

Jody Ono

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Professional Experience

[DMF Lighting](#)

December 2022 to Present

PRINCIPAL FIRMWARE ENGINEER

CARSON, CA

- Involved in all aspects of embedded lighting control
- Embedded H/W & F/W design with:
 - STM32 (STM32CubeIDE)
 - NXP LPC824, LPC845 (MCUXpresso)
 - Renesas RA6M2 (e² Studio)
 - Espressif ESP32-WROOM-32E (Arduino)
 - Altium Designer
- DALI & DMX512 firmware development in C
- Win32/64 application development in C++
- NFC/RFID integration & app development
- Bare-metal & FreeRTOS implementations
- DMX gateway/device firmware design & debug
- SVN source code control
- MantisBT bug tracking
- H/W & F/W debug using ST-Link, NXP MCU-Link, Segger J-Link, scopes, logic analyzers and PCB rework when necessary
- Coordination with remote firmware development teams

[FrontRow Calypso LLC](#)

April 2015 to November 2022

PRINCIPAL SOFTWARE ENGINEER

PETALUMA, CA

- Designed and developed networked classroom A/V communication platforms based on ARM Cortex:
 - STM32
 - i.MX6
 - PSoC 4/5/6
 - ATSAM
 - OMAPL137
 - TMS320C6000 DSP (with and without DSP/BIOS)
 - dsPIC33
 - MSP430
 - STM8
- Bare-metal
- RTOS
- Embedded Linux
- HW/FW design included:
 - Firmware update
 - IR and DECT communication (SC14441)
 - Audio streaming
 - Ethernet/Wi-Fi
 - Embedded web servers
 - I²C
 - SPI
 - I²S
 - USB
 - RS-232

- Bluetooth (CSR8635)
- BLE/Thread (nRF52840)
- Developed enhancements and bug fixes for Windows control application in Delphi XE7
- All firmware development in C/C++ using:
 - STM32CubeIDE
 - STM32CubeMX
 - Cypress PSoC Creator
 - IAR Embedded Workbench
 - TI Code Composer Studio
 - Microchip MPLAB
 - gcc or other cross-compilers
 - Code debug with JTAG/SWD using:
 - ST-Link
 - J-Link
 - Spectrum Digital XDS
 - PICKit
 - Other in-circuit debuggers
- Windows test applications written in C++ using Embarcadero RAD Studio Berlin, Tokyo, and Sydney
- Build utilities written in C/C++, C#, PowerShell
- Test fixture code written in C/C++ for Arduino targets and C# (VS2017) for Windows 10 targets
- Source code control via SVN, Git
- Hardware skills include:
 - Schematic capture
 - Board bring-up and debug
 - Fine-pitch board repair and modification
- Test tools include:
 - Scopes
 - Logic analyzers
 - WireShark
 - Microscopes
 - Full solder rework, including hot-air
 - Toaster-oven reflow

[Aldetec, Inc.](#)

FIRMWARE CONSULTANT

October 2014 to April 2024

SACRAMENTO, CA

- Developed embedded firmware in C for ARM Cortex-M4 and Atmel AVR-based microwave amplifier control electronics
- Tool chain included:
 - gcc, Visual Studio Code, SEGGER J-Link
 - CodeVisionAVR C Compiler
 - Atmel JTAGICEmk-II
 - Tortoise SVN
 - Altium Designer
- Involved in hardware & firmware design of space-qualified RF equipment, from schematic capture to client design reviews

Wind Harvest International
EMBEDDED SYSTEMS CONSULTANT

January 2022 to May 2022
DAVIS, CA

- Created updated PLC firmware for latest wind turbine prototype hardware
- Specified, procured, setup remote computing/control platforms
- Deployed and debugged software and firmware remotely

Synapse Product Development
FIRMWARE ENGINEER

January 2022 to May 2022
SEATTLE, WA

- Developed interface and CLI code in C/C++ for Nordic nRF52840 Zigbee dongles on an embedded Linux product platform
- Wrote driver and CLI code in C for Analog Devices AD7147 capacitive touch controllers on an STM32H7-based bare-metal platform

