

# JOHN BRYDON

PO Box 222 North Adelaide SA 5006

mail@johnbrydon.com

(+61 8) 8342 6407 • 0419 465 104

---

A very experienced, hands-on manager with an extensive product development and research background and a proven track record with several highly successful Australian and international companies in the medical equipment and communication areas. A holder of 15 US patents who is still current in electronic hardware and software design and who can clear log jams at both a technical and a personal level. A problem solver with a “first time right” attitude and excellent people skills.

---

## Areas of Expertise

---

- Design and development management
  - Medical & communications product design
  - Defence awareness (security clearance)
  - Analysis and resolution of complex problems
  - Wide knowledge of clinical environments
  - Product development research
  - Intellectual property generation & analysis
  - Dispute resolution
  - Regulatory support
  - Analog & digital hardware design
- 

## Core Competencies

---

- Ability to enthuse and manage teams
  - Ability to manage “difficult” people
  - Ability to reduce product development risk
  - Ability to visualize user/customer needs
  - New technology evaluation & introduction
  - Analog & digital signal processing
  - Human Factors: User Interface design
  - Transducer design & applications
  - Embedded software design
  - Accomplished writing style
- 

## Professional Profile

(positions with an asterisk\* are discussed further in the Career Accomplishments section below)

---

### **CONSULTING ENGINEER**

**2008 - Present**

Consulting Engineer in the above areas of expertise: Regulatory assistance in FDA 510k application for biomedical equipment.

### **SIGNOSTICS PTY LTD\***

**2007 - 2008**

Consultant to, then Advanced Products & Research Manager of, Signostics Pty Ltd: Applied R&D in support of current and future diagnostic ultrasound products: collateral product specifications, prototyping and technical feasibility studies. Authored and conducted trials with key customers. Regulatory planning in support of FDA 510k application. Laid off as a consequence of the world financial crisis.

**UNIVERSITY OF SOUTH AUSTRALIA****2005 - 2007**

Associate Professor of Systems Technology in the Defence & Systems Institute at the University of South Australia: Teaching and consultancy in training and technical management projects. Originated the Associate Degree in Engineering (Defence Systems) for upskilling senior technical staff.

**CONSULTING ENGINEER****1996 - 2005**

Hardware & software design and prototyping; Research into respiratory instrumentation; Transducer development, Digital Signal Processing, Rapid Application Development software design and analysis, User Interface design, Intellectual Property & graphics expert witness, p/t University Lecturer, District Court Referee, Arbitrator & Mediator. Consulting to ResMed Ltd (see below). Hardware Team leader for Cochlear Ltd for their first DSP-based hearing aid.

**RESMED LTD\*****1993 - 2000**

Electronic Product Development Manager then Director of Technology Development then consultant with ResMed Ltd (formerly ResCare Ltd), Sydney: Designing and managing a team that developed products to monitor and treat respiratory problems. Embedded system architecture design, analog and transducer design.

**PRECISION DESIGN SERVICES\*****1991 - 1993**

Director and owner of Precision Design Services Pty Ltd: Design, manufacture and marketing of a Digital Signal Processing (DSP) development system (board, software & documentation). Consultancy in instrumentation, DSP product design (for Navy) and signal processing.

**PHILIPS COMMUNICATIONS PTY LTD\*****1989 - 1991**

Senior Signaling Engineer with Philips Communications Pty Ltd, Melbourne: Designing analog and Digital Signal Processing based radio products. Trained engineers in use of DSP and introduced standard formats for DSP implementations. Took voluntary redundancy when corporate changes moved most product design back to Europe.

**UK NATIONAL HEALTH SERVICE\*****1972 - 1988**

Design engineer, researcher, project leader and technical manager. Last appointment prior to emigrating to Australia in 1988 was Deputy/Acting Director of the Department of Medical Physics at the Hammersmith Hospital and Royal Postgraduate Medical School, London, managing 55 staff in five sections covering radiation and imaging physics, clinical instrumentation, mechanical engineering and bioengineering services.

---

**Education & Affiliations**

---

- BA (Hons) in Natural Sciences and Engineering, Cambridge University
- MSc (Distinction) in Medical Electronics and Physics, London University
- PhD in Biomedical Engineering, University of New South Wales
- Professional Certificate In Arbitration & Mediation (Distinction), University of Adelaide
- Fellow of the Institution of Engineers Australia & Chartered Professional Engineer
- Fellow of the Institution of Engineering & Technology, London (formerly IEE)
- Member of the Institute of Arbitrators & Mediators Australia (IAMA)
- Practitioner's Certificate in Mediation and Conciliation (IAMA)

- Adjunct Associate Professor with University of South Australia Defence & Systems Institute and University of Adelaide School of Electrical & Electronic Engineering

---

### **Patents & Publications**

---

- 15 granted US patents and 9 current provisional patents in medical technology areas (below)
- 18 publications in medical technology areas
- Details of the above are available on request

---

### **Award**

---

Australian Defence Industry Quality & Achievement Award 1994 (Commended): Co-designer of Radio Teletype Modem for the Royal Australian Navy.

