



**Senior Mechanical Design Engineer. Mechanical Lead.**  
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## **CURRENT EMPLOYMENT**

### **2015– 2024: Senior Mechanical Design Engineer - TAIT technologies UK ltd, London.**

- Leading teams to design and engineer:
  - Bespoke machines, Mechanisms, Automation and Robotics, for the stage and entertainment industries.
  - Transmissions, gears, belts brakes, motors (including servo and direct drive) linear and rotating mechanisms. Precision Machined parts.
  - Welded Fabrications (mainly welded mild steel with some aluminium frames.) Weld strength and fatigue analysis. (complex Weld-free Bolted assemblies)
  - Wheels, tracks, Steel wire rope systems and associated parts, sheaves, pulleys, winch drums (all materials)
  - Switches, encoders, custom load cells. SIL3 (safety) components and systems.
  - Electrical component layout, cable management, air flow,
- Concepts. Design modelling.
  - 8 years of experience with Catia V5 CAD software.
  - Experience with Solidworks and EPDM, Autodesk suite, Inventor
  - Also responsible for CAD install, settings, environments, catalogs, (and catalog design tables).
- Engineering analysis and validation. FEA (finite element analysis), Hand calcs and spreadsheets.
- Engineering paperwork includes; FMEA (failure mode analysis), RA (risk assessments), HA (hazard analysis.), Project scheduling. Parts-lists. Drawing-Lists. Relevant content for assembly procedures and instruction documents.
- Design considerations for regulated industries with strict standards. Its second nature to work to project specs and relevant industry standards. Stage and performer industry. Lifting equipment. (Previously both Medical and Food industries.)
- Detailed Drawings, (parts and assemblies) Bills of materials, Work instructions, Manuals.
- Involvement in Full process from bidding, thru concept, detailed designs, validation, and build. Dealing directly with big name customers and all suppliers.
- Project management and cross discipline coordination on small projects
- Working with subcontractors and production departments to improve design for manufacture.

I lead mixed ability teams of engineers across 2 sites. Balancing the design, engineering, drafting and reviews to the strengths of the teams. Responsible for design hours, build budget and functional design.

Bespoke projects often span many years and cost tens of millions of pounds. Engineered, to work safely and reliably first time. Some recent examples of some of my projects:

- 10 axis gantry crane to fly a 700kg flying animatronic “puppet” over a theatre audience.
- Revolving theatre (capacity 200) with multi section motorised and configurable seating and stage.
- High power, high acceleration, stunt winch for launching a (robotic) superhero thru the sky’s of a Disney theme park. (Direct drive motor integration. Outdoor and Waterproof construction. ).

In addition to these projects, I have been involved in the development of several standard products and winches. For these our target cost is only a few thousand pounds and much more time is spent engineering, prototyping and testing. For reliability and value. One recent example is:

- Compact safety winch to fit in a standard truss and supply power down the lifting lines. (High quantity)

I have also developed and rolled out many departmental process documents including report templates, component guidelines and procedures. I work with in-house manufacturing, and external subcontractors, to improve our design guidelines for manufacture.

## **PREVIOUS EMPLOYMENT + OTHER EXPERIENCE**

### **2013 – 2015: Design Engineer - West group Ltd, Waterlooville.**

Pneumatic systems. Circuit design, control and schematic drawings.

Distributing and designing pneumatic parts and assemblies, many of the design projects were for medical and analytical companies. I developed a good knowledge of pneumatic parts, seals, fits and tolerances. Projects included design and engineering of; manifold block assemblies, gripper cylinders, spool valves and selector switches. Responsible for working directly with customers and subcontractors to make sure my projects come in both on time and on budget, at every stage. Typical production batch size is 1-1000 assemblies, with production costs ranging from £1-£400 per assembly. The projects typically include some electronic valves or sensors, so the assemblies are required to integrate with both fluid control and electrical control systems. Many projects also require special assembly tooling and test rigs and all require full assembly, test and inspection procedures. I also took the opportunity to develop my machine shop skills, making various machined parts for my prototypes.

