

## Curriculum Vitae

Mr Jon Freeman B. Eng. Hons

Born 1956  
Nationality British  
Location West Somerset, UK  
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A seasoned engineer, Electronic Design Consultant and Technical Author, 1979 to date.

### Education

1991-4 - Bristol UWE (University of the West of England)

Read '*Digital Systems Engineering*'

Awarded '*Bachelor of Engineering*' degree with First class Honours.

1976-77 – Southampton College of Technology

Gained various City and Guilds certificates in Telecoms related subjects

-1975 - Beal Grammar School, Ilford, Essex

10 GCE 'O' levels plus 'A' level Physics.

1971 - Ilford Evening Institute

City and Guilds Radio Amateur Exam

As a mature student in the 1990s, I gained my First Class Honours degree in Digital Systems Engineering. VLSI Logic Design was my top subject at Uni where I scored 97% for course work and 98% in the final exam.

### Recently Completed (June 2018) : -

Complete analogue and digital hardware design, software, firmware, multi-layer PCB design and build – ARM Cortex powered, twin brushless motor controller / driver ([Youtube](#))

### Experience Includes : -

- Design of analogue, power and digital hardware, and computer hard and software from the smallest embedded systems to industrial-scale automation, serving military and industrial clients, large and small.

- Software development – machine code, assembler, 'C', 'C++' code to run on devices from the smallest PIC processor through most popular architectures through the ages including DSP, Z80, 68000, Coldfire and all the rest. Most recent work focuses on the range of 'ARM Cortex' cores.
- Xilinx, Altera and Lattice CPLD and FPGA products – working with schematic and VHDL design entry
- PCB design – single sided, double sided PTH, multilayer
- Design of complete 'Embedded Systems' for many applications including RTOS, Interrupt driven code, telecomms instrumentation, motion control, traction, brushless motor drives and more.
- Team Player - All positions within 'Teams' of many sizes and structures

### Employment Examples : -

1979 – 2002 Swires Research. Employed on discontinuous contract basis responsible for design and development of instrumentation for the telecoms industry – design of products, hardware, software, embedded systems, analogue, digital, SMPS ... Example (<http://swires.com/pdf/TVA97ds.pdf>)

1979 – 2011 Contracts with clients including DERA and many maily private clients involved in design of embedded, DSP, power, and numerous small projects.

2012 – 2017 Caring for aged parent dictated reduced working from home. However, have worked for clients including West Somerset Railway Association (electronics and mechanics), a private client in design of musical instrument auto-tuning, and projects of my own to keep my skill-set sharp. These include : -

- ARM Cortex based embedded system to monitor solar PV grid-connected system to divert surplus generation from export to water heating (see <http://jons-workshop.com/solar.html>)
- Electronic Speed Controllers (ESC) for brushless motors as part of projects to design and create modern miniature railway locomotives. The latest design in for a versatile twin motor controller usable also for robotics (see <http://jons-workshop.com/elec/STM3.html>).
- Dec 2017 – date - Working with Bristol Society of Model and Experimental Engineers – Design of computer control system for retrofit to 'Michigan', an existing locomotive.

- Numerically Controlled Oscillators (NCOs) applied to CNC machine design
- Web design HTML5 CSS3 – I do not consider myself a web designer, but please take some time to look around my web site [www.jons-workshop.com](http://www.jons-workshop.com) for all the latest.

#### Publications : -

[CNC from the Absoute Basics](#) – A series of articles published in 'Engineering in Miniature' magazine Sept 2013 to July 2014

[The Design of a Modern Electric Locomotive in 5 Inch Gauge](#) - A series of articles published in 'Engineering in Miniature' magazine October, November and December 2015.

[Electric Locomotives – A Look at Motors and Control Methods](#) – in Taunton Model Engineers quarterly "[Oily Rag](#)" magazine autumn 2016.

#### Other Interests and Activities : -

2007 – 2015 District Councillor, West Somerset Council

2007 – 2015 Board member – Exmoor National Park Authority

2015 - Board member – West Somerset Community Land Trust

2015 – 2016 Worked part time – West Somerset Railway Association (Design of electronic dynamo controller for 'Mk I' vehicles, mechanical engineering)

2017 - Working with team members at Bristol Society of Model and Experimental Engineers – applying modern methods to traction control systems.

Recent examples of work (as hobby) in electronic hardware and software design, with mechanical design and construction of two computer controlled electric locomotives – Two Videos : -

May 2018 – Latest petrol electric loco on test at Ashton Court, Bristol, ([see here](#)). Has since been put into action on public running days at Ashton Court, Bristol and Vivary Park, Taunton.

June 2017 – Video of 'The Wedge' electric loco with explanation of the electronics and design - [https://www.youtube.com/watch?v=Y1Io2\\_i0AXk](https://www.youtube.com/watch?v=Y1Io2_i0AXk)

