WILLIAM J. BIESSMAN

William J. Biessman
4376 Liverpool Court
Denver, Colorado 80249
303-596-8124
bill@biessman.com
http://resume.biessman.com

SUMMARY: Over 25 years engineering system and software development experience, involving:

- Real-time communication software and system design, including CDMA wireless systems
- Embedded OS experience with VxWorks and pSOS, among others.
- Development under UNIX and various PC environments
- Microprocessor based system design (Intel 80x86 and Motorola 680x0, PowerPC)
- Object-Oriented design and device driver implementation
- Circuit design and interface development

EDUCATION: Bachelor of Science Degree in Electrical Engineering (Cum Laude),
New Jersey Institute of Technology, Newark, New Jersey, May 1988.

Associate Degree in Engineering, Electrical Engineering Technology (with High Honors),
Vermont Technical College, May 1979.

Additional Training:

- System Analysis and Design, with introduction to Object Oriented Design concepts
- Programming and Data Communications
- VxWorks Operating System and Tools
- Qualcomm CDMA system
- ARM Programming

HARDWARE:

Micros: Intel (8080, 8085, 8742, 8031, 8086/186/188); MC (6800, 680x0, 68332. PowerPC); Zilog Z80; ARM, Hitachi SH3-DSP, SH4; Atmel AVR, Qualcomm 8K/13K Cell Site Modem (CSM), Analog Devices Blackfin DSP

Busses/Interfaces: IEEE 488 GPIB, SCSI. JTAG, VME, PCI, MIL-STD-1553 USB

SOFTWARE:

Languages: C (extensive), C++, Korn-shell, Bash, PERL/Tk, HTML, FORTRAN, Forth, Ada, Informix SQL & ACE, assemblers (Intel 8080/8085, 8086/186/188, 8742, 80960; Z80; MC680x0,SH3-DSP,SH4)

OSs: UNIX, AIX, XINU, Linux, MS-DOS, DESQview 386, pSOS, CP/M, RTXC, VxWorks, VxWorks AE653, ARINC653, ThreadX, proprietary real-time kernels, Micro-Monitor

Comm: AT&T Operations Systems Alarm Surveillance Protocols: E2, E2A, TBOS, TABS, G2 (async), Datakit, X.25, T1, FDDI, CDMA (IS95), CDMA - PCS (J-008), IS95B, ISDN, SONET, TCP/IP, SNMP, Telnet, Ethernet MAC, ARP, ICMP, UDP, Sockets

Other: *Operations Support Systems:* SCOTS, TCAS, TASC, TMAS, TRANSVU, TRANSVU II, E3; *Configuration Management:* Sablime, Lucent nmake, GNU Revision Control System (RCS), Concurrent Versions System (CVS), Bugzilla, Microsoft SourceSafe, PVCS Dimensions *Tools:* XRAY+, PROBE+, Paradigm Debugger, Tornado, Apache, MySql, Cygwin, PowerPC JTAG Emulators, GNAT

EXPERIENCE:

4/2008 to Current: Consultant, Coast Temporary Services,
Phoenix, Arizona

On Assignmenwith Ascent Healthcare Solutions, Phoenix,Arizona
Reverse Engineering:

- Analyzed a medical device's internally stored data to determine the algorithm the manufacturer used to

prevent the device from being used more than once So that the original data could be restored, making the device look “new”

- designed several C, Perl, and Perl/TK programs to read, display and manipulate the stored data evaluated several methods to drive the momory's IIC interface from a Personal computer on the factory floor
- Designed a handheld instrument to read the device's memory in the hospital, so the data could be sent to the factoryThe base for the design was an AtmelIUSBKEY reference design with the AT90USB1287 single-chip processor
- Analyzed the implementation of a position detection sensor for a medical catheter for the purposes developing a factory functional testf or the devices.
- Designed test fixtures for analyzing the position sensor system.
- Reverse engineered the thre-channel Preamplifier board for the medical device for the purpose of developing requirements for interconnection with laboratory and factory instruments

