

## **PHILIP RUSSELL JAMES SMITH**

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### **Career Summary**

I am an engineering graduate with over 30 years' experience of working in Technical Consultancy and Manufacturing companies. At my current employer, I am a project manager leading the development of large inkjet printers, which are sold worldwide. Previously I have worked in a variety of market sectors, mostly to supply custom designed automated equipment, but also to analyse existing or new equipment. I have worked in many countries in Europe, USA, and Africa.

### **Personal Strengths**

- Innovative and imaginative
- Well respected as a mechanical engineer
- Able to comprehend data quickly and assess what is important
- Good theoretical background in a wide variety of engineering disciplines
- Able to communicate well at all levels within an organisation
- Understanding of all aspects of automated machinery design: mechanical; electronics; PLC software; sensors; actuators; PC software
- Can very quickly recognise errors or illogical argument
- Good formal writing and presentation skills
- An effective team leader and project manager
- Able to identify and use appropriate level of quality.

### **Career Highlights and Achievements**

Project manager and technical lead in the development of a new wide format inkjet printer, which has become the company's best selling product for over 5 years. This introduced new technologies and approaches into the company, which have been very successful.

Technical manager of a project to design and supply a set of automated equipment for screening of chemicals for agrochemical use. The equipment consisted of several separate machines using the same sample magazines and containers, connected on a PLC network.

Leader of a project to design and build an engineering model of novel process equipment for freeze drying pharmaceuticals. During tests this equipment achieved drying times of one tenth of the conventional method. A patent was granted for aspects of this project.

Mechanical team leader on a project to design and install breath operated inhaler production test equipment in the USA. The inhalers are 100% tested after assembly to ensure operation within specification. This equipment was FDA validated and the client bought additional equipment after the initial set to increase production rates.

Technical manager of several large projects (over £2million) to supply custom equipment to pharmaceutical companies. These are based around the company's standard processing modules, often with significant custom development, and completely new functional units. I have been instrumental in several new developments, and the layout of the systems' architecture.

## Secondary and Further Education

Dates	School or College	Main Subjects and Results
Sept 72- June 77	Highcliffe Comprehensive School, Dorset	‘O’ levels, including: Maths (A); Further Maths (A); English (A); Chemistry (A); French (B); Music (C); Biology (A); Physics (A).
Sept 77- June 79	Brockenhurst 6 <sup>th</sup> form College, Hampshire	‘A’ and ‘S’ Levels: Maths (A); Further Maths (A,1); Higher Maths (A); Physics (A,1); Chemistry (A)
Oct 80- May 83	Churchill College Cambridge	BA in engineering (2:1) 1 <sup>st</sup> and 2 <sup>nd</sup> years: theory in a wide range of engineering disciplines including: mechanics; structures; electronics; thermodynamics; computing. Final year: papers in mechanical; electronic; and nuclear engineering.

## Career History

2004 to present: **Inca Digital Printers Ltd**

Inca designs and builds industrial ink-jet printers, sold worldwide. At Inca, I am a project manager within the New Product Development group. The job of “project manager” at Inca is mainly about being chief designer and system architect of the product being designed, in addition to controlling the project timescale, resources etc.

Initially I investigated a new ink for use in one of the printers. My knowledge gained by the experimental use and in-depth study of the printer was used to develop the printer further, including a print mode that was 40% faster than the previous ones.

I was then given the responsibility to lead the design of Inca’s next generation printer. This printer, the Onset S20, has since become Inca’s leading product, and has sold over 200 in its various generations. A significant innovation was to break away from Inca’s traditional thinking of aligning the printheads during production. Instead the printheads are aligned on the finished printer by printing and analysing test patterns to determine the required position. This allowed much better alignment than the previous method of aligning in the factory, resulting in better print quality. The printer could also be installed in under half the time of the previous one as it used a telescopic motion for the print head gantry. This meant that all the high precision parts could be shipped in a single piece and therefore maintain alignment. These and other innovations kept the cost down, and resulted in a very successful product, that after some updates is still Inca’s biggest selling printer today, 8 years later.

I also developed a semi-automated substrate loader/unloader. This has sold over 100 units. Again a novel motion system resulted in a product that can be shipped in one piece whilst being able to load and unload the 5m<sup>2</sup> sheets of substrate.

Between printer design projects, I led a project to update the user interface of Inca’s printers. This uses Microsoft WPF technology and required me to learn C# and XAML. The concept and overall design is now used on all of Inca’s current products.

