

# Computer Aided Design Personified!

Earl Vraa Sperry/UNIVAC/Unisys Career Summary, 1961 to 1991

## INTRODUCTION

In 2019/20 The Minnesota Historical Society conducted oral interviews of numerous computer industry individuals with no end purpose other than to save history. The project’s intent was to transcribe the interviews and save for researchers. Keith Myhre had provided a list of Sperry/Unisys candidates including Mr. Vraa. Unfortunately, the interviewer, Ryan Borland, left on maternity leave then COVID stalled the project. Below is Earl’s transcription with personal data edited out by Earl and Keith; sequencing adjusted by former co-worker Jim Andrews; then formatted for the web by Lowell Benson.

### Contents

INTRODUCTION.....1	1970: DoD Requirements .....8
BACKGROUND.....1	1971: Microfilm Document Use .....9
EMPLOYEE #14866 STORY .....2	1972: Bldg. 6 Challenge .....9
Mid July 1961 .....2	About 1973: Long Island Adventure..10
1962: Classified Program(s) .....4	1975: Another Classified ‘Job’ .....10
1964: An Automation Conference .....5	1979: Here Came VHSIC: .....11
1966: Interactive Displays .....6	1983: Sperry Semiconductor Spin-off12
1968: Promoted to Manager.....6	1984 – 1987: Time Marched On .....13
1969: Reorganized.....7	1988: Marketing Assignment.....13
1969: 1108 Computer Use .....7	1991: I Put in My Time and Resigned14
	EPILOGUE .....14

Edited with Microsoft Word.

## BACKGROUND

**1961:** I graduated from Northrop University in 1960 with a **BS in Aeronautical Engineering**. I also was a licensed Airframe and Power Plant mechanic with an A&P license. In addition, I had a private pilot’s license with over two hundred hours of flying time with some “hood” time. My intention was to either get a job with one of the airlines as a flight engineer as my vision was not 20/20 and that was a commercial pilot’s requirement at the time. Flight Engineers could wear glasses.

I begin to look to my future. The Space Program was gaining momentum and I was working at AirResearch on the environmental system of the Mercury Program that Alan Shepard piloted. That gave me some insight into the system requirements. Computers appeared to be an interesting area to investigate as computers were influential in the success of the programs. I wanted some computer experience for the space program. My thought was that a few years of experience with computer applications would enhance my resume. This led me to interviewing “space related” companies and somehow Remington Rand Univac (RRU) popped up.

I sent a resume to RRU and was invited for an interview; “if I could get there on my own buck”! Was RRU really interested in a graduate with an Aeronautical Engineering degree? “What would we do with him?” My thought was, did I want to go from LA to MSP as new graduate with a wife and two boys; with a chance there might be employment? Lois (aka Louie) my wife voted for Los Angeles!

I don’t remember who I interviewed at Remington Rand, but it was for a support position “on an Island out in the Pacific”! The entire family would go, and my wife would be “probably taking care of other engineers’ children as she was not a professional. Also, we would be flown out for a vacation every six months, most likely Hawaii. I deduced later that it was Johnston Atoll, a barren island of about one square mile area without any trees located about 800 miles WSW of Hawaii.

THEN WE WAITED FOR AN OFFER FROM REMINGTON RAND! AND WAITED! I finally called back after about a month and found that “they had mis-placed my paperwork! That didn’t sit well with Louie. Words to the effect, “They are going to put us out on some God-forsaken Island in the Pacific and forget us”! Luckily, the delay had resulted in the “God-forsaken Island” position being filled by another lucky soul! But I was told that there was an opening for a programmer! I had no idea what programming was, but I was willing to learn! Throw me in that briar patch!

After I received the offer of a programming position with Remington Rand Univac (RRU), we took a short vacation with our parents in NW Minnesota. Arriving at Minneapolis, we rented a two-bedroom walkout apartment in St. Anthony that was convenient to RRU.

## EMPLOYEE #14866 STORY

Mid July 1961

I probably had orientation but after sixty plus years, it has faded from my memory. I do recall Plant #2; 1902 Minnehaha Avenue W., where I was introduced to “computer programming”. I had absolutely no idea of what I was getting into; I was familiar with a slide rule from college that was our calculator. Mine still resides on one of my bookshelves in its original leather case! I was assigned to the Computer Aided Design (CAD) department that is sometimes referred to as “Automated Design” or “Design Automation;” it was all the same.

