

VCF PNW 2019



<http://vcfed.org/vcf-pnw/>

Schedule

Saturday

- 10:00 AM Museum opens and VCF PNW 2019 starts
- 11:00 AM **Erik Klein**, opening comments from VCFed.org
Stephen M. Jones, opening comments from Living Computers:Museum+Labs
- 1:00 PM **Joe Decuir, IEEE Fellow**, *Three generations of animation machines: Atari and Amiga*
- 2:30 PM **Geoff Pool**, *From Minix to GNU/Linux - A Retrospective*
- 4:00 PM **Chris Rutkowski**, *The birth of the Business PC - How volatile markets evolve*
- 5:00 PM Museum closes - come back tomorrow!

Sunday

- 10:00 AM Day two of VCF PNW 2019 begins
- 11:00 AM **John Durno**, *The Lost Art of Telidon*
- 1:00 PM **Lars Brinkhoff**, *ITS: Incompatible Timesharing System*
- 2:30 PM **Steve Jamieson**, *A Brief History of British Computing*
- 4:00 PM Presentation of show awards and wrap-up

Exhibitors

One of the defining attributes of a Vintage Computer Festival is that exhibits are interactive; VCF exhibitors put in an amazing amount of effort to not only bring their favorite pieces of computing history, but to make them come alive. Be sure to visit all of them, ask questions, play, learn, take pictures, etc. And consider coming back one day as an exhibitor yourself!

Rick Bensene, *Wang Laboratories' Electronic Calculators*, An exhibit of Wang Labs electronic calculators from their first mass-market calculator, the Wang LOCI-2, through the last of their calculators, the C-Series. The exhibit includes examples of nearly every series of electronic calculator that Wang Laboratories sold, unusual and rare peripheral devices, documentation, and ephemera relating to Wang Labs calculator business.

Alan Perry, *Attack of the SPARC Clones*, The exhibit will feature a number of SPARC workstations and processors developed by companies other than Sun. It will include an Axil 320, a Solbourne S4000DX, and Tadpole SPARCbook.

Josh Dersch, *40 Years of the Three Rivers PERQ Workstation*, In May of 1979, a small company in Pittsburgh announced a high performance personal graphical workstation - the Three Rivers PERQ. Inspired by the Xerox Alto it featured a user-microcoded bitslice 16-bit CPU, a high-resolution bitmapped display, local disk storage, and Ethernet. While not a commercial success, it was instrumental in the design of the Mach kernel and the Common Lisp standard. It also inspired the design of Java bytecode. On display are a PERQ 1A, a PERQ T2, and the PERQ emulator, PERQemu. Come see what kind of computer \$30,000 got you in 1979!

Geoff Pool & Charles Tipper, *From Minix to Linux - An Early History of the Origins of the Linux Kernel*, An interactive demonstration of two x86 PCs running early UNIX-like operating systems. The first is a Leading Edge Model D with a 4.77 MHz CPU running Minix 1.5. The second is a 486 clone running Slackware 1.03. Visitors will be able to experience the performance, capabilities and limitations of both systems.

Stephen M. Jones, *SDF Public Access UNIX System*, A demonstration of a previous incarnation of a bulletin board system running on an AT&T 3B2/500 computer along with a Teletype 5620 and an AT&T 605 terminal.

David Cooper & Ian Finder, *VAX 11/750 in a VAXcluster*, This exhibit includes a working VAX 11/750 and a variety of MicroVAX machines, all running VAX/VMS. A VAXcluster is formed with an Ethernet interconnect. The VAX 750 has a DECwriter II hard copy console terminal. A VT-100 and VT-220 are provided through a terminal server to allow signing into the machines.

John Ball, *AppleTalk - Apple's Network Ecosystem*, In the 1980s multiple networking standards were starting to emerge in the commercial market as the concept of interconnected desktop systems became a viable solution to the previous years of desktop terminals and central computers. In Apple's corner, a low-cost standard was created named AppleTalk. Enjoy a sample of The Macintosh Office in a carefully recreated AppleTalk network, complete with working laser printer.

Vincent Slyngstad, *PDP-8 Repair and Reanimation*, A miracle has occurred and you have acquired a PDP-8 or similar minicomputer. How do you test it? How do you fix it? What can it do? Answers to some of these questions will be provided. We hope to present a PDP-8 running SPCWAR, as well as a variety of test gear and replica and replacement parts we have used to get various PDP-8 gear to (or at least close to) that state.

