



WORK DESCRIPTION

ATS Test Program Developer

Department/Agency: Department of National Defense
Section: Combat Systems Automated Test Systems
Division: Fleet Maintenance Facility Cape Breton
Branch: Maritime Forces Pacific
Geographic location: Esquimalt (B.C.)
Security clearance: Secret
Language requirements: English Essential
Departmental use:

Immediate supervisor: SR-MGT-1 Production Supervisor (CURRENTLY)

Version:
Classification:
Effective Date of Decision:
Model Identifier:

Client-Service Results

Through electronic circuit analysis and Computer Aided Modelling, develop Test Program Sets (TPS's) for the purpose of operationally testing Circuit Cards and electronic modules in the CFSS for ADM(Mat). Perform TPS facilitated simulation, "Go-No-Go" testing, fault diagnosis, and repair, of electronic Circuit Card Assemblies (CCAs) and electronic modules for the RCN and other customers. Design and fabrication of "form-fit-function" equivalent circuits for LCMM's, when existing IC's, CCA's, or modules, are obsolete and/or no longer supported.

Key Activities

- Acts as Technical lead for Test Program Set (TPS) development when assigned by the Work Center Supervisor(WCS).
- When tasked by the WCS, and in response to the ATSO (ATS Officer) direction, has critical input and maintenance responsibility for TRDs (Test Requirement Document's).
- Collects, analyzes, and predicts circuit card and component level operational specifications.
- Develops software TPS's in accordance with the TRD and based on CCA technical data.
- When assigned by WCS, designs, constructs and tests interface hardware and circuitry required to support CCA testing.
- Acts as Technical Subject Matter Expert (SME) during execution/demonstration for newly completed TPS's during ATSO QA/PAR acceptance process.
- When assigned by WCS, using previously completed TPS's, conducts "Go-No-Go" testing, fault diagnosis and repair of electronic Circuit Cards (CCAs) and other electronic modules.
- Provides subject matter technical expertise as required on ATS supported CCA's including technical specifications, schematics, Printed Circuit Board (PCB) layout, functionality and TPS diagnostics.
- When tasked by WCS, performs maintenance, troubleshooting, repairs and modifications to existing ATS systems and test equipment.
- When tasked by WCS, on receipt of fault report, investigates and repairs TPS's or test interfaces.
- Provides technical guidance in the operation/execution of TPS's to peer ATS Technicians, WCS and ATSO as required.
- When tasked by WCS, works with the ATSO to investigate the possibility and viability of reverse engineering obsolete electronic assemblies.
- When tasked by WCS, designs, prototypes, and manufactures replacement circuits/IC's/modules using ATS tools, resources when other solutions are obsolete or not viable otherwise.
- Reports TPS progress and issues affecting any ATS work to WCS.
- Coaches and mentors other members on the theories, procedures and best practices of ATS, such as Apprentices, Coop Students, including developing staff at all levels as appropriate

Employee's Statement:

I have been given the opportunity to read and comment on the content of this Work Description.

Employee's Name:

Employee's Signature

Date

Supervisor's Statement:

This Work Description accurately describes the activities and demands of the position.

Supervisor's Name

Supervisor's Signature

Date

Authorization:

Manager's Name

Manager's Signature

Date

Work Characteristics

Skill

Physical Skill

Dexterity, hand-eye coordination, visual perception and colour discrimination skills are required to make fine adjustments when tuning, adjusting and probing electronic equipment, carrying out precise alignments of instrumentation and discerning subtle deviations from expected results.

Fine hand and eye coordination and delicacy are required to perform High Reliability Soldering during repairs to CCA's, local ATS Testers and equipment, and CCA/module interface manufacturing.

Manual dexterity and coordination skills are required to operate a computer keyboard and mouse.

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Intellectual Skill

Thorough working knowledge of the ATS specific Computer programming language, and the Computer Aided Design simulation and modeling languages (see Annex A).

Thorough knowledge of Electronics theory and experience is required to reverse engineer existing circuits, IC's, and hybrid modules in order to design, prototype and manufacture a replacement equivalent circuit.

Ability to recognise electronic semiconductors of varying styles and density, encompassing both linear and digital Integrated Circuit's(IC's), and discrete semiconductors.

Thorough knowledge and ability in determining and executing circuit simulation tools and techniques.

Thorough knowledge of microcontroller programming and interfacing.

Thorough knowledge of electrical and physical properties of components and materials in the design and fabrication of replacement equivalent circuits and devices.