Lorom Cable and System Design
CONSULTANT

June 2016 to February 2017
MORRISVILLE, NC

- Created microcontroller firmware in C for various Microchip MCU-based QSFP cable products

RGB Spectrum, Inc.
CONSULTANT

May 2016 to November 2016
ALAMEDA, CA

- Developed QV2Synergy Windows application to translate QuadView layout information to Synergy screen configuration on-demand
- All code written in C++ using Embarcadero RAD Studio 10.1 Berlin

Owlized, Inc.
CONSULTANT

August 2014 to December 2015
SAN LEANDRO, CA

- Developed embedded firmware in C and C++ for PIC and Arduino platforms with Bluetooth connectivity

Springer Design, Inc.
CONSULTANT

July 2014 to May 2015
DUBLIN, CA

- Developed embedded firmware in C++ for ARM Cortex M4-based patient monitoring device
- Target platform was Freescale Kinetis K70 running MQX 4.x and PEG+ embedded GUI
- Tool chain included CodeWarrior 10.6, P&E Micro Tracelink, Tortoise SVN

Flip Technologies, Inc.
CONSULTANT

June 2014 to January 2017
SAN FRANCISCO, CA

- Developed embedded firmware in C for ARM-based medical imaging products
- Target platform was embedded Linux on AT91S MCU
- Development environment was Ubuntu 14.04 LTS x64
- Modified Atmel SAM-BA tool for custom development hardware
- Modified bootloader and Linux kernel
- Tool chain included gcc, make, git, ARM cross-development tools

[FrontRow Calypso LLC.](#)

CONSULTANT

October 2013 to May 2014

PETALUMA, CA

- Developed embedded firmware in C, assembly language, and JavaScript for networked classroom A/V communication products
- dsPIC33 MCU
- HW/FW design and debug for:
 - Audio codecs
 - HDMI MUX/switches and repeaters
 - HDBaseT converters
 - Analog telephony control
 - Ethernet and embedded web servers
- Tool chain included:
 - MPLAB C30/ASM30
 - MPLAB IDE
 - MPLAB ICD3
 - Tortoise SVN
 - WireShark
 - Scopes
 - Logic analyzers

[Bramson Welch & Associates, Inc.](#)

CONSULTANT

September 2011 to March 2014

EMERYVILLE, CA

- Developed embedded firmware in C (ARM, PIC, μ C/OS-II)
- Developed Windows test software in C++ for medical and consumer devices
- Tool chain included:
 - IAR Systems EWARM
 - Segger J-Link
 - MPLAB IDE
 - MPLAB ICD
 - Microsoft Visual Studio
 - Tortoise SVN

[Wind Harvest International](#)

CONSULTANT

May 2012 to January 2013

DAVIS, CA

- Co-designed wind generation control system
- Wrote firmware for Triangle Research FMD88-10 PLC
- Created Win32 application (C++, RAD Studio XE2) and JavaScript for remote monitoring and control

[Lakewood Instruments](#)

CONSULTANT

August 2008 to November 2012

MILWAUKEE, WI

- Embedded firmware development in C for Atmel AVR-based industrial control products
- Tool chain included:
 - ImageCraft ICCV6 C Compiler
 - Atmel AVR Studio
 - Atmel ICE50 emulator
 - Atmel STK500 development system
 - Microsoft Visual SourceSafe

Pix2o Corporation

CONSULTANT

October 2011 to March 2012

ROHNERT PARK, CA

- o Developed embedded firmware in C for TI Stellaris ARM
- o Developed utilities in C++ (Windows) for large-scale video LED products
- o Tool chain included:
 - TI Code Composer Studio 5
 - Embarcadero RAD Studio XE2
 - Tortoise SVN

Atmel Corporation (now Microchip)

CONSULTANT

September 2011 to October 2011

SAN JOSE, CA

- Developed embedded firmware in C (PIC)
- Windows application software
- USB drivers in C++ for LED controller IC's
- Tool chain included:
 - o Microchip MPLAB C
 - o ICD 2
 - o Borland Developer Studio 2006
 - o Microsoft Visual SourceSafe

National Semiconductor (now Texas Instruments)

