Charles R. DeVane

Software, Test Development and Integration, Diagnostics, Simulation and Project Consultant

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Education: BSEE - Memphis State University
SECURITY: Secret Clearance (Inactive Oct 2008)

SUMMARY OF EXPERIENCE

I have an extensive history of **rapid learning, achievement and completion** for a diverse range of projects in systems, lab and production testing, as well as software and hardware design capabilities that range from **analog/digital/mixed signal circuitry to RF/space systems**. I easily adapt and acquire expertise for customer in-house software and design systems, becoming expert in a short timeframe. I have excellent **"hands-on"** experience designing and debugging test systems, test programs, test scripts, test interfaces, training courses, ATE designs, control systems and a wide variety of application programs. I am known by my clients and customers as a person who **"gets the job done."** I have successfully met the challenges of being a highly technical engineer as well as an achiever as a **Lead Enginee**r, a **Project Engineer** and a **Program Manager.**

I am equally **skilled at defining software and hardware requirements**, as well as developing and proofing **Test Plans** and Documentation for the most complex systems. I've laid out schedules, PERT and GANT charts as well as developing graphical design and engineering documents for both commercial and military applications/projects.

A few of these successful projects include: **Production Testing** for COTS spacecraft; **Software Testing** for **THAAD** missile defense and **International Space Station** communication bus emulation; **Training Provider** and course developer in simulation and programming at SMC and Naval Air Engineering Center; **Hardware Testing** for TOW, Patriot, Hawk, F-16, F/A18, F-111, missiles, tanks, submarines, and aircraft; **Test Simulation and Integration Expert** in defense, aerospace, space, commercial and industrial systems. **Interface Design** for test, control and operations. I am experienced with **Electro-optical, Infrared, RF**, **Electronic Warfare (EW), TDMA, Spread Spectrum,** Sonar, Analog, Digital, ASIC, DSP, FPGA and Mixed Signal devices, sensors and systems. I have worked in both **System in the Loop/Systems Integration Labs (SIL) and Electronics Development Lab (EDL)** environments. My interest in radio communication led me to get an Amateur Radio license. I am currently a member of programming team for a **Perl/LINUX** web based, content management system. I also host and design websites for a wide variety of commercial applications, authors, writers and web communities

SKILL SET

Hardware

- **Systems Design:** VXI/PXI test system to test propulsion units in spacecraft. Complex RF interface for L-band receiver-transmitter.
- **Functional Board Level Tests:** (microprocessors, DSP, FPLD, PLA) ASIC Verification and VHDL: Simulation, EGSE, Bulk Memory
- **Unit Level Testing:** JTIDS, F-2/F-16
- **Design for Test Analysis:** (scan path, critical path, BIT)
- **Interface Design:** Digital, Analog, and RF circuitry for ATE/UUT/ITA
- **Control System Design:** Temperature Control, Energy Management, Life Safety and Security Systems

- **Test Stations:** CASS, GD AIS, GenRad 227x, GETS-1000, IFTE, HTS, MATE, Honeywell, Teradyne, COTS. HiPot Testing
- **Documentation:** IETM, SRD, SRS, STP, STR, TO, TPS, TRD, WWW/HTML, Manuals, Course, Presentations.
- **UNIX/LINUX Server:** operation and hosting.

Software

- **Simulation:** SystemLab , HWIL/GPS guided munitions./C programming. Teradyne and LM-1000 Hardware Modelers, Behavioral Simulation, Stimulus Generation, LASAR, Synopsis SABER
- **Test Languages:** 1750A Assembler, ATLAS, C++, LabView, LabWindows/CVI, PSPICE, SCPI, Teradyne, TestStand, TestStudio, Verilog, Maestro, Vmetro/Vanguard Script
- **General Programming Languages:** ADA, Basic, C and C++, FORTRAN, Microcode, Perl, JavaScript, Java, HTML
- **System Level Testing:** Bradley Fighting Vehicle, STEP – Suitcase Tester/Emulator for International Space Station Payloads, TPS, Thrusters and Telemetry
- **Requirements Definition:** SERD, SRS, Test Plans, Test Procedures, VDD, SVD, STD, STR
- **CAD:** Adobe Acrobat/Photoshop and Illustrator, Visio
- **Web Based Activities:** Web-APP, LINUX server hosting and management, website development in HTML, DHTML, Javascript, Java.
- **Graphics:** Visio, Adobe Illustrator, Acrobat, Paintshop Pro, Photoshop, Inkscape.

