

Gary Chanson
Software/Hardware Consultant
Ayer, MA 01432
Telephone: +1 978 772 9627
Cell: +1 617 447 1697
Email: gchanson@mvps.org

Summary: Software and Hardware Engineer with over 20 years experience in:

- **Embedded Systems**
- **Real-Time device control**
- **Windows** development and internals
- **Software Tool** development for **Windows, DOS**, and other operating systems
- **Real-Time** industrial process control
- Serial **data communications** (RS-232, terminal emulation, etc.)
- **Microcontrollers** and **single-board computers**
- **Radio** communication and **telemetry** systems
- Analog Circuit Design
- Switching Power Supplies
- Linear Power Supplies

Languages:

- **C/C++**
- **Forth**
- **Assembly** (80x86, Arm7, 8097, 6502, 6303, Hitachi H8, 680x0, Z-80, VAX)

Highlights of Clients and Projects:

Active and successful contract software and hardware consultant/developer specializing in embedded systems, real-time control, development tools, and Windows 95/98/NT development and internals, and electronic circuit design.

Clients:

- 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)
- Bose Corporation

Bose Corporation

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.

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).

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.

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.

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.

Xillix

Technical planning consultation for a project to build a special purpose endoscope to sketch out a C++ framework for software development.

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**.

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**.

Varian Associates (Vacuum System)

Programming of an HP-48G for use as a remote controller for a high vacuum system in HP **RPL** language.

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**.

Osram Sylvania

Programming of a production automation system which produces light bulbs.

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.

Varian Associates (Vacuum System)

Programming of an HP-48G for use as a remote controller for a high vacuum system in HP **RPL** language.

Megapulse, Inc.

Modifications and improvements to the Lordac signal analyzer instrument.

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.

Capcoitol Tool and Manufacturing

Technical program planning consultation and development for an automated metal cutting machine..

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. This program was written in **Forth**.

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.

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.

Cambridge Software Project

Development of an automated telephone data collection device. This program was written in **Forth**.

Metalspray

Development of a data logger based on a Triangle Digital Systems **Forth single board computer**.

Aurora Technologies

Development of several diagnostic programs for I/O boards for Sun workstations, written in **Unix Open Boot**.

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

Conmed

Development of a data logger based on a Triangle Digital Systems **Forth single board computer**.

FCIAFiberChem

Development of a decompiler for programs written for the Triangle Digital Systems **Forth single board computer**.

Sensitech

Development of a tester for temperature detectors based on a Triangle Digital Systems **Forth single board computer**

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 a Triangle Digital Systems **Forth single board computer**.

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. The program ran on a Triangle Digital Systems **Forth single board computer**.

Feedback

Development of a hand-held device for taking surveys running on a Triangle Digital Systems **Forth single board computer**.

Don Schroeder

Environmental controller for a greenhouse using a Triangle Digital Systems **Forth single board computer**.

Shibley

Firmware development for an environmental controller. This program ran on a Triangle Digital Systems **Forth single board computer**.

Shibley

Firmware development for a Wafer Processor which moves a silicon wafer between various chemical baths using stepper motors and a vacuum lift assembly.

Shibley

Firmware development for a machine to do chemical analysis of a plating solution using titration. This program was written for a Triangle Digital Systems **Forth single board computer**.

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. This system was written in **Forth** to run on the development system I created for Varian in an earlier project.

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.

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**. This program was written for their proprietary **8080 (CP/M) Forth** system.

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. These programs ran on their proprietary **PDP-11 Forth** system

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.

Employment History:

Consulting Engineer, 1983-present

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
is available for download at
<http://ArcaneIncantations.mvps.org/programs.htm>

References available on request.