

## **Grace Hopper, Digital Equipment Corporation, and Me**

*By Jackie Kahle  
October 21, 2018*

Navy Rear Admiral and computer pioneer Grace Murray Hopper had a long association with Digital Equipment Corporation (DEC), and out of that came my early interactions with her, and my most cherished career memories.

First, some background. Grace Hopper graduated from Vassar in 1928 and earned a PhD in Mathematics from Yale in 1934. The onset of World War II inspired her to serve in the military and Grace joined the WAVES in 1943. After graduating midshipman's school (first in her class), she soon found herself assigned to the Harvard Computational Laboratory under the direction of Howard Aiken, where she began her long computing career working on the Mark I and Mark II. After the war, Grace continued her work in the Naval Reserves and moved to the private sector in 1949, working for the Eckert-Mauchly Computer Corp which was building the Univac I. She continued there after it was acquired by Remington Rand which eventually merged with the Sperry Corporation.

Grace's focus during those early years was on software programming, and in particular, trying to find ways to make it easier for people without years of professional training to be able to program. While at Harvard she developed a large catalog of reusable sub-routines for the Mach I, which up until that time were not commonly available or even imagined. This led to her work writing the first known compiler in 1951-1952, called the A-0. Not only did Grace believe compilers would make it easier to build programs, but they also made possible the portability of code across different machines. Soon Grace was working on programming languages and produced MATH-MATIC, which could accept English verbs and mathematical symbols, and eventually FLOW-MATIC which was more useful in the general business market. Grace was always a huge champion of industry standardization and machine portability, and was an initial advisor to CODASYL (Committee on Data Systems Languages). CODASYL produced the specifications for COBOL, which was largely based on the FLOW-MATIC manual, thus leading to the oft-used moniker for Grace as the "mother of COBOL".

### **My customer, Grace Hopper!**

By 1975 at the age of 69, Grace was still on active duty with the Naval Reserves and tasked with standardizing COBOL across the Navy. She was given a basement office in the Pentagon as the Director of the Navy Programming Languages Group. That same year, I joined DEC in Lanham Maryland as an Associate Software Specialist. I was 22 and just one month out of college, with very little computing experience, having only taken two computer classes at NYU writing programs for a CDC 6600 mainframe. I was assigned to support the RSTS/E operating system on DEC PDP-11 minicomputers, and was responsible for installing software on clients' machines and providing post-installation support. Our office was close to Washington, D.C., so many of my clients were in the government. In March of 1976 I was tasked with installing RSTS/E on Grace Hopper's PDP-11 minicomputer in the Pentagon, and later, installing a field-test version of our first COBOL compiler on that same computer.

I confess that, given my relative lack of knowledge of computer industry history at the time, I had absolutely no idea that Grace Hopper was anything other than just another customer. Still, it was my first visit to the Pentagon, so with some excitement I showed up at the front entrance and made my way down to the basement level, D Ring, to Room BD770 and Grace Hopper's office. The pictures below show Admiral Hopper in 1976 sitting at her desk in the inner room of that very office, and in the outer office standing in front of the PDP-11 on which I was to install RSTSE/E.



Pentagon, 1976. U.S. Navy photograph from the collections of the Naval History and Heritage Command.



Photograph by Lynn Gilbert, Wikimedia Commons.

When I first met her, she was dressed in her Navy uniform and looked to me quite stern and no-nonsense. However, as we started to talk, she was warm and cordial, and happy to answer the questions I had about two curious items in her office. On the wall in the outer office, near the PDP-11, was a clock that ran backwards. It told perfect time, you just had to accustom yourself to reading it counter-clockwise. When I asked about it, she told me the now oft-quoted anecdote about it being a response to people who insisted they have always done things a certain way, which is one of the things she hated most. In addition, in her inner office she had a huge wall map of the United States, with red and blue pins in every location to which she had traveled, with the blue ones representing the places she had been since being promoted to Captain in 1973. I noticed that only one state had no pins in it – I believe it was

either Idaho or Wyoming. When I asked her why she had never had a chance to visit there, she said she was convinced that the state didn't actually exist; otherwise, why wouldn't she have been invited there? It made complete sense to me.

The installation went smoothly, and after I got back to my office, I sent her a letter (a copy of which I still have) along with a brochure outlining all the post-installation support and training services available. As I said in my letter "We believe that the Software Maintenance Service is a must". There I was at 23 years of age, trying to upsell Grace Hopper!

When I attempted to fill out the paperwork assigning my time to the appropriate business group in DEC, I could find no record of the sale of any PDP-11 to Grace Hopper. After asking around for a bit, someone told me they thought Gordon Bell knew the details and I should check with him. At the time, Gordon was Vice President of Engineering at DEC, and later took a top research position at Microsoft and co-founded the first computer museum in Boston. Not knowing how important Gordon was in the company at the time (continuing on the theme of how little I knew back then!), I took out the company phone directory and called him. He actually answered his phone, and was happy to explain that DEC had donated the PDP-11 to Grace so that she could further her work on her own version of "mini-Cobol", and I shouldn't charge for my time. I learned while doing research for this article that Grace knew DEC founder and President Ken Olsen when he was at MIT, and they shared a common view and commitment to bringing computing to a broader array of people – DEC by creating the minicomputer and Grace by focusing on simpler programming languages. So it was natural for DEC to donate that PDP-11. I recently got back in touch with Gordon Bell to get his recollections about Adm. Hopper. He told me he once invited her to Boston to speak at the Computer Museum. Grace insisted on staying at the Copley Plaza hotel and eating dinner at Durgin Park, where she smoked Lucky Strikes during the entire meal.

