

Longer Lasting, Lower Priced Batteries and Battery Testing App for Mobile Devices used in the Retail and Logistics/Shipping Industries



Larry Murray
Chairman & CEO

CEOCFO: *Mr. Murray, why is GTS passionate about batteries? What is your focus today?*

Mr. Murray: We focus primarily on mobility; mobile devices that provide voice, data, or diagnostics functionality. These are mobile devices that you see in supermarkets, big box stores, warehouses, with delivery drivers and in hospitals with various medical applications. I first got involved in this many years ago as an Army officer when I realized that batteries are very weak and there is no way to tell when they had reached the end of their usual life. Military personnel typically throw away all of their batteries and get new ones regularly because they could not tell what was good and what was bad. Later, I worked in a research laboratory and we developed the human artificial heart and it worked very well actually in animals but the power source for it was the size of a washing machine. It was totally impractical. There was no way to develop a portable power source that had enough power to do practical things other than really simple applications and this caught my attention. As I founded other businesses, I always had my eye on batteries. About 20 years ago, new lithium ion technology became available with much lighter weight and much greater power. They provided a platform on which more could be done with portable power. Today, most people think the ultimate in portable electric devices might be the Tesla automobile, which is a very sophisticated, elegant machine that is driven by batteries. More and more devices now are becoming available because of these lithium batteries and the battery management systems that go along with them.

CEOCFO: *What are you offering to the marketplace?*

Mr. Murray: Today we design and manufacture batteries that last longer, that tend to be lower priced, and that are much more efficient. On top of that, we have recently introduced what we call our GTS Managed Services Group. It solves a problem with batteries that has been around since they were invented and that is identifying when a battery has reached the end of its useful life.

CEOCFO: *How does the GTS Managed Services Group work?*

Mr. Murray: It is built around the same technology that we have developed that enables us to use a small tester the size of a deck of cards and connect that, via Bluetooth, to a mobile app we have developed that can be downloaded and run a smartphone. This enables us to put some probes on that tester and test the battery on location instantly and determine its state of health. No one else can do that and we have applied for a patent on this process.

CEOCFO: *Are there ways for a company to test it on premise?*

Mr. Murray: If you think about batteries, they are always in action. In a mobile device, like barcode scanners and two-way radios, they are always in use. Traditional ways of testing batteries are to put them on a fixed testing device in a lab and it will take several hours to test a battery using conventional means. We have developed a process where we can do it instantly. Instead of taking a battery out of service and testing it for several hours, we can do it in three or four seconds and get an instant read on that battery. Because it is connected our app and to our server, we know when a customer is testing this battery and we know the results of that test. We can then provide the customer with certain data analytics based on the testing history we are seeing and provide that back to the customer. Now a customer can go ahead and test batteries in each location, identify the bad ones, take them out of service, and we can go ahead and send batteries to that location based on the testing and it is a much more efficient way of running a business.

CEOCFO: *How does the technology work? How can you do this remotely?*

Mr. Murray: It is called a process of chemical polarization. What we do is when you put probes on the battery we put a little electrical charge into that battery and we are able to measure the rebound of that charge. That rebound of charge

coming back is put through an algorithm we have developed that enables us to interpret the state of health of that battery with a very high level of accuracy. We are the only ones that we know of who can do that on a portable basis. The testing takes place at the customer's facility. They literally pull batteries out, put the probes on it, the device measures, and it then the data goes up to the app. We may crunch the numbers in the Cloud but the testing actually takes place in the store, in the warehouse, that type of thing. It is not remote testing per se. The testing is right there in the facility but we do all the analytics up in the Cloud.

"Organizations run on mobility. Mobility runs on batteries. Bad Batteries add cost and risk to the organization." - Larry Murray

CEOCFO: *Might a company take batteries out of services every 6 months, test them and then with analytics realize they only need to test once a year? How do the analytics play into what a company can do? How do you monetize this for people so they understand what it is really worth?*

Mr. Murray: Batteries are not important to people generally. Generally, people think that they get batteries at the checkout counter in Walmart. They never think about the health of them and the cost they incur. One of the interesting issues about batteries is that the bad batteries will charge up faster because of something called impedance builds up in batteries. If you envision a 20-gallon gas tank and we punch a big dent in that gas tank, then it only takes 15 gallons because of the big dent. If you go to fill up both gas tanks, the 20 gallon and the 15 gallon, they both show that they are full but one of them has 20 and one them has much less gas in it. The same is true with impedance build up in a battery. As electrical impedance builds up, it takes on less juice. Because it takes on less juice, it fails faster. If an EMT, a police officer, or someone in a warehouse is using a mobile device with a battery that has high impedance, they will take it off the charger because the green light goes on the charger. It charges up fast but then it only runs for about an hour. A good battery will take much longer to charge up but it might run for 8 to 12 hours. Employees or officers will grab the battery that charges up fastest thinking it is the freshest and they will use it. That is the big problem. What you need to do is test them periodically with the GTS tester and app and determine its state of health. Do not let it fool you that it is full when it is not and then take the bad ones out. The other problem we see particularly in retail and logistics applications is that no one is authorized to throw away a \$40 or \$50 asset, in this case, a bad battery. First, they have difficulty identifying bad ones but then if they do identify one, they are not authorized to throw it away. There is no independent process in most organizations to identify and throw away the bad batteries. Our technology is an independent arbiter of good and bad. The tester tests it and if it says "bad" they now are authorized to throw it away. We can adjust our tester so that if we are testing for EMTs or police, we can make it a very fine line, very strict as far as leaving a battery behind. If we are dealing in a noncritical warehouse application, we have the ability to set out parameters so that we can leave a marginal battery behind because they will still get value out of it over time and the potential impact is not life-threatening if it has a shorter run time. We can make it very efficient for each customer as we determine the customer's needs.

CEOCFO: *How are you approaching various groups, companies, and organizations that could utilize what you do? How do you educate? How do you get them to listen?*

Mr. Murray: A lot of people think that batteries are not important so why worry about them? But by connecting it to productivity loss in an organization via failure of mobile devices, it can be compelling. We have found, for example, in a top 5 retailer that more than 100% of their mobile devices were sent to repair facilities each year. That means some were sent more than once. We also found that 30% of those repairs were the result of bad batteries. Workers kept putting bad batteries in the devices and finding that they failed so they naturally assumed that the devices were defective rather than recognizing the fact that they were using bad batteries over and over. They now are saving significantly in service contract costs. They also are saving down time. There are additional savings in having cleaner inventories and in having a more efficient purchasing process for each customer by connecting it to our app, our server and automatic replacement of bad batteries only when they need to be replaced and where they need to be replaced.

CEOCFO: *How are you reaching out?*

Mr. Murray: We are reaching out in a number of ways. Our website is trying to feature our test and Replace capabilities. We are working on newsletters and blogs. We also are actually converting our current customers over to Test and Replace because it is good for them and gets us word of mouth referrals. We find that customers are calling us because others are having great success with it. So we are using a number of methods to get this story in front of our customers.

CEOCFO: *Where are you having the most success?*

Mr. Murray: We have had success for a lot of reason with EMTs, police, and federal law enforcement because our batteries generally run longer and perform better. Some federal customers have bought new radios from the major radio

manufacturer without batteries and they buy our batteries to use in them. They recognize the value of what we do. Now we are giving them additional opportunity to better manage their mobile power. In addition to better and longer running batteries, they can now manage the batteries much more efficiently and take them out of service when they need to be removed. Up until now, no one has been able to do that. It is a big advantage for our customers.

CEOCFO: *Are there environmental concerns or benefits as you do not have to throw away batteries that might be good? Does that come into play?*

Mr. Murray: By making batteries last longer, fewer of them end up in a landfill. Even more important, perhaps, on the environmental side, when the batteries reach the end of life, there needs to be a method to dispose of them properly. Our Test and Replace process under our Managed Services Group provides our customers with disposal boxes which are cardboard boxes that we put at each location so that after a test the batteries marked with a red X are put into a recycling box that is preaddressed so they are sent to the proper recycling facilities. Our customers have a record of how many bad batteries are identified and removed. They also have a record of those batteries being disposed of properly. Some materials in batteries can be recycled and reused. Some materials in batteries are harmful so they are recycled properly.

CEOCFO: *Why is GTS an important company?*

Mr. Murray: We are an important company because we are enablers of much more efficient operation of portable mobile devices. It is hard to think of many companies today that do not rely on mobile devices. Think of all of the delivery services, all of the retailers, all of the medical staff, and all of the public safety organizations that rely on mobility. If we can make that mobility much more efficient and much more economical, we think we have done something very useful. In the public safety area, if we can add to the safety of officers and EMTs, and make sure that the calls get through on emergencies, we think that is critically important. If we can help companies or municipalities to save money and operate more efficiently we think that is very useful. Organizations run on mobility. Mobility runs on batteries. Bad Batteries add cost and risk to the organization.

Interview conducted by: Lynn Fosse, Senior Editor, CEOCFO Magazine

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