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TEST REPORT

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NATIONAL CERTIFICATION TEST REPORT FOR CERTIFICATION TESTING OF THE ELECTION SYSTEMS & SOFTWARE EVS 5.0.1.0 VOTING SYSTEM

EAC CERTIFICATION NUMBER – ESSEVS5010

for

Election Systems & Software, LLC.
11208 John Galt Boulevard
Omaha, NE 68137

STATE OF ALABAMA
COUNTY OF MADISON }

Robert D. Hardy, Department Manager, being duly sworn, deposes and says: The information contained in this report is the result of complete and carefully conducted testing and is to the best of his knowledge true and correct in all respects.

Robert Hardy

SUBSCRIBED and sworn to before me this 25 day of Feb 20 14

Sandra A. Daniel
Notary Public in and for the State of Alabama at Large

My Commission expires June 2, 2015

SEAL

Wyle shall have no liability for damages of any kind to person or property, including special or consequential damages, resulting from Wyle's providing the services covered by this report.

PREPARED BY: James R Long 2-25-14
James Long, Project Engineer Date

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Frank Padilla, Voting Systems Manager Date

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			REVISION: REV. B
wyle laboratories			**REPORT NO.** T71352.01-01 REV. B
			DATE: February 25, 2014
REV	**DATE**	**PAGE OR PARAGRAPH AFFECTED**	**DESCRIPTION OF CHANGES**
---	01-13-14	Entire Document	Original Document Release
A	02-03-14	Section 1.1	Reworded first and third paragraphs
A	02-03-14	Section 2.1.1	Added the operation flow diagram
A	02-03-14	Section 2.2	Added language to specify reference table
A	02-03-14	Section 3.1	Added the name of the testing campaign that was being referenced
A	02-03-14	Section 3.2	Reworded bullets 3, 7, and 8
A	02-03-14	Section 4.1	Added a breakdown of the source code non-conformities
A	02-03-14	Section 4.3	Added a breakdown of the TDP non-conformities
A	02-03-14	Section 4.5.4	Added the hardware revision number for the DS200
A	02-03-14	Section 4.5.5	Corrected language referring to retesting.
A	02-03-14	Section 4.6	Corrected language referring to retesting.
A	02-03-14	Appendices	Added Appendix D and E
B	02-24-14	Title Page	Added certification number

TABLE OF CONTENTS

Page No.

TABLE OF CONTENTS (Continued)

Page No.

APPENDICES

1.0 INTRODUCTION

1.1 Testing Scope

This report presents the procedures followed and the results obtained during certification testing of the Election Systems & Software (ES&S) EVS 5.0.1.0 Voting System. ES&S submitted the EVS 5.0.1.0 Voting System to Wyle Laboratories, Inc. for compliance to the United States Election Assistance Commission (EAC) 2005 Voluntary Voting Systems Guidelines (VVSG). The EVS 5.0.1.0 Voting System is a modification to the EAC certified EVS 5.0.0.0 Voting System documented by Wyle Laboratories' Test Report Number T59087.01-01, dated May 16, 2013. All testing on the modifications to the voting system was tested to the EAC 2005 VVSG.

The focus of this test campaign was to test all additions and modifications made to both the system's software and hardware, since the last certification. Wyle Laboratories performed functionality testing on the reporting enhancements to the DS200 and DS850, as listed in the TDP. Wyle Laboratories performed system integration testing and accuracy testing to verify the hardware and software changes to the DS200.

The changes to the DS200 hardware for version 1.3 include:

- New Motherboard – VT6070 Mini-ITX (Replace EOL, 'End-of-Life')
- New System RAM – DDR3 Ram Module (Replaced to fit new motherboard)
- New Scanner Board – (Replace EOL)
- Removal of the ATX power supply (now incorporated in the motherboard)
- ECO 1281 – DS200 Transport Assembly
  - Redesign spring plate (improve handling of damaged ballots)
  - Redesign beveled Contact Image Sensor (improve handling of damaged ballots)
  - Add the ultrasonic detect shield and grommet
  - Redesign closing linkage
  - Revise fit and tolerance on five sheet metal parts (improve manufacturing tolerances)
    - Right side of the transport assembly – change round holes to slots to allow horizontal adjustability in stainless steel guide plates
    - Bottom front stainless steel platen – add additional clearance around bushing openings to allow horizontal adjustability in stainless steel guide plates
    - Drive belt cover on the left side of transport – added access holes for CIS mounting hardware
    - Bottom rear stainless steel platen – add additional clearance around bushing openings to allow horizontal adjustability in stainless steel guide plates
    - Top front stainless steel platen – add additional clearance around bushing openings to allow horizontal adjustability in stainless steel guide plates
- Replace CFL backlight with LED backlight (Replace EOL)
- Removable rails for attachment to ballot box (Replace built in feet)
- Battery access door
- Improve power/close switch fit
- Plastic housing change to update company logo

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1.1 Testing Scope (Continued)

Implemented ECO 1281 (described above) on DS200 hardware version 1.2.1 to create DS200 hardware version 1.2.3. The changes to the DS200 2.7.0.0 software include:

- Print scanner board hardware type on tape
- Implemented the use of the 8-bit "Scanner ID" field to report the scanner board firmware
- Integrated ability to read and report Power Management Board firmware version
- Report motherboard version on configuration report and in log
- Modify HAL for new VIA motherboard

Changes to DS850 Datawin firmware:

- No proposed changes or modifications to the proprietary firmware
- Change increased the rising and lowering speed of the input and output trays.

There were no proposed changes or modifications to the AutoMARK or the EMS software in this test campaign; therefore, no component level testing was included for this equipment.

1.2 Objective

The objective of this system modification test program was to ensure that EVS 5.0.1.0 complied with the hardware and software requirements of the EAC 2005 VVSG. The scope and detail of the requirements tested in the certification were selected to correspond to the scope of the system detailed in the application submitted by ES&S. An in-depth examination of the system further confirmed the applicable requirements selected for compliance testing. This included the inspection and evaluation of system documentation, and the execution of functional tests to verify system performance and function under normal/abnormal conditions.

1.3 Test Report Overview

This test report consists of five main sections (including appendices):

- **Introduction:** Provides the architecture of the National Certification Test Report (hereafter referred to as Test Report); a brief overview of the testing scope of the Test Report; a list of documentation, customer information, and references applicable to the voting system hardware, software, and this test report.
- **System Identification and Overview:** Provides information about the system tested that includes the system under test, test support hardware, and specific documentation provided by the vendor used to support testing.
- **Certification Test Background**: Contains information about the certification test process and the system tested.
- **Test Findings and Recommendation:** Provides a summary of the results of the testing process.
- **Appendices:** Information and data supporting testing of the voting system and hardware analysis are included as appendices to this report. This includes: Notices of Anomaly, Test Setup Photographs, Hardware Test Results (FL EVS 4.5.0.0 Test Report), Technical Data Package Issues, and the "As Run" Test Plan.

1.0 INTRODUCTION (Continued)

1.4 Customer

Election Systems & Software, LLC
11208 John Galt Boulevard
Omaha, NE 68137

1.5 References

The documents listed were utilized to perform certification testing.

- Wyle Laboratories' "National Certification Test Report for the Certification Testing of the Election Systems & Software EVS 5.0.0.0 Voting System Revision B", Test Report Number T59087.01-01, dated May 16, 2013
- Wyle Laboratories' "Hardware Compliance of the Election Systems & Software FL EVS 4.5.0.0 Voting System DS200 Hardware Version 1.3," Test Report Number T71013.01-01, dated September 18, 2013.
- Election Assistance Commission 2005 Voluntary Voting System Guidelines, Volume I, Version 1.0, "Voting System Performance Guidelines," and Volume II, Version 1.0, "National Certification Testing Guidelines," dated December 2005
- United States Federal Election Commission Voting System Standards Volume I, "Performance Standards" and Volume II, "Test Standards," dated April 2002
- Election Assistance Commission Testing and Certification Program Manual, Version 1.0, effective date January 1, 2007
- Election Assistance Commission Voting System Test Laboratory Program Manual, Version 1.0, effective date July 2008
- National Voluntary Laboratory Accreditation Program NIST Handbook 150, 2006 Edition, "NVLAP Procedures and General Requirements (NIST Handbook 150)," dated February 2006
- National Voluntary Laboratory Accreditation Program NIST Handbook 150-22, 2008 Edition, "Voting System Testing (NIST Handbook 150-22)," dated May 2008
- United States 107th Congress Help America Vote Act (HAVA) of 2002 (Public Law 107-252), dated October 2002
- Wyle Laboratories' Test Guidelines Documents: EMI-001A, "Wyle Laboratories' Test Guidelines for Performing Electromagnetic Interference (EMI) Testing," and EMI-002A, "Test Procedure for Testing and Documentation of Radiated and Conducted Emissions Performed on Commercial Products"
- Wyle Laboratories' Quality Assurance Program Manual, Current Revision
- Wyle Laboratories' Quality Program Manual, Current Revision
- ANSI/NCSL Z540-1, "Calibration Laboratories and Measuring and Test Equipment, General Requirements"
- ISO 10012-1, "Quality Assurance Requirements for Measuring Equipment"
- EAC Requests for Interpretation (listed on www.eac.gov)
- EAC Notices of Clarification (listed on www.eac.gov)

2.0 SYSTEM IDENTIFICATION AND OVERVIEW

2.1 System Overview

The ES&S EVS 5.0.1.0 Voting System is a modification EVS 5.0.0.0 Voting System. The full EVS 5.0.1.0 Voting System description can be found in Section 2.0 of Wyle Laboratories' ES&S EVS 5.0.0.0 Test Report No. T59087.01-01, dated May 16, 2013. For the ES&S EVS 5.0.1.0 Voting System, Wyle Laboratories only tested the modifications to the DS200, DS850 and their interface with the EMS. Therefore, Wyle Laboratories only documented the configuration used during testing conducted at Wyle Laboratories.

2.1.1 System Operational Concept

The operational flow and low-level system interfaces for the ES&S EVS 5.0.1.0 Voting System are illustrated in Figure 1-1.

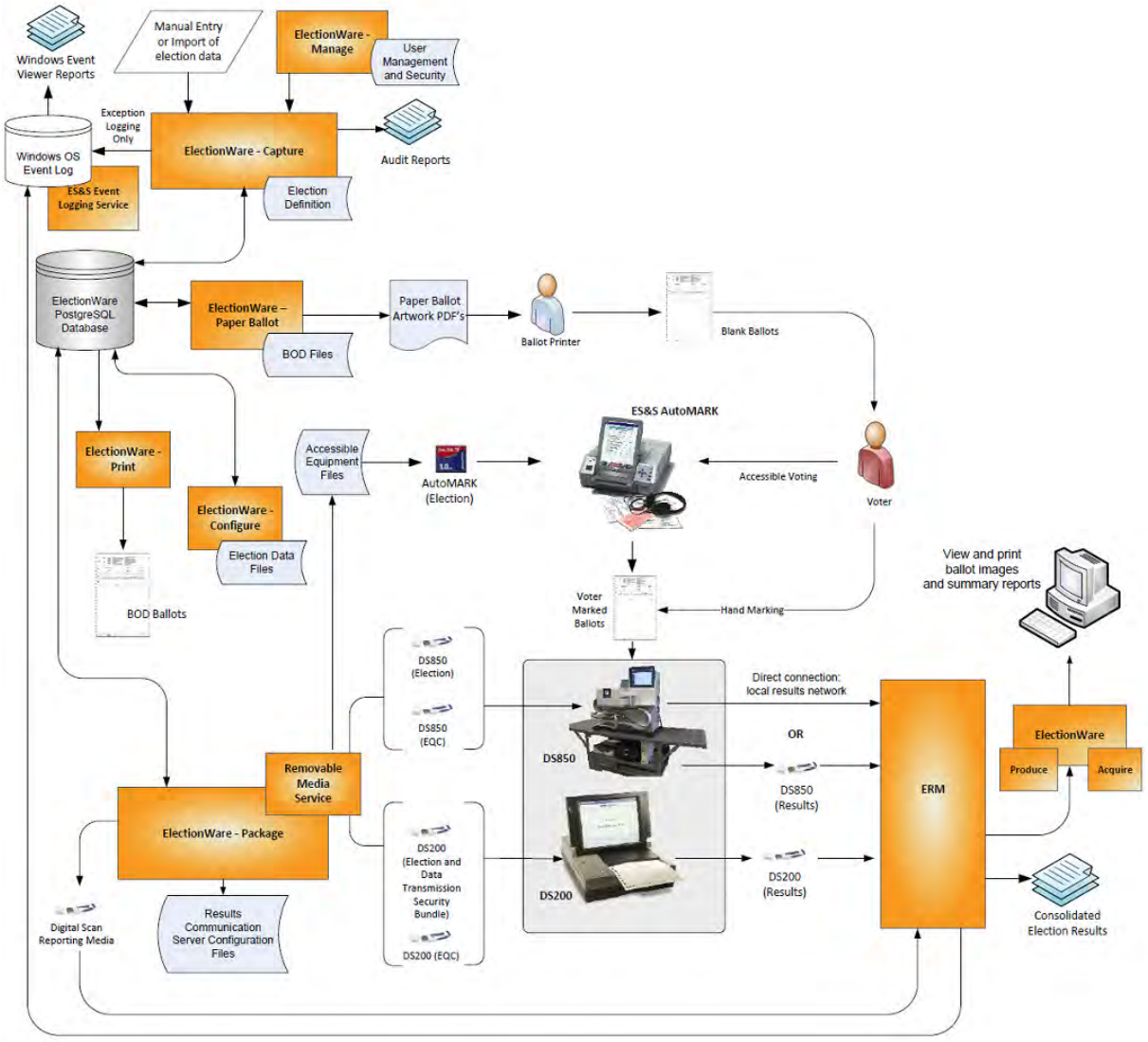

Figure 1-1 System Overview Diagram

2.2 System Identification

The materials required for testing of the EVS 5.0.1.0 Voting System included software, hardware, test materials, and deliverable materials (as specified in table 2-7) shipped directly to Wyle Laboratories by ES&S. The materials documented in the following sections are the materials used during Wyle Laboratories' testing of only the DS200 and its interface with the EMS and are not a complete list of materials used in the previously-certified EVS 5.0.0.0 Voting System.

2.2.1 Hardware

This subsection categorizes the equipment the manufacturer submitted for testing listed in Table 2-1. Each test element is included in the list of the equipment required for testing of that element, including system hardware, general purpose data processing and communications equipment, and any required test instrumentation.

Table 2-1 EVS 5.0.1.0 Voting System Equipment Description

Equipment	Manufacturer	Specifications	Serial Number	COTS/ Non-COTS
EMS Client Laptop	Dell Latitude E6410	Intel Core i5 CPU M580 @ 2.67 GHz 4.00 GB Installed RAM / Hard Drive Capacity 250 GB	2FD65Q1	COTS
EMS Server	Dell T710	Intel Xeon CPU E5645 @ 2.40 GHz (2 processors) 12.0 GB Installed RAM / Hard Drive Capacity 320 GB	JPZ6VR1	COTS
EMS Client Desktop	Dell OptiPlex 980	Intel Core i5 CPU 650 @ 3.20 GHz 4.0 GB Installed RAM / Hard Drive Capacity 320 GB	3TZJFQ1	COTS
Communications Server	Dell T410	Intel Xeon CPU E5504 @ 2.00 GHz 4.0 GB Installed RAM / Hard Drive Capacity 300 GB	4D6BQM1	COTS

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.2 System Identification (Continued)

2.2.1 Hardware (Continued)

Table 2-2 EVS 5.0.1.0 Build Machine Description

Equipment	Manufacturer	Specifications	Serial Number	COTS/ Non-COTS
Build 1	Dell OptiPlex 760	Processor: Intel Duo Core E8400 Wolfdale Memory: 4x1 GB, 800 MHz Ram Hard Drive Capacity: 80 GB	6D7DJG1	COTS
Build 2	Dell OptiPlex 760	Processor: Intel Duo Core E8400 Wolfdale Memory: 4.0 GB Installed Ram Hard Drive Capacity: 80 GB	6DCKJG1	COTS
Build 3	Dell Precision T3500	Processor: Intel X5650 2.66/6.4 12 MB Xeon Westmere Memory: 2.0 GB Installed Ram Hard Drive Capacity: 160 GB	15TMMN1	COTS
Build 4	Dell Precision T3500	Processor: Intel X5650 2.66/6.4 12 MB Xeon Westmere Memory: 2.0 GB Installed Ram Hard Drive Capacity: 160 GB	15TNMN1	COTS

Table 2-3 EVS 5.0.1.0 Voting System Equipment

Equipment	Description	Serial Number
AutoMARK	Voting Assist Terminal (A200)	AM0308421809
DS200 Hardware Version 1.3	Precinct Count Digital Scanner	DS0313350010
DS200 Hardware Version 1.3	Precinct Count Digital Scanner	DS0313350002
DS200 Hardware Version 1.2.3	Precinct Count Digital Scanner	DS0113360186
DS200 Hardware Version 1.2.1	Precinct Count Digital Scanner	DS0313340087
DS200 Hardware Version 1.2.1	Precinct Count Digital Scanner	ES0108340026
DS850 Hardware Version 1.0	Central Count Digital Scanner	DS8511090075
Ballot Box Hardware Version 1.2; 1.3	Plastic Box	002, 003, 004, 005
Ballot Box Hardware Version 1.2	Metal Box with Diverter	001

2.2.2 Software

The software evaluated was limited to ElectionWare, Election Reporting Manager (ERM), and the firmware build for the DS200. Only the changes incorporated since the EVS 5.0.0.0 test campaign were evaluated by Wyle Laboratories. Wyle Laboratories utilized an EMS setup with new versions of ElectionWare and ERM to load election information onto transport media and to upload election data from the DS200 to the EMS via the transport media. Wyle Laboratories did not test the EMS for any other functionality.

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.2 System Identification (Continued)

2.2.2 Software (Continued)

Table 2-4 EVS 5.0.1.0 EMS Software Platform Component Descriptions

Software Required For Testing	Software Version
ElectionWare	4.1.0.0
Election Reporting Manager (ERM)	8.6.0.0
Event Logging Service (ELS)	1.5.0.0
VAT Previewer	1.8.1.0
Removable Media Service (RMS)	1.4.0.0
DS200 Firmware	2.7.1.0
DS850 Firmware	2.4.0.0

Table 2-5 EVS 5.0.1.0 EMS COTS Software Platform Component Descriptions

Software Required For Testing	Description
Windows 7 Professional, with SP1	Original Disk
Windows Server 2008 R2, with SP1	Original Disk
Adobe Acrobat Standard version 9.0 or better	Original Disk
RM/Cobol	12.06
Microsoft Office Excel 2007 or better	Original Disk
Adobe Acrobat Standard 9.0	Original Disk
AVG AntiVirus Business Edition 2012	Original Disk & virus definition updates

2.3 System Limits

No system limits were impacted by this modification.

2.4 Test Support Materials

This subsection enumerates any and all test materials needed to perform voting system testing. The scope of testing determines the quantity of a specific material required.

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2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.4 Test Support Materials (Continued)

The following test materials were required to support the EVS 5.0.1.0 test campaign:

Table 2-6 Test Support Equipment

Test Material	Quantity
Paper Rolls	25 rolls total
COTS Printer	1
Security Seals	50
ES&S Pens	20
Security Sleeves	3
Security Locks	5
Transport Media (USB Flash Drives) Delkin 1 GB Delkin 4 GB	20
Delkin Devices 1 GB Compact Flash	3

2.5 Deliverable Materials

The materials listed in Table 2-7 are to be delivered as part of the EVS 5.0.1.0 Voting System to the users.

Table 2-7 Deliverable Materials for EVS 5.0.1.0 Voting System

Deliverable Material	Version	Description
ElectionWare	4.1.0.0	EMS
ERM	8.6.0.0	EMS
Event Logging Service (ELS)	1.5.0.0	EMS
VAT Previewer	1.8.1.0	EMS
Removable Media Service (RMS)	1.4.0.0	EMS
DS200	Firmware 2.7.1.0; Hardware 1.2.1, 1.2.3 and 1.3	Precinct ballot scanner
AutoMARK™	Firmware 1.8.1.0; Hardware 1.0, 1.1 and 1.3	Voter Assist Terminal
DS850	Firmware 2.4.0.0; Hardware 1.0	Central ballot scanner
OKI Printer	B430dn or B431dn	Laser Report Printer
OKI Printer	Microline 420	Dot Matrix Printer
Headphones	Avid FV 60	Stereo headphones
Voting System Overview EVS 5.0.1.0	19.0	TDP Document
ES&S DS200 System Operations Procedures Hardware version 1.2	10.1	TDP Document

2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.5 Deliverable Materials (Continued)

Table 2-7 Deliverable Materials for EVS 5.0.1.0 Voting System (Continued)

Deliverable Material	Version	Description
ES&S DS200 System Operations Procedures Hardware version 1.3	1.0	TDP Document
ES&S DS850 System Operations Procedures	11.1	TDP Document
ES&S AutoMARK™ System Operations Procedures	5.0	TDP Document
ES&S ElectionWare 4.1 Vol II: Admin User's Guide	4.8	TDP Document
ES&S ElectionWare 4.1 Vol II: Define User's Guide	4.0	TDP Document
ES&S ElectionWare 4.1 Vol III: Design User's Guide	3.2	TDP Document
ES&S ElectionWare 4.1 Vol IV: Deliver User's Guide	5.6	TDP Document
ES&S ElectionWare 4.1 Vol V: Results User's Guide	1.5	TDP Document
EVS Event Logging Service System Operations Procedures	1.0	TDP Document
ES&S ERM System Operations Procedures	13.1	TDP Document
ES&S Voting System Security Specification	3.1	TDP Document
ES&S Voting System Security: Best Practices for Physically Securing ES&S Equipment	2.0	TDP Document
ES&S Hardening Procedures	4.3	TDP Document

2.6 Vendor Technical Data Package

The Technical Data Package (TDP) contains information about requirements, design, configuration management, quality assurance, and system operations. The EAC 2005 VVSG requirements state that, at a minimum, the TDP shall contain the following documentation: system configuration overview; system functionality description; system hardware specifications; software design and specifications; system test and verification specifications; system security specifications; user/system operations procedures; system maintenance procedures; personnel deployment and training requirements; configuration management plan; quality assurance program; and system change notes.

Since the EVS 5.0.1.0 Voting System is a modification to the previously certified EVS 5.0.0.0 Voting System, Table 2-8 only lists the documents in the TDP that were modified for the EVS 5.0.1.0 Voting System. For a complete list of all documents, please refer to the EVS 5.0.0.0 Voting System documented by test report number T59087.01-01 dated May 16, 2013.

2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.6 Vendor Technical Data Package (Continued)

Table 2-8 ES&S EVS 5.0.1.0 Voting System TDP

EVS 5.0.1.0 TDP Documents	Version	Doc. No.	Document Code
Voting System Overview	19.0	01-01	EVS5010_OVR00
System Functionality Description			
System Functionality Description	9.0	02-01	EVS5010_SFD00
System Hardware Specification			
System Hardware Specification – DS200 hardware V 1.2	1.0	03-02	DS200HW_M_SPC_0312_HWSpec
System Hardware Specification – DS200 hardware V 1.3	3.0	03-02	DS200HW_M_SPC_0313_HWSpec
Software Design and Specification			
Software Design and Specification – ERM	1.0	04-03	EVS5010_SDS00_ERM
Software Design and Specification – DS200	1.0	04-04	EVS5010_SDS00_DS200
Software Design and Specification – DS850	1.0	04-04	EVS5010_SDS00_DS850
System Operations Procedures			
System Operations Procedures – DS200	1.0	07-09	EVS5010_SOP00_DS200
System Maintenance Manuals			
System Maintenance Manual – DS200	1.0	08-02	EVS5010_SMM00_DS200
System Change Notes			
EVS 5.0.1.0 System Change Notes	2.0	12-01	EVS5010_DOC_D_1200_ ChangeNotes

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3.0 TEST BACKGROUND

Wyle Laboratories is an independent testing laboratory for systems and components under harsh environments, including dynamic and climatic extremes as well as the testing of electronic voting systems. Wyle Laboratories holds the following accreditations:

- ISO-9001:2000
- NVLAP Accredited ISO 17025:2005
- EAC Accredited VSTL, NIST 150,150-22
- A2LA Accredited (Certification No.'s 845.01, 845.02, and 845.03)
- FCC Approved Contractor Test Site (Part 15, 18, 68)

3.1 General Information about the Test Process

All testing performed as part of the test effort was performed at Wyle Laboratories' Huntsville, AL, facility. Testing was limited to EVS 5.0.1.0 which includes items listed in Section 2.0 of this test report.

The strategy for evaluation of the EVS 5.0.1.0 was to review the change log, source code, and the engineering changes submitted for the modified system. Wyle Laboratories also evaluated test results from FL EVS 4.5.0.0 as well as test cases and results of any developmental testing conducted by ES&S during the pre-certification process that were provided by ES&S in their TDP. The purpose of this evaluation was to determine the scope of testing required for system certification.

3.2 Testing Scope

To evaluate the system test requirements and the scope of the test campaign, each section of the EAC 2005 VVSG was analyzed to determine the applicable tests. The EAC 2005 VVSG, Volume I Sections, along with the strategy for evaluation, are described below:

- **Section 2: Functional Requirements** – The requirements in this section were tested during the FCA, utilizing test cases specially designed for the ES&S EVS 5.0.1.0 Voting System.
- **Section 3: Usability and Accessibility** – The requirements in this section were not tested during this test campaign.
- **Section 4: Hardware Requirements** – The requirements in this section were tested during the Florida EVS 4.5.0.0 state test campaign. The FL EVS 4.5.0.0 test campaign tested the hardware modifications to the DS200 1.3. Wyle accepts this testing and requests reuse for the EVS 5.0.1.0 test campaign. The FL EVS 4.5.0.0 Hardware Test Report Number T71013.01-01 is presented in Appendix B.
- **Section 5: Software Requirements** – The requirements in this section were tested during source code review, TDP review, and FCA. A combination of review and functional testing was performed to insure these requirements are met.
- **Section 6: Telecommunication** – The requirements in this section were not tested during this test campaign.
- **Section 7: Security Requirements** – The requirements in this section were tested during source code review, FCA, and Security Tests.

3.0 TEST BACKGROUND (Continued)

3.2 Testing Scope (Continued)

- **Section 8: Quality Assurance (QA) Requirements** – The QA requirements were spot checked and limited to only the changes included within this modification. The following documents were utilized during the limited review process:
    - ESSSYS_M_P_1000MNFQualityAssurancePlan
    - ESSSYS_Q_P_0100SoftwareQualityAssurance Program
- **Section 9: Configuration Management (CM) Requirements** – The CM requirements were spot checked and limited to only the changes included within this modification. The following documents were utilized during the limited review process:
    - ESSSYS_CMP_P_1000_ESSCMProgram
    - ESSSYS_DOC_P_1000_TDPProgram

The EVS 5.0.1.0 Voting System is a paper-based precinct counting system; therefore, all EAC 2005 VVSG requirements pertaining to DRE's were excluded from this test campaign. Additionally, the following requirements were also excluded from the campaign:

- Volume I Section 6 (Telecommunication Requirements)
- Volume I Section 7.5.2-7.5.4 (Telecommunications and Data Transmission)
- Volume I Section 7.6 (Use of Public Communication Networks)
- Volume I Section 7.7 (Wireless Communications)
- Volume I Section 7.9 (Voter Verifiable Paper Audit Trail Requirements)

The rationale for not evaluating the EVS 5.0.1.0 Voting System to the requirements contained in the indicated sections of the EAC 2005 VVSG is described in Table 3-1.

Table 3-1 Not Applicable Requirements

EAC 2005 VVSG Volume I Section	Rationale for 'Not Applicable'
6, 7.5.2-7.5.4	These requirements are written for use on public networks. The EVS 5.0.1.0 Voting System as configured for this certification does not use public networks.
7.6	This section pertains to "Voting systems that transmit data over public telecommunications…" The EVS 5.0.1.0 Voting System as configured for this certification does not permit transmission over public networks.
7.7	No wireless technology is present in the EVS 5.0.1.0 Voting System.
7.9	The EVS 5.0.1.0 Voting System is a paper based system.

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3.0 TEST BACKGROUND (Continued)

3.3 Wyle Quality Assurance

All work performed on this program was in accordance with Wyle Laboratories' Quality Assurance Program and Wyle Laboratories' Quality Program Manual, which conforms to the applicable portions of International Standard Organization (ISO) Guide 17025.

The Wyle Laboratories, Huntsville Facility, Quality Management System is registered in compliance with the ISO-9001:2008 International Quality Standard. Registration has been completed by SAI Global, a Division of Canadian Standards Association (CSA).

3.4 Test Equipment and Instrumentation

All instrumentation, measuring, and test equipment used in the performance of this test program was calibrated in accordance with Wyle Laboratories' Quality Assurance Program, which complies with the requirements of ANSI/NCSL 2540-1, ISO 10012-1, and ISO/IEC 17025. Standards used in performing all calibrations are traceable to the National Institute of Standards and Technology (NIST) by report number and date. When no national standards exist, the standards are traceable to international standards, or the basis for calibration is otherwise documented.

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3.0 TEST BACKGROUND (Continued)

3.5 Terms and Abbreviations

Table 3-2 in this subsection defines all terms and abbreviations applicable to this Test Report.

Table 3-2 Terms and Abbreviations

Term	Abbr.	Definition
Americans with Disabilities Act of 1990	ADA	ADA is a wide-ranging civil rights law that prohibits, under certain circumstances, discrimination based on disability.
Configuration Management	CM	---
Commercial Off the Shelf	COTS	Commercial, readily available hardware or software.
Direct Record Electronic	DRE	An electronic voting system that utilizes electronic components for the functions of ballot presentation, vote capture, vote recording, and tabulation which are logically and physically integrated into a single unit. A DRE produces a tabulation of the voting data stored in a removable memory component and in printed hardcopy.
United States Election Assistance Commission	EAC	Commission created per the Help America Vote Act of 2002, assigned the responsibility for setting voting system standards and providing for the voluntary testing and certification of voting systems.
Election Management System	EMS	Within the EVS system, the EMS is ElectionWare in addition with ERM.
Election Results Manager	ERM	A component of the EMS that is used for results gathering and reporting.
Equipment Under Test	EUT	---
Help America Vote Act	HAVA	Act created by United States Congress in 2002.
National Institute of Standards and Technology	NIST	Government organization created to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhances economic security and improves our quality of life.
Physical Configuration Audit	PCA	Review by accredited test laboratory to compare voting system components submitted for certification testing to the manufacturer's technical documentation, and confirmation the documentation meets national certification requirements. A witnessed build of the executable system is performed to ensure the certified release is built from tested components.
Quality Assurance	QA	---
Specimen Under Test	SUT	---
Technical Data Package	TDP	Manufacturer documentation related to the voting system required to be submitted as a precondition of certification testing.
Uninterruptible Power Supply	UPS	---
Voluntary Voting System Guidelines	EAC 2005 VVSG	Published by the EAC, the third iteration of national level voting system standards.
Wyle Operating Procedure	WoP	Wyle Test Method or Test Procedure
Functional Configuration Audit	FCA	Exhaustive verification of every system function and combination of functions cited in the manufacturer's documentation.
Secure File Transfer Protocol	SFTP	A network protocol that provides file access, files transfer, and file management functionality over any reliable data stream.

4.0 TEST PROCEDURES AND RESULTS

4.1 Source Code Review

As part of the testing activities, the ES&S EVS 5.0.1.0 Voting System received a 100% source code review to the EAC 2005 VVSG coding standards and the manufacturer supplied coding standards. The manufacturer supplied coding standards (ESSSYS_D_D_0100_Coding Standards) can be found within the vendor provided TDP. The review was conducted per the guideline described in the following paragraph.

As the updated source code was received, a SHA1 hash value was created for each source code file. The source code team then conducted a visual scan of every line of modified source code. This was done to identify any violation of EAC 2005 VVSG coding standards or manufacturer supplied coding standards. The COTS tools utilized by the source code group were Beyond Compare and Crimson Editor. Each identified violation was then recorded by making notes of the standards violation along with directory name, file name, and line number.

Summary Findings

Two header revision history standards violations were identified and sent to ES&S for resolution. ES&S then corrected the standards violations and re-submitted the source code for re-review. No additional standards violations were identified during the re-review. The Notice of Anomaly (NOA No. 2) documenting that source code discrepancies were found is included in Appendix C of this report. Tables 4-1 and 4-2 below provide the discrepancies and count identified during the entire review process:

Table 4-1 Source Code Discrepancies by type

Header Revision History	2
Total:	2

Table 4-2 Source Code Review Breakdown

Source Code Component and Utilities	*Number of Reviews	*Number of Discrepancies
DS200	2	2
DS850	0	0
ElectionWare	0	0
ERM	0	0
LogMonitor	0	0

***The number of reviews include both initial submissions and subsequent reviews which may include clean versions of code where no discrepancies were identified.**

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4.0 TEST PROCEDURES AND RESULTS (Continued)

4.2 Trusted Build

A Trusted Build of the software was created using ES&S's trusted build documents. The "Trusted Builds" were performed by completing the following tasks in the order listed:

- Clear hard drive of existing data
- Retrieve the compliant source code
- Retrieve the installation media for OS, compilers, and build software
- Construct the build environment
- Create digital signatures of the pre-source build environment
- Create a disk image of the pre-source build environment
- Load the compliant source code into the build environment
- Create a digital signature of the post-source build environment
- Create a disk image of the post-source build environment
- Build the executable code
- Create the installation media
- Create a digital signature of the final build environment
- Create a disk image of the final build environment
- Create a digital signature of the installation media
- Install executable code onto the hardware and validate the software/firmware
- Deliver source code with digital signature, disk image of pre-build environment with digital signatures, disk image of post-build environment with digital signatures, executable code with digital signatures, and installation media to the EAC Repository

The "Trusted Builds" for the ES&S EVS 5.0.1.0 include source code, data, and script files, in clear text form. The builds also include COTS software on commercially available media, COTS software downloaded by the VSTL, COTS software verified by SHA1 from the software supplier, and picture and sound files in binary format provided by ES&S. The first step of the process was to clean the hard drives by writing data to every sector of the hard drive, so the drive is cleared of existing data. The designated operating system was then loaded and the applications from the VSTL-reviewed source along with the VSTL verified COTS software was built. The final step was installing the applications on the hardware.

