# *** Mr. David G NORMAN : CURRICULUM VITAE *** (October 2020)


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| FULL NAME : | **MR. DAVID GEOFFREY NORMAN** |
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| AVAILABLE : | **October 2020** |
| PREFERRED LOCATION : | ***Remote working (VPN, Zoom/Skype)*, with occasional trips to UK South-coast or South-West England sites** |


Since graduating in **Computer Science** at **Brunel University** in 1980, I have gained 40 years of experience as a **real-time, embedded software/systems engineer** and **mobile applications developer**, working in the **aerospace, defence, communications and transport** industries on critical applications such as defence and civil avionics; military and internet/wireless communications; weapon systems; radar and transport systems, primarily under client contracts through my own company, **High-level Algorithms Limited** and former employers **QinetiQ** (Portsmouth) and **Smiths Aerospace** (Cheltenham). All roles have been within an integrated team environment and include substantial periods of **project management**, **team leadership** and **systems engineering** experience.

I have gained/renewed SC *many* times (though it is currently expired as on civil work for the last 2+ years)

Principal clients/employers, projects, languages and development environments, methodologies and tools are as follows (broadly, most recent first .. though I have worked at some sites on multiple, separate contracts) :-

***At:*** **Lumentum (**formerly **Oclaro) -** Paignton (2 years 4 months); **UTC Aerospace Systems -** Plymouth (1 year 11 months); **Atlantic Inertial Systems** - Plymouth (10 months); **BAE Systems** - Yeovil (6 months); **L-3 TRL National Security Division** (3 months)**; Cobham Mission Equipment** - Wimborne (19 months), **GE Aviation** - Cheltenham (18 months); **Invitation Digital -** Bristol; **Sub10 Systems** - Kingsteignton (6 months); **Agusta Westland** - Yeovil (1 year); **EADS Astrium** - Portsmouth (2 years); **SELEX-SI** - Portsmouth and Euston, London (5 months); **QinetiQ** - Portsdown Technology Park, Portsmouth (2 years 7 months); **AIRBUS UK** - Filton, Bristol (10 months); **SYN-APPS-SYS / NORTEL NETWORKS** - Newton Abbot/Maidenhead (18 months); **BAE SYSTEMS Avionics** - Plymouth (6 years 7 months); **THORN TRANSIT SYSTEMS INTERNATIONAL** - Wells (3 months); **WAYFARER TRANSIT SYSTEMS Limited** - Poole (17 months); **PLESSEY RADAR SYSTEMS** - Chessington (19 months); **SMITHS INDUSTRIES AEROSPACE AND DEFENCE SYSTEMS LTD** - Cheltenham (4 years 7 months);

***On:*** **Fibre-optic module testing/specification** (2 years); **Mission Planning** (CAGE); **REAL-TIME, EMBEDDED .. Civil and Defence Avionics** (Typhoon GPWS, Gulfstream Advanced Power Management System, C130 Terrain Avoidance Warning System, Future Lynx Tactical Processor, Airbus A380 Integrated Modular Avionics, Airbus A310 Flight Management System, Boeing Autothrottle, Tornado ADV Automated wing sweep) (7 years); **Airborne Flight Refuelling Systems** (19 months)**, Naval Combat Systems Engineering** (3 years), **Weapon Systems** (Electro-optical Missile Tracking, Naval Gun Fire Control) (6 years); **Military Communications** (4 years); **Internet/Wireless Communications** (3 years); **Military Air-Defence Radar** (2 years); **Transport** (4 years);

***Using:*** Python (2 years); C (8 years); JAVA (6+ years); C++ (2 years); ADA 95 (4 years), ADA 83 (6 months); INTERNET (JavaScript, VBscript, HTML, DHTML, CSS, XML, ASP, PHP 4) (3 years); ASSEMBLER (Intel 80x86, Zilog Z8000, Motorola 68000, TMS320 DSP, MicroChip PIC, Rockwell 6502, Hitachi SHx) (5 years); SQL(ORACLE,Informix,MySQL) (1 year); CORAL 66 (2 years); RTL/2 (18 months); VISUAL BASIC (6 months);

## SOFTWARE and SYSTEMS ENGINEERING CONSULTANCY EXPERIENCE

**02.2018 - 06.2020 (2 years 4 months) Client: Lumentum (formerly Oclaro) (Paignton)**

Project: OC1200. Design/development of a Python-based automated test suite for a 1.2TBps Ethernet to fibre-optic module. Both Windows and Linux OS-based (with low-level access via Linux to PCIe interface). Development of Win GUI (Python/wxPython) over IP to test suite. Also system derivation of memory-mapped interface definition for new Lu400Gbps module.

