TEK RETIREE NEWS
ExTek
Tektronix Retiree Volunteer Program
TRVP
Web Page: www.TekRetirees.org A Newsletter for and by Tek Retirees February 2017

News from the vintageTEK Museum

The vintageTEK museum is a charitable, educational and scientific museum founded to commemorate the early history of Tektronix and its role in spawning approximately 300 high technology companies in the 'Silicon Forest', the four county, two state metropolitan area around Portland, Oregon. The museum's main goal is to share our knowledge and history and to "pique the interest of young people in science and technology".

The vintageTEK museum opened their doors in 2011 at 4820A SW Beaverton-Hillsdale Hwy, about 15 minutes from the Tektronix campus, thanks to former Tektronix employee Gary Hoselton made the space available at a very affordable rate. In the past 6 years the museum has collected and restored a vast number of products representing the breadth and depth of Tektronix in a variety of scientific and technical markets. In addition to products, the museum has a number of early photographs of Tektronix and employees, training and demonstration films, marketing materials, catalogs, and product manuals that also tell the history of this great company and the impact in the community and technical world.

The museum is supported through donations and items sold on their web store. Their restoration engineers are available to repair, restore, or assist others around the world that collect vintage Tektronix products. After 6 years in the Beaverton-Hillsdale Hwy location the museum needed to relocate and early in 2016 began looking for a new site.

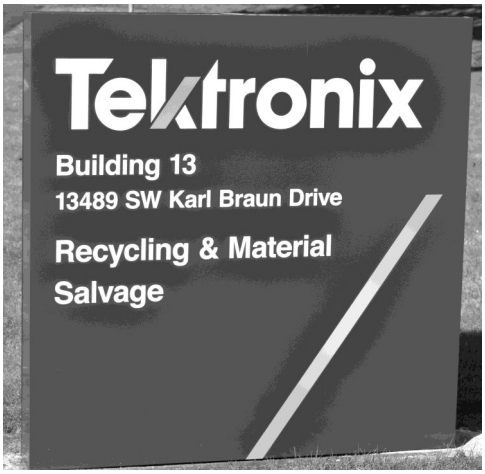
The museum approached Tektronix with the idea of returning to the Tektronix campus and were able to negotiate a portion of the former Ceramics Plant Building 13, again at a very affordable rate. Volunteers moved the museum in December and have spent January and February preparing for a Grand Opening in the near future.

The museum has need of volunteers to help with the organization of the museum in preparation for opening and for on-going operations. Former Tektronix employee Bob Haas is in charge of volunteers and can let you know how you can help. The best way to reach Bob is to send an email to contactus@vintagetek.org or leave a message on the museum's phone answering machine at (503) 644-0161. Some of you may recognize this as the very early telephone number for Tektronix.

Keep an eye here or on the museum's website http://www.vintagetek.org for the Grand Opening in the new location at 13489 SW Karl Braun Drive, Beaverton, OR, 97077. The opening date has not been set yet due to some pending construction work and the remaining work to prepare the space.

The new location consists of a main showroom of products from 1946 to approximately 1990. There is a classroom to support the museum's STEM outreach program that also has additional displays. There is a documentation room for the many different reference collections, and a main parts -inventory-restoration room. This room features original Tektronix engineering benches which were first used in the Technical Center Building 50 in late 1960s. Those benches are filled with working early and late-model Tektronix equipment used every week to repair and restore donated equipment. The range of years represented in the museum is astounding. There is a vast wealth of information in the museum including Tek Blue was not the original color, and the first product wasn't an oscilloscope.

The museum is a 501(C)(3) organization so contributions are tax-deductible. We greatly appreciate your support in volunteer hours, equipment or cash donations or just to stop by and visit. Watch for the Grand Opening.



And Speaking of Ceramics…

The current home of RAMS and the vintageTEK museum once held one of Tektronix' critical component manufacturing operations. In order to create high performance circuitry for our products, the early mechanical team created what were called ceramic strips, and they replaced phenolic boards with riveted solder terminals. The demand for these strips led to initiation of our own ceramics facility. Ceramic was blended as a low-moisture powder, then filled into a rotary small punch press, and the "green" strip was ejected and put into "bisque-ware" carriers for batch-firing in the classical cubical ovens. There were several designs, and some of you may have attached them to the finished metal parts in Unit Wiring.

In the early 60's, suppliers of glass for CRT manufacturing were under pressure from TV producers. It quickly became obvious that our demands were small in comparison to those of color TV sets, so prices and leadtimes were going up and quality was coming down.

One of the earliest oscilloscopes to be considered for a ceramic funnel was the 453. It was a big success in the market, and CRT supply was a problem. The project to create these funnels showed the potential for other oscilloscopes as well. A large addition was made with the very visible high arched roof, and inside was a new tunnel kiln that ran a small "train" of cars continuously. By 1966, designs included the eleven-inch storage tubes used in Information Display products, and soon a second addition was put on the north end of the building enabling installation of a second tunnel-kiln.

But another development was responsible for the last addition that held Hybrid Circuit Operations (HCO). Many of our probes and attenuators used single layer and multi-layer ceramics to meet the critical performance needs. Early circuit boards were made of phenolic, and it was known to have a poor characteristic known as "hook." That characteristic would also change if the board could absorb moisture. Phenolic was replaced with epoxy with fiberglass reinforcement, but as circuit speeds increased, the "hook" was still present. The solution was in development of the ceramic hybrids, and by 1970 we introduced multi-layer hybrids made of ceramic.

Eventually, HCO became Max-Tek, and by the late 90's, the ceramics operation was sold to a joint venture with Coors (Golden Colorado) and called Coors-Tek. Another venture of Tektronix' innovation had become a commodity.

Museum Front Door

Building 13

From the Editor's Desk

February 15, 2017

Dear readers,

You might note that my letter starts with "from the editor's desk", and it is intentional. Louis Sowa has been the editor for many years, and in the last issue from TVRP, he said that if there was not a volunteer to take of the job, that the newsletter might cease to exist.

As a reader of this newsletter since its inception in about 2002, I felt good about replying to Louis to offer my services. I frequently reflect and comment on the blog site set up by John Gates and I'm a fan of the vintageTek museum. Because I had the good fortune to work in many parts of the company and at many levels, I felt like my work experience and interest in people might fit well.

