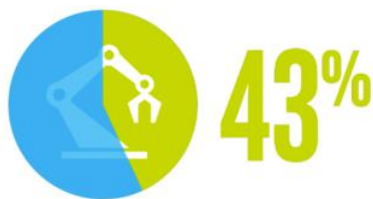
Table 5.
Companies across the world are ready to embrace 5G, but 5G’s disruptive features will take some time to materialize

5G is seen as an attractive proposition and there is appetite to launch quickly

Three-quarters of industrial companies (75%) believe that 5G is going to be a key enabler for their digital transformation in the next five years. In fact, 5G is placed higher than artificial intelligence or advanced data analytics (see Figure 1). The reason, partly, is that 5G will be the connectivity engine that drives the development, at scale, of technologies such as real-time image processing, edge analytics, advanced automation, and AR/VR.



<https://www.capgemini.com/us-en/wp-content/uploads/sites/4/2019/06/5G-in-industrial-operations.pdf>



43 Percent of AI Tasks
 Will happen on edge devices in 2023.²

www.intel.com

Inasmuch as cloud computing has changed the information world by enabling the storage, maintenance and access of big data, that collective paradigm has in turn enabled the Internet of Things. As the name implies, the Internet of Things amounts to bringing the internet to a host of devices that previously were not connected in any way. There are countless examples in the consumer space, like home security and monitoring devices that can be accessed via smart phone, and from that perspective, most consumers are familiar with IoT. However, much like our argument throughout this report that while the *front end* of 5G may be identified as a faster way to download a movie on your phone, there are far bigger things

afoot here in terms of applications that enable industry. Certainly, IoT is part of the industrial “digital transformation” we noted above, and many industries have and will continue to embrace IoT solutions. For example, there are IoT solutions that monitor soil moisture helping farmers optimize their water solutions, while in other cases, quality assurance processes on the factory floor can be monitored and adjusted remotely as well. That said, as IoT proliferates there becomes more and more devices trying to communicate across IT networks, which drives the need for better infrastructure and/or better ways to deal with the information that is being exchanged across those networks. That brings us to edge computing.

Edge computing is perhaps the next leg of the data evolution we have been describing above. However, in some ways, edge computing seems a bit counterintuitive to the cloud computing pitch we made above. That is, cloud computing attempts to pull all the data from various devices and applications into a central place (the “cloud”) where it can be stored, parsed and redistributed on demand. On the other hand, as IBM describes it:

*Edge computing is a distributed computing framework that brings enterprise applications **closer to data sources** such as IoT devices or local edge servers. This proximity to data at its source can deliver strong business benefits, including faster insights, improved response times and better bandwidth availability. **The explosive growth and increasing computing power of IoT devices has resulted in unprecedented volumes of data. And data volumes will continue to grow as 5G networks increase the number of connected mobile devices.***

In the past, the promise of cloud and AI was to automate and speed innovation by driving actionable insight from data. But the unprecedented scale and complexity of data that is created by connected devices has outpaced network and infrastructure capabilities. Sending all that device-generated data to a centralized data center or to the cloud causes bandwidth and latency issues. Edge computing offers a more efficient alternative; data is processed and analyzed closer to the point where it is created. Because data does not traverse over a network to a cloud or data center to be processed, latency is significantly reduced.



70 Percent of Enterprises
Will run varying levels of data processing at the IoT edge by 2023.¹
www.intel.com

Edge computing — and mobile edge computing on 5G networks — enables faster and more comprehensive data analysis, creating the opportunity for deeper insights, faster response times and improved customer experiences. (<https://www.ibm.com/cloud/what-is-edge-computing>).

Again, the evolution of data has involved multiple layers (big data ~ cloud computing ~ Internet of Things ~ edge computing) with the proliferation of each depending on the advances of others. That is, big data, needs the cloud, which supports the growth of IoT, which requires more edge computing. As IBM’s view above reflects, the growth of edge computing will require the realization of the potential of 5G. However, 5G is not able to deliver on all that potential *today*, and much like the progression of data and data related frameworks, 5G’s growth will depend on the continued development of more robust pieces. To be clear, that notion embodies much of our enthusiasm for COMSovereign in the sense that we believe the Company is poised to deliver solutions across the growth/advance of 5G. We believe COMSovereign’s business in the near and intermediate terms will be driven by radios, drones and other offerings they are selling today and/or will be selling shortly that address 5G as it exists today. However, while also believe that their intermediate and longer term(s) opportunities will emerge from proprietary technologies they are developing today for the 5G of tomorrow.

4) The trade-offs of 5G.

As we noted above, 5G is more than simply the next generation of mobile telecom and some of its advantages over prior generations center on the fact that it operates in a different spectrum than its predecessor generations. More specifically, 5G operates in the 6 to 60 GHz spectrum(s), which provides some inherent advantages and disadvantages. As we have noted, 5G has to potential to operate at significantly faster speeds as well as substantially improved latency. However, as the Table 6. below also illustrates, the higher spectrum environment of 5G (6-60 GHz) also comes with a far more limited range.

Table 6.

Band/Parameter	4G LTE	5G
Frequency of operation	2.1 GHz	6–60 GHz
Speed	10–20 Mbps	20 Gbps
Latency	100–200 milliseconds	1 millisecond
Average range (from a tower)	10 km	300 m
Device coverage density	1 million devices per 500 km ²	1 million devices per 1 km ²

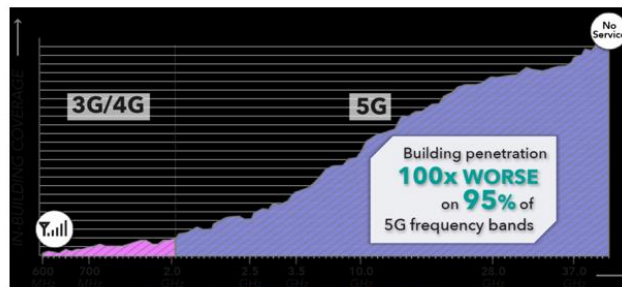
<https://techbullion.com/anomaly-detection-on-5g-possibilities-and-opportunities/>

Moreover, higher frequencies are also far more limited in terms of obstructions/line of sight issues as reflected in Table(s) 7 below. While obstructions include things like buildings, trees and even glass in windows, these frequencies are more susceptible to weather as well.

Table 7.



<https://www.pcmag.com/news/heres-the-real-truth-about-verizons-5g-network>



<https://blog.surecall.com/what-is-5g-frequencies-faults/>

To be clear, the distance, line of site and obstruction issues are in our view, one of the major keys to the trajectory of the rollout of 5G. To translate, the 5G trade-off of faster and less latent vs. less range and penetration, is not insignificant. As we have argued throughout this report, the advantages and potential of 5G could be transformational, they are not without cost. Ostensibly, the solution to less range and penetration is to add multiple numbers of radios/cells to extend the (collective) range of the platform. That is, the limitations of 5G suggest that its proliferation will likely require several times more radios and cells than its 4G predecessor. We would add, **COMSovereign makes both**. That brings us to our *next* point.

5) Private Networks, Smart Campuses and Connected Communities

As the limitations of 5G suggest, there is a considerable amount of new infrastructure that will need to be developed and deployed if it is to achieve much of the “vision”. As we just covered, part of that infrastructure will include a host of new radios, small cells and other devices that allow 5G to be accessible by the millions of devices that will utilize it. To reiterate a salient point, because 5G has significant distance and line of sight issues

relative to its lower frequency predecessors, the density (distance from one another) of the devices that carry signals will have to increase dramatically, which begs the question, who will be responsible for installing and managing all of these new devices?

For the sake of comparison, many consumers are familiar with the logistics of using Wi-Fi in their homes. For instance, while the cable company may deliver the cable to the home, and that may include a modem that helps “route” the signals, consumers may need to purchase a router that will further deliver the signal (wirelessly) to various devices throughout the home. Moreover, others with larger home may use additional devices like a Wi-Fi booster/extender to further enhance the reach and strength of that the signal. This Wi-Fi example differs from the current cellular structure, where aside from purchasing a phone and a service contract from a telecom (Verizon, AT&T, T-Mobile, etc.), the consumer has no additional responsibility for or for that matter even knowledge of where/how their phone reception is delivered and maintained. Certainly, part of that stems from the notion that Wi-Fi is typically delivered to a static location, whereas cellular service is delivered to the consumer (almost) wherever they may be. That said, the 5G world may work a bit differently.

As we illustrated above, while 5G is projected to grow significantly, that growth will not generally come at expense of 4G. That is, even in a well-equipped 5G future, 4G will likely still carry a significant load because the limitations of 5G’s reach (and the expense related to mitigating those limitations) will make less densely populated and remote areas less likely to be outfitted for 5G. For example, some of the more rural areas of the country that may have 4G service today may never have 5G service but *will still* be able to utilize the 4G network. In that case, those areas will not have access to the speed and latency benefits of 5G. However, that limitation may apply to more than just rural areas. In our view, 5G’s reliance on more dense infrastructure may require businesses, communities or other cooperative organizations to participate more directly in their own access to, and consumption of, 5G enabling their campuses, buildings, offices. etc. with the equipment density necessary for the delivery of and access to full 5G functionality. Again, while most consumers of 4G generally rely on their telecom providers for access to relatively ubiquitous cellular service, 5G users (especially some enterprises) may have to deploy some of their own infrastructure to take full advantage of the network.

To advance the point, we are beginning to see the development of examples of the above in the form of “private networks”, “smart campuses” and “connected cities”. The illustrations below provide some examples:

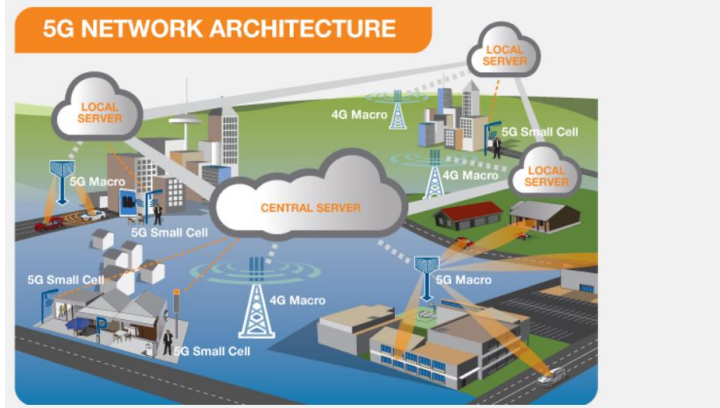
Table 8.



<http://www.emfexplained.info/?ID=25916>

Table 9.

Most operators will initially integrate 5G networks with existing 4G networks to provide a continuous connection.



<http://www.emfexplained.info/?ID=25916>

In our view, the proliferation of 5G will likely depend on adoption and collaboration from/of a host of stakeholders. Per the above illustrations, that collaboration will likely take a multitude of forms, but will include cities and other municipalities, working with hospitals, utilities, businesses, homeowners and others to create communication platforms that work ubiquitously much like to current telecom infrastructure that in contrast is largely provided and managed by incumbent telecoms. These new platforms will likely include more public type configurations such as a smart city where the municipality provides portions of the 5G infrastructure for access by citizens, first responders, small businesses, and others, that will in turn be able to utilize in some form the private networks of large businesses or perhaps local universities (“smart campuses”). That patchwork of interconnected 5G enabled platforms will allow for the sharing of dense 5G functionality within those geographic areas.