Good level of multi-disciplinary knowledge is required in order to analyze and determine solutions for CCA's and modules deployed in various RCN/CF systems: RADAR, SONAR, EW, Communications, Computers, Data Networks, Machinery Control, Power Supplies, to name some.

Good working knowledge of mathematics as applied in electronic theory.

Good working knowledge in printed circuit board troubleshooting, diagnostics and repair techniques.

Good working knowledge of digital, analog and hybrid circuit design, including printed circuit board design.

Good working knowledge in ATS processes, including TPS design, generation and execution.

Good working knowledge of Computer Aided Design (CAD)/ Computer Aided Manufacturing (CAM) software as applied to electronic schematics and layouts and simulations (see Annex A).

Good working knowledge of Automated Test System internal and external hardware, controls, interface components and the associated inter-connection circuits and cabling (see Annex A).

Good working knowledge of ATS business operations, policies, procedures and management practices, ensuring final TPS's are compliant with National requirements.

Sufficient knowledge of Electronic Theories and practices to be innovative in developing effective test methods for obsolete, existing, and emerging electronic systems and components.
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Knowledge of TPS development best practices and associated sub-tasks sequence and chronology.

Good knowledge of English language, both technical and non-technical, verbally, in writing, and in electronic format, to enable writing clear concise and unambiguous technical programs, messages, letters, memos, reports, instructions to a variety of audiences.

Effort

Intellectual Effort

A high level of concentration and study over extended periods reviewing Technical Information Packages (TIP's) provided by ATSO, and frequently requires industry research into component functionality and specification data. In demonstrating a CCA's serviceability, the incumbent is assigned the TPS tasking and takes on the responsibility to become subject matter expert on the function, specifications, diagnostics, schematic and PCB layout of the subject electronic CCA/module in order to be responsive to the ATSO in the development of the TRD, and to effectively design and develop a thorough TPS solution.

A high level of mental effort is required in predicting and planning the work breakdown and schedule that will lead to timely completion of a TPS solution. Under guidance of WCS, multi-tasking, working to priorities, and recommending risk mitigation solutions is required in developing the TPS from start to finish. Under guidance of WCS, sub-tasks are identified and assigned to peer Technicians in a team environment.

Initiative and judgement is required in ensuring the TRD inputs, TPS, physical interface, and all necessary sub-tasks are progressing on time and within acceptable parameters.

A high level of study and concentration for extended periods, applying knowledge of Electronics Theory in the reverse engineering of circuits, and personal judgment to generate an effective, accurate TPS for CCA testing and simulation. Identifying and predicting the appropriate input stimulus for each test and to identify inherent failure modes of the CCAs/Modules being tested.

A high level of study and concentration using Electronic Theory and personal judgement for extended periods in reverse engineering to determine and define the function of obsolete electronic devices, including Integrated Circuits, Hybrid IC's and other otherwise unsupported modules. Also for the design and prototyping of drop-in replacement equivalent circuits.

Good working knowledge of Integrated Circuit internal architecture to determine and reconstruct replacement equivalent IC's and circuits.

Real-time monitoring and reacting to key operational data, including input/output waveforms and power requirements by injecting and capturing analog and digital signals with various pieces of

Test Program Developer

test equipment.

Being responsive to the ATSO, offer technical input into and assist in developing specification documentation for newly re-engineered microelectronic circuits.

Exercise judgment in the development of methods, criteria and procedures for testing and diagnosing CCA's or modules.

Recommendations are to be made based on consideration of cost vs value and time in selecting the solution and materials for fabrication of test circuits, test fixtures and drop-in replacement components.

Apply a significant amount of study and judgement in deriving actual performance criteria from a variety of technical sources.

Exercise a significant amount of personal judgement in identifying criteria for diagnostics down to the individual component level.

Apply knowledge of Electronic Theory and experience in determining technical specifications without supplied literature when no such information exists and manufacturer no longer supports or exists.

Apply knowledge of Electronics Theory and Computer Aided Design and Programming for extended periods in developing "fit-form-function" software models of analog and digital components.

Apply knowledge and experience in the use of specialized ATS software and Operating Systems.

Apply knowledge and experience in formulating effective techniques for computer controlled fault diagnostics.

Collecting and considering "real-life" environmental details in designing test apparatus that will best emulate the physical environment of a CCA's host installation.

Exercise diligence in maintaining a nationally shared library of software subroutines and modules.

Under advisement of ATSO and when tasked by WCS, develops, installs, configures and verifies control software for new hardware in the ATS.

