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MESSAGE FROM ARCHIVES CHAIRMAN DON NIELSON

Don Nielson

In case you haven't been counting, this year will see SRI's 70th anniversary! In a tumultuous environment such as Silicon Valley's, where companies or institutions come and go regularly, this longevity is truly remarkable. Although our environment in the South Bay has seen its share of reinvention, SRI has maintained itself for seven decades, largely in the business of selling its talent to others. That is not to say that changes haven't been necessary as SRI's market has changed, but SRI has adapted and continues to do so at this writing.

A couple of changes are worth mentioning here. Perhaps most noteworthy has been SRI's increasing attention to its intellectual property (IP). In the early days, SRI used patent acquisition largely as leverage to get new research projects with a high likelihood that the associated value of that patent might transfer to the new client in return for sponsorship. No more. With the help of new government laws that enable nonprofits to retain their IP, commercialization of the IP became much more practical. One can now best see SRI as an institution ready to carry its research clear to the marketplace and—it hopes—to derive its commensurate reward, be it from drug development or engineering hardware or even software systems.

Second, SRI, largely through absorbing existing research organizations or from notable research facilities, now has offices in over 20 locations around the United States and internationally.

Another point is that SRI is doing well. Although the details of its current status are not public enough for this newsletter, I can say that 2015 was a good year for SRI, which met its budget plan, and 2016 is starting out strong as

well. In the words of SRI CEO, William Jeffrey, "I'm proud to say that the state of SRI is strong!" New changes are in store for this year both in business development and in the modernization of common services and infrastructure that SRI needs to operate.

Finally, the chairmanship of the Alumni Association Steering Committee has suffered some blows of late. Last year's chair, Pete Valenti, fell so ill that he left us last fall, and Klaus Krause, who took over for him, is now successfully recovering from a serious surgery. Although you may judge that these events are not unexpected when many of us are retirees and Medicare-able, they have still been hard to contemplate. Klaus heretofore also gathered the material for the newsletters, so we are plowing a bit of new ground now and I'm trying to help in the process. We hope you will enjoy this issue and, importantly, if any of you in the South Bay or Peninsula would like to participate in keeping us all informed about SRI and in touch with each other, please come join us. Also, please remind nonmember alumni that they can now easily join through our website at www.sri.com/about/alumni/contact-us.

SRI's Robotic Program Opens Its Door to the Commercial Sector

While SRI has a long history in robotics dating back to about 1968 with Shakey, perhaps the world's first mobile robot, the last decade or so has seen this program become one of SRI's most prolific groups in commercialization. Although not all of its incipient products are strictly robotics, all explore the leading edges of technology. Examples are electrostatic wall climbers and material handlers, electrically activated artificial muscle, exoskeletons for augmenting human performance, and various devices in the surgical area. Some of these commercial developments have been public and some not. Here is an example of each.

Verb Surgical: A New Robotic Surgery Platform

An example of a relatively hidden relationship is the SRI robotic technology licensed to a new company formed just last year called Verb Surgical. Formed in stealth mode, the company is a collaboration between a Google Alphabet entity called Verily (formerly Google Life Sciences), Johnson & Johnson, and Ethicon. While its public purposes are still vague, their press release gives this picture: "In the coming years, Verb aims to develop a comprehensive surgical solutions platform that will incorporate leading-edge robotic capabilities and best-in-class medical device technology for operating room professionals." And from SRI's Robotics website: "Verb Surgical is developing a new robotic surgery platform that will integrate technologies such as advanced imaging, data analysis, and machine learning to enable greater efficiency and improved outcomes across a wide range of surgical procedures…we believe will impact both the open and minimally invasive surgery markets and ultimately make the benefits of robotic surgery accessible to more patients around the world." Embodied within their unfolding products will be technology licensed from SRI, and Verb's vice president of research and technology will be Pablo Garcia, a longtime member of the Robotics Program at SRI.

If the above mission recalls SRI's pivotal role in the creation of Intuitive Surgical, it is no accident. "Intuitive" has been wonderfully innovative and impactful, becoming a world leader in minimally invasive surgery and proving that SRI is well grounded in the robotic and surgical fields.

Personal HVAC

The second example is based on a distinctly different and new technology emerging from the same SRI group. To describe it, here is an extract from the SRI Blog titled *Wearable Active Textiles for Personal Cooling and Heating: Saving Energy and Increasing Comfort* entered by staff member Roy Kornbluh on Tuesday, November 24, 2015.

Heating, ventilation, and air conditioning (HVAC) account for almost half of the energy used in a typical U.S. home and about 13 percent of all energy consumed in the nation. Such energy consumption has negative effects on the environment and climate, wastes money from inefficient heating and cooling of buildings, and results in lower productivity because office workers are too hot or too cold.

What if each of us had our own heating and cooling system that could regulate our individual thermal comfort? The U.S. Department of Energy's Advanced Research Projects Agency-Energy (ARPA-E) Delivering Efficient Local Thermal Amenities (DELTA) program is exploring the possibilities of such innovative "localized" thermal management systems. Funded by ARPA-E through the DELTA program, SRI is leading a multidisciplinary team that includes University of California, Los Angeles, and Stanford University to combine novel technologies for a highly efficient, wearable system that works synergistically with the human body to manage a person's heating and cooling individually. If widely implemented, such a system could save two percent of energy consumed in the U.S.

Personal Thermal Textiles

SRI's research team is leveraging the human body's thermal regulatory system by transferring heat through glabrous (nonhairy) skin—that's mainly the palms of the hands, soles of the feet, and the upper facial area. These areas have very dense networks of blood vessels that act as heat exchangers for the body, similar to a car radiator. A person may have cold hands and feet not because of poor blood flow but because, when someone is cold, the body restricts blood flow to those areas.