Summary Findings

Wyle Laboratories performed Trusted Builds for each system component of EVS 5.0.1.0 on December 20, 2013. A Technical Representative was present for each of the Witnessed Builds. The outputs from the Witness Builds have been supplied to the EAC as part of the certification effort.

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4.3 Technical Data Package (TDP) Review

The ES&S, Unity 5.0.1.0 Technical Data Package was reviewed to the 2005 VVSG. This review was performed as part of the testing activities. The TDP review included only the documents that support the scope of certification for this testing campaign.

The TDP contains information about requirements, design, configuration management, quality assurance, and system operations. The EAC requirements state that, at a minimum, the TDP shall contain the following documentation: system configuration overview; system functionality description; system hardware specifications; software design and specifications; system test and verification specifications; system security specifications; user/system operations procedures; system maintenance procedures; personnel deployment and training requirements; configuration management plan; quality assurance program; and system change notes.

The TDP documents were reviewed for accuracy, completeness, and compliance to the VVSG. The TDP documentation served as the basis for design and development of the functional tests.

Summary Findings

The review results were recorded in a worksheet that provided the pass/fail compliance to each applicable VVSG requirement. There were 9 discrepancies reported to ES&S and internally tracked by Wyle as test exceptions until verified that the applicable documents had been corrected. ES&S corrected nonconformance observations and resubmitted the associated documents for review. This process continued until the TDP complied with TDP Standards.

A summary of the TDP issues encountered is provided below:

- Some descriptive information included was inconsistent with descriptions in other TDP documents.
- Some documents included functionality that was not supported in the voting system.
- Some of the individual user guides included information which conflicted with the actual information encountered when verified during the testing process.
- Missing manufacturer test documentation that describes the testing performed on the modificaitons.

All noted TDP issues were resolved prior to the conclusion of the review process. The Technical Data Package Review Report that summarizes the 9 discrepancies noted is included in Appendix D of this report. The Notice of Anomaly (NOA No. 1) documenting that TDP discrepancies were found is included in Appendix C of this report.

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4.0 TEST PROCEDURES AND RESULTS (Continued)

4.4 Hardware Testing

EVS 5.0.1.0 is a paper-ballot based optical scan voting system. EVS 5.0.1.0 system consists of five major components: ElectionWare, ERM, DS200 precinct scanner, DS850 central count scanner, and AutoMARK. EVS 5.0.1.0 is comprised of two proprietary pieces of hardware; DS200 and DS850. Wyle Laboratories determined that the COTS PCs and laptops are not subject to hardware testing per the EAC 2005 VVSG. The provided PCs and laptops documented in Section 3 Materials Required For Testing all contained CE, UL, and FCC labeling.

DS200 hardware 1.3 – Wyle Laboratories previously performed testing to the EAC 2005 VVSG during the state testing campaign for FL EVS 4.5.0.0 (Wyle Test Report No. T71013.01-01). All hardware testing as noted in table 4-1 was accepted for reuse based on the findings of the evaluation.

Table 4-1 Hardware Test Examination Results

Test/EAC 2005 VVSG Section	Procedure/Description	EVS 5.0.1.0 Voting System Component
		DS200 1.3
Electromagnetic Radiation/4.1.2.9	FCC Part 15 Class B for both radiated and conducted emissions	Accept EVS 4.5.0.0
Low Temperature/4.1.2.14	MIL-STD-810D minimum temperature shall be -4°F	Accept EVS 4.5.0.0
Vibration/4.1.2.14	MIL-STD-810D, Method 514.3 physical shock and vibration during handling and transport	Accept EVS 4.5.0.0
Lightning Surge/4.1.2.7	IEC 61000-4-5 (1995-02)	Accept EVS 4.5.0.0
High Temperature/4.1.2.14	MIL-STD-810D, Method 501.2 maximum temperature shall be 140°F	Accept EVS 4.5.0.0
Bench Handling	MIL-STD-810D, Method 516.3 Procedure VI six 4" drops on each edge totaling 24 drops	Accept EVS 4.5.0.0
Electrical Fast Transient/4.1.2.6	IEC 61000-4-4 (2004)	Accept EVS 4.5.0.0
Humidity Test/4.1.2.14	MIL-STD-810D, Method 501.2 ten 24 hour humidity cycles	Accept EVS 4.5.0.0
Electrostatic Disruption/4.1.2.8	IEC 61000-4-2 (1995-01) 15kV air discharge and 8kV contact discharge	Accept EVS 4.5.0.0
Electromagnetic Susceptibility/4.1.2.10	IEC 61000-4-3 (2006) electromagnetic field of 10V/m modulated by a 1kHZ, 80% AM modulation at 80MHz to 1000MHz frequency	Accept EVS 4.5.0.0
Conducted RF Immunity/4.1.2.11	IEC 61000-4-6 (1996-04) conducted radio frequency energy	Accept EVS 4.5.0.0
Magnetic Fields Immunity/4.1.2.12	IEC 61000-4-8 (1993-06) AC magnetic fields of 30 A/m at 60Hz	Accept EVS 4.5.0.0
Electrical Power Disturbance/4.1.2.5	IEC 61000-4-11 (1994-06) power surges and dips	Accept EVS 4.5.0.0
Temperature/Power Variation/4.1.2.13	MIL-STD-810D, Method 502.2 and Method 501.2 163 hours at 50°F to 95°F	Accept EVS 4.5.0.0
Safety/4.3.8	UL 60950-1 product safety review	Accept EVS 4.5.0.0

4.0 TEST PROCEDURES AND RESULTS (Continued)

4.4.1 Electrical Supply Testing

Electrical Supply Testing was performed in accordance with Section 4.1.2.4 of Volume I of the VVSG. This test was performed to ensure that the DS200 will continue to provide the capability for any voter who is voting at the time of a failure of the main power supply external to the voting system to complete the casting of a ballot. Additionally, it is required that the voting system perform a successful shutdown without loss or degradation of the voting and audit data, and allow voters to resume voting once the voting system has reverted to back-up power.

To perform the test, the EUT was configured as for normal operation. The EUT was then operated as designed for fifteen minutes prior to the removal of the AC input power. Once AC power was interrupted, the DS200 was continuously operated for a minimum period of two hours until backup power was exhausted. Following the exhaustion of backup power, the AC power was restored and the system was operated for an additional fifteen minutes.

Summary Findings

The DS200 successfully completed the requirements of the Electrical Supply Test.

4.4.2 Maintainability

Maintainability Testing was performed in accordance with Section 4.7.2 of Volume II of the VVSG. This test was performed to evaluate the ease with which preventive and corrective maintenance actions can be performed based on the design characteristics of equipment and software and the processes the vendor and election officials have in place for preventing failures and for reacting to failures. It includes the ability of equipment and software to self-diagnose problems and make non-technical election workers aware of a problem and addresses all scheduled and unscheduled events which are performed to determine operational status and make component adjustments or repairs. The DS200 was evaluated with the appropriate vendor documentation, and maintainability was determined based on the presence of specific physical attributes that aid system maintenance activities, and the ease with which system maintenance tasks were able to be performed.

Summary Findings

The DS200 successfully completed the requirements of the Maintainability Test.

4.5 System Level Testing

System Level Testing was performed to evaluate the integrated operation of the voting system hardware and software. The suite of tests that comprise the System level Testing includes: System Integration Test, Security Test, Usability and Accessibility Tests, Data Accuracy, as well as the Physical and Functional Configuration Audits.

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4.0 TEST PROCEDURES AND RESULTS (Continued)

4.5 System Level Testing (Continued)

4.5.1 System Integration Test

An overview of the suite of tests performed during System Level Testing is provided in the following paragraphs, along with the summary findings of each test.

System Integration Testing was performed to test all system hardware, software, and peripherals. System Integration Testing focused on the complete system including all proprietary software, proprietary hardware, proprietary peripherals, COTS software, COTS hardware, and COTS peripherals configured as a precinct count unit as described in the ES&S-submitted TDP for the EVS 5.0.1.0 Voting System. To perform the System Integration Testing, Wyle Laboratories developed specific procedures and test cases designed to test the system as a whole. These procedures demonstrated compliance of the EVS 5.0.1.0 Voting System, to Sections 2, 3, 4, 5, and 6 of Volume I of the VVSG.

The six election definitions exercised during the System Integration Testing are listed below:

- GEN-01
- GEN-02
- GEN-03
- PRIM-01
- PRIM-02
- PRIM-03

Summary Findings

Through System Integration Testing, it was demonstrated that the system performed as documented with all components performing their intended functions.

4.5.2 Security

EVS 5.0.1.0 was subjected to Security Testing in accordance with the requirements of Section 7.0 of Volume I and Section 6.4 of Volume II of the VVSG. The purpose of the Security Test was to verify that the modifications to the EVS 5.0.1.0 did not compromise the security of the DS200 or the ballot box. All other previously certified components of the EVS 5.0.1.0 system were unmodified and therefore accepted for the current test campaign.

Summary Findings

The security tie straps/tamper evident seals and their documented installation were analyzed and found to be adequate. Wyle has determined the EVS 5.0.1.0 Voting System to be compliant with the security requirements of the EAC 2005 VVSG.

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4.0 TEST PROCEDURES AND RESULTS (Continued)

4.5 System Level Testing (Continued)

4.5.3 Accuracy Test

Per the VVSG Vol. II Section 4.7.1.1, "As indicated in Volume I, Section 4, data accuracy is defined in terms of ballot position error rate." This rate applies to the voting functions and supporting equipment that capture, record, store, consolidate, and report the selections (or absence thereof) made by the voter for each ballot position. To meet the requirements of this test, the voting system must be subjected to the casting of a large number of ballots to verify vote recording accuracy, i.e. at least 1,549,703 ballot positions correctly read and recorded. Wyle determined the DS200 (versions 1.2.3, and 1.3) required an accuracy test based on the software/hardware changes made to each of the components.

Table 4-2 shows the breakdown of how many ballots of the specified ballot size were scanned during the accuracy test.

Table 4-2 EVS 5.0.1.0 Accuracy Test DS200

Ballot Size	No. of Ballots	No. Vendor Pre-printed	No. Hand Marked	No. Ballot Positions per Ballot	No. of Machines in Test	No. of times Voted per Machine	Total Ballot Positions
11 inch	100	30	70	392	3	2	235,200
14 inch	100	30	70	512	3	2	307,200
17 inch	100	30	70	640	3	2	384,000
19 inch	100	30	70	720	3	3	648,000
Total	**400**	**120**	**280**	**N/A**	**3**	**N/A**	**1,574,400**

Summary Findings

The DS200 successfully met the requirements of the Data Accuracy Test by scanning and processing at least 1,549,703 ballot positions. No anomalies were noted during the performance of the Accuracy test.

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4.0 TEST PROCEDURES AND RESULTS (Continued)

4.5 System Level Testing (Continued)

4.5.4 Physical Configuration Audit

A Physical Configuration Audit (PCA) of the EVS 5.0.1.0 Voting System was performed in accordance with Section 6.6 of Volume II of the VVSG. The PCA compares the voting system components submitted for certification with the vendor's technical documentation and confirms that the documentation submitted meets the requirements of the Guidelines. The PCA included the following activities:

- Establishing a configuration baseline of software and hardware to be tested; confirm whether manufacturer's documentation is sufficient for the user to install, validate, operate, and maintain the voting system,
- Verifying software conforms to the manufacturer's specifications; inspect all records of manufacturer's release control system; if changes have been made to the baseline version, verify manufacturer's engineering and test data are for the software version submitted for certification,
- Reviewing drawings, specifications, technical data, and test data associated with system hardware, and to establish system baseline,
- Reviewing manufacturer's documents of user acceptance test procedures and data against system's functional specifications; resolve any discrepancy or inadequacy in manufacturer's plan or data prior to beginning system integration functional and performance tests,
- Subsequent changes to baseline software configuration made during testing, as well as system hardware changes that may produce a change in software operation are subject to re-examination

The PCA performed on the EVS 5.0.1.0 Voting System consisted of inspecting the DS200 firmware/software and the TDP used in the EVS 5.0.1.0 Voting System for DS200 hardware revision 1.2.3. The PCA for DS200 hardware revision 1.3 was performed during the FL EVS 4.5.0.0 test campaign. Please refer to Appendix C (FL EVS 4.5.0.0 Hardware Test Report T71013.01-01) for additional information.

Summary Findings

A limited PCA was performed to baseline the system's hardware and software components that were used during the test campaign. Only the modifications to the system were examined. No discrepancies were noted during the PCA.

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4.0 TEST PROCEDURES AND RESULTS (Continued)

4.5 System Level Testing (Continued)

4.5.5 Functional Configuration Audit

An abbreviated Functional Configuration Audit (FCA) was performed on the ES&S EVS 5.0.1.0 Voting System in accordance with Section 6.7 of Volume II of the VVSG. The purpose of the FCA was to verify the modifications to the DS200 and the EMS performed as documented in the ES&S-supplied technical documentation and validate that the modifications meet the requirements of the EAC 2005 VVSG.

To perform the FCA, the EVS 5.0.1.0 Voting System was subjected to a series of tests to test all modifications to the certified system and retest areas that may have been affected by the modification to ensure that those areas continued to function properly. The modification included:

- Functional change to update print results report candidates in rotation order to match ballot layout.
- Print scanner board hardware type on tape
- Implemented the use of the 8-bit "Scanner ID" field to report the scanner board firmware
- Integrated ability to read and report Power Management Board firmware version
- Report motherboard version on configuration report and in log

Testing was performed on the DS200 for hardware Version 1.2.3 (ECO 1281) to verify the modifications functioned properly.

Testing was also performed on the DS850 for the Datawin COTS firmware updates to verify the modifications functioned properly.

Summary Findings

A Functional Configuration Audit of the DS200, DS850, and the EMS was performed to verify that the modification and added functionality operated as described in the system's technical documentation. The voting system successfully met the requirements of the 2005 VVSG.

4.5.6 Usability and Accessibility

The EVS 5.0.1.0 Voting System was subjected to Usability and Accessibility Tests in accordance with Volume I, Section 3 of the EAC 2005 VVSG. The purpose of this testing was to assess the modified DS200 conforms to the usability and accessibility requirements in the EAC 2005 VVSG. Conformance to these requirements should result in quality interaction between the voter and the voting system and the effectiveness with which the system provides a comfortable and efficient voting session that provides confidence to the voter that their votes are cast correctly.

The Usability and Accessibility requirements set forth by the VVSG and the Help America Vote Act (HAVA) ensure that all eligible voters are provided the ability to vote without discrimination regardless of any disabilities. As stated in the VVSG, to meet the requirements of the Usability and Accessibility Test, the voting system shall: conform to the specified usability requirements of Volume I, Section 3.1; provide the capabilities required by Volume I, Section 3.2; and operate consistently with vendor specifications and documentation.

4.0 TEST PROCEDURES AND RESULTS (Continued)

4.5 System Level Testing (Continued)

4.5.6 Usability and Accessibility (Continued)

Summary Findings

The DS200 successfully completed the requirements of the Usability and Accessibility Test.

4.5.7 Quality Assurance and Configuration Management

A limited QA/CM review was performed on all applicable system components to verify that the submitted modifications follow ES&S documented QA/CM process. This review concentrated on Functional Configuration Audit, Configuration Identification, Release Process and Quality Conformance Inspection as these are the areas impacted by modifications.

Summary Findings

EVS 5.0.1.0 successfully met the requirements of the Quality Assurance and Configuration Management review.

4.6 Anomalies and Resolutions

A total of two Notices of Anomaly were issued throughout the test campaign upon occurrence of a verified failure, an unexpected test result, or any significant unsatisfactory condition. All anomalies encountered during testing were successfully resolved and retested without error prior to test completion. The Notices of Anomaly generated during testing are presented in their entirety in Appendix C and are summarized below along with their resolution.

Notice of Anomaly No. 1: TDP Review
Review of the submitted documentation revealed discrepancies between the TDP and the EAC 2005 VVSG requirements. Each noted discrepancy was documented in detail in the Wyle Laboratories generated TDP issues matrix that is on file as raw data.

Resolution to Anomaly No. 1:
EVS 5.0.1.0 is a Modification of a previously certified system. As such the TDP was only reviewed where modified or where impacted by system modification. ES&S corrected each nonconformance observation and resubmitted the associated documents for review. This process continued until the TDP complied with all applicable requirements.

Notice of Anomaly No. 2: Source Code Review
Review of the submitted source code comprising the EVS 5.0.1.0 Voting System revealed deviations from the 2005 VVSG.

Resolution to Anomaly No. 2:
Upon completion of the review for each source code submission, a technical summary report of all identified standards violations was sent to ES&S for resolution. ES&S then corrected the reported discrepancies and re-submitted the source code for re-review. All discrepancies were resolved by ES&S before the conclusion of the test campaign.

4.0 TEST PROCEDURES AND RESULTS (Continued)

4.5 System Level Testing (Continued)

4.7 Recommendation for Certification

Wyle Laboratories concludes that EVS 5.0.1.0, submitted by ES&S, meets all applicable requirements for certification as set forth in the Election Assistance Commission (EAC) 2005 Voluntary Voting Systems Guidelines, Version 1.0, as well as passes all additional tests performed at Wyle Laboratories' discretion. As such, Wyle Laboratories recommends that the EAC grant the ES&S EVS 5.0.1.0, certification to the VVSG.

This test report is valid only for the system identified in Section 2.0 of this report. Any changes, revisions, or corrections made to the system after this evaluation shall be submitted to the EAC to determine if the modified system requires a new application, or can be submitted as a modified system. The scope of testing required will be determined based upon the degree of modification.

Due to the varying requirements of individual jurisdictions, it is recommended by the EAC 2005 VVSG that local jurisdictions perform pre-election logic and accuracy tests on all systems prior to their use in an election within their jurisdiction.

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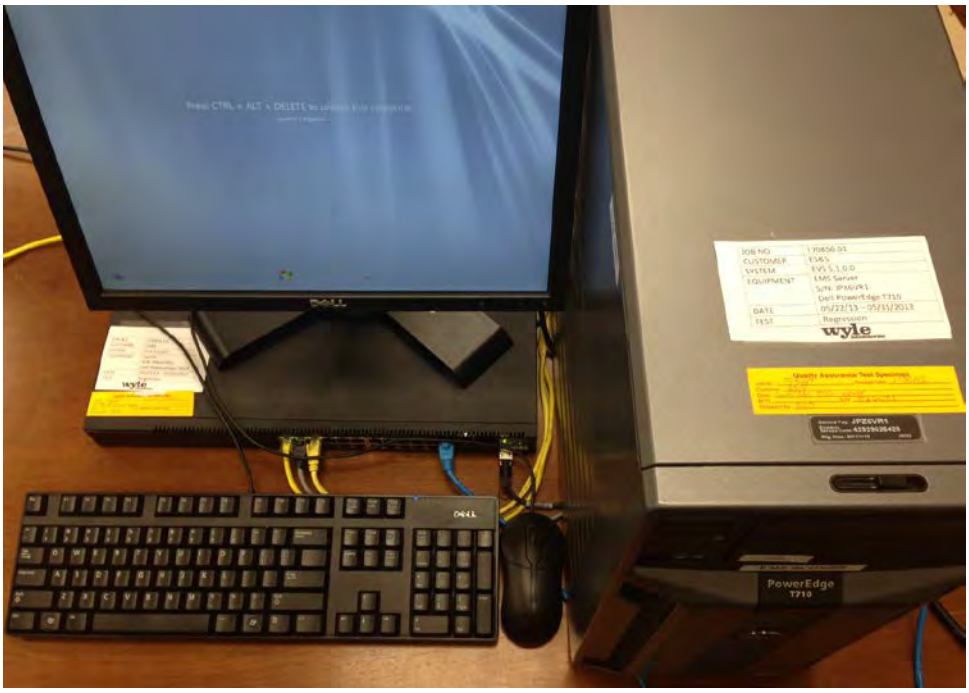
APPENDIX A
PHOTOGRAPHS

Photograph No. 1
ES&S EVS 5.0.1.0 Functional Test Setup

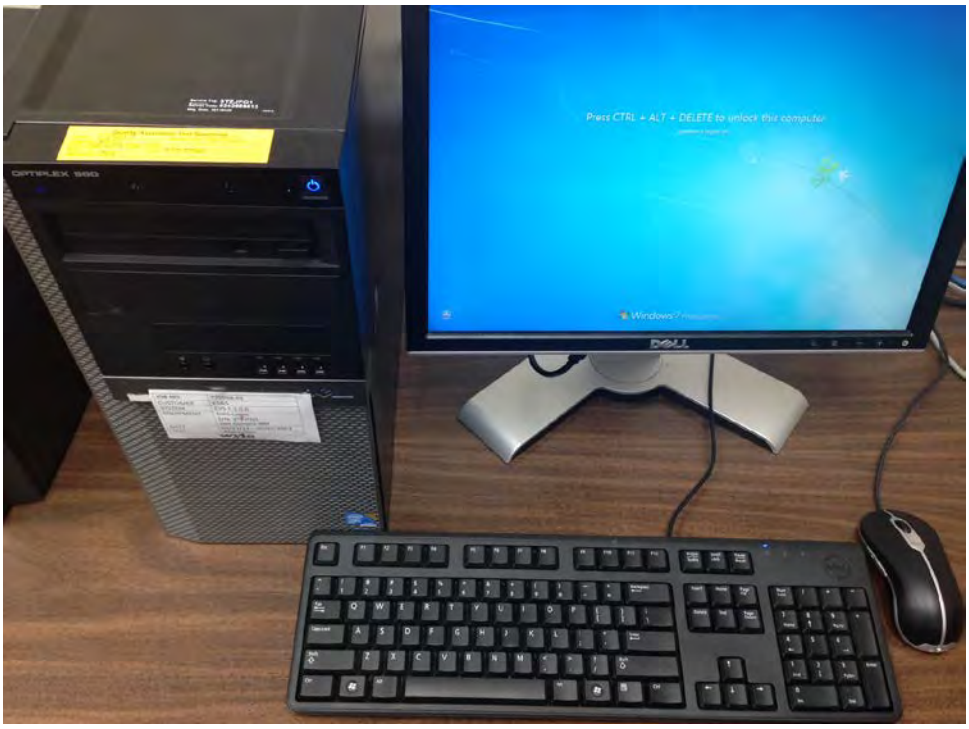
Photograph No. 2
ES&S EVS 5.0.1.0 Accuracy Test Setup

Photograph No. 3
ES&S EVS 5.0.1.0 System Integration Test Setup

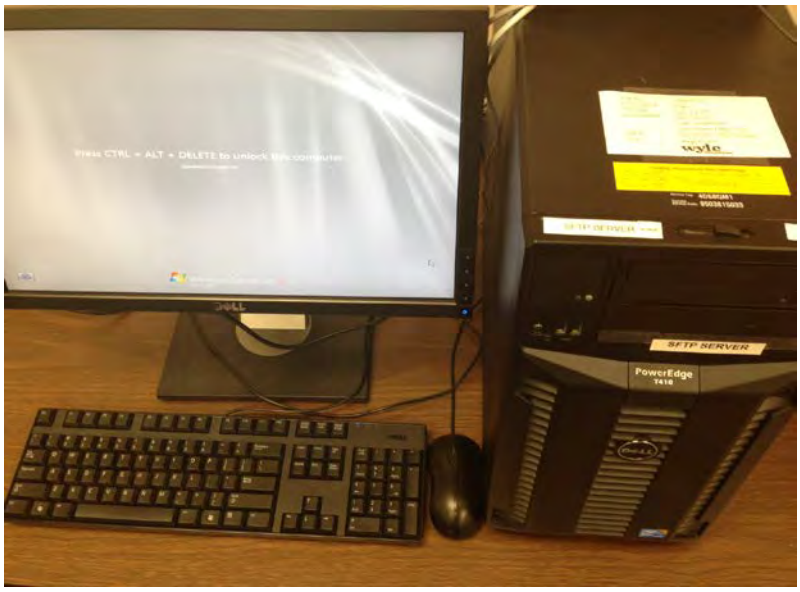
Photograph No. 4
ES&S EVS 5.0.1.0 System Integration Test Setup



Photograph No. 5
ES&S EVS 5.0.1.0 System Integration Test Setup



Photograph No. 6
ES&S EVS 5.0.1.0 System Integration Test Setup



Photograph No. 7
ES&S EVS 5.0.1.0 System Integration Test Setup

Photograph No. 8
ES&S EVS 5.0.1.0 Electrical Supply Test

APPENDIX B
FL EVS 4.5.0.0 HARDWARE TEST REPORT T71013.01-01

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WYLE JOB NO.: T71013.01
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TEST REPORT

HARDWARE COMPLIANCE TESTING OF THE ELECTION SYSTEMS & SOFTWARE FL EVS 4.5.0.0 VOTING SYSTEM DS200 HARDWARE VERSION 1.3

for

Election Systems & Software, LLC
11208 John Galt Boulevard
Omaha, NE 68137

STATE OF ALABAMA
COUNTY OF MADISON }

Robert R. Bridges, Director, being duly sworn, deposes and says: The information contained in this report is the result of complete and carefully conducted testing and is to the best of his knowledge true and correct in all respects.

SUBSCRIBED and sworn to before me this 18 day of Sept 20 13

SEAL

Notary Public in and for the State of Alabama at Large

My Commission expires 3/19/16

Wyle shall have no liability for damages of any kind to person or property, including special or consequential damages, resulting from Wyle's providing the services covered by this report.

PREPARED BY: 09/18/2013
Ryan D. Chambers, Project Engineer Date

APPROVED BY: 9/18/13
Frank Padilla, Voting Systems Manager Date

WYLE Q. A.: 9/18/13
for Raul Terceno, Q. A. Manager Date

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ITAC Lab Code 0704

Revisions

REVISION Original Release
REPORT NO. T71013.01-01
DATE September 18, 2013

wyle laboratories

REV	DATE	PAGE OR PARAGRAPH AFFECTED	DESCRIPTION OF CHANGES
---	9-12-12	Entire Document	Original Release

TABLE OF CONTENTS

Page No.

TABLE OF CONTENTS (continued)

1.0 INTRODUCTION

1.1 Scope

This report documents the test procedures followed and the results obtained from the Environmental and Electrical Testing performed on the Florida Election Voting System (FL EVS) 4.5.0.0 for Election Systems & Software (ES&S). Upon receipt by Wyle Laboratories, the systems were inspected and subjected to a Physical Configuration Audit (PCA). All testing was performed at Wyle Laboratories' Huntsville, Alabama, Test Facility.

1.2 Objective

The ES&S FL EVS 4.5.0.0 Voting System was tested in reference to the United States Federal Election Commission (FEC) 2002 Voting System Standards (VSS) and all applicable EAC 2005 Voluntary Voting Systems Guidelines (VVSG).

1.3. Test Report Overview

This test report consists of four main sections and attachments:

- 1.0 Introduction – Provides the architecture of the National Certification Test Report (hereafter referred to as Test Report); a brief overview of the testing scope of the Test Report; a list of documentation, customer information, and references applicable to the voting system hardware, software, and this test report.
- 2.0 System Identification and Overview – Provides information about the equipment tested.
- 3.0 Test Background – Contains information about the certification test process and a list of terms and nomenclature pertinent to the Test Report and system tested.
- 4.0 Test Procedures and Results – Provides a summary of the results of the testing process.
- Attachments – Information supporting reviews and testing of the voting system are included as attachments to this report.

1.4 Customer

Election Systems & Software, LLC
11208 John Galt Boulevard
Omaha, NE 68137

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1.0 INTRODUCTION (Continued)

1.5 References

The documents listed were utilized to perform certification testing.

- Election Assistance Commission 2005 Voluntary Voting System Guidelines, Volume I, Version 1.0, "Voting System Performance Guidelines," and Volume II, Version 1.0, "National Certification Testing Guidelines," dated December 2005
- United States Federal Election Commission Voting System Standards Volume I, "Performance Standards" and Volume II, "Test Standards" dated April 2002
- Election Assistance Commission Testing and Certification Program Manual, Version 1.0, effective date January 1, 2007
- Election Assistance Commission Voting System Test Laboratory Program Manual, Version 1.0, effective date July 2008
- Florida Voting System Standards, Form DS-DE 101, 1-12-05
- National Voluntary Laboratory Accreditation Program NIST Handbook 150, 2006 Edition, "NVLAP Procedures and General Requirements (NIST Handbook 150)," dated February 2006
- National Voluntary Laboratory Accreditation Program NIST Handbook 150-22, 2008 Edition, "Voting System Testing (NIST Handbook 150-22)," dated May 2008
- United States 107th Congress Help America Vote Act (HAVA) of 2002 (Public Law 107-252), dated October 2002
- Wyle Laboratories' Test Guidelines Documents: EMI-001A, "Wyle Laboratories' Test Guidelines for Performing Electromagnetic Interference (EMI) Testing," and EMI-002A, "Test Procedure for Testing and Documentation of Radiated and Conducted Emissions Performed on Commercial Products"
- Wyle Laboratories' Quality Assurance Program Manual, Revision 5
- ANSI/NCSL Z540-1, "Calibration Laboratories and Measuring and Test Equipment, General Requirements"
- ISO 10012-1, "Quality Assurance Requirements for Measuring Equipment"
- EAC Requests for Interpretation (listed on www.eac.gov)
- EAC Notices of Clarification (listed on www.eac.gov)

2.0 SYSTEM IDENTIFICATION AND OVERVIEW

2.1 System Overview

The ES&S FL EVS 4.5.0.0 Voting System is a new system that contains a newly configured DS200 hardware version 1.3. The new DS200 tabulator configuration consists of a new mother board, scanner board, redesigned transport path, and a removable battery access panel. Based on the upgrades and modifications to the DS200 a full hardware testing suite was performed at Wyle. For the ES&S FL EVS 4.5.0.0 Voting System, Wyle subjected the DS200 to: non-operating environmental tests, operating environmental tests and Electromagnetic Compatibility (EMC) tests. The ElectionWare EMS was only utilized to generate election media and verify results. Wyle only documented the configuration used during testing conducted at Wyle.

2.2 System Identification

The materials required for testing of the ES&S FL EVS 4.5.0.0 Voting System included software, hardware, test materials, and deliverable materials shipped directly to Wyle by ES&S. The materials documented in the following sections are the materials used during Wyle's testing of only the DS200 and the interface with the EMS.

2.2.1 Hardware

This subsection categorizes the equipment the manufacturer submitted for testing and is listed in Table 2-1. Each test element is included in the list of the equipment required for testing of that element, including system hardware, general purpose data processing and communications equipment, and any required test instrumentation.

Table 2-1 ES&S FL EVS 4.5.0.0 Test Equipment

Equipment	Description	Serial Numbers
DS200 (Hardware Revision 1.3)	Precinct Count Digital Scanner	DS0313350006 (ENV) DS0313350010 (ENV) DS0313350009 (EMI)
Ballot Box	Plastic Ballot Box/Plastic Transport Case	T71013-BB-002
Ballot Box	Hard Vinyl Transport Case	T71013-BB-003
Ballot Box	Metal Box with Electromechanical Diverter	T71013-BB-001
Dell Latitude Laptop	CPU: Intel Core i5-2540M 2.60Ghz RAM: 4.00 GB HDD: 250 GB – ST250LT007-9ZV14C OS: Windows 7 Professional SP1 – 64 bit	39CMJS1
Transport Media/ Memory Device/ USB Flash Drive	Approved Manufacturer List: Kingston SanDisk Delkin Approved Capacity List: 512 MB 1 GB 2 GB 4 GB 8GB	Wyle-assigned: TM-XXX*
Compact Flash Card/ CF Card	Approved Manufacturer List: Delkin Approved Capacity List: 1 GB	Wyle-assigned: CF-XXX*

*Wyle uniquely labels each media device with the information (election, results, test utilized for) loaded on the device.

2.0 SYSTEM IDENTIFICATION AND OVERVIEW (Continued)

2.2 System Identification (Continued)

2.2.2 Software

The software evaluated was limited to ElectionWare, Election Reporting Manager (ERM), and the firmware build for the DS200. Only the changes incorporated since the EVS 5.0.0.0 test campaign were evaluated by Wyle. Wyle utilized an EMS setup with new versions of ElectionWare and ERM to load election information onto transport media. Wyle did not test the EMS for any other functionality.

Table 2-2 Software Required for Testing

Software Identification	Version
DS200 Firmware	2.11.0.0l
DS200 Scanner Board Firmware	3.0.0.0b
DS200 Power Management Board	1.2.10.0a

2.3 Test Support Materials

This subsection enumerates any and all test materials needed to perform voting system testing. The scope of testing determines the quantity of a specific material required.

The following test materials were required to support the ES&S FL EVS 4.5.0.0 test campaign:

Table 2-3 Test Support Equipment

Test Material	Quantity
Paper Rolls	25 rolls total
Pre Printed Ballots	1,200 total (14" size)

2.4 Vendor Technical Data Package

The Technical Data Package (TDP) contains information about requirements, design, configuration management, quality assurance, and system operations. A scaled version of the TDP was submitted for this campaign due to only Hardware Testing being performed. The table below provides the TDP documents submitted and reviewed for the ES&S FL EVS 4.5.0.0 campaign.

