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INTERVIEW WITH GEORGE THOMAS
President of Contemporary Controls

George Thomas received his BSEE and MSEE degrees from the Illinois Institute of Technology in Chicago, Illinois. He completed the American Electronics Association/Stanford University Executive Institute for managing high-tech companies. He has served as a director on several boards, including the MIDCON Electronics Show and Convention, the STD BUS Manufacturer's Group, the ARCNET Trade Association, the American Electronics Association, the Chicago Manufacturing Center and the Management Association of Illinois. He is a senior member of the Institute of Electrical and Electronics Engineers, and past chairman of the Chicago Section. He is a senior member of the International Society for Measurement and Control.

As Contemporary Controls celebrated its silver anniversary, Martha Stott talked with President George Thomas about the birth of the business, the trials of operating a company for 25 years, and the challenges facing the industry in the future.

Stott: **Congratulations on your silver anniversary. Tell me when Contemporary Controls began.**

Thomas: The founding date on our Illinois incorporation papers was June 23, 1975. That's why we had our open house celebration on the same date in the year 2000.

Stott: **Did you have any partners?**

Thomas: No, I could not convince anyone to join me. Of course, my wife was a significant partner, and yes, we are still married.

Stott: **How did you choose the name Contemporary Control Systems?**

Thomas: I was reading a data sheet from Motorola with a tag line that read "semiconductors for contemporary systems." I liked the idea of "contemporary" to imply that we would always be leading edge. I wanted the word "control" to identify the market we wanted to be in. The word "systems" identified that we did system integration work... so I ended up with Contemporary Control Systems, Inc. We just recently trademarked Contemporary Controls.

Stott: **Did you do a market analysis before you began?**

Thomas: No. My interest was in control systems, and that's why I chose it.

Stott: **What was your first electronics job?**

Thomas: My first electronics job was as a TV serviceman. As a teenager, I helped a one-armed TV serviceman carry a tube caddy and through him, I learned the business. Later I joined a bigger company and was doing six or seven outside calls a day. That was exhausting, so I decided I had better get more education.

Stott: **Where were you educated?**

Thomas: I attended the University of Illinois at Chicago's Navy Pier while working part-time. After about three years, I joined the Marine Corps Reserve and completed its Basic Electronics and Air Radio Repair schools. When I returned from active duty, I was hired as a technician in Motorola's consumer electronics division. I was assigned to a test equipment design group, working with engineers, and I found the work fascinating.

At that point, I was convinced I wanted to be an engineer. With the help of Motorola's tuition reimbursement

George Thomas with home-made microprocessor development system ca. 1975

program, I attended evening classes at the Illinois Institute of Technology. I took a leave of absence from Motorola to finish my degree in the day division. From beginning to end, it took me eight years to get my BSEE. I was encouraged to continue my education towards an MSEE, and I could not have done it without a traineeship from the National Science Foundation.

Stott: What did you do next?

Thomas: I needed a job, and the job market in 1971 was terrible, so I took a job with my uncle's firm doing light engineering work. Later I joined Johnson and Johnson as an electrical engineer in the Baby Products division. They were building a new plant, and I was doing control design work using solid-state logic boards for their disposable diaper maker machines. I gained experience with drive systems, programmable logic controllers, and even minicomputers.

It was a great opportunity for me and I loved Johnson and Johnson, but I wanted to do circuit design and not just application engineering, so I left for a company called Datalogics. Datalogics made minicomputer text editing systems for publishers. They were developing a video display unit that used an Intel 8008 microprocessor. I realized that the microprocessor had great potential for the controls industry, and possibly as a business opportunity.

Stott: Is that why you started Contemporary Control Systems?

Thomas: I always wanted to be in my own business, but what pushed me into business was that Datalogics fired me. That forced the issue. Although I could not find any partners, I decided to start the company anyway. My wife was skeptical, especially with an infant at home, but she knew that was what I wanted to do and she supported my decision.

Stott: How did you fund the business?

Thomas: Through personal savings. Unlike today, it did not take much to hang out your shingle... but I was naive about the amount of money required to launch a business, and we did go through our savings.

Stott: Did you have a business plan?

Thomas: It was in my head. I was to talk to my old bosses and colleagues and offer to do design work for projects that I knew were not completed. I told suppliers I knew to look out for any work for me.

Stott: Did that strategy work?

Thomas: Yes. Granted, I got some work I was not thrilled about, but I did land other projects I wanted. One was the Computing Ratiometer, which I built for Johnson and Johnson. The unit made high resolution rate measurements at low speeds. I knew the application well, and I knew there was no commercial equipment available to do the job, because I personally searched everywhere for such equipment when I worked there.

