LITHIUM TECHNOLOGY CORP
Form 10KSB
April 15, 2003
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UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

WASHINGTON, D.C. 20549

FORM 10-KSB

(MARK ONE)

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

For the fiscal year ended December 31, 2002

OR

¨ **TRANSITION REPORT UNDER SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from _____ to _____

Commission File Number 1-10446

LITHIUM TECHNOLOGY CORPORATION

(Name of Small Business Issuer in Its Charter)

DELAWARE	13-3411148
(State or Other Jurisdiction of Incorporation or Organization)	(I.R.S. Employer Identification No.)

5115 CAMPUS DRIVE, PLYMOUTH MEETING, PENNSYLVANIA 19462

(Address of Principal Executive Offices)

(610) 940-6090

(Issuer s Telephone Number, Including Area Code)

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

NONE.

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

COMMON STOCK, PAR VALUE, $0.01

Check whether the issuer: (1) filed all reports required to be filed by Section 13 or 15(d) of the Exchange Act during the past 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 x No ¨

Check if there is no disclosure of delinquent filers in response to Item 405 of Regulation S-B is not contained in this form, and no disclosure will 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-KSB or any amendments to this Form 10-KSB. x

State issuer s revenues for its most recent fiscal year. $121,000.

State the aggregate market value of the voting and non-voting common equity held by non-affiliates computed by reference to the price at which the common equity was sold, or the average bid and asked prices of such common equity, as of a specified date within the past 60 days.

Approximately $4,942,859 as of March 31, 2003. The aggregate market value was based upon the mean between the closing bid and asked price for the common stock as quoted by the NASD OTC Electronic Bulletin Board on that date.

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ISSUERS INVOLVED IN BANKRUPTCY PROCEEDINGS

DURING THE PAST FIVE YEARS

Check whether the issuer has filed all documents and reports required to be filed by Section 12, 13 or 15(d) of the Exchange Act after the distribution of securities under a plan confirmed by a court. Yes ¨ No ¨

APPLICABLE ONLY TO CORPORATE REGISTRANTS

State the number of shares outstanding of each of the issuer s classes of common equity, as of the latest practicable date: As of March 31, 2003, 88,235,392 shares of common stock.

DOCUMENTS INCORPORATED BY REFERENCE

If the following documents are incorporated by reference, briefly describe them and identify the part of the Form 10-KSB (e.g., Part I, Part II, etc.) into which the document is incorporated: (1) any annual report to security-holders; (2) any proxy or information statement; and (3) any prospectus filed pursuant to Rule 424(b) or (c) of the Securities Act of 1933 (Securities Act). None.

Transitional Small Business Disclosure Format (check one): Yes ¨ No x

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CURRENCY AND EXCHANGE RATES

All monetary amounts contained in this Report are, unless otherwise indicated, expressed in U.S. Dollars. On March 31, 2003, the noon buying rate for Euros as reported by the Federal Reserve Bank of New York was 1.0900 to $1.00 U.S.

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PART I

ITEM 1. DESCRIPTION OF BUSINESS

OVERVIEW AND RECENT DEVELOPMENTS

GENERAL

We are engaged in the development and pilot-line production of large format lithium-ion rechargeable batteries to be used as a new power source in emerging applications in the national security systems, automotive and stationary power markets. With higher energy density, lighter weight, smaller volume, longer operational life and greater cost effectiveness, we believe that lithium batteries are especially compatible with rapidly emerging developments in these markets. We further believe that our unique flat and cylindrical battery designs provide a special advantage in the national security systems, automotive and stationary power.

We recently combined our operations with GAIA Akkumulatorenwerke GmbH (GAIA), a private lithium polymer battery company headquartered in Nordhausen, Germany. See GAIA Share Exchange. The combination of Lithium Technology Corporation (LTC) and GAIA has resulted in a merger of our lithium-ion and lithium polymer technologies, manufacturing processes, know-how and market positioning.

Our corporate headquarters continue to be located at Plymouth Meeting, Pennsylvania. We now have two operating locations GAIA USA in Plymouth Meeting, Pennsylvania and GAIA Europe in Nordhausen, Germany. We have begun to implement our new combined strategic business plan which provides for a unified approach to overall business strategy; technology research and development; product development; procurement; production; market and competitive analysis; customer contact plans; marketing; public relations/investor relations; sales; distribution; securing future joint venture relationships for manufacturing and distribution; future resource needs; and financial matters.