---

### **National Security Clearance**

---

Secret.

---

### **Career Accomplishments**

---

#### **ESTABLISHING FUTURE PRODUCT PATHWAYS**

Signostics' first product was a medical ultrasound scanner less than a third of the size and price of its nearest competitor. Employed to manage Advanced Products & Research but also initially acting as Voice of the Customer, I was able to influence the design away from a PDA, towards that of a medical instrument, establishing enhanced usability in the operator interface and increasing the imaging functionality. I developed an interface simulator to make communication with the software engineers about this topic more effective.

Another interesting challenge was helping get an Agile development environment to come to terms with the process-driven one required for regulatory approval and subsequent manufacture.

I was also pleased to be able to train my small team in working in first-time-right mode with a focused and thorough approach to their work. From the feasibility studies that we performed, we were able to lay down risk-reduced concept designs for a number of peripherals aimed at enhancing the functionality of the basic scanner product.

The two most exciting projects from this period were a rapid deadline project to customise scanner design for a particular target application and foundation work in ultrasound image processing.

#### **EXPERT WITNESSING, MEDIATION & ARBITRATION**

My involvement in drafting patents for ResMed led on to expert witness work in Intellectual Property for their patent agents and finally to alternate dispute resolution. I then acquired

arbitration and mediation qualifications and have since heard a number of hardware and software based cases, including the first internet domain name dispute under the new Australian rules. I have found that legal knowledge of such subjects as contracts, evidence and trade practices plus formal training in Alternative Dispute Resolution have often been helpful in subsequent managerial roles.

### **THE RESMED PHENOMENON**

Following a short period as a consultant to them, I joined ResMed as their first Electronic Product Development Manager in 1992. Starting with a couple of staff I built up the section to 13, providing ongoing electronic and software design support for three respirator designs (the Sullivan III, the first bilevel VPAP and a neonatal model) plus several other small instrumentation products.

Within the company, I was also able to introduce the first project planning and regular reporting procedures. I was also involved in preparing marketing material, audiovisual user guides and dealing with regulatory matters such as helping prepare FDA 510(k)s, applications to ethics committees and handling technical queries from customers worldwide.

I also spent extensive periods in sleep laboratories, working with clinical staff, patients and our prototype equipment (I was, at this time, developing more leak tolerant methods of breath detection). I have always believed that such hands on experience is very important for product designers and I instituted a routine of regular attendance in sleep labs for the younger engineers in the company.

I then moved on within ResMed to start up and direct the Technology Development Group, a multidisciplinary blue sky team who were looking at the “product after the next one”. Here we studied mask and equipment noise problems plus novel means of generating air pressure. Over my time at ResMed I contributed 12 international patents to the company. The analysis of Intellectual Property and its management remains a current interest.

After this period I still continued to consult to ResMed, designing and coding their first commercial review software for the AutoSet system, “AutoView 98”, along with supporting audiovisual training material.

### **DOING A PHD**

By 1996 some share options that I owned had appreciated significantly and I decided to take a couple of years off to do some applied research with some ideas I had in the cable-free monitoring of respiration. I developed a novel method of doing this as part of a mid-career PhD at the University of New South Wales.

The system I invented took the known principle of using a single piezoelectric sensor embedded in a mattress to monitor respiratory and other movement and added a spatial dimension so that the phasic movement of a patient’s body was measured at 12 points between neck and thigh. Novel algorithms processed these signals to produce a very reliable indication of respiration rate and, in many patients, cardiac rate also (via the cardioballistogram). The system utilised about 75 digital filters, required no calibration and has worked on all patients (~100) to date, including those within a Coronary Care environment.

### **STARTING MY OWN COMPANY**

With my redundancy money from Philips I started Precision Design Services. At that time Digital Signal Processor (DSP) development systems were very expensive and I identified an unfulfilled niche in the market, designing, manufacturing and marketing a lower cost and more fully featured board than the existing Motorola one. With the support of Motorola (!) I marketed

my system through their Australian distributors (along with my consultancy services). This necessitated a rather quick learning curve in handling manufacturing and software subcontractors, advertising, marketing and financial planning (no sales = no mortgage repayment !). At one time virtually every university in Australia had one or more of my boards and they were a good introduction to further consultancies.

