

Gary Chanson
Senior Software Engineer
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Objective: To work on challenging embedded software engineering projects.

Summary: Software Engineer with over 25 years experience. Strong experience with:

- **Embedded Systems**
- **Real-Time device control**
- **Windows and Windows Mobile** development and internals
- **Software Tool** development for **Windows**
- **Real-Time industrial process control**
- **Data communications** (RS-232, terminal emulation, networking, etc.)
- **Microcontrollers** and **single-board computers**
- **Radio** communication and **telemetry** systems
- Experience with **analog** and **digital** electronic **hardware design** & fabrication
- Excellent problem-solving skills

Languages: C/C++, Forth, Assembly (80x86, Arm, 8097, 6502, 6303, Hitachi H8, 680x0, Z-80, VAX), and others.

Experience: Contract/Consulting Engineer, 1983-present

Active and successful contract software consultant/developer specializing in embedded systems, real-time control, development tools, and Windows and Windows Mobile development and internals. Clients include Aeonic Systems, Loral Infrared and Imaging Systems., Megapulse Corp., Varian Ion Implant Systems, Varian Vacuum Systems, Tality, Anro Engineering Consultants, Aurora Technologies, Metalspray USA, Osram Sylvania, PictureTel, Sensitech, Shipley Company, Tektronics, Vee-Arc Corporation, McKay Laboratory (Harvard University), and others.

Some of my more interesting projects are listed below. I implemented all the code for most of these projects, working closely with clients on system architecture and design.

2014 Thru 2015 **Starquest Systems**

Development of QSync, a program for Windows which synchronizes files and directories between hard drive, network storage, thumb drives, etc.

2013 **Varian Associates**

Modifications and new programs to support ion implanter system development on newer versions of Microsoft Windows.

2012 Thru 2013 **Starquest Systems**

Development of SlipStream Music Player, a Windows multimedia program which plays audio media files and media streams along with companion programs for Windows Mobile which provide remote control functions and synchronization with Windows Mobile media players.

2009 Thru 2010 **Starquest Systems**

Development of QCalendar, a program for Windows and Windows Mobile which manages calendars and appointments and CalDav server. Supports synchronization of events between QCalendar running on Windows computers and Windows Mobile devices, using various synchronization protocols including CalDav and can act as a server or client for network-based calendars using CalDav or HTTP protocols.

- 2007** **Teradyne**
Development of code for automated test equipment for custom tests on LCD driver devices in C++ using Microsoft Visual Studio 6.
- 2007** **TEL Epion**
Troubleshooting network connectivity problems. Involved debugging and modifying LAN driver to properly handle error conditions and maintain proper communications handshaking.
- 2006** **Bose Corporation, Stow, MA**
Firmware development for an Automotive DVD player in C using the Green Hills Multi C/C++ compiler. The processor was an ARM7 and the operating system was the osCAN RTOS version of OSEK. The work included merging two versions, adding new features, and debugging.
- 2005** **Varian Associates**
Customization and technical support for my Starquest QExec program. This program is an enhanced CMD replacement command and script processor for Windows which Varian will use as part of their suite of development tools for ion implanters used in semiconductor manufacturing. This work was to add special commands specifically for their use. This program is written in Forth using my Starquest Forth development system (Quest32).
- 2002 thru 2005** **McKay Laboratory, Harvard University**
Porting of the control program of a scanning tunneling microscope from the 16 bit DOS environment to the 32 bit Windows environment. This entailed writing an emulator for the graphics library used in the original program, writing interfaces to couple text input and output to Windows consoles, writing binding layers for disk access and other operating system services, providing drivers for hardware, and modifying many functions to account for the different word size. This work was done in C and Forth and used Visual Studio and Borland C.
- 2002** **Megapulse, Inc.**
Modifications to the UTC Sync GPS time synchronization program. Development work on the algorithm which synchronizes the time of the atomic clock of a Loran C transmitter with the UTC time received by a GPS receiver and on interfacing the program to different types of GPS receivers. This program is a Windows program written in C/C++ using MS Visual C.
- 2001 thru 2002** **Megapulse, Inc.**
Modifications to the Lordac Loran C diagnostics program. Lordac is a Loran C transmitter **signal analyzer instrument**. It consists of a high speed data acquisition board, transmitter interface circuitry, and a PC used as an embedded controller. It tests waveform amplitudes, timings, and envelope shape for acceptance testing of Loran C global positioning transmitters. This program does data acquisition and signal analysis. It also generates reports and supports batch processing. This program was written in **Borland C**.
- 2001** **Xillix**
Technical planning consultation for a project to build a special purpose endoscope to sketch out a C++ framework for software development.
- 2000 thru 2001** **Tality, Inc. (formerly part of Cadence Design Systems)**
Firmware development to port the **ISaGRAF Pro** PLC programming environment for embedded control systems, to our target operating system and environment, **ThreadX** running on an **Arm7** based single board computer, from **VxWorks**. This entailed writing a binding layer, which connects the target run-time module with the ISaGRAF Workbench Debugger via an **Ethernet** connection. The binding layer supports memory allocation and thread controls, timers and time of day, events and message queues, semaphores and mutexes, file i/o and **TCP/IP** communications, etc. It also supports the execution and debugging of programs passed to it from the ISaGRAF Workbench. This project involved working in C and C++ using **Green Hills MULTI** and **Microsoft Source Safe**.
- 1999 thru 2001** **McKay Laboratory, Harvard University**
Adding new features to the control program of a scanning tunneling microscope. This project added support to synchronize exposures by a CCD camera to STM surface scanning. This work involved adding I/O drivers for the CCD camera and functions to control camera exposure to the PC program (written in C) and timing and handshaking functions to synchronize with them to the firmware of the controller board for the scanner (written in Forth). This project involved working in **Borland C** and **Forth**.