We believe that the combined company has the capability to design, develop, build and sell large format lithium-based rechargeable batteries for a variety of advanced applications. GAIA USA has a range of potential customer contacts in U.S. commercial and government circles as well as in Asian markets, while GAIA Europe has the ability to attract and capture German and other European customers. We have a small revenue stream from certain government research and development contracts with GAIA Europe. Through blending the technologies, battery systems engineering and operations management of LTC and GAIA, we expect to enter the commercial marketplace sooner than either individual company previously would have been able to do on its own. Prior to our combination, we and GAIA expended a combined total of approximately $47 million in advancing our battery technologies. To date, we have delivered only limited prototypes.

We believe that the advantages of our battery technology over other batteries include:

Higher power and/or energy density

Longer life cycle

Greater cost effectiveness

More flexible battery designs

Broader range of operating temperatures

In the past, we have worked closely with selected portable electronics original equipment manufacturers exploring various notebook computer, personal data assistant and wireless handset applications. Over the past two and a half years, we refocused our large footprint cell technology and market activities to concentrate on large, high rate battery applications. Our commercialization efforts are focused on utilization of our lithium-ion rechargeable batteries in the following targeted markets as described further below in Development and Commercialization Plan :

National security systems

Automotive

Stationary power

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Our accompanying consolidated financial statements have been prepared on a going concern basis, which contemplates the continuation of operations, realization of assets and liquidation of liabilities in the ordinary course of business. Since inception, we have incurred substantial operating losses and expect to incur additional operating losses over the next several years. As of December 31, 2002, we had an accumulated deficit of approximately $27.4 million.

Operations have been financed primarily through the use of proceeds from loans from Arch Hill Capital N.V. of the Netherlands (Arch Hill Capital) and other related parties, loans from silent partners and bank borrowings secured by assets. Continuation of our operations in 2003 is dependent upon obtaining further financing from either Arch Hill Capital or other related parties, continued bridge financing from Arch Hill Capital and the new equity financing described below. See Item 6-Management s Discussion and Analysis or Plan of Operation. These conditions raise substantial doubt about our ability to continue as a going concern. The accompanying consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty.

Our operating plan seeks to minimize our capital requirements, but commercialization of our battery technology will require substantial amounts of additional capital. We expect that technology development and operating and production expenses will increase significantly as we continue to advance our battery technology and develop products for commercial applications.

We are currently seeking sources of additional financial, in the form of equity financing, to provide the additional capital in order to fund our current operations, expand our scope of operations and pursue our business strategy. However, no assurance can be given that we will be successful in completing any financing. If we are unsuccessful in completing any financing, we will not be able to fund our current expenses or pursue our business strategy.

GAIA SHARE EXCHANGE

On October 4, 2002, we closed a share exchange (the First Share Exchange) pursuant to which we acquired a 60% interest in GAIA. We acquired the 60% interest in GAIA through our acquisition of 60% of the outstanding shares of GAIA Holding B.V. (GAIA Holding) from Arch Hill Ventures, N.V., a private company limited by shares incorporated under the laws of the Netherlands (Arch Hill Ventures), in exchange for our issuance to Arch Hill Ventures of 60,000 shares of LTC Series A Preferred Stock convertible into 66,804,314 shares of LTC common stock. On December 13, 2002, we closed a second share exchange (the Second Share Exchange) in which Arch Hill Ventures transferred to us shares of GAIA Holding constituting 40% of the outstanding shares of GAIA Holding, and we issued to Arch Hill Ventures 40,000 shares of LTC Series A Preferred Stock convertible into 44,536,210 shares of LTC common stock. We now hold 100% of the outstanding shares of GAIA Holding and a 100% beneficial ownership interest in GAIA through certain trust arrangements described below. See Corporate Information. For a description of the terms of the Series A Preferred Stock held by Arch Hill Ventures, see Item 11 Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters Changes in Control.

Subsequent to the First and Second Share Exchanges, Arch Hill Capital controls LTC. As a result, the acquisition is accounted for as a reverse acquisition, whereby for financial reporting purposes, GAIA Holding is considered the acquiring company. Hence, the historical financial statements of GAIA Holding became the historical financial statements of the Company and include the results of operations of LTC only from the acquisition date. LTC and GAIA Holding are collectively referred to herein as the Company .

CORPORATE INFORMATION

LTC is a Delaware corporation that was incorporated on December 28, 1995. LTC s predecessor Lithium Technology Corporation (a Nevada corporation previously named Hope Technologies, Inc.) merged with and into LTC in a reincorporation merger that became effective on February 8, 1996. The executive office of LTC is located at 5115 Campus Drive, Plymouth Meeting, Pennsylvania 19462, telephone number: (610) 940-6090.

LTC holds 100% of the outstanding shares of GAIA Holding, a Netherlands holding company. GAIA Holding is a private limited liability company incorporated under the laws of the Netherlands on February 2, 1990, with a statutory seat at The Hague (the Netherlands) and office address at Parkweg 2, 2585 JJ, the Hague, the Netherlands.

GAIA Holding is the legal and beneficial owner of all of the issued and outstanding shares of Lithiontech B.V., a Netherlands company limited by shares that was formed on February 8, 1999 (Lithiontech). Lithiontech has the legal and beneficial ownership of all the issued and outstanding shares of DILO Trading AG, a Switzerland company limited by shares that was formed on September 11, 1975 (DILO Trading) and Lithiontech Licensing B.V., a Netherlands company limited by shares that was formed on February 8, 1999 (Lithiontech Licensing). DILO Trading holds patents for which the intellectual property was developed by DILO Trading in collaboration with GAIA. GAIA holds a license for all these patents.

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GAIA Holding is the beneficial owner of all of the issued and outstanding shares of GAIA. Legal ownership of the outstanding shares of GAIA are held pursuant to certain Dutch and German trust agreements by two Netherlands entities (the Nominal Stockholders) for the risk and account of GAIA Holding. Based on the Dutch and the German trust agreements, the Nominal Stockholders are obliged to transfer the legal ownership of the shares in GAIA without any further payments to GAIA Holding to a third party designated by GAIA Holding on the demand of GAIA Holding. Pursuant to the trust agreements, GAIA Holding has the right to vote the shares of GAIA held by the Nominal Stockholders.

In connection with the First Share Exchange closing, LTC entered into an agreement with GAIA Holding, Arch Hill Ventures and the Nominal Stockholders (the Share Transfer Agreement) which provides that without LTC s prior written consent, GAIA Holding may not directly or indirectly transfer or instruct any party to transfer the legal ownership of the shares of GAIA held by the Nominal Stockholders to any party other than to GAIA Holding and that upon LTC s written direction, GAIA Holding will instruct the Nominal Stockholders to transfer the legal ownership of the shares of GAIA held by the Nominal Stockholders to GAIA Holding for no payment. The Share Transfer Agreement further provides that at such time as the parties determine that there would no longer be any possible adverse tax effect as a result of the transfer of the GAIA shares to GAIA Holding, then the legal ownership of the GAIA shares held by the Nominal Stockholders shall be transferred to GAIA Holding without any payment.

GAIA is a private limited liability company organized under German law on April 4, 1996. GAIA is located at Montaniastrasse 17, D-99734 Nordhausen/Thuringia, Germany, telephone number: 011 49 3631 616 670.

LTC holds 100% of the outstanding shares of Lithion Corporation, a Pennsylvania corporation that was incorporated on June 3, 1988.

Information contained on the LTC web site or GAIA web site (www.lithiumtech.com and www.gaia-akku.com) does not constitute part of this Report.

DEVELOPMENT AND COMMERCIALIZATION PLAN

TARGET MARKETS

We plan to leverage our expertise in large format cells and large battery assemblies to commercialize advanced lithium batteries as a new power source in the national security systems, automotive and stationary power markets with a particular focus on the European and U.S. markets.

n NATIONAL SECURITY SYSTEMS BATTERY MARKET - We intend to pursue business in certain national security applications in the U.S. and in Europe. In both defense and aerospace applications there is a demand for extremely high power at low temperatures, with weight, size and long operational life at a premium. The United States government and certain allies are seeking advanced lightweight, compact, high-rate, high-capacity batteries. We believe that there is a preference for a domestic supply of such batteries. We are also targeting the aerospace arena as a potential customer for our batteries. We believe our batteries may be used in the following applications:

DEFENSE APPLICATIONS

- Manned combat support vehicles land-based and underwater
- Unmanned reconnaissance and combat support systems air, space, ground and underwater

AEROSPACE APPLICATIONS

- Satellites
- Astronaut Support Systems (EMU, space unit)
- Low earth orbit experiments

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n AUTOMOTIVE BATTERY MARKET During our development phase, we adapted proven industrial manufacturing processes to produce rechargeable flat lithium cells. In parallel, by using our coating and laminating capabilities and operations, we have developed processes for manufacturing large footprint lithium-ion and lithium polymer cells. In recent years, we combined these techniques with proprietary design, packaging and assembly techniques to produce large battery assemblies in response to a growing interest by automobile manufacturers for 42-volt automotive and hybrid electric vehicle (HEV) batteries.

We believe that major automakers throughout the world are considering the development of HEVs, 42-volt systems, or both. Sales of HEVs by Japanese carmakers have already begun and automakers in Europe, Japan and the U.S. have announced plans to introduce 42-volt systems over the next few years as well. The batteries for these two advanced automotive applications represent our main target market. More specifically, we will focus initially on the European and U.S. advanced automotive markets.

We believe that there are three strong initiatives driving automakers to seek advanced battery products such as ours:

Better fuel efficiency

Reduction of emissions

Increasing demand for on-board electric power

We intend to focus on two sectors of the automotive battery market:

HEVs

HEVs are vehicles that combine an electric drive system with a smaller internal combustion engine. The on-board battery enables the engine to be down-sized, since the battery provides a source of peak power for acceleration and hill climbing.

HEVs have or are expected to have battery systems ranging from 144-288 volts (compared to today s standard 12-volt car battery), which power the car part of the time in tandem with a smaller gas engine. The result is a half electric vehicle, which gets increased gas mileage compared to conventional vehicles and therefore has reduced emissions.

Innovative transmission systems assure a smooth blending of the two power sources. The gas engine powers the vehicle while cruising on level roads and charges the on-board battery, which provides the extra power needed for acceleration and hill climbing.

A major improvement in mileage and emissions comes from the inclusion of regenerative braking. Regenerative braking slows the car by connecting an electric generator to its wheels, thereby capturing the energy as electric power, rather than dissipating it as heat, which brakes

currently do. This captured power is then fed back to and accumulated in the battery, making it available to the electric motor for subsequent acceleration. This is critical to all HEVs, including experimental versions that employ fuel cells.

We believe that competitive battery technologies, such as lead acid (see Competition), have only limited ability to receive regenerative braking as such results in diminished battery performance and shorter life span. Our batteries accept pulse charging and thus do not have such a limitation.

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42-VOLT BATTERY SYSTEM

In addition to the development of HEVs, there has been movement towards a 42-volt battery system. The standard 12-volt electrical system, which has been utilized for 45 years, can not accommodate all of the new electronics available for today s cars. In the mid 1990 s, carmakers in the U.S., Japan and Europe began to consider tripling the on-board battery power to 36 volts, which increases to 42 volts when the car is operating.

The 42-volt battery system is expected to provide multiple advantages better fuel efficiency, reduced emissions and more consumer benefits by enabling an expanded array of on-board electronics and comforts, some of which operate when the vehicle is not in use. This 42-volt system, sometimes referred to as a mild hybrid, may be viewed as an enabling technology in the transition to higher voltage platforms.

The 42-volt battery systems involve some redesign and modification of a car s electrical system and its components (particularly lights), although some manufacturers are initially planning to use a 12-volt battery along with the 42-volt battery until the older system can be phased out. Introduction of 42-volt system is anticipated in the Japanese marketplace in 2003, while European manufacturers are aiming at 2004-2005. The intention of U.S. auto manufacturers regarding 42-volt battery systems is less clear.

n STATIONARY POWER BATTERY MARKET

We intend to pursue business in three segments of the large stationary power battery market where mission critical applications demand enhanced power reliability and power quality. We believe that LTC s lithium ion/lithium ion polymer battery technology offers robust constructions, wide operating temperature range and extended maintenance free cycle life as a new alternative to lead acid batteries in this market. We anticipate that the time frame for use of lithium batteries in the uninterruptible power systems and telecommunications infrastructure systems is 2003-2004 and 2005-2010 for distributed power systems. The stationary power market encompasses:

UNINTERRUPTIBLE POWER SYSTEMS (UPS)

Uninterruptible Power Systems are isolated back-up systems that do not operate continuously or feed back into the grid. They are generally batteries or banks of batteries that provide power while the grid supply is inoperative until it is restored. UPS also includes stand-by generators that switch on automatically to provide continuity of power supply when the grid goes down.

The demand for commercial and industrial UPS applications has tracked the increasing dependence of business on computerized systems. UPS users are seeking more reliable, longer-life and lower maintenance batteries.

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TELECOMMUNICATIONS INFRASTRUCTURE SYSTEMS

Telecommunications (T-Comm) infrastructure systems are a specific subset of UPS that need uninterruptible quality power for assured continuation of operations. Applications include T-Comm POPs, cell sites, CATV, Internet service sites, data centers, and remote locations.

Large telecom companies have taken a strong interest in improving the long term value of the battery systems supporting their networks. Advanced lead acid batteries have not proven to last their warranted five or 10 year battery life. As a result, we believe there is an opportunity for other superior battery chemistries such as ours to enter this market.

The need for advanced batteries is particularly important in remote sites signal repeaters and distributed nodes where maintenance visits are more costly. Also, newer telecom networks including broadband network systems appear to be more open to consider battery chemistries other than lead acid.

DISTRIBUTED POWER SYSTEMS

Distributed power systems are generally small, continuously operating, self-contained power generating units. These systems often employ high power batteries or capacitors for power control and conditioning functions, and a low power battery for energy storage.

These units are privately owned by companies other than public utility companies such as TelCos, industrial firms, hospitals, universities, broadcast networks and data centers and government installations. These power users have determined that they cannot always rely on the power grid to meet their power reliability and quality needs. (The power grid is the nationwide collection of interconnected public utility companies that supply electric power within developed countries.) The distributed power generators usually remain connected to the grid and may draw from or feed to the grid based upon their demands.

Alternative energy generation sources such as solar, wind and thermal are established sections of the distributed power systems market segment. These applications have their major impact in developing nations.

This market segment also includes small independent generators, which supply a single or limited number of users due to their remote location or power quality requirements. The energy storage component of distributed power systems currently consists of older battery technology. There is a demand for advanced, low maintenance, cost-effective, long-life batteries to perform this function.

We are also researching high end niche applications in the US and Europe that would benefit from a high rate battery that enables advanced power control and conditioning functions.

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PRODUCT COMMERCIALIZATION PLAN

We intend to pursue the following commercialization plan:

- PENETRATION OF NATIONAL SECURITY MARKET. Our primary strategy to enter the national security market is to partner with existing government contractors and aerospace system integrators and OEMs with government contracts.

- PENETRATION OF OEM MARKETS. We are targeting sales of our batteries to the automotive and stationary power OEM markets. Our primary strategy for entering the OEM market is to:

  Design to customer specifications

  Develop application-specific cell structures and batteries

  Showcase the capabilities and performance of our unique large-format flat and cylindrical cells

  Deliver prototype batteries

- OUTSOURCE CERTAIN OPERATIONS. We believe that the partial outsourcing strategy is important to achieve prototype production volumes and product acceptance. In particular, we anticipate outsourcing the coating of our electrodes. We believe that outsourcing significantly reduces the capital required and the environmental restrictions, controls and reporting requirements.

- ESTABLISHMENT OF STRATEGIC RELATIONSHIPS. We intend to cover small-volume orders of our batteries in-house and through outsourcing. We plan to establish strategic relationships to meet large-volume orders of our batteries, including through a manufacturing joint venture with a major battery manufacturer. We also plan to establish joint venture relationships for the distribution of products in selected markets.

- IDENTIFICATION OF NEW APPLICATIONS. We believe that we have the capability to design batteries for a wide array of applications such as those requiring high rates or high capacity as well as high or low temperatures. We intend to use our proprietary technology and expertise to develop rechargeable lithium batteries in different sizes and voltage configurations for use in a wide range of existing and future applications.

- PURSUE NICHE APPLICATIONS. We intend to identify and sell into small specialty markets with power source needs in order to generate revenue, gain application experience, gain name recognition and expand our expertise in integration.

- INCORPORATE ENABLING TECHNOLOGIES. We intend to explore relationships with manufacturers of ultracapacitors and other electrical components that complement our batteries and may add value to our customers if the technologies are made available to them in

a single product. For example, we intend to procure or develop battery management systems that will support testing in initial customer evaluations. A Battery Management System (BMS) is an electronic watchdog that monitors and reports on the safety, health and performance capabilities of the battery to the application s central computer or charger. Advanced BMS systems also provide cell balancing for optimal performance. We believe that this approach will simplify customer evaluations, will expose technology synergies and will demonstrate the forward thinking that has been incorporated into our battery products.

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Our recent milestones include the following:

January 2002 GAIA was awarded a contract, which includes IQ Wireless as a subcontractor, for a 16-volt/2 amp-hours (Ah) telecom infrastructure application.

April 2002 GAIA was awarded a development contract with BMW to deliver a prototype 42-volt automotive battery to BMW under the European Union-sponsored Astor program (Assessments and testing of advanced storage systems for propulsion and other electrical systems in passenger cars). The Astor consortium consists of seven European auto companies: Volkswagen, BMW, Daimler Chrysler, Opel, Fiat, Volvo, and Peugeot.

May 2002 GAIA entered into a contract with a shipbuilder to conduct a feasibility study for a submarine battery application.

July 2002 we were awarded a University of Minnesota contract to develop prototype robotics batteries.

September 2002 together with GAIA, we completed and shipped a prototype 42-volt automotive battery to BMW under the European Union-sponsored Astor program.

December 2002 we made available a second 42-volt prototype battery for independent testing in Europe, delivered 6 Ah cells for high-end power tools and completed the feasibility study for a submarine battery application.

January 2003 we entered into a contract with the University of Chicago for prototype high altitude balloon batteries and Daimler Chrysler has requested 27Ah cells for testing.

We are targeting the following product commercialization timeline:

2003: Deliver Prototypes:

- Telecom Infrastructure batteries
- Custom applications batteries
- Technology development contract batteries
- 42-volt automotive batteries
- 288-volt HEV batteries

2003-2004: Pilot delivery of large batteries for national security, automotive and stationary power markets

2004-2005: Beta Testing of 42-volt automotive batteries

2005-2006: Early commercial production of:

- ♦ Stationary power batteries
- ♦ Automotive batteries

2006-Onwards: Scale up to mass production

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The above sets forth our targeted time frame for achieving certain milestones. As of April 14, 2003, we have not yet delivered a prototype HEV, or stationary power or national security systems battery for testing by a third party. No assurance can be given that we will meet each of the above milestones in the targeted time frame, or at all.

TECHNOLOGY OVERVIEW

Our rechargeable lithium battery technology base dates back to 1983. Since 1983, we have evaluated a wide array of lithium-ion cell designs covering a broad spectrum of applications. These evaluations have involved coating a wide variety of electrode materials including those for lithium-ion liquid, lithium metal and lithium polymer chemistries onto a variety of substrates, including solid foils, expanded metal grids and fiber webs. We have engaged in high-yield pilot line operations since 1996. Over the last six years, certain manufacturing steps were adapted to our pilot line to accommodate these new techniques. These factors have allowed us the flexibility to match the battery design to the application. In recent years, we have extended our experience to the assembly of full batteries complete with battery management systems. In 1997, we began focusing on unique large footprint flat cells and large battery assemblies comprised of stacked cells and control circuitry.

GAIA began as a venture business based upon proprietary, novel manufacturing technology in 1996. GAIA has developed technology to continuously extrude lithium-ion polymer electrodes and the separator that contains the final electrolyte solution. This simplifies the manufacturing process by eliminating process steps such as drying coatings, extraction of plasticizer, and cell activation with electrolyte solution. The result is a liquid-free process that operates at lower cost and with minimal emission of organic solvents. GAIA Europe s plant is a modern facility with state-of-the-art automated equipment for extrusion/coating, lamination, winding, packaging and formation/testing.

In 2000, after four years of development, the GAIA team of experienced industrial managers, battery development engineers and production engineers, succeeded in advancing GAIA Europe s lithium polymer technology to the pilot production stage. By the end of 2001, GAIA Europe had developed two new types of cylindrical cells which may be used in HEV batteries and in national security applications.

Our lithium-ion and lithium polymer batteries encompass both thin, flat prismatic cells and large wound cylindrical and prismatic cells. Our proprietary technology includes critical composition, processing, and packaging aspects of the battery. We also have experience in cell and battery manufacturing processes. Our coating, lamination and extrusion know-how enables us to achieve uniformity and consistency via a range of application techniques. We have the ability to handle large footprint cells and assemble cells into large battery stacks. In addition, we are familiar with many coating, lamination, extrusion, assembly, packaging, and formation equipment suites which can be scaled up for large volume operations.

The electrodes used in our batteries are extrusion-coated onto foil current collectors while the separator is cast onto a carrier film. The resulting components are then laminated together into thin, lightweight, flexible form factor polymer cells and packaged in either flat or wound cell geometries. Batteries for the consumer, automotive, and industrial markets require different electro-chemical systems that we believe can be easily accommodated by our extrusion process. We also believe that our extrusion process can be applied to producing supercapacitors and electrodes for fuel cells.

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We believe that our technology advantages include the following:

Large format cells prismatic and cylindrical

Readily customized as to size, shape and performance
Common building blocks which result in cost savings

Higher energy density

Lower weight
Smaller size

Higher power density

Higher rates
Higher pulse power

Broader range of operating temperatures

Longer operational life

Unique, simplified extrusion, coating and assembly processes

Life cycle cost-competitive per watt hour

Environmental advantages

DEVELOPMENT CONTRACTS AND RESEARCH SUBSIDIES

We had revenue from development contracts and prototype sales of $121,000 for the year ended December 31, 2002. In addition, we received a total of $1,112,000 from foreign government subsidies (research grants) for the year ended December 31, 2002. As of March 31, 2003, GAIA had four technology research grants with various European and German government entities. The end-dates for these grants range from October 2003 to March 2004, and the total amount due under these grants in the 2003 and 2004 fiscal years is expected to be approximately 1.2 million and 615,000, respectively.

As of March 31, 2003, LTC had contracts with two Universities to deliver batteries for robotics and high altitude balloon applications, with a total due under such contracts of approximately $19,000.

INTELLECTUAL PROPERTY

PATENTS AND PROPRIETARY INFORMATION

As of March 31, 2003, 26 patents have been issued to LTC and LTC has four patent applications pending in the United States. LTC also pursues foreign patent protection in countries of interest. LTC has been granted three foreign patents and has seven patent applications pending in foreign countries. DILO Trading holds patents for which the intellectual property was developed by DILO Trading in collaboration with GAIA. DILO Trading has granted GAIA the right to use these patents. As of March 31, 2003, five patents have been issued to DILO Trading and DILO Trading has 30 patent applications pending in Europe. Although we believe that the pending patent applications will be granted, no assurance to this effect can be given.

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We also have proprietary knowledge that is in the patent disclosure stage or that we protect as trade secrets. Our early patents relate to materials and construction for lightweight solid-state rechargeable batteries. Our later patents and applications relate to improvements to the technology contained in the first patents or to other key aspects of rechargeable lithium battery technology. The earliest any of our patents expires is 2005. There is no current or, to our knowledge, threatened litigation regarding our patents.

We also rely on unpatented proprietary information to maintain and develop our commercial position. Although we seek to protect our proprietary information, there can be no assurance that others will not either develop independently the same or similar information or obtain access to our proprietary information. In addition, there can be no assurance that we would prevail if we were to challenge intellectual property rights claimed by third parties that we believed infringed upon our rights or that third parties will not successfully assert infringement claims against us in the future.

LTC and GAIA employees are required to enter into agreements providing for confidentiality and the assignment of rights to inventions made by them while employed by such company. There can be no assurance that these agreements will be enforceable by us.

LICENSING RELATIONSHIPS AND RELATED MATTERS

We have entered into a cross-license with Valence Technology Corporation with respect to rights relating to U.S. Patent No. 4,997,732 held by Valence (Battery in a Vacuum Sealed Enveloping Material and Process for Making the Same) and rights relating to U.S. Patent No. 5,057,385 held by us (Battery Packaging Construction) and granted certain license/distributorship option rights pursuant to a Japanese consortium technology development agreement entered into in 1996.

In connection with our termination of our previously proposed merger with Ilion Technology Corporation (Ilion), we entered into cross licensing agreements with Ilion effective January 8, 2002, whereby worldwide, non-exclusive, royalty free, perpetual licenses were granted by each to the other with respect to certain specified technology. The license from us to Ilion covers all product designs, processing techniques and knowledge known to those skilled in the art whether or not patented or patentable which we owned or possessed on December 31, 2001 and have communicated to Ilion or was developed by us pursuant to the LTC-Ilion merger agreement, solely as the foregoing relates to the materials, design and architecture of lithium-ion/lithium-ion polymer batteries and excluding any of the foregoing as it relates to lithium metal polymer batteries and excluding any improvements to the technology after December 31, 2001. The license from Ilion to us covers all product designs, processing techniques and knowledge known to those skilled in the art whether or not patented or patentable which Ilion owned or possessed on December 31, 2001 and has communicated to us or was developed by us pursuant to the LTC-Ilion merger agreement, solely as the foregoing relates to the materials, design and architecture of lithium-ion/lithium-ion polymer batteries and excluding any improvements to the technology after December 31, 2001.

As part of the licensing arrangement with Ilion, we agreed not to duplicate Ilion s High Power Device product or design or any other aspect of the high power device system that can be protected by patent or may not be determined by outside analysis and agreed to not enter the power conditioning reliability market for a period of two years after Proteus Power LLC (or its successor) (Proteus) enters commercial production or December 31, 2004, whichever is earlier. We do not believe that Ilion-Proteus has yet entered into commercial production

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of this product. Subject to the foregoing, we have the right to use known conventional construction designs which exist in the commercial marketplace outside of Ilion-Proteus.

In connection with the closing of the First Share Exchange on October 4, 2002, we entered into a Strategic Alliance Agreement with GAIA (the Strategic Alliance Agreement). Our Strategic Alliance Agreement with GAIA covers technology sharing and licensing, among other matters. The Strategic Alliance Agreement provides that as determined in accordance with the rules of inventorship, we will have sole ownership of all inventions, patents, know-how, trade secrets, technical information, data, manufacturing processes, designs, ideas, and the like (Technology) invented, discovered or developed solely by us, by our employees, or by our agents prior to and during the term of the Strategic Alliance Agreement (LTC Technology) and GAIA will have sole ownership of all Technology invented, discovered or developed solely by GAIA, by GAIA s employees, or by GAIA s agents prior to and during the term of the Strategic Alliance Agreement (GAIA Technology). We and GAIA will each own jointly and equally with the other party all Technology invented, discovered or developed jointly by the parties, their employees or agents during the term of the Strategic Alliance Agreement (Strategic Alliance Technology).