I digress often!! Computer Aided Design was not new; some of the original employees thought that the technology had promise and some of the big players such as Seymour Cray and Robert Kirsch did some of the original work back in the mid ‘50s. I don’t mean to discredit the work of any of the people dedicated to the development before I arrived in 1961; they were the forward-looking thinkers. The CAD technology advanced by some of those that I know and who are too numerous to mention. We can’t exclude those like the engineers who would say, “Can’t we do “X””? Marketing folks who said, “We have to get the cost down to sell it,” the Manufacturing types that said, “We need to simplify the design.” There were “drivers of CAD” from all directions. THAT WAS GOOD!

Some papers written describe the development and status of CAD were written by Seymour Cray, Robert Kirsch, Curt Bute, Jerry Neese, Jerry Pertl, Burt Horstad, Wayne Leverkus, Jim Andrews, Jay Myers, Bill Swenson, Keith Behnke, and a multitude of others. Forgive me if I missed someone that I surely did!

There were also some “management types” that also made CAD successful; namely Robert “Bob” Erickson, Paul Welshinger, et al.

How did CAD work or what was the basis for it? CAD, I’m talking about the 1950 to 1990 timeframe. There were changes made after that which are not relevant to this discussion. It begins with the designers writing Boolean Equations that describe the electronic design and that are augmented with component and physical characteristics of the design. I know that I’m glossing over it but you get the idea. I, personally, did not know the function of some of the first programs; there was a “need to know”! But that changed as I was to find out over a decade as “I really got involved”! CAD evolved from the Boolean logic equations to logic simulation, logic diagrams, wiring tabs for the wire wrap machines, automated routing of PC boards, etc. Over a period, it evolved to include test and eventually hardware description language in the later years.

Jerry Neese was the Department Manager reporting to Curt Bute. Jerry’s responsibility was to “develop a full range of design automation software and processes” with a staff of about twenty-five. The professionals were college graduates with a mix of degrees that included electrical engineering, mathematics, etc. and a “lone aeronautical engineer.”

Who were these guys that I was going to work with? They couldn’t count over “8”! I was introduced to a new version of math; “octal”, and I won’t even try to describe it as it is not important after sixty years, this being 2023. Besides me, there were several other new employees that needed “programming education.” Our instructor was Milton Montgomery who was a patient and knowledgeable person. If the other employees in the class were as “unknowledgeable” as me, he had his work cut out for himself! He taught us the repertoire of instructions for the 1103A computer that was dedicated to CAD program development. He also taught us the process of “flow-charting” a program. Jeez, I don’t want to get into that detail! Let’s just say that it is a “step by step” process to generate a “bubble” of each computer instruction to complete a task. Flow-charts were drawn on “D-size” paper and could/always involve numerous pages. Each of the “symbols” were then converted to a thirty-six-bit machine code instruction. Confused? You outta try to explain it!! There are program compilers now, so machine coding is generally “a lost art”!

After one had coded the instructions, it was sent to a key-punch operator who punched a card for each instruction. I won’t even go into what could go wrong in the process. Let’s say no one is perfect and that includes the keypunch operators so there was always some errors and those cards had to be replaced. I do remember that the 1103A computer was limited in memory and I had to swap segments of the program “in and out of mass storage” to complete the run. My first program ran to completion in microseconds without error! OOPS!

There were two instructions; “37” that was a “return jump” and a “45” that was “selective jump”. To put it simply, I used a “45” where it should have been “37” and the program went to “End” in microseconds! The 1103A that we were using had only 4,096 words of magnetic core memory and my program was over 10,000 words. That made it necessary for me to swap part of my program in and out of storage. UFFDA like us Norwegians say!

After we completed our programming and flowcharting classes, I found that I was going to work on a Department of Defense classified program and it would require that I have a polygraph. Jeez, RRU unknowingly hired a “reformed thief”! Let me tell you the story!