EMPLOYMENT and CONTRACT HISTORY

SENIOR ENGINEERING ANALYST AND PROGRAMMER
DeVane Engineering, Inc. (DEI)
08/92 to Present

- **Test Analysis, Design and Programming.** I have been President of my own company for over 12 years (7 years at DeVane Engineering, Inc.). Have completed contracts on a corp-to-corp basis teamed with technical service firms. Also have contracted directly with Westinghouse Electric Corp., AAI Corp., and Allied-Bendix Corporation.
- **Technical Consultant** to commercial and defense industries for testing, technical training, control system design and installation, interface design and software development.
- **Web Site Development (LINUX and Windows based)**. Developed online cyber community software package for clients using Java/HTML/JavaScript/Perl/PHP to support interactive web environment as well as e-marketing. Sites used shopping carts, message boards and real time Java Chat/Whiteboard. Hosted on a LINUX/UNIX system.
- **Webmaster and Developer** for a series of commercial online communities and electronic shopping malls.
- **Team Member** for an open source web based content management system (WebAPP).
- **Web Hosting and Provider** for LINUX/UNIX based websites for the past 15 years.
- **Electronic Publishing** of e-books using Kindle, ePub, Calibre, HTML, Frontpage, Adobe PDF, Adobe Illustrator and MSWord.
- **Provided Training** in areas of LASAR and simulation software, as well as being a recognized expert in the testing community.

Current Development Work at DeVane Engineering

- **A GUI enabled Energy Management System** using cellular, wireless and wired technologies to sense and control electrical systems and power loading.
- **Cellphone Apps** for entertainment and remote control.
- **ePublishing** documents, books and websites using Microsoft Office, Adobe Acrobat, Adobe Illustrator, Inkscape and Calibre.
- **Graphical Design** of posters, brochures and book covers using Adobe Illustrator and Acrobat as well as Photoshop and the Open Source vector graphic program, Inkscape.

Recent Contract Assignments

At DEI, Gainesville, VA October, 2013 to Present

- Managing 30 LINUX based websites on our server. These are generally for writers and small communities and include JavaScript, Dynamic HTML and some scripting (CGI, PHP and PERL).
- Providing Graphical Design and Editing Services for Book Publishing. This involves the use of Adobe Illustrator, Acrobat and Photoshop for cover designs, posters and illustrations, as well as an expert level in Word for manuscripts, commenting and editing.
- Developing a Concept for a Graphic Novel Series and Video Game.

At L-3 Com/ACSS, Phoenix, AZ March, 2013 to October 2013

- **Hardware Test Engineer:** Modified existing complex test program to include diagnostic BITE in production test and to root out calibration differences between ATE and bench test results in T3CAS L-band, airborne transponder/avoidance system. Work involved writing, modifying and augmenting TestStand 4.2 scripting and LabWindows/CVI 8.5 software routines to use BITE information via RS232 connection and to analyze test results from an extended burn-in/"shake and bake" test platform**.** Tested RF Wrap-around, Squitter Pulses, and Database integrity. Updated TRD and supporting documentation**.** Analyzed differences in imbedded C code calibration routines used in manual and automatic tests to eliminate failures and system incompatibility. Implemented new routines using TestStand and LabWindows/CVI. Verified and validated updated code for Operation Software and final testing of T3CAS units. Updated Test Requirements Documentation. Acceptance test documents and VDD. Data and CR tracking using AIM, Rational ClearQuest and ClearCase. **L-Band RF level testing on LRU platform.**

At Orbital Sciences Corp., Dulles, VA July, 2012 to March, 2013

- **Senior Principal Engineer:** Successfully updated and developed two programs for **Cygnus spacecraft** and CRS: Power Ground Assembly (PGA) and the Power System Electronics (PSE). Work involved additional TestStand scripting and LabWindows/CVI software routines to allow the use of a Deployment Motor Device (DMD) to be used in place of a Thermal Knife (TK) for deploying Solar Arrays (SA). Power and motor characteristics were charted with an oscilloscope and Bode diagrams. Solar array, passavation and dynamic tests as well as stall tests were produced. Instrumentation involved additions and modifications to Power Test Platform (PTP) and special rack equipment. Used dynamic and static loads to exercise 50 Amp. test circuits. Programs are currently being used to certify new components for updated spacecraft. **Repeat Customer.** Follow on work was developed for new XPDA XSA EGSE switching assembly using **TestStand 2012** and **LabWindows/CVI 2012.**

At DCD Productions, Chantilly, VA February, 2012 to June, 2012

- **Graphical Designer and Web Site Developer:** Developed websites for writers. Designed and produced banners, flyers, posters and web art for trade shows and presentations as well as website production. Designed and produced book covers for printing and publication through Lighntning Source POD services, Used HTML, FrontPage, Javascript, Adobe Acrobat, Microsoft Word, Adobe Illustrator, In Design, Calibre, Perl and PSP software packages and tools. Created and Maintained over forty websites and domains.

At CPU Tech Corp., Pleasanton, CA July-2011 to February-2012

Diagnostic Test and Validation Engineer: I quickly acquired expertise in 1750A Assembly Language Programming and SystemLab (an in-house ADE, including a Verilog-like simulator and scripting language). Overall duties included: Developing C code and Assembly code, verifying and testing **FPGA/SOC** design replacement for 1750A processor in **Lantirn** system. Debugging assembly language and machine code in simulation, brass-board-design and legacy hardware. Programming in **1750A Assembly Language and Visual C++.** Design and test simulation in SystemLab, a simulator and design tool similar to Verilog. Developing device drivers and test software for **MIL-STD-1553B, POD** bus, internal timers and **IEEE-488** interfaces Work was equal parts software develoment, system verification and hands on lab validation of FPGA design.

Diagnostic Testing Highlights

- **Survey existing OFP** and other tests to determine primary functions that are not yet tested in CPUTech Test Plan.

- Implement all **Primary Diagnostic Tests** using **Microsoft Visual C** and **GCC inline Assembly Language**.
- **Verify All Tests in Simulation** (on new SOC/MAPCC hardware and Legacy LANTIRN APCC hardware).
- **Develop Individual Diagnostic Tests** for Self-Tests (particularly for MBR and MUX/1553B).
- **Expanding Self-Test Results for POD and MUX Buses** to Include ALL Results.
- Looking at More Cases where Bus Fault Registers Come into Play for **Diagnostic Visibility**.
- **Investigating Test Console Interface (TCI) Routines and Diagnostics** (to take direct control of system software).
- **Analyzing the Software Exceptions** and Peculiarities of the Delco Spec.
- **Testing Memory Management** to a Higher Level.
- Become Familiar with **On-site External Test Equipment/Software** for MAPCC/APCC External Tests.
- **Implement a Test Menu** for running particular Tests from a **Scheduler** or **Command Menu.**

In-House DEI and ePower Solutions Chantilly, VA and Long Beach, CA
Jan-2011 to July 2011

System Design and Software Engineer: Designed and developed a COTS energy management system for home control and energy optimization uses. Devices were standard SMS and Modbus controlled and accessed. Opto-isolated and automatic circuit breakers used in load shedding and management control along with temperature and power sensors. Android based GUI customer interface along with wireless interfacing for low cost installation and accessability. System design was leveraged off of lessons learned from testing Honeywell EMS during production and manufacturing, as well as from having been project engineer for a Hughes Aircraft Company large scale energy management project.

At Orbital Sciences Corp. , Dulles, VA October-2008 to January-2011

Senior Principal Engineer: Acquired fluency in Orbital's proprietary on orbit software tracking language and system as well as their RAZOR document tracking and configuration management system. Maestro I initially worked on spacecraft systems for propulsion and control of Commercial Orbital Transportation System (COTS). Among these were GLORY, a payload module, and the Minotaur IV launch vehicle. Designed and developed a **LabView** test stand based on **NI SCXI cards/racks and PXI hardware** for Electrical Ground Support Equipment **(EGSE).** Software was written using LabView 8.2. Worked in both Clean Room (10K and 100K) and ESD environments. Identified and defined requirements for testing and potential risk analysis in meeting schedule and quality goals.

After successfully completing the **LabView 8.2** design, I shifted from hardware EGSE design engineering to software engineering. Developed and designed test program and interface for **Cygnus spacecraft** and COTS Bulk Memory Card (BMC). Also developed and integrated test program for Uplink/Downlink Processor card (UDP) in same spacecraft's Command and Data Handling (C&DH) system. Worked in a concurrent design/test environment to test new design on Standard Test Platform (STP) built by SymTx. These programs interfaced **between cPCI racks; cPCI, JTAG, RS422, SpaceWire buses, and cPCI test emulation** cards, as well as MIL-STD-1553B (SuMMIT) instruments in the tester and the BMC. Software being used: **LabWindows/CVI** and **NI TestStand**. Memory size: 12 GBytes Flash, 64 Kbytes SRAM, 32 GBits Reed Solomon Protected SDRAM. Access through special arbitrated DMA protocol. Augmented tester capability using **cPCI analyzer card (VMETRO/Vanguard)** and independently powered **cPCI E-Frame** chassis. Designed level shifting interface circuitry to go from **LVDS to LVDM to RS422** levels. Added in active extender module for debug, design integration and extended testing capabilities. Used Avtech/Maestro uplink/downlink scripting interface to sequence UDP tests. Tested imbedded software for FPGA through functional vectors applied through system and test connectors.

Assignment Highlights

LabView 8.2

- Developed code and GUI Interface to operate Minotaur IV Thruster Altitude Control System (ACS).

- Modified existing source code and GUI in LabView 8.2.
- Used NI-DAQmx Assistant to Speed Instrument Integration and Testing.

Lab Hardware

- Designed PXI/SCXI Chassis and selected NI PXI and SCXI Cards.
- Assisted in modification, assembly and reassembly of Minotaur IV Thruster ACS EGSE.
- Modified and updated Cable Drawings. Rang out, checked, debugged and validated new test equipment and cables manufactured in the lab for ACS.

Evaluation and Analysis

- Verified modifications to allow two power supplies to run in series submitted by vendor.
- Also assisted in design for testing of COTS spacecraft.

LabWindows/CVI and NI Test Stand

- Worked with C code and GUI Interface to operate COTS BMC and UDP.
- Identified and matched Tester Capabilities to UUT Requirements.
- Designed Interface and Cabling.
- Sequenced BusView Tests using VMETRO/Vanguard cPCI Analyzer and SymTx STP Tester
- Used Documentation and Debug Features of BusView and ELMA/E-Frame chassis
- Developed and Integrated TestStand/CVI test programs for two cards (BMC and UDP).

At Northrop Grumman Electronic Systems, Huntsville, AL March-2008 to October-2008

EDL/SIL Engineer: Worked on Viper Strike munition, a laser guided, **GPS oriented smart munition, "fast track"** US Army design/development activity. Work activities included identifying requirements, developing test procedures and specification as well as being involved in engineering test lab daily activities as well as updating production facility testing equipment and test approaches. Analyzed existing production tests to "reverse engineer" SRS and TRD for systems and test engineering activities. Developed Software Test Description (STD) and Software Test Report (STR) for Munitions Interface Unit (MIU). Performed lab simulations to verify flight readiness and in-flight test activities for munition. Systems analyzed and tested included **GPS, Semi-Active Laser (SAL), FPGA** - high density circuit card assemblies, device simulators and active antenna elements. Software used included Lab Windows/CVI 8.5, C++, Windows XP and various serial bus protocols including **MIL-STD-1553B, RS232, RS422, RS485** and special proprietary serial buses. Wrote **C++ and LabWindows/CVI** code to modify and simulate laser guidance system.

Assignment Highlights

LabWindows/CVI

- Developed code and **GUI Interface** to operate a **Semi Active Laser (SAL)** for use in evaluating a new seeker for the ViperStrike munition. Worked on a test bench with prototype seeker and lab munition.
- Modified existing source code and GUI in **Lab/Windows/CVI** to incorporate data logging feature. Proofed code and updated **STD (Software Test Description), STR (Software Test Report) and SVD (Software Version Document)**.

Lab Hardware

- Repaired various computers and modified others to allow interfacing to new lab hardware. Also upgraded software as needed.
- Assisted in modification, assembly and reassembly of lab test munitions.

- Rang out, checked, debugged and validated new test equipment manufactured in the lab for both field testing and production testing.
- Modified and updated Flash routines and storage devices for flight testing and operational test programs (OTP).

Hardware in the Loop Simulation

- Assisted in checking new software updates in a Simulation Lab (SIL) for code updates and performance enhancements.
- Also assisted in Captive Carry (CC) validation and Verification (V&V) of new hardware/software for munition.

At General Dynamics AIS, Pittsfield, MA March-2007 to March 2008

Test Engineer. Designed Interface Test Adapter (ITA) and developed LabView/TestStudio test programs on a Teradyne spectrum 9100 test station for a **mixed signal** US Navy Sonar module (Preamplifier Module). Produced fault analysis, parametric and functional tests. Also assisted in porting existing **TestStudio, LabView, LabWindows and Microsoft Visual C++** test programs to upgraded test station. Developed new VI's for Fluke Counter-Timer. Captured schematic for Preamplifier module and simulated circuit transient responses using **Synopsis Saber Sketch, Book and Simulate software**. Produced necessary review and documentation packages using Microsoft Office XP Word, Excel and PowerPoint software. Developed and verified HiPot testing for UUT.

Assignment Highlights

- **NSS Preamplifier Module for Shipboard Electronic Repair Facility (SERF)**
- Ported programs from NAVAIDs test station to Teradyne Spectrum S9100
- Upgraded Tester to LabView 8.5 from LabView 7.1 with resulting VI rework for HP1420 to Fluke 6681 Counter-Timer VI development (from LabView Device Driver examples).
- **Developed Mixed Signal Test and Interface for Preamplifier Module**
- Developed and verified HiPot Tests.

Test Programming

- **Analog/Mixed Signal Testing**
- Low Noise Testing
- Gain Tests
- Image Rejection Testing
- Frequency Centering
- Passband Determination

Teradyne Spectrum S9100 Test System

- Windows XP Professional
- **TestStudio/LabView 8.2** Test Software Suite

Interface Design

- Virginia Panel
- Shielded Cables and Enclosures
- Low Noise / High Gain Amplifier
- Isolation Transformer
- Custom Attenuators

Software Development

- Synopsis/Saber Schematic Capture and Simulation Software
- LabView, Teradyne TestStudio, LabWindows/CVI, Microsoft Visual C++
- Microsoft Office: Excel, Word, Power Point
- **Extensive JavaScript coding** and adaptation for Navy standard test approach.

