

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 10-K

(Mark One)

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended June 30, 2019

or

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the transition period from _____ to _____

Commission file number: 001-38029



AKOUSTIS TECHNOLOGIES, INC.
(Exact name of registrant as specified in its charter)

Delaware

(State or other jurisdiction of
incorporation or organization)

33-1229046

(IRS Employer
Identification No.)

9805 Northcross Center Court, Suite A
Huntersville, NC

(Address of principal executive offices)

28078

(Postal Code)

Registrant's telephone number, including area code: 1-704-997-5735

Securities registered under Section 12(b) of the Act:

Title of Each Class:

Trading Symbol

Name of each exchange on which registered:

Common Stock, \$0.001 par value

AKTS

The NASDAQ Stock Market LLC (NASDAQ Capital Market)

Securities registered under Section 12(g) of the Act:

None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes No

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Exchange Act. Yes No

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Exchange Act during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes No

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes No

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large Accelerated Filer

Accelerated Filer

Non-Accelerated Filer

Smaller reporting company

Emerging growth company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes No

The aggregate market value of the registrant's common stock, par value \$0.001 per share ("Common Stock"), held by non-affiliates on December 31, 2018 was approximately \$123.6 million. For purposes of this computation, shares of Common Stock held by all officers, directors, and beneficial owners of 10% or more of the outstanding Common Stock were excluded because such persons may be deemed to be affiliates of the registrant. Such determination should not be deemed an admission that such persons are, in fact, affiliates of the registrant.

As of September 06, 2019, there were 30,329,525 shares of Common Stock issued and outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

The registrant intends to file a definitive proxy statement pursuant to Regulation 14A within 120 days after the end of the fiscal year ended June 30, 2019. Portions of such proxy statement are incorporated by reference into Part III of this Form 10-K.

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CAUTIONARY NOTE REGARDING FORWARD-LOOKING INFORMATION

This Annual Report on Form 10-K (this “Report”) contains forward-looking statements, including, without limitation, in the sections captioned “Business,” “Risk Factors,” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations,” and elsewhere. Any and all statements contained in this Report that are not statements of historical fact may be deemed forward-looking statements. Terms such as “may,” “might,” “would,” “should,” “could,” “project,” “estimate,” “predict,” “potential,” “strategy,” “anticipate,” “attempt,” “develop,” “plan,” “help,” “believe,” “continue,” “intend,” “expect,” “future,” and terms of similar import (including the negative of any of the foregoing) may be intended to identify forward-looking statements. However, not all forward-looking statements may contain one or more of these identifying terms. Forward-looking statements in this Report may include, without limitation, statements regarding (i) the plans and objectives of management for future operations, including plans or objectives relating to the development of commercially viable radio frequency (“RF”) filters and the pursuit of relationships with original equipment manufacturers (“OEMs”) and R&D development agreements and joint ventures with customers and other strategic partners, (ii) expectations of our current and future products’ performance and competitive position, (iii) a projection of income (including income/loss), earnings (including earnings/loss) per share, capital expenditures, dividends, capital structure or other financial items, (iv) our future financial performance, including any such statement contained in a discussion and analysis of financial condition by management or in the results of operations included pursuant to the rules and regulations of the Securities and Exchange Commission (“SEC”), (v) our ability to efficiently utilize cash and cash equivalents to support our operations for a given period of time, (vi) our ability to engage customers while maintaining ownership of our intellectual property, and (vii) the assumptions underlying or relating to any statement described in points (i) through (vi) above.

The forward-looking statements are not meant to predict or guarantee actual results, performance, events or circumstances and may not be realized because they are based upon our current projections, plans, objectives, beliefs, expectations, estimates and assumptions and are subject to a number of risks and uncertainties and other influences, many of which are beyond our control. Actual results and the timing of certain events and circumstances may differ materially from those described by the forward-looking statements as a result of these risks and uncertainties. Factors that may influence or contribute to the inaccuracy of the forward-looking statements or cause actual results to differ materially from expected or desired results may include, without limitation,

- our inability to obtain adequate financing,
- our limited operating history,
- our inability to generate revenues or achieve profitability,
- our inability to service the debt represented by our \$25.0 million principal amount of senior convertible notes issued in calendar year 2018,
- the results of our research and development (“R&D”) activities,
- our inability to achieve acceptance of our products in the market,
- general economic conditions, including upturns and downturns in the industry,
- risks related to doing business in foreign countries,
- any security breaches or other disruptions compromising our proprietary information and exposing us to liability,
- our limited number of patents,
- failure to obtain, maintain and enforce our intellectual property rights,
- our inability to attract and retain qualified personnel,
- our reliance on third parties to complete certain processes in connection with the manufacture of our products,
- product quality and defects,
- existing or increased competition,
- our ability to market and sell our products,
- our inability to successfully scale the New York fabrication facility and related operations into our business and to maintain a successful fabrication operation,
- our failure to innovate or adapt to new or emerging technologies, including in relation to our competitors,
- our failure to comply with regulatory requirements,

- results of any present or future arbitration or litigation,
- stock volatility and illiquidity,
- our failure to implement our business plans or strategies,
- our failure to maintain effective internal control over financial reporting, and
- our failure to obtain the Trusted Foundry accreditation of our New York fabrication facility.

A description of the risks and uncertainties that could cause our actual results to differ materially from those described by the forward-looking statements in this Report appears in the section captioned “Risk Factors” and elsewhere in this Report.

Readers are cautioned not to place undue reliance on forward-looking statements because of the risks and uncertainties related to them and to the risk factors. Except as may be required by law, we do not undertake any obligation to update the forward-looking statements contained in this Report to reflect any new information or future events or circumstances or otherwise.

DEFINITIONS

When used in this Report, the terms, “we,” “Akoustis,” the “Company,” “our,” and “us” refers to Akoustis Technologies, Inc., a Delaware corporation, and its wholly owned consolidated subsidiary, Akoustis, Inc. also a Delaware corporation.

Glossary

The following is a glossary of technical terms used herein:

- **Acoustic wave** - a mechanical wave that vibrates in the same direction as its direction of travel.
- **AlN** - Aluminum Nitride.
- **Acoustic wave filter** - an electromechanical device that provides radio frequency control and selection, in which an electrical signal is converted into a mechanical wave in a device constructed of a piezoelectric material and then back to an electrical signal.
- **Band, channel or frequency band** - a designated range of radio wave frequencies used to communicate with a mobile device.
- **Bulk acoustic wave (BAW)** - an acoustic wave traveling through a material exhibiting elasticity, typically vertical or perpendicular to the surface of a piezoelectric material.
- **Digital baseband** - the digital transceiver, which includes the main processor for the communication device.
- **Duplexer** - a bi-directional device that connects the antenna to the transmitter and receiver of a wireless device and simultaneously filters both the transmit signal and receive signal.
- **Filter** - a series of interconnected resonators designed to pass (or select) a desired radio frequency signal and block unwanted signals.

- **Group III element nitrides** - a dielectric material comprised of group IIIA element, such as boron (B), aluminum (Al) or gallium (Ga), combined with group 5A (or VA nitrogen) to form a compound semiconductor nitride such as BN, AlN, or GaN. For resonators, the dielectric is typically chosen based upon the piezoelectric constant of the material in order to generate the highest electromechanical coupling.
- **Insertion Loss** - the power losses associated with inserting a BAW filter into a circuit.
- **Lossy** - resistive losses that result in heat generation.
- **Metrology** - techniques used to evaluate materials, devices and circuits.
- **Monolithic topology** - a description of an electrical circuit whereby all the elements of the circuit are fabricated at the same time using the same process flow.
- **Power Amplifier Duplexer (PAD)** - an RF module containing a power amplifier and duplex filter components for the RFFE of a smartphone.
- **Piezoelectric materials** - certain solid materials (such as crystals and certain ceramics) that produce a voltage in response to applied mechanical stress, or that deform when a voltage is applied to them.
- **Quality factor, or Q** - energy stored divided by the energy dissipated per cycle. Higher Q represents a higher caliber of resonance and implies mechanical and electrical factors responsible for energy dissipation are minimal. For a given amount of energy stored in a resonator, Q represents the number of cycles resonance will continue without additional input of energy into the system.
- **Resonator** - a device whose impedance sharply changes over a narrow frequency range and is characterized by one or more 'resonance frequency' due to a standing wave across the resonator's electrodes. The vibrations in a resonator can be characterized by mechanical "acoustic" waves which travel without a characteristic sound velocity. Resonators are the building blocks for RF filters used in mobile wireless devices.
- **RF** - radio frequency.
- **RF front-end (RFFE)** - the circuitries in a mobile device responsible for processing the analog radio signals; located between the device's antenna and the digital baseband.
- **RF spectrum** - a defined range of frequencies.
- **Surface acoustic wave (SAW)** - an acoustic sound wave traveling horizontally along the surface of a piezoelectric material.
- **TDD LTE** - Time Division Duplex- Long-Term Evolution or a wireless standard which shares the bandwidth between transmit and receive.
- **Tier one** - a supplier or OEM with substantial market share.
- **Tier two** - a supplier or OEM with an established but not substantial market share.
- **Trusted Foundry**- The Trusted Foundry Program was initiated by the Department of Defense in 2004 to ensure mission-critical national defense systems access to leading-edge integrated circuits from secure, domestic sources. Defense Microelectronics Activity (DMEA) is the manager of the Trusted Foundry Program for the U.S. Department of Defense (DoD). It is a joint DoD / National Security Agency (NSA) program and is administered by the NSA's Trusted Access Program Office (TAPO).
- **Wafer** - a thin slice of semiconductor material used in electronics for the fabrication of integrated circuits.

PART I

ITEM 1. BUSINESS

Overview

Akoustis® is an emerging commercial company focused on developing, designing and manufacturing innovative RF filter products for the wireless industry, including for products such as smartphones and tablets, network infrastructure equipment, WiFi Customer Premise Equipment (“CPE”) and defense applications. Located between the device’s antenna and its digital backend, the RF front-end (“RFFE”) is the circuitry that performs the analog signal processing and contains components such as amplifiers, filters and switches. We have developed a new and proprietary microelectromechanical systems (“MEMS”) based bulk acoustic wave (“BAW”) technology and unique manufacturing flow, which we have trademarked as XBAW. Our XBAW™ process incorporates optimized high purity piezoelectric materials designed to achieve high power, high frequency and/or wide bandwidth filter performance. Filters are critical in selecting and rejecting signals, and their performance enables differentiation in the hardware modules defining the RFFE.

We believe owning the core resonator device technology, manufacturing facility and intellectual property (“IP”) to produce our designs is the most direct and efficient means of delivering our solutions to the market. Furthermore, our technology is based upon bulk-mode acoustic resonance, which we believe is superior to surface-mode acoustic resonance for high-band applications that include 4G/LTE, 5G, WiFi, and defense applications. Although some of our target customers utilize or make the RFFE module, they may lack access to critical ultra-high band (UHB) filter technology needed to compete in high-frequency applications. We intend to design, manufacture, and market our RF filter products to mobile phone original equipment manufacturers (“OEMs”), defense OEMs, network infrastructure OEMs, and WiFi CPE OEM’s to enable broader competition among the front-end module manufacturers. We operate as a “pure-play” RF filter supplier and align with the front-end module manufacturers who seek to acquire high performance filters to expand their module business.

We currently build high performance RF filter circuits, using our first generation XBAW™ wafer process, in our 120,000 square-foot wafer-manufacturing facility located in Canandaigua, New York, which we acquired in June 2017. As of September 11, 2019, our (IP) portfolio included 24 patents, including one blocking patent that we have licensed from Cornell University. Additionally, we have 52 active and pending patent applications. These patents cover our XBAW™ RF filter technology from the substrate level through the system application layer. Where possible, we leverage both federal and state level R&D grants to support development and commercialization of our technology.

We are developing RF filters for 4G/LTE, 5G, WiFi and defense bands using our proprietary resonator device models and product design kits (PDK’s). As we qualify our first RF filter products, we are engaging with target customers to evaluate our filter solutions. Our initial designs target UHB, sub-7 GHz 4G/LTE, 5G, WiFi and defense bands. Since Akoustis owns its core technology and controls access to its intellectual property, we expect to offer several ways to engage with potential customers. First, we intend to engage with multiple wireless markets, providing standardized filters that we design and offer as standard catalog components. Second, we expect to deliver unique filters to customer-supplied specifications, which we will design and fabricate on a customized basis. Finally, we may offer our models and design kits for our customers to design their own filters utilizing our proprietary technology.

We have earned minimal revenue from operations since inception, and we have funded our operations primarily with development contracts, RF filter prototype and initial production orders, government grants, MEMS foundry and engineering services, sales of our equity securities, and issuance of debt. We have incurred losses totaling approximately \$67.5 million from inception through June 30, 2019. These losses are primarily the result of material and processing costs associated with developing and commercializing our technology, as well as personnel costs, professional fees (primarily accounting and legal), and other general and administrative (“G&A”) expenses. We expect to continue to incur substantial costs for commercialization of our technology on a continuous basis because our business model involves materials and solid-state device technology development and engineering of catalog and custom filter design solutions.

Plan of Operation

We plan to commercialize our technology by designing and manufacturing single-band and multi-band BAW RF filter solutions in our New York wafer fabrication facility. We expect our filter solutions will address problems (such as power loss, bandwidth, power handling, and isolation) created by the growing number and convergence of frequency bands in the RFFE of mobile devices, infrastructure and premise equipment to support 4G/LTE, 5G, and WiFi. We have prototyped our first single-band BAW filter designs for 4G/LTE frequency bands, which are dominated by competitive BAW solutions and historically cannot be addressed with low-band, lower power handling surface acoustic wave (“SAW”) technology.

To succeed, we must convince mobile phone OEMs, RFFE module manufacturers, network infrastructure OEMs, WiFi CPE OEMs and defense customers to use our XBAW™ filter technology in their systems and modules. However, since there are two dominant BAW filter suppliers in the industry that have high-band technology, and both utilize such technology as a competitive advantage at the module level, we expect customers that lack access to high-band filter technology will be open to engage with our pure-play filter company.

We plan to pursue RF filter design and R&D development agreements and potentially joint ventures with target customers and other strategic partners. These types of arrangements may subsidize technology development costs and qualification, filter design costs, and offer complementary technology and market intelligence and other avenues to revenue. However, we intend to retain ownership of our core technology, intellectual property, designs, and related improvements. We expect to pursue development of catalog designs for multiple customers and to offer such catalog products in one or more sales channels.

Recent Developments

Business Developments

In July 2018, we completed the qualification of our high purity piezoelectric materials process and our XBAWTM manufacturing process to support an initial product family of 4G/LTE, 5G mobile, WiFi and defense filter solutions. Now that we have stabilized our resonator process technology in a manufacturing environment, we intend to complete a production release of our RF filter products in the frequency range from 1 to 7 GHz. The target frequency bands will be prioritized based upon customer priority. We expect this will require recruiting and hiring additional personnel and capital investments.

We added our first 5G network infrastructure customer for the Citizen's Broadband Radio Service in August 2018 and announced first samples to our 5G customer in March 2019. We announced a second 5G network infrastructure customer in October 2018, and we provided initial samples of our 3.5 GHz CBRS filter product in March 2019. In September 2018, we recorded our first XBAWTM filter revenue from our defense customer for pre-production units and received multiple follow-on orders in addition to the original purchase order for production units.

In December 2018, we introduced the AKF-1256, a 5.6 GHz BAW filter for the WiFi market and shipped samples to select partners for evaluation and testing. We are currently shipping production units of the AKF-1938 to our defense customer and have shipped pre-production units of our AKF-1252 product to multiple WiFi customers, including a new customer that signed a supply agreement with an initial order of more than 80,000 AK-1252 filters, which were delivered in the quarter ended March 31, 2019.

In May 2019, we announced receipt of sub-6GHz 5G filter development order from tier one wireless telecommunication customer and successfully delivered our first 5G prototype filter for mobile devices in June 2019. As we receive customer evaluations for our growing portfolio, we will do further iterations on the designs and provide next generation samples for evaluation and characterization.

Financing Developments

On October 23, 2018, the Company completed the offering of \$10.0 million principal amount of the Company's 6.5% Convertible Senior Notes due 2023. The notes are unsecured and rank pari passu with the Company's outstanding unsubordinated liabilities. As unsecured obligations, the notes effectively rank junior in right of payment to our secured indebtedness, including our \$15.0 million outstanding principal amount of convertible senior secured notes issued in May 2018. The net proceeds of the offering after payment of offering costs were approximately \$8.9 million. The notes will mature on November 30, 2023, unless earlier converted, redeemed or repurchased. Interest on the notes accrues at the rate of 6.5% per year and is payable in cash on each February 28, May 31, August 31 and November 30, beginning February 28, 2019. The notes are convertible into common stock at the option of the holder at any time prior to maturity at an initial conversion price of \$5.10 per share, subject to adjustment under certain circumstances.

Additionally, on October 23, 2018, the Company sold a total of 7,250,000 shares of its common stock at a price to the public of \$4.25 per share for aggregate gross proceeds of \$30.8 million, before deducting the underwriting discount and offering expenses payable by the Company of approximately \$2.1 million.

Our Technology

Current RF acoustic wave filters utilize technologies that are limited by the piezoelectric material physical properties, the resonator device structure and/or the manufacturing process technology. Existing BAW filters use an “acoustic wave ladder” that is based on a monolithic topology approach using lossy polycrystalline materials. By contrast, our XBAW technology uses high purity materials, which provides high performance acoustic properties. We have fabricated resonators that demonstrate the feasibility of our approach and believe our technology will yield a new generation of high frequency RF filter products.

XBAW technology consists of novel high purity piezoelectric materials, which are fabricated into bulk-mode, acoustic wave resonators and RF filters. Our patented piezoelectric materials contain high-purity Group III element nitride materials and possess a unique signature, which can be detected by conventional material metrology tools. We utilize analytical modeling techniques to aid in the design and internal manufacturing of our materials, whereby the raw substrate materials utilized in our XBAW process are sourced from a third party. Once our filter designs are simulated and ready to manufacture, we supply our NY fabrication facility raw materials, a mask design file, and a unique process sequence in order to fabricate our resonators and filters. Our wafer process flow is patented and compatible with wafer level packaging (WLP) that allows for low profile, cost effective filters to be produced.

Challenges Facing the Mobile Device Industry

Rising consumer demand for always-on wireless broadband connectivity is creating an unprecedented need for high performance RFFE for mobile devices. Mobile devices such as smartphones and tablets are quickly becoming the primary means of accessing the Internet, driving the Internet of Things (IoT). The rapid growth in mobile data traffic is testing the limits of existing wireless bandwidth. Carriers and regulators have responded by opening new spectrums of RF frequencies, driving up the number of frequency bands in mobile devices. This substantial increase in frequency bands has created a demand for more filters, as well as a demand for filters with higher selectivity. The global transition to LTE and adoption of LTE-Advanced with more sophisticated carrier aggregation and multiple-input, multiple-output (MIMO) techniques will continue to push the requirements for increased supply of high-performance filters. Furthermore, the introduction of 5G mobile technologies and their associated frequencies over the next several years will create an even greater need for high-performance, high-frequency filters as the bands being auctioned have primarily been in the 3-6 GHz range, well above current networks.

The new spectrum introduced by 4G/LTE and 5G is driving spectrum licensing at higher frequencies than previous 3G smartphone models. For example, new TDD LTE frequencies allocated for 5G wireless cover frequencies nearly twice as high as those covered in previous generation phones. As a result, the demand for filters represents the single largest growth opportunity in the RFFE industry, according to a Mobile Experts 2018 report. For traditional “low band” frequencies, SAW filters have been the primary choice, while high band solutions have utilized BAW filters due to their performance and yield. While there are multiple sources of supply for SAW technology, the source of supply for BAW filters is more limited and essentially dominated by two manufacturers worldwide. See “Competition” below.

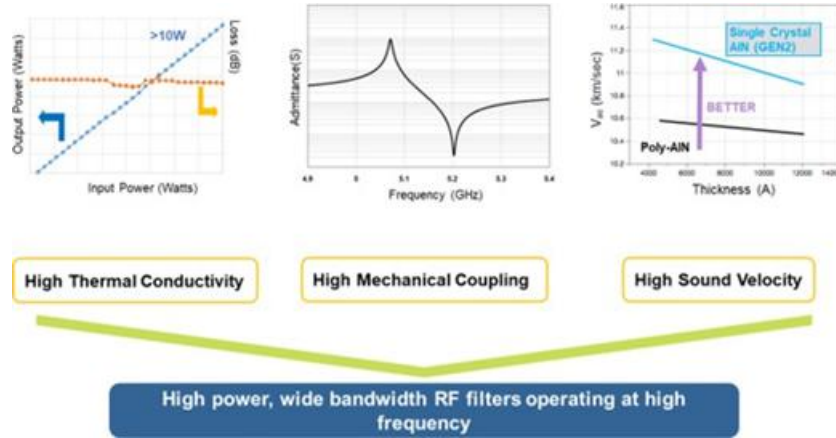
In addition, signal loss of current generation acoustic wave filters is excessively high, and up to half of the transmit power is wasted as heat, which ultimately constrains battery life. Another challenge is that the allocated spectrum for mobile communication bands requires high bandwidth RF filters, which, in turn, requires wide bandwidth core resonator technology. In addition, filters with inferior selectivity either reduce the available operating bands the mobile device can support or increase the noise in the operating bands. Each of these problems negatively impacts the end-user’s experience when using the mobile device.

The RFFE must meet growing data demands while reducing cost and improving battery life. Our solution involves a new approach to RFFE component manufacturing, enabled by XBAW technology. We expect our technology to produce filters that will reduce the overall system cost and improve performance of the RFFE.

Our Solutions

Our immediate focus is on the commercialization of wide bandwidth RF filters operating in the high frequency spectrum known as the sub 6 GHz bands. Using our XBAW technology, we believe these filters enable new PAD module or RFFE competition for high band modules as well as performance-driven low band applications. Initially, we expect to target select strategic RFFE market leaders as well as tier two mobile phone (“OEMs”) and/or RFFE module suppliers. Longer term, our focus will be to expand our market share by engaging with additional mobile phone OEMs and RFFE module manufacturers. We manufacture our wafer technology in our Canandaigua, NY fabrication facility where we continue to focus on the commercialization of our filters using our XBAW technology. We plan to develop a series of filter designs to be used in the manufacturing of discrete filters, duplexers or more complex multiplexers targeting the 4G/LTE, 5G, WiFi and defense frequency bands. We believe our filter designs will create an alternative for, and replace, filters currently manufactured using materials with fundamentally inferior performance. Figure 1 below illustrates characterization plots that represent the high power, high bandwidth and high frequency capability of our essential single crystal materials.

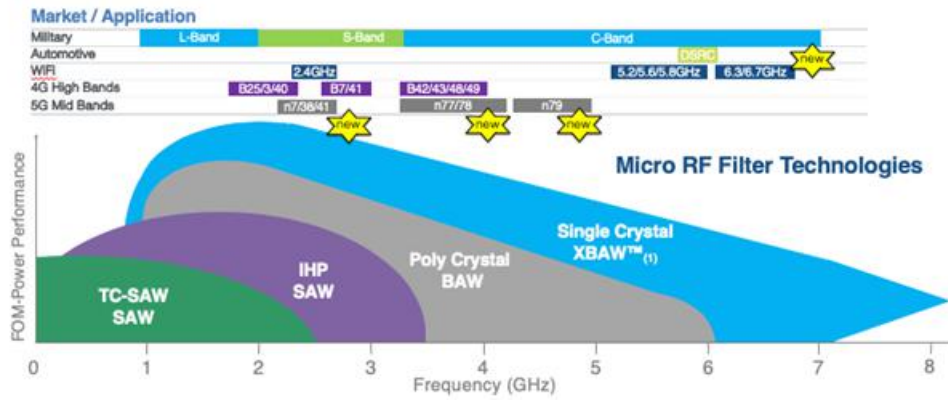
Figure 1-Characteristics of our essentially single crystal materials used to fabricate our BAW RF filters.



Single-Band Discrete Designs, Duplexers and Multiplexers

SAW filters have been preferred in modern RFFE because of their high performance, small size and low cost. However, traditional SAW ladder designs do not perform well in high frequency bands or bands with closely spaced receive and transmit channels, typical of many new bands. Therefore, BAW filters are needed for these bands. We have demonstrated in our Canandaigua, NY wafer fabrication facility an ability to fabricate BAW resonators, the building block of BAW filters, that offer high frequency, wide bandwidth and high power performance. Furthermore, we believe the improved efficiency provided by BAW filters will reduce the total cost of RFFE, offer efficient use of shared frequency spectrum as well as reduce the battery demand of mobile devices. Additionally, we believe that our XBAW technology will allow for a single manufacturing method that will support all of the BAW filter band range and a significant portion of the SAW band range. Figure 2 below illustrates what we believe will be the frequency range of our XBAW technology.

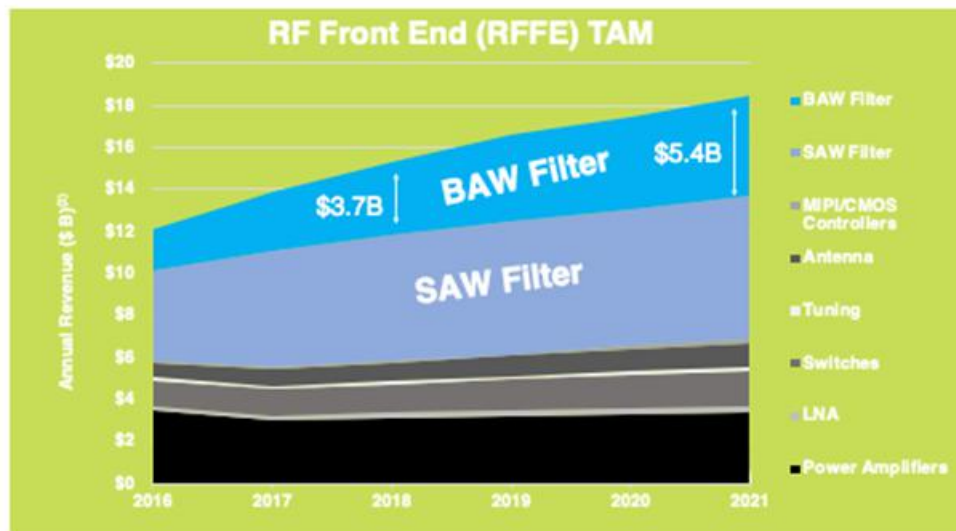
Figure 2- The potential range of our technology



Pure-Play Filter Provider Enables New Module Competition

Given the high sound velocity in our piezoelectric materials, our technology allows for a wide range of frequency coverage, and we plan to supply filters that will support 4G/LTE, 5G, WiFi and defense bands. We have successfully demonstrated resonators that will support the design and fabrication of 4G/LTE filters, WiFi filters and defense filters, with frequencies adjacent to the emerging 5G mobile auctions. We completed the development required to transition our XBAW technology to high volume manufacturing in June 2018. We aim to be a pure-play filter supplier that will address the increasing RF complexity placed on RFFE manufacturers supporting 4G/LTE 5G, and WiFi. Figure 3 illustrates historical and projected growth in RF complexity.

Figure 3- Increase in Filter content in Mobile Phone Front End Modules (FEMs) from 2016 - 2021 (Source: Mobile Experts 2016)



Commercialization

Our immediate focus is on the commercialization of wide bandwidth RF filters to address the WiFi, Infrastructure and defense bands with innovative single-band designs using our XBAW sub 6 GHz RF filter technology. We are currently developing commercial single-band filters through our wafer fabrication facility. We are focused on developing fixed-band filters because we believe these designs present the greatest near-term potential for commercialization of our technology, and that once demonstrated, the facility can be more efficiently readied for production compared to alternative technologies.

Our technology development process consists of the following five phases:

1. Pre-Alpha – Demonstrate basic feasibility/capabilities
2. Alpha – Develop stable recipe (Process freeze) with limited production development
3. Beta – Complete technology qualification (Process qualification) in factory to enable product design
4. Pre-Production – Demonstrate lead product production capabilities, release final design tools
5. Production – Continual improvement of process and parametric performance

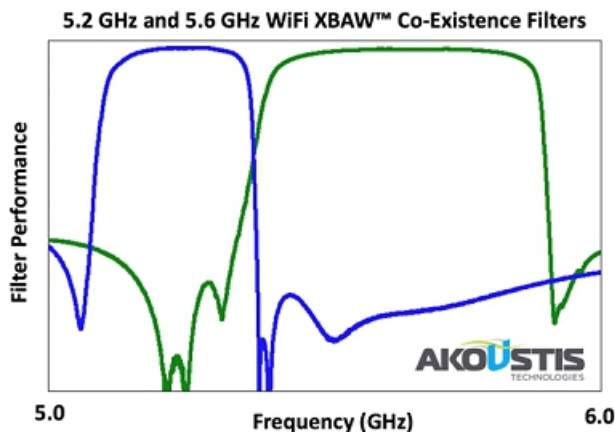
In March 2018, we announced the completion of the alpha-phase for our first generation XBAW process technology called XB1. In July 2018 we announced the completion of the beta-phase for both the XB1 and our materials process. This shortens the development cycle time for new catalog and custom components as each new product will start in the pre-production phase and will not require end-to-end qualification.

Research and Development

Since inception, the Company's focus has been on developing an innovative mobile-wireless filter technology with a compelling value proposition to our potential customers and a significant and noticeable impact to the end user. Whereas today's polycrystalline material (used to manufacture RF resonators and filters) is sputtered on a metal-coated carrier, our patented XBAW technology employs high purity piezoelectric films in our resonators, which are used as the enabler to create high performance BAW RF filters. Our high purity piezoelectric materials are a key differentiator when compared to the incumbent amorphous thin-film technologies because it increases the acoustic velocity, the electromechanical coupling coefficient in the resonator and/or high-power performance. These technology features allow Akoustis to engineer RF filter solutions for a broad spectrum for multiple radio frequencies and thus multiple end markets. Research and development expense totaled \$19.3 million for the year ended June 30, 2019 and \$13.3 million for the year ended June 30, 2018. These R&D activities focused on high purity piezoelectric materials development and resonator demonstration. Current R&D investments include materials advancement, resonator development, RF filter design and high yield wafer manufacturing.

As a result of our efforts, we have developed and introduced several new filters which are currently sampling with multiple customers across multiple markets. Our focus remains on improving the electromechanical coupling and quality factor of our resonator technology and the performance of our fabricated filters through design improvements and process optimization experiments.

We announced our first filter in March 2018, the AKF-1252, a 5.2 GHz filter for the WiFi premise equipment market. The AKF-1252 is a wideband filter for the U-NII-1&2A bands with typical insertion loss of less than 1dB, high rejection and a high-power rating in an ultra-small footprint module. Offering our customers 23-times size reduction over current dielectric resonator technology, our product is the first BAW RF filter targeting the 5.2 GHz WiFi band and achieved pre-production status in November 2018. In addition, we have announced the sister part to the AKF-1252, called the AKF-1256, which allows the Company to bundle the 5.2 GHz and 5.6 GHz filter solutions to the CPE market. The Company received its first pre-production order in May 2019. The tandem 5.2 GHz and 5.6 GHz filter solutions allow coexistence of WiFi signals in the 5GHz spectrum as shown below.



Following the AKF-1252, we also announced the AKF-1652, a 5.2 GHz filter for the WiFi device market, with lower insertion loss. We are currently working on the development of a small footprint, wafer-level package (WLP) that will be required before the expected uptake of 5.2 GHz WiFi in cellular handsets and other devices. We believe that handset makers are still several years away from including tri-band WiFi in smartphones, tablets and other mobile devices, and expect to complete the packaging development ahead of the market.

In April 2018 we announced the AKF-1938 filter in the 3.8 GHz band, adjacent to emerging 5G mobile frequency auctions. In July 2018, we announced that we signed our first customer, a large military OEM with annual revenue of over \$1 billion. We received revenue from this product in the second quarter of fiscal 2019, with follow-on new orders received in calendar 2019.

We have also announced a 4G LTE infrastructure win for two adjacent filters, with engineering revenue attached and follow on production filter revenue expected upon completion of the design. Moving forward, we expect to deliver new catalog components based on the frequencies in highest demand from our customers and will announce additional products as we continue to benefit from our research and development efforts.

Raw Materials

Within its internal manufacturing operation, Akoustis sources raw materials, process gases, metals and other miscellaneous supplies to fabricate its BAW RF filter circuits. Materials range from substrates (used to deposit key piezoelectric materials) to standard dielectric-based laminates (used for packaging of the RF filter circuits). The Company sources at least two types of substrate materials for its BAW process and we have more than one supplier for one material and a single source for the other. Multiple process gases are used for material synthesis, process etching and wafer treatment. While there is more than one supplier for most process gases, the purity levels of such gases may change by source. Hence, either purification or process requalification may be required, as purchasing from a second source is required. Akoustis sources various high purity metals for electrode formation and interconnect layers for its RF circuits. Such metals are available in various purity levels and are available from more than one supplier. Other process handling hardware common to the semiconductor industry is available in abundance from multiple suppliers. Consistent with other semiconductor manufacturers, the Company may have to work with all its suppliers to ensure adequate supply of raw materials, process gases and metals as the Company ramps from R&D into high volume manufacturing.

Intellectual Property

We rely on a combination of intellectual property rights, including patents and trade secrets, along with copyrights, trademarks and contractual obligations and restrictions to protect our core technology and business.

In the United States and internationally, as of September 11, 2019, our IP portfolio included 24 patents, including one blocking patent that we have licensed from Cornell University. Additionally, we have 52 active and pending patent applications. These patents cover our XBAWTM RF filter technology from the substrate level through the system application layer. Where possible, we leverage both federal and state level R&D grants to support development and commercialization of our technology. Our patents expire between 2031 and 2037. We intend to continue to innovate and expand our patent portfolio, and when appropriate, we will look to purchase license(s) that grant access to additional intellectual property that enables, enhances or further expands our technical capabilities and/or product.

We believe that Akoustis will have competitive advantages from rights granted under our patent applications. Some applications, however, may not result in the issuance of any patents. In addition, any future patent may be opposed, contested, circumvented or designed around by a third party or found to be unenforceable or invalidated. Others may develop technologies that are similar or superior to our proprietary technologies, duplicate our proprietary technologies or design around patents owned or licensed by us.

We generally control access to, and use of, our confidential information through the use of internal and external controls, including contractual protections with employees, contractors and customers. We rely in part on the United States and international copyright laws to protect our intellectual property. All employees and consultants are required to execute confidentiality and intellectual property assignment agreements in connection with their employment and consulting relationships with us. We also require them to agree to disclose and assign to us all inventions conceived or made in connection with the employment or consulting relationship.

Competition

The RF filter market is controlled by a relatively small number of RF component suppliers. These companies include, among others, Broadcom Corporation, Murata Manufacturing Co., Ltd., Qorvo, Inc., Skyworks Solutions Inc., Taiyo Yuden Co. Ltd., and Qualcomm Incorporated. Broadcom Corporation and Qorvo, Inc. dominate the high band BAW filter market, controlling a significant portion of the customer base and are increasing capacity to meet the growing RF filter demand of the 4G/LTE market.

Upon completion of our product development, we will compete directly with these companies to secure design slots inside RFFE module targeting companies that procure filters or internally source filters. While many of our competitors have more resources than we have, we believe that our filter designs will be superior in performance, and we will approach prospective customers as a pure-play filter supplier, offering advantages in performance over the full frequency range at competitive costs. Our challenges will include convincing our customers that we have a strong intellectual property position, that we will be able to deliver in volume, that we will meet their price targets, and that we can satisfy reliability and other requirements. For a list of other competitive factors, see "Item 1A. Risk Factors - We are still developing many of our products, and they may not be accepted in the market."

Employees

We place an emphasis on hiring the best talent at the right time to enable our core technology and business growth. This includes establishing a competitive compensation and benefits package, thereby enhancing our ability to recruit experienced personnel and key technologists. As of June 30, 2019, we had a total of 82 full-time employees plus 8 part-time employees. We will continue to hire specific and targeted positions to further enable our technology and manufacturing capabilities as and when appropriate.

Government Regulations

Our business and products in development are subject to regulation by various federal and state governmental agencies, including the radio frequency emission regulatory activities of the Federal Communications Commission (the "FCC"), the consumer protection laws of the Federal Trade Commission (the "FTC"), the import/export regulatory activities of the Department of Commerce, the product safety regulatory activities of the Consumer Products Safety Commission, and the environmental regulatory activities of the Environmental Protection Agency (the "EPA").

The rules and regulations of the FCC limit the RF used by, and level of power emitting from, electronic equipment. Our RF filters, as a key element enabling consumer electronic smartphone equipment, are required to comply with these FCC rules and may require certification, verification or registration of our RF filters with the FCC. Certification and verification of new equipment requires testing to ensure the equipment's compliance with the FCC's rules. The equipment must be labeled according to the FCC's rules to show compliance with these rules. Testing, processing of the FCC's equipment certificate or FCC registration and labeling may increase development and production costs and could delay the implementation of our XBAW acoustic wave resonator technology for our RF filters and the launch and commercial productions of our filters into the U.S. market. Electronic equipment permitted or authorized to be used by us through FCC certification or verification procedures must not cause harmful interference to licensed FCC users, and may be subject to RF interference from licensed FCC users. Selling, leasing or importing non-compliant equipment is considered a violation of FCC rules and federal law, and violators may be subject to an enforcement action by the FCC. Any failure to comply with the applicable rules and regulations of the FCC could have an adverse effect on our business, operating results and financial condition by increasing our compliance costs and/or limiting our sales in the United States.

The semiconductor and electronics industries also have been subject to increasing environmental regulations. A number of domestic and foreign jurisdictions seek to restrict the use of various substances, a number of which have been used in our products in development or processes. While we have implemented a compliance program to ensure our product offering meets these regulations, there may be instances where alternative substances will not be available or commercially feasible, or may only be available from a single source, or may be significantly more expensive than their restricted counterparts. Additionally, if we were found to be non-compliant with any such rule or regulation, we could be subject to fines, penalties and/or restrictions imposed by government agencies that could adversely affect our operating results. Our cost to maintain compliance with existing environmental regulations is expected to be nominal based on our structure in which we outsource a majority of our operations to suppliers that are responsible for meeting environmental regulations. We will continue to monitor our quality program and expand as required to maintain compliance and ability to audit our supply chain.

Noncompliance with applicable regulations or requirements could subject us to investigations, sanctions, mandatory product recalls, enforcement actions, disgorgement of profits, fines, damages, civil and criminal penalties, or injunctions. An adverse outcome in any such litigation could require us to pay contractual damages, compensatory damages, punitive damages, attorneys' fees and costs. These enforcement actions could harm our business, financial condition and results of operations. If any governmental sanctions are imposed, or if we do not prevail in any possible civil or criminal litigation, our business, financial condition and results of operations could be materially adversely affected. In addition, responding to any action will likely result in a significant diversion of management's attention and resources and an increase in professional fees.

ITEM 1A. RISK FACTORS

This section is a summary of the risks that we presently believe are material to the operations of the Company. Additional risks of which we are not presently aware or which we presently deem immaterial may also impair the Company's business, financial condition or results of operations.

Risks Related to our Business and the Industry in which we Operate

We have a limited operating history upon which investors can evaluate our business and future prospects.

We are an emerging commercial company that recently began commercial operations selling advanced single-crystal BAW filter products for RFFE for use in the mobile wireless device industry. Historically, we have primarily focused on R&D of high efficiency acoustic wave resonator technology utilizing single-crystal piezoelectric materials, and have earned minimal revenue from operations since inception.

Since our expectations of potential customers and future demand for our products are based on only limited experience, it is difficult for our management and our investors to accurately forecast and evaluate our future prospects and our revenues. Our proposed progression of our operations are therefore subject to all of the risks inherent in light of the expenses, difficulties, complications and delays frequently encountered in connection with the growth of any new business and the development of a product, as well as those risks that are specific to our business in particular. The risks include, but are not limited to, our reliance on third parties to complete some processes for the manufacturing of our products, the possibility that we will not be able to develop functional and scalable products, or that although functional and scalable, our products and/or services will not be accepted in the market. To successfully introduce and market our products at a profit, we must establish brand name recognition and competitive advantages for our products. There are no assurances that the Company can successfully address these challenges. If it is unsuccessful, the Company and its business, financial condition and operating results will be materially and adversely affected.

We may not generate sufficient revenues to achieve profitability.

We have incurred operating losses since our inception and expect to continue to have negative cash flow from operations. We have only generated minimal revenues from shipment of product while our primary sources of funds have been R&D grants, MEMS foundry services, issuances of our equity, and debt. We have experienced net losses of approximately \$67.5 million for the period from May 12, 2014 (inception) to June 30, 2019. Our future profitability will depend on our ability to create a sustainable business model and generate sufficient revenues, which is subject to a number of factors, including our ability to successfully implement our strategies and execute our R&D plan, our ability to implement our improved design and cost reductions into manufacturing of our RF filters, the availability of funding, market acceptance of our products, consumer demand for end products incorporating our products, our ability to compete effectively in a crowded field, our ability to respond effectively to technological advances by timely introducing our new technologies and products, and global economic and political conditions.

Our future profitability also depends on our expense levels, which are influenced by a number of factors, including the resources we devote to developing and supporting our projects and potential products, the continued progress of our research and development of potential products, our ability to improve R&D efficiencies, license fees or royalties we may be required to pay, and the potential need to acquire licenses to new technology, the availability of intellectual property for licensing or acquisition, or the use of our technology in new markets, which could require us to pay unanticipated license fees and royalties in connection with these licenses.

Our development and commercialization efforts may prove more expensive than we currently anticipate, and we may not succeed in increasing our revenues to offset higher expenses. These expenses, among other things, may cause our net income and working capital to decrease. If we fail to generate sufficient revenue and manage our expenses, we may never achieve profitability, which would adversely and materially affect our ability to provide a return to our investors.

We have identified material weaknesses in our internal control over financial reporting. If we are not able to remediate these material weaknesses appropriately and timely, or if we are unable to implement and maintain effective internal control over financial reporting in the future, this could result in losses from errors, harm our reputation or cause investors to lose confidence in the reported financial information, all or any of which could have a material adverse effect on our results of operations and financial condition, which, in turn, could adversely affect the market price of our Common Stock, our access to debt or other capital markets or other aspects of our business, prospects, results of operations or financial condition.

As a public company, we are required to maintain internal control over financial reporting and to report any material weaknesses in such internal control. A material weakness is a deficiency, or a combination of deficiencies, in internal control over financial reporting such that there is a reasonable possibility that a material misstatement of a company's annual or interim financial statements will not be prevented or detected on a timely basis. Section 404 of the Sarbanes-Oxley Act of 2002 ("Sarbanes-Oxley") requires that we evaluate and determine the effectiveness of our internal control over financial reporting and provide a management report on internal control over financial reporting. In addition, as we are no longer an emerging growth company, Sarbanes-Oxley requires that our management report on internal control over financial reporting be attested to by our independent registered public accounting firm.

As discussed further in Item 9A, "Controls and Procedures," we have identified certain material weaknesses in our internal control over financial reporting relating to (i) controls over the operating effectiveness of information technology general controls relevant to the preparation of our financial statements and (ii) management review controls designed to address risks associated with complex accounting matters that arise from significant non-routine transactions. We describe the specific issues leading to these conclusions in Item 9A, "Controls and Procedures—Management's Annual Report on Internal Control over Financial Reporting." We expect to remediate these material weaknesses in fiscal 2020.

The actions we are taking to remediate the material weaknesses, however, may be insufficient and we may in the future discover other areas of our internal controls that need improvement. If we have material weakness in our internal control over financial reporting, we may not detect errors on a timely basis and our financial statements may be materially misstated. Additionally, if we are unable to assert that our internal control over financial reporting is effective or if our independent registered public accounting firm is unable to express an opinion as to the effectiveness of our internal control over financial reporting, we may not be able to access debt markets, equity investors may lose confidence in the accuracy and completeness of our financial reports and the market price of our Common Stock could be adversely affected, and we could become subject to investigations by Nasdaq, the SEC or other regulatory authorities, which could require additional financial and management resources.

The industry and the markets in which the Company operates are highly competitive and subject to rapid technological change. Therefore, in order for our RF filters to be competitive and achieve market acceptance, we need to keep pace with rapid development of new process technologies.

The markets in which we compete are intensely competitive. We operate primarily in the industry that designs and produces semiconductor components for wireless communications and other wireless devices, which is subject to rapid changes in both product and process technologies based on demand and evolving industry standards. The markets for our products are characterized by:

- rapid technological developments and product evolution,
- rapid changes in customer requirements,
- frequent new product introductions and enhancements,
- continuous demand for higher levels of integration, decreased size and decreased power consumption,
- short product life cycles with declining prices over the life cycle of the product, and
- evolving industry standards.

The continuous evolutions of these technologies and frequent introduction of new products and enhancements have generally resulted in short product life cycles for wireless semiconductor products, in general, and for RFFEs, in particular. Our R&D activity and resulting products could become obsolete or less competitive sooner than anticipated because of a faster than anticipated change in one or more of the above-noted factors. Therefore, in order for our RF filters to be competitive and achieve market acceptance, we need to keep pace with rapid development of new process technologies, which requires us to:

- respond effectively to technological advances by timely introducing new technologies and products,
- successfully implement our strategies and execute our R&D plan in practice,
- improve the efficiency of our technology, and
- implement our improved design and cost reductions into manufacturing of our RF filters.

We are still developing many of our products, and they may not be accepted in the market.

Although we believe that our XBAW acoustic wave resonator technology, which can utilize single-crystal piezoelectric materials, provides material advantages over existing RF filters, and we have developed and are currently developing various methods of integration suitable for implementation of this technology into RF filters, we cannot be certain that our RF filters will be able to achieve or maintain market acceptance. While we have fabricated R&D filters that demonstrate the performance of our XBAW technology, and this technology has been stabilized, and it has been verified in small volumes both in practice and in commercial utilization, it has not yet been ramped in volumes for commercial scale. There are also no records that can demonstrate our ability to successfully overcome many of the risks and uncertainties frequently encountered by companies in new and rapidly evolving fields. In addition to our limited operating history, we will depend on a limited number of manufacturers and customers for a significant portion of our revenue in the future and we cannot guarantee their acceptance of our products. Each of these factors may adversely affect our ability to implement our business strategy and achieve our business goals.