CONSULTANT

June 2011 to November 2011

SANTA CLARA, CA

- Developed Atmel XMEGA embedded firmware in C for low-power mobile devices
- Created Windows test harness application in C++ to exercise Bluetooth OTA and all other functions of target
- Tool chain included:
 - o Atmel AVR Studio 4
 - o JTAGICE mkII
 - o Embarcadero C++ Builder 2010
 - o Microsoft Visual SourceSafe

Layered Intelligence Corporation

CONSULTANT

February 2011 to March 2011

MILL VALLEY, CA

- Developed embedded firmware (in C) for ARM Cortex-M4 image processing prototype on Freescale Kinetis K60 tower platform
- Developed message processing for Ethernet communication with target
- Windows test software written in Borland C++ Builder 2010
- Embedded tool chain included:
 - o Freescale MQX
 - o IAR Systems EWARM development system

mSilica, Inc. (acquired by Atmel)

CONSULTANT

July 2007 to January 2011

SANTA CLARA, CA

- Firmware, driver, and software design for custom integrated circuits
- Developed USB/I²C firmware in C for PIC18F4550, PIC18F2455, and ATmega88 using:
 - o MCC18 C compiler
 - o MPLAB IDE
 - o ICD 2 debugger
 - o CodeVision AVR
 - o JTAGICE mkII
- Developed Win32 application software and USB driver in C++ for Windows XP & Vista platforms using Borland Developer Studio 2006 and assorted third-party VCL components
- Source code control with Microsoft Visual SourceSafe

Orchard-Rite Ltd, Inc.

CONSULTANT

October 2009 to November 2009

YAKIMA, WA

- Embedded C/C++ firmware development for Atmel AVR32-based RF mesh network products
- Tool chain included:
 - IAR Embedded Workbench
 - Atmel JTAGICE mkII

Schilling Robotics LLC

CONSULTANT

January 2008 to April 2008

DAVIS, CA

- Developed firmware for TMS320DM642-based HD video link for deep-sea Remote Operated Vehicle (ROV)
- Tool chain included:
 - TI Code Composer Studio
 - Spectrum Digital XDS510 USB emulator

Innovative Imaging, Inc. (acquired by [Ellex](#))

CONSULTANT

April 2005 to November 2007

SACRAMENTO, CA

- Lead developer of Win32 software for medical ultrasound imaging product based on Windows XP Embedded platform with kernel agent device driver extensions (DriverX) for real-time control of imaging hardware
- Development environment was Borland C++ Builder 6 Professional with assorted third-party VCL components
- Product features included:
 - Real-time imaging
 - Self-contained database
 - Archive to CD/DVD media
 - Export to various image file formats
 - Internet-based software updating
 - Encrypted license/feature control

Thoratec Corporation (acquired by [Abbott](#))

CONSULTANT

August 2006 to February 2007

PLEASANTON, CA

- Atmel AVR firmware development for various Ventricular Assist (VA) devices and accessories

EMIT Technologies LLC

CONSULTANT

January 2007 to February 2007

SEATTLE, WA

- Atmel ATmega128 firmware designed with CodeVisionAVR
- CPLD design (VHDL) and NIOS II code development using Altera Quartus II for advanced microwave technology products

Schilling Robotics LLC

CONSULTANT

September 2005 to October 2005

DAVIS, CA

- Created firmware for Freescale MC9S12NE64 to control various peripherals via I²C as part of telemetry system
- Developed bit-banged I²C drivers and interface code for Small Form-Factor Pluggable (SFP) devices
- All code cross-developed in C using CodeWarrior on Windows platform

Sound Metrics Corp.

CONSULTANT

March 2005 to April 2005

LAKE FOREST, WA

- Provided tool support for serial communication library and Watcom development environment

Innovative Imaging, Inc. (acquired by [Ellex](#))

June 2003 to September 2004

CONSULTANT

SACRAMENTO, CA

- Assisted in object-oriented Win32 software development for medical ultrasound imaging product based on embedded Pentium III-class PC running Windows 2000 or XP Embedded and various real-time extensions (WinRT)
- Development environment was C++ in Visual Studio .NET 2003 and Borland C++ Builder 6 Pro
- Developed DirectX 9 and GDI-based real-time graphics display code for A-mode and B-mode scanning displays

[Baldwin Environmental, Inc.](#) (now Perma Pure)