The personal thermal regulation system SRI is developing is enabled by "active textile" technology that comprises low-cost electroactive polymer materials and structures that efficiently manage active heat transfer and boost passive cooling while being quiet and comfortable. The system is versatile and can be incorporated into various clothing accessories, such as arm wear similar to many existing braces, gel-filled comfort wraps used by office workers, insoles or socks that are compatible with shoes, and scarves and eyewear. This technology would allow a person to continue to wear existing clothing.

SRI researchers are working with low-cost electroactive polymers to develop a wearable thermal management system.

A Textile Platform

By incorporating the means for heating and cooling into thin, light, and flexible active textiles, researchers hope to create a versatile technology platform that can be used in many applications. For example, SRI is exploring applications in which the system would bring heating and cooling benefits to users in extreme environmental conditions. For example, humanitarian aid workers who work in environments that are hot and humid and who have to wear extensive personal protection equipment are limited in the time they spend helping others by their equipment. A personal thermal regulation system that can be worn with the equipment and increase the workers' comfort could potentially extend the amount of time the worker could wear the protective equipment. Personal thermal regulation systems can also make recreational or fitness activities more enjoyable and productive.

Finally, it is possible that the system could be integrated with smart watches, fitness bands, and other wearable technology for data logging and communications with other systems, such as a building's HVAC system.

See more at: https://www.sri.com/blog/wearable-active-textiles-personal-cooling-and-heating-saving-energy-and-increasing-comfort#sthash.B9mfQK1f.dpuf

Can the SRI/Yamaha Motorcycle Robot— "MOTOBOT"— Best Valentino Rossi's Lap Time?

In conjunction with a team from Yamaha Motor Company, SRI's Robotics Department is building MOTOBOT, the first autonomous, motorcycle-riding, humanoid robot. Designed to ride like a person, MOTOBOT will aid development of future motorcycles, improve motorcycle safety, and push the limits of what is possible in design and performance. The goal of MOTOBOT's performance is to be able to beat MotoGP™ world champion rider Valentino Rossi's lap times around a racetrack.

MOTOBOT, the first autonomous motorcycle-riding humanoid robot (Image: Yamaha).

SRI and Yamaha Motor announced their partnership at the January 2016 Consumer Electronics Show (CES) Robotics Conference. MOTOBOT fuses Yamaha Motor's technology gained from developing motorcycles and industrial robots with SRI's expertise in developing humanoid robots that operate far more efficiently than current humanoid robotic platforms. Their objective is to develop a humanoid robot capable of operating the motorcycle that can exceed a human—with little or no modifications made to the vehicle. The first step will be to develop the MOTOBOT's ability to navigate a racetrack independently by 2017.[1] Initial trials have begun in closed test areas.

SRI will offer its world-renowned robotics expertise in an attempt to enable the MOTOBOT to use data for vehicle speed, engine rpm, machine attitude, and the like to control its six actuators (for operating the steering, throttle, front brake, rear brake, clutch, and gearshift pedal) to autonomously operate the vehicle.[1] As the project advances, the hope is that technology for machine position recognition (for example, high-precision GPS [global positioning system] and other

sensors) and machine learning can be used to enable MOTOBOT to make its own decisions regarding the best lines to take around a racetrack. Thus, MOTOBOT could test the limits of the motorcycle's performance and improve its lap times by constantly adapting to higher speeds.

SRI roboticists at work on the MOTOBOT.

"We will demonstrate how far humanoid robots have advanced in efficiency and performance and how industry leaders such as Yamaha Motor can leverage robotics to solve business challenges, create competitive advantages, and accelerate innovation," says Thomas P. Low, Associate Director of Robotics at SRI.

Yamaha Motor launched the MOTOBOT project to pioneer a new approach to vehicle development. Unlike a crash-test dummy that is designed to test the impact of a collision on a vehicle's occupants, MOTOBOT is designed to test the limits to an unmodified vehicle that does not crash.[2] Using such a humanoid robot could not only lead to improvements in safety but could also extend the limits of design and performance.

"Developing a humanoid vehicle rider is an ambitious effort, which is why we decided to work with SRI International, one of Silicon Valley's great R&D powerhouses. This is a strong collaboration as we bring some experience in motorcycle racing and manufacturing robotics and SRI is making contributions to the field of robotics with breakthrough components and systems," said Amish Parashar, director of strategic business development at Yamaha Motor Ventures & Laboratory Silicon Valley. "This project will be able to push several boundaries: visualizing data about human motorcycle operation, further quantifying the relationship between rider input and machine behavior, and then using the resulting know-how to build even better vehicles."

And the benefits may go beyond motorcycles. For example, consider the possibility of autonomous vehicles such as large agricultural harvesters or tractors that must repetitively track over many acres while avoiding obstacles. "This pushes the limits of what's possible, so this is a very moon-shot type of program," said Philip von Guggenberg, SRI's director of business development.[3]

Except where noted, this article is based on the SRI Press Release, "Yamaha Motor and SRI International Announce Collaboration on the Development of a Motorcycle-Riding Humanoid Robot (MOTOBOT) at CES 2016" Menlo Park, CA. 6 January 2016.

1. Yamaha website: "How close can MOTOBOT get to Valentino Rossi as a rider?" Accessed at: http://global.yamaha-motor.com/showroom/event/2015tokyomotorshow/sp/exhibitionmodels/mgp/

2. Spiros Tsantilas. "Yamaha partners with SRI to beat Valentino Rossi's records with the Motobot." 8 January 2016. Accessed at: http://www.gizmag.com/ces-2016-yamaha-sri-motobot/41251/.