The successful development of our XBAW technology and market acceptance of our RF filters will be highly complex and will depend on the following principal competitive factors, including our ability to:

- comply with industry standards and effectively compete against current technology for producing RF acoustic wave filters,
- differentiate our products from offerings of our competitors by delivering RF filters that are higher in quality, reliability and technical performance,
- anticipate customer and market requirements, changes in technology and industry standards and timely develop improved technologies that meet high levels of satisfaction of our potential customers,
- maintain, grow and manage our internal teams to the extent we increase our operations and develop new segments of our business,
- develop and maintain successful collaborative, strategic, and other relationships with manufacturers, customers and contractors,
- protect, develop or otherwise obtain adequate intellectual property for our technology and our filters; and
- obtain strong financial, sales, marketing, technical and other resources necessary to develop, test, manufacture, commercialize and market our filters.

If we are unsuccessful in accomplishing these objectives, we may not be able to compete successfully against current and potential competitors. As a result, our XBAW technology and our RF filters may not be accepted in the market and we may never attain profitability.

We face risks associated with the operation of our manufacturing facility.

We operate a wafer fabrication facility in Canandaigua, NY that we acquired in June 2017. We currently use several international and domestic suppliers to assemble and test our products, as well as our own test and tape and reel facilities located in the U.S.

A number of factors related to our facilities will affect our business and financial results, including the following:

- our ability to adjust production capacity in a timely fashion in response to changes in demand for our products;
- the significant fixed costs of operating the facilities;
- factory utilization rates;
- our ability to qualify our facilities for new products and new technologies in a timely manner;
- the availability of raw materials, the impact of the volatility of commodity pricing and tariffs imposed on raw materials, including substrates, gold, platinum and high purity source materials such as gallium, aluminum, arsenic, indium, silicon, phosphorous and palladium;

- our manufacturing cycle times;
- our manufacturing yields;
- our ability to hire, train and manage qualified production personnel;
- our compliance with applicable environmental and other laws and regulations; and
- our ability to avoid prolonged periods of down-time in our facilities for any reason.

If we experience poor manufacturing yields, our operating results may suffer.

Our products have unique designs and are fabricated using multiple semiconductor process technologies that are highly complex. In many cases, our products are assembled in customized packages. Many of our products consist of multiple components in a single module and feature enhanced levels of integration and complexity. Our customers insist that our products be designed to meet their exact specifications for quality, performance and reliability. Our manufacturing yield is a combination of yields across the entire supply chain, including wafer fabrication, assembly and test yields. Defects in a single component in an assembled module product can impact the yield for the entire module, which means the adverse economic impacts of an individual defect can be multiplied many times over if we fail to discover the defect before the module is assembled. Due to the complexity of our products, we periodically experience difficulties in achieving acceptable yields and other quality issues, particularly with respect to new products.

Our customers test our products once they have been assembled into their products. The number of usable products that result from our production process can fluctuate as a result of many factors, including:

- design errors;
- minute impurities and variations in materials used;
- contamination of the manufacturing environment;
- equipment failure or variations in the manufacturing processes;
- losses from broken wafers or other human error; and
- defects in substrates and packaging.

We constantly seek to improve our manufacturing yields. Typically, for a given level of sales, when our yields improve, our gross margins improve, and when our yields decrease, our unit costs are higher, our margins are lower, and our operating results are adversely affected.

Costs of product defects and deviations from required specifications could include the following:

- writing off inventory;
- scrapping products that cannot be fixed;
- accepting returns of products that have been shipped;
- providing product replacements at no charge;
- reimbursement of direct and indirect costs incurred by our customers in recalling or reworking their products due to defects in our products;
- travel and personnel costs to investigate potential product quality issues and to identify or confirm the failure mechanism or root cause of product defects; and
- defending against litigation.

These costs could be significant and could reduce our gross margins. Our reputation with customers also could be damaged as a result of product defects and quality issues, and product demand could be reduced, which could harm our business and financial results.

Industry overcapacity could cause us to underutilize our manufacturing facilities and have a material adverse effect on our financial performance.

It is difficult to predict future demand for our products, which makes it difficult to estimate future requirements for production capacity and avoid periods of overcapacity. Fluctuations in the growth rate of industry capacity relative to the growth rate in demand for our products also can lead to overcapacity and contribute to cyclicity in the semiconductor market.

Capacity expansion projects have long lead times and require capital commitments based on forecasted product trends and demand well in advance of production orders from customers. In recent years, we have made significant capital investments to expand our RF filter capacity to address forecasted future demand patterns. In certain cases, these capacity additions may exceed the near-term demand requirements, leading to overcapacity situations and underutilization of our manufacturing facilities.

As many of our manufacturing costs are fixed, these costs cannot be reduced in proportion to the reduced revenues experienced during periods of underutilization. Underutilization of our manufacturing facilities can adversely affect our gross margin and other operating results. If demand for our products experiences a prolonged decrease, we may be required to close or idle facilities and write down our long-lived assets or shorten the useful lives of underutilized assets and accelerate depreciation, which would increase our expenses.

We face intense competition, which may cause pricing pressures, decreased gross margins and loss of potential market share and may materially and adversely affect our business, financial condition and results of operations.

We compete with U.S. and international semiconductor manufacturers and mobile semiconductor companies of all sizes in terms of resources and market share, some of whom have significantly greater financial, technical, manufacturing and marketing resources than we do. We expect competition in our markets to intensify as new competitors enter the RF component market, existing competitors merge or form alliances, and new technologies emerge. Our competitors may introduce new solutions and technologies that are superior to our BAW technology, are verified on a commercial scale, and have achieved widespread market acceptance. Certain of our competitors may be able to adapt more quickly than we can to new or emerging technologies and changes in customer requirements or may be able to devote greater resources to the development, promotion and sale of their products than we can. This implementation may require us to modify the manufacturing process for our filters, design new products to more stringent standards, and redesign some existing products, which may prove difficult for us and result in delays in product deliveries and increased expenses.

Increased competition could also result in pricing pressures, declining average selling prices for our RF filters, decreased gross margins and loss of potential market share. We will need to make substantial investments to develop these enhancements and technologies, and we cannot assure investors that we will have funds available for these investments or that these enhancements and technologies will be successful. If a competing technology emerges that is, or is perceived to be, superior to our existing technology and we are unable to adapt to these changes and to compete effectively, our market share and financial condition could be materially and adversely affected, and our business, revenue, and results of operations could be harmed.

We may be subject to risks related to doing business in, and having counterparties based in, foreign countries.

We engage in operations, and enter into agreements with counterparties, located outside the U.S., which exposes us to political, governmental and economic instability and foreign currency exchange rate fluctuations.

Any disruption caused by these factors could harm our business, results of operations, financial condition, liquidity and prospects. Risks associated with potential operations, commitments and investments outside of the U.S. include but are not limited to risks of:

- global and local economic, social and political conditions and uncertainty;
- currency exchange restrictions and currency fluctuations;
- war or terrorist attack;
- renegotiation or nullification of existing contracts or international trade arrangements;
- labor market conditions and workers' rights affecting our manufacturing operations or those of our customers;
- macro-economic conditions impacting key markets and sources of supply;
- changing laws and policies affecting trade, taxation, financial regulation, immigration, and investment;
- compliance with laws and regulations that differ among jurisdictions, including those covering taxes, intellectual property ownership and infringement, imports and exports, anti-corruption and anti-bribery, antitrust and competition, data privacy, and environment, health, and safety; and
- general hazards associated with the assertion of sovereignty over areas in which operations are conducted, transactions occur, or counterparties are located.

As our reporting currency is the U.S. dollar, any operations conducted outside the U.S. or transactions denominated in foreign currencies would face additional risks of fluctuating currency values and exchange rates, hard currency shortages and controls on currency exchange. In addition, we would be subject to the impact of foreign currency fluctuations and exchange rate changes on our financial reports when translating our assets, liabilities, revenues and expenses from operations or transactions outside of the U.S. into U.S. dollars at the then-applicable exchange rates. These translations could result in changes to our results of operations from period to period.

Economic regulation in China could adversely impact our business and results of operations.

A significant portion of our potential customer base is in China. For many years, the Chinese economy has experienced periods of rapid growth and wide fluctuations in the rate of inflation. In response to these factors, the Chinese government has, from time to time, adopted measures to regulate growth and to contain inflation, including currency controls and measures designed to restrict credit, control prices or set currency exchange rates. Such actions in the future, as well as other changes in Chinese laws and regulations, including actions in furtherance of China's stated policy of reducing its dependence on foreign semiconductor manufacturers, could increase the cost of doing business in China, foster the emergence of Chinese-based competitors, decrease the demand for our products in China, or reduce the supply of critical materials for our products, which could have a material adverse effect on our business and results of operations.

Changes in government trade policies, including the imposition of tariffs and export restrictions, could limit our ability to sell our products to certain customers, which may materially adversely affect our sales and results of operations.

The U.S. or foreign governments may take administrative, legislative or regulatory action that could materially interfere with our ability to sell products in certain countries, particularly in China. For example, between July 2018 and September 2019, the Office of the United States Trade Representative imposed 10% to 25% tariffs on specified product lists, including certain electronic components and equipment, totaling approximately \$250 billion in Chinese imports. In response, China imposed or proposed new or higher tariffs on U.S. products. At this time, the U.S. government has announced it intends to increase the tariff rate on the approximately \$250 billion in Chinese imports to 30%, effective October 1, 2019. The U.S. government also imposed a 15% tariff on an additional \$325 billion of Chinese imports effective September 1, 2019 for certain specified products and December 15, 2019 for the remaining specified products. China has taken additional retaliatory actions, including an increase in tariffs applied to U.S. products effective September 1, 2019. China has also threatened further retaliatory actions, including additional tariff increases later in 2019. While the imposition of these tariffs did not have a direct, material adverse impact on our business during fiscal year ended June 30, 2019, the direct and indirect effects of tariffs and other restrictive trade policies are difficult to measure and are only one part of a larger U.S./China economic and trade policy disagreement.

For example, U.S. government actions targeting exports of certain technologies to China are becoming more pervasive. In 2018, the U.S. adopted new laws designed to address concerns about the export of emerging and foundational technologies to China. In addition, in May 2019, President Trump issued an executive order that invoked national emergency economic powers to implement a framework to regulate the acquisition or transfer of information communications technology in transactions that imposed undue national security risks. These actions could lead to additional restrictions on the export of products that include or enable certain technologies, including products we could potentially provide to China-based customers.

Furthermore, the imposition of tariffs on our potential customers' products that are imported from China to the U.S. could harm sales of such products, which could indirectly harm our business. We cannot predict what actions may ultimately be taken with respect to tariffs or trade relations between the U.S. and China or other countries, what products may be subject to such actions, or what actions may be taken by the other countries in retaliation.

The loss or temporary loss of potential foreign customers or the imposition of restrictions on our ability to sell products to such customers as a result of tariffs, export restrictions or other U.S. regulatory actions could materially adversely affect our sales, business and results of operations.

Changes in general economic conditions, together with other factors, cause significant upturns and downturns in the industry, and our business, therefore, may also experience cyclical fluctuations in the future.

From time to time, changes in general economic conditions, together with other factors, may cause significant upturns and downturns in the semiconductor industry. These fluctuations are due to a number of factors, many of which are beyond our control, including:

- levels of inventory in our end markets,
- availability and cost of supply for manufacturing of our RF filters using our design,
- changes in end-user demand for the products manufactured with our technology and sold by our prospective customers,
- exposure to foreign currency exchange rates, import duties and tariffs,
- industry production capacity levels and fluctuations in industry manufacturing yields,
- market acceptance of our current and future customers' products that incorporate our RF filters,
- the gain or loss of significant customers,
- the effects of competitive pricing pressures, including decreases in average selling prices of our RF filters,
- new product and technology introductions by competitors,
- changes in the mix of products produced and sold, and
- intellectual property disputes.

As a result, the demand for our products can change quickly and in ways we may not anticipate, and our business, therefore, may also experience cyclical fluctuations in future operating results. In addition, future downturns in the electronic systems industry could adversely impact our revenue and harm our business, financial condition and results of operations.

Security breaches and other disruptions could compromise our proprietary information and expose us to liability, which would cause our business and reputation to suffer.

We rely on trade secrets, technical know-how and other unpatented proprietary information relating to our product development and manufacturing activities to provide us with competitive advantages. We protect this information by entering into confidentiality agreements with our employees, consultants, strategic partners and other third parties. We also design our computer networks and implement various procedures to restrict unauthorized access to dissemination of our proprietary information.

We face internal and external data security threats. Current, departing or former employees or third parties could attempt to improperly use or access our computer systems and networks to copy, obtain or misappropriate our proprietary information or otherwise interrupt our business. Like others, we are also subject to significant system or network disruptions from numerous causes, including computer viruses and other cyber-attacks, facility access issues, new system implementations and energy blackouts.

Security breaches, computer malware, phishing, spoofing, and other cyber-attacks have become more prevalent and sophisticated in recent years. While we defend against these threats on a daily basis, we do not believe that such attacks to date have caused us any material damage. Because the techniques used by computer hackers and others to access or sabotage networks constantly evolve and generally are not recognized until launched against a target, we may be unable to anticipate, counter or ameliorate all of these techniques. As a result, our and our customers' proprietary information may be misappropriated, and the impact of any future incident cannot be predicted. Any loss of such information could harm our competitive position, result in a loss of customer confidence in the adequacy of our threat mitigation and detection processes and procedures, cause us to incur significant costs to remedy the damages caused by the incident, and divert management and other resources. We routinely implement improvements to our network security safeguards and we are devoting increasing resources to the security of our information technology systems. We cannot, however, assure that such system improvements will be sufficient to prevent or limit the damage from any future cyber-attack or network disruption.

The costs related to cyber-attacks or other security threats or computer systems disruptions typically would not be fully insured or indemnified by others. Occurrence of any of the events described above could result in loss of competitive advantages derived from our R&D efforts or our intellectual property. Moreover, these events may result in the early obsolescence of our products, product development delays, or diversion of the attention of management and key information technology and other resources, or otherwise adversely affect our internal operations and reputation or degrade our financial results and stock price.

We may be subject to theft, loss, or misuse of personal data by or about our employees, customers or other third parties, which could increase our expenses, damage our reputation, or result in legal or regulatory proceedings.

In the ordinary course of our business, we have access to sensitive, confidential or personal data or information regarding our employees and others that is subject to privacy and security laws and regulations. The theft, loss, or misuse of personal data collected, used, stored, or transferred by us to run our business, or by our third party service providers, including business process software applications providers and other vendors that have access to sensitive data, could result in damage to our reputation, disruption of our business activities, significantly increased business and security costs or costs related to defending legal claims.

Global privacy legislation, enforcement, and policy activity in this area are rapidly expanding and creating a complex regulatory compliance environment. For example, the European Union has adopted the General Data Protection Regulation ("GDPR"), which requires companies to comply with rules regarding the handling of personal data, including its use, protection and the ability of persons whose data is stored to correct or delete such data about themselves. Failure to meet GDPR requirements could result in penalties of up to 4% of worldwide revenue. In addition, the interpretation and application of consumer and data protection laws in the U.S., Europe and elsewhere are often uncertain and fluid, and may be interpreted and applied in a manner that is inconsistent with our data practices. Complying with these changing laws has caused, and could continue to cause, us to incur substantial costs, which could have an adverse effect on our business and results of operations. Further, failure to comply with existing or new rules may result in significant penalties or orders to stop the alleged non-compliant activity. Finally, even our inadvertent failure to comply with federal, state, or international privacy-related or data protection laws and regulations could result in audits, regulatory inquiries or proceedings against us by governmental entities or others.

Our business and operations would suffer in the event of system failures, and our operations are vulnerable to interruption by natural disasters, terrorist activity, power loss and other events beyond our control, the occurrence of which could materially harm our business.

Despite the implementation of security measures, our internal computer systems and those of our contractors and consultants are vulnerable to damage from computer viruses, unauthorized access as well as telecommunication and electrical failures. While we have not experienced any such system failure, accident or security breach to date, if such an event were to occur and cause interruptions in our operations, it could result in a material disruption of our R&D. If any disruption or security breach resulted in a loss of or damage to our data or applications, or inappropriate disclosure of confidential or proprietary information, we could incur liability and/or the further development of our technology for RF filters could be delayed.

We are also vulnerable to accidents, electrical blackouts, labor strikes, terrorist activities, war and other natural disasters and other events beyond our control, and we have not undertaken a systematic analysis of the potential consequences to our business as a result of any such events and do not have an applicable recovery plan in place. We carry business interruption insurance that would compensate us for certain actual losses from interruptions of our business that may occur, however that may not fully cover all losses incurred, any losses or damages incurred could cause our business to materially suffer.

If we are unable to attract and retain qualified personnel to contribute to the development, manufacture and sale of our products, we may not be able to effectively operate our business.

As the source of our technological and product innovations, our key technical personnel represent a significant asset. We believe that our future success is highly dependent on the continued services of our current key officers, employees, and Board members, as well as our ability to attract and retain highly skilled and experienced technical personnel. The loss of their services could have a detrimental effect on our operations. Specifically, the loss of the services of our President and Chief Executive Officer, our Interim Chief Financial Officer, our Vice President of Business Development, our Chief Product Officer, any major changes in our Board or other senior management, or our inability to attract, retain and motivate qualified personnel could have a material adverse effect on our ability to operate our business. The competition for management and technical personnel is intense in the wireless semiconductor industry, and therefore, we cannot assure you that we will be able to attract and retain qualified management and other personnel necessary for the design, development, manufacture and sale of our products.

Litigation or legal proceedings, including product liability claims, could expose us to significant liabilities, occupy a significant amount of our management's time and attention and damage our reputation.

We are from time to time party to various litigation claims and legal proceedings. We evaluate these claims and proceedings to assess the likelihood of unfavorable outcomes and estimate, if possible, the amount of potential losses. If we or any of our manufacturers fails to successfully manufacture wafers that conform to our design specifications and the strict regulatory requirements of the FCC, it may result in substantial risk of undetected flaws in components or other materials used by our manufacturers during fabrication of our filters and could lead to product defects and costs to repair or replace these parts or materials, significantly impacting our ability to develop and implement our technology and to improve performance of our RF filters. In addition, claims made or threatened by our suppliers, customers or current or former employees could adversely affect our relationships, damage our reputation or otherwise adversely affect our business, financial condition or results of operations. The costs associated with defending product liability and other claims, and the payment of damages, could be substantial. Our reputation could also be adversely affected by such claims, whether or not successful.

We may establish reserves as appropriate based upon assessments and estimates in accordance with our accounting policies in accordance with U.S. GAAP. We base our assessments, estimates and disclosures on the information available to us at the time and rely on legal and management judgment. Actual outcomes or losses may differ materially from assessments and estimates. Actual settlements, judgments or resolutions of these claims or proceedings may negatively affect our business and financial performance. A successful claim against us that is not covered by insurance or is in excess of our available insurance limits could require us to make significant payments of damages and could materially adversely affect our financial condition, results of operations and cash flows.

If we are unable to establish effective marketing and sales capabilities or enter into additional agreements with third parties to market and sell our RF filters, we may not be able to effectively generate and sustain or increase product revenues.

We have limited experience selling, marketing or distributing products and currently have a small internal marketing and sales force. To progress the launch and commercialization of our technology and our RF filters, we must build on a territory-by-territory basis marketing, sales, distribution, managerial and other non-technical capabilities or make arrangements with third parties to perform these services, and we may not be successful in doing so. Therefore, we may choose to collaborate, either globally or on a territory-by-territory basis, with third parties that have direct sales forces and established distribution systems, either to augment our own sales force and distribution systems or in lieu of our own sales force and distribution systems. If so, our success will depend, in part, on our ability to enter into and maintain collaborative relationships for such capabilities, such collaborator's strategic interest in the products under development and such collaborator's ability to successfully market and sell any such products.

If we are unable to enter into such arrangements when needed on acceptable terms or at all, we may not be able to successfully commercialize our filters. Further, to the extent that we depend on third parties for marketing and distribution, any revenues we receive will depend upon the efforts of such third parties, and there can be no assurance that such efforts will be successful. If we decide in the future to establish an internal sales and marketing team with technical expertise and supporting distribution capabilities to commercialize our RF filters, it could be expensive and time consuming and would require significant attention of our executive officers to manage. We may also not have sufficient resources to allocate to the sales and marketing of our filters. Any failure or delay in the development of sales, marketing and distribution capabilities, either through collaboration with one or more third parties or through internal efforts, would adversely impact the commercialization of any of our products that we obtain approval to market. As a result, our future product revenue would suffer, and we may incur significant additional losses.

Problems in scaling our manufacturing operations could have a material adverse effect on our business.

Future customer demand may require us to significantly increase our manufacturing capacity. There are substantial technical challenges to increasing manufacturing capacity, including equipment acquisition lead times, materials procurement, scaling our manufacturing process, manufacturing site expansion, and the need to significantly increase production yields while maintaining or improving quality control and assurance. Developing commercial-scale manufacturing facilities will require the investment of substantial additional funds and the hiring and retention of additional management, quality assurance, quality control and technical personnel who have the necessary manufacturing experience. The scaling of manufacturing capacity is subject to numerous risks and uncertainties and may lead to variability in product quality or reliability, increased construction timelines, as well as resources required to acquire, install and maintain manufacturing equipment, among others, all of which can lead to unexpected delays in manufacturing output. Additionally, the production of our products must occur in a highly controlled and clean environment to minimize particles and other yield- and quality-limiting contaminants. Weaknesses in process control or minute impurities in materials may cause a substantial percentage of defective products. We may not be able to maintain stringent quality controls and contamination problems could arise. Material defects in our products could result in loss or delay of revenues, delayed market acceptance, damage to our reputation, lost customers, legal claims, increased insurance costs or increased service and warranty costs. If we are unable to successfully scale up our manufacturing operations to meet customer demand, our business growth could be materially adversely affected.

We may engage in future acquisitions that could disrupt our business, cause dilution to our shareholders and harm our financial condition and operating results.

While we currently have no specific plans to acquire any other businesses, we may, in the future, make acquisitions of, or investments in, companies that we believe have products or capabilities that are a strategic or commercial fit with our current business or otherwise offer opportunities for our company. In connection with these acquisitions or investments, we may:

- issue Common Stock or other forms of equity that would dilute our existing shareholders' percentage of ownership,
- incur debt and assume liabilities, and
- incur amortization expenses related to intangible assets or incur large and immediate write-offs.

We may not be able to complete acquisitions on favorable terms, if at all. If we do complete an acquisition, we cannot assure you that it will ultimately strengthen our competitive position or that it will be viewed positively by customers, financial markets or investors. Furthermore, future acquisitions could pose numerous additional risks to our expected operations, including:

- problems integrating the purchased business, products or technologies,
- challenges in achieving strategic objectives, cost savings and other anticipated benefits,
- increases to our expenses,
- the assumption of significant liabilities that exceed the limitations of any applicable indemnification provisions or the financial resources of any indemnifying party,
- inability to maintain relationships with prospective key customers, vendors and other business partners of the acquired businesses,
- diversion of management's attention from its day-to-day responsibilities,
- difficulty in maintaining controls, procedures and policies during the transition and integration,
- entrance into marketplaces where we have no or limited prior experience and where competitors have stronger marketplace positions,
- potential loss of key employees, particularly those of the acquired entity, and
- historical financial information may not be representative or indicative of our results as a combined company.

Risks Related to Our Intellectual Property

If we fail to obtain, maintain and enforce our intellectual property rights, we may not be able to prevent third parties from using our proprietary technologies.

Our long-term success largely depends on our ability to market technologically competitive products which, in turn, largely depends on our ability to obtain and maintain adequate intellectual property protection and to enforce our proprietary rights without infringing the proprietary rights of third parties. While we rely upon a combination of our patent applications currently pending with the United State Patent and Trademark Office ("USPTO"), our trademarks, copyrights, trade secret protection and confidentiality agreements to protect the intellectual property related to our technologies, there can be no assurance that:

- our currently pending or future patent applications will result in issued patents,
- our limited patent portfolio will provide adequate protection to our core technology,
- we will succeed in protecting our technology adequately in all key jurisdictions,
- we will be able to finalize negotiations to enter into agreements pursuant to which we will license certain patents, or
- we can prevent third parties from disclosure or misappropriation of our proprietary information which could enable competitors to quickly duplicate or surpass our technological achievements, thus eroding any competitive advantage we may derive from the proprietary information.

In addition, we intend to expand our international presence, and effective patent, copyright, trademark and trade secret protection may not be available or may be limited in foreign countries.

We have a limited number of patent applications, which may not result in issued patents or patents that fully protect our intellectual property.

In the United States and internationally we had fifty-two pending patent applications as of September 11, 2019; however, there is no assurance that any of the pending applications or our future patent applications will result in patents being issued, or that any patents that may be issued as a result of existing or future applications will provide meaningful protection or commercial advantage to us.

The process of seeking patent protection in the United States and abroad can be long and expensive. Since patent applications in the United States and most other countries are confidential for a period of time after filing, we cannot be certain at the time of filing that we are the first to file any patent application related to our single-crystal acoustic wave filter technology. In addition, patent applications are often published as part of the patent application process, even if such applications do not issue as patents. When published, such applications will become publicly available, and proprietary information disclosed in the application will become available to others. While at present we are unaware of competing patent applications, competing applications could potentially surface.

Even if all of our pending patent applications are granted and result in registration of our patents, we cannot predict the breadth of claims that may be allowed or enforced, or that the scope of any patent rights could provide a sufficient degree of protection that could permit us to gain or keep our competitive advantage with respect to these products and technologies. For example, we cannot predict:

- the degree and range of protection any patents will afford us against competitors, including whether third parties will find ways to make, use, sell, offer to sell or import competitive products without infringing our patents;
- if and when patents will be issued;
- if third parties will obtain patents claiming inventions similar to those covered by our patents and patent applications;
- if third parties have blocking patents that could be used to prevent us from marketing our own patented products and practicing our own technology; or
- whether we will need to initiate litigation or administrative proceedings (e.g. at the USPTO) in connection with patent rights, which may be costly whether we win or lose.

As a result, the patent applications we own may fail to result in issued patents in the United States. Third parties may challenge the validity, enforceability or scope of any issued patents or patents issued to us in the future, which may result in those patents being narrowed, invalidated or held unenforceable. Even if they are unchallenged, our patents and patent applications may not adequately protect our intellectual property or prevent others from developing similar products that do not infringe the claims made in our patents. If the breadth or strength of protection provided by the patents we hold or pursue is threatened, we may not be able to prevent others from offering similar technology and products in the RFFE mobile market and our ability to commercialize our RF filters with technology protected by those patents could be threatened.

If we fail to obtain issued patents outside of the United States, our ability to prevent misappropriation of our proprietary information or infringement of our intellectual property rights in countries outside of the United States where our filters may be sold in the future may be significantly limited. If we file foreign patent applications related to our pending U.S. patent applications or to our issued patents in the United States, these applications may be contested and fail to result in issued patents outside of the United States or we may be required to narrow our claims. Even if some or all of our patent applications are granted outside of the United States and result in issued patents, effective enforcement of rights granted by these patents in some countries may not be available due to the differences in foreign patent and other laws concerning intellectual property rights, a relatively weak legal regime protecting intellectual property rights in these countries, and because it is difficult, expensive and time-consuming to police unauthorized use of our intellectual property when infringers are overseas. This failure to obtain or maintain adequate protection of our intellectual property rights outside of the United States could have a materially adverse effect on our business, results of operations and financial conditions.

We may be involved in lawsuits to protect or enforce our patents, which could be expensive, time-consuming and unsuccessful.

Competitors may infringe our patents or the patents of our potential licensors. To attempt to stop infringement or unauthorized use, we may need to file infringement claims, which can be expensive and time consuming and distract management.

If we pursue any infringement proceeding, a court may decide that a patent of ours or our licensors is not valid or is unenforceable or may refuse to stop the other party from using the relevant technology on the grounds that our patents do not cover the technology in question. Additionally, any enforcement of our patents may provoke third parties to assert counterclaims against us. Some of our current and potential competitors have the ability to dedicate substantially greater resources to enforcing their intellectual property rights than we have. Moreover, the legal systems of certain countries, particularly certain developing countries, do not favor the enforcement of patents, which could reduce the likelihood of success of, or the amount of damages that could be awarded resulting from, any infringement proceeding we pursue in any such jurisdiction. An adverse result in any infringement litigation or defense proceedings could put one or more of our patents at risk of being invalidated, held unenforceable, or interpreted narrowly and could put our patent applications at risk of not issuing, which could limit the ability of our filters to compete in those jurisdictions.

Interference proceedings could be provoked by third parties or brought by the USPTO to determine the priority of inventions with respect to our patents or patent applications. An unfavorable outcome could require us to cease using the related technology or to attempt to license rights to use it from the prevailing party. Our business could be harmed if the prevailing party does not offer us a license on commercially reasonable terms, or at all.

We need to protect our trademark rights and disclosure of our trade secrets to prevent competitors from taking advantage of our goodwill.

We believe that the protection of our trademark rights is an important factor in product recognition, protecting our brand, maintaining goodwill, and maintaining or increasing market share. We currently have four trademarks that we have filed to register with the USPTO - the Akoustis, XBAW and BulkONE marks and the XBAW logo - and we may expend substantial cost and effort in an attempt to register new trademarks and maintain and enforce our trademark rights. If we do not adequately protect our rights in our trademarks from infringement, any goodwill that we have developed in those trademarks could be lost or impaired.

Third parties may claim that the sale or promotion of our products, when and if we have any, may infringe on the trademark rights of others. Trademark infringement problems occur frequently in connection with the sale and marketing of products in the RFFE mobile industry. If we become involved in any dispute regarding our trademark rights, regardless of whether we prevail, we could be required to engage in costly, distracting and time-consuming litigation that could harm our business. If the trademarks we use are found to infringe upon the trademark of another company, we could be liable for damages and be forced to stop using those trademarks, and as result, we could lose all the goodwill that has been developed in those trademarks.

In addition to the protection afforded by patents and trademarks, we seek to rely on copyright, trade secret protection and confidentiality agreements to protect proprietary know-how that is not patentable, processes for which patents are difficult to enforce and any other elements of our processes that involve proprietary know-how, information or technology that is not covered by patents. For Akoustis, this includes chip layouts, circuit designs, resonator layouts and implementation, and membrane definition. Although we require all of our employees and certain consultants and advisors to assign inventions to us, and all of our employees, consultants, advisors and any third parties who have access to our proprietary know-how, information or technology to enter into confidentiality agreements, our trade secrets and other proprietary information may be disclosed, or competitors may otherwise gain access to such information or independently develop substantially equivalent information. If we are unable to prevent material disclosure of the intellectual property related to our technologies to third parties, we will not be able to establish or maintain the competitive advantage that we believe is provided by such intellectual property, which would weaken our competitive market position, and materially adversely affect our business and operational results.

Development of certain technologies with our manufacturers may result in restrictions on jointly-developed intellectual property.

In order to maintain and expand our strategic relationship with manufacturers of our filters, we may, from time to time, develop certain technologies jointly with these manufacturers and file for further intellectual property protection and/or seek to commercialize such technologies. We may enter into joint development agreements with manufacturers to provide for joint development works and joint intellectual property rights by us and by such manufacturer. Such agreements may restrict our commercial use of such intellectual property, or may require written consent from, or a separate agreement with, that manufacturer. In other cases, we may not have any rights to use intellectual property solely developed and owned by such manufacturer or another third party. If we cannot obtain commercial use rights for such jointly-owned intellectual property or intellectual property solely owned by these manufacturers, our future product development and commercialization plans may be adversely affected.

We may be subject to claims of infringement, misappropriation or misuse of third party intellectual property that, regardless of merit, could result in significant expense and loss of our intellectual property rights.

The semiconductor industry is characterized by the vigorous pursuit and protection of intellectual property rights. We have not undertaken a comprehensive review of the rights of third parties in our field. From time to time, we may receive notices or inquiries from third parties regarding our products or the manner in which we conduct our business suggesting that we may be infringing, misappropriating or otherwise misusing patent, copyright, trademark, trade secret and other intellectual property rights. Any claims that our technology infringes, misappropriates or otherwise misuses the rights of third parties, regardless of their merit or resolution, could be expensive to litigate or settle and could divert the efforts and attention of our management and technical personnel, cause significant delays and materially disrupt the conduct of our business. We may not prevail in such proceedings given the complex technical issues and inherent uncertainties in intellectual property litigation. If such proceedings result in an adverse outcome, we could be required to:

- pay substantial damages, including treble damages if we were held to have willfully infringed;
- cease the manufacture, offering for sale or sale of the infringing technology or processes;
- expend significant resources to develop non-infringing technology or processes;
- obtain a license from a third party, which may not be available on commercially reasonable terms, or may not be available at all; or
- lose the opportunity to license our technology to others or to collect royalty payments based upon successful protection and assertion of our intellectual property against others.

In addition, our agreements with prospective customers and manufacturing partners may require us to indemnify such customers and manufacturing partners for third party intellectual property infringement claims. Pursuant to such agreements, we may be required to defend such customers and manufacturing partners against certain claims that could cause us to incur additional costs. While we endeavor to include as part of such indemnification obligations a provision permitting us to assume the defense of any indemnification claim, not all of our current agreements contain such a provision and we cannot provide any assurance that our future agreements will contain such a provision, which could result in increased exposure to us in the case of an indemnification claim.

Defense of any intellectual property infringement claims against us, regardless of their merit, would involve substantial litigation expense and would be a significant diversion of resources from our business. In the event of a successful claim of infringement against us, we may have to pay substantial damages, obtain one or more licenses from third parties, limit our business to avoid the infringing activities, pay royalties and/or redesign our infringing technology or alter related formulations, processes, methods or other technologies, any or all of which may be impossible or require substantial time and monetary expenditure. The occurrence of any of the above events could prevent us from continuing to develop and commercialize our filters and our business could materially suffer.

Risks Related to our Financial Condition

We have a history of losses, will need substantial additional funding to continue our operations and may not achieve or sustain profitability in the future.

Our operations have consumed substantial amounts of cash since inception. We have incurred losses since our incorporation and formation in 2014. We anticipate that our operating expenses will increase in the foreseeable future as we continue to pursue the development of our patent-pending high purity single crystal acoustic wave filter technology, invest in marketing, sales and distribution of our RF filters to grow our business, acquire customers, commercialize our technology in the mobile wireless market and continue to invest in our manufacturing facility in Canandaigua, NY. These efforts may prove more expensive than we currently anticipate, and we may not succeed in generating sufficient revenues to offset these higher expenses. In addition, we expect to incur significant expenses related to regulatory requirements and our ability to obtain, protect, and defend our intellectual property rights.

We may also encounter unforeseen expenses, difficulties, complications, delays and other unknown factors that may increase our capital needs and/or cause us to spend our cash resources faster than we expect. Accordingly, we will need to obtain substantial additional funding in order to continue our operations.

To date, we have financed our operations through a mix of investments from private investors, public offerings of Common Stock, the incurrence of debt, foundry services revenue, RF filter revenue, and grant funding, and we expect to continue to utilize such means of financing for the foreseeable future. Additional funding from those or other sources may not be available when or in the amounts needed, on acceptable terms, or at all. If we raise additional capital through the sale of equity, or securities convertible into equity, it would result in dilution to our then existing stockholders, which could be significant depending on the price at which we may be able to sell our securities. If we raise additional capital through the incurrence of indebtedness, such as our issuance of senior convertible notes in May and October 2018, we may become subject to additional covenants restricting our business activities, and holders of debt instruments may have rights and privileges senior to those of our equity investors. In addition, servicing the interest and principal repayment obligations under debt facilities could divert funds that would otherwise be available to support research and development, or commercialization activities. If we are unable to raise capital when needed or on attractive terms, we could be forced to delay, reduce or eliminate the production and sale of our RF filter products, our R&D programs for our acoustic wave filter technology or any future commercialization efforts. Any of these events could materially and adversely affect our business, financial condition and prospects, and could cause our business to fail.

Servicing our debt requires a significant amount of cash or Common Stock, and we may not have sufficient cash flow from our business or have the ability to issue the necessary number of shares of Common Stock to pay our substantial debt.

Pursuant to the convertible note offerings we completed in the calendar year 2018, we incurred \$25.0 million of indebtedness. This level of debt could have significant consequences on future operations, including:

- increasing our vulnerability to adverse economic and industry conditions;
- making it more difficult for us to meet our payment and other obligations;
- making it more difficult to obtain any necessary future financing for working capital, capital expenditures, debt service requirements or other purposes;
- requiring the dedication of a substantial portion of any cash flow from operations to service our indebtedness, thereby reducing the amount of cash flow available for other purposes, including capital expenditures;
- placing us at a possible competitive disadvantage with competitors that are less leveraged than us or have better access to capital than we have; and
- limiting our flexibility in planning for, or reacting to, changes in our business and the markets in which we compete.

Accrued interest on our October 2018 6.5% Convertible Senior Notes due 2023 is payable quarterly in cash and we have the ability, at our option, to pay accrued interest on our May 2018 6.5% Convertible Senior Secured Notes due 2023 in cash or freely tradable shares of Common Stock. Our ability to make scheduled payments of interest depends on our future performance, which is subject to economic, financial, competitive and other factors beyond our control. Our business may not generate cash flow from operations in the future sufficient to service our debt in cash and make necessary capital expenditures. Furthermore, we may not issue Common Stock to make payments of interest to the extent such issuance would violate Nasdaq Marketplace Rule 5635(d), which limits the amount of Common Stock that we may privately issue without prior stockholder approval. Therefore, our ability to repay debt with Common Stock will depend on the capital markets and whether we have obtained stockholder approval for such issuances of Common Stock.

If we are unable to generate sufficient cash flow or issue Common Stock to satisfy payment obligations under our convertible notes, we may be required to adopt one or more alternatives, such as selling assets or obtaining additional equity capital on terms that may be onerous or highly dilutive. We may not be able to engage in any of these activities or engage in these activities on desirable terms, which could result in a default on our debt obligations.

Furthermore, our \$15.0 million principal amount of 6.5% Convertible Senior Secured Notes due 2023 are secured by a first priority lien on substantially all of the Company's and the Company's existing and future subsidiaries' assets. Therefore, if we default on any of our debt obligations, it could result in our noteholders foreclosing on our assets. In such an event, the noteholders' rights to such assets would likely be superior to those of our stockholders.

We are subject to a number of restrictive covenants, relating to our indebtedness, which may restrict our business and financing activities. Additionally, certain of our indebtedness is secured by a first priority lien on our and our subsidiaries assets', which may limit our ability to obtain additional financing.

The indentures governing our convertible notes imposes operating and other restrictions on us. Such restrictions may affect, and in many respects limit or prohibit, among other things, our ability to:

- incur or guarantee additional indebtedness;
- issue preferred stock or stock of any subsidiary;
- make investments or acquisitions;
- merge, consolidate, dissolve or liquidate;
- engage in certain asset sales (including the sale of stock of our subsidiary);
- grant liens (except permitted liens);
- pay dividends;
- engage in transactions with our affiliates; and
- enter into a new line of business.

The restrictions in the indentures governing the convertible notes may prevent us from taking actions that we believe would be in the best interests of our business, and may make it difficult for us to successfully execute our business strategy or effectively compete with companies that are not similarly restricted. We also may incur future debt obligations that might subject us to additional restrictive covenants that could affect our financial and operational flexibility. Our ability to comply with these covenants in future periods will largely depend on the pricing of our products and services, and our ability to successfully implement our overall business strategy. We cannot assure you that we will be granted waivers or amendments to these agreements if for any reason we are unable to comply with these agreements. The breach of any of these covenants and restrictions could result in a default under the indenture governing the promissory notes, which could result in an acceleration of our indebtedness.

Additionally, potential lenders or other sources of capital may be less likely to extend financing to us due to their interests' potential subordination to the first priority lien on substantially all of the Company's and the Company's existing and future subsidiaries' assets securing the Company's \$15.0 million principal amount of convertible notes issued in May 2018.

Risks Related to Regulatory Requirements

Government regulation may adversely affect our business.

The effects of regulation may materially and adversely impact our business. For example, regulatory policies of the FCC relating to radio frequency emissions, consumer protection laws of the FTC, product safety regulatory activities of the Consumer Products Safety Commission, and environmental regulatory activities of the EPA could impede sales of our products in the United States. We and our customers are also subject to various import and export laws and regulations. If we fail to continue to comply with these regulations, we may be unable to manufacture the affected products or ship these products to certain customers and be subject to investigations, sanctions, mandatory product recalls, enforcement actions, disgorgement of profits, fines, damages, civil and criminal penalties, or injunctions.

As described above under the risk factor entitled “We may be subject to risks related to doing business in, and having counterparties based in, foreign countries,” our business is also increasingly subject to complex foreign and U.S. laws and regulations, including but not limited to, anti-corruption laws, such as the Foreign Corrupt Practices Act and equivalent laws in other jurisdictions, antitrust or competition laws, and data privacy laws, among others. Foreign governments may also impose tariffs, duties and other import restrictions on components that we obtain from non-domestic suppliers and may impose export restrictions on products that we sell internationally. These tariffs, duties or restrictions could materially and adversely affect our business, financial condition and results of operations.

Our product or manufacturing standards could also be impacted by new or revised environmental rules and regulations or other social initiatives. Those rules, or similar rules that may be adopted in other jurisdictions, could adversely affect our costs, the availability of minerals used in our products and our relationships with customers and suppliers.

We may incur substantial expenses in connection with regulatory requirements, and any regulatory compliance failure could cause our business to suffer.

The wireless communications industry is subject to ongoing regulatory obligations and review. See “Business - Government Regulations” above. Maintaining compliance with these requirements may result in significant additional expense to us, and any failure to maintain such compliance could cause our business to suffer.

Noncompliance with applicable regulations or requirements could also subject us to investigations, sanctions, mandatory product recalls, enforcement actions, disgorgement of profits, fines, damages, civil and criminal penalties, or injunctions. An adverse outcome in any such litigation could require us to pay contractual damages, compensatory damages, punitive damages, attorneys’ fees and costs. These enforcement actions could harm our business, financial condition and results of operations. If any governmental sanctions are imposed, or if we do not prevail in any possible civil or criminal litigation, our business, financial condition and results of operations could be materially adversely affected. In addition, responding to any action will likely result in a significant diversion of management’s attention and resources and an increase in professional fees.

Compliance with regulations regarding the use of “conflict minerals” could limit the supply and increase the cost of certain metals used in manufacturing our products.

Regulations in the United States require that we determine whether certain materials used in our products, referred to as conflict minerals, originated in the Democratic Republic of the Congo or adjoining countries, or originated from recycled or scrap sources. We incur costs associated with our policies and procedures to comply with the applicable rules and due diligence procedures. In addition, verification and reporting requirements could affect the sourcing and availability of minerals that are used in the manufacture of our products, and we may face reputational and competitive challenges if we are unable to sufficiently verify the origins of all conflict minerals used in our products. We may also face challenges with government regulators, potential customers, suppliers and manufacturers if we are unable to sufficiently verify that the metals used in our products are conflict free.

There could be an adverse change or increase in the laws and/or regulations governing our business.

We and our operating subsidiary are subject to various laws and regulations in different jurisdictions, and the interpretation and enforcement of laws and regulations are subject to change. We are also subject to different tax regulations in each of the jurisdictions where we conduct our business or where our management or the management of our operating subsidiary is located. We expect that the scope and extent of regulation in these jurisdictions, as well as regulatory oversight and supervision, will generally continue to increase. There can be no assurance that future regulatory, judicial and legislative changes in any jurisdiction will not have a material adverse effect on us or hinder us in the operation of our business. In addition, we may incur substantial costs in order to comply with current or future environmental, health and safety laws and regulations applicable to us.

These current or future laws and regulations may impair our research, development or production efforts or impact the research activities we pursue. Our failure to comply with these laws and regulations also may result in substantial fines, penalties or other sanctions, which could cause our financial condition to suffer.

Investment Risks

You could lose all of your investment.

An investment in our securities is speculative and involves a high degree of risk. Potential investors should be aware that the value of an investment in the Company may go down as well as up. In addition, there can be no certainty that the market value of an investment in the Company will fully reflect its underlying value.

The value of our Common Stock could be volatile.

The overall market and the price of our Common Stock may fluctuate greatly. During the fiscal year ended June 30, 2019, our Common Stock traded on the Nasdaq Capital Market as high as \$9.50 and as low as \$3.40 per share. An active, liquid and orderly market for our Common Stock may not be sustained, which could depress the trading price of our Common Stock. The trading price of our Common Stock may be significantly affected by various factors, including quarterly fluctuations in our operating results, changes in investors' and analysts' perception of the business risks and conditions of our business, issuance of additional shares in connections with strategic transactions or acquisitions we may make, our ability to meet the earnings estimates and other performance expectations of financial analysts or investors, unfavorable commentary or downgrades of our stock by equity research analysts, and general economic or political conditions.

Our stock trades in low volumes, which may make it more difficult for investors to sell their shares quickly.

Our Common Stock trades on the Nasdaq Capital Market, but it trades in low volumes, which may make it more difficult for investors to sell their shares quickly. This situation may be attributable to a number of factors, including but not limited to the fact that we are an emerging commercial company that is relatively unknown to stock analysts, stockbrokers, institutional investors, and others in the investor community. In addition, investors may be risk averse to investments in emerging commercial companies. As a consequence, it may be more difficult for investors to sell their shares quickly and our stock price may be more sensitive to sales of our Common Stock in the market. The low trading volume is outside of our control and may not increase or, if it increases, may not be maintained.

Stockholders may experience dilution of their ownership interests because of the future issuance of additional shares of our Common Stock or preferred stock or other securities that are convertible into or exercisable for our Common Stock or preferred stock.

In the future, we may issue our authorized but previously unissued equity securities, resulting in the dilution of the ownership interests of our stockholders. The Company is authorized to issue an aggregate of 45,000,000 shares of Common Stock and 5,000,000 shares of Preferred Stock. We may issue additional shares of our Common Stock or other securities that are convertible into or exercisable for our Common Stock in connection with hiring or retaining employees, future acquisitions, future sales of our securities for capital raising purposes, or for other business purposes. In addition, as of September 06, 2019, warrants and options to purchase 633,343 and 2,080,665 shares, respectively, of our Common Stock remained outstanding. Additionally, our outstanding convertible senior notes were convertible into approximately 4.96 million shares of Common Stock on such date. The future issuance of additional shares of our Common Stock may create downward pressure on the trading price of the Common Stock. We will need to raise additional capital in the near future to meet our working capital needs, and there can be no assurance that we will not be required to issue additional shares, warrants or other convertible securities in the future in conjunction with these capital raising efforts, including at a price (or exercise prices) below the price you paid for your stock.

