

# Afterword

--Jeff Thomas



John Minck asked me how I was able to get all this sculpture work done while working at HP/Agilent/Keysight. I didn't sleep much. Work by day and sculpt by night and weekends. A weekday schedule would be to come home about 6:00, do chores and have family time until evening, then sculpt until about 1 a. m. To unwind, I would put on Koss headphones and listen to LP rock or classical music for the better part of an hour, then go to bed.

As the years have passed, I have taken on fewer sculpture commissions. Also, my desire to create works for my own pleasure has also diminished as I grow older. But I haven't quit designing. I was in the process of having mobile designs cut out of stainless steel when COVID hit. I intended to have a local shop with a computer-controlled water stream cutter precision-cut pieces, which I would assemble. I just have to get off my butt and do it

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The following is a look at my 38 years at HP/Agilent/Keysight. Over these years I've had many diverse jobs, made possible by to the HP-way philosophy; letting people find a niche when their current responsibilities no longer suit them or they find themselves frustrated at what they are doing. I went for product design in the lab (Bill Hanish) to environmental test (Jerry Chamberlain), to quality assurance (Dixon Browder), to component advertising (Dean Abramson), to product marketing (George Bodway), to signal analysis product marketing (Larry Rayher, et al) where I found a comfortable and productive home. Here's the story::

When I joined Hewlett-Packard, my employee number was a mere 5841

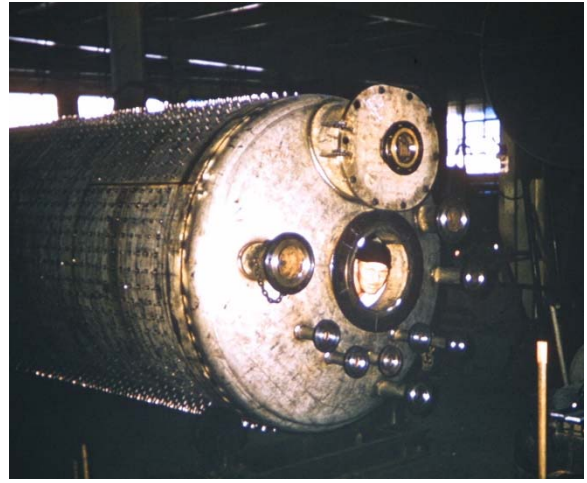
Such a low employee number. In the Palo Alto headquarters, where I started in 1964, they recycled employee numbers from people who had left the company.

I felt privileged to be there. My journey started in Los Angeles suburb of Downey, California, where I graduated from high school in 1958 at 17 years old. I always fooling around with mechanical things and admired people who could fix things. Early on, so my parents told me, I was mechanically inclined. They said it was not uncommon for me to remove the screws from kitchen cupboard cabinets near the floor when I was 5 years old.

My father was a powerful influence. He had been a metal worker in the sheet metal worker's union, and once had a job at the Griffith Planetarium in the '30s helping to install the copper roof on the main dome. (He said he could see Catalina Island almost every day from there.) At home he was a superb handyman, building whimsical Christmas lawn decorations and home improvements. Here are two: the hula-hoop Santa and the whisky-barrel BBQ. Of course, the tools he used for these projects were not at home, but at the shop. He and his partner made high-quality steel products for food processing, heavy industry, and aerospace items, such as the stainless-steel pipes carrying liquefied gases. The company also made the nose cone for the rocket still standing in Disneyland's Tomorrow Land.



I worked at the shop in the summers as a boilermaker's helper. I got the dirty jobs, like holding an iron block against the inside wall of a large food processing tank while the welded seam is being flattened on the outside with a sledgehammer.



I attended BYU in their five-year Electrical Engineering course in 1964. The program had a good reputation and was also located close to Dad's family in Provo. Being a solid B student, I spent six years getting my BSEE, adding a few graduate courses along the way. Part of the latter-day curriculum in the EE department was a bus tour of electrical engineering companies in the West. We toured hydroelectric facilities, defense industries, and electronic instrument companies. When we finished the tour most of my classmates were wanted to join HP. I was the only one who got an offer! My offer was for product design in the Palo Alto division lab headed up by Howard Polter. I was mentored by the senior product designer Bill Hanisch, who showed inexhaustible patience with my lack of professional experience.



ENGINEERING TEAM WHICH CREATED NEW HEWLETT-PACKARD  
MODEL 8405A VECTOR VOLTMETER

Left to right: Fritz Weinert, project leader,  
Bill Hanisch, Allen Baghdasarian, Siegfried  
Linkwitz, Jeff Thomas, and Rod Carlson,  
manager, Signal Analysis Section, Hewlett-  
Packard microwave laboratory



The HP 8405 Vector Voltmeter

From the lab I migrated to the environmental testing group headed by Jerry Chamberlain. He was an excellent manager. I learned all physical and electronic tests that the instruments had to pass to bring them to market in order to live up to the HP quality standard. The environmental test standards were from the military requirements called "Class B."