I returned to Grace Hopper's office one more time, accompanied by Ray Fusci from DEC's HOSS (Home Office Software Support) team to install a field-test version of our COBOL compiler for RSTS/E. Hopper was particularly interested in this due to a project that landed in her lap in 1974 – she was tasked with building compilers for shipboard mini-computers to automate non-tactical support systems.

### **Grace and Ken Olsen come to New Hampshire**

Fast-forward to 1983 and we now find Adm. Hopper and DEC in partnership again, this time in New Hampshire, my home for the last 39 years. Grace had always been interested in advancing opportunities for students to learn programming, and she prevailed upon her old friend Ken Olsen to donate equipment to the newly-established "Grace Hopper Center for Computer Learning" at Brewster Academy – a small private school in Wolfeboro, NH which had been attended by her grand-nephew and –nieces. Grace had spent every summer growing up at her family's "camp" on Lake Wentworth in Wolfeboro and she eventually bought a house there. On November 7, 1983 Ken Olsen flew up to Wolfeboro by DEC helicopter to give the keynote address at the dedication, and formally donate several DECmate II word processors to the center. According to the *Brewster Academy Review*, more than 400 people were in attendance, including senior executives from Wang Laboratories, Prime Computer,

Sanders Associates, Planning Research Corporation, NEC Laboratories, and Computer Sciences Corporation, demonstrating the wide impact Grace had on the industry and the high esteem in which she was held. Governor John Sununu was on hand to proclaim it “Grace Hopper Day” across New Hampshire.



Headmaster of Brewster Academy David Smith, Grace Hopper and Ken Olsen, Nov 7, 1983; Photo by Rick Dixon

### **Grace joins DEC**

The final chapter of the Grace Hopper-DEC story begins with her retirement from the Navy on September 1, 1986, and starting the very next day as a senior consultant at DEC. Her hiring had been orchestrated by Rita Yavinsky, who at the time was business development manager for DEC’s Government Systems Group (GSG) in Washington, D.C. By then, I had transferred to GSG headquarters in Merrimack, N.H. but had known Rita quite well from our days in Washington, and her ongoing work in GSG. She had met Grace several years earlier by chance, and they had become good friends. Given Grace’s past connections to Ken Olsen and DEC, Rita had little trouble getting GSG’s head Harvey Weiss to approve hiring Grace as an “ambassador”.

Shortly after joining DEC, Grace made a visit to Merrimack and gave a speech to the employees. It was here that I encountered her for the last time. At the event I received one of her now-famous “nanoseconds” – an 11.8 inch length of fiber optic cable which she said represented the distance that light travels in a nanosecond. I greatly regret having somehow misplaced my nanosecond.

Grace spent several years visiting clients on behalf of DEC and traveling the country and the globe speaking at industry conferences and events. But after a series of falls which left her very weak, by 1991 she was largely house-bound and spending most of her time writing. Rita helped care for her in that final year until she died on January 1, 1992. I spoke with Rita while researching this article, and she mentioned two funny anecdotes about Grace’s love of smoking and Lucky Strikes: “She smoked through the State of the Company meeting that I took her to. She was in the front row --- I was way back in the rear. I asked her not to smoke and she said OK, but then as the meeting went on I could see a little curl of smoke coming from the area where I had left her. Even during hospital stays she would sneak them

in. Once, the hospital called me to come over as they could not control her. She had hidden the Luckies under her mattress!”

Grace Hopper’s legacy continues to have an influence on our industry. For many years while I worked at CA Technologies, we participated in the annual Grace Hopper Celebration of Women in Computing conference, which is the world’s largest gathering of women in the industry. I’m so proud to have had the opportunity to actually work with her, and of DEC’s support for her efforts over the years.

### **Acknowledgements**

I am grateful to Gordon Bell, Ray Fusci and Rita Yavinsky for sharing their memories about Grace with me, and would also like to thank:

- Paul Taylor, Communication Branch Head of the Communication and Outreach Division of the Naval History and Heritage Command who provided me with a number of great articles and also tracked down the original source file for the picture of Grace in her office. We both loved the pirate flag, and Paul shared with me the very apropos article “Grace Hopper: Navy to the Core, a Pirate at Heart” (<http://usnhistory.navylive.dodlive.mil/2014/12/09/grace-hopper-navy-to-the-core-a-pirate-at-heart/>). He even sent a staff member over to Grace’s old office in the Pentagon to check out who was in residence, but alas the space is no longer controlled by the Navy.
- Beth Hayes in the Advancement Office at Brewster Academy, who found for me the Spring/Summer 1984 edition of the Brewster Review and patiently scanned and sent me all 5 pages of the article about the dedication ceremony, as well as other helpful links.

### **For further reading:**

- *Grace Hopper, Admiral of the Cybersea* by Kathleen Broome Williams, 2004  
Excellent overall biography, the author covers Grace’s time at DEC and interviewed Rita Yavinsky for the book.
- *Grace Hopper and the Invention of the Digital Age* by Kurt W. Beyer, 2009  
In-depth technical coverage of Hopper’s early computing work through the development of COBOL.
- *Grace Hopper, Navy Admiral and Computer Pioneer* by Charlene W. Billings, 1989  
Part of the Contemporary Women series for young audiences, the book has wonderful details of Hopper’s early life, along with many photos.
- The CHIPS (U.S. Navy’s Information Technology Magazine) landing page on Grace Hopper focuses on her naval career and includes photos and links to more than two dozen articles that have appeared over time in CHIPS. See <http://www.doncio.navy.mil/chips/ArticleDetails.aspx?id=2265>.