

Tempest Droneworx and its Software Platform Harbinger™, Robotics and Sensor Technology are Providing Insights to the Military and Agriculture Market



Ty Audronis
Founder & Chief Executive Officer

Tempest Droneworx, Inc.

Interview conducted by:
Lynn Fosse, Senior Editor
CEO CFO Magazine

CEO CFO: Mr. Audronis, what is Tempest Droneworx?

Mr. Audronis: Tempest Droneworx specializes in real-time intelligence to prevent issues from becoming serious problems. We do that by aggregating thousands of sources of data, whether it is existing infrastructure like terrestrial or security cameras, crowd-sourced mobile data, or sources we can control, like drones and robotics. Our software platform is called Harbinger™ because of the insights it provides.

CEO CFO: Would you give us a few examples of who might use your service and when?

Mr. Audronis: We are in two primary markets now with a tertiary market that we are just now making the foray into. The two primary markets are the military, as they need real-time intelligence, and agriculture. We went into agriculture because food security is national security.

The Defensewerx organization, an innovation hub, runs the SBIR and STTR programs which are small business innovation research contracts so that businesses like ours have a chance to add defense contracts. AFWERX, which works with the Air Force, is who our first two contracts were with. We got invited to participate in Defensewerx's new program called Landwerx and that is how we got into agriculture.

CEO CFO: How do your engagements work?

Mr. Audronis: Harbinger™ works as dedicated installations. All of our clients own their data, we can work with their existing sensors and infrastructure, or we can use our partner ecosystem to find the best solution. And although we can use manually piloted drones, we can also control them with our software. We do not have subcontractors that go out and fly drones for people. We are not your standard surveying operation like most drone companies. We are a software development company and drones are a secondary market of ours, filling in holes in the data.

It did start with drones. My hometown of Paradise, California burnt down in 2018. It was a massive fire called the Camp Fire. It was the most expensive and deadly wildfire in the US and Hawaii surpassed it by almost double and that is unfortunate. Nobody ever wants to have a ranking of #1 on something like that. Because I was in the drone industry for

twenty-some-odd years, it inspired me to create a method for spotting wildfires and other disasters before they unfold into disasters. That is where our company mission statement comes in, preventing issues from becoming much larger problems. As we were developing the idea, the Abbey Gate explosion happened during the Afghanistan withdrawal and we could have probably prevented that as well, not with drones but with dog robots on the ground like the Ghost Robotics' Vision 60® with olfactory sensors to sniff out explosives that could have prevented that incident. Ghost Robotics is one of our partners. There is the Miami apartment building collapse of 2021; if we had a Harbinger™ system in that building using their existing security cameras or created a digital twin to monitor micro differences in geometry or cracks over time, then we could have detected any number of structural flaws.

Harbinger™ works by having a cloud server dedicated to that client like we have in agriculture or an on-premises server which is about the size of a suitcase on premises for the military. To give you an example of a military application, there is something called Contingency Response, and CR, as the military calls it, goes in and they are the first people to set up a temporary airfield in austere territory. That is the place where all operations are launched from; whether they are Special Forces, or logistics. These guys go out to survey the ground to make sure that it is safe for planes to land and take off and that the ground is not too soft. Our first contract was with the Air Force for actually going out and using our software with one of the Vision 60 dog bots with GPR (Ground Penetrating Radar) made by Sensors & Software, a Canadian company, to do in real-time what it took three Airmen three or four hours to do with a whole lot better resolution of mapping out what the ground pack is on these runways. At the same time, they can use Harbinger™ for LiDAR surveys and security patrols. That is your typical military installation. It is multi-purpose for both intelligence and surveying. It is designed to make sure that robots can take the place of people so that people are not targeted out in the middle of the airfield trying to get these surveys done.

"A big problem in agriculture right now is that data aggregators tend to own that data and then they sell off the farmer's data to hedge funds, and foreign governments. And even their competition. Our biggest pledge to agriculture is it is your data, you own it." Ty Audronis

For your typical agricultural installation, we have one going on in a place called Doubting Thomas Farms in Minnesota, run by Noreen Thomas. They are an organic farm and what we are doing there is running it in several phases. The first phase is we have in-ground sensors that are constantly telling us about the temperature, moisture level, humidity, CO2, and nitrogen. Those sensors are made by Soiltech Wireless, Inc. Those sensors are in the ground telling us this information all the time and Harbinger™ maps all of the data, generating a contextual heat map in real time. We are installing cameras soon so that we can monitor wildlife in the area and those cameras will be a mixture of RGB (red, green and blue wavelengths) and thermal. The final phase is putting in OGI sensors and they can sense volatile organic emissions, as a lot of pesticides contain carbon-based chemicals. We will be training an AI to look for overspray from neighboring non-organic farms onto the organic farm to help maintain the organic certification and to help with insurance claims for crops lost because of the non-organic overspray.

CEOCFO: Are you providing the raw data and/or potential solutions for the threat?

Mr. Audronis: We are providing both the raw data and analysis. We are contextualizing it. For you to see the data currently from sensors in the soil, for example, you would be looking at a spreadsheet interfaced with a bunch of graphs whereas Harbinger gives you instant color-coded data so that you can know what is going on at a glance. It is also using a video game engine, so not only is it available across every member of your organization from boots to brass, but we are implementing it using augmented reality so that you can stand in the middle of your field and see what is good and what is not, rather than being detached from that data.

CEOCFO: How often do you provide data?

Mr. Audronis: It depends on the sensor. With the farming data, we are sensing every five seconds. For military, we are sensing even more frequently. For example, the soil sensors themselves, in order to conserve batteries depending upon what mode they are in, they can be doing persistent monitoring or be getting us results every four hours. These sensors are designed to be harvested with the crops and go with them. When they are harvested they enter bruising mode, to see if your crops are getting bruised. When they are in the ground they are only monitored once every four hours because you do not need the kind of resolution of once every couple of seconds. If there is a hail storm surge then we

switch them back to bruising mode. From a customer's ability to access and see the data, however, the data is available in real time.

CEOCFO: *What has been the response from the AG community?*

Mr. Audronis: There has not been a single farmer we have talked to who has not gotten the concept of our software. Noreen Thomas loves our installation; she says it saves her so much time. We are also installed over at the Grand Farm, which is a farm that has a lot of major corporate sponsors including Microsoft and they do third-party testing. Harbinger™ is the monitoring solution for their sensors as well.

Agriculture is an industry that is currently the newest focus of technology. These guys are used to a lot of snake oil salesmen, so they approach us with a degree of skepticism because it sounds too good to be true. Once we show them the software installation that we have they are very excited, especially with the fact that they own the data.

A big problem in agriculture right now is that data aggregators tend to own that data and then they sell off the farmer's data to hedge funds, and foreign governments. And even their competition. Our biggest pledge to agriculture is it is your data, you own it.

CEOCFO: *What have you learned from your military service that has helped you in your business world as CEO of Tempest Droneworx?*

Mr. Audronis: In my early military career I had what was known as TAD (Temporary Assigned Duty) at the Commander of the Air Wing Office, known as the CAG. I was an Airman in the Navy. The First-Class Petty Officer I believe was an AM. He asked me to swab the decks in the hallways at night but there was no floor stripper in the Second Lieutenant, that's what we called the janitorial closet in the Navy. I went back and he said "Stop wasting energy telling me it can't be done and use that same energy to figure out a way to make it happen.' I ended up making my own floor stripper that was even better and got the job done. That phrase, as simple as it is, made a switch go on in my mind that changed my life. That motto is actually in my email signature to this day. Everybody at the company knows it by heart.

CEOCFO: *Are you seeking partnerships, investment, or funding as you grow?*

Mr. Audronis: Absolutely! Our product is 100% dependent on partnerships. We have a lot of great partnerships. I mentioned some of them with Soiltech and Ghost Robotics, but also drone companies willing to work with us like Freefly Systems. When we control robotics or drones it is agnostic. We will control anything, but we will make zero changes to it, no changes to the firmware, the software, no changes or add-ons to their stuff. That is a difficult proposition if you do not have those partnerships. Our ecosystem is important to us.

We are bootstrapped up until now. We originally put in \$180 thousand out of a 401k. We are in the millions this year. I do not want the exact number printed in a magazine but millions this year in contracts alone. We are doing a raise now so that we can triple our development staff and go full commercial in late spring. That raise is for \$3 million.

CEOCFO: *Is there anything potential investors or customers might miss or not understand about Tempest Droneworx that should be recognized?*

Mr. Audronis: Although the name 'drone' is in the title of the company, that is just an image of how the company started. Drones make up only about 10% of what we do. We do control the drones, and we do get data from them but most of our data comes from existing infrastructure or static sensors and existing technology, things that our clients do not even have to mess around with. A lot of investors or people who want to work with us, hear the name 'drone' in the title and they think oh no not another drone company that will go belly up in six months. However, we are not a drone company, we are a software company.

Also, our software was designed to be modular. So even though military and agriculture seem completely different, the same software architecture is used and can be easily modified for specific configurations. It therefore takes us little development effort, especially with our growing number of ecosystem partners and years of experience, to focus on new use cases or a new market.