That said, I'm trying out the remote "editor's desk" from my home here in Corvallis, Oregon. I've watched the content of the TVRP Newsletter change over the years, and also watched the issue size get a bit smaller over time. I'd like to learn about your interests when opening a new issue.

We are a very diverse collection of readers. Will you let me know the kind of stories you like best? Which have captured your attention? Are they perhaps the articles you feel compelled to read all the way through?

For some time, the banner has included Ex Tek, as well. I can only guess at the number of employees who were hired since the doors were opened in 1946. I know that some of you were hired more than once, and that a few returned in time to have your benefits "bridged."

I'd love to hear from you, and to make this newsletter one that appeals to old-timers and short-timers alike. After all, the company was only 19 years old when I joined it, and I was barely past being a teenager, myself.

Regards,
Bill Gellatly
At Tek 1965-2002
BILL GELLATLY <bgellatly@msn.com> [

Death Notices

Beckman, Gary –d11/29/2016

Bonte, Vyella - d2/7/2017 @Tek21 years

Buck, Alida, -d12/13/2016 @ Tek 15 years

Collins, Sharon Lee –d10/27/2016 @Tek 23 years

Dougherty, Larry "Larry" Michael – d5/21/2016 @Tek 21 years

Ewers, Robert William (Bill) - d11/17/2016 @Tek 29 years

Gilbarg, Paul –d11/20/2016 @ Tek 10 years

Harman, Evelyn Lois –d6/20/16 @Tek 11 years

Hudetz, Lawrence –d 11/14/2016

Jameson, Cecelia M. d-11/4/2016

Karr, Dorothy M. –d9/17/2016

Kirby, John -d2/13/2017

Kretschmer, William O. –d7/24/2016 @Tek 27 years

Manuel, James C. -d2/1/2017 @ Tek 30 years

Nakao, Chizuko -d1/20/2017 @Tek 18 years

Sakrisson. Richard Eli - d2/13/2017 @ Tek 20 years

Smith, Ethel C (Smitty) d– 11/12/2016 @ Tek 21 years

Webb, Robert I. -d11/23/2016 @Tek 25 years

Wilbur, Norma -d1/4/2017

Zilk, Edward - d2/1/2017

RETIREE BENEFIT INFORMATION & ADDRESS CHANGE PROCEEDURE

Retiree Medical and/or Life Insurance

Anyone who is a past employee with Retiree Medical and/or Life Insurance will need to request information or make changes in writing to A & I. You must include your signature and Social Security number.

Tektronix Post Employment Services
A & I Benefit Plan Administrators, Inc.
1220 SW Morrison St., Suite 300
Portland, OR 97205-2222
Toll Free: 1-800-778-7956
Fax: 503-228-0149

401k Benefit

Anyone who has a 401k benefit must contact Fidelity for information or to change their address directly with them at:

1-800-835-5092

Cash Balance Plan

The Cash Balance Plan has been transferred to Danaher Pension Plan Processing Center with Hewitt. Questions or changes should be directed to:

1-800-580-7526

Tektronix Retiree Volunteer Program

M/S 22-037
PO Box 500
Beaverton, OR 97077 - 0001

Phone: 503-627-4056
Email Address:
Tek-Retirees@Tektronix.com

Tek Retiree News

Editor Bill Gellatly
Publisher: Open

TRVP Staff

John Addis • Gary Hoselton
Paul Kristof • Pete Nelson
Neil Robin • Louis Sowa
Emeritus: Peggy Jo Berg

Tek Retiree Newsletter is published quarterly by the Tektronix Retiree Volunteer Program. Send all correspondence to Tek Retiree News, M/S 22-037, PO Box 500, Beaverton, OR 97077

Office Telephone: 503-627-4056

Email: tek-retirees@tektronix.com

Manager's Cell Phone:

503-320-0440

TRVP Web Page:

www.tekretirees.org

Tektronix Retiree Volunteer Program
M/S 22-037, PO Box 500

TRVP News

Louis Sowa

In the past quarter we have lost two important TRVP members. Their passing will be greatly missed as they were both significant contributors to our program and both a joy to know.

On the plus side Bill Gellatly has agreed to the role of editor.

Jim Manuel

Jim retired from Tektronix April 1987. Then he volunteered to help with Tektronix Retirees Volunteer program for another 18 years when declining heath forced him to quit.

Millie Scott

Millie took on the newly created role of on-line only notification distribution.

We apologize for the delay in publishing this newsletter, should be back to normal in May.

CALENDAR

Previous Tek-Employees Luncheon

11:30 a.m. 2nd Monday monthly
Peppermill Restaurant
17455 SW Farmington Road #26B
(Corner of Farmington
& Kinnaman Rd)
Aloha, OR 97007
Details: Annetta Spickelmier
503-649-2491

Redmond Breakfasts

8:00 a.m. 1st Monday monthly
Shari's Restaurant; Redmond, OR
1565 SW Odem Medo Way
Spouses welcome
Details: Nick Hughes 541-548-1201

TERAC

6:00 p. m.
Round Table — Beaverton
Weekly on Friday

READ YOUR TEK-RETIREE NEWSLETTER ONLINE

Would you like to help save postage and read your Tek-Retiree Newsletter on our webpage? Send your name, address, phone number and email address to:

tek-retirees@tektronix.com

We will send you a notice when the newsletter is posted each quarter. If your email is changed or rejected for any reason you will receive one phone call to request an update. If you don't respond we will return your newsletter to the US mail list. To preview the web page and previous issues of the newsletter go to: **www.tekretirees.org**

Please send questions, information or correspondence not involving the newsletter online to TVRP at **tek-retirees@tektronix.com**

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My Experience at Tektronix

by Hal Lillywhite

I am perhaps a bit unusual for a Tek employee. When I was hired in 1974, Tek had about 10,000 employees. When I left in 1994, Tek again had about 10,000 employees. In between it had grown to, I believe, about 28,000. Divisions were added and sold off during that time.

I started in Marketing Training in Building 74. My memory may be hazy on the building number but it was on the south side of the railroad tracks. Then I moved into the integrated circuit (IC) department which at the time made discrete diodes and transistors, silicon integrated circuits, and hybrid circuits. It was a totally captive facility that only made parts for Tektronix instruments.