Lesson learned! I was probably about ten or so. One fall, Dad and I walked over to Edwin and Otto Sigerud’s farm across the road from our farm in (*Nord Vest Minnesota*). Dad and the Sigerud brothers were visiting, and I wandered out in the woods (windbreak) on the west side of the building site. There I found a wild plum tree just loaded with ripe plums, so I proceeded to fill my cap with plums. It was wrong to take them, so I left my cap with the plums along the driveway and walked back to where Dad and the Sigerud brothers were talking. Dad and I left, when we got to where my cap was, and I picked it up. Dad asked me where I got the plums, I told him, and he told me that I was stealing! He marched me back into the yard and made me tell Otto and Edwin what I had done. They told me that it was OK and to keep the plums. Dad deferred and said it was stealing so I left the plums with them and went home with “my tail between my legs”! Now, about twenty-five years later, I’m going to take my first polygraph test for my security clearance. I was “strapped with the usual sensors and the operator started out with a few nebulous questions such as my wife’s name, where I went to school, and then he asked, “Have you ever stolen anything?” The “pens went wild”! I had them stop the test and I told them my “stolen plum” story which got a hearty laugh. Every time after that when I was to take a polygraph, I told the story before we even began the test. I always got a chuckle out of the operators who were probably thinking, “We really have a simpleton here.”

#### 1962: Classified Program(s)

Now I was introduced to Plant #2, Bldg. #6 that had no windows and a high fence. I was kinda kept in the dark as we were working designing and assembling computers for NSA (National Security Agency). Security was TIGHT! After sixty<sup>+</sup> years I can relate those names of the computers “which will mean absolutely nothing to you. The classified names of the computers were Blueplate I, Blueplate II, Thornhill, Blondell, Belter, and Seacrest. These were “BIG and high powered” computers.

Note: John Alton has written a great summary of this class of computers. Reference Legacy chapter <https://www.vipclubmn.org/cpothers.html#byAlton>.

The people that I remember that had access to the facility were John Alton, Carl Glewwe, Joe Kimlinger, “Lee” Granberg, Stan Dunwidde, Wayne Olson, Wally Eidahl, Tom Sollar, Ed Nelson, and a number whom I can’t remember. A great bunch of guys that I worked with “off and on” until I retired.

My first CAD programming task was that of automating the generation of D-size logic diagrams. The numerical-controlled device was the Cal-Comp 35 drum plotter that was only twelve inches wide. I had to split a “D” size drawing into three “strips” and then tape them together, “this was really “proof of concept.” The major problem that I had programming was to position the “symbols” so that they didn’t get placed on the “splice line.” UFFDA again like us Norwegians say!

Once we had “proof of concept,” a larger Cal-Comp plotter; thirty-six inches wide was purchased. My memory seems to recall that it still took 45 minutes for each logic diagram, but they met military specifications (MilSpec) for delivery to the customer.

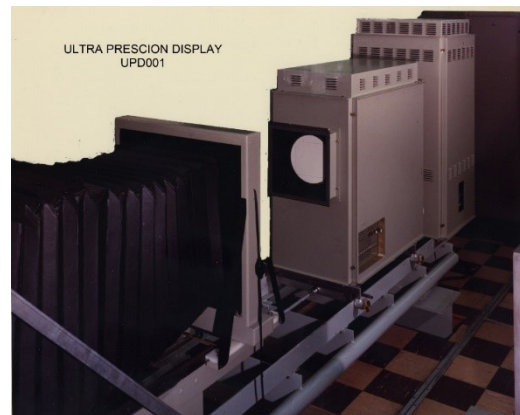
The designs were forcing automated design technology. A number of applications were developed for the various customer projects. These were loading and verifying logic equations, logic simulation, logic diagram placement and routing, logic diagram generation, automated circuit placement, PCB routing, wire tabs for numerical control of wire wrapping back panels,

#### [1964: An Automation Conference](#)

I was fortunate in 1964 to be sent to a Design Automation conference in New Orleans where I met a fellow design automation programmer from IBM. We talked about the logic design generation challenge “over some libation.” “Wouldn’t it be great if we could generate the diagrams on a Cathode Ray Tube (CRT) and then take a picture”? I came back home and talked to Leland (Lee) Granberg about it. “Let’s see what we can do,” said Lee!!! Like many engineers, he was “thinking out of the box”!

This resulted in the development of the **Autogram**, a table-top box of electronics and a cathode ray tube with a camera mounted in front of it. The fine ground phosphor was necessary to provide the goal of 3,200 line/pair per inch resolution on the screen. That was required to generate a “D” size diagram in a one-inch-wide area on the CRT. I seem to remember that it cost over \$2,400 for the cathode ray tube itself (1964 dollars). Then there were the optics that was what one would call “custom.” It had a Zeiss lens mounted on a Bell & Howell 35mm camera frame.