**02.2016 - 12.2017 (1 year 11 months) Client: UTC Aerospace Systems (Plymouth)**

Project: TERPROM® PGCAS/GPWS for Beechcraft trainer aircraft. Design, development and testing of “DIB” test environment for Beechcraft trainer aircraft version of TERPROM®. C/C++ (VS 2013 IDE) software driving ARINC-429 (via AIM 429-8 interface), discrete I/o and power supply lines for fully automated feeding/recording of test data and results. Preparation of ADA Verifier, 2D and 3D Simulation suites for Beechcraft and Pilatus Trainer platforms.

Project C17 Simulator: Update of TERPROM® software suite within C17 Simulator.

Project: Typhoon GPWS. Update of avionics software for Typhoon Ground Proximity Warning System. ADA 95 code/Object ADA IDE.

Project: DMU30 Inertial Measurement Unit. Development of C unit tests and continuous integration test environment. Visual Studio IDE.

**05.2015 - 11.2015 (6 months) Client: BAE Systems (Yeovil)**

Project: CAGE (Common Augmented Gateway Environment)

An advanced Mission Planning application initially targetted to support AW159 Wildcat helicopter and Typhoon jet fighter operations. Java source code development for Eclipse RCP environment. Agile/Sprint (Jira). DOORS Requirements/Test management. Eclipse/eGit.

**01.2015 - 04.2015 (3 months) Client: L-3 TRL National Security Division (Tewkesbury)**

Project: A cryptographic certificate management demonstrator.

Agile/Sprint (Rally); Java (Netbeans 7.4), C++ (Visual Studio Pro 2012); CVS/SmartGIT

**04.2013 - 11.2014 (19 months) Client: Cobham Mission Equipment / Flight Refuelling Limited (Wimborne)**

Project: 805E (Airbus A330 Centreline Refuelling System), 912E (Embraer KC390 Wing Refuelling System), RP910E/FR600 (Boeing KC46 Wing/Centreline Refuelling System).

Safety-critical C software design, coding and testing to DO-178B Level B. Eclipse IDE. All-Change software configuration management system. Artisan Studio UML.QAC source code analysis.

**05.2012 - 04.2013 (1 year) Client: GE Aviation Limited (Bishops Cleeve, Cheltenham)**

Project: 'Gulfstream Advanced Power Management System (APMS)'. Safety-critical C software design, coding and testing to DO-178B Level A. APMS Bus Power Control Unit (BPCU) Platform layer driver development based on TMS320F28335 device. Includes CAN bus II (ARINC 825), ePWM waveform generation, eCAP phase/frequency measurement, eQEP and

timing device drivers and support of Single-Event Upset (SEU) strategy. TI Code Composer Studio IDE. Serena Dimensions software configuration control and DOORS 9.1 requirements management. LDRA code analysis. Vector CANalyser bus testing.

**10.2011 - 04.2012 (6 months) Client: Sub10 Systems Limited (Kingsteignton, Devon)**

Software development for **Liberator V320** V-band 60GHz 320Mbps point-to-point wireless Ethernet bridge. PowerPC architecture. C coding. Eclipse IDE. Embedded Linux target OS. U-Boot bootloader. Busybox. Subversion and Mercurial software configuration management. Includes code for driving and characterisation of Hittite HMC6000,HMC6001,HMC6075 and HMC6076 60GHz transceiver devices.

**05.2011 - 10.2011 (6 months) Client: GE Aviation Limited (Bishops Cleeve, Cheltenham)**

Validation and Verification (V&V) analysis to DO-178B Level A of the '10x8' Integrated Display Unit (IDU) for the Future Lynx/Wildcat helicopter. Artisan Studio/UML. Serena Dimensions. C software analysis.