It was during my time in integrated circuits that I joined Portland Mountain Rescue, doing volunteer work that required cooperation from managers and co-workers. I much appreciated those who were willing to pick up the load on short notice so I could disappear into the mountains for a while. It may be worth mentioning that my first operation with PMR was the Oregon Episcopal School search which remains the largest mountain search in U.S. history, and had the second largest loss of life. It was a sad introduction to that work.

When I started in ICs, all production work was done in Building 48 though research and design was in Building 50. As we expanded that was not enough room so, like most of the engineers, I moved to Building 19 while Tek constructed Building 59. That was an amazing building, state of the art for integrated circuits at the time. Concrete pilings went to bedrock and the second floor was on springs for vibration isolation. As the geometries for semiconductor devices shrunk, that isolation was necessary, even a small vibration could ruin a whole batch of silicon wafers. Though semiconductor technology has progressed through several generations, that building still serves as its purpose.

At about that time, the hybrid group split off into a separate department and moved, if I remember correctly, to Building 13.

While that was going on with the IC department, Tek was growing elsewhere. Management noticed that the bistable storage display, useful for many oscilloscopes, could also be used to display other information, especially for the computers of the day. They established the Wilsonville facility to make and market those displays, and even made some computers that were state of the art at the time. Tek also expanded to a facility at 185th and Walker Road, and to the Vancouver area. As a product engineer, I was the primary liaison with the instrument groups, so I got to visit those sites regularly.

A couple of products I particularly remember went into the 7612D digitizing scope. We worked with the hybrid and CRT departments to create a system that worked with 7000 series plug-ins to digitize what were then considered fast signals. The electron beam in the CRT hit an array of diodes, with thick and thin aluminum areas that either blocked or turned on current depending on where the beam was. That produced a digital signal that told where the beam was. The signal went to another hybrid circuit outside the CRT for further processing. I understand that our main customer for that and the even faster 7912D was a certain government agency that took them to Nevada and dropped them down a hole to collect information just before a test bomb went off. We got no warranty returns on those instruments.

The semiconductor state of the art was advancing rapidly and we had to regularly update our processes and equipment. Unfortunately, each generation of equipment was more expensive than the last. It became impossible for us to keep up as a captive supplier, so we really had no choice but to market our products outside the company. That allowed us to keep up with the state of the art, but also led to our eventual “divorce” from Tektronix.

As that was happening, other technological advances ate into some of Tek's advantages, especially the advantage our CRT department had given us for so long. Tek had CRTs that allowed our instruments to work at high frequencies, to store displays on screen, etc. Then memory chips and other technologies started to perform those functions at lower cost and higher performance. The advantage of high speed CRTs and CRT storage disappeared, eventually taking with it whole Tek divisions, including the CRT department. The company shrank.

The IC department was also struggling. The Tek marketing and sales force had neither the specialized knowledge nor the customer contacts to sell our product\, and we were not a big enough organization to create our

own marketing and sales force. In addition, it was obvious that the next generation of semiconductor technology was on the way and it would be more expensive than Tek could really afford. Something had to be done, and I soon learned what.

I scheduled a winter vacation, planning to ski up on the north side of Mount Hood. The evening before I was to leave, Jon Murphy, my manager, called. "We've been sold, the buyers will be here tomorrow and we need everybody available." I arranged to postpone my vacation and went in to meet with representatives of Maxim Integrated Products. Soon, I found myself working for them. They also agreed to become co-owners of the hybrid organization on a temporary basis. Eventually that co-ownership ended with a coin toss. Tek won the toss and bought out Maxim's half of the hybrid organization.

I had my celebration of twenty years with Tek just before we were sold, I believe that was the last such celebration in the Integrated Circuits Department.

Since then I have left Maxim and am now semi-retired. My wife and I served as missionaries in Mexico for a while and I remain active in Portland Mountain Rescue. They even allow me to go into the field on searches at my age.

I now consider myself a writer, having written several books available at Barnes and Noble and on Amazon. My writing career covers a rather wide subject area, from politics to biblical commentary to search and rescue stories.

The Most Visible Tektronix Building

With a rapidly emerging computer market taking off in the early 1960's, Tektronix was literally bursting at the seams trying to keep a steady flow of 453's and 545's going out the door. Engineering was being pushed, manufacturing was being pushed, and manufacturing engineering groups were being pushed.

Ground was broken in late 1964 or early 1965 for Building 50. It would become known as the Technical Center, or Tech Center, for short.

I recall the work to establish footings sufficient to support the five-level structure. Before concrete can be poured, steel pilings need to driven into the ground, and the criteria for stopping is the amount of motion measured with each hit of the piledriver. In simple terms, the soil has to supply enough friction, or the pilings have to hit bedrock.

We might not often think of the "beaver" side of the name of Beaverton, but the entire area between Jenkins Road and Tualatin Valley Highway lying west of Cedar Hills Boulevard is a huge beaver marsh. The soil had been building in this marshland for hundreds, if not thousands of years. Simply put, there is no bedrock.

Steve Piazza, a former Tek evaluation engineer and son of a steel fabricator in Portland told me that there is between two and three times as much steel piling material under the Tech Center than had been predicted during the initial soils study. I was also told that some of the piles were so long that it is thought some were able to bend so as to form the letter "J." That delayed pouring of footings, but once done, the framing of the building went up quite quickly.

In order to make flexible use the above ground floors, the number of columns was held to a minimum, and that meant that steel girders were long. Reinforced concrete created the floors, and with the large spans, the floors were quite uneven, so extra layers of finishing cement were added. I recall being able to go into the building and seeing areas where as much as an inch was added to achieve that flatness.

Completely characteristic of the company philosophy, there was no "basement" – the model shop, the environmental equipment lab, all the vacuum equipment used to support the Engineering Tube Lab were located on the "First Level."

As we began building our own IC's it was clear that building vibrations could disturb critical processes and that use of the environmental lab's drip table could interfere, as well. Years later, when Building 59 was constructed, the necessary design criteria were far better understood, and it's most vibration elements were the mask-making equipment. More learning, more precautions and more expense!

The front steps of the building enter into the foyer in the second level, and initially, a stairwell on that foyer rose to the third level, creating a very impressive entry. Groups began moving into the building in late 1966, and the moves were done over a period of about six months. Most engineers were provided with a "U-Bench" composed of two benches (one for equipment and the other as a desk area), bookshelves and pegboard used to hold tools, probes and pictures.