The development of automatic PCB routing led to Lee Granberg, et al, designing and fabricating a “large scale” AUTOGRAM type that could generate printed circuit board (PCB) artwork quickly. This one was called the UPD001 or “Ultra Precision Display 001”. The UPD001 was unique to program. I seem to remember that the image on the CRT was about four inches in the vertical direction and three inches in the horizontal direction. I’m not going to get into mathematics (because I don’t remember the details of it after sixty years); AND IT’S NOT DEMENTIA.





I don't believe we calculated the "beam deflection" correction in the program, not enough computation capability at that time. I think someone had calculated and provided a table for the "beam correction" as the beam moved from "dead center." This way we could maintain the straight lines required for the PCB masks. Technically, as a light beam moves away from the center of a flat surface, the hypotenuse of a triangle increases as does the opposite side of the triangle. The "opposite side of the triangle" must be modified to maintain a straight line required for the PCB masks. It was first used for one of the "classified projects" that had about a 12" x 15" PCB panel.

### 1966: Interactive Displays

As interactive display technology emerged, we did some design automation feasibility analysis on the Univac 1557/1558 developed by Sperry Roseville. We were looking for an interactive logic design capability, but it was deemed inadequate (and too expensive) for our applications. I remember one Sunday when Tom Robinson and I were up at Roseville doing some programming on this display and I sensed someone behind me. It was Jerry Probst, General Manager of Univac at the time. He told me not to stop what I was doing, he was just "passing through"!

I didn't follow this development as I was "off to conquer new worlds" and I don't know if some of this technology went into the Airborne or Shipboard programs. Whatever; everyone was as busy as a proverbial "Cat on a tin roof with diarrhea digging holes"! Only, we were making progress and the cat wasn't!

CAD moved out of the "black" and was to be applied to support the design process of military computers. Increasing computational capability was a requirement and much time was spent re-writing programs for "new and faster computers." We went through a series of computers; the 1206, AN/USQ-17, CP-667, and the 1108.

### 1968: Promoted to Manager

Sometime in the 1960s, the decision to develop, manufacture, and market "desktop" displays in Salt Lake City. I seem to have had "fleeting" acquaintance with programming a U-300 if my memory hasn't failed me completely. It was probably about 1968 that "Red" Phillips who was Director of Engineering called Tom Robinson and me to his office in Plant #4. He told us that Jerry Neese, then manager of Automated Design, was going to the SLC facility. Red said that he needed someone to replace Jerry and he was to send one of us to SLC to integrate CAD into SLC engineering and manufacturing processes. The other was to take Jerry's position. It was up to us two would take each position. We walked out of Red's office and Tom vehemently said, "I'm going to Salt Lake City!" That left me with the CAD Department.

*Note: About then, Don Edam was running SLC, he had transferred there from St. Paul.*

### 1969: Reorganized

In the reorganization (shuffle) of about 1969, Bob Erickson replaced Red Phillips as Director of Engineering. I don't remember for sure but those reporting to Bob were myself: Computed Aided Design; Phil Schwartz, Software/Firmware Development; Don Vizanko, Reliability and Support Engineering; Don Mager: Computer Development; and Hy Osofsky; Subsystem Development.

Bob Erickson and Paul Welshinger were instrumental in the integration of CAD and "documentation." Paul Welshinger had the Drafting & Design, Installation Design, Continuation Engineering, Environmental Test Lab, Mechanical Lab, Chemical Lab, Component Engineering and maybe Reliability Engineering organizations. They were always one step ahead of me!

We did face one problem that was uncovered. Some of the Design Drafting employees feared that CAD would take their job, so we were being sabotaged! Once the implications were explained, the employees found that there were new opportunities in the CAD process and became supporters.