3. Keven Kelly. "The Robots Are Coming: Yamaha, SRI team up on humanoid robot to test motorcycle safety, push performance—and much more" in the San Jose Mercury News. Accessed at: http://www.mercurynews.com/news/ci_29443173/menlo-park:-yamaha-sri-team-up-on-humanoid-robot-to-test-motorcycle-safety-push-performance--and-much-more.

Taxi Tales

In this issue, Peter Weisshuhn takes us to Saudi Arabia, giving us a glimpse into the unhappy life of a guest worker driver.

Riyadh

By Peter Weisshuhn

Saudis don't drive taxis; that is a job for guest workers. These workers come from the rest of the Muslim world, and I have been driven by Pakistanis, Bangladeshis, Sri Lankans, Indonesians, and Somalis. They don't much enjoy their existence in the kingdom, possibly because of the way they are recruited and treated. Their stories were all variations on a common theme: A man is unable to make ends meet in his home country. Whether it is to support his widowed mother and his siblings, buy his children an education, build a house or set up in business, the common denominator is a lack of money and no prospect of obtaining it where he is.

However, one way of earning it is as a guest worker for a few years in a rich Gulf country. For that, the man needs a job offer, a work permit, and the airfare. These are provided by local agents who are not always above exploiting their fellows. A loan for the air ticket and the agent's fee is secured from a moneylender, to be paid off in installments. None of my drivers could tell me what interest rate they were charged. We can take it that it was high. The applicant may be given a choice of jobs, such as between washing cars and driving them. The men I met had elected the driver option, as there was the hope of tips. According to the agent, the wages were to be 1,000 riyals.

On arrival in the kingdom, the guest worker is met by his employer, who gives him the work permit and retains his passport. He will get the passport back when returning home for the contracted annual vacation of a month. Later, the worker will discover that it is inconvenient for his employer to abide strictly by that clause. So the contracted 12 months between home leaves stretches to 14 or 15, as it seems that there are never enough drivers for one to be spared.

But first, another surprise awaits the new arrival. His employer refutes the idea that the wage is 1,000 riyals. A mistake by the agent! He must have known that drivers' wages were 800 riyals. Of course, lodging would be provided free, but that was already understood. Later, the driver will find that there are deductions from his wages. These strike him as arbitrary. Coming to work without a tie costs a day's wages, but nobody

had warned him. Small deviations from the employer's rules are punished by deductions from wages, but those rules are not clear and seem to vary.

And then there are the police. I was in the back of a taxi trundling along at the prescribed 30 mph on the wide, nearly empty road into Riyadh when we were stopped by a US-style motorcycle cop for "speeding." The driver being unwilling to argue, I protested on his behalf, to no avail. The fine would cost the driver several days' wages.

But even more feared are the religious police. They patrol the city in blue cars. No foreigner argues with them. One driver related this experience. A call had come in from the local hospital to collect three women. My driver was dispatched. The women squeezed into the back, as it would be a crime for one to sit in the front with a man who is not a blood relation. The women were jolly. They took off their head coverings. The driver informed them that this was illegal and that they could all be punished. They ignored him.

Then the women became exuberant, laughing and hugging. The driver warned that the religious police were following close behind. The women told him they took no instruction from a foreigner. He should mind his own business; they were not afraid of the religious police. He was relieved when the police car peeled off and he could drop the women at their destination, a large house in an expensive suburb.

Back at the office the religious police were waiting. They wanted to know who these women were, why they were laughing, why he had not stopped them, where he had taken them. He explained as best he could but did not reveal their address, saying he had dropped them at a shopping center. He must have been appropriately submissive and remorseful, for he was let off with a warning: If he were ever caught again in a situation like this, he would go to prison.

I said I admired his chivalry in protecting strangers who had been rude to him. But presumably the women had nothing to fear because they were well connected, so why had he taken the risk of lying? He replied that in his country people could enjoy themselves openly and laughter was not forbidden.
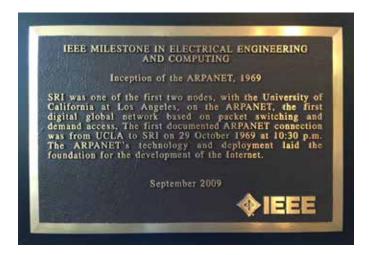
IEEE Plaques at SRI

By Don Nielson

The Institute for Electrical and Electronic Engineers (IEEE) is the world's largest organization for technical professionals, with over 400,000 members. It has a wide variety of functions, one of which is to note the history of its technical fields. That history is often marked by its selection of important "milestones"; to recognize those milestones, the IEEE places bronze plaques in the locations where important events have occurred. SRI now has one of those milestone plaques prominently displayed in our front lobby, and another will likely join it soon.

SRI received its present plaque in September of 2009 on the 125th anniversary of the IEEE. Below is the image of that plaque and some of the SRI acceptance speech I gave during the award ceremony at the Computer History Museum. To understand the text, you need to know that an IMP, or Interface Message Processor, is a network packet switch, equivalent to today's routers, and that the sentences in italics came from a regular report to ARPA from the Augmentation Research Center.

"First, on behalf of SRI, I would like to thank Dr. Terman [President of the IEEE] for this cherished recognition. I assure you, the plaque will find a prominent place at SRI.

"In the course of technology development, history often plays a fickle role. If innovation is your business, doing something for the first time isn't all that uncommon. So, a description of the event we are celebrating, taken from a

November 7, 1969, SRI report to ARPA, reads like so many similar efforts at SRI:

> *Test programs have been developed to check out communications with the IMP and with other Network host computers by 'looping' messages. A preliminary operating system that allows one remote user to log in to our system over the Network and simultaneously allows us to log in to any other available system on the Network has been written and is in operation.*

"History looked kindly on this particular effort, for the modest event I just described turned out to have truly significant consequences."