Food Service set up a full cafeteria in the Fifth level area with dining tables to the north end and an executive lunchroom/conference room on the south end.

Building

50

From the Editor

I hope you're able to see some of the flowers that ought to be in wild bloom after a very wet April. My thanks go out to Hal Lillywhite, who has contributed an article for this issue. He's one of several writers who have been published, and I'd like to get an updated version of the list Bob Ross created in about 2006 that lists some 89 books written by Tektronix employees. (see vintagetek web listed below)

I've appreciated hearing feedback from several of you after my first issue as editor. Keeping this newsletter lively is fun for me, but all of you are the people who can help me make this labor of love entertaining. If you have any thoughts about articles you'd like to see, or comments on articles you read, please let me know. I want to keep a finger in this "stirring" of the history that we all carry with us. If you'd like to write some history, let me know and I'll work with you.

There's no single history of Tektronix, although there has been some marvelous writing. Miles Tippery wrote some very early history, and of course, there was the book **Winning with People**, done when the company was celebrating its 40th anniversary. At the 50th Anniversary, I was asked to join a team of folks to plan the celebration and to work on the creation of the company history exhibit that is still located of the lobby of Building 50.

Keep an eye out for information on the opening of the **VintageTEK** museum. There are a handful of dedicated people who are passionate about the early years.

Keep your cards and letters coming!

Bill Gellatly

Vintage Tek Museum
http:www.vintagetek.org

Death Notices

Allen, Faye J. –d12/31/2016 @Tek 6 years

Bigalow, Donna Jean (Hoyt) - d4/15/2017

Buchanan, Donovan Grant – d12/11/2015 @Tek 15 years

Dahl, Mark -d03/07/2017

Dietz, Roger Lee d2/26/2017 @Tek 32 years

Herron, Phillip Alan –d3/5/2017

Hopper, Elinor J. d11/1/2015 @Tek 26 years

King, DonaldR. –d3/29/2017

Laakso, Carl –d3/26/2010

Melinichuk, George –d2/9/2017 @ Tek 22 years

Moen, Dorothy French - d2/25/2012 @ Tek 22 years

Mooney, Ralph Douglas -d2/14/2017 @Tek 15 years

Nelson, Ronald K. d3/14/2016 @Tek 33 years

Olson, Oscar Henry –d4/12/2017 @Tek 30 years

Palmer, Gene R. –d5/7/2016 @ Tek 27 years

Rasmussen, Carol Sue –d4/25/2013

Sang, Emmanuel -d2/18/2017 @Tek 22 years

Scott, Mildred "Millie" d1/27/2017 @Tek 37 years

Sikorsli, James –d7/24/2017

Stevens, Leon Ramsey -d2/12/2017

Stotts, Betty Jean –d4/8/2017

Tatro, Edward J. –d4/20/2o17 @Tek 11 years

Weber, Bradley Dean -d3/11/2017

TRVP News

Louis Sowa

Articles about your life after Tek whether professional or what you do for fun is encouraged.

For those of you that worked at Tektronix Wilsonville see the Wilsonville employee gathering article on page four.

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Portland, OR 97205-2222
Toll Free: 1-800-778-7956
Fax: 503-228-0149

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Office Telephone: 503-627-4056

Email: tek-retirees@tektronix.com

Manager's Cell Phone:

503-320-0440

Wilsonville Employee Gathering

On Saturday June 17, we are having a very casual gathering of exTek/ Xerox/3D systems folks... basically anyone

who ever worked in or knows about Tek Wilsonville site is welcome.

We will start at McMenamin's Wilsonville at 12:30. At 1:30 or 2:00 we head to wine tasting. There will be choices, but we can have a tour at Adelsheim or go to any other wineries in smaller groups. Nothing pre determined at this time.

Everyone: PLEASE Email rose.marshall@innovationframeworks.com so we can update you on how to find us.

Cheers
Rosi

Tek Wilsonville Website

http://www.tekwilsonville.com/

Tektronix Retiree Volunteer Program

M/S 22-037, PO Box 500

Beaverton, OR 97077 - 0001

CALENDAR

Previous Tek-Employees Luncheon

11:30 a.m. 2nd Monday monthly
Peppermill Restaurant
17455 SW Farmington Road #26B
(Corner of Farmington
& Kinnaman Rd)
Aloha, OR 97007
Details: Annetta Spickelmier
503-649-2491

Redmond Breakfasts

8:00 a.m. 1st Monday monthly
Shari's Restaurant; Redmond, OR
1565 SW Odem Medo Way
Spouses welcome
Details: Nick Hughes 541-548-1201

TERAC

6:00 p. m.
Round Table — Beaverton
Weekly on Friday

READ YOUR TEK-RETIREE NEWSLETTER ONLINE

Would you like to help save postage and read your Tek-Retiree Newsletter on our webpage? Send your name, address, phone number and email address to:

tek-retirees@tektronix.com

We will send you a notice when the newsletter is posted each quarter. If your email is changed or rejected for any reason you will receive one phone call to request an update. If you don't respond we will return your newsletter to the US mail list. To preview the web page and previous issues of the newsletter go to: **www.tekretirees.org**

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Tektronix from MOS Integrated Circuits to the Hubble Space Telescope

By Jon Ferrara (aka Jon Morris, Tek engineer with MOS Group from 1978 until 1993)

MOS at Tek, the early years

There was a little known business at Tektronix about which many people were not aware. This was the MOS (metal oxide semiconductor) design and wafer fabrication business. This business originated in Tek Labs in building 50. There was a design engineering group in Tek Labs and a wafer fabrication group which built a laboratory in building 48. The wafer fabrication group was formed by Brian Corrie who managed the manufacturing and process engineering functions. This occurred in the mid 1970s. The original designs incorporated PMOS (p type metal oxide semiconductors and NMOS (ntype) designs which were used in some of the 7000 series scopes and communications equipment. In the early 1980s this group was transferred to the Integrated Circuit Division of Tektronix which was also located in building 48 at the time. The main business of the IC Division was to manufacture bipolar semiconductors. These were used in all the 5000 and 7000 series scopes as well as other equipment made by Tektronix. So, the MOS business was considered a minor business.