**03.2011 - 05.2011**

(High-level Algorithms Limited) Continued development of ***vidAR*** real-time, optical object tracking Android mobile phone application (m-app) and associated (Java) server apps suite.

**02.2011 Client: Invitation Digital (Bristol)**

Project 'VoucherCloud for Android' . Development/integration of the Android version of VoucherCloud - a popular mobile application offering 'show-on-phone' discount vouchers and other commercial deals based on location and user-selected categories. Java software development using the Android SDK with Eclipse IDE.

**09.2010 - 02.2011**

(High-level Algorithms Limited) Major further development of ***locAR*** real-time, multi-user team location tracking Android mobile phone application (m-app) and associated (Java) server applications suite. Includes real-time server search and distribution of geographical database items in support of upcoming 'location-based services' (LBS) provision. Addition of camera image capture and sharing capability, supporting team-based surveillance. Commenced development of ***vidAR*** real-time image capture, analysis and object tracking m-app.

**02.2010 - 08.2010 (7 months) Client: Atlantic Inertial Systems (Plymouth)**

Project 'TERPROM-TAWS'. Development of avionics software within Terrain Avoidance Warning System for C130 Aircraft Modernisation Program (plus some work on C17 upgrade and F15 LRU demonstrator). ADA 95 code/ObjectADA IDE. DO-178B level C standard.

**09.2009 - 02.2010** (High-level Algorithms Limited) Development of ***m-apps:locAR*** - a real-time team, multi-user location tracking mobile phone application (m-app) for Google Android and Apple iPhone. First version for Google Android released via Android Market on **2010 January 1st**. Includes (April) release of full "Augmented Reality" (AR) capability for viewing team and user object locations in real-time overlaid upon phone camera view.

Java/Eclipse Android development environment. Google Maps API. Objective C/Xcode iPhone development environment. Includes development and deployment of a complete Java-based distributed server applications suite supporting secure, real-time phone-to-phone data communication.

**09.2008 - 09.2009 (1 year) Client: AgustaWestland (Yeovil)**

Project 'AW-159 Wildcat (formerly Future Lynx) Tactical Processor'.

Development of avionics software for the Tactical Processor within the AW159 Wildcat / Future Lynx helicopter. UML design using Artisan Studio. ADA 95 code. DO-178B standard. Allied Standards Avionics Architecture Council (ASAAC) software architure. Green Hills Integrity OS. Allchange configuration management.

(High-level Algorithms Limited) Development of mobile phone applications for Google Android and Apple iPhone.

**09.2006 - 08.2008 (2 years) Client: EADS Astrium (Broad Oak, Portsmouth)**

Project 'Skynet 5 Paradigm Modem'.

Software engineering for the Paradigm Modem within the ground segment of the Skynet 5 military satellite communications programme. Implementation of Joint Tactical Radio System (JTRS) Software Communications Architecture (SCA) using Java,C++,CORBA and XML on embedded Linux and Windows platforms. Zeligsoft CE (Component Enabler) SCA tool. Eclipse IDE. Subversion and Clearcase version control. ClearQuest change request management. Installation of Linux OS, NX server/client and VMware virtual machines.

(High-level Algorithms Limited) Development of networked security image capture, recording and intelligent analysis system, hosted on multiple (SUSE) linux web-servers. Java applications for intelligent image processing and communication between multiple hosts across the internet.

**04.2006 - 09.2006 (5 months) Client: SELEX Systemi Integrati (a Finmeccanica Company) (Broad Oak, Portsmouth and Euston Tower, London)**

Project 'ITPS'. Member of System Architectural Design team for an Integrated Train Planning System for Network Rail (required to support over 400 users distributed across multiple national data centres). Technologies include: Enterprise Oracle database, Citrix server, web portal, COTS solution integration. Analysis and specification of Non-Functional Requirements, including LAN/WAN network bandwidth loading for database, Citrix and HTTP traffic; database storage capacities; database/application server farm sizing, etc.