Table 2-5 ES&S FL EVS 4.5.0.0 Voting System TDP

ES&S FL EVS 4.5.0.0 TDP Documents	Version	Doc No.	Document Code
System Hardware Specification			
System Hardware Specification – DS200	1.0	03-01	DS200HW_M_SPC_0313_HWSpec
System Test/Verification Specification			
System Operations Procedures – DS200	1.0	07-06	FLEVS4500_SOP_DS200
System Maintenance Manuals			
System Maintenance Manual – DS200	1.0	08-01	FLEVS4500_SMM_DS200

3.0 TEST BACKGROUND

Wyle Laboratories is an independent testing laboratory for systems and components under harsh environments, including dynamic and climatic extremes as well as the testing of electronic voting systems. Wyle holds the following accreditations:

- ISO-9001:2000
- NVLAP Accredited ISO 17025:2005
- EAC Accredited VSTL, NIST 150,150-22
- A2LA Accredited (Certification No.'s 845.01, 845.02, and 845.03)
- FCC Approved Contractor Test Site (Part 15, 18, 68)

3.1 General Information about the Test Process

All testing performed as part of the test effort was performed at the Wyle Labs Huntsville, AL facility. Conformance testing was limited to the ES&S FL EVS 4.5.0.0 Voting System component previously identified in this report.

All hardware used during testing for this test campaign was configured "As Used" for voting. Each tabulator was placed on a ballot box and loaded with the proper firmware. The ES&S FL EVS 4.5.0.0 EMS suite was loaded on a COTS PC. All media used during testing was loaded from this EMS PC. All hardware used to build the DS200 firmware was configured by Wyle.

3.2 Wyle Quality Assurance

All work performed on this program was in accordance with Wyle Laboratories' Quality Assurance Program and Wyle Laboratories' Quality Program Manual, which conforms to the applicable portions of International Standard Organization (ISO) Guide 17025.

The Wyle Laboratories, Huntsville Facility, Quality Management System is registered in compliance with the ISO-9001 International Quality Standard. Registration has been completed by Quality Management Institute (QMI), a Division of Canadian Standards Association (CSA).

3.3 Test Equipment and Instrumentation

All instrumentation, measuring, and test equipment used in the performance of this test program was calibrated in accordance with Wyle Laboratories' Quality Assurance Program, which complies with the requirements of ANSI/NCSL 2540-1, ISO 10012-1, and ISO/IEC 17025. Standards used in performing all calibrations are traceable to the National Institute of Standards and Technology (NIST) by report number and date. When no national standards exist, the standards are traceable to international standards, or the basis for calibration is otherwise documented.

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3.0 TEST BACKGROUND (Continued)

3.4 Terms and Abbreviations

Table 3-1 in this subsection defines all terms and abbreviations applicable to this Test Report.

Table 3-1 Terms and Abbreviations

Term	Abbreviation	Definition
Americans with Disabilities Act of 1990	ADA	ADA is a wide-ranging civil rights law that prohibits, under certain circumstances, discrimination based on disability
Configuration Management	CM	---
Commercial Off the Shelf	COTS	Commercial, readily available hardware or software
Direct Record Electronic	DRE	---
United States Election Assistance Commission	EAC	Commission created per the Help America Vote Act of 2002, assigned the responsibility for setting voting system standards and providing for the voluntary testing and certification of voting systems.
Election Management System	EMS	---
Equipment Under Test	EUT	---
Help America Vote Act	HAVA	Act created by United States Congress in 2002.
National Institute of Standards and Technology	NIST	Government organization created to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhances economic security and improves our quality of life.
Physical Configuration Audit	PCA	Review by accredited test laboratory to compare voting system components submitted for certification testing to the manufacturer's technical documentation, and confirmation the documentation meets national certification requirements. A witnessed build of the executable system is performed to ensure the certified release is built from tested components.
Quality Assurance	QA	---
Technical Data Package	TDP	Manufacturer documentation related to the voting system required to be submitted as a precondition of certification testing.
Voting System Standards	VSS	Published by the FEC, second iteration of national level voting system standards.
Voluntary Voting System Guidelines	2005 VVSG	Published by the EAC, the third iteration of national level voting system standards.
Wyle Operating Procedure	WOP	Wyle Test Method or Test Procedure

4.0 TEST FINDINGS AND RECOMMENDATIONS

The ES&S FL EVS 4.5.0.0 Voting System component, as listed in Section 2.0, were subjected to the tests described in Section 3.2 of this report. The results of those tests are summarized in the sections below. All hard copy data generated by the performance of these tests is retained by Wyle as raw data.

4.1 System Level Baseline

A System Level Baseline was performed to evaluate the system being submitted for testing in comparison to the system TDP. A Physical Configuration Audit was performed on the ES&S FL EVS 4.5.0.0 submitted for Hardware Testing.

4.1.1 Physical Configuration Audit

A focused Physical Configuration Audit (PCA) of the ES&S FL EVS 4.5.0.0 Voting System was performed in accordance with Section 6.6 of Volume II of the VVSG. The PCA compares the voting system components submitted for certification with the vendor's technical documentation and confirms that the documentation submitted meets the requirements of the Guidelines. The purpose of the PCA is to: establish a configuration baseline (both hardware and software) of the system to be tested; verify that the reviewed source code conforms to the vendor's specification; and assess the adequacy of user acceptance test procedures and data.

The PCA performed on the ES&S FL EVS 4.5.0.0 Voting System consisted of inspecting the DS200 scanner, firmware/software, and the TDP used in the ES&S FL EVS 4.5.0.0 Voting System.

Summary Findings: A focused PCA was performed to baseline the system's hardware and software components prior to commencement of the test campaign. No discrepancies were noted during the PCA.

4.2 Technical Data Package Review

The ES&S FL EVS 4.5.0.0 Voting System Technical Data Package (TDP) was not reviewed to the 2005 VVSG. The supplied TDP documents were only utilized as reference material for EUT configuration and test set-up.

Summary Findings: TDP was not performed.

4.3 Hardware Testing

Hardware testing included: the inspection and evaluation of voting system documentation; tests of voting system under conditions simulating the intended storage, operation, and transportation; and operational tests verifying system performance and function under normal and abnormal conditions. Hardware testing was limited to the ES&S FL EVS 4.5.0.0 Voting System. Hardware Testing Data can be located in Attachments A - G of this document for additional information

The DS200 was subjected to hardware tests as summarized in Table 4-1.

Table 4-1 Test Program Requirements

REPORT SECTION	VVSG VOL. I SECTION	VVSG VOL. II SECTION	TEST DESCRIPTION
4.5.1	N/A	4.6.4	Low Temperature Test
4.5.1	N/A	4.6.5	High Temperature Test
4.5.1	N/A	4.6.3	Vibration Test

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.3 Hardware Testing (Continued)

Table 4-1 Test Program Requirements (Continued)

REPORT SECTION	VVSG VOL. I SECTION	VVSG VOL. II SECTION	TEST DESCRIPTION
4.5.1	N/A	4.6.2	Bench Handling Test
4.5.1	N/A	4.6.6	Humidity Test
4.5.2	N/A	4.7.1	Temperature/Power Variation Test
4.6.1	4.1.2.5	4.8A	Electrical Power Disturbance Test
4.6.2	4.1.2.9	4.8B	Electromagnetic Radiation Test
4.6.3	4.1.2.8	4.8C	Electrostatic Disruption Test
4.6.4	4.1.2.10	4.8D	Electromagnetic Susceptibility Test
4.6.5	4.1.2.6 (a)	4.8E	Electrical Fast Transient Test
4.6.6	4.1.2.7 (a) (b)	4.8F	Lightning Surge Test
4.6.7	4.1.2.11 (a)	4.8G	Conducted RF Immunity Test
4.6.8	4.1.2.12	4.8H	Magnetic Fields Immunity Test
4.6.9	4.3.8	N/A	Product Safety Review, UL60950-1

4.4 Environmental Tests

Environmental tests were performed to ensure that the EUT and associated machine resident firmware were in compliance with the VVSG.

During test performance, the EUT was configured as it would be for use in an election precinct.

4.4.1 Non-Operating Environmental Tests

The EUT was subjected to various Non-Operating Environmental Tests. Prior to and immediately following each test environment, the EUT was powered on and subjected to operability functional checks to verify continued proper operation. The EUT was not powered on during the performance of any of the non-operating tests.

Low Temperature Test

The EUT was subjected to a Low Temperature Test in accordance with section 4.6.4 of Volume II of the VVSG. The purpose of this test is to simulate stresses associated with the storage of voting machines and ballot counters. This test is equivalent to the procedure of MIL-STD-810D, Method 502.2, Procedure I-Storage, with a minimum temperature of -4°F.

Prior to test initiation, the EUT was subjected to a baseline operability checkout to verify system readiness. The EUT was then placed in an environmental test chamber and the chamber temperature was lowered to -4°F and allowed to stabilize. Upon temperature stabilization, the temperature was maintained for an additional four hours. The temperature was then returned to standard laboratory ambient conditions at a rate not exceeding 10°F per minute.

During the Low Temperature Test there was one anomaly encountered (reference Notice of Anomaly No. 7 in Attachment A for further reference). This anomaly required testing to be repeated.

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.4.1 Non-Operating Environmental Tests (Continued)

Upon completion of the second attempt the EUT was removed from the chamber and inspected for any obvious signs of degradation and/or damage. None were observed. The EUT was successfully subjected to a post-test operability checkout.

The EUT successfully completed the requirements of the Low Temperature Test. The Test Data Sheet, Photographs, and Instrumentation Equipment Sheet are contained in Attachments B, C, and G of this report.

High Temperature Test

The EUT was subjected to a High Temperature Test in accordance with section 4.6.5 of Volume II of the VVSG. The purpose of this test is to simulate stresses associated with the storage of voting machines and ballot counters. This test is equivalent to the procedure of MIL-STD-810D, Method 501.2, Procedure I-Storage, with a maximum temperature of 140°F.

Prior to test initiation, the EUT was subjected to a baseline operability checkout to verify system readiness. The EUT was then placed in an environmental test chamber and the chamber temperature was raised to 140°F and allowed to stabilize. Upon temperature stabilization, the temperature was maintained for an additional four hours. The temperature was then returned to standard laboratory ambient conditions at a rate not exceeding 10°F per minute.

The EUT was removed from the chamber and inspected for any obvious signs of degradation and/or damage. None were observed. The EUT was successfully subjected to a post-test operability checkout.

The EUT successfully completed the requirements of the High Temperature Test. The Test Data Sheet, Photographs, and Instrumentation Equipment Sheet are contained in Attachments B, C, and G of this report.

Vibration Test

The EUT was subjected to a Vibration Test in accordance with section 4.6.3 of Volume II of the VVSG. The purpose of this test is to simulate stresses faced during transport of voting machines and ballot counters between storage locations and polling places. This test is equivalent to the procedure of MIL- STD-810D, Method 514.3, Category 1- Basic Transportation, Common Carrier.

Prior to test initiation, the EUT was subjected to a baseline operability checkout to verify system readiness. Upon completion, the EUT was secured to an electro dynamics shaker. One control accelerometer was affixed to the shaker table. The EUT was subjected to the Basic Transportation, Common Carrier profile as depicted in Mil-Std-810D, Method 514.3, Category I, with a frequency range from 10 to 500 Hz and an overall rms level of 1.04, 0.74, and 0.20 G for durations of 30 minutes in each orthogonal axis.

The DS200 successfully completed the requirements of the Vibration Test. The Test Data Sheet, Photographs, and Instrumentation Equipment Sheet are contained in Attachments B, C, and G of this report.

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.4 Environmental Tests (Continued)

4.4.1 Non-Operating Environmental Tests (Continued)

Bench Handling Test

The EUT was subjected to a Bench Handling Test in accordance with section 4.6.2 of Volume II of the VVSG. The purpose of this test is to simulate stresses faced during maintenance and repair of voting machines and ballot counters. This test is equivalent to the procedure of MIL-STD-810D, Method 516.3, Procedure VI.

Prior to performance of the test, the EUT was subjected to a baseline operability checkout. Following the checkout, each edge of the base of the machine was raised to a height of four inches above the surface and allowed to drop freely. This was performed six times per edge, for a total of 24 drops.

Upon test completion, the EUT was inspected for any obvious signs of degradation and/or damage. None were observed. The EUT was subjected to a post-test operability checkout and continued operability verified.

The EUT successfully completed the requirements of the Bench Handling Test. The Test Data Sheet, Photographs, and Instrumentation Equipment Sheet are contained in Attachments B, C, and G of this report.

Humidity Test

The EUT was subjected to a Humidity Test in accordance with section 4.6.6 of Volume II of the VVSG. The purpose of the test was to simulate stresses encountered during storage of voting machines and ballot counters. This test is similar to the procedure of MIL-STD-810D, Method 507.2, Procedure I-Natural Hot-Humid.

The EUT was subjected to a baseline operability checkout to verify system readiness. Upon completion, the EUT was placed in an environmental test chamber and was subjected to a 10-day humidity cycle in accordance with the 24-hour cycle values as shown in Table 4-2.

Upon test completion, the EUT was inspected for any obvious signs of degradation and/or damage. The DS200 successfully completed the requirements of the Humidity Test. The Test Data Sheet, Photographs, and Instrumentation Equipment Sheet are contained in Attachments B, C, and G of this report.

Table 4-2 Humidity Test Cycle Values

Time	Hot-Humid (Cycle 1)			Time	Hot-Humid (Cycle 1)		
	Temperature		RH		Temperature		RH
	°F	°C	%		°F	°C	%
0000	88	31	88	1200	104	40	62
0100	88	31	88	1300	105	41	59
0200	88	31	88	1400	105	41	59
0300	88	31	88	1500	105	41	59
0400	88	31	88	1600	105	41	59
0500	88	31	88	1700	102	39	65
0600	90	32	85	1800	99	37	69
0700	93	34	80	1900	97	36	73
0800	96	36	76	2000	94	34	76
0900	98	37	73	2100	97	33	85
1000	100	38	69	2200	90	32	85
1100	102	39	65	2300	89	32	88

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.4 Environmental Tests

4.4.2 Operating Environmental Tests

Temperature/Power Variation Test

The DS200 was subjected to a Temperature and Power Variation Test in accordance with section 4.7.1 of Volume II of the VVSG. The purpose of this test was to evaluate system operation under various environmental conditions. The cumulative duration of at least 163 hours was achieved by utilizing three units for a period of 64 hours based on the (EAC RFI 2008-01), with 48 hours in the environmental test chamber. For the remaining hours, the equipment was operated at room temperature. This test is similar to the low temperature and high temperature tests of MIL-STD-810-D, Method 502.2 and Method 501.2.

To perform the test, the EUTs were placed inside an environmental walk-in test chamber and connected to a variable voltage power source. The temperature inside the chamber and the voltage supplied to the hardware varied from 50°F to 95°F and from 105 VAC to 129 VAC (as depicted in Figures 4-1 through 4-4). During test performance, the operational functions were continuously exercised by the scanning of ballots. A minimum of 100 ballots per hour were scanned.

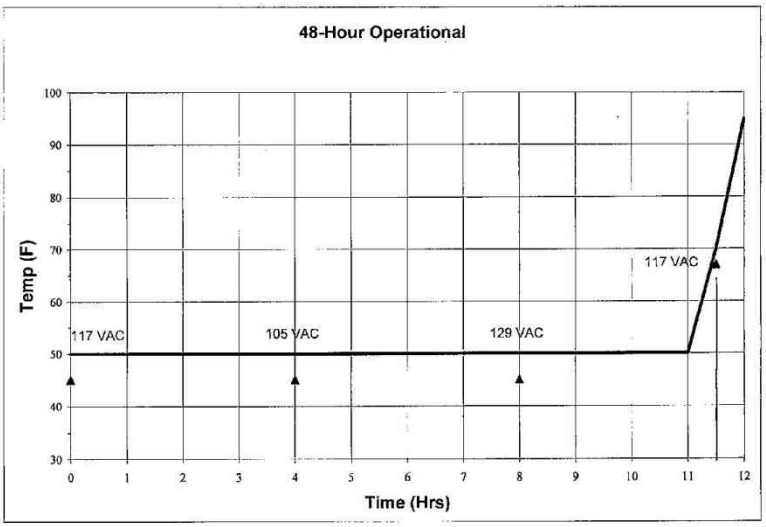

Figure 4-1 Temperature/Power Variation Profile Hours 0-12

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.4.2 Operating Environmental Tests (Continued)

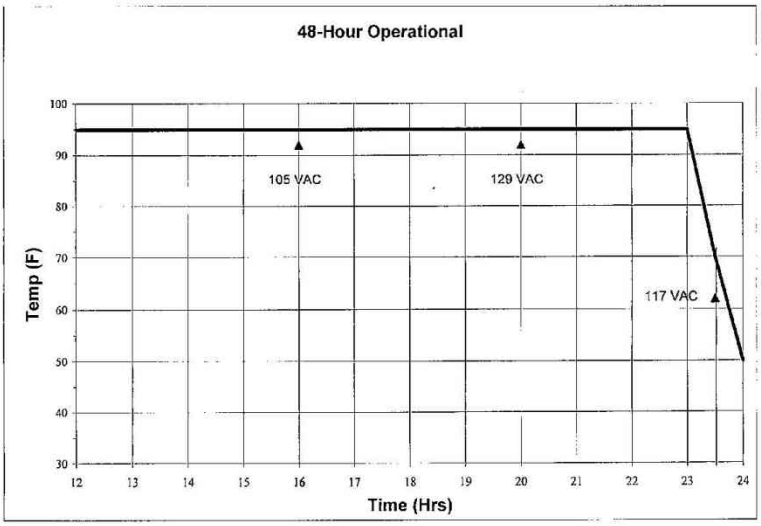

Figure 4-2 Temperature/Power Variation Profile Hours 12-24

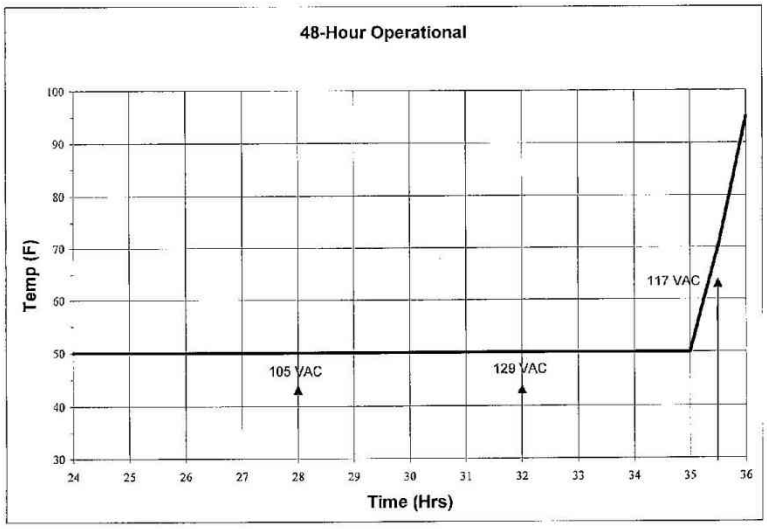

Figure 4-3 Temperature/Power Variation Profile Hours 24-36

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.4.2 Operating Environmental Tests (Continued)

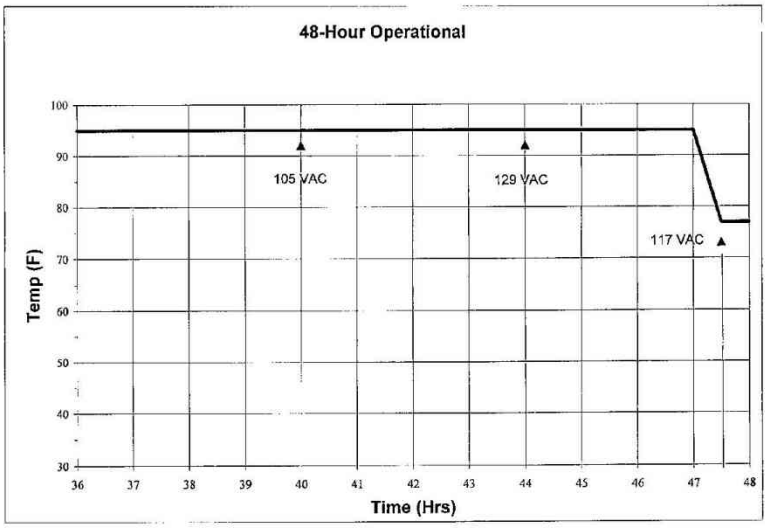

Figure 4-4 Temperature/Power Variation Profile Hours 36-48

Summary Findings

The DS200 successfully completed the requirements of the Temperature/Power Variation Test on the first attempt without issue.

4.5 Electrical Tests

Electrical tests were performed to ensure that the EUT and associated machine resident firmware were in compliance with the VVSG.

During test performance, the EUT was configured as it would be for use in an election precinct.

The EUT was subjected to various electrical tests to ensure continued system operation and reliability in the presence of abnormal electrical events. The EUT was powered and actively counting ballots during all electrical tests. Prior to and immediately following each electrical test, an operational status check was performed. The Test Data Sheets, Photographs, and Instrumentation Equipment Sheets are contained in Attachments B, D, and G of this report.

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.5.1 Electrical Power Disturbance

Electrical Power Disturbance testing was performed in accordance with sections 4.1.2.5 of Volume I and 4.8 of Volume II of the VVSG. This testing was performed to ensure that the EUT was able to withstand electrical power line disturbances (dips/surges) without disruption of normal operation or loss of data.

The EUT was configured to run in an automated ballot count test mode, where continual ballot processing would occur during the testing, and subjected to the voltage dips and surges over periods ranging from 20ms to four hours.

The EUT successfully met the requirements of the Electrical Power Disturbance Test. The Test Data Sheet, Photographs, and Instrumentation Equipment Sheet are contained in Attachments B, D, and G of this report.

4.5.2 Electromagnetic Radiation Test (FCC Part 15 Emissions)

Electromagnetic Radiation emissions measurements were performed in accordance with sections 4.1.2.9 of Volume I and 4.8 of Volume II of the VVSG. This testing was performed to ensure that emissions emanating from the unit do not exceed the limits of 47 CFR Part 15, Subpart B, Class B Limits.

The EUT was configured to run in an automated ballot count test mode, where continual ballot processing would occur during the testing. The DS200 was subjected to the test requirements detailed in Table 4-3.

Table 4-3 Conducted and Radiated Emissions Requirements

Conducted Emissions			Radiated Emissions	
Frequency Range (MHz)	Limits (dBµV)		Frequency Range (MHz)	3 Meter Test Limit (dBµV)
	Quasi-peak	Average		
0.15 to 0.50	66 to 56	56 to 46	30 to 88	40.0
0.50 to 5.0	56	46	88 to 216	43.5
5.0 to 30.0	60	50	216 to 960	46.0
			960 to 1000	54.0

Testing was performed at the Wyle Laboratories' Open Air Test Site 2 (OATS-2) located on the Intergraph Complex in Huntsville, AL. The OATS-2 is fully described in reports provided to the Federal Communication Commission (FCC) (FCC Reference 98597). The site was tested and complies with the requirements of ANSI C63.4-2003.

To perform the Conducted Emissions portion of the test, the DS200 was set up as depicted in Figure 4-5.

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.5.2 Electromagnetic Radiation Test (FCC Part 15 Emissions) (Continued)

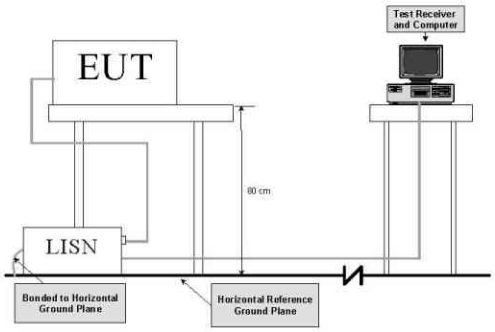

Figure 4-5 Conducted Emissions Test Setup

The DS200 was then subjected to the following test procedure:

1. The DS200 was placed on a non-metallic table 0.8 meters above the turntable and reference ground plane at the Open-Area Test Site.
2. The DS200 AC/DC Power Adapter was connected to the power mains through a Line Impedance Stabilization Network (L.I.S.N.). Other support units were connected to the power mains through another L.I.S.N. The L.I.S.Ns provided 50 ohm/50 µH of coupling impedance for the measuring instrument.
3. The DS200 was placed in an active state and monitored for functionality throughout testing.
4. Both Line and Neutral of the power mains connected to the DS200 were checked for maximum conducted interference.
5. The frequency range from 150 kHz to 30 MHz was evaluated and recorded. Emissions levels below – 20 dB were not recorded.

To perform the Radiated Emissions portion of the test, the DS200 was set up as depicted in Figure 4-6.

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.5.2 Electromagnetic Radiation Test (FCC Part 15 Emissions) (Continued)

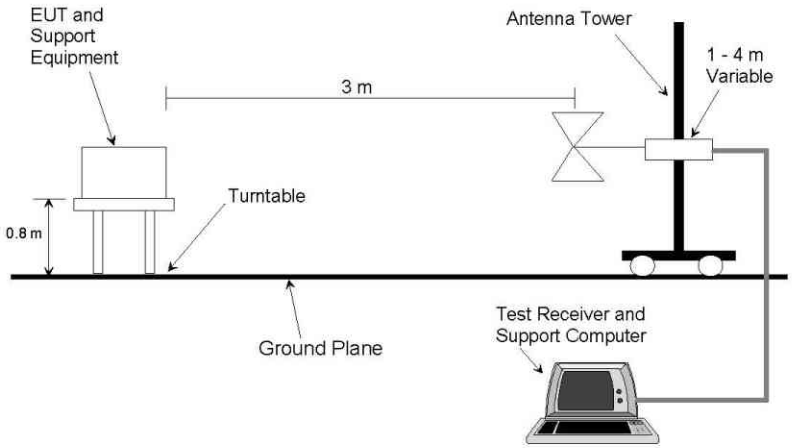

Figure 4-6 Radiated Emissions Test Setup

The DS200 was then subjected to the following test procedure:

1. The DS200 was placed on a non-metallic turn-table 0.8 meters above the reference ground plane at the Open-Area Test Site.

2. The DS200 was placed 3 meters away from the interference-receiving antenna, which was mounted on a variable-height antenna tower. The interference-receiving antenna used was a broadband antenna.

3. For each suspected emissions point, the DS200 was arranged in a worst case configuration. The table was rotated from 0 to 360 degrees and the antenna height was varied from one (1) to four (4) meters to identify the maximum reading.

4. All emissions points identified within 20 dB of the specified limit were tested individually using the quasi-peak method as specified and then reported in the tabular data.

The EUT was found to comply with the required emissions limits. The Test Data Sheet, Photographs, and Instrumentation Equipment Sheet are contained in Attachments B, D, and G of this report.

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.5 Electrical Tests (Continued)

4.5.3 Electrostatic Disruption

Electrostatic Disruption testing was performed in accordance with sections 4.1.2.8 of Volume I and 4.8 of Volume II of the VVSG to ensure that should an electrostatic discharge event occur during equipment setup and/or ballot counting, that the EUT would continue to operate normally. A momentary interruption is allowed so long as normal operation is resumed without human intervention or loss of data.

The EUT was configured to run in an automated ballot count test mode, where continual ballot processing would occur during the testing without operator intervention. The EUT was then subjected to electrostatic discharges of +/- 8 kV contact and +/- 15 kV air as shown in Table 4-4. Discharges were performed at areas typical of those which might be touched during normal operation, including the touch screen, user buttons, and other likely points of contact. The DS200 was then setup per the following conditions:

1. Power lines and power line returns were configured as required by the system configuration.
2. The EUT was raised approximately 10 cm from the ground using isolated stand-offs.
3. Signal/control test cables were positioned approximately 5 cm (2 in.) above the ground.

Table 4-4 Electrostatic Discharge Transients

	Requirements		
Characteristic	**Capacitance**	**Resistance**	**Value**
Pulse Wave Shape (RC Network)	150	330	pf / Ω
Test Levels	**Discharge Types**		**Value**
	Air Gap	**Direct Contact**	
	±15	±8	KV
Rise Time	≤1		nanosecond
Pulse Decay Time	≈30 at 50% height		nanosecond
Pulse Repetition	≥1		per second
Total Injected Pulse at each Test Point	10		per polarity (±)
Temperature	≥15 to ≤35		°C
Relative Humidity	≥30 to ≤60		%

During the ESD Test there was one anomaly encountered (reference Notice of Anomaly No. 8 in Attachment A for further reference).

During the second attempt the EUT successfully met the requirements of the ESD Test. The Test Data Sheet, Photographs, and Instrumentation Equipment Sheet are contained in Attachments B, D, and G of this report.

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.5 Electrical Tests (Continued)

4.5.4 Electromagnetic Susceptibility

Electromagnetic Susceptibility testing was performed in accordance with sections 4.1.2.10 of Volume I and 4.8 of Volume II of the 2005 VVSG. This testing was performed to ensure that the EUT was able to withstand a moderate level of ambient electromagnetic fields without disruption of normal operation or loss of data.

The EUT was configured to run in an automated ballot count test mode, where continual ballot processing would occur during the testing without operator intervention. The DS200 was then subjected to ambient electromagnetic fields at 10 V/m over a range of 80 MHz to 1000 MHz, as shown in Figure 4-7. Testing was conducted utilizing both horizontally and vertically polarized waves. The limits were measured with a maximum scan rate of 1% of the fundamental frequency and the dwell duration was three seconds.

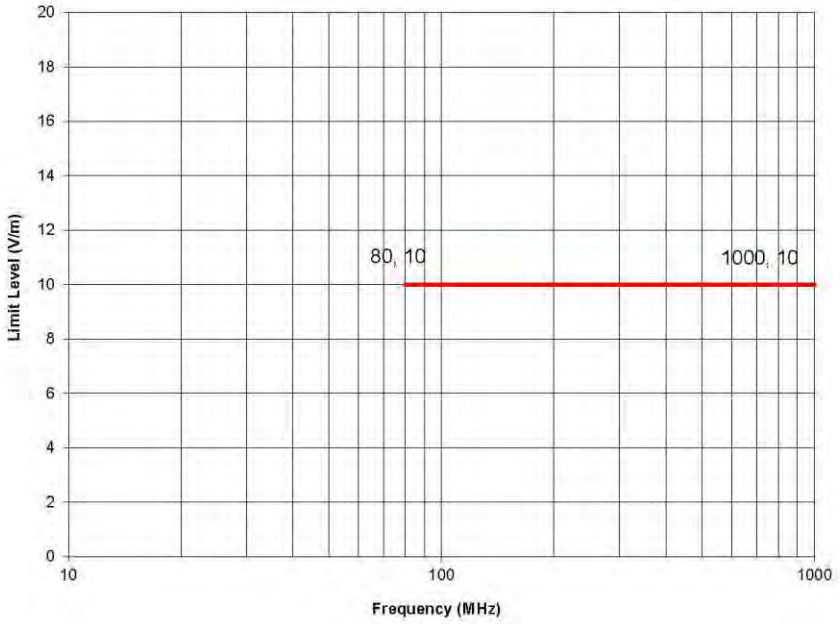

Figure 4-7 Radiated Susceptibility Limit

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.5 Electrical Tests (Continued)

4.5.4 Electromagnetic Susceptibility

During the Susceptibility Test there were three anomalies encountered (reference Notice of Anomaly Nos. 4, 5 and 6 in Attachment A). During the fourth attempt there was no loss of normal operation or loss of data as a result of the applied electromagnetic fields.

On the fourth attempt the EUT successfully met the requirements of the Electromagnetic Susceptibility Test. The Test Data Sheet, Photographs, and Instrumentation Equipment Sheet are contained in Attachments B, D, and G of this report.

4.5.5 Electrical Fast Transients

Electrical Fast Transients (EFT) testing was performed in accordance with sections 4.1.2.6 (a) of Volume I and 4.8 of Volume II of the 2005 VVSG to ensure that, should an electrical fast transient event occur on a power line, the EUT would continue to operate without disruption of normal operation of loss of data. Section 4.1.2.6 (b) of Volume I is not applicable because there are no I/O lines greater than three meters.

The EUT was configured to run in an automated ballot count test mode, where continual ballot processing would occur during the testing without operator intervention. The EUT was then subjected to electrostatic fast transients of 2 kV applied to its AC power lines. The pulse characteristics are listed in Table 4-5.

Table 4-5 EFT Pulse Characteristics

Pulse Description	Requirements	Units
Pulse Amplitude	+/-2.0	kV peak to peak
Pulse Rise Time	5 ±30%	nanoseconds
Pulse Width	50 ±30%	nanoseconds
Pulse Repetition Rate	100	kHz
Pulse Shape	Double exponential	N/A
Burst Duration	15	milliseconds
Burst Period	300	milliseconds
Test Duration	60	seconds

There was no loss of normal operation or loss of data as a result of the applied transients. The EUT successfully met the requirements of the Electrical Fast Transients Test. The Test Data Sheet, Photographs, and Instrumentation Equipment Sheet are contained in Attachments B, D, and G of this report.

4.5.6 Lightning Surge

Lightning Surge testing was performed in accordance with sections 4.1.2.7 (a), (b) of Volume I and 4.8 of Volume II of the 2005 VVSG to ensure that, should a surge event occur on a power line due to a lightning strike, the EUT will continue to operate without disruption of normal operation or loss of data. Sections 4.1.2.7 (c), (d), and (e) are not applicable because there are no DC lines greater than 10 meters and no I/O lines greater than 30 meters.