Move from building 48 to the Microelectronics building 59

Later when building 59 was built, the wafer fabrication, assembly and engineering functions of the bipolar part of the business were moved into the newly built building 59. The MOS group remained behind in building 48 until several years later when a MOS wafer fabrication lab was built in building 59. About this same time, the design function was transferred from Tek Labs to the MOS group.

Development of CCD business

There were several engineers led by a Chief Engineer named Dr. Morley Blouke. Morley had a number of patents related to CCDs (Charge Coupled Devices) and started designing some of these for the group. It was at this time now in the early 1990s that the group began selling these designs for electronic imaging. The first customers were major observatories around the world which used the CCDs as the digital image capture feature of cameras mounted on the telescopes. NASA became aware of the CCD group at Tektronix and issued a subcontract through Ball Aerospace for a second generation STIS (Space Telescope Imaging Spectrograph) or camera system to be installed in the Hubble Space Telescope (HST). The original HST had a defective mirror which made the telescope near-sighted and the camera system was primitive compared to the capability of the Tektronix CCDs at the time. A mission was quickly designed by NASA to add a corrective lens to the HST This was done in 1993. Then an upgrade to the camera system to be higher definition using the Tektronix CCDs was completed in February 1997. Another major customer group was medical imaging which used CCDs for digital mammography (breast cancer detection).

Spinoff of CCD business

In late 1993 as Tektronix was planning to divest the Microelectronics business in building 59, they sold the CCD business to a private equity company from Kentucky. The group renamed themselves SITe (Scientific Imaging Technologies). Most of the Tektronix employees about 50 people were hired by the new company. They continued to operate from building 59 by leasing their space from Tektronix. Later in 1996, after Maxim purchased building 59 from Tektronix, SITe moved off campus to continue their business.

About the author:

Prior to joining Tektronix I had 8 years experience as an MOS design engineer at a Silicon Valley company in Mt. View, CA. I was hired at Tektronix on January 2, 1978 as an MOS product engineer to assist with the recently formed MOS products group which were being manufactured for proprietary use by Tektronix. But I reported to the Product Engineering Manager of the bipolar group in building 48 and later moved into building 59 when the IC Division moved there and was renamed the Microelectronics Division. Throughout this time, I provided engineering services for the MOS group and eventually transferred to them as an Senior Engineer. I held various positions

in the group including Test and Assembly Manager and Quality Manager. A position I held when the group was spun off to SITe. I was with the new company until September 1994. When I left to join Tek Labs in building 50 as a project manager for three of the scientists with government contracts.

My life after Tektronix

In 1996, I left Tektronix and became Procurement Quality Assurance Manager for an aerospace company in Redmond, Washington. In January 2000, I moved to Oceanside, California to consider retirement there. But by June 2000, I decided to go back to work for a few more years. I became Quality Manager for Ferro Electronic Materials in Vista, California. I retired in June 2003 and moved to Henderson, Nevada. My wife and I live in a nice guard gated community next to a golf course. We enjoy the entertainment and dining options here.

The Good Old Days at Tektronix

But I will always remember Tektronix where I spent most of my working years. Since my retirement, I have visited with some of the current employees at Tek booth during the Optical Society annual conventions in San Diego, Anaheim and Los Angeles. Most of these people are newer employees and have only heard stories about the good old days at Tektronix when we had free coffee and donuts, profit sharing, pensions, lucrative vacation time (5 weeks after 15 years), and a happy working environment. I can still remember Tek President and co founder Howard Vollum walking across the parking lot in the morning to his office in building 50 because he didn't believe in having reserved parking spaces for executives. Also, his "walking-around" tours to see what the engineers were inventing next. Oh, for the good old days!!!

A Career at Tek in Field Sales and Marketing

By John Simmons

I began my career at Tektronix in January of 1967 as a Field Engineer candidate in the Syracuse, NY Region. I retired in 2006 as an Application Engineer working in the Mid-Atlantic Region. My LOS was a little over 36 years. For those of you are working the math (i.e 2006 – 1967), I left Tek and spent several years working for other companies. For those of us who left and came back to Tek, we were often given the label Retread, but I think most of us became better employees because of the experience.

For many of my years at Tek, I spent majority of time selling and marketing fringe product lines including Semiconductor Test Systems, Signal Processing Systems, Microprocessor Development Systems, and yes, even Numerical Control. Besides the Oscilloscope, I spent time selling Logic Analyzers, Spectrum Analyzers, Television Products, TDRs/OTDRs and Graphic Terminals.

With that background, I'll jump back to my days as a Field Engineer (FE) trainee. The first couple of months were spent traveling the Region with experienced FEs. FE's that I traveled with were: Bill Eppick and Bob Johnson (Detroit); Bill Demerlee (Syracuse); Joe Gayer (Pittsburgh); Jim Fischer (Endicott). Bill Eppick, Bob Johnson and Jim Fischer eventually took jobs in Beaverton with Tek. My time with Jim Fischer was especially memorable. I came away thinking "How am I going to follow that act!". Jim is one of the wittiest persons I've worked with. I suspect those who interfaced with him in Semiconductor Test Systems would feel the same.

Lucky me, the Syracuse Region encompassed much of the Great Lakes area. The region has its fair share of lake effect snow in January and February. On one occasion, flying back to Syracuse from Detroit late in the day, the Syracuse airport was closed because of heavy snow. The airplane turned around and landed in Buffalo which was a bit strange because Buffalo typically gets a lot more snow than Syracuse. The airline put us on a train from Buffalo to Syracuse. It was 4 or 5 AM before I got home. I'm sure those of us who travel a lot have had similar experiences but this one sticks with me.

The rest of FE training consisted of six months in Beaverton. Most FE trainees moved their families with them as I did. Many rented apartments directly across Jenkins Rd. from the Tek Campus. Being different, I rented a duplex SE of the city. Prior to moving to Oregon in March for training, I was told to expect a lot of rainy and overcast weather. Well, you could have fooled me; the Portland area went 70 plus days without rain that summer. It was also the first time I experienced temperatures above 100 degrees.

Most of our training occurred in Bldg. 74 on Millikan Way. The training in Bldg. 74 was mainly on oscilloscopes. A lot of class time was spent going over circuit diagrams on products such as the 540 series and the 647. The 453 was covered but since its circuitry was like the 647, we did not spend much time on it. Lab time was spent troubleshooting faults inserted by our instructors plus tweaking delay lines on the 545 non-B scopes for proper transient response. After spending a fair amount of time trying to tweak delay lines, I considered it more of an art form than science based. I was impressed how the manufacturing folks could do it in about a tenth of the time than I could do it.

