PROLOGUE

Don Weidenbach is from America's 'Greatest Generation' – those who served our country during WWII followed by a memorable career. Don's career was part of the Information Technology industry which had some of its roots in St. Paul, MN. (Photo circa 1939) Don has been supporting the VIP Club's IT Legacy project with recollections of computer technologies of the 50s and 60s. His text of an open forum history presentation follows. Lowell A. Benson, editor.

NORTH STAR PRESENTATION - September 22, 2012

In July of 1946 I was on board an Army troop ship, along with several thousand other GI's, coming home from the Philippines. We were in a happy mood. The war with Japan had been over for a year and we were finally on our way home. It was a long year of "hurry up and wait", as the old saying goes. Most of us had work to do during that time, but there was little sense of urgency now that the war was over. The military had a point system to determine when it was your turn to go home. If you were young, single, and had no dependants - your turn didn't come up very quickly.

I finally got my orders to go to the replacement depot near Manila. On the third day after our ship sailed, tragedy struck. Three cases of polio were detected on board. We immediately changed our course to Yokohama, Japan. When we arrived, the patients were taken to a military hospital and our ship was put into quarantine. We were told that we would have to wait for an iron lung being flown over from the States. So we sat there at anchor for seven days until it arrived. We were not allowed to leave the ship, so much time was spent playing poker and waiting for mealtime. Finally, we pulled up anchor and headed for home. We made it back to San Francisco with no more polio cases, much to everyone's relief.

Before I go any further, I should tell you a bit of my earlier life. I was born in 1921 in the very small town of Heil - seventy five miles southwest of Bismarck, ND. At the tender age of six months my family moved to Scotland, SD - thirty miles northwest of Yankton, because my Dad had gotten a better job there. It was where he was born, where his parents and all twelve of his brothers and sisters lived. They were farmers and my great grandfather, Conrad Weidenbach had homesteaded there in 1873, in the original Odessa settlement. My Dad, at age 21 decided that he didn't want to be a farmer, so enrolled at the business college in Yankton. After graduating he went to Harvey, ND to visit his Mother's relatives and ended up getting a job as the book keeper in the general store. Two years later he was hired as cashier of the Heil bank. It was there that he met my mother, Emma Bader, from New Leipzig, a courtship followed and they were married. A year later I arrived.

So back to Scotland, SD, I graduated from high school in 1939. I liked science and math courses, and had tinkered with radios and electrical appliances, so decided to become an

electrical engineer. I enrolled at South Dakota State College in Brookings, SD and graduated in June, 1943. World War II was going on, and within a month I was at Ft. Snelling reporting for Army duty. Ft. Snelling was an induction center, so I was there only for a short time. We traded our civilian clothes for Army uniforms, got shots and saw some training films. During this time, I met a man named Bob Erickson, who was a recent University of Minnesota graduate with an electrical engineering degree.

We would become close friends and were on the same track for our three years in the service. We had orders to go to Ft. Monmouth, NJ, an Army Signal Corps base. We traveled by train and it took two days to get there. We were to change trains in New York City, as we had some time before our next train - we decided to see a bit of the city. We got outside the station, started walking and gawking at the huge skyscrapers. After awhile, we realized that our train was due to leave and we wouldn't get back to the station in time. We hurried back and found out that there was another train in an hour, which we got on. But we were sure we would be in big trouble when we got to our base. As you might have guessed, no one seemed to know or care that we had been goofing off in NYC!

Bob and I spent about a year a Ft. Monmouth, first in basic training, then Officers' Candidate School, and finally in specially schools. I was trained for radio communications and would be part of a twenty man team to set up and operate base radio stations. During this time I saw a lot of Bob Erickson - we would go to New York City whenever we could get a weekend pass.

In September, 1944 I was sent to Camp Crowder, Missouri where I was assigned to a radio team and prepared to go overseas. We were issued some different clothing, got some more shots and saw more training films. Up to this point we had been guessing as to where we would go, Europe or the south Pacific. But as soon as we got our new clothes, we knew it wasn't Europe.