Other Recent Contract Assignments

At Honeywell/Novar Controls, Murfreesboro, TN June-2006 to March 2007

ATE Engineer. Developed system and test programs in **Borland C++, Developer 6.0** and Access database. Performed **ATE system validation** for new Honeywell Watcher Test system. This included writing device drivers and using Visa packages, as well as coding and debugging controller test programs. Two fixtures were designed using Visio for the Honeywell Watcher test system which uses a Genrad 227x test connector. Rack cards tested included the Analog Output module and the Rack Input module. These cards were 80C32 microprocessor controlled utilizing 12 bit D/A and A/D components as well as AMUX switches, opto-isolators and EEPROM. Developed and produced Engineering Specifications, Test Specifications, test plans and test program code for the two units. Assisted in the design and modification testing for a precision voltage and current source module for use in several test fixtures requiring accuracies to +/-50 microvolts. Used RS232/RS485 serial interface converters, **SCPI, RC/2** and software drivers to communicate with onboard UUT controllers. Programmed instruments using **IEEE-488** commands.

At Lockheed Martin Space Sys., Huntsville, AL June, 2005 - February 2006

Software Integration and Test Engineer. Developing, writing, executing and maintaining Software Test Procedures (STP) and Test Cases for the Operations Management (OM) Software Item (SI) of the Terminal High Altitude Air Defense (THAAD) system for the U.S. Army. The OM SI is part of a suite of software programs on a **UNIX platform** that allows THAAD to multitask as well as pre-establish Battle Plans (BP) for Missile Defense (MD) scenarios, activities and successful intercepts of enemy missiles. The position included requirements analysis, tool-proofing, dry-runs and run-for-record activities with customer representatives. **ADA, C++ and Perl** software analysis was accomplished using **Object Oriented Analysis (OOA)** and **Object Oriented Design (OOD)** tools such as **Rational Apex, Oracle SQL databases** and **CASE RTM** (Requirements and Traceability Management). Test Cases were based on the Universal Modeling Language (UML) and Object Lifecycles/Universal State Modeling. Software development and testing activities were structured according to J-STD-16 and MIL-STD-458). I demonstrated a strong ability to interact with other team/staff members in multi-level meetings and planning sessions. System documentation was maintained in both a Windows XP and a **Sun Solaris** environment. Updated and wrote Software Test Description (STD) using Software Requirements Specification (SRS) and Prime Item Development Specification (PIDS) as guides. I also performed analysis on the testbeds and simulators to overcome system errors and deficiencies, verifying successful test execution and software performance. Object Oriented Products (OOP) included: Segment Event Traces, Process Deployment, Component Deployment, State Transition, Segment Thread, Process Thread and Component Thread Diagrams.

Other Client Companies and Successes: DEI, Lockheed Martin, ManTech, Boeing, PEI, RJO, GE, Summa Tech, GD, AAI, SMC, Westinghouse. Additional work information, contract successes and technical references are available for the above client companies covering the years from 1972 to 1995 in the expanded pages of this resume.

Prior Contract Successes

At Lockheed Martin, Orlando, FL 09/2004 – 06/2005

- **TPS Engineer.** Contracted to Lockheed Martin, Inc. Orlando, Florida as a technical services consultant. Performed Test Program Set (TPS) software development and integration for **ALQ-162 Electronic Warfare Weapons System and Receiver/Transmitter**. Picked up and completed an existing TPS that had numerous schedule and programming problems with its completion (stemming from a lack of available documentation, personnel problems and the overall unit complexity). Rehosted existing assembler-like **script code** from a special purpose Northrop Grumman test system to the CASS/ATLAS test station, I was able to get the TPS back on track and schedule. The WRA was a wide band receiver/transmitter that is digitally controlled through discrete, **MIL-STD 1553 and RS422** interfaces and operates in the gigahertz region. Work was done in a secure lab as the unit is classified at the secret level. Modified code in ATLAS and L200 to synchronize unit tuning and test.

At ManTech, Inc., Chantilly, VA 04/2003 – 06/2004

- **TPS Engineer.** Contracted to ManTech, Inc. Chantilly, Virginia as a technical services consultant. Performed Test Program Set (TPS) software development and integration for TOW-2 Weapons System and infrared

AN/TAS – 4A/ -4C Night Vision Sights UUTs. These are **Electro-Optical (EO)** TPS running on an automatic, portable test station (Third Echelon Test Station - TETS, a ManTech product using **TYX/IEEE 716 ATLAS, SBIR Collimator**). The TPS was for the United States Marine Corps (USMC) and was heavily based on the existing Tech Manuals, Tech Orders and IETM for the system. U.S. Army MIS were also utilized for additional depth of understanding. I modified, developed and integrated the primary diagnostic software for the TOW-2 system test program as well as the integrated "step up" procedure that is necessary to interact with either processor in the unit. On the **Night Vision Sights (NVS)**, I was initially responsible for the alignment and adjustment routines but was promoted to the lead TPS engineer. The TPS was taken from a state of being only 25% complete after 18 months of development before I arrived to being completely finished in a period of about 9 months. Sold off TPS in mid-February. Assigned follow-on TPS for Basic Sight Assembly of same unit. This TPS was completed and done on a “fast track” basis as it used similar routines to the NVS. It was also accepted by the USMC.

At Lockheed Martin Technology Services, Inc., Huntsville, AL 03/2001 - 01/2003

- **TPS Engineer.** Contracted to Lockheed Martin Technology Services, Huntsville, Alabama as a technical services consultant. Performed TPS software development and integration for complex, high density, ASIC implemented electronic modules. Developed a variety of TPS for the **Hawk and Patriot Missiles** under contract to Lockheed Martin Technology Services. Completed two complex TPS for ASIC implemented circuit boards of the Patriot missile (Memory I/O Controller and the Serial Interface No. 2). Completed TPS for the DAAD (digital to analog and analog to digital) module for the HAWK missile. Used a **Teradyne D300 Hardware Modeling System** to develop tests since no information was available about ASIC internal logic structure. Programs were written and developed using **LabWindows CVI** test development software and **LASAR simulation** software. The GETS-1000 test system was the host ATE.

At Boeing, Inc., Marshall Space Flight Center (MSFC) 02/2000 -3/2001

- **Software Test Engineer**. Contracted to Boeing Corp., Huntsville, AL through Entegee Corp. Worked as lead engineer to update, develop and implement test procedures for the Suitcase Test Environment for Payloads (STEP), a **UNIX and SUNOS** based system, on the **International Space Station (ISS).** This device is used by payload developers to insure compatibility between experimental packages and payloads in the ISS. The STEP uses a Solaris based Sparc Station to interface to a VME chassis for implementing command, control and data acquisition between the test environment and the ISS payload racks. Standard buses included **MIL-STD-1553B**, **Ethernet (ANSI/IEEE 802.3), fiber optic High Rate Data Links (HRDL) and standard RS-232 and RS-422**. Test software was implemented using LabView, VxWorks and Timeliner scripting. Assisted in the development of the B-2 specification for the STEP unit as well as defining the test requirements for additional hardware. Attended status meetings and reported directly to Software Test Engineering manager for the ISS.

At Comarco Systems, Inc., Huntsville, AL 10/99 - 12/99

- **Board Level Testing to Component Level**. Lead Engineer for Minor Adapter number 6 of TOW II SRU testing project (7 UUT’s). Picked up a design for IFTE interface and TPS. Corrected and completed unfinished code. Duties involved working with MS Office Suite of tools as well as ASTE software to develop, code, compile and integrate test programs for 7 TPS and a Self-Test for an IFTE Minor adapter. Worked with IETM and Tech Orders.

At PEI Electronics, Inc., Huntsville, AL 03/99 - 10/99

- **System Level Testing**. Analyzed electronic systems and developed requirements for testing ICE and electronics in the Bradley Fighting Vehicle. This work involved specifying detailed repair procedures for complex electronic boxes as well as developing HTML screens for use by **Java/C++/JavaScript interfaces** to the PC-based SPORT /VADS tester. Testing was done at platform/vehicle level.

At Lockheed Martin Corporation, Ft. Worth, TX 07/97 - 01/99

- **System Level Testing**. Developed and **“Sold Off”** the first commercial Test Program Set (TPS) for Pilot Fault List Display (PFLD) unit at Lockheed Martin Corp for Mitsubishi Heavy Industries (MHI) F-2 Fighter program. Used Assembly language to develop MIL-STD-1553B digital test vectors and IEEE 716 Atlas to run commercial VXI custom developed tester. Designed and developed additional equipment and techniques to allow the capabilities of the tester to be extended to satisfy the Unit-Under-Test (UUT) requirements. Worked with a multi-

national team to complete and successfully sell program and Interface Test Adapter (ITA) to MHI, on time and under budget. Participated in ISO9001 audit, which was successfully accomplished during the same time period.

At RJO Corporation, Chesapeake, VA 10/96 - 07/97

- **System Level to Board Level Testing**. Corrected and updated rehosted VAST Test Program Sets (TPS) to CASS test system for Navy rehost project. These Weapons Replaceable Assemblies (WRA) are out of the S-3 aircraft. Resolved problems between Interface Device (ID) and the TPS. Wrote additional Manchester (MIL-STD-1553B) encoded Atlas and L200 tests to allow the WRA's to improve the fault detection percentages. Took two "problem" WRA's through QA demonstration and First Article Testing (FAT) and assisted in getting the project back on track.

At Lockheed Martin Corporation, Orlando, FL 09/94 – 10/96

- **Board Level Testing to Component Level**. Developed CASS SRA TPS for Infra-Red Search and Track Radar System at Lockheed Martin Corp. Card used interpolation and digital filters to determine missing pixels from sensor images. Testing to component level for ASIC, FPLA and microprocessor based circuit cards. Used LASAR 6.4 to develop digital test vectors and IEEE 716 Atlas to run CASS Tester. These programs used FORTRAN Extensions (FEP) to run L200 from ATLAS. They also used a combination of major/minor adapters to interface the Unit-Under-Test (UUT) hardware to the CASS Virginia Panel and General Purpose Interface.

Naval Air Engineering Center, Lakehurst, NJ 08/92 – 09/94

- **Programmer/Analyst.** Invented new approach to rehost L200 programs from L297 tester to CASS tester. Integrated 4 Test Program Sets (TPS) on CASS for the Naval Undersea Warfare Center. Developed and integrated techniques to handshake between L200 and ATLAS code. Produced IEEE-716 ATLAS shell to monitor L200 requests. Supported CASS Hypertext Users Guide development for the Naval Air Engineering Center and wrote Statement of Work for In-circuit tests/tester procurement for Genrad 227X tester series. I also developed a PowerPoint presentation regarding system capabilities and participated in the production of the first set of CASS Users Manuals, Cass Programming Manuals and electronic system documentation for the test system

Additional Experience and Contract Work:

VERILOG VHDL TEST ENGINEER at General Electric Corp. Syracuse, NY
12/90 - 07/92

- **Software Development and Test**. Concurrently developed L200 Test programs for L297/L393 test systems. Used design **VHDL/CAD** system, as well as hardware modeler, to produce test vectors and test bed. Translated vectors using TSSI/TDS software. Wrote **DSP Assembly language programs** to modify boot up routines and to perform embedded testing. Developed C/C++ Programs on VMS and UNIX based systems to allow translation of **DSP56001** assembly code into **Verilog and L200** code. Completed tests, test plans and production debug for Special Processor Module (SPM) and Clock and Timing Module for the AN/BSY-2 SEM D modules. Graduated from GE internal school in C Programming and DSP56000 design courses.

PROGRAM MANAGER at Summa Tech Corporation, Inc., Huntsville, AL
05/90 - 12/90

- **Designed Interface Test Adapter** (ITA) for 50 HAWK missile analog and digital Line Repairable Units (LRU) and IFTE test station. Used IBM PC/EXCEL to spreadsheet requirements allowing a single interface to host all LRU's. Used Macintosh to setup Master Project Schedule for all TPS. Served as Program Manager for missile tracking console production and design based on VME Bus. Reported directly to the Vice President of Engineering. Completed LASAR 6.0 training course.

CASS TPS ENGINEER at General Electric, Inc., Huntsville, AL
08/88 - 05/90

- **Test Software Programmer**. Developed an RF TPS for the JTIDS Receiver/Transmitter WRA for demonstrating CASS CNI test station capabilities. Designed interface device and RF module to work with L-band signals. Wrote IEEE-716 ATLAS programs that incorporated new COMPLEX SIGNAL forms for producing CPSM and

TACAN signals from eighteen different CASS asset building blocks such as: AWG, frequency hopping RF signal generators, generic code generators, L200 digital test units, correlators, discriminators, down converters, linear pulse modulators, HP Sampling Signal Analyzer (SSA), HP Spectrum Analyzer, etc. Developed TDMA and TACAN digital control patterns using LASAR Version 6.40 and L200 pattern languages. Modeled the Digital Data Processor Interface (DDPI) for enhancing WRA fault isolation.

National Computer Engineering Assignments and Duties:

PRESIDENT - National Computer Engineering (NCE), TIMONIUM, MD

01/84 - 07/88

- **Founded Technical Service Firm** to market engineering services to the electronic industry. Offered expertise in Test Programming Development, digital design and software engineering. Completed contracts with Westinghouse Electric Corporation, AAI Corporation, Allied Bendix Signal Division and Harris Corporation. Provided technical services and engineers for the FA/18, F-16, F/FB-111, B1B and other military avionics system and diagnostic testing. Company was given SECRET level Facility Security Clearance by the Defense Investigative Service. Advertised and listed in C.E. Weekly. Produced training courses for digital simulation testing and In-Circuit testers. Constructed high-level technical proposals and marketing programs. Management and other duties were performed concurrently with technical contract assignments for clients.

NCE Contracts and Clients

SENIOR ATE SPECIALIST – Westinghouse, Hunt Valley, MD 01/85 - 01/87

- **Developed Test Program Sets** (TPS) for USAF F/FB-111 Navigation Computer LRU. Acted as lead engineer for two other test engineers assigning tasks and setting schedules. Determined computer's test and operating sequences when proper documentation was not available. Synchronized Digital Word Generator (DWG) and Digital Interface (DI) to enable MATE test station to exercise unit's serial inputs. Produced the necessary macro procedures to allow a modular test approach to other digital functions. System Level Testing to Circuit Card Level. Test program included over 500 different IEEE-716 ATLAS tests and LRU was rated as one of the most complex in the F/FB-111.

TPS ENGINEER - AAI Corporation, Hunt Valley, MD 06/83 - 07/85

- **Developed Test Program Sets** (TPS) for US Navy F/A-18 Avionics. TPS were for the Discretes/ICS, Multiplex Interface and Timing and Discrete SRA's. These boards included discrete, CMOS, LSI, hybrid and memory components and were some of the most complete digital SRA's tested. Board Level Testing to the Component Level. Defined the digital interface requirements for five digital SRA's and assisted in the design of a complete Interface Device (ID) that also included six analog SRA's. Trained other engineers in the use of the LASAR simulation system and assisted in the development of other digital TPS. Performed test integration at a remote integration site in Westbury, NY using the Harris Program Development Station (PDS) and Hybrid Test System (HTS).

Other Technical Services Contracts

TEST ENGINEER at Westinghouse, Hunt Valley, MD 02/82 - 06/83

- **Board Level Testing to the Component Level.** Developed TPS for the US Army DIVAD program. Assisted in specifying criteria for general purpose Interface Test Adapter (ITA). Gave group assistance with unusual LASAR program and digital test generation problems. Developed programs using ATLAS AND LASAR. Systems used were VAX 11/780 and RCA EQUATE testers. Assisted design group in making hardware changes to improve testability of augmentation equipment for the EQUATE. Became familiar with use of RDOS, AOS and VMS operating systems and editors.

NAEC LASAR ANALYST at SSAI, Lakehurst, NJ 02/81 - 02/82

- **ATPG Specialist.** Assisted remote users in producing LASAR test programs on the NAEC 3110 multi-processor ATPG. Answered all test generation and integration questions. Established standard test generation and application procedures. Developed individual test programs for users, benchmarks and upgrades. Analyzed LASAR library for compatibility with F/A-18 testing requirements. Authored NAEC LASAR training manual and taught training classes. Worked to improve telecommunication techniques for error correction and data

transmission.

SENIOR APPLICATIONS ENGINEER at SMC Corporation, Dallas, TX 06/80 - 02/81

- **Developed application procedures for LASAR programs.** Worked in the development of LSI/microprocessor models. Assisted time-sharing users in program development. Helped to develop a program for the USAF MATE competition. Presented a paper on "smart probing" to the LASAR Users Conference. Taught SMC LASAR Training School. Supervised time-sharing system operations. Test Programming Analyst for All Levels of Test. Provided on-site LASAR support to NAEC following purchase of SMC 3110 LASAR ATPG Family.

TEST ENGINEER at General Dynamics, Ft. Worth, TX 05/78 - 06/80

- **Interface Design.** Designed ITA for testing of digital SRU's in F-16 aircraft. Board Level Testing to the Component Level. Developed LASAR and ATLAS test programs for: CADC Timing and Control, Program Memory, and Digital/Analog Converter. Evaluated effectiveness of LASAR as a tool for producing test programs from test generation through integration and fault insertion. Assisted group engineers with the development of test programs for CPU, Microprocessor, Digital Signal Processor and Timing control SRU's. Taught LASAR training class and developed user application notes. Sold off one of the first Test Programs to USAF for the F-16 digital SRU Depot.

Experience from 1972 - 1978

Skil

- **District Manager**
  - **Sales**
  - **Marketing**
  - Advertising
  - Customer Relations
  - Corporate Accounts
  - **Demonstrations**

Hughes Aircraft

- **Project Engineer**
  - **Energy Management**
  - Central computer
  - Process Controls
  - HVAC
  - Security and Life Safety
  - Switch Gear
  - Pumping Station
  - CATV and Control System Distribution
  - Customer Liason (USAF and AERO Contracting Firm)

Honeywell

- **Controls Systems Design**
  - Security System Design
  - Life Safety
  - Pneumatics
  - Electronics
  - Power Management
  - Technical Support
  - Presentations
  - Sales
  - Marketing
  - Supervision

REFERENCES:Available on request.