October 2002 to January 2004

CONSULTANT

RENO, NV

- Xilinx CPLD design
- Hardware debug
- Atmel AVR-based firmware development for sample conditioner product
- Features included:
 - Multi-channel data acquisition
 - PWM
 - Calibration
 - PID thermal control
- Onboard resources included:
 - External static RAM
 - Serial (SPI) FLASH
 - 16x2 LCD
 - RS-232
- Design incorporated:
 - Atmel ATmega128 microcontroller
 - Crystal Semiconductor CS8900A Ethernet PHY for embedded browser interface
- Code developed in C using:
 - CodeVision AVR
 - PR_RTX real-time kernel
 - JTAG ICE debugging

NovaLynx Corporation

August 2002 to Jan 2003

CONSULTANT

AUBURN, CA

- Hardware debug and Atmel AVR-based firmware development for wind speed and temperature monitoring
- Product uses Atmel ATmega16 microcontroller with NTC thermistor and included:
 - Hyundai or Seiko 16x2 LCD
 - RS-232 debug
- Code developed in C using CodeVision AVR and PR_RTX real-time kernel

Biomechanical Consultants of California

July 2002 to August 2002

CONSULTANT

DAVIS, CA

- Created LabWindows/CVI real-time data acquisition software for Windows with:
 - Single-shot, triggered waveform acquisition on multiple channels
 - Stream-to-disk capabilities
- Application was targeted for handheld PC running Windows 98

HydroLynx Systems, Inc.

CONSULTANT

January 2002 to January 2004

WEST SACRAMENTO, CA

- Microcontroller firmware development
- Hardware design and debug for remote sensing and RF repeater products based on Microchip Technology PIC MCU's (PIC12C508, PIC16C65B, PIC16x73, PIC16F874)
- Code developed in C using CCS PICC under Windows
- Extensive use of I²C, tone decoding and encoding
- Maintained ToolBox Windows application (Visual C++)
- Created Borland C++ Builder 6 application for scheduled dialup and data retrieval from remote sensing stations

California Primate Research Center

CONSULTANT

June 2001 to September 2002

UNIVERSITY OF CALIFORNIA, DAVIS

- Developed NIH CORTEX code for stimulus presentation and coding with awake behaving primates
- Developed CED Spike2 scripts for data analysis
- Designed and constructed reward delivery control electronics
- Built CORTEX-to-CED digital interface cable and wrote corresponding event code processing scripts
- Miscellaneous computer/electronics problem-solving

Loctronics, Inc.

CONSULTANT

July 2001 to December 2001

RANCHO CORDOVA, CA

- Developed C/assembly language firmware
- Corrected hardware design for embedded RFID automotive security product based on Mitsubishi 37531 microcontroller and Temic/Atmel transponder IC
- Used IAR Embedded Workbench development environment with Mitsubishi PC4701M emulator
- Wrote Win32 application for RFID programming using Borland C++ Builder to interface with third-party ActiveX/OCX object

Indivos Corporation

CONSULTANT

June 2001 to September 2001

OAKLAND, CA

- Assisted in hardware redesign of Hitachi SH7750 CPU board for biometric point-of-sale terminal system
- Ported startup firmware, flash programming code, ThreadX kernel to SH4 target using:
 - Green Hills Software MULTI 2000 C++/C/assembly language development environment
 - Hitachi E10A JTAG ICE under Windows 2000
- Wrote I²C code for communication between SH4 master and PIC18C252 slave. PIC development with CCS PCWH C compiler and EPIC programmer
- Assisted in schematic and CPLD design for embedded USB host controller board based on ScanLogic IC
- Hardware design tools included Protel 99 SE and Xilinx Foundation

Center for Neuroscience

CONSULTANT

November 2000 to June 2001

UNIVERSITY OF CALIFORNIA, DAVIS

- Developed digital audio stimulus presentation software using:
 - Tucker-Davis Technologies hardware
 - ActiveX interface/control components
 - Borland C++ Builder
 - TurboPower Orpheus and SysTools
- System was used with awake, behaving primates

TrueTime, Inc.