I got orders early in December to go to Ft. Mason in San Francisco, two weeks ahead of my unit, to make preparations for our overseas shipment. My duty was to check our equipment as it arrived from the various depots around the country. This usually took and hour or two each morning and then I had free time to see the sights of San Francisco. It was tough duty! I spent Christmas day with an aunt and uncle in Sacramento.

My unit arrived from Camp Crowder near the end of December, and on New Year's Eve we were loaded, along with 5,000 other troops, on a converted passenger liner to travel to some

unknown destination. We were traveling alone (no escort) so we did a lot of zigzagging to avoid enemy submarines. Twenty days later we arrived in Hollandia, New Guinea. However, we found out that the war had moved from there to the Philippines, so our ship sailed for Leyte, the island where General Mac Arthur and his Army were fighting. Again, the Japanese had been beaten on that island, so we were loaded on another ship and sent to Manila, Luzon.

Shortly after we arrived our team received an assignment to build and operate a station in Batangas, a port city 75 miles south of Manila. Building and operating the station was an enjoyable experience. We were some distance from the combat zone, so were never in any great danger. The war had another six months to go before the A bombs were dropped on Japan, and then our station was no longer needed.

Shortly after arriving at Batangas, I got a phone call - it was my friend Bob, calling to tell me that he had just arrived in Manila. So we were back together again, and saw each other quite often. After our station had been shut down, we were given other duties. I was assigned to work in the Signal depot in Batangas. Our job was to receive the signal equipment being turned in by Army units on their way home. We would then sort and classify it for disposal. It was not as interesting as running the station, but it kept me busy.
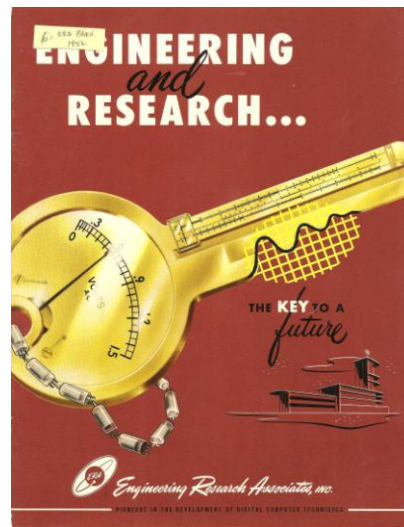
Which brings me back to when I was at the replacement depot waiting for a ship to take me home - who should show up but my friend Bob. So we were going home on the same ship! After we left Yokohama, Bob and I were on deck one day "shooting the breeze" and the subject of work came up. Bob said he was going to the Twin Cities to look for a job. I had never thought of going there. When I was in college, most of the engineering graduates went to work on the east coast at companies like GE, RCA, or Westinghouse. That had been my plan. Bob suggested that after we had some time to visit our families, I should come to his home at Kasson, MN (near Rochester) and we'd go to the Twin Cities to look for work. That sounded good to me.

Early in November, 1946 I took the bus from Scotland to Kasson. Bob's parents were very cordial, fed us well, and the next day we took their car and headed for the city. We started our search by going to Honeywell, the largest company that employed engineers. They interviewed us and said it would be several months before they would decide if they would make us an offer. Next we went to a much smaller company, ADC and had interviews. Job opportunities didn't look very good there and the work didn't seem that interesting. We were about out of ideas where to go next when someone suggested that we visit the state employment office, which we did. They told us that there was a new company in St. Paul that was looking for engineers and set up interviews for us the next day.

The company was called Engineering Research Associates, or ERA for short, located in the Midway district, not far from the former Montgomery Ward store on University Avenue. When we got there, the first thing we noticed was a large factory type building with several smaller buildings, the complex being surrounded by a chain link fence with barbed wire on top. We entered one of the small buildings where the personnel office was located. During our interviews we were told that the company was doing classified electronic work for the government. The buildings they were in had been used for constructing Army gliders during the war and were now mostly vacant. They wouldn't tell us any more about the work, but said they would decide if they would make us an offer in a week or two. Bob and I left there intrigued by the mystery of it, and decided if they made us an offer, we would accept.

