

# Curriculum Vitae

## David Annett



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### Profile

I am a developer with extensive expertise in both the hardware and software aspects of development on a wide range of equipment. I enjoy taking a specification and producing the hardware and software to implement it. My knowledge of both software and hardware means I know the pros and cons of both and find the right balance for the task. I have experience with plastics and other mechanical issues and the whole volume manufacture and testing process. My management experience allows me to deal with all aspects of a project.

*For a more recent version of this document please check <http://www.annett.co.nz/resume/david.html>*

## **Employment History**

### ***Technical Manager***

**Period:** August 2008, Current position

**Employer:** eWatch Limited

**Work Done:** Managing a team of developers creating innovative home automation solutions. Working all all levels and aspects of the project including design and specification. Technical reviews and mentoring. Project planning and budgeting. Customer requirements discussions. Products developed included technologies such as OLED displays, Cortex ARM processors and embedded Linux controllers.

### ***Embedded Product Developer, Contractor***

**Period:** February 2006, Current position

**Employer:** Annett Computer Company Limited

**Work Done:** I am currently also working as a contact developer to a few high tech companies in Auckland doing development work on a range of equipment. Work includes development of both hardware, software, and complete product development. I have recently worked on consumer and commercial products used in home, automotive and industrial environments. Some of the companies I have recently performed development work for are:

Audio Lynx  
Fusion  
Impact LED  
Lynx Innovation  
Reel Skill Games  
Zephyr Technologies

### ***Hardware Team Leader, Wireless Data Division***

**Period:** August 2005, February 2006

**Employer:** Navman NZ Ltd

**Work Done:** Navman's Wireless Data Group had grown to be a division in it's own right, the Wireless Data Division. My role was heading the team developing the next generation of hardware for the Wireless Data Division.

### ***Senior R&D Engineer, Wireless Data Group***

**Period:** September 2002, August 2005

**Employer:** Navman NZ Ltd

**Work Done:** The Mobile Data Group was very successful so a new larger group, the Wireless Data Group, was formed to allow increased worldwide roll out. This included some expansion into Europe and operations in New Zealand and Australia. During this period I worked on the development of a new in car version of the Halo Dome called the Halo Qube. I then added telephone voice functionality to the Halo Qube. I also did much of the early development of the new I/O expansion unit. I developed the first commercial navigation product, the M-Nav 650 which took the consumer iCN650 product and interfaced it to the Qube product to combined messaging, tracking and navigation into one system..

### ***Technical Group Leader, Mobile Data Group***

**Period:** July 2000 to September 2002

**Employer:** Talon Technology (later renamed to Navman)

**Work Done:** I lead the initial technical team that architected Navman's vehicle tracking and communications system. It is known as the OnlineAVL system and the UK operation was featured in a TV documentary when Navman won the NZ Supreme Export Awards in 2002. The concept of the Halo Dome tracking product was my idea and the unique ideas in it have been granted [US patent 6,789,013](#). I did most of the hardware development of this product and wrote the API libraries and test code for it. I wrote the application and test code for the MDT800 data terminal along with some of its SDK and did much of the final hardware development needed to get it into volume production.

### ***R&D Engineer***

**Period:** June 1999 to July 2000

**Employer:** Talon Technology

**Work Done:** I performed software and hardware development of marine instruments. I also undertook support of manufacturing processes and test engineering of marine products. I worked with the dealer network worldwide to coordinate software release and resolve customer issues. I installed a Linux Internet gateway to allow the network users to access the Internet from the company LAN.

### ***Technology Manager***

**Period:** October 1997, May 1999

**Employer:** Smartcash Systems Ltd (was Scandic)

**Work Done:** In addition to my role with Scandic I also redeveloped much of the Australian developed Scandic product to create a more reliable product. With the introduction of a new NT based product I was responsible for the general layout of the system as it is used in New Zealand and the creation or upgrading of those parts needed to make the system supportable and reliable. Many of my

enhancements were sold back the original developer. I also took on the establishment of [www.smartcash.co.nz](http://www.smartcash.co.nz) to give the company it's first web presence. I developed new looms and interfaces for the new generation of gaming machines for both cashless products and saw them through lab testing in Australia for approval to be use locally.

### ***Information Services Manager***

**Period:** March 1996 to October 1997

**Employer:** Scandic NZ Ltd (was GMS)  
United Gaming Limited (UGL)

**Work Done:** In addition to my original role with GMS I also upgraded and look after UGLs LAN and any advanced technical requirements they need. I created a new version of the Smartcard POS software to replace Scandic DOS program which was causing performance problems in a multitasking environment.