The environmental lab was in the lower floor of building 5 in Palo Alto (now Tesla). We had chambers for heat, humidity, vibration, altitude, and electromagnetic interference (EMI) testing. I believe the EMI chamber had been used to test an early version of the Apple computer.

One of the first instruments I tested was the high-performance microwave spectrum analyzer, the HP 8551A/851A, whose project manager was Art Fong. I remember Art as a gentleman who was patient with me while I learned how to test the analyzer while putting it through the Class B tests while preventing unnecessary damage. I also benefitted by learning a bit of spectrum analyzer operation.

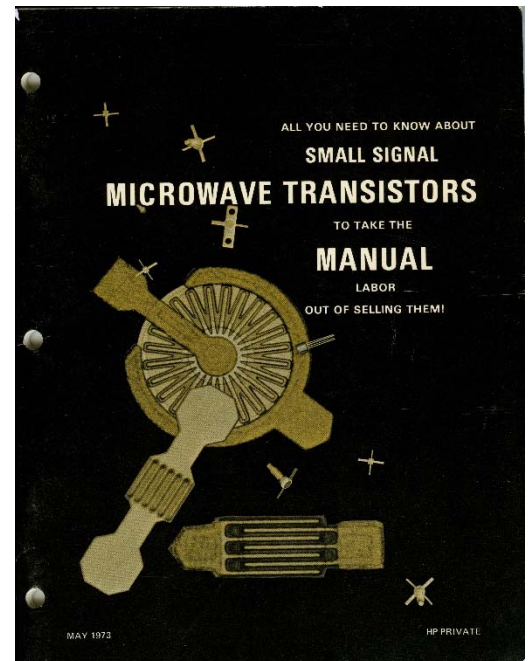


The environmental lab was moved to 1 lower, right under the corporate offices. An admin came down to the lab with a broken ski with the boot attached. She said it was from Bill Hewlett who had blamed the binding for a fall. He wanted it tested at various snow field environments to see if I could confirm the problem. I can't remember the result but it was the oddest environmental test report I ever wrote.

Before I left the environmental test job, I oversaw the installation and training for electromagnetic vibration testing. Instruments were strapped to a monster loudspeaker-like device with a piston driver and a signal generator that shook the instrument to meet the exacting test limits. From there I worked in quality assurance in components manufacturing. Here I oversaw a few folks inspecting various components being developed by the newly formed microelectronics group managed by Mr. S-parameter, George Bodway.

Soon after, I applied and got a job in the components marketing department, working for Doug Spreng as a marketing advertising pleb under the tutelage of Dean Abramson. What fun that was! Trips to the ad agency in San Francisco, working with the "creatives" of the advertising craft to get the magazine ad messages just right. The product I remember most was a low-noise microwave transistor that was state-of-the-art at the time. [It was rumored that only one silicon wafer produced the devices, and the formula was either lost or the wafer was a fluke.]

The marketing of components such as transistors and diodes was quite a different animal for our sales engineers who sold instruments. Even the existing component salespeople were not yet confident in selling RF and microwave active devices. I helped them by creating an internal application note on the basic high-frequency transistor's properties and uses. This including the use of network analysis and S-parameters.



From there I moved into product marketing for the RF and microwave components group, which was closely affiliated with the newly added acquisition of [name of company] located where Page Mill Road meets El Camino Blvd. [The site was empty for years due to contamination of the soil. The area is now Stanford/Palo Alto playing fields.]

The Santa Rosa HP site was opened in the early '70's and I applied for a job there in spite of my ex's wishes. But I wanted a job that would expand my marketing breadth and experience. I asked a fellow pilgrim how his family was adjusting to the move. He said his wife had finally stopped crying.



I was hired in the Santa Rosa Division as a product marketing engineer for spectrum analyzers, a wholly new product line for me. I worked for Larry Rayher. The marketing department was managed by Bill Wurst. Dean Abramson moved up to Santa Rosa too after first putting up resistance because he didn't want to return to the "country" where he grew up. He wanted me to be the Santa Rosa Division advertising person, but I wanted to be in the nuts and bolts of the product technology and applications. And that's what I got.