Make recommendations to ATSO and WCS for acquisition of new Test Equipment or software as new requirements arise.

Assist the ATS WCS and ATSO with the reviewing and proposing solutions to the ATS system configuration and operation in affecting upgrades, issues and faults.

Test Program Developer

Using trade knowledge, make recommendations to the WCS and ATSO and perform the most cost effective maintenance and component/board level repair of the ATS, its accompanying instruments, and perform the required system maintenance and calibration.

Adhere to requirements and expectations in utilizing 3rd level contracts setup by DMSS8 for support of ATS Testers. Make recommendations for 3rd level contract repairs to WCS and ATSO.

When tasked by WCS assist ATSO with maintaining the ATS internal network PCs by performing data backups of the network drives, resolving communication issues, replacing hardware and reloading software.

Apply knowledge of ATS Tester operation in developing and executing TPS's and Go-No-Go tests.

Exercise patience and coaching skills in mentoring and training developing ATS staff members.

Physical Effort:

The physical effort required is that usually associated with office activities. Considerable time is spent viewing electronic video displays. Occasionally lifting & moving of ATS test instruments and test fixtures. View devices and circuit boards under microscope and on video displays.

Wearing of appropriate Personal Protective Equipment in the repairing of circuit cards, soldering, cutting materials, using low pressure compressed air, various aerosol solvents and coatings, and while transiting throughout the workplace.

Responsibility

Human Resources

Under supervision of WCS and technical guidance of ATSO, works with and assigns sub-tasks to peers on a TPS project, ensuring all adhere to the same objectives and schedule.

Trains, orients and assists new and developing ATS staff.

Provides input into the Performance Appraisals of staff under their mentorship.

Reports to and is responsible to the Work Center Supervisor

Works with WCS supervision and ATSO guidance on matters pertaining to Specification data collection, TRD generation, TPS acceptance, LAN maintenance, ATS capability, strategies, and standards.

Provides status updates to WCS and/or ATSO on matters pertaining to TPS progress and other tasks and investigations.

Financial Resources

Makes recommendations only, concerning:

- The procurement of new test hardware and software, as necessary, to solve testability problems and to ensure that Automated Test Systems keep pace with equipment advances.
- Locating vendors and making recommendations on the purchase of spare parts necessary to maintain the longevity of Automated Test Systems.
- The course of action to be followed in projects that may involve significant labour or material costs.

Technical Resources

Maintain End User responsibilities of the ATS Testers and equipment.

Exercise diligence and initiative in caring and maintaining for the ATS workstation computers.

Responsible to adhere to the appropriate protocols for classified documents and equipment.

Adherence to protocols for database and Information Management best practices.

Filing and managing of OEM, Navy, locally generated, and other specification documentation.

Working Conditions

Physical Environment

TPS development and CAD/CAM type work is normally performed in an office environment with daily exposure of up to 8hrs per day of glare from a computer screen.

When working in the ATS Tester room, is exposed to a continuously noisy environment due to system cooling fans and to an intentionally cold working environment for extended periods of time.

Routine exposure to “live” circuits, with occasional exposure to potentially dangerous voltage levels.