Project 'CCDSR'. Preparation and presentation of software design for Code/Callsign Distribution System Replacement air traffic control (ATC) system component bid to NATS (National Air Transport Service). System required to meet extremely high availability and safety requirements using multiple redundancy with automated fail-over to ED109 AL4 software development standard. Assessment of high-availability database packages (Berkeley, Oracle Times Ten, mySQL) and database schema design.

**09.2003 - 04.2006 (2 years 7 months) Employer: QinetiQ (Portsdown Technology Park, Portsmouth)**

Watchkeeper IRL - NATO Standard Image Library Interface (STANAG 4559) Image Reference Library development to MIL STD 1521B. Using Java 5 (Eclipse IDE), JDBC (Oracle 9i RDBMS), UML (jude), unit testing (junit), Subversion/TortoiseSVN version management. Software manager/(Java) developer for IP routing, logging and analysis package for Wide Area Integration Facility (WAIF) - Linux OS (Red Hat 7.2, kernel 2.4). Combat Systems Engineering for Royal Naval combat systems. Project management and Java/C++ software development for: the Highway Interface Processor (HIP) - a new DEF-STAN 00-19 naval combat system highway

(CSH) to Ethernet gateway; Network-enabled, open-architecture CSH data recording, health monitoring, tele-engineering and Quick-Look Analysis (QLA) tools; Byte Parallel Data Recorder and (Java) IFF, Sonar 2050 and UAT data analysis software tool development (with on-ship trial recording/analysis); CS highway interface units for scenario generator system. Research on better delivery of non-functional requirements (NFRs) using Incremental Acquisition (IA) and Evolutionary Acquisition (EA) strategies under Smart Acquisition policy. Development of Java (Swing) and Visual Basic application components to support (Microsoft Speech API) voice recognition control of advanced naval tactical picture display demonstrator.

(High-level Algorithms Limited) Development of Java (Ewe JVM) mobile applications to run on both PC/Windows and PDA/Pocket PC 2003. Applications support advanced image viewing and processing; IP and serial link comms utilities; a complete GPS moving map and tactical picture display package.

**08.2002 - 05.2003 (10 months) Client: AIRBUS UK (Filton, Bristol)**

Realtime Avionics Systems and Software Engineering Consultancy for the Integrated Modular Avionics (IMA) suite on the Airbus A380. Specification, assessment, installation and support of tools for the development, integration, configuration, dataloading and qualification of C and Ada 95 IMA software applications to DO-178B level A standards. Primary consultancy role within Airbus for the Thales Avionics/Diehl/Axlog HBOSS, TBOSS, COTAGE, PIT, LODGE and BETSI tools. Development of IMA software applications and drivers to support ARINC 429, discrete digital, CANbus and analogue i/o via VME cards within a target IMA OS simulator based on Thales VMPC6a PowerPC (PPC750) processor card (including VME i/o and processor card selection, procurement and installation) with customisation for Smiths Aerospace A380 LGERS/LGCIS application. System administration and tool installation across a mixed Sun Solaris 2.8 and PC Windows NT4/2000 network.

**09.2001 - 07.2002 (10 months)**

Creation of SQL/XML web databases and query pages using MySQL, PHP4, JAVA/JDBC,JAXP and XML DOM. Development of Visual C++ (v6) and JAVA 2 (jdk 1.3) versions of video image object tracking software able to identify objects against varying background scenes and lighting conditions. Incorporation of voice-output to warn of activity in specified zones and internet connectivity to enable transmission of images and email/SMS message alerts. Commercial development and continued support of an internet web-site for Irvine Nott estate agents (**irvinenott.co.uk**), including JAVA applications suite to support automatic generation and maintenance of property details web pages based on customer database. Addition of **Dartmouth** and **Exeter Quay** to the **HALIEN Virtual Tours** site.

