

The story of Geoduck Developmental Systems

As best I can recall 30 years later, I started Geoduck Developmental Systems in the summer of 1982. Tom, a friend who worked as a programmer for the Washington State Library Network¹ had decided to spend the “big bucks” to purchase an Atari 800 computer and start making money writing programs for it. To look more like a business and to take advantage of some federal tax deduction opportunities (and because it just seemed ‘way cool) he created a sole proprietorship company licensed by the State of Washington. He used some variation of “dolphin” as the company’s name.

I had the opportunity to spend many hours working with his Atari 800 and I decided that I wanted to do the same thing...write programs and make money. For reasons unclear to me now, I spent even bigger bucks on the newly released Commodore 64, a fortuitous decision given the quick demise of Atari computers. I decided to follow Tom’s marine animal lead in naming my company. And wanting something a bit on the humorous side I chose the Geoduck (pronounced “GOOEY-duck), a large saltwater clam found in my part of the world. The Geoduck has its own “theme song” (<http://www.youtube.com/watch?v=3JjhZfJ4dto>) which I planned to incorporate into a splash screen at some point, perhaps with Geoduck sprites dancing in time to the music. To avoid any conflicts with existing Washington State companies also named “Geoduck” I added “Developmental Systems” to my company’s name which I thought made it sound even more “business like.”

Tom and I both found out, after purchasing our computers, that the Atari and Commodore worlds already had most of the programs we’d thought about writing available for free from their large user communities. Both platforms lacked some of the really sophisticated software available for the IBM PC and Apple, but we both had full-time jobs and didn’t have the time to create grandiose projects.

Then I discovered the amazing number of magazines published for the Commodore community, and also several user groups in my neighborhood. I started tinkering with the C64’s hardware, helping other users solve problems, and came across interesting curiosities and solutions that I didn’t find documented in any of the magazines. So, I dropped the idea of selling programs for the C64 and began writing magazine articles instead. I already had a bit of experience in the late 1970’s writing “how to” articles on building electronics projects for *Radio-Electronics* magazine (<http://en.wikipedia.org/wiki/Radio-Electronics>)...no processors in them, just individual IC chips. I showed the payments from magazine articles as company income to keep the Geoduck Developmental Systems license active.

Except for some work my wife and I did for a non-profit group we belonged to using a custom C64 program, Geoduck concentrated on submitting magazine articles. I probably had one or two a year

¹ As best I can tell from casual internet research, the Library Network no longer exists. In those dark ages, libraries used card catalogs to help patrons find stuff (look up “library catalog” in Wikipedia for details if you’ve never seen those ancient “databases”). Many smaller library systems in Washington State could not afford to print their own cards for their catalogs. The Library Network maintained a large database, on a mainframe if I recall correctly, that the libraries could access remotely and enter the bibliographic info of items in their collections. If an entry already existed, the library could just tag that data to indicate that they also had copies of the item. Then the library would order printed catalog cards from the Library Network, which used facilities at Washington State University in Pullman WA to print and ship the cards.

actually published. In the mid-1980's some of those articles came to the attention of Karl Hildon, publisher of *The Transactor*, the hands-down best publication for Commodore hardware enthusiasts ever! Karl and staff worked in Canada. They had problems with Canadian Customs when people in the USA sent them hardware for review. Customs wanted them to pay exorbitant duties on that hardware, even though they'd eventually send it back. So I started reviewing hardware for *The Transactor*. Companies in the US sent their review hardware to me, avoiding any customs problems. I had the opportunity to work with new stuff I didn't have to buy and got paid a small amount to do it...very cool indeed! I even got a free Transactor T-shirt, much too small for my girth, that I passed on to Kent Sullivan.

About that same time Kent Sullivan asked me to work with him and Bryan Minugh on the SwiftLink cartridge project. We've told that story elsewhere.