Delaware law, our charter documents, the ability of our Board of Directors to issue additional stock, and certain provisions of our convertible notes could impede or discourage a takeover or change of control that stockholders may consider favorable.

As a Delaware corporation, we are subject to certain anti-takeover provisions. Under Delaware law, a corporation may not engage in a business combination with any holder of 15 percent or more of its capital stock unless the holder has held the stock for three years or, among other things, the board of directors has approved the transaction. Accordingly, our Board of Directors could rely on Delaware law to prevent or delay an acquisition of our company. In addition, certain provisions of our certificate of incorporation and bylaws may have the effect of delaying or preventing a change of control or changes in our management. These provisions include only our Board of Directors being able to fill vacancies on the Board and various limitations in our bylaws on stockholder meeting, including advance notice requirements for stockholders to make nominations of candidates for election as directors or to bring matters before an annual meeting of stockholders and our stockholders not having the ability to call a special meeting.

Our Board of Directors is authorized to issue up to 5,000,000 shares of preferred stock with powers, rights and preferences designated by it. Shares of voting or convertible preferred stock could be issued, or rights to purchase such shares could be issued, to create voting impediments or to frustrate persons seeking to effect a takeover or otherwise gain control of the Company. The ability of the Board to issue such additional shares of preferred stock, with rights and preferences it deems advisable, could discourage an attempt by a party to acquire control of the Company by tender offer or other means. Such issuances could therefore deprive stockholders of benefits that could result from such an attempt, such as the realization of a premium over the market price for their shares in a tender offer or the temporary increase in market price that such an attempt could cause. Moreover, the issuance of such additional shares of preferred stock to persons friendly to the Board of Directors could make it more difficult to remove incumbent managers and directors from office even if such change were to be favorable to stockholders generally.

Certain provisions of the \$15.0 million and \$10.0 million principal amounts of convertible notes we issued in May 2018 and October 2018, respectively, could make it more difficult or more expensive for a third party to acquire us. If the Company undergoes a “qualifying fundamental change,” as such term is defined in the respective indentures for the notes, under certain circumstances holders who convert their notes in connection with such a qualifying fundamental change will be entitled to a “qualifying fundamental change payment” equal to \$130 per \$1,000 of aggregate principal of notes converted. In addition, the indentures and the convertible notes prohibit us from engaging in certain mergers or acquisitions unless, among other things, the surviving entity assumes our obligations under the convertible notes and the indenture. These and other provisions in the indentures could deter or prevent a third party from acquiring the Company.

These types of provisions could make it more difficult for a third party to acquire control of us, even if the acquisition would be beneficial to our stockholders.

Our bylaws provide, subject to certain exceptions, that a state or federal court in the State of North Carolina will be the sole and exclusive forum for certain stockholder litigation matters, which could limit our stockholders’ ability to obtain a favorable judicial forum for disputes with us or our directors, officers, employees or stockholders.

Our bylaws provide, subject to limited exceptions, that a state or federal court located within the State of North Carolina will be the sole and exclusive forum for (i) any derivative action or proceedings brought on our behalf, (ii) any action asserting a claim of breach of a fiduciary duty owed by any director, officer or other employee of the Company to the Company or the our stockholders, (iii) any action asserting a claim arising pursuant to any provision of the Delaware General Corporation Law or (iv) any action asserting a claim governed by the internal affairs doctrine. Any person or entity purchasing or otherwise acquiring any interest in shares of our Common Stock shall be deemed to have notice of and to have consented to the provisions of our bylaws described above. This choice of forum provision may limit a stockholder’s ability to bring a claim in a judicial forum that it finds favorable for disputes with us or any of our directors, officers, other employees or stockholders which may discourage lawsuits with respect to such claims. Alternatively, if a court were to find the choice of forum provision that is contained in our bylaws to be inapplicable or unenforceable in an action, we may incur additional costs associated with resolving such action in other jurisdictions, which could materially adversely affect our business, financial condition and results of operations.

We do not anticipate paying dividends on our Common Stock.

Cash dividends have never been declared or paid on our Common Stock, and we do not anticipate such a declaration or payment for the foreseeable future. We expect to use future earnings, if any, to fund business growth. Therefore, stockholders will not receive any funds absent a sale of their shares of Common Stock. If we do not pay dividends, our Common Stock may be less valuable because a return on your investment will only occur if our stock price appreciates. We cannot assure stockholders that our stock price will appreciate or that they will receive a positive return on their investment if and when they sell their shares.

As a smaller reporting company, we are subject to scaled disclosure requirements that may make it more challenging for investors to analyze our results of operations and financial prospects.

As a smaller reporting company, we are subject to scaled disclosure requirements that may make it more challenging for investors to analyze our results of operations and financial prospects. As a “smaller reporting company,” we may elect to provide simplified executive compensation disclosures in our filings and take advantage of other decreased disclosure obligations in our filings with the SEC, including being required to provide only two years of audited financial statements in our annual reports. Consequently, it may be more challenging for investors to analyze our results of operations and financial prospects. We will remain a smaller reporting company until the beginning of a fiscal year in which we have a public float of \$250 million held by non-affiliates as of the last business day of the second quarter of the prior fiscal year, assuming our common stock is registered under Section 12 of the Exchange Act on the applicable evaluation date.

Being a public company is expensive and administratively burdensome.

As a public reporting company, we are subject to the information and reporting requirements of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and other federal securities laws, rules and regulations related thereto, including compliance with the Sarbanes-Oxley Act. Complying with these laws and regulations requires the time and attention of our Board of Directors and management and increases our expenses. Among other things, we are required to:

- maintain and evaluate a system of internal control over financial reporting in compliance with the requirements of Section 404 of the Sarbanes-Oxley Act and the related rules and regulations of the SEC and the Public Company Accounting Oversight Board;
- maintain policies relating to disclosure controls and procedures;
- prepare and distribute periodic reports in compliance with our obligations under federal securities laws;
- institute a more comprehensive compliance function, including with respect to corporate governance; and
- involve, to a greater degree, our outside legal counsel and accountants in the above activities.

The costs of preparing and filing annual and quarterly reports, proxy statements and other information with the SEC and furnishing audited reports to stockholders is expensive and much greater than that of a privately-held company, and compliance with these rules and regulations may require us to hire additional financial reporting, internal controls and other finance personnel, and will involve a material increase in regulatory, legal and accounting expenses and the attention of management. There can be no assurance that we will be able to comply with the applicable regulations in a timely manner, if at all. In addition, being a public company makes it more expensive for us to obtain director and officer liability insurance. In the future, we may be required to accept reduced coverage or incur substantially higher costs to obtain this coverage. These factors could also make it more difficult for us to attract and retain qualified executives and members of our Board of Directors, particularly directors willing to serve on the Audit Committee of our Board of Directors.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

Our current headquarters in Huntersville, NC, is 10,400 square feet, and its base rent is \$9,880 per month with a term expiring December 2022. The prior headquarters, a 4,800-square foot facility, was vacated in April 2018. On June 26, 2017, the Company acquired a 120,000 square foot MEMS fabrication facility in Canandaigua, New York, which currently houses 46 employees (the "NY Facility"). In connection with the offering and sale of senior secured convertible notes on May 14, 2018, the Company granted a first priority lien to The Bank of New York Mellon Trust Company, N.A. on substantially all of its current and future assets, including a mortgage on the NY Facility. Additionally, the Company has entered into a Lease and Project Agreement and a Company Lease Agreement with the Ontario County Industrial Development Agency, a public benefit corporation of the State of New York (the "OCIDA"), covering the NY Facility, pursuant to which the Company leases the NY Facility to the OCIDA for nominal consideration and the OCIDA leases the NY Facility back to the Company for annual rent payments set forth in such agreements. The Company believes its 10,400-square foot facility in Huntersville, NC, along with the NY Facility, will be suitable and sufficient to meet the Company's needs for the next several years.

ITEM 3. LEGAL PROCEEDINGS

From time to time, we may become involved in various lawsuits and legal proceedings that arise in the ordinary course of business. Litigation is subject to inherent uncertainties, and an adverse result in any such matters may arise from time to time that may have an adverse effect on our business, financial condition, results of operations and prospects.

Except as noted below, we are currently not aware of any material pending legal proceedings to which we are a party or of which any of our property is the subject, nor are we aware of any such proceedings that are contemplated by any governmental authority.

During the year ended June 30, 2019, the Company ended the employment of its principal financial officer, John T. Kurtzweil (the "Former CFO"). The Former CFO's employment was terminated for cause pursuant to the terms of his employment agreement by unanimous vote of the Company's Board of Directors, and not due to any disagreement concerning the Company's financial statements, accounting policies or accounting practices. The Former CFO disputes the termination for cause and has since filed for an arbitration hearing pursuant to the terms of his employment agreement, and has filed a complaint under the whistleblower provisions of the Sarbanes Oxley Act of 2002 with the Occupational Safety and Health Administration of the U.S. Department of Labor, alleging that his termination constituted retaliation by the Company for raising Regulation FD-related concerns. The Former CFO seeks lost wages and severance pay, including compensation for his forfeited equity awards, as well as attorney's fees, interest, costs and punitive damages.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Market Information and Holders

Our Common Stock is currently traded on the Nasdaq Capital Market under the symbol "AKTS." There has been limited trading in our Common Stock to date.

As of September 6, 2019, 30,329,525 shares of our Common Stock were issued and outstanding and were held by approximately 156 stockholders of record.

Dividends

We have never paid any dividends on our capital stock and do not anticipate paying any cash dividends on our Common Stock in the foreseeable future. We intend to retain future earnings to fund ongoing operations and future capital requirements. Any future determination to pay dividends will be at the discretion of our Board of Directors and will be dependent upon financial condition, results of operations, capital requirements and such other factors as the Board of Directors deems relevant.

Warrants and Options

As of June 30, 2019, there were outstanding warrants and options to purchase 633,433 shares of our Common Stock and 2,127,317 shares of our Common Stock, respectively.

Equity Compensation Plan Information

The following table provides information as of June 30, 2019, relating to our equity compensation plans, under which grants of options, restricted stock, and other equity awards may be made from time to time:

Plan category	Number of securities to be issued upon exercise of outstanding options, warrants and rights	Weighted-average exercise price of outstanding options, warrants and rights	Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column (a))
	(a)	(b)	(c)
Equity compensation plans approved by security holders - options	2,127,317(1)	\$ 5.57	1,865,035(3)
Equity compensation plans approved by security holders – restricted stock units	1,196,882(2)	\$ 0.00	–
Equity compensation plans not approved by security holders	–	–	–
Total	3,324,199		1,865,035(3)

- (1) Consists of 160,000 shares of Common Stock to be issued upon the exercise of outstanding options issuable under the Company’s 2015 Equity Incentive Plan (the “2015 Plan”), 1,062,859 issuable under the Company’s 2016 Stock Incentive Plan (the “2016 Plan”) and 904,458 issuable under the Company’s 2018 Stock Incentive Plan (the “2018 Plan”).
- (2) Consists of 694,500 shares of Common Stock to be issued upon the vesting of outstanding restricted stock units issuable under the 2016 Plan (the “2016 Plan”) and 502,382 issuable under the 2018 Plan.
- (3) As of June 30, 2019, 1,865,035 additional shares of Common Stock remained available for future issuance under the 2018 Plan. No additional grants will be made under the Company’s 2014 Stock Plan (the “2014 Plan”), the 2015 Plan or the 2016 Plan

Recent Sales of Unregistered Securities

We have not sold any equity securities during the fiscal year ended June 30, 2019 that were not registered under the Securities Act, other than as previously reported in our Quarterly Reports on Form 10-Q and our Current Reports on Form 8-K filed with the SEC.

Repurchases

Unvested restricted stock awards granted under the 2014 Plan and the 2015 Plan are subject to repurchase options upon certain terminations of the respective recipient’s service with the Company. Under the terms of the respective award agreements, repurchases will generally be made for no value or for par value. As of June 30, 2019, 157,500 shares of restricted stock remained subject to repurchase options that expire as the restricted shares vest generally through August 2020. We repurchased 21,125 shares of our equity securities pursuant to these repurchase options during the fiscal year ended June 30, 2019.

ITEM 6. SELECTED FINANCIAL DATA

Not applicable.

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following management's discussion and analysis should be read in conjunction with the historical financial statements and the related notes thereto contained in this Annual Report on Form 10-K. See also the "Cautionary Note Regarding Forward-Looking Information" on page [1] of this Report.

The following discussion highlights the results of operations and the principal factors that have affected our financial condition, as well as our liquidity and capital resources for the periods described, and provides information that management believes is relevant for an assessment and understanding of the statements of financial condition and results of operations presented herein. The following discussion and analysis are based on the audited financial statements contained in this Report, which we have prepared in accordance with United States generally accepted accounting principles. You should read the discussion and analysis together with such financial statements and the related notes thereto.

Overview and Plan of Operation

Akoustis® is an emerging commercial company focused on developing, designing and manufacturing innovative RF filter products for the wireless industry, including for products such as smartphones and tablets, network infrastructure equipment, WiFi Customer Premise Equipment ("CPE") and defense applications. Located between the device's antenna and its digital backend, the RF front-end ("RFFE") is the circuitry that performs the analog signal processing and contains components such as amplifiers, filters and switches. We have developed a new and proprietary microelectromechanical systems ("MEMS") based bulk acoustic wave ("BAW") technology and unique manufacturing flow, which we have trademarked as XBAW. Our XBAW™ process incorporates optimized high purity piezoelectric materials designed to achieve high power, high frequency and/or wide bandwidth filter performance. Filters are critical in selecting and rejecting signals, and their performance enables differentiation in the hardware modules defining the RFFE.

We believe owning the core resonator device technology, manufacturing facility and intellectual property ("IP") to produce our designs is the most direct and efficient means of delivering our solutions to the market. Furthermore, our technology is based upon bulk-mode acoustic resonance, which we believe is superior to surface-mode acoustic resonance for high-band applications that include 4G/LTE, 5G, WiFi, and defense applications. Although some of our target customers utilize or make the RFFE module, they may lack access to critical ultra-high band (UHB) filter technology needed to compete in high-frequency applications. We intend to design, manufacture, and market our RF filter products to mobile phone original equipment manufacturers ("OEMs"), defense OEMs, network infrastructure OEMs, and WiFi CPE OEM's to enable broader competition among the front-end module manufacturers. We operate as a "pure-play" RF filter supplier and align with the front-end module manufacturers who seek to acquire high performance filters to expand their module business.

We currently build high performance RF filter circuits, using our first generation XBAW™ wafer process, in our 120,000 square-foot wafer-manufacturing facility located in Canandaigua, New York, which we acquired in June 2017. As of September 11, 2019, our (IP) portfolio included 24 patents, including one blocking patent that we have licensed from Cornell University. Additionally, we have 52 active and pending patent applications. These patents cover our XBAW™ RF filter technology from the substrate level through the system application layer. Where possible, we leverage both federal and state level R&D grants to support development and commercialization of our technology.

We are developing RF filters for 4G/LTE, 5G, WiFi and defense bands using our proprietary resonator device models and product design kits (PDK's). As we qualify our first RF filter products, we are engaging with target customers to evaluate our filter solutions. Our initial designs target UHB, sub-7 GHz 4G/LTE, 5G, WiFi and defense bands. Since Akoustis owns its core technology and controls access to its intellectual property, we expect to offer several ways to engage with potential customers. First, we intend to engage with multiple wireless markets, providing standardized filters that we design and offer as standard catalog components. Second, we expect to deliver unique filters to customer-supplied specifications, which we will design and fabricate on a customized basis. Finally, we may offer our models and design kits for our customers to design their own filters utilizing our proprietary technology.

We have earned minimal revenue from operations since inception, and we have funded our operations primarily with development contracts, RF filter prototype and initial production orders, government grants, MEMS foundry and engineering services, sales of our equity securities, and issuance of debt. We have incurred losses totaling approximately \$67.5 million from inception through June 30, 2019. These losses are primarily the result of material and processing costs associated with developing and commercializing our technology, as well as personnel costs, professional fees (primarily accounting and legal), and other general and administrative ("G&A") expenses. We expect to continue to incur substantial costs for commercialization of our technology on a continuous basis because our business model involves materials and solid-state device technology development and engineering of catalog and custom filter design solutions.

We plan to commercialize our technology by designing and manufacturing single-band and multi-band BAW RF filter solutions in our New York wafer fabrication facility. We expect our filter solutions will address problems (such as power loss, bandwidth, power handling, and isolation) created by the growing number and convergence of frequency bands in the RFFE of mobile devices, infrastructure and premise equipment to support 4G/LTE, 5G, and WiFi. We have prototyped our first single-band BAW filter designs for 4G/LTE frequency bands, which are dominated by competitive BAW solutions and historically cannot be addressed with low-band, lower power handling surface acoustic wave ("SAW") technology.

To succeed, we must convince mobile phone OEMs, RFFE module manufacturers, network infrastructure OEMs, WiFi CPE OEMs and defense customers to use our XBAW™ filter technology in their systems and modules. However, since there are two dominant BAW filter suppliers in the industry that have high-band technology, and both utilize such technology as a competitive advantage at the module level, we expect customers that lack access to high-band filter technology will be open to engage with our pure-play filter company.

We plan to pursue RF filter design and R&D development agreements and potentially joint ventures with target customers and other strategic partners. These types of arrangements may subsidize technology development costs and qualification, filter design costs, and offer complementary technology and market intelligence and other avenues to revenue. However, we intend to retain ownership of our core technology, intellectual property, designs, and related improvements. We expect to pursue development of catalog designs for multiple customers and to offer such catalog products in one or more sales channels.

Please see “Overview” and “Plan of Operation” under Item 1. Business for more information.

Critical Accounting Policies

The following discussion and analysis of our financial condition and results of operations is based upon our financial statements, which have been prepared in conformity with accounting principles generally accepted in the United States of America (“GAAP”). Certain accounting policies and estimates are particularly important to the understanding of our financial position and results of operations and require the application of significant judgment by our management or can be materially affected by changes from period to period in economic factors or conditions that are outside of our control. As a result, they are subject to an inherent degree of uncertainty. In applying these policies, our management uses its judgment to determine the appropriate assumptions to be used in the determination of certain estimates. Those estimates are based on our historical operations, our future business plans and projected financial results, the terms of existing contracts, our observance of trends in the industry, information provided by our customers and information available from other outside sources, as appropriate.

Derivative Liability

The Company evaluates its options, warrants, convertible notes, and other contracts, if any, to determine if those contracts or embedded components of those contracts qualify as derivatives to be separately accounted for in accordance with paragraph 815-10-05-4 and Section 815-40-25 of the FASB Accounting Standards Codification. The result of this accounting treatment is that the fair value of the embedded derivative is marked-to-market each balance sheet date and recorded as either an asset or a liability. The change in fair value is recorded in the consolidated statement of operations as other income or expense. Upon conversion, exercise or cancellation of a derivative instrument, the instrument is marked to fair value at the date of conversion, exercise or cancellation and then the related fair value is reclassified to equity.

In circumstances where the embedded conversion option in a convertible instrument is required to be bifurcated and there are also other embedded derivative instruments in the convertible instrument that are required to be bifurcated, the bifurcated derivative instruments are accounted for as a single, compound derivative instrument.

The classification of derivative instruments, including whether such instruments should be recorded as liabilities or as equity, is re-assessed at the end of each reporting period. Equity instruments that are initially classified as equity that become subject to reclassification are reclassified to liability at the fair value of the instrument on the reclassification date. Derivative instrument liabilities will be classified in the balance sheet as current or non-current based on whether or not net-cash settlement of the derivative instrument is expected within 12 months of the balance sheet date.

The Company adopted Section 815-40-15 of the FASB Accounting Standards Codification (“Section 815-40-15”) to determine whether an instrument (or an embedded feature) is indexed to the Company’s own stock. Section 815-40-15 provides that an entity should use a two-step approach to evaluate whether an equity-linked financial instrument (or embedded feature) is indexed to its own stock, including evaluating the instrument’s contingent exercise and settlement provisions.

The Company utilizes a Monte Carlo simulation to compute the fair value of the derivative liability and to mark to market the fair value of the derivative at each balance sheet date. The Company records the change in the fair value of the derivative as other income or expense in the consolidated statements of operations.

The Company utilizes the with-and-without method, a form of the income approach model to compute the fair value of its embedded derivatives associated with its convertible notes. The fair value of the embedded derivatives represents the difference in the present value of anticipated cash flows assuming the feature is present as compared to a security without the same feature. The Company records the change in the fair value of the derivative as other income or expense in the consolidated statements of operations.

Fair Value of Financial Instruments

The carrying amounts of cash and cash equivalents and accounts payable approximate fair value due to the short-term nature of these instruments.

The Company measures the fair value of financial assets and liabilities based on the guidance of ASC 820, “*Fair Value Measurements and Disclosures*,” which defines fair value, establishes a framework for measuring fair value, and expands disclosures about fair value measurements.

ASC 820 defines fair value as the exchange price that would be received for an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. ASC 820 also establishes a fair value hierarchy, which requires an entity to maximize the use of observable inputs and minimize the use of unobservable inputs when measuring fair value.

Fair value measurements are categorized using a valuation hierarchy for disclosure of the inputs used to measure fair value, which prioritize the inputs into three broad levels:

Level 1 - Quoted prices are available in active markets for identical assets or liabilities as of the reporting date. Active markets are those in which transactions for the asset or liability occur in sufficient frequency and volume to provide pricing information on an ongoing basis.

Level 2 - Pricing inputs are other than quoted prices in active markets included in level 1, which are either directly or indirectly observable as of the reported date, and include those financial instruments that are valued using models or other valuation methodologies.

Level 3 - Pricing inputs include significant inputs that are generally less observable from objective sources. These inputs may be used with internally developed methodologies that result in management's best estimate of fair value.

Stock-based Compensation

The Company recognizes compensation expense for all stock-based payments in accordance with ASC 718 "*Compensation - Stock Compensation*". Under fair value recognition provisions, the Company recognizes stock-based compensation net of forfeitures and recognizes compensation cost only for those shares expected to vest over the requisite service period of the award.

Restricted stock awards and restricted stock units are granted at the discretion of the Company. These awards are restricted as to the transfer of ownership and generally vest over the requisite service periods, typically over a four-year period (vesting on a straight-line basis). The fair value of a stock award is equal to the fair market value of a share of Company stock on the grant date.

The fair value of an option award is estimated on the date of grant using the Black-Scholes option valuation model. The Black-Scholes option valuation model requires the development of assumptions that are inputs into the model. These assumptions are the value of the underlying share, the expected stock volatility, the risk-free interest rate, the expected life of the option, and the dividend yield on the underlying stock. Expected volatility is calculated using the historical volatilities of the Company's common stock traded on the Nasdaq Capital Market. Risk-free interest rates are calculated based on continuously compounded risk-free rates for the appropriate term. The dividend yield is assumed to be zero as the Company has never paid or declared any cash dividends on its Common Stock and does not intend to pay dividends on its Common Stock in the foreseeable future. The Company accounts for the impact of forfeitures as they occur.

Determining the appropriate fair value model and calculating the fair value of stock-based payment awards requires the input of the subjective assumptions described above. The assumptions used in calculating the fair value of stock-based payment awards represent management's best estimates, which involve inherent uncertainties and the application of management's judgment. As a result, if factors change and the Company uses different assumptions, our stock-based compensation could be materially different in the future. In addition, the Company is required to account for the impact of forfeitures as the forfeitures for those shares occur. If the Company's actual forfeitures are material, the stock-based compensation could be significantly different from what the Company has recorded in the current period.

The Company accounts for stock-based payments granted to non-employees in accordance with ASC 505-40, "*Equity Based Payments to Non-Employees*". The Company determines the fair value of the stock-based payment as either the fair value of the consideration received or the fair value of the equity instruments issued, whichever is more reliably measurable. If the fair value of the equity instruments issued is used, it is measured using the stock price and other measurement assumptions as of the earlier of either (1) the date at which a commitment for performance by the counterparty to earn the equity instruments is reached, or (2) the date at which the counterparty's performance is complete. The fair value of the equity instruments is re-measured each reporting period over the requisite service period.

Results of Operations

Our results of operations are presented for the fiscal years ended June 30, 2019 and June 30, 2018.

Year Ended June 30, 2019 Compared to Year Ended June 30, 2018

Revenue

The Company recorded revenue of \$1.4 million for the year-ended June 30, 2019 as compared to \$1.2 million for the year ended June 30, 2018. The increase of \$0.2 million was primarily due to increases in engineering services of \$0.4 million and increases in filter/amplifier sales of \$0.2 million offset by a decrease in foundry services revenue of \$0.4 million.

Cost of Revenue

The Company recorded cost of revenue of \$1.0 million in both fiscal 2019 and fiscal 2018. These costs include direct labor, material, and facility costs primarily associated with the foundry services revenue, manufacturing of filter product and engineering services.

Research and Development Expenses

R&D expenses were \$19.3 million for the year ended June 30, 2019, which were \$6.0 million, or 45%, higher than the prior year amount of \$13.3 million. The year-over-year increase was primarily in the areas of R&D personnel, stock-based compensation, depreciation, and facility costs. R&D expenses include personnel costs, stock-based compensation, facility and material costs and depreciation expense. Personnel costs were \$7.1 million for the year ended June 30, 2019 compared to \$5.0 million in the comparative period, an increase of \$2.1 million, or 43.6%. The higher spend was primarily due to R&D personnel in our acquired NY Facility, as well as incremental R&D hires. Stock-based compensation of \$4.2 million for the year ended June 30, 2019 was \$1.7 million, or 71.5%, higher than the year ended June 30, 2018 due to new stock awards made to R&D personnel and the change in the fair value of awards from prior periods. Facility and material costs of \$5.3 million primarily associated with the NY Facility, increased by \$0.6 million, or 12.9%, from the year ended June 30, 2018. These costs include utilities, repair and maintenance, supplies, materials and parts. In addition, depreciation expense was \$2.4 million as compared to \$1.1 million in the comparative period ended June 30, 2018, an increase of \$1.4 million, or 128.6%, due to additional capital expenditures made in fiscal year 2019.

General and Administrative Expenses

General and administrative (“G&A”) costs include salaries and wages for executive and administrative staff, stock-based compensation, professional fees, insurance costs and other general costs associated with the administration of our business. General and administrative expenses for the year ended June 30, 2019 were \$8.7 million versus \$8.8 million for the comparative period ended June 30, 2018. The decrease of \$0.1 million, or 1.2%, was primarily driven by lower discretionary spending of travel and other expenses.

Other Operating Expenses

Other operating expenses for the year ended June 30, 2019 were \$50 thousand compared to other expenses of \$395 thousand in fiscal year 2018. The \$345 thousand decrease was due to a reduction of impairment on assets held for sale.

Other Income/(Expense)

Other expenses for the year ended June 30, 2019 were \$1.7 million compared to other income of \$0.5 million in fiscal year 2018. The \$2.2 million increase in expense was due to higher interest expense of \$2.6 million offset by changes in the real estate contingent liability and derivative liabilities which resulted in income of \$0.4 million.

Net Loss

The Company recorded a net loss of \$29.2 million for the year ended June 30, 2019, compared to a net loss of \$21.7 million for the year ended June 30, 2018. The year-over-year incremental loss of \$7.5 million, or 34.5%, was primarily driven by an increase in interest expense of \$2.6 million, higher personnel costs of \$2.3 million (primarily related to research and development), and increased stock compensation costs of \$1.7 million. These increases were partially offset by reductions in the real estate contingent liability and derivative liabilities of \$0.4 million.

Liquidity and Capital Resources

Since inception, the Company has recorded approximately \$1.1 million and \$2.1 million of revenue from contract research and government grants, and microelectromechanical systems (“MEMS”) foundry and engineering review services, respectively. Our operations thus far have been funded primarily with contract research and government grants, foundry services, engineering services, sales of our equity securities, and debt.

The Company had \$30.2 million of cash on hand as of June 30, 2019, which reflects an increase of \$15.4 million compared to \$14.8 million as of June 30, 2018. The \$15.4 million increase is primarily due to \$37.8 million of cash proceeds from sales of common stock as well as convertible note offerings. Offsetting the cash proceeds were cash used in operating activities of \$17.6 million and cash used for capital expenditures of \$4.8 million.

Financing Activities

On May 14, 2018 the Company completed the offering of \$15.0 million principal amount of the Company’s 6.5% Convertible Senior Secured Notes due 2023. The net proceeds of the offering after payment of offering costs were approximately \$13.1 million. The notes will mature on May 31, 2023, unless earlier converted, redeemed or repurchased. Interest on the notes accrues at the rate of 6.5% per year and is payable at the Company’s option quarterly in cash and/or freely tradable shares of the Company’s common stock, subject to certain limitations. The notes may be converted into common stock at the option of the holder at any time prior to maturity at an initial conversion price of \$6.55 per share, subject to adjustment under certain circumstances. If the holder elects to convert the notes at any time on or after the date that is one year after the last date of original issuance of the notes and prior to May 31, 2021, the holder will also receive a make-whole payment equal to the remaining scheduled interest payments that would have been made on the notes converted had such notes remained outstanding through May 31, 2021 (the “put date”). At the Company’s option, make-whole payments may be paid in cash and/or freely tradable shares of the Company’s common stock.

On October 23, 2018 the Company completed the offering of \$10.0 million principal amount of the Company’s 6.5% Convertible Senior Notes due 2023. The notes are unsecured and rank pari passu with the Company’s outstanding unsubordinated liabilities, including its 6.5% Convertible Senior Secured Notes due 2023 issued in May 2018. The net proceeds of the offering after payment of offering costs were approximately \$8.9 million. The notes will mature on November 30, 2023, unless earlier converted, redeemed or repurchased. Interest on the notes accrues at the rate of 6.5% per year and is payable in cash on each February 28, May 31, August 31 and November 30, beginning February 28, 2019. The notes are convertible into common stock at the option of the holder at any time prior to maturity at an initial conversion price of \$5.10 per share, subject to adjustment under certain circumstances.

On October 23, 2018, the Company also sold a total of 7,250,000 shares of its common stock at a price to the public of \$4.25 per share for aggregate gross proceeds of \$30.8 million before deducting the underwriting discount and offering expenses payable by the Company of approximately \$2.1 million.

Balance Sheet and Working Capital

June 30, 2019 Compared to June 30, 2018

As of June 30, 2019, the Company had current assets of \$31.8 million made up primarily of cash on hand of \$30.2 million. As of June 30, 2018, current assets were \$15.9 million comprised primarily of cash on hand of \$14.8 million. The \$15.4 million increase is primarily due to \$37.5 million of cash proceeds from sales of common stock as well as convertible note offerings. Offsetting the cash proceeds were cash used in operating activities of \$17.6 million and cash used for capital expenditures of \$4.8 million.

Property, Plant and Equipment was \$15.2 million as of June 30, 2019 as compared to a balance of \$12.8 million as of the year ended June 30, 2018. The approximate \$2.4 million year-over-year increase is primarily due to the purchase of equipment for the NY facility of \$4.5 million and software of \$0.3 million primarily offset by depreciation of \$2.5 million.

Total assets as of June 30, 2019 and June 30, 2018 were \$47.9 million and \$29.3 million, respectively.

Current liabilities as of June 30, 2019 were \$3.2 million and increased year-over-year by \$0.6 million which was primarily due to vesting of employee related equity compensation.

Long-term liabilities totaled \$18.8 million as of June 30, 2019, compared to \$12.8 million for the prior year period. The increase of \$6.0 million was primarily due to the October 2018 convertible debt offering partially offset by a decrease in the real estate contingent liability of \$0.8 million.

Stockholders' equity was \$26.0 million as of June 30, 2019, compared to \$13.8 million as of June 30, 2018. Additional paid-in-capital ("APIC") was \$93.4 million as of June 30, 2018 and increased by \$41.3 million. The year-over-year increase was due to an increase from net proceeds of \$28.7 million for the issuance of common stock during the year, common stock issued for services in the amount of \$6.7 million, impact of beneficial conversion feature on convertible note of \$4.0 million and common stock issued in payment of convertible note interest of \$1.0 million. The \$12.2 million increase in stockholders' equity consisted of the \$41.3 million increase in APIC reduced by the \$29.2 million net loss recorded for the year ended June 30, 2019.

Cash Flow Analysis

Year Ended June 30, 2019 Compared to the Year Ended June 30, 2018

Operating activities used cash of \$17.7 million during the year ended June 30, 2019 and \$14.2 million for the 2018 comparative period. The \$3.4 million year-over-year increase in cash used was attributable to higher operating expenses associated with the ramp up of development and commercialization activities (primarily R&D personnel and material costs), higher spend on G&A costs for support personnel and professional fees and increase in depreciation expense.

Investing activities used cash of \$4.9 million for the year ended June 30, 2019 compared to \$7.0 million for the comparative year ended June 30, 2018. The \$2.1 million year-over-year decrease was primarily due to decreased spend on R&D equipment.

Financing activities provided cash of \$37.9 million for the year ended June 30, 2019 versus \$26.4 million for the 2018 comparative period. The \$11.5 million increase was due to additional proceeds from common stock offset by lower proceeds from convertible notes issued during the period compared to the prior period.

Off-Balance Sheet Transactions

The Company did not engage in any "off-balance sheet arrangements" (as that term is defined in Item 303(a)(4)(ii) of Regulation S-K) as of June 30, 2019.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK.

Not applicable.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTAL DATA

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Shareholders and Board of Directors of
Akoustis Technologies, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Akoustis Technologies, Inc. and Subsidiary (the "Company") as of June 30, 2019 and 2018, the related consolidated statements of operations, changes in stockholders' equity and cash flows for each of the two years in the period ended June 30, 2019, and the related notes (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of June 30, 2019 and 2018, and the results of its operations and its cash flows for each of the two years in the period ended June 30, 2019, in conformity with accounting principles generally accepted in the United States of America.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) ("PCAOB"), the Company's internal control over financial reporting as of June 30, 2019, based on the criteria established in Internal Control - Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in 2013 and our report dated September 13, 2019, expressed an adverse opinion on the effectiveness of the Company's internal control over financial reporting because of the existence of material weaknesses.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ Marcum llp

Marcum llp

We have served as the Company's auditor since 2015.

New York, NY
September 13, 2019

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM
ON INTERNAL CONTROL OVER FINANCIAL REPORTING

To the Shareholders and Board of Directors of
Akoustis Technologies, Inc.

Adverse Opinion on Internal Control over Financial Reporting

We have audited Akoustis Technologies, Inc.'s (the "Company") internal control over financial reporting as of June 30, 2019, based on criteria established in *Internal Control-Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission. In our opinion, because of the effect of the material weaknesses described in the following paragraph on the achievement of the objectives of the control criteria, the Company has not maintained effective internal control over financial reporting as of June 30, 2019, based on criteria established in *Internal Control-Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission.

A material weakness is a control deficiency, or combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the Company's annual or interim financial statements will not be prevented or detected on a timely basis. The following material weaknesses have been identified and included in "Management's Annual Report on Internal Control Over Financial Reporting":

1. The Company did not design and implement effective Information Technology General Controls ("ITGC") for certain information systems that are relevant to the preparation of the Company's financial statements. Specifically, applications supporting the processes of payroll, cash management, fixed assets and financial close included deficiencies related to user access controls, change management, information technology operations and third party service providers. These ITGC deficiencies, combined with inadequate compensating review controls, create a reasonable possibility that a material misstatement to the consolidated financial statements will not be prevented or detected on a timely basis.
2. Management review controls designed to address risks associated with complex accounting matters that arise from significant routine and non-routine transactions – related to revenue, share-based compensation, research and development expense, and debt – to ensure that those transactions are properly accounted for in accordance with U.S. GAAP did not operate effectively.

These material weaknesses were considered in determining the nature, timing and extent of audit tests applied in our audit of the fiscal June 30, 2019 consolidated financial statements, and this report does not affect our report dated September 13, 2019 on those financial statements.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) ("PCAOB"), the consolidated balance sheets as of June 30, 2019 and June 30, 2018 and the related consolidated statements of operations, changes in shareholders' equity, and cash flows for each of the two years in the period ended June 30, 2019 of the Company and our report dated September 13, 2019 expressed an unqualified opinion on those financial statements.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying "Management Annual Report on Internal Control Over Financial Reporting". Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audit also included performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of the inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that degree of compliance with the policies or procedures may deteriorate.

/s/ Marcum llp

Marcum llp
New York, NY
September 13, 2019

Akoustis Technologies, Inc.
Consolidated Balance Sheets
(In thousands, except per share data)

	<u>June 30,</u> <u>2019</u>	<u>June 30,</u> <u>2018</u>
Assets		
Assets:		
Cash and cash equivalents	\$ 30,154	\$ 14,817
Accounts receivable	285	215
Inventory	94	58
Other current assets	1,288	790
Total current assets	<u>31,821</u>	<u>15,880</u>
Property and equipment, net	15,178	12,820
Intangibles, net	388	264
Assets held for sale, net	300	333
Other assets	262	11
Total Assets	<u><u>\$ 47,949</u></u>	<u><u>\$ 29,308</u></u>
Liabilities and Stockholders' Equity		
Current Liabilities:		
Accounts payable and accrued expenses	\$ 3,211	\$ 2,593
Deferred revenue	5	53
Total current liabilities	<u>3,216</u>	<u>2,646</u>
Long-term Liabilities:		
Contingent real estate liability	445	1,230
Convertible notes payable, net	18,215	11,465
Other long-term liabilities	118	117
Total long-term liabilities	<u>18,778</u>	<u>12,812</u>
Total Liabilities	<u>21,994</u>	<u>15,458</u>
Stockholders' Equity		
Preferred Stock, par value \$0.001: 5,000,000 shares authorized; none issued and outstanding	—	—
Common stock, \$0.001 par value; 45,000,000 shares authorized; 30,140,955 and 22,203,437 shares issued and outstanding at June 30, 2019 and June 30, 2018, respectively	30	22
Additional paid in capital	93,399	52,074
Accumulated deficit	(67,474)	(38,246)
Total Stockholders' Equity	<u>25,955</u>	<u>13,850</u>
Total Liabilities and Stockholders' Equity	<u><u>\$ 47,949</u></u>	<u><u>\$ 29,308</u></u>

See accompanying notes to the consolidated financial statements.

Akoustis Technologies, Inc.
Consolidated Statements of Operations
(In thousands, except per share data)

	For the Year Ended June 30, 2019	For the Year Ended June 30, 2018
Revenue	\$ 1,443	\$ 1,208
Cost of revenue	<u>1,013</u>	<u>1,020</u>
Gross profit	<u>430</u>	<u>188</u>
Operating expenses		
Research and development	19,246	13,267
General and administrative expenses	8,701	8,804
Loss on disposal of fixed assets	50	45
Impairment of assets held for sale	—	350
Total operating expenses	<u>27,997</u>	<u>22,466</u>
Loss from operations	<u>(27,567)</u>	<u>(22,278)</u>
Other (expense) income		
Interest (expense) income	(2,886)	(329)
Rental income	270	313
Change in fair value of contingent real estate liability	785	501
Change in fair value of derivative liabilities	150	54
Total Other (expense) income	<u>(1,681)</u>	<u>539</u>
Net loss	<u>\$ (29,248)</u>	<u>\$ (21,739)</u>
Net loss per common share - basic and diluted	<u>\$ (1.06)</u>	<u>\$ (1.04)</u>
Weighted average common shares outstanding - basic and diluted	<u>27,512,426</u>	<u>20,928,235</u>

See accompanying notes to the consolidated financial statements.

Akoustis Technologies, Inc.
Consolidated Statement of Changes in Stockholders' Equity
For the Years Ended June 30, 2019 and 2018
(In thousands)

	Common Stock		Additional Paid In Capital	Accumulated Deficit	Stockholders' Equity
	Shares	Amount			
Balance, June 30, 2017	19,075	\$ 19	\$ 31,500	\$ (16,507)	\$ 15,012
Common stock issued for cash, net of issuance costs	3,183	3	13,197	—	13,200
Warrants issued to underwriter	—	—	(646)	—	(646)
Common stock issued for services	131	—	5,617	—	5,617
Common stock issued for exercise of warrants	18	—	75	—	75
Intrinsic value of beneficial conversion feature	—	—	1,809	—	1,809
Vesting of restricted shares	—	—	522	—	522
Repurchase and retirement of common shares	(204)	—	—	—	—
Net loss	—	—	—	(21,739)	(21,739)
Balance, June 30, 2018	22,203	\$ 22	\$ 52,074	\$ (38,246)	\$ 13,850
Cumulative-effect adjustment from adoption of ASC 606	—	—	—	20	20
Common stock issued for cash, net of issuance costs	7,363	8	28,652	—	28,660
Common stock issued for services	291	—	6,684	—	6,684
Common stock issued for exercise of options	29	—	200	—	200
Common stock issued for exercise of warrants	92	—	70	—	70
ESPP purchase	17	—	99	—	99
Intrinsic value of beneficial conversion feature	—	—	3,951	—	3,951
Vesting of restricted shares	—	—	648	—	648
Common stock issued in payment of note interest	167	—	1,021	—	1,021
Repurchase and retirement of common shares	(21)	—	—	—	—
Net loss	—	—	—	(29,248)	(29,248)
Balance, June 30, 2019	30,141	\$ 30	\$ 93,399	\$ (67,474)	\$ 25,955

See accompanying notes to the consolidated financial statements.

Akoustis Technologies, Inc.
Consolidated Statements of Cash Flows
(In thousands)

	For the Year Ended June 30, 2019	For the Year Ended June 30, 2018
CASH FLOWS FROM OPERATING ACTIVITIES:		
Net loss	\$ (29,248)	\$ (21,739)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and Amortization	2,497	1,263
Stock-based compensation	7,240	5,491
Non-cash interest payments	1,017	—
(Gain)/Loss on disposal of assets	(50)	45
Impairment on assets held for sale	—	350
Change in fair value of derivative liabilities	(150)	(54)
Amortization of debt discount	1,984	205
Change in fair value of contingent real estate liability	(785)	(501)
Changes in operating assets and liabilities:		
Accounts receivable	(70)	(215)
Inventory	(36)	131
Prepaid expenses	(42)	(147)
Other current asset	(420)	(441)
Other assets	(250)	(1)
Accounts payable and accrued expenses	710	1,258
Change in other long-term liabilities	—	117
Deferred revenue	(65)	38
Net Cash Used in Operating Activities	(17,668)	(14,200)
CASH FLOWS FROM INVESTING ACTIVITIES:		
Cash paid for machinery and equipment	(4,750)	(6,942)
Cash received from assets held for sale	33	—
Cash paid for intangibles	(174)	(73)
Net Cash Used in Investing Activities	(4,891)	(7,015)
CASH FLOWS FROM FINANCING ACTIVITIES:		
Proceeds from issuance of common stock	28,959	13,200
Proceeds from exercise of warrants	70	75
Proceeds received from convertible notes, net	8,867	13,125
Net Cash Provided by Financing Activities	37,896	26,400
Net Increase (Decrease) in Cash	15,337	5,185
Cash - Beginning of Period	14,817	9,632
Cash - End of Period	\$ 30,154	\$ 14,817
SUPPLEMENTARY CASH FLOW INFORMATION:		
Cash Paid During the Period for:		
Income taxes	\$ —	\$ —
Interest	\$ 443	\$ —
SUPPLEMENTARY DISCLOSURE OF NON-CASH INVESTING AND FINANCING ACTIVITIES:		
Stock compensation payable	\$ 93	\$ 3
Warrants issued for stock issuance costs	\$ —	\$ 646
Reclassification of fixed assets to assets held for sale, net	\$ 33	\$ 683
Vesting of restricted shares	\$ 648	\$ 522
Common stock issued in payment of note interest	\$ 1,021	\$ —
Debt issuance costs included in accounts payable and accrued expenses	\$ (30)	\$ 30
Intrinsic value of beneficial conversion feature	\$ 3,951	\$ 1,809

See accompanying notes to the consolidated financial statements.

AKOUSTIS TECHNOLOGIES, INC.
Notes to the Consolidated Financial Statements

Note 1. Organization

Akoustis Technologies, Inc (“the Company”) was incorporated under the laws of the State of Nevada on April 10, 2013. Effective December 15, 2016, the Company changed its state of incorporation from the State of Nevada to the State of Delaware. Through its subsidiary, Akoustis, Inc. (a Delaware corporation), the Company, headquartered in Huntersville, North Carolina, is focused on developing, designing, and manufacturing innovative RF filter products for the mobile wireless device industry, including for products such as smartphones and tablets, cellular infrastructure equipment, and WiFi premise equipment. Located between the device’s antenna and its digital backend, the RF front-end (“RFFE”) is the circuitry that performs the analog signal processing and contains components such as amplifiers, filters and switches. To construct the resonators that are the building blocks for the RF filter, we have developed a fundamentally new single-crystal acoustic materials and device technology manufactured with our proprietary XBAW process. Filters are critical in selecting and rejecting signals, and their performance enables differentiation in the modules defining the RFFE.

The Company’s common stock is listed on the Nasdaq Capital Market under the symbol AKTS.

Note 2. Liquidity

At June 30, 2019, the Company had cash and cash equivalents of \$30.2 million and working capital of \$28.6 million. The Company has historically incurred recurring operating losses and has experienced net cash used in operating activities of \$17.7 million for the year ended June 30, 2019.

As of September 06, 2019, the Company had \$24.5 million of cash and cash equivalents, which funds are expected to be sufficient to fund our operations beyond the next twelve months from the date of filing of this Form 10-K. These funds will be used to fund the Company’s operations, including capital expenditures, R&D, commercialization of our technology, development of our patent strategy and expansion of our patent portfolio, as well as to provide working capital and funds for other general corporate purposes. However, the Company has no commitments to obtain any additional funds, and there can be no assurance such funds will be available on acceptable terms or at all. If the Company is unable to obtain additional financing in a timely fashion and on acceptable terms, its financial condition and results of operations may be materially adversely affected and it may not be able to continue operations or execute its stated commercialization plan. However, the Company can mitigate this risk by actively managing and controlling cash outflows.

Note 3. Summary of significant accounting policies

Basis of presentation

The Company’s consolidated financial statements have been prepared in accordance with accounting principles generally accepted in the United States of America (“GAAP”) and the rules and regulations of the Securities and Exchange Commission (“SEC”).

Principles of Consolidation

The accompanying consolidated financial statements include the accounts of the Company and its wholly-owned subsidiary, Akoustis, Inc. All significant intercompany accounts and transactions have been eliminated in consolidation.

Use of estimates and assumptions

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date(s) of the financial statements and the reported amounts of revenues and expenses during the reporting period(s).