CONSULTANT

April 2000 to June 2000

SANTA ROSA, CA

- Developed Windows diagnostic/demonstration utility application for PCI-bus precision synchronized time code generator using Microsoft Visual C++ 6.0

Giga-tronics, Inc.

CONSULTANT

July 1999 to August 2000

PLEASANTON, CA

- Developed embedded C/C++ code for IEEE-488 native mode and SCPI commands for a MC68340-based microwave test instrument running Nucleus RTOS
- Target code cross-compiled using Diab Data D-C++ and pre-tested/simulated using Borland C++
- Embedded development tools included:
 - EST visionICE Background Mode Debugger
 - visionClick software
- Wrote Windows C++ application for firmware upgrades via RS-232 using Borland C++ Builder and TurboPower AsyncPro communications library

Center for Neuroscience

CONSULTANT

November 1997 to September 2000

UNIVERSITY OF CALIFORNIA, DAVIS

- Responsible for design and implementation of trial-based stimulus sequencing and data acquisition software/hardware for use in the research of neuronal mechanisms involved in visual pattern recognition.
- Typical system requirements included:
 - Real-time control better than 1ms
 - Frame-accurate, refresh-aligned video display dynamics
 - Timing accuracy to 1ms
 - TCP and digital communications control
- Development tools included:
 - National Instruments LabWindows/CVI
 - Microsoft Visual C++
 - Borland C++ Builder
 - TurboPower Async Professional
 - DirectX 7
 - Visual SourceSafe
- Developed real-time kernel-level driver for PCI data acquisition card using:
 - NuMega Driver::Agent
 - SoftICE
 - VToolsD
- Developed 64-channel data acquisition software featuring:
 - Real-time display
 - Stream-to-disk
 - Programmable triggering
 - Sync statistics collection
 - Remote TCP control

Folsom Research, Inc. (acquired by [Barco](#))

CONSULTANT

June 1997 to August 1998

RANCHO CORDOVA, CA

- Assisted development of Windows application in Borland C++ Builder with TurboPower Async Professional library for Radar Remoting & Tracking System (RRTS)
- Product communicates via RS-232 links with multiple radars and video scan converter to track, display, and log maritime vessel movement in real-time on Windows NT 4.0 workstation PC's
- Other features included user-defined zones, lines, reference points, history trails, video remoting, remote control

Advanced Mobile Solutions, Inc.

CONSULTANT

July 1998 to January 1999

MORAGA, CA

- Developed PC-based manufacturing test fixtures with statistical process control for cellular telephone accessories
- Test equipment was controlled via IEEE-488 GPIB using National Instruments LabWindows/CVI
- Other development tools included Borland C++ Builder, SPSS QI Analyst

Duncan Technologies, Inc.

CONSULTANT

December 1997 to June 1998

AUBURN, CA

- Completed development on production version of Flight Absorption System (FAS), including firmware for Motorola MC68360 QUICC and Intel 28F016SV flash memory devices
- Code was developed using the Microtec MCC68K C Compiler and corresponding assembler/linker/librarian in conjunction with EST visionICE for 68K Background Debug Mode (BDM) emulator
- Corresponding Windows applications for control and data conversion were written using National Instruments LabWindows/CVI and Borland C++ Builder
- Developed Windows stereo image viewing software for use with LCD shutter goggles
- Application flips two images at the vertical refresh frequency of the target monitor
- Development tools included Microsoft Visual C++, MFC, Borland C++ Builder, DirectDraw 5

Integrated Surgical Systems

CONSULTANT

February 1998, April 1998 to May 1998

SACRAMENTO, CA

- Debugged SCSI tape driver functions for use in protected-mode DOS with Watcom C/C++ 11.0 and DOS/4GW DPMI extender
- Began development of Windows NT case manager application for surgical planning station using Borland C++ Builder

Expert Microsystems, Inc.

CONSULTANT

March 1997 to May 1998

ORANGEVALE, CA

- Designed embedded firmware/logic for 8051-based Hydrogen Detection System (HDS) on a 6U VME board featuring multi-channel data acquisition and control, PID sensor temperature regulation, RS-232 and VMEbus communication paths
- The RS-232 link includes both packet and text-terminal modes of operation at 19200 bps
- VMEbus communication is achieved using a dual-ported RAM messaging protocol
- All code development for the 8051 was performed in C using the Keil Software Development System
- Used ISP Synario 5.0 to enhance existing Lattice ispLSI-1032 programmable logic design to support on-board EEPROM programming and provide hardware PWM channels

Calimetrics, Inc.