**03.2000 - 09.2001 (18 months) Client: SYN-APPS-SYS (Newton Abbot) and NORTEL NETWORKS (Maidenhead)**

(18 months) Project 'IFWA'. Development of a fixed wireless access (FWA) telephone system to support 'always-on' internet access. Detailed design, real-time embedded C++ coding and integration of communications protocol stack Network (NWK) and Data Link Control (DLC) layer modifications to support IP packet data handling. Hitachi SH1 and SH2 embedded processors. Windows 98 / Linux development OS. Integration of DLC/NWK protocol stack layers with L2TP and MAC layers, USB serial communications link and applications layers. Measurement and optimisation of IP data throughput under various protocols (FTP,SMTP,SNMP,etc). Detailed design, embedded C++ coding and integration of base-station Carrier Auto-Calibration package to handle 'Multiple Diversity' receiver automatic calibration function. Embedded Motorola 68000/TMS320 series processors. Managed software team configuration control using 'Clearcase' configuration management system.

**06.1999 - 02.2000 (9 months)** Commercial development of an internet multimedia

advertising/e-commerce site for A1 Pursuits. Employing JAVA (jdk1.2.2 and JBuilder2) and Microsoft Visual C++ to produce a suite of applications which support automatic generation,indexing and maintenance of web pages based on customer and advertisement databases. Development and hosting of several small commercial web-sites under A1 Pursuits site.

Creation of **HALIEN Virtual Tour of the London Boat Show 2000 at Earls Court**. Expansion of the **HALIEN Virtual Tour of Torbay** (**tor-bay.com**) to incorporate over 2000 images within a structured tour of Torbay (and now featured by many national and international web-sites). Preparation of a CD version of the HALIEN virtual tours and TAS web-sites for sale via the internet. Extensive web-site upgrade using JAVA, JavaScript, Cascading Style Sheets and Dynamic HTML. Ongoing addition of HALIEN site search and other facilities using Active Server Pages (ASP) and PHP.

Preparation of video acquisition hardware, development of internet site pages and management of a **live webcast** from within the totality zone of the **August 11th Total Solar Eclipse** from the Torbay observatory (during this event over 208,000 eclipse image files containing 2,500 Megabytes of data were served to at least 10,000 different destinations in more than 70 countries). Capture, conversion and CD/internet presentation of extensive eclipse-related video footage. Design, digital hardware construction and software development for optical director platform that can be remotely controlled via an RS485 multi-point data bus. Arizona Microchip PIC16C84 microcontrollers, MPASM assembler software.

**09.1998 - 05.1999 (9 months) Client: BRITISH AEROSPACE Systems and Equipment (Plymouth)** Project 'AMHS'. Advanced Message Handling System for Royal Navy Landing Platform Dock (Replacement) vessels. PC-based, networked system for assisted generation and automatic distribution, relay and logging of messages conforming to NATO ACP126, ACP127 and JANAP-128 specifications. Windows NT 4.5, Microsoft Visual C++ v5, Informix/SQL database, Ethernet. Application/OS installation. Windows NT and application security penetration testing. Analysis, writing and execution of Year 2000 compliance application test suite.

**07.1998 - 08.1998 (2 months)** Development of first phase of the **HALIEN Virtual Tour of Torbay** web-site at **tor-bay.com**. Acquisition of over 1200 digital photographs, image processing and HTML programming to create a 'virtual tour' of Torbay. JAVA, JavaScript, HTML.

Design, construction and software development of a new generation drive control system for the 19 inch reflector telescope at the Torbay Observatory. Multiple PIC 15Cxx and 16Cxx series microcontrollers programmed using MPASM assembler. Drive system update to meet accuracy requirements for remote/internet control as part of Telescopes In Education programme sponsored by NASA/JPL.

**08.1994 - 06.1998 (3 years 11 months) Client: BRITISH AEROSPACE Systems and Equipment (Plymouth)**

Project 'GSA8'. Naval Gunfire Control System for Royal Navy Type 23 and Type 22 frigates. Upgrading of GSA8 to support integration with and control by ship Combat System. GPEOD electro-optical director system upgrade to support single and coordinated dual installation operation with CS. MASCOT 3 design methodology. Real-time embedded Z8000 assembler developed on VAX/VMS and running on multiple Z8000s. Real-time embedded ADA 95 on Motorola M68000 series microprocessor under VxWorks. UML and Teamwork under SUN/SOLARIS. Microsoft Visual C++ on PC. Systems engineering to acquire, analyse and manage formal functional requirements using RTM. Systems successfully delivered to and accepted by Royal Navy.