Critical accounting estimates are estimates for which (a) the nature of the estimate is material due to the levels of subjectivity and judgment necessary to account for highly uncertain matters or the susceptibility of such matters to change and (b) the impact of the estimate on financial condition or operating performance is material. The Company's critical accounting estimates and assumptions affecting the financial statements were:

- (1) *Fair value of long-lived assets:* Fair value is generally determined using the asset's expected future discounted cash flows or market value, if readily determinable. If long-lived assets are determined to be recoverable, but the newly determined remaining estimated useful lives are shorter than originally estimated, the net book values of the long-lived assets are depreciated over the newly determined remaining estimated useful lives. The Company considers the following to be some examples of important indicators that may trigger an impairment review: (i) significant under-performance or losses of assets relative to expected historical or projected future operating results; (ii) significant changes in the manner or use of assets or in the Company's overall strategy with respect to the manner or use of the acquired assets or changes in the Company's overall business strategy; (iii) significant negative industry or economic trends; (iv) increased competitive pressures; (v) a significant decline in the Company's stock price for a sustained period of time; and (vi) regulatory changes. The Company evaluates acquired assets for potential impairment indicators at least annually and more frequently upon the occurrence of such events.
- (2) *Valuation allowance for deferred tax assets:* Management assumes that the realization of the Company's net deferred tax assets resulting from its net operating loss ("NOL") carry forwards for Federal income tax purposes that may be offset against future taxable income was not considered more likely than not and accordingly, the potential tax benefits of the NOL carry forwards are offset by a full valuation allowance. Management made this assumption based on (a) the Company's incurrence of losses, (b) general economic conditions, and (c) other factors.
- (3) *Estimates and assumptions used in valuation of equity instruments:* Management estimates expected term of share options and similar instruments, expected volatility of the Company's common shares and the method used to estimate it, expected annual rate of quarterly dividends, and risk-free rate(s) to value share options and similar instruments.
- (4) *Estimates and assumptions used in valuation of derivative liabilities:* Management utilizes a Monte Carlo simulation to estimate the fair value of derivative liabilities, and utilizes the with-and-without method, a form of the income approach model to compute the fair value of its embedded derivatives associated with its convertible note. These models include subjective assumptions that can materially affect the fair value estimates.
- (5) *Estimates and assumptions used in valuation of the contingent real estate liability:* The fair value of the contingent liability was calculated by an independent third-party appraisal firm, utilizing a present value calculation based on the probability the Company sells the property triggering the contingent penalty which management estimates, and a discount rate. The discount rate was derived from a weighted average cost of capital, modified to include the effects of the bargain purchase price, and assumes a percentage chance of real estate sale.

These significant accounting estimates or assumptions bear the risk of change due to the fact that there are uncertainties attached to these estimates or assumptions, and certain estimates or assumptions are difficult to measure or value.

Management bases its estimates on various assumptions that are believed to be reasonable in relation to the financial statements taken as a whole under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results could differ from those estimates.

Cash and Cash Equivalents

The Company considers all highly liquid investments with an original maturity of three months or less when purchased to be cash equivalents. Financial instruments that potentially subject the Company to concentrations of credit risk consist primarily of cash deposits. The Company maintains its cash in institutions insured by the Federal Deposit Insurance Corporation ("FDIC"). At times, the Company's cash and cash equivalent balances may be uninsured or in amounts that exceed the FDIC insurance limits; as of June 30, 2019, approximately \$29.9 million was uninsured.

Inventory

Inventory is stated at the lower of cost or net realizable value using the first-in, first-out (FIFO) valuation method.

Property and equipment, net

Property and equipment are stated at cost less accumulated depreciation. Depreciation is calculated using the straight-line method on the various asset classes over their estimated useful lives, which range from two to eleven years. Expenditures for major renewals and betterments that extend the useful lives of property and equipment are capitalized. Expenditures for maintenance and repairs, which do not extend the economic useful life of the related assets, are charged to operations as incurred. The Company records gains or losses on the disposal of assets as the difference between net book value of assets and cash received less costs to dispose of assets. Gains or losses on the disposal of assets, as well as impairment of assets held for sale are recorded in operating expenses.

Intangible assets, net

Intangible assets consist of patents, trademarks and customer relationships. Applicable long-lived assets are amortized over the shorter of their estimated useful lives, the estimated period that the assets will generate revenue, or the statutory or contractual term in the case of patents. Estimates of useful lives and periods of expected revenue generation are reviewed for appropriateness and are based upon management's judgment. Patents are amortized on the straight-line method over their useful lives of 15 years.

Impairment of Long-Lived Assets

The Company assesses the recoverability of its long-lived assets, including property and equipment, when there are indications that the assets might be impaired. When evaluating assets for potential impairment, the Company compares the carrying value of the asset to its estimated undiscounted future cash flows. If an asset's carrying value exceeds such estimated undiscounted cash flows, the Company records an impairment charge for the difference between the carrying amount of the asset and its fair value.

Based on its assessments of equipment that is no longer needed as part of the XBAW single crystal manufacturing process, the Company recorded \$0.4 million of impairment charges on assets held for sale for the year ended June 30, 2018.

Fair Value of Financial Instruments

The carrying amounts of cash and cash equivalents and accounts payable approximate fair value due to the short-term nature of these instruments.

The Company measures the fair value of financial assets and liabilities based on the guidance of ASC 820, *Fair Value Measurements and Disclosures*, which defines fair value, establishes a framework for measuring fair value, and expands disclosures about fair value measurements.

ASC 820 defines fair value as the exchange price that would be received for an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. ASC 820 also establishes a fair value hierarchy, which requires an entity to maximize the use of observable inputs and minimize the use of unobservable inputs when measuring fair value.

Fair value measurements are categorized using a valuation hierarchy for disclosure of the inputs used to measure fair value, which prioritize the inputs into three broad levels:

Level 1 - Quoted prices are available in active markets for identical assets or liabilities as of the reporting date. Active markets are those in which transactions for the asset or liability occur in sufficient frequency and volume to provide pricing information on an ongoing basis.

Level 2 - Pricing inputs are other than quoted prices in active markets included in level 1, which are either directly or indirectly observable as of the reported date, and include those financial instruments that are valued using models or other valuation methodologies.

Level 3 - Pricing inputs include significant inputs that are generally less observable from objective sources. These inputs may be used with internally developed methodologies that result in management's best estimate of fair value.

Derivative Liability

The Company evaluates its options, warrants, convertible notes, or other contracts, if any, to determine if those contracts or embedded components of those contracts qualify as derivatives to be separately accounted for in accordance with paragraph 815-10-05-4 and Section 815-40-25 of the FASB Accounting Standards Codification. The result of this accounting treatment is that the fair value of the embedded derivative is marked-to-market each balance sheet date and recorded as either an asset or a liability. The change in fair value is recorded in the consolidated statement of operations as other income or expense. Upon conversion, exercise or cancellation of a derivative instrument, the instrument is marked to fair value at the date of conversion, exercise or cancellation and then the related fair value is reclassified to equity.

In circumstances where the embedded conversion option in a convertible instrument is required to be bifurcated and there are also other embedded derivative instruments in the convertible instrument that are required to be bifurcated, the bifurcated derivative instruments are accounted for as a single, compound derivative instrument.

The classification of derivative instruments, including whether such instruments should be recorded as liabilities or as equity, is re-assessed at the end of each reporting period. Equity instruments that are initially classified as equity that become subject to reclassification are reclassified to liability at the fair value of the instrument on the reclassification date. Derivative instrument liabilities will be classified in the balance sheet as current or non-current based on whether or not net-cash settlement of the derivative instrument is expected within 12 months of the balance sheet date.

The Company adopted Section 815-40-15 of the FASB Accounting Standards Codification ("Section 815-40-15") to determine whether an instrument (or an embedded feature) is indexed to the Company's own stock. Section 815-40-15 provides that an entity should use a two-step approach to evaluate whether an equity-linked financial instrument (or embedded feature) is indexed to its own stock, including evaluating the instrument's contingent exercise and settlement provisions.

The Company utilizes a Monte Carlo simulation to compute the fair value of the derivative liability and to mark to market the fair value of the derivative at each balance sheet date. The Company records the change in the fair value of the derivative as other income or expense in the consolidated statements of operations.

The Company utilizes the with-and-without method, a form of the income approach model to compute the fair value of its embedded derivatives associated with its convertible note. The fair value of the embedded derivatives represents the difference in the present value of anticipated cash flows assuming the feature is present as compared to a security without the same feature. The Company records the change in the fair value of the derivative as other income or expense in the consolidated statements of operations.

Research and Development

Research and development expenses are charged to operations as incurred.

Stock-based compensation

The Company recognizes compensation expense for all equity-based payments in accordance with ASC 718 "*Compensation – Stock Compensation*". Under fair value recognition provisions, the Company recognizes –based compensation net of actual forfeitures and recognizes compensation cost only for those shares expected to vest over the requisite service period of the award.

Restricted stock awards are granted at the discretion of the Company. These awards are restricted as to the transfer of ownership and generally vest over the requisite service periods, typically over a four-year period (generally vesting either ratably over the first four years or on a tier basis of 50% on the second anniversary of the effective date and 25% on the third and fourth anniversary dates). The fair value of a stock award is equal to the fair market value of a share of Company stock on the grant date.

The fair value of an option award is estimated on the date of grant using the Black–Scholes option valuation model. The Black–Scholes option valuation model requires the development of assumptions that are inputs into the model. These assumptions are the value of the underlying share, the expected stock volatility, the risk-free interest rate, the expected life of the option, and the dividend yield on the underlying stock. Expected volatility is calculated using the historical volatilities of the Company's common stock traded on the Nasdaq Capital Market. Risk-free interest rates are calculated based on continuously compounded risk-free rates for the appropriate term. The dividend yield is assumed to be zero as the Company has never paid or declared any cash dividends on its Common stock and does not intend to pay dividends on its Common stock in the foreseeable future. The Company accounts for the impact of forfeitures as they occur.

Determining the appropriate fair value model and calculating the fair value of equity-based payment awards requires the input of the subjective assumptions described above. The assumptions used in calculating the fair value of equity-based payment awards represent management's best estimates, which involve inherent uncertainties and the application of management's judgment. As a result, if factors change and the Company uses different assumptions, equity-based compensation could be materially different in the future. In addition, the Company is required to account for the impact of forfeitures as those forfeitures occur. If the Company's actual forfeitures are material, the equity-based compensation could be significantly different from what the Company has recorded in the current period.

The Company accounts for share-based payments granted to non-employees in accordance with ASC 505-40, "*Equity Based Payments to Non-Employees*". The Company determines the fair value of the stock-based payment as either the fair value of the consideration received or the fair value of the equity instruments issued, whichever is more reliably measurable. If the fair value of the equity instruments issued is used, it is measured using the stock price and other measurement assumptions as of the earlier of either (1) the date at which a commitment for performance by the counterparty to earn the equity instruments is reached, or (2) the date at which the counterparty's performance is complete. The fair value of the equity instruments is re-measured each reporting period over the requisite service period.

Income taxes

In determining income for financial statement purposes, the Company must make certain estimates and judgments in the calculation of tax expense, the resultant tax liabilities, and in the recoverability of deferred tax assets that arise from temporary differences between the tax and financial statement recognition of revenue and expense.

As part of the financial process, the Company assesses on a tax jurisdictional basis the likelihood that the Company's deferred tax assets can be recovered. If recovery is not more likely than not (a likelihood of less than 50 percent), the provision for taxes must be increased by recording a reserve in the form of a valuation allowance for the deferred tax assets that are estimated not to ultimately be recoverable. In this process, certain relevant criteria are evaluated including: the amount of income or loss in prior years, the existence of deferred tax liabilities that can be used to absorb deferred tax assets, future expected taxable income, and prudent and feasible tax planning strategies. Changes in taxable income, market conditions, U.S. or international tax laws, and other factors may change the Company's judgment regarding whether the Company will be able to realize the deferred tax assets. These changes, if any, may require material adjustments to the net deferred tax assets and an accompanying reduction or increase in income tax expense which will result in a corresponding increase or decrease in net income in the period when such determinations are made.

As part of the Company's financial process, the Company also assess the likelihood that the Company's tax reporting positions will ultimately be sustained. To the extent it is determined it is more likely than not (a likelihood of more than 50 percent) that some portion or all of a tax reporting position will ultimately not be recognized and sustained, a provision for unrecognized tax benefit is provided by either reducing the applicable deferred tax asset or accruing an income tax liability. The Company's judgment regarding the sustainability of the Company's tax reporting positions may change in the future due to changes in U.S. or international tax laws and other factors. These changes, if any, may require material adjustments to the related deferred tax assets or accrued income tax liabilities and an accompanying reduction or increase in income tax expense which will result in a corresponding increase or decrease in net income in the period when such determinations are made. The Company recognizes interest and penalties related to uncertain tax positions in selling, general and administrative expenses.

Loss Per Share

Basic net loss per common share is computed by dividing net loss attributable to common stockholders by the weighted-average number of common shares outstanding during the period. Diluted net loss per common share is determined using the weighted-average number of common shares outstanding during the period, adjusted for the dilutive effect of common stock equivalents. In periods when losses are reported, which is the case for the years ended June 30, 2019 and 2018 presented in these consolidated financial statements, the weighted-average number of common shares outstanding excludes common stock equivalents because their inclusion would be anti-dilutive.

The Company had the following common stock equivalents at June 30, 2019 and 2018:

	June 30, 2019	June 30, 2018
Convertible Notes	4,960,800	2,290,077
Options	2,127,317	1,338,859
Warrants	633,343	748,572
Total	<u>7,721,460</u>	<u>4,377,508</u>

Shares Outstanding

Shares outstanding include shares of restricted stock with respect to which restrictions have not lapsed. Restricted stock included in reportable shares outstanding was 265,000 shares and 734,561 shares as of June 30, 2019 and 2018, respectively. Shares of restricted stock are included in the calculation of weighted average shares outstanding.

Recently Issued Accounting Pronouncements

Accounting Pronouncements Not Yet Effective

In February 2016, the FASB issued Accounting Standards Update (“ASU”) 2016-02, “Leases (Topic 842),” with multiple amendments subsequently issued, which will require that lease arrangements be presented on the lessee’s balance sheet by recording a right-of-use asset and a lease liability equal to the present value of the related future minimum lease payments. This standard will be effective for the Company in the first quarter of fiscal 2020. The Company plans to elect the optional transition method that allows lessees to apply the new guidance as of the adoption date and recognize any cumulative-effect adjustment to the opening balance of retained earnings in the period of adoption. Upon adoption, the Company expects to elect the transition package of practical expedients which allows the Company (1) to not reassess whether any expired or existing contracts are leases, or contain leases, (2) to not reassess the lease classification for any expired or existing leases, and (3) to not reassess initial direct costs for any existing leases. Further, upon implementation of the new guidance, the Company intends to elect the practical expedient to not separate lease and non-lease components for all leases and account for the combined lease and non-lease components as a single lease component. The Company also plans to make an accounting policy election to exclude leases with an initial term of 12 months or less from the balance sheet. The Company expects to record a right-of-use asset and lease liability for substantially all operating lease arrangements, which is expected to approximate the present value of the Company’s future minimum lease obligations pertaining to its operating leases as disclosed in Note 11. Any new lease arrangements or material modifications entered into subsequent to the adoption date will be accounted for in accordance with the new standard. The new guidance will not have a significant impact on its Consolidated Statements of Operations or its Consolidated Statements of Cash Flows.

In June 2018, the Financial Accounting Standards Board (FASB) issued Accounting Standards Update (ASU) No. 2018-07, *Compensation – Stock Compensation (Topic 718): Improvements to Nonemployee Share-Based Payment Accounting*. Under the new standard, companies will no longer be required to value non-employee awards differently from employee awards. Companies will value all equity classified awards at their grant-date under ASC 718 and forgo revaluing the award after the grant date. ASU 2018-07 is effective for annual reporting periods beginning after December 15, 2018, including interim reporting periods within that reporting period. The Company plans to adopt during the first interim reporting period of fiscal year 2020 and does not believe it will have a significant impact on its consolidated financial statements.

Accounting Pronouncements Recently Adopted

In January 2017, the FASB issued ASU 2017-01, “Business Combinations (Topic 805): Clarifying the Definition of a Business” which clarifies the definition of a business and provides further guidance for evaluating whether a transaction will be accounted for as an acquisition of an asset or a business. The Company adopted ASU 2017-01 in the first quarter of fiscal 2019 and there was no impact to the Company’s Consolidated Financial Statements.

In August 2016, the FASB issued ASU 2016-15, “Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments (a consensus of the FASB’s Emerging Issues Task Force)” which addresses eight specific cash flow issues with the objective of reducing the existing diversity in practice. The Company adopted ASU 2016-15 in the first quarter of fiscal 2019. The Company’s historical policies were consistent with the guidance in this standard, and therefore, there was no impact to the Company’s Consolidated Financial Statements.

In January 2016, the FASB issued ASU 2016-01, “Financial Instruments - Overall (Subtopic 825-10): Recognition and Measurement of Financial Assets and Financial Liabilities” which affects the accounting for equity investments, financial liabilities measured under the fair value option and presentation and disclosure requirements for financial instruments. In addition, the FASB clarified guidance related to the assessment of valuation allowances when recognizing deferred tax assets related to unrealized losses on available-for-sale debt securities. The Company adopted ASU 2016-01 in the first quarter of fiscal 2019 and there was no material impact to the Company’s Consolidated Financial Statements.

In May 2014, the FASB issued ASU 2014-09, “Revenue from Contracts with Customers (Topic 606),” with several amendments subsequently issued, which provided an updated framework for revenue recognition, resulting in a single revenue model to be applied by reporting companies under accounting principles generally accepted in the United States (“U.S. GAAP”). Under this model, recognition of revenue occurs when a customer obtains control of promised goods or services in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. The Company adopted ASU 2014-09 in the first quarter of fiscal 2019 for open contracts using the modified retrospective approach through a cumulative adjustment to “Accumulated deficit” in the Consolidated Balance Sheet for the fiscal year beginning July 1, 2018. The impact from the cumulative-effect adjustment was \$20 thousand. The Company implemented changes to its accounting policies, internal controls and disclosures (footnote 4) to support the new standard.

In November 2016, the FASB issued ASU 2016-18, “*Statement of Cash Flows (Topic 230)*”, requiring that the statement of cash flows explain the change in the total cash, cash equivalents, and amounts generally described as restricted cash or restricted cash equivalents. This guidance is effective for fiscal years, and interim reporting periods therein, beginning after December 15, 2017 with early adoption permitted. The provisions of this guidance are to be applied using a retrospective approach which requires application of the guidance for all periods presented. The Company’s historical policies were consistent with the guidance in this standard, and therefore, there was no impact to the Company’s Consolidated Financial Statements.

In May 2017, the FASB issued ASU 2017-09, “*Compensation—Stock Compensation (Topic 718): Scope of Modification Accounting*,” which provides guidance about which changes to the terms or conditions of a stock-based payment award require an entity to apply modification accounting in Topic 718. The Company does not believe it will have a significant impact on its consolidated financial statements.

In July 2017, the FASB issued ASU 2017-11, “*Earnings Per Share (Topic 260), Distinguishing Liabilities from Equity (Topic 480) and Derivatives and Hedging (Topic 815): I. Accounting for Certain Financial Instruments with Down Round Features; II. Replacement of the Indefinite Deferral for Mandatorily Redeemable Financial Instruments of Certain Nonpublic Entities and Certain Mandatorily Redeemable Noncontrolling Interests with a Scope Exception*”. Part I of this update addresses the complexity of accounting for certain financial instruments with down round features. Down round features are features of certain equity-linked instruments (or embedded features) that result in the strike price being reduced on the basis of the pricing of future equity offerings. Current accounting guidance creates cost and complexity for entities that issue financial instruments (such as warrants and convertible instruments) with down round features that require fair value measurement of the entire instrument or conversion option. Part II of this update addresses the difficulty of navigating Topic 480, Distinguishing Liabilities from Equity, because of the existence of extensive pending content in the FASB Accounting Standards Codification. This pending content is the result of the indefinite deferral of accounting requirements about mandatorily redeemable financial instruments of certain nonpublic entities and certain mandatorily redeemable noncontrolling interests. The amendments in Part II of this update do not have an accounting effect. This ASU is effective for fiscal years, and interim periods within those years, beginning after December 15, 2018. The Company adopted this update during Q4 of fiscal year 2018 with no impact on its financial statements.

In March 2018, the FASB issued ASU 2018-05, “*Income Taxes (Topic 740): Amendments to SEC Paragraphs Pursuant to SEC Staff Accounting Bulletin No. 118*.” The amendments incorporate into the ASC the recent SEC guidance related to the income tax accounting implications of the Tax Cuts and Jobs Act (the “Tax Act”). See Note 13 for further disclosures.

Note 4. Revenue Recognition from Contracts with Customers

Effective as of July 1, 2018, the Company adopted Accounting Standards Codification (“ASC”) Topic 606, “Revenue from Contracts with Customers” (“ASC 606”). The core principle of ASC 606 requires that an entity recognize revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the company expects to be entitled in exchange for those goods or services. ASC 606 defines a five-step process to achieve this core principle and, in doing so, it is possible more judgment and estimates may be required within the revenue recognition process than required under existing U.S. GAAP including identifying performance obligations in the contract, estimating the amount of variable consideration to include in the transaction price and allocating the transaction price to each separate performance obligation.

To achieve this core principle, the Company applies the following five steps:

Step 1 - Identify the Contract with the Customer - A contract exists when (a) the parties to the contract have approved the contract and are committed to perform their respective obligations, (b) the entity can identify each party’s rights regarding the goods or services to be transferred, (c) the entity can identify the payment terms for the goods or services to be transferred, (d) the contract has commercial substance and (e) it is probable that the entity will collect substantially all of the consideration to which it will be entitled in exchange for the goods or services that will be transferred to the customer.

Step 2 - Identify Performance Obligations in the Contract - Upon execution of a contract, the Company identifies as performance obligations each promise to transfer to the customer either (a) goods or services that are distinct or (b) a series of distinct goods or services that are substantially the same and have the same pattern of transfer to the customer. To the extent a contract includes multiple promised goods or services, the Company must apply judgement to determine whether the goods or services are capable of being distinct within the context of the contract. If these criteria are not met, the goods or services are accounted for as a combined performance obligation. The Company considers the performance obligation in a product sale to be title transfer of the specified product to the customer. The transfer of title occurs according to the purchase order (contract) specification. The Company considers performance obligations related to foundry fabrication services to be title transfer of the specified product or prototype to the customer. The transfer of title occurs according to the purchase order (contract) specification. In the absence of title transfer language, transfer occurs at the time of shipment.

Step 3 - Determine the Transaction Price - The transaction price is determined based on the consideration to which the Company will be entitled in exchange for transferring products or services to the customer. Generally, all contracts include fixed consideration. If a contract did include variable consideration, the Company would determine the amount of variable consideration that should be included in the transaction price based on the expected value method. Variable consideration would be included in the transaction price, if in the Company’s judgement, it is probable that a significant future reversal of cumulative revenue under the contract would not occur.

Step 4 - Allocate the Transaction Price - After the transaction price has been determined, the next step is to allocate the transaction price to each performance obligation in the contract. If the contract only has one performance obligation, the entire transaction price will be applied to that obligation. If the contract has multiple performance obligations, the transaction price is allocated to the performance obligations based on the relative standalone selling price (SSP) at contract inception.

Step 5 - Satisfaction of the Performance Obligations (and Recognition of Revenue) - When an asset is transferred, and the customer obtains control of the asset (or the services are rendered), the Company recognizes revenue. At contract inception, the Company determines if each performance obligation is satisfied at a point in time or over time. The Company will recognize sales of its product in the period that title of the product is transferred to the customer. The Company will evaluate foundry fabrication services contracts on a case by case basis as they vary with regards to enforceable right and alternative use. If an unrestricted, enforceable right and no alternative use exists, the Company will recognize revenue over time utilizing the input method which the Company considers to be the best method of measuring progress toward complete satisfaction of the performance obligation. However, if either of these does not exist, the Company will recognize revenue at a point in time based on title transfer of the final prototype or specified product.

Disaggregation of Revenue

The Company's primary revenue streams include foundry fabrication services and product sales.

Foundry Fabrication Services

Foundry fabrication services revenue includes microelectromechanical systems ("MEMS") foundry services and Non-Recurring Engineering ("NRE"). Under these contracts, products are delivered to the customer at the completion of the service which represents satisfaction of the performance obligation as well as change of control. Depending on language with regards to enforceable right to payment for performance completed to date, related revenue will either be recognized over time or at a point in time.

Product Sales

Product sales revenue consists of sales of RF filters and amps which are sold with contract terms stating that title passes, and the customer takes control at the time of shipment. Revenue is then recognized when the devices are shipped, and the performance obligation has been satisfied. If devices are sold under contract terms that specify that the customer does not take ownership until the goods are received, revenue is recognized when the customer receives the goods.

The following table summarizes the revenues of the Company's reportable segments for the year ended June 30, 2019, (in thousands):

	Foundry Fabrication Services Revenue	Product Sales Revenue	Total Revenue with Customers
MEMS	\$ 540	—	\$ 540
NRE - RF Filters	518	—	518
Filters/Amps	—	276	276
Total	<u>\$ 1,058</u>	<u>\$ 276</u>	<u>\$ 1,334</u>

Performance Obligations

The Company has determined that contracts for product sales revenue and foundry fabrication services revenue involve one performance obligation, which is delivery of the final product.

Contract Balances

The Company records a receivable when the title for goods has transferred. Generally, all sales are contract sales (with either an underlying contract or purchase order), resulting in all receivables being contract receivables. When invoicing occurs prior to revenue recognition a contract liability is recorded (as deferred revenue on the Consolidated Balance Sheet).

The following table summarizes the changes in revenue recognition for the year ended June 30, 2019, (in thousands):

	Deferred Revenue
Balance, June 30, 2018	\$ 53
Revenue recognized from prior year	(53)
Year to date invoicing in excess of revenue recognition	5
Balance, June 30, 2019	<u>\$ 5</u>

Additionally, when revenue recognition occurs prior to invoicing, a contract asset is recognized.

The following table summarizes the changes in contract assets, included in Other current assets on the Consolidated Balance Sheet, for the year ended June 30, 2019:

	Contract assets
Balance, June 30, 2018	\$ —
Year to date revenue recognition in excess of billings	140
Balance, June 30, 2019	<u>\$ 140</u>

Backlog of Remaining Customer Performance Obligations

Revenue expected to be recognized and recorded as sales during the next fiscal year from the backlog of performance obligations that are unsatisfied (or partially unsatisfied) was \$0.5 million at June 30, 2019.

Grant Revenue

From time to time the Company applies for grants from various government bodies (state & federal), such as the National Science Foundation (“NSF”), to support research and development. In addition, the Company is eligible for “matching awards” from state boards to provide additional funds to the Company to supplement the funds awarded under the federal grant program. The Company records grant revenue as a part of revenue from operations due to the fact that grant revenue is viewed as an ongoing function of its intended operations. The Company recorded \$109 thousand in grant revenue for the year ended June 30, 2019. The revenue from grants is not viewed as “incidental” or “peripheral” which would result in the presentation of grant revenue as “Other income”. The Company recognizes nonrefundable grant revenue when the performance obligations have been met, application has been submitted and approval is reasonably assured.

Note 5. Property and equipment

Property and equipment consisted of the following as of June 30, 2019 and 2018 (in thousands):

	June 30, 2019	June 30, 2018	Estimated Useful Life
Land	\$ 1,000	\$ 1,000	n/a
Building	3,000	3,000	11 years
Equipment	13,611	9,126	2-10 years
Leasehold Improvements	949	885	*
Software	161	42	3 years
Furniture & Fixtures	11	14	5 years
Computer Equipment	203	117	3 years
Total	<u>18,935</u>	<u>14,184</u>	
Less: Accumulated depreciation	<u>(3,757)</u>	<u>(1,364)</u>	
Total	<u>\$ 15,178</u>	<u>\$ 12,820</u>	

(*) Leasehold improvements which are amortized on a straight-line basis over the term of the lease or the estimated useful lives, whichever is shorter.

The Company recorded depreciation expense of \$2,447 thousand and \$1,248 thousand for the years ended June 30, 2019 and 2018, respectively.

As of June 30, 2019, equipment with a net book value totaling \$2,582 thousand were not placed in service and therefore not depreciated during the period. As of June 30, 2018, fixed assets with a net book value totaling \$436 thousand were not placed in service and therefore not depreciated during the period.

Note 6. Accounts payable and accrued expenses

Accounts payable and accrued expenses consisted of the following at June 30, 2019 and June 30, 2018 (in thousands):

	June 30, 2019	June 30, 2018
Accounts payable	\$ 245	\$ 139
Accrued salaries and benefits	735	505
Accrued bonuses	817	750
Accrued professional fees	315	293
Accrued utilities	193	103
Accrued interest	135	127
Accrued good received not invoiced	69	160
Other accrued expenses	702	516
Totals	\$ 3,211	\$ 2,593

Note 7. Derivative Liabilities

The table below provides a summary of the changes in fair value, including net transfers in and/or out, of all financial assets and liabilities measured at fair value on a recurring basis using significant unobservable inputs (Level 3) during the years ended June 30, 2019 and 2018 (in thousands):

	Fair Value Measurement Using Level 3 Inputs Total
Balance, June 30, 2017	\$ —
Issuance of derivative feature of make whole provision in convertible note	703
Issuance of derivative feature of change in control provision in convertible note	456
Change in fair value of derivative warrant liabilities	(54)
Balance, June 30, 2018	\$ 1,105
Change in fair value of derivative liabilities	(150)
Balance, June 30, 2019	955

The fair value of the derivative features of the convertible note on the issuance dates, and at the balance sheet date were calculated using the with-and-without method, a form of the income approach, valued with the following weighted average assumptions:

	June 30, 2019	June 30, 2018
Remaining term (years)	3.92	4.92
Expected volatility	49%	42%
Risk free interest rate	1.73%	2.73%
Dividend yield	0.00%	0.00%

Risk-free interest rate: The Company uses the risk-free interest rate of a U.S. Treasury Bill with a similar term on the date of the issuance.

Dividend yield: The Company uses a 0% expected dividend yield as the Company has not paid dividends to date and does not anticipate declaring dividends in the near future.

Volatility: The Company estimated the expected volatility of the stock price based on the corresponding volatility of the Company's peer group stock price for a period consistent with the convertible note's expected term.

Remaining term: The Company's remaining term is based on the remaining contractual term of the convertible note.

Note 8. Convertible Notes

The following table summarizes convertible debt as of June 30, 2019 (in thousands):

	<u>Maturity Date</u>	<u>State Interest Rate</u>	<u>Conversion Price</u>	<u>Face Value</u>	<u>Remaining Debt (Discount)</u>	<u>Fair Value of Embedded Conversion Option</u>	<u>Carrying Value</u>
Long Term convertible notes payable							
6.5% convertible senior secured notes	5/31/2023	6.50%	\$ 5.00	\$ 15,000	\$ (6,825)	\$ 955	\$ 9,130
6.5% convertible senior notes	11/30/2023	6.50%	\$ 5.10	\$ 10,000	\$ (915)	\$ —	\$ 9,085
Ending Balance as of June 30, 2019				<u>\$ 25,000</u>	<u>\$ (7,740)</u>	<u>\$ 955</u>	<u>\$ 18,215</u>

The following table summarizes convertible debt as of June 30, 2018 (in thousands):

	<u>Maturity Date</u>	<u>State Interest Rate</u>	<u>Conversion Price</u>	<u>Face Value</u>	<u>Remaining Debt (Discount)</u>	<u>Fair Value of Embedded Conversion Option</u>	<u>Carrying Value</u>
Long Term convertible notes payable							
6.5% convertible senior secured notes	5/31/2023	6.50%	\$ 6.55	\$ 15,000	\$ (4,640)	\$ 1,105	\$ 11,465
Ending Balance as of June 30, 2018				<u>\$ 15,000</u>	<u>\$ (4,640)</u>	<u>\$ 1,105</u>	<u>\$ 11,465</u>

May 2018 Notes

On May 14, 2018, the Company completed the offering of \$15.0 million principal amount of the Company's 6.5% Convertible Senior Secured Notes due 2023. The net proceeds of the offering after payment of offering costs were approximately \$13.1 million. The notes will mature on May 31, 2023, unless earlier converted, redeemed or repurchased. Interest on the notes accrues at the rate of 6.5% per year and is payable quarterly at the Company's option in cash and/or freely tradable shares of the Company's common stock, subject to certain limitations. The notes may be converted into common stock at the option of the holder at any time prior to maturity at an initial conversion price of \$6.55 per share, subject to adjustment under certain circumstances. If the holder elects to convert the notes at any time on or after the date that is one year after the last date of original issuance of the notes and prior to May 31, 2021, the holder will also receive a make-whole payment equal to the remaining scheduled interest payments that would have been made on the notes converted had such notes remained outstanding through May 31, 2021 (the "put date"). At the Company's option, make-whole payments may be paid in cash and/or freely tradable shares of the Company's common stock.

As a result of the Company issuing new shares of common stock for a price to the public of \$4.25 per share in October 2018, the Company adjusted the conversion price of the convertible notes from \$6.55 per share to \$5.00 per share pursuant to the terms of the Indenture.

In addition, the Company identified a beneficial conversion feature in relation to the conversion option of the notes. The fair value of the conversion option of \$1,809 thousand was recorded as a debt discount with a corresponding credit to additional paid in capital. As a result of the decrease of the conversion price of the convertible notes due to the October 2018 common stock offering, the associated beneficial conversion feature was increased by \$3,951 thousand and recorded as a debt discount with a corresponding credit to additional paid in capital.

The Company recorded total debt discount and debt issuance costs of \$4,845 thousand, to be amortized over three years using an effective interest method. Debt discount and debt issuance costs include the fair value of the embedded features at the issuance date of \$1,159 thousand, the intrinsic value of the beneficial conversion feature of \$1,809 thousand, and debt issuance costs paid totaling \$1,877 thousand.

October 2018 Notes

On October 23, 2018 the Company completed the offering of \$10.0 million principal amount of the Company's 6.5% Convertible Senior Notes due 2023. The notes are unsecured and rank pari passu with the Company's outstanding unsubordinated liabilities, including its 6.5% Convertible Senior Secured Notes due 2023 issued in May 2018. The net proceeds of the offering after payment of offering costs were approximately \$8.9 million. The notes will mature on November 30, 2023, unless earlier converted, redeemed or repurchased. Interest on the notes accrues at the rate of 6.5% per year and is payable in cash on each February 28, May 31, August 31 and November 30, beginning February 28, 2019. The notes are convertible into common stock at the option of the holder at any time prior to maturity at an initial conversion price of \$5.10 per share, subject to adjustment under certain circumstances.

The Company may redeem the notes, at its option and in whole or in part, at a redemption price equal to 100% of the principal amount of Notes plus accrued and unpaid interest on such principal up to the redemption date, as follows: (1) on or after November 30, 2019 until November 29, 2020, if the closing sale price per share of the Common Stock exceeds 175% of the then-effective conversion price of the notes for each of 20 of any 30 consecutive trading days immediately preceding the optional redemption notice delivered by the Company; (2) on or after November 30, 2020 until November 29, 2021, if the closing sale price per share of the Common Stock exceeds 150% of the then-effective conversion price of the notes for each of 20 of any 30 consecutive trading days immediately preceding the optional redemption notice delivered by the Company and (3) on or after November 30, 2021, if the closing sale price per share of the Common Stock exceeds 125% of the then-effective conversion price of the notes for each of 20 of any 30 consecutive trading days immediately preceding the optional redemption notice delivered by the Company. Upon redemption, each noteholder will receive an interest make-whole payment equal to the remaining scheduled interest payments that would have been made on the redeemed notes had the notes remained outstanding through the Maturity Date, which will be paid in cash; provided, however, that so long as the Make-Whole VWAP Price (as defined below) is not less than \$5.01 per share (as appropriately adjusted for any stock split, reverse stock split, stock dividend or other reclassification or combination of our common stock occurring after the date of issuance of the notes offered hereby), the Company will have the option to pay interest make-whole payments in freely tradable shares of Common Stock valued at the product of (x) 95% and (y) the volume weighted average price of Common Stock for the ten trading days ending on and including the trading day immediately preceding the redemption date (such product, the "Make-Whole VWAP Price").

Each holder of notes will have a one-time right to require the Company to repurchase on November 30, 2021 for cash all (but not less than all) of the notes of such holder at a purchase price equal to 100% of the principal amount of the notes to be repurchased, plus accrued and unpaid interest on such principal, if any, up to such repurchase date. In addition, if a "fundamental change" (as defined in the indenture) occurs prior to the maturity date, subject to certain conditions, holders of the notes will have the right to require the Company to repurchase for cash all of the notes, or any portion thereof that is equal to \$1,000 or an integral multiple of \$1,000, at a purchase price equal to 100% of the principal amount of the notes to be repurchased, plus accrued and unpaid interest on such principal, if any, up to such repurchase date.

The Company analyzed the components of the convertible notes for embedded derivatives and the application of the corresponding accounting treatment. This analysis determined that certain features of the notes represented derivatives that require bifurcation from the host contract. The fair value of these components of \$0 was recorded as a debt discount and will be adjusted to fair value at the end of each future reporting period.

Note 9. Concentrations

Customers

Revenue from significant customers, those representing 10% or more of revenue for the respective periods, are summarized as follows:

	2019	2018
Customer 1	31%	37%
Customer 2	—	24%
Customer 3	—	14%
Customer 4	12%	—

Note 10. Stockholders' Equity

Equity Issuances

December 2017 Offering

During the year ended June 30, 2018, the Company sold a total of 2,640,819 shares of its common stock at \$5.50 per share in a private placement for aggregate gross proceeds of \$14.5 million before deducting commissions and expenses of approximately \$1.3 million. In addition to the commissions and expenses paid, the Company issued to the placement agents warrants to purchase 154,177 shares of the Company's common stock. The warrants represent a cost of the offering, have a grant date fair value of \$646 thousand and are shown as an offset on the consolidated statements of changes in stockholders' equity.

The fair values of the warrants were estimated at the dates of grant using a binomial option pricing model with the following weighted average assumptions:

Expected term (years)	5.50
Risk-free interest rate	2.12%
Volatility	69%
Dividend yield	0%

Investors in the December 2017 Offering (other than directors, officers, employees, or other affiliates of the Company) were given price-protected anti-dilution rights such that if, prior to September 30, 2018, the Company issued additional shares of Common Stock or Common Stock equivalents (subject to customary exceptions, including but not limited to issuances of awards under equity compensation plans and certain other issuances of securities in connection with credit arrangements, equipment financings, lease arrangements or similar transactions) for a consideration per share less than the December 2017 Offering price per share (as adjusted for any subsequent stock dividend, stock split, distribution, recapitalization, reclassification, reorganization or similar event) (the "Lower Price"), each such investor would be entitled to receive from the Company additional shares of Common Stock in an amount such that, when added to the number of shares of Common Stock initially purchased by such investor, will equal the number of shares of Common Stock that such investor's subscription amount would have purchased at the greater of the Lower Price and \$5.00 (or \$4.40 in the case of one investor).

During the year ended June 30, 2018, the Company also issued 542,450 shares of its common stock to investors in the Company's private placement offering that closed in May 2017. These issuances were made pursuant to the price-protection provisions granted to such investors in their subscription agreements.

October 2018 Offering

During the quarter ended December 31, 2018, the Company sold a total of 7,250,000 shares of its common stock at a price to the public of \$4.25 per share for aggregate gross proceeds of \$30.8 million before deducting the underwriting discount and offering expenses payable by the Company of approximately \$2.1 million. The Company expects to use the proceeds of the offering to fund the Company's operations and growth of its business, including for capital expenditures, working capital, research and development, the commercialization of its technology and other general corporate purposes.

During the year ended June 30, 2019, the Company also issued 113,592 shares of its common stock to investors in the Company's private placement that closed in May 2017. These issuances were made pursuant to the price-protection provisions granted to such investors in their subscription agreements.

Equity incentive plans

On May 22, 2015, the Board of Directors adopted, and on the same date the stockholders approved, the 2015 Equity Incentive Plan (the "2015 Plan"), which reserved a total of 1,200,000 shares of common stock for issuance under the 2015 Plan. The 2015 Plan authorized the grant to participants of nonqualified stock options, incentive stock options, restricted stock awards, restricted stock units, performance grants. Effective December 15, 2016, equity awards were granted under the Company's 2016 Stock Incentive Plan (the "2016 Plan"), which was approved stockholders on the same date. Effective November 1, 2018, equity awards are granted under the Company's 2018 Stock Incentive Plan (the "2018 Plan"), which was approved stockholders on the same date. No additional shares will be issued under the 2015 Plan or the 2016 Plan. The Company settles awards issued under all plans with newly issued common shares.

In addition, the number of shares of our common stock subject to the 2015 Plan, 2016 Plan and 2018 Plan, any number of shares subject to any numerical limit in the Plans, and the number of shares and terms of any incentive awards thereunder would be adjusted in the event of any change in our outstanding common stock by reason of any stock dividend, spin-off, split-up, stock split, reverse stock split, recapitalization, reclassification, merger, consolidation, liquidation, business combination or exchange of shares or similar transaction.

Options granted under the 2015 Plan, 2016 Plan and 2018 Plan vest as determined by the Company's board of directors and expire over varying terms, but not more than ten years from the date of grant. In the case of an Incentive Stock Option that is granted to a 10% shareholder on the date of grant, such Option shall not be exercisable after the expiration of five years from the date of grant.

The fair values of the Company's options were estimated at the dates of grant using a Black-Scholes option pricing model with the following weighted average assumptions:

	June 30, 2019	June 30, 2018
Exercise price	\$3.78 – \$8.18	\$6.24 – \$7.59
Expected term (years)	4.00 – 7.00	4.00 – 7.00
Risk-free interest rate	1.89 – 2.97%	1.76-2.81%
Volatility	66 – 69%	67-70%
Dividend yield	0%	0%
Weighted Average Grant Date Fair Value of Options granted during the period	\$2.88	\$3.82

Expected term: The Company's expected term is based on the period the options are expected to remain outstanding. The Company estimated this amount utilizing the "Simplified Method" in that the Company does not have sufficient historical experience to provide a reasonable basis to estimate an expected term.

Risk-free interest rate: The Company uses the risk-free interest rate of a U.S. Treasury Note with a similar term on the date of the grant.

Volatility: The Company calculates the expected volatility of the stock price using the historical volatilities of the Company's common stock traded on the Nasdaq Capital Market.

Dividend yield: The Company uses a 0% expected dividend yield as the Company has not paid dividends to date and does not anticipate declaring dividends in the near future.

The following is a summary of the option activity:

	Options	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Term (in years)	Aggregate Intrinsic Value (in thousands)
Outstanding – June 30, 2018	1,338,859	6.06		
Granted	992,455	5.04		
Exercised	(29,250)	6.83		
Forfeited/Cancelled	(174,747)	6.12		
Outstanding – June 30, 2019	2,127,317	5.57	5.90	2,204
Exercisable – June 30, 2019	610,359	5.17	5.53	832

The total intrinsic value of options exercised during the fiscal years ended June 30, 2019 and June 30, 2018 was \$20 thousand and \$0, respectively.

As of June 30, 2019, the Company has \$2.8 million in unrecognized stock-based compensation expense attributable to the outstanding options, which will be amortized over a period of two years.

For the years ended June 30, 2019 and 2018, the Company recorded \$7.2 million and \$5.5 million, respectively, in stock-based compensation which is reflected in total operating expenses in the consolidated statements of operations as follows (in thousands):

	2019	2018
Research and Development	\$ 4,182	\$ 2,424
General and Administrative	\$ 3,058	\$ 3,067
Total	\$ 7,240	\$ 5,491

Restricted Stock Units and Restricted Stock Awards

A summary of unvested restricted stock awards (“RSAs”) and restricted stock unit awards (“RSUs”) outstanding as of June 30, 2019 and changes during the year ended is as follows:

	Number of RSAs/RSUs	Weighted Average Fair Value per Share/Unit
Outstanding - June 30, 2018	<u>1,599,055</u>	<u>\$ 5.73</u>
Granted	720,380	6.21
Vested	(754,930)	5.54
Forfeited/Cancelled/Repurchased	(222,123)	5.86
Outstanding – June 30, 2019	<u>1,342,382</u>	<u>6.01</u>

The weighted average grant date fair value per share for awards granted during the fiscal years ended June 30, 2019 and June 30, 2018 was \$6.21 and \$6.61, respectively. The total fair value of restricted awards that vested during the fiscal years ended June 30, 2019 and June 30, 2018 was \$4.9 million and \$3.8 million, respectively.

During the years ended June 30, 2019 and 2018, the Company recorded stock-based compensation expense of \$4.2 million and \$3.8 million, respectively related to the RSAs and RSUs that have been issued to date.

As of June 30, 2019, the Company had approximately \$4.2 million in unrecognized stock-based compensation expense related to the unvested shares.

Performance Awards

In September 2018 the Company granted 119,500 performance-based restricted stock units (PBRUSU) to employees with a grant date fair value per share of \$8.30. The PBRUSU awards contain performance and service conditions which must be satisfied for an employee to earn the award. The performance condition is based primarily on the achievement of certain performance objectives. Once earned, the PBRUSU awards vest 100% on the first anniversary of the grant date. The Company recognizes compensation expense for PBRUSU awards using a graded vesting model, based on the probability of the performance condition being met. During the year, 119,500 of the PBRUSU awards were earned.

A summary of unvested PBRUSU’s outstanding as of June 30, 2019 and changes during the year ended is as follows:

	Number of PBRUSUs	Weighted Average Fair Value per Share/Unit
Outstanding - June 30, 2018	<u>15,000</u>	<u>\$ 6.26</u>
Granted	119,500	8.30
Vested	(15,000)	6.26
Forfeited/Cancelled/Repurchased	—	—
Outstanding – June 30, 2019	<u>119,500</u>	<u>8.30</u>

The weighted average grant date fair value per share for awards granted during the fiscal years ended June 30, 2019 and June 30, 2018 was \$8.30 and \$6.26, respectively. The total fair value of restricted awards that vested during the fiscal years ended June 30, 2019 and June 30, 2018 was \$0.1 million and \$0, respectively.

During the years ended June 30, 2019 and 2018, the Company recorded stock-based compensation expense of \$0.63 million and \$0.03 million, respectively related to the PBRUSU awards that have been issued to date.

As of June 30, 2019, the Company had approximately \$177 thousand in unrecognized stock-based compensation expense related to the 120 thousand unvested PBRUSU awards.