Intel had just announced the 8080 microprocessor and I purchased one for $360, which was a small ransom at that time. I designed the unit using wire-wrap boards, which my wife wired. She never did that again. A colleague of mine from Datalogics, Steuart Dewar, wrote the code using a cross assembler he developed that ran on a Digital Equipment Corporation PDP-8/E

minicomputer. The whole process was crude, but the unit worked. I realized that if I was going to make any money in this venture, I needed a way to develop these applications quicker and easier.

Stott: What did you do next?

Thomas: I needed a set of pre-designed microcomputer modules that I could use for these various projects, so I designed a bus board system based upon Vector Electronics' 44-pin bus. For example, the same microprocessor module could be used for different applications since all applications needed a processor.

I wanted a front panel for my development system, so I patterned one based on the new Altair microcomputer, which also used the Intel 8080. I received from an Intel applications engineer the monitor program used in their Intellec 8/80 development system, and after I added a ASR33 Teletype for the console and a high speed paper tape reader, I was in business doing microprocessor applications with my home-made bus boards. It was not until a few years later that I converted these designs to the 56-pin STD-BUS, which allowed me to purchase those modules that I could not produce.

Stott: Was that profitable?

Thomas: It kept me in business, but I was not making enough to pay the bills, so I decided to take on consulting jobs. I did PLC programming for many different applications, such as pumping stations, sewage treatment plants, sterilizers, weigh batching systems and steel processing.

I was getting other microprocessor projects as well, and I could not do all the work, so I hired a super technician and former colleague at Datalogics named George Szatkowski. He concentrated on building systems, and I on consulting.

Stott: Were there difficulties with that approach?

Thomas: We were profitable, but just getting by. The problem with consulting is that no one pays you for the time it takes to get new jobs. You are constantly trying to maximize your billable hours, but you also need to find that next job.

The problem with system integration is that you are paid one time for a lot of work. There are many unknowns in a project. If problems occur on a fixed-fee job, you could take a financial beating.

Stott: **What sort of problems could occur?**

Thomas: There could be problems due to poor project definition by the client, problems with specified equipment not meeting specification, or simply that the project was harder than you thought.

If there were more systems to be built later, you could possibly recoup your losses on the other systems, but if there was to be only one system you could be stuck. Clients tend to expand the project scope without a corresponding increase in price, and you would like to be accommodating, but there is a limit. I have sympathy for system integrators.

Stott: **Did you consider simply folding the business?**

Thomas: When you tell someone at a party that you are a consultant, they immediately think you are between jobs. After five years of doing this, my friends and family began to believe that I was serious about this, although they had no idea what I did. To this day, I still do not think they know.

No, I did not consider folding the business, but I realized that the investment I made in the company simply bought me a job.

Stott: **How did Contemporary Controls move from system integrator to manufacturer?**

Thomas: We were doing hardware support for Steuart Dewar's company, DISC, that was producing a minicomputer-based newspaper

publishing system. The minicomputers were getting harder to support, so he suggested using networked microcomputers instead of minicomputers. We were already producing a terminal server system using a Z-80 based STD BUS microcomputer as a front-end to a DEC PDP/8E minicomputer.

We proposed replacing the minicomputers with 80188-based STD BUS microcomputers and networking all the microcomputers with ARCNET. We produced all the hardware and DISC did all the software, and the system took off. In a short period, we were now a hardware manufacturer learning all the intricacies of manufacturing. We were still doing system integration and consulting work, but it soon became clear that we needed to focus on one or the other. We chose manufacturing.

Stott: **Is that when your business grew?**

Thomas: In 1982, we had eight employees doing system integration work. With the DISC business, we were up to 42 people in 1987 designing boards, building boards and assembling systems in-house. We had expanded our facility three times. We were basically a captive manufacturing and design house for DISC. We attempted to sell our STD BUS and ARCNET products as standard products, but that business did not grow as fast as the DISC business.

Stott: **Was this a problem?**

Thomas: DISC was asking for more performance from our products and wanted to migrate to the 80286 microprocessor. It was difficult to get more performance from the STD BUS, since it was originally designed as an 8-bit bus. The other problem was the operating system. We were using Digital Research's CP/M-86, and the world was going to DOS and the IBM PC.

Eventually DISC informed us that they were moving from our proprietary platform to the IBM PC and were going to port their code to DOS. The

transition occurred faster than we thought, and our business plummeted. We became road-kill of the IBM PC movement. We had miserable years in 1988 and 1989, and although we were able to increase our standard product business, it was not enough to offset the lost DISC business.