**06.1994 - 08.1994 (3 months) Client: THORN TRANSIT SYSTEMS INTERNATIONAL (Wells)**

Preparation of bid for replacement of mass-transit subway system fare collection/management system for Massechussets Bay Transportation Authority (USA).

**01.1993 - 05.1994 (17 months) Client: WAYFARER TRANSIT SYSTEMS Limited (Poole)**

(1 year) Development of (Borland) C++ software on Pcs for embedded 80186 processor-based Depot Reader system. QNX RTOS. PVCS software configuration management.

(5 months) Project 'SVT'. Incorporation of a stored value contactless smart-card reader into a ticket-issue system for London Transport. Project leader and software engineer, responsible for detailed requirement management, timescale planning, software engineering staff supervision and hardware development coordination. Specification, design, coding and testing of C/6502 assembler RS485 communications link and reader simulator software. Networked PC development environment under MSDOS and WINDOWS 3.1. Embedded 6502 and 80188 target hardware. System successfully delivered to LT for public trial.

**03.1992 - 12.1992 (9 months)**

Analysis, development and installation of PC-based software packages using C++ (OOD) under MSDOS and MS-WINDOWS 3; plus VISUAL BASIC under MS-WINDOWS 3. Projects include an intelligent home/office safety and security system (also including design, construction and installation of communications links and digital interface hardware); a commercial food-processing database and labelling package for a Poole-based client; an image recognition and moving object tracking software package (DOS and Windows versions) and an astronomical image processing package (MS Windows)

**04.1990 - 03.1992 (23 months) Client: BRITISH AEROSPACE Systems and Equipment (Plymouth)**

(6 months) Project 'JZY' (part of RN OUTBOARD). Real-time embedded naval intelligence processing, display and secure communications system for Royal Navy "Invincible"-class carriers. VAX ORACLE database. FORTRAN coding. FORTRAN/ORACLE interface and SQL database-query language. MicroVAX/VMS operating system internals. Systems successfully delivered to and accepted by Royal Navy.

(17 months) Project 'EOTI' (Electro-Optical Tracking Instrument). An optical missile-tracking system for telescopic camera and radar guidance on RAE test ranges. Highly time-critical real-time embedded software required to manage system operation in response to real-time video input. Based upon PC + multiple-Z8000 microprocessors. Z8000 ASM and PASCAL coding. MASCOT 3 design methodology. Tektronix+UNIX, VAX+VMS & PC development/target environments. Configuration control package written using VAX TPU. VAX WordPerfect documentation. Team leadership. On-site system testing. Systems successfully delivered to and accepted by Royal Aircraft Establishment.

**08.1988 - 03.1990 (19 months) Client: PLESSEY RADAR SYSTEMS (Chessington)**

Project 'PoACCS'. Design, code and test of a new NATO LINK 11 networked MILITARY COMMUNICATIONS subsystem (integrated into a radar-based air COMMAND AND CONTROL system), plus an X25/pseudo-Link 11 datalink to a NATO command centre. Virtually full Link 11 implementation to STANAG 5511. Multiple Intel 80386 target. Multibus 2. Ethernet LAN. RTL/2 + 80386 assembler code. DEC VAX+VMS development environment. MASCOT 3/YOURDON design methodology. Assessment of feasability and costs of conversion from RTL/2 to ADA 83 environment.

**04.1985 - 08.1988 (3 years 4 months):**

Creation and development of "HALCIEN" - a structured computing language with built-in 3D graphics, textual file editing and database processing features. Language design. 6502 assembler for prototype version. Language implementation using C / C++ and 8086 assembler under MSDOS for IBM PC. Development of PC HALCIEN/ASM/C s/w for 3D graphics (CAD/SIM), CASE, document management (esp for technical text/diagrams), text retrieval and database management. AI (neural network-based) intelligent control systems research + related CMOS/HCTTL digital h/w development. Project management & product marketing (including exporting). Development and installation of a PC-based stock control system (C language). Design , development and testing of automated stellar acquisition & tracking software; plus hardware design, construction and installation of computer interface & stepper motor drive electronics for a 19" reflecting telescope at the Torbay Observatory.