### **2012 – 2013: A Big Adventure.**

A 9-month career break started with 4 months volunteering, (with Raliegth international) as a project manager. Undertaking youth development and community projects in Borneo. This included planning, purchasing and prep work for a gravity water feed system, and the final (hands on) build stages of a full scale, wooden frame, community school.

### **2003-2012: Senior project engineer - Radix Systems ltd, Winchester.**

Designing and manufacturing optical inspection machines for the food industry. I started out as a draught-person, quickly moving on to design engineer and for the majority of the time as a senior project engineer. Working as part of a small company, of around 15 staff, gave me responsibilities for all aspects of machine design and build; from pre-sales concepts and drawings, through designing, ordering, building and developing whole systems and installations. Working together with subcontractors and suppliers, I ran projects at large well known customers and for small farms and individuals. During the final year at radix, I took on extra responsibilities relating to team management and project management. I lead our small team of 4 designers. I also liaised with the software and purchasing departments to prioritise work and to ensure that all projects were on schedule. Good basic understanding of optics, lenses, i.e.ds, cameras and lighting

### **2001-2002: Student placement. (Neos) Superform Aluminium, Worcester. (Year 4 of a 5 year degree.)**

Producing large, vacuum formed, aluminium panels, including many of the body panels for Bentley and Morgan Motorcars. I spent some time working directly with Morgan motorcars on panel fixings, adhesive selection and assembly jigs.

### **1998: Summer placement, Straightpoint ltd (Crosby), Hampshire.**

Designing and building prototypes of a load cell module, built into a shackle pin, for use in industrial lifting assemblies. Experience gained with product design, strain gauges and pull test equipment.

### **Notable areas of practical experience.**

- Previous experience using all workshop tools, including manual lathe, mill and MIG welder.
- Machine building and machine wiring, including safety and pre-shipping tests.
- Machine commissioning, servicing and upgrades on customers sites. (Mainly in Western Europe.)
- Giving customer training to operators and maintenance engineers.

## **BACK PAGE STUFF - EDUCATION AND INTERESTS**

### **1998-2003: Brunel University. “Mechanical Engineering and Design” MEng, BEng (Second class upper)**

A five-year course that combines mechanical engineering with product and industrial design courses. This gave a complete coverage of the whole “product design-engineering-manufacture” process from concept to the shelf. Year 4 of this course was spent in industry as detailed above. My main project, in my final year, was a machine to solve a Rubik’s cube. This combined PIC microcontrollers, simple optics, and stepper motors to inspect and analyse the cube. A series of pneumatic cylinders and moving arms twisted and rotated the cube.

Other modules and theory covered:

- Advanced mathematical analysis of stress, strain and movement in both static and dynamic systems. Thermal properties, heat transfer, turbines, energy cycles and use of steam tables.
- Vibrations, simple harmonic motion and machine dynamics in multi body systems.
- Fluid dynamics and flow in systems, and combined thermo-fluid theory.
- Digital and analogue electronics, control systems, feedback, microprocessors and logic control.
- PIC microcontroller programming, PCB design (Using HiWire) and PCB / electronics practical skills.
- Computer programming (using Pascal), PLC programming and HTML web design.
- Graphic design, Environmental awareness, design history and basic level French language.

### **1996-1998: A – Levels, Itchen College, Southampton.**

Grade B: Chemistry and Design Technology. Grade C: Mathematics and AS-level Physics

Major project: A recumbent tricycle with steel frame brazed joints and “joy stick” brakes and steering.

### **1992-1996: GCSE’s, Bitterne Park School, Southampton.**

Grade A: Maths, Design Technology, Double Science, Art and Geography Grade B: English Language, Drama.

Grade C: English Literature. Grade D: French language

### **Interests and home projects:**

Away from work, I very much enjoy outdoor activities of all varieties, cycling, and paddling and a lot of walking. I have spent many years as a scout leader, planning and running activities for young people.

I have taken part in many downhill gravity races, which involved designing and building small gravity powered go-carts, which could handle an off-road course. Previous entries have included a wooden tractor with real tractor wheels; one that folds up into a briefcase; and one based on a wheel-barrow which only had 3 wheels and “joystick steering”.

My current “home project” is a demountable (and modular) campervan system in marine ply and timbers.