We went back to our homes and within two weeks we both received job offers, and started work late in November, 1946. We found out some interesting things. The company was started with a group of 40 people, all Navy veterans who had worked on code breaking equipment during WW II. When the war ended and they were leaving the service, the Navy decided they still needed this capability and told the people that if they started a company to do this work the Navy would fund them. How did they end up in Saint Paul? John Parker, the man who owned the company that built the gliders during the war, was a former Navy officer with connections in Washington. He had an empty plant and money to back the new company. When he heard about this group, he made them an offer they couldn't refuse. So ERA was born at 1902 W. Minnehaha Ave. in St. Paul, MN.

Cryptographic work had been done earlier by groups of mathematicians working with mechanical calculators. Later on they replaced the calculators with punched card tabulating equipment. From there they built special machines using electromechanical relays, much like the ones used in the early central telephone offices. This is what the Navy group was doing during the war, but it wasn't long before they discovered that vacuum tubes were much faster and more reliable than relays. So what ERA was doing was basically an extension of that work. Each machine was built for a specific task and could only solve one type of problem. In the late 1940's some smart person or persons figured out if they put a memory into the machine they could store a program to tell the machine what to do and then it could be used for many different problems by changing the program. Thus was born the general purpose digital computer. ERA was building special purpose computers when they started but by the early 50's were building general purpose computers as well. They received permission to use the design of a machine they had done for the Navy, and with minor modification market it as a commercial computer. It was called the ERA 1101. It filled up a

large room, had several thousand vacuum tubes and cost over a million dollars per unit. As for its capability, it could do far less than present day personal computers.

Up to this time I had been working as a design engineer on the electronic circuitry for special purpose computers, mostly for magnetic storage drums. These units served the same purpose as the hard drives do on personal computers today. However, they were huge by comparison, expensive to build, and didn't store much information. Magnetic tape, similar to that used for sound recording, was glued to the surface of drum and pickup heads were placed near the

surface of the tape. The first unit I worked on had a wheel (drum) 34" in diameter, driven by an electric motor. As it rotated, data was recorded on the tape and when the program needed the data it was read back. The advantage of a drum over a magnetic tape recorder was speed--it was much faster. This unit, the prototype lab model (right), was found in a warehouse several years ago and is presently located at the Minnesota History Center in St. Paul as part of their "The Greatest Generation" exhibit.

In early 50s, a picture collage was made showing the various steps in drum manufacturing. A large print, four by eight feet, hung in the office of ERA's then vice president, Bill Norris for some time until the office was being redecorated in 1957 – after Mr. Norris left to form

the Control Data Corporation. They were going to throw it away, but someone thought I might want it. So it hung in my home recreation room until 2010 when we moved to our apartment at 7500 York Ave. in. I donated it to the U of M's Charles Babbage Institute, where it now hangs in the Director's office, Dr. Tom Misa. If you haven't noticed, the young man in the center of the collage is me!

In 1950 I was appointed as Project Engineer for a commercial machine called Speed Tally (photo at left.) I was responsible for not only the design, but had to supervise a small group of engineers and technicians as well. The machine had been ordered by a mail order company in Chicago by the name of John Plain. Its function was to store their catalog in the drum memory, along with the inventory of each item in the catalog (13,000 items). By means of keyboards, operators could find out how much stock they had on hand. As orders came in they would subtract the amount sold from the quantity on hand. When new stock arrived it would be added to the balance. It sounds ridiculously simple in today's world but sixty years ago it was on the cutting edge! The machine was used by John Plain for about a year. They didn't have the technical savvy to maintain the machine and computers at that time required a lot of maintenance. Maintenance services from our company were not yet available.