Rob Carnegie, Alex Dumitru, Jordan Evans, George Phillips & Peter Phillips, *Telephone Modem BBS from the Internet Pre-Dawn*, Chiliwack Retro-Computing Club members present their BBS experience using various brands of vintage computers, connecting via telephone modems to a real live stand-alone bulletin board systems. See how messaging, threaded discussions, file downloads and online gaming were accomplished in the days before TCP/IP and WWW were ubiquitous.

Patrick Finnegan, *TeleVideo projects: Bringing CP/M into the 21st century*, TeleVideo produced CRT terminals and computers in the 1980s, including a multi-user resource sharing system called MmmOST. I will be displaying TeleVideo computers from the early 1980s along with three projects that bring TeleVideo systems into the 21st century.

Foone Turing, *Floppy Disks/Optical Discs*, The evolution of the floppy disk over the last 50 years with all of the weird & obscure side-formats you may never have seen, including its eventual successor, the optical disc. Everything from giant analog laserdiscs to 4K Ultra HD Blu-ray, tiny black & white discs full of Spongebob Squarepants and giant WORM disks for federal banking records, and a disc that could destroy your CD-ROM!

Madeline Autumn-Rose, *CompuServe and their PDP-10 Clones*, A working example of a Systems Concepts SC-40 used by CompuServe. The system is currently running the latest variant of DEC's TOPS-10 customised by CompuServe for their use. The unit has a manufacture date of sometime in 1994 and contains 16 megawords of memory at a word size of 36 bits. Play around with the various compilers and get a feel for the environment provided to timesharing customers. Work on getting PC clients to connect is an ongoing project.

Mark D. Overholser, Brett Gordon, & Thomas Cherryhomes, *Networked 8-Bit Computers for Gaming, Collaboration and Socializing*, A demonstration of some 8-bit systems including the Commodore 64, the Apple][and the Tandy Color Computer (CoCo) networked together with Ethernet or WiFi to interoperate in a game or on the Internet connected to a system like IRATA.ONLINE.

Chris Henkel, *Early PC based Engineering Workstations*, In the 1980s computer-aided engineering tools transitioned from the very expensive proprietary time-shared mainframe systems developed in the 1960s and 1970s to the individual PC based engineering workstations we use today. Design tasks like Computer Aided Drafting, schematic capture, analog and digital circuit simulation, and programmable logic design all found a home on PC based systems. Experience a late 1980s IBM AT based engineering workstation with desktop digitizer and pen plotter running engineering software from this time period.



Sergey Kiselev, Michael Kiselev & Max Malinov, *Retro Brew Computing - Do-it-yourself 8-bit Single Board Computers*, This is an interactive exhibit that demonstrates several Zilog Z80 and Intel 8085 based single board computers and provides information about designing, building, and programming these systems. The shown SBCs are open source hardware projects that anyone can build with commonly available parts.

George Amores, *Commodore 64 vs. Commodore Plus 4*, The Commodore 64 was a big success, but the Commodore Plus/4 was a huge failure. Find out what makes them so different in this exhibit.

Luther Johnson, *MakerLisp Machine*, The MakerLisp machine is a portable, modular computer system, designed to recapture the feel of classic computing, with modern hardware. The machine centers on a 2" x 3.5" CPU (about the size of a business card) which can be used stand-alone or plugged into a 2" x 8" main board for expansion to a full computer system. A laser-cut wood enclosure holds a small keyboard, an LCD monitor, the circuit boards, and a prototyping area with a breadboard for electronics experimentation and development.

Jörg Hoppe, *BlinkenBone - Program a PDP-11/70 over a reanimated front panel*, There are many dead "Blinkenlight" panels in collections; BlinkenBone connects them to a BeagleBone/Linux/SimH simulation. On exhibit is a physical PDP-11/70 panel where you can watch "idle light patterns" or enter, run and debug short assembler programs. The panel is of same type as the ex-Microsoft PDP-11 "Miss Piggy" shown in the museum on the second floor. While "Miss Piggy" may not be touched, "BlinkenBone" is ready to experiment with!

Josh Dersch & Jörg Hoppe, *UniBone - a Linux to UNIBUS bridge makes a PDP-11/05 run*, Many older PDP-11s of the UNIBUS generation are incomplete, suffer from defective parts, or can not be shown on exhibit because of their size and weight. UniBone is BeagleBone micro-Linux system on standard UNIBUS card, able to emulate missing memory, disk drives, processor or act as diagnostic tool. More

functions can be added using a C++/Linux environment. Here on display it provides disk drives and memory to a reduced PDP-11/05 running some graphics demos on a Tektronix monitor.

