

Research Update



Sigma Labs, Inc.

(NasdaqGS: **SGLB**) (http://www.sigmalabsinc.com)

Report Date: 03/07/22

12-24 month Price Target (Adjusted): \$9.50

Allocation: 6

(Adjusted) Closing Stock Price at Initiation (Closing Px: 10/29/19): \$5.10 Closing Stock Price at Allocation Increase (Closing Px: 10/07/20): \$2.58
Stock Price at This Allocation Increase and Price Target Decrease (Closing Px: 07/29/21): \$3.76
Stock Price at This Research Update (Closing Px: 03/07/22): \$1.97

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

Recall, we provided an update regarding Sigma on 07/29/21. In retrospect, that update fell between their 2Q-F21 earnings release and their 3Q-F21 earnings release, we did not provide a subsequent update around the Q3 earnings release. Perhaps we would have been better off waiting for that release to provide the update, but to be frank, for the companies we follow that are in early-stage revenue postures, we do not typically view earnings releases as the most topical events around which to provide updates. We recognize that may be a bit unorthodox and perhaps counterintuitive to some, but that is our view/approach. Moreover, while not anticipated when we initiated the coverage in 4Q 2019, Sigma happens to fit in that "early stage revenue" bucket today. That said, despite setbacks along the way, (Covid, supply chain issues, et al), we continue to believe they are making progress towards becoming a major contributor/enabler to the additive manufacturing industry(s) and below is a recap of a few recent developments that we think support that view. Before we provide that however, we would encourage readers to visit the attached link, which features Sigma CEO, Mark Ruport's interview on Seeking Alpha 'CEO Interviews'. We think the interview was well done and provides an excellent overview of the Company's current industry posture and associated opportunities.

Sigma Labs CEO Mark Ruport - Improving 3D Printing - YouTube

Again, here are a few recent bullet points.

12/15/21 - Sigma Labs Expands In-Process Monitoring Product Capabilities into the Polymer 3D

This is a development we discussed in prior research and one we viewed as a potential catalyst for the stock. Our enthusiasm in that regard was addressed in the press release as follows:

The industrial polymer market is estimated to be about 2.5 times the size of its metal equivalent, according to AMPOWER, one of the worldwide leading independent consultancies focusing on industrial Additive Manufacturing. Approximately 35% of the industrial polymer 3D printers are sold in the United States, with more than 50% of total revenue earned by powder bed fusion suppliers and is expected to grow sevenfold by 2025. Global Market Insights, a market research company, states, "3D printing polymers market share is being significantly propelled by the rising product adoption across myriad industries including healthcare, locomotive, automotive, and aviation."

As the release notes, the TAM for polymers is multiples larger that the TAM for metals, so our rationale has been that Sigma adding polymer functionality should increase their total addressable market as well. At the time, we were a bit surprised that the announcement didn't impact the stock. On the other hand, on the face, our sense is that their overall opportunity in polymers will not likely be as large as their opportunities in metals and (as we understand the issues) there are a few reasons for that. For instance, the release notes that Sigma now supports *"selective laser sintering ("SLS"), a laser powder bed process, an established technology with high material throughput, and functionality that aligns with production applications in regulated industries"*. However, there are several additive polymer processes that include approaches that Sigma does not address (resin and or filament processes for example). In short, we view the Company's entre into polymers as another significant "arrow in their quiver", but we submit, like much of the story to this point, it is difficult to assess the breadth and timing the opportunity(s). That said, we think Sigma is more valuable *with* the ability to address the additive polymer industry than it is *without* it, which begs the question, "why didn't the news impact the stock"?

01/20/22 - Sigma Labs Announces Worldwide Partnership with Aconity3D

This is not Sigma's first agreement with an additive metal manufacturing printer OEM. recall, in September 2021, Sigma announced a similar agreement with DMG MORI, a multibillion-dollar worldwide manufacturer of machine tools including 3D metal printers. They have announced other similar agreements with other notable printer manufacturers as well.

As a point of interest, Aconity3D's CEO noted the following:

Dr. Yves Hagedorn, CEO of Aconity3D added, "We are delighted about this partnership. We believe Sigma Lab's and Aconity3D's joint endeavor to achieve steadily increasing part quality will **be a main enabling** factor for further industrial applications of 3D metal printing, as well as the ability to create fascinating applications."

