

DRAFT REQUIREMENTS

NOTE: THE INFORMATION BELOW IS A DRAFT TO ASSIST WITH INTERESTED SOURCES AND SUBJECT TO CHANGE IF A SOLICITATION IS ISSUED.

C.1 BACKGROUND

NSWCDD Launcher Systems Branch (G21) has upgraded the Automated Test System (ATS) for production screening of Electronic Circuit Card Assemblies (CCAs) from the Teradyne L293 Test System to the Teradyne Spectrum 9100 (S9100) Test System. Existing MK41 Vertical Launch System (VLS) application-specific Test Program Sets (TPSs) developed to interface with the original Teradyne L293 system need to be converted to the upgraded S9100. NSWCDD requires contract assistance to re-host specific CCA TPS from the L293 to S9100 system.

C.2 GENERAL REQUIREMENT

CCAs for the MK41 VLS Baseline VII module have been categorized into low, medium, and high complexity based on an engineering assessment of the hardware design. The Contractor shall re-host three L293 CCA TPSs (one from each complexity category) to the S9100 with an option for up to four additional if the first three are converted successfully. General test content and reporting requirements are described in Table 1.1.

Table 1.1: CCA Test Content

Verification Test	Low Complexity CCA	Medium Complexity CCA	High Complexity CCA
Power supply requirements include 5V@2.5A, 24V@1A, and 28.5V@0.1A. Standard TTL logic levels	✓	✓	✓
Functional: 95% of detectable faults	✓	✓	✓
PLD: non edge pin all functions, edge pin IAW release drawing	✓	✓	✓
ROM: complete verification	✓	✓	✓
EEPROM: Edge pin complete verification	✓	✓	✓
FPGA: complete pin-level fault coverage including at least one		✓	✓

primary function.			
Microprocessor: Verify all nodes for proper function or use BIT			✓

C.3 GOVERNMENT FURNISHED MATERIAL

C.3.1 The government will provide the following material prior to contract award:

- a. CCA assembly drawings, parts list, schematics, and Printed Circuit Board (PCB) drawings.
- b. Legacy ATS (L293) Interface Test Adapter (ITA) assembly drawings, parts list, and wire running lists.
- c. Acceptance Test Requirements (ATR) documentation.
- d. NSWCCD S9100 Configuration Drawings.

C.3.2 The government will provide the following material after contract award:

- a. Source code files from legacy ATS (L293).
- b. At least one known-good Unit Under Test (UUT) without conformal coating and three injected faults for program integration. (golden fail UUT)
- c. At least one known-good UUT will be provided for the purpose of test program integration. (golden pass UUT)
- d. Set of ITA identification numbers
- e. Set of program identification numbers

C.4 TPS DEVELOPMENT ENVIRONMENT

The government owned S9100 Spectrum ATS will not be available on a regular basis for Contractor development. The

Contractor is required to have independent access to the Teradyne development environment described herein.

C.4.1 The contractor shall use Test Studio as the framework for the development, integration, and operation of the TPS.

C.4.2 The contractor shall use the Teradyne TPS Convertor Studio on the L293 TPS code to generate the initial TPS for the S9100. This methodology is critical to help maintain test coverage during the re-host process.

C.4.3 The contractor shall use the C programming language as the primary development environment. Operator controls and messaging shall be browser based and written in a variety of tools that may include any of the following: Javascript, Visual Basic Script, HTML, Labwindows CVI.

C.4.4 Source code that is redundant from program to program shall be reused and not regenerated for each module. Program implementation may be altered to take advantage of enhanced Spectrum capability.

C.5 TECHNICAL REQUIREMENTS

C.5.1 Functional Test Strategy Review. The L293 TPS shall be reviewed in parallel with the ATR and schematics to determine the best method for designing and developing the TPS. The results shall be documented in a Test Strategy Report and submitted to the government for approval (CDRL A001).

C.5.2 TPS Development. The contractor shall develop the TPS to run specifically on NSWCCD's S9100 Spectrum ATS (configuration details provided in Attachment 1). Program implementation may be altered to take advantage of enhanced Spectrum capability. Source code that is common from program to program shall be reused and not regenerated for each module.

The contractor shall retain or improve the original L293 level of test coverage during TPS conversion and shall ensure that all requirements in the ATR are satisfied. The TPS shall be programmed to generate a run-time Fault Coverage Log Report

(FCLR) that includes faults from both INPUT and OUTPUT functional tests. Faults that cannot be covered shall be documented and explained in an Undetectable Fault Table (UFT).