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.5 Electrical Tests (Continued)

4.5.6 Lightning Surge (Continued)

The EUT was configured to run in an automated ballot count test mode, where continual ballot processing would occur during the testing. The EUT power input lines were then subjected to lightning surge testing at a level of 2 kV applied to its AC power line per the surge characteristics listed in Table 4-6.

Table 4-6 Surge Characteristics

Test I.D.	Cable Type	Number of Interfacing Cables	Description	Injection Signals Summary Characteristics
Surge	Line (L) to Neutral (N)	1	120 VAC Power Lines	Injection at Power Input Sinewave: 0°, 90°, and 270° Combination Wave Test Levels: ±2.0 kV and Ring Wave Test Level = ±2.0 kV
	Line (L) to Ground (G)	1		
	Neutral (N) to Ground (G)	1		
	Line (L) & Neutral (N) to Ground (G)	1		

During the Lightning Surge Test there were two anomalies encountered (reference Notice of Anomaly Nos. 1 and 2 in Attachment A).

During the third attempt the EUT successfully met the requirements of the Lightning Surge Test. The Test Data Sheet, Photographs, and Instrumentation Equipment Sheet are contained in Attachments B, D, and G of this report.

4.5.7 Conducted RF Immunity

Conducted RF Immunity testing was performed in accordance with sections 4.1.2.11 (a) of Volume I and 4.8 of Volume II of the 2005 VVSG. Section 4.1.2.11 (b) of Volume I is not applicable because there are no signal/control lines greater than three meters. This testing was performed to ensure that the EUT was able to withstand conducted RF energy onto its power lines without disruption of normal operation or loss of data.

4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.5 Electrical Tests (Continued)

4.5.7 Conducted RF Immunity

The EUT was configured to run in an automated ballot count test mode, where continual ballot processing would occur during the testing without operator intervention. The EUT was then subjected to conducted RF energy of 10 V rms applied to its power lines over a frequency range of 150 kHz to 80 MHz.

There was no loss of normal operation or loss of data as a result of the applied conducted RF energy. The EUT successfully met the requirements of the Conducted RF Immunity Test. The Test Data Sheet, Photographs, and Instrumentation Equipment Sheet are contained in Attachments B, D, and G of this report.

4.5.8 Magnetic Fields Immunity

Magnetic Fields Immunity testing was performed in accordance with sections 4.1.2.12 of Volume I and 4.8 of Volume II of the 2005 VVSG. This testing was performed to ensure that the EUT was able to withstand AC magnetic fields without disruption of normal operation of loss of data.

The EUT was configured to run in an automated ballot count test mode, where continual ballot processing would occur during the testing. The EUT was then subjected to AC magnetic fields of 30 A/m at a 60 Hz power line frequency.

There was no loss of normal operation or loss of data as a result of the applied magnetic field.

The EUT successfully met the requirements of the Magnetic Fields Immunity Test. The Test Data Sheet, Photographs, and Instrumentation Equipment Sheet are contained in Attachments B, D, and G of this report.

4.5.9 Product Safety Review

The VVSG states that all voting systems shall meet the following requirements for safety:

All voting systems and their components shall be designed to eliminate hazards to personnel or to the equipment itself.

Defects in design and construction that can result in personal injury or equipment damage must be detected and corrected before voting systems and components are placed into service.

Equipment design for personnel safety shall be equal to or better than the appropriate requirements of the Occupational Safety and Health Act, Code of Federal Regulations, Title 29, Part 1910.

To satisfy these requirements, the voting system was subjected to a Product Safety Review in accordance with UL 60950-1, "Safety of Information Technology Equipment".

Attachment F of this report contains the Product Safety Certificate of Conformance.

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.6 Anomalies and Resolutions

Eight Notices of Anomalies were issued during the test campaign. A Notice of Anomaly (NOA) is generated upon occurrence of a verified failure, an unexpected test result, or any significant unsatisfactory condition. The Notices of Anomaly generated during testing are presented in their entirety in ATTACHMENT A and are summarized below.

Notice of Anomaly No. 1: Lightning Surge Test

After being subjected to the Lightning Surge Test, the AC Power Adapter ceased to function. As a result, the FL EVS 4500 system did not successfully pass the Lighting Surge Test.

Resolution to Notice of Anomaly No. 1
ES&S acknowledged the nonconformance observation and resubmitted a replacement AC Power Adapter for testing as part of the DS200.

Notice of Anomaly No. 2: Lightning Surge Test

After being subjected to the Lightning Surge Test, the AC Power Adapter ceased to function. As a result, the FL EVS 4500 system did not successfully pass the Lighting Surge Test.

Resolution to Notice of Anomaly No. 2
ES&S modified the FL EVS 4500 system to include an in-line COTS surge suppressor and resubmitted a replacement AC Power Adapter for testing as part of the DS200.

Notice of Anomaly No. 4: Electromagnetic Susceptibility Test

After being subjected to the Electromagnetic Susceptibility Test, the DS200 suffered disruption of normal operation. As a result, the FL EVS 4500 system did not successfully pass the Electromagnetic Susceptibility Test.

Resolution to Notice of Anomaly No. 4
ES&S acknowledged the nonconformance observation and provided a root cause analysis.

Notice of Anomaly No. 5: Electromagnetic Susceptibility Review

After being subjected to the Electromagnetic Susceptibility Test, the DS200 suffered disruption of normal operation. As a result, the FL EVS 4500 system did not successfully pass the Electromagnetic Susceptibility Test.

Resolution to Notice of Anomaly No. 5
ES&S acknowledged the nonconformance observation and provided a root cause analysis.

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4.0 TEST FINDINGS AND RECOMMENDATIONS (Continued)

4.6 Anomalies and Resolutions (Continued)

Notice of Anomaly No. 6: Electromagnetic Susceptibility Review

After being subjected to the Electromagnetic Susceptibility Test, the DS200 suffered disruption of normal operation. As a result, the FL EVS 4500 system did not successfully pass the Electromagnetic Susceptibility Test.

Resolution to Notice of Anomaly No. 6
ES&S acknowledged the nonconformance observation and provided a root cause analysis.

Notice of Anomaly No. 7: Low Temperature Test

After being subjected to the Low Temperature Test, the DS200 was damaged due to human error during testing. As a result, the FL EVS 4500 system did not successfully pass the Low Temperature Test.

Resolution to Notice of Anomaly No. 7
Wyle counseled and retrained all technicians on the associated Wyle Operating Procedure and performed the test correctly, at which time the DS200 successfully completed the Low Temperature Test.

Notice of Anomaly No. 8: Electrostatic Disruption Test (ESD)

After being subjected to the Electrostatic Disruption, the DS200 ceased to function and required human intervention in the form of a power cycle, during testing. As a result, the FL EVS 4500 system did not successfully pass the Electrostatic Disruption.

Resolution to Notice of Anomaly No. 8
ES&S acknowledged the nonconformance observation; Wyle performed the Electrostatic Disruption Test a second time and the EUT successfully passed.

4.7 Test Summary and Conclusion

Wyle performed conformance testing on all modifications submitted for the ES&S FL EVS 4.5.0.0 Voting System. Wyle only tested the DS200 for the modifications. Modifications of the DS200 met all applicable requirements in the EAC 2005 VVSG.

This report is valid only for the system identified in Section 2 of this report. Any changes, revisions, or corrections made to the system after this evaluation shall be submitted to Wyle to determine the scope of testing for the modified system. The scope of testing required will be determined based upon the degree of modification.

ATTACHMENT A

NOTICES OF ANOMALY

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ORIGINAL

NOTICE OF ANOMALY | DATE: 07/11/2013

NOTICE NO: 1 P.O. NUMBER: ES&S-MSA-TA029 CONTRACT NO: N/A
CUSTOMER: ES&S WYLE JOB NO: T71013.01
NOTIFICATION MADE TO: Paul Huffman NOTIFICATION DATE: 07/11/2013
NOTIFICATION MADE BY: Ryan Chambers VIA: In person

CATEGORY: [X] SPECIMEN [ ] PROCEDURE [] TEST EQUIPMENT DATE OF ANOMALY: 07/11/2013
PART NAME: DS200 PART NO. DS200
TEST: Lightning Surge Test (LST) I.D. NO. DS0313350009
SPECIFICATION: VVSG Volume I
PARA. NO. Section 4.1.2.7

REQUIREMENTS: 2005 VVSG Volume I: Section 4.1.2.4

Vote scanning and counting equipment for paper-based systems, and all DRE equipment shall be able to withstand, without disruption of normal operation or loss of data, surges of:

a. +2 kV AC line to line
b. +2 kV AC line to earth
*c. + or – 0.5 kV DC line to line >10m
*d. + or – 0.5 kV DC line to earth >10m
*e. +1 kV I/O sig/control >30m

*Indicates requirements that do not apply to the Unit Under Test (UUT), due to the fact that UUT does not contain DC lines in excess of 10 Meters, nor does it contain any I/O lines greater than 30 meters.

DESCRIPTION OF ANOMALY:

After the being subjected to the Lightning Surge Test (LST) being performed on July 11, 2013 the AC Power Adapter ceased to function and as a result, the DS200 suffered a disruption of normal operation. The AC Power Adapter ceased to function, during application of 2 kV. The failure occurred at pulse 3 of 7 Sync: 0°/60Hz between the Path L1--N. Photographs were taken of the testing site.

Component Description: AC Power Adapter
Manufacturer: Power-Win Technology Corp.
Model: PW-080A2-1Y24AP

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WH-1066, Rev. MAR '09 Page 1 of 2

wyle laboratories

NOTICE OF ANOMALY

DISPOSITION • COMMENTS • RECOMMENDATIONS:
The final disposition is pending a root cause analysis to be presented by the client.

Potential 10 CFR Part 21 ☐ YES ☒ NO

RESPONSIBILITY TO ANALYZE ANOMALIES AND COMPLY WITH 10 CFR PART 21: ☒ CUSTOMER ☐ WYLE

CAR Required: ☐ YES ☒ NO CAR No.

VERIFICATION:

TEST WITNESS: 7/17/13

REPRESENTING: ES&S

QUALITY ASSURANCE:

PROJECT ENGINEER: 7/17/13

PROJECT MANAGER: 07/17/13

INTERDEPARTMENTAL COORDINATION: N/A

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WH-1066, Rev. MAR '09

Page 2 of 2

Field Issue Resolution Process

Date Reported			7/11/2013
Report Date			9/6/2013
Who is Reporting the Issue?			Ryan Chambers
Brief Description of the Issue			Power supply damaged during test (NOA #1 & #2)
Supplemental Information	What location is reporting the issue?		Wyle Labs
	Equipment Affected (Model & Hdw Rev)		DS200_1.3
	What Version of Software are They Running		FLEVS4500
	Has this Issue Been Confirmed or Duplicated		Yes
	By Who		Paul Huffman
	How		Lightning Surge Test

Implement Action Plan

1. Assign Field Issue Tracking Number			
2. Notify Reg Acct Mgr, Cust Svc Mgr, Cert			Joe McKay,
3. Assess Warehouse Inventory as required			na
4. Categorize Issue	Software	Notify Div	na
		Submit RCR	na
	Hardware	Notify Div	
		Identify Product Line Manager	Paul Huffman
		Is situation trivial?	NO
5. Conference Call Date:	What are the customer expectations?	Short Term	na
		Long Term	
	Immediate customer action		
	Is info gathered sufficient to resolve?		
	Engineering site visit required?		Yes
	Arrange return of equipment?		no
6. Find Root Cause	Workmanship? ___ Wear/Handling? ___ Design? ___ Other? _Faulty Capacitor_____	How to fix?	Add Tripp-Lite Spike Cube
		What prevents future occurrences?	Add to QC checklist
7. Confirm Solution		Describe how fix was verified.	Retest at Wyle was successful
		How does this solution impact the certified configuration?	Official testing already complete
		What additional customer testing required?	na

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NOTICE OF ANOMALY	DATE: 07/12/2013

NOTICE NO: 2 P.O. NUMBER: ES&S-MSA-TA029 CONTRACT NO: N/A
CUSTOMER: ES&S WYLE JOB NO: T71013.01
NOTIFICATION MADE TO: Paul Huffman NOTIFICATION DATE: 07/12/2013
NOTIFICATION MADE BY: Ryan Chambers VIA: In person

CATEGORY: [X] SPECIMEN [ ] PROCEDURE [] TEST EQUIPMENT DATE OF ANOMALY: 07/12/2013
PART NAME: DS200 PART NO. DS200
TEST: Lightning Surge Test (LST) I.D. NO. DS0313350009
SPECIFICATION: VVSG Volume I
PARA. NO. Section 4.1.2.7

REQUIREMENTS: 2005 VVSG Volume I: Section 4.1.2.4

Vote scanning and counting equipment for paper-based systems, and all DRE equipment shall be able to withstand, without disruption of normal operation or loss of data, surges of:

a. +2 kV AC line to line
b. +2 kV AC line to earth
*c. + or – 0.5 kV DC line to line >10m
*d. + or – 0.5 kV DC line to earth >10m
*e. +1 kV I/O sig/control >30m

*Indicates requirements that do not apply to the Unit Under Test (UUT), due to the fact that UUT does not contain DC lines in excess of 10 Meters, nor does it contain any I/O lines greater than 30 meters.

DESCRIPTION OF ANOMALY:

After the being subjected to the Lightning Surge Test (LST) being performed on July 12, 2013 the AC Power Adapter ceased to function and as a result, the DS200 suffered a disruption of normal operation. The AC Power Adapter ceased to function, during application of 2 kV. The failure occurred at pulse 4 of 7 Sync: 0°/60Hz between the Path L1--N. Photographs were taken of the testing site.

Component Description: AC Power Adapter
Manufacturer: Power-Win Technology Corp.
Model: PW-080A2-1Y24AP

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WH-1066, Rev. MAR '09 Page 1 of 2

wyle laboratories

NOTICE OF ANOMALY

DISPOSITION • COMMENTS • RECOMMENDATIONS:
The final disposition is pending a root cause analysis to be presented by the client.

Potential 10 CFR Part 21 ☐ YES ☒ NO

RESPONSIBILITY TO ANALYZE ANOMALIES AND COMPLY WITH 10 CFR PART 21: ☒ CUSTOMER ☐ WYLE

CAR Required: ☐ YES ☒ NO CAR No.

VERIFICATION:

TEST WITNESS: 7/17/13

REPRESENTING: ES&S

QUALITY ASSURANCE: 7/17/13

PROJECT ENGINEER: 7/17/13

PROJECT MANAGER: 07/17/13

INTERDEPARTMENTAL COORDINATION: N/A

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WH-1066, Rev. MAR '09

Page 2 of 2

Field Issue Resolution Process

Date Reported			7/11/2013
Report Date			9/6/2013
Who is Reporting the Issue?			Ryan Chambers
Brief Description of the Issue			Power supply damaged during test (NOA #1 & #2)
Supplemental Information	What location is reporting the issue?		Wyle Labs
	Equipment Affected (Model & Hdw Rev)		DS200_1.3
	What Version of Software are They Running		FLEVS4500
	Has this Issue Been Confirmed or Duplicated		Yes
	By Who		Paul Huffman
	How		Lightning Surge Test

Implement Action Plan

1. Assign Field Issue Tracking Number			
2. Notify Reg Acct Mgr, Cust Svc Mgr, Cert			Joe McKay,
3. Assess Warehouse Inventory as required			na
4. Categorize Issue	Software	Notify Div	na
		Submit RCR	na
	Hardware	Notify Div	
		Identify Product Line Manager	Paul Huffman
		Is situation trivial?	NO
5. Conference Call Date:	What are the customer expectations?	Short Term	na
		Long Term	
	Immediate customer action		
	Is info gathered sufficient to resolve?		
	Engineering site visit required?		Yes
	Arrange return of equipment?		no
6. Find Root Cause	Workmanship? ___ Wear/Handling? ___ Design? ___ Other? _Faulty Capacitor_____	How to fix?	Add Tripp-Lite Spike Cube
		What prevents future occurrences?	Add to QC checklist
7. Confirm Solution		Describe how fix was verified.	Retest at Wyle was successful
		How does this solution impact the certified configuration?	Official testing already complete
		What additional customer testing required?	na

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NOTICE OF ANOMALY	DATE: 08/28/2013
NOTICE NO: 4 a	P.O. NUMBER: ES&S-MSA-TA029
CONTRACT NO: N/A	
CUSTOMER: Election Systems and Software (ES&S)	WYLE JOB NO: T71013.01
NOTIFICATION MADE TO: Paul Huffman	NOTIFICATION DATE: 08/13/2013
NOTIFICATION MADE BY: Ryan Chambers	VIA: In person
CATEGORY: [x] SPECIMEN [ ] PROCEDURE [ ] TEST EQUIPMENT	DATE OF ANOMALY: 08/13/2013
PART NAME: EVS 4.5.0.0 FL	PART NO. DS200
TEST: Electromagnetic Susceptibility Test (EST)	I.D. NO. DS0313350009
SPECIFICATION: EAC 2005 VVSG, Volume I	PARA. NO. Section 4.1.2.10

REQUIREMENTS:

Vote scanning and counting equipment for paper-based systems, and all DRE equipment, shall be able to withstand an electromagnetic field of 10 V/m modulated by a 1 kHz 80% AM modulation over the frequency range of 80 MHz to 1000 MHz, without disruption of normal operation or loss of data.

DESCRIPTION OF ANOMALY:

The EUT was oriented at 180 degrees, with the back of the EUT facing the Anntenna. The Anntenna was oriented in the Vertical position. Upon exposure to an electromagnetic field of 10 V/m modulated by a 1kHz 80% AM modulation over the frequency range of 80 MHz to 1000 MHz, the DS200 suffered disruption of normal operation. The shoeshine setup menu was available on the display and the shoeshine ballot was hanging from the front of the DS200 paper path.

DISPOSITION • COMMENTS • RECOMMENDATIONS:

The final disposition is pending a root cause analysis to be presented by ES&S.

Safety Related ☐ YES ☒ NO Potential 10 CFR Part 21 ☐ YES ☐ NO ☒ N/A

RESPONSIBILITY TO ANALYZE ANOMALIES AND COMPLY WITH 10 CFR PART 21: ☐ CUSTOMER ☐ WYLE

CAR Required: ☐ YES ☒ NO CAR No.

VERIFICATION:

TEST WITNESS: N/A

REPRESENTING: N/A

QUALITY ASSURANCE: 8/30/13

PROJECT ENGINEER: 08/30/2013

PROJECT MANAGER: 8/30/13

INTERDEPARTMENTAL COORDINATION: N/A

N/A

WH 1066, Rev. March '09 Page 1 of 1

Field Issue Resolution Process

Date Reported			8/28/2013
Report Date			9/6/2013
Who is Reporting the Issue?			Ryan Chambers
Brief Description of the Issue			Show shine mode stops: [NOA #4a]
Supplemental Information	What location is reporting the issue?		Wyle Labs
	Equipment Affected (Model & Rdw Rev)		DS200, 1.5
	What Version of Software are They Running		FLEV34500
	Has this Issue Been Confirmed or Duplicated		Yes
	By Who		Paul Huffman
	How		Electromagnetic Susceptibility Test

Implement Action Plan

1. Assign Field Issue Tracking Number			
2. Notify Reg Acct Mgr, Cust Svc Mgr, Cert			Sue McKay
3. Assess Warehouse Inventory as required			na
4. Categorize Issue	Software	Notify Dir	na
		Submit RCR	na
	Hardware	Notify Dir	
		Identify Product Line Manager	Paul Huffman
		Is situation trivial?	no
5. Conference Call Date:	What are the customer expectations?	Short Term	na
		Long Term	
	Immediate customer action		
	Is info gathered sufficient to resolve?		
	Engineering site visit required?		Yes
	Arrange return of equipment?		no
6. Find Root Cause	Workmanship? ___ Wear/Handling? ___ Design? ___ Other?_Faulty Capacitor_____	How to fix?	Double wrap sensor cable ferrite near scanner board
		What prevents future occurrence?	
7. Confirm Solution		Describe how fix was verified.	Retest at Wyle was successful
		How does this solution impact the certified configuration?	Official testing already complete
		What additional customer testing required?	
8. Close Out	Release Planning	What's planned for this	Change manufacturing process document

wyle laboratories ORIGINAL

NOTICE OF ANOMALY		DATE: 08/28/2013
NOTICE NO: 5	P.O. NUMBER: ES&S-MSA-TA029	CONTRACT NO: N/A
CUSTOMER: Election Systems and Software (ES&S)		WYLE JOB NO: T71013.01
NOTIFICATION MADE TO: Paul Huffman		NOTIFICATION DATE: 08/16/2013
NOTIFICATION MADE BY: Ryan Chambers		VIA: In person
CATEGORY: [x] SPECIMEN [ ] PROCEDURE [ ] TEST EQUIPMENT		DATE OF ANOMALY: 08/16/2013
PART NAME: EVS 4.5.0.0 FL		PART NO. DS200
TEST: Electromagnetic Susceptibility Test (EST)		I.D. NO. DS0313350009
SPECIFICATION: EAC 2005 VVSG, Volume I		PARA. NO. Section 4.1.2.10

REQUIREMENTS:

Vote scanning and counting equipment for paper-based systems, and all DRE equipment, shall be able to withstand an electromagnetic field of 10 V/m modulated by a 1 kHz 80% AM modulation over the frequency range of 80 MHz to 1000 MHz, without disruption of normal operation or loss of data.

DESCRIPTION OF ANOMALY:

The EUT was oriented at 0 degrees, with the front of the EUT facing the Anntenna. The Anntenna was oriented in the Vertical position. Upon exposure to an electromagnetic field of 10 V/m modulated by a 1kHz 80% AM modulation over the frequency range of 80 MHz to 1000 MHz, the DS200 suffered disruption of normal operation. The following error was displayed on the DS200 "1003059: Event Log Write Failed" and the shoeshine ballot was hanging from the front of the DS200 paper path. When the EUT was unplugged from AC to be removed from the test chamber, the EUT unexpectedly shut off. The EUT would not power back on when only being supplied with DC power. When the EUT was plugged back into an AC outlet outside of the chamber, the EUT successfully powered on. After 5 minutes the plug was removed from the AC outlet, the EUT successfully switched to DC and displayed 75% power for the battery status. Within 3 minutes the EUT displayed 100% power. Within 1 minute the EUT displayed 50% power. Within 1 minute the EUT displayed 100% power.

DISPOSITION • COMMENTS • RECOMMENDATIONS:

The final disposition is pending a root cause analysis to be presented by ES&S.

Safety Related ☐ YES ☒ NO Potential 10 CFR Part 21 ☐ YES ☐ NO ☒ N/A

RESPONSIBILITY TO ANALYZE ANOMALIES AND COMPLY WITH 10 CFR PART 21: ☐ CUSTOMER ☐ WYLE

CAR Required: ☐ YES ☒ NO CAR No.

VERIFICATION:	PROJECT ENGINEER: 08/30/2013
TEST WITNESS: N/A	PROJECT MANAGER: 8/30/13
REPRESENTING: N/A	INTERDEPARTMENTAL COORDINATION: N/A
QUALITY ASSURANCE: 8/30/13	N/A

WH 1066, Rev. March '09 Page 1 of 1

Field Issue Resolution Process

Date Reported		8/28/2013
Report Date		9/6/2013
Who is Reporting the Issue?		Ryan Chambers
Brief Description of the Issue		Event Log write failed. (NOA #6)
Supplemental Information	What location is reporting the issue?	Wyle Labs
	Equipment Affected (Model & H/w Rev)	DS200_1.3
	What Version of Software are They Running	FLEV34500
	Has this Issue Been Confirmed or Duplicated	Yes
	By Who	Paul Huffman
	How	Electromagnetic Susceptibility Test

Implement Action Plan

1. Assign Field Issue Tracking Number			
2. Notify Reg Acct Mgr, Cust Svc Mgr, Cert			Sue McKay,
3. Assess Warehouse Inventory as required			na
4. Categorize Issue	Software	Notify Dir	na
		Submit RCR	na
	Hardware	Notify Dir	
		Identify Product Line Manager	Paul Huffman
		Is situation trivial?	no
5 Conference Call Date:	What are the customer expectations?	Short Term	na
		Long Term	
	Immediate customer action		
	Is info gathered sufficient to resolve?		
	Engineering site visit required?		Yes
	Arrange return of equipment?		no
6 Find Root Cause	Workmanship? ___ Wear/Handling? ___ Design? ___ Other? _Faulty Capacitor_____	How to fix?	Copper tape shielding of paper entry
		What prevents future occurrences?	This modification will be added to the checklist to ensure application of tape
7 Confirm Solution		Describe how fix was verified.	Retest at Wyle was successful
		How does this solution impact the certified configuration?	Official testing already complete
		What additional customer testing required?	
8 Close	Release Planning	What's planned for this	Add copper tape during manufacturing process

wyle laboratories ORIGINAL

NOTICE OF ANOMALY	DATE: 08/28/2013
NOTICE NO: 6	P.O. NUMBER: ES&S-MSA-TA029
CONTRACT NO: N/A	
CUSTOMER: Election Systems and Software (ES&S)	WYLE JOB NO: T71013.01
NOTIFICATION MADE TO: Paul Huffman	NOTIFICATION DATE: 08/19/2013
NOTIFICATION MADE BY: Ryan Chambers	VIA: In person
CATEGORY: [x] SPECIMEN [ ] PROCEDURE [ ] TEST EQUIPMENT	DATE OF ANOMALY: 08/17/2013
PART NAME: EVS 4.5.0.0 FL	PART NO. DS200
TEST: Electromagnetic Susceptibility Test (EST)	I.D. NO. DS0313350009
SPECIFICATION: EAC 2005 VVSG, Volume I	PARA. NO. Section 4.1.2.10

REQUIREMENTS:

Vote scanning and counting equipment for paper-based systems, and all DRE equipment, shall be able to withstand an electromagnetic field of 10 V/m modulated by a 1 kHz 80% AM modulation over the frequency range of 80 MHz to 1000 MHz, without disruption of normal operation or loss of data.

DESCRIPTION OF ANOMALY:

The EUT was oriented at 0 degrees, with the back of the EUT facing the Anntenna. The Anntenna was oriented in the Vertical position. Upon exposure to an electromagnetic field of 10 V/m modulated by a 1kHz 80% AM modulation over the frequency range of 80 MHz to 1000 MHz, the DS200 suffered disruption of normal operation. The shoeshine setup menu was available on the display and the shoeshine ballot was hanging from the front of the DS200 paper path. When the EUT was unplugged from AC to be removed from the test chamber for ES&S representative, the EUT unexpectedly shut off. The EUT would not power back on when only being supplied with DC power. When the EUT was plugged back into an AC outlet outside of the chamber, the EUT successfully powered on. After 5 minutes the plug was removed from the AC outlet, the EUT successfully switched to DC and displayed 75% power for the battery status.

DISPOSITION • COMMENTS • RECOMMENDATIONS:

The final disposition is pending a root cause analysis to be presented by ES&S.

Safety Related ☐ YES ☒ NO Potential 10 CFR Part 21 ☐ YES ☐ NO ☒ N/A

RESPONSIBILITY TO ANALYZE ANOMALIES AND COMPLY WITH 10 CFR PART 21: ☐ CUSTOMER ☐ WYLE

CAR Required: ☐ YES ☒ NO CAR No.

VERIFICATION:

PROJECT ENGINEER: 08/30/2013

TEST WITNESS: N/A

PROJECT MANAGER: 8/30/13

REPRESENTING: N/A

INTERDEPARTMENTAL COORDINATION: N/A

QUALITY ASSURANCE: 8/30/13

N/A

WH 1066, Rev. March '09

Page 1 of 1

Field Issue Resolution Process

Date Reported			8/28/2013
Report Date			9/6/2013
Who is Reporting the issue?			Ryan Chambers
Brief Description of the Issue			Unit shuts off when A/C removed. (NOA #6)
Supplemental Information	What location is reporting the issue?		Wyle Labs
	Equipment Affected (Model & Hdw Rev)		D5200_1.3
	What Version of Software are They Running		FLEV34500
	Has this Issue Been Confirmed or Duplicated		Yes
	By Who		Paul Hoffman
	How		Electromagnetic Susceptibility Test

Implement Action Plan

1. Assign Field Issue Tracking Number			
2. Notify Reg Acct Mgr, Cust Svc Mgr, Cert			Sue McKay,
3. Assess Warehouse Inventory as required			na
4. Categorize Issue	Software	Notify Dir	na
		Submit RCR	na
	Hardware	Notify Dir	
		Identify Product Line Manager	Paul Huffman
		Is situation trivial?	yes
5. Conference Call Date:____	What are the customer expectations?	Short Term	na
		Long Term	
	Immediate customer action		
	Is info gathered sufficient to resolve?		
	Engineering site visit required?		Yes
	Arrange return of equipment?		no
6. Find Root Cause	Workmanship? ___ Wear/Handling? ___ Design? ___ Other?_Faulty Capacitor_____	How to fix?	Replaced battery pack
		What prevents future occurrences?	
7. Confirm Solution		Describe how fix was verified.	Retest at Wyle was successful
		How does this solution impact the certified configuration?	Official testing already complete
		What additional customer testing required?	
8. Close	Release Planning	What's planned for this	

wyle laboratories

ORIGINAL **NOTICE OF ANOMALY** DATE: 09/16/2013

NOTICE NO: 7 (Rev A) P.O. NUMBER: ES&S-MSA-TA029 CONTRACT NO: N/A
CUSTOMER: Election Systems and Software (ES&S) WYLE JOB NO: T71013.01
NOTIFICATION MADE TO: Paul Huffman NOTIFICATION DATE: 08/20/2013
NOTIFICATION MADE BY: Ryan Chambers VIA: In person

CATEGORY: [ ] SPECIMEN [x] PROCEDURE [ ] TEST EQUIPMENT DATE OF ANOMALY: 08/20/2013
PART NAME: EVS 4.5.0.0 FL PART NO. ---
TEST: Low Temperature I.D. NO. DS0313350009
SPECIFICATION: EAC 2005 VVSG, Volume II PARA. NO. Section 4.6.4

REQUIREMENTS:

The low temperature test simulates stresses faced during storage of voting machines and ballot counters. All system components, regardless of type, shall meet the requirements of this test. This test is equivalent to the procedure of MIL-STD-810D, Method 502.2, Procedure I-Storage. The minimum temperature shall be -4 degrees F. As outlined in the VVSG 4.6.4.2 Procedure, the following procedure is identified in Step 5: Allow the internal temperature of the equipment to stabilize at laboratory conditions before removing it from the chamber.

DESCRIPTION OF ANOMALY:

The technician removed the EUT from the environmental chamber approximately 1 hour after the interal temperature of the thermal chamber was returned to standard laboratory conditions. The technician did not allow the internal temperature of the equipment to stabilize at laboratory conditions before removing it from the chamber. As a result the accumulated moisture on the circuit board of the scanner assembly module caused a short circuit when the EUT was powered on. This anomaly was directly caused by human error in following the VVSG standard and the Wyle Operating Procedures.

DISPOSITION • COMMENTS • RECOMMENDATIONS:

The final disposition was to council and retrain all of the Wyle technicians on the associated Wyle Operating Procedure.

Safety Related ☐ YES ☒ NO Potential 10 CFR Part 21 ☐ YES ☐ NO ☒ N/A
RESPONSIBILITY TO ANALYZE ANOMALIES AND COMPLY WITH 10 CFR PART 21: ☐ CUSTOMER ☐ WYLE
CAR Required: ☐ YES ☒ NO CAR No.

VERIFICATION:
TEST WITNESS: N/A PROJECT ENGINEER: 09/16/2013
REPRESENTING: N/A PROJECT MANAGER: 9/12/13
QUALITY ASSURANCE: INTERDEPARTMENTAL COORDINATION: N/A
N/A

WH 1066, Rev. March '09 Page 1 of 1

wyle laboratories ORIGINAL

NOTICE OF ANOMALY		DATE: 08/30/2013
NOTICE NO: 8	P.O. NUMBER: ES&S-MSA-TA029	CONTRACT NO: N/A
CUSTOMER: Election Systems and Software (ES&S)		WYLE JOB NO: T71013.01
NOTIFICATION MADE TO: Paul Huffman		NOTIFICATION DATE: 07/31/2013
NOTIFICATION MADE BY: Ryan Chambers		VIA: In person
CATEGORY: [x] SPECIMEN [ ] PROCEDURE [ ] TEST EQUIPMENT		DATE OF ANOMALY: 07/31/2013
PART NAME: EVS 4.5.0.0 FL		PART NO. ---
TEST: Electrostatic Disruption (ESD)		I.D. NO. DS0313350009
SPECIFICATION: EAC 2005 VVSG, Volume I		PARA. NO. Section 4.1.2.8

REQUIREMENTS:

Vote scanning and counting equipment for paper-based systems, and all DRE equipment, shall be able to withstand ±15 kV air discharge and ±8 kV contact discharge without damage or loss of data. The equipment may reset or have momentary interruption so long as normal operation is resumed without human intervention or loss of data. Loss of data means votes that have been completed and confirmed to the voter.

DESCRIPTION OF ANOMALY:

Upon application of +15 kV air discharge to the top-right corner of the black plastic ballot tray cover, located closest to the front right of the DS200 screen. It was observed that the DS200 had become completely unresponsive and required human intervention, by means of a system reboot, to regain normal operation of the DS200. A clicking sound was observed during operation of the EUT, thus the shoeshine ballot was replaced with a new ballot and the clicking sound was resolved. After rebooting the EUT, the same test point was subjected to ±2,4,8,15 kV air discharge, at which time the EUT continued normal operation throughout the remainder of the test.

DISPOSITION • COMMENTS • RECOMMENDATIONS:

To ensure testing results where accumulated in accordance with the VVSG, the Electrostatic Disruption (ESD) was reperformed on 08/29/2013, for which there were no anomalies.
The final disposition is that the original observance could not be replicated.