We think these developments (Aconity3D, DMG MORI and others) are telling data points, as they reflect some issues we identified in our initiating coverage and have reiterated along the way. Recall, collaboration with additive printer manufacturers has largely been a headwind for Sigma since (and well before) our initiation. Specifically, manufacturers all have some sort of quality assurance functionality built into their printers. As such, they have historically taken the (general) position that customers can rely on their embedded QA solutions, and as a result do not need to add a third-party solutions like Sigma's. Moreover, as we have also discussed, some printer manufacturers have threatened to void warranties if customers deployed third party QA solutions like Sigma's with their products. That is not a hard position to understand. From the "10,000-foot view", no manufacturer wants to sell a product with the caveat (admission) that they cannot guarantee the product's ability to consistently generate acceptable results. Further, they cannot practically be expected to support sand issues with their own QA that is being augmented by someone else's. To that end, Sigma has always taken the position that their approach provides printer users with a ubiquitous QA solution that can be used across a fleet of printers from different manufacturers. That touches on two issues.

First, Sigma is careful *not to* suggest that their QA solution is *better* than those of printer manufacturers, but rather, that it is more flexible in that it can be applied to multiple printers from multiple manufactures rather than monitoring and managing the proprietary QA solutions of each manufacturer. (As an aside, we tend to believe that Sigma's solution may in fact be better than much of the QA provided by printer manufacturers, but we do not expect to hear them say that. Our reasoning is simply that they have a group of Los Alamos engineers that have working together to solve the problem for a very long time, and our anecdotal bet is that they know more about the QA of the process than the engineers focused on trying to build better AM machines.) Keep in mind, as we understand it, there are over 50 metal printer manufacturers, so standardizing the QA across than number of iterations is challenging, time consuming and resource intense.

More specifically, while Sigma's approach to avoid suggesting that the manufacturers should adopt the PrintRite3D solution because it works better than all their QA solutions is notable, the notion still provides objections. That is, Sigma's approach still requires manufacturers to collaborate with a solution that seeks to eliminate one of the advantages those manufactures may hold with respect to the differentiation of their products vis-à-vis competitors, i.e. a proprietary piece that discourages customers from buying a printer from another manufacturer rather than encouraging ubiquity. We think that paradigm illuminates at least in part Sigma management's use of the term "radical collaboration", which is essentially collaboration to solve a problem, as opposed to simply collaborating solely to make yourself better off, with the leap of faith that the tide of that solution will "raise all boats".

Again, these issues have provided headwinds for Sigma. As a result, they have spent the past few years trying to drive adoption by printer manufactures by pitching the value proposition to the *printer users* and encouraging

those customers to in turn demand adoption by the printer manufacturers. Even though many of these customers are large corporations with considerable clout (Lockheed Martin, Airbus etc.), that has been, and remains, a challenging approach. We think it is fair to say, for Sigma to effectively scale the business, they likely must gain the support of and collaboration with successful printer manufactures who are willing to embrace (much less oppose) the integration of PrintRite3D into their respective devices. To revisit the original point, that is precisely why we think announcements regarding acceptance by printer manufactures are so topical and frankly validating.

01/25/22 - Auburn University Selects PrintRite3D(R) to Support Several Additive Manufacturing Projects (including) Solution Supports Initiative of The National Center for Additive Manufacturing Excellence (NCAME) in Support of Aviation and Space Industries.

Auburn University's Samuel Ginn College of Engineering hosts "The National Center for Additive Manufacturing Excellence (NCAME), (which) was founded in 2017 through a collaboration between Auburn University (AU) and the National Aeronautics and Space Administration (NASA) leveraged by a signed AU/NASA Space Act Agreement. The center is also a founding partner of the ASTM Additive Manufacturing Center of Excellence". Apparently, Auburn is one of the nation's premier engineering schools (we will take their word on that) and given the above, includes a particular focus on additive manufacturing, which again, in that context we think may provide further validation for Sigma's technology. As it turns out, Auburn is also a customer which is, for lack of a better term, additive.

We would point out another aspect of this arrangement that we think is worth reiterating. From the release:

"The objective (of the collaboration) is to address issues related to the variability in additive manufacturing machines, as well as generate an understanding of how microscopic anomalies in the 3D-printed metals affect overall fatigue and fracture properties".

"This is what I call the 'Achilles' heel' of additive manufacturing," said NCAME director Nima Shamsaei, Philpott-WestPoint Stevens Distinguished Professor of Mechanical Engineering. "Such variations make the qualification and certification of AM materials and parts challenging. We intend to use PrintRite3D to detect anomalies during fabrication and relate them to the variations in mechanical performance of 3D-printed parts."