**08.1980 - 03.1985 (4 years 7 months) Employer: SMITHS INDUSTRIES , AEROSPACE AND DEFENCE SYSTEMS LTD (Cheltenham)**

Levels: Avionics Software Engineer, Systems Engineer and Team leader

Development of avionics software for multi-8086 based Flight Management Computer System. Installed on Airbus Industrie A300/A310 passenger airliners and selected by US Navy for submarine communications aircraft guidance.

(1 year) Design, code and testing of Intel 8086 assembly-level software for ARINC 429 aircraft communications system and Bubble Memory database system. Extensive hardware/ software interface processing. ASM86 upon Intel MDS under ISIS-II. ICE86 emulation. DEC PDP11 under RSX11. Period includes 5 months module testing s/w for STS10 Autothrottle and designing s/w for successful Tornado ADV wing-sweep automation project contract proposal.

(2 years) Design and coding of 8086-based software for handling pilot command input , flight-plan construction/update and flight data-management requirements - both across a multiple-8086 architecture within each FMC unit and for command/data communication between dual-FMC units.

CORAL-66 on DEC PDP11 under RSX11, plus VAX under VMS.

Full structured design methodology appropriate to the development of highly safety-critical flying software to the standards necessary for aircraft Certification.

(6 months) Systems Engineering. Definition of FMS Control/Display Unit characteristics to support operational requirements. Analysis of Performance (Vertical Navigation) requirements.

(1 year) Team leadership - including responsibility for all resource/timescale planning, monitoring and reporting; design integrity; software standards control; staff review/interview, etc. over a team of 14 engineers developing lateral Flight Navigation software.

## QUALIFICATIONS

DEGREE : Bachelor of Technology SUBJECT : Computer Science

CLASS : Upper Second (Honours) AT : BRUNEL UNIVERSITY Uxbridge, Middlesex UB8 3PH

PERIOD : 1976 - 1980

TYPE : A four year, 'Thin' Sandwich course incorporating three 5-month periods of practical experience in industry

SCHOOL : Crypt Grammar School , Gloucester

GCE : 1 'S' level (Applied Mathematics), 5 'A' levels (Pure, Applied, Combined Maths, Physics, Chemistry), 11 'O' levels

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## DEGREE COURSE INDUSTRIAL TRAINING:

**9.76 - 6.80:**

Four year Degree course in COMPUTER SCIENCE at BRUNEL University. Three 5-month industrial training periods at MARCONI SPACE AND DEFENCE SYSTEMS LIMITED (mainly FORTRAN design / coding), the ATOMIC WEAPONS RESEARCH ESTABLISHMENT, ALDERMASTON and the ROYAL GREENWICH OBSERVATORY (two M6800/FORTH telescope instrumentation projects)

Graduated 1980 with Upper Second class Honours Degree.

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## INTERESTS:

My software development skills are supported by an in-depth knowledge of digital electronics, largely acquired over many years of development work on embedded systems. I have designed and constructed the electronics for several projects based on microcontrollers and discrete logic devices. These include optical tracking platforms, video switching systems and the entire control system drive electronics and object acquisition/tracking software for a 19" reflector telescope at the Torquay Boys' Grammar School.

My main actively pursued interests are **space and astronomy**. From 2000 to 2006 and since May 2009 I have served as chairman of the **Torbay Astronomical Society**, following many years as the society's computing adviser and two years as vice-chairman. As the society's coordinator for the 1999 total solar eclipse I performed a live **web-cast** (watched in over 70 countries around the world!) from the Torquay Boys' Grammar School observatory.

From March 2001 to July 2003 I presented a regular monthly astronomy feature on **BBC local radio's Tony Gillham show**, featuring an interactive talk (and, occasionally, phone-in) aimed at bringing up-to-date news and explanation of space activities and astronomical events to the people of South-West England.

I am **currently** writing a science-fiction series. The first novel ("**HALIEN Aeon**") of the "**HALIEN Pentalogy**" is available on Amazon. See **http://halien.com/aeon** for full details.