- 1998 thru 1999** **Varian Associates (Vacuum System)**
Programming of an HP-48G for use as a remote controller for a high vacuum system in HP **RPL** language.
- 1998 thru 1999** **PicturTel, Inc.**
Firmware development for the Audio sub-system of a video conferencing system, written in **C**, running under **pSOS** on the **Philips TriMedia** processor. Included writing hardware device drivers, waveform generators, protocol converters and diagnostics. This work was done using **TriMedia C compiler** and **Clear Case**.
- 1998** **Osram Sylvania**
Programming of a production automation system which produces light bulbs.
- 1998** **Megapulse**
Development of the second version of the Accufix 500A Timing Receiver Interface. This is a DOS program which receives data via serial ports from one or two Accufix Loran C Timing Receivers and displays the data for both units in real time as they operate.
- 1997** **Varian Associates (Vacuum System)**
Programming of an HP-48G for use as a remote controller for a high vacuum system in HP **RPL** language.
- 1997** **Megapulse**
Modifications and improvements to the Lordac signal analyzer instrument.
- 1996 thru 1998** **Starquest Systems**
Development of *Quest32*, a **Win32 program development system** for **Windows 95** and **Windows NT**, based on a derivative of the language **Forth**. *Quest* is a complete 32 bit programming environment, including compiler, interpreter, assembler, interactive debugging environment, meta compiler, source code editor, and many libraries and example programs. The entire codebase for *Quest* was written by me.
- 1996** **Capcoitol Tool and Manufacturing**
Technical program planning consultation and development for an automated metal cutting machine..
- 1994 thru 1996** **Varian Ion Implant Systems**
Implementation of major improvements to the existing Forth development system and development of new development tools including a source code analysis and formatting tool.
- 1994 thru 1995** **Megapulse, Inc.**
Development of the original version of the Accufix 500A Timing Receiver Interface. This is a DOS program which receives data via serial ports from one or two Accufix Loran C Timing Receivers and displays the data for both units in real time as they operate.
- 1994** **Varian Ion Implant Systems, Inc.**
Terminal emulator to replace a discontinued terminal. Supports three terminal emulations, two I/O ports (simultaneously) with spooling, file capture and playback, print screen to graphics file, pop-up calculator. Hardware is built around a DOS single board computer.
- 1993 thru 1994** **Cambridge Software Project**
Development of an automated telephone data collection device.
- 1993** **Metalspray**
Development of a single board data logger.
- 1993 thru 94** **Aurora Technologies**
Development of several diagnostic programs for I/O boards for Sun workstations, written in **Unix Open Boot**.
- 1993** **Megapulse, Inc.**
Loran C transmitter **signal analyzer instrument** written in **C**. Consists of a high speed data acquisition board, transmitter interface circuitry, and a PC used as an embedded controller. It tests waveform amplitudes, timings, and envelope shape for

acceptance testing of Lorán C global positioning transmitters. It also generates reports and supports batch processing. This program was written in **Borland C**.