The contractor shall implement clear and concise TPS operator messages to support of production testing. The TPS program shall have the capability for diagnostics (software breakpoints or test looping) without additional support hardware or software.

The contractor shall deliver all necessary code and associated documentation to compile and execute the TPS on the S9100 (CDRL A002). Delivery shall be on CD media identified by the respective part numbers for the completed and validated test programs. The contractor shall deliver a Test Manifest Listing (CDRL A003) that lists files required for maintenance and production testing, documents path\filenames, and identifies the file creation time, date, and size.

The contractor shall design and fabricate an Interface Test Adaptor (ITA) to accommodate each CCA. CCA's that share the same higher assembly shall also share a common ITA whenever possible. Each ITA shall:

- a. Use production quality connector and probes for connections to the UUT.
- b. Use Light Emitting Diodes (LEDs) to indicate UUT Power On and Power Off.
- c. Have no obstructions that block access to the edge of connector signals and external interfaces.
- d. Support a temperature forcing system with equivalent capabilities of the Thermonics T2420.
- e. Include custom self-test software and hardware to verify the integrity of the fixture components and connections prior to test operations.

- f. Be ergonomically compatible with single user operation (including lift and docking).
- g. Mate successfully to the VPC Adapter defined in the NSWCCD S9100 Configuration Drawing.
- h. Meet all OSHA safety requirements when performing high voltage testing.

The contractor shall include the following documentation (CDRL 0004) with each ITA delivered: Dimensioned Assembly Drawings, Parts Lists, Wire Running Lists, and Printed Circuit Board (PCB) Plots.

C.5.3 Functional Integration Testing. Integration testing will be a two-step process. The contractor shall conduct initial integration testing on the Contractor's S9100 used for development. When successfully completed, the contractor shall conduct final integration testing on the NSWCCD S9100 at the government facility in Dahlgren, VA. Results of integration testing shall be included in the final TPS Acceptance Test Report (CDRL A005).

C.5.4 Acceptance Testing. Following final integration testing, the contractor shall demonstrate the test program and ITA on the Government's test system at the Government's facility for the purposes of a final acceptance. Data Log Files shall be generated during testing indicating the following:

- UUT Name
- Part Number
- Serial Number
- Operator Identification
- Date & Time of Test
- "PASSED" or "FAILED" Statement
- If "FAILED", indication of Failure Mode
- Each Test and Measured Value

Failure of any one of the following criteria will be a failure for the entire module TPS:

- a. Successful equivalence trace between the ATR and the new S9100 TPS
- b. Empty socket test: The first test in the TPS flow will include a contact check. The contact check will detect an empty socket and stop on fail before proceeding.
- c. The TPS successfully reads the ITA Identification
- d. Golden pass units pass a minimum of five consecutive runs on the NSWCCD S9100 ATS. Pass results shall be documented with a soft copy data log.
- e. The S9100 TPS detects all three faults on the golden fail units. Results shall be documented with a soft copy of the data log.

If the TPS module meets all the criteria above, the Government TPOC will sign the Customer TPS Acceptance Form to be included in the final TPS Acceptance Test Report (CDRL A005). This signed form shall also be included in the WAWF submission for payment when all deliverables related to the specific TPS have been received and approved by the government.

C.6 CONTRACT DELIVERABLES

Deliverables under the contract include:

- Test Strategy Report
- TPS Software Code & Associated Documentation
- Test Manifest List
- Interface Test Adapter
- ATS Documentation
- TPS Acceptance Test Report
- Action Item List

C.7 CONTRACT REPORTING REQUIREMENTS

C.7.1 Kick-off Meeting. A meeting will be conducted at the government facility in Dahlgren, Va, approximately two weeks after contract award. The contractor shall present a schedule of all significant milestones and the completion date for each TPS conversion. The Government shall be notified immediately of any issue that has the potential of impacting the schedule.

C.7.2 Status Reviews. Status reviews will be conducted, via conference call, a minimum of once every two weeks. The contractor shall maintain an Action Item List (CDRL A006) to be updated and distributed electronically after each status review.

C.7.3 Final Review. A final review will be conducted at the government facility in Dahlgren, VA, during the last month of the contract. Preliminary versions of all deliverables shall be received by the government prior to this review. The contractor shall summarize the tasks and accomplishments and demonstrate that the SOW requirements have been met. The contractor shall provide the final version of any outstanding deliverable at this meeting.