One other observation relates to the fact that in starting this new communication field, ARPA granted a clean slate to a bunch of young researchers who were outside the technical establishment of the day. Continuing: "ARPA…wisely gave these innovative young graduate students the freedom to create something totally new. For a brief time, these rather modest students actually looked around, waiting for the network professionals to appear and guide them. And it was a blessing that they did not come. Given the decades it took for the professionals of that day to accept the promises of this new digital packet technology, their absence was indeed a gift, and ultimately a gift to all of us."

Most accounts of this first ARPANET connection depict the failure of the first log-in from UCLA to SRI. Because this code was originally written for direct terminal access to a computer and then modified by SRI's Bill Duvall to go cross-net to log-in on a distant computer, the auto-log-in feature for direct terminal access had not been removed. It, of course, was immediately removed and the first computer network connection completed. The date on the plaque came from a note UCLA's Charlie Kline had jotted down on a pad. That note and the report extract in the italics above are the only known references to the accomplishment. Though this event was all in just another day's work at both institutions, it has become, as the plaque implies, very noteworthy.

Within about three years after the ARPANET began, other packet networks had to be created to meet the military requirements for digital communications. Packet Radio, the world's first mobile digital radio network, was the first to

be placed in tandem with the wired ARPANET and it was led by SRI. Bridging these two networks in a way that was transparent to their end users required *internetworking*— an original coinage at the time. And when a protocol for that transparent connection was defined in 1974 by two ARPA colleagues, internetworking began. Another plaque, mounted by neither the IEEE nor SRI, is now on the wall at the Alpine Inn (Rossotti's) to commemorate a day in 1976 when SRI first demonstrated that protocol across both the ARPANET and the Packet Radio Net. That same protocol still defines transport on today's Internet.

A year or so before the occasion that the above IEEE plaque celebrates, another momentous event in the history of computing occurred at SRI. In December of 1968, SRI's Douglas Engelbart introduced to the world interactive computing. In a computer conference in San Francisco, where the norm was to read papers, Engelbart and his talented lab *showed* for 90 minutes how their online system could be immediately and intimately responsive to its user(s). That event has come to be called the "Mother of All Demonstrations," and through it, the public saw for the first time computing as we all know it today.

So, a second plaque for SRI honoring that event has passed most of the approval hurdles at the IEEE, and here is the citation likely to appear on it:

The Mother of All Demonstrations, 1968

Douglas Engelbart and his team publicly demonstrated their oNLine System (NLS) at Brooks Hall in San Francisco on 9 December 1968 while connected via microwave link to the host computer and to other active users at SRI in Menlo Park. NLS integrated many fundamentals of later computing including: collaborative online editing, hypertext, video conferencing, word processing, dynamic file linking, collapsible views, spell checkers, revision control, and the mouse.

These two awards, particularly when coupled together, go a long way in setting the stage for today's computing environment.

And here is one last association of SRI and the IEEE of which few people are aware. Each year the IEEE gives an award to an individual "who has demonstrated outstanding contributions to nanotechnology and miniaturization in

the electronics arts." It is the IEEE Cledo Brunetti Award, and it was established in 1975. Its first recipients in 1978 were integrated circuit creators Robert Noyce and Jack Kilby.

The IEEE Cledo Brunetti Award.

Cledo Brunetti.

But, I can hear you say, what has this award to do with SRI? Cledo came to SRI in 1949 as an engineer from the National Bureau of Standards, where in 1948 he had begun development of a two-way wrist radio. Remarkably, and probably of necessity, he employed a very early version of printed circuits. In 1952, while at SRI, he was awarded a patent: Nonplanar Printed Circuits and Structural Units; that is, to save space, he made vertical extensions to the planar board. These extensions contained the same conductors and components that the flat surface contained and yet could also form vacuum tube enclosures, printed circuit coils, and other space-saving uses.

But after four years at SRI, Cledo left to join General Mills and be near his original home in Minnesota. From the *Stanford Daily* of 15 January 1953 we find: "Dr. J. E. Hobson, director of the Institute…[said]…Brunetti's best-known achievement while at SRI was the development of a miniature wrist radio."

What's in a Paradox?

By Don Nielson

In the mid-1980s, two researchers in SRI's Computer Science Lab contracted the itchy-feet symptom of "entrepreneurialitis" and decided to strike out on their own. Richard Schwartz and Rob Shostak were both brilliant in their chosen field: computer science. In the early 1980s and stimulated by the explosive growth of computer sales, computer software was also a burgeoning field and—quite unlike today—you could then find stores with many aisles and shelves of hundreds of software packages for the IBM PC. This onslaught occurred for both the lucrative enterprise market, served by large IBM computers, and the personal-use market served by the PC.
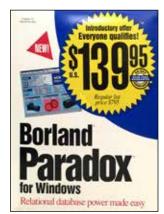
Two of the very early applications for such software were spreadsheets and database management systems, and Richard and Rob chose the latter in which to launch their venture. In 1985, their company—Ansa Software—issued its first product: a relational database system directed toward the PC—first toward DOS and eventually toward the Windows world.

Richard and Rob called that first database product "Paradox." And one of the more interesting aspects of this start-up— an oft-told tale in Silicon Valley—is why such a name. It certainly doesn't engender confidence or an image in the buyer's mind of an easily mastered product. Well, the answer is simple: A "pair of docs"—two PhDs—just happened to come from SRI and dream up a product!

At the time, they were certainly not alone in their chosen marketplace, where dBASE was just one of several significant competitors. So, for reasons one can only guess, they sold their rights to Paradox to Borland Software of Scotts Valley in 1987, itself only four y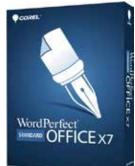ears old. In the transition, Richard Schwartz became the Chief Technical Officer and Senior Vice President of Borland and Rob Shostak its Chief Scientist.