- 1993** **Conmed**
Development of a single board data logger.
- 1992 thru 1993** **FCIFiberChem**
Development of a Forth decompiler.
- 1992 thru 93** **Sensitech**
Development of a single board tester for temperature detectors.
- 1992 thru 93** **Shipley, Inc.**
Firmware development for **Real time process controller** for electro-less copper plating system. Monitors the **temperature, PH and chemical composition** of the plating bath and controls the **flow rates** of replenishing chemicals. Included multitasker running seven concurrent tasks, control of stepper motors, measurement, chemical analyses, replenishment, operator interfacing, etc., built around an 8 bit **single board computer**.
- 1991 thru 1992** **Loral Infrared and Imaging Systems, Inc.**
Control firmware for a motion stabilizer used in an in-flight camera mount. Processes the output of a ring laser gyroscope as well as other signal sources using **digital signal processing** techniques, resulting in analog outputs which drives the positioning motors of the camera mount.
- 1991** **Feedback**
Development of a hand-held device for taking surveys.
- 1991** **Don Schroeder**
Environmental controller for a greenhouse using a single board computer.
- 1991** **Shipley**
Firmware development for an environmental controller.
- 1990** **Shipley**
Firmware development for a Wafer Processor which moves a silicon wafer between various chemical baths using stepper motors and a vacuum lift assembly.
- 1989 to 1992** **Shipley**
Firmware development for a machine to do chemical analysis of a plating solution using titration and related projects.
- 1989** **Varian Ion Implant Systems, Inc.**
Development of a sub-system of an embedded operating system to support network communications over a SECS-II network for and ion-beam implanters used in the manufacturing of integrated circuits.
- 1989** **Varian Ion Implant Systems, Inc.**
Development environment and real time operating system for use in ion-beam implanters used in the manufacturing of integrated circuits. Included **Forth kernel, mass storage, source code editor, interrupt handlers, meta compiler**, as well as many extensions and tools.
- 1988 thru 1989** **TERC, Inc**
Serial communications.
- 1988** **Prentice Associates**
Printer hardware design and printer driver development.
- 1987** **Vee-Arc, Inc.**
Real time operating system of a **microcontroller** based **(8097) industrial motor control system**. Including interrupt routines, multitasking, user interface, I/O systems, as well as development tools and **switching power supply design**.

1987 thru 1988 **Aeonic Systems, Inc.**

Real time control interfaces to connect various industrial controllers to an **Ethernet**-based computer integrated manufacturing system. Includes protocol conversions, error handling, bi-directional communications, etc.

Estabrook Digital Graphics, Inc.

Printer/Print Head Development System. Hardware and software to support R&D efforts in the impact printing field. Software included both machine control systems and applications such as font generators, graphics, and test programs.

Previous Experience:

Analog Design Engineer, General Electric (aero. instrumentation division), Wilmington MA 1982-1983

Analog design engineer for the Engine Instrumentation Sub-system for B-1B bomber.

Design Engineer, Flick Inc., Cambridge MA 1981-1982

Circuit design for xenon marker flashers including power supply and flasher circuitry.

Research Associate, Sperry Research Center, Sudbury MA 1975-1981

Hardware design engineer designing **telemetry systems**, and **communications** equipment use in geothermal wells and well drilling operations. These instruments pushed the state of the art in telemetry systems for adverse environments, including very **high temperatures, high vibration and highly corrosive environments**. These designs involved signal measurement, analog signal processing, analog/digital interfacing and multiplexing, precision calibration, displays and controls, RF and acoustic transmission, device qualification and testing. Was responsible for the design, construction, testing and documentation for these instruments.

Electronic Technician, Advent Corp., Cambridge MA 1972-1975

Junior design engineer on consumer audio electronics, amplifiers, FM receivers, cassette tape pickup head electronics, internal test equipment, etc.

Electronic Technician, Audiosonics, Arlington MA 1970-1972

Repair & maintenance of consumer audio equipment

Education: Northeastern University (Electrical Engineering), Boston MA 1969-1970

Patents: US #4,282,588, "Resonant Acoustic Transducer and Driver System for a Well Drilling String Communication System", Issued to G. Chanson and A. M. Nicolson and assigned to Sperry Corporation

Awards: Microsoft **Most Valuable Professional** for Windows SDK support from 2002 to present.

Other: Chairman of Boston Forth Interest Group. This group is dedicated to supporting the Forth programming language and local Forth programmers.

A selection of programs I've written are available for download at
<http://www.mvps.org/ArcaneIncantations/programs.htm>

References available on request.