



ELECTRONIC DESIGN

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Company Profile

Paragon is a company backed by highly experienced engineering and project management professionals, offering design and development outsourcing services for hardware, software and VHDL development.

Paragon outsources to companies across a whole range of industries that require specialised computer hardware and software to control their products.

The Paragon team was previously part of Paragon Solutions, prior to its acquisition by Turnstone Systems in 2000. Founded in October 2001, Paragons credentials are:

- A commitment to technical excellence
- Extensive project management experience
- Over 80 man-years of engineering development
- Existing intellectual property for embedded product development
- An impressive track record of contract development
- Proven ability to work to deadlines and budget
- A scalable organisational structure – we can operate efficiently as a team or as individuals
- A close-knit team driven by similar values

Company Values

We value excellence. Our technical abilities and experience gives us a thorough understanding of development life cycles and enables us to provide appropriate solutions with reduced risk. Our effective management and communications skills ensure we consistently deliver results on time, that work, are reliable and maintainable.

We value effective relationships. Your interests are our interests and we believe that they can best be served by open, honest and respectful communication. We aim to be a company that is fun to deal with.

We value flexibility. We recognise that we need to be flexible in our abilities to meet your goals. We can accommodate cost and requirement changes to ensure you are successful.

Services

Paragon offers the following services:

- Product analysis and specification.
- Real-time embedded system development.
- Web application development.
- VHDL design and development.
- Hardware design.
- Design for manufacture

Work Examples

Paragon staff have developed the following products (with the associated technologies):

Product	Technologies
GPRS 'always on' data transfer for IP connectivity	Siemen's MC35 GPRS module (multiplex mode, cell hand-over), Async PPP, IP
IADs (integrated Access Devices)	xDSL, ATM (AAL2, AAL5), codecs, Ethernet, T1, GR303
LAN – WAN Bridge	xDSL, Ethernet, TCP/IP
Serial Router	PPP, RS422, RPC, Internet Protocols
Digital Services Testhead	xDSL, T1, PPPoE, PPPoA, T3, G.821, G.826
Metallic Access Testhead	ADSL splitter, TL1, POTS testing, MTAU
Digital Line Cards	Voice trunk interfaces (compression), Proprietary PBX subscriber line cards
Access Products	xDSL, voice/data bandwidth management
ISDN digital phones, Terminal Adapters	LAPB, LAPD, Q.931, ETSI supplementary services, V.110, V.120, modem emulation
Analogue phones Modems PBX	swipe card, encryption V.22, V.22bis Modem firmware, VoIP, Call control, DPNSS
PDA CF slot interface I2C controller T1 BERT 100 MHz uP interface ADPCM compression Ethernet bridge USB 1.1 slave interface	VHDL design
Laser Operated Keyboard	Optics and general embedded product development
Timesheet Application	Linux, HTML, DHTML, Perl, PHP, JavaScript and SVG web

Customer Services Configuration Mgmt Protocol Simulation Internal/External Web site	development
Product internationalisation	Unicode, Perl
Low speed radio portable radio link	AM/FM data over 433 MHz short range radio
ZISC simulator and FET analysis tool	Python
Voice module	32 kbps ADPCM encoder/decoder for TI DSP
Call data logger	Linux, serial protocols
Network management system testing Database application installers	Visual Basic .NET
PDA Applications (IPAQ)	CE.NET, wireless data connections, CF slot peripherals
PDA Applications (Palm)	Palm OS programming

Technical Skills

Paragon offers the following skills:

System Environment

- pSOS/pROBE, Linux, ATMOS, Windows CE, PalmOS, proprietary OS's
- 64 bit - MPC8260 (PowerQUICC II)
- 32 bit - MPC860SAR (PowerPC), AMD ELAN 486, ARM7
- 16 bit - TI TMS320VC54xx DSP (100 MIPS), Motorola MC68302, Infineon C161RI (RISC)
- 8 bit - Intel 80C52 family, Motorola 68HC11, PIC16Cxx, 80C188, Thompson ST7

Programming languages

- C, C++, Assembly
- Borland C++ Builder
- Python, Perl, PHP, ASP & JavaScript
- DHTML, XML
- LabVIEW, Matlab
- Visual Basic .NET

Internet application programming

- Linux
- Apache HTTP Server
- XML
- MySQL Database
- Client-side scripting (Javascript, VBscript)
- Server-side scripting (Perl, PHP)

VHDL development

- FPGA (Xilinx Spartan/Virtex family)
- PLD (Xilinx 9500 series)
- Modelsim simulation

Intellectual Property

Paragon has developed the following IP for use in embedded products:

- UDP/TCP/IP protocol stack
- ISDN protocol stack
- Web server
- Multi-tasking embedded system kernel

Testimonials

Ericsson

"Paragon has worked as a design sub-contractor for Ericsson Data Services on various product development projects. They have proven to be an experienced design team who display a high level of professionalism and drive to achieve quality results. At the same time, they have been co-operative and flexible, making them easy to work with. The teams technical competence and appreciation of the importance of delivering on time make them a pleasure to work with.