To see what the product looked like at the time, here is a picture of the Paradox container that I purchased but never opened. Interestingly, on top of the box is this restriction: "NOT FOR EXPORT, FOR USE IN THE USA AND CANADA ONLY."

Through the 1980s Borland's database efforts struggled, mostly against Microsoft's entry with is database program Access. Even after buying Ashton-Tate, the owner of dBASE in 1991, Borland still couldn't compete with Microsoft and its Office Suite, so closely integrated with Windows. So, in 1994 Borland sold Paradox and its companion spreadsheet program Quattro Pro to Novell for $140M in cash. Novell then tried to build, along with WordPerfect, a Microsoft Office competitor. Corel eventually acquired all this in 1996 and has used Paradox as the database component of its WordPerfect Office Suite to this day.

One other SRI linkage to this saga occurred as Borland was struggling in the mid 1990s. Bill Miller, SRI's president from 1979 to 1990, who has an extensive background in helping companies get started and cope with change, was a member of Borland's Board. In 1996 when Borland's long-serving president amicably resigned, as part of his managerial assistance, Miller became its temporary president as he and the Board helped find new leadership talent.

As for the enterprise sector of database programs, most all of that functionality became embodied in the proprietary software of the very large management services companies such as Oracle, SAP, IBM, and Microsoft.

In another curious link, Rob Shostak's brother Seth is an astronomer who currently leads the SETI (Search for ExtraTerrestrial Intelligence) Institute in Mountain View. One of SETI's missions is to search for signs of extraterrestrial life, and one of the instruments it uses to do that was completed with the help of Microsoft founder and benefactor Paul Allen in 2007. That facility is the large 42-dish Hat Creek Radio Observatory in Northern California, which SRI has operated since 2012.

Finally, both Richard and Rob went on to be serial entrepreneurs, both in the communications field. After Borland, Richard founded Diffusion Inc. That company was bought by Vignette Corporation, where he became president of a subsidiary. From there he founded SoloMio Corp., which was purchased by Unwired Planet, Inc. He then founded Macheen, Inc., where he is still a Director. It operates a cloud-based communications platform that brings mobile broadband and connected services to tablets, digital cameras, personal gaming devices, connected cars, etc., without WiFi and traditional data plans.

After leaving Borland, Rob founded Portera Systems and then in 2000 Vocera Communications, Inc., which provides wireless communications within hospitals, tying doctors, nurses, and other time-sensitive services together with instantaneous communications. Rob is still Chief Technical Officer and a Director there.

Flying Adventures

By Walter E. Jaye

Very recently I received a phone call from an acquaintance I had made many years ago. The caller identified himself as the radio operator on an Air Force radar plane on which we had spent some time together in 1962—that's 54 years ago! He was now retired, wanted to do a bit of reminiscing, and so Googled my name and found me. We had a wonderful time on the phone recalling much of a story you might now find interesting.

Between the spring and fall of 1962, I spent almost 300 hours and nearly 80,000 miles flying over the Central Pacific in an Air Force Super Constellation—all on an SRI project. The start and end point of every one of our flights was Hickam AFB on Oahu, Hawaii. Each time, our destination was a point 400 km south of Johnston Island, where we loitered on station for hours, flying in a 10-minute oval pattern. (See photo below for a plane of the same type.) The project was with the Defense Nuclear Agency, and its purpose was to obtain data about radar performance in the event of high-altitude nuclear detonations. The United States conducted these tests over Johnston Island as part of Operation Dominic, a series of high-altitude detonations that President Kennedy ordered in response to the Russians' breaking a multilateral moratorium in 1961.

An Air Force Super Constellation configured as an early warning radar plane.

The U.S. government had given SRI the task of collecting and analyzing radar and radio communications effects during these tests in order to better understand the environment that communications and ballistic missile defense systems could face in a nuclear war. In addition to me, a large number of other SRI staff members of the Radio Physics Lab (RPL) and the Communications Lab were on Johnston Island and many other islands scattered widely across the Pacific as well as aboard the SRI-operated merchant vessel *Acania*, operating in the South Pacific and loaded with radio and radar equipment.

Because Johnston Island, the launch point of the missiles carrying the nuclear device, is a very small island from which one could obtain only a single aspect angle of the expected effects, a decision was to supplement such data with radar-equipped airplanes that could view these same effects from different angles.

Four years earlier, in another series of tests, MIT's Lincoln Lab had used a single radar-equipped U.S. Air Force airplane to make observations of the same kind of effects on the ionosphere. This time, the decision was to use four of the Air Force's early warning planes—Lockheed Super Constellations—each of which was equipped with a low-frequency radar (UHF, but still low by radar standards) under the belly and a high-frequency (X-band) radar in a radome atop the fuselage.

Ray Leadabrand, the Director of RPL, decided to put me in charge of the aerial phase of the operation. That position involved coordination trips to Colorado Springs, Hickam AFB on Oahu, and finally McClellan AFB north of Sacramento, the planes' home base. In May 1962, participants and their aircraft were deployed to their appointed stations. I was located at Hickam Field.

My actual task was to determine where the aircraft should operate during the tests—two of them not very far from Johnston Island and two somewhere in the vicinity of Samoa, which was near in the southern magnetic conjugate region. Doing so meant taking the predictions of the physicists about what would happen, particularly at an altitude of about 100 km, and then determining where the airplanes must fly such that their radar beam would, at that same altitude, intersect the magnetic field at right angles—and doing it all with just a calculator and graphic plots. Simple, isn't it?