So, this is an issue that is one of the cornerstones of our investment thesis for Sigma and one that we have reiterated ad nauseum. We continue to believe, and apparently in lock step with some of the experts in the industry, that a lack of standardized quality assurance has held back the proliferation of the additive metal manufacturing industry. To that end, the quote above is not ours and it comes from someone who most certainly knows more about it than we do. Moreover, if we connect the dots, if the lack of standardized QA processes has been impairing the industry's growth, then the emergence/adoption of standardized QA processes should accelerate its growth. We continue to view Sigma's solution as at least a portion of that standardization. To that end we would add, the release also noted the following:

NCAME aims to guide multi-disciplinary research and foster effective collaborations amongst industry, government, academia, non-profit organizations, and ASTM committees for ensuring a coordinated, global effort toward **rapidly closing standards** and workforce development gaps in additive manufacturing.

Clearly, many of the industry's constituents recognize the need for standards in additive manufacturing. While we would argue that in this case, they have not exactly been "rapidly closed", we think they are heading in that direction, which again, we view as a potential watershed for Sigma.

Beyond the above, this release provided one addition point that was included in the narrative that we think is worth highlighting. The release notes that Sigma deployed its system *"under a commercial lease/purchase program that provides more flexible and acceptable terms for academic institutions and early adopters"*. This is a topical development we will address more specifically later in this update.

01/26/21- Materialise and Sigma Labs Develop Breakthrough Technology to Advance Metal Additive Manufacturing

First, here is an excerpt from the release that we think prefaces our analysis of its import.

"...The Materialise Control Platform (MCP) is an embedded hardware solution that provides end-users more control over the AM process. By integrating the MCP with Sigma Labs' PrintRite3D® sensor technology, the companies have created the possibility to identify quality issues and intervene to **correct** them in real time. This improves the productivity in metal AM and reduces scrap rates, paving the way for manufacturers to advance their operations and implement metal AM in serial production...".

If we understand this correctly, this announcement expands on another emerging milestone we have discussed in prior coverage, which is the advance of PrintRite3D (et al) to a point where the process not only identifies a problem in the process, but then also corrects the problem "in real time" without someone shutting down the process, fixing it and then continuing the process. As we said, this is something we have discussed, and the Company has always indicated would represent a **marked breakthrough** for the technology and its value proposition if they could achieve it.

The announcement also raises another issue we think is worth reiterating. The Company continues to demonstrate traction in various parts of the industry and much of that focus has been on customers and/or printer manufacturers, which we think, because they tend to speak more directly to revenues, investors seem to pay more attention to. For instance, their prior announcement of Lockheed Martin as a customer probably drove more immediate interest in the stock than any we can recall. Fair enough. However, we do not believe it was the most fundamentally telling announcement they have ever made. Along those lines, we think the Company's relationship with Materialise may be one of its more important.

To expand on the point, Materialise NV (NasdaqGS: MTLS) describes itself as follows:

When Materialise was founded in 1990, our goal was to enable new uses for the extraordinary potential that 3D printing offers. Since then, we have leveraged our experience to create a range of software solutions and 3D printing services, which together **form a backbone** for the 3D printing industry. Our **open and flexible platforms** enable players in industries such as healthcare, automotive, aerospace, art and design, and consumer goods, to build innovative 3D printing applications that make the world a better and healthier place. Headquartered in Belgium, with branches worldwide, Materialise has combined the largest group of software developers in the industry with one of the largest 3D printing facilities in the world.

To wander off a bit off point for a moment, we have been asked several times (as has the Company), if there is a reasonable public comp for Sigma. Since we have historically argued that Sigma is one of very few companies trying to solve this problem, it stands to reason that there are no real public comps, although some have suggested printer manufactures. Frankly, we would argue that there are public companies in other industries that probably represent better comps for Sigma than printer manufactures in the AM industry. That said, in our view Materialise probably provides the best relevant public comp for Sigma, while at the same time being a partner. With that in mind, over the past five years Materialise has experienced impressive growth (adjusting for Covid) and ended

fiscal 2021 with revenues of just under \$233 million and EPS of \$.26. We think as a pioneer in the additive industry, Materialise provides a good representation of what we view as Sigma's potential as its gains traction. Further from a purely speculative standpoint, for those who take the time to listen to the interview we noted above, the interviewer asked CEO Mark Ruport about the potential for one of the printer manufacturers to acquire Sigma. That is a question he has fielded before. However, from our perspective, an acquisition by Materialise (hypothetically) would make a lot more sense to us than an acquisition by a printer manufacturer, although we would not be excited about an acquisition by anyone unless the price was much closer to our target than to the current value of the shares. We think management would agree with that view.

