

Biography – Stuart Charles

Stuart Charles is a chartered EMC engineer with over 30 years of experience in electromagnetic engineering. Stuart obtained an HND in electrical and electronic engineering from South East London Technical College (SELTEC) in 1972 and joined STC Basildon as an electronics engineer, initially working on a secure communications project for MOD. He was introduced to the field of TEMPEST engineering, a subject associated with the study of compromising emanations, and voice digitization/digital electronics design using 7400 TTL and early custom ASICs.

In 1976 Stuart joined Cossor Electronics (now Raytheon) as an electronics design engineer working on MOD projects associated with secure communications and secondary surveillance radar hardware.

In 1980 Stuart established an EMC/TEMPEST and Nuclear Hardening Group at Cossor Electronics in Harlow Essex. The group was responsible for internal Company design consultancy, EM design strategy/implementation and also provided EMC/TEMPEST design consultancy to MOD on a number of IUKADGE RAF projects. Stuart also managed a small EMC/TEMPEST test laboratory and worked closely with MOD on a number of UK secure data projects. The department also provided EMC support to Cossor's Secondary Surveillance Radar (SSR) design team working on high speed electronic signal processing of aircraft digital communications.

In 1988 Stuart completed an Open University degree in mathematics and electronic engineering. He specialised at Honours Level in Electromagnetism, Electronic Signal Processing and Control Theory. He embarked on further post graduate studies and in 1992 gained an MSc in EMC from the University of Hull, awarded with distinction.

In 1992 Stuart joined Nortel Networks as an EMC consultant working on high speed (622Mb/s and later 2.5Gb/s) SDH communications hardware. In 1998 he was appointed a senior EMC advisor responsible for EMC research and development and university interaction programmes within North America and the UK. He worked closely with senior staff at the University of Missouri Rolla on the University/Industry partnership programme to develop EMC design strategies to support new technologies being developed at Nortel.

Stuart left Nortel, and started up his own consultancy in EMC/TEMPEST in 2004. The same year he started working in EMC in the railway industry.

Today, Stuart is working for London Underground as a Senior EMC engineer specializing in signaling safety and EMC. This work encompasses working with other engineers modeling railway signaling systems and using time and frequency domain network analysis techniques concomitant with the FFT analysis of test data obtained from rolling stock/track circuit EMC tests and trials. Stuart has also worked extensively on modeling the effect of variable resistance ballast on signaling systems to negate the impact of RSFs (Right Side Failures) whilst maintaining safety-critical functionality.

Stuart is currently providing EMC consultancy to a company with a revolutionary technology developing Ethernet based hardware for use in high performance data centres. These products will provide an order of magnitude improvement in efficiency and power consumption when benchmarked against current Ethernet products.

He also provides EMC/TEMPEST support to a global company specializing in the field of secure communications. He has developed a novel algorithm associated with TEMPEST prediction techniques using frequency domain analysis.

Stuart teaches EMC courses for both electronic circuit designers and mechanical engineers. He is the author of a number of technical papers that have been presented at EMCUK200X and the IET.

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