### 1969: 1108 Computer Use

In the 1969 timeframe, CAD went big time and used a UNIVAC 1108 for software development. (This move turned out to be a significant benefit for all CAD applications. With each improvement to the 1108 system, more and more capability was available to the CAD programs.) Unfortunately, the Univac 1108 was shared with the Controller Department. It was "Al Wald's plaything, da Controller"! "Finance" had priority "and "Engineering be damned." At least that's how I felt about the situation. Later, I was reporting to Bob Erickson and Bob said that Engineering needed their own 1108. One noon, Bob, Harry Schramel and I did some "brainstorming;" where else, Eddie Webster's, and because of lack of paper we used the back of an Eddie Webster menu! It became the basis of a presentation to Al Wald. One of the shortest presentations in history;" it was just after the new year, and I mistakenly used "the previous year" as the date! That's as far as I got; Al "threw a fit" saying words to the effect of "How in da 'ell should I believe anything in your presentation if you can't even get the date right? GET OUT!" Like I said, it was brief!

*NOTE: The MENU is now "framed" and displayed at the Lawshe Memorial Museum in South St. Paul.*

That same year I tasked Jim Andrews to interface the Autogram with the Logic Diagram System. Assisted by Electronic Technician Bob Helmueller they were able to get the Autogram operational. Bob tweaked the hardware and handled the photography while Jim wrote the software and procedures.

I'll digress again for a moment. A few years later, the Roseville Univac 1110 development project was having documentation problems. The project had about 2,200 logic diagrams for the design, and they were challenged with rapidly making changes and keeping the design

current. Jim Andrews was given the task of supporting the program. He interfaced their Logic Diagram System with the AUTOGRAM and programmed a Univac 1004 with a magnetic tape unit to drive it. He would receive a file magnetic tape daily and then generate and print the logic diagrams on the AUTOGRAM overnight. He must have “saved their bacon” because they gave him a \$286,000 Cost Savings award. This was an example of the initiative of a Defense Systems employee. *Note: (Autogram story at <https://www.vipclubmn.org/Articles/AutogramSystem.pdf>*



### 1970: DoD Requirements

Another problem that we had was that DoD required “Class A” logic diagrams documentation. The Cal-Comp plotter could provide that, but it was SLOW. And, the AUTOGRAM did not meet the DoD requirements. The AUTOGRAM was “quick and dirty” thus a replacement was sought. A study identified a possible replacement and that was the Xynetics 1000. Bob Erickson sent me to Loveland, Colorado to check out the company and product. It looked good and I recommended that it be purchased, and it was delivered.

**\$70,000 (about 1968 dollars) and it didn't work!** The Xynetics 1000 design had a grid table with an electro-magnetic two-axis stepper motor that moved the pen around the platen generating the drawing. The problem was that the electro-magnetic motor mass was too much for the moving rate (40 inches per second) and it drifted out of tolerance with each change in



direction. The cause was the thickness of the sheet of mylar interfered with the signal between the motor and the platen. Mylar was required for all Class A drawings. Xynetics went back to “the drawing board” and their new design had two surfaces; the top surface was the platen on which the motor moved, and the mylar was placed on the lower surface. Xynetics delivered the Xynetics 1100 plotter that was used for many years. The per drawing time went down to about ten minutes for a D-size drawing and was Mil-Spec. (I have one picture). The Xynetics 1100 Plotter worked so well that another unit was later purchased as production increased. They were still in operation in 2000. “Vraa survived another miscalculation!”



## 1971: Microfilm Document Use

Also, somewhere in this time, the Computer Output Microfilm (COM) was designed and built as a step up from the AUTOGRAM and it was capable of producing final documentation. We thought that it had commercial application and I “pitched” it to Commercial Management (Roseville) but it went nowhere; other than Cal-Comp came out later with what looked like a “Chinese copy.” Who left the company in that timeframe? The COM was developed in the 1973 timeframe and in 1975, the CAMIDS (Computer Aided Microfilm Documentation System) was developed. An automated documentation system using the 1616 computer and the COM as the output device. Jay Myers, Don Wheatcraft, and Al Davis were key in that system development.



There was a lot of consolidation of the applications that used the design master file of equations. during the early 1970's. One of the first was automated test that John Travalent managed and was merged into CAD. And about the same time here came Maintenance & Test with Keith Oliver; “da leader of da band;” aka “Manager.”

Sometime in here, the Defense Computer System with Leon Morrison as manager, was also folded into CAD or whatever it was called at the time. I sometimes thought, “Wait for me, I’m your leader”! There were some great people in “our organization”!!! “Hire “or inherit” good people to be successful!!!