Employee Stock Purchase Plan

Effective November 1, 2018, the Company adopted the Akoustis Technologies, Inc. Employee Stock Purchase Plan 2018 (the “ESPP”), which was approved by the stockholders on the same date. The ESPP is intended to qualify as an “employee stock purchase plan” under Section 423 of the Code. All regular full-time employees of the Company (including officers) and all other employees who meet the eligibility requirements of the plan may participate in the ESPP. The ESPP provides eligible employees an opportunity to acquire the Company’s common stock at 85.0% of the lower of the closing price per share of the Company’s common stock on the first or last day of each six-month purchase period. At June 30, 2019, 0.48 million shares were available for future issuance under this plan. The Company makes no cash contributions to the ESPP but bears the expenses of its administration. The Company issued 0.02 million, and 0.0 million shares under the ESPP in fiscal years 2019 and 2018, respectively. The Company settles awards issued under the ESPP with newly issued common shares.

For the years ended June 30, 2019 and 2018, the Company recorded \$0.04 million and \$0.00 million, respectively, in stock-based compensation related to grants of ESPP shares.

Note 11. Commitments and contingencies

Operating leases

The Company leased three office locations in Huntersville, NC pursuant to five- and three-year lease agreements, and month to month. The three-year lease agreement expired in April 2018 in connection with a move in corporate office location, and the five-year lease agreement expires in November 2022. The operating leases provide for annual real estate tax and cost of living increases and contain predetermined increases in the rentals payable during the terms of the leases. The aggregate rent expense is recognized on a straight-line basis over the lease term. The total lease rental expense was \$0.1 million and \$0.1 million for the years ended June 30, 2019 and 2018, respectively.

The Company leases equipment for the NY Facility until September 2023. The aggregate rent expense is recognized on a straight-line basis over the lease term. The total lease rental expense was \$0.1 million, and \$0.1 million for the years ended June 30, 2019 and 2018, respectively. Additionally, the Company leases a copier for the NC office location pursuant to a five-year lease agreement. The total lease rental expense was \$6 thousand and \$1 thousand for the years ended June 30, 2019 and 2018.

The following table outlines the minimum future lease payments for the next five years and thereafter, (in thousands):

June 30,		
2020	\$	171
2021		175
2022		179
2023		183
2024		153
Thereafter		71
Total	\$	932

Ontario County Industrial Development Authority Agreement

On February 27, 2018, the Company entered into a Lease and Project Agreement (the “Lease and Project Agreement”) and a Company Lease Agreement (the “Company Lease Agreement”) and together with the Lease and Project Agreement, the “Agreements”), each dated as of February 1, 2018, with the Ontario County Industrial Development Agency, a public benefit corporation of the State of New York (the “OCIDA”). Pursuant to the Agreements, the Company will lease for \$1.00 annually to the OCIDA an approximately 9.995 acre parcel of land in Canandaigua, New York, together with the improvements thereon (including the Company’s New York fabrication facility), and transfer title to certain related equipment and personal property to the OCIDA (collectively, the “Facility”). The OCIDA will lease the Facility back to the Company for annual rent payments specified in the Lease and Project Agreement for the Company’s primary use as research and development, manufacturing, warehouse and professional office space in its business, and to be subleased, in part, by the Company to various existing tenants. The Company estimates substantial tax savings during the term of the Agreements, which expire on December 31, 2028. In addition, subject to the terms of the Lease and Project Agreement, certain purchases and leases of eligible items will be exempt from the imposition of sales and use taxes. Subject to the terms of the Lease and Project Agreement, the OCIDA has also granted to the Company an exemption from certain mortgage recording taxes for one or more mortgages securing an aggregate principal amount not to exceed \$12.0 million, or such greater amount as approved by the OCIDA in its sole and absolute discretion. The benefits provided to the Company pursuant to the terms of the Lease and Project Agreement are subject to claw back over the life of the Agreements upon certain recapture events, including certain events of default.

Real Estate Contingent Liability

On March 23, 2017, we entered into an Asset Purchase Agreement and a Real Property Purchase Agreement (collectively, the “STC-MEMS Agreements”) with The Research Foundation for the State University of New York (“RF-SUNY”) and Fuller Road Management Corporation (“FRMC”), an affiliate of RF-SUNY (collectively, “Sellers”), respectively, to acquire certain specified assets, including STC-MEMS, a semiconductor wafer-manufacturing and microelectromechanical systems (“MEMS”) operation with associated wafer-manufacturing tools, and the associated real estate and improvements located in Canandaigua, New York used in the operation of STC-MEMS (the assets and real estate and improvements referred to together herein as the “STC-MEMS Business”).

In connection with the acquisition of the STC-MEMS Business, the Company agreed to pay to FRMC a penalty, as set forth below, if the Company sells the property subject to the related Definitive Real Property Purchase Agreement within three (3) years after the date of such agreement for an amount in excess of \$1,750 thousand, subject to certain enumerated exceptions. The penalty imposed shall be equivalent to the amount that the sales price of the property exceeds \$1,750 thousand up to the maximum penalty (“Maximum Penalty”) defined below, (in thousands):

	Maximum Penalty
Year 3, ending March 23, 2020	\$ 445

The fair value of the contingent liability was calculated by an independent third-party appraisal firm, utilizing a present value calculation based on the probability the Company sells the property triggering the contingent penalty and a discount rate of 15.6%. The 15.6% discount rate was derived from a weighted average cost of capital, modified to include the effects of the bargain purchase price. As of June 30, 2019, and 2018, the fair value of the contingent liability was \$0.4 million and \$1.2 million, respectively. During the year ended June 30, 2019 and 2018, the Company marked the contingent liability to fair value and recorded a gain of \$0.8 million and \$0.5 million, respectively, relating to the change in fair value.

Litigation, Claims and Assessments

From time to time, the Company may become involved in lawsuits, investigations and claims that arise in the ordinary course of business. The Company believes it has meritorious defenses against all pending claims and intends to vigorously pursue them. While it is not possible to predict or determine the outcomes of any pending actions, the Company believes the amount of liability, if any, with respect to such actions, would not materially affect its financial position, results of operations or cash flows.

During the year ended June 30, 2019, the Company ended the employment of its principal financial officer, John T. Kurtzweil (the "Former CFO"). The Former CFO's employment was terminated for cause pursuant to the terms of his employment agreement by unanimous vote of the Company's Board of Directors and not due to any disagreement concerning the Company's financial statements, accounting policies or accounting practices. The Former CFO disputes the termination for cause and has since filed for an arbitration hearing pursuant to the terms of his employment agreement and has filed a complaint under the whistleblower provisions of the Sarbanes Oxley Act of 2002 with the Occupational Safety and Health Administration of the U.S. Department of Labor. The Company has not recorded a loss contingency associated with the Former CFO's termination. In accordance with the Former CFO's employment agreement, if it is determined that grounds for termination were for cause then the expense to the Company would be \$0. A determination that grounds were without cause would result in the cash expenditure of approximately \$206 thousand representing 1 years' salary, COBRA and cost of living expense, and prorated bonus up to the date of termination. Additionally, the Company would record a non-cash expense of approximately \$883 thousand representing the immediate full vesting of restricted stock units and stock options on the date of termination.

Tax Credit Contingency

The Company accrues a liability for indirect tax contingencies when it believes that it is both probable that a liability has been incurred and that it can reasonably estimate the amount of the loss. The Company reviews these accruals and adjusts them to reflect ongoing negotiations, settlements, rulings, advice of legal counsel and other relevant information. To the extent new information is obtained and the Company's views on the probable outcomes of claims, suits, assessments, investigations or legal proceedings change, changes in the Company's accrued liabilities would be recorded in the period in which such determination is made.

The Company's gross unrecognized indirect tax credits totaled \$0.1 million as of June 30, 2019 and \$0.1 million as of June 30, 2018 and is recorded on the Consolidated Balance Sheet as a long-term liability.

Note 12. Related Party Transactions

Consulting Services

AEG Consulting, a firm owned by one of the Company's Co-Chairmen, received \$0 and \$10 thousand for consulting fees for the years ended June 30, 2019 and 2018, respectively.

On November 2, 2018, the Company granted the Co-Chairman 5,000 RSUs with a fair value on the grant date of \$19 thousand and stock options to purchase 10,000 shares of the Company's common stock with a fair value on the grant date of \$25 thousand for consulting services provided by AEG Consulting. Both awards vest in four equal installments on each of the first four anniversaries of the grant date. The options carry an exercise price of \$3.78 and have a term of 7 years.

On September 27, 2017, the Company granted the Co-Chairman 5,000 RSUs with a fair value on the grant date of \$36 thousand and stock options to purchase 10,000 shares of the Company's common stock with a fair value on the grant date of \$47 thousand for consulting services provided by AEG Consulting. Both awards vest in four equal installments on each of the first four anniversaries of the grant date. The options carry an exercise price of \$7.12 and have a term of 7 years.

Total stock-based compensation expense related to stock-based awards granted for the Co-Chairman's consulting services was \$51 thousand and \$26 thousand for the years ended June 30, 2019 and 2018, respectively.

Offering/Private Placement

On November 14, 2017, certain members of the Company's Board of Directors purchased shares of the Company's common stock at a price of \$5.50 per share in a private placement. One of the Company's Co-Chairmen purchased 154,545 shares at a price of \$5.50 per share for an aggregate purchase price of \$850 thousand. The other Co-Chairman purchased 1,818 shares at a price of \$5.50 per share for an aggregate purchase price of \$10 thousand. Three additional members of the Company's Board of Directors each purchased 5,454 shares at a price of \$5.50 per share for an aggregate purchase price of \$30 thousand for each such Board member.

On December 1, 2017 a brother of the Company's Chief Executive Officer purchased 12,000 shares of the Company's common stock in a private placement at a price of \$5.50 per share for an aggregate purchase price of \$66 thousand.

Note 13. Income Taxes

On December 22, 2017, the Tax Cuts and Jobs Act (“Tax Act”) was signed into law. ASC 740, Accounting for Income Taxes, requires companies to recognize the effects of changes in tax laws and rates on deferred tax assets and liabilities and the retroactive effects of changes in tax laws in the period in which the new legislation is enacted. Due to the timing of the Company’s fiscal year. The lower corporate tax rate was phased in, resulting in a U.S. statutory federal rate of approximately 27.6% for our fiscal year ended June 30, 2018 and 21% for subsequent fiscal years.

The SEC issued Staff Accounting Bulletin No. 118 (“SAB 118”) to address the appropriate accounting treatment when a registrant does not have the necessary information available, prepared, or analyzed (including computations) in reasonable detail to complete the accounting for certain income tax effects of the Tax Act.

In the fiscal year ended June 30, 2018, the deferred tax assets and liabilities of the Company were impacted by the Tax Act. The reduction in the U.S. federal corporate tax rate from 35% to 21% for tax years beginning after December 31, 2017, required the Company to remeasure its deferred tax assets and liabilities. In accordance with SAB 118, the Company evaluated this change and recorded a provisional decrease to net deferred tax assets with a corresponding decrease to the Company’s valuation allowance against deferred tax assets of \$4.6 million. We finalized our accounting for the impact of the Tax Act during fiscal 2019 with no material adjustments to the previous provisional amounts recognized.

Income Tax Expense

	June 30, 2019	June 30, 2018
Current:		
Federal	\$ —	\$ —
State and Local	—	—
Total Current Tax Provision	—	—
Deferred:		
Federal	—	—
State and Local	—	—
Total Deferred Tax Provision	—	—
Total Tax Provision	\$ —	\$ —

The provision for/(benefit from) income tax differs from the amount computed by applying the statutory federal income tax rate to income before the provision for/(benefit from) income taxes. The sources and tax effects of the differences are as follows:

	For the Year Ended June 30, 2019	For the Year Ended June 30, 2018
Income taxes at Federal statutory rate	(21.00)%	(27.55)%
State income taxes, net of Federal income tax benefit	(0.45)%	(1.96)%
Tax Credits	(1.45)%	(0.21)%
Permanent differences	(0.23)%	0.04%
Convertible Debt Discount	2.89%	1.90%
Other	(0.02)%	0.00%
Change in Valuation Allowance	18.92%	12.19%
Effect of changes in income tax rate applied to net deferred taxes	1.34%	15.59%
Income Tax Provision	0.00%	0.00%

The tax effects of temporary differences that give rise to the Company's deferred tax assets and liabilities are as follows, (in thousands):

	June 30, 2019	June 30, 2018
Deferred Tax Assets		
Net Operating Loss Carryforwards	\$ 13,196	\$ 7,849
Stock-based compensation	1,786	1,283
Credits	470	46
Other	346	514
	<u>15,798</u>	<u>9,692</u>
Deferred Tax Liabilities		
Convertible debt discount	(964)	(397)
Accumulated depreciation/basis differences	(925)	(919)
	<u>(1,889)</u>	<u>(1,316)</u>
Valuation Allowance	(13,909)	(8,376)
Net Deferred Tax Assets	\$ —	\$ —

At June 30, 2019, the Company had federal loss carryovers of approximately \$34.2 million that will expire in stages beginning in 2034 if unused and federal loss carryovers of \$26.5 million that will carry forward indefinitely. The North Carolina and New York state loss carryovers of approximately \$22.3 million and \$12.5 million, respectively, will begin to expire in 2029 if unused. Federal research credits of \$0.5 million will expire beginning in 2034 if not utilized.

The company has not performed a detailed analysis to determine whether an ownership change under IRC Section 382 has occurred during the year ended June 30, 2019 or during any earlier year. If upon a complete analysis the company were to determine that an ownership change under Section 382 had occurred the effect of the ownership change would be the imposition of annual limitations on the use of NOL carryforwards. Any limitation may result in the expiration of a portion or all of the NOLs before utilization.

Based on a history of cumulative losses at the Company and the results of operations for the years ended June 30, 2019 and 2018, the Company determined that it is more likely than not it will not realize benefits from the deferred tax assets. The Company will not record income tax benefits in the financial statements until it is determined that it is more likely than not that the Company will generate sufficient taxable income to realize the deferred income tax assets. As a result of the analysis, the Company determined that a full valuation allowance against the deferred tax assets is required. The net change in the valuation allowance during the year ended June 30, 2019 was an increase of approximately \$5.5 million.

The Company's gross unrecognized tax benefits totaled \$0.1 million as of June 30, 2019 and \$0.3 million as of June 30, 2018. Of these amounts, \$0.1 million and \$0.3 million as of June 30, 2019 and June 30, 2018, respectively, represent the amounts of unrecognized tax benefit that, if recognized, would impact the effective tax rate in each of the fiscal years.

A reconciliation of June 30, 2018 through June 30, 2019 beginning and ending amount of gross unrecognized tax benefits is as follows (in thousands):

	June 30, 2019	June 30, 2018
Beginning Balance	\$ 296	\$ —
Additions based on positions related to the current year	50	250
Additions for tax positions in prior years	—	46
Reductions for tax positions in prior years	(198)	—
Expiration of statute of limitations	—	—
Ending Balance	\$ 148	\$ 296

The unrecognized tax benefit of \$148 thousand at the end of June 30, 2019 is recorded on the Consolidated Balance Sheet as a reduction to the carrying value of the gross deferred tax assets.

The Company's fiscal 2015, 2016 and 2017 federal and state returns remain open for examination. The Company is not currently under examination by any taxing authorities.

Note 14. Segment Information

Operating segments are defined as components of an enterprise about which separate financial information is available and evaluated regularly by the chief operating decision maker, or decision-making group, in deciding how to allocate resources and in assessing performance. The Company's chief operating decision maker is its Chief Executive Officer. The Company operates in two segments, Foundry Fabrication Services which consists of engineering review services and STC-MEMS foundry services; and RF Filters which consists of amplifier and filter product sales, and grant revenue. The Company records all general and administrative costs in the RF Filters segment.

The Company evaluates performance of its operating segments based on revenue and operating profit (loss). Segment information for the years ended June 30, 2019 and 2018 are as follows (in thousands):

	Foundry Fabrication Services	RF Filters	Total
Year ended June 30, 2019			
Revenue	\$ 1,058	\$ 276	\$ 1,334
Grant revenue	-	109	109
Cost of revenue	<u>811</u>	<u>202</u>	<u>1,013</u>
Gross margin	247	183	430
Research and development	-	19,246	19,246
General and administrative	-	8,701	8,701
Other operating expenses	<u>50</u>	<u>-</u>	<u>50</u>
Income/(Loss) from Operations	\$ 197	\$ (27,764)	\$ (27,567)
Year ended June 30, 2018			
Revenue	\$ 1,007	\$ 54	\$ 1,061
Grant Revenue	-	147	147
Cost of revenue	<u>1,016</u>	<u>4</u>	<u>1,020</u>
Gross margin	(9)	197	188
Research and development	-	13,267	13,267
General and administrative	-	8,804	8,804
Other operating expenses	<u>-</u>	<u>395</u>	<u>395</u>
Loss from Operations	\$ (9)	\$ (22,269)	\$ (22,278)
As of June 30, 2019			
Accounts receivable	\$ 150	\$ 135	\$ 285
Property and equipment, net	54	15,124	15,178
As of June 30, 2018			
Accounts receivable	\$ 192	\$ 23	\$ 215
Property and equipment, net	465	12,355	12,820

Note 15. Subsequent Events

None

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None.

ITEM 9A. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

Our management is responsible for establishing and maintaining a system of disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act) that is designed to ensure that information required to be disclosed by us in the reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the Commission's rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by an issuer in the reports that it files or submits under the Exchange Act is accumulated and communicated to the issuer's management, including its principal executive officer and principal financial officer, or persons performing similar functions, as appropriate to allow timely decisions regarding required disclosure.

We conducted an evaluation under the supervision and with the participation of our Chief Executive Officer and our Interim Chief Financial Officer of the effectiveness of the design and operation of our disclosure controls and procedures as of June 30, 2019. Based on that evaluation, our Chief Executive Officer and Interim Chief Financial Officer concluded that our disclosure controls and procedures were not effective as of such date due to the material weaknesses described below with respect to our internal control over financial reporting.

Management's Annual Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting for the Company. Our management assessed the effectiveness of our internal control over financial reporting as of June 30, 2019. In making this assessment, our management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO") in Internal Control Integrated Framework (2013).

A material weakness is a deficiency, or a combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the Company's annual or interim financial statements will not be prevented or detected on a timely basis.

Our management, including our chief executive officer and interim chief financial officer, assessed the effectiveness of the Company's internal control over financial reporting as of June 30, 2019. Based on this assessment, we identified the following material weaknesses in the Company's internal control over financial reporting:

1. The Company did not design and implement effective Information Technology General Controls ("ITGC") for certain information systems that are relevant to the preparation of the Company's financial statements. Specifically, applications supporting the processes of payroll, cash management, fixed assets and financial close included deficiencies related to user access controls, change management, information technology operations and third party service providers. These ITGC deficiencies, combined with inadequate compensating review controls, create a reasonable possibility that a material misstatement to the consolidated financial statements will not be prevented or detected on a timely basis.
2. Management review controls designed to address risks associated with complex accounting matters that arise from significant routine and non-routine transactions – related to revenue, share-based compensation, research and development expense, and debt – to ensure that those transactions are properly accounted for in accordance with U.S. GAAP did not operate effectively.

Notwithstanding the material weaknesses discussed above, our management has concluded that the consolidated financial statements included in this Annual Report on Form 10-K fairly present in all material respects our financial condition, results of operations and cash flows for the periods presented in conformity with generally accepted accounting principles.

The effectiveness of the Company's internal control over financial reporting as of June 30, 2019 has been audited by Marcum LLP, an independent registered public accounting firm, as stated in their report which appears herein.

Remediation Plan

As fiscal year 2019 was the first year that the Company was subject to an audit over of internal controls over financial reporting (Sarbanes Oxley section 404(b)), fiscal year 2020 will present the first opportunity to remediate the material weaknesses described above.

Remediation activities will include:

IT General Controls: During fiscal year 2020, key mitigating controls will be designed and implemented in the absence of full year coverage of SSAE-18 (SOC1) reports. Controls will include complementary entity user controls or other supporting documentation for applications used to support the financial statements.

Non-Routine Transaction Review: During fiscal year 2020, controls will be put in place in order to comprehensively review all non-routine, material transactions in order to ensure that they are accounted for properly. Specifically, requirements such as thresholds, level of documentation and compensating controls will be considered in the design process. This control will include members of the executive team and, if needed, the Company will employ the use of external subject matter experts.

Changes in Internal Control over Financial Reporting

There have been no changes in our internal control over financial reporting during the quarter ended June 30, 2019 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

ITEM 9B. OTHER INFORMATION

None.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

The information required by this Item is incorporated by reference to our Proxy Statement on Schedule 14A relating to our 2019 annual meeting of stockholders.

ITEM 11. EXECUTIVE COMPENSATION

The information required by this Item is incorporated by reference to our Proxy Statement on Schedule 14A relating to our 2019 annual meeting of stockholders.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDERS MATTERS

The information required by this Item is incorporated by reference to our Proxy Statement on Schedule 14A relating to our 2019 annual meeting of stockholders.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

The information required by this Item is incorporated by reference to our Proxy Statement on Schedule 14A relating to our 2019 annual meeting of stockholders.

ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES

The information required by this Item is incorporated by reference to our Proxy Statement on Schedule 14A relating to our 2019 annual meeting of stockholders.

PART IV

ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

The following Consolidated Financial Statements as set forth in Part II, Item 8 of this report are filed herein.

Consolidated Financial Statements

Consolidated Balance Sheets	F-4
Consolidated Statements of Income and Comprehensive Income	F-5
Consolidated Statements of Equity	F-6
Consolidated Statements of Cash Flows	F-7

Notes to Consolidated Financial Statements

Financial Statement Schedules

All financial statement schedules are omitted because they are not applicable or the required information is shown in the financial statements or notes thereto.

Exhibits

EXHIBIT INDEX

Exhibit Number	Description
2.1	<u>Plan of Conversion, dated December 15, 2016(incorporated by reference to Exhibit 2.1 to the Company's Current Report on Form 8-K filed with the SEC on December 16, 2016)</u>
2.2	<u>Definitive Asset Purchase Agreement dated March 23, 2017 by and between The Research Foundation for the State University of New York and the Company (incorporated by reference to Exhibit 2.1 to the Company's Current Report on Form 8-K filed with the SEC on March 24, 2017)</u>
2.3	<u>Definitive Real Property Purchase Agreement dated March 23, 2017, by and between Fuller Road Management Corporation and the Company (incorporated by reference to Exhibit 2.2 to the Company's Current Report on Form 8-K filed with the SEC on March 24, 2017)</u>
3.1	<u>Articles of Conversion of the Company, as filed with the Nevada Secretary of State on December 15, 2016(incorporated by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K filed with the SEC on December 16, 2016)</u>
3.2	<u>Certificate of Conversion of the Company, as filed with the Delaware Secretary of State on December 15, 2016(incorporated by reference to Exhibit 3.2 to the Company's Current Report on Form 8-K filed with the SEC on December 16, 2016)</u>
3.3	<u>Certificate of Incorporation, as filed with the Delaware Secretary of State on December 15, 2016(incorporated by reference to Exhibit 3.3 to the Company's Current Report on Form 8-K filed with the SEC on December 16, 2016)</u>
3.4	<u>Bylaws of the Company (incorporated by reference to Exhibit 3.4 to the Company's Current Report on Form 8-K filed with the SEC on December 16, 2016)</u>
4.1	<u>Indenture, dated as of May 14, 2018, by and among Akoustis Technologies Inc., Akoustis, Inc. and The Bank of New York Mellon Trust Company, N.A. (incorporated by reference to Exhibit 4.1 to the Company's Current Report on Form 8-K filed with the SEC on May 15, 2018)</u>
4.2	<u>Indenture, dated as of October 23, 2018, by and between the Company and The Bank of New York Mellon Trust Company, N.A.(incorporated by reference to Exhibit 4.1 to the Company's Current Report on Form 8-K filed with the SEC on October 23, 2018)</u>
4.3	<u>First Supplemental Indenture, dated as of October 23, 2018, by and between the Company and The Bank of New York Mellon Trust Company, N.A. (incorporated by reference to Exhibit 4.2 of the Company's Current Report on Form 8-K filed with the SEC on October 23, 2018)</u>
4.4	<u>Form of 6.5% Convertible Senior Note due November 30, 2023(incorporated by reference to Exhibit 4.3 of the Company's Current Report on Form 8-K filed with the SEC on October 23, 2018)</u>
4.5	<u>Form of Supplemental Indenture, dated as of October 18, 2018, among the Company, Akoustis, Inc. and The Bank of New York Mellon Trust Company, N.A. (incorporated by reference to Exhibit 4.4 of the Company's Current Report on Form 8-K filed with the SEC on October 23, 2018)</u>
10.1.1†	<u>Akoustis, Inc. 2014 Stock Plan(incorporated by reference to Exhibit 10.10 to the Company's Transition Report on Form 10-K filed with the SEC on October 31, 2016)</u>
10.1.2†	<u>Form of Restricted Stock Purchase Agreement under the 2014 Stock Plan between the Company (as assignee of Akoustis, Inc.) and each of Steve DenBaars, Mark Boomgarden and Arthur Geiss (incorporated by reference to Exhibit 10.12 to the Company's Current Report on Form 8-K filed with the SEC on May 29, 2015)</u>
10.1.3†	<u>Form of Amendment to Restricted Stock Purchase Agreement under the 2014 Stock Plan between the Company and each of Steve DenBaars and Mark Boomgarden (incorporated by reference to Exhibit 10.18 to the Company's Annual Report on Form 10-K filed with the SEC on June 29, 2016)</u>
10.1.4†	<u>Declaration of Amendment to the Akoustis, Inc. 2014 Stock Plan (incorporated by reference to Exhibit 10.2 to the Company's Quarterly Report on Form 10-Q filed with the SEC on November 14, 2017)</u>
10.2	<u>Joint Development Agreement, dated February 27, 2015, between Akoustis, Inc. and Global Communication Semiconductors, LLC (incorporated by reference to Exhibit 10.13 to the Company's Current Report on Form 8-K filed with the SEC on May 29, 2015)</u>

10.3	<u>Foundry Agreement, dated February 27, 2015, between Akoustis, Inc. and Global Communication Semiconductors, LLC (incorporated by reference to Exhibit 10.14 to the Company's Current Report on Form 8-K filed with the SEC on May 29, 2015)</u>
10.4	<u>Form of 2015 Placement Agent Warrant for Common Stock of the Company in connection with the Company's 2015 private placement offering (incorporated by reference to Exhibit 10.8 to the Company's Current Report on Form 8-K filed with the SEC on May 29, 2015)</u>
10.5	<u>Form of 2015 Registration Rights Agreement (incorporated by reference to Exhibit 10.9 to the Company's Current Report on Form 8-K filed with the SEC on May 29, 2015)</u>
10.6.1†	<u>Akoustis Technologies, Inc. 2015 Equity Incentive Plan (incorporated by reference to Exhibit 10.10 to the Company's Current Report on Form 8-K filed with the SEC on May 29, 2015)</u>
10.6.2†	<u>Form of Stock Option Agreement under the Akoustis Technologies, Inc. 2015 Equity Incentive Plan (incorporated by reference to Exhibit 10.11 to the Company's Current Report on Form 8-K filed with the SEC on May 29, 2015)</u>
10.6.3†	<u>Form of Restricted Stock Agreement, under the Akoustis Technologies, Inc. 2015 Equity Incentive Plan, between the Company and each of Mark Boomgarden, Dave Aichele and Cindy Payne (incorporated by reference to Exhibit 10.17 to the Company's Annual Report on Form 10-K filed with the SEC on June 29, 2016)</u>
10.7†	<u>Employment Agreement between the Company and Jeffrey Shealy dated as of June 15, 2015 (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed with the SEC on June 19, 2015)</u>
10.8.1†	<u>Employment Agreement between the Company and David M. Aichele dated as of June 15, 2015 (incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K filed with the SEC on June 19, 2015)</u>
10.8.2†	<u>Offer Letter from the Company to David M. Aichele (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed with the SEC on May 30, 2017)</u>
10.9	<u>Form of 2016 Subscription Agreement between the Company and the investors party thereto (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed with the SEC on April 20, 2016)</u>
10.10	<u>Form of 2016 Placement Agent Warrant for Common Stock of the Company in connection with the Company's 2016 private placement offering (incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K filed with the SEC on April 20, 2016)</u>
10.11	<u>Form of 2016 Registration Rights Agreement (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed with the SEC on March 11, 2016)</u>
10.12.1	<u>Form of Registration Rights Agreement by and among the Company and the investors in the 2016-2017 Offering (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed with the SEC on November 25, 2016)</u>

- 10.14.2 [Amendment No. 1 to Registration Rights Agreement by and among the Company and the investors in the 2016-2017 Offering \(incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K filed with the SEC on December 28, 2016\)](#)
- 10.15 [Form of Placement Agent Warrant in the 2016-2017 Offering \(incorporated by reference to Exhibit 10.3 to the Company's Current Report on Form 8-K filed with the SEC on December 28, 2016\)](#)
- 10.21 [Form of Amended and Restated Placement Agent Warrant for Common Stock of the Company in connection with the Company's 2015 private placement offering and 2016 private placement offering \(incorporated by reference to Exhibit 10.12 to the Company's Quarterly Report on Form 10-Q filed with the SEC on February 14, 2017\)](#)
- 10.22.1† [Akoustis Technologies, Inc. 2016 Stock Incentive Plan \(incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed with the SEC on December 16, 2016\)](#)
- 10.22.2† [Form of Restricted Stock Award Agreement under the Akoustis Technologies, Inc. 2016 Stock Incentive Plan \(incorporated by reference to Exhibit 10.2 to the Company's Quarterly Report on Form 10-Q filed with the SEC on February 14, 2017\)](#)
- 10.22.3† [Revised Form of Restricted Stock Award Agreement under the Akoustis Technologies, Inc. 2016 Stock Incentive Plan \(incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed with the SEC on June 23, 2017\)](#)

- 10.23.1 [Form of Subscription Agreement by and among the Company and the investors in the 2017 Offering \(incorporated by reference to Exhibit 10.35 to the Company's Registration Statement on Form S-1 \(SEC File No. 333-218245\) filed with the SEC on May 25, 2017\)](#)
- 10.23.2 [Form of Amended Subscription Agreement by and among the Company and the investors in the 2017 Offering \(incorporated by reference to Exhibit 10.36 to the Company's Registration Statement on Form S-1 \(SEC File No. 333-218245\) filed with the SEC on May 25, 2017\)](#)
- 10.24 [Form of Registration Rights Agreement by and among the Company and the investors in the 2017 Offering \(incorporated by reference to Exhibit 10.37 to the Company's Registration Statement on Form S-1 \(SEC File No. 333-218245\) filed with the SEC on May 25, 2017\)](#)
- 10.25 [Form of Placement Agent Warrant in the 2017 Offering \(incorporated by reference to Exhibit 10.38 to the Company's Registration Statement on Form S-1 \(SEC File No. 333-218245\) filed with the SEC on May 25, 2017\)](#)
- 10.26 [Purchase Order for Deposition Tool \(incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed with the SEC on June 20, 2017\)](#)
- 10.27.1† [Employment Agreement by and between John T. Kurtzweil and the Company, dated July 14, 2017 \(incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed with the SEC on July 17, 2017\)](#)
- 10.27.2† [Form of Restricted Stock Award Agreement to be entered into by and between John T. Kurtzweil and the Company in connection with Mr. Kurtzweil's employment \(incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K filed with the SEC on July 17, 2017\)](#)
- 10.27.3† [Form of Option Agreement to be entered into by and between John T. Kurtzweil and the Company in connection with Mr. Kurtzweil's employment \(incorporated by reference to the Company's Current Report on Form 8-K filed with the SEC on July 17, 2017\)](#)
- 10.28† [Summary of Akoustis Technologies, Inc. Director Compensation Program, effective October 3, 2017 \(incorporated by reference to Exhibit 10.6 to the Company's Quarterly Report on Form 10-Q filed with the SEC on November 14, 2017\)](#)
- 10.30 [Form of Registration Rights Agreement by and among the Company and the investors in the 2017 Offering \(incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed with the SEC on November 17, 2017\)](#)

10.34	<u>Form of Placement Agent Warrant in the 2017 Offering (incorporated by reference to Exhibit 10.34 to the Company's Registration Statement on Form S-1 (SEC File No. 333-222552) filed with the SEC on January 16, 2018)</u>
10.35	<u>Purchase Agreement, dated as of May 10, 2018, by and among Akoustis Technologies, Inc., Akoustis, Inc. and Oppenheimer & Co. Inc., as representative of the several Initial Purchasers named in Schedule 1 thereto (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed with the SEC on May 15, 2018)</u>
10.36	<u>Registration Rights Agreement, dated as of May 14, 2018, by and among Akoustis Technologies, Inc., Akoustis, Inc. and Oppenheimer & Co. Inc., as representative of the several Initial Purchasers named in Schedule 1 thereto (incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K filed with the SEC on May 15, 2018)</u>
10.37	<u>Pledge and Security Agreement, dated as of May 14, 2018, by and among Akoustis Technologies, Inc., Akoustis, Inc. and The Bank of New York Mellon Trust Company, N.A., as Collateral Agent (incorporated by reference to Exhibit 10.3 to the Company's Current Report on Form 8-K filed with the SEC on May 15, 2018)</u>
10.38	<u>Grant Agreement, dated as of July 24, 2018, by and among Akoustis Technologies, Inc., Akoustis, Inc. and the Town of Canandaigua (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed with the SEC on July 27, 2018)</u>
10.39*††	<u>Price Quotation, dated January 14, 2019, by and between the Company and ASML US, LLC</u>
10.40*†	<u>Akoustis Technologies, Inc. 2018 Stock Incentive Plan</u>
10.41*†	<u>Akoustis Technologies, Inc. Employee Stock Purchase Plan</u>
21.1*	<u>Subsidiaries of the Company</u>
23.1*	<u>Consent of Marcum LLP</u>
31.1*	<u>Rule 13(a)-14(a)/15(d)-14(a) Certification of Principal Executive Officer</u>
31.2*	<u>Rule 13(a)-14(a)/15(d)-14(a) Certification of Principal Financial and Accounting Officer</u>
32.1*	<u>Section 1350 Certification of Principal Executive Officer</u>
32.2*	<u>Section 1350 Certification of Principal Financial and Accounting Officer</u>
101§*	<u>Interactive Data Files of Financial Statements and Notes.</u>
101.ins*	<u>Instant Document</u>
101.sch*	<u>XBRL Taxonomy Schema Document</u>
101.cal*	<u>XBRL Taxonomy Calculation Linkbase Document</u>
101.def*	<u>XBRL Taxonomy Definition Linkbase Document</u>
101.lab*	<u>XBRL Taxonomy Label Linkbase Document</u>
101.pre*	<u>XBRL Taxonomy Presentation Linkbase Document</u>

* Filed herewith
† Management contract or compensatory plan or arrangement
†† Confidential portions of this exhibit have been omitted.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, as amended, the Registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

AKOUSTIS TECHNOLOGIES, INC.

Dated: September 13, 2019

By: /s/ Jeffrey B. Shealy
Jeffrey B. Shealy
President and Chief Executive Officer

In accordance with the Exchange Act, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

<u>SIGNATURE</u>	<u>TITLE</u>	<u>DATE</u>
<u>/s/ Jeffrey B. Shealy</u> Jeffrey B. Shealy	Chief Executive Officer (Principal Executive Officer), Director	September 13, 2019
<u>/s/ Kenneth E. Boller</u> Kenneth E. Boller	Interim Chief Financial Officer (Principal Financial and Accounting Officer)	September 13, 2019
<u>/s/ Arthur E. Geiss</u> Arthur E. Geiss	Co-Chairman of the Board	September 13, 2019
<u>/s/ Jerry D. Neal</u> Jerry D. Neal	Co-Chairman of the Board	September 13, 2019
<u>/s/ Steven P. DenBaars</u> Steven P. DenBaars	Director	September 13, 2019
<u>/s/ Jeffrey K. McMahon</u> Jeffrey K. McMahon	Director	September 13, 2019
<u>/s/ Suzanne B. Rudy</u> Suzanne B. Rudy	Director	September 13, 2019

CERTAIN CONFIDENTIAL PORTIONS HAVE BEEN REDACTED FROM THIS EXHIBIT BECAUSE THEY ARE BOTH (i) NOT MATERIAL AND (ii) WOULD BE COMPETITIVELY HARMFUL IF PUBLICLY DISCLOSED. INFORMATION THAT HAS BEEN OMITTED HAS BEEN IDENTIFIED IN THIS DOCUMENT WITH A PLACEHOLDER IDENTIFIED BY THE MARK “[***]”.



CUSTOMER:

Akoustis, Inc. 5450 Campus
Drive
CANANDAIGU NY 14424
U.S.A.

QUOTATION NUMBER **20066744**
November 26, 2018

Valid to **December 26, 2018**

SHIP TO ADDRESS:

Akoustis, Inc.
5450 Campus Drive
CANANDAIGU NY 14424
U.S.A.

Dear Customer,

Thank you for your interest in ASML's equipment and related services. We are pleased to submit the following quotation for the REFURB LITE PAS 5500/100D RMS for your consideration. Included in this quotation are Pricing, Technical Specifications, and Sales Terms and Conditions, which are made part of this quotation.

This quote is subject to system availability of the REFURB LITE PAS 5500/100D RMS with used projection lens. Unavailability of such system could have an adverse impact on the lead time for such system. Consequently, a quoted delivery date is always a target date and the delivery date is only final if unconditionally confirmed in writing by ASML. ASML disclaims all liability resulting from a delay of delivery of a system as a result of unavailability.

We look forward to providing continued support and meeting your capital equipment needs. If you have any questions, or require additional information, please do not hesitate to contact your account manager. Sincerely,

/s/ Jerry Drube

Jerry Drube
President, ASML US, LLC

Tel. -
Fax. -



ASML US, LLC., 2650 W. Geronimo Place,
Chandler, AZ 85224, USA

ASML US, LLC.
2650 W. Geronimo Pl.
Chandler, AZ 85224 USA
(480) 696-2888, Fax (480) 214-7132

QUOTATION

QUOTATION NUMBER
November 26, 2018
Valid to **December 26, 2018**

20066744

REFURB LITE PAS 5500/100D RMS

I-line Wafer Stepper



AGREED AND ACCEPTED:

ASML US, LLC

By: _____

Name: _____

Its: _____

Date: _____

AKOUSTIS INC.

By: _____

Name: _____

Its: _____

Date: _____



Customer

Akoustis, Inc.
5450 Campus Drive
CANANDAIGUA NY 14424
U.S.A.

Account Manager

Tom Lichtenberg

Tel.
Fax.
E-mail TOM.LICHTENBERG@ASML.COM

Contents

1. Pricing
2. Configuration
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6. Installation & Warranty
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8. Delivery
9. Shipment
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1. Pricing

This price is applicable to ASML's standard configuration, including: features, specifications, customer support and sales terms and conditions as referenced within the contents of this quotation.

ITEM	MATERIAL NUMBER	DESCRIPTION	QTY	UNIT PRICE	EXTENDED PRICE	TOTAL DISCOUNT PRICE
Main System						
01	9428.999.60230-URL	REFURB LITE PAS 5500/100D RMS	1	EUR [***]	EUR [***]	EUR [***]
Field Upgr. & Access.						
02	9428.999.52670	THIN-WAFER CAPABILITY STEPPER PACKAGE	1	EUR [***]	EUR [***]	EUR [***]
03	9428.999.62010	FOUR CASSETTE INDEXERS (UF)	1	EUR [***]	EUR [***]	EUR [***]
04	9428.999.62100	PAS5500 SECS I and II INTERFACE UF	1	EUR [***]	EUR [***]	EUR [***]
05	9428.999.62490	IMAGE QUALITY CONTROL /1XX /2XX UF	1	EUR [***]	EUR [***]	EUR [***]
06	9428.999.62630	FOCAL SOFTWARE UF	1	EUR [***]	EUR [***]	EUR [***]
07	9428.999.63220	RETICLE: RASTER 6"	1	EUR [***]	EUR [***]	EUR [***]
08	9428.999.63540	RETICLE: OVERLAY MATRIX 22/6"	1	EUR [***]	EUR [***]	EUR [***]
09	9428.999.63550	RETICLE: RESOLVE-22	1	EUR [***]	EUR [***]	EUR [***]
10	9428.999.63760	RETICLE: FOCAL-200	1	EUR [***]	EUR [***]	EUR [***]
11	9428.999.64380	RETICLE: COMBI-5X/DIFF	1	EUR [***]	EUR [***]	EUR [***]
Service Products						
12	SC_MISC	1 YEAR EXTENDED OPTICS WARRANTY	365	EUR [***]	EUR [***]	EUR [***]
Standard Warranty						
13	WARR3	MONTH(S) STANDARD WARRANTY	6	EUR [***]	EUR [***]	EUR [***]
Additional Warranty						
14	WAREXT_5X8_24RT	EXTENDED WARRANTY_5X8_24RT	180	EUR [***]	EUR [***]	EUR [***]
Training						
15	TRAINING	TRAINING VALUE	1	EUR [***]	EUR [***]	EUR [***]
Freight Costs						
16	FREIGHT-CHARGE	FREIGHT, INSURANCE AND DUTIES CHARGES	1	EUR [***]	EUR [***]	EUR [***]
					TOTAL EXTENDED PRICE	GRAND TOTAL DISCOUNTED PRICE
					EUR [***]	EUR [***] (***) %

* Unless expressly stated otherwise herein, ASML's standard terms and conditions shall apply to all products and services described in this quotation, and all purchase orders relating hereto.

** Lead-time is a non-binding estimate, which is conditional upon receipt of binding purchase order from customer and will be subject to change by ASML. You will be notified of the anticipated delivery date once the purchase order is booked.

2. Configuration

Used Stepper

Cassette (elevator) position	Cassette position 1,2,3 and 4
Ethernet interface	Standard
FAT Attendance	No (Data Review Only)
Focal	Yes
Four Cassette Indexers	Yes
Hertz	60 Hertz
Image quality control	Yes
Optical Prealign (Mark Sensor)	Standard
PEP1	Standard
PEP2	Standard
PEP4X (/100C TO /100D)	Standard
Position of Signal Tower	Local
Power	380 Volt
Reticle Error Compensation	Standard
SECS I and II Interface	Yes
Software release	Sw rel. 8.9.0
Thin Wafer Capability Package	Yes
Valid ATP-document	Refurbishment Requirement Spec
Wafer size	200 mm
Wafer type	Flat

Extended warranty

Emergency shipment fee	Included
FCO Type 3 & 4 Parts	Included
Machine Main Type	100
Non consumable Parts	Included
Periodic Maintenance Monthly	Included
Periodic Maintenance Quarterly	Included
Priority shipment fee	Included
Response Time	<24H
Telephone Support	Included
Travel	Included

The above configuration reflects how your system will be delivered provided that all the items in Section 1 of the Pricing table are purchased. If any changes are needed, please contact your account manager.

3. Technical Specifications

Item 01 9428.999.60230-URL REFURB LITE PAS 5500/100D RMS

HT: 8486200000

CoO: NL

Eccn: 3B991B2F

A REFURB LITE system from ASML includes the following:

1. Refurbishment at System Level

Refurbishment at System Level means the system will meet agreed upon specifications as listed in referenced document: REFURBISHMENT REQUIREMENT SPECIFICATION (RRS). The RRS will be agreed upon and signed by both parties.

2. Defined System Configuration

The configuration of the system will be as listed in the pricing section of this REFURB LITE quotation.

3. Warranty

The warranty for the system is as listed and quantified in this quotation.

4. Operating License

The Operating License legally permits the use of the PAS software and therefore the use of the entire system. This includes the once only right to a software upgrade, free of charge, within 2 months after the installation to the latest software release compatible with the hardware on the system.

5. Installation

This consists of labor hours, installation materials, such as cables and hoses, and if applicable, beam delivery parts. Spare parts and labor hours for trouble shooting, repair and upgrades during installation, to bring the system to agreed upon specifications are as listed in the RRS.

6. Consumables

One-time consumable items replacement is included in URL. Laser consumables replacement, if applicable, are per RRS

7. System Qualification

System Qualification as per ASML acceptance test procedures according to the specifications as listed in the RRS.

8. Mandatory Field Change Orders (FCO's)

The system will be upgraded to the latest mandatory safety related FCO level.

A REFURB LITE system from ASML does not include:

1. Customer/fab specific parts (including but not limited to power conditioners, line conditioners, filter systems).
2. The transportation and move-in of the system.
3. Any transport insurance.
4. The upgrade of any part, which is not included in the pricing section of this quotation.
5. The upgrade to last revision of parts unless specified in the RRS.
6. The manuals and or electronic documentation.
7. Training and training credits.

The final configuration of the system is established at customer site. Parts removed and/or replaced to create the customer configuration or to replace defect parts will be retained by ASML.

Item 02 9428.999.52670 THIN-WAFER CAPABILITY STEPPER PACKAGE

HT: 8486900000

CoO: NL

Eccn: 3B991B2F

The Thin-Wafer Capability Package provides the ability to level and image 4,5,6 and 8-inch thin wafers and every thickness in the range of 150µm-1000µm. The package contains a customized wafer table, a vacuum reduction valve and additional SW-embedded functionality to enable a broad thickness range.

Installation of the package results in the following modifications of the standard system:

- Installation of the thicker wafer table.

The flatness specification for the customized wafer table is 0.2 micron on a 20x20mm square field with a 10mm edge exclusion zone using wafers with a standard Semi thickness. The pimple pitch for this wafer table has been reduced in order to limit the local sag between the pimples for extremely thin wafers hereby securing image and focus budget.

- A reduction valve is installed to set vacuum pressure from typically 0.6 bar to typically 0.4 bar

- The software key THICK_SUBSTRATES increases the range of thicknesses that can be handled when using a thicker wafer table from 150µm-600µm to 150µm-1000µm.

Disclaimers

Wafer flatness in e-pins area may not be sufficient for critical CDs Support of 3-inch wafers with thickness in the range of 150µm-1000µm requires the commercial option known as "3-Inch Wafer Handling Capability" (9428.999.67050)

Installation and support

On-site process availability, SEM & Track availability are prerequisite during installation and qualification

Audit and qualifications

Standard e-chuck flatness test is performed on 6" or 8" wafers to qualify the wafer table and hardware. Cycling of 15 thin wafers (150µm-1000µm), supplied by customer, is shown. Single machine overlay performance is measured.