Andras Tantos & Chris Fenton, *Cray supercomputers emulators: Resurrecting the giants.*, Come and experience these old machines through software emulation. Exercise your UNIX skills to work on a J90 or experience the archaic COS operating system running on an XMP. This exhibit will feature PCs emulating older Cray systems. While they might not be original metal and silicon, they are fully functional and run original operating systems from the early 1980s and the late 1990s.

Jason Howe, *Atari 800: Productivity and Desktop Publishing*, In 1979 Atari released a line of home computers. Despite the company's history with games, Atari's Home Computer Division produced a fully fledged, very forward thinking, and powerful home computer. To help dispell the notion of Atari as a "game company", this exhibit will demonstrate a range of office, desktop publishing, and communications software available for the Atari 8-bit line of home computers.

Oscar Vermeulen, *Replicas of classic computers*, Computers from before the microprocessor era have a lot to teach us. But the real hardware is hard to obtain, and even harder to maintain. Shown are some hobby projects that have resulted in close replicas of the PDP-8, PDP-11, and LGP-30.

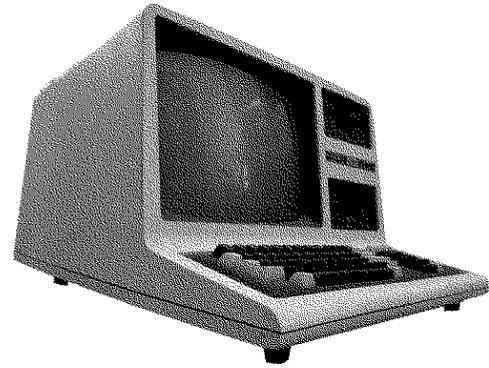
Gordon Steemson, *How to get There from Here*, Older systems were rarely built with cross-platform communication in mind. Contemporaneous solutions either relied upon storage mechanisms which have aged very poorly or were so uncommon that today their mere existence is occasionally disputed. Things have gotten better and even devising custom methods is easier than it used to be. This exhibit explains my solution concentrating on systems from the 8-bit era.

Larry Pezzolo, *From MINI to MICRO*, When Intel released its first microprocessor in the early 1970s other chip manufacturers rushed to come up with their own examples. Several based their CPUs on existing minicomputer architectures and instruction sets. Two examples are the Intersil 6100, a 12-bit CMOS CPU known as the PDP-8 on a chip and the Signetics 2650, an 8-bit CPU based on the IBM 1130 Minicomputer. After limited success both have faded into history. Working examples of both will be on display.

J.P. McGlinn, *Indigo, Indigo², and Indy*, The Indigo was introduced in 1991 and brought a RISC workstation to the desktop. Hailed as a low cost entry Indigo found use in engineering, design, and scientific computing. The Indigo² followed quickly expanding the CPU and graphics options. The Indy launched into the low-cost UNIX workstation market in 1993 at under \$5000 though some upgrades were necessary to make a usable workstation.

Angelo Papenhoff, Jeff Kaylin & Keith Hayes, *PDP-6 emulation with interface to PDP-6 Console and 340 Display*, The PDP-6 was sold only 23 times and no complete machine remains. Parts of machine #4 are now at LCM+L and its console has been

connected to an emulator. The emulation code is a close approximation of the schematics in C so the internal state is accurately modeled and the console lights reflect internal snapshots. A BASYS 3 FPGA board communicates with the emulator over USB serial, driving the console panel lamps and reading switches.



Danny Miller, Darek Mihocka & Steven Noonan,

40 years of Atari on the desktop: from the Atari

400 to virtual machines, When launched in 1979,

the Atari 400 and 800 home computers brought

gaming and productivity to the average consumer. There was no need to build a kit

or have engineering skills; simply plug in and connect the computer to your

television. Our hands-on exhibit includes the original Atari 400 and 800 computers,

the next generation 130XE, the 32-bit Atari TT computers, and the latest 2019

emulation technology that runs Atari software on ARM64 laptops and up to 400 Atari

virtual machines concurrently on a single PC!

Ian Finder, *Only Amiga Makes It Necessary,* A brief history of the much loved, quirky computer that could never decide if it was a home computer, a game console, or a professional workstation. Simultaneously over-engineered, yet built with vertically-integrated bargain-basement Commodore construction to save cost, the Amiga is a quirky window into a promising ecosystem that never was.

Marcel van Kervinck & Walter Belgers, *Gigatron TTL microcomputer,* In 1975

Steve Wozniak famously designed the "Breakout" arcade game out of 44 simple TTL

chips without using a microprocessor, simply because those were not available to him

at the time. When one year later the MOS 6502 and Zilog Z80 were launched, his

Apple 1 started the home-computer revolution. But were these processors really

necessary for the personal computer revolution? What would have happened if they

had never appeared?