## 1972: Bldg. 6 Challenge

And one day someone that sure looked like “Bob Erickson”, walked into my office, and said “Vraa, you are the only CAD guy left with a “x” Clearance. The “customer” from one of the “earlier classified programs” had a PCB, (printed circuit board) “short out and it was a mite unusable.” An understatement! It looked like someone had shot it up close with a 12-gauge



shotgun. That “high amperage” (2,000 amps) did at job on it! I was “relocated alone” back to Plant 2, Bldg. 6 in isolation with a set of magnetic tapes from the customer to reproduce the

artwork for the damaged board. That was nearly enough to drive one to imbibe. I remember one especially challenging program, the program had virtually no documentation. Stan Halper, “I haven’t forgotten”!!!! The result was that the artwork was generated after taking me about six weeks in isolation. I was the only one in the building except a guard that would come by occasionally to see if I hadn’t slit my wrists! I later heard that Plant 8 had never been so peaceful!

### About 1973: Long Island Adventure

I was a regular for some time traveling to Sperry Long Island. Late one afternoon I headed out again. After leaving home, Louie found my billfold on the dresser; she thought to herself, “Oh, he’ll be back.” She waited and waited and no Earl. I got to the airport where my ticket was waiting and boarded the plane; this was before the strict requirements now. I got on the plane and ordered a beer; came to pay for it and “No Money.” The stewardess laughed and said, “We’ll get you next time,” and I got a free beer or two. No phone, No ID, No money! This was during the “dark” evening, and it wouldn’t do any good to call Long Island. I got on the rental car van; I was the only passenger. I got to the rental car counter and there was only one lady there whom I had seen on previous trips. I explained my predicament - she let me have a car; NO ID, NO \$\$\$s. She said she didn’t know why she was doing it; she could lose her job. Her parting words were, “Please drive carefully!” Could it have been my good looks and personality that got me the car? 😊

I had the same challenge when I got to the motel, but I knew the clerk and he let me stay. The next day, Long Island Finance cut some cash and I was good to go! I made a few other trips and saw the car rental lady and we had a few laughs about it.

Those “Long Island Cats” were a different breed! One of my guys was with me out there one time at their request to propose some CAD work for them. Things didn’t go “good” and I said something to the effect, “I don’t need this s\*^t” and told my guy, “Let’s go.” He rebutted me and was told “we can’t do that.” I said, “Hell we can’t” and we headed back to MSP. My guy wondered how we were going to explain this fiasco. Long story “short;” there was a contract on the order of \$100,000 when we got back! Some of those dudes were a different breed and thought that anyone west of the Hudson River were “Hicks.” Alternatively, some were great engineers and managers.

### 1975: Another Classified ‘Job’

In the midst of 1975, came “Maroon Shield” (aka “Draw String”) a proposal for a surveillance system in Northern Turkey. TRW was the prime with DSD, Motorola, and EG&G. The team worked at the TRW “secure facility” in San Jose, California. The DSD guys with me were Jim Blumke, Pat Houlihan, Bob Shogren, Don Stang, and Lauren Cady. One Saturday that were working I was near the entrance when there was a knock on the door. This guy tried to come in. I told him that this was a classified area, and I didn’t know him and shut the door on him. I went to the back and said, “Anyone know a guy by the name of (can’t remember it).

One of the TRW guys said, “Vraa, I think you want to meet him, he’s the TRW vice-president in charge of this program?” He was let in and then he told me, “You did the right thing. If you had let me in, you would be on your way back to St. Paul.”

Maroon Shield finally ended; I took my last trip out there in November.

1979: [Here Came VHSIC:](#)

Time marched on and one day, probably about 1979, I was called by my boss, Robert A (Bob) Erickson, to give a presentation to some program management types from TRW and Motorola. I didn’t know “wat da ‘ell” Bob had cooked up this time. He was a great guy to work for, but he kept me on my toes “or off-balance”! TRW and Motorola were headed for CDC to review their CAD management to team for the Very High-Speed Integrated Circuit (VHSIC) program. Somehow, Bob contacted them and convinced them to come to Sperry DSD instead. I “pitched” them, and they never went to CDC. I was not privy to the meeting held after my presentation, but Bob walked into my office after the meeting and said, “Good job, Vraa. You are now the VHSIC Program Director.” Oh no, here we go again! Throw me into the briar patch and see if can could find my way out! It was like my entrance into “computer programming,” I had no idea “wad da ‘ell” VHSIC was or hoped to accomplish.