One project of note from this period was the design and implementation of the DSP section of the Radioteletype Fleet Modem for the Royal Australian Navy. This involved extensive data and process modelling and was my introduction to the world of Defence technology.

### **INTRODUCTION OF DSP TO PHILIPS COMMUNICATIONS**

Having married and emigrated to Australia, I was fortunate to arrive in Melbourne at a time that Philips Communications were looking for someone to introduce Digital Signal Processing (DSP) into their portable mobile radio systems. My responsibilities there were twofold: to design their first DSP based products and to convert some of their senior analog designers to digital. The former task was easier than the latter – I had to produce an incremental training course with plenty of staged, practical examples to persuade some of my colleagues of the merits of going digital.

### **GETTING A LARGE HEALTH SERVICE DEPARTMENT BACK ON THE RAILS**

In the UK, my final position was at the Hammersmith Hospital as Deputy then Acting Director of the Medical Physics department. At the time I was the youngest Top Grade Physicist in England (there were no separate professional engineering grades.) This was a move from managing 5 people in my previous position to managing 55 in five disparate sections. It was a steep learning curve, particularly as the individual sections had only recently been amalgamated into one department and numerous tensions remained between their managers.

Fortunately, the hospital administration was very supportive of their scientific managers, providing us with considerable on the job training plus various, tailor-made senior management courses. So, within a fairly short time, I got a good grounding in human resources, financial and scientific management and by the end of my time with it the department was operating cohesively with little internal tension and was holding its own financially within the hospital. This was a defining period as far as managerial experience was concerned; I think that during my 3 years at the Hammersmith it was my “privilege” to deal, usually successfully, with almost every managerial problem that one would normally ever encounter.

---

### **Other Interests**

---

Photography, writing, history, horse riding. Reasonably fluent in French.

## Patents

Current provisionals	9 currently active Australian provisional patents in the area of diagnostic ultrasound.
US 6,840,907 US 6,547,743	Detection and classification of breathing patterns BRYDON JWE Respiratory Analysis Systems. BRYDON JWE
US 6,338,473 & US 6,135,432	Humidifier. HEBBLEWHITE M, KWOK PR, STYLES RE, BRYDON JWE
WO 9908738	An apparatus for supplying on-demand additional breathable gas to a patient receiving a primary flow of gas from a primary breathable gas supply. BRYDON JWE, WICKHAM JD.
US 6,213,119 & AU B72072/96	Automatic control of IPAP duration during CPAP or assisted respiration treatment - includes motor driven turbine which is controlled according to inspiration and expiration determined from respiratory flow. BRYDON JWE, WILLSON G.
US 6,526,974 US 6,182,657 & US 6,526,974	Pressure control in CPAP treatment or assisted respiration. BRYDON JWE, WICKHAM PJD, BACHAK M, HOLLIS SD.
AU 199666503	Apparatus and methods for oro-nasal respiration monitoring. BRYDON JWE, CAPPIUS H.
US 6,155,986 & AU B58879/96	Oro-nasal respiration monitoring apparatus for monitoring eg snoring - uses two separate nasal and oral tubes coupled to electrical pressure transducers and whose pneumatic impedances are arranged to be different. BRYDON JWE, PICCIONE PM.
US 6,363,270	Apneic or hypopneic episode arousal monitoring apparatus - has sensors for obtaining signals from patient indicative of skin conductance and physiological variables and correlator for arousal confirmation. COLLA GA, BRYDON JWE
US 6,091,973	Monitoring the occurrence of apneic and hypopneic arousals. COLLA GA, BRYDON JWE
US 6,240,921	Automated stop/start control in the administration of CPAP treatment. BRYDON JWE, CALLUAUD M.
AU 9479077	Continuous positive air pressure treatment apparatus determining whether patient is wearing mask for commencing continuous positive air pressure treatment. BRYDON JWE, CALLUAUD M.

US 5,740,795 & US 6,237,593	Estimation of flow and detection of breathing in CPAP treatment. BRYDON JWE.
WO 8802618	External fixator for osteosynthesis - has pair of sections with bone pin holders and flexible spring to bias them towards each other. BEVERLY M, BRYDON JWE, COOMBS RRH.
US 5,181,520	Method and apparatus for analyzing an electro-encephalogram.. WERTHEIM DFP, OOZEER RC, DUBOWITZ V, CONNELL JA, BRYDON JWE.

-  -