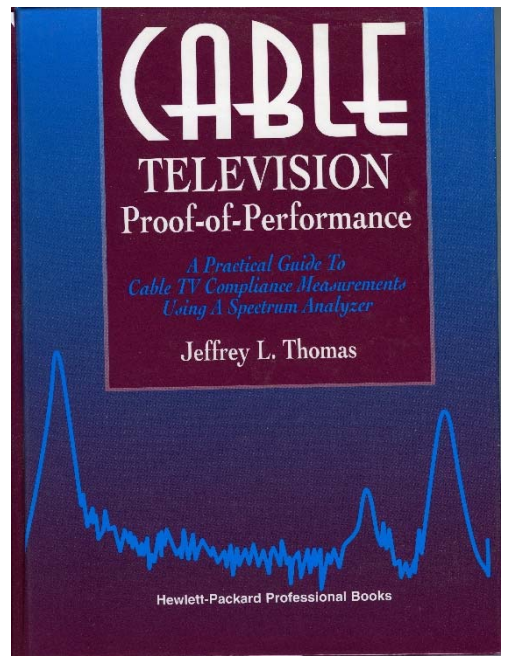
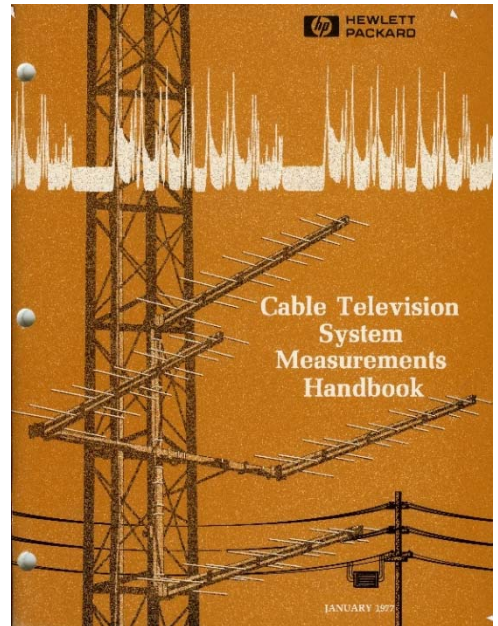
The HP 8558 RF spectrum analyzer was just about to be introduced in 1968. It was the first spectrum analyzer to be part of the HP 141 plug-in main-frame series and as a stand-alone instrument. I was assigned to create its data sheet. I made an eight-page brochure with fancy half pages and foldouts. Whoa. Bill Wurst and Dean Abramson dumped on it for being way too expensive. So, I went back to a four-pager.

The Santa Rosa cable television company expanded as were many throughout North America. The local company adding quite a few channels including the subscription channel HBO. The clever design engineers at HP developed a cheater box to avoid paying the monthly fee. They even made a production-like PC circuit board that we could load and solder ourselves.

The HP 8558A spectrum analyzer could help cable companies meet the FCC regulations for transmission quality for a reasonable price. So, our engineers worked with the local cable system on test protocols. I followed along by writing an application note in 1977 which available free to our U. S. customers.

In the late '70s and early '80s I worked on the documentation and applications for high-performance spectrum analyzers of the Signal Analysis Division. I wrote the operating and programming manuals and training a customer training course for the HP 8568A RF Spectrum Analyzer and HP 8566 Microwave Spectrum Analyzer. I also wrote the text for the analyzer's pull-out reference cards. The analyzers were the state-of-art, not only in measurement performance, but first to have internal microprocessors so they could be controlled by a computer/controller via the HP-IB interface, or a downloaded internal program.

In the 1990s I accumulated the testing experience from our analyzer cable system testing to write a book for Prentice-Hall. It covered test procedures for meeting the FCC cable television system quality standards. *Cable Television Proof of Performance Using a Spectrum Analyzer* targeted the North American market but was also translated and licensed to the Asian markets. Thanks go to Larry Straford and Mario Narducci for sponsoring my effort.



As TV standards began to go digital, Francis (Frank) Edgington and I wrote a book to introduce cable industry engineers and technicians to the digital technology which was soon to dominate their work lives. Unfortunately, it came out at a time when the TV broadcast standards were not fully established, so it didn't have the impact of the first book.

In the final years at Agilent/Keysight I worked as a mentor for marketing engineers in the instrument divisions, assisting them in their online presentations to sales engineers world-wide. I retired in 2002, but contracted with Keysight to write web-based training modules on measurement basics and communication standards, such as Bluetooth and Wi-Fi.

In the final couple of years before retirement I was busy using professional-grade digital cameras to shoot rehearsals for live theater productions. Digital cameras were so much better at capturing light than color film that they could be used to shoot promotional pictures during a rehearsal. This meant that the company didn't have to set up a "photo call." The photos could also be used for the portfolios of the production designers of costumes, stage, properties, and, of course, the actors. Since 1998 I have photographed 440 productions for eight theater companies. My image archive contains 86 thousand images (155 Gb). When I shoot a show, it's like having the production done just for me.

In 2009 I put my experience in theater photography into a self-published 180-page book called *Shooting Actors – Performance Photography with a Digital Camera*. I published with an Amazon subsidiary called CreateSpace. I'll bet they used one of HP's Indigo printers so the orders could be printed on demand. Unfortunately, there wasn't much demand, but I had a great time writing and formatting it!

And there you have it, my satisfying HP/Agilent/Keysight experiences and contributions over 38 years.