The DOD goal was to design and fabricate integrated circuitry to reduce size by a factor of ten, cut power demands by up to eighty percent. This would increase capability, ease of repair and replacement and interoperability by huge margins. The application of this technology was for defense electronics, but the spinoffs were many and varied.

Now, it has gotten interesting; really very interesting! I had accumulated these departments through the efforts of the Erickson/Welshinger team. They were all managed by some good and knowledgeable people and there I was the VHSIC Program Director. It crossed my mind that “I shouda slit my wrists” when Bob isolated me over in Plant 2, Bldg. 6 for six weeks! ‘ell, I da missed all the fun on the VHSIC Program. It was a blur! Get to know the other team members, understand the VHSIC goals, who was the competition, carve out a part of the contract proposals; aw, anyone reading this “has been through the mill” and had similar experiences. We had an initial proposal DOD awarded just to get a feel for the teams and how they would perform on VHSIC. The TRW/Motorola/Univac team won that one. It was followed by others that was more functional or application oriented.

VHSIC was an interesting and demanding program with some interesting applications and people. We made presentations at such places as Wright-Patterson, NOSC, Redstone, Fort Meade, Boeing, NADC, etc. To keep busy, there was always another DoD proposal “in the mill.”

One of the more interesting programs we worked out of Wright Patterson Air Development Center (WPADC) was a program called Information Warfare (INFOWAR). The program was the brain-child of a Sperry employee named Robert (Bob) Huber. The program was “to embed” a virus in a VHSIC module.

About “thirty years later” I happened to see an article about the “Iraq Air Defense System” in the Gulf War. The story was that DOD implemented a “printer system.” The system was “given” to the Brits who had a relationship with the French. The French were known to and were actively providing military electronic systems to the Iraqis. The Brits sold the “system” to the French knowing that the French would give/sell it to the Iraqis. Whatever, it implied that the “system” aided in turning down/off the Iraqi Air Defense System at the beginning of Desert Storm. Who knows? But it is interesting. Was this some of the work we did?

### **1981: Now a Director**

I was the VHSIC Program Director and still had the CAD and other departments. Bob called me in one day and said “he had a deal” for me! Heard that one before! He told me that I needed to focus either on the CAD, et al or the VHSIC program but it was too much to do both. Here’s the deal: “You make the decision; you can do either!” Then came the “BUT”! If you take VHSIC, you probably need a staff of five or six “and you have to recruit them yourself”! Is it going to be “warm and fuzzy” or “that’s really a challenge”? I thought, “What da ‘ell do I have to lose” and took the VHSIC position.

I pondered for a short time and went out to recruit my staff. My staff was outstanding: Ken Thurber, Computer Architecture; Ken Pearson, Materials; Dick Petschauer, Technology; Noel Schmidt, Systems; and Dr. John Esch, Software Languages.

VHSIC was the beginning of CAD expanding into integrated circuit support. The beginnings of the Hardware Design Language (HDL) in DSD. John Travalent, Dr. John Esch, and Larry Anderson were instrumental in its development. It was also not only our entry into this game through the efforts of John Travalent, Dr/ John Esch, and others that we expanded our presence with some computer architecture concepts (binary tree maintenance bus ??). Building on our internal CAD work in automated layout, test, and simulation and with the advent of the Ada programming language, ideas, and prototypes for VHSIC CAD kept popping out; mixed level simulators (MIXSIM), automated layout for irregular sized objects (SLATE), and a Hierarchical System Language (HSL) based on Ada concepts to describe both the structure and behavior of hardware. DoD became so enamored with HSL that they established a VHSIC Phase 3 contract for development of an HDL. We were involved with some of the initial development but eventually, due in part I believe to internal politics, full scale development went to a competitor.

### **1983: Sperry Semiconductor Spin-off**

Somewhere in this timeframe, was the Sperry Semiconductor spin off. The plan was to provide a separate semiconductor facility for Sperry. Bob Erickson was the new VP of Sperry Semiconductor Division, and he took a few employees with him; namely Ralph Kerler and Dave Kirkwood.