We also spent a fair amount of time

getting trained on non-scope products by the folks in Product Technical Information (PTI) in Bldg. 50. Many of the people in PTI were Field Engineers on rotation from the field. As an aside, I joined PTI after several years in the field. Some product groups and support folks who trained us include:

Spectrum Analyzers (Danny Welch) – The 491 was just introduced as well as the 1L5 plug-in for the 540 series. In TV Products – I recall Jerry Eastman was the technician. Sandy Sanford trained us on Signal Sources and was a great resource as a Tek historian. Earl Williams for Cameras who provide great background in general camera technology. Sampling Scopes (John Mulvey) – Probably the most technically interesting product for me.

There were other trainers, but approaching 74, I'm not recalling the rest of them.

I should also note who's who (as best I can remember) relative to the structure of Field Training. Tom Long was the manager of Field Training and PTI. Dave Weathers, as Tom's assistant, oversaw FE training. In my opinion Dave set up a great training program. It was a shopping cart style program where we set up our own schedule relative to training on products other than oscilloscopes. It allowed me to complete my Beaverton training in five months instead of six. Our oscilloscope instructors were Chuck Miller and Bob Sadelek. And one person who all FEs will remember is Rose Avery. She helped facilitate our short term move and kind of mothered us through our stay in Beaverton.

Here are some of the other FE's who were in my training sessions: Emory Harry, Angelo Domina, Bob Mahony, Denny Chamberlin, Thor Hallen, Paul Berkebile, Robin Morphew, Dennis Bayne, Jim Quinn, Harry Sheppard, to work. Thor Hallen did not spend much time in FE training. It was evident he was a technical talent above and beyond most trainees. Within a few months of starting FE training he transferred into engineering.

Endicott Field Office

Syracuse Region
Two Field Engineers
Each Field Engineer had a Field Secretary reporting to him
Main job was Order Entry and Sales Support
Service Center
Major customer was IBM which had a number of facilities in the area
Other were Link Simulators, GE, Corning Glass.

Field Engineer Job

Toolkit
Product Demonstrations
For a short time had to use personal Volkswagen bug to carry demos
User and some Service Training

Trip to WESCON

T4002 Prototype

IBM in Owego NY Testing IBM 360 SLT modules

567/6R1 Repeatability issues

Was told they could not have produced the IBM 360 Model 90 without being able to do dynamic testing of the SLT modules with the 567/6R1

Death Notices

Allen, Faye J. –d12/31/2016 @Tek 6 years

Batchelder, Burton Milford – d6/4/2017 @Tek 17 years

Berrigan, Delores –d6/30/2017 @ tek 18 years

Bloom, James Robert –d5/31/2017

Brauner, Eleanor Reed-d4/27/17 @ Tek 5 years

Deaver, Frank L. –d3/29/2017 @Tek 28 years

Freed, Dorothy "Dolly" -d6/3/2017

Mitchell, Edward -d 3/2017 @24 years

Prier, Stanley Aubrey –d12/23/2016 @Tek 21 years

Vandecoevering, Agnes M – d12/23/2016

RETIREE BENEFIT INFORMATION & ADDRESS CHANGE PROCEEDURE

Retiree Medical and/or Life Insurance

Anyone who is a past employee with Retiree Medical and/or Life Insurance will need to request information or make changes in writing to A & I. You must include your signature and Social Security number.

Tektronix Post Employment Services
A & I Benefit Plan Administrators, Inc.
1220 SW Morrison St., Suite 300
Portland, OR 97205-2222
Toll Free: 1-800-778-7956
Fax: 503-228-0149

401k Benefit

Anyone who has a 401k benefit must contact Fidelity for information or to change their address directly with them at:

1-800-835-5092

Cash Balance Plan

The Cash Balance Plan has been transferred to Danaher Pension Plan Processing Center with Hewitt. Questions or changes should be directed to:

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M/S 22-037
PO Box 500
Beaverton, OR 97077 - 0001

Phone: 503-627-4056
Email Address:
Tek-Retirees@Tektronix.com

Tek Retiree News

Editor Bill Gellatly

Publisher: Open

TRVP Staff

John Addis • Gary Hoselton
Paul Kristof • Pete Nelson
Neil Robin • Louis Sowa
Emeritus: Peggy Jo Berg

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From the Editor

This issue brings more recollections about work experiences at Tektronix. John Simmons and Jon Ferrara had quite different jobs at Tektronix, and I hope their stories are reminders of the time you spent at Tektronix. I'm trying to keep a regular flow of stories in the queue, and I'd like to hear yours.

I'd like to acknowledge some of the "behind the scenes" work. Pete Nelson is on top of lots of details to keep addresses current, and to bring news of those who are no longer with us. Also, I'm delighted that Louis Sowa is continuing to do the page layouts for what become the printed and PDF versions of the newsletter.

Finally, I'd like to welcome John Stoops to our staff of volunteers. My vision for our newsletter is to attract the occasional new retiree. Its already been more than fifteen years since I left the company, and I look forward to the continuous refreshing of stories, not just about the "founders' company, but also about the recent accomplishment that keep the Tektronix name vital.

Bill Gellatly

CALENDAR

Previous Tek-Employees Luncheon

11:30 a.m. 2nd Monday monthly
Peppermill Restaurant
17455 SW Farmington Road #26B
(Corner of Farmington
& Kinnaman Rd)
Aloha, OR 97007
Details: Annetta Spickelmier
503-649-2491

Redmond Breakfasts

8:00 a.m. 1st Monday monthly
Shari's Restaurant; Redmond, OR
1565 SW Odem Medo Way
Spouses welcome
Details: Nick Hughes 541-548-1201

TERAC

6:00 p. m.
Round Table — Beaverton
Weekly on Friday

READ YOUR TEK-RETIREE NEWSLETTER ONLINE

Would you like to help save postage and read your Tek-Retiree Newsletter on our webpage? Send your name, address, phone number and email address to:

tek-retirees@tektronix.com

We will send you a notice when the newsletter is posted each quarter. If your email is changed or rejected for any reason you will receive one phone call to request an update. If you don't respond we will return your newsletter to the US mail list. To preview the web page and previous issues of the newsletter go to: **www.tekretirees.org**

Please send questions, information or correspondence not involving the newsletter online to TVRP at **tek-retirees@tektronix.com**

TEK RETIREE NEWS
ExTek
Tektronix Retiree Volunteer Program
TRVP
Web Page: www.TekRetirees.org A Newsletter for and by Tek Retirees November 2017

Early Marketing Days of the 4051

By Gary Laroff

The Tektronix 4051, introduced to the world in November 1975 quickly became a popular product regardless whether it was positioned as a "Graphics Computer System" (1975) or a "Desktop Computer" (1978). The sure indication of a popular product is when their enthusiasm overwhelms the product manager. Buyers of winning products also eventually decide the most useful features and applications, regardless of the original promotional effort. These things were all true with the 4051.