CONSULTANT

June 1997 to October 1997

EMERYVILLE, CA

- Developed Windows application (ComBlaster) using Microsoft Visual C++ & MFC to transmit command files to test equipment via RS-232 port

Duncan Technologies, Inc.

CONSULTANT

September 1996 to September 1997

AUBURN, CA

- Designed and developed firmware for 80C196KC-based laser igniter subsystem in C and assembly language using BSO Tasking development system
- Designed host/slave communications protocol
- Subsystem monitors several temperature and pressure sensors via A/D converter and controls various valves and switches via digital I/O
- Developed software for prototype Flight Absorption System (FAS), a spectral absorption measurement system that samples multiple optical sensors and stores data in nonvolatile memory
- The prototype target uses PC/104 components with software written in Watcom C/C++ 11.0 and utilizes the Greenleaf CommLib 5.2 communications library running under DOS
- An accompanying LabWindows/CVI application module was also developed to control the the FAS via a 57600 bps RS-232 link, providing real-time data monitoring and XModem-1K file transfer. Designed, developed, and debugged the communications protocol
- Created a Windows application (FAS Data Converter) using Borland C++ Builder to convert spectral data files to comma-delimited ASCII text files

MedaSonics, Inc. (acquired by [CooperSurgical](#))

CONSULTANT

March 1995 to March 1997

FREMONT, CA

- Designed microcontroller hardware and software for back-end of Doppler fetal stethoscope device (firstBeat)
- The battery-powered product uses a Microchip Technology PIC16C73 microcontroller to determine/display heart rate and control audio output circuit
- Estimated heart rate is displayed on an LCD that is controlled via I²C bus
- Firmware development was performed in C and assembly language using the Byte Craft Limited PIC Code Development System
- Developed Doppler sensitivity test fixture software for use with PC-controlled data acquisition/motion control system using Watcom C/C++ with 32-bit DPPI extender and MetaWINDOW graphics library (for event-driven GUI)
- Developed security and compression software for trans-cranial Doppler system based on embedded PC platform
- Modified existing product software written in Zortech C++ for execution under US Software's MultiTask! real-time kernel with DOS extender

Folsom Research, Inc. (acquired by [Barco](#))

CONSULTANT

March 1995 to June 1996

FOLSOM, CA

- Developed firmware for VMEbus 680x0 and 68340-based radar products in C and assembly language with SDS Cross-Development System
- Typical firmware functions include power-up diagnostics, RS-232 user command processing, dual-port RAM-based inter-processor communication, radar vector interrupt processing
- Developed protected-mode PC-based test fixtures for acquiring and displaying radar test data using SBS Bit 3 PCI-VME bus adaptor, Metagraphics MetaWINDOW graphics library, and Watcom C32 with 32-bit DPPI extender
- MetaWindows library used to create event-driven GUI
- Developed Windows-based test software for production board and system tests

EndoSonics Corp.

CONSULTANT

September 1993 to March 1995

RANCHO CORDOVA, CA

- Developed system software and peripheral firmware for intravascular ultrasound imaging systems
- Host systems based on MC680x0 CPU in a 9U VMEbus backplane running OS-9
- Designed bit-mapped icons and logo for graphics display subsystem based on TMS34020
- Developed hardware diagnostics tools for manufacturing and field service
- Designed embedded software upgrade subsystem
- Designed and implemented 80C51 and MC680x0 firmware (C, assembly language) for patient interface module (PIM) that communicates with host and catheter-mounted Dallas DS2502 Add-only serial PROM IC
- Modified 80C51 and 80C550 hardware and firmware (C, assembly language) for enhanced Patient Interface Module Controller (PIC) and User Interface Controller (UIC)
- Implemented software-based log compression and grayscale enhancement tools

Aspect Electronics, Inc.

