David Beard – BEng Communications, MIEEE

I've worked, and consulted, for a number of small and start-up companies, managing tight-knit teams and directing technical development, generally under a limited budget. I enjoy taking on the challenge of complex technical issues; especially ones thrown in the "too-hard" basket. My solutions include novel architectures, protocols, algorithms and hardware. A number of these techniques are patented.

My core competencies extend from mathematical modeling to DSP, analog, logic, RF and PCB layout. The ability to cover all these segments means a close to optimal solution with the required price/performance and being able to fit in the box!

Being fortunate to work with talented colleagues, I've recently picked up valuable techniques including test-driven development and clean coding. Extending this mindset, my algorithm development for the Bluechiip reader employed matlab objects for all blocks. This eased porting to and testing of the embedded C++ code.

Similarly, my schematic development follows a similar philosophy with clearly defined functions and interfaces for each block. This extends to library and version control, generally.

I am practical, able to solder tiny SMD components and operate a lathe. My hobbies include amateur radio "fox-hunting", rogaining, restoring cars and hobby farming on our property.

Tools/Abilities

Doc	Requirements specifications, user manuals, papers and patents.
Design	Algorithms, digital signal processing, analog, digital, RF, antennas & EMC compliance.
Hardware	Schematic/PCB layout, mechanical, packaging, backplanes.
Languages	c/c++, python, system verilog, VHDL, SPICE, matlab, octave & assembly.
IDEs	MCUXpresso, Segger embedded studio, Ti code composer, doxygen, Visual Studio, Xcode Xilinx ISE, COMSOL, HFSS & Lattice Diamond.
Hardware	Altium, DipTrace, Mentor, Draftsight & freeCAD.
OS	Linux, macOS & Windows.
Machinery	Lathe, milling, MIG, heavy rigid vehicle & excavator.

Contact

david.beard@propersystems.com.au
0414 337 116
www.linkedin.com/profile/view?id=3322509

Key achievements

2019-   **Fiberdyne Research: Automotive grade 8.1 channel audio amplifier**
Miniature 1.5kW/45V DC/DC using 4-phase architecture.
Novel solution for single ended channels without series caps.

2018-   **Medmont: new product in R&D**
Multi-processor USB/DFU bootloader.

2016-   **Fiberdyne Research: Automotive grade 5.1 channel audio amplifier**
Automotive grade miniature 1kW/22V power supply.
Novel feed-forward architecture for stabile operation without super-caps.
Microsecond response 2kW active DC load.
Sensorless amplifier overload/short-circuit protection.

2016   **Calyptech: CWG 100**
Diagnostics to- and improved performance of line echo canceller.

2015   **Senetas: CN9000 encryptor**
Ultra high-performance core voltage regulator for high-end Vertex FPGA core.

2014/15   **Bluechiip: hand-held reader**
Electronics debugging. PCB and layout requirements.
Charging & power supply electronics.

2014   **Wave Computing: benchmarking of ARM processor**
Non-invasive real-time power measurement technique.
Test algorithms to stress/measure SIMD/memory IO performance.

2010-13   **Bluechiip: Bio-sample tagging system**
Novel non-linear dispreading to improve SNR by >40dB that enabled real-world deployment.
New tag frequency model and BCH encoding scheme.
Key improvements to RF, FPGA and analog sections.

2006-10   **KeyEye Communications: 10GBase-T transceiver**
Design and verification of front-end high-speed DSP blocks.
Identification of critical flaws/fixes in signal processing architecture.

2006   **Speed shield: FM2 Vehicle Safety System**
Robust speed-control algorithm.
Packaging, schematic, PCB & device drivers.

2002-05   **Freestyle Technology: FME**
Original architecture, hardware and large portion of embedded firmware (~100K lines).
Invented segmented file distribution protocol (patented),

2001   **Trio Datacom: E-series Repeater Station**
~20k lines of 100% functional embedded code in <3 months.

1999/00   **Bandspeed: ADSL modem**
Architected test platform, designed electronics, laid-out PCBs. Wrote DSP drivers/functions.

Patents

A METER DEVICE - EP176642, WO2006000033
CLIENT PROCESSOR DEVICE - EP1766515, WO/2006/000038
AN ALERT DEVICE - EP1766516, WO2006000039
FADING SIMULATOR, US5862455A, CA2164409A1, DE69416404D1, DE69416404T2, EP0702868A1