As an extension to the above, while we suspect 5G will enable/encourage the creation of connected cities, smart campuses etc., we also think it will dramatically increase the deployment of other private networks amongst industries and companies looking to take control of their own data security, network availability, and system reliability. In short, we believe private networks will drive a considerable portion of the 5G revolution, as organizations both public and private seek to take advantage of its various value propositions. In that regard, we believe that COMSovereign is preparing to play a significant role in the development and maintenance of these

types of networks. If we are correct about that, the Company will create entirely new revenue streams around these offerings that will result in recurring revenue streams that do not exist today.

4) 5G Standards

For edification, technology folks tend to use words that many people do not understand. By extension, sometimes one of the tasks for generalists writing technology names is to try to understand and then articulate the vernacular in terms that the not-as-technical portion of the population can understand. In that regard, one of the terms that is often used is “ubiquity” (a term we used above). By definition, in short, ubiquity means “existing everywhere all the time”. In the technology world, the term is typically grounded in standards. By extension, industry standards are generally voluntary protocols or rules that industries apply to the participants in the space that provide some assurance with respect to the ultimate uniformity of the products/services they sell. In many cases, those standards lead to interoperability amongst the various products/technologies the industry purveys. The mobile telecom space provides a good example of that. For instance, an Apple phone may differ from a Samsung in terms of the graphic interface(s) and other functions they provide, and in turn the technologies that the various telecom providers like Verizon and AT&T deploy to deliver services may be made by different manufacturers, but industry standards allow all of these devices, be they phones or backhaul radios, to seamlessly deliver that service regardless of who may have manufactured the different parts. That ubiquity is possible because of the interoperability that is driven by the standards. Without standards most technology would not work the way consumers expect it to.

As we alluded to above, while we have some sense of what 5G is supposed to look like in the future, and we know *some of* the technology that will deliver it, there is almost certainly technology that is yet to be fully developed that will likely play a significant role in the functionality of tomorrow’s 5G. That said, it’s hard to develop standards around technologies that have not been fully invented yet. To invoke the “chicken and the egg” analogy, **the evolution of 5G will be predicated in part on the evolution of associated standards, thus the pace of the development of those standards will impact the pace of the 5G rollout and its associated technologies.**

To step back a bit on the standards notion, The National Institute of Standards and Technology (“NIST”) is (according to them) the *“world’s leader in creating critical measurement solutions and promoting equitable standards. (Their) efforts stimulate innovation, foster industrial competitiveness, and improve the quality of life”*. For historical context, the NIST *“was founded in 1901 and is now part of the U.S. Department of Commerce. NIST is one of the nation’s oldest physical science laboratories. Congress established the agency to remove a major challenge to U.S. industrial competitiveness at the time—a second-rate measurement infrastructure that lagged behind the capabilities of the United Kingdom, Germany, and other economic rivals.”*

Given the role that standards will play in 5G, we think it is important to note that in April (2021) COMSovereign announced that its *“Virtual NetCom (“VNC”) business unit had entered into a Cooperative Research and Development Agreement (“CRADA”) with the National Institute of Standards and Technology (NIST)*. More specifically, this particular agreement provides that *“engineers at NIST will work with COMSovereign to evaluate and demonstrate the applicability of 5G distributed systems (“DS”) in a use case for 5G in public safety and other programs. The parties will utilize the 5G core and gNodeB radio technology from VNC to test specific 3GPP standard features and their impact on public safety operations. Research will focus on all aspects of deploying a 5G network for public safety’s use including deployment feasibility, 5G features employed, local and distributed compute resources leveraged, and broadband service availability and quality expected from a DS.”*

To be clear, this agreement covers a small slice of the 5G landscape (*“public safety and other programs”*), so we are certainly not suggesting that COMSovereign is helping develop all of the standards that will impact 5G. However, we think this agreement demonstrates that COMS is developing technology that could in fact help shape the future of 5G and some of the standards that will drive its growth. While we are not suggesting that those efforts will necessarily translate into success for COMS. However, *we are suggesting* that agreements of this nature may help validate COMSovereign’s technological posture, which is a measurable portion of our thesis here.

5) U.S. 5G Security, Huawei and the push to Buy American.

We will try to sum this up without getting too far into the weeds, however, to preface the argument, the pandemic has shed new light on and caused many to reconsider the risks associated with international supply chains, especially with respect to China. Further, while related although not entirely, emerging issues around technology security vis-à-vis China in general are becoming increasingly topical and in the 5G space and that would include products and/or services from China's Huawei. Again, this is a broad and complex issue on the face, and it certainly beyond the scope of this research, but there are some topical bullet points worth covering albeit it briefly.

First, there is considerable discussion in the 5G universe regarding domestic policy with respect to providing foreign competitors access to our market(s). That argument is largely centered on China's Huawei, and the U.S. government has expressed a myriad of concerns regarding Huawei over the years, and while that drumbeat was loud and clear from the Trump administration, we suspect at least some of those concerns remain with the new administration and certainly amongst many government agencies.

To that end, the Council on Foreign Relations (www.cfr.org) sums it up as follows:

In recent years, the United States and several other countries have asserted that the company threatens their national security, saying it has violated international sanctions and stolen intellectual property, and that it could commit cyber espionage.

The main concern, according to U.S. intelligence agencies, is that the Chinese government could use Huawei to spy. Officials, primarily in the United States but also in Australia and several other countries, point to vague Chinese intelligence laws that could be used to force Huawei to hand over data to the Chinese government. (The United States has not publicly provided evidence that this has happened.) There are also concerns that Huawei's 5G infrastructure could contain backdoors giving the Chinese government access to its inner workings and allowing Beijing to attack communications networks and public utilities.

A 2012 U.S. House Permanent Select Committee on Intelligence report [PDF] concluded that using equipment made by Huawei and ZTE, another Chinese telecommunications company, could "undermine core U.S. national security interests." In 2018, six U.S. intelligence chiefs, including the directors of the CIA and FBI, cautioned Americans against using Huawei products, warning that the company could conduct "undetected espionage.

At the heart of Washington's concerns is 5G, the next generation of cellular networks, which will provide faster download speeds for smartphones, connect devices in smart cities, and support autonomous vehicles and robots. "5G is a different type of risk versus 4G or 3G. It's much harder to separate the core from the periphery," says CFR's Adam Segal. "Once you have those risks, you have to trust the company much more. But it is difficult to trust Huawei, given the relationship between companies and the Communist Party." https://www.cfr.org/background/huawei-chinas-controversial-tech-giant?gclid=EAIaIQobChMIkr2hooCs8QIVAQh9Ch1NNgHfEAAAYASAAEgJkcvD_BwE

In addition to the above, other concerns have been raised including things like intellectual property theft, potential trade violations, supply chain concerns and others. However, generally speaking, the overarching theme is the relationship between Huawei and the Chinese Communist Party, which for all intents and purposes is the Chinese government. For instance, the Council on Foreign Relations notes further that "*Huawei became the world's largest telecommunications company over three decades, reporting \$123 billion in revenue in 2019, a 19 percent jump from the previous year. This success has helped drive suspicion that the Chinese government has played a more*

significant role in the company in recent years than its leaders have let on. In 1996, both the government and military began treating Huawei as an official “national champion,” a status reserved for firms that bolster China’s strategic aims. The move highlighted a shift in official policy. From then on, Beijing explicitly supported domestic telecom companies (and Huawei even more than others) to prevent foreign domination of the industry. The Chinese government ensured Huawei had easy access to financing and high levels of government subsidies—\$222 million in grants in 2018 alone. This support has allowed Huawei to price its network equipment below foreign competitors’ rates. In the Netherlands, Huawei underbid Swedish firm Ericsson by 60 percent to provide network equipment for the national 5G network. Experts said that Huawei’s prices would not have even covered the cost of producing their parts without subsidies. Chinese state banks also provide countries low-interest loans to use Huawei’s equipment.

Clearly, the Chinese government has played a major role in the success of Huawei specifically, and that support is certainly expected to continue. That paradigm has provided Huawei economic advantages in terms of pricing and perhaps advanced technological advantages as well. That said, the security issues remain, so it seems to us that the U.S. government (as well as perhaps other allied governments) is likely to play a role in trying to level that field via policy and more specifically support from the proposed infrastructure spending. Our expectation is that domestic players like COMSovereign are more likely than not to benefit from those efforts, although frankly, in our view, a focus on the expeditious development of the standards we addressed above would be constructive as well. To that “buy American” point, the Company’s most recent presentation refers to COMSovereign as “THE AMERICAN 5G STORY”. We think that is more than a tag line, as it embodies much of the strategy here.

Product/Technology Overview

To be clear, our investment thesis regarding COMSovereign centers around a handful of bullet points that collectively, we believe will converge to drive the Company’s success. One of those is the strategic assembly of companies and technologies that we think may provide COMSovereign with some advantages in addressing the expanding 5G rollout, and specifically perhaps that rollout in the U.S. That said, we think that “strategic assembly of companies” requires some color to help illustrate its significance to the whole.

Below is some narrative regarding each of the Company’s business units that we have excerpted from COMSovereign’s filings, website(s) and other collateral. We have provided some added color to each. In addition, we have generated a table that reflects each asset as well as other associated information, which think provides a good reference to the pieces of the enterprise.

To step back a bit, as Table 10 illustrates, the Company currently consists of 13 entities, and these have been acquired/added over time and through a variety of transactions. The original COMSovereign assets consisted of the five companies within the green highlighted box of the table. COMSovereign was essentially formed from those acquisitions, largely through 2019. Drone on the other hand, was the original public entity. Drone and COMSovereign merged at the end of 2019, to form what is today the “public” version of COMSovereign. The remaining seven companies were then added at various points through fiscal 2020 and 2021. The original COMSovereign/Drone combination was done largely via a stock swap while the remaining pieces were acquired in separate transactions that included varying combinations of cash, stock and notes. As a result of those transactions, the Company’s capital structure was a bit of a patchwork reflecting the various financing of each piece. However, the Company’s \$27 million February (2021) stock offering (followed by another raise of \$10 million a few months later) cleaned much of that “patchwork” (and the balance sheet along with it), and we suspect they will continue to consider additional strategic pieces.

In addition, Table 11. below reflects a segmentation of the businesses. (As a matter of disclosure, these were buckets/descriptions the Company used in prior presentations to delineate the units. They have since reframed the

categories, but for the sake of trying to delineate some points we think are topical, we have stuck with the original buckets and categorized some of the newer acquisitions as we see their fit).

Table 10.