02/24/22- Sigma Labs Expands into U.S. Federal Government Markets with Appointment of Phillips Federal as Exclusive Reseller

As with some of Sigma's other announcements this one requires some additional color and/or "reading between the lines" to fully appreciate the message. First, here is the description of Phillips from the release, followed by a comment from the company regarding their new relationship with Sigma:

"For more than 60 years, federal government, private sector industry and education leaders have trusted the experts at Phillips Corporation to solve their greatest manufacturing challenges. Our mission is to create legendary value for the manufacturing community by unlocking solutions to propel capabilities, profitability, and productivity. Phillips represents a robust combination of equipment, applications expertise, and services that are well-suited to meet the growing range of present and future manufacturing applications requirements".

"...The purpose of the agreement is to deliver an agnostic quality monitoring and analytics solution to standardize qualification across government installations, unify various technologies and accelerate readiness, quality, scale, and supply chain options for the U.S. government. Joe Harrison, President of Phillips Federal, stated, "We are extremely pleased to represent a company of the caliber of Sigma Labs. Our domain and implementation expertise, combined with the PrintRite3D in-process monitoring and analytics solution, makes for a great combination to improve part qualification and process efficiency in additive manufacturing implementations throughout the U.S. government...".

When we peel back the onion, we think this announcement may be more topical than the market may realize.

First, the announcement also provides the following:

To facilitate the ability of Phillips Federal to provide testing and onsite demonstrations, Sigma Labs will install a PrintRite3D® system at the Phillips Additive Innovation Center inside the Army Center of Excellence for Advanced Manufacturing at Rock Island Arsenal Joint Manufacturing and Technology Center. Phillips' Additive Innovation Center is a dedicated space utilized in conjunction with their collaborative work with the Department of Defense (DoD) to educate, inspire, and redefine the capabilities of additive manufacturing. The PrintRite3D system will be installed on an EOS M290 DMLS machine to be used for demonstration, training and education of DoD personnel on the benefits of in-process monitoring.

(Just to segue for a moment to something we found interesting, we believe the EOS M290 machine is the same machine that Auburn University is installing Print Rite 3D on). Further, perhaps some description of the Rock Island Arsenal Joint Manufacturing and Technology Center would be helpful for those who may not know what it is (We didn't, so indulge us for a moment).

https://home.army.mil/ria/index.php/about/history Rock Island Arsenal is an active US Army facility located on a 946-acre island in the Mississippi River. Today, Rock Island Arsenal is our nation's largest government owned and operated arsenal. The importance of the island was identified as early as 1809, when it was set aside as a federal military reservation by an Act of Congress.

An Act of Congress established Rock Island Arsenal in 1862. Major Charles P. Kingsbury, the first Commanding Officer of Rock Island Arsenal, located and designed three buildings for the arsenal. In 1867, the Clock Tower Building was the only one completed. Today, it is the home of the U.S. Army Corps of Engineers, Rock Island District.

<u>https://www.rockislandhousing.com/history</u> The arsenal was expanded from 1865-1871. The additions included 5 buildings called "arsenal row" for the manufacture and overhaul of general ordnance, and for the manufacture and overhaul of small arms...".

In 1902, over 16,000 sets of cavalry equipment and 53,000 sets of infantry equipment were shipped to the Manila Ordnance Depot to support U.S. troops still fighting in the Philippines. World War I saw the arsenal load nearly 200,000 155mm howitzer shells, the only time ammunition would be produced here.

During World War II, the focus for Rock Island became artillery production. About 600 artillery cartridges were made each month and throughout the entirety of the war, nearly 85,000 Model 1917A1, Model 1919A4, and Model 1919A5 .30 caliber machine guns were produced. The Korean War was supplied with the "superbazooka", a 3.5mm rocket launcher produced at Rock Island.

In 1962, the Rossford Army Depot of Ohio tool and equipment distribution mission was transferred to Rock Island, meaning the arsenal would be stocking over 65,000 different items. Then in 1967, the Springfield Armory of Massachusetts small arms mission was also transferred here. In addition to manufacturing, Rock Island became involved with the product engineering and research and development of small arms. During the Vietnam War, the M102 105mm lightweight howitzer was developed at Rock Island.