The Commodore oriented magazines began to fade away in the early 1990's and Geoduck lost most of its income sources. Its last major project came from QS Products. Bob, the husband of a co-worker and one of his friends had just bought out the developer of a generator add-on product intended for use by recreational vehicle owners. Users mounted the generator in the vehicle's engine compartment and connected a thick flexible shaft to a pulley they installed in the fan belt's path. With the vehicle in neutral and the engine running, the generator produced 120VAC. A voltage regulator kept the output steady at 120 volts, but the engine speed determined the output frequency. Most AC devices sold in the US expect and perhaps even require 60Hz to operate correctly. To maintain a constant engine speed, the original developer used his experience with Navy electronics guidance systems to build a complex circuit with six operational amplifiers to drive a servo connected to the engine's throttle. The circuit and servo brought the output back to 60Hz when changes in the load on the generator caused the engine speed to change.

The circuit often worked...eventually...and perhaps for days at a time. Balancing those operational amplifiers required carefully adjusting twelve interacting potentiometers. Minor changes in temperature, engine performance, generator load characteristics, and phases of the moon caused frequency drift. Most users didn't have the skill or desire to tweak a bunch of pots to get things working right. They also didn't have an easy way to measure 60Hz, although the failure of their portable TV sets occasionally gave them a clue that the generator had drifted off its target frequency!

The company had no sales to speak of and Bob asked me if I could create a digital version of the complex op-amp controller that didn't require constant tweaking. Because of several features the new company owners wanted to add, we decided against using any of the then available off-the-shelf microprocessor systems (no Arduino's in those days). Instead I used the technology I knew best, the 6502 processor!

I breadboarded a system using the C64's user port to drive their servo and the Up/Down Arrow keys to simulate changes in frequency. They bought the idea, we built the thing, and it worked...NO adjustments required on any installation and no drift with temperature or moon phases. The board had several DIP switches that could select different profiles to control how quickly the circuit responded to changes in frequency, but in practice we didn't need them. QS Products went into production and targeted

construction businesses instead of recreational vehicle owners...think house building on sites that have no electricity yet and needing a lot of light when repairing roadways at night.

Unfortunately QS encountered two major problems when they tried to sell the new system. The company-built generator did not produce a clean sine wave output. When I put an oscilloscope on its output, we saw a “notch” on the trailing side of every wave. The generator the original developer had built used asymmetrical windings...I have no idea why. The notch didn’t bother inductive loads or most electronics, but it caused unacceptable flicker in fluorescent lamps. No sales to those nighttime road crews. QS still had construction industry prospects, but by then solid-state inverter technology had improved so it could drive inductive loads like synchronous AC motors without problems. I don’t remember if QS Products ever actually sold any of the boards I designed.

Geoduck Developmental Systems officially ceased operation in 1994 when I started working at Microsoft. Employees there work on salary, not hourly wage. And Microsoft effectively owns or has first right of refusal on any ideas any employee might come up with at any time. While Microsoft probably has no interest in anything Commodore these days, I decided that I’d rather not deal with the hassle of clearing everything through whomever. I asked the State of Washington to deactivate Geoduck’s license. Technically the company still exists and I could revive it should any opportunity appear. But hobby electronics has moved well beyond the days of “do nothing” boxes and house control systems assembled from discrete IC chips.² Now we have readily available powerful processing hardware from a variety of sources and the Internet keeps everyone in touch with what the community discovers. We now have C64s connected to distant servers hosting their software and space satellites powered by the same processors we can buy for about \$20 (<http://en.wikipedia.org/wiki/STS-127> and http://www.techhive.com/article/258353/ardusat_a_tiny_arduino_powered_satellite_thats_meant_to_be_shared.html).

² The “Automate Your Home” article appeared in the October 1979 issue of *Radio-Electronics*, their 50th anniversary issue. The magazine published “The Latest Way To Do Nothing”, my second version of an LED “do nothing” box, in their Spring 1981 *Special Projects* issue.