Subsidiary	Date	Technology Focus	Core Competencies and Advantages	Price
	06/2014	develops and manufactures cost-effective, compact and enhanced tethered unmanned aerial vehicles for LTE	tactical-sized aerostat capable of carrying a variety of payloads in support of military operations	Original Entity
	01/2019	Develops and manufactures advanced intelligent lithium-ion batteries for various applications.	The company has several patents in battery management systems, high impact casings and printed circuit boards.	Part of COM Sovereign (Total Purchase value; \$75 million)
	01/2019	processes that will significantly advance the state-of-the-art in Silicon Photonic devices for use in advanced data interconnects, communication networks, and computing systems.	VEO owns intellectual property (IP) including patents protecting its novel photonic methods and designs. VEO's development efforts include independent R&D, as well as projects in conjunction with leading academic institutions.	Part of COM Sovereign (Total Purchase value; \$75 million)
	03/2019	hardware and software design and development	deep experience and specific expertise in both hardware and software design and development including embedded designs, high-speed digital and RF PCB design, FPGA and ASIC design, large scale network protocol development and software-defined radio systems.	Part of COM Sovereign (Total Purchase value; \$75 million)
	04/2019	packet microwave and packet convergence backhaul solutions	DragonWave-X has developed significant intellectual property, which provides the company with a steep competitive advantage in the industry.	Part of COM Sovereign (Total Purchase value; \$75 million)
	04/2019	use of beam steering antennas controlled by smart antenna heuristics to achieve spatial filtering of self-interference multipath is the core technology	network technology specialists in the field of RF transmission	Part of COM Sovereign (Total Purchase value; \$75 million)
	03/2020	injection molding machinery, light-assembly, fulfillment, and packaging lines	deliver immediate intra-company 'just-in-time' supply chain eliminating the need for international manufacturing and large inventories	\$829,347
	07/2020	EDGE telecom access radio development and both 4G LTE/Advanced and 5G capable radio equipment.	VNC offers several decades of cumulative wireless network engineering and operational experience	\$19 million in cash and stock
	01/2021	leading-edge radio, data networking and backhaul solutions	aeronautics, robotics, computer programming and electronics.	\$14 million - cash, debentures, and convertible debentures
	03/2021	tethered hovering platform, with exceptional size-to-payload ratio, visibility, durability and stability.	vast military, business and engineering experience including aeronautics, robotics, computer programming and electronics.	\$12.7 million - \$2.7 million in cash and 2.55 million shares of common stock.
	04/2021	technologically advanced, environmentally hardened video products and physical security solutions for government and private sectors	sophisticated, physical security requirements including innovative imaging systems for governmental and commercial customers.	\$5.58 million - shares of restricted common stock.
	04/2021	intellectual property licensing, design and consulting services supporting the implementation of advanced digital system technologies and services	high-performance communications, RADAR, and integrated component applications. Clients include multiple U.S. defense contractors and various U.S. Department of Defense agencies.	\$8 million - \$1.6 million in cash and convertible debt and \$6.4 million of restricted common stock.
	05/18/21	Powerful cloud computing infrastructures for game changing applications including augmented and virtual reality, IoT, edge analytics, high-def. video, connected cars, autonomous drones and more.	Multi access Edge Cloud Computing pioneer, helps communication companies monetize, optimize & accelerate their networks. Any-access Edge-Cloud solutions transform communication networks into	\$13.1 million consisting of shares of restricted common stock

Table 11.

Hardware/Software and Services
("HSS")



Drones/Supply/Support
("DSS")



Research & Development
("R&D")



DragonWave-X ("DragonWave") manufactures high-capacity microwave and millimeter point-to-point telecom backhaul radio units. DragonWave and its predecessor have been selling telecom backhaul radios since 2012 and its microwave radios have been installed in over 330,000 locations for approximately 3,000 customers in more than 100 countries worldwide. According to a report of the U.S. Federal Communications Commission, as of December 2019, DragonWave was the second largest provider of licensed point-to-point microwave backhaul radios in North America.



DragonWave-X is a leading provider of high-capacity packet microwave solutions that drive next-generation IP networks. DragonWave-X's carrier-grade point-to-point packet microwave systems transmit broadband voice, video and data, enabling service providers, government agencies, enterprises and other organizations to meet their increasing bandwidth requirements rapidly and affordably. The principal application of DragonWave-X's portfolio is wireless network backhaul, including a range of products ideally suited to support the emergence of underlying small cell networks. Additional solutions include leased line replacement, last mile fiber extension and enterprise networks. DragonWave-X's award-winning products are known in the industry for their leading capacity, reliability, and spectral efficiency.

Voice, video and data needs are growing at an astounding rate. This growth is putting pressure on today's existing backhaul networks. DragonWave-X enables service providers to meet that demand by offering high speed, high-capacity solutions which allow the service provider to rapidly expand and augment their network to support full-feature applications, such as streaming video and IPTV. Our product portfolio offers operators "invest as you grow" scalability to ensure profitable growth.

DragonWave-X has a network of distributor and reseller partners globally. Customers include Carriers, Service Providers, Utilities, WISP's and Enterprises. All are assured the highest level of excellence in product design, product quality, and overall customer services.

DragonWave-X, which is based in Dallas, Texas has sales offices around the world and customers in over 150 countries.

DragonWave (along with Lextrum at the time) was part of the formation of the original, and much of the basis of COMSovereign. As the narrative above suggests, this is **an established legacy business** in the telecom space that has done business across the globe over the past decade, and as such we consider it to be COMSovereign's "core" business. Granted, as we will delineate, we think that core designation includes some of the other pieces, but generally speaking, we think it is fair to say that DragonWave is the genesis of the business. That said, as again, we will attempt to demonstrate, the other portions of the business have been added around the industry beachhead

that DragonWave has established, with the goal of creating a cutting-edge turnkey player in the transition/emergence of 5G, primarily in the U.S.



Skyline Technology Partners LLC, which does business under the name Fastback Networks (“Fastback”), is a manufacturer

of intelligent backhaul radio (IBR) systems that deliver high-performance wireless connectivity to virtually any location, including those challenged by Non-Line of Sight (NLOS) limitations. Fastback’s advanced IBR products allow operators to economically add capacity and density to their macrocells and expand service coverage density with small cells. These solutions also allow operators to both provide temporary cellular and data service utilizing mobile/portable radio systems and provide wireless Ethernet connectivity. Fastback was acquired in January 2021. Fastback Networks is a mobile infrastructure company that allows network operators to secure, monitor, and manage data connectivity.



Without belaboring the history, Fastback much like DragonWave was a promising player in the telecom space (largely backhaul) that ended up experiencing some financial challenges and ultimately in bankruptcy. As an adjunct, from 2011 thru 2017, the Company was funded with \$56 million of venture capital and to reiterate, COMSovereign purchased the company for \$14 million. In that context, we believe COMSovereign’s purchase was opportunistic. We would add, as we also noted above, DragonWave has a well-established sales channel (3,000 customers in 100 countries) and COMSovereign will leverage that channel to sell Fastback’s complimentary products and solutions as well. Based upon recent company disclosures, due to growing customer demand, COMSovereign has indicated it is shifting more short-term focus on the sales of Fastback radios while it transitions end-of-life DragonWave products to its next generation Polaris line.



Virtual Network Communications Inc. (“Virtual NetCom” or “VNC”) is an edge centric wireless telecommunications technology developer and equipment manufacturer of both 4G LTE Advanced and 5G capable radio equipment. VNC designs, develops, manufactures, markets, and supports a

line of network products for wireless network operators, mobile virtual network operators, cable TV system operators, and government and business enterprises that enable new sources of revenue, and reduce capital and operating expenses. VNC also has developed rapidly deployable, tactical systems that can be combined with the tethered aerostats and drones offered by our Drone Aviation subsidiary and enabled and operated in nearly any location in the world.

VNC is reinventing how wireless networks service mission-critical communications for Public Safety, Homeland Security, Department of Defense and commercial Private Network users. They envision the future of virtualized micro networks blanketing the globe without expensive terrestrial based radio towers and building installations. They are the avengers to the cause of "Democratizing Broadband Networks" by moving the network intelligence, power and flexibility to the edge close to the customers.





RAID™ (Rapid Access Independent Deployable) - Tactical and Emergency Solution

VNC's RAID™ combines the key elements of an LTE broadband communications network into a single system using the latest technological advancements such as network function virtualization and cloud native services and orchestration. The RAID™ is integrated with easy-to-use network and element management interfaces and supports industry software for sophisticated remote proxy configuration and management functionalities to manage external users. A 5G version is under development.



FeatherLite™

VNC's FeatherLite™ low-altitude and high-altitude airborne LTE communication solutions are designed to stay for longer durations in the air and provides comprehensive LTE network coverage. One platform can cover vast area equivalent to coverage provided by several terrestrial cell towers. Using advanced network function virtualization, is a complete airborne LTE network hosted solution with a virtualized LTE EPC (Evolved Packet Core), eNB radio, specialized application software and backhaul radio. 5G version under development.



vCore - Powerful Virtualized Credit Card Sized Micro-Computing Platform

VNC's vCore is a powerful micro LTE network solution suitable for rapid deployment of tactical LTE networks that can be operational in three minutes after powering on. No complicated maneuvers and configurations are required. 5G version under development.



GreenCell - High Power Mobile Radio Solution

VNC's GreenCell radio architecture combines the latest virtualization techniques and System on a Chip Technology to create the best LTE small cell products on the market that enables multi-band, multi-operator LTE small cells for neutral host deployments. Designed for backpack, vehicles or fixed infrastructure, this flexible, light-weight solution is the Industry's most powerful and energy-efficient LTE small cell. 5G version under development.



VNC's Customer Premises Equipment (CPE) brings the best fixed broadband LTE solutions for customers and service providers. This cost-effective, full-featured solution offers better spectrum efficiency. Outdoor units are IP67 rated. 5G version under development.

Clearly, the VNC acquisition broadened the Company's product base both in terms of specific products/radios, but also with respect to existing and what we see as emerging portions of the telecom market, specifically the front haul or "edge" of the landscape. As we suggested with Fastback's products, we think COMsovereign will leverage their established distribution to sell VNC offerings as well. As we see it, in aggregate, these three portions of the business will likely carry the majority of the revenue load for the next several quarters and frankly, we think a considerable portion of that business may involve selling radio upgrades to the existing Dragon Wave installed base. However, as 4G and 5G rollouts continue to advance, we also believe that new demand (beyond replacement/upgrade of established legacy infrastructure) from the edge, will drive demand for VNC offerings wherein VNC may become a growing portion of the revenue mix.

DRONE

Drone develops and manufactures cost-effective, compact and rapidly deployable unmanned aerial platforms including lighter-than-air aerostats and drones designed to provide government and commercial customers with enhanced surveillance and communication capabilities. Utilizing a patented tether system, Drone Aviation's products are designed to provide prolonged operational duration capabilities combined with improved reliability, uniquely fulfilling critical requirements in military, law enforcement, commercial, and industrial applications.



Drone currently has a handful of configurations, which include its core tethered aerostat platforms like the one pictured here as well as other more traditional drones. The Company refers to its aerostat line as “WASP” (Winch Aerostat Small Platform). The aerostat systems are highly functional and include several characteristics that make them adaptable to a multitude of tasks. For instance, they are lifted by helium and can be in the sky for 3 weeks on a single load. They have flight altitudes up to 1,500 feet and communication ranges of 40 miles as well as payload capabilities of up to 130 pounds. Moreover, they can be deployed (or torn down) in 30 minutes.

Recognize, Drone initially developed WASP for the US Army to provide “enhanced situational awareness, intelligence, surveillance and reconnaissance (ISR) capabilities. Their products have since been deployed by other sectors of the government including the United States Border Patrol. We would add, these systems typically sell for \$1 million+.

Drone is based in Jacksonville, Florida.



Sky Sapience is the leading provider of tethered hovering platforms which are field proven worldwide. The company was founded on vast military, business and engineering experience. Its dedicated team members are experts in the

fields of aeronautics, robotics, computer programming, electronics and business management. The company's flagship product series, the HoverMast tethered hovering platform, offers an exceptional size-to-payload ratio, visibility, durability and stability in all weather and light conditions. The HoverMast serves leading organizations in military and homeland security settings, as well as in enterprise and commercial environments worldwide.



Sky Sapience designs its products for a wide range of applications and vehicle compatibility. The company invests heavily in R&D, developing new technologies and expanding its product base to accommodate the needs of customers in the field. Its solutions offer a variety of sizes, payloads, heights supported, and levels of mobility and wind endurance, as well as customization for different applications, such as marine scenarios, and different regulatory requirements.