Safety Related ☐ YES ☒ NO Potential 10 CFR Part 21 ☐ YES ☐ NO ☒ N/A

RESPONSIBILITY TO ANALYZE ANOMALIES AND COMPLY WITH 10 CFR PART 21: ☐ CUSTOMER ☐ WYLE

CAR Required: ☐ YES ☒ NO CAR No.

VERIFICATION:

TEST WITNESS: N/A

REPRESENTING: N/A

QUALITY ASSURANCE: 8/30/13

PROJECT ENGINEER: 08/30/2013

PROJECT MANAGER: 8/30/13

INTERDEPARTMENTAL COORDINATION: N/A

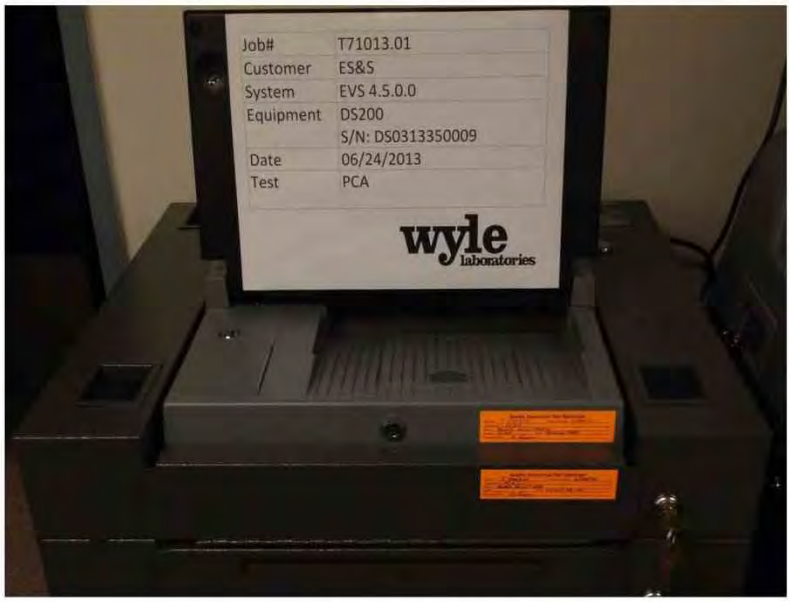
N/A

WH 1066, Rev. March '09 Page 1 of 1

ATTACHMENT B

PHOTOGRAPHS

Photograph 1: ES&S FL EVS 4.5.0.0 PCA



Photograph 2: ES&S FL EVS 4.5.0.0 PCA

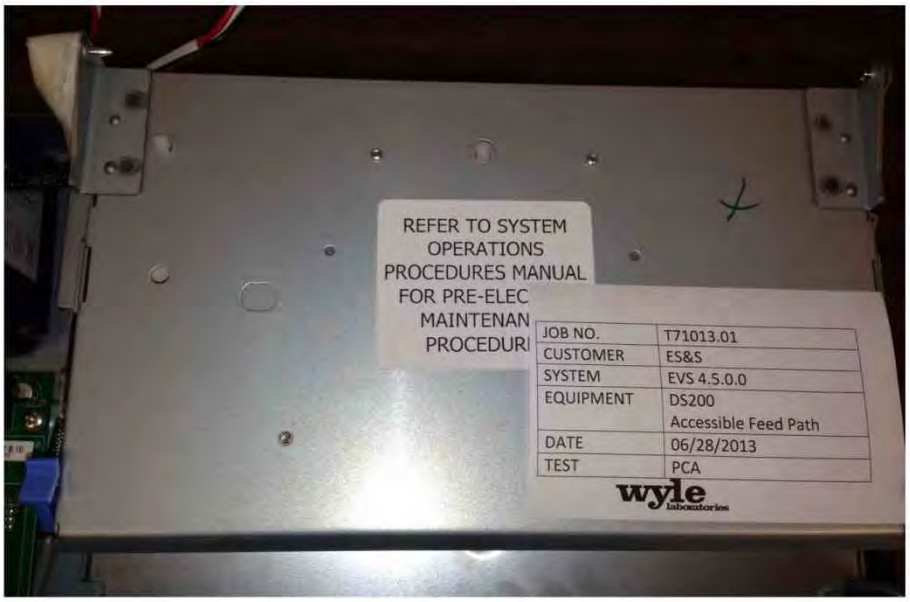
Photograph 3: ES&S FL EVS 4.5.0.0 PCA

Photograph 4: ES&S FL EVS 4.5.0.0 PCA

Photograph 5: ES&S FL EVS 4.5.0.0 PCA

Photograph 6: ES&S FL EVS 4.5.0.0 PCA

Photograph 7: ES&S FL EVS 4.5.0.0 PCA



Photograph 8: ES&S FL EVS 4.5.0.0 PCA

Photograph 9: ES&S FL EVS 4.5.0.0 PCA

Photograph 10: ES&S FL EVS 4.5.0.0 PCA

Photograph 11: ES&S FL EVS 4.5.0.0 Lightning Surge

Photograph 12: ES&S FL EVS 4.5.0.0 Lightning Surge

Photograph 13: ES&S FL EVS 4.5.0.0 Magnetic Fields Immunity

Photograph 14: ES&S FL EVS 4.5.0.0 Magnetic Fields Immunity

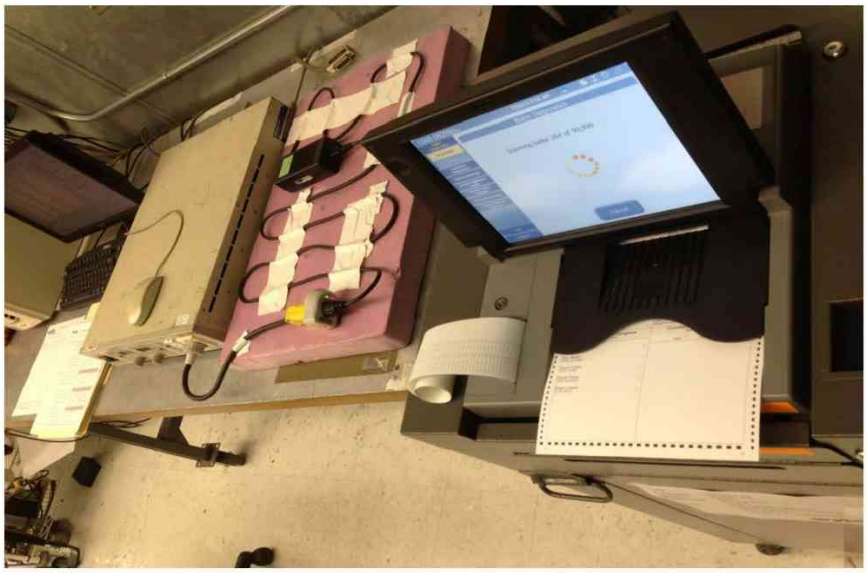
Photograph 15: ES&S FL EVS 4.5.0.0 Electromagnetic Emissions

Photograph 16: ES&S FL EVS 4.5.0.0 Electromagnetic Emissions

Photograph 17: ES&S FL EVS 4.5.0.0 Electrostatic Disruption

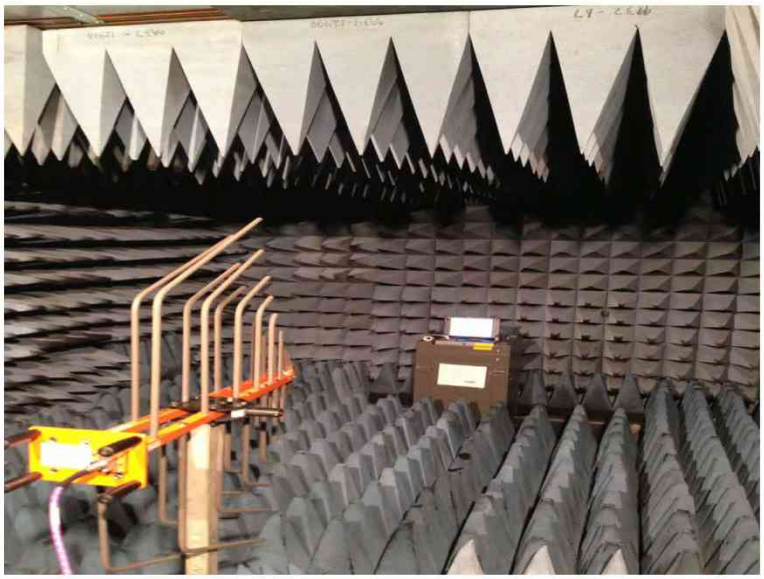
Photograph 18: ES&S FL EVS 4.5.0.0 Electrostatic Disruption

Photograph 19: ES&S FL EVS 4.5.0.0 Electrical Power Disturbance



Photograph 20: ES&S FL EVS 4.5.0.0 Electrical Power Disturbance

Photograph 21: ES&S FL EVS 4.5.0.0 Electromagnetic Susceptibility



Photograph 22: ES&S FL EVS 4.5.0.0 Electromagnetic Susceptibility

Photograph 23: ES&S FL EVS 4.5.0.0 Temperature and Power Variation

Photograph 24: ES&S FL EVS 4.5.0.0 Temperature and Power Variation

Photograph 25: ES&S FL EVS 4.5.0.0 Bench Handling

Photograph 26: ES&S FL EVS 4.5.0.0 Bench Handling

Photograph 27: ES&S FL EVS 4.5.0.0 Humidity

Photograph 28: ES&S FL EVS 4.5.0.0 Humidity

Photograph 29: ES&S FL EVS 4.5.0.0 Low Temperature

Photograph 30: ES&S FL EVS 4.5.0.0 Low Temperature

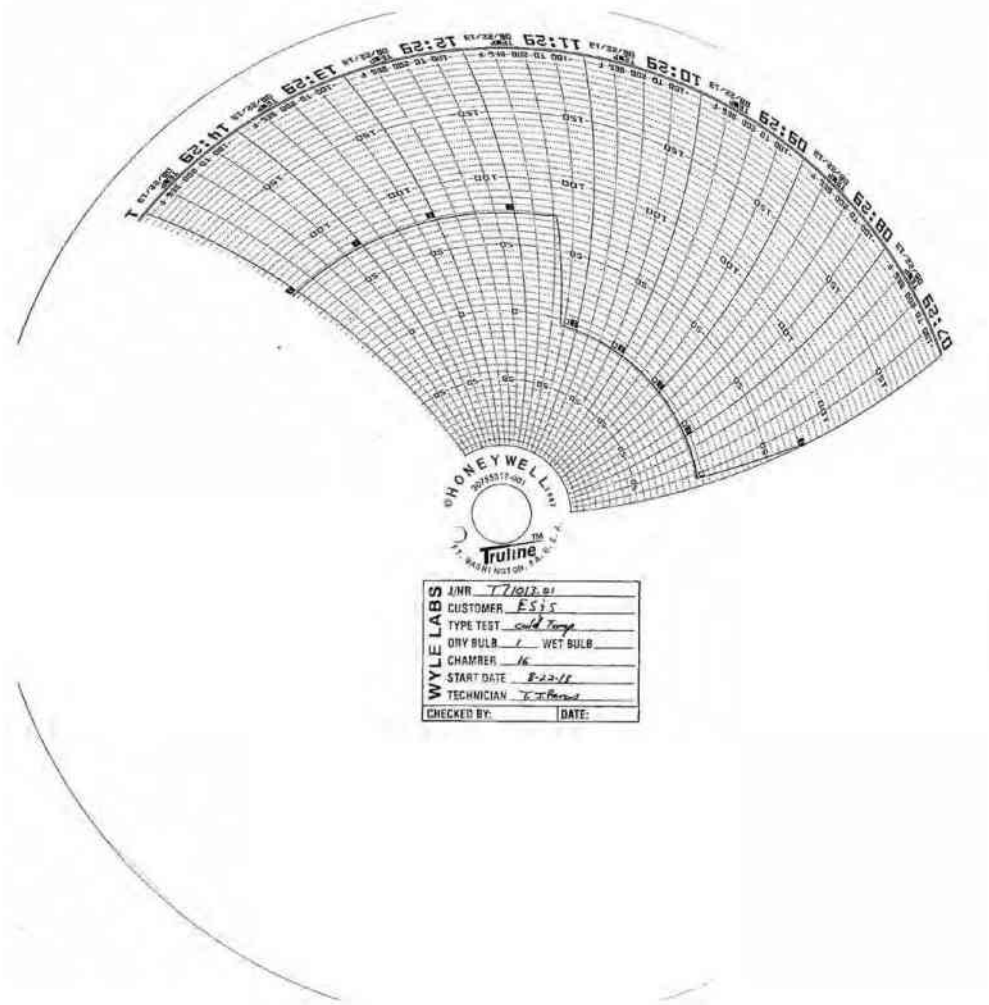
Photograph 31: ES&S FL EVS 4.5.0.0 High Temperature

Photograph 32: ES&S FL EVS 4.5.0.0 High Temperature

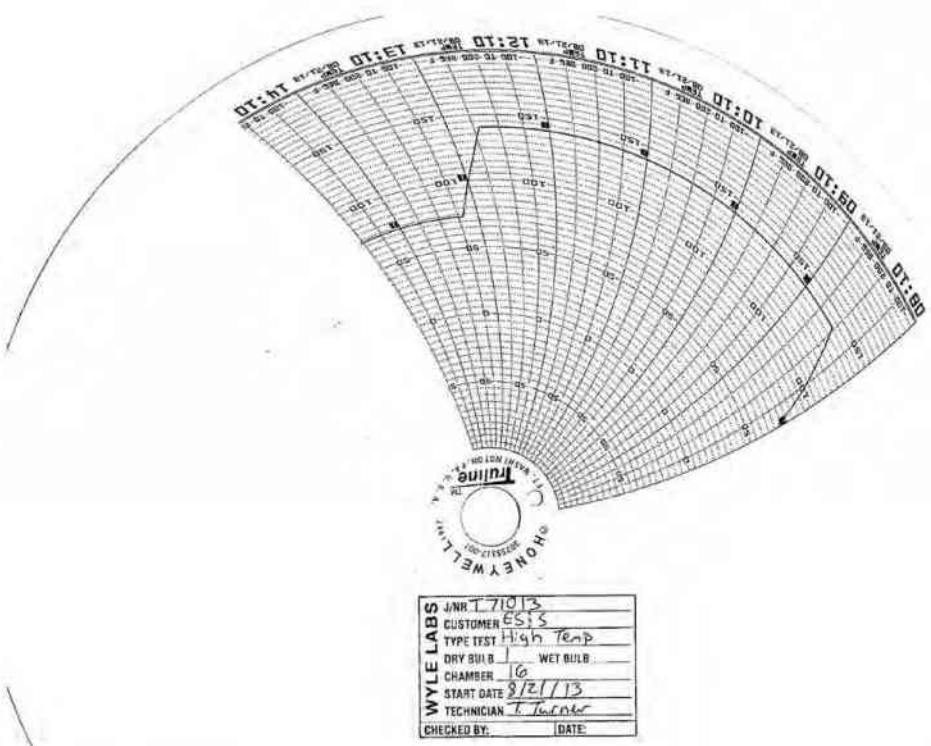
ATTACHMENT C

NON-OPERATING ENVIRONMENTAL TEST DATA

LOW TEMPERATURE TEST DATA


HONEYWELL
Truline
WYLE LABS
J/NR T71013.01
CUSTOMER ESS
TYPE TEST cold Temp
DRY BULB 1 WET BULB
CHAMBER 16
START DATE 8-22-11
TECHNICIAN
CHECKED BY:
DATE:

HIGH TEMPERATURE TEST DATA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J/NR T7013
CUSTOMER ESS
TYPE TEST High Temp
DRY BULB
WET BULB
CHAMBER 16
START DATE 8/21/13
TECHNICIAN T. Turner
CHECKED BY:
DATE:

VIBRATION TEST DATA

VIBRATION TEST DATA SHEET

Customer ES&S Spec. _____ Specimen DS200 Hardshell & DS200 Plastic Case

Job No. T71013.01 Method _____ Part No. _____ Specimen Temp. Ambient

GSI Yes ☐ No ☒ Procedure _____ S/N _____ Photo Yes ☒ No ☐

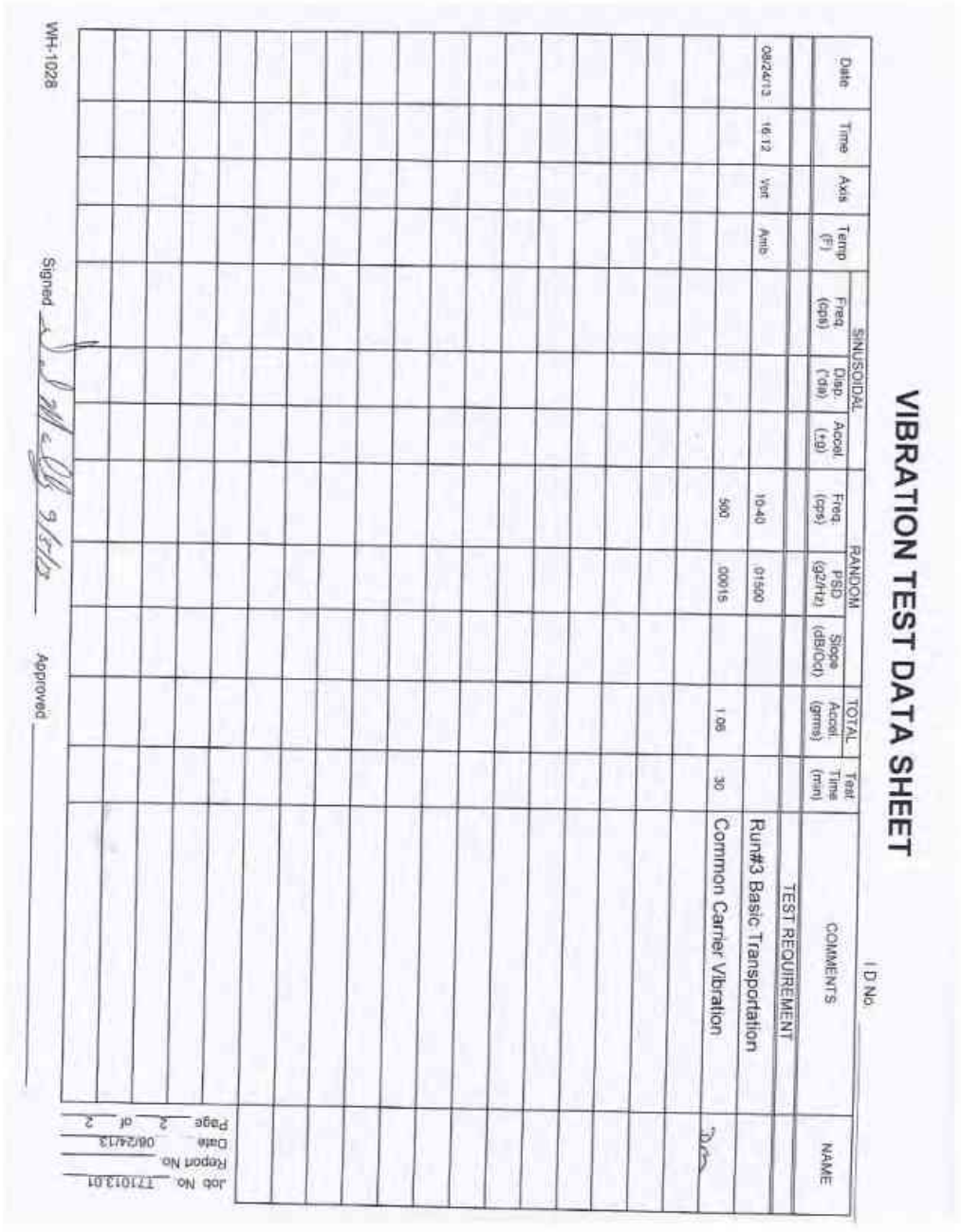
Test Title _____

				SINUSOIDAL			RANDOM			TOTAL			
Date	Time	Axis	Temp (F)	Freq (cps)	Disp. (+da)	Accel (+g)	Freq (cps)	PSD (g2/Hz)	Slope (dB/Oct)	Accel (grms)	Test Time (min)	COMMENTS	NAME
												TEST REQUIREMENT	
08/24/13	13:40	Input	Amb				10	.00013				Run#1 Basic Transportation	
							20-30	.00065				Common Carrier Vibration	DJ
							78	.00002					
							71-120	.00018					
							900	.00001		.205	30		
08/24/13	14:42	Long	Amb				10-20	.00560				Run#2 Basic Transportation	
							120	.00020				Common Carrier Vibration	DJ
							121-200	.00030					
							240	.00180					
							140	.00003					
							300	.00015		.749	30		

WH-1028A

Signed _____ Approved _____

Job No T71013.01
Report No
Date 08/24/13
Page 1 of 2



VIBRATION TEST DATA SHEET

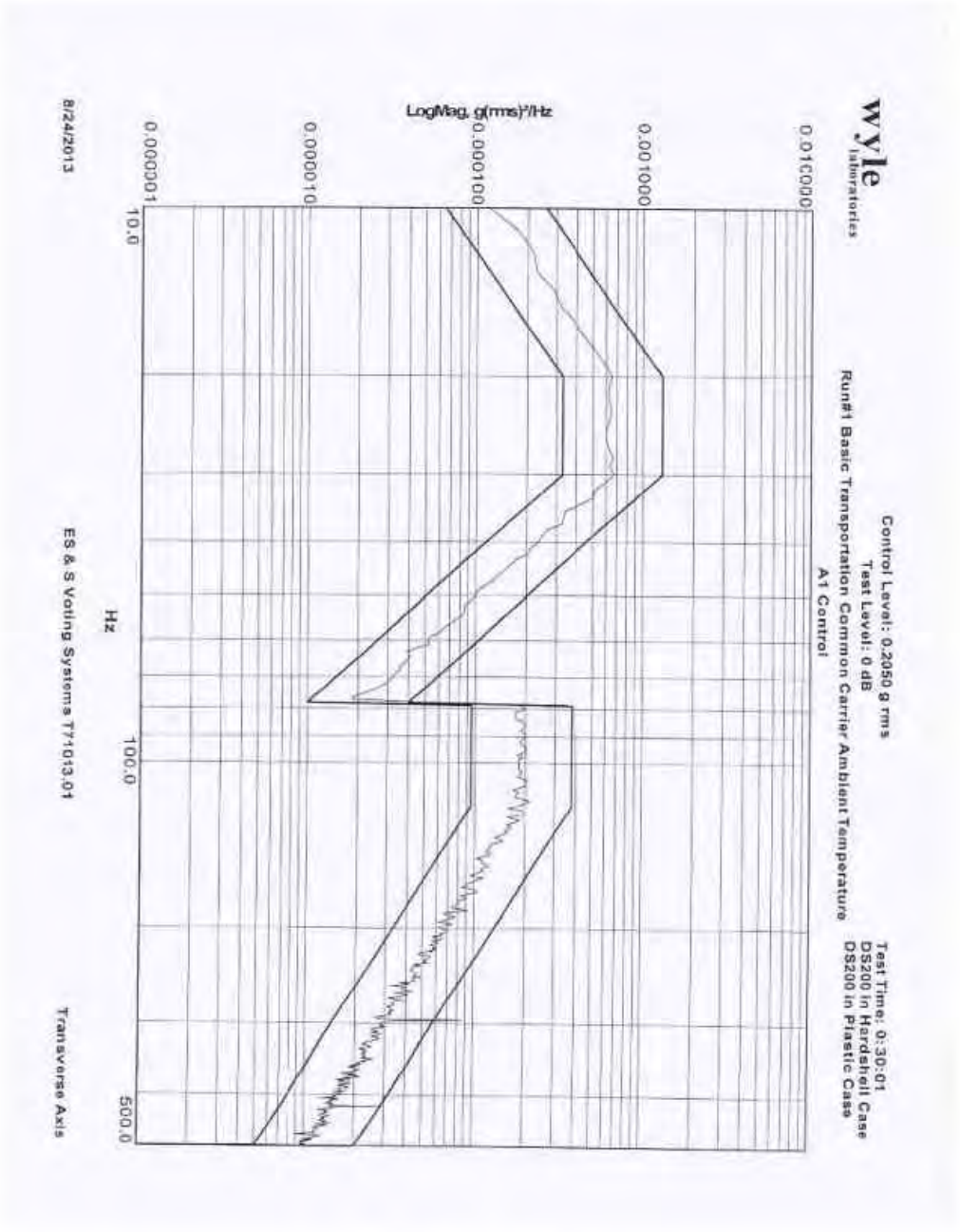
I D No.

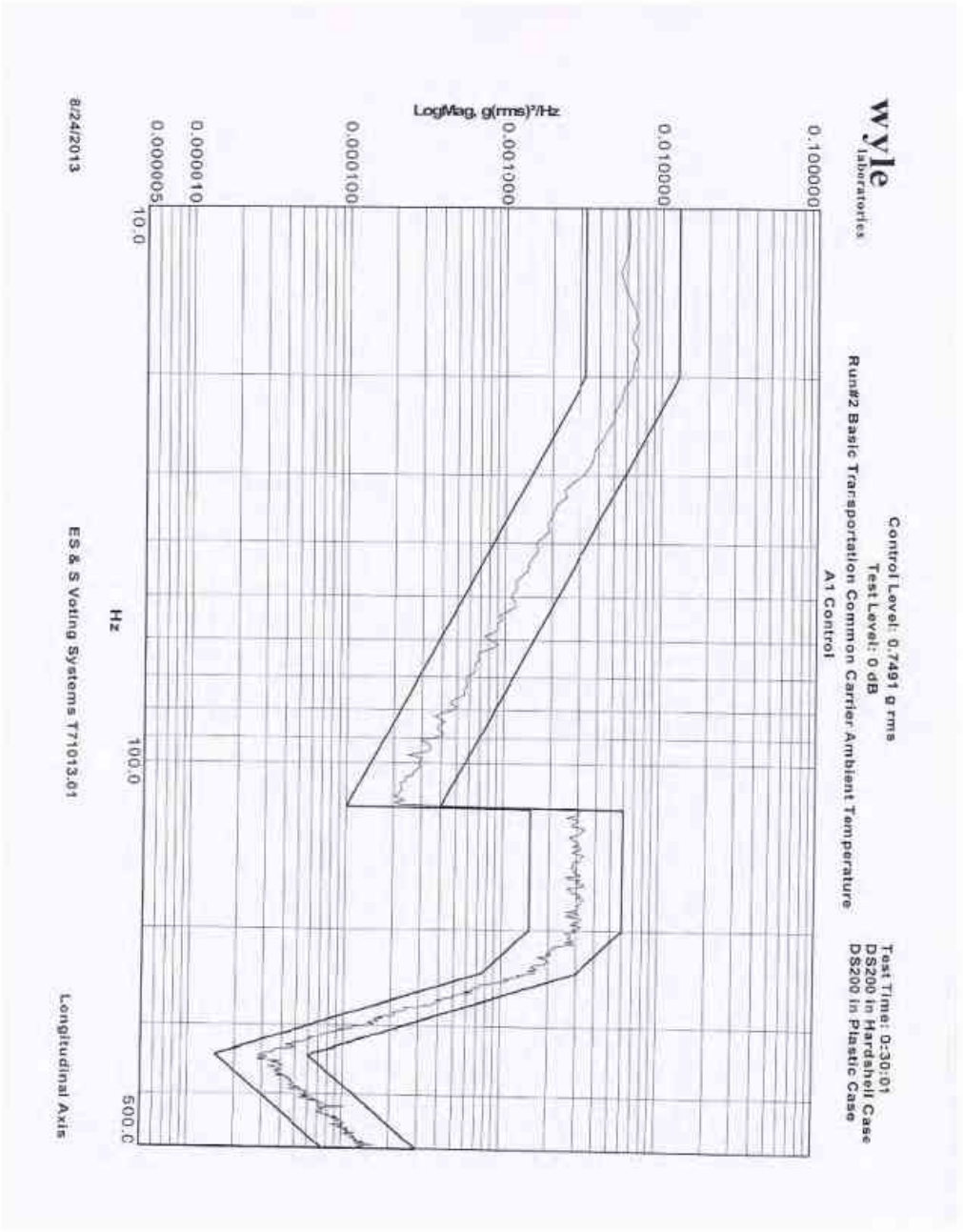
Date	Time	Axis	Temp (F)	SINUSOIDAL Freq. (cps)	SINUSOIDAL Disp. ("dia)	SINUSOIDAL Accel. (±g)	RANDOM Freq. (cps)	RANDOM PSD (g2/Hz)	RANDOM Slope (dB/Oct)	TOTAL Accel. (grms)	Test Time (min)	COMMENTS	NAME
												TEST REQUIREMENT	
08/24/13	16:12	Vert	Amb				10-40	01500		1.06	30	Run#3 Basic Transportation Common Carrier Vibration	DC

WH-1028

Signed _____ Approved _____

Job No. T71013.01
Report No. _____
Date 08/24/13
Page 2 of 2


Wyle
Laboratories
LogMag, g(rms)²/Hz
0.010000
0.001000
0.000100
0.000010
0.000001
10.0
100.0
500.0
Hz
Control Level: 0.2050 g rms
Test Level: 0 dB
Run#1 Basic Transportation Common Carrier Ambient Temperature
A1 Control
Test Time: 0:30:01
DS200 in Hardshell Case
DS200 in Plastic Case
8/24/2013
ES & S Voting Systems T71013.01
Transverse Axis


wyle
laboratories
LogMag, g(rms)²/Hz
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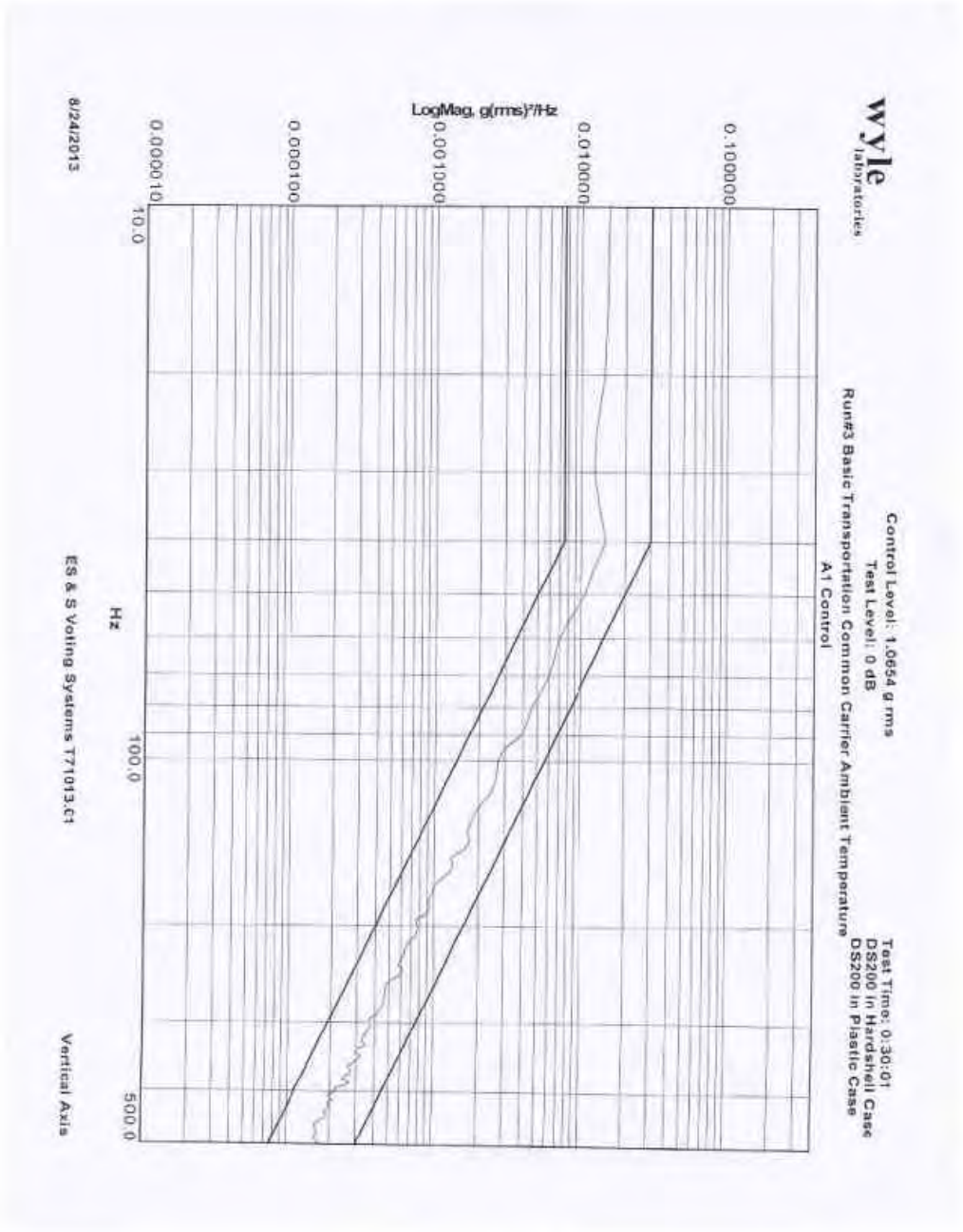
0.010000
0.001000
0.000100
0.000010
0.000005
10.0
100.0
500.0
Hz
Control Level: 0.7491 g rms
Test Level: 0 dB
Run#2 Basic Transportation Common Carrier Ambient Temperature
A1 Control
Test Time: 0:30:01
DS200 in Hardshell Case
DS200 in Plastic Case
8/24/2013
ES & S Vating Systems T71013-01
Longitudinal Axis


wyle
laboratories
LogMag, g(rms)²/Hz
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0.000100
0.001000
0.010000
0.100000
10.0
100.0
500.0
Hz
Control Level: 1.0654 g rms
Test Level: 0 dB
Run#3 Basic Transportation Common Carrier Ambient Temperature
A1 Control
Test Time: 0:30:01
DS200 in Hardshell Case
DS200 in Plastic Case
8/24/2013
ES & S Voting Systems T71013.C1
Vertical Axis

BENCH HANDLING TEST DATA

wyle laboratories

DATA SHEET

Customer ES&S
Specimen EVS 4500
Part No. DS200 | Amb. Temp. ~75°F | Job No. T71013
Spec. EAC 2005 VVSG | Photo Yes | Report No. T71013-01
Para. 4.6.2 | Test Med. Air | Start Date 8-26-13
S/N DS0313350010 & DS0313350006 | Specimen Temp. Ambient

Test Title Bench Handling

Drop Height: 4"

	EUT 1	EUT 2
Edge 1: Drops 1-6	✓	✓
Edge 1: Drops 7-12	✓	✓
Edge 1: Drops 13-18	✓	✓
Edge 1: Drops 19-24	✓	✓

Post-Test Inspection: Post-OP Status check completed on both units under test without issue

Test Passed & Completed 8/26/13 10:25 A.M.