Deploying from Hickam to the designated locations for hours makes for a long night. The planes can stay aloft for up to 18 hours, though our missions varied between 12 and 16 hours in duration. Inside the plane's cabin were CRT displays where operators monitored the radar returns. For

these tests, the interesting events on the scopes might last only several minutes, to be captured by a camera and by plastic overlays on which the operators quickly draw what they see as the radar rotates at 6 rpm. It was moments of high intensity preceded by many hours of boredom and fatigue. I always flew with the same crew and aircraft, and the pilot was kind enough to let me stand in the cockpit on takeoff and landing.

At the end of the first successful test, we took all the exposed films, put them in canisters, put the canisters in a box, and I made a trip home to SRI to have them developed to be sure everything had worked. Two armed guards carried the box as I boarded the commercial flight. I sat in First Class in seat 1A. The box of films was in seat 1B.

CREDIT UNION NEWS

Plan to Attend the Spring Fling at Gamble Garden on Friday, May 6, from 11:00 a.m. to 2:00 p.m.

Join your fellow alumni on Friday, May 6, for a visit to the historic Gamble Garden in Palo Alto.

The estate is one of the last remaining Palo Alto properties to combine extensive gardens with a house authentic to the early 1900's. This three story dwelling, with its carriage house, was called a "villa" when built in 1902 for $6,039.

Edwin Gamble, son of Procter and Gamble's co-founder, his wife, Elizabeth, and their children, James, George, Elizabeth, and Launcelot, moved to Palo Alto from Kentucky in 1901 when James entered Stanford University.

The estate, willed to the City of Palo Alto by Elizabeth F. Gamble in 1981, features a 1902 Colonial/Georgian Revival house and formal, working, and demonstration gardens. The historic 2.5-acre property is now a nonprofit community horticultural foundation and places an emphasis on education as well as aesthetic beauty.

There is a $30 fee per person, which includes a box lunch and access to all garden areas and the first floor of the historic house. Please send in your completed reservation form, including payment, to the SRI Alumni Association by May 2. For questions, please contact Dave Harvey at dave.harvey620@gmail.com. We hope to see you there!

Wanted: Editor for SRI Alumni Association Newsletter

The SRI Alumni Association is looking for a managing editor for its newsletter, which is published three times a year. Duties include obtaining, selecting, and writing articles and other items related to SRI and members of the association, as well as managing the publication process from draft materials to final production. Assistance will be available from the previous editors and from the newsletter's current design/layout artist. To see past issues of the newsletter, go to the Alumni Association's website at http://www.sri.com/about/alumni and click on "Publications." If you or someone you know would be interested in volunteering for this position or would like further information, please send a message to steering-committee-alumni@sri.com.

Who Do You Believe Made an Exceptional Contribution to the Success of SRI? Nominate That Person for the SRI Alumni Hall of Fame!

The SRI Alumni Hall of Fame honors former staff members who made exceptional contributions to the success of SRI. We are seeking nominations for Hall of Fame candidates by June 3.

All former staff members are eligible, but nominees should meet the following criteria:
- Significant, lasting contributions to the success of SRI
- Contributions recognized by staff, management, or clients
- Contributions in any area of research, management, or service, such as
  – Establishing a new laboratory or a new field of research
  – Performing an outstanding recognized service
  – Clearly demonstrating qualities of leadership, vision, and creativity
- What did the person leave behind?
  – Enhanced reputation for SRI
  – New or enhanced research, business, or support activity or facility.

Please prepare a write-up of about 300 words indicating how your nominee meets these criteria. If you have questions about the nomination process, members of the Steering Committee will be happy to answer them. Send the write-up or questions to steering-committee-alumni@sri.com or SRI Alumni Association, 333 Ravenswood Avenue, AC-108, Menlo Park, CA 94025-3493. Again, the due date is June 3.

The SRI Alumni Association welcomes new members:

Michael Boots
William Grindley
Sara Gurunathan
Mike Ji
Andrea Kraay
Sue Marchant
Louis Schreier
John Shockley
Thomas Strat
Larry Sweeney
Jennifer White

And welcomes back previous members:

William Ring
Susan Romley Moranz

We look forward to your participation in the Alumni Association and hope to see you at our next group event.

Directory Addendum

The enclosed directory addendum (covering the period December 1, 2015, to March 31, 2016) contains new members and corrections. Please add it to your 2016 Directory.

Wanted: Your Submissions

We welcome articles and shorter items from all Alumni Association members to be considered for publication in the newsletter. Have you done something interesting or traveled to interesting places? Received any awards or honors? Your fellow alumni want to know! Please send items to steering-committee-alumni@sri.com.

SRI International Alumni Association
Cash Flow/Income and Expense
Year ending December 31, 2015

CASH BALANCE as of 01/01/15		**$10,706.71**
INCOME		
Cash income from membership dues and fees	$8,640.00	
Dividend income from SRI Federal Credit Union account funds	$4.80	
Contributed funds		
SRI International	$500.00	
TOTAL INCOME	$9,144.80	**$9,144.80**
EXPENSE		
Services provided by SRI International		
Report production services	$4,730.23	
Postage and mailing expense	$1,202.74	
Computer charges	$60.00	
Special events and awards		
Annual reunion expense		
Food and beverage	$4,714.02	
Music	$450.00	
Recognition awards	$288.57	
Spring Fling (Shoreway Environmental Center)		
Entry fee/lunch	$495.00	
Other expenditures and costs		
Office supplies	$187.47	
TOTAL EXPENSE	$12,128.03	**$12,128.03**
CASH BALANCE as of 12/31/15		**$7,723.48**

Gordon D. Anderson*

Gordon Anderson passed away peacefully at his home in Livermore, California, on December 17, 2015. He was 84 years old.