With 7 international patents, Sky Sapience offers a variety of mobile hovering systems with specialized mission capabilities which have been selected by some of the largest entities worldwide. The company's systems have been successfully serving enterprises, HLS and defense customers in the field since 2014.

Sky Sapience is located in Yokneam, Israel.

The combination of Drone and Sky Sapience provides COMSovereign with an established drone related presence, with proven entrees into the government and military surveillance space. Again, each of these enterprises has experienced success selling into these sectors, which by the way, we think provides some validation for the products and associated technologies. The Company believes they will continue to experience success in these channels, however, they also believe the 4G and 5G rollout(s) will create new telecom related opportunities in both government and commercial networks. While as we noted, we expect the radio piece of the business (DragonWave/Fastback/VNC) to make the largest contribution to revenues over the next several quarters, we also expect the drones business to make marked contributions to the whole.



Through its InduraPower subsidiary, COMS offers and is further developing a line of lightweight environmentally-friendly, non-volatile advanced intelligent lithium ion batteries and back-up power units that charge quickly, have a life span approximately five times longer than conventional lead-acid batteries, **can be monitored remotely and can provide power for a wide range of applications, including cellular towers and other RAN infrastructures**, as well as automotive, aerospace and marine vehicles. Used in conjunction with its microwave radios, our batteries and back-up power solutions would ensure their seamless operation in the event of a power grid or local electrical failure or interruption. The use of lithium-ion phosphate chemistry in its batteries provides for an approximate 70% reduction in weight and 30% to 40% reduction in size over current lead-acid/ absorbent glass mat (AGM)-driven power supplies.



The IP arm of InduraPower is called Elitise LLC, which is a recognized leader in R&D, engineering and manufacturing of intelligent Lithium-ion batteries for autos, motorcycles and boats. Advanced features include remote control by a proprietary mobile phone app, power reserves to guarantee a final engine crank, heaters to provide starting power in cold weather, circuitry to turn the battery off when not in use and a gyroscope to disconnect power in case of an accident. The company has several patents in BMS, high impact casings and printed circuit boards. Elitise specializes in electrical, mechanical and software engineering. The company has extensive experience in lithium-ion battery development and remote communication with the battery.

InduraPower brand currently sells into largely high-performance vehicles markets, but clearly, its fit with COMSovereign, is to deploy their batteries into cell towers, base stations, etc. where on-demand backup power is a mission critical necessity. InduraPower's batteries are uniquely suited for those types of backup power requirements for a variety of reasons. First, the batteries are smaller, lighter, longer lasting and more powerful than comparable legacy batteries. Second, they are ruggedized and designed to perform in harsh environments which includes extreme temperature. Third, they are "intelligent" batteries built around an AI-driven battery management system and are also Bluetooth enabled and as such, can be monitored and controlled remotely, which is obviously advantageous for enterprises deploying them to remote (unmanned) sites like towers and base stations. Conceptually, as we discuss throughout this report, we think the advantages of 5G enables notions like "edge" computing, and by extension, we think InduraPower's battery's "intelligent" functionality is applicable as well.

InduraPower is based in Tucson, Arizona.



Sovereign Plastics LLC ("Sovereign Plastics"), based in Colorado Springs, Colorado, operates as the material, component manufacturing and supply chain source for all of COMSovereign's subsidiaries, and also provides plastic and metal components to third-party, outside customers. Its ability to rapidly prototype new product offerings and machine moldings, metals and plastic castings has reduced the production cycle for many of the Company's components from months to days. COMSovereign acquired the business currently conducted by Sovereign Plastics in March 2020.

Dan Hodges, chairman and CEO of COMSovereign Holding Corp., stated, "With the launch of our in-house, U.S.-based component manufacturing facilities, we are now delivering on our 'Made in the USA' mission as a pure-play provider of communications system technology able to serve domestic and international 3G, 4G, 5G and nG carriers today. We believe Sovereign Plastics can deliver immediate 'just-in-time' supply chain value to all of our operating companies and is a competitive advantage because it eliminates the need for international manufacturing and large inventories, which is now a significant barrier for nearly all organizations that rely on overseas production and supply chains."

Sovereign Plastics is based in Colorado Springs, Colorado.

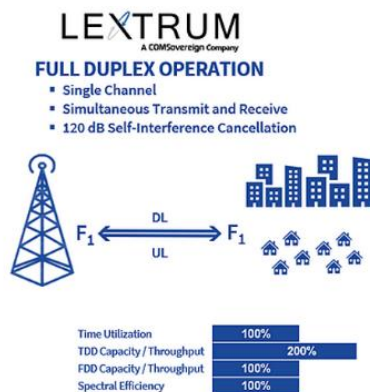
Much like InduraPower, Sovereign Plastics was acquired as an enabling piece to the emerging COMSovereign ecosystem. However, as an established business (formerly, Fast Plastic Parts), Sovereign Plastics generates revenue from its outside customer base, but clearly, the plan here is first and foremost for the enterprise to produce parts and other form factors that will be used in their own radios and associated products. That may complicate some of the modeling going forward if DragonWave (hypothetically) becomes Sovereign Plastic’s largest “customer”, but then again, this is all part of the bigger picture. To edify, the Company believes that building an integrated 4G/5G hardware/services provider whose products are largely “Made in the U.S.A.” will create marked advantages for the Company. We concur with that view, in fact it is one of the pillars of our thesis here and Sovereign Plastics, and InduraPower clearly represent cogs in that integrated wheel. As an extension of that notion, in late January (2021), COMSovereign completed the “*acquisition of a 140,000-square-foot building on 12.7 acres in Tucson, Arizona and they intend to use this facility for manufacturing and office space for their DragonWave, VNC, Drone Aviation, InduraPower and Lextrum subsidiaries*”. At the time of the announcement, the Company also noted that it had “*begun making improvements and retrofits to the existing facility and installing production assembly lines required to commence initial manufacturing for its InduraPower and Drone Aviation business units later in the first quarter of 2021. Production of the Company's 4G LTE Advanced and 5G radios and electronics products are anticipated to begin in the third quarter of 2021. DragonWave-X's current generation of Harmony Enhanced and Multi-Channel (MC) model radios for mobile network backhaul infrastructure continues to be produced and is being ramped up by Benchmark Electronics, Inc. (NYSE: BHE) under an expanded production agreement announced in September.* This guidance is topical to our model assumptions which we will elaborate on in the Operating Overview of this report.



Lextrum, Inc. (“Lextrum”) developer of full-duplex wireless technologies and components, including multi-reconfigurable radio

*frequency (RF) antennae and software programs. **This technology enables the doubling of a given spectrum band by allowing simultaneous transmission and receipt of radio signals on the same frequencies.***

Lextrum was founded in 2015 at University of California, Irvine by a team of network technology specialists in the field of RF transmission. They emerged from UCI's Applied Technology incubator in 2019 after their development of patented FD transceiver intellectual property that can be easily integrated into current systems. Their use of beam steering antennas controlled by smart antenna heuristics to achieve spatial filtering of self-interference multipath is their core technology. Cancelling the major self-interference multipath energy components in the propagation domain reduces the compression of the front-end, improves linearity and increases the bandwidth that can be handled by the system by inherently reducing frequency selectivity.



FDD (Frequency Division Duplex), and later TDD (Time Division Duplex), technologies have been the foundation of 2G, 3G, and most recently 4G networks. With the advent of 5G networks, and the continually growing need for both spectrum efficiency and increased throughput, these traditional technologies have reached their limits.

The Lextrum FD solution marries the spectral efficiency of TDD with the throughput advantage of FDD, making it the obvious choice for meeting the rigorous requirements of today’s developing 5G networks. The flexibility of the Lextrum FD solution means it can support legacy 4G protocols, and new 5G protocols, allowing a seamless transition from one generation to another, as networks evolve.

Lextrum is based in Tucson, Arizona.

As the Table 11. at the front of this Product/Technology Overview reflects Lextrum represents a portion of the “R&D” arm of COMSovereign. That designation largely implies that each of these divisions is currently developing technologies that will provide the basis future product enhancements as well as new products altogether.

We would add, approximately three years ago, prior to COMSovereign’s acquisition of Lextrum, a third party valuation of Lextrum conducted by Hilco Valuation Services (<https://www.hilcovaluationservices.com/>) concluded that the “fair value” of the enterprise was between \$440 million and \$675 million. The current market capitalization of COMS is approximately \$180 million. Obviously, we have done our own valuation analysis, but keep in mind, Lextrum is one piece of this puzzle.



VEO Photonics Inc. (“VEO”) is a research and development company innovating Silicon photonics (SiP) technologies for use in copper-to-fiber-to-copper switching, high-speed computing, high-speed ethernet, autonomous vehicle applications, mobile devices and 5G wireless equipment. VEO, is developing processes that will significantly advance the state-of-the-art in Silicon Photonic devices for use in advanced data interconnects, communication networks, and computing systems. VEO's novel approach allows for overcoming the limitations of current silicon photonic (SiP) modulators, and hence can dramatically increase computing bandwidth and reduce drive power while offering lower operating costs.

Silicon photonics, a category of fiber optics utilizing silicon as the optical medium, holds the power to drastically increase data communication rates within, and between, computing devices. VEO is on the forefront of using silicon photonics to achieve light-speed computing and is poised to exploit the demand with a capability and direct application to multi-billion-dollar markets such as cloud data centers, high-speed ethernet, autonomous vehicles, mobile devices and 5G wireless equipment.

VEO Photonics owns intellectual property (IP) including patents protecting its novel methods and designs. VEO’s current development efforts include independent R&D, as well as projects in conjunction with leading academic institutions.

Unlike some of the other pieces VEO is largely an R&D piece at this point. While that is the case *today*, VEO is developing technology(s) that COMS believes it can perhaps *begin* to commercialize in the coming (1)18-24 months. For instance, in December (2020), COMS/VEO announced the following:

*DALLAS, Dec. 15, 2020 /PRNewswire/ -- COMSovereign Holding Corp. (OTCQB: COMS) ("COMSovereign" or the "Company"), a U.S.-based developer of 4G LTE Advanced and 5G Communication Systems and Solutions, announced that its silicon photonics unit, VEO Photonics, has been **granted a patent on a new technology which has the potential to break the current limit of existing silicon data transmission speeds utilizing standard silicon foundry processes.***

VEO's dielectric technology will permit a silicon modulator to operate at up to 10x the speed of its PN diode equivalent. With its performance advantage, a 400Gb transceiver can be delivered with half the power of existing units, dramatically increasing total capacity while reducing the high costs currently associated with transmission and cooling of large data centers and telecommunication backbones. Applications for this technology extend to 5G, artificial intelligence, switch fabrics, quantum computing, and many others. VEO's technology can also be easily scaled to support volume manufacturing.

"This is an exciting milestone, for the first time, a silicon-based modulator has demonstrated the potential to offer up to a 10x speed advantage over its competition and do so at significantly reduced cost," said Dr. Dustin McIntire, COMSovereign CTO. "(1)By mid-2022, we will be able to showcase

how this intellectual property will be commercialized and licensable and the major benefits it can bring to data center operations and in the deployment of new fiber optic cabling required to support 5G. Thanks to VEO's significant improvement in network capacity and its compatibility with current fiber optic systems, this dielectric technology can greatly reduce the expected costs of 5G's rollout."

VEO, is based in San Diego, California.



Silver Bullet Technology, Inc. ("Silver Bullet") is a California-based engineering firm that designs and develops next generation network systems and components, including large-scale network protocol development, software-defined radio systems and wireless network designs.

Over the years, Silver Bullet has worked with a variety of government and associated entities (DARPA, DoD and others) developing and designing communication systems and other adjuncts. As such Silver Bullet is essentially an engineering shop, and our understanding is that they will provide similar support across the COMSovereign ecosystem.

Silver Bullet Technology, Inc. is located in Newbury Park, California.



RVision develops, manufactures and sells technologically advanced, environmentally hardened video products and physical

security solutions for government and private sectors. Products incorporate both infrared and daylight optical dual sensors, scene awareness detection algorithms, and an all-weather, multiple-sensor surveillance platform with the ability to pan/tilt/zoom in all directions. RVision markets and integrates waterside, land-based, and mobile mounted security systems that meet the security requirements of facilities such as military bases, military and commercial ports, drilling rigs, power and petrochemical plants, airports, and water treatment facilities.



RVision, Inc. is headquartered in San Jose, California.



Innovation Digital provides intellectual property licensing, design and consulting services supporting the implementation of advanced digital system technologies and services for extremely high-performance communications, RADAR, and integrated component applications. Clients include multiple U.S. defense contractors such as General Dynamics, Raytheon, L3Harris and various U.S Department of Defense agencies including The Naval Surface Warfare Center, the Missile Defense Agency, the Air Force Research Laboratory and DARPA.

"Innovation Digital's engineers are among the top experts in signal efficiency and waveform engineering and aligns with our strategy of building and maintaining our technological leadership and capabilities through either organic means or via acquisition. Their addition to our team will accelerate the integration of both Lextrum's In-Band-Full-Duplex and the licensed Transpositional Modulation technologies into our next generation 'Polaris' 5G radio products, resulting in dramatic improvements in product performance and expanding our unique features and capabilities," said Dr. Dustin McIntire, CTO of COMSovereign.

The accretive acquisition of Innovative Digital is expected to contribute approximately \$3 million in net revenue from licensing this year from committed customers.

Innovation Digital holds 21 issued and several pending United States Patents. As part of COMSovereign, its valuable IP and expertise will further advance the performance capabilities of the Company's entire range of next-gen radio products that will set a new standard for throughput and efficiency.

Innovation Digital is located in San Diego, California



SAGUNA, the Multi access Edge Cloud Computing (MEC) pioneer, helps communication companies monetize, optimize & accelerate their networks.

Its any-access Edge-Cloud solutions transform communication networks into powerful cloud computing infrastructures for game changing applications including augmented and virtual reality, IoT, edge analytics, high- definition video, connected cars, autonomous drones and more.

The award winning SAGUNA Edge Cloud MEC solution simplifies & accelerates development, deployment, management and automation of edge cloud platforms and edge applications. Fully compliant with the ETSI MEC standard and 3GPP 5G specifications, SAGUNA's MEC solution provides Ultra Reliable and Low Latency Communication (URLLC) enabling 5G features over existing 4G networks and setting the stage for 5G roll-out.

On June 24, 2021, COMSovereign announced a “strategic technology partnership designed to empower customers with new, end-to-end telecommunications solutions” with Radisys® Corporation, a “global leader of open telecom solutions”. This announcement is highly prospective on multiple levels. First, this particular deal involves COMSovereign’s most recent acquisition SAGUNA. While we have suggested above that COMSovereign’s acquisition strategy involves a synergistic, “end-to-end” vision, we recognize SAGUNA’s software solutions will be part of that more holistic offering, and think the above announcement also reflects the ability of some of these pieces to become portions of other solutions as well. For instance, in the case of the announcement above, Radisys Corporation’s focus is on “open telecom solutions” and in turn, Radisys’s open telecom solutions are based on a concept called Open Radio Access Networks (“OpenRAN”). To expand in that, the Telecom Infra Project (TIP) is “a global community of companies and organizations that are driving infrastructure solutions to advance global connectivity”. TIP is a big supporter of the advance of OpenRAN and they describe it as follows:

“OpenRAN’s mission is to accelerate innovation and commercialization in RAN domain with multi-vendor interoperable products and solutions that are easy to integrate in the operator’s network and are verified for different deployment scenarios. TIP’s OpenRAN program supports the development of disaggregated and interoperable 2G/3G/4G/5G NR Radio Access Network (RAN) solutions based on service provider requirements”.

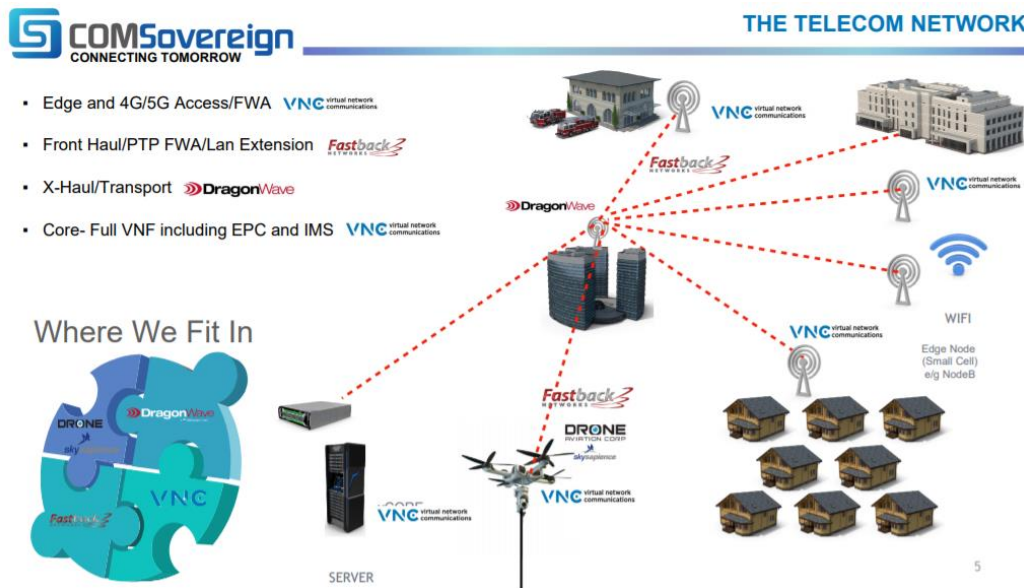
Here again, without getting too far into the weeds, the goal of OpenRAN is to provide an infrastructure that allows for interoperability between technologies across the 5G spectrum. This should sound familiar because we addressed some of this above in terms of the importance of industry standards in advancing 5G. Recognize, prior telecom generations typically involve(d) proprietary approaches by network product vendors that did not generally allow network builders to mix “best of breed” products. Many would argue that the lack of interoperability stymies the collective advance of the industry by not allowing those best of breed technologies to be used in conjunction with one another. In addition, not only does that “siloing” of proprietary approaches hold back innovation, it also inhibits competition, which in our view allows larger incumbent players to build moats that keep out smaller innovators (which we will revisit later). In contrast, the interoperability provided by initiatives like OpenRAN, will allow 5G network builders to mix-and-match the best-of-breed, which we think may prove to be paramount to the growth of 5G. We also think it may provide a marked opportunity for smaller emerging innovators like COMSovereign.

Additionally, we believe initiatives like OpenRAN also indicate the transition of network infrastructure from more software centric solutions, which could provide better margin opportunities for innovators. In short, we think COMSovereign’s acquisition of SAGUNA, and its subsequent collaboration with Radisys, is indicative of COMSovereign’s direction here. For instance, we know that COMS’s new Gen1 Polaris line is not designed to be OpenRAN compliant largely because we believe they are initially pursuing opportunities in the continued buildout of 4G which is obviously not OpenRAN compliant. However, we also believe Polaris Gen2 *will be 5G, OpenRAN compliant*, which we think is telling in terms of COMS’s overall strategy.

Saguna is headquartered in Yokneam, Israel.

We recognize that the individual company overviews above are a bit voluminous, but we thought it was important to provide at least a brief overview of each because one of the major tenants of our thesis here is that the Company has strategically assembled these pieces to become a viable player in the coming rollout of 5G. We would add, while the Company provides a host of hardware centric solutions, they also provide a variety of software centric solutions and they provide them along various portions of the 5G delivery chain (“end to end”). Further, the view is that each piece provides a synergistic opportunity for the whole. That said, the Company’s most current presentation provides a good illustration of how they are addressing current opportunities and where each of these pieces fit:

Table 12.



Operating Overview

Circling back to Table 11 above, we see the collective pieces and their associated current (and future) operating contributions as follows.

Currently, the revenue generating portions of the business are largely in the first two columns of the table. Specifically, as we see it, hardware and software revenues from DragonWave, Fastback, and VNC will be driven by continued growth in both 4G and emerging 5G platforms. Recall, DragonWave has a considerable installed customer base including 330,000 installed locations, which the company believes is the “2nd largest installed

base of microwave backhaul equipment in America". We believe the Company will benefit from both the "rip and replace" requirements of existing installs that need to be replaced/upgraded but also from, as we discussed above, the increase in radios required to densify the new 5G footprint. In short, we think the Company is poised to sell a lot more radios (back haul, front haul and small cells) and that view in part drives our assessment that the Company is poised to experience breakout numbers in the second half of fiscal 2021 as well as by extension for the full year 2022.

As a point of reference, we believe the DragonWave sells a backhaul radio for something in the \$10,000 to \$12,000 range. Further, in their fiscal year 2015, DragonWave recognized hardware sales of \$150 million. In 2016, those sales declined markedly. In short, during the time, DragonWave had a channel partner agreement with Nokia, and that agreement accounted almost half of DragonWave's business. As we understand it, that arrangement was substantially impaired when Nokia acquired Alcatel-Lucent, which was a competitor of DragonWave. Further, DragonWave outsourced its manufacturing at the time and we believe they may have encountered some manufacturing Q/A issues as well. That said, we think it is important to keep in mind that DragonWave selling \$150+ million worth of hardware in a single year is a place they have been before. Further, we believe that today, the Company may have some wind at their back (as opposed to in their face) in the sense that we believe they may have better relative products to sell and we think that will be especially true when they rollout their Polaris line later this year. To expand on that notion, we also think their focus on software solutions will drive both product functionality and value, as well as margins. We also believe their "Made in America" posture will prove advantageous, which includes taking control of their own manufacturing, which as we noted, we think has been problematic in the past both in terms of Q/A and perhaps costs. Moreover, as we have elaborated, we think the market for their products in general is poised for growth as the 5G rollout accelerates.

The Company's less telecom centric pieces are currently generating revenues and have marked opportunities to grow their businesses via the 4G/5G expansions as well. First and foremost, we believe the Company's drone businesses are delivering robust results and have good visibility with respect to the continuation of that success. That should not be particularly hard to believe given current border issues in the context of COMS' past traction with border patrol authorities as well as with other federal defense agencies. Moreover, keep in mind, the Company's drone units along with technology from VCN and others can deploy their out-of-the-box, private 4G LTE and 5G networks anywhere on the globe including "*the world's first miniaturized, fully virtualized 5G network Core (vCore)*". While the drone businesses include obvious opportunities outside of telecom, we believe they are likely to see increasing demand from inside the telecom industry as well. We would add, some of the Company's drone products carry price tags of \$1 million+ each, and we believe some of their customers (Border Patrol for instance), could deploy dozens of these devices to address current problems at the border alone (and around the world for that matter). As another point of refence to what *we are thinking*, in our view it is entirely possible that the Company's drone assets could collectively generate \$50 to \$100 million of revenue over the next 12-24 months.

In addition to the drone units, as we understand it, the Company's other enabling units (InduraPower and Sovereign Plastics) are quickly being integrated into the intra-company mix. That is, while each of these enterprises had established commercial businesses prior to their acquisition by COMS, and continue to target new outside customers, the "big picture" is for these entities to also contribute directly to other COMSovereign brands and services. For instance, we expect Sovereign Plastics to manufacture molded parts for COMS radios etc., while InduraPower batteries will be integrated into platforms and designs that COMS delivers to the private network market we covered above. Just to reiterate, we believe the Company's "smart battery" technology is highly topical to the edge computing concept as well as sales outside of the telecom market to fleet operators and logistics companies. While Sovereign Plastics operations are in Colorado, InduraPower manufacturing has been moved in the Company's new Arizona manufacturing facility, and we believe that integration is complete and batteries are now being manufactured there. Aside from fitting with the Company's "Made in America" label, we think each of these pieces hold some marked synergistic potential for COMS and are also relevant to their "front-to-back" approach to their opportunities.

The above noted, from a historical standpoint, the operating visibility here is not good. We submit, on the face, they have assembled a group of companies with collectively nominal (and in some cases declining) past revenue performance, in addition to some others that are essentially pre-revenue pieces. Like we said, the visibility as we sit here today is not good, however, our expectation is that as visibility improves, the valuation of the Company will follow, *whatever direction that visibility takes*. Obviously, our thesis is built around the notion that visibility around markedly better revenues and cashflow will improve in the coming 12-24 months, which we think will validate our targets. To that end, while the Company has not provided guidance, their most recent presentation provides the following, **which they specifically note is not guidance**, but it's the closest thing we have to a place to start so this is where we will start.

Table 13.

	REVENUE*		EBITDA	%
FY 2021				
	IF: \$ 30,000,000	THEN:	\$ 1,500,000	5%
	IF: \$ 45,000,000	THEN:	\$ 4,950,000	11%
	IF: \$ 60,000,000	THEN:	\$ 9,600,000	16%
FY 2022	\$ 185,000,000		\$ 37,000,000	20%
FY 2023	\$ 248,000,000		\$ 52,080,000	21%

HOW DO WE ACHIEVE THIS CAGR?

- Product Demand
- Market Leading Technologies
- Large Breadth of Product Offerings
- Volume Manufacturing Line – Up
- Targeted Sales
- Margins – Services & Cloud enhancement vs. only Hardware

** The above model is for illustration purposes only and not intended to serve as financial guidance*

Recognize, for Q1-F21, COMS generated revenues of \$2.1 million. Obviously, that number is not in the same zip code as the “illustration” above implies. We are going to assume that while the above is NOT guidance, in our view, it certainly implies that they anticipate and/or intend to generate far better revenues than the historic numbers suggest. That by the way is a characteristic that we generally look for in our coverage companies, so it goes without saying that we would not be writing this if we could not see that path forward.

Specifically, as we noted above, DragonWave generated over \$150 million of revenues in fiscal 2016. We know that because it was a public entity. As a result, in the context of what we see as the growing market for both 4G and 5G well into the foreseeable future, as well as what we think are going to be clear advantages for the few domestic hardware/software producers that exist in the space, we do not think we are out over our skis to think that COMS could be on a \$200+ million revenue run rate over the next 24 months. Doing some simple math, if they can reach prior revenue threshold at *DragonWave alone* and add the \$50 million to \$100 million we suggested from the drone side, they would get to those numbers. Again, we expect contributions from other portions of the Company as well.

Moving down the operating statement, in retrospect, historically, DragonWave operated on what we would describe as largely commoditized margins, which look like they were in the 17% to 18% range. For Q1-F21 margins were closer to 50%. We recognize that on the face, making margin assumptions about \$2 million worth of revenues versus \$150 million of revenues may not be appropriate without more information, however, as a result of a number of the issues we have addressed here (technology enhancements, software additions, in-house manufacturing, etc.) *we do anticipate* the Company generating much better margins than the legacy DragonWave business. Our attached model reflects some of those assumptions.

In case it is not clear, part of the Company’s enthusiasm is centered on the personnel they have added as a result of their acquisitions. Obviously, each of those adds a layer(s) of operating expenses that did not exist without them. Getting our arms around the ongoing level of those expenses will initially be challenging. We think that statement applies to their new manufacturing facility as well. On the other hand, while Table 13 above may not be guidance in the sense of revenues, it does give us some help in determining the relationship of anticipated expenses relative to particular levels of revenue.

Lastly, as we also alluded to above, the Company has been able to raise meaningful capital through the first half of 2021. Depending on how quickly they are actually able to drive revenues, we think additional capital raises are probably likely. That may be particularly true if they seek additional acquisitions, which we also think is more likely than not. Here again, we have made some assumptions in our initial model regarding further dilution that may prove inaccurate one way or the other.

To summarize, we are expecting some rather dramatic increases in the Company's business and the pace and magnitude of those items will determine in part, the accuracy of our model assumptions. To reiterate, visibility at this point is poor, so we expect some misses until visibility on multiple fronts improve. We will adjust or model as relevant data points emerge.

Management Overview

- DANIEL L. HODGES

Board Chairman, CEO and Co-Founder

Mr. Hodges founded and acted as Chairman for Transform-X, Inc., the former holder of our DragonWave-X and Lextrum subsidiaries. Mr. Hodges also served as founder and Chief Executive Officer of, Medusa Scientific LLC, a science and engineering research and development company. When one of Medusa's technologies showed extreme commercial promise, he made the decision to spin it off and formed TM Technologies, Inc., a 'sister-company,' to commercialize the proprietary modulation technology. He continues to serve as Board Chairman and CEO of TM. We believe Mr. Hodges has an extraordinary business development mind-set, strong investigative research experience and deep experience within both the commercial sector and the U.S. Department of Defense and related areas. In addition to his commercial successes, Lieutenant Colonel Hodges served for 26 years as a military member, spending his last 18 years in service as a senior flight instructor with the Air National Guard and retired in September 2014. Mr. Hodges holds multiple U.S. Patents as inventor including a "Method and System for a Grass Roots Intelligence Program" along with numerous radar and communications and radar related technologies. As an author he wrote and published a volume titled "Future Span" covering current and future U.S. energy paradigms. As the founder and leader of multiple enterprises, he has built organizations from inception that included subsidiaries covering focus areas of Aerospace, Marine, Communications, and Scientific R&D.

- JOHN E. HOWELL

Director, President and Co-Founder

Mr. Howell held senior roles within Transform-X, Inc. and TM Technologies, Inc., including as CEO of Transform-X and President of TM Global, LLC. Prior to leading TM Global, Mr. Howell was a Co-Founder of the Willowdale Family of boutique advisory companies. Mr. Howell continues to serve as Willowdale's Non-Executive Chairman. Outside of leading efforts on behalf of Willowdale's clients, Mr. Howell is also an active leader with a number of national non-profits, particularly in the fields of children's health and veterans' affairs. Mr. Howell was an early member of the Business Advisory Committee for the Muscular Dystrophy Association's venture philanthropy activity (MVP). Mr. Howell also serves as one of the four Directors of The Rip Van Winkle Foundation, the New York-based Foundation funded largely with proceeds from the Estate of late New York Yankee Henry "Lou" Gehrig and his wife Eleanor. Previously, Mr. Howell served the U.S. government in a variety of uniformed and civilian capacities worldwide for the United States Army and Central Intelligence Agency. John is both Airborne and Ranger Qualified. Mr. Howell is a Fulbright Scholar and alumnus of Davidson College in Davidson, North Carolina.

- **DUSTIN H. MCINTIRE, PhD**

Chief Technology Officer

Dr. McIntire is an electrical design engineer with more than 20 years of experience designing hardware and software for embedded and consumer electronics, wireless communications systems, and the Internet of Things. Additionally, he has an acute broad area expertise over several technological fields and is a skilled technologist and systems architect with a history of successfully leading projects and teams from concept through production utilizing extensive background in computer architecture, low power circuits, embedded software, and communications protocols. Previous commercial accomplishments include co-founding of a cloud-based SaaS company providing IoT services, hosting hundreds of thousands of devices for multiple Fortune 500 companies and developing a scalable edge computing system to perform distributed tracking using multimodal sensing assets. Previous government program experience includes leading efforts under multiple successful DARPA STO programs including early software defined radio technology and a technology transition program into the US Army for distributed target tracking and classification. Companies Dr. McIntire has led as either a Chief Technologist, CTO, or CEO include Tranzeo Wireless, Arrayent, Prodea, and Silver-Bullet Technology. He holds a B.S. from Stanford, and M.S. and Ph.D. degrees in Electrical Engineering from UCLA.

- **MARTIN R. WADE III**

Chief Financial Officer and Executive Vice President

Mr. Wade has spent 40 years advising senior management and boards of directors on more than 200 business strategy, acquisition, divestiture and restructuring projects. Since 2007, Mr. Wade has been a Partner in Residence with Catalyst Acquisition Group and has served as Chairman and Chief Executive Officer of Broadcaster, Inc., VITA Mobile Systems, Inc. and Madice.com. He currently serves on several corporate boards including MNG Enterprises, Inc., a company that owns media properties such as The Denver Post, San Jose Mercury News, Orange County Register and the Boston Herald and Oyster Enterprises Acquisition Corp., a special purpose acquisition company. Mr. Wade's career includes holding senior-level positions with investment banking firms including Lehman Brothers and Salomon Brothers and he served as National Head of Investment banking at Price Waterhouse LLP. Mr. Wade is a U.S. Veteran and holds a B.S. in Business Administration from West Virginia University and an M.B.A. in Finance from the University of Wyoming.

- **BUD PATTERSON**

Chief Operating Officer

Mr. Patterson brings over 30 years of operational and engineering experience in the development of wireless communications systems and semiconductors. He most recently served as COO of Silver Bullet Technology, leading an expert team to successfully deliver commercial products and government projects while managing on-shore and off-shore manufacturing resources to build low and high-volume products, including management of export restricted materials. Mr. Patterson has a unique interdisciplinary skill set and holistic approach to the design-for-manufacturing process which results in manufacturable products on tight engineering schedules. Recent commercial successes include the design through production delivery of an embedded IoT platform for the automotive telematics market. Government successes include delivery of software defined radio platforms for multiple DARPA STO programs. Previous roles and companies include VP Operations at Coretex, VP Engineering at Tranzeo Wireless, Sensoria Corporation and Accelerix, as well as senior engineering management roles at MOSAID Technologies, Rockwell Semiconductor Systems and Brooktree Corporation. Mr. Patterson holds a B.S. in Chemical Engineering from Michigan State University and graduated from the Leadership and Management Program at the University of California San Diego.

- **KEVIN M. SHERLOCK**

Secretary and General Counsel

Mr. Sherlock is licensed to practice law in Washington D.C., Florida and Arizona, having graduated from Georgetown with his Juris Doctorate. He began his legal career as an associate in the Washington D.C. office of a New York law firm with a practice area of aviation law, insurance defense litigation (including complex multi-district air crash disaster litigation) and general corporate matters. After 5 years, Mr. Sherlock opened his solo practice in 1993, with a focus on small business mergers and acquisitions. Since 1996, Mr. Sherlock has been involved in various capacities with small public companies, including serving as corporate secretary, senior management, general counsel, and as a director. Mr. Sherlock has had considerable experience in corporate structure, preparation and review of SEC filings, and mergers and acquisition work. Since 2008, Mr. Sherlock has worked as a law partner at the firm he co-founded Heurlin & Sherlock, PC, in Tucson, Arizona, with a focus on business litigation, securities arbitration, and security clearance matters. Since 1995 Mr. Sherlock has been involved with a non-profit organization, Perimeter Bicycling Association of America, including as Vice-President since 1996 and a Director since 1999. Kevin joined ComSovereign full-time in January 2020.