Ian Finder, *The GRiD,* GRiD Systems Corp. was founded in 1979 with a vision of an

uncompromising portable office information appliance for high-level knowledge

workers, deeply inspired by Alan Kay's Dynabook concept. With a team poached

largely from Xerox PARC, a keen eye toward industrial and interaction design, and a

true lack of concern about positioning themselves "upmarket," they developed a

portable computer that spared no expense and could fit in a briefcase. Unfortunately,

GRiD's vision of a deskless, networked office of the future was misunderstood.

Today, GRiDs are misremembered as "rugged" systems due to their popularity with

the military, MS-DOS clones, or perhaps most irritatingly as "the sentry gun

computer from 'Aliens!'"

Presentation abstracts

Joe Decuir, IEEE Fellow, *Three generations of animation machines: Atari and Amiga*, The speaker had the great luck to be a contributor to three early animation machines. The Atari 2600 (1977) was the first mass market game console. The Atari 8-bit computers (1979) were better animation machines and personal computers. The Amiga computers (1985) pioneered hardware graphics processing, with line draw, area fill and bit-blit. This presentation discusses how they came to be, what they included, and the current markets for hardware and software.

Geoff Pool, *From Minix to GNU/Linux - A Retrospective*, In this presentation, we will explore the early history and development of the Linux kernel. We will discuss Minix 1.5 as the initial development platform, its shortcomings and ultimately how the Linux kernel was independently created as an original, standalone UNIX-like system. The presentation primarily covers events from January 1991 through March of 1994.

Chris Rutkowski, *The birth of the Business PC - How volatile markets evolve*, The early 1980s marked the shift from the hobbyist/industrial eras of computers to the emergence of the modern PC. The Epson QX10, the last and arguably greatest of the 8-bit computers, set user expectations of what a PC can and should be. Those expectations persist today in the form of the standard PC keyboard, the various "office" suites, and the "push button" ease of a touch-screen UI. We are going to investigate why the form-factor has been so successful, and how that success can be extrapolated into understanding that age-old question: "What's next?"

John Durno, *The Lost Art of Telidon*, What is the best way to restore 1980s videotex graphics emulation - hardware preservation or format migration? How about all of the above? This is the story of a four year project to recover a lost school of videotex art, with sidebars on the history of Telidon and the North American Presentation Level Protocol Syntax.

Lars Brinkhoff, *ITS: Incompatible Timesharing System*, MIT's Incompatible Timesharing System, or ITS, was used on their PDP-10 mainframes from 1967 to 1990. It has influenced many other operating systems and laid the groundwork for the free software movement. This presentation is about the history and development of ITS. A few programs will be demonstrated running in simulation.

Steve Jamieson, *A Brief History of British Computing*, This talk will briefly cover the computers, technology and people from British computing history, including some of the more obscure and less well-known stories. We will quickly review some British contributions to the early days of computing and then move on to the exciting times of the 1970s and 1980s. In those days the British home computing scene was the most active and innovative outside of the USA, but many British computers never

made it to these shores and are largely unknown on this side of the pond. We will finish up with some good places to see computers in the UK next time you visit.

About us ...

Vintage Computer Federation Inc. (VCFed) is a 501(c)(3) nonprofit organization whose mission is to enable the preservation of computing history through education, hands-on work at our museum in New Jersey, and outreach at events such as this and on the Internet.

In addition to VCF PNW we also run VCF East (New Jersey, each spring) and VCF West (Silicon Valley, August). Outreach includes running the Vintage Computer Forum (the hobby's largest online discussion forum), supporting in-person meetups through regional chapters, and helping other related groups fulfill their missions.

Want to know more? Visit us at <http://www.vcfed.org/> or email us at info@vcfed.org for general information. For VCF PNW specific questions email me at michael@vcfed.org.

VCF shows are a volunteer effort. Without people pitching in their personal time and resources this doesn't happen. Besides the exhibitors and speakers listed above we want to recognize other people who made this happen including Erik Klein, Evan Koblentz, Jeff Brace, Corey Cohen, Gene Buckle, Alan Perry, Curtis Jones, Kent Sullivan, Kyle Sullivan, and Steve Jamieson. Special thanks also goes to LC:M+L for hosting us and helping with the show logistics.

Tell us what you think!

Have a moment for a survey? If so please head over to <https://goo.gl/forms/V3DiyxwkpbIOCKn73> .

Did you see something awesome? Maybe something that can be improved? Write me at michael@vcfed.org or mbrutman@brutman.com.

Thanks,
Michael Brutman, VCF PNW 2019 Producer