Dr. Anderson was born in 1931 in Turlock, California. He spent the war years in Richmond, California, where his parents worked in the war industry. He graduated from Turlock High School in 1949. After a start at Modesto Junior College, he received a B.S. degree in physics from Iowa State University in 1953, followed by an M.S. degree in physics from Washington State University in 1956.

Dr. Anderson was hired as a physicist in the Poulter Lab at SRI in 1956; in 1960, he returned to Washington State University to study under Professor William Band. After he received his Ph.D. in physics from Washington State in 1963, he returned to the Poulter Lab.

In 1968, Dr. Anderson left SRI and moved to La Jolla, California, where he was employed first by Systems, Science and Software LLC, and later by Science Applications International Corporation until 1974. He worked for 16 years at the Lawrence Livermore National Laboratory in Livermore until he retired in 1990.

Survivors include Trudy, his wife of 61 years; sons Bruce W. Anderson of San Jose, California, Paul F. Anderson of Glen Ellyn, Illinois, and Peter R. Anderson of Caldwell, Idaho; daughter Bonnie L. Bucalo of Las Vegas, Nevada; six grandchildren; and one great-granddaughter.

Edwin Blackwell*

Edwin "Ed" Blackwell died in October 2015 after a short battle with lymphoma. He had been an IT specialist at SRI.

Ed grew up in Dallas, Texas, where was born in August 1934. He received a B.S. in chemistry at the University of Texas in Austin. After three years as a naval officer, he studied briefly at UCLA and embarked on a career with IBM.

During some 25 years with IBM, he worked at locations in Los Angeles, Santa Barbara (where he met his future wife, Jeanne), and Palo Alto, California, and Dallas, Texas.

Ed came to SRI in 1990 as a Senior Management Consultant in the Information Technology Practice. He left SRI in 1993 and worked briefly at SRI subsidiary Atomic Tangerine before retiring.

In retirement, Ed volunteered at El Camino Hospital. He took up the piano again and studied French. Ed enjoyed running, jogging, and working out at the YMCA. He was a longtime member of the Menlo Park Presbyterian Church.

Survivors include Jeanne, his wife of 47 years, of Mountain View; son Kevin of Paris; daughter Beth Allin of Santa Barbara; and five grandchildren.

William L. Bryson*

William "Bill" Bryson died of complications of Parkinson's disease at his home in Los Altos, California, on March 4, 2016. He was 93 years old.

Born November 9, 1922, in Kansas City, Missouri, Bill received a congressional appointment to the U.S. Naval Academy, supported by Senator Harry S Truman. He graduated a year early to serve in the Pacific in 1944 with the destroyer USS *Burns* and later the USS *Davison*. He and his wife, Ann, were married in 1945.

In 1958, Bill earned an MBA from Stanford and retired from the navy as a Commander in 1964. He then served as Vice President of Van Waters & Rogers, a national chemical distributor in San Francisco.

Bill settled in Los Altos and joined SRI in 1976. As a management consultant in a succession of business orgs, Bill worked with clients in both government and business, in the United States and abroad. Assignments took him to many locations in the United States, Europe, Saudi Arabia, and the Far East.

After he retired from SRI as a Program Manager in 1988, Bill ran his own management consulting business for some five years. He volunteered with the Service Corps of Retired Executives, counseling small businesses. He served on the Board of Directors of two theater companies, a homeowners' association, and Christ Episcopal Church in Los Altos.

His wife, Ann, died in 2008. Son Stephen and daughter Mary Lee, six grandchildren, and three great-grandchildren survive Bill.

Marcia I. Dawson

Marcia Dawson, whose pioneering research helped lay the groundwork for pro-apoptotic (programmed cell death) small molecules for the treatment of cancer, died in February 2016 at her home in Menlo Park.

Dr. Dawson earned a Ph.D. from Stanford University in 1968. She held postdoctoral appointments at Caltech and Harvard and joined SRI in 1972. She rose to become Senior Program Director of Drug Discovery in the Bio-Organic Chemistry Lab. She left SRI in 1999 to become Head of the Medicinal Medical Chemistry Department at the Molecular Medicine Research Institute in Sunnyvale.

In 2001, Dr. Dawson joined Sanford Burnham Prebys Medical Research Institute (SBP) in Charlottesville, Virginia, as a professor. Her research focused on the development of novel compounds affecting the retinoic X receptors.

Her work ultimately led to the synthesis of the drug Targretin®, now FDA approved for treating patients with cutaneous T-cell lymphoma.

Adapted from an obituary on SBP's website.
Photo from SBP's website.

Thelma D. Dry*

Thelma Dry, born Thelma Struening in Newark, New Jersey, on November 17, 1926, passed away on January 25 at her home in the Terraces of Los Gatos, California. She and her husband, John, had moved to Menlo Park in the early 1950s. For 35 years, Thelma worked at SRI in Engineering and later Corporate Security.

Thelma volunteered with the San Francisco Opera, Opera San Jose, and especially the West Bay Opera of Palo Alto, where she transformed its Opera in the Schools program from just a few schools per season to nearly 50 schools. Thelma was most passionate about Richard Wagner and was a longtime active member of the Wagner Society of Northern California.

Her husband, John H. Dry, died in 1988.

William John Fies

William "Bill" Fies, a 48-year resident of Portola Valley, died December 19, 2015. He was born in Dallas, Texas, on February 22, 1931, and grew up in Dallas with his brother, Bob Fies, a current resident of San Carlos, California. When Bill was a teenager, his family moved to San Francisco, where he attended Balboa High School. There, he met the love of his life, his wife of 50 years, the late Cynthia Diane Barton, whom he married on July 14, 1951.

Bill possessed a unique genius for electronics. As a youth, Bill developed an avid interest in amateur radio (K6TYO), which he credited with developing his abilities in the area of radio-frequency detection for electronic instrumentation.