- **JEFFREY L. LANDERS**

Chief Creative Officer / Vice President of Marketing

Mr. Landers has over 30 years' experience delivering creative marketing and advertising campaigns for companies worldwide.

As an award-winning director, cinematographer and creative designer, Jeff has experience designing and executing campaigns via web, gorilla marketing, viral, and broadcast through traditional and non-traditional media. Jeff has owned his own creative services company since 1993 serving clients around the world as well as founding and selling an advertising agency and other entrepreneurial ventures. His work has been in diverse industries including healthcare, technology, automotive, food and industrial packaging. His expertise also includes brand development and marketing management helping companies grow their market share. Jeff has served on several non-profit boards across the nation.

BOARD OF DIRECTORS

- **DANIEL L. HODGES, Chairman of the Board and Executive Director**

See bio above

- **JOHN E. HOWELL, President and Executive Director**

See bio above

- **DAVID V. AGUILAR, Director**

During a 35-year career at the U.S. Border Patrol and Customs and Border Protection, Mr. Aguilar led our nation's largest federal law enforcement organization with a workforce of over 60,000 including 43,000 uniformed law enforcement officers. Mr. Aguilar began his CBP career as a Border Patrol agent in 1978 and became Chief of the U.S. Border Patrol in 2004. He was appointed Deputy Commissioner in April 2010 and served as acting Commissioner from 2011 to March 2013. For his work and his career of service, Commissioner Aguilar received the Presidential Rank Award in 2008, the President's Meritorious Excellence Award in 2005, the Department of Homeland Security Distinguished Service Medal, the Washington Homeland Security Roundtable Lifetime Achievement Award, and the Institute for Defense and Government Advancement Lifetime

Achievement Award. Since retiring in February 2013, Aguilar has been a Principal at Global Security and Innovative Strategies ("GSIS"), a leading security consulting and business advisory firm headquartered in Washington, DC. At GSIS, David advises clients on a broad range of national homeland and international security matters including border security and logistics, global trade and commerce, supply chain management and security, risk management, viability assessments, and strategic planning and implementation.

- RICHARD J. BERMAN, Director

Richard's business career spans over 35 years of venture capital, senior management, and merger & acquisitions experience. In the past 5 years, Berman has served as a director and/or officer of over a dozen public and private companies. In 2016, he was elected Chairman of Cevolva Biotech Inc. From 2014-2016, he was Chairman of MetaStat, Inc. From 2006-2011, he was Chairman of National Investment Managers, a company with \$12 billion in pension administration assets. Berman is a director of four public healthcare companies: Advaxis, Inc., Catasys, Inc., and Cryoport Inc. and Immuron Ltd. From 2002 to 2010, he was a director of Nexmed Inc. (now called Seelos Therapeutics, Inc.) where he also served as Chairman/CEO in 2008 and 2009. From 1998-2000, he was employed by Internet Commerce Corporation (now Easylink Services) as Chairman and CEO, and was a director from 1998-2012. Previously, Berman worked at Goldman Sachs; was Senior Vice President of Bankers Trust Company, where he started the M&A and Leveraged Buyout Departments; he created the largest battery company in the world, in the 1980's, by merging Prestolite, General Battery and Exide to form Exide Technologies (XIDE); he helped create SoHo, the lower Manhattan neighborhood in NYC, by developing five buildings; and he advised on over \$4 billion M&A transactions, completing over 300 deals. Berman is a past Director of the Stern School of Business of NYU where he obtained his B.S. and M.B.A. degrees. He also has U.S. and foreign law degrees from Boston College and The Hague Academy of International Law, respectively. Notably, Richard was nominated for public company "Director of the Year" in 2012. and foreign law degrees from Boston College and The Hague Academy of International Law, respectively. Notably, Richard was nominated for public company "Director of the Year" in 2012.

- BRENT M. DAVIES, CPA, Director

Mr. Davies is also a member of the Board of Directors of TM Technologies, Inc. and a partner in his accounting practice in Salt Lake City, Utah. He has previously served as CFO of Patient Central Technologies, Inc. and of CEO of Robison, Hill & Co. Brent graduated from the University of Utah with a B.S. in Marketing and a B.S. in Management. After serving as a manager in the S. S. Kresge Co. (K-Mart), he returned to school and received a B.S. in Accounting and an MBA (accounting option) from the University of Wyoming. He is a Certified Management Accountant and has CPA certificates from California, Nevada, Utah and Wyoming. He has had more than 35 years of Diversified public accounting, industry and teaching experience, including national accounting firm auditing experience; serving as a controller of a small privately-owned company; serving on the Board of Directors of several small public and private companies; and participating in accounting and marketing research projects that resulted in two of the articles which he wrote, being published in national magazines. During his career in public accounting he has been involved with various oil and gas, coal, gold, silver, phosphate, sand and gravel mining companies as a consultant, tax preparer, auditor (well over 300 audits) and in financial statement preparation. He has also served on the board of directors for two mining companies. He has taught various tax and accounting courses at the University of Wyoming and has been a frequent speaker at seminars and workshops sponsored by professional, civic and private groups.

- JAMES A. MARKS, Director

Mr. “Spider” Marks is the President of The Marks Collaborative, an advisory firm dedicated to the development and transformation of corporate leaders and their organizations. He has led business ventures to include entrepreneurial efforts in education, energy, IT, and primary research. General Marks spent over 30 years in the United States Army holding every command position from infantry platoon leader to commanding general. Significantly, in industry he was responsible for creating, training and managing a company that staffed over 10,000 linguists in Iraq generating annual revenues of over \$700 million in less than a year. He has led large multinational organizations and universities within NATO, European Union, Korea, Southeast Asia, and the Middle East. Gen Marks is a published author, routine guest speaker, leader and senior advisor for multiple corporations, and has been an on-air military and intelligence analyst to CNN. In governmental relations, he prepared and presented testimonies for intelligence, armed services, and appropriations committees of both houses of the US Congress. He is an Honor Graduate of the US Army’s Ranger School and a member of the Military Intelligence Hall of Fame. General Marks has a Bachelor of Science degree in Engineering from the United States Military Academy at West Point, NY and a Master of Arts degree in Foreign Affairs from the University of Virginia.

- **KAY KAPOOR, Director**

Ms. Kapoor's 30-year career spans across technology, telecommunications, consulting, and defense markets with significant experience in matters including corporate governance, portfolio restructuring, and government and regulatory matters. Ms. Kapoor is currently the CEO of Arya Technologies, an end-to-end technology solutions provider in the public sector serving the U.S. Federal Government and the industry that supports it. As an advisory and consulting firm, Arya Technologies clients include large public companies as well as silicon-valley tech firms, providing expertise in 5G, cyber, digital platforms, smart infrastructure, IoT, secure communications, and big data/analytics. She is the recipient of numerous industry awards including the Stevie Award for Woman of the Year in Business Services, the Women in Technology Leader Award, the prestigious Janice K. Mendenhall Spirit of Leadership Award from the American Council for Technology/Industry Advisory Council, the FCW Fed100 Award and the Asian American Engineer of the Year Award. Kapoor has an advisory role with Harvard's John F. Kennedy School of Government and has a seat on the Dean's Council. She is also on the Board of the Belfer Center for Science and International Affairs and is a member of the Dean's Council at Johns Hopkins University. Kapoor earned a master's degree in business from Johns Hopkins University complemented by executive programs at MIT and Harvard University and earned her bachelor's degree in information systems from the University of Maryland.

In addition to the board and management, the Company also has assembled an impressive advisory board, which consists of individuals with relevant and deep telecom, government, and other technology-associated collective experience. A listing of these individuals and their biographies are available at:

<https://www.comsovereign.com/advisoryboard> .

Risks and Caveats

We are microcap generalists and our preference is to find companies early and at the front end of catalysts we think we have identified that can potentially drive extraordinary relative financial results. As we alluded to above, that scenario typically involves poor visibility and the potential for marked errors in our initial assumptions and corresponding model.

In conjunction with above statement, along with poor visibility, many of our coverage stocks are small companies that often compete on some level(s) with much larger, better established and better capitalized competitors. The telecom/4G/5G industry is certainly one of those. We believe that small companies **can compete** with larger

players in large industries because we have seen it happen. That does not mitigate the risks of that posture, nor does it mean that COMSovereign will be one of the successful ones. They will most certainly face competitors with more R&D resources, more marketing resources and other marked advantages. We submit, in order for the Company to be successful, COMS will have to execute at a high level and they may even need the turn of a friendly card or two along the way.

Much of our investment thesis is built around the notion that 5G is coming and its success will depend considerably on some of the issues we raised above. That will include massive investment by both public and private organizations along the way. As we addressed above, it will also depend on the development of standards to advance the industry and foster adoption. Those things may or may not happen, and/or it may not happen at a pace that might be necessary for the successes of COMS specifically. We would argue that notion has probably been topical to some of the smaller players in space in the past, and that may be true of both DragonWave and Fastback. We would add, the pace of 5G's prefoliation will also likely be predicated on general economic conditions. As a result, poor overall economic conditions will likely prove onerous to COMS.

We suspect that some of 5G's success will depend on the development/advance of technologies that are not commercialized today. In fact, our investment thesis suggests that some of the Company's valuation is predicated on their own ability to develop and commercialize some of these technologies. There is no assurance they will be able to commercialize some or all of these efforts, and there is no assurance that others will not come up with technologies that are better, or at least more successful in the marketplace than theirs.

We have suggested/modeled that a good portion of the Company's near and intermediate term(s) success will likely come from various government initiatives such as border surveillance/security and others. Government contracts of that nature can provide watershed opportunities for small companies. However, in our experiences, reliance on business of this nature can be precarious as well. Government contracts are often subject to the deployment schedules of the agencies/departments involved, and as such are often unpredictable. Further, they are also dependent on funding and appropriation variables that can be equally unpredictable.

As we noted above, while the Company has been successful as of late attracting capital, they may need to seek additional capital in the future, which they may or may not be able to do. Obviously, that can have draconian prospects for companies that are burning cash. Even in the event that they can raise additional capital, it will likely create more dilution for existing shareholders.

We believe the Company currently relies on the expertise and guidance of a small group of people. Therefore, their inability to retain those key individuals could prove detrimental to the Company's success.

Like many small companies, the shares of COMS are relatively thinly traded and as such are subject to considerable illiquidity and volatility and that may be the case for the foreseeable future.

These are just some of the more cogent risks associated with COMS. There are likely others we have missed and/or others that are unforeseeable at the current time but may become topical in the future.

Summary and Conclusion

As we attempted to illustrate above, while 5G holds tremendous potential, there are a host of things that need to happen before/if that potential is to be realized. Those "things" include the broader adoption and continued advance of 5G enabling technologies, continued proliferation of the internet-of-things (IoT) and edge computing as well as others. There are also the issues of capital and time because even in the most modest models, the buildout of 5G will be expensive and will likely occur over much of the next decade. However, as we also alluded

to above, if 5G does in fact achieve much of its billing, it will change entire industries, foster new industries, and hasten the demise of others. Again, the prospects and the stakes here are enormous.