Prerequisite:

- Software release 8.9.0

- System must meet ATP specifications and relevant sub-system performance specifications prior to upgrade General Upgrade Statement:

Buyer to ensure the system meets all prerequisites prior to the start of the upgrade including providing sufficient time to assess the system configuration and performance, and to perform all necessary work to meet the prerequisites. Procurement of services and parts, necessary to fulfil all prerequisites, is the responsibility of the Buyer.

Remark:

Any part removed from the Equipment as part of the Upgrade will be retained by the Seller.

Item 03 9428.999.62010 FOUR CASSETTE INDEXERS (UF)

HT: 8486900000

CoO: NL

Eccn: EAR99

Four wafer cassette indexers are fit into the wafer transport system for stand-alone operation of the PAS 5500 system.

Prerequisite: System must meet ATP specifications and relevant sub-system performance specifications prior to upgrade

General Upgrade Statement:

Buyer to ensure the system meets all prerequisites prior to the start of the upgrade including providing sufficient time to assess the system configuration and performance, and to perform all necessary work to meet the prerequisites. Procurement of services and parts, necessary to fulfil all prerequisites, is the responsibility of the Buyer.

Remark:

Any part removed from the Equipment as part of the Upgrade will be retained by the Seller.

Item 04 9428.999.62100 PAS5500 SECS I and II INTERFACE UF

HT: 8523809000

CoO: NL

Eccn: 3D991

The **SECS Interface** allows communication between a fab host computer and PAS 5500 steppers/scanners or Stand-Alone Workstations. This production automation yields a wide range of important benefits, including reduced cycle times, lowered contamination, less operator involvement, and reduced rework due to human errors. The SECS process equipment communications link is the essential first step in factory automation. Equipment can be monitored with several parameters. For example, the host computer can automatically notify steppers/scanners of process anomalies and inhibit further processing steps. Also, process programs can be easily managed by the host and transferred to the steppers/scanners. In addition, the host can perform numerous remote control functions. ASML's SECS Interface provides process control and flexibility that enables semiconductor manufacturers to improve productivity and enhance competitiveness in the decades ahead.

Item 05 9428.999.62490 IMAGE QUALITY CONTROL /1XX /2XX UF

HT: 9027500000

CoO: NL

Eccn: 3B991B2F

The main function of ASML's image sensor and Image Quality Control™ (IQC) software option is to enhance stepper productivity by minimizing time-consuming off-line performance measurements. The image sensor and IQC software are designed to support automatic Statistical Process Control (SPC) of PAS 5500 i-Line and Deep UV steppers.

The image sensor automatically verifies stepper focus and alignment performance by measuring the aerial image quality of grating patterns. The patterns are measured on the reticle scanned across image sensor grating artifacts mounted on the stage. By monitoring these aerial image properties, the image sensor can provide an automatic quick verification of focus and alignment performance relative to a calibrated reference state. These Image Sensor measurements can be displayed as trend data enabling the operator to make a quick visual analysis confirming stable stepper operation.

The image sensor measures three points of the image field simultaneously. It then provides output data verifying control of image tilt, magnification, translation, rotation, and focus. With the image sensor, the time required for a complete focus and alignment verification measurement is reduced to less than 60 seconds.

These automatic performance measurements can greatly improve stepper use for manufacturing by speeding up lithographic process control and minimizing stepper test time.

Key features and Benefits

Automatic Image Measurement

- Increases stepper productivity
- Supports automatic SPC

Reflective Differential Measurement

- Ensures measurement accuracy and stability

Simultaneous 3-point Measurement

- Eliminates stage error from measurement
- Enables tilt, rotation, magnification, leveling measurements

Image Quality Control™ (IQC) Software

- Provides graphical trend data output

Technical Specifications

Focus Repeatability (3sigma)	≤ 50 nm
Image Tilt Repeatability (3sigma)	≤ 2.0 μrad
Translation Repeatability (3sigma)	≤ 20 nm
Magnification Repeatability (3sigma)	≤ 2 ppm
Die Rotation Repeatability (3sigma)	≤ 2 μrad
Machine Focus:	± 0.1 μm per month
Image Calibration Cycle Time: Focus Calibration	< 60 seconds
Cycle Time:	< 30 seconds

Prerequisite: System must meet ATP specifications and relevant sub-system performance specifications prior to upgrade

General Upgrade Statement:

Buyer to ensure the system meets all prerequisites prior to the start of the upgrade including providing sufficient time to assess the system configuration and performance, and to perform all necessary work to meet the prerequisites. Procurement of services and parts, necessary to fulfil all prerequisites, is the responsibility of the Buyer.

Remark:

Any part removed from the Equipment as part of the Upgrade will be retained by the Seller.

Item 06 9428.999.62630 FOCAL SOFTWARE UF

HT: 8523809000

CoO: NL

Eccn: 3D991

FOCAL (FOCUS Calibration using the ALIGNMENT System of the Stepper) is an automatic focus measurement technique where focus offsets are transformed into apparent mark shifts, which can then be measured using the TTL Alignment System in the Stepper.

A special FOCAL Reticle containing specially designed alignment marks is required to perform this measurement. Part of each 8 μm line of which the mark is composed, is divided into smaller, so-called 'chopped lines and spaces' at the resolution limit of the stepper model. Under conditions of defocus these small lines will not be resolved and so the image of the specially designed alignment mark appears to be similar to the standard PM mark using only 8 μm lines and spaces. When in focus, the 'chopped' lines are resolved inducing an asymmetry in the alignment mark and a resultant shift in the aligned position.

Once calibrated the alignment shift can be used as a measure of focus offset to provide fast and accurate daily monitoring focus drift of the Stepper. This quick FOCAL test provides lens information on Astigmatism (AST) and Focal Plane Deviation (FPD).

Please note that this FOCAL option is not specified, nor is it designed for lens qualification purposes. It is designed for focus calibration only and can be used to monitor the lens status.

Specifications

The FOCAL software provides the capability Compute Focal Plane Adjustment Parameters. The parameters are computed from the data obtained from the FOCAL experiment. The system can be saved in an optimized state using the procedure Save System Optimized State using the computed parameters for best system performance.

The FOCAL test has certain constraints with respect to required exposure area. The FOCAL test can be performed using either 8-inch or 6-inch wafers.

Prerequisites

- FOCAL requires software release 6.2.3 or higher.
- A Software Package Upgrade can be ordered per site
- A Software Configuration Key is needed and can be ordered per stepper
- System must meet ATP specifications and relevant sub-system performance specifications prior to upgrade

General Upgrade Statement:

Buyer to ensure the system meets all prerequisites prior to the start of the upgrade including providing sufficient time to assess the system configuration and performance, and to perform all necessary work to meet the prerequisites. Procurement of services and parts, necessary to fulfil all prerequisites, is the responsibility of the Buyer.

Remark:

Any part removed from the Equipment as part of the Upgrade will be retained by the Seller.

Item 07 9428.999.63220 RETICLE: RASTER 6"

HT: 8486900000

CoO: NL

Eccn: EAR99

The Raster reticle is used to qualify both accuracy and half shadow on reticle masking blades. The patterned area of the reticle contains a square grid (with linewidths of 50, 20 and 10µm at wafer level) to aid analysis and interpretation.

Item 08 9428.999.63540 RETICLE: OVERLAY MATRIX 22/6"HT: 8486900000
CoO: US
Eccn: EAR99

Overlay and Matching reticles consist of an array of alignment marks. These marks allow automatic stepper overlay and matching metrology. The location of each overlay module is labeled with a position indicator to assist in inspection and data interpretation.

Item 09 9428.999.63550 RETICLE: RESOLVE-22HT: 8486900000
CoO: NL
Eccn: EAR99

The Reticle Resolve-22 consists of resolutions test structures with measuring stepper resolution linearity and depth of focus.

Item 10 9428.999.63760 RETICLE: FOCAL-200HT: 8486900000
CoO: NL
Eccn: EAR99

The Focal reticle is used to automatically measure the focus offsets within an image field. This reticle consists of an array of special focal alignment marks. The aligned position of the focal marks depends on the focus value of the specific position within the image field. Using ASML's special PAS focal modeling software, the relative best focus position can be determined quickly and to an extremely high level of accuracy.

ASML's Focal reticles can be used for both image plane setup, and qualifying astigmatism and Focal Plane Deviation (FPD) for steppers or Image Plane Deviation (IPD) for Step & Scan systems.

Item 11 9428.999.64380 RETICLE: COMBI-5X/DIFFHT: 8486900000
CoO: NL
Eccn: EAR99

ASML's Combi-5 reticles are used for system set-up and printing all alignment marks. They contain all standard and new mark designs currently in use (large global alignment marks, primary marks and Extended Pattern Area (XPA)), including scribble marks and special designs for CMP applications. Combi-5 reticles also contain a simple clear area, specifically sized to allow clear-out exposures if desired.

Item 12 SC_MISC 1 YEAR EXTENDED OPTICS WARRANTYHT:
CoO:
Eccn:

For a more detailed specification of this item please contact your local ASML account manager.

Item 13 WARR3 MONTH(S) STANDARD WARRANTYHT:
CoO:
Eccn:

Parts and Labor Warranty Period (Qty, as described in the section Pricing of this quotation) specifies in number of months the time period for the warranty defined in Section 13.1 of the Terms of Sale below applicable for each item under this Quotation. For the avoidance of doubt, the warranty for "Refurbished Capital Equipment" applies to the listed main system (REFURB LITE PAS 500/100D RMS), and the warranty for HARDWARE UPGRADE/OPTION applies to each item listed above "Field Upgr. & Access". System performance according ATP specification (excluding optics, excluding FAT only items); Parts coverage (excluding consumables and Optics) for litho system and light source, labor coverage for litho system and light source; during regular business hours, Monday through Friday with a 24 hours response time; ASML holidays are excluded. The start of the warranty period is determined by the Site Acceptance date, the shipment date, or first use of the Equipment as described in the terms and conditions of sale.

The warranty is subject to, and based on, customer's continuing compliance with the general warranty conditions set forth in the warranty section of the Terms and Conditions of this quotation. OPTICS as mentioned in the above are defined as the Zoom Axicon (or FlexRay equivalent), the Rod module (or the FLG/FDE for immersion systems), the REMA objective and the projection lens only, and explicitly excludes consumables and non-consumables. Warranty is conditioned upon the user's full compliance with the requirements in the IRM (Installation Requirement Manual), the MRM (Maintenance Requirements Manual) and the PMM (Preventive Maintenance Manual) for Optics Warranty of the system.

Item 14 WAREXT_5X8_24RT EXTENDED WARRANTY_5X8_24RT

HT:
CoO:
Eccn:

Extended Parts and Labor Warranty (beyond WARR3). Period (Qty, as described in the section Pricing of this quotation) is specified in number of days. Extended Warranty is sold as an additional warranty (as defined in Section 13.1 of the Terms of Sale below) for each item under this Quotation after WARR3 expires.

Extended Warranty applies to labor and parts coverage (excluding consumables and Optics) for the litho system only and does not apply to the light source.

The labor coverage of this Extended Warranty is 5x8, during regular business hours, Monday through Friday with a 24 hours response time; ASML holidays are excluded.

System performance according ATP specification (excluding optics, excluding FAT only items). Optics are defined in the section entitled WARR3 of this document.

The warranty is subject to, and based on, customer's continuing compliance with the general warranty conditions set forth in the warranty section of the Terms and Conditions of this quotation. Warranty is conditioned upon the user's full compliance with the requirements in the IRM (Installation Requirement Manual), the MRM (Maintenance Requirements Manual) and the PMM (Preventive Maintenance Manual) for Optics Warranty of the system.

Item 15 TRAINING TRAINING VALUE

HT:
CoO:
Eccn:

Please see the ASML internet site:

<http://www.asml.com/asml/show.do?lang=EN&ctx=5839&rid=1048>

Item 16 FREIGHT-CHARGE FREIGHT CHARGES

HT:
CoO:
Eccn:

For a more detailed specification of this item please contact your local ASML account manager.

4. Acceptance

Testing of system and/or options/accessories if appropriate, to the specifications for acceptance at our facility (and at source inspection, if requested) will be conducted using standard ASML Acceptance Test Procedures document, then in effect at the time of shipment. Verification of the system performance to these specifications constitutes the sole criterion for system acceptance (and authorisation for shipment in case of source inspection).

5. Facilities Requirements

Installation condition information, including ASML's pre-installation conditions, will be provided by your account manager. Buyer is responsible for satisfying ASML's pre-installation conditions.

6. Installation & Warranty

Price of the system includes installation and standard warranty. Standard Warranty coverage is described in the chapter Technical specifications of this quotation. The price quoted assumes the timely return by Buyer of ASML's transportation containers and other materials used in transporting the system. ASML will charge Buyer for the cost of such containers and materials if they are not returned to ASML in a timely manner. Any part removed from the system during installation and the warranty period or as part of an extended warranty service contract for replacement will be retained by ASML.

7. Field Upgrades

Prior to any field upgrade, it is Buyer's responsibility to ensure that the system to be upgraded meets the original ATP specifications (the "Specifications"). Upon request, Buyer shall provide documentation evidencing the compliance with the Specifications, and ASML reserves the right to examine the system to ensure its compliance with the Specifications. Systems that fail to meet the Specifications must have the performance restored to meet the Specifications prior to accomplishing the upgrade. Upon request from Buyer, ASML Customer Service shall provide system restoration services based on normal time and material schedules or under warranty or extended service contract coverage. Any part removed from the system during the installation of the Field Upgrade will be retained by ASML.

8. Training

Not applicable

9. Delivery

All quoted deliveries are subject to prior sales, please contact your account manager for more details. Note: Delivery date is confirmed upon ASML acceptance of purchase order.

10. Shipment

DAP, Customer Dock

11. Payment

All payments are due as follows:

- 50% due upon order placement
- 40% due upon shipment, net 30 days
- 10% due upon acceptance, net 30 days or no later than 90 days after shipment, whichever occurs first.

12. TERMS AND CONDITIONS

1. TERMS OF SALE. UNLESS OTHERWISE AGREED UPON BY BOTH PARTIES IN WRITING, ACCEPTANCE OF CUSTOMER'S ORDER IS EXPRESSLY MADE CONDITIONAL ON CUSTOMER'S ASSENT TO ASML'S STANDARD TERMS AND CONDITIONS OF SALE SET FORTH HEREIN (THE "TERMS AND CONDITIONS"), AND ASML AGREES ONLY UPON THESE TERMS AND CONDITIONS TO (A) FURNISH THE CAPITAL EQUIPMENT AND/OR HARDWARE UPGRADE/OPTIONS (COLLECTIVELY, THE "EQUIPMENT"), (B) LICENSE SOFTWARE UPGRADES/OPTIONS RELATED TO THE EQUIPMENT (THE "SOFTWARE") AND/OR (C) PROVIDE SERVICES RELATED TO THE INSTALLATION, ACCEPTANCE TESTING, AND ORIGINAL WARRANTY ON THE EQUIPMENT OR THE SOFTWARE (THE "SERVICES") DESCRIBED IN CUSTOMER'S ORDER. Notwithstanding anything to the contrary, any post warranty services shall not be covered by the Terms and Conditions but will be covered by separate service terms and conditions. Any terms or conditions of CUSTOMER's order (or of CUSTOMER's other purchase documents and correspondences) inconsistent with or in addition to these Terms and Conditions hereof shall not be binding on ASML and are expressly rejected by ASML. No waiver, alteration, or modification of any of these Terms and Conditions shall be binding on ASML unless made in writing and signed by an authorized representative of ASML.

2. TERMS OF SHIPMENT. All shipments are made DAP, according to Incoterms (2010). Shipments are made in a commercially reasonable manner as determined by ASML. Risk of loss or damage shall pass to CUSTOMER at the CUSTOMER loading dock. Partial and/or installment shipments are authorized and shall be paid for when due. Shipment schedules are approximate, and ASML will use commercially reasonable efforts to complete shipment as indicated.

3. PAYMENT. Payments are due in EURO unless the parties specifically agree otherwise in writing. ASML reserves the right to require an irrevocable letter of credit from a bank which it designates. Notwithstanding anything to the contrary, for the computational lithography products, including time-based usage in Asia (excluding Japan), ASML Netherlands, B.V. ("ASML NL"), not ASML Hong Kong, Ltd. ("ASML HK"), shall be the proprietary rights owner of record and the contracting party to transactions. For such transactions, ASML HK will serve only as a collecting agent for ASML NL. As the collecting agent, ASML HK's exclusive purpose is to issue quotations for the computational lithography products, receive purchase orders, collect payments, and transfer such payments to ASML NL.

4. PRICES. For all Buyers not located in the People's Republic of China (the "PRC"), all prices are exclusive of sales, use, import, VAT, or similar taxes or duties whether imposed currently or in the future. Such taxes shall be borne by CUSTOMER in addition to the prices quoted or invoiced. In the event ASML is required to pay any such taxes, CUSTOMER shall reimburse ASML therefor. Unless otherwise explicitly indicated, prices quoted assume the timely return by CUSTOMER of ASML's transportation containers and other materials, including lockings and servicing tools and accessories, used in transporting, and installation of, the Equipment. ASML is entitled to charge CUSTOMER for the cost of such containers and materials if these are not returned to ASML in a timely manner.

For Buyers located in the PRC, all prices quoted are exclusive of customs duty, VAT (or similar tax), surtaxes and any withholding tax based on invoice amounts, whether imposed currently or in the future. Such taxes shall be borne by Buyer in addition to the prices quoted or invoiced. In the event ASML is required to pay any such taxes, or the Buyer are obliged to withhold on any payments to ASML, the Buyer shall reimburse ASML therefor.

5. CHANGES. ASML reserves the right to modify or change the Equipment in whole or in part, at any time prior to delivery thereof, in order to include therein electrical or mechanical refinements deemed appropriate by ASML, but without incurring any liability to modify or change any product previously delivered, or to supply new products in accordance with earlier specifications. If CUSTOMER requests changes in the configuration of the Equipment, subject to ASML's acceptance, CUSTOMER shall pay for the reasonable cost for rework and rescheduling of the Equipment. Any deleted feature, option, or accessory, including the Software, shall be subject to the cancellation fee shown in Section 11. All requested changes must be made by revised order in writing to ASML, subject to ASML's express acceptance. ASML shall inform CUSTOMER of the new delivery date and additional costs via a new order acknowledgment.

6. DELIVERY DELAY. CUSTOMER can delay delivery of the Equipment or the Software one-time only up to thirty (30) days beyond the scheduled shipment date by providing written notice to ASML, provided that written notice of CUSTOMER's delay request is received by ASML at least ninety (90) days prior to the originally scheduled shipment date and provided that such delay does not result in the Equipment or the Software being scheduled for delivery during ASML's subsequent financial quarter. If the CUSTOMER requested delay exceeds thirty (30) days, or if the CUSTOMERs request for delay is received by ASML less than ninety (90) days prior to the scheduled shipment date, or if such delay results in the Equipment or the Software being re-scheduled for delivery in a subsequent financial quarter to that originally agreed, subject to ASML's written agreement to such delay, for the purpose of payment of the purchase price, shipment shall be deemed to have occurred on the scheduled shipment date and the Site Acceptance Date (as defined in Section 10) shall be deemed to have occurred thirty (30) days thereafter. CUSTOMER shall be responsible for any and all costs associated with any such delay, including storage, maintenance and retesting costs.

7. INSPECTION. CUSTOMER shall visually examine the Equipment promptly upon receipt thereof. Within ten (10) days of such receipt, CUSTOMER shall notify ASML in writing of any complaint which CUSTOMER may have concerning the Equipment delivered hereunder, including but not limited to any claimed shortages, defects, delivery errors or any other problems.

8. PREINSTALLATION. CUSTOMER is responsible for the following: (a) ensure the Equipment installation site's compatibility with ASML's shipment crates; (b) provide environmentally adequate storage space for the Equipment or the Software upon its arrival at CUSTOMER's facility and prior to installation, provide access to the facility to ASML's employees for pre-installation surveys, unpacking, and installation of each system; (c) make available CUSTOMERs personnel in sufficient numbers and of adequate capabilities on site to assist ASML during pre-installation, unpacking, and installation; (d) use ASML approved equipment, rigging, or other services to transport the Equipment or the Software, either assembled or in parts, to the place of installation; (e) establish and maintain additional site conditions as indicated pursuant to ASML's then current installation requirements; and (f) provide any other support or assistance as requested by ASML (collectively, the "Pre-Installation Conditions"). If, as a result of CUSTOMER's failure to comply with the Pre-Installation Conditions, ASML is unable to complete an installation as scheduled, CUSTOMER shall be responsible for such delays and compensate ASML for any additional costs or expenses incurred, including the cost of subsequent or extended visits necessary to complete the installation.

9. INSTALLATION. The Equipment or the Software shall be installed by ASML, provided that all the Pre-Installation Conditions stated in Section 8 have been met by CUSTOMER. In the event installation cannot be completed within thirty (30) days of the delivery of the Equipment or the Software due to causes other than ASML's fault, including CUSTOMER's failure to comply with the Pre-Installation Conditions, installation shall be deemed completed and the SAT (as defined in Section 10) shall be deemed satisfied and met within thirty (30) days of shipment. Any unpaid balance of the purchase price shall thereupon become due, and the warranty period shall commence to start thirty (30) days after shipment.

10. ACCEPTANCE TEST. Prior to shipment, the Capital Equipment will be subjected to ASML's standard factory-acceptance test at ASML's factory (the "Factory Acceptance Test" or, alternatively, "FAT"). The FAT shall be performed in compliance with ASML's then-current standard procedure and specifications ("Acceptance Test Procedure", or, alternatively, "ATP") as defined by ASML. CUSTOMER will be invited to attend the FAT at CUSTOMER's expense. ASML shall provide CUSTOMER with written verification of the Capital Equipment's performance to the ATP. Upon delivery of such verification, ASML is authorized to proceed with shipment of the Capital Equipment. After onsite installation at CUSTOMER's premises, the Capital Equipment will be subjected to ASML's then standard onsite acceptance test (the "Site Acceptance Test" or, alternatively, "SAT"). CUSTOMER will be invited to attend the SAT. At such time as the Capital Equipment meets the SAT, the installation shall be deemed to be completed (the "Site Acceptance Date", or, alternatively, "Final Acceptance Date"). Notwithstanding anything to the contrary in these Terms and Conditions, the Site Acceptance Date, or, alternatively, the Final Acceptance Date shall be the earlier of: (a) such time as the Capital Equipment meets the SAT, (b) such time CUSTOMER uses the Capital Equipment for any purpose, including production or R&D, prior to completion of the SAT, and (c) ninety (90) days from shipment if acceptance or use has been delayed through no fault of ASML. Any unpaid balance of the purchase price shall thereupon become due and payable within ten (10) days after the Final Acceptance Date, and the warranty period shall start from the Final Acceptance Date. Minor deviations from specifications or acceptance criteria, which do not affect CUSTOMER's ability to use the Capital Equipment shall not be grounds for delayed acceptance, but shall be remedied under the terms of the applicable warranty.

11. CANCELLATION. CUSTOMER agrees that in the event of cancellation by CUSTOMER of the order or any part thereof prior to the scheduled shipment date, CUSTOMER shall pay ASML as liquidated damages, and not as penalty, a percentage of the price for such items cancelled as based on the following schedule:

- * >151 days before scheduled shipment date 10% of the purchase price;
- * 150-121 days before scheduled shipment date 20% of the purchase price;
- * 120-90 days before scheduled shipment date 30% of the purchase price;
- * 60-89 days before scheduled shipment date 40% of the purchase price;
- * 30-59 days before scheduled shipment date 50% of the purchase price; * < 29 days before scheduled shipment date 60% of the purchase price.

This section shall not be deemed to create any right of cancellation in CUSTOMER and only reflects the parties agreement as to the fair and reasonable damages to which ASML shall be entitled in the event of cancellation by CUSTOMER taking into account relevant factors, including without limitation, the customized nature of the Equipment or the Software and the limited number of potential customers for the Equipment or the Software.

12. RETURNS. CUSTOMER shall have no right to return the Equipment or the Software or any part thereof, and no Equipment or the Software may be returned without ASML's written consent, which may be withheld, in ASML's sole discretion. ASML assumes no responsibility for unauthorized returns. All expenses for returned Equipment or the Software shall be borne by CUSTOMER.

13. WARRANTY.

13.1

NEW, REMANUFACTURED or REFURBISHED CAPITAL EQUIPMENT - ASML warrants that for a period of one (1) year after the Site Acceptance Date or fifteen (15) months after shipment, whichever occurs earlier (or such other warranty period specified in Section 1 of the Quotation), that a NEW, REMANUFACTURED or REFURBISHED CAPITAL EQUIPMENT (including the listed main system identified as REFURB LITE PAS 500/100D RMS), used under normal operating conditions, shall be free of material defects in materials and workmanship and shall perform in all material respects in accordance with its specifications and documentation.

SOFTWARE UPGRADE/OPTION - ASML warrants that for a period of three (3) months after shipment (or such other warranty period specified in Section 1 of the Quotation), THE SOFTWARE UPGRADE/OPTION, used under normal operating conditions, shall perform in all material respects in accordance with standard documentation provided with the SOFTWARE UPGRADE/OPTION. Notwithstanding anything to the contrary, ASML does not warrant operation of the SOFTWARE UPGRADE/OPTION shall be uninterrupted or error free.

HARDWARE UPGRADE/OPTION - ASML warrants for a period of three (3) months after shipment (or such other warranty period specified in Section 1 of the Quotation), the HARDWARE UPGRADE/OPTION (including each item listed above in Section 1 of the Quotation as "Field Upgr. & Access"), used under normal operating conditions, shall be free of material defects in materials and workmanship and shall perform in all material respects in accordance with its specifications and documentation.

SERVICES - ASML warrants that the Services (including items listed as "Service Products") shall be performed in a workmanlike manner by qualified professionals using due care and skill.

CUSTOMER acknowledges and agrees that ASML may use new or as new parts in the Equipment and when providing warranty services hereunder. "As new" parts shall mean used parts that have been restored and refurbished by ASML and/or its supplier to have the same specifications, performance and warranty as new parts.

Capital Equipment sold hereunder may include additional warranty terms and conditions for systems and components. Such additional warranty terms and conditions, if any, shall be stated in the body of the quotation.

Each part or spare part or out-of-warranty repair is warranted within the scope of the original applicable warranty for a period of ninety (90) days after shipment or after such repair service has been rendered.

This warranty is extended solely to CUSTOMER and is not transferable to subsequent entities or users, and is conditioned upon CUSTOMER maintaining and operating the Equipment and the Software in accordance with ASML's then current specifications. If ASML finds the Equipment and the Software or any part of it, after notice from CUSTOMER and appropriate tests and inspection, to have any defect covered by this warranty, ASML will, at its discretion and as its sole liability, and CUSTOMER's sole and exclusive remedy, either repair the same or install a replacement. Any parts removed from the Capital Equipment for replacement will be retained by ASML. Warranty services shall be provided during normal business hours 8:00 a.m. to 5:00 p.m., Monday through Friday based on the location of (the nearest ASML repair facility). LIABILITY FOR THE WARRANTY MADE HEREIN SHALL IN NO EVENT EXCEED THE COST OF CORRECTING DEFECTS OR, AT ASML'S OPTION, OF REPLACING THE DEFECTIVE ITEM.

13.2 With respect to any Services performed by ASML, ASML's sole liability, and CUSTOMER's sole and exclusive remedy, for any defect therein shall be to perform again such Services at ASML's expense. Parts furnished in the Services shall be new or rebuilt parts, at the option of ASML, but shall be as good as new parts.

13.3 THE FOREGOING ARE THE SOLE AND EXCLUSIVE WARRANTIES PROVIDED BY ASML TO CUSTOMER, AND ASML HEREBY DISCLAIMS ALL OTHER WARRANTIES WHETHER WRITTEN OR ORAL, OR WHETHER EXPRESS, IMPLIED, OR STATUTORY, INCLUDING BUT NOT LIMITED, ANY IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY, NON-INFRINGEMENT, TITLE OR FITNESS FOR A PARTICULAR PURPOSE OR ARISING FROM COURSE OF DEALING OR USAGE OF TRADE, IN CONNECTION WITH THE DESIGN, SALE, INSTALLATION, SERVICE OR ANY USE OF THE EQUIPMENT, THE SOFTWARE, THE SERVICE, ANY PART THEREOF, OR ANY OTHER SERVICES OR MATERIALS PROVIDED UNDER THESE TERMS AND CONDITIONS.

13.4 WITHOUT LIMITING THE GENERALITY OF THE FOREGOING, ASML'S WARRANTY DOES NOT COVER AND NO WARRANTY IS MADE WITH RESPECT TO:

- Failures discovered but not reported within the warranty period specified.
- Accessories, attachments or other devices not furnished by ASML.
- Failure of the Equipment, caused by other than normal wear and tear or by, conditions not controllable by ASML, including without limitation thereto: (a) attempts by other than ASML personnel to install, modify, repair or maintain the Equipment without ASML's specific prior written authorization, (b) improper use or misuse or lack of use of the Equipment, (c) fluctuations of line voltage, current, vacuum, gas, humidity, temperature or other factors which exceed those limits as indicated in the then current Installation conditions manual, (d) damage by fire, water, vandalism, riots, civil unrest or acts of God, or (e) strikes, lockouts, embargoes, insurrection, inability to obtain shipping space or materials, or government acts, restrictions, or limitations.
- Damage in shipment or otherwise not caused by faulty packing or crating, whether or not ASML selected the means of shipment and/or carrier.
- Such parts, which by their nature in normal use in accordance with ASML's specifications therefor, have a life expectancy shorter than the applicable warranty period, commonly referred to as "consumable."

13.5 As a condition of ASML's obligations under this warranty, CUSTOMER shall (a) notify ASML promptly of any claimed failure of the Equipment, the Software, or the Services, (b) allow ASML's service personnel prompt, full and free access to the Equipment, the Software, or the Services and the premises on which it is located, (c) other than the requirement to provide a Certificate of Insurance and execute non-disclosure agreements, not impose a waiver of liability or other restriction on ASML's service personnel as a site access requirement, (d) ensure that at least one (1) of CUSTOMER's employees shall be on the premises during the performance by ASML of any Services, and (e) provide free of charge to ASML service personnel performing the Services a reasonable and secure space for documentation, tools, test equipment, etc. Furthermore, CUSTOMER agrees to permit ASML to implement remote, automatic means of collecting data from the Equipment. Such data may relate to the use of the Equipment, including tool and process parameters, environmental conditions, and interconnections with other equipment. ASML will use such data solely for purposes of fulfilling its obligations under this Section, supporting the use of the Equipment, providing maintenance and repair services, analyzing Equipment problems or underperformance, providing preventative maintenance monitoring, developing recommendations for use of the Equipment, performing tuning and performance enhancement, and developing new features and improved performance. Such data shall be deemed CUSTOMER's Confidential Information, and ASML will protect the data in accordance with Section 19: Confidentiality. CUSTOMER agrees to permit ASML to continue the data collection processes for so long as it owns or operates the Equipment.

14. LIMITATION OF LIABILITY. EXCEPT FOR (i) LIABILITY UNDER THE NDA (AS DEFINED IN SECTION 19, AND (ii) ASML'S OBLIGATIONS UNDER SECTION 20, EACH PARTY'S TOTAL AGGREGATE LIABILITY TO THE OTHER PARTY UNDER THIS AGREEMENT FOR ANY AND ALL DAMAGES OF ANY NATURE TO THE OTHER PARTY OR ANY OTHER PERSON OR ENTITY WHETHER IN CONTRACT, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY), OR OTHERWISE, SHALL IN NO CASE EXCEED THE PRICE ALLOCABLE TO THE SERVICES, THE EQUIPMENT, THE SOFTWARE OR PART THEREOF WHICH GIVES RISE TO THE CLAIM. IN NO EVENT WILL EITHER PARTY BE LIABLE TO THE OTHER PARTY UNDER THIS AGREEMENT FOR ANY LOSS OF PRODUCTION, LOSS OF PROFITS, LOSS OF USE, BUSINESS INTERRUPTION, COST OF COVER, OR FOR ANY SPECIAL, INDIRECT, EXEMPLARY, PUNATIVE, INCIDENTAL, CONSEQUENTIAL OR CONTINGENT DAMAGES, HOWSOEVER CAUSED, INCLUDING ANY SUCH DAMAGES CAUSED IN CONNECTION WITH, OR ARISING OUT OF, OR RESULTING FROM THE PROVISION OF THE SERVICES OR FROM THE DESIGN, MANUFACTURE, SALE, DELIVERY, RESALE, INSPECTION, REPAIR, MAINTENANCE, OPERATION, OR USE OF ANY EQUIPMENT, THE SOFTWARE, OR PARTS THEREOF, EVEN IF SUCH PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. ASML AND CUSTOMER HAVE AGREED THAT THESE LIMITATIONS WILL SURVIVE AND APPLY EVEN IF ANY LIMITED REMEDY SPECIFIED IN THESE TERMS AND CONDITIONS IS FOUND TO HAVE FAILED OF ITS ESSENTIAL PURPOSE.

15. DOCUMENTATION. ASML shall furnish with each Equipment or Software one (1) copy (except as otherwise quoted) of the manuals as stated in the effective quotation from which the Equipment or the Software was purchased. CUSTOMER shall not make copies of such documents for any purpose other than for its own internal use, and all such copies shall bear any ASML copyright notice which appears on the original.

16. DEFAULT IN PAYMENT. Failure by CUSTOMER to make any payment promptly when due shall be default by CUSTOMER and shall entitle ASML, in addition to such remedies as are provided by law, including but without limitation thereto to suspending all business activities, warranty service, and post warranty service with respect to CUSTOMER, to collect interest on overdue amounts equal to one and one half (1 1/2%) per month or at maximum rate permitted by law, and/or to repossess any Equipment as to which any payment or partial payment has not been made in full when due at the sole discretion of ASML. CUSTOMER shall reimburse ASML for any and all collection fees incurred.

17. SECURITY INTEREST.

17.1 For sales involving Equipment used or to be used in the United States, ASML retains, and CUSTOMER hereby grants, a security interest in the Equipment (including modification and replacements) delivered hereunder and in the proceeds from the sale, exchange, collection, or disposition thereof to secure the full and timely payment of the purchase price of such Equipment. This Section serves as a security agreement, and CUSTOMER authorizes ASML to file any financing statements deemed appropriate by ASML for purposes of perfecting the security interest granted herein. Without limiting the foregoing, CUSTOMER, shall upon request by ASML, provide all information and signatures required by ASML to perfect such security interest. ASML reserves all rights granted to a secured creditor under the Arizona and other applicable Uniform Commercial Codes including but not limited to the right upon demand, to repossess the Equipment delivered hereunder if CUSTOMER fails to make timely payments. To simplify such possession, ASML may require the CUSTOMER to assemble the collateral and make it available to ASML at a place reasonably convenient to both parties and designated by ASML.

17.2 For sales involving Equipment used or to be used in Asia or Europe, Buyer explicitly accepts that Seller shall retain title of the Equipment until full payment has been received of all amounts due in accordance with the transaction and Buyer shall only sell, pledge or alienate the Equipment in Buyers ordinary course of business and Buyer shall take all measures to protect the Equipment and to ensure that Seller's right to the Equipment is in no way prejudiced. For the avoidance of doubt parties agree that the only rights that Seller retains with the title are those enabling recovery of the Equipment in the event of Buyers default on payment. Buyer shall be obliged to insure the Equipment at its own expense for the time the equipment is not paid for in full by the Buyer. Buyer shall give Seller any assistance in taking any measures required to protect Seller's rights in Equipment not fully paid. If Buyer fails to make any payments to Seller when due, the Buyer shall, upon Seller's first notice, be obliged to return to Seller, at Buyer's risk and expense, any Equipment that is subject to the retention of title. The retention and the shipping back of Equipment shall not in any way affect any other rights of compensation Seller may have under this Agreement or applicable law.

18. SOFTWARE LICENSE. All operating software, revisions of operating software, source code, and other software, including the Software, furnished by ASML shall remain the property of ASML or its suppliers, whichever is applicable, and title thereto is not being sold or transferred to CUSTOMER. ASML reserves all rights and licenses in and to the Software not expressly granted to CUSTOMER under this Agreement. ASML hereby grants to CUSTOMER a personal (revocable only in the event of default by CUSTOMER), nonexclusive, paid-up, site-specific, nontransferable license to use all such software contained in the Equipment for the purpose of operating the Equipment for its intended purposes or using the Software in connection with the Equipment. CUSTOMER may not make copies (other than backup and archive copies, which are permitted) of the software or may not transfer or export the software or the right to make copies thereof to any third party without ASML's prior written consent. CUSTOMER acknowledges that the Software contains trade secrets of ASML, and, in order to protect such trade secrets, CUSTOMER agrees not to disassemble, decompile or reverse engineer the Software nor permit any third party to do so, except to the extent such restrictions are prohibited by law. Notwithstanding anything to the contrary, where the license being purchased by CUSTOMER is for a specified period of time then such license will be deemed to have commenced upon delivery of the Software.

19. CONFIDENTIALITY. Confidentiality shall be governed by the Non-Disclosure Agreement between the parties dated effective as of May 3, 2018 (the "NDA"). Customer may disclose the terms of this Agreement if Customer determines in its sole discretion that such disclosure is required by law, rule, regulation, or an order from a court, regulatory agency or other governmental authority, or the rules of any stock exchange on which Customer's shares are listed or quoted. In such event, Customer will provide to ASML a copy of the agreement proposed to be disclosed so that ASML may consent to the disclosure of this agreement, including any redactions thereto proposed by ASML, such consent not to be unreasonably withheld. Customer agrees to submit a request to the SEC or the applicable governing body that ASML's redactions receive confidential treatment under the laws, rules and regulations of the SEC or otherwise be held in confidence to the fullest extent permitted under the laws, rules or regulations of the applicable governing body.

20. PATENT, TRADEMARK, COPYRIGHT INFRINGEMENT INDEMNITY.

20.1.1 ASML shall, at its own sole cost and expense, defend CUSTOMER in a third party suit based upon an assertion that the sale or use of the Capital Equipment hereunder (for the avoidance of doubt, including Upgrades, Software and all other items listed in Section 1 of this Quotation), as such, hereinafter collectively referred to as the Relevant System, directly infringes a third party U.S. patent, trademark, or copyright issued by the country into which the Relevant System has been initially sold, hereinafter referred to as Third Party Right, and indemnify CUSTOMER against any final award (including reasonable cost and any compensatory damages) in such suit subject to other provisions in Section 20, including Section 20.3.

20.1.2 Such defense and indemnity are each strictly conditioned upon CUSTOMER providing to ASML prompt and written notice of such suit of infringement, and of a claim for infringement, and of a request for defense or indemnity, with full authority at ASML's discretion to conduct such defense, or to settle such suit or claim (provided such settlement does not include payment or admission of liability or infringement by CUSTOMER without prior written consent of CUSTOMER), and full assistance and co-operation in such conduct or settlement as ASML may request.

20.1.3 In the event of such suit or claim, ASML may, at its own sole cost and expense, and at its own sole discretion, either obtain adequate license to such Third Party Right, or modify the Relevant System so that it becomes non-infringing, or replace the Relevant System, or repurchase the Relevant System by repayment to CUSTOMER of the sales price of the Relevant System, paid by CUSTOMER to ASML hereunder, less straight-line depreciation as provided in Section 20.3.

20.1.4 ASML shall not be liable for any cost or expense of defense incurred by CUSTOMER in connection with any such suit or claim, without ASML's prior and specific authorization and consent.

20.1.5 Notwithstanding any other section herein, ASML shall not be obligated to defend against, and shall not be obligated to indemnify for, (a) infringement of any claim of a patent that covers the use of a System in combination with other equipment or materials not furnished or recommended by ASML and where liability results solely from such combination; (b) infringement resulting from modification of any System or component thereof, which modification is not authorized by ASML, but only to the extent that the infringement liability results from such unauthorized modification; (c) infringement resulting from compliance with designs, specifications or working drawings furnished by CUSTOMER, but only to the extent that the infringement results from ASML's compliance with such designs, specifications or working drawings; and (d) infringement of any process or method claims of any third party patent unless such System cannot be used as designed other than in an infringement of such claim.

20.1.6 Notwithstanding any other clause herein, ASML shall not be liable for any suit or claim against CUSTOMER by any future purchaser or user of the Relevant System, without ASML's prior and specific consent.

20.1.7 ASML's aggregate liability and obligation under this Section 20 shall be limited to a suit formally commenced within a term of five years starting on the shipment date of the Relevant System subject to such suit, and a maximum amount not to exceed one and a half times the sales price of the Relevant System, paid by CUSTOMER to ASML hereunder, less straight-line depreciation over said five years.

20.1.8 The foregoing states ASML's entire liability and obligation in connection with any suit or claim for infringement or misappropriation of any intellectual property or other proprietary right, and, except as expressly stated in this SECTION 20, ASML makes no warranty, express or implied, regarding non-infringement of any Third Party Right. Furthermore, ASML shall not under any circumstances be liable to CUSTOMER or any other party for any other loss or damage whatsoever not explicitly provided for herein, including without limitation, consequential, enhanced, exemplary, incidental, punitive, or special damages, or for any claim by CUSTOMER or any other party for loss of data, profits, revenue, savings, or use of the Relevant System, however caused, or under any theory of liability.

21. GENERAL.**21.1 GOVERNING LAW; JURISDICTION.**

21.1.1 For sales involving the Equipment or the Software used or to be used outside of United States, this Agreement shall be governed by and construed according to the laws of the Netherlands. The parties consent to the jurisdiction of the competent court residing in the juridical district of Rotterdam for any action involving this agreement. The parties expressly exclude the application of the United Nations Convention on Contracts for the International Sale of Goods in its entirety. No action by CUSTOMER may be brought more than twelve (12) months after the facts occurred upon which the cause of action arose.

21.1.2 For sales involving the Equipment or the Software used or to be used in the United States, this Agreement shall be governed by and construed according to the laws of the State of Arizona. The parties consent to the jurisdiction of the federal and state courts in Maricopa County, Arizona for any actions involving this Agreement. The parties expressly exclude the application of the United Nations Convention on Contracts for the International Sale of Goods in its entirety. No action by CUSTOMER may be brought more than twelve (12) months after the facts occurred upon which the cause of action arose.

21.2 FORCE MAJEURE ASML shall not be liable in any manner for failure to deliver or delays occasioned by causes beyond ASML's reasonable control, to include without restriction, strikes, lockout, fires, embargoes, war, riots, insurrection, acts of God, accidents, delays of carriers, subcontractors or suppliers, inability to obtain shipping space or materials, and governmental acts and regulations. If such delays occur, the time for performance shall be extended for such time as may be reasonably necessary to enable ASML to perform. If, due to any such contingency, ASML's supplies of the Equipment, the Software, or the Services covered hereby are limited, ASML shall have the right to allocate and prorate the available supply in such a manner as it, in its sole discretion, determines.

21.3 COMPLIANCE WITH LAW. In the performance of its obligations under this Agreement, each party shall at all times strictly comply with all applicable laws, regulations and orders, including export control laws and regulations of any country having proper jurisdiction. CUSTOMER specifically acknowledges that the Equipment, the Software, and other information, including technical data, technology, and software (the "Controlled Matter") related to the Equipment or the Software may be subject to export control laws and regulations, including the U.S. Export Administration Regulations and U.S. trade embargo regulations as well as to the European export control regulations. Without limiting the generality of this provision, CUSTOMER agrees that no Controlled Matter supplied will be: (a) re-exported, released or in any way transmitted to countries other than the United States except as may be authorized under U.S. law and with the prior written authorization of ASML, or (b) re-exported, released or in any way transmitted to any other person outside of the U.S. if such a re-export, release or transmission would violate U.S. law. ASML agrees to provide accurate export classification information for the Controlled Matter promptly upon request from CUSTOMER.

21.4 ASSIGNMENT. Neither party shall assign or delegate its rights and obligations hereunder without the prior written consent of the other party, which shall not be unreasonably withheld. Any attempted assignment or delegation by a party without the prior consent of the other party shall be void or of no effect.

21.5 MISCELLANEOUS. This document constitutes the entire agreement between CUSTOMER and ASML with respect to the subject matter hereof and supersedes all prior representations, negotiations and agreements, whether written or oral. No term or provision hereof shall be waived or modified or deemed waived or modified by either party unless such waiver or consent to modify is in writing signed on behalf of the party against whom it is asserted. All communications required or permitted hereunder shall be in writing. No consent by either party to, or waiver of, a breach by either party will constitute a consent to, waiver of, or excuse of any other, different, or subsequent breach by either party. If any provision of the Terms and Conditions is held unenforceable, ineffective or illegal for any reason, such decision shall not affect the validity or enforcement of any or all of the remaining portion of the Terms and Conditions.

AKOUSTIS TECHNOLOGIES, INC.

2018 STOCK INCENTIVE PLAN

1. Purpose

The purposes of the Plan are to encourage and enable selected Employees, Directors and Consultants of the Company and its Affiliates to acquire or increase their holdings of Common Stock and other equity-based interests in the Company and/or to provide other incentive awards in order to promote a closer identification of their interests with those of the Company and its stockholders, and to provide flexibility to the Company in its ability to motivate, attract and retain the services of Participants upon whose judgment, interest and special effort the successful conduct of its operation largely depends. These purposes may be carried out through the granting of Awards to selected Participants.

2. Effective Date; Term

The Effective Date of the Plan shall be November 1, 2018, the date it was approved by the Company's stockholders (the "Effective Date"). Awards may be granted on or after the Effective Date, but no Awards may be granted after November 1, 2028. Awards that are outstanding at the end of the Plan term (or such earlier termination date as may be established by the Board pursuant to Section 16(a)) shall continue in accordance with their terms, unless otherwise provided in the Plan or an Award Agreement. The Plan replaces the Prior Plans, and no further grants will be made under the Prior Plans after the Effective Date.

3. Definitions

In addition to other terms defined herein or in an Award Agreement, the following terms shall have the meanings given below:

(a) Administrator means the Board and, upon its delegation of all or part of its authority to administer the Plan to the Committee, the Committee.

(b) Affiliate means any Parent or Subsidiary of the Company, and also includes any other business entity which controls, is controlled by or is under common control with the Company; provided, however, that the term "Affiliate" shall be construed in a manner in accordance with the registration provisions of applicable federal securities laws if and to the extent required.

(c) Applicable Law means any applicable laws, rules or regulations (or similar guidance), including but not limited to the Securities Act, the Exchange Act, the Code and the listing or other rules of any applicable stock exchange. References to any applicable laws, rules and regulations, including references to any sections or other provisions of applicable laws, rules and regulations, shall also refer to any successor provisions thereto unless the Administrator determines otherwise.