All manufacturing steps were unified under the roof of the Rock Island Arsenal Joint Manufacturing and Technology Center during the 1980s. This complex contains the DoD's only forge, foundry, and plating shop. Today, the arsenal is the only Army facility that assembles tool sets and kits for field support equipment.

https://ria-jmtc.ria.army.mil/ Today, the Rock Island Arsenal - Joint Manufacturing and Technology Center footprint covers over 30 buildings and over 3 million sq. ft. of manufacturing space. This state of the art, vertically integrated metal manufacturing facility is a readiness provider for the Department of Defense, designed to meet the needs of America's Warfighter. Our skills do not make us unique, but we are unique in the fact that



we can create product from the initial alloying and casting of raw material through all the manufacturing processes required to deliver a finished part or system all under one roof. (We think that may have just describe the ultimate "supply chain of the future"...).

At any given time, over 300 projects are running through our factory - items as small as a spring to as big as an Ambulance. Our mission is to develop, manufacture and deliver readiness solutions through conventional and advanced manufacturing processes for the U.S. Army and Department of Defense systems globally. Our vision is to transform our premier metal manufacturing facility in support of Army readiness and modernization requirements by optimizing our highly skilled workforce and operationalizing our cutting-edge technology to provide flexible and responsive Joint Warfighter readiness solutions in partnership with our Army and DoD family.

Obviously, the arsenal provides a wide variety of manufacturing capabilities aimed at ensuring the timely provisioning of armaments, fighting vehicles, tools, parts, accessories and others to the U.S military. That pursuit includes R&D and other collaborations with private industry for the development of advanced processes, weapons and systems like those pictured below, as well as others (we assume) that we are not allowed to see. We think most familiar with the facility and its work would likely acknowledge that it is a critical piece of the nation's defense and readiness protocols.



In 2018 the U.S. Army designated the Center of Excellence for **Advanced Manufacturing** at Rock Island Arsenal to "*serve as a central location to develop best practices and promote execution of the campaign plan throughout the Army materiel enterprise*". At the time, the Army provided the following additional color:

The Army is operationalizing additive and advanced manufacturing across the materiel enterprise to improve equipment readiness and warfighter capabilities at the tactical level.

"What we're trying to do within the constructs of the Army's campaign plan for additive manufacturing, is really to operationalize AM and industrialize it," said RIA-JMTC commander, Col. Ken Letcher. "To me this is all enabled by moving into the start of industry 4.0. It's merging old-school manufacturing, with the increased use of manufacturing aids: robots, the industrial network, advanced machines, additive manufacturing. It's leveraging those together to make us better and more agile and adaptive to meet those Army and DoD requirements."

"The Army has been using additive manufacturing for at least 20 years, so we've been using it within the Organic Industrial Base (OIB) and the research and development (R&D) community has been using it as well," said Letcher. "We have really been dabbling in it, where we have a problem we can't fix through conventional manufacturing we'll turn to additive manufacturing of either metal or plastic to help solve a tooling or fixture issue. The R&D community has been using it to figure out what that next thing could be for the military, the next material, the next design. They're going to continue to do that, **but we feel the technology is mature enough to pick that fruit off the tree and roll it into the Organic Industrial Base**. This is an evolution and increase in capabilities," said Letcher.

In August 2020, the Army announced that the Center of Excellence for Advanced Manufacturing qualified and provisioned for production **its first additive manufactured product**, the M249 Sight Adjustment Tool, which is used to adjust the front sights of an M240 machine gun. Apparently, the items original manufacturer only sold the wrench as part of a (expensive) bundle of accessories. Consequently, as a more cost-effective substitute, the Army bult its own replacement, to which they noted, *"while not as cool as a suppressor or other 3D printed accessories, the humble M249 Sight Adjustment Tool is an important milestone. Moreover, it contributes to saving money, which doesn't hurt"*.



To recap this just a bit, Sigma's agreement with Phillips Federal designates the latter as Sigma's exclusive reseller to U.S. Federal Government markets. On the face that seems like a good choice because Phillips is an entrenched and successful provider of products and services to the gambit of government agencies including the department of defense. More specifically, Phillips has established their Phillips Additive Innovation Center *inside the Army Center of Excellence for Advanced Manufacturing at Rock Island Arsenal Joint Manufacturing and Technology Center*. As we just described, the Center of Excellence for Advanced Manufacturing technologies across the Rock Island Arsenal and moving those technologies beyond prototype and design and into standard and scalable manufacturing processes. Aside from opening the door into the U.S. defense space, we think this arrangement could include Sigma contributions to standards that apply at least to the myriad of AM projects that run through the arsenal specifically, but perhaps the DoD and other agencies in general. Again, this is just our observation of the collaboration, which we could be overstating, but we think this is perhaps a much more important development than the street is recognizing.