CONSULTANT

May 1993 to May 1994

AUBURN, CA

- Developed video image acquisition module for capturing, displaying, and storing real-time medical ultrasound images in modified TIFF format
- Designed video signal interface board for IBM PC bus and remote switches (using Tango Schematic)
- Product was comprised of:
 - 80x86 motherboard with 8 MB RAM
 - Commercial 24-bit video frame-grabber board
 - Cine-loop memory card
 - Video signal interface board
 - Ethernet network interface card
 - 3.5" SCSI magneto-optical disk drive
 - 345 MB IDE hard disk
 - Remote keypad and switches
- Assisted in implementation of DICOM protocol for transmission of image data from acquisition module to various Ethernet servers
- Wrote protected-mode-to-real-mode hooks to ASPI (Advanced SCSI Programming Interface) driver
- All software was written in Borland C and Watcom C32 with protected-mode multitasking extensions (US Software MultiTask!) and DOS/4GW 32-bit DOS extender

EndoSonics Corp. (acquired by Volcano Corp & Philips)

CONSULTANT

December 1992 to February 1993

RANCHO CORDOVA, CA

- Developed 8051 assembly language firmware for User Interface Controller (UIC) of ultrasonic scanned-image catheter system
- The UIC receives and routes user inputs from keyboard, function keys, and trackball
- Designed and documented message protocol for communication with 68000 VME Host via dual-port RAM
- Designed and documented message protocol for RS-232 communication with Front End/Patient Interface Module (FE/PIM)

VeriFone, Inc.

CONSULTANT

June 1990 to June 1992

GEMSTONE DIVISION, AUBURN, CA

- Designed hardware (using OrCAD SDT, PLD) and software (all firmware, O/S drivers, test applications, font utilities) for intelligent vacuum fluorescent display (VFD) peripherals based on MC6805 & MC68000 processors for the Gemstone POS product line
- Designed interprocessor communication protocol using Motorola's Serial Peripheral Interface (SPI)
- Designed discrete SPI hardware for use with various host processors
- Developed device drivers in Lattice C and assembly language for MC68302 Serial Communication Controller subsystem
- Developed I/O manager subsystem for Kodak AMX-based realtime operating system
- Created various cross-development utilities in Borland C
- Developed bank-switched ROM/RAM firmware kernel and application programming interface in C and assembly language for MNP3 modem peripheral based on Zilog Z84C15 to support downloadable code modules

Life Measurement Instruments, Inc.

CONSULTANT

July 1991 to August 1991

DAVIS, CA

- Designed 16-bit, IBM PC ISA bus-compatible add-in board (using OrCAD SDT, PLD) for data acquisition and control as part of a body plethysmography system (The Bod Pod)
- The 3/4-length card uses all-CMOS circuitry and features eight channels of 12-bit A/D with selectable feedback loops, eight channels of 16-bit D/A, sixteen channels of digital I/O, and three timer/counters
- Wrote software driver functions in Borland C to control all on-board resources

H.W. Theller, Inc.

CONSULTANT

November 1990 to May 1991

PETALUMA, CA

- Designed and implemented time-division multiplexed software subsystem in Microsoft C and assembly language to control heated dies and allow programmable data acquisition in real-time for IBM PC-controlled heat sealer
- Provided proportional-integral-derivative (PID) temperature control at a set frequency with discretely adjustable load cell sampling rate
- Cleaned-up and enhanced existing graphics display routines

Sunrise Medical Quickie Designs

CONSULTANT

December 1990 to January 1991

FRESNO, CA

- Designed controller board (using Tango Schematic) for intelligent wheelchair motor control system based on 80C51-derivative microcontroller (Signetics 8xC552)
- Constructed, tested, and debugged prototype hardware, developed startup, basic control, and data acquisition firmware (Franklin C, assembly language), and assisted in integration with analog control components

UCDMC Pulmonary Services Laboratory

CONSULTANT

July 1984 to May 1990

SACRAMENTO, CA

- Designed and implemented a comprehensive on-line blood gas laboratory data management system written in Microsoft QuickBASIC 3.0 and assembly language on an enhanced IBM PC running multi-user, multitasking operating system and Novell Btrieve
- Features include data acquisition, diagnostic interpretations, instrumentation quality control, automated billing and archiving, laboratory information system interface
- Provided full set of design documentation for all software modules

Loredan Biomedical, Inc.