Another indication of a winner was when customers dragged out the length of a sales call when they typically chose to end a sales call as quickly as possible. In most environments a visit from a sales or marketing representative was an unwelcome interruption in the person's day. A visit with the 4051 almost always went overtime.

A number of 4051 visits are still memorable. Months before the official product introduction we conducted sales training at major Tektronix offices. One of the first was in Rockville, MD when we were still working on Columbus Day, Monday October 13. Senior Sales Representative A. G. Yeakle had scheduled to bring me with the 4051 to visit Computer Graphics Professor Dr. David Rogers at the United States Naval Academy at Annapolis. We chose to go there after training for a quick visit before dinner. I doubt we ever ate.

Dr. Rogers was a demanding, loud, in-your face Naval Officer who quickly challenged a number of our design decisions. A.G. expected this but hadn't warned me. Off the top of my head, tapping in to what I remembered from years of discussions with the design engineers, we successfully defended our feature set decisions. This was my first defense of our innovative system using the Graphic Display Units (GDUs), a method of ensuring that graphics maintained its aspect ratio especially on displays and plotters. Simply put, circles look round, and squares look square. He ran us through every graphics feature and more. We defended inclusion of simple "graphics input." The engineers who designed the world's first graphics desktop computer had thought it out well and the graphics guru at Annapolis finally let us out of there. It was well after midnight!

Knowledgeable customers spread the word, doing more for us than all the marketing from Wilsonville. Life was busy supporting and publicizing the 4051 and a number of IDG employees have long lists of their own "war stories" but a number of my longer chains of events surround the U.S. Navy.

The 4051 had been announced for only a few weeks, demonstrator units were few and far between and were hogged by anyone lucky enough to get one. Senior Sales Representative John Roddy requested that I join him for a follow-up 4051 demo on the USS Talbot, a Guided Missile Frigate at Norfolk Naval Shipyard in Virginia. The executive officer, a commander, was aware of our discussion at Annapolis the previous month and had asked pointed questions about graphics input, computational speed and our ability to read fairly complex data streams. I seem to remember that we didn't meet all his needs at that time. We ran a quick programming course for a midship-man who had a specific problem to solve. People there liked the ease of programming, the line editor keys, the Step Program key and the flashing arrow that pointed out syntax errors. Despite the fact that the 4051 had some limitations, when they quickly ordered some of the first 4051 units and certainly the first for the Navy, they said it fulfilled "Objective 1: Be able to run problems with minimum of effort and programming." That, in a nutshell, was the 4051.

A few weeks after Annapolis and Norfolk, I drove to a customer visit at the Naval Submarine Base New London at Groton, CT. I was still working at the Boston Field Office in the winter of 1975-1976. A storm was expected and I wanted to cut the visit short since I was driving an old company station wagon with worn snow tires. The locals at the submarine base also wanted to get home while they could. After all, everything is uphill from a coastal Navy base. As before, the locals had spoken with other Navy contacts and for all I knew, some of them had been at the earlier training in Norfolk. They knew programming and small systems as we worked in a large room also lined with offerings from HP, Wang and IBM. We spent a lot of time on graphics input and they felt we were not ready for prime time. They didn't like our "quick" labeling of graphics with the hardware font. They felt the screen was too small and the lines too thick for a program to be useful and that the operator or programmer would have trouble getting engaged. No, the 4051 was not a million-dollar Evans & Sutherland system, but with their quantity discount, they could buy two hundred 4051 units for a million dollars. The 4051 was portable, affordable and programmable by mere mortals.

To overcome their objections, I did the unthinkable. Violating the rules of Tek Wilsonville, I brought out the Weather Wars game tape. It got the point across on our small screen. It was perfectly interactive with the minimum of hardware. It was infectious and

kept everyone engaged. The hardware font was acceptable. We didn't finish that day and the storm came in. I stayed at a motel for the night and went back to Groton the next day. They programmed and tested the 4051 all of that second day. Ironically, a real New England ice storm came in, but our schedules were finally impacted by Weather Wars.

Many people are aware that a year later, from late 1976 through the end of the product life of all succeeding 4050 series products, the U. S. Navy was the largest or one of the largest long-term high-volume customers. Those of us in sales, sales support and marketing can pat ourselves on the back as much as we like, but the success of the 4051 was due to its enormous attractiveness and approachability in a field of programmable calculators without screens and a few products with screens but no graphics.

Gary Laroff

At Tektronix 1973 – 1999, and then VideoTele.com, a Tektronix subsidiary, through 2002

Gary Laroff started with Tektronix as a Calculator Systems Analyst working out of the Boston Field Office and relocated to Wilsonville in 1976 to be the Product Marketing Manager of the 4050 Series.

The Tektronix 4051

By Bill Gellatly

In 1974, Information Display was growing quickly. I was working on the mechanical design of the 4006, a fourth-generation graphics terminal weighing in at about 40 pounds, and sporting an 11" direct view storage tube. We were looking forward to our move to the new headquarters for Information Display under construction on 260 acres in Wilsonville. Engineering for the division was cramped into close quarters in the Sunset plant, while product manufacturing was pushing the walls of the old Plant 4, in building 47 of the Beaverton Campus, and rapidly pushing capacity in our circuit board operations.

Modular portable office space was added next to the west-bound ramp onto Highway 26 (near today's OR-217), and it was occupied by the group from Beaverton who were extending the calculator product line we had acquired from the purchase of Cintra, down in Sunnyvale, CA. The Tek21 and Tek31 were our first additions to that line, but newly formed team was crafting what would become one of Tek's very widely appreciated tools, the 4051 Graphic Computing System.