(d) Award means a grant under the Plan of an Incentive Option; a Nonqualified Option; a Stock Appreciation Right; a Restricted Stock Award; a Restricted Stock Unit; a Deferred Stock Unit; a Performance Share; a Performance Unit; an Other Stock-Based Award; a Dividend Equivalent Award; and/or any other award granted under the Plan.

(e) Award Agreement means an award agreement or certificate (which may be in written or electronic form, in the Administrator's discretion, and which includes any amendment or supplement thereto) between the Company and a Participant, specifying such terms, conditions and restrictions as may be established by the Administrator with regard to an Award and shares of Common Stock or any other benefit related to an Award.

(f) Board or Board of Directors means the Board of Directors of the Company.

(g) Cause means, unless otherwise provided in an Award Agreement or determined by the Administrator, a Participant's termination of employment or service resulting from the Participant's (i) termination for "Cause" as defined under the Participant's employment agreement, change in control agreement, consulting agreement or other similar agreement with the Company or an Affiliate, if any, or (ii) if the Participant has not entered into any such agreement (or, if any such agreement does not define "Cause"), then the Participant's termination shall be for "Cause" if termination results due to the Participant's (A) dishonesty; (B) refusal to perform his or her duties for the Company or an Affiliate; or (C) engaging in fraudulent conduct or conduct that could be materially damaging to the Company without a reasonable good faith belief that such conduct was in the best interest of the Company. The determination of "Cause" shall be made by the Administrator and its determination shall be final and conclusive. Without in any way limiting the effect of the foregoing, for purposes of the Plan and an Award, a Participant's employment or service shall also be deemed to have terminated for Cause if, after the Participant's employment or service has terminated, facts and circumstances are discovered that would have justified, in the opinion of the Administrator, a termination for Cause.

(h) A Change of Control shall (except as may be otherwise required, if at all, under Code Section 409A) be deemed to have occurred on the earliest of the following dates:

(i) The date any entity or person shall have become the beneficial owner of, or shall have obtained voting control over, more than fifty percent (50%) of the total voting power of the Company's then outstanding voting stock;

(ii) The date of the consummation of (A) a merger, recapitalization, consolidation or reorganization of the Company (or similar transaction involving the Company), in which the holders of the Common Stock immediately prior to the transaction have voting control over less than fifty-one percent (51%) of the voting securities of the surviving corporation immediately after such transaction, or (B) the sale or disposition of all or substantially all the assets of the Company; or

(iii) The date there shall have been a change in a majority of the Board of Directors of the Company within a 12-month period unless the nomination for election by the Company's stockholders or the appointment of each new Director was approved by the vote of two-thirds of the members of the Board (or a committee of the Board, if nominations are approved by a Board committee rather than the Board) then still in office who were in office at the beginning of the 12-month period (excluding, for this purpose, any such person whose initial assumption of office occurs as a result of an actual or threatened election contest with respect to the election or removal of directors or other actual or threatened solicitation of proxies or consent by or on behalf of a Person other than the Board).

For the purposes herein, the term "person" shall mean any individual, corporation, partnership, group, association or other person, as such term is defined in Section 13(d)(3) or Section 14(d)(2) of the Exchange Act, other than the Company, a Subsidiary of the Company or any employee benefit plan(s) sponsored or maintained by the Company or any Subsidiary thereof, and the term "beneficial owner" shall have the meaning given the term in Rule 13d-3 under the Exchange Act.

For the purposes of clarity, a transaction shall not constitute a Change of Control if its principal purpose is to change the state of the Company's incorporation, create a holding company that would be owned in substantially the same proportions by the persons who held the Company's securities immediately before such transaction or is another transaction of other similar effect.

Notwithstanding the preceding provisions of this Section 3(i), in the event that any Awards granted under the Plan are deemed to be deferred compensation subject to (and not exempt from) the provisions of Code Section 409A, then distributions related to such Awards to be made upon a Change of Control may be permitted, in the Administrator's discretion, upon the occurrence of one or more of the following events (as they are defined and interpreted under Code Section 409A): (A) a change in the ownership of the Company; (B) a change in effective control of the Company; or (C) a change in the ownership of a substantial portion of the assets of the Company.

(i) Code means the Internal Revenue Code of 1986, as amended. Any reference herein to a specific Code section shall be deemed to include all related regulations or other guidance with respect to such Code section.

(j) Committee means the Compensation Committee of the Board (or a subcommittee thereof), or such other committee of the Board which may be appointed to administer the Plan in whole or in part.

(k) Common Stock means the common stock of Akoustis Technologies, Inc., \$0.001 par value, or any successor securities thereto.

(l) Company means Akoustis Technologies, Inc., together with any successor thereto. In the Administrator's discretion, the term "Company" may also refer to the Company and any or all of its Affiliates.

(m) Consultant means an independent contractor, consultant or advisor providing services (other than capital raising services) to the Company or an Affiliate.

(n) Deferred Stock Unit means a Restricted Stock Unit, the terms of which may, in the Administrator's discretion, provide for delivery of shares of Common Stock, cash or a combination thereof on a date or dates subsequent to the date the Award is earned and vested, as provided in Section 9.

(o) Director means a member of the Board.

(p) Disability shall, unless otherwise provided in an Award Agreement or determined by the Administrator (taking into account any Code Section 409A considerations), as applied to any Participant, having the meaning given in any employment agreement, change in control agreement, consulting agreement or other similar agreement, if any, to which the Participant is a party, or, if there is no such agreement (or if such agreement does not define "Disability"), "Disability" shall mean the inability of the Participant to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment which can be expected to result in death, or which has lasted or can be expected to last for a continuous period of not less than 12 months. The Administrator shall have authority to determine if a Disability has occurred.

(q) Dividend Equivalent Award means a right granted to a Participant pursuant to Section 12 to receive the equivalent value (in cash or shares of Common Stock) of dividends paid on Common Stock.

(r) Effective Date means the effective date of the Plan, as provided in Section 2.

(s) Employee means any person who is an employee of the Company or any Affiliate (including entities which become Affiliates after the Effective Date). For this purpose, an individual shall be considered to be an Employee only if there exists between the individual and the Company or an Affiliate the legal and bona fide relationship of employer and employee (taking into account Code Section 409A considerations if and to the extent applicable); provided, however, that with respect to Incentive Options, "Employee" means any person who is considered an employee of the Company or any Parent or Subsidiary for purposes of Treasury Regulation Section 1.421-1(h).

(t) Exchange Act means the Securities Exchange Act of 1934, as amended.

(u) Exercise Price means the price at which an Option or SAR may be exercised, as provided in Section 7(b) and Section 8(a), respectively.

(v) Fair Market Value per share of the Common Stock shall be established by the Administrator and, unless otherwise determined by the Administrator, the Fair Market Value shall be determined in accordance with the following provisions: (i) if the shares of Common Stock are listed for trading on the New York Stock Exchange, LLC (“NYSE”), the NASDAQ Stock Market LLC (“Nasdaq”) or another national or regional stock exchange, the Fair Market Value shall be the closing sales price per share of the shares on the principal stock exchange on which such securities are listed on the date an Award is granted or other determination is made (such date of determination being referred to herein as a “valuation date”), or, if there is no transaction on such date, then on the trading date nearest preceding the valuation date for which closing price information is available, and, provided further, if the shares are not listed for trading on the NYSE, Nasdaq or another stock exchange but are regularly quoted on an automated quotation system (including the OTC Bulletin Board and the quotations published by the OTC Markets Group) or by a recognized securities dealer, the Fair Market Value shall be the closing sales price for such shares as quoted on such system or by such securities dealer on the valuation date, but if selling prices are not reported, the Fair Market Value of a share of Common Stock shall be the mean between the high bid and low asked prices for the Common Stock on the valuation date (or, if no such prices were reported on that date, on the last date such prices were reported), as reported in The Wall Street Journal or such other source as the Administrator deems reliable; or (ii) if the shares of Common Stock are not listed or reported in any of the foregoing, then the Fair Market Value shall be determined by the Administrator based on such valuation measures or other factors as it deems appropriate. Notwithstanding the foregoing, (i) with respect to the grant of Incentive Options, the Fair Market Value shall be determined by the Administrator in accordance with the applicable provisions of Section 20.2031-2 of the Federal Estate Tax Regulations, or in any other manner consistent with Code Section 422; and (ii) Fair Market Value shall be determined in accordance with Code Section 409A if and to the extent required.

(w) Full Value Award means an Award, other than in the form of an Option or SAR, which is settled by the issuance of Common Stock.

(x) Good Reason means, unless otherwise provided in an Award Agreement or determined by the Administrator, in the context of a Change of Control, a Participant’s termination of employment or service resulting from the Participant’s (i) termination for “Good Reason” as defined under the Participant’s employment agreement, change of control agreement, consulting agreement or other similar agreement with the Company or an Affiliate, if any, or (ii) if the Participant has not entered into any agreement (or, if any such agreement does not define “Good Reason”), then a Participant’s termination shall be for “Good Reason” if termination results due to any of the following without the Participant’s consent: (A) a material reduction in the Participant’s base salary as in effect immediately prior to the date of the Change of Control, (B) the assignment to the Participant of duties or responsibilities materially inconsistent with, or a material diminution in, the Participant’s position, authority, duties or responsibilities as in effect immediately prior to the Change of Control, or (C) the relocation by the Company of the Participant’s principal place of employment by more than 100 miles from the location at which the Participant was stationed immediately prior to the Change of Control. Notwithstanding the foregoing, with respect to Directors, unless the Administrator determines otherwise, a Director’s termination from service on the Board shall be for “Good Reason” if the Participant ceases to serve as a Director, or, if the Company is not the surviving company in the Change of Control event, a member of the board of directors of the surviving entity, in either case, due to the Participant’s failure to be nominated to serve as a director of such entity or the Participant’s failure to be elected to serve as a director of such entity, but not due to the Participant’s decision not to continue service on the Board of Directors of the Company or the board of directors of the surviving entity, as the case may be. An event or condition that would otherwise constitute “Good Reason” shall constitute Good Reason only if the Company fails to rescind or cure such event or condition within 30 days after receipt from the Participant of written notice of the event which constitutes Good Reason, and Good Reason shall cease to exist for any event or condition described herein on the 60th day following the later of the occurrence or the Participant’s knowledge thereof, unless the Participant has given the Company written notice thereof prior to such date. In the context other than a Change of Control, “Good Reason” shall be as defined by the Administrator. The determination of “Good Reason” shall be made by the Administrator and its determination shall be final and conclusive.

(y) Incentive Option means an Option that is designated by the Administrator as an Incentive Option pursuant to Section 7 and intended to meet the requirements of incentive stock options under Code Section 422.

(z) Nonqualified Option means an Option granted under Section 7 that is not intended to qualify as an incentive stock option under Code Section 422.

(aa) Option means a stock option granted under Section 7 that entitles the holder to purchase from the Company a stated number of shares of Common Stock at the Exercise Price, and subject to such terms and conditions, as may be set forth in the Plan or an Award Agreement or established by the Administrator.

(bb) Option Period means the term of an Option, as provided in Section 7(d).

(cc) Other Stock-Based Award means a right, granted to a Participant under Section 11, that relates to or is valued by reference to shares of Common Stock or other Awards relating to shares of Common Stock.

(dd) Parent means a "parent corporation," whether now or hereafter existing, as defined in Code Section 424(e).

(ee) Participant means an individual who is an Employee employed by, or a Director or Consultant providing services to, the Company or an Affiliate who satisfies the requirements of Section 6 and is selected by the Administrator to receive an Award under the Plan.

(ff) Performance Award means a Performance Share Award and/or a Performance Unit Award, as provided in Section 10.

(gg) Performance Measures mean one or more performance factors or criteria which may be established by the Administrator with respect to an Award. Performance Measures may be based on such performance factors or criteria as the Administrator in its discretion may deem appropriate, which may include, without limitation: (i) cash flow; (ii) return on equity; (iii) return on assets; (iv) earnings per share; (v) operations expense efficiency milestones; (vi) consolidated earnings before or after taxes (including earnings before interest, taxes, depreciation and amortization); (vii) net income; (viii) operating income; (ix) pre-tax income; (x) book value per share; (xi) return on investment; (xii) return on capital; (xiii) improvements in capital structure; (xiv) expense management; (xv) profitability including of an identifiable business unit or service offering; (xvi) maintenance or improvement of profit margins; (xvii) stock price or total shareholder return; (xviii) market share; (xix) revenues or sales; (xx) costs; (xxi) working capital; (xxii) economic wealth created; (xxiii) strategic business criteria; (xxiv) efficiency ratio(s); (xxv) operating ratio(s); (xxvi) achievement of division, group, function or corporate financial, strategic or operational goals; (xxvii) gross margins; (xxviii) product productions or shipments; and (xxix) comparisons with stock market indices or performance metrics of peer companies. The foregoing criteria may relate to the Company, one or more of its Subsidiaries or other Affiliates or one or more of its segments, operating units or groups, divisions, departments, partnerships, joint ventures or minority investments, facilities, product lines or products service offerings or any combination of the foregoing. The targeted level or levels of performance with respect to such business criteria also may be established at such levels and on such terms as the Administrator may determine, in its discretion, including but not limited to on an absolute basis, in relation to performance in a prior performance period, relative to one or more peer group companies or indices, on a per share and/or share per capita basis, on a pre-tax or after tax basis and/or any combination thereof. For avoidance of doubt, the foregoing list of performance factors and criteria are illustrative only, and the Administrator may select any other objective or subjective performance criteria as it may determine.

(hh) Performance Share means an Award granted under Section 10, in an amount determined by the Administrator and specified in an Award Agreement, stated with reference to a specified number of shares of Common Stock, that entitles the holder to receive shares of Common Stock, a cash payment or a combination of Common Stock and cash (as determined by the Administrator), subject to the terms of the Plan and the terms and conditions established by the Administrator.

(ii) Performance Unit means an Award granted under Section 10, in an amount determined by the Administrator and specified in an Award Agreement, that entitles the holder to receive shares of Common Stock, a cash payment or a combination of Common Stock and cash (as determined by the Administrator), subject to the terms of the Plan and the terms and conditions established by the Administrator.

(jj) Plan means the Akoustis Technologies, Inc. 2018 Stock Incentive Plan, as it may be amended and/or restated.

(kk) Prior Plans means the Akoustis, Inc. 2014 Stock Plan, the Akoustis Technologies, Inc. 2015 Equity Incentive Plan and the Akoustis Technologies, Inc. 2016 Stock Incentive Plan, in each case as the same may be amended and/or restated.

(ll) Restricted Award means a Restricted Stock Award, a Restricted Stock Unit Award and/or a Deferred Stock Unit, as provided in Section.

(mm) Restricted Stock Award means an Award of shares of Common Stock granted to a Participant under Section 9. Shares of Common Stock subject to a Restricted Stock Award shall cease to be restricted when, in accordance with the terms of the Plan and the terms and conditions established by the Administrator, the shares vest and become transferable and free of substantial risks of forfeiture.

(nn) Restricted Stock Unit means an Award granted to a Participant pursuant to Section 9 which is settled, if at all, (i) by the delivery of one share of Common Stock for each Restricted Stock Unit, (ii) in cash in an amount equal to the Fair Market Value of one share of Common Stock for each Restricted Stock Unit or (iii) in a combination of cash and shares equal to the Fair Market Value of one share of Common Stock for each Restricted Stock Unit, as determined by the Administrator. A Restricted Stock Unit represents the unfunded promise of the Company to deliver shares of Common Stock, cash or a combination thereof, as applicable, at the end of the applicable restriction period if and only to the extent the Award vests and ceases to be subject to forfeiture, subject to compliance with the terms of the Plan and Award Agreement and any performance or other terms and conditions established by the Administrator.

(oo) Retirement shall, unless otherwise provided in an Award Agreement or determined by the Administrator (taking into account any Code Section 409A considerations), as applied to any Participant, have the meaning given in any employment agreement, change in control agreement, consulting agreement or other similar agreement, if any, to which the Participant is a party, or, if there is no such agreement (or if such agreement does not define "Retirement"), then "Retirement" shall, unless the Administrator determines otherwise, mean retirement in accordance with the retirement policies and procedures established by the Company. The Administrator shall have authority to determine if a Retirement has occurred.

(pp) SAR or Stock Appreciation Right means a stock appreciation right granted under Section 8 entitling the Participant to receive, with respect to each share of Common Stock encompassed by the exercise of such SAR, the excess, if any, of the Fair Market Value on the date of exercise over the Exercise Price, subject to the terms of the Plan and Award Agreement and any other terms and conditions established by the Administrator. References to “SARs” include both Related SARs and Freestanding SARs, unless the context requires otherwise.

(qq) Securities Act means the Securities Act of 1933, as amended.

(rr) Subsidiary means a “subsidiary corporation,” whether now or hereafter existing, as defined in Code Section 424(f).

(ss) Termination Date means the date of termination of a Participant’s employment or service for any reason, as determined by the Administrator (taking into account any Code Section 409A considerations).

4. Administration of the Plan

(a) The Plan shall be administered by the Board or, upon its delegation, by the Committee (or a subcommittee thereof). To the extent required under Rule 16b-3 adopted under the Exchange Act, the Committee shall be comprised solely of two or more “non-employee directors,” as such term is defined in Rule 16b-3, or as may otherwise be permitted under Rule 16b-3. In addition, Committee members shall qualify as “independent directors” under applicable stock exchange rules if and to the extent required.

(b) Subject to the provisions of the Plan, the Administrator shall have full and final authority in its discretion to take any action with respect to the Plan including, without limitation, the authority to (i) determine all matters relating to Awards, including selection of individuals to be granted Awards, the types of Awards, the number of shares of Common Stock, if any, subject to an Award, and all terms, conditions, restrictions and limitations of an Award; (ii) prescribe the form or forms of Award Agreements evidencing any Awards granted under the Plan; (iii) establish, amend and rescind rules and regulations for the administration of the Plan; (iv) correct any defect, supply any omission or reconcile any inconsistency in the Plan or in any Award or Award Agreement; and (v) construe and interpret the Plan, Awards and Award Agreements, interpret rules and regulations for administering the Plan and make all other determinations deemed necessary or advisable for administering the Plan. In addition, (i) the Administrator shall have the authority, subject to the restrictions contained in Section 4(c) herein, to accelerate the date that any Award which was not otherwise exercisable, vested or earned shall become exercisable, vested or earned in whole or in part without any obligation to accelerate such date with respect to any other Award granted to any recipient; and (ii) the Administrator may in its sole discretion modify or extend the terms and conditions for exercise, vesting or earning of an Award (in each case, taking into account any Code Section 409A considerations). The Administrator’s authority to grant Awards and authorize payments under the Plan shall not in any way restrict the authority of the Company to grant compensation to Employees, Directors or Consultants under any other compensation plan, program or arrangement of the Company or an Affiliate. In addition, the Administrator shall have the authority and discretion to establish terms and conditions of Awards (including but not limited to the establishment of subplans) or other arrangements as the Administrator determines to be necessary or appropriate to conform to the applicable requirements or practices of jurisdictions outside of the United States. In addition to action by meeting in accordance with Applicable Law, any action of the Administrator with respect to the Plan may be taken by a written instrument signed by all of the members of the Board or Committee, as appropriate, and any such action so taken by written consent shall be as fully effective as if it had been taken by a majority of the members at a meeting duly held and called. All determinations of the Administrator with respect to the Plan and any Award or Award Agreement will be final and binding on the Company and all persons having or claiming an interest in any Award granted under the Plan.

(c) Notwithstanding the provisions of Section 4(b), Awards granted to a Participant under the Plan shall be subject to a minimum vesting period of one year; provided, however, that (i) the Administrator may provide for acceleration of vesting of all or a portion of an Award in the event of a Participant's death, Disability or Retirement, or (to the extent provided pursuant to Section 13 herein) upon the occurrence of a Change of Control of the Company; (ii) the Administrator may provide for the grant of an Award to any Participant without a minimum vesting period or may accelerate the vesting of all or a portion of an Award for any reason, but only with respect to Awards for no more than an aggregate of five percent (5%) of the total number of shares of Common Stock authorized for issuance under the Plan pursuant to Section 5(a) herein, upon such terms and conditions as the Administrator shall determine; and (iii) the Administrator also may provide for the grant of Awards to Participants that have different vesting terms in the case of Awards that are substituted for other equity awards in connection with mergers, consolidations or other similar transactions, Awards that are granted as an inducement to be employed by the Company or an Affiliate or to replace forfeited awards from a former employer, or Awards that are granted in exchange for foregone cash compensation.

(d) The Administrator may adjust or modify Performance Measures or other performance factors or terms or conditions of Awards due to transactions, events or developments, or in recognition of any other unusual or infrequent events affecting the Company or the financial statements of the Company, or in response to changes in Applicable Law, accounting principles or business conditions, in each case as determined by the Administrator. By way of example but not limitation, the Administrator may provide with respect to any Award that any evaluation of performance shall exclude or otherwise adjust for any specified circumstance or event that occurs during a performance period, including but not limited to circumstances or events such as the following: currency fluctuations; discontinued operations; non-cash items, such as amortization, depreciation or reserves; asset impairment; significant litigation or claim judgments or settlements; changes in accounting standards; any recapitalization, restructuring, reorganization, merger, acquisition, divestiture, consolidation, spin-off, split-up, combination, liquidation, dissolution, sale of assets or other similar corporate transaction or event and/or any other specific unusual or infrequent events or objectively determinable category thereof.

(e) Notwithstanding the other provisions of Section 4, the Board may delegate to one or more officers of the Company or a special committee consisting of one or more directors who are also officers of the Company the authority, within specified parameters, to grant Awards to eligible Participants, and to make any or all of the determinations reserved for the Administrator in the Plan and summarized in Section 4(b) with respect to such Awards (subject to any restrictions imposed by Applicable Law and such terms and conditions as may be established by the Administrator); provided, however, that, if and to the extent required by Section 16 of the Exchange Act, the Participant, at the time of said grant or other determination, is not deemed to be an officer or director of the Company within the meaning of Section 16 of the Exchange Act. To the extent that the Administrator has delegated authority to grant Awards pursuant to this Section 4(e) to an officer(s) and/or a special committee, references to the "Administrator" shall include references to such officer(s) and/or special committee, subject, however, to the requirements of the Plan, Rule 16b-3, and other Applicable Law.

5. Shares of Stock Subject to the Plan; Award Limitations

(a) *Shares of Stock Subject to the Plan.* Subject to adjustments as provided in this Section 5, the maximum aggregate number of shares of Common Stock that may be issued pursuant to Awards granted under the Plan shall not exceed 3,000,000 shares, plus any shares subject to an award granted under any of the Prior Plans, which Prior Plan award is at any time forfeited, cancelled, terminated, expires or lapses for any reason without the issuance of shares or pursuant to which such shares are forfeited or reacquired by the Company. Shares delivered under the Plan shall be authorized but unissued shares, treasury shares or shares purchased on the open market or by private purchase. The Company hereby reserves sufficient authorized shares of Common Stock to meet the grant of Awards hereunder.

(b) *Award Limitations*: Notwithstanding any provision in the Plan to the contrary, the following limitations shall apply to Awards granted under the Plan, in each case subject to adjustments pursuant to Section 5(d):

(i) The maximum aggregate number of shares of Common Stock that may be issued under the Plan pursuant to the grant of Incentive Options shall not exceed 3,000,000 shares of Common Stock.

(ii) With respect to non-employee Directors, in any 12-month period, no such non-employee Director may be granted Awards for more than 200,000 shares of Common Stock (or the equivalent value thereof based on the Fair Market Value per share of Common Stock on the date of grant of such an Award), provided, however, that any Director cash retainer fees or other fees that are settled in shares of Common Stock shall not be subject to this limitation. For this purpose an Option and Related SAR shall be treated as a single award.

(c) *Additional Share Counting Provisions*. The following provisions shall apply with respect to the share limitations of Section 5(a):

(i) For purposes of determining the number of shares of Common Stock to be counted against the maximum share limit set forth in Section 5(a), each share of Common Stock subject to an Award shall be counted against the limit as one share.

(ii) To the extent that an Award is canceled, terminates, expires, is forfeited or lapses for any reason, any such unissued or forfeited shares subject to the Award will again be available for issuance pursuant to Awards granted under the Plan.

(iii) Awards settled in cash shall not be counted against the share limitations stated in Section 5(a) herein.

(iv) Dividends, including dividends paid in shares, or dividend equivalents paid in cash in connection with outstanding Awards, will not be counted towards the share limitations in Section 5(a).

(v) To the extent that the full number of shares subject to an Award other than an Option or SAR is not issued for any reason, including by reason of failure to achieve performance factors or criteria, only the number of shares issued and delivered shall be considered for purposes of determining the number of shares remaining available for issuance pursuant to Awards granted under the Plan.

(vi) The following shares of Common Stock may not again be made available for issuance as Awards under the Plan: (A) shares withheld from an Award or delivered by a Participant to satisfy tax withholding requirements for Awards; (B) shares not issued or delivered as a result of the net settlement of an outstanding Award; (C) shares withheld or delivered to pay the Exercise Price related to an outstanding Award; and (D) shares repurchased on the open market with the proceeds of the Exercise Price.

(vii) Further, (A) shares issued under the Plan through the settlement, assumption or substitution of outstanding awards granted by another entity or obligations to grant future awards as a condition of or in connection with a merger, acquisition or similar transaction involving the Company acquiring another entity shall not reduce the maximum number of shares available for delivery under the Plan, and (B) available shares under a stockholder approved plan of an acquired company (as appropriately adjusted to reflect the transaction) may be used for Awards under the Plan and will not reduce the maximum number of shares available under the Plan, subject, in the case of both (A) and (B) herein, to applicable stock exchange listing requirements.

(d) *Adjustments; Right to Issue Additional Securities:* If there is any change in the outstanding shares of Common Stock because of a merger, change in control, consolidation, recapitalization or reorganization involving the Company, or if the Board declares a stock dividend, stock split distributable in shares of Common Stock or reverse stock split, other distribution (other than ordinary or regular cash dividends) or combination or reclassification of the Common Stock, or if there is a similar change in the capital stock structure of the Company affecting the Common Stock (excluding conversion of convertible securities by the Company and/or the exercise of warrants by their holders), then the number and type of shares of Common Stock reserved for issuance under the Plan shall be correspondingly adjusted, and the Administrator shall make such adjustments to Awards (such as the number and type of shares subject to an Award, the Exercise Price of an Award and any performance goals) or to any provisions of this Plan as the Administrator deems equitable to prevent dilution or enlargement of Awards or as may otherwise be advisable. Nothing in the Plan, an Award or an Award Agreement shall limit the ability of the Company to issue additional securities of any type or class.

6. Eligibility

An Award may be granted only to an individual who satisfies all of the following eligibility requirements on the date the Award is granted:

(a) The individual is either (i) an Employee, (ii) a Director or (iii) a Consultant.

(b) With respect to the grant of Incentive Options, the individual is otherwise eligible to participate under this Section 6, is an Employee of the Company or a Parent or Subsidiary and does not own, immediately before the time that the Incentive Option is granted, stock possessing more than 10% of the total combined voting power of all classes of stock of the Company or a Parent or Subsidiary. Notwithstanding the foregoing, an Employee who owns more than 10% of the total combined voting power of all classes of stock of the Company or a Parent or Subsidiary may be granted an Incentive Option if the Exercise Price is at least 110% of the Fair Market Value of the Common Stock, and the Option Period does not exceed five years. For this purpose, an individual will be deemed to own stock which is attributable to him or her under Code Section 424(d).

(c) With respect to the grant of substitute awards or assumption of awards in connection with a merger, consolidation, acquisition, reorganization or similar transaction involving the Company or an Affiliate, the recipient is otherwise eligible to receive the Award and the terms of the award are consistent with the Plan and Applicable Law.

(d) The individual, being otherwise eligible under this Section 6, is selected by the Administrator as an individual to whom an Award shall be granted (as defined above, a "Participant").

7. Options

(a) *Grant of Options:* Subject to the terms of the Plan, the Administrator may in its discretion grant Options to such eligible Participants in such numbers, subject to such terms and conditions, and at such times as the Administrator shall determine. Both Incentive Options and Nonqualified Options may be granted under the Plan, as determined by the Administrator; provided, however, that Incentive Options may only be granted to Employees of the Company or a Parent or Subsidiary. To the extent that an Option is designated as an Incentive Option but does not qualify as such under Code Section 422, the Option (or portion thereof) shall be treated as a Nonqualified Option. An Option may be granted with or without a Related SAR.

(b) *Exercise Price:* The Exercise Price per share at which an Option may be exercised shall be established by the Administrator and stated in the Award Agreement evidencing the grant of the Option; provided, that (i) the Exercise Price of an Option shall be no less than 100% of the Fair Market Value per share of the Common Stock as determined on the date the Option is granted (or 110% of the Fair Market Value with respect to Incentive Options granted to an Employee who owns stock possessing more than 10% of the total combined voting power of all classes of stock of the Company or a Parent or Subsidiary, as provided in Section 6(b)); and (ii) in no event shall the Exercise Price per share of any Option be less than the par value per share of the Common Stock. Notwithstanding the foregoing, the Administrator may in its discretion authorize the grant of substitute or assumed options of an acquired entity with an Exercise Price not equal to 100% of the Fair Market Value of the stock on the date of grant, if the terms of such substitution or assumption otherwise comply, to the extent deemed applicable, with Code Section 409A and/or Code Section 424(a).

(c) *Date of Grant:* An Option shall be considered to be granted on the date that the Administrator acts to grant the Option, or on such later date as may be established by the Administrator in accordance with Applicable Law.

(d) *Option Period and Limitations on the Right to Exercise Options*

(i) The Option Period shall be determined by the Administrator at the time the Option is granted and shall be stated in the Award Agreement. The Option Period shall not extend more than 10 years from the date on which the Option is granted (or five years with respect to Incentive Options granted to an Employee who owns stock possessing more than 10% of the total combined voting power of all classes of stock of the Company or a Parent or Subsidiary, as provided in Section 6(b)). Any Option or portion thereof not exercised before expiration of the Option Period shall terminate. The period or periods during which, and the terms and conditions pursuant to which, an Option may vest and become exercisable shall be determined by the Administrator in its discretion, subject to the terms of the Plan (including but not limited to the provisions of Section 4(c) herein).

(ii) An Option may be exercised by giving written notice to the Company in form acceptable to the Administrator at such place and subject to such conditions as may be established by the Administrator or its designee. Such notice shall specify the number of shares to be purchased pursuant to an Option and the aggregate purchase price to be paid therefor and shall be accompanied by payment of such purchase price. Unless an Award Agreement provides otherwise, such payment shall be in the form of cash or cash equivalent; provided that, except where prohibited by the Administrator or Applicable Law (and subject to such terms and conditions as may be established by the Administrator), payment may also be made:

(A) By delivery (by either actual delivery or attestation) of shares of Common Stock owned by the Participant for such time period, if any, as may be determined by the Administrator;

(B) By shares of Common Stock withheld upon exercise;

(C) So long as a Public Market exists at the time of exercise of the Option, by delivery of written notice of exercise to the Company and delivery to a broker of written notice of exercise and irrevocable instructions to promptly deliver to the Company the amount of sale or loan proceeds to pay the Exercise Price;

(D) By such other payment methods as may be approved by the Administrator and which are acceptable under Applicable Law; and/or

(E) By any combination of the foregoing methods.

Shares delivered or withheld in payment on the exercise of an Option shall be valued at their Fair Market Value on the date of exercise, as determined by the Administrator or its designee. For the purposes of the Plan, a "Public Market" for the Common Stock shall be deemed to exist (A) upon consummation of a firm commitment underwritten public offering of the Common Stock (or successor securities thereto) pursuant to an effective registration statement under the Securities Act or (B) if the Administrator otherwise determines that there is an established public market for the Common Stock.

(iii) The Administrator shall determine the extent, if any, to which a Participant may have the right to exercise an Option following termination of the Participant's employment or service with the Company. Such rights, if any, shall be subject to the sole discretion of the Administrator, shall be stated in the individual Award Agreement, need not be uniform among all Options issued pursuant to this Section 7, and may reflect distinctions based on the reasons for termination of employment or service.

(e) *Notice of Disposition*: If shares of Common Stock acquired upon exercise of an Incentive Option are disposed of within two years following the date of grant or one year following the transfer of such shares to a Participant upon exercise, the Participant shall, promptly following such disposition, notify the Company in writing of the date and terms of such disposition and provide such other information regarding the disposition as the Administrator may reasonably require.

(f) *Limitation on Incentive Options*: In no event shall there first become exercisable by an Employee in any one calendar year Incentive Options granted by the Company or any Parent or Subsidiary with respect to shares having an aggregate Fair Market Value (determined at the time an Incentive Option is granted) greater than \$100,000; provided that, if such limit is exceeded, then the first \$100,000 of shares to become exercisable in such calendar year will be Incentive Options and the Options (or portion thereof) for shares with a value in excess of \$100,000 that first became exercisable in that calendar year will be Nonqualified Options.

8. Stock Appreciation Rights

(a) *Grant of SARs*: Subject to the terms of the Plan, the Administrator may in its discretion grant SARs to such eligible Participants, in such numbers, upon such terms and at such times as the Administrator shall determine. SARs may be granted to the holder of an Option (a "Related Option") with respect to all or a portion of the shares of Common Stock subject to the Related Option (a "Related SAR") or may be granted separately to an eligible individual (a "Freestanding SAR"). The Exercise Price per share of a SAR shall be no less than 100% of the Fair Market Value per share of the Common Stock on the date the SAR is granted. Notwithstanding the foregoing, the Administrator may in its discretion authorize the grant of substitute or assumed SARs of an acquired entity with an Exercise Price per share not equal to at least 100% of the Fair Market Value of the stock on the date of grant, if the terms of such substitution or assumption otherwise comply, to the extent deemed applicable, with Code Section 409A and/or Code Section 424(a). A SAR shall be considered to be granted on the date that the Administrator acts to grant the SAR, or on such other date as may be established by the Administrator in accordance with Applicable Law.

(b) *Related SARs*: A Related SAR may be granted either concurrently with the grant of the Related Option or (if the Related Option is a Nonqualified Option) at any time thereafter prior to the complete exercise, termination, expiration or cancellation of such Related Option. The Exercise Price of a Related SAR shall be equal to the Exercise Price of the Related Option. Related SARs shall be exercisable only at the time and to the extent that the Related Option is exercisable (and may be subject to such additional limitations on exercisability as the Administrator may provide in an Award Agreement), and in no event after the complete termination or full exercise of the Related Option. Notwithstanding the foregoing, a Related SAR that is related to an Incentive Option may be exercised only to the extent that the Related Option is exercisable and only when the Fair Market Value exceeds the Exercise Price of the Related Option. Upon the exercise of a Related SAR granted in connection with a Related Option, the Option shall be canceled to the extent of the number of shares as to which the SAR is exercised, and upon the exercise of a Related Option, the Related SAR shall be canceled to the extent of the number of shares as to which the Related Option is exercised or surrendered.

(c) *Freestanding SARs*: A SAR may be granted without relationship to an Option (as defined above, a "Freestanding SAR") and, in such case, will be exercisable upon such terms and subject to such conditions as may be determined by the Administrator, subject to the terms of the Plan.

(d) *Exercise of SARs*:

(i) Subject to the terms of the Plan (including but not limited to Section 4(c) herein), SARs shall be vested and exercisable in whole or in part upon such terms and conditions as may be established by the Administrator. The period during which a SAR may be exercisable shall not exceed 10 years from the date of grant or, in the case of Related SARs, such shorter Option Period as may apply to the Related Option. Any SAR or portion thereof not exercised before expiration of the period established by the Administrator shall terminate.

(ii) SARs may be exercised by giving written notice to the Company in form acceptable to the Administrator at such place and subject to such terms and conditions as may be established by the Administrator or its designee. Unless the Administrator determines otherwise, the date of exercise of a SAR shall mean the date on which the Company shall have received proper notice from the Participant of the exercise of such SAR.

(iii) The Administrator shall determine the extent, if any, to which a Participant may have the right to exercise a SAR following termination of the Participant's employment or service with the Company. Such rights, if any, shall be determined in the sole discretion of the Administrator, shall be stated in the individual Award Agreement, need not be uniform among all SARs issued pursuant to this Section 8 and may reflect distinctions based on the reasons for termination of employment or service.

(e) *Payment Upon Exercise*: Subject to the terms of the Plan, upon the exercise of a SAR, a Participant shall be entitled to receive payment from the Company in an amount determined by multiplying (i) the excess, if any, of the Fair Market Value of a share of Common Stock on the date of exercise of the SAR over the Exercise Price of the SAR, by (ii) the number of shares of Common Stock with respect to which the SAR is being exercised. The consideration payable upon exercise of a SAR shall be paid in cash, shares of Common Stock (valued at Fair Market Value on the date of exercise of the SAR) or a combination of cash and shares of Common Stock, as determined by the Administrator.

9. Restricted Awards

(a) *Grant of Restricted Awards:* Subject to the terms of the Plan, the Administrator may in its discretion grant Restricted Awards to such Participants, for such numbers of shares of Common Stock, upon such terms and at such times as the Administrator shall determine. Such Restricted Awards may be in the form of Restricted Stock Awards, Restricted Stock Units and/or Deferred Stock Units that are subject to certain conditions, which conditions must be met in order for the Restricted Award to vest and be earned (in whole or in part) and no longer subject to forfeiture. Restricted Stock Awards shall be payable in shares of Common Stock. Restricted Stock Units and Deferred Stock Units shall be payable in cash or shares of Common Stock, or partly in cash and partly in shares of Common Stock, in accordance with the terms of the Plan and the discretion of the Administrator. Subject to the provisions of Section 4(c) herein, the Administrator shall determine the nature, length and starting date of the period, if any, during which a Restricted Award may vest and be earned (the “Restriction Period”), and shall determine the conditions which must be met in order for a Restricted Award to be granted, vested, earned and/or distributable (in whole or in part), which conditions may include, but are not limited to, payment of a stipulated purchase price, attainment of performance objectives, continued service or employment for a certain period of time, a combination of attainment of performance objectives and continued service, Retirement, Disability, death or other termination of employment or service or a combination of such or other conditions. In the case of Restricted Awards based in whole or in part upon performance factors or criteria, the Administrator shall determine the Performance Measures applicable to such Restricted Awards (subject to Section 3(ii)).

(b) *Vesting of Restricted Awards:* Subject to the terms of the Plan (and taking into account any Code Section 409A considerations), the Administrator shall have sole authority to determine whether and to what degree Restricted Awards have vested and been earned and are payable and to establish and interpret the terms and conditions of Restricted Awards.

(c) *Termination of Employment or Service; Forfeiture:* Unless the Administrator determines otherwise, if the employment or service of a Participant shall be terminated for any reason (whether by the Company or the Participant and whether voluntary or involuntary) and all or any part of a Restricted Award has not vested or been earned pursuant to the terms of the Plan and related Award Agreement, such Award, to the extent not then vested or earned, shall be forfeited immediately upon such termination and the Participant shall have no further rights with respect thereto.

(d) *Share Certificates; Escrow:* Unless the Administrator determines otherwise, a certificate or certificates representing the shares of Common Stock subject to a Restricted Stock Award shall be issued in the name of the Participant (or, in the case of uncertificated shares, other written evidence of ownership in accordance with Applicable Law shall be provided) after the Award has been granted. Notwithstanding the foregoing, the Administrator may require that (i) a Participant deliver the certificate(s) (or other instruments) for such shares to the Administrator or its designee to be held in escrow until the Restricted Stock Award vests and is no longer subject to a substantial risk of forfeiture (in which case the shares will be promptly released to the Participant) or is forfeited (in which case the shares shall be returned to the Company); and/or (ii) a Participant deliver to the Company a stock power, endorsed in blank (or similar instrument), relating to the shares subject to the Restricted Stock Award which are subject to forfeiture. Unless the Administrator determines otherwise, a certificate or certificate representing shares of Common Stock issuable pursuant to a Restricted Stock Unit or a Deferred Stock Unit shall be issued in the name of the Participant (or, in the case of uncertificated shares, other written evidence of ownership in accordance with Applicable Law shall be provided) promptly after the Award (or portion thereof) has vested and been earned and is distributable.

(c) *Deferred Stock Units*: A Deferred Stock Unit represents the unfunded promise of the Company to deliver shares of Common Stock, cash or a combination thereof, as applicable, if and to the extent that the Award has vested and is eligible for distribution (including, by way of example only, distribution upon termination of employment or service or upon a specified date or dates, and taking into account any Code Section 409A considerations), subject to compliance with the terms of the Plan and Award Agreement and any other terms and conditions established by the Administrator. A Deferred Stock Unit shall be settled, if at all, (i) by the delivery of one share of Common Stock for each Deferred Stock Unit, (ii) in cash in an amount equal to the Fair Market Value of one share of Common Stock for each Deferred Stock Unit or (iii) in a combination of cash and shares equal to the Fair Market Value of one share of Common Stock for each Deferred Stock Unit, as determined by the Administrator.

10. Performance Awards

(a) *Grant of Performance Awards*: Subject to the terms of the Plan, the Administrator may in its discretion grant Performance Awards to such eligible Participants upon such terms and conditions and at such times as the Administrator shall determine. Performance Awards may be in the form of Performance Shares and/or Performance Units. Subject to Section 5(b), the Administrator shall have discretion to determine the number of Performance Units and/or Performance Shares granted to any Participant. Subject to the provisions of Section 4(c) herein, the Administrator shall determine the nature, length and starting date of the period during which a Performance Award may be earned (the "Performance Period"), and shall determine the conditions which must be met in order for a Performance Award to be granted or to vest or be earned (in whole or in part), which conditions may include but are not limited to payment of a stipulated purchase price, attainment of performance objectives, continued service or employment for a certain period of time, a combination of such conditions or other conditions. Subject to Section 3(ii), the Administrator shall determine the Performance Measures applicable to such Performance Awards.

(b) *Earning of Performance Awards*: Subject to the terms of the Plan (and taking into account any Code Section 409A considerations), the Administrator shall have sole authority to determine whether and to what degree Performance Awards have been earned and are payable and to interpret the terms and conditions of Performance Awards.

(c) *Form of Payment*: Payment of the amount to which a Participant shall be entitled upon earning a Performance Award shall be made in cash, shares of Common Stock or a combination of cash and shares of Common Stock, as determined by the Administrator in its sole discretion. Payment may be made in a lump sum or upon such terms as may be established by the Administrator (taking into account any Code Section 409A considerations).

(d) *Termination of Employment or Service; Forfeiture*: Unless the Administrator determines otherwise (taking into account any Code Section 409A considerations), if the employment or service of a Participant shall terminate for any reason (whether by the Company or the Participant and whether voluntary or involuntary) and the Participant has not earned all or part of a Performance Award pursuant to the terms of the Plan and related Award Agreement, such Award, to the extent not then earned, shall be forfeited immediately upon such termination and the Participant shall have no further rights with respect thereto.

11. Other Stock-Based Awards

The Administrator shall have the authority to grant Other Stock-Based Awards to eligible Participants. Such Other Stock-Based Awards may be valued in whole or in part by reference to, or otherwise based on or related to, shares of Common Stock or Awards for shares of Common Stock, including but not limited to Other Stock-Based Awards granted in lieu of bonus, salary or other compensation, Other Stock-Based Awards granted with vesting or performance conditions and/or Other Stock-Based Awards granted without being subject to vesting or performance conditions (subject to the terms of Section 4(c) herein). Subject to the provisions of the Plan, the Administrator shall determine the number of shares of Common Stock to be awarded to a Participant under (or otherwise related to) such Other Stock-Based Awards; whether such Other Stock-Based Awards shall be settled in cash, shares of Common Stock, other securities or any other form of property as the Administrator may determine, or a combination of such forms of consideration; and the other terms and conditions of such Awards.

12. Dividends and Dividend Equivalent Rights

The Administrator may, in its sole discretion, provide that Awards other than Options and SARs may earn dividends or dividend equivalent rights (or “dividend equivalents”); provided, however, that dividends and dividend equivalents, if any, on unearned or unvested Awards (time-vesting or performance-vesting) shall not be paid (even if accrued) unless and until the underlying Award (or portion thereof) has vested and/or been earned. Any crediting of dividends or dividend equivalents may be subject to such additional restrictions and conditions as the Administrator may establish, including reinvestment in additional shares of Common Stock or share equivalents. Notwithstanding the other provisions herein, any dividends or dividend equivalents related to an Award shall be structured in a manner so as to avoid causing the Award and related dividends or dividend equivalents to be subject to Code Section 409A or shall otherwise be structured so that the Award and dividends or dividend equivalents are in compliance with Code Section 409A.

13. Change of Control

Notwithstanding any other provision in the Plan to the contrary, the following provisions shall apply in the event of a Change of Control (except to the extent, if any, otherwise required under Code Section 409A):

(a) To the extent that the successor or surviving company in the Change of Control event does not assume or substitute for an Award (or in which the Company is the ultimate parent corporation and does not continue the Award) on substantially similar terms or with substantially equivalent economic benefits (as determined by the Administrator prior to the Change of Control) as Awards outstanding under the Plan immediately prior to the Change of Control event, (i) all outstanding Options and SARs shall become fully vested and exercisable, whether or not then otherwise vested and exercisable; and (ii) any restrictions, including but not limited to the Restriction Period, Performance Period and/or performance factors or criteria applicable to any outstanding Awards other than Options or SARs shall be deemed to have been met, and such Awards shall become fully vested, earned and payable to the fullest extent of the original grant of the applicable Award (or, in the case of performance-based Awards the earning of which is based on attaining a target level of performance, such Awards shall be deemed earned at the greater of actual performance or target performance).

(b) Further, in the event that an Award is substituted, assumed or continued as provided in Section 13(a) herein, the Award will nonetheless become vested (and, in the case of Options and SARs, exercisable) in full and any restrictions, including but not limited to the Restriction Period, Performance Period and/or performance factors or criteria applicable to any outstanding Award shall be deemed to have been met, and such Awards shall become fully vested, earned and payable to the fullest extent of the original award (or, in the case of performance-based Awards the earning of which is based on attaining a target level of performance, such Awards shall be deemed earned at the greater of actual performance or target performance), if the employment or service of the Participant is terminated within two years after the effective date of a Change of Control if such termination of employment or service (i) is by the Company not for Cause or (ii) is by the Participant for Good Reason. For clarification, for the purposes of this Section 13, the “Company” shall include any successor to the Company.