### ***Technical Support Manager***

**Period:** June 1995 to March 1996

**Employer:** Gaming & Monetary Solutions (GMS)

**Work Done:** Designed and set up a service workshop. Managed the day to day running of the workshop and it's staff. Solved any problem with GMS's Cashless systems and other products which where beyond the scope of the other technical support staff. Developed tools to aid in technical support operations. Provided technical support and staff training for the IGT dealer network nation wide. Supported the operation of 30 cashless sites from Whangarei to Invercargill, implemented remote modem support. Co-ordinate with Scandic (Australia) on cashless upgrades and supply. Deal with repair of Ardac (USA) note acceptors used in 600 gaming machines at the AK casino. Installed and maintained an OS/2 Warp Server LANs. Developed a XBase application for tracking of parts stock, customer details and cashless site information.

## ***Software / Electronic Engineer***

**Period:** April 1994 to June 1995

**Employer:** Cadac Ltd

**Work Done:** Development of hardware and software for motor controllers for Cadac's brushless. Motor controllers included a low noise ceiling fan controller which employed modulation of the PSU output voltage during commutation and a washing machine controller which could be configured via a PC to control agitate angle, spin speed profiles and power limiting. Development of custom test hardware and software, including the use of LabView, to allow performance profiles to be measured and to aid in manufacture. Installation and day to day running a Novel network including related remote dial in software.

## ***Systems Engineer***

**Period:** July 1993 to April 1994

**Employer:** Kiwisoft

**Work Done:** Development of high resolution CCD imaging system. This system used 4K x 4K CCD directly from the chip manufacture in California in hardware developed at Kiwisoft. The two output channels were digitized, hardware JPEG compressed, converted to packets and sent down a fiber optic link to a custom buffer card in a PC for wireless transmission to a DEC Alpha for processing.

**For earlier positions refer to <http://www.annett.co.nz/resume/employ.html>**

## **Hardware experience**

I have experience with both analogue and digital circuit design and the use of both PADS and Altium (Protel) for schematic and PCB design.

Some of the recent work I have undertaken:

### ***eWatch hardware***

**Produced for:** eWatch Limited

**Year:** 2009

**Work Done:** As Technical Manager I set the overall hardware specs and reviewed all schematics. I aided developers with the hardware development process. I also researched parts and technologies that were suitable for use in the eWatch system. I worked with suppliers and manufactures to manage the hardware production process.

### ***Reel Skill Games hardware***

**Produced for:** Reel Skill Games Limited

**Year:** 2008

**Work Done:** The Reel Skills Games systems are a skills based variant of the traditional reeler gaming machine (pokies). I designed all the interface hardware used in the system. The main application communicates with it's peripherals via a local serial network. Each of the peripherals has it's own interface board with an AVR controller. The coin mech controller uses an ATTiny2313 and the note acceptor and button deck controllers use the ATMega162.

### ***Water cooler hardware***

**Produced for:** As contractor

**Year:** 2007

**Work Done:** This project was for remote bottle change monitoring on water coolers. It uses a GSM module to relay events from the water cooler to a central server. It was designed to be cost effective using a basic GSM model and PCB supplying high current low voltage PSU it needs. An AVR ATtiny261 processor controls the operation of the unit.

### ***Fusion Marine Head Unit hardware***

**Produced for:** Fusion

**Year:** 2006

**Work Done:** I designed the head unit schematic for the Fusion [MS-CD500](#) multizone marine audio system. It uses a Samsung ARM processor with integrated LCD controller and external memory.

### ***Navman MDT 860 hardware***

**Produced for:** Navman

**Year:** 2005

**Work Done:** The Navman MDT 860 is M16 based data terminal designed to replace MDT800 with a better display and keypad. I managed the development process. The manufacturing, including the prototype, was undertaken in China. I had to confirm the validity of the prototype which required hardware testing and debugging on site in China.

### ***Navman M-Nav 650 hardware***

**Produced for:** Navman

**Year:** 2004

**Work Done:** By 2004 Navman had grown to three divisions and hundreds of engineers yet there was little synergy between the division and the same IP was being independently developed. I was actively looking at what was happening in all of the engineering divisions and realised that consumer iCN 650 navigation product would make an ideal starting point for a new class of commercial product. I designed a new interface module to replace the flip out GPS so the unit could directly substitute for the existing MDT 800. The new module extended the operating voltage to accommodate trucks operating at 24V. It also handle the issue of automatically powering on the unit and shutting off to preserve the vehicle's battery life which the original iCN could not handle.

### ***Navman Qube hardware***

**Produced for:** Navman

**Year:** 2003

**Work Done:** The Qube was a follow on to the Halo Dome tracking and communications device. It used external antennas to offer a more conventional and, for smaller vehicles, discrete install option but was was otherwise derived from the Halo Dome.