The latest generation of the Onset printer now has 14 colour channels enabling it to reach speeds of over 1000m<sup>2</sup>/hour (200 sheets per hour). This is about 8 times faster than the original S20 printer, but retains virtually the same footprint. I led this project to upgrade the printer, whilst keeping as much of the design the same as possible, to help with product change-over, and familiarity within Inca.

#### **1997 to 2004: The Automation Partnership**

Initially at TAP, my role was as project manager and lead engineer of projects to design, build and supply high value (typically a few million pounds) automated equipment systems supplied into pharmaceutical companies' research departments. This required definition of the specification with the client, leading the design and build teams, and ensuring successful installation on site. One project of this type was installed in Cincinnati. Early in this project I frequently flew to visit the client for a few days at a time, to agree the specification, project timescales and costs.

Because of a company reorganisation, I then changed role to technical manager, concentrating on the technical and design leadership side of the projects. Finally I worked in the Technology group, which works on the research and development of new ideas for future machines, i.e. before a system concept is sold to a client. An example of this was to design and build a technology demonstrator to pick and place miniature test tubes at 5 per second. This position also included reviewing of other projects, producing initial concepts for new projects and quotations, as well as introducing new technologies and techniques into TAP.

#### **1989 – 1997 PA Consulting Group (Global Technology Group)**

I worked at PA in the Flexible Automation, Manufacturing Engineering and Healthcare groups. My eight years at PA covered a very wide range of projects in a wide range of industries. The scope of these projects ranged from purely technical consultancy, with a report or presentation at the end, up to projects to develop and supply equipment. The larger projects were usually in phases, starting with initial feasibility, progressing through experimentation with test rigs or prototypes, and concluding with delivery of equipment. Examples of larger projects include the supply of production equipment to automatically test breath-operated-inhalers, delivered into the USA; and developing a high-speed novel freeze-drying process for pharmaceuticals. This latter project progressed through to making a demonstration test rig, but unfortunately not to production equipment. As well as the project manager on both these projects, I was the chief engineer, responsible for the architecture of the systems, through to control of the detail designs. Projects where the deliverable was a report included: assessing bids for the channel tunnel (Eurostar) ticket machines; checking the safety of a navy fire fighting training unit. I was also often invited to attend brainstorms, as my innovative and creative mind was well respected at PA.

#### **1983 – 1989 Cambridge Consultants Limited**

Whilst a consultant at CCL I worked mainly on projects to design, build and supply machinery. This work involved all aspects of automated machinery design: mechanical design; software modelling and design; and machine control using PLCs. Clients were from many market sectors, eg sausage skin manufacturers; the Joint European Torus; silicon wafer manufacturers; agrochemical research establishment. In addition to the engineering aspects of these projects, specifying the scope of the project, client management, and project control were also very important.

1979-1980 (gap year) **Sir Robert McAlpine**

I worked on a building site erecting a multi-storey office block in Swindon. I worked with the site engineers, my tasks included setting gridlines and levels defining the position of the building, producing samples of the concrete for testing, checking steel reinforcing and laying out ground works.

## Personal Details

Marital Status: Married  
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## Hobbies

I am currently designing and building an autonomous sailing boat to sail to Australia. I have developed the navigation and communication electronics, using an Arduino controller, GPS module, 3-axis compass, and an Iridium satellite communication module. As well as programming in C and C++, I have learnt about I2C communication to connect together all the electronic parts. The rig of the boat is also novel as I am hoping to have the sail self-setting, to avoid the need for a wind direction sensor (as I think this will be fragile and not survive the journey). This system has included a ball bearing I have 3D printed with my home FDM printer. In addition, I have been learning about weather patterns, ocean currents, shipping lanes, the location of small islands in the middle of oceans, how to display maps on websites, etc. see [www.philsboat.info](http://www.philsboat.info) for more details.

I also enjoy keeping the garden under control.

Hobbies that I used to do include: playing hockey; glass blowing and model helicopter flying.

## Patents

Patents have been granted on ideas arising from several of the projects I have worked on. I am named as inventor on the following:

Print table: [WO 2014140521 A1](#)

Droplet size in inkjet printing: [WO 2008090361 A1](#)

Test tube for storing fluid: [EP 1477226 A1](#)

Apparatus for sealing tubes: [US 20050063874 A1](#)

Freeze-drying process and apparatus: [WO 1996029556 A1](#)