

## Sophisticated receivers aren't child's play

Sombra finds ready market for sophisticated receivers for radio-control toys

**Jeff Buckstein**

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Model airplanes have come a long way from the low-tech days of generations past when hobbyists would take their bulky machines to a large field, then send them aloft and watch them circle overhead.

Today's high-tech machines are capable of flying at such heights and speeds that equally demanding technology is required to properly monitor them and provide fail-safe options should something go awry.

That's where Sombra Labs Inc., an Ottawa startup that is applying remote-control surveillance-related technologies to the hobby industry, has begun to make its name. Its high-tech receivers are designed to improve the performance, and increase the safety element for a variety of radio-controlled hobby machines, including model airplanes, helicopters, boats, monster trucks, cars and robots. "We realized there was a niche in this market, plus my experience with hobbyists gave me a very good perspective of exactly what was needed," says Aroosh Elahi, the company's vice-president of engineering, who's long held a passion for model airplanes and views this as an ideal way of combining work with pleasure.

"Today, you have gasoline-based engines and extremely powerful electronic motors. Sailplanes can fly over a large distance, so they have to be extremely reliable. But in terms of the state of existing electronics, the market was pretty archaic. So we figured we could take some of our experiences from the high-tech world and apply them to the hobby industry," adds Mr. Elahi, an electrical engineering graduate of Carleton University who worked for General Dynamics, Nortel Networks and Solidum Systems before co-founding Sombra in 2000.

In 2003, Mr. Elahi and his partners, John Lambadaris and Jorge Perez, who are



CREDIT: Jean Levac, The Ottawa Citizen

John Lambadaris, president of Sombra Labs Inc., helped the company diversify from an information technology consulting firm specializing in communications networks to one designing and manufacturing sophisticated wireless control devices for remote-control toys. It hopes to expand into surveillance and remote control automation for military and civilian applications

Sombra's president and manufacturing engineer, respectively, devised a means to program frequency information into the company's receiver, instead of forcing the user to carry expensive crystals (which are small metal devices) for that purpose. "We connect our custom software to the computer, so the user can download his codes and program the receiver to tell it what to do in case something goes wrong. That's very innovative," says Mr. Lambadaris, who is also an associate professor in the department of systems and computer engineering at Carleton University.

If, for example, the transmitter breaks and cannot receive any transmissions from the person controlling it from the ground, Sombra's technology would allow a fail-safe pre-programmed instruction to kick in through the receiver that might instruct a model plane, for example, to do something like circle, lose altitude and gradually land.

It took the founders a bit of time and experimentation to get their technology to the stage it is at today. Challenging technical areas included figuring out how to introduce a user-friendly way to program and change the frequency of the receiver; programming the receiver so that it would only respond to one specific transmitter; and reducing the weight earlier, heavier receiver designs so they would fit into and accommodate the flight of an efficient model airplane.

Sombra's receiver has captured the eye of Barry Kennedy of Grand Prairie, Texas, who plans to attempt a world altitude record of about 12,000 feet for his model plane, which has a wing span of 3.2 metres, in the spring of 2006. To help set that record, he has purchased Sombra's receiver.

The flagship product of Sombra, which means "shadow" in Spanish, is its Shadow 3, a seven-channel crystal-less synthesizing receiver (that is, able to listen to multiple frequencies) that is capable of controlling seven independent control surfaces. The receiver works at interchangeable frequencies of 72 MHz, which is the frequency typically reserved for model airplanes, and 75 MHz, which is used for surface vehicles like radio controlled cars and robots in North America. Sombra's technology also covers different band frequencies for Europe and Asia.

The benefit of being able to use multiple frequencies, explains Mr. Elahi, is that "if you are in the field, and there is another person on the same channel who is already using (your) frequency, you don't have to wait, or ask the other guy to shut down his transmitter. With our technology you can just change the frequency of your receiver, and use it almost simultaneously."

The company's big breakthrough came last April at the Weak Signals RC Expo in Toledo, Ohio. "That's where we introduced the Shadow 3 and got a tremendous response," Mr. Elahi recalls.

Sombra's founders estimate that about 5,000 units of their product have been sold in North America, and they are ramping up production to what they expect will be sales of about 2,000 units a month worldwide by the first quarter of 2006. The Shadow receiver retails at about \$80 U.S., with the programmer costing another \$15 U.S. when sold separately. When sold as a combination, the price is about \$90 U.S.

Sombra's long-term goal is to develop innovative technologies for surveillance and remote control automation for both military and civilian applications, using a sensor network that is capable of both receiving and relaying information.

Sombra has been primarily self-financed, with the entrepreneurs having sunk

about \$150,000 of their own money, not including foregone salaries, into the venture; they've also received outside funding totaling about \$65,000 from Communications Information Technology Ontario (CITO) and Carleton University.

"Right from day one, we were always trying to generate revenue, not look at something down the road and get VC funding to build up the company," says Mr. Elahi. "We financed nearly the whole thing ourselves and now have a product that sells, with positive cash flow. Sombra Labs is not in debt to anyone," he adds proudly.

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