Tested By _____ (Technician) Date 8/26/13

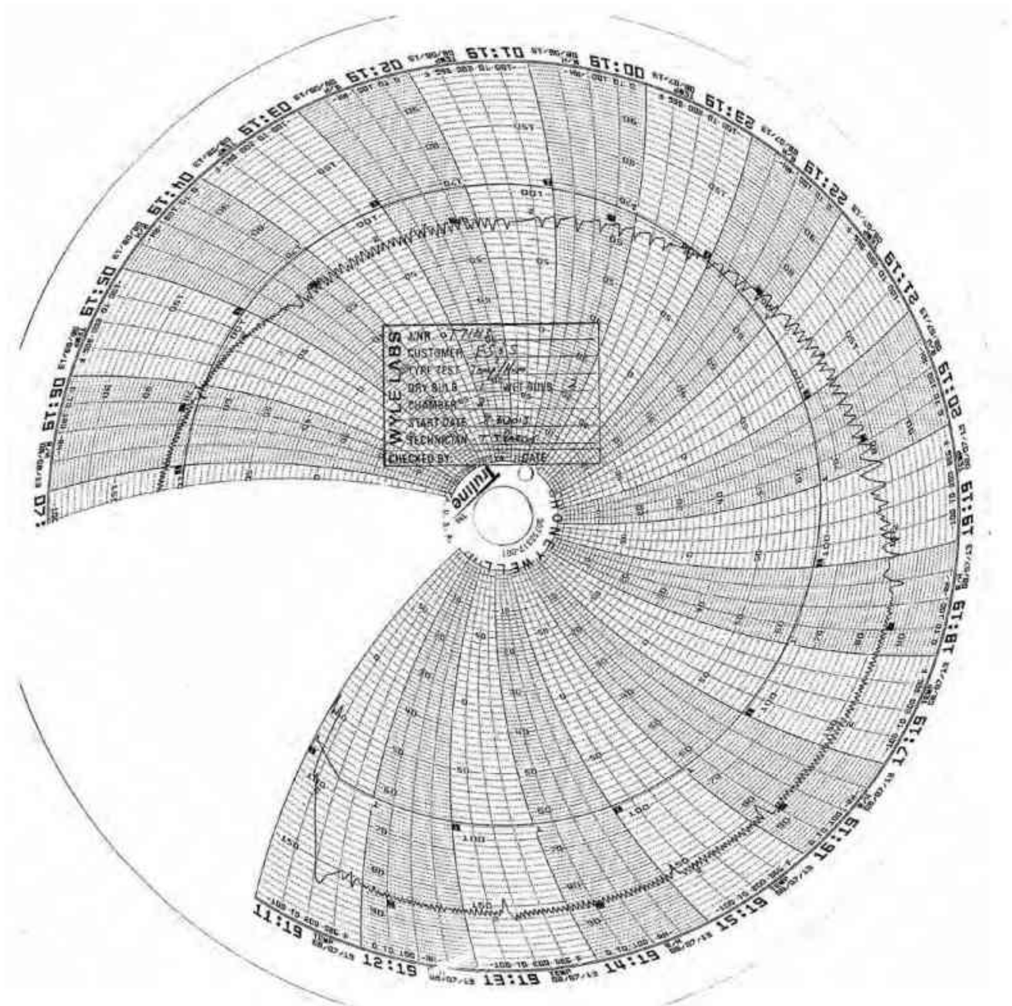
Sheet No. 1 of 1

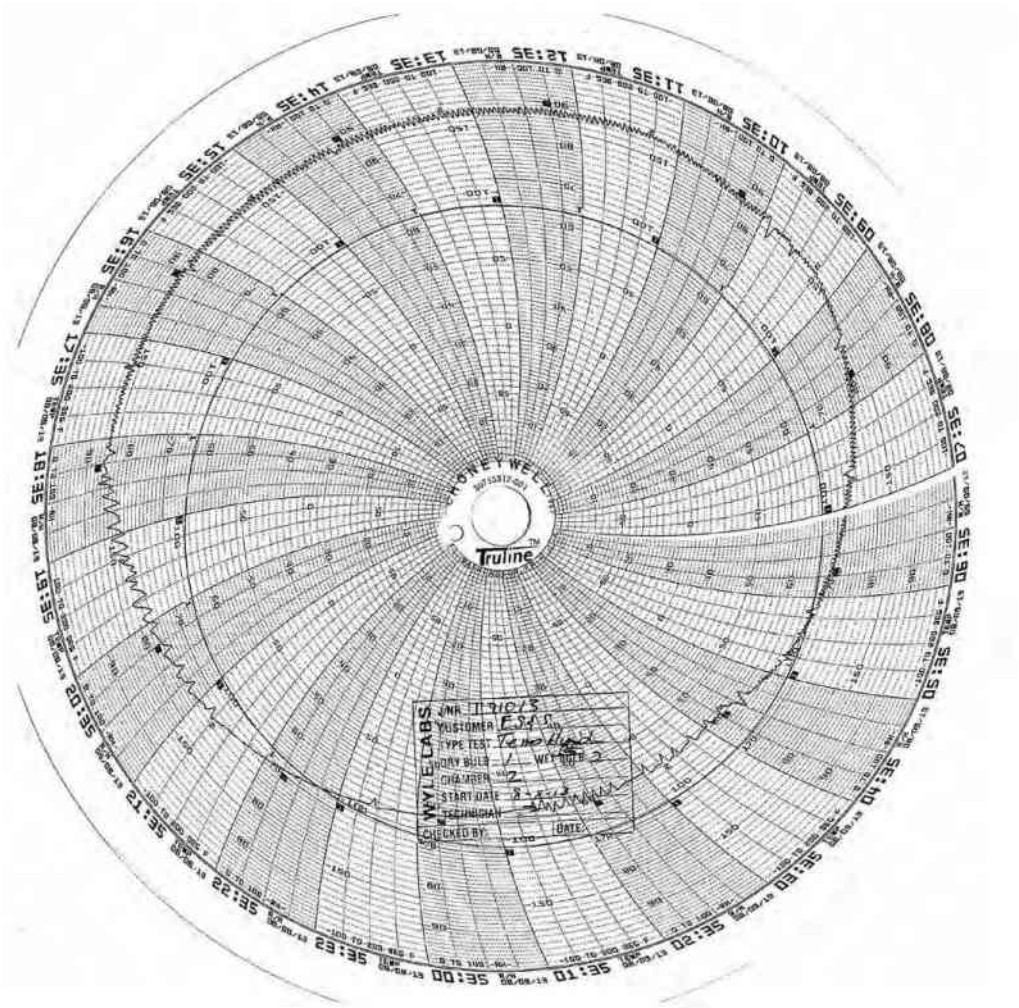
Notice of Anomaly N/A

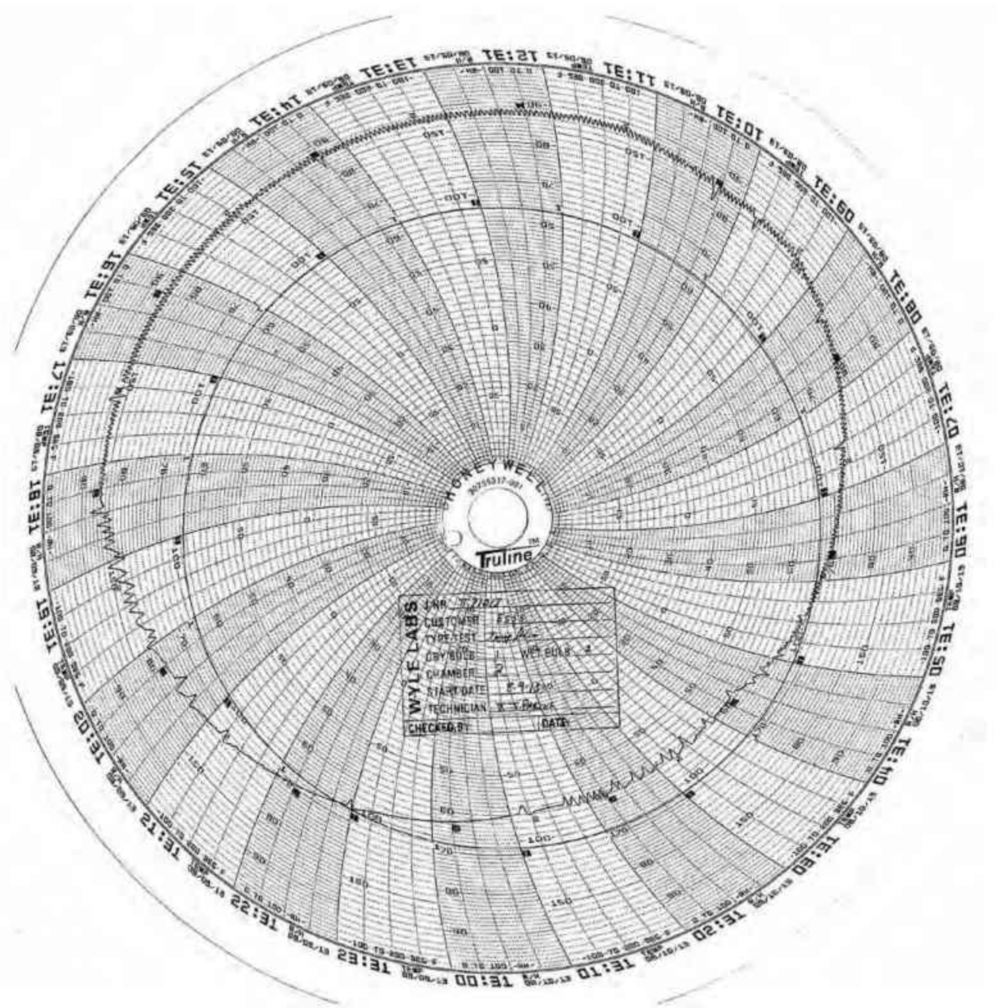
Approved Michael L Walker (Project Engineer)

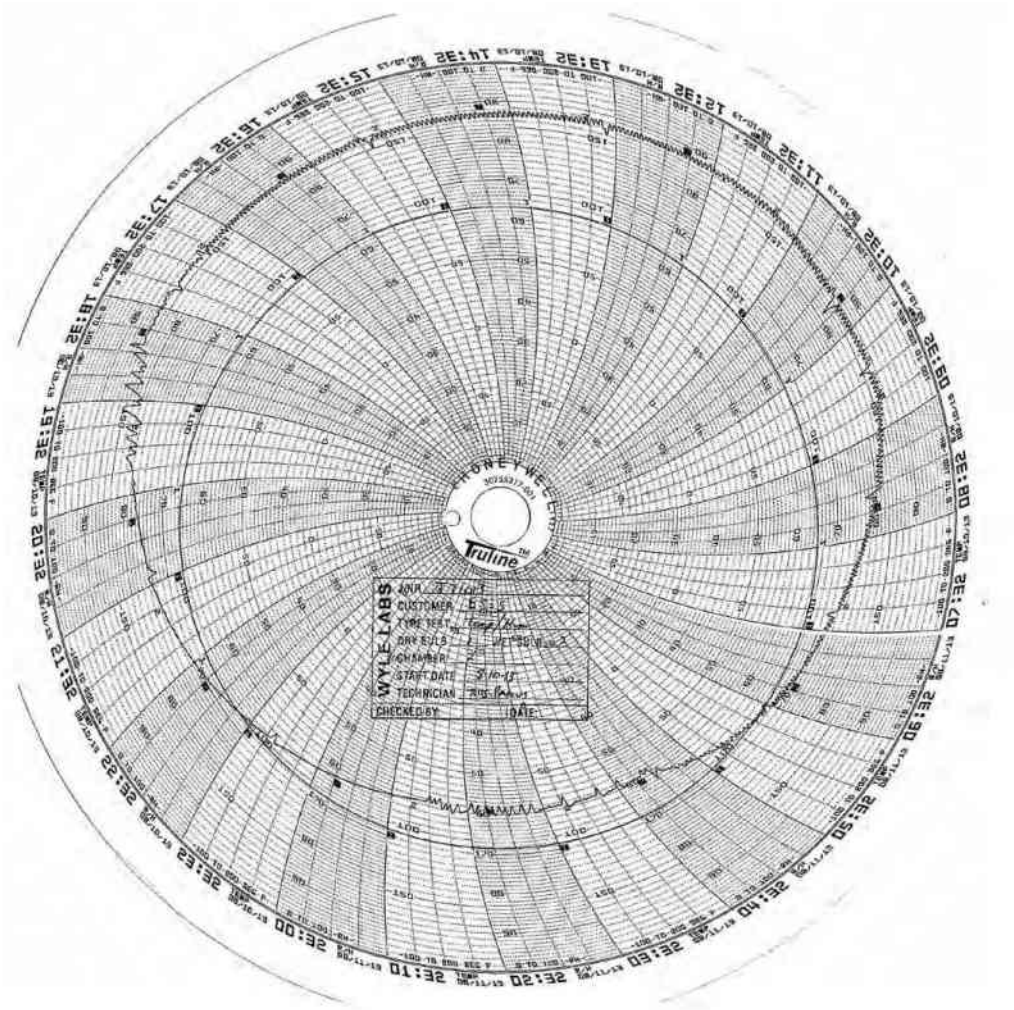
Wyle Form WH-614A, Rev. Jun 03

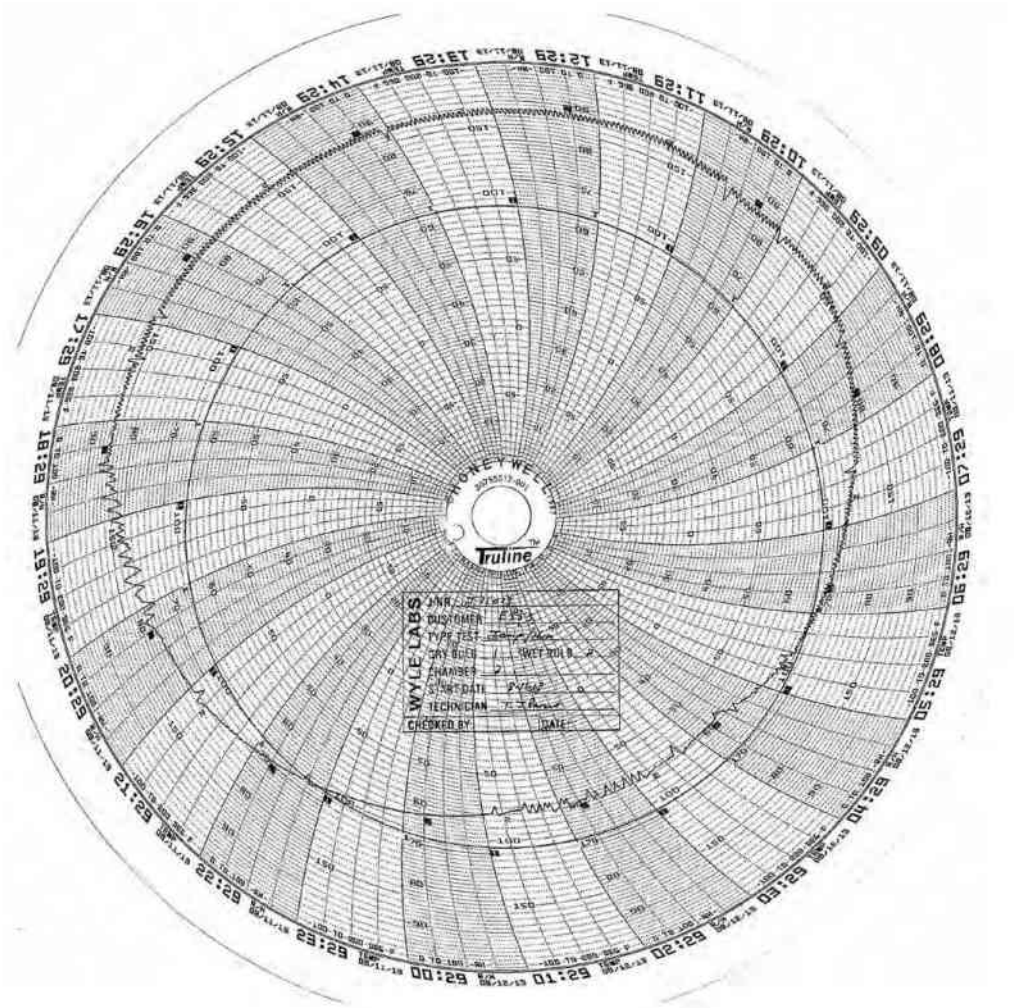
HUMIDITY TEST DATA

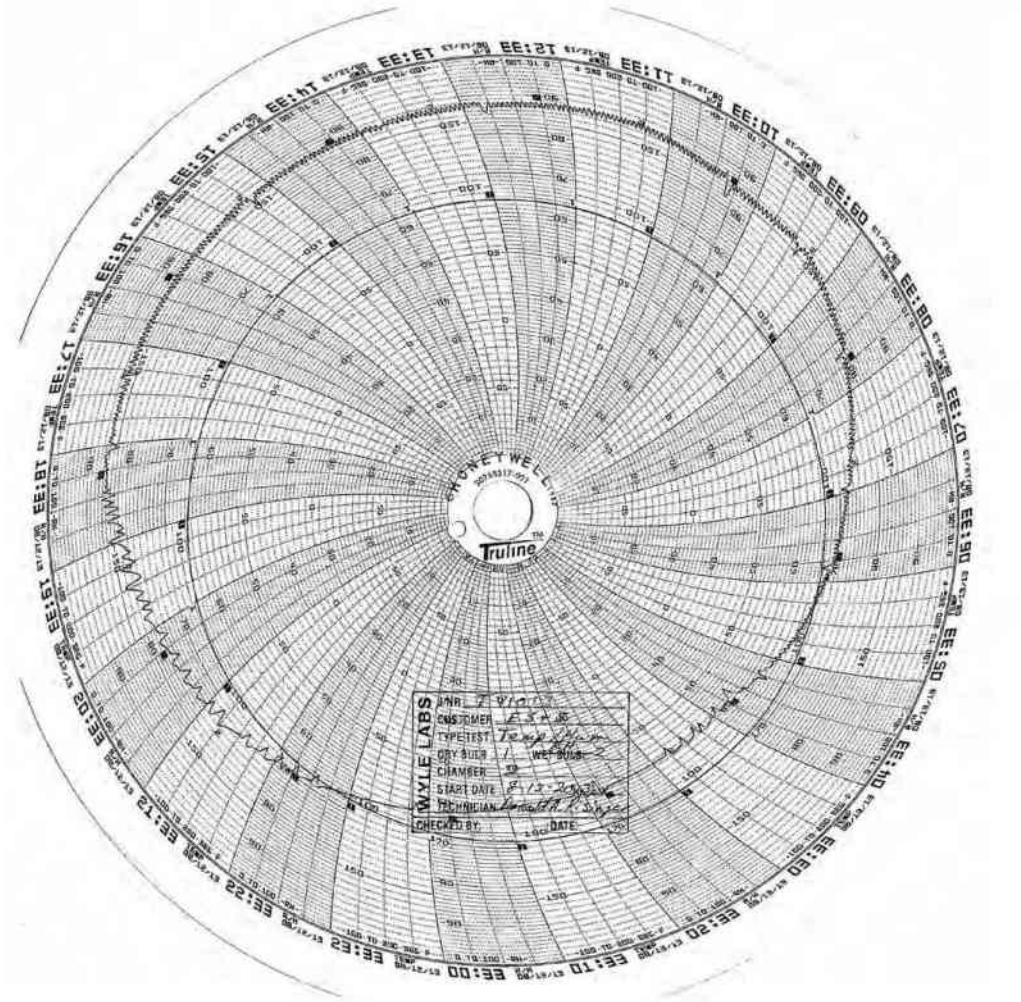


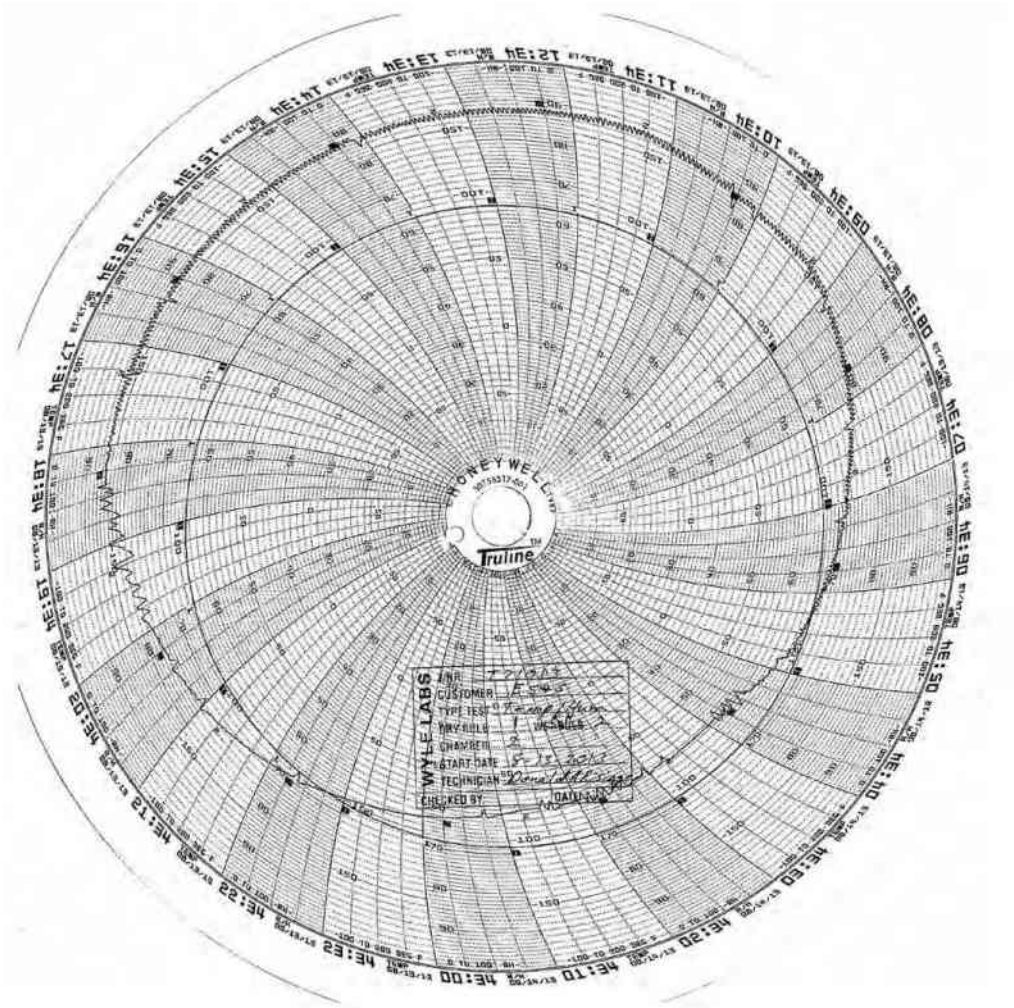

WYLE LABS
Truline

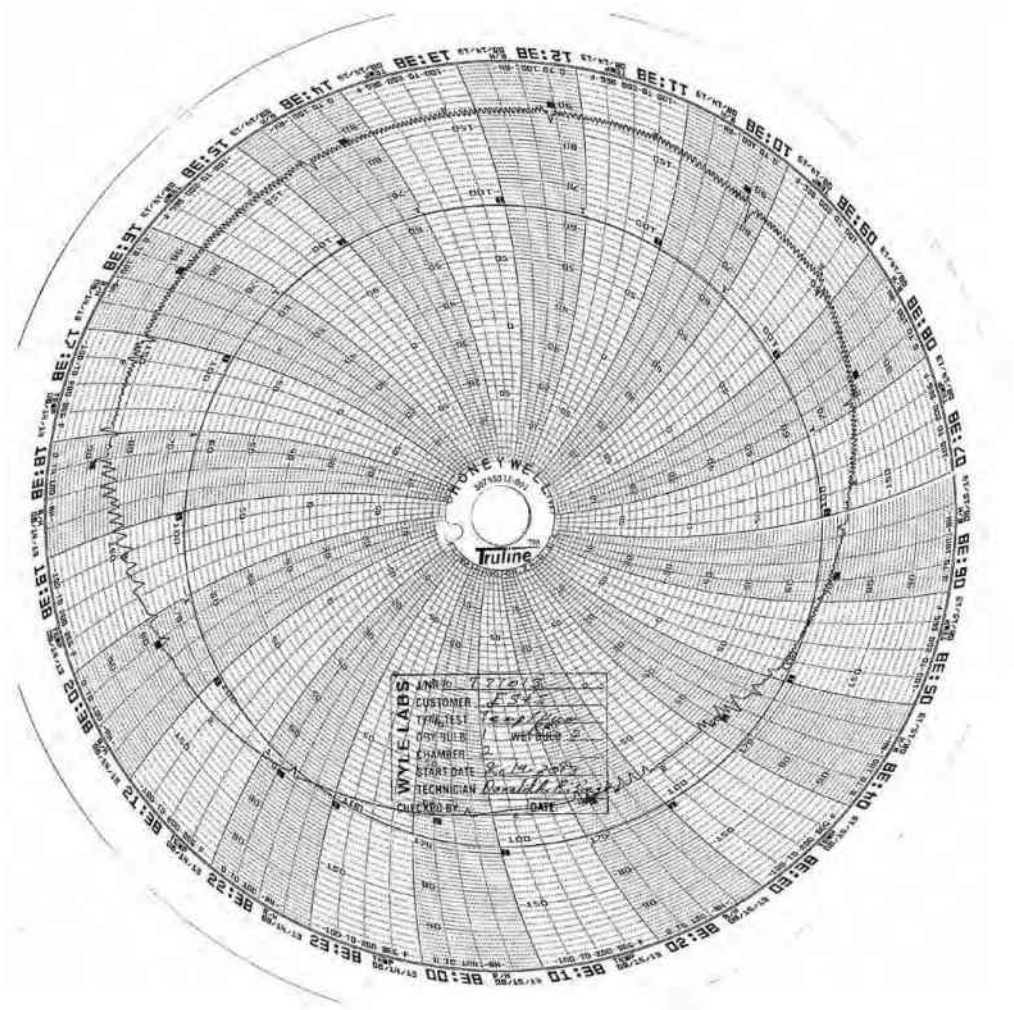

Truline
WYLE LABS
CUSTOMER
TYPE TEST
DRY BULB
WET BULB
CHAMBER
START DATE
TECHNICIAN
CHECKED BY
DATE

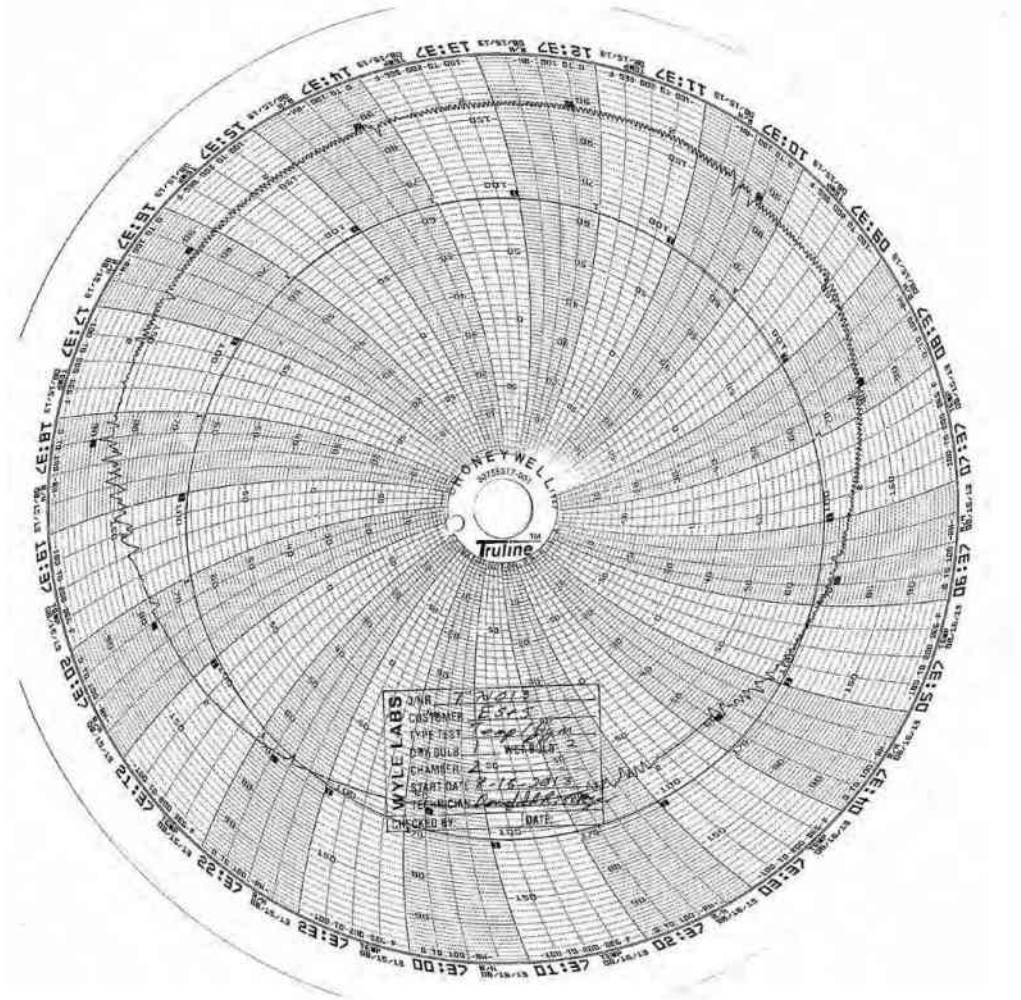

HONEYWELL
Truline
WYLE LABS
JOB#
CUSTOMER
TYPE TEST
DRY BULB
CHAMBER
START DATE
TECHNICIAN
CHECKED BY
DATE

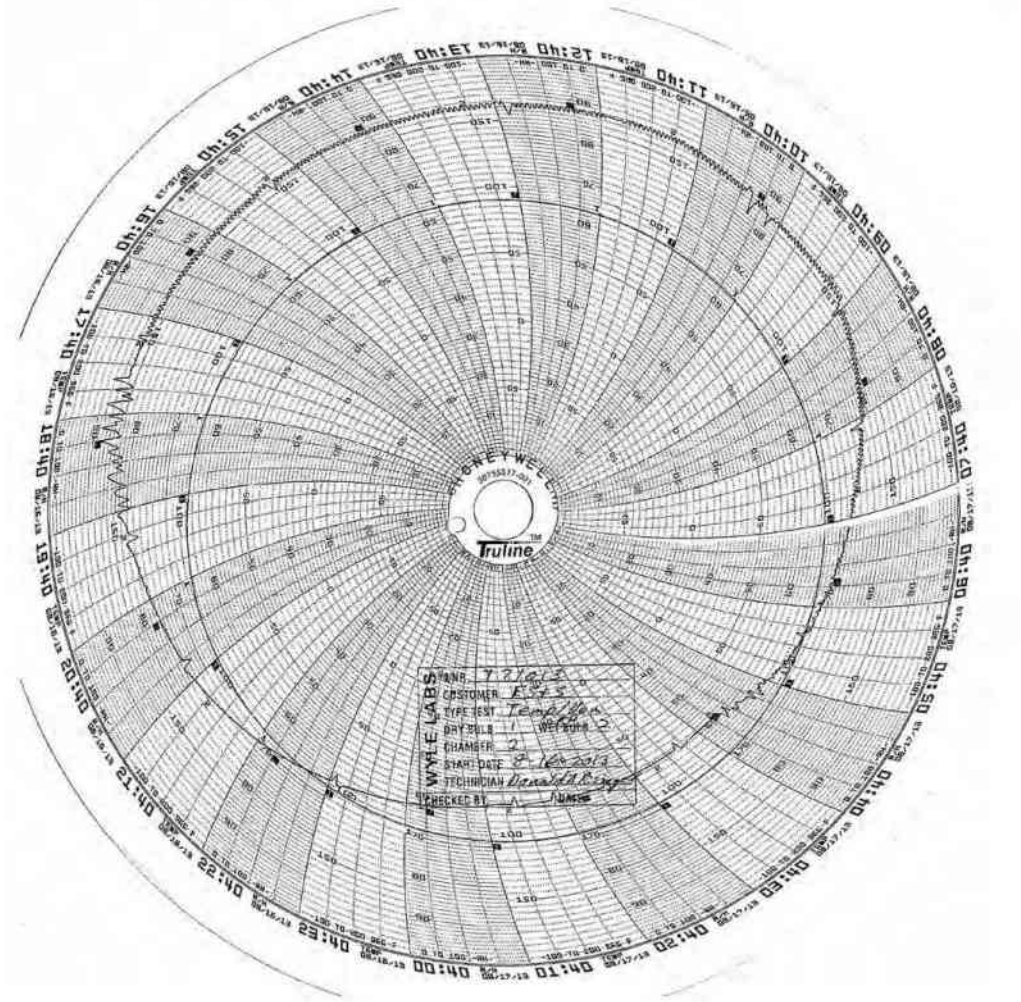

HONEYWELL
Truline
WYLE LABS
JNR
CUSTOMER
TYPE TEST
DRY BULB
WET BULB
CHAMBER
START DATE
TECHNICIAN
CHECKED BY
DATE

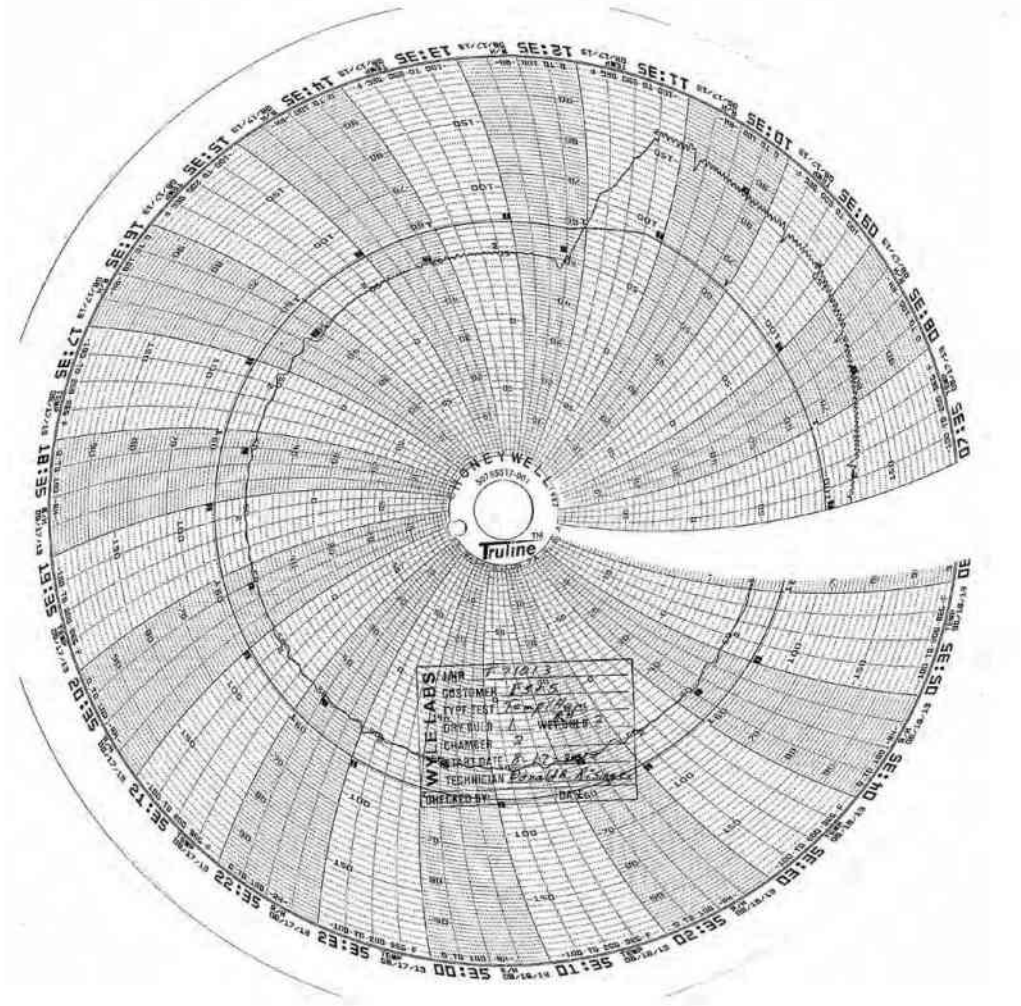

Truline
WYLE LABS
JNR:
CUSTOMER:
TYPE TEST:
DRY BULB:
WET BULB:
CHAMBER:
START DATE:
TECHNICIAN:
CHECKED BY:
DATE:


HONEYWELL
Truline
WYLE LABS
JOB NO.
CUSTOMER
TYPE TEST
DWV SIZE
CHAMBER
START DATE
TECHNICIAN
CHECKED BY
DATE


HONEYWELL
Truline
WYLE LABS
CUSTOMER
TYPE TEST
DRY BULB
WET BULB
CHAMBER
START DATE
TECHNICIAN
CHECKED BY
DATE


HONEYWELL
Truline
WYLE LABS
CHECKED BY
DATE


WYLE LABS
Truline


Truline
WYLE LABS
JOB NO. T71013
CUSTOMER Ford
TYPE TEST Temp Cycle
CHAMBER 2
TECHNICIAN
CHECKED BY
DATE

ATTACHMENT D

ELECTRICAL TEST DATA

ELECTROSTATIC DISRUPTION

wyle laboratories

DATA SHEET

Job No.: T71013.01
Start Date: 8-29-2013

Customer: ES&S (page 1 of 2)
EUT: 4500
Model No.: DS200
Serial No.:
Test Title: Electrostatic Disruption

Temperature: 22.4°F
Humidity: 56%
Measurement Point: See Test Points Below
Interference Signal: See Applied Signal
Frequency Range: N/A

Test Points	Meets Limit Yes	Meets Limit No	Applied Level (kV)	Discharge Type	Times Tested	Comments
TP001: Vertical Coupling Plane	✓		±2, 4, 8	Contact	10	Each Side of EUT
TP002: DS200 USB Well Keyhole	✓		±2, 4, 8	Contact	10	Engineering keyhole denotes TP002 and TP006
TP003: DS200 Front keyhole	✓		±2, 4, 8	Contact	10	
TP004: Metal Ballot Box Front Upper Right Keyhole	✓		±2, 4, 8	Contact	10	
TP005: Metal Ballot Box Front Lower Right Keyhole	✓		±2, 4, 8	Contact	10	
TP006: Metal Ballot Box Top Right-Rear Keyhole	✓		±2, 4, 8	Contact	10	
TP007: Metal Ballot Box Right Ballot Box Door Keyhole	✓		±2, 4, 8	Contact	10	
TP008: Metal Ballot Box Above Right Ballot Door	✓		±2, 4, 8	Contact	10	
TP009: Metal Ballot Box Front Above the Auxiliary Slot	✓		±2, 4, 8	Contact	10	
TP010: Metal Ballot Box Back Upper Center	✓		±2, 4, 8	Contact	10	
TP011: Metal Ballot Box Above Left Ballot Box Door	✓		±2, 4, 8	Contact	10	
TP012: Metal Ballot Box Left Ballot Box Door Keyhole	✓		±2, 4, 8	Contact	10	
TP013: DS200 Modem Door Keyhole	✓		±2, 4, 8	Contact	10	
TP014: DS200 Track Cover Left Rear	✓		±2, 4, 8, 15	Air	10	
TP015: DS200 Track Cover Left Front	✓		±2, 4, 8, 15	Air	10	
TP016: DS200 Track Cover Right Front	✓		±2, 4, 8, 15	Air	10	
TP017: DS200 Track Cover Right Rear	✓		±2, 4, 8, 15	Air	10	
TP018: DS200 Ballot Track Front Center	✓		±2, 4, 8, 15	Air	10	
TP019: DS200 Screen Frame Front-face Left Top Corner Interior	✓		±2, 4, 8, 15	Air	10	

Notice of Anomaly: 0

Witness: —

Tested By: [signature] Technician Date: 08/29/2013

Approved: [signature] Project Engineer Date: 08/29/2013

WH-1433, Rev. Dec. 2004

wyle laboratories

DATA SHEET

Job No.: T71013.01
Start Date: 8-29-2013

Customer: ES&S (Page 2 of 2)
Temperature: 22.4F
Humidity: 56%
EUT: 4500
Measurement Point: See Test Points Below
Model No.: DS200
Interference Signal: See Applied Signal
Serial No.:
Frequency Range: N/A
Test Title: Electrostatic Disruption

Test Points	Meets Limit Yes	Meets Limit No	Applied Level (kV)	Discharge Type	Times Tested	Comments
TP020: DS200 Screen Frame Front-face Left Top Corner Exterior	✓		±2, 4, 8, 15	Air	10	
TP021: DS200 Screen Frame Front-face Top-Span	✓		±2, 4, 8, 15	Air	10	
TP022: DS200 Screen Frame Front-face Top Right Corner	✓		±2, 4, 8, 15	Air	10	
TP023: DS200 Screen Top Right Corner	✓		±2, 4, 8, 15	Air	10	
TP024: DS200 Screen Top Right-Center	✓		±2, 4, 8, 15	Air	10	
TP025: DS200 Screen Top Left-Center	✓		±2, 4, 8, 15	Air	10	
TP026: DS200 Screen Top Left Corner	✓		±2, 4, 8, 15	Air	10	
TP027: DS200 Screen Middle Left Side	✓		±2, 4, 8, 15	Air	10	
TP028: DS200 Screen Middle left-Center	✓		±2, 4, 8, 15	Air	10	
TP029: DS200 Screen Middle Right-Center	✓		±2, 4, 8, 15	Air	10	
TP030: DS200 Screen Middle Right Side	✓		±2, 4, 8, 15	Air	10	
TP031: DS200 Screen Lower Right Corner	✓		±2, 4, 8, 15	Air	10	
TP032: DS200 Screen Lower Middle-Right	✓		±2, 4, 8, 15	Air	10	
TP033: DS200 Screen Lower Left Corner	✓		±2, 4, 8, 15	Air	10	
TP034: DS200 USB Door Rear	✓		±2, 4, 8, 15	Air	10	
TP035: DS200 Screen Frame Left-face	✓		±2, 4, 8, 15	Air	10	
TP036: DS200 Modem Door Rear	✓		±2, 4, 8, 15	Air	10	
TP037: DS200 Rear Cover Front Center	✓		±2, 4, 8, 15	Air	10	
TP038: DS200 Rear Cover Right Front	✓		±2, 4, 8, 15	Air	10	
TP039: DS200 Rear Cover Back	✓		±2, 4, 8, 15	Air	10	

Notice of Anomaly: 0
Witness:

Tested By: _____ Technician Date: 08/29/2013
Approved: _____ Project Engineer Date: 08/29/2013

WH-1433, Rev. Dec. 2004

ELECTRICAL POWER DISTURBANCE TEST DATA

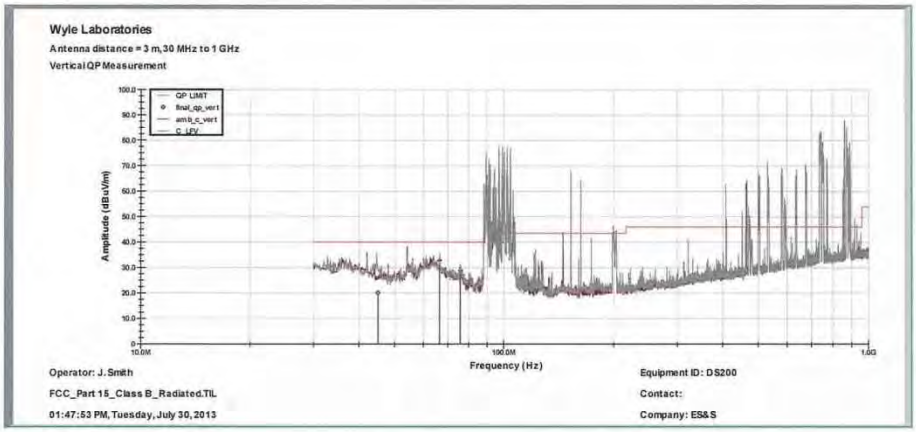
California Instruments Corp.
Data entry mode: Absolute

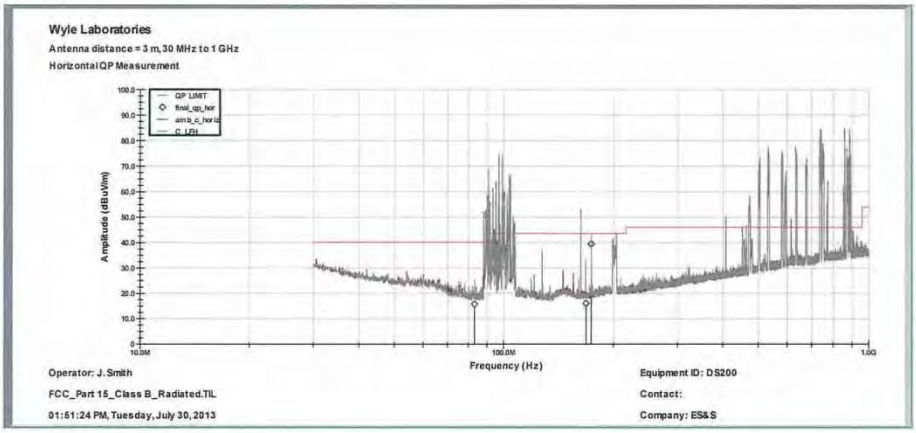
No.	Type	Time (s)	Volt
1	V Step	60.000	120.0
2	V Step	0.020	84.0
3	V Step	60.000	120.0
4	V Step	0.100	48.0
5	V Step	60.000	120.0
6	V Step	1.000	48.0
7	V Step	60.000	120.0
8	V Step	5.000	6.0
9	V Step	60.000	120.0
10	V Step	1.000	102.0
11	V Step	60.000	120.0
12	V Step	1.000	138.0
13	V Step	60.000	120.0
14	V Step	14400.000	129.0
15	V Step	60.000	120.0
16	V Step	14400.000	105.0
17	V Step	60.000	120.0
18	Empty		

Transient List: <NEW>
Printed on: Friday, July 26, 2013 9:50:02 AM

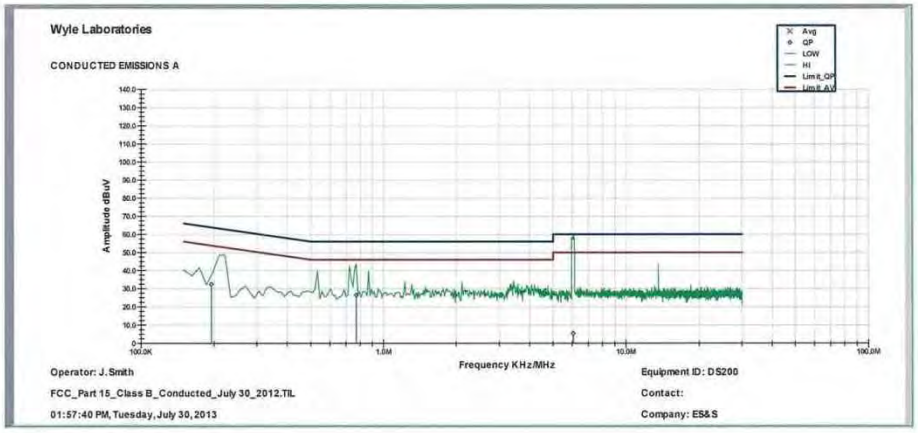
Page #1

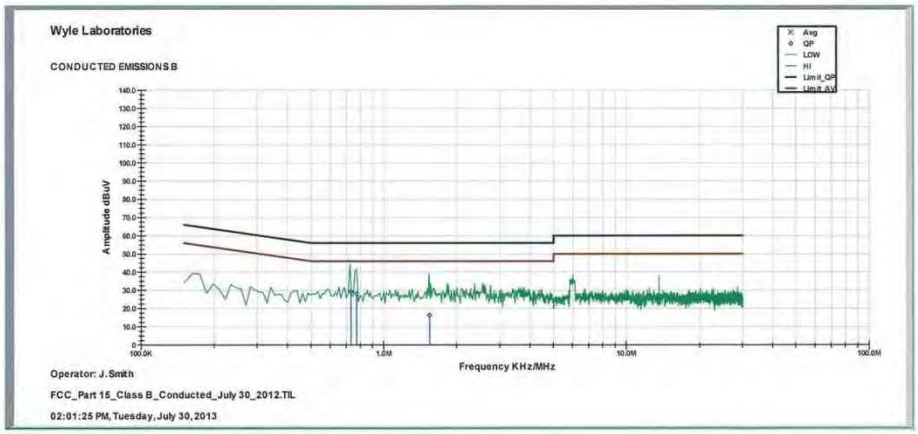
ELECTROMAGNETIC EMISSIONS: RADIATED EMISSIONS TEST DATA


Wyle Laboratories
Antenna distance = 3 m, 30 MHz to 1 GHz
Vertical QP Measurement
QP LIMIT
final_qp_vert
amb_c_vert
C_LEV
Amplitude (dBuV/m)
Frequency (Hz)
Operator: J. Smith
FCC_Part 15_Class B_Radiated.TIL
01:47:53 PM, Tuesday, July 30, 2013
Equipment ID: DS200
Contact:
Company: ES&S


Wyle Laboratories
Antenna distance = 3 m, 30 MHz to 1 GHz
Horizontal QP Measurement
QP LIMIT
final_qp_hor
amb_c_horiz
C_LEH
Amplitude (dBuV/m)
Frequency (Hz)
Operator: J. Smith
FCC_Part 15_Class B_Radiated.TIL
01:51:24 PM, Tuesday, July 30, 2013
Equipment ID: DS200
Contact:
Company: ES&S

ELECTROMAGNETIC EMISSIONS: CONDUCTED EMISSIONS TEST DATA


Wyle Laboratories
CONDUCTED EMISSIONS A
Avg
QP
LOW
HI
Limit_QP
Limit_AV
Amplitude dBuV
Frequency KHz/MHz
Operator: J.Smith
FCC_Part 15_Class B_Conducted_July 30_2012.TIL
01:57:40 PM, Tuesday, July 30, 2013
Equipment ID: DS200
Contact:
Company: ES&S


Wyle Laboratories
CONDUCTED EMISSIONS B
Avg
QP
LOW
HI
Limit_QP
Limit_AV
Amplitude dBuV
Frequency KHz/MHz
Operator: J.Smith
FCC_Part 15_Class B_Conducted_July 30_2012.TIL
02:01:25 PM, Tuesday, July 30, 2013

ELECTROMAGNETIC SUSCEPTIBILITY TEST DATA

wyle laboratories

DATA SHEET

Job No.: T71013.01
Start Date: 23 Aug 13

Customer: ES&S
EUT: DS200
Model No.: DS200
Serial No.: DS0313350009
Temperature: 21.7° C
Humidity: 49.9%
Measurement Point: EUT @ All Four Sides
Interference Signal: 1Khz @ 80% AM
Frequency Range: 80Mhz to 1Ghz

Test Title: EN 61000-4-3 (Electromagnetic Susceptibility)

Test Frequency	Meets Limit		Susceptibility Threshold Level	Maximum Signal Applied	Comments
( )kHz (X)MHz ( )GHz	Yes	No	( )A ( )V ( )kV (X)V/m ( )Vrms ( )dBµA ( )dBµV ( )dBµV/m ( )dBpT		
80	X		>10	10	Vertical and Horizontal
↓	↓		↓	↓	↓
1,000	X		>10	10	Vertical and Horizontal

Notice of Anomaly:
Witness:

Tested By: Technician Date: 8/23/13
Approved: Project Engineer Date: 08/23/2013

Page ___ of ___

WI-1437, Rev. Dec. 2004

ELECTRICAL FAST TRANSIENT TEST DATA

wyle laboratories

DATA SHEET

Job No.: T71013.01
Start Date: 24 Jul 13

Customer: ES&S
EUT: DS200
Model No.: DS200
Serial No.: DS0313350009

Temperature: 21.7° C
Humidity: 50.1%
Measurement Point: See Comments Below
Interference Signal: Test Signal Applied @ 5/50nS
Frequency Range: See Test Frequencies Below

Test Title: EN 61000-4-4 (Electrical Fast Transient)

Test Frequency	Meets Limit		Susceptibility Threshold Level	Maximum Signal Applied	Comments
(X)kHz ( )MHz ( )GHz	Yes	No	( )A ( )V (X)kV ( )V/m ( )Vrms ( )dBµA ( )dBµV ( )dBµV/m ( )dBpT		
.060	X		>1	1	Line to Neutral
.060	↓		↓	↓	Line to Ground
.060	X		>1	1	Neutral to Ground

Notice of Anomaly:

Witness:

Tested By: Technician Date: 7/24/13

Approved: Project Engineer Date: 07/24/2013

Page ___ of ___

WH 1432, Rev. Dec. 2004

LIGHTNING SURGE TEST DATA

wyle laboratories

DATA SHEET

Job No.: T71013.01
Start Date: 22 Jul 13

Customer: ES&S
EUT: DS200
Model No.: DS200
Serial No.: DS0313350009

Temperature: 21.9° C Humidity: 53.6%
Measurement Point: See Comments Below
Interference Signal: Test Signal Applied @ 1.2/50uS
Frequency Range: See Test Frequencies Below

Test Title: EN 61000-4-5 (Lightning Surge Test)

Test Frequency	Meets Limit		Susceptibility Threshold Level	Maximum Signal Applied	Comments
(X)kHz ( )MHz ( )GHz	Yes	No	( )A ( )V (X)kV ( )V/m ( )Vrms ( )dBµA ( )dBµV ( )dBµV/m ( )dBpT		
.060	X		>.5	.5	Line to Neutral @ 0°, 90°, 180°, and 270°
.060	↓		↓	↓	Line to Ground @ 0°, 90°, 180°, and 270°
.060	X		>.5	.5	Neutral to Ground @ 0°, 90°, 180°, and 270°
.060	X		>1	1	Line to Neutral @ 0°, 90°, 180°, and 270°
.060	↓		↓	↓	Line to Ground @ 0°, 90°, 180°, and 270°
.060	X		>1	1	Neutral to Ground @ 0°, 90°, 180°, and 270°
.060	X		>2	2	Line to Neutral @ 0°, 90°, 180°, and 270°
.060	↓		↓	↓	Line to Ground @ 0°, 90°, 180°, and 270°
.060	X		>2	2	Neutral to Ground @ 0°, 90°, 180°, and 270°

Notice of Anomaly: NOA: 1 & 2
Witness: 07/22/2013

Tested By: Technician Date: 07/22/13
Approved: Project Engineer Date: 07/22/2013

Page 1 of 1

WH-1432, Rev. Dec. 2004

CONDUCTED RF IMMUNITY TEST DATA

wyle laboratories

DATA SHEET

Job No.: T71013.01
Start Date: 29 Jul 13

Customer: ES&S
EUT: DS200
Model No.: DS200
Serial No.: DS0313350009

Temperature: 22.4° C
Humidity: 44.5%
Measurement Point: See Comments Below
Interference Signal: 1Khz @ 80% AM
Frequency Range: 150Khz to 80Mhz

Test Title: EN 61000-4-6 (Conducted RF Immunity)

Test Frequency	Meets Limit		Susceptibility Threshold Level	Maximum Signal Applied	Comments
( )kHz (X)MHz ( )GHz	Yes	No	( )A (X)V ( )kV ( )V/m ( )Vrms ( )dBµA ( )dBµV ( )dBµV/m ( )dBpT		
.150	X		>10	10	AC Input
↓	↓		↓	↓	↓
80	X		>10	10	AC Input

Notice of Anomaly: Ø
Witness: N/A

Tested By: _____ Date: 07/29/13
Technician
Approved: _____ Date: 07/29/2013
Project Engineer

Page 1 of 1

WH-1433, Rev. Dec. 2003

MAGNETIC FIELDS IMMUNITY TEST DATA

wyle laboratories

DATA SHEET

Job No.: T71013.01
Start Date: 29 Jul 13

Customer:	ES&S	Temperature:	22.1° C	Humidity:	49.9%
EUT:	DS200	Measurement Point:	See Comments Below		
Model No.:	DS200	Interference Signal:	CW for a Period of 5 Minutes		
Serial No.:	DS0313350009	Frequency Range:	See Test Frequencies Below		

Test Title: EN 61000-4-8 (Magnetic Field Immunity)

Test Frequency	Meets Limit		Susceptibility Threshold Level	Maximum Signal Applied	Comments
(X)kHz ( )MHz ( )GHz	Yes	No	(X)A ( )V ( )kV ( )V/m ( )Vrms ( )dBμA ( )dBμV ( )dBμV/m ( )dBpT		
.060	X		>30 A/m	30 A/m	EUT on X, Y, and Z Axis

Notice of Anomaly: Ø

Witness: N/A

Tested By: _____ Date: 07/29/13
Technician

Approved: _____ Date: 07/29/2013
Project Engineer

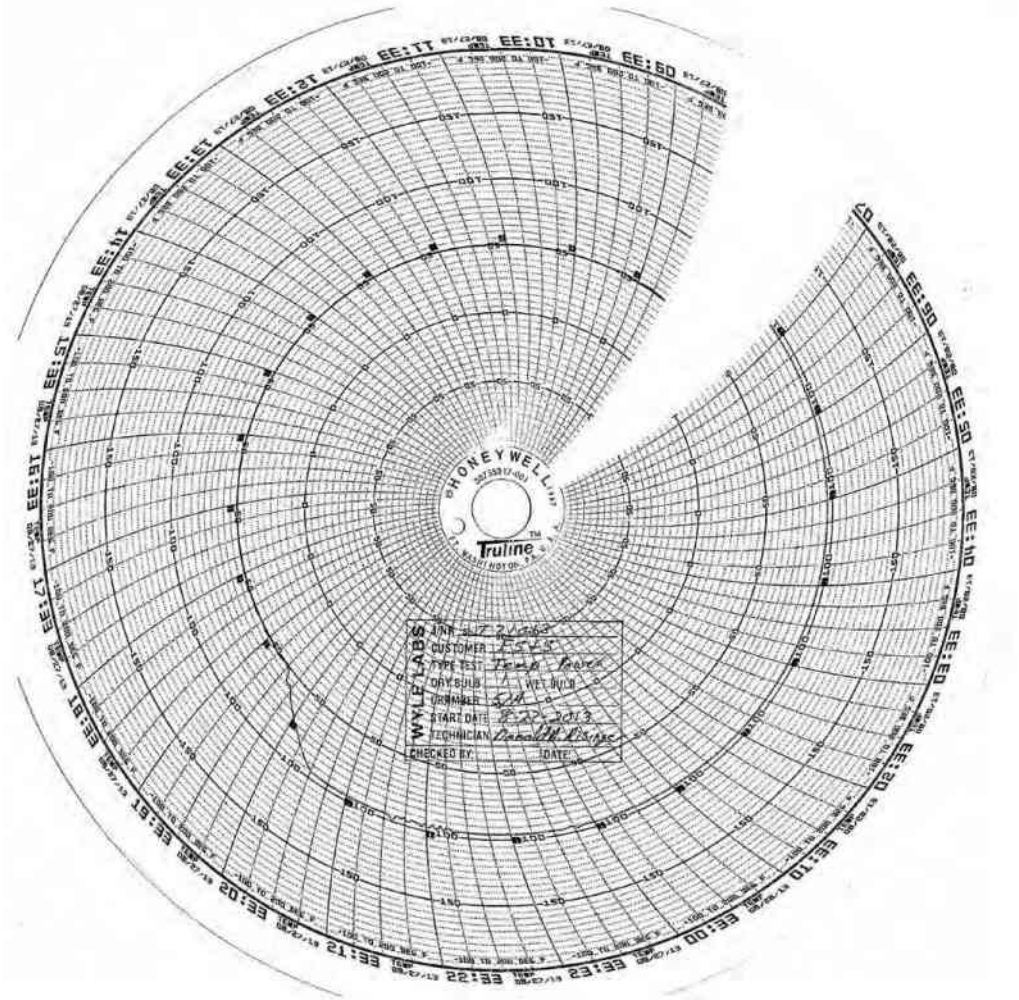
Page ___ of ___

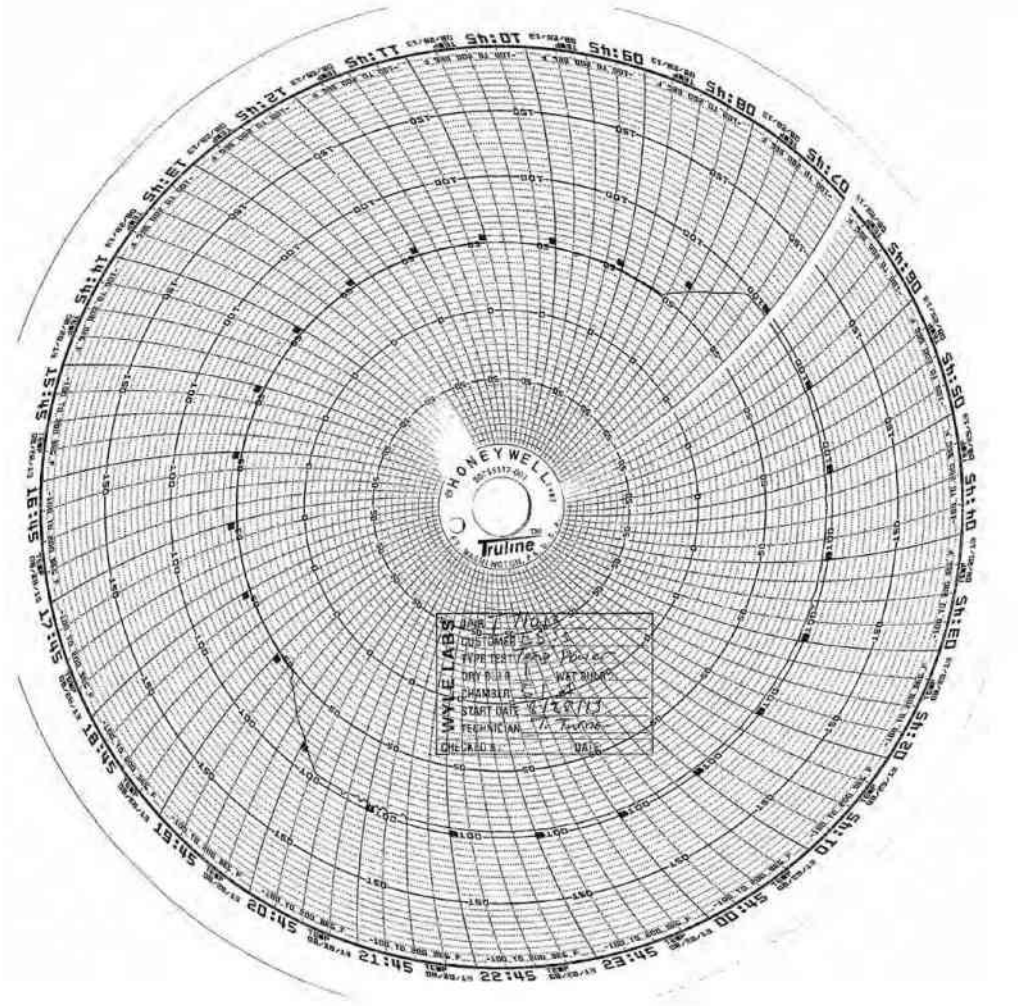
WI-1432, Rev. Dec. 2003

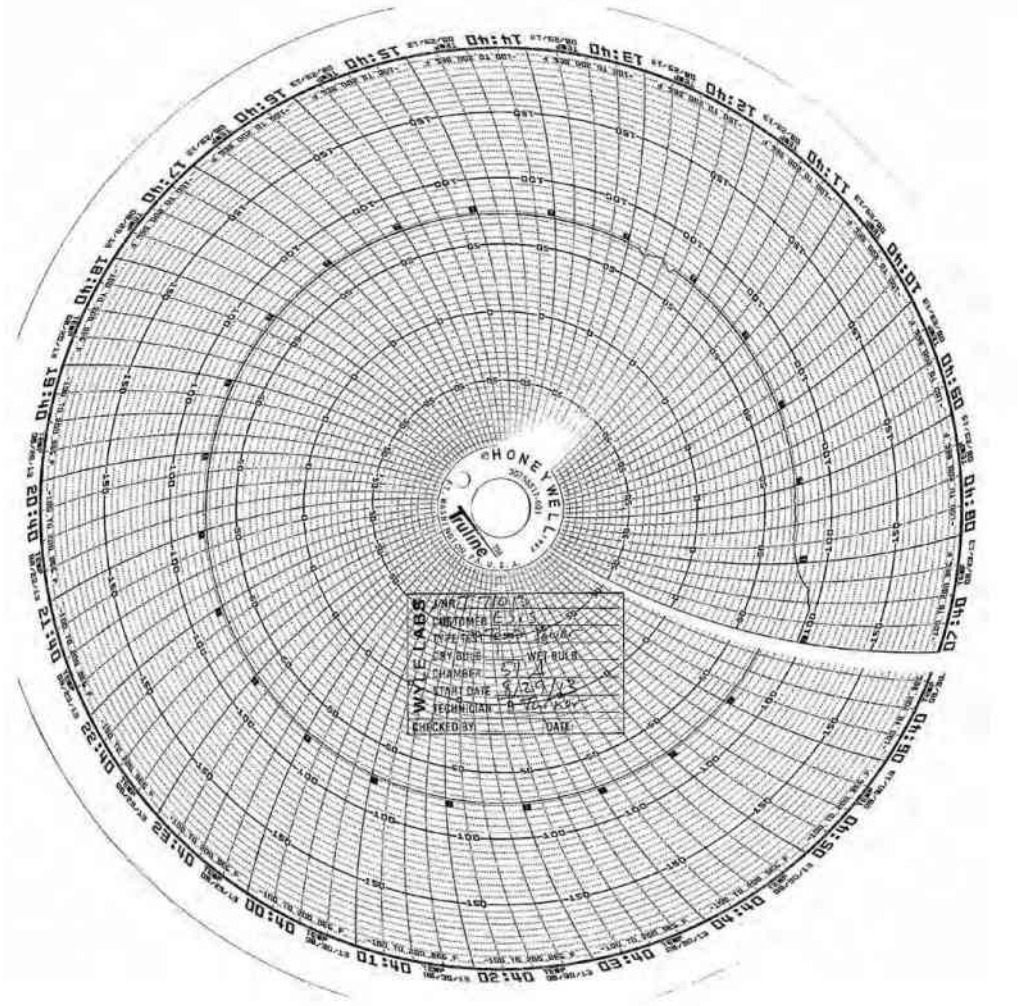
ATTACHMENT E

OPERATING ENVIRONMENTAL TEST DATA

TEMPERATURE/POWER VARIATION TEST DATA


HONEYWELL
Truline
WYLE LABS
CUSTOMER
TYPE TEST
DRY BULB
WET BULB
DRUM NO.
START DATE
TECHNICIAN
CHECKED BY
DATE


HONEYWELL
Truline
WYLE LABS
DATE
CUSTOMER
TYPE TEST
DRY BULB
WET BULB
CHAMBER
START DATE
TECHNICIAN
CHECKED
DATE


WYLE LABS
CHAMBER
START DATE
TECHNICIAN
CHECKED BY
DATE
HONEYWELL
Tullne

ATTACHMENT F

PRODUCT SAFETY CERTIFICATE OF CONFORMANCE

wyle laboratories

7800 Highway 20 West
Huntsville, Alabama 35806
Phone (256) 837-4411
Fax (256) 721-0144
www.wylelabs.com

CERTIFICATE OF CONFORMANCE

Product Safety Review

Wyle Project No. T71013-05
Customer PO ES&S-MSA-TA029
Issue Date 17 September 2013

The device exhibited below has been reviewed in accordance with the particular requirements of applicable sections of UL60950-1, Standard for Safety for Information Technology Equipment, Second Edition, and the Recommended Practice for Unlabeled Electrical Equipment Evaluation, First Edition, (developed by the American Council for Electrical Safety), and has been found to be in compliance.