Moving on, we alluded to this development above, but our primary reason for providing this update was to recast our model given the new subscription-based pricing the Company recently rolled out. We got a bit carried away on some of the other issues, but we do that sometimes. Regardless, we think the new pricing scheme may be telling. On one hand, perhaps they would have preferred using this approach from the very beginning, but as CEO Mark Ruport alluded to in the interview we referenced above, this approach requires more working capital than the system sales model because they get paid for the system over several months as opposed to up front, which on the face requires more working capital, which has typically been constrained. On the other hand, we tend to think at least some of the new pricing is likely related to feedback from their sales efforts, which would in turn suggest to us that the sales efforts are accelerating or at least they are addressing what may have been objections/hurdles to prior sales efforts. We have recast our model to reflect this new approach.

One additional observation. When we consider our own direct conversations with Sigma management and we listen to their calls and their presentations, we think there is a common thread that is beginning to weave through some of that discussion. Perhaps we are just misunderstanding the context, but it seems like there is growing discussion around the idea that certain organizations (NASA, DoD, the aeronautics industry and others) are beginning to push for standards in general, but perhaps more specifically for QA processes that are verified/supported by **third party** systems and/or protocols. Again, we may be overanalyzing this, but we think some of the new collaborations we noted above (Auburn University/NASA and Phillips/U.S. Army for instance) may support our hunch.

Lastly, while we have noted some of the challenges the industry has faced and some of the missing elements that may have been holding it back, we think the case for additive manufacturing is getting stronger. The "reimagining" of the supply chain, a focus on more local sourcing ("buy American") and the continued search for more efficient and cost-effective production approaches (to name a few) are all advantages of a developed (read: standardized) AM industry. We continue to believe the industry is trending in that direction and there is evidence that the trend may be accelerating.

To summarize, we submit, Sigma's transition to consistent, sequential, and marked revenue growth has taken longer than we anticipated. There are several factors that we think contributed to the longer runway including the pandemic, the continued (guarded) pace of AM adoption, emerging supply chain issues and likely others. The other side of that however, is that despite those things we were also most certainly early, (which we often are), but in this case, there were some things here we did not fully understand. That also happens occasionally. For instance, it is clear to us now that when we initiated coverage, Sigma had more development to do to make PrintRite3D truly commercial ready than we realized. Again, referring to the interview we mentioned above, the interviewer asked Mark Ruport something that struck a chord with us specifically with respect to Sigma when he asked something along the lines of, "do you ever wonder if you are early or if you are just wrong?" As we said, we are often early, but sometimes we are just plain wrong. However, when we consider the Company's ongoing progress, we continue to believe, probably more than ever, that we are right about this one.

While we submit revenue visibility remains challenging, we are more convinced than ever that the Company is positioned to play a meaningful role in the emerging growth and proliferation of additive manufacturing. Further because of their equity raise earlier in 2021, they ended 3O-F21 with roughly \$13 million in cash, which should keep the working capital worries at bay for the foreseeable future and allow them to focus on growing the business. To reiterate, we have transitioned our model to reflect the subscription-based pricing we covered above, which from a practical standpoint means that customers will pay Sigma \$3000-\$4000 per month for PrintRite3D, rather than \$100,000 to \$200,000 up front. To be clear, management has suggested that some customers may still pay for the systems up front, so we really do not know how all the new pricing will impact revenue recognition through 2022 and probably into 2023 until subscription-based pricing makes up the preponderant share of the revenues. As a result, we could see a few quarters that reflect poor comps as new quarters with larger portions of subscription-based revenues get compared to prior quarters with more outright sales. In other words, in or view, the key metric here to focus on through 2022 and perhaps even 2023 will be systems placed in service, rather than revenues per se, as the model shifts to a smaller up-front but larger recurring revenue stream. Further, management has also provided the vision of a largely software model, especially with respect to systems that are installed at the printer OEM level (which, in-line with company guidance, we are eventually projecting to make up roughly 70% of sales). That transition could drive down revenues as well, as the monthly subscription fee would then apply to software only rather than the current software/hardware configuration. However, in that case, margins would expand accordingly, which would probably result in even more robust aggregate profitability. We have not, tried to model that iteration, although again, all other things remaining the same, we would expect that iteration to vield better, not worse, earnings and cash flow results.

We are reiterating our price target of \$9.50 for Sigma share. All told we think the shares represent an extraordinary risk/return profile because we continue to believe the Company's prospect remain quite open-ended and we also think the pace of their progress on multiple fronts is accelerating. We are inclined to raise our allocation (again) but given the current state of the markets (oil prices, war etc.) and the resulting volatile macro environment, we will keep that powder dry until we are afforded more clarity on the world order. Thus, we reiterate our current allocation of 6. We will revisit all of our assumptions as visibility dictates.

Projected Operating Model

Projected Operating Model																	
Sigma Labs, Inc.																	
Prepared By: Dave Lavigne, Trickle Research																	
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		(Actual)		(Actual)	(Actual)	(Estimate)		(Estimate)	Œ	Estimate)	(Estimate)		(Estimate)	(Estimate)		(Estimate)	
		3/31/2021		6/30/2021	9/30/2021	12/31/2021	F	fiscal 2021	3	3/31/2022	6/30/202	2	9/30/2022	12/31/2022	F	iscal 2022	Fiscal 2023
REVENUES	\$	458,140	\$	144,148	\$ 700,237	\$ 791,932	\$	2,094,457	\$	549,750	\$ 583,92	2 \$	790,857	\$ 1,007,738	\$	2,932,267	\$ 8,083,594
COST OF REVENUE	\$	128,331	\$	116,397	\$ 164,766	\$ 372,500	\$	781,994	\$	190,519	\$ 254,46	1 \$	345,429	\$ 441,369	\$	1,231,777	\$ 2,933,438
GROSS PROFIT	S	329,809	\$	27,751	\$ 535,471	\$ 419,432	\$	1,312,463	\$	359,231	\$ 329,46	1 \$	445,429	\$ 566,369	\$	1,700,490	\$ 5,150,156
EXPENSES:							\$	-							\$	-	s -
Salaries & Benefits	\$	847,171	\$	985,348	\$ 1,222,760	\$ 1,267,422	\$	4,322,701	\$ 1	1,262,095	\$ 1,262,840	5 \$	1,267,399	\$ 1,272,170	\$	5,064,510	\$ 5,177,839
Stock-Based Compensation	\$	117,477	\$	116,441	\$ 659,512	\$ 150,000	\$	1,043,430	\$	150,000	\$ 150,00	0 \$	150,000	\$ 150,000	\$	600,000	\$ 600,000
Operating R&D Costs	\$	196,340	\$	280,700	\$ 131,772	\$ 177,518	\$	786,330	\$	184,395	\$ 166,23	1 \$	168,794	\$ 184,314	\$	703,735	\$ 975,364
Investor & Public Relations	\$	108,341	\$	114,762	\$ 119,622	\$ 125,000	\$	467,725	\$	125,000	\$ 125,00	0 \$	125,000	\$ 125,000	\$	500,000	\$ 500,000
Organizational Costs	\$	77,616	\$	158,529	\$ 342,112	\$ 180,000	\$	758,257	\$	180,900	\$ 181,80	5 \$	182,714	\$ 183,627	\$	729,045	\$ 743,736
Legal & Professional Service Fees	\$	176,847	\$	244,019	\$ 261,075	\$ 323,758	\$	1,005,699	\$	316,493	\$ 217,51	8 \$	223,726	\$ 230,232	\$	987,968	\$ 1,142,508
Office Expenses	\$	148,225	\$	151,871	\$ 172,238	\$ 173,758	\$	646,092	\$	166,493	\$ 167,51	8 \$	173,726	\$ 180,232	\$	687,968	\$ 842,508
Depreciation & Amortization	S	23,031	\$	25,783	\$ 27,689	\$ 27,827	\$	104,330	\$	27,967	\$ 28,100	5	28,247	\$ 28,388	\$	112,708	\$ 114,979
Other Operating Expenses	S	86,356	\$	91,198	\$ 90,108	\$ 90,559	\$	358,221	\$	91,011	\$ 91,460	5	91,924	\$ 92,383	\$	366,785	\$ 374,176
Total Operating Expenses	\$	1,781,404	\$	2,168,651	\$ 3,026,888	\$ 2,515,842	\$	9,492,785	\$ 2	2,504,352	\$ 2,390,490) \$	3 2,411,529	\$ 2,446,347	\$	9,752,718	\$ 10,471,109
LOSS FROM OPERATIONS	\$	(1,451,595)	\$	(2,140,900)	\$ (2,491,417)	\$ (2,096,411)	\$	(8,180,322)	\$ (2	2,145,121)	\$ (2,061,02	9) \$	6 (1,966,100)	\$ (1,879,979)) \$	(8,052,229)	\$ (5,320,953)
OTHER INCOME (EXPENSE)							\$	-							\$	-	s -
Interest Income	\$	55	\$	7,018	\$ (2,052)	\$ 33,340	\$	38,361	\$	27,955	\$ 21,999	\$	15,954	\$ 10,016	\$	75,925	\$ 91,965
State Incentives	\$	-	\$	-	\$ -	\$ -	\$		\$	-	\$ -	\$	- 6	\$ -	\$	-	s -
Change in fair value of derivative liabilities	\$	802,285	\$	-	\$ -	\$ -	\$	802,285	\$	-	s -	\$	- 3	s -	\$	-	s -
Exchange Rate Gain (Loss)	\$	(51)	\$ (208	\$ (490)	\$ -	\$	(333)	\$	-	s -	\$	- 3	s -	\$	-	s -
Interest Expense	\$	(1,353)	\$	(2,029)	\$ 2,981	\$ 2,996	\$	2,595	\$	3,011	\$ 3,020	5 \$	3,041	\$ 3,056	\$	12,134	\$ 12,379
Loss on Disposal of Assets	\$	-	\$	-	\$ -	\$ -	\$	-	\$	-	s -	\$	- 6	\$ -	\$	-	s -
Debt discount amortization	\$	-	\$	-	\$ -	\$ -	\$	-	\$	-	s -	\$	- 3	\$ -	\$	-	s -
Total Other Income (Expense)	\$	800,936	\$	295,353	\$ 439	\$ 36,336	\$	1,133,064	\$	30,966	\$ 25,025	\$	18,995	\$ 13,072	\$	88,059	\$ 104,343
LOSS BEFORE PROVISION FOR INCOME TAXES	\$	(650,659)	\$	(1,845,547)	\$ (2,490,978)	\$ (2,060,074)	\$	(7,047,258)	\$ (2	2,114,155)	\$ (2,036,004	4) \$	6 (1,947,105)	\$ (1,866,906)	\$	(7,964,170)	\$ (5,216,609)
Provision for Income Taxes	\$	-	\$	-	\$ -	\$ -	\$	-	\$	-	\$ -	\$	- 6	\$ -	\$	-	s -
Net Loss	\$	(650,659)	\$	(1,845,547)	\$ (2,490,978)	\$ (2,060,074)	\$	(7,047,258)	\$ (2	2,114,155)	\$ (2,036,004	4) \$	6 (1,947,105)	\$ (1,866,906)	\$	(7,964,170)	\$ (5,216,609)
Preferred Dividends	S	60,908	\$	-	\$ 14,222	\$ -	\$	75,130	\$	-	\$ -	\$	-	\$ -	\$	-	s -
Net Loss applicable to Common Stockholders	\$	(711,567)	\$	(1,845,547)	\$ (2,505,200)	\$ (2,060,074)	\$	(7,122,388)	\$ (2	2,114,155)	\$ (2,036,004	ŧ) \$	6 (1,947,105)	\$ (1,866,906)	\$	(7,964,170)	\$ (5,216,609)
Net Loss per Common Share - Basic and Diluted	\$	(0.09)	\$	(0.18)	\$ (0.24)	\$ (0.20)	\$	(0.72)	\$	(0.20)	\$ (0.19) \$	(0.18)	\$ (0.18)	\$	(0.75)	\$ (0.40)
Net Loss per Common Share - Diluted	\$	(0.09)	\$	(0.18)	\$ (0.24)	\$ (0.20)	\$	(0.72)	\$	(0.20)	\$ (0.19) \$	(0.18)	\$ (0.17)	\$	(0.75)	\$ (0.38)
Weighted Average Number of Shares Outstanding - Basic		7,790,121		10,493,598	10,510,085	10,534,305		9,832,027	10	0,566,580	10,595,922	2	10,622,596	10,646,845		10,607,986	12,903,404
Weighted Average Number of Shares Outstanding - Diluted		7,790,121		10,493,598	10,510,085	10,534,305		9,832,027	10	0,566,580	10,595,922	2	10,622,596	10,711,459		10,624,139	13,782,239

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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. 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.