2/2007 to 4/2008 Medical Leave

3/2006 to 1/2007: Consultant – Technisource, Kalamazoo, Michigan

On assignment with Smiths-Aerospace in Grand Rapids, Michigan, C-130 Aircraft Modernization Program and 7E7 Tanker programs

- Reverse-engineered a PC-basedsoftware tool(implemented in Microsoft C++) used to control a JTAG In-Circuit Emulator automatically with scripted commands.
- Created program documentation and a user manual required to satisfy DO178B certification reqirements for the coverage test tools
- Prototyped a Perl-TK replacement for the tool
- Analyzed crashes of the xworks AE653-based application The problem originated with an exception at the application level and caused a cascade of processor exceptions which corrupted kernel memory
- Developed core dump and analyses tools needed to support the failure analysis
- Assumed the support role for the structural coverage test scripts for the built-in –test (BIT)Feature
- Participated in the implementation of a software download Feature for the xworks AE653-based application
- Assisted others in various tasks related to BSP and Driver Development

8/2005 to 3/2006: Consultant – Tropaion, Mountainside, New Jersey

On assignment with Sarnoff Corporation on a Software-Defined Radio project.

Advanced a prototype system to implement a MAC bridge allowing Ethernet frame forwarding over the air.

- Reconstituted configuration management for the suspended project with CVS on Linux
- Selected software development tools to support changes
- Analyzed the current hardware C++/C ARM controller code, the C DSP code
- Studied the application for use in UAV and other battlefield applications

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- Designed a MAC layer state machine that compensated for errors over the air
- Optimized the ThreadX C++ ARM code to increase throughput
- Added a simple FLASH file system for storing operating parameters
- Multi-threaded the system to increase throughput
- Implemented an ARP Cache for both the Ethernet and RF interfaces to support bridging
- Implemented processing of incoming ARP messages from the Ethernet
- Implemented generation of ARP requests to support outbound frames
- Implemented processing of incoming IP messages from the Ethernet
- Implemented processing of incoming ICMP PING messages from the Ethernet
- Implemented forwarding from Ethernet to RF based upon contents of RF ARP Cache
- Implemented incoming UDP messages, provided a port subscription mechanism to support UDP sockets by threads
- Implemented PERL/Tk GUIs to support setting radio parameters from either Windows or Linux hosts
- Implemented radio log capture tool for both Windows and Linux over PCAP
- Ported MicroMonitor to the ARM radio platform
- ARM development with the aid of Green Hills compiler and JTAG emulator
- Analog Devices Blackfin ADSP-BF533 development with the aid of Analog Devices VisualDSP++ compilers and APEX USB Ice Emulator
- Software maintenance with Cygwin and Linux toolkits including Bash, Vi, X-Windows, TightVNC, CVS, WinMerge

5/2004 to 8/2005: Consultant – Technisource, Kalamazoo, Michigan

On assignment with Smiths-Aerospace in Grand Rapids, Michigan, C-130 Aircraft Modernization Program and 7E7 Tanker program

- Participated in requirements process for synchronizing time and ARINC653 partitions schedules on multiple PowerPC VME modules.
- Designed device driver to distribute timing from a timing master to timing slaves. Debugged driver and executed tests as part of a DO178B process.
- Debugged problems associated with the VxWorks AE653 operating system configuration and with application configuration.
- Designed and built and configuration tools to augment the Wind River AE653 Tornado tool chain using Bash, PERL, and PERL/Tk
- Participated in the configuration management and build processes for the project.
- Mentored other developers with respect to VxWorks development processes.
- Debugged problems associated with the interfaces between the automated test system and the VME chassis.
- Analyzed VME and PCI bus problems in the Tundra/Universe and Marvel/Galileo implementation. Proposed solutions to bandwidth problems.

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- Integrated a SeaWeed OpenGl Device Driver for the 3Dlabs P9 graphics processor to the VxWorks AE653 environment. The driver served a PMC Mezzanine card on the PowerPC host VME card.

11/2000 to 3/2003: Senior Software Engineer - Jedai Broadband Networks, Inc. Red Bank, NJ

Jedai is a startup company that develops IP/voice access network elements for the cable TV industry

- Led software architecture team for the Alpha products. Directed the work of and contributed to the team developing the Alpha ONU product (a simple OC48 DWDM to OC12 multiplexer).

- Worked with a technology partner developing the software for an OC12/100BaseT access device

- Worked with a outside contract design firm for an OC12/OC3 multiplexer. Prepared the common portions of the OC48/OC12 multiplexer for use on the OC12/OC3 multiplexer.

- Solve software tools issues for the above products: multiple development platforms (Sun, Windows), multiple compiler and build tools. Set up a web-based software documentation library so that all necessary schematics, data sheets, and specifications were available from all locations. Encapsulated all information for each project on dedicated pages so that new hires could be brought up to speed easily without taxing the time of the veteran developers.

- Worked with system architecture teams for the Alpha access, aggregation, head end terminals, and Element Management System using my experience in software, electronic, system, mechanical, and system management design. Continued participation in the later products as the teams expanded.

- Designed and implemented the source code control system for all embedded software products. This involved configuring and maintaining the CVS client-server control system with a Windows 2000 server and Windows NT and Windows 2000 clients. Added an Apache server and many CGI programs to generate reports of CVS source change activity. The tools aided generating reports for deliveries to system test.

- Applied the Bugzilla bug-tracking software for change management on a Linux server. Customized the tool for our methodology. Integrated the Bugzilla MySql bug database with CVS using Bash and SQL scripts. This integration required developers to indicate which bug was associated with the changes, verified that the bug was assigned to the developer attempting to commit the change (and preventing the commit if necessary), and annotated the Bugzilla bug report with the list of changed files, the file revision numbers, and the commit comment entered by the developer.

- Developed software build systems for both developers and the production environment for all projects. This entailed makefiles, wrapper scripts, automatic build daemons triggered from CVS commit activity, as well as the packaging required for delivering the software to the factory. Integrated build systems provided with purchased software components. Evaluated a number of GPL software development tools (code browsers, editors, debuggers, code generators, cross-compilers, network analyzers) to reduce the purchased license costs for Jedai, and to reduce the management overhead of purchased licenses.

- Designed a web-based Element Management System prototype around the Net-SNMP, Cygwin, and Apache products. This product would include an SNMP MIB browser and simple graphical representations of the customer network and network element configurations. Special CGI programs provided for provisioning Jedai element features that were not easily configured with the MIB browser.

- Designed a number of Web-base CGI tools to manage miscellaneous development databases (prototype inventory and allocation, MAC address allocation, etc).

9/94 to 11/2000: *Senior Consultant* - Tropaion Inc., Matawan, NJ

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11/98 - 11/2000: On assignment at elemedia/Lucent Technologies, Holmdel, NJ
Software-only Modem Development. Responsibilities and contributions include:

- Direct modifications of the development of a V.34/V.17 software modem to be more readily distributed in a binary software library form.
- Defined and implemented the split between the modem library code and sample user code. Prepared sample applications for delivery to customers.
- Assisted product management in product definition, feature delivery plans, configuration planning, and negotiation support.
- Defined and executed configuration and build processes to control the quality of deliveries to the system test organization and the customer.
- Ported the modem to several hardware platforms.
- Designed a software instrumentation technique that allowed non-intrusive MIPs measurements down to the function level.

7/96 - 11/98: On assignment at Philips Consumer Communications, Piscataway, NJ
Worked on CDMA cellular wireless telephone development. Responsibilities & contributions included:

- Analysis of IS95A call processing code that was started by a former Japanese partner of Lucent
- Ported that code from the original platform to the newer Lucent platform, and from a Microtech Research Incorporated (MRI) compiler to a Borland compiler
- Developed configuration management and build processes spanning from the UNIX Sablime configuration management system to the Window 95/NT build and emulation systems
- Developed PC-based support tools to support logging and debugging of call processing
- Helped convert the call processing code from the IS95A standard to J-008
- Developed data mining tools to help analyze physical layer and call processing performance from data logged from the phones during drive tests.
- Worked on porting code from initial 80188 microprocessor-based phone to one using an ASIC containing an ARM processor core.
- Evaluated Qualcomm MSM3000 mobile chip associated software for incorporation into a phone

9/94 - 7/96: On assignment at AT&T, Network Wireless System Business Unit.
Served as liaison between AT&T and Qualcomm on a joint effort to port CDMA cell modem driver code. Responsibilities and contributions at Qualcomm's Colorado location included:

- Represented AT&T's view during architectural, design and code reviews.
- Transferred information between companies.
- Set up a Bell Labs-like development environment for the Qualcomm personnel.
- Trained Qualcomm personnel on developing under UNIX.
- Contributed to porting cell driver code. This entailed: porting from the MS-DOS based Intel 80960 C compiler to the MRI Unix-based C compiler, and then to the MRI C++ compiler; from a locally produced kernel to pSOS+; from a complex chip set to a more integrated chip.
- Redesigned subsystems that were not part of the Qualcomm deliverables.
- Built a revision control system, and coordinated revisions
- Integrated modem systems, integrated and tested the modem with AT&T's cell code, and supported the modem implementation at AT&T after completion of Qualcomm's contract.

Responsibilities at AT&T's Whippany, NJ facility included: Integrated modem, operating system, and other support subsystems with the cell application code developed by AT&T; integrated the cell code with the switch; and participated in first 13KB CDMA call.

4/93 to 9/94: *Consultant* - Computer Horizons Inc., Clark, NJ
Developed test plan and procedures for large multi-host RAID disk subsystem. Developed script-based, multi-tasking test system under AIX and X Window on the RS6000 for RAID system verification. The system used normal file operations, raw device I/O, and direct SCSI I/O operations (via the SCDISK driver) to verify and characterize RAID algorithms, design validity, throughput, and response time. The system used parent/child relationships, communicating via semaphore-protected shared-memory segments and pipes. Administered several RS6000 computers being used for test positions. Developed

driver for analog to digital conversion interface on a 68332 based circuit pack. Designed build procedures for entire project and converted the Microtek XRAY monitor to run on the board. Developed conformance testing procedures to support the development of a VME FDDI network card for commercial aircraft use. Responsible for electrical, mechanical, environmental, and software conformance. Specified the software design of a VME host controller used to test the FDDI card. Ported FDDI code to a VME MC68020 CPU card and provided sufficient stub software so that card could emulate FDDI card operation well enough to test the VME controller card. Produced a PC-based script-oriented test system that managed tests executing on the FDDI card, the host, and various peripheral cards.

12/92 to 4/93: *Member of Technical Staff* - Integrated Network Corp., Bridgewater, NJ
Designed automatic test execution program, used as the basis for developing a test fixture for testing circuit boards during manufacturing process. The system included a series of drivers, abstract circuit board component models, and canned algorithms to test circuit board models. Defined screen objects for simulating various types of input and output devices that the tester would be manipulating or reading. Using the ASCII description language, the test designer described: test fixture hardware in terms of the device driver connections; the circuit under test in terms of the circuit models; the test procedure in terms of the objects manipulations provided by the canned tests; the screen layout in terms of the supported indicator types. The test execution program read and checked the test specification, built the display screen indicators and menus automatically, and prompted the tester for test execution.

3/90 to 6/92: *Senior Consultant* - Tropaion, Inc., Matawan, NJ
Modified an SCO UNIX tty device driver, which provides an interface allowing Arabic character sets to be displayed on a variety of terminals. Modified driver to accept color commands from the user application, to get color control command strings for destination terminal from terminfo database, and to control colors of the destination terminal.
Consultant to AT&T on assignments that included:

- Developed LADS 1.0 PC-XT based alarm monitoring system for telephone central offices. Duties included analyzing the proprietary AT&T E-Telemetry alarm protocol and devising a method to eavesdrop on the alarm traffic using a PC. The binary alarm data was to be mapped to alarm naming information extracted from the AT&T TMAS operations support system. Analyzed the TMAS Informix database structure and wrote appropriate K-shell, Informix SQL, ACE, and C programs.
- Developed PMAS 386/PC-based system to monitor alarm and performance monitoring data for a trans-Atlantic fiber-optic transmission system. Implemented AT&T TABS-AS&C and TABS-Path-PM protocols on and eight-port expansion card. The system used DESQview 386 API to provide multi-tasking window-management and menu execution needs. Used MKS Toolkit to provide K-shell user interface windows and dial-in capability. The system logs alarm events, thresholds and performance data, provides history and present-state summary reports. Currently in use in 5 countries.
- Developed LADS 2.0, which required modifying system to support 4 E-Telemetry facilities, 8 remote display terminals, and external aisle pilot indicators. E-Telemetry facility was re-engineered to allow LADS 2.0 to monitor the protocol to extract information like LADS 1.0, but to take over the polling functions in the event that the E-Telemetry central stops polling. Tasks included selecting modems, bridges, PC-controllable facility switches, remote terminals, and electrical and mechanical design of the interconnects between these components. The LADS 1.0 was ported to the PMAS DESQview/MKS platform and expanded to support the multiple facilities and external pilot panels. The Informix code was expanded as needed and data compression was used to speed the database transfer process. The database and log reporting techniques of the PMAS & LADS 1.0 systems were merged and expanded to support needs of different customers.

11/87 to 3/90: *Design Engineer* - Telecom Analysis Systems, Eatontown, NJ
Designed high speed synchronous/asynchronous serial communications test set. Duties included functional specification, designing multiple-80C188 processor boards, porting XINU operating system to the boards, and designing system architecture and application software. Managed work of 2 other programmers. Brought product design from concept to manufacture. Designed software tools, startup code, and libraries necessary to allow use of an MS-DOS native compiler for embedded code

development for the system. Code modularity and portability allowed 60% to 70% of the 80K lines of code representing the operating system, ASYNC and GPIB control interfaces, and front panel menu system to be ported to a new ISDN test set on a similar hardware platform in 2 afternoons.

6/79 to 6/87: *Technical Associate to Member of Technical Staff* - Bell Laboratories, NJ

- Participated in software specification and operational firmware design for 80188 based "wrapper" processor board used in modems. Responsible for system analysis, analyzing implementation of communications protocols, designing unit front panel menu control system, and designing program building tools to support 80188 code cross-development on UNIX.
- Designed an 8085-based surveillance terminal for AT&T Operations Systems. Defined software and hardware architecture and participated in software design for a 80186 based protocol converter that concentrates four E2A protocol links to a single point-to-point link with a UNIX host processor.
- Designed an IBM PC based E2A protocol communications analyzer.
- Participated in architecture design of new AT&T UNIX based Operations Support Systems. Had primary responsibility for defining the hardware/firmware/software architecture and components necessary for the distributed communications fabric used by the systems for event gathering. Analyzed, performed needs evaluation and specified network configurations of private multipoint data facilities, dial-up networks, data multiplexers, and Datakit.
- Developed system test tools on UNIX, PC and embedded platforms. Did extensive development on Hewlett-Packard 64000 and 64700 uprocessor development systems. Wrote an MS-DOS API to run on an Intel 80188 based co-processor board to allow simple embedded-DOS applications to run on the board without modifications. Ported XINU operating system from LSI-11 to run under MS-DOS.