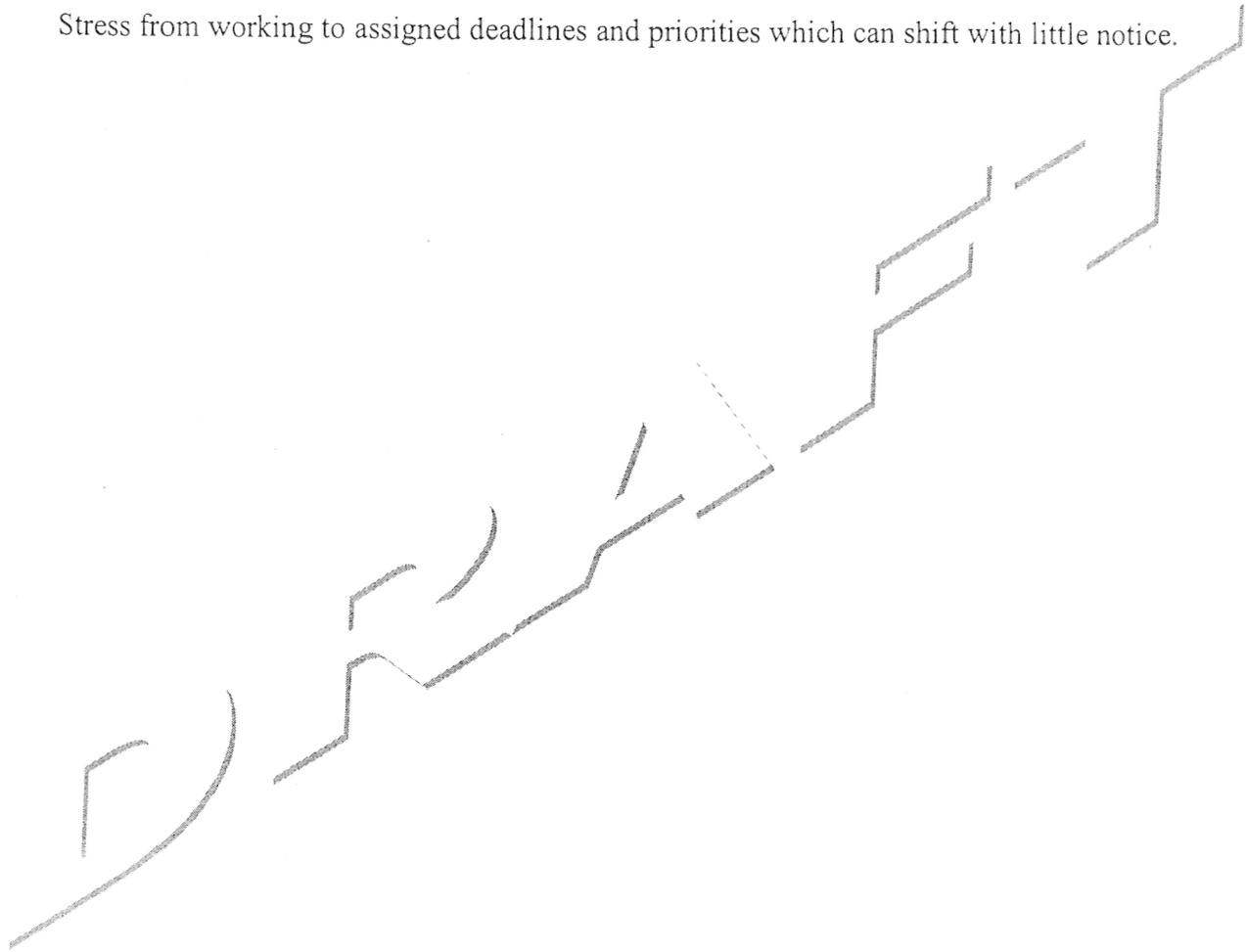
A light industrial bench type environment is utilized for electronic CCA, interface, and module repair and assembly.

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Psychological Environment

Much of the analyses work requires a quiet setting, which is often interrupted by random office or light industrial noise, and interruptions by fellow staff and other normal workplace events.

Stress from working to assigned deadlines and priorities which can shift with little notice.



ANNEX A ATS SYSTEMS AND SOFTWARE

At time of writing, the following systems and software are in use in ATS.

Hardware

- SCHLUMBERGER S790 Automated Test System
- Computer controlled General Purpose Test Instruments (eg, Function Generator, RF Generator, Spectrum Analyzer, Network Analyzer, Oscilloscope, Pulse Generator, Counter, DVM, Synchro Simulator, Electronic Load, Signal Switching Matrix, Lambda Power Supplies, etc.)
- SUN Computer Workstations (Solaris/UNIX Based)
- CATS 10000 Digital Hardware Modeler
- ALTIUM UNIVERSAL JTAG INTERFACE
- MICROCHIP IDC3 (universal flash PIC programmer)
- CHIP WRITER (device programmer for flash, eeprom, PALs, etc..)
- Desktop Personal Computers
- Computer Peripherals (printers, scanners, etc.)

Software:

- CATE, Computer Aided Test Engineering Environment
- CADAT, Computer Aided Design and Test Modeling
- VISULA CAD, Schematic Capture, Circuit Card Layout
- Instrumentation Control Drivers
- UNIX Shell Programming
- PC Based Document/Presentation preparation Software Tools
- Computer Communication Packages
- TCP/IP Based Local Area Network components
- Database Management Tools
- Solaris, UNIX, DOS and Windows Operating Systems
- IEEE-488 (HP-IB) Standard Interface

Test Program Developer

- Microsoft Word, Excel and Access.
- DRMIS

- Programming Languages such as C, Pascal, Mediator and Java
- WordPerfect, Open Office, and Libre Office
- ALTIUM DESIGNER (Printed Circuit Board design software)
- MPLAB X, XC8, XC16 (embedded system PIC C compilers)
- National Instruments Labview