Pursuant to the Strategic Alliance Agreement, we granted to GAIA a worldwide, non-sublicensable, royalty-free license of all LTC Technology and GAIA granted to us a worldwide, non-sublicensable, royalty-free license of all GAIA Technology. Neither party may sell, transfer, divest or license to any third party, any Strategic Alliance Technology or any interest in the Technology that is the subject of the foregoing licenses without the written consent of the other party.

Pursuant to the Strategic Alliance Agreement, each party will have full responsibility for the application, prosecution, and maintenance of patents and/or patent applications worldwide for those inventions which are solely owned by such party. Unless the parties determine otherwise, all patent applications relating to LTC Technology, GAIA Technology and Strategic Alliance Technology will be filed in the United States and Germany. LTC will be the owner of any resulting patents, approvals or licenses issued by any governmental entity relating to any LTC Technology. GAIA will be the owner of any resulting patents, approvals or licenses issued by any governmental entity relating to any GAIA Technology. We and GAIA will be co-owners on an equal basis, of any resulting patents, approvals or licenses issued by any governmental entity relating to any Strategic Alliance Technology. We and GAIA have the right to bring and maintain any appropriate suit or action for infringement of any patent or other right with respect to Technology owned by such party.

In addition to technology sharing and licensing matters, the Strategic Alliance Agreement covers joint production, marketing, sales and distribution activities and similar matters. Pursuant to the Strategic Alliance Agreement, LTC and GAIA have agreed to enter into mutually acceptable manufacturing, supply, and other agreements. Each party must adhere to specified accounting and internal financial controls and furnish to the other party specified financial information.

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COMPETITION

Competition in the battery industry is, and is expected to remain, intense. In the near term we believe that our advanced lithium-ion technology and products are ideally suited to expanding national security applications, where there is a strong demand for lighter weight, smaller volume and higher energy density batteries. In our target markets of advanced automotive and stationary power applications, the principal competitive technologies are currently lead acid and nickel metal hydride (NiMH). We believe that lithium-ion and lithium polymer batteries will enter this segment of the rechargeable battery market in the near future. We believe that lithium-ion and lithium polymer batteries will compete in this market based on superior performance and life cycle, particularly in the HEV market which requires constant deep cycle charge and discharge, high rate regenerative braking and operation over a wide range of temperatures.

The rechargeable battery industry consists of major domestic and international companies, many of which have financial, technical, marketing, sales, manufacturing, distribution and other resources substantially greater than ours. We compete against companies producing lithium batteries as well as other primary and rechargeable battery technologies. Our primary competitors who have announced availability of rechargeable battery products for the advanced automotive and stationary power markets include Sanyo, Johnson Controls, Varta, Exide, GS Battery of Japan, Shin-Kobe Electric Machinery, SAFT, Fiamm, Delphi, Panasonic EV Energy, Enersys and Bahner.

NATIONAL SECURITY SYSTEMS MARKET

Competition in the national security systems market is intense. Several companies compete in the government contract area for custom batteries. These include Alliant Tech, Yardney, Eagle-Pitcher and SAFT. Only SAFT has produced commercially available batteries to date. SAFT USA s cylindrical lithium ion cells have initial market recognition for large format applications which has paved the way for development of electrical platforms that will also support LTC lithium ion technology. Based on performance data that SAFT has presented at technical conferences, we believe that LTC flat lithium ion cell technology has the advantage of producing less waste heat and improved removal of waste heat. We believe such may be a particularly significant competitive advantage in large battery configurations such as those used in large HEVs being considered by the military for unmanned reconnaissance vehicles and platforms that move heavy equipment.

AUTOMOTIVE MARKET

Advanced lead acid batteries exist for the 42-volt mild HEV platforms. Hoppecke s automotive battery division, which was recently acquired by Johnson Controls, has presented a lead acid 42-volt battery. A 42-volt lead acid battery is currently used in Toyota s Crown vehicle.

For higher voltage automotive systems, competition today comes largely from NiMH batteries. Advanced NiMH automotive batteries from Panasonic Energy Venture are being used in the commercially available Honda and Toyota HEV models. Competition from lithium ion batteries may materialize in this market in the near future. Nissan has reported work on a lithium ion battery for a developmental HEV model. Compact Power announced that its battery system with lithium ion polymer cells from LG Chemical will be tested by the US Advanced B