After graduating from Balboa High School in 1950, Bill worked as an airline technician for Pan American Airlines. In 1959 he joined SRI's Electronics and Radio Sciences Division as a Lab Technician. There, he worked on laser and LIDAR research, among other technologies, and became an Engineering Associate. He worked with Robert Finnigan, who recruited him in 1967 for a start-up to make and market commercial quadrupole mass spectrometers. Bill was one of four cofounders of Finnigan Instrument Corporation, in charge of electronic design. He remained its Chief Scientist until 1990, when the company was sold to Thermo Instrument Systems.

Bill devoted considerable time to local emergency-preparedness efforts. In 1992, Bill joined the South County Amateur Radio Emergency Service (SCARES), served on the SCARES board of directors, and was the trustee of the SCARES radio repeater for many years. He was also active in the Citizens Emergency Response Preparedness Program.

Survivors include four children, ten grandchildren, and seventeen great-grandchildren.

Adapted from an article that appeared in Palo Alto Online.
Photo from Palo Alto Online.

Else Koelln*

Else Koelln died on November 26, 2015. Her SRI career began in 1996. At the time of her retirement in 2006, Else was the Administrator for SRI's Chief Financial Officer, Tom Furst.

Jeannette Robinson Peregoy

Jeannette Marie Peregoy (Jeannette Robinson while at SRI) died on January 5, 2016, in Paradise, California.

Jeannette was born in Berkeley, California, on February 26, 1971. She graduated from the University of California, Santa Cruz, with a degree in microbiology.

Her SRI career started in 2002. At the time of her departure in 2012, she worked in the Biosciences Quality Assurance Department as a Quality Assurance Specialist IV.

Jeannette's other talents as a singer, dancer, and actress were on display in plays, on nightclub dance floors, and in front of the bands for which she became the lead singer. She was a lover of sports, having competed in gymnastics and soccer in her youth; she was a lifelong Raiders, Warriors, and A's fan.

Survivors include her parents Patti and Jerry Martinez and James and Penney Peregoy; her brothers Patrick Martinez and Ronald Peregoy; her sisters Natalia Peregoy, Cassandra Peregoy, and Christina Peregoy. She was preceded in death by her sister Jerrialyson Martinez.

Adapted from an article in Inside Bay Area.
Photo from Inside Bay Area.

Sam Smidt

Sam Smidt died on January 12, 2016, at the age of 84. A graphic designer and artist, Sam refined his unique style of nuance, wit, and sophistication in a career spanning more than 50 years.

Sam was born on May 1, 1931, in Peabody, Massachusetts, and moved to San Francisco with his family when he was age ten. He attended Presidio Junior High, where he met Marlene Joy Roth, who would become his wife after his stint in the U.S. Navy during the Korean War.

Sam attended art school in San Francisco and the Art Center College of Design in Pasadena. Sam's first job was at SRI, where he spent a year (1955–56) as a Commercial Artist.

Sometime in the 1970s, he opened an advertising agency—Sam Smidt Associates—in Palo Alto Square. By the time he sold the agency in the 1980s, Sam Smidt Associates was one of the Bay Area's top advertising agencies.

Sam opened his studio—Sam Smidt, Inc.—on High Street in Palo Alto, where he specialized in branding and environmental signage. He also taught design at San Jose State. In 2013, Sam was honored with the AIGA Fellows Award.

Sam was also a highly talented photographer and videographer. Sam's other passions included travel, good food and wine, music, and a good horse race.

Sam was preceded in death by his wife, Marlene. Survivors include son Nathan and daughter Becca and granddaughter Sarah Kirby-Smidt.

Adapted from an obituary that appeared in the San Francisco Chronicle.

Daniel Frederick Walter

Daniel "Dan" Walter passed away on December 21, 2015, in Lincoln, California. He had been an Instrumentation Engineer Specialist in the Poulter Lab's Shock and Detonation Physics Department.

Dan was born in Fresno, California, on December 29, 1934. He spent most of his childhood in San Francisco and graduated from Burlingame High School. He served in the U.S. Army during the Korean conflict. Dan married Arloa in 1957 and they lived in San Mateo until their retirement, when they moved ultimately to Lincoln, California.

Dan was a research and test engineer, first with the URS Corporation and then with SRI's Poulter Lab from 1973 until he retired in 2000.

Survivors include his wife Arloa; sons Greg, Jay, Gary, and their wives; seven grandchildren; three brothers; and one sister.

Adapted from an obituary that appeared in the San Jose Mercury News.

Joseph Zelez

Joseph Zelez, a physicist at the Sarnoff Labs and devoted Mason who spent much of his life in Philadelphia, Pennsylvania, died on January 2, 2016, in Henryville, in the Poconos of Pennsylvania. He was 84.

Dr. Zelez was born in the coal town of Elysburg, Pennsylvania, and graduated from high school in nearby Mount Carmel, Pennsylvania. He spent four years in the U.S. Air Force and served in the Korean war.

Dr. Zelez earned a doctorate in physics from Temple University. He spent most of his career working as a physicist for the David Sarnoff Research Center in Princeton, New Jersey. In January 2011, the Sarnoff Center fully integrated into SRI.

He also worked for General Electric in King of Prussia, Pennsylvania, and spent the final years of his career teaching at various colleges. He retired in 1995.

Dr. Zelez was an active member of the Masonic Lodge for six decades and also was a past Master.

Survivors include his wife, Diana Titsch Zelez; sons Christopher and Andrew; his twin brother Paul; four sisters; and three grandchildren.

Adapted from an article and photo that appeared in the Philadelphia Inquirer.

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*Member of the SRI Alumni Association