Philip McGaw

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Summary

I have over seven years of professional EMC experience on top of my experience with general electrical and electronics engineering, both via formal education and personal projects, I believe the knowledge and skills built up during this time make me the perfect candidate for the role, One of my personal projects is to build an electric go-kart for my two children, this is being designed to be a frame welded from 20mm square box, and MDF sheet, the motors for it are recovered from "Hoverboards", the control electronics will be bespoke with custom ESCs.

A work-based solution I delivered was involved with the testing of Traction Inverters for EMC and functional testing, the motors they are designed to drive are 100 kW 400 V brushless motors, meaning at full load they can draw up to 400 A peak, this makes it hard to source the required power. The solution I implemented was to use two traction inverters and two traction motors, and couple the motors mechanically together. One motor would be used as an electronic load, and the other would be running in regeneration mode, applying torque and providing about 80% of the required electrical energy to the first, this meant that the current provided by the external PSUs could be vastly reduced.

I also implemented a standardisation on the Amphenol Industrial PL282 series of connectors for use in testing, this allows test set-ups to be quicker to set up and modify while ensuring safe isolation and containment for operators from HaV.

In my time consulting for Energym, I have already managed to make a number of suggestions that will improve the reliability of their product and reduce failure rates, coupled with design suggestions allow them to supply customers in both the Fitness Studio, and home markets, and implement functionality not seen on their competitor's products.

I am actively working towards professional registration through the IET, with a view to becoming a chartered engineer.

Experience

Energem, WLF innovations Ltd. <div align="right">Birmingham</div>
Technical Consultant *2021*

This is a consultant position with Energym to ensure regulatory compliance of their product for the UK, EU, US and Canadian markets.

Relevant standards include Radio Equipment Directive (incorporating requirements from the EMC Directive, Low Voltage Directive), General Product Safety, Machinery Directive, and ISO 20957 - Stationary training equipment Parts 1 and 10 (Class S and H), as well as the UL counterparts.

I am utilising my experience with the authorship of test plans, technical reports and technical construction files to create the text for user instruction manuals, decals, and paperwork required for compliance.

ARRIVAL Ltd. <div align="right">Banbury</div>
Automotive Component EMC Engineer *2020 - 2021*

My role was as the Lead Component EMC Engineer, providing subject specialist support for automotive components for EMC, EMF and EMI compliance, and assessment.

- Specifying testing and standards relevant to the component, working with the ARRIVAL product teams to ensure we aim for compliance.
- Reviewing test plans and test reports prepared by internal and external stakeholders.
- Perform review testing at component and whole vehicle integration level to enable comparison between versions of components.
- Perform Schematic, PCB and PCBA review of components to better understand test results and enable the integration of modifications to enable compliance.
- Health and Safety, and Risk Assessment review of facilities and procedures.
- Writing and maintaining test procedures to ensure regulatory compliance with internal and external standards.

- Working as a subject specialist.

Typical EMC and EMF standards used within ARRIVAL are ATDETP0048, ATDETP0049, CISPR 25 Edition 4 (Working towards Edition 5), ICNIRP 1998, 2010 and 2020, UNECE Regulation 10, and GB 8702 2014.

This position required the experience gained while with both CASS and JLR, I have also had the opportunity to pick up new skills. The project management experience I gained working at JLR has helped me adjust to a more senior position, with more responsibilities.

Project management skills were used in writing the specification, the tendering of the contract and overseeing the construction and setup of a new Conducted Immunity and Emissions facility for testing Battery Electric vehicles, and components, this facility included a 10 meter long SAC, amplifiers, control PCs and software (ETS Lindgren't Tile and Vision TRX applications) and Receivers.

Until the new laboratory was operational my responsibilities included interfacing with external test houses and service providers in regards to purchasing services based on test plans produced by either myself or the component team. These documents need to convey enough information to allow someone who has never seen the component before to perform testing whilst ensuring a robust EMC sign-off (at component and vehicle level) and ensure that radio reception (customer satisfaction) is not compromised.

Other duties included:
- Writing test plans for both full testing and quick evaluation tests.
- Writing test reports for both full testing and quick evaluation tests.
- Working closely with external stakeholders and suppliers.
- Daily maintenance of the test facility and constant improvement of the processes within the test laboratory.
- Ensuring all equipment is calibrated including cables and test equipment.
- Helping clients gain compliance by ensuring the correct standards are used during testing.
- On failure to meet the requirements of EMC, offering advice on cost-effective fixes, ranging from decoupling on the mainboard to correct track and board layout.
- Development of test plans and procedures in line with manufacturing and design requirements.
- Test of complex electronic equipment.
- Evaluation of Technical problems to develop proposals for investigations and corrective actions, including process improvements.

Other parts of my role were:
- Review schematics, PCB layouts, technical datasheets, simulation results and design calculations. Based on this review I am required to provide design recommendations to engineering teams to meet EMC and EMI requirements, and any other improvements I can derive from the data.
- Ensuring the correct design requirements have been met by the component team.
- provide technical leadership to troubleshoot component and system issues.
- Reviews both schematics and PCBs for EMC best practice
- Perform ECU and PCB level assessments using a variety of test equipment.
- work closely together with component teams developing electronic devices
- communicating complex technical information to all levels of leadership in a clear and concise manner to aid issue resolution.
- Researching new measurement techniques and design custom electronic instrumentation and physical parts to facilitate testing and provide more streamlined stakeholder service.