This left the VP Product Engineering position vacant; Clyde Allen was promoted to the position of VP Product Engineering. Those reporting to him were Earl Vraa, VHSIC Development; Phil Schwartz, Software/Firmware Development; Don Vizanko, Reliability and Support Engineering; Don Mager, Computer Development; and Hy Osofsky, Subsystem Development.

#### 1984 – 1987: Time Marched On

We continued to perform the various aspects of VHSIC with presentations and meetings with the various DoD Research and Development Labs, Functional Operational Military Units (they had heard of VHSIC and wanted to understand the implications), etc. It seems we always had our bag packed for a new destination; from Europe to the Far East and “in-between”.

#### 1988: Marketing Assignment

I received a call from Clyde Allen, my boss, he asked me if I had time to come over to his office which was very close to mine. We were up on “Mahogany Row;” not me, I was just next door! There I was greeted with basically, “Your services are no longer required”! I was relieved of my position! Ah, so, it’s been a good run!

As I walked into my office, the phone was ringing. It was John Kolling, VP of Advanced Systems Marketing. He asked how things were going and started to laugh before I had a chance to answer. He asked if I could come over to his office. There he offered me a position in his organization. The position was for “the acquisition of contracts that did not result in a *Univac product in less than five years*” i.e., these would be requirement study contracts and can sometimes end up in a proof-of-concept brass-board. It takes good customer relations.

So, I was out of the job for five minutes! But it was not a bed of roses! I was reporting to one of the “Marketing Directors” that didn’t last too long. Some funny things were happening, and I didn’t feel comfortable! I couldn’t put my finger on it. I guess I had stepped on some toes; “I played in someone else’s sandbox!” We didn’t see “eye to eye” and I had six weeks’ vacation accumulated so I told him that I was going on vacation for six weeks. He didn’t like that! Louie and I flew into Frankfurt, Germany with no plans for the next six weeks other than we were flying out again in six weeks. We rented a car and hit most of the European and Scandinavian countries before our return home.

Surprise! When I arrived at work, I found that I was transferred to Marketing Support! I didn’t ask if it was my taking the vacation or the comment that I made one time in WDC. We are both on the same flight one time after a meeting in our WDC sales office. He was putting his coat up above in the overhead bin. It kept sliding out and I said, “Looks like it’s about as slippery as its owner!” Probably not good; politically!

Marketing Support was really “market research.” Reading various news periodicals and providing presentations to Marketing personnel. The late 1980’s was a time of reduced or limited DOD budgets.



Sperry was in the “computer system business” and with reduced or limited “platform” (aircraft, ships, vehicles, etc.). Some of the marketing types were in a “woe is me” state. I remember specifically one day; I told them they had opportunities now. DOD wasn’t “buying iron” (ships, aircraft, mobile units, etc.) but they would be buying “electronics;” expand the systems integration business that Sperry was already in via some of the shipboard and avionics business. They had opportunities!

I’m still at Sperry, now Unisys (a merger of Sperry and Burroughs) has been going on for 27 years. After Engineering, I did a stint in Program Management, then time in Marketing and then moved to Quality Management. Must be time for another change!

Burroughs {Mike Blumenthal} had acquired Sperry in a hostile takeover and had to shed a number of Sperry Divisions. Things were never the same after that.

### 1991: I Put in My Time and Resigned

One of the primary reasons that I remained with Sperry was that I was given challenging tasks and the opportunity to investigate and try new technology. Shortly after I started at Remington Rand, back in 1961, I received an offer from US Rubber (now Uniroyal) for a position as engineer/company pilot. Jeez, it was tempting but I was intrigued with the challenge where I was. I was “always on the fringe of flying.” I never did continue flying after my RRU employment because I made the decision that I would need my “instrument rating” and must stay proficient on the rating. It was just too much dedication and time what with my RRU employment. I enjoyed my work in the classified area because the customer was amenable to and funded the application of computers i.e., design automation to solve his problem more effectively. Design automation was at the time an emerging technology, science, art, or what have you; maybe throw in a bit of “black magic” and luck!

## EPILOGUE

It was a great run for 30 years and I appreciate all the people “well most”, that I worked for and with; but most of all those that supported “the lone Aeronautical Engineer” for all those three decades!

I am now enjoying working with the Legacy Committee – shown here is Keith Myhre and me while we were re-setting the exhibits at the Lawshe Memorial Museum in January 2023.