As we also noted 5G is not 4G, nor is it an extension of the same. 5G operates on a different spectrum, which presents unique benefits and unique challenges vis-à-vis 4G. As a result, 5G will include an array of new technologies, some that will be necessary for it to work and others that 5G will largely *allow to work*. Further, some of those required technologies are not developed, or at least perfected yet, which adds to the complexity of the analysis of the space. However, we would add that 4G is still growing and it is expected to grow well into the future as 4G continues to essentially fill the voids that 5G is not and perhaps will not be suited to fill.

While we may not know precisely which technologies will collectively drive 5G, we *are* beginning to get a glimpse of some of that platform. As we suggested above, we believe things like OpenRAN will be key pieces of 5G's expansion because they stress interoperability between hardware and software, which should drive innovation and adoption as network buyers can focus on best of breed technologies regardless of vendors. That approach stands in contrast to the largely proprietary approach in prior generations that we would argue supported large incumbent players, perhaps at the expense of smaller innovators. Additionally, we think the bias towards best of breed technologies, especially those providing more software centric solutions, should provide better margin environments for successful players in that regard, as opposed to the commoditization challenges that many smaller players have faced in the past.

More specifically, to reiterate, COMSovereign has assembled a group of companies that they believe create specific synergies around both near and intermediate opportunities in 4G and 5G, as well as intermediate and long terms opportunities in the futures of each. On the front end, we think the Company is having success selling radios into the legacy DragonWave customer data base. Some of those selling efforts through 2H-F20 and through Q1-F21 were hampered by insufficient production capabilities, which in turn negatively impacted their financial results. However, we believe those constraints have been addressed and are ramping to meet demand. We also think selling efforts will be bolstered by the rollout of their new Polaris radios, which we expect them to begin manufacturing and delivering in Q4-F21. The Polaris line will replace the Company's Harmony and Harmony Enhanced^{MC} radio lines and includes considerable technology upgrades integrated from the technologies of some of the other acquisitions. As we also alluded to above, we expect further intraorganizational contributions from acquired companies to make increasing contributions to future iterations of COMS products and services. For instance, the Polaris Gen2 radios we addressed above and the Company intends to launch in 2H-F22, will be OpenRAN compliant and software centric in part due to integrations/inclusions of Lextrum and SAGUNA technologies. The Company believes that functionality will drive marked demand for the Polaris Gen2 radios, as well as other offerings they will be introducing from the 5G core to the 5G edge.

While developments like OpenRAN are by nature standards driven, we believe the optimal proliferation of domestic 5G infrastructure will likely require considerable collaboration between government and the private sector, and certainly some of that collaboration will need to include a focus on the development of 5G standards. While in the big picture, COMS represents a little fish in a big lake, we think the recent inclusion of the Company's VNC division in a National Institute of Standards program to construct some particular 5G standards provides validation of our view that COMS is developing some of the "best of breed" technologies that we have argued will be paramount to the successful development of 5G.

In **Table 11.** of this report, we provided a group of the Company's acquisitions that we refer to as "Drones/Supply/Support". These companies consist primarily of their drone businesses, their intelligent battery division and their plastics/ injection molding business. Succinctly, while we have suggested that COMS's opportunities center around the coming rollout of 5G, the fact is that over the near and intermediate terms, we expect their opportunities outside of 5G to make major and perhaps initially outsized contributions to the whole. For instance, if we look out to the 3 to 5 year time horizon, we suspect the Company's Polaris (Gen2) line as well

as other developing products from its VNC and SAGUNA will command much of the Company's revenue mix. However, in the more foreseeable future (2021 and 2022), we think the drone business could represent as much as 40% to 50% of the revenue contribution in particular quarters. Frankly, that is much (although not all) of the basis for the dramatic relative revenue increases in our model assumptions for 2H-F21 and F22. In short, while the Company is not providing guidance therein, they have suggested that they expect the drone business to be robust as border surveillance remains highly topical. COMS drone operations have demonstrated traction within government agencies including the military (both domestic and foreign) and we expect that to continue. Beyond surveillance, we also think the use of drone technologies in the government and commercial telecom space(s), in terms of the deployment, for instance, of portable and temporary/on demand networks will be growth opportunity for COMS.

As we suggested throughout this report, historically, the U.S. telecom infrastructure space has *not generally* included a relatively commensurate number of domestic vendors. There are many reasons for that precedence, however, concerns surrounding national security implications of at least some internationally sourced communication infrastructures are becoming increasingly acute and frankly alarming. Further, concerns regarding international supply chains of the same are also beginning to shape both public policy as well as private domestic commercial strategies. We believe those "buy American" sentiments could provide marked advantages for domestic players like COMS. We submit, we are not sure how to handicap/delineate those advantages, however, given the choice, if we were a domestic producer, we would much rather have some "buy American" wind at our backs than not.

The Company has accumulated a number of enterprises that we believe will collectively prove synergistic in terms of their front to back approach to addressing the growing 4G and the 5G market(s). *Succinctly, our argument is that given the relatively modest market cap of the stock in the context of the considerable opportunity in these growing markets, COMS could remain a "little fish in a big lake" and still become extraordinarily successful.* As we have attempted to delineate above, in our view, the COMS story includes a number of historic data points, milestones, and emerging collaborations that suggest they could in fact become a viable player in the emerging 5G space. That said, any analysis of this nature must obviously attempt to build an investment thesis around identifiable tangible/visible variables, which in this case includes many of the items we identified above such as the existing installed DragonWave customer base, demonstrated traction amongst large telecom players as well as with relevant government agencies, national standards collaborations, partnerships with other best-of-breed players and several others.

Briefly, our model assumes that COMS will grow the business considerably in the coming quarters and years for that matter. We submit, there is a considerable amount of "blue sky" in these estimates, yet those estimates are also the basis for our DCF and/or cash flow based valuation conclusions. Obviously, if our cash assumptions prove overstated, then our targets may prove aggressive as well. On the other hand, as our subscribers are generally aware, our approach is to discount our DCF models at significant rates to reflect the risks associated with our cash flow assumptions being wrong with respect to breadth or timing, or both. Our targets currently reflect the impact of those deep discounts.

Lastly, there is perhaps another construct here that we think is worth considering with respect to COMS's prospects as a potential winner in the space. To reiterate a notion we include in much of our work, Trickle Research is a generalist microcap analysis provider. We are not industry analyst nor do we hold ourselves out as such. As a result, we submit our research may or may not include the depth, breadth and/or understanding that some industry analysts may be capable of providing. However, we think our track record over 25+ years of microcap analysis suggests that we have demonstrated success in finding early stage enterprises that have aligned themselves to take advantage of macroeconomic, governmental, industry, and other catalysts that can provide them the basis for extraordinary fundamental success. Obviously, we believe COMS has that potential. In that regard, in most instances that success is driven by the qualities and determination of the people running these

small enterprises. One of those “qualities” we often focus on is “tribal knowledge”, which is really a person’s deep understanding of the industry they work in, which is often correlated with the amount of time they have spent working in it. In the case of COMS, our sense is that while their acquisitions have included businesses with developed commercial products/services, existing sales/customer bases, protected/advanced technologies and/or differing combinations of each, the hidden asset here might be the collective tribal knowledge of the people who have come with these acquisitions. Here again, we are not sure how to handicap all of that collective “grey matter”, but in our view it may prove to be one of the more salient parts of the story.

We are initiating coverage of COMSovereign Holding Corp. with an initial allocation of 4, and a 12-24 month price target of \$9.00. We will reassess all of our targets as additional data points emerge.

Projected Operating Model

COMSovereign Holding Corp.						
Projected Operating Overview						
By: Trickle Research						
	Actual	Estimate	Estimate	Estimate	Estimate	Estimate
	3/31/2021	6/30/2021	9/30/2021	12/31/2021	Fiscal 2021	Fiscal 2022
Revenue	\$ 2,086,452	\$ 4,172,904	\$ 16,691,616	\$ 33,383,232	\$ 56,334,204	\$ 154,919,061
Cost of Goods Sold	\$ 1,073,990	\$ 2,080,193	\$ 7,845,060	\$ 13,499,889	\$ 24,499,131	\$ 77,227,152
Gross Profit	\$ 1,012,462	\$ 2,092,711	\$ 8,846,556	\$ 19,883,343	\$ 31,835,073	\$ 77,691,909
Operating Expenses					\$ -	\$ -
Research and development	\$ 547,556	\$ 604,323	\$ 708,645	\$ 833,832	\$ 2,694,356	\$ 9,478,626
Sales and marketing	\$ 48,123	\$ 225,187	\$ 350,374	\$ 433,832	\$ 1,057,517	\$ 9,374,352
General and administrative	\$ 7,135,126	\$ 7,166,916	\$ 7,667,665	\$ 8,335,329	\$ 30,305,036	\$ 34,196,762
Depreciation and amortization	\$ 3,660,811	\$ 3,521,416	\$ 3,521,416	\$ 3,521,416	\$ 14,225,058	\$ 14,085,663
Gain on the sale of assets	\$ (83,000)	\$ -	\$ -	\$ -	\$ (83,000)	\$ -
Total Operating Expenses	\$ 11,308,616	\$ 11,517,842	\$ 12,248,100	\$ 13,124,410	\$ 48,198,967	\$ 67,135,404
Net Operating Loss	\$ (10,296,154)	\$ (9,425,130)	\$ (3,401,543)	\$ 6,758,934	\$ (16,363,894)	\$ 10,556,505
Other Income (Expense)					\$ -	\$ -
Interest expense	\$ (468,534)	\$ (763,325)	\$ (763,325)	\$ (763,325)	\$ (2,758,509)	\$ (3,053,300)
Other income (expense)	\$ (13,042)	\$ -	\$ -	\$ -	\$ (13,042)	\$ -
Loss on extinguishment of debt	\$ (5,348,469)	\$ -	\$ -	\$ -	\$ (5,348,469)	\$ -
Loss on conversion of debt	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Foreign currency transaction gain (loss)	\$ (80,234)	\$ -	\$ -	\$ -	\$ (80,234)	\$ -
Interest income	\$ 4	\$ -	\$ -	\$ -	\$ 4	\$ -
Gain on the sale of assets	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Other Expenses	\$ (5,910,275)	\$ (763,325)	\$ (763,325)	\$ (763,325)	\$ (8,200,250)	\$ (3,053,300)
Net Loss Before Income Taxes	\$ (16,206,429)	\$ (10,188,455)	\$ (4,164,868)	\$ 5,995,609	\$ (24,564,144)	\$ 7,503,205
Deferred Tax Benefit	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Net Income (Loss)	\$ (16,206,429)	\$ (10,188,455)	\$ (4,164,868)	\$ 5,995,609	\$ (24,564,144)	\$ 7,503,205
Loss per common share:						
Basic	\$ (0.25)	\$ (0.14)	\$ (0.05)	\$ 0.08	\$ (0.36)	\$ 0.10
Diluted	\$ (0.25)	\$ (0.13)	\$ (0.05)	\$ 0.08	\$ (0.36)	\$ 0.09
Weighted-average shares outstanding:						
Basic	65,941,513	75,295,721	76,295,721	76,295,721	73,457,169	76,295,721
Diluted	65,941,513	76,287,241	77,764,973	78,147,159	74,535,221	81,280,092

On 07/16/21, COMSovereign announced the acquisition RF Engineering & Energy Resource. The acquisition was announced just prior to this initiation. As a result, we chose to initiate the coverage without covering this new portion of the Company. However, our model does reflect the impact of the acquisition in terms of cash and capital structure. We will cover the acquisition in more detail in future updates.

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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.