Electronics Magazine, in its October 30, 1975 issue described the new 4051 offering this way, *"Building on its expertise in graphics equipment, the Information Display Group of Tektronix Inc. appears to be edging its way into the desktop computer business with the model 4051 Graphic Computing System. The 65-pound system can also serve as an intelligent terminal that will reduce computer time-sharing costs, and as an instrumentation-system controller, being compatible with the new IEEE general-purpose interface bus."* Note: the same issue carried an ad for the Motorola 6800 chip at $69 in quantities up to 100. That article can be found at:

http://www.swtpc.com/mholley/Microprocessors/Microprocessor_History.htm

I asked Jack Grimes, one of the original team members to describe the initial concepts. *"The 4051 was based on two main product ideas. 1) the Tek31 programmable calculator, and 2) the 4010 Graphics terminal. The Tek31 had just a simple numeric display and a proprietary programming language. The 4010 Graphics terminal was not programmable, but featured a proprietary storage-based graphics display. There was no separate memory to hold the graphics data. Instead, the direct view storage display itself displayed the graphics data.*

"The 4051, in effect, formed the host computer for a 4010 Graphics terminal. The host aspect of the 4051, was provided by the BASIC programming language, and a magnetic tape storage subsystem. The host aspect also included a CPU and main memory. The BASIC interpreter was held in a ROM memory, such that when the 4051 was powered on, the system was ready to execute BASIC programs and a set of operating system commands. The magnetic storage was a 3m tape unit that we thought of as an industrial quality version of an audio cassette tape unit.

"Recall that the Personal Computer was introduced after the 4051. This meant that the initial formulation of the 4051 was as a programmable calculator, compared with both the Tek31, and the HP 9800 family of programmable calculators.

"The 4051 CPU was a Motorola microprocessor, the 6800. The ROM memory held the OS

and BASIC interpreter. There was over 32Kbytes of ROM and up to 32Kbytes of RAM. One of the design assumptions was 'memory is free.' That is, we made little or no attempt to worry about the amount of semiconductor memory in the product design. We, instead, assumed that as the years passed, the manufacturing cost represented by the memory would decrease, resulting in an overall decrease in the total manufacturing cost of the 4051."

So, what was a 4051?

From my viewpoint, the 4051 was a 4006 terminal ($3995) with another $3000 worth of computer, tape drive, RS-232 and a GPIB ports. Those of us who took one of these home for the weekend understood the effort of getting the awkward and heavy device onto a cart and into our car.

There was optional Tektronix software for statistics, mathematics and some rudimentary tabular bookkeeping we later called spreadsheets.

The display board was an assembly shared by the 4006 and the 4051, and appearances had similarity, with the use of die castings to achieve a look not attainable with sheetmetal. Gary Burgess and Michio Haniu were the industrial designers, and both wanted our products to look more like office products than engineering test equipment.

This was a transformational product in many ways, and I think most would agree that it represented an important point along the path from mini-computers to the personal computer. Many parallel paths were being taken that led up to the devices built with the ubiquitous Microsoft Disk Operating System (DOS) and the IBM PC. It's worth noting that the IBM PC was not introduced for another eight years.

Applications

Through the Wizard Workshop, Tek began publishing subroutines and programs that were submitted by customers. One that fascinated me, and for which I found a serious use was one developed by a local timber company. It would take surveying measurements (an array of x, y and z axis data) and create a topographical plot. The basic element is computation of where elevation (z) lines cross the x-y grid. The contours were fairly rough, with each being a polygon rather than any smoothed lines. I was able to adapt the program to analyze measurement data for a molded rubber belt where we had trouble with consistency for the thickness. With some study, the molding process was dramatically improved.

Steve Hunter, one of our Information Display mechanical product evaluation engineers, wrote a very involved program that helped with design improvements of the paper path in the 4631 Hard Copy Unit. It allowed some of the production adjustments to be optimized. Today we'd call it a sensitivity analysis, because part tolerances could also be changed, every one of which would affect actions like the cutting of the print from the roll of paper. One way of visualizing the program would be like looking into the back side of a wrist watch, and calculating the motion of the parts, but in detail, it is a very long list of equations that combine the geometry of the parts **and kinematics for part motions. It was a precursor to motion analysis** taken for granted in today's mechanical CAD software.

Death Notices

Anderson, Velma R –d5/22/2017

Chalumeau, Bernard Achille - d7/10/2017 @Tek 30 years

Cook Jr., William Bays -d8/14/17

Gallipeau, Joseph G. –d1/29/2017 @Tek 10 years

Glathar, Gorden -d9/2/2017

Gregware Jr., Kendrell R. – d9/16/2017 @Tek 32 years

Herb (Coates), Agnes –d12/23/2016 @Tek 19 years

McHenry, Michael –d8/9/2017 @Tek 28 years

Neudorfer, Nancy M -d8/16/2017

Ravins, Mary Margaret -d10/4/2017 @ Tek 16 years

Smith, Ralph R –d6/17/2017 @Tek 22 years

Takacs, Anita Marie –d12/14/2016 @Tek 18 years

Warren, Carlton Daniel –d5/23/2017

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Tek Retiree News

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Publisher: Open Louis Sowa interim

TRVP Staff
John Addis • Gary Hoselton
Paul Kristof • Pete Nelson
Neil Robin • Louis Sowa
Emeritus: Peggy Jo Berg

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TRVP Web Page:
www.tekretirees.org

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Beaverton ham radio volunteers fulfill this role and have the opportunity to participate in:

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- Neighborhood disaster situation reporting training
- Disaster response field exercises
- Inter-agency disaster communications

HELP YOUR COMMUNITY BY REGISTERING AT

http://www.BeavertonOregon.gov/CERTregister

CALENDAR

Previous Tek-Employees Luncheon

11:30 a.m. 2nd Monday monthly
Peppermill Restaurant
17455 SW Farmington Road #26B
(Corner of Farmington
& Kinnaman Rd)
Aloha, OR 97007
Details: Annetta Spickelmier
503-649-2491

Redmond Breakfasts

8:00 a.m. 1st Monday monthly
Shari's Restaurant; Redmond, OR
1565 SW Odem Medo Way
Spouses welcome
Details: Nick Hughes 541-548-1201

TERAC

6:00 p. m.
Round Table — Beaverton
Weekly on Friday

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