

Robert B. Philip

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Summary

A Software Engineer with over 40 years of experience in operating system maintenance and design, telephony, communications protocols, and embedded software systems in general. Experienced as a technical lead on multiple-person teams of software engineers, in addition to having many years of experience interacting with customers, exploring their desires and needs and solving their problems in a cost-effective and complete manner. I have both Canadian and American citizenship and am thus free to work in either country.

Specific Technical Experience

Hardware: Intel 80x86, Motorola 680x0, 68302, MPC860, MPC8260, PowerPC, Honeywell DPS-8, DPS6, MPC555, ST7, Intel 8260, Mitsubishi m16c62, ARM9, Xilinx Virtex-4 microblaze/PPC, 8051, ARM

Systems: Microsoft Windows, UNIX, Linux, FreeBSD, OpenBSD, pSOS, VxWorks, MQX, MS-DOS, CP/M, Honeywell CP-6, Velocity, Nucleus, uCOS-II, FreeRTOS

Languages: C, various assembler languages

Standards: X25, X.400, ECMA-25, BX-25, POSIX, V5.1, V5.2, GR303, TR08

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Detailed Professional Experience

Dobbins Run Consulting, Lafayette, CO

2011 - 2017

Senior Member of Technical Staff (I own the company)

This time was spent primarily consulting through Embedded Access in Ottawa, Canada. They do customer support for NXP customers using the MQX operating system. As a contractor with them I worked on many small projects, including..

- New device drivers (USB, I2S, I2C, etc..) for new Freescale/NXP processors
- Bug fixes on old drivers
- BSP porting to new processors. LOTS of this
- Fixing vast amounts of customer code - ADC, USB, ethernet, Even serial drivers.
- Co-developing code for GSM & CDMA modems for an ignition interlock customer in Texas.
- Converted a large embedded Linux system to Micro-C OS
- Helped develop dog-tracking software for a customer in San Francisco
- Helped avert a crisis with a customer in Minnesota with multiple processors controlling a shower.
- Ported "old" GPS tracking software for a customer in Texas to new hardware.
- Developed ethernet to 4G modem bridge software for a customer in Australia
- Created and refined RNDIS USB software for an assortment of customers

Additionally and separately from the work above there have been and are other projects

- Porting and upgrading Xilinx FPGA project for a small Boulder company
- Co-authored motor control software using an Atmel ARM-based processor
- Starting February 2018 I have been consulting 40 hours per week to a company in Texas, continuing development of the camera software mentioned above, as well as my current task developing device drivers under FreeRTOS for a Nordic Semiconductor nRF52840, developing bare-metal code on a different nRF52840 board to communicate with small nRF51 devices.
- I have recently been consulting with a small company here in Boulder, developing a tasking model and implementing GPS handling software on a TI TMS570LS31x MCU. We'll be taking this further and implementing ethernet, SPI-connected devices and application software.

And finally - the best part of 2012 - 2018 was 3 months of travel annually, all over the world. New Zealand, Australia, Singapore, Malaysia, Japan, Iceland, Turkey, Sweden, Norway, Latvia, Denmark, France, Spain, Portugal, Canada, and many more. Most of those were 2-6 week trips and all were amazing. I'm a little travel fatigued now, though.

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Dobbins Run Consulting, Lafayette, CO

2008 - 2010

Senior Member of Technical Staff (I own the company)

This time has been spent working as a consultant to a small aerospace company in Boulder, investigating Xilinx Virtex-4, Virtex-5 and Spartan-3 processors. We've been using the Xilinx Microblaze processor cores, along with multiple pieces of Xilinx-provided IP (serial, SPI, etc.) to enable us to use the FPGA as the core of a system that we're developing for UAV control. We've been using Micro-C/OS for these projects.

As well I've been working on ARM and C8051 systems, implementing all the low-level drivers (timers, serial, SPI, A/D conversion) as well as message protocols to operate between the loosely coupled processors. This system will be used for a new helicopter autopilot.

Mobilepeak Systems, Boulder, CO

2005-2008

Senior Member of Technical Staff

The work here involved implementing portions of the GSM wireless communications protocol on a custom-built ASIC with an ARM processor core. This involved working with the Velocity (from Green Hills Systems) real-time kernel, as well as the Nucleus real-time kernel. To support this I designed and implemented an operating system abstraction layer so that switching between kernels was a matter of compiler flags.

Work on Velocity was on their simulator, development hardware and eventually on our own target hardware. The Nucleus work was exclusively on our in-house target hardware.

Vina Technologies & Larscom Inc., Newark, CA

2000-2004

Senior Staff Engineer

Vina Technologies, (now Larscom), designs and manufactures Integrated Access Devices (IADs) and the MBX (Multi-service Broadband Exchange) a T1 concentrator. During my time at Vina/Larscom I:

- Acted as mentor to junior software engineers.
- Redesigned and implemented Dallas DS21352 T1 framer drivers
- Helped redesign and implement the task scheduling and message passing subsystem for the MBX, enhancing system stability, debug-ability, and general reliability.
- Took over all aspects of the MBX GR303 subsystem, including:
 - Acted as tech lead to more junior engineers working on the GR303 project. Until they were laid off.

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- Repaired and enhanced the signaling interface between the class-5 switches and the Vina equipment, both the MBX RDT and Vina IADs
 - Substantially rewrote the interface between the rest of the MBX system and the GR303 subsystem.
 - Re-implemented the Embedded Operations Channel (EOC) interface to the class-5 switch, with a new protocol stack.
 - Restructured the low-level interface to the MPC8260 MCC hardware to reduce hardware resource utilization.
 - Melded all of the above into a functioning system, including long and extensive interoperability testing with Lucent 5ESS, Nortel DMS and Siemens EWSD class-5 switches, as well as several popular soft switches (by Taqua, Santera, etc.)
- Implemented a TR08 to GR303 translation capability in the MBX, to allow TR08 equipment (such as a SLC96 or Vina T1 Integrator) to interface to the MBX as TR08 and make calls on the GR303 connection to the class-5 switch.
 - Worked extensively with customers to ensure that any field issues were addressed expeditiously so that their systems “just worked” for them.
 - Acted as a consultant to Larscom, helping resolve customer issues with installed MBX platforms, including problem analysis, reproducing the problem at a test lab, and repairing the bug.
 - Acted as a consultant to Advanced Fiber Communications (subcontracting to Vauban Advanced Technologies) to design and implement a base-line test environment for their Fiber to the home equipment. This project included physical installation & setup of AFC’s equipment, configuration of test equipment (voice & data) and demonstration of the basic functionality they needed demonstrated.

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Dobbins Run Consulting, Lafayette, CO

1999-2000

President

- Designed and implemented serial device drivers for the Motorola MPC555 processor
- Designed, implemented and documented user interface code for automated device driver generation, for the Motorola MPC555 processor.
- Investigated and designed generic device drivers for the USB and CAN controllers on ST Micro ST7 processors.
- Designed and implemented boot code and timer drivers for Mitsubishi m16c62 micro-controllers
- Implemented T1 framer drivers for the Dallas 21352 quad framer chip for Vina Technologies
- Designed and implemented T1 performance monitoring code for Vina Technologies

Aztek Engineering, Boulder CO

1996-1999

Senior Software Engineer

Aztek Engineering is a small Engineering firm specializing in telephony software and hardware.

- A member of several teams of software engineers developing communications protocols (V5.1, V5.2) and porting these protocols to various hardware platforms for Aztek's customers.
- Acted as a mentor for the most junior team member of the V5 team.
- Designed and implemented the task managing the interface to the telephone network for Aztek's V5.1 and V5.2 protocols.
- Designed and implemented the operating system abstraction used in Aztek's V5.1, V5.2, and TR303 protocols.
- Created pSOS and VxWorks Board Support Packages for Aztek's customers.
- Acted as designer and implementer of T1 device handlers to support the TR08 protocol.
- Software lead for the software portion of a TR08 line card
- Acted as designer and implementer of HDLC drivers for inter-board communications between VxWorks systems.

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SEAKR Engineering, Englewood, CO

1995

Senior Software Engineer

SEAKR Engineering is an engineering firm that makes data recorders for satellites, and crash recorders for military aviation.

- Specified, designed, and implemented the software for several data recorder products, including a flash memory recorder launched as part of the NASA SPARTAN project, and a DRAM based recorder for the Swedish space agency.
- Supervised junior engineers, both software and hardware.
- Participated in the technical aspects of proposals for data recorder programs.

Orbital Sciences Corporation, Dulles, VA

1992-1994

Senior Software Engineer

Orbital Sciences Corporation is a small aerospace company that designs and manufactures small communications satellites and inexpensive launch vehicles.

- Supported and enhanced real-time operating system (OSX) being used on Orbital's Apex and ORBCOMM satellite systems. The computers running on these satellites are primarily Motorola 68302 based.
- Designed, implemented and tested of communication drivers to provide Asynchronous, Synchronous, and bit-level communications between Motorola 68302 based systems, as well as third party provided instruments.
- Implemented and tested the simple token-ring protocol running on the ORBCOMM serial spacecraft bus. The lower levels of this protocol ran on a RS485 serial bus running HDLC.
- Designed, implemented, and tested the portion of the ORBCOMM satellite software that detects, recovers from, and reports to the ground hardware errors and anomalies.
- Supported the satellite ground system effort for ORBCOMM by configuring the ground station UNIX and PC computers into Orbital's Novell network, so that ground station development could occur transparently across the Wide Area Network between Boulder and Virginia.

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Precise Software Technologies Inc., Ottawa, Canada

1990-1992

Manager, Embedded systems

Precise Software Technologies was a small company formed to develop real-time multiprocessor software tools and provide expertise to the real-time software development marketplace.

- A principal founder of Precise Software Technologies Inc.,
- Responsible for the development of embedded systems products, including the adaptation of products to new hardware platforms, and new communication products.
- Developed a combined X.25 LAPB and Serial I/O firmware product. Completed implementation and verification the RAMP LAPB firmware product.
- Consulted to Robotechnic GmbH in Munich developing embedded software for the Panzer Howitzer 2000 program, which involved design, implementation and testing Precise/MPX communications servers for 4-axis servo control hardware and SDLC communications controllers

DY-4 Systems Inc., Ottawa, Canada

1989

Senior Software engineer

DY-4 systems is a manufacturer of commercial and military VME-bus based computer systems.

- Ported and enhanced the Harmony Real Time Operating System, developed at the National Research Council of Canada, to DY-4 VMEbus 680x0 single board computers and intelligent peripheral controllers.
- Ported the Harmony RTOS from the M680x0 to the Intel 80x86 family, for embedded and DOS PC environments.

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Honeywell Bull, Stockholm Sweden

1984-1988

Senior Software Engineer

Honeywell Bull is a European computer manufacturer, manufacturing and selling small, medium, and large-scale computer systems.

- Performed operating system release, update, and technical support for the Swedish Telephone company (Televerket) and the Swedish Power company (Vattenfall).
- Interfaced Digital Equipment Corp., VAX computers to Televerket's Honeywell CP-6 mainframe, to facilitate X.400 based message traffic from the CP-6 to the Swedish X.400 network. This work required enhancement of Honeywell-Bull X.400 software.
- Designed and implemented the technical and linguistic changes necessary to the Honeywell CP-6 operating system such that the user interface aspects of the operating system software were in the Swedish language.
- Consulted with and assisted Televerket's Radio division in the design and development of a network database system, also running on a Honeywell CP-6 mainframe. This work included system support and maintenance and the interfacing of peripherals to the mainframe.
- Was involved in the design, implementation and support of an X.25 network between Televerket equipment, the Vattenfall equipment and the Swedish X.25 network (DATAPAK).
- Consulted to Rechen Zentrum Trebur (RZT), Mitsubishi's computer center, assisting Bull Germany in their support of RZT, and RZT in their implementation of a transaction processing system.
- Acted as technical lead for the adoption of Honeywell CP6 systems in Sweden, and consultant to Swedish software developers (Televerket and Vattenfall) in their efforts to develop software for the CP6 system.
- Performed maintenance and system release updates for the Honeywell CP-6 computer systems owned by the Swedish telephone company (Televerket), the Swedish electric company (Vattenfall) as well as Rechen Zentrum Trebur (Mitsubishi) in Germany.
- Designed, implemented, and tested a high-speed X.25 communications handler to interface CP-6 front-end processors to ASEA workstations used to monitor the Scandinavian power grid.
- Assisted in the design and debugging of an ECMA-25 synchronous communications handler, to interface the CP-6 system to Vattenfall's data collection network.
- Designed and developed several Transaction Processing environments for German Mitsubishi, to improve performance of their high use application systems, and to improve the ease of development of further systems.
- Developed synchronous communications software to allow interface of CP-6 machines to Hewlett-Packard minicomputer systems, as part of a German Videotext system.

Honeywell Information Systems, Ottawa, Canada

1982-1984

Systems Analyst

- Played a technical reference and support role in the procurement process that resulted in the sale of Honeywell CP-6 computer systems to the three Canadian military colleges (RRMC, RMC, and

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St. Jean), as well as Defense Research Establishment Suffield (DRES) and Defense Research Establishment Val d'Or (DREV).

- As the senior analyst for the military colleges, completed the software installation of the CP-6 systems and the preparatory work for the use of the systems by the staff and students at the colleges. This involved the interfacing of terminals, microcomputers and the existing PDP-11 microcomputer to the CP-6 system, as well as continued assurance of smooth operation of their systems.
- Installed the CP-6 system at Defense Research Establishment Suffield, ensuring the smooth acceptance of the system.
- Acted as technical lead in training the DND personnel with system maintenance.
- Installed the CP-6 system at Royal Roads Military College, and additionally supported a substantial software conversion effort at that college.
- Was extensively involved in benchmarking work for Honeywell's sales efforts and with performance tuning the CP-6 system installed for the University of Toronto Libraries (UTLAS).

Carleton University, Ottawa, Canada

1977-1982

Systems Programmer

- Designed and implemented a multitasking kernel supporting the PASCAL environment on Z80 microcomputers. This combined with a generalized interrupt handler for Z80 SIO chips formed the groundwork for a specialized screen editing workstation used by the Carleton University library.
- Performed operating system development and support functions at Carleton University, as well as consulting to the programming, academic, and student community