By 1952 ERA had grown to over 700 people and had a backlog of $8,000,000 in orders. The company had grown too fast and was running out of money. John Parker, the President and major stock holder decided to sell the company. He found a buyer, Remington Rand, a manufacturer of typewriters, adding machines, and punched card equipment. Three years later Remington merged with Sperry Corp, a large defense contractor, and the new company was called Sperry Rand. Our group was called the Univac division of Sperry Rand. Was selling the company a good idea? The good part was that we were now in a much better position to be funded for research and development of new products. The bad part was that we were a 1,000 miles away from headquarters (New York), communication was slow and difficult and Sperry Rand management didn't know or appreciate the complexity of computer development.

The follow on to the Speed Tally machine was a company funded business machine called the Univac File Computer. It was designed to do a wide variety of applications. I was chosen to be one of the designers. It took us about a year to finish the prototype and another year to get it ready for manufacturing. The company built and delivered over 200 of these machines. There were some very interesting applications for this computer. Northwest Airlines used it for a ticket reservation system, one of the first to do so. The Federal Aviation Authority installed them at major airports in the country to control (keep track of) the scheduled takeoff and landings of commercial and private aircraft.

In 1957 I went back to the military computer group. I became the manager of a project to build a computer for the Air Force to control the launching and guidance of the Titan missile. The computer would be designed using the newly invented transistor, rather than vacuum tubes. There were many advantages to the transistor. They were much smaller, generated far less heat, had a much longer life, and were more reliable. We built and delivered over thirty of these computers. In addition to guiding missiles they were used for putting satellites into orbit. Our computer at the Cape Canaveral test center was used to launch the Echo balloon and also Telstar, the first communications satellite. We participated in launching over 200 satellites, from either Cape Canaveral or Vandenberg Air Force base.

In 1962 I was assigned as manager of the Nike anti-missile computer project. Nike was a defensive system that was intended to intercept and shoot down enemy missiles that might attack us. It had very high performance requirements. Both the missile and the computer that guided it had to operate at extremely high speeds. We built several of these computers for test sites, including White Sands Proving Ground in New Mexico and Kwajalein Island in the South Pacific. When testing the system at Kwajalein, a Titan missile was launched from Vandenberg AFB and aimed at Kwajalein. At Kwajalein the Nike missile would be launched to intercept it. Both systems were being guided by Univac computers! No they didn't talk to each other!
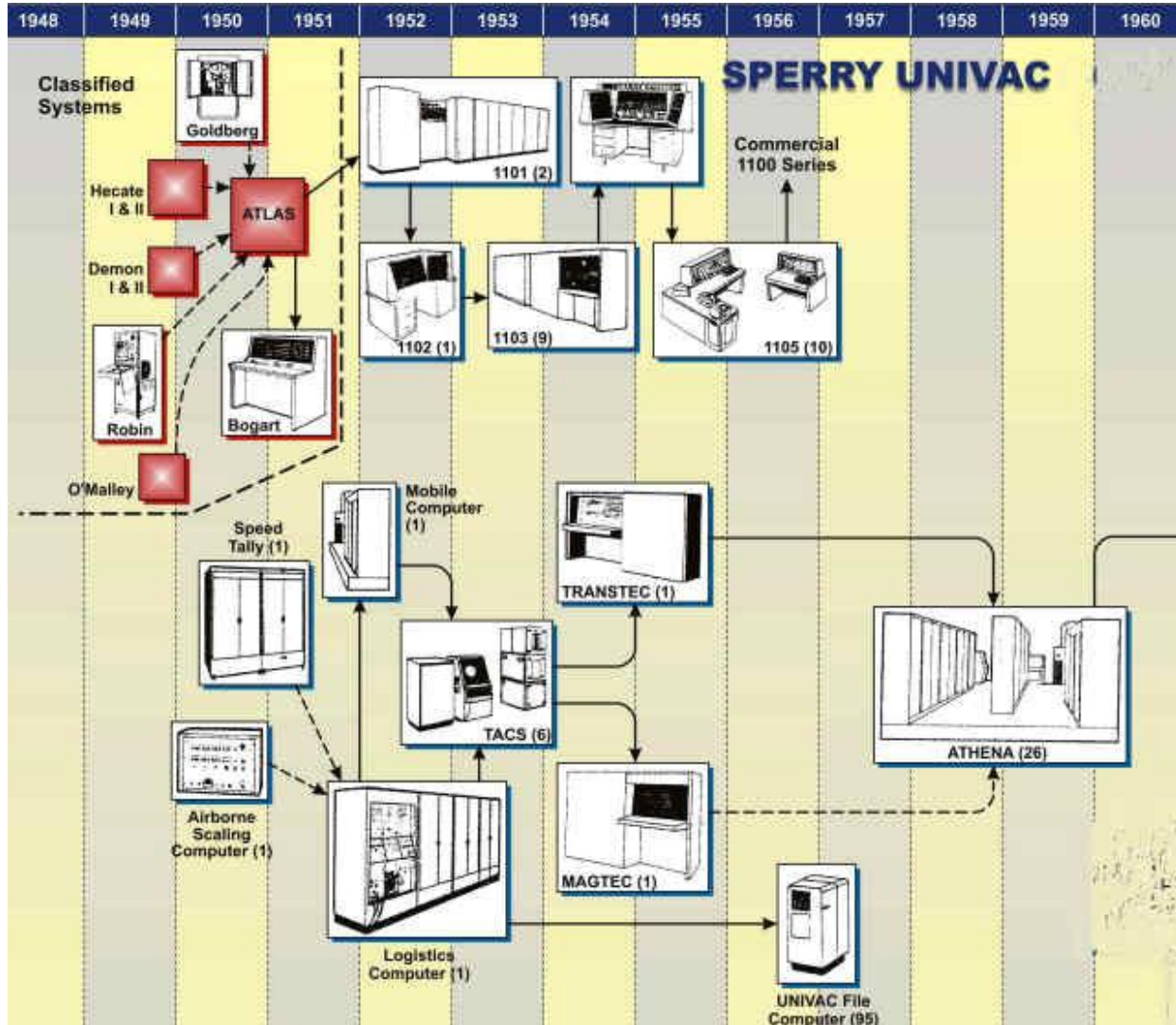
From 1972 to 1976 I was assigned as Manager of a research group. One of the things we worked on was optical character recognition, a technology that is used to day in almost all retail stores used for scanning at the checkout counter. We also worked on digitization of x-ray images, used now in hospitals.