Product Identification	
Device Description	Voting Scanner/Tabulator
Manufacturer	Election Systems & Software
Device Model No.	DS200
Device Serial No.	DS0313350009
Electrical Ratings	Input 24 VDC – 2A - 80W Max.
Hardware Revision	1.3
Power Supply	
Power Supply Description	ITE Power Supply
Manufacturer	Power-Win Technology Corporation
Model No.	PW080A2-1Y24AP
Input	100-240 VAC – 2A
Output	24 VDC – 3.34A (80W max)
UL Listed ITE PS	UL File No. E156513

This report is valid for the equipment model and serial indicated in the product identification table above. Wyle makes no endorsement of the equipment reviewed, nor does this evaluation constitute approval of similar equipment. This evaluation does not constitute an product listing.

Brian Coppock NCT, Product Safety Supervisor 9/17/13
iNARTE Certified Product Safety Technician No. PS-00438-NCT

Robert D. Hardy, Department Manager 9/17/13
EMI/EMC/FCC, Product Safety, Election Systems, & Packaging

ACCREDITED
Cert. No. 845.01

ATTACHMENT G

INSTRUMENTATION EQUIPMENT SHEETS

wyle laboratories

INSTRUMENTATION EQUIPMENT SHEET

DATE: 7/31/2013 JOB NUMBER: T71013 TYPE OF TEST VVSG 4.1.2.11 CRFI

TECHNICIAN: R.CHAMBERS CUSTOMER: ES&S TEST AREA: EMI CHAMBER 3

No.	Description	Manufacturer	Model	Serial #	WYLE #	RANGE	ACCURACY	Cal Date	Cal Due
1	AMPLIFIER	AR	2500A225	0342861	03485	MFG	NCR	7/24/2013	7/24/2020
2	ATTEN	BIRD	25-T-MN	0129	03142	50 OHMS 25 W.	MFG	6/24/2013	6/24/2014
3	ATTENUATOR	NARDA	769-6	03180	04860	DC to 6GHz	MFG	3/25/2013	3/25/2014
4	DATALOGGER	EXTECH	42280	9051859	04926	-4°F to 144°F/0-	±1°F / ±3%RH	5/14/2013	5/14/2014
5	DIR COUPLER	AMP RESEARCH	DC3010	304022	117208	.01-1000MHz	±0.8dB	5/15/2013	5/15/2014
6	DMM	FLUKE	87V	18290046	01474	4VDC	±0.1%+1	12/6/2012	12/6/2013
7	PASS IMP ADAPT	FISHER CC	FCC-801-150-50-CDI	9784	116854	150KHz-230MH	MFG	6/24/2013	6/24/2014
8	PASSIVE	FISHER CC	FCC-801-150-50-CDI	04049/04050	110405	150KHZ - 230M	MFG	7/20/2012	7/20/2014
9	SIG GEN	MARCONI	2023	112224/092	L12224	9kHz-1.2GHz	±0.8dB	2/11/2013	2/11/2014
10	SPEC ANAL	AGILENT	E446A/H70	US44020335	03123	MFG	MFG	5/10/2013	5/10/2014
11	SPEC ANAL	HP	E4446a	US44020311	04447	44GHz	MFG	8/6/2012	8/6/2013
12	TAPE MEASURER	LUFKIN	HV1048CME	NSN	02708	8meters	±1mm	4/24/2012	4/24/2014

This is to certify that the above instruments were calibrated using state-of-the-art techniques with standards whose calibration is traceable to the National Institute of Standards and Technology.

INSTRUMENTATION: 7/31/13 CHECKED & RECEIVED BY: 07/31/2013

QA: 7/31/13

WH-1029A,REV,APR'99

Page 1 of 1

wyle laboratories

INSTRUMENTATION EQUIPMENT SHEET

DATE: 7/30/2013 JOB NUMBER: T71013 TYPE OF TEST VVSG 4.1.2.8 ESD

TECHNICIAN: J.GALEONE CUSTOMER: ES&S TEST AREA: ESD TEST LAB

No.	Description	Manufacturer	Model	Serial #	WYLE #	RANGE	ACCURACY	Cal Date	Cal Due
1	DISCHARGE	EMC-PARTNER	ESD3000DM1	049	03229	150pF	MFG	7/30/2013	7/30/2014
2	DMM	FLUKE	87V	18290046	01474	4VDC	±0.1%+1	12/6/2012	12/6/2013
3	ESD GUN	EMC-PARTNER	ESD3000	059	04446	16.5 KV	±10%	10/1/2012	10/1/2013
4	ESD TARGET	HAEFELY TRENCI	2520311	152461	110794	15KV	±5%	12/6/2011	12/6/2013
5	OSCILLOSCOPE	TEKTRONIX	DPO5104	C012091	01737	MFG	MFG	10/23/2012	10/23/2013
6	TAPE MEASURER	LUFKIN	1IV104ECME	NSN	02708	8meters	±1mm	4/24/2012	4/24/2014
7	TEMP/HUM/BAR	EXTECH	SD700	Q590477	01539	MULTI	MFG	2/27/2013	2/27/2014

This is to certify that the above instruments were calibrated using state-of-the-art techniques with standards whose calibration is traceable to the National Institute of Standards and Technology.

INSTRUMENTATION: 7/30/13 CHECKED & RECEIVED BY: 07/30/2013

Q.A.: 7/30/13

WH-1029A,REV,APR'99

Page 1 of 1

wyle laboratories

INSTRUMENTATION EQUIPMENT SHEET

DATE: 7/24/2013 JOB NUMBER: T71013 TYPE OF TEST VVSG SECTION 4.1.2.6

TECHNICIAN: R.CHAMBERS CUSTOMER: ES&S TEST AREA: EMI LAB - CHAMBER 3

No.	Description	Manufacturer	Model	Serial #	WYLE #	RANGE	ACCURACY	Cal Date	Cal Due
1	ATTEN	HAEFELY TRENCI	2520111/00	153823-153801	04590	MFG	MFG	3/14/2012	3/14/2014
2	DMM	FLUKE	87V	18290046	01474	4VDC	±0.1%+1	12/6/2012	12/6/2013
3	EFT JUNIOR TSTR	HAEFELY TRENCI	093204.1	83762-14	112575	5NS/50NS	30%	12/28/2012	12/28/2014
4	OSCILLOSCOPE	TEKTRONIX	DPO5104	C012091	01737	MFG	MFG	10/23/2012	10/23/2013
5	TAPE MEASURER	LUFKIN	HV1048CME	NSN	02708	8meters	±1mm	4/24/2012	4/24/2014

This is to certify that the above instruments were calibrated using state-of-the-art techniques with standards whose calibration is traceable to the National Institute of Standards and Technology.

INSTRUMENTATION: 7/24/13 CHECKED & RECEIVED BY: 07/24/2013

Q.A.: 7/24/13

WH-1029A,REV,APR'99

Page 1 of 1

wyle laboratories

INSTRUMENTATION EQUIPMENT SHEET

DATE: 7/30/2013 JOB NUMBER: T71013 TYPE OF TEST FCC PART 15

TECHNICIAN: J.SMITH CUSTOMER: ES&S TEST AREA: OATS 2

No.	Description	Manufacturer	Model	Serial #	WYLE #	RANGE	ACCURACY	Cal Date	Cal Due
1	ATTENUATOR	NARDA	766-20	740582	01444	DC-4 GHz	MFG	3/25/2012	3/25/2014
2	DMM	FLUKE	87	64440152	112518	MULTI	±0.1%+1	6/14/2013	6/14/2014
3	EMI TEST RCVR	ROHDE SCHWARZ	ESCI	100386	117803	MULTI	MFG	4/1/2013	4/1/2014
4	LISN	SOLAR	21107-50-TS-50-N	1125266	01686	MFG	MFG	8/7/2012	8/7/2014
5	LISN	SOLAR	21107-50-TS-50-N	1125267	01687	MFG	MFG	8/7/2012	8/7/2014
6	TAPE MEASURER	LUFKIN	EL15SI	116893	116893	15meter	±1mm	7/12/2011	7/12/2014

This is to certify that the above instruments were calibrated using state-of-the-art techniques with standards whose calibration is traceable to the National Institute of Standards and Technology.

INSTRUMENTATION: 7/30/2013 CHECKED & RECEIVED BY: 7/30/13

Q.A.: 7/30/13

WH-1029A,REV,APR'99

Page 1 of 1

wyle laboratories

INSTRUMENTATION EQUIPMENT SHEET

DATE: 7/29/2013 JOB NUMBER: T71013 TYPE OF TEST VVSG 4.1.2.12 MFI

TECHNICIAN: J.GALEONE CUSTOMER: ES&S TEST AREA: CHAMBER 3

No.	Description	Manufacturer	Model	Serial #	WYLE #	RANGE	ACCURACY	Cal Date	Cal Due
1	AMPLIFIER	TECHRON	7560	015075	04566	600W	NCR	7/8/2008	7/8/2020
2	DMM	FLUKE	87V	18290046	01474	4VDC	±0.1%+1	12/6/2012	12/6/2013
3	METER	HOLADAY	HOL-HI3604	76285	117549	30-2KHz	MFG	2/24/2012	2/24/2014
4	STOP WATCH	HANHART	STRATOS1	110131	110131	10HR	5 sec/day	6/24/2013	6/24/2014
5	TAPE MEASURER	LUFKIN	HV1048CME	NSN	02708	8meters	±1mm	4/24/2012	4/24/2014
6	WAVE GEN	AGILENT	33250A	SG40007026	014181	MULTI	CERT	12/18/2012	12/28/2013

This is to certify that the above instruments were calibrated using state-of-the-art techniques with standards whose calibration is traceable to the National Institute of Standards and Technology.

INSTRUMENTATION: [signature] 7/29/13 CHECKED & RECEIVED BY: [signature] 07/29/2013

Q.A.: Brenda Mask 7/29/13

WH-1029A,REV,APR'99

Page 1 of 1

wyle laboratories

INSTRUMENTATION EQUIPMENT SHEET

DATE: 7/25/2013 JOB NUMBER: T71013 TYPE OF TEST VVSG SEC.4.1.2.5 EPD

TECHNICIAN: R.CHAMBERS CUSTOMER: ES&S TEST AREA: EMI LAB - CHAMBER 3

No.	Description	Manufacturer	Model	Serial #	WYLE #	RANGE	ACCURACY	Cal Date	Cal Due
1	DATALOGGER	EXTECH	42280	9051859	04926	-4°F to 144°F/0-	±1°F / ±3%RH	5/14/2013	5/14/2014
2	DMM	FLUKE	87V	18290046	01474	4VDC	±0.1%+1	12/6/2012	12/6/2013
3	POWER SOURCE	CALIFORNIA INST	1251RP/IF	L06361	117347	0-270VAC RMS	1%	2/20/2013	2/20/2014
4	TAPE MEASURER	LUFKIN	HV1048CME	NSN	02708	8meters	±1mm	4/24/2012	4/24/2014

This is to certify that the above instruments were calibrated using state-of-the-art techniques with standards whose calibration is traceable to the National Institute of Standards and Technology.

INSTRUMENTATION: 7/25/13 CHECKED & RECEIVED BY: 07/25/2013

WH-1029A,REV,APR'99

Page 1 of 1

wyle laboratories

INSTRUMENTATION EQUIPMENT SHEET

DATE: 8/19/2013 JOB NUMBER: 371013 TYPE OF TEST: VVSG4.1.2.10 EST WOP11

TECHNICIAN: R.CHAMBERS CUSTOMER: ES&S TEST AREA: EMI CHAMBER#1

No.	Description	Manufacturer	Model	Serial #	WYLE #	RANGE	ACCURACY	Cal Date	Cal Due
1	AMPLIFIER	AMP RESEARCH	500W1000A	25361	03143	80MHz to 1GHz	NOR	8/22/2012	8/22/2013
2	DATALOGGER	EXTECH	42280	9051859	04926	-4°F to 144°F/0-	±1°F / ±35RH	5/14/2013	5/14/2014
3	DIR COUPLER	AMP RESEARCH	DC3010	304022	117298	01-1000MHz	±0.8dB	5/15/2013	5/15/2014
4	ISOTROPIC PROBE	AMP RESEARCH	FP2000	17657	LI7657	10 KHz - 1 GHz	±0.7 dB	11/8/2012	11/8/2013
5	SIG GEN	AEROFLEX	2023A	202306/068	829330	9KHz-1.2GHz	MFG	10/23/2012	10/23/2013
6	SPEC ANAL	AGILENT	E4446A	US42070108	110948	44 GHz	CERT	2/8/2013	2/8/2014
7	TAPE MEASURER	LUFKIN	HV1048CME	NSN	02708	8meters	41mm	4/24/2012	4/24/2014

This is to certify that the above instruments were calibrated using state-of-the-art techniques with standards whose calibration is traceable to the National Institute of Standards and Technology.

INSTRUMENTATION: 8/19/13 CHECKED & RECEIVED BY: 08/19/2013

Q.A. 8/19/2013

WII-1029A,REV.APR'90

Page 1 of 1

wyle laboratories

INSTRUMENTATION EQUIPMENT SHEET

DATE: 7/22/2013 JOB NUMBER: T71013 TYPE OF TEST VVSG SECTION 4.1.2.7

TECHNICIAN: J.GALEONE CUSTOMER: ES&S TEST AREA: EMI LAB - CHAMBER 3

No.	Description	Manufacturer	Model	Serial #	WYLE #	RANGE	ACCURACY	Cal Date	Cal Due
1	COUPL NETWK	HAEFELY TRENCI	PCD100	149869	R90540	MFG	MFG	7/10/2013	7/10/2015
2	DATALOGGER	EXTECH	42280	9051859	04926	-4°F to 144°F/0-	±1°F / ±3%RH	5/14/2013	5/14/2014
3	IMPULSE MODULE	HAEFELY TRENCI	PIM100	1103	R90538	6kV	MFG	7/10/2013	7/10/2015
4	OSCILLOSCOPE	TEKTRONIX	DPO5104	C012091	01737	MFG	MFG	10/23/2012	10/23/2013
5	STOP WATCH	HANHART	STRATOS1	110131	110131	10HR	5 sec/day	6/24/2013	6/24/2014
6	SURGE TSTR	HAEFELY TRENCI	PSURGE8000	150270	R90537	MULTI	MFG	7/10/2013	7/10/2015

This is to certify that the above instruments were calibrated using state-of-the-art techniques with standards whose calibration is traceable to the National Institute of Standards and Technology.

INSTRUMENTATION: 7/22/13 CHECKED & RECEIVED BY: 7/22/13

Q.A.: Brenda Mace 7/22/13

WH-1029A,REV,APR'99

Page 1 of 1

wyle laboratories

INSTRUMENTATION EQUIPMENT SHEET

DATE: 8/23/2013 JOB NUMBER: T71013 TYPE OF TEST: VIBRATION

TECHNICIAN: D. MEDLEY CUSTOMER: ES&S VOTING SYSTEMS TEST AREA: DYNAMICS

No.	Description	Manufacturer	Model	Serial #	WYLE #	RANGE	ACCURACY	Cal Date	Cal Due
1	ACCELEROMETER	ENDEVCO	7704A-50	13073	02600	50 pC/g / 20-5k	±5%	8/14/2013	2/14/2014
2	ACCELEROMETER	ENDEVCO	7704A-50	12605	04867	50pC/g	±5%	8/14/2013	2/14/2014
3	CHARGE	ENDEVCO	2775A	EE24	112652	GAIN	1.5%	8/20/2013	2/16/2014
4	CHARGE	ENDEVCO	2775A	ED75	112653	GAIN	1.5%	8/20/2013	2/16/2014
5	DMM	FLUKE	45	5095170	114297	MULTI	CERT	6/25/2013	6/25/2014
6	DYN SIG	DATA PHYSICS CC	70499	10004048	02760	MULTI	MFG	9/12/2012	9/12/2013

This is to certify that the above instruments were calibrated using state-of-the-art techniques with standards whose calibration is traceable to the National Institute of Standards and Technology.

INSTRUMENTATION: CHECKED & RECEIVED BY: 8/23/13

Q.A.: 8/23/13

WH-1029A,REV.APR'99

Page 1 of 1

wyle laboratories

INSTRUMENTATION EQUIPMENT SHEET

DATE: 8/19/2013 JOB NUMBER: T71013 TYPE OF TEST: TEMP

TECHNICIAN: T TURNER CUSTOMER: ES&S TEST AREA: CHAMBER 16

No	Description	Manufacturer	Model	Serial #	WYLE #	RANGE	ACCURACY	Cal Date	Cal Due
1	CHART RECORDER	HONEYWELL	DRT45AT-1111	0549Y56B9061	110980	32 TO 131°F	0.5% FS	8/8/2013	8/8/2014 **
2	TEMP ALARM	THERMOTRON	THERM-ALARM	nso	03379	TYPE T	±1°C	8/8/2013	8/8/2014 *
3	TEMP	THERMOTRON	4800	nso	03378	-125-375°F	.25%	8/8/2013	8/8/2014 *

This is to certify that the above instruments were calibrated using state-of-the-art techniques with standards whose calibration is traceable to the National Institute of Standards and Technology.

INSTRUMENTATION: Terance Turner 8/19/13 CHECKED & RECEIVED BY: 08/19/2013

Q.A.: 8/19/2013

WH-1029A,REV,APR'99

Page 1 of 1

wyle laboratories

INSTRUMENTATION EQUIPMENT SHEET

DATE: 8/21/2013 JOB NUMBER: T71013.01 TYPE OF TEST: COLD TEMP

TECHNICIAN: T.J.PARCUS CUSTOMER: ES&S TEST AREA: CHAMBER#16

No.	Description	Manufacturer	Model	Serial #	WYLE #	RANGE	ACCURACY	Cal Date	Cal Due
1	CHART RECORDER	HONEYWELL	DRT45AT-1111	0549Y5689061	110980	32 TO 131°F	0.5% FS	8/8/2013	8/8/2014
2	TEMP ALARM	THERMOTRON	THERM-ALARM	non	03379	TYPE T	±1°C	8/8/2013	8/8/2014
1	TEMP	THERMOTRON	4800	non	03378	-125-375°F	25%	8/8/2013	8/8/2014

This is to certify that the above instruments were calibrated using state-of-the-art techniques with standards whose calibration is traceable to the National Institute of Standards and Technology.

INSTRUMENTATION: 8/21/2013 CHECKED & RECEIVED BY: 8/21/13

Q.A.: 8/21/2013

WI-1029A,REV,APR'99

Page 1 of 1

wyle laboratories

INSTRUMENTATION EQUIPMENT SHEET

DATE: 8/7/2013 JOB NUMBER: T71013 TYPE OF TEST: TEMP-HUM

TECHNICIAN: T.J.PARCUS CUSTOMER: ES&S TEST AREA: CHAMBER#2

No.	Description	Manufacturer	Model	Serial #	WYLE #	RANGE	ACCURACY	Cal Date	Cal Due
1	HUMIDITY\TEMP	VAISALA	HMT315	H1410005	01610	MULTI	MFG	3/4/2013	9/4/2013
2	TEMP	THERMOTRON	SE12005	28417	114758	-70-180°C	0.3°C	3/13/2013	3/13/2014
3	TEMP RECORDER	HONEYWELL	DR4500A	9829Y8369828	114837	-184-371°C	.35°C	3/13/2013	3/13/2014

This is to certify that the above instruments were calibrated using state-of-the-art techniques with standards whose calibration is traceable to the National Institute of Standards and Technology.

INSTRUMENTATION: 8-7-2013 CHECKED & RECEIVED BY: 8/7/2013

Q.A.: 8/7/13

WH-1029A,REV,APR'99

Page 1 of 1

wyle laboratories

INSTRUMENTATION EQUIPMENT SHEET

DATE: 8/26/2013 JOB NUMBER: T71013 TYPE OF TEST TEMP POWER

TECHNICIAN: LARRY IVEY CUSTOMER: ES&S TEST AREA: ENV CHAMBER 51A

No.	Description	Manufacturer	Model	Serial #	WYLE #	RANGE	ACCURACY	Cal Date	Cal Due
1	POWER SOURCE	CALIFORNIA INST	1251RP/IF	L06361	117347	0-270VAC RMS	1%	2/20/2013	2/20/2014
2	TEMP	MICRISTAR	828-B11	10033	108416	-400-700°F	1%FS	12/5/2012	12/5/2013
3	TEMP IND	NEWPORT	Q2001TC	N/A	116533	TYPE T	±1.5%	12/5/2012	12/5/2013
4	TEMP RECORDER	HONEYWELL	DR450T	924488505000	109830	-200-600°F	.4°F	12/5/2012	12/5/2013

This is to certify that the above instruments were calibrated using state-of-the-art techniques with standards whose calibration is traceable to the National Institute of Standards and Technology.

INSTRUMENTATION: Larry Ivey 8/26/13 CHECKED & RECEIVED BY: Michael L Walker 8/26/13

Q.A.: [signature] 8/26/13

WH-1029A,REV.APR'99

Page 1 of 1

APPENDIX C
NOTICES OF ANOMALY

ORIGINAL

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NOTICE OF ANOMALY		DATE: 12/10/2013
Notice No: 1	P.O. Number: ES&S-MSA-TA036	Contact No: N/A
Customer: Election Systems & Software		Wyle Job Number: T71352.01
Notification Made To: Sue McKay		Notification Date: 12/10/13
Notification Made By: Alan Simmons		Via: Email

Category: ☒Specimen ☐Procedure ☐Test Equipment	Date of Anomaly: 12/10/2013
Part Name: EVS 5.0.1.0	Part Number: N/A
Test: TDP Review	Serial/ID Number: N/A
Specification: 2005 VVSG Volume 1	Paragraph/Section Number: Section 2

REQUIREMENTS:

The ES&S EVS 5.0.1.0 Voting System Technical Data Package (TDP) shall be reviewed for accuracy, completeness, and compliance to the EAC 2005 VVSG.

DESCRIPTION OF ANOMALY:

Review of the summited documentation revealed discrepancies between the TDP and the EAC 2005 VVSG requirements. Functional testing also identified text in the TDP that conflicted with the actual operations of the system. Each noted discrepancy was documented in detail in the Wyle generated TDP issues matrix that is on file as raw data.

DISPOSITION * COMMENTS * RECOMMENDATIONS:

EVS 5.0.1.0 is a Modification of a previously certified system. As such the TDP was only reviewed where modified or where impacted by system modification. ES&S corrected each nonconformance observation and resubmitted the associated documents for review. This process continued until it appeared that the TDP complied with all applicable requirements.

Potential 10 CFR Part 21 ☐Yes ☒No	
Responsibility to analyze anomalies and comply with 10 CFR PART 21 ☐ Customer ☐ Wyle	
CAR Required: ☐Yes ☒No	CAR Number:

VERFICATION

Test Witness: None	Project Engineer: 12-10-13
Representing: N/A	Project Manager: 12-10-13
Quality Assurance: 12/10/2013	

WH-1066, Rev. MAR '09

Page 1 of 1

ORIGINAL

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NOTICE OF ANOMALY		DATE: 12/10/2013
Notice No: 2	P.O. Number: ES&S-MSA-TA036	Contact No: N/A
Customer: ES&S		Wyle Job Number: T71352.01
Notification Made To: Sue McKay		Notification Date: 12/10/13
Notification Made By: Jim Falwell		Via: Email
Category: ☒Specimen ☐Procedure ☐Test Equipment		Date of Anomaly: 12/10/13
Part Name: DS200		Part Number: N/A
Test: Source Code Review		Serial/ID Number: N/A
Specification: 2005 VVSG Volume I		Paragraph/Section Number: Section 5

REQUIREMENTS:

Software used in voting systems shall meet the essential design and performance characteristics detailed in Section 5 of the EAC 2005 VVSG.

DESCRIPTION OF ANOMALY:

Review of the submitted source code modules comprising the EVS 5.0.1.0 system revealed deviations from the standard as well as issues with the commenting. These anomalies are documented in detail in the Wyle generated review reports on file as raw data.

DISPOSITION * COMMENTS * RECOMMENDATIONS:

Upon completion of the review for each source code submission, a technical summary report of all identified standards violations was sent to ES&S for resolution. ES&S then corrected the reported violations and re-submitted the source code for re-review. This process was repeated as many times as necessary until all identified standards violations were corrected.

Potential 10 CFR Part 21	☐Yes ☒No	
Responsibility to analyze anomalies and comply with 10 CFR PART 21	☐ Customer ☐ Wyle	
CAR Required: ☐Yes ☒No	CAR Number:	

VERFICATION

Test Witness: None	Project Engineer: 12/10/2013
Representing: N/A	Project Manager: 12/10/13
Quality Assurance: 12/10/2013	

WH-1066, Rev. MAR '09

Page 1 of 1

APPENDIX D
TECHNICAL DATA PACKAGE (TDP) ISSUES REPORT

ID	Category	Status	Summary
59	TDP	closed	DS200HW_M_SPC_0313_HWSpec, pg 41, section 3.2.1.4 (old Issue #1)
60	TDP	closed	EVS5010_OVR, pdf pg 62, DS200, Specifications, Connectivity (old Issue #2)
64	TDP	closed	EVS5010_OVR00, Section 1.8, Benchmark Directory Listings (pg 26), #3
65	TDP	closed	EVS5010_OVR00, Section 1.8, Benchmark Directory Listings (pg 26), #5, 6, 7, 8, 9, 11, & 12
66	TDP	closed	EVS5010_OVR00, Section 1.8, Benchmark Directory Listings (pg 26), # 7
70	TDP	closed	EVS5010_DOC_D_1200_ChangeNotes
71	TDP	closed	EVS5010_DOC_D_1200_ChangeNotes
85	TDP	closed	EAC RFI 2008-05
87	TDP	closed	VVSG VII, 2.13.d

APPENDIX E
EVS 5.0.1.0 AS-RUN TESY PLAN

wyle laboratories
7800 Highway 20 West
Huntsville, Alabama 35806
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Job No. T71352.01
Test Plan No. T71352.01 Rev A
December 19, 2013

CERTIFICATION TEST PLAN

Prepared for:

Manufacturer Name	ES&S
Manufacturer System	EVS 5.0.1.0
EAC Application No.	**ESS1302**
Manufacturer Address	11208 John Galt Boulevard Omaha, NE 68137

12-19-13
James Long, Test Plan Preparer

12-19-13
Frank Padilla, Voting Systems Manager

12/19/13
Robert D. Hardy, Department Manager

12/19/13
Rick Davis, Q.A. Manager

A	12-19-13	Pg. 12 Section 3.1	Added period to end of sentence
A	12-19-13	Pg. 12 Section 3.1	Added reference to COTS software location
A	12-19-13	Pg. 15 Section 4.0	Corrected grammar
A	12-19-13	Pg. 17 Section 4.2	Removed Hardware descriptor from the election definition title
A	12-19-13	Pg. 18 Section 4.4.1	Added titles to test report numbers
A	12-19-13	Pg. 18 Section 4.4.1	Improved readability
A	12-19-13	Pg. 20 Section 4.4.2	Added explanation of factors considered when determining regression testing
A	12-19-13	Pg. 22 Section 4.4.3	Added wording to limit scope of requirements review
A	12-19-13	Pg. 25 Section 4.6	Corrected grammar
A	12-19-13	Pg. 26 Section 4.6	Changed Anomaly to Discrepancy
A	12-19-13	Pg. 38 Section 6.3.3	Corrected grammar
A	12-19-13	Pg. 39 Section 6.3.3	Added QA/CM testing explanation
A	12-19-13	Appendix B	Added Appendix B

TABLE OF CONTENTS

TABLE OF CONTENTS

APPENDICES

1.0 INTRODUCTION

The purpose of this National Certification Test Plan is to document the procedures that Wyle Laboratories, Inc. will follow to perform certification testing of the Election Systems and Software (ES&S) EVS 5.0.1.0 Voting System to the requirements set forth for voting systems in the U.S. Election Assistance Commission (EAC) 2005 Voluntary Voting System Guidelines (EAC 2005 VVSG). Prior to submitting the system for certification testing, ES&S submitted an application to the EAC for certification of the EVS 5.0.1.0 modification to the previously-certified EVS 5.0.0.0 (Certification Number: ESSEVS5000) Voting System. This Test Plan follows Notice of Clarification 09-005: Development and Submission of Test Plans for Modifications to EAC Certified Systems and Notice of Clarification 13-02: Detailed Description of Changes for Modifications.

1.1 Established Baseline System

The baseline system for this modification is the EVS 5.0.0.0 Voting System. Table 1-1 describes the certified equipment and firmware versions. For full details about the EVS 5.0.0.0 test campaign refer to Wyle Laboratories' Test Report No. T59087.01-01 Rev A posted on the EAC website.

Table 1-1 EVS 5.0.0.0 Voting System Hardware Components

Component	Hardware Version	Firmware Version
DS200	1.2.1.0	2.7.0.0
AutoMARK™ A100	1.0	1.8.1.0
AutoMARK™ A200 (SBC 2.0)	1.1	1.8.1.0
AutoMARK™ A200 (SBC 2.5)	1.1	1.8.1.0
AutoMARK™ A300 (SBC 2.0)	1.3	1.8.1.0
AutoMARK™ A300 (SBC 2.5)	1.3	1.8.1.0
DS850	1.0	2.4.0.0

Table 1-2 EVS 5.0.0.0 Voting System Software Components

Component	Version
ElectionWare	4.1.0.0
Election Reporting Manager (ERM)	8.6.0.0
ES&S Event Log Service	1.5.0.0
VAT Previewer	1.8.1.0
Removable Media Service	1.4.0.0

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1.0 INTRODUCTION (Continued)

1.2 Scope of Modification

The purpose of this modification is to add the DS200 hardware Version 1.3, DS200 1.2 hardware with ECO 1281 applied (DS200 hardware Version 1.2.3.0) and Datawin update to the DS850. All modifications are to the previously-certified voting system EVS 5.0.0.0. The system modification is limited to the DS200 hardware and software required to for the new hardware and the Datawin update. No new features or functions are being introduced.

The changes to the DS200 hardware for version 1.3 include:

- New Motherboard – VT6070 Mini-ITX (Replace EOL, 'End-of-Life')
- New System RAM – DDR3 Ram Module (Replaced to fit new motherboard)
- New Scanner Board – (Replace EOL)
- Removal of the ATX power supply (now incorporated in the motherboard)
- ECO 1281 – DS200 Transport Assembly
  - Redesign spring plate (improve handling of damaged ballots)
  - Redesign beveled Contact Image Sensor (improve handling of damaged ballots)
  - Add the ultrasonic detect shield and grommet
  - Redesign closing linkage
  - Revise fit and tolerance on five sheet metal parts (improve manufacturing tolerances)
    - Right side of the transport assembly – change round holes to slots to allow horizontal adjustability in stainless steel guide plates
    - Bottom front stainless steel platen – add additional clearance around bushing openings to allow horizontal adjustability in stainless steel guide plates
    - Drive belt cover on the left side of transport – added access holes for CIS mounting hardware
    - Bottom rear stainless steel platen – add additional clearance around bushing openings to allow horizontal adjustability in stainless steel guide plates
    - Top front stainless steel platen – add additional clearance around bushing openings to allow horizontal adjustability in stainless steel guide plates
- Replace CFL backlight with LED backlight (Replace EOL)
- Removable rails for attachment to ballot box (Replace built in feet)
- Battery access door
- Improve power/close switch fit
- Plastic housing change to update company logo

The changes to the DS200 hardware for version 1.2.3.0 include ECO 1281 (described above).

The changes to the DS200 2.7.0.0 software include:

- Print scanner board hