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Contemporary Controls Interviews John Pittman: Former Fieldbus Foundation President Speaks on the Early Days of Automation, the Progress of Open Systems, and the Greatest Generation...

By Contributing Editor Perry Sink Marshall

John Pittman, former President and CEO of the Fieldbus Foundation, has played a major role in making the automation industry what it is today.

This year he was the recipient of the ISA's Outstanding Achievement Award and has held key positions at Bailey Controls, the Control Systems Integrated Association, GE and Tri-State University. We caught up with John to talk about high-speed Ethernet, Open Systems, and the consolidation that's been going on in the process control world.

Q: Can you tell me a little bit of your story? Where did you grow up, and who were some important people who influenced you early on?

JP: I grew up in South Bend, Indiana, and lost my father while I was very young. As a youngster growing up in South Bend, there were several strong influences on my life. I was lucky enough to attend excellent schools with teachers that demanded the best and wouldn't accept less.

I learned to be disciplined and to manage my time. I caddied at a local golf club and learned from those successful men that honesty and ethics were a constant, even when engaged in a game.

I also saw that successful men; lawyers, doctors, business owners were polite and optimistic people. As a youngster, my heroes were my uncles, cousins, and men from my neighborhood that were away fighting in WWII. What many people are now calling our "greatest generation." I was fascinated by the exploits of those great and brave men who gave so much and asked for so little.

Q: When did you catch the techie bug? What happened to steer you in that direction?

JP: I joined the Navy immediately after high school in 1951; the time of the Korean War. I think many of us that were too young for WWII saw Korea as both a duty and an opportunity to serve. The Navy—in their wisdom—decided that I should be trained as an Aviation Electronics technician. It still amazes me sometimes as I had no prior exposure or interest in electronics, but it turned out to be very perceptive and set me out on my life's career path. I spent more than a year, after boot camp, in several excellent Navy electronic schools and the rest of my service time working with VHF and UHF communications equipment and airborne radar. After nearly six years in the Navy I married and left the Navy to continue my education, using my GI benefits—just as the men of WWII did in 1946 and 1947.

The GI education programs for WWII, and to a lesser extent Korea War vets, had a profound effect on our country producing many thousands of skilled professionals that have made the enormous economic progress of our country possible. I think it changed the social dynamics in the US forever.

I enrolled at Tri-State University in Angola, Indiana, because of its emphasis on a practical and quantitative engineering curriculum and its reputation for producing "work ready" engineers. I graduated with a B.S. in Electrical Engineering and at the time had a wife and two children.

Q: I understand you are still involved at Tri-State?

JP: Yes, I received the University's Distinguished Service Award in 1982. In 1997 I joined the Board of Trustees. I served as Chair of the Committee on Trustees, Vice Chair of the Board and I am now in my second two-year term as Chair of the Board of Trustees. (John was awarded an honorary doctorate of engineering at the University's May 2004 Commencement—Ed.). In addition, my wife Marguerite, and I have established an endowed scholarship for a student or students majoring in Electrical Engineering.

Q: How did you find your way into the strange world of automation and controls? What was it that caused you to stick around and make it a career?

JP: After graduating TSU, I joined Convair Fort Worth. I was engineering "automated test equipment" for the radars for the B-58, our first supersonic bomber. Automated testing in 1959 meant reading the test instructions one by one from a punched paper tape. Then there was a short stint at Raytheon working on sonar for nuclear subs.

But life in the defense industry seemed to me to be unstable, and I saw that General Electric was developing something really new: digital computers to control industrial processes. I joined GE in Phoenix, Arizona, where they were developing the GE 312 computer. To the young people today it seems weird, I know, but the CPU that is now a chip in your laptop or desktop then occupied three large cabinets—each the size of a large home refrigerator. Memory was on a magnetic drum and both instructions and data were loaded into the CPU one at a time from the drum. Input from the process was by a tree matrix of mercury wetted relay switches and a single A to D converter. But in the early sixties, it was very advanced technology and very exciting.

In those days our competitors were IBM (the 1800) and CDC (the 1700). I was the installation Project Manager on a number of the first computer control installations in steel,

cement, and chemical plants. Later, I was an application engineer and then Marketing Manager at GE's Instrument Business in West Lynn, Massachusetts and then General Manager of GE Instrument Transformer business. Later, the GE process control computer and instrument businesses were sold to Honeywell and that helped form their industrial automation business.

From there, the path led to Bailey Controls (VP of Marketing and Sales) and an MBA from Baldwin-Wallace College. At that time Bailey was the clear leader in instrumentation/control for the electric power industry, particularly boiler control. When Honeywell introduced the TDC-2000, Bud Keyes, the VP of Engineering, and I saw that this was the next step in control and immediately began the development and introduction of Bailey's DCS system the Network 90. This not only sustained our position in the Utility industry, but led Bailey to increased penetration in other industries such as the petro-chemical industry.

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My next step was asVP and General Manager of the Process Automation Division of Computer Products. At the Process Automation Division we engineered and manufactured high precision, high noise tolerant, nuclear qualified I/O gear for computers in the commercial nuclear electric generating stations and other similar applications. I retired, but not quite. I took on the task of helping to organize and start the Control System Integrators Association (CSIA) as their Executive Director.

An old friend from Bailey, Charlie Bergman, had been the leader in getting the CSIA started and persuaded me to take over as Executive Director; get the organization on a business foundation, begin to develop programs to support the members, and recruit new members.

The CSIA has grown steadily since its inception. It now has a rigorous certification program for control system integrators that assures the client that a certified firm has solid documented processes for both the engineering and the business aspects of their work. The CSIA now operates a number of programs that help the integrator be effective and cost efficient and is an asset to both its members and their clients.

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Later I was approached by the Fieldbus Foundation and joined them as their first President and CEO. We completed the development of the technology, demonstrated it in an industrial plant, and assisted in the commercial introduction. We worked our way through the international standards minefield and then helped our members as they made FOUNDATION Fieldbus™ the "de facto" standard in the continuous process industries and increasing utilization in the batch industries. I have retired (again!) and now serve the Foundation as Senior Advisor.

Q: Can you briefly tell the story of how the SP50 committee evolved into WorldFIP North America and the Interoperable Systems Project (ISP), and how the Fieldbus Foundation then came into its own?

JP: The SP50 committee was part of the ISA. ISA is an ANSI accredited Standards making body and as such, the membership of standards committees is open to all. Hence, when SP50 began to develop a Fieldbus Communication Standard, the committee was flooded with supporters of many different communication protocols. After a while, it became apparent that the committee was trying to develop a single communication standard to two different sets of application requirements. Process Automation required secure message delivery, modest real-time speeds, and Intrinsic Safety. Factory Automation required fast real-time speeds, and synchronized message delivery and did not require Intrinsic Safety. With so many competing interests there was little chance that there was going to be an agreeable single outcome.

After years of trying to achieve consensus within SP50, some of the manufacturers formed ISP. The approach was to develop a spec that fully met the Process Automation requirements. Other manufacturers created WorldFIP based on the FIP spec. However the customers in the process industries were not satisfied that this would meet their needs. They wanted a single protocol that included the major DCS suppliers and the major field instrument suppliers. The manufacturers listened and the North American branch of WorldFIP and ISP merged. The new organization was called the Fieldbus Foundation.

Q: Along the way you've directed the CSIA, worked at Bailey Controls and GE, the ISA and the Fieldbus Foundation. What were some red-letter days in your career and some "ah-ha" moments?

JP: At GE, I was part of the team that put the first six-stand, hot strip mill in the steel industry, worldwide, under computer control. We were all so thrilled on that first day, when the steel came out of the mill on gauge for the first time under the computer's control (after many setbacks).

Another thrilling moment was the day we shipped the first Network 90 DCS system from Bailey Controls.

And, seeing the Fieldbus Foundation's technology, FOUNDATION™ fieldbus, voted an International Standard, and then become the "de facto" standard in the continuous process industries, was a very rewarding experience.

Q: When was it that you recognized the potential of open networks for changing the automation business?

JP: From the beginning use of digital computers in automation it was clear to many of us that more and faster data acquisition would lead to better process models and more responsive and precise control.

It was in discussions with John Berra, chairman of the Fieldbus Foundation and with the foundation's Executive Committee, that the light came on. The more I learned about the Foundation's technology and its capabilities, the more convinced I became that this was the major shift we had been looking for—akin to the shift from pneumatic controls to single-loop electronic control. Open networks would change the control world, from design, to engineering, installation and operations!

Q: Most people say they want open systems. But Microsoft is more popular than Linux, for example, so maybe we have to take that with a grain of salt. What do you think automation users "really" want?

JP: It seems clear to me that the end user community really does want—and is demanding—open systems. I believe most end-users have, and will continue to maintain, a "preferred supplier." But, the ability to select "best in class" products and the field device that is absolutely the right one for their particular process situation is very important to them. They have demonstrated this fact by their active participation and support of open systems such as the Fieldbus Foundation's technology.

Q: Heading up the Fieldbus Foundation was, in your words, like "herding cats." Everyone wants everyone else to play fair, but we all like to have an advantage over others, too. How did you walk that fine line with all your members? What "diplomacy lessons" did you learn from that experience?

JP: First off, to be successful with an organization like the Fieldbus Foundation, you must be vendor-neutral. You must treat all the members exactly alike—in all cases—and at all times. And, you must ensure that any proprietary information that becomes known to you is held in complete confidentiality. The members' trust in the organization must never be jeopardized. Secondly, you must ensure that the technology provides the benefits that are valuable to the user. And finally, for me at least, it was necessary to be patient and to see myself as a facilitating agent, assisting the members to reach a consensus. Given time, the members always ended up doing the right thing for the industry.

Q: What achievements at the Fieldbus Foundation do you feel most proud of?

JP: First, seeing FOUNDATION fieldbus become an International Standard despite the dedicated opposition from some people that is sometimes characterized as the "Fieldbus Wars." It was a long and contentious struggle and required educating and enlisting support from worldwide users, manufacturers, and IEC committees from around the world. We were convinced that the users would then evaluate our technology and Foundation fieldbus would become the "de facto" standard in the continuous process industries and that has happened.

Second, the unwavering and committed support of the foundation's Board, Executive Committee and Technical Steering Committee. This is a tribute to them and to the leadership of the Fieldbus Foundation.

Third, the deep involvement of the end user community, and the foundation's willingness to listen to users as the technology developed. That process of listening and responding to the user continues today.

And, finally, the tremendous growth of FOUNDATION fieldbus installations, now totaling more than 5,000 host systems and 450,000 field devices in service around the world.

Q: What work is still undone?

JP: We are about to begin a demonstration of the foundation's High Speed Ethernet (HSE) technology in a production setting. Along with that will be the completion of extensions to the Electronic Device Description Language (EDDL). EDDL is a text-based language for describing the digital communication characteristics of intelligent devices and equipment parameters in an Operating System (OS) and Human-Machine Interface (HMI) neutral environment.

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The technology enables a Host System manufacturer to create a single engineering environment that can support any device, from any supplier, using any communications protocol, without the need for custom software drivers for each device type. Another important step has been the completion of Draft Preliminary Specifications (DPS) for the Fieldbus Foundation-Safety Instrumented Systems technology. Laboratory tests of the DPS will now be conducted at Infraserv Höchst Technik GmbH & Co. KG, an independent consultancy located in Frankfurt, Germany, that will validate the FF-SIS specifications.

Q: What do you consider the two or three most important developments in automation during the last 20 years?

JP: No doubt in my mind that the introduction of FOUNDATION fieldbus and other open protocols is a major paradigm shift. Along with that is the ability to put microprocessors in the field device, giving us much more information about the process and the device itself. This provides another major benefit that is just starting to be exploited: the ability to do diagnostic operations, from the control room, on field devices like valves, with the attendant savings in time and money. Finally, much more information about the process is now available, and this data will be used by engineers to make new improvements in the process itself.

We Americans are waking up and relearning what our leaders in the late 40s and early 50s knew; a highly educated and creative workforce is the key to our continued progress.

The development of Function Blocks is another critically important advancement. Function Blocks make it possible to put control functions, such as the PID function, in field instruments. The foundation's new Flexible Function Blocks (FFBs) will allow end-users to move beyond outdated legacy systems in favor of a distributed fieldbus architecture enabling robust, reliable control at the field level. Developed specifically for the foundation's HSE program, but also compatible with H1 fieldbus systems, FFBs are a key component of the open, integrated FOUNDATION fieldbus architecture for information integration. FFBs, which are application-specific, reside at the fieldbus User-Layer along with standard function blocks, and enable control strategies such as supervisory data acquisition, batch control, PLC sequencing, and I/O interfacing, including gateways to other plant device networks.

Q: What changes would you like to see in the automation business?

JP: In some respects the automation world is no different than any other industry and I believe we would be better served with less political maneuvering and more emphasis on merit and performance. This applies across the spectrum from the individual; to the group; to the company; to the various international organizations.

Q: What's your perspective on the consolidation that's gone on in the process industry? Bailey, Taylor, Foxboro, Moore products have all been absorbed into other entities. What's the big lesson?

JP: I believe it all starts with "economies of scale." It takes significant resources, people and money to fund the research, training, and support of products in the fast moving automation markets. Today's control system and product markets are both faster paced and far more complex than in prior years, and that trend will only continue to accelerate. In addition, suppliers realize they must have a relatively complete product offering to both meet the client's needs, and to fund the marketing, sales, and service efforts that are required for success.

Q: Where does Ethernet really fit into the process world?

JP: I believe there are several potential applications for Ethernet in the process world. Ethernet will tie together multiple control subsystems, such as systems using FOUNDATION fieldbus H1 segments, in a plant- wide system. It will integrate different protocols, such as DeviceNet, Profibus, ASI and other discrete manufacturing protocols, through Flexible Function Blocks and servers in HSE linking devices. It may also be used in direct data acquisition and control architectures with more sophisticated analytical devices such as gas chromatographs or spectrometers, where more data, at higher transfer speeds, is desirable.

And as Ethernet is one of the physical media that Foundation Fieldbus supports, the integration of FF H1, FF-HSE (Ethernet) and OPC forms the ideal backbone for a truly integrated architecture in a process enterprise. It's a single architecture for Plant floor to Top floor in corporate reporting systems.

Q: Finally what's your crystal ball on the US in the midst of Global manufacturing? Are the innovations we're working on here going to make a big difference in the next 10-20 years? What does the future hold?

JP: I agree with the view that further outsourcing of low-skilled assembly/manufacturing work is inevitable. I believe our future (for the US) lies in advanced technology in areas such as electronics, medicine, biochemistry, nano technology, the environment, and probably other areas we don't understand or recognize today.

We were thrilled when, after many setbacks, steel came out of the world's first computer-controlled, six-stand, hot strip steel mill.

A very important component of this advance into our future is education. The United States was until recently the premier location for education— we are no longer. We must improve the access and the quality of education in our country. That's why I am involved in education as the Chair of the Board of Trustees at Tri-State University and why I'm actively assisting in the establishment of the James O. Gray—Fieldbus Foundation endowed scholarship program.

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