I have a high degree of confidence in Paragon's ability to add value and have no hesitation recommending them or using them in the future."

Peter Sirett, Product Manager, Data Services, Ericsson Communications Ltd

Vcomms Ltd

"We have been using Paragon since its formation to supplement our own software development.

Their Software engineers are in our opinion among the best available in their field, have a wide range of relevant experience, and work well with us to deliver quality results on time.

Paragon understand our needs, and are flexible and supportive in helping us meet our wider project objectives."

John Robins, CEO, Vcomms Ltd.

The People

Paragon consists of the following people:

Vaughan Bardell – Vaughan graduated from Canterbury University with a BE (Hons) in 1996. He joined Paragon Solutions as a hardware engineer and has thrived on the challenge of designing telecommunications hardware to meet international standards requirements. He is an early adopter of new technologies, having quickly demonstrated web design and VHDL design skills, as well as high end Mentor Graphics CAD proficiency. During the 12 months with Turnstone Systems he designed VHDL implementations of an I²C controller and a T1 BER tester and has subsequently worked on a CF card interface in VHDL.

Vaughan also has extensive PHP and Perl experience along with C/C++ and CE.NET driver experience.

Andrew Bridger – Andrew is a VHDL and software engineer who graduated with a first class honours BE degree from Canterbury University in 1998, having gained four scholarships during his university career. His subsequent experience at Paragon Solutions and Turnstone Systems has been in developing hardware and software for telecommunications related products, including extensive VHDL experience. In this time he has demonstrated first-rate analytical skills, a high work rate and a strong drive to see a project through to completion.

Andrew also has labview, Python and low level C driver experience.

Shane Harrison - Shane's engineering career began with a BE (Hons) from Auckland University in 1986 and then he joined Philips New Zealand as a hardware engineer. Later he moved into software engineering, project management and finally into engineering management, developing a strong technical background particularly in the subscriber-to-exchange domain. Shane has worked as an engineer and project leader for a European multi-national, a director and engineering manager of a self owned New Zealand company and an engineering director for an American startup. This career has given him solid experience in technical management and a wide exposure to various management approaches and ideas. This, underpinned with a strong people focus is what drives his vision and management style.

Richard Hudson – Richard's professional career spans 20 years. After graduating with a BSc (Hons) in 1980, he started his software career working on embedded data communication products writing 6809 assembler. He then went on to write device drivers and applications for real-time operating systems such as RSX-11M, Unix and MS-Windows before moving into project management and software management. Prior to moving to New Zealand, Richard was the VP of Software Development for a UK based company developing IP for 3D graphics and SoC devices. As a result, he has extensive experience of working with large international companies such as Compaq, Microsoft, Matrox, ST Microelectronics, IBM and NEC. Since joining Paragon Solutions in 2000 he has successfully managed several multi-disciplinary development projects. Richard brings a broad knowledge of the electronics industry and project management

techniques to the Paragon skill set along with some 'coal face' programming skills in Visual Basic.NET, Palm OS and general C programming.

Rory Latchem – Rory began developing telecommunications software after graduating with a BE from Auckland University in 1981. He joined Philips New Zealand and worked on call control software for their PBX product line. During the subsequent 13 years at Philips, Rory proved himself to be a very thorough, efficient and highly professional engineer. He was a key member of the Paragon Solutions software team from 1996 to 2000. The contract development environment provided Rory with a rich diversity of products and technologies from which he has developed a broad industry knowledge. Rory is comfortable with all phases of software development, from requirements analysis, to high level system design, implementation and test specification.

Rory is very strong in C and C++ in the embedded arena.

Owen Lynch – Owen began his career in embedded telecommunications software development at Philips in 1992, after graduating with a BE (Hons) from Canterbury University in 1984 and spending several years developing embedded software for fire alarm and motor controller products. The ensuing decade has seen him develop from junior to senior engineer with a corresponding depth of experience in the telecommunications industry and professional software programming practice. Owen enjoys the variety of work and exposure to leading edge technologies that the contract development environment provides.

Owen has extensive experience in embedded C/C++ including the Linux environment and has lately been heavily involved in CE.NET platform programming.

Darrin Scott - Darrin was introduced to computers at a young age - he started playing with his father's D2 (6800) system when 10 years old. Since then he has spent many work and non-work hours involved in a wide range of computer related projects. Darrin graduated with a BE (Hons) from Canterbury University in 1987, and with a post graduate diploma in computer science (DipCS) from Victoria University in 1993. In between he worked for Wellington Polytechnic and the spin off company Digicom Networks Ltd doing various special projects. In 1995 Darrin joined Philips New Zealand as a software engineer. During his time at Philips and subsequently Paragon Solutions he has worked on a wide range of telecommunications products including analog and ISDN phones, xDSL cards, and various terminal (protocol) adapters. Darrin also wrote Paragon's custom "Taupo" kernel, the generic low level 68302 hardware support, and their ISDN layer 3 protocol stack. Recently he has been heavily involved in transaction processing over GPRS.

Darrin is very strong in C and C++ in the embedded area but also has significant experience in writing Windows applications.

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