SOFTWARE ENGINEER

August 1987 to August 1989

DAVIS, CA

- Developed real-time software in Pascal, C, and assembly language for microprocessor-controlled physical therapy products
- Specific responsibilities included all firmware/software related to data acquisition and control of robotic electromechanical assembly by embedded, single-board STD-BUS x86 computer communicating with IBM PC host system
- Developed various real-time graphics display strategies for PC-based user interfaces
- Developed manufacturing and field service diagnostic software for testing and troubleshooting to component level

General Electric Medical Systems

CONSULTANT

April 1987 to August 1987

RANCHO CORDOVA, CA

- Ported and modified Motorola's VME-117 Debug Monitor (assembly language) for use in real-time, multitasking, multiprocessor, MC68010-based diagnostic ultrasound imaging system operating under VRTX
- Member of hardware diagnostics group responsible for system power-up and performance diagnostic software (C, assembly language)

Atkinson System Technologies Co.

SOFTWARE ENGINEER II

August 1986 to March 1987

SACRAMENTO, CA

- Developed real-time assembly language firmware for Z80-based multitasking, multiprocessor, industrial mobile telecommunication systems
- Assisted in the design and implementation of an RF-based, automatic vehicle location system using a proprietary real-time executive

EMS Software

CONSULTANT

August 1984 to March 1994

PLEASANT GROVE, CA

- Developed custom agricultural land leveling software for personal computers
- Responsibilities included a full rewrite of product to incorporate full VGA graphical user interface (GUI) using Microsoft BASIC PDS 7.1 and various third-party graphics libraries
- The product, PC Leveler, features enhanced field design entry with mouse control, on-screen cut/fill maps and design results, 2-D contour maps, 3-D surface plots, context-sensitive on-line help, and user-controlled configuration including user-defined printer definitions

Education

California State University Sacramento

November 1986

Master of Science, Biomedical Engineering

Sacramento, CA

- Thesis: A Prototype Microcomputer-based Arrhythmia Monitoring System

University of California Davis

June 1982

Bachelor of Science, Electrical & Computer Engineering

Davis, CA

- Area of specialization: Computers

Miscellaneous Technical Skills

- Analog and digital hardware design (using Altium, PADS, KiCad, DipTrace, OrCAD, Tango, Protel), prototype development, debugging
- Programmable-logic (CPLD/FPGA) design (using Xilinx, Altera, Lattice) in VHDL
- Hardware debugging with JTAG/BDM debuggers (Segger, IAR, ST-Link, MCU-Link), in-circuit emulators (EST, ZAX, American Arium, HMI, Nohau, Orion, Applied Microsystems), logic analyzers (HP, American Arium, Orion, Pod-A-Lyzer), scopes (HP, Tektronix), and other cross-development tools
- Embedded microprocessor software development with STM32CubeIDE, STM32CubeMX, PSoC Creator, IAR EWARM, TI Code Composer Studio with DSP/BIOS, Atmel Studio, Microchip MPLAB, Keil MicroVision, NXP MCUXpresso, Renesas e² studio
- Fluent in the following languages:
C/C++, C# (Borland/Embarcadero, Microsoft/MFC, Watcom), Assembly Language, Pascal, FORTRAN, BASIC, LISP, FORTH, Delphi, LabWindows/CVI
- Experienced with source code control systems such as SVN, Git, SCCS, PVCS, Visual SourceSafe
- Design experience with the following microprocessor and microcontroller families:
ATSAMS70, STM32, STM8, Rockchip ARM Cortex, Freescale/NXP LPC82x/84x/55x06, OMAPL137, TMS320C6748, MSP430, Atmel AT91, AVR, Intel x86, Hitachi SH4, ColdFire MCF5206e, MC680x0, MC68302, MC68340, MC68360, Z8, Z80, 8080, 8051 & derivatives, 8xC196, M6805, 6502, dsPIC33, PIC16C6x, PIC16C73/74, PIC16F87x, PIC18F4550, PIC18F2455, CY8C4200 family, CY8C52LP family, Renesas RA6M2, Espressif ESP32
- Real-mode and protected-mode programming for real-time x86 applications