In early 1990, we sold the business to one of our customers, the health-care company Hollister.

Stott: **Was that the end of Contemporary Control Systems?**

Thomas: Not really. Contemporary Control Systems continued to operate as a business unit of Hollister, and I remained as president. In fact, we were given the manufacturing responsibilities from other divisions.

We continued to sell our standard industrial products, but Hollister's focus was for us to manufacture the electro-medical products we developed for them. We did that, but it became clear that the industrial products did not fit into their strategic plans. In 1992, we were informed that the industrial product component would be sold, and the electro-medical component relocated to other plants.

They asked me if I would be interested in buying back the divested company. I said yes, and we struck a deal. Hollister retained about one-third of the people, I took an equal amount, and unfortunately the others either resigned or were not offered positions. It was a difficult decision, because most of those people stuck with me through tough times, but I was not sure that I could support everyone with only our industrial products as income.

As part of the deal, I bought the name Contemporary Control Systems.

Stott: **So Contemporary Control Systems lived on.**

Thomas: Yes, but the system integration and consulting business was finally over. We concentrated on products we could manufacture in reasonable volume. We dropped the

STD BUS products and only sold ARCNET products.

I was not sure that was enough, so I offered to build some electro-medical assemblies for Hollister on a contract basis. That business lasted for a few years, but today we concentrate only on standard products.

Stott: **What did you learn from the acquisition and subsequent buy-back?**

Thomas: It is difficult to integrate the cultures of the affected companies, and difficult to make acquisitions successful. I have a high regard for Hollister because all my dealings with them were extremely fair, and I still have friends at the company. They are a fine company.

Stott: **What is Contemporary Controls doing today?**

Thomas: We are in the industrial networking business, concentrating on ARCNET, CAN and Industrial Ethernet. We make a fieldbus extender for DeviceNet and Smart Distributed System as well as gateway and routers to the Internet. We manufacture our own products.

Stott: **Is it common for a company your size to manufacture its own products?**

Thomas: Not really. In fact, I see the whole industry moving away from captive manufacturing to contract manufacturing. For our level of production, with numerous build options and batch sizes, I do not think we would be attractive to a contract manufacturer.

One of our competitive advantages is that we ship from stock, and we need responsive manufacturing in order to maintain adequate stocking levels. This is the business model we chose.

Stott: **How is business?**

Thomas: Business is the best it has been in 25 years. We invested in surface mount equipment in 1995, established a subsidiary in the UK in 1997, and doubled the size of our facility in 1998. Our international business is more than 25 percent of our overall business. You can thank the Internet for that.

Stott: **Why is that?**

Thomas: The technologies we support serve diverse industries, so it has been difficult to reach customers in the numerous vertical markets. Now our customers can find us by searching on the net by technology. Some of our biggest orders have come from customers who did not know us, in an industry we knew little about.

Also, advertising on the net gives us international exposure compared with print media. Web sites level the playing field. It is difficult to determine size of company based upon a company's web site.

I thought the microprocessor was a big deal 25 years ago, but the Internet is bigger. Distributors and representatives, traditional in our industry, are being squeezed to death due to e-commerce.

Stott: **What is your biggest business challenge today?**

Thomas: People. Our company is located in the western suburbs of Chicago, and we compete for engineers with local companies such as Tellabs, Motorola, Lucent Technologies and the former U.S. Robotics. Those companies can be vacuum cleaners for engineers. Besides engineers, it is tough to fill any skilled position. I do not know any company that says it is adequately staffed. I have never before seen the hiring situation this severe.

Stott: **What are you doing to solve it?**

Thomas: We use consultants. We try cooperative education programs for undergraduates. We fund H-1B visa applicants. We use university graduate students pursuing research. We partner with other firms. We try to be imaginative.

Stott: **What are the challenges to your industry?**

Thomas: A fieldbus war has been created with fourteen incompatible fieldbuses vying for market share. Because of interest in the Internet, Ethernet has been proposed as the one and only fieldbus replacement, but Ethernet does not provide the total solution. For industrial control, a common application layer is required, and there are several choices. So the fieldbus war continues, pleasing the press but confusing customers, thereby delaying adoption of industrial networks over hard wiring. I do not believe there will only be one fieldbus standard, but the industry must reduce the number of viable options if we want our businesses to expand.

What will happen, I do not know. Like the microprocessor 25 years ago, the Internet is causing a revolution in thinking. These are exciting and challenging times for the people at Contemporary Controls.

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