In 1976, I retired from Univac after 30 years in a company that I doubted I would stay with for more than a year or two when I joined it in 1946!! My parting gift was a desk set with a Speed Tally vacuum tube, an Athena module, and a Nike-X project sticker – it is now at the Lawshe Museum in S. St. Paul. *It was a great time for 30 years!!*

I should tell you about my family. Some of you know my wife Charleen. She grew up on a farm in northwestern Minnesota near the town of Hawley. She graduated from Concordia College in Moorhead, MN, had a short career of teaching and then came to St. Paul to do office work. I met her in 1951 on a blind date. We courted and were married in 1952 (we celebrated our 60th anniversary in June, 2012). We had five children; three girls and two boys, one of our sons is deceased. None of the children followed their father's career into engineering, but in a way they did. The girls all chose engineers as spouses! We have six grandchildren and three great grandchildren.

Established in 1980

Editor's notes: An excerpt from the Sperry UNIVAC computers genealogy chart shows the Goldberg computer (top left), Speed Tally (left center), Logistics Computer, UNIVAC File Computer, and the Athena (right center) – all of which Don had worked with or designed.

Don has contributed to our VIP Club IT Legacy anthology - see pages 15, 37, and 45 of our web site, http://vipclubmn.org. He is also a regular participant at the monthly first Friday lunches – called "The Original Geek Squad" in 2005 by the Minnesota Monthly writer, James Lenfestey - http://vipclubmn.org/Articles/AGaggleOfGeeks.pdf.

I am privileged to know Don Weidenbach, indeed an Information Technology pioneer and part of the 'Greatest Generation' of Americans.

Lowell A. Benson – UNIVAC 1960 => UNISYS 1994 – BEE, U of MN 1966