Where there is a risk of issues on the vehicle, I worked with the Vehicle EMC engineer to perform vehicle level EMC assessments, based on the impact of the issues, either looking for containment or mitigation to meet the requirements of the legal requirements.

While working at Arrival I learned about High power electronics design to support EV system development, this involved working with the Powertrain team and the High Voltage Battery Module team to safely test HaV components and systems.

Jaguar Land Rover. GAYDON

Automotive Component EMC Engineer *2018 - 2020*

Working with a team of Engineers and Technical Specialists on several cross vehicle line projects and, technical projects including EMF investigation.

My role as project manager included, clearly and concisely providing subject specialist support for around 60 automotive components for EMC compliance and assessment.

- Specifying testing and standards relevant to the component, working with the JLR component managers to ensure compliance.
- Reviewing test plans and test reports prepared by internal and external stakeholders.
- Perform review testing at component and whole vehicle integration level to enable comparison between versions of components.
- Perform Schematic, PCB and PCBA review of components to better understand test results and enable the integration of modifications to enable compliance.
- Health and Safety, and Risk Assessment review of facilities and procedures.
- Writing and maintaining test procedures to ensure regulatory compliance with internal and external standards.
- Working as a subject specialist.
- Author of the tender document for a new two lab EMC facility to replace the current one from the 1980s.

Typical EMC and EMF standards used within JLR are JLR-EMC-CS, CISPR 25 Edition 3, ICNIRP 1998 and 2010, UNECE Regulation 10, and GB 8702 2014.

CASS Industries Ltd. MANCHESTER

EMC Test and Compliance Engineer (commercial) *2014 – 2018*

My main duties involved managing the testing of clients' electrical and electronic products for compliance with European Directives and appropriate test standards using RF measurement techniques and electronic test equipment such as Oscilloscopes, and Spectrum Analysers. Other duties included:

- Writing test reports for both full testing and quick evaluation tests.
- Daily maintenance of the test facility and constant improvement of the processes within the test laboratory.
- Ensuring all equipment was calibrated including cables and test equipment.
- Helping clients gain compliance by ensuring the correct standards are used during testing.
- On failure to meet the requirements of EMC, offering advice on cost-effective fixes, ranging from decoupling on the mainboard to correct track and board layout.
- Developing test plans and procedures in line with manufacturing and design requirements.
- Testing of complex electronic equipment.
- Evaluating Technical problems to develop proposals for investigations and corrective actions, including process improvements.
- Looking after the internal network, desktop computers, and servers (Microsoft Office on Windows 7 and 10).

I also assisted with researching new measurement techniques, designing custom electronic instrumentation and physical parts to facilitate testing and provide more streamlined customer service.

Typical EMC standards used within the test facility would be EN55032, EN50130-4, and the EN61000 series of standards.

Squashed Fly Ltd.

Freelance Geek *2006 – 2014*

Website design and hosting for some clients, including pro-bono work for charities. SquashedFly's servers are Debian and Ubuntu Linux, managed via SSH, sites being built using WordPress as a CMS.

Several long and short terms IT contracts covering First, Second and Third Tier support, Dev Ops and Administration roles, for companies and organisations including:

- McCann Erickson.
- Secure Borders and Communities (SERCO).
- UK Borders Agency.
- Allegro Networks.
- FACT (Foundation for Art and Creative Technology).
- Pennant Training Systems Ltd.
- Department for Work and Pension.
- Ministry of Justice.
- Freedom Press.
- BIMM Institute (British and Irish Modern Music Institute).

Experience:

- Supporting and managing IT estates of more than 500 Windows 7 and Mac OS X users, in high-

pressure production environments.

- DBS checked, Working within the Official Secrets Act, and International Traffic in Arms Regulations, Holding Security Vetting.
- Munki!, Jamf and Deploy Studio
- Lone and out of hours working.
- Day to day running of the IT and Technical resources.
- Ensuring Service Level Agreements (SLAs) are met at all times.
- Deploying bare metal images to Mac and Windows computers.
- Maintenance of Linux servers (LAMP stack and email)
- Hosting and maintaining the security of WordPress installs.

Please refer to Philip's LinkedIn profile for a more complete list of work experience along with recommendations.

Education

University of Plymouth   Plymoth
Certificate of Higher Education in Electrical Engineering   *2004 — 2007*

Skills

Technical expertise: Leading and recruiting teams of software engineers. Big fan of Agile methodologies, continuous delivery and functional programming. Enjoys writing Ruby/Python/Java/C++ and Haskell. Solid knowledge of the full web technology stack. Able to architect *and* implement distributed/HA systems. Strong Linux administration skills (e.g. Bash scripting, Apache/NGINX, Postgres/My/NoSQL, ElasticSearch). Well experienced with virtualization/containerization (Docker/Kubernetes, KVM, Xen and several AWS solutions) and DevOps (Puppet). Emacs user.

Interests

Non-exhaustive and in alphabetical order: art, Buddhism, cryptography, functional programming, Go (board game), history, music (from classical and jazz to Berlin-techno), NLP, permaculture, philosophy, rock climbing, startups, travel, typography (e.g. graphic design, LaTeX), UX-design and vegan cuisine.