(c) Notwithstanding any other provision of the Plan to the contrary, in the event that a Participant has entered into an employment agreement, consulting agreement or other similar agreement, plan or policy as of the Effective Date of the Plan, the Participant shall be entitled to the greater of the benefits provided upon a change of control of the Company under the Plan or the respective employment agreement or other arrangement as in effect on the Plan Effective Date, and such agreement or arrangement shall not be construed to reduce in any way the benefits otherwise provided to a Participant upon a Change of Control as defined in the Plan.

14. Nontransferability of Awards

Incentive Options shall not be transferable (including by sale, assignment, pledge or hypothecation) other than transfers by will or the laws of intestate succession or, in the Administrator's discretion, such transfers as may otherwise be permitted in accordance with Treasury Regulation Section 1.421-1(b)(2) or Treasury Regulation Section 1.421-2(c). Awards other than Incentive Options shall not be transferable (including by sale, assignment, pledge or hypothecation) other than by will or the laws of intestate succession, except for transfers if and to the extent permitted by the Administrator in a manner consistent with the registration provisions of the Securities Act. Except as may be permitted by the preceding, an Option or SAR shall be exercisable during the Participant's lifetime only by him or her or by his or her guardian or legal representative. The designation of a beneficiary in accordance with the Plan does not constitute a transfer.

15. Withholding

The Company shall withhold all required local, state, federal, foreign and other taxes and any other amount required to be withheld by any governmental authority or law from any amount payable in cash with respect to an Award. Prior to the delivery or transfer of any certificate for shares or any other benefit conferred under the Plan, the Company shall require any Participant or other person to pay to the Company in cash the amount of any tax or other amount required by any governmental authority to be withheld and paid over by the Company to such authority for the account of such recipient. Notwithstanding the foregoing, the Administrator may in its discretion establish procedures to require or permit a recipient to satisfy such obligations in whole or in part, and any local, state, federal, foreign or other income tax obligations relating to such an Award, by delivery to the Company of shares of Common Stock held by the Participant (which are fully vested and not subject to any pledge or other security interest) and/or by the Company withholding shares of Common Stock from the shares to which the recipient is otherwise entitled. The number of shares to be withheld or delivered shall have a Fair Market Value as of the date that the amount of tax to be withheld is determined as nearly equal as possible to, but not exceeding (unless otherwise permitted by the Administrator in a manner in accordance with Applicable Law and applicable accounting principles), the amount of such obligations being satisfied. Such withholding obligations shall be subject to such terms and procedures as may be established by the Administrator. The Participant shall remain responsible at all times for paying any federal, state, foreign and/or local income or employment tax due with respect to any Award, and the Company shall not be liable for any interest or penalty that a Participant incurs by failing to make timely payments of tax or otherwise.

16. Amendment and Termination of the Plan and Awards

(a) *Amendment and Termination of Plan; Prohibition on Repricing.* The Plan may be amended, altered, suspended and/or terminated at any time by the Board; provided, that (i) approval of an amendment to the Plan by the stockholders of the Company shall be required to the extent, if any, that stockholder approval of such amendment is required by Applicable Law; and (ii) except for adjustments made pursuant to Section 5(d), the Company may not, without obtaining stockholder approval, (A) amend the terms of outstanding Options or SARs to reduce the Exercise Price of such outstanding Options or SARs; (B) exchange outstanding Options or SARs for cash, for Options or SARs with an Exercise Price that is less than the Exercise Price of the original Option or SAR, or for other equity awards at a time when the original Option or SAR has an Exercise Price above the Fair Market Value of the Common Stock; or (C) take other action with respect to Options or SARs that would be treated as a repricing under the rules of the principal stock exchange on which shares of the Common Stock are listed.

(b) *Amendment and Termination of Awards:* The Administrator may (subject to Section 16(a)(ii) herein) amend, alter, suspend and/or terminate any Award granted under the Plan, prospectively or retroactively, but (except as otherwise provided in Section 16(c)) such amendment, alteration, suspension or termination of an Award shall not, without the written consent of a Participant with respect to an outstanding Award, materially adversely affect the rights of the Participant with respect to the Award.

(c) *Amendments to Comply with Applicable Law:* Notwithstanding Section 16(a) and Section 16(b) herein, the following provisions shall apply:

(i) The Administrator shall have unilateral authority to amend the Plan and any Award (without Participant consent) to the extent necessary to comply with Applicable Law or changes to Applicable Law (including but in no way limited to Code Section 409A, Code Section 422 and federal securities laws).

(ii) The Administrator shall have unilateral authority to make adjustments to the terms and conditions of Awards in recognition of unusual or nonrecurring events affecting the Company or any Affiliate, or the financial statements of the Company or any Affiliate, or of changes in Applicable Law, or accounting principles, if the Administrator determines that such adjustments are appropriate in order to prevent dilution or enlargement of the benefits or potential benefits intended to be made available under the Plan or necessary or appropriate to comply with applicable accounting principles or Applicable Law.

17. Restrictions on Awards and Shares; Compliance with Applicable Law

(a) *General.* As a condition to the issuance and delivery of Common Stock hereunder, or the grant of any benefit pursuant to the Plan, the Company may require a Participant or other person at any time and from time to time to become a party to an Award Agreement, other agreement(s) restricting the transfer, purchase, repurchase and/or voting of shares of Common Stock of the Company, and any employment, consulting, non-competition, confidentiality, non-solicitation, non-disparagement or other agreements or provisions imposing such restrictions as may be required by the Company. In addition, without in any way limiting the effect of the foregoing, each Participant or other holder of shares issued under the Plan shall be permitted to transfer such shares only if such transfer is in accordance with the Plan, the Award Agreement, any other applicable agreements and Applicable Law. The acquisition of shares of Common Stock under the Plan by a Participant or any other holder of shares shall be subject to, and conditioned upon, the agreement of the Participant or other holder of such shares to the restrictions described in the Plan, the applicable Award Agreement, any other applicable agreements and Applicable Law.

(b) *Compliance with Applicable Laws, Rules and Regulations.* The Company may impose such restrictions on Awards, shares of Common Stock and any other benefits underlying Awards hereunder as it may deem advisable, including without limitation restrictions under the federal securities laws, the requirements of any stock exchange or similar organization and any blue sky, state or foreign securities or other laws applicable to such securities. Notwithstanding any other Plan provision to the contrary, the Company shall not be obligated to issue, deliver or transfer shares of Common Stock under the Plan, make any other distribution of benefits under the Plan, or take any other action, unless such delivery, distribution or action is in compliance with Applicable Law (including but not limited to the requirements of the Securities Act). The Company will be under no obligation to register shares of Common Stock or other securities with the Securities and Exchange Commission or to effect compliance with the exemption, registration, qualification or listing requirements of any state securities laws, stock exchange or similar organization, and the Company will have no liability for any inability or failure to do so. The Company may cause a restrictive legend or legends to be placed on any certificate issued pursuant to an Award hereunder in such form as may be prescribed from time to time by Applicable Law or as may be advised by legal counsel.

18. No Right or Obligation of Continued Employment or Service or to Awards; Compliance with the Plan

Neither the Plan, an Award, an Award Agreement nor any other action related to the Plan shall confer upon a Participant any right to continue in the employ or service of the Company or an Affiliate as an Employee, Director or Consultant, or interfere in any way with the right of the Company or an Affiliate to terminate the Participant's employment or service at any time. Except as otherwise provided in the Plan, an Award Agreement or as may be determined by the Administrator, all rights of a Participant with respect to an Award shall terminate upon the termination of the Participant's employment or service. In addition, no person shall have any right to be granted an Award, and the Company shall have no obligation to treat Participants or Awards uniformly. By participating in the Plan, each Participant shall be deemed to have accepted all of the conditions of the Plan and the terms and conditions of any rules and regulations adopted by the Administrator and shall be fully bound thereby. Any Award granted hereunder is not intended to be compensation of a continuing or recurring nature, or part of a Participant's normal or expected compensation, and in no way represents any portion of a Participant's salary, compensation or other remuneration for purposes of pension benefits, severance, redundancy, resignation or any other purpose.

19. General Provisions

(a) *Stockholder Rights*: Except as otherwise determined by the Administrator or provided in the Plan, a Participant and his or her legal representative, legatees or distributees shall not be deemed to be the holder of any shares of Common Stock subject to an Award and shall not have any rights of a stockholder unless and until certificates for such shares have been issued and delivered to him or her or them under the Plan. A certificate or certificates for shares of Common Stock acquired upon exercise of an Option or SAR shall be issued in the name of the Participant or his or her beneficiary and distributed to the Participant or his or her beneficiary (or, in the case of uncertificated shares, other written notice of ownership in accordance with Applicable Law shall be provided) as soon as practicable following receipt of notice of exercise and, with respect to Options, payment of the Exercise Price (except as may otherwise be determined by the Company in the event of payment of the Exercise Price pursuant to Section 7(d)(ii)(C)). Except as otherwise provided in Section 9(d) regarding Restricted Stock Awards or otherwise determined by the Administrator, a certificate for any shares of Common Stock issuable pursuant to a Restricted Award, Performance Award, or Other Stock-Based Award shall be issued in the name of the Participant or his or her beneficiary and distributed to the Participant or his or her beneficiary (or, in the case of uncertificated shares, other written notice of ownership in accordance with Applicable Law shall be provided) after the Award (or portion thereof) has vested and been earned and is distributable.

(b) *Section 16(b) Compliance*: To the extent that any Participants in the Plan are subject to Section 16(b) of the Exchange Act, it is the general intention of the Company that transactions under the Plan shall comply with Rule 16b-3 under the Exchange Act and that the Plan shall be construed in favor of such Plan transactions meeting the requirements of Rule 16b-3. Notwithstanding anything in the Plan to the contrary, the Administrator, in its sole and absolute discretion, may bifurcate the Plan so as to restrict, limit or condition the use of any provision of the Plan to Participants who are officers or directors subject to Section 16 of the Exchange Act without so restricting, limiting or conditioning the Plan with respect to other Participants.

(c) Unfunded Plan; No Effect on Other Plans

(i) The Plan shall be unfunded, and the Company shall not be required to create a trust or segregate any assets that may at any time be represented by Awards under the Plan. The Plan shall not establish any fiduciary relationship between the Company and any Participant or other person. Neither a Participant nor any other person shall, by reason of the Plan, acquire any right in or title to any assets, funds or property of the Company or any Affiliate, including, without limitation, any specific funds, assets or other property which the Company or any Affiliate, in their discretion, may set aside in anticipation of a liability under the Plan. A Participant shall have only a contractual right to shares of Common Stock or other amounts, if any, payable under the Plan, unsecured by any assets of the Company or any Affiliate. Nothing contained in the Plan shall constitute a guarantee that the assets of such entities shall be sufficient to pay any benefits to any person.

(ii) The amount of any compensation deemed to be received by a Participant pursuant to an Award shall not constitute compensation with respect to which any other employee benefits of such Participant are determined, including, without limitation, benefits under any bonus, pension, profit sharing, life insurance or salary continuation plan, except as otherwise specifically provided by the terms of such plan or as may be determined by the Administrator.

(iii) Except as otherwise provided in the Plan, the adoption of the Plan shall not affect any other stock incentive or other compensation plans in effect for the Company or any Affiliate, nor shall the Plan preclude the Company from establishing any other forms of stock incentive or other compensation for employees or service providers of the Company or any Affiliate.

(d) *Governing Law:* The Plan and Awards shall be governed by and construed in accordance with the laws of the State of Delaware, without regard to the conflict of laws provisions of any state, and in accordance with applicable federal laws of the United States.

(e) *Beneficiary Designation:* The Administrator may, in its discretion, permit a Participant to designate in writing a person or persons as beneficiary, which beneficiary shall be entitled to receive settlement of Awards (if any) to which the Participant is otherwise entitled in the event of death. In the absence of such designation by a Participant, and in the event of the Participant's death, the estate of the Participant shall be treated as beneficiary for purposes of the Plan, unless the Administrator determines otherwise. The Administrator shall have discretion to approve and interpret the form or forms of such beneficiary designation. A beneficiary, legal guardian, legal representative or other person claiming any rights pursuant to the Plan is subject to all terms and conditions of the Plan and any Award Agreement applicable to the Participant, except to the extent that the Plan and/or Award Agreement provide otherwise, and to any additional restrictions deemed necessary or appropriate by the Administrator.

(f) *Gender and Number:* Except where otherwise indicated by the context, words in any gender shall include any other gender, words in the singular shall include the plural and words in the plural shall include the singular.

(g) *Severability:* If any provision of the Plan or an Award Agreement shall be held illegal or invalid for any reason, such illegality or invalidity shall not affect the remaining parts of the Plan or the Award Agreement (which shall be construed or deemed amended to conform to Applicable Law), and the Plan or Award Agreement shall be construed and enforced as if the illegal or invalid provision had not been included.

(h) *Rules of Construction:* Headings are given to the sections of the Plan solely as a convenience to facilitate reference. The reference to any statute, regulation or other provision of law shall (unless the Administrator determines otherwise) be construed to refer to any amendment to or successor of such provision of law.

(i) *Successors and Assigns:* The Plan shall be binding upon the Company, its successors and assigns, and Participants, their executors, administrators and permitted transferees and beneficiaries.

(j) *Award Agreement:* The grant of any Award under the Plan shall be evidenced by an Award Agreement between the Company and the Participant. Such Award Agreement may state terms, conditions and restrictions applicable to the Award and may state such other terms, conditions and restrictions, including but not limited to terms, conditions and restrictions applicable to shares of Common Stock or other benefits subject to an Award, as may be established by the Administrator.

(k) *Right of Offset:* Notwithstanding any other provision of the Plan or an Award Agreement, the Company may at any time (subject to any Code Section 409A considerations) reduce the amount of any payment or benefit otherwise payable to or on behalf of a Participant by the amount of any obligation of the Participant to or on behalf of the Company or an Affiliate that is or becomes due and payable.

(l) *Uncertificated Shares:* Notwithstanding anything in the Plan to the contrary, to the extent the Plan provides for the issuance of stock certificates to reflect the issuance of shares of Common Stock, the issuance may, in the Company's discretion, be effected on a non-certificated basis, to the extent not prohibited by the Company's certificate of incorporation or bylaws or by Applicable Law.

(m) *Income and Other Taxes:* Participants are solely responsible and liable for the satisfaction of all taxes and penalties that may arise in connection with Awards (including but not limited to any taxes arising under Code Section 409A), and the Company shall not have any obligation to indemnify or otherwise hold any Participant harmless from any or all of such taxes. The Company shall have no responsibility to take or refrain from taking any actions in order to achieve a certain tax result for a Participant or any other person.

(n) *Effect of Certain Changes in Status:* Notwithstanding the other terms of the Plan or an Award Agreement, the Administrator has sole discretion to determine (taking into account any Code Section 409A considerations), at the time of grant of an Award or at any time thereafter, the effect, if any, on Awards (including but not limited to modifying the vesting, exercisability and/or earning of Awards) granted to a Participant if the Participant's status as an Employee, Director or Consultant changes, including but not limited to a change from full-time to part-time, or vice versa, or if other similar changes in the nature or scope of the Participant's employment or service occur.

(o) *Stockholder Approval:* The Plan is subject to approval by the stockholders of the Company, which approval must occur, if at all, within 12 months of the Effective Date. Awards granted prior to such stockholder approval shall be conditioned upon and shall be effective only upon approval of the Plan by such stockholders on or before such date.

(p) *Deferrals:* Subject to the provisions of this Section 19(p) and Section 20, the Administrator may permit or require a Participant to defer such Participant's receipt of the payment of cash or the delivery of shares of Common Stock that would otherwise be payable with respect to an Award. Any such deferral shall be subject to such terms and conditions as may be established by the Administrator and to any applicable Code Section 409A requirements.

(q) *Fractional Shares*: Except as otherwise provided in an Award Agreement or determined by the Administrator, (i) the total number of shares issuable pursuant to the exercise, vesting or earning of an Award shall be rounded down to the nearest whole share, and (ii) no fractional shares shall be issued. The Administrator may, in its discretion, determine that a fractional share shall be settled in cash.

(r) *Compliance with Recoupment, Ownership and Other Policies or Agreements*: Notwithstanding anything in the Plan or an Award Agreement to the contrary, the Administrator may, at any time (during or following termination of employment or service for any reason), determine that a Participant's rights, payments and/or benefits with respect to an Award (including but not limited to any shares issued or issuable and/or cash paid or payable with respect to an Award) shall be subject to reduction, cancellation, forfeiture or recoupment upon the occurrence of certain specified events, in addition to any other conditions applicable to an Award. Such events may include, but shall not be limited to, termination of employment for Cause, violation of policies of the Company or an Affiliate, breach of non-solicitation, non-competition, confidentiality, non-disparagement or other covenants, other conduct by the Participant that is determined by the Administrator to be detrimental to the business or reputation of the Company or any Affiliate, and/or other circumstances where such reduction, cancellation, forfeiture or recoupment is required by Applicable Law. In addition, without limiting the effect of the foregoing, as a condition to the grant of an Award or receipt or retention of shares of Common Stock, cash or any other benefit under the Plan, (i) the Administrator may, at any time, require that a Participant comply with any compensation recovery (or "clawback"), stock ownership, stock retention or other policies or guidelines adopted by the Company or an Affiliate, each as in effect from time to time and to the extent applicable to the Participant, and (ii) each Participant shall be subject to such compensation recovery, recoupment, forfeiture or other similar provisions as may apply under Applicable Law.

(s) *Attestation*: Wherever in the Plan or any Award Agreement a Participant is permitted to pay the Exercise Price of an Award or taxes relating to the exercise, vesting or earning of an Award by delivering shares of Common Stock, the Participant may, unless the Administrator determines otherwise and subject to procedures satisfactory to the Administrator, satisfy such delivery requirement by presenting proof of beneficial ownership of such shares, in which case the Company shall treat the Award as exercised, vested or earned without further payment and/or shall withhold such number of shares from the shares acquired by the exercise, vesting or earning of the Award, as appropriate.

(t) *Plan Controls*: Unless the Administrator determines otherwise, (i) in the event of a conflict between any term or provision contained in the Plan and an express term contained in any Award Agreement, the applicable terms and provisions of the Plan will govern and prevail, and (ii) the terms of an Award Agreement shall not be deemed to be in conflict or inconsistent with the Plan merely because they impose greater or additional restrictions, obligations or duties, or if the Award Agreement provides that such Award Agreement terms apply notwithstanding the provisions to the contrary in the Plan.

(u) *Indemnification*: No member of the Board or Committee or its or their designees or agents, as applicable, shall be liable while acting as Administrator for any action or determination made in good faith with respect to the Plan, an Award or an Award Agreement. Members of the Board and the Committee and officers and employees of the Company or an Affiliate to whom authority to act for the Board or the Committee is delegated shall be entitled to such indemnification and other rights as may be provided under the Company's certificate of incorporation, bylaws and/or other instrument and/or pursuant to Applicable Law.

20. Compliance with Code Section 409A

Notwithstanding any other provision in the Plan or an Award Agreement to the contrary, if and to the extent that Code Section 409A is deemed to apply to the Plan or any Award, it is the general intention of the Company that the Plan and all such Awards shall, to the extent practicable, comply with, or be exempt from, Code Section 409A, and the Plan and any such Award Agreement shall, to the extent practicable, be construed in accordance therewith. Deferrals of shares or any other benefit issuable pursuant to an Award otherwise exempt from Code Section 409A in a manner that would cause Code Section 409A to apply shall not be permitted unless such deferrals are in compliance with, or exempt from, Code Section 409A. In the event that the Company (or a successor thereto) has any stock which is publicly traded on an established securities market or otherwise, distributions that are subject to Code Section 409A to any Participant who is a "specified employee" (as defined under Code Section 409A) upon a "separation from service" (as defined in Code Section 409A) may only be made following the expiration of the six-month period after the date of separation from service (with such distributions to be made during the seventh month following separation from service), or, if earlier than the end of the six-month period, the date of death of the specified employee, or as otherwise permitted under Code Section 409A. For purposes of Code Section 409A, each installment payment provided under the Plan or an Award Agreement shall be treated as a separate payment. Without in any way limiting the effect of any of the foregoing, (i) in the event that Code Section 409A requires that any special terms, provisions or conditions be included in the Plan or any Award Agreement, then such terms, provisions and conditions shall, to the extent practicable, be deemed to be made a part of the Plan or Award Agreement, as applicable, and (ii) terms used in the Plan or an Award Agreement shall be construed in accordance with Code Section 409A if and to the extent required. Further, in the event that the Plan or any Award shall be deemed not to comply with Code Section 409A, then neither the Company, the Administrator nor its or their designees or agents shall be liable to any Participant or other person for actions, decisions or determinations made in good faith.

ADOPTED BY THE BOARD OF DIRECTORS ON AUGUST 24, 2018

ADOPTED BY THE STOCKHOLDERS OF THE COMPANY ON NOVEMBER 1, 2018

AKOUSTIS TECHNOLOGIES, INC.
EMPLOYEE STOCK PURCHASE PLAN

1. PURPOSE

This Akoustis Technologies, Inc. Employee Stock Purchase Plan is intended to provide employees of the Company and its Participating Subsidiaries with an opportunity to acquire a proprietary interest in the Company through the purchase of shares of Common Stock. The Company intends that this Plan qualify as an “employee stock purchase plan” under Code Section 423 and this Plan shall be interpreted in a manner that is consistent with that intent.

2. DEFINITIONS

“**Board**” means the Board of Directors of the Company.

“**Code**” means the U. S. Internal Revenue Code of 1986.

“**Committee**” means the committee appointed by the Board to administer this Plan from time to time. As of the Effective Date, the Compensation Committee of the Board shall be the Committee.

“**Common Stock**” means the common stock of the Company, par value \$0.001 per share.

“**Company**” means Akoustis Technologies, Inc., a Delaware corporation, and any successor or assign.

“**Compensation**” means, except as may otherwise be determined by the Committee consistent with the requirements of Section 423 of the Code, base salary, wages, and commissions paid to an Eligible Employee by the Company or a Participating Subsidiary as compensation for services to the Company or Participating Subsidiary, before deduction for any salary deferral contributions made by the Eligible Employee to any tax-qualified or nonqualified deferred compensation plan, including overtime, vacation pay, holiday pay, jury duty pay, and funeral leave pay, but excluding education or tuition reimbursements, imputed income arising under any group insurance or benefit program, travel expenses, business and relocation expenses, income received in connection with stock options or other equity-based awards, and any other non-cash remuneration.

“**Corporate Transaction**” means a merger, consolidation, acquisition of property or stock, separation, reorganization, or other corporate event described in Code Section 424.

“**Designated Broker**” means the financial services firm or other agent designated by the Company to maintain ESPP Share Accounts on behalf of Participants who have purchased shares of Common Stock under this Plan.

“**Disability**” means the Participant is unable to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment that can be expected to result in death or that has lasted or can be expected to last for a continuous period of not less than twelve (12) months.

“**Effective Date**” means the date as of which this Plan is adopted by the Board, subject to this Plan obtaining stockholder approval in accordance with **Section 19.11**.

“**Employee**” means any person who renders services to the Company or a Participating Subsidiary as an employee pursuant to an employment relationship with such employer. For purposes of this Plan, the employment relationship shall be treated as continuing intact while the individual is on military leave, sick leave, or other leave of absence approved by the Company or a Participating Subsidiary that meets the requirements of Treasury Regulation Section 1.421-1(h)(2). Where the period of leave exceeds three (3) months, or such other period of time specified in Treasury Regulation Section 1.421-1(h)(2), and the individual’s right to reemployment is not guaranteed by statute or contract, the employment relationship shall be deemed to have terminated on the first day immediately after such three (3)-month period, or such other period specified in Treasury Regulation Section 1.421-1(h)(2).

“**Eligible Employee**” means each Employee; *provided, however*, that the Committee may exclude from participation in this Plan or any Offering any Employee who (i) has been employed by the Company or a Participating Subsidiary for less than two (2) years, (ii) is customarily employed by the Company or a Participating Subsidiary for twenty (20) hours per week or less, (iii) is customarily employed by the Company or a Participating Subsidiary for not more than five (5) months per calendar year, or (iv) is a “highly compensated employee” of the Company or a Participating Subsidiary (within the meaning of Code Section 414(q)). Consistent with the requirements of Code Section 423, the Committee may (A) select a shorter time period than those specified in clauses (i) - (iii), and (B) exclude highly compensated employees with compensation above a specified level or who are subject to Section 16 of the Securities Exchange Act of 1934, in each case to be applied in an identical manner for an Offering.

“**Enrollment Form**” means an agreement authorized by the Committee (which may be electronic) pursuant to which an Eligible Employee may elect to enroll in this Plan, to authorize a new level of payroll deductions, or to stop payroll deductions and withdraw from an Offering Period.

“**ESPP Share Account**” means an account into which Common Stock purchased with accumulated payroll deductions at the end of an Offering Period are held on behalf of a Participant.

“**Exchange Act**” means the U.S. Securities Exchange Act of 1934.

“**Fair Market Value**” means, as of any date, the value of the shares of Common Stock as determined in the immediately following sentences. If the shares are listed on any established stock exchange or a national market system, the Fair Market Value shall be the closing price of a share (or if no sales were reported, the closing price on the first trading day immediately preceding such date) as quoted on such exchange or system on the day of determination, as reported in *The Wall Street Journal*. In the absence of an established market for the shares, the Fair Market Value shall be determined in good faith by the Committee and such determination shall be conclusive and binding on all persons.

“**Grant Date**” means the first day of each Offering Period as designated by the Committee.

“**Offering or Offering Period**” means a period of six (6) months beginning June 1 and December 1 of each year; *provided, however*, that, pursuant to **Section 5**, the Committee may change the duration of future Offering Periods (subject to a maximum Offering Period of twenty-seven (27) months) and/or the start and end dates of future Offering Periods.

“**Participant**” means an Eligible Employee who is actively participating in this Plan.

“**Participating Subsidiaries**” means the Subsidiaries that have been designated as eligible to participate in this Plan, and such other Subsidiaries that may be designated by the Committee from time to time in its sole discretion.

“**Plan**” means this Akoustis Technologies, Inc. Employee Stock Purchase Plan.

“**Purchase Date**” for an Offering Period means the last day of the Offering Period, or such other day(s) during the Offering Period as determined by the Committee.

“**Purchase Price**” means an amount equal to the lesser of (i) eighty-five percent (85%) (or such greater percentage as designated by the Committee) of the Fair Market Value of a share of Common Stock on the Grant Date or (ii) eighty-five percent (85%) (or such greater percentage as designated by the Committee) of the Fair Market Value of a share of Common Stock on the Purchase Date, provided that the Purchase Price per share of Common Stock will in no event be less than the par value of the Common Stock.

“**Securities Act**” means the U.S. Securities Act of 1933.

“**Subsidiary**” means any corporation, domestic or foreign, of which not less than fifty percent (50%) of the combined voting power is held by the Company or a Subsidiary, whether or not such corporation exists now or is hereafter organized or acquired by the Company or a Subsidiary. In all cases, the determination of whether an entity is a Subsidiary shall be made in accordance with Code Section 424(f).

3. ADMINISTRATION

3.1 General. This Plan shall be administered by the Committee, which shall have the authority to construe and interpret this Plan, prescribe, amend, and rescind rules relating to this Plan’s administration, and take any other actions necessary or desirable for the administration of this Plan, including adopting sub-plans applicable to particular Participating Subsidiaries or locations, which sub-plans may be designed to be outside the scope of Code Section 423. The Committee may correct any defect or supply any omission or reconcile any inconsistency or ambiguity in this Plan. All decisions of the Committee in connection with the administration of this Plan shall be in the Committee’s sole discretion, and such decisions shall be final and binding on all persons. All expenses of administering this Plan shall be borne by the Company. The Board may take any action under this Plan that would otherwise be the responsibility of the Committee.

3.2 Delegation. To the extent necessary or appropriate, the Committee may delegate any of its duties or responsibilities under the Plan as they pertain to a Participating Subsidiary to such Participating Subsidiary. The Committee (or any Participating Subsidiary with the consent of the Committee) may appoint or engage any person or persons as a third party administrator to perform ministerial functions pertaining to the issuance, accounting, recordkeeping, forfeiture, exercise, communication, transfer, or any other functions or activities necessary or appropriate to administer and operate this Plan.

4. ELIGIBILITY

4.1 General. Unless otherwise determined by the Committee in a manner that is consistent with Code Section 423, any individual who is an Eligible Employee as of the first day of the enrollment period designated by the Committee for a particular Offering Period shall be eligible to participate in such Offering Period, subject to the requirements of Code Section 423.

4.2 Eligibility Restrictions. Notwithstanding any provision of this Plan to the contrary, no Eligible Employee shall be granted an option under this Plan if (i) immediately after the grant of the option, such Eligible Employee (or any other person whose stock would be attributed to such Eligible Employee pursuant to Code Section 424(d)) would own capital stock of the Company or hold outstanding options to purchase stock possessing five percent (5%) or more of the total combined voting power or value of all classes of stock of the Company or any Subsidiary or (ii) such option would permit his or her rights to purchase stock under all employee stock purchase plans (described in Code Section 423) of the Company and its Subsidiaries to accrue at a rate that exceeds twenty-five thousand dollars (\$25,000) of the Fair Market Value of such stock (determined at the time the option is granted) for each calendar year in which such option is outstanding at any time.

5. OFFERING PERIODS

This Plan shall be implemented by a series of Offering Periods, each of which shall be six (6) months in duration, with new Offering Periods commencing on or about June 1 and December 1 of each year (or such other times as determined by the Committee). The Committee shall have the authority to change the duration, frequency, start date, and end date of Offering Periods.

6. PARTICIPATION

6.1 Enrollment; Payroll Deductions. An Eligible Employee may elect to participate in this Plan by properly completing an Enrollment Form, which may be electronic, and submitting it to the Company, in accordance with the enrollment procedures established by the Committee. Participation in this Plan is entirely voluntary. By submitting an Enrollment Form, the Eligible Employee authorizes payroll deductions from his or her paycheck in an amount equal to at least one percent (1%), but not more than ten percent (10%) (or such other maximum percentage as the Committee may establish from time to time before an Offering Period begins) of his or her Compensation on each pay day occurring during an Offering Period. Payroll deductions shall commence on the first payroll date after the Grant Date and end on the last payroll date on or before the Purchase Date. The Company shall maintain records of all payroll deductions but shall have no obligation to pay interest on payroll deductions or to hold such amounts in a trust or in any segregated account. Unless expressly permitted by the Committee, a Participant may not make any separate contributions or payments to this Plan.

6.2 Election Changes. During an Offering Period, a Participant may not change his or her rate of payroll deductions applicable to such Offering Period unless the Committee determines otherwise. A Participant may decrease or increase his or her rate of payroll deductions for future Offering Periods by submitting a new Enrollment Form authorizing the new rate of payroll deductions at least fifteen (15) days before the start of the next Offering Period.

6.3 Automatic Re-enrollment. The deduction rate selected in the Enrollment Form shall remain in effect for subsequent Offering Periods unless the Participant (i) submits a new Enrollment Form authorizing a new level of payroll deductions in accordance with **Section 6.2**, (ii) withdraws from this Plan in accordance with **Section 10**, or (iii) terminates employment or otherwise becomes ineligible to participate in this Plan.

7. GRANT OF OPTION

On each Grant Date, each Participant in the applicable Offering Period shall be granted an option to purchase, on the Purchase Date, a number of shares of Common Stock determined by dividing the Participant's accumulated payroll deductions by the applicable Purchase Price; *provided, however*, that in no event shall any Participant purchase more than 2,000 shares of Common Stock during an Offering Period (subject to adjustment in accordance with **Section 18** and the limitations set forth in **Section 4.2** and **13**).

8. EXERCISE OF OPTION/PURCHASE OF SHARES

A Participant's option to purchase shares of Common Stock shall be exercised automatically on the Purchase Date of each Offering Period. The Participant's accumulated payroll deductions shall be used to purchase the maximum number of whole shares that can be purchased with the amounts in the Participant's notional account, subject to the limitations set forth in this Plan. Unused payroll deductions remaining in a Participant's notional account at the end of an Offering Period (i.e., by reason of the inability to purchase a fractional share), as well as any accumulated payroll deductions that remain in a Participant's notional account after applying the limitations of **Section 4.2** and **Section 7**, shall be returned to the Participant as soon as administratively practicable.

9. TRANSFER OF SHARES

As soon as reasonably practicable after each Purchase Date, the Company shall arrange for the delivery to each Participant of the shares of Common Stock purchased upon exercise of his or her option. The Committee may permit or require that the shares be deposited directly into an ESPP Share Account established in the name of the Participant with a Designated Broker and may require that the shares of Common Stock be retained with such Designated Broker for a specified period of time. Participants shall not have any voting, dividend, or other rights of a stockholder with respect to the shares of Common Stock subject to any option granted hereunder until such shares have been delivered pursuant to this Section 9.

10. WITHDRAWAL

10.1 Withdrawal Procedure. A Participant may withdraw from an Offering by submitting to the Company a revised Enrollment Form indicating his or her election to withdraw at least fifteen (15) days before the Purchase Date. The accumulated payroll deductions held on behalf of a Participant in his or her notional account (that have not been used to purchase shares of Common Stock) shall be paid to the Participant promptly after receipt of the Participant's Enrollment Form indicating his or her election to withdraw and the Participant's option shall be automatically terminated. If a Participant withdraws from an Offering Period, no payroll deductions shall be made during any succeeding Offering Period, unless the Participant re-enrolls in accordance with **Section 6.1**.

10.2 Effect on Succeeding Offering Periods. A Participant's election to withdraw from an Offering Period shall not have any effect upon his or her eligibility to participate in succeeding Offering Periods that commence after the completion of the Offering Period from which the Participant withdraws.

11. TERMINATION OF EMPLOYMENT; CHANGE IN EMPLOYMENT STATUS

Upon termination of a Participant's employment from the Company and the Participating Subsidiaries for any reason or at any other time, or a change in the Participant's employment status after which the Participant is no longer an Eligible Employee, the Participant shall be deemed to have withdrawn from this Plan and the payroll deductions in the Participant's notional account (that have not been used to purchase shares of Common Stock) shall be returned to the Participant, or in the case of the Participant's death, to the person(s) entitled to such amounts under **Section 17**, and the Participant's option shall be automatically terminated.

12. INTEREST

No interest shall accrue on or be payable with respect to the payroll deductions of a Participant in this Plan.

13. SHARES RESERVED FOR PLAN

13.1 Number of Shares. A total of 500,000 shares of Common Stock have been reserved as authorized for the grant of options under this Plan. The shares of Common Stock may be newly issued shares, treasury shares, or shares acquired on the open market. If an option under this Plan expires or is terminated unexercised for any reason, the shares as to which such option so expired or terminated again may be made subject to an option under this Plan.

13.2 Oversubscribed Offerings. The number of shares of Common Stock that a Participant may purchase in an Offering under this Plan may be reduced if the Offering is oversubscribed. No option granted under this Plan shall permit a Participant to purchase shares of Common Stock that, if added together with the total number of shares of Common Stock purchased by all other Participants in such Offering, would exceed the total number of shares of Common Stock remaining available under this Plan. If the Committee determines that, on a particular Purchase Date, the number of shares of Common Stock with respect to which options are to be exercised exceeds the number of shares of Common Stock then available under this Plan, the Company shall make a pro rata allocation of the shares of Common Stock remaining available for purchase in as uniform a manner as practicable and as the Committee determines to be equitable.

14. TRANSFERABILITY

No payroll deductions credited to a Participant, nor any rights with respect to the exercise of an option or any rights to receive Common Stock hereunder, may be assigned, transferred, pledged, or otherwise disposed of in any way (other than by will, the laws of descent and distribution, or as provided in **Section 17**) by the Participant. Any attempt to assign, transfer, pledge, or otherwise dispose of such rights or amounts shall be without effect.

15. APPLICATION OF FUNDS

All payroll deductions received or held by the Company under this Plan may be used by the Company for any corporate purpose to the extent permitted by applicable law, and the Company shall not be required to segregate such payroll deductions or contributions.

16. STATEMENTS

Participants shall be provided with statements at least annually that shall set forth the contributions made by the Participant to this Plan, the Purchase Price of any shares of Common Stock purchased with accumulated funds, the number of shares of Common Stock purchased, and any payroll deduction amounts remaining in the Participant's notional account.

17. DESIGNATION OF BENEFICIARY

A Participant may file, on forms supplied by the Committee, a written designation of beneficiary who is to receive any shares of Common Stock and cash in respect of any fractional shares of Common Stock, if any, from the Participant's ESPP Share Account under this Plan in the event of such Participant's death. In addition, a Participant may file, on forms supplied by the Committee, a written designation of beneficiary who is to receive any cash withheld through payroll deductions and credited to the Participant's notional account in the event of the Participant's death before the Purchase Date of an Offering Period.

18. ADJUSTMENTS FOR CHANGES IN CAPITALIZATION; DISSOLUTION OR LIQUIDATION; CORPORATE TRANSACTIONS

18.1 Adjustments. In the event that any dividend or other distribution (whether in the form of cash, Common Stock, or other property), recapitalization, stock split, reverse stock split, reorganization, merger, consolidation, split-up, spin-off, combination, repurchase, or exchange of Common Stock or other securities of the Company, or other change in the Company's structure affecting the Common Stock occurs, then in order to prevent dilution or enlargement of the benefits or potential benefits intended to be made available under this Plan, the Committee shall, in such manner as it deems equitable, adjust the number of shares and class of Common Stock that may be delivered under this Plan, the Purchase Price per share, and the number of shares of Common Stock covered by each outstanding option under this Plan, and the numerical limits of **Section 7** and **Section 13**.

18.2 Dissolution or Liquidation. Unless otherwise determined by the Committee, in the event of a proposed dissolution or liquidation of the Company, any Offering Period then in progress shall be shortened by setting a new Purchase Date and the Offering Period shall end immediately before the proposed dissolution or liquidation. The new Purchase Date shall be before the date of the Company's proposed dissolution or liquidation. Before the new Purchase Date, the Committee shall provide each Participant with written notice, which may be electronic, of the new Purchase Date and that the Participant's option shall be exercised automatically on such date, unless before such time, the Participant has withdrawn from the Offering in accordance with **Section 10**.

18.3 Corporate Transactions. In the event of a Corporate Transaction, the then-current Offering Period shall be shortened by setting a new Purchase Date on which the Offering Period shall end. The new Purchase Date shall occur before the date of the Corporate Transaction. Before the new Purchase Date, the Committee shall provide each Participant with written notice, which may be electronic, of the new Purchase Date and that the Participant's option shall be exercised automatically on such date, unless before such time, the Participant has withdrawn from the Offering in accordance with **Section 10**.

19. GENERAL PROVISIONS

19.1 Equal Rights and Privileges. Notwithstanding any provision of this Plan to the contrary and in accordance with Code Section 423, all Eligible Employees who are granted options under this Plan for an Offering shall have the same rights and privileges with respect to that Offering.

19.2 No Right to Continued Service. Neither this Plan nor any compensation paid hereunder shall confer on any Participant the right to continue as an Employee or in any other capacity.

19.3 Rights as Stockholder. A Participant shall become a stockholder with respect to the shares of Common Stock that are purchased pursuant to options granted under this Plan when the shares are transferred to the Participant's ESPP Share Account. A Participant shall have no rights as a stockholder with respect to shares of Common Stock for which an election to participate in an Offering Period has been made until such Participant becomes a stockholder as provided above.

19.4 Successors and Assigns. This Plan shall be binding on the Company and its successors and assigns.

19.5 Entire Plan. This Plan constitutes the entire plan with respect to the subject matter hereof and supersedes all prior plans with respect to the subject matter hereof.

19.6 Compliance with Law. The obligations of the Company with respect to payments under this Plan are subject to compliance with all applicable laws and regulations. Common Stock shall not be issued with respect to an option granted under this Plan unless the exercise of such option and the issuance and delivery of the shares of Common Stock pursuant thereto shall comply with all applicable provisions of law, including the Securities Act, the Exchange Act, and the requirements of any stock exchange upon which the shares may then be listed.

19.7 Notice of Disqualifying Dispositions. Each Participant shall give the Company prompt written notice of any disposition or other transfer of shares of Common Stock acquired pursuant to the exercise of an option acquired under this Plan, if such disposition or transfer is made within two (2) years after the applicable Grant Date or within one (1) year after the applicable Purchase Date.

19.8 Term of Plan. This Plan shall become effective on the Effective Date and, unless terminated earlier pursuant to **Section 19.9**, shall have a term of ten (10) years.

19.9 Amendment or Termination. The Committee may, in its sole discretion, amend, suspend, or terminate this Plan at any time and for any reason. If this Plan is terminated, the Committee may elect to terminate all outstanding Offering Periods either immediately or once shares of Common Stock have been purchased on the next Purchase Date (which may, in the discretion of the Committee, be accelerated) or permit Offering Periods to expire in accordance with their terms (and subject to any adjustment in accordance with **Section 18**). If any Offering Period is terminated before its scheduled expiration, all amounts that have not been used to purchase shares of Common Stock shall be returned to Participants (without interest, except as otherwise required by law) as soon as administratively practicable.

19.10 Applicable Law. The laws of the State of Delaware shall govern all questions concerning the construction, validity, and interpretation of this Plan, without regard to such state's conflict of law rules.

19.11 Stockholder Approval. This Plan shall be subject to approval by the stockholders of the Company within twelve (12) months before or after the date this Plan is adopted by the Board.

19.12 Code Section 423. This Plan is intended to qualify as an "employee stock purchase plan" under Code Section 423. Any provision of this Plan that is inconsistent with Code Section 423 shall be reformed to comply with Code Section 423.

19.13 Withholding. To the extent required by applicable Federal, state, or local law, a Participant must make arrangements satisfactory to the Company for the payment of any withholding or similar tax obligations that arise in connection with this Plan.

19.14 Severability. If any provision of this Plan shall for any reason be held to be invalid or unenforceable, such invalidity or unenforceability shall not affect any other provision hereof, and this Plan shall be construed as if such invalid or unenforceable provision were omitted.

19.15 Plan Construction. In this Plan, unless otherwise stated, the following uses apply: (i) references to a statute or law shall refer to the statute or law and any amendments and any successor statutes or laws, and to all regulations promulgated under or implementing the statute or law, as amended, or its successors, as in effect at the relevant time; (ii) in computing periods from a specified date to a later specified date, the words "from" and "commencing on" (and the like) mean "from and including," and the words "to," "until" and "ending on" (and the like) mean "to and including"; (iii) indications of time of day shall be based upon the time applicable to the location of the principal headquarters of the Company; (iv) the words "include," "includes" and "including" mean "include, without limitation," "includes, without limitation" and "including, without limitation," respectively; (v) all references to articles and sections are to articles and sections in this Plan; (vi) all words used shall be construed to be of such gender or number as the circumstances and context require; (vii) the captions and headings of articles and sections have been inserted solely for convenience of reference and shall not be considered a part of this Plan, nor shall any of them affect the meaning or interpretation of this Plan or any of its provisions; (viii) any reference to an agreement, plan, policy, form, document, or set of documents, and the rights and obligations of the parties under any such agreement, plan, policy, form, document, or set of documents, shall mean such agreement, plan, policy, form, document, or set of documents as amended from time to time, and any and all modifications, extensions, renewals, substitutions, or replacements thereof; and (ix) all accounting terms not specifically defined shall be construed in accordance with GAAP.

As adopted by the Board on August 24, 2018.

As approved by the stockholders of the Company on November 1, 2018.

SUBSIDIARIES OF AKOUSTIS TECHNOLOGIES, INC.

Akoustis, Inc., a Delaware corporation

INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM'S CONSENT

We consent to the incorporation by reference in the Registration Statement of Akoustis Technologies, Inc. (the "Company") on Form S-8, File No. 333-215153, Form S-8, File No. 333-228451, Form S-8, File No. 333-222917, Form S-3, File No. 333-218245, Form S-3, File No. 333-222552, Form S-3, File No. 333-227637, and Form S-1, File No. 333-225870, of our report dated September 13, 2019, with respect to our audits of the consolidated financial statements of Akoustis Technologies, Inc. and Subsidiary as of June 30, 2019 and 2018, and for the two years in the period ended June 30, 2019 and our report dated September 13, 2019 with respect to our audit of the effectiveness of internal control over financial reporting of Akoustis Technologies, Inc. as of June 30, 2019, our report on the effectiveness of internal control over financial reporting expressed an adverse opinion because of the existence of material weaknesses, which reports are included in this Annual Report on Form 10-K of Akoustis Technologies, Inc. for the year ended June 30, 2019.

/s/ Marcum llp

Marcum llp
New York, NY
September 13, 2019

**CERTIFICATION PURSUANT TO RULE 13a-14(a) OR 15d-14(a)
OF THE SECURITIES EXCHANGE ACT OF 1934**

I, Jeffrey B. Shealy, certify that:

1. I have reviewed this Annual Report on Form 10-K of Akoustis Technologies, Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: September 13, 2019

/s/ Jeffrey B. Shealy

Jeffrey B. Shealy
President and Chief Executive Officer
(Principal Executive Officer)

**CERTIFICATION PURSUANT TO RULE 13a-14(a) OR 15d-14(a)
OF THE SECURITIES EXCHANGE ACT OF 1934**

I, Kenneth E. Boller, certify that:

1. I have reviewed this Annual Report on Form 10-K of Akoustis Technologies, Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: September 13, 2019

/s/ Kenneth E. Boller

Kenneth E. Boller
Interim Chief Financial Officer
(Principal Financial and Accounting Officer)

**CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the Annual Report of Akoustis Technologies, Inc. (the "Company") on Form 10-K for the fiscal year ended June 30, 2019, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Jeffrey B. Shealy, Chief Executive Officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

- (1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and
- (2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: September 13, 2019

/s/ Jeffrey B. Shealy

Jeffrey B. Shealy
President and Chief Executive Officer
(Principal Executive Officer)

A signed original of this written statement required by Section 906, or other document authenticating, acknowledging, or otherwise adopting the signature that appears in typed form within the electronic version of this written statement required by Section 906, has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.

**CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the Annual Report of Akoustis Technologies, Inc. (the "Company") on Form 10-K for the fiscal year ended June 30, 2019, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Kenneth E. Boller, Interim Chief Financial Officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

- (1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and
- (2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: September 13, 2019

/s/ Kenneth E. Boller

Kenneth E. Boller
Interim Chief Financial Officer
(Principal Financial and Accounting Officer)

A signed original of this written statement required by Section 906, or other document authenticating, acknowledging, or otherwise adopting the signature that appears in typed form within the electronic version of this written statement required by Section 906, has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.