### *Navman ConEx hardware*

**Produced for:** Navman

**Year:** 2002

**Work Done:** The Navman ConEx is a M16 based I/O expansion unit for the Online AVL system. My role was predominately the function specification and project management.

### *Navman Halo Dome hardware*

**Produced for:** Navman

**Year:** 2001

**Work Done:** The Halo Dome was Navman's first tracking and communications device. I envisioned a self contained unit that could be mounted on the roof of a truck and contain both the the GPS with it's antenna and a cellular modem with it's antenna. A M16 processor processes the GPS and vehicle status and communicated it via the modem. At the time of development there was no single unit solutions. To create a compact unit the cellular antenna was a halo design and the GPS antenna placed below it. The design was sufficiently novel to receive an US patent. The Halo Dome is used with the Navman Online AVL system and OEM customers such as a major US telco. I ensured the design was compliant with EMC and automotive standards. The initial version used either a CDPD or GPRS modem. The product was trialled in the UK where it was their first non-handset device, as it was when launched in New Zealand. I travelled to the UK in September to over see the trial configuration with Vodafone and ended up with an extended stay when all flights were cancelled on the 11th.

### *Navman MDT 800 hardware*

**Produced for:** Navman

**Year:** 2000

**Work Done:** The MDT 800 was Navman's first data terminal. Based on the M16 processor careful efforts were made to keep the BOM cost low while providing reasonable graphics and comms features. The MDT 800 is used with the Navman Online AVL system and OEM customers such as Trimble and Tait. I ensured the design was compliant with EMC and automotive standards.

### *Navman 41 series hardware*

**Produced for:** Navman

**Year:** 1999

**Work Done:** The 8051 variant used in the Navman 40 series of products was being EOL'd so I implemented a solution for the replacements, the S41 speed instrument and F41 fuel instrument. I also arranged the EMC compliance testing and modified the design to handle the new EMC immunity standards. As part of the compliance testing I created a fast transient coupling test fixture to allow in house pre-compliance testing.

For earlier hardware development work see:  
<http://www.annett.co.nz/resume/hardware.html>

## **Software experience**

I have experience in programming in C++, C, C#, Delphi, Kylix, Modula II, Basic, PHP, assembler, MySQL and XBase. The processors I have dealt with at assembler level include the following: Arm, AVR, M16, 80x86 (PC), 680x, 68HC11, 6502, 68x00 , 8048, 8051, 8085, Z80, CP1600 and the 1802.

I have worked with Windows, WinCE, Linux, OS/2 and DOS operating systems as well as virtual machines.

Some of the recent work I have undertaken:

### ***eWatch software***

**Produced for:** eWatch Limited

**Year:** 2009

**Work Done:** The eBase is an embedded Linux controller for the eWatch system. Have written some of the messaging code in C. It uses an XML definition file that is parsed to create message nodes related to eWatch devices install in home effectively creating a logical to physical mapping needed for messaging.

## ***Reel Skill Games software***

**Produced for:** Reel Skill Games Limited

**Year:** 2008

**Work Done:** The Reel Skills Games systems are a skills based variant of the traditional reeler gaming machine (pokies). I designed and wrote all the software used in the overall system. The main application runs under Linux and is written in C. It communicates with it's peripherals via a local serial network. Each of the peripherals has it's own interface board with an AVR controller. The coin mech controller uses an ATTiny2313 and the note acceptor and button deck controllers use ATmega162s. All AVR code is written in C. The main application also connects via the Internet to a MySQL server at head office. There is also a TCP monitor and control port so the running application can be supervised remotely. I also wrote BASH scripts to allow tracking of IP address changes so it is possible to locate a remote machine after any IP address changes. For the supervisor role I wrote a Lazarus Pascal application for realtime access. Lazarus allows Delphi like code but builds for both Linux and Windows. For head office I created the website in PHP and added site administration and reporting features from the MySQL database. I used a site specific wiki to document key information.

## ***Zephyr BioHarness ATE software***

**Produced for:** Zephyr Technologies

**Year:** 2007

**Work Done:** I created the ATE (Automated Test Equipment) software in C# for testing the Zephyr [BioHarness](#). Test data was gathered from a range of devices including a LabJack module and external programs. The result of each test was compared with a limits configuration file. The design was created to be easily extended if new hardware tests

were added.

### ***Audio Lynx HC86 A/V system software***

**Produced for:** Lynx Innovation (formerly Audio Lynx)

**Year:** 2006

**Work Done:** The Audio Lynx HC86 Audio Visual system has 8 A/V inputs and can individually switch them to the 6 zones it support providing a central A/V hub for high end homes. The main unit uses a Philips LPC ARM processor which is network connected to 8051 based keypads. I did the bulk of the software development for both the main unit an keypads in C. I also created installer PC configuration software in Delphi Pascal. The keypads capture and decode or compress IR data which was sent over the keypad network to the main unit. The main unit uses configuration information to process the IR data. The PC configuration software can analysis both information stored in the main unit and live IR data from the keypads and decode the IR format in use. It can create device based configurations, scripting macros and timer features.

### ***Navman MDT 860 software***

**Produced for:** Navman

**Year:** 2005

**Work Done:** The Navman MDT 860 is M16 based data terminal designed to replace MDT800 with a better display and keypad. I managed the development process. The manufacturing, including the prototype, was undertaken in China. I had to confirm the validity of the prototype which required writing and testing the display driver on site in China.

### *Navman M-Nav 650 software*

**Produced for:** Navman

**Year:** 2004

**Work Done:** The Navman M-Nav 650 is an X-Scale based data terminal and navigation unit. I create this device by modifying the consumer iCN 650 product. I modified the existing code base to modify the behaviours to suit a commercial user. Then I added a messaging screen and added the ability to embed a location into a message that could be passed to the navigation engine.

### *Navman Qube software*

**Produced for:** Navman

**Year:** 2003

**Work Done:** The Navman Qube is a M16 tracking and communications unit. The [Halo](#) Dome code was modified to support both devices automatically.

### *Navman ConEx software*

**Produced for:** Navman

**Year:** 2002

**Work Done:** The Navman ConEx is a M16 based I/O expansion unit for the Online AVL system. My role was predominately the function specification and project management.

### *Navman Halo Dome software*

**Produced for:** Navman

**Year:** 2001

**Work Done:** The Navman Halo Dome is a M16 tracking and communications unit. The code for this was predominately C with a small amount of assembler. I defined and created some the code and the SDK. It was designed to interface with the Online AVL system and the MDT 800.

### *Navman MDT 800 software*

**Produced for:** Navman

**Year:** 2000

**Work Done:** The Navman MDT 800 is M16 based data terminal. The code for this was predominately C with a small amount of assembler. I created the low level interface software for hardware access. I then created an API to access these routines and documentation. The API, support tools and documentation where bundled to create a SDK for OEM customers such as Trimble and Tait. I also created the OnlineAVL application for it.

### *Navman 41 series software*

**Produced for:** Navman

**Year:** 1999

**Work Done:** The 8051 variant used in the Navman 40 series of products was being EOL'd so I implemented a solution for the replacements, the S41 speed instrument and F41 fuel instrument. The old code was updated to work with the new register defintions.

For earlier programming work see: <http://www.annett.co.nz/resume/software.html>



## **Education**

### ***Courses Attended:***

**2006, Ongoing**

Russian language night classes

**2003, 1 Week**

Embedded Systems Conference, San Francisco

**1995, Year** (Cut short due to new job)

Engineering Maths 1 for B.E. at Auckland  
University

**1993, 3 Days**

Object Oriented Analysis and Design

**1989, 1 Week**

Structured Program Design & Testing

**1988, 2 Days**

HDLC Communications Course

**1988, 3 Days**

Terminal Servicing Course

### ***Tertiary:***

**2000 to 2005**

AUT

**1988 to 1990 Part Time**

Hutt Valley Polytechnic

**1981 to 1988 Part Time**

Wellington Polytechnic

**1980**

Victoria University

***Secondary:***

**1976 to 1979**

Hutt Valley Memorial Technical College

***Primary:***

**1974 to 1975**

Hutt Intermediate School

**1972 to 1973**

Carolside Primary School

**1968 to 1971**

Muritai Primary School

## Qualifications Held

**2003** (Incomplete, 2 courses remain)

Undergraduate studies for BE Electrical at AUT

**1996**

Casino Control Act 1990 Certificate of Approval

**1990**

NZCE, Electronics and Computer Technology,  
including Stages 1 & 2 Radio Technology

**1986**

Restricted Electrical Certificate

**1980**

B.Sc. Related Courses

Phys 131	B2
Info 151	C

**1979**

University Entrance and Sixth Form Certificate

Physics	79
Mathematics	63
Chemistry	62
English	53
Economics	52

**1978**

School Certificate

Mathematics	83
Science	80
Electricity	79
Technical Drawing	79
Economic Studies	65
English	54

**1978**

Drivers License, A+B

**1977**

Amateur Radio License, ZL2DAA(formerly  
ZL2TPW)

## **Personal Details**

**Date of birth:** 6 January 1963

**Marital Status:** Single

**Children:** Tony - 24  
Candice - 23

## **Interests & Hobbies**

Motorcycles, trail, trials and touring.  
Ham radio, video systems and computers.

## **Availability**

Immediate for contract jobs, subject to workload.  
4 weeks notice for full-time work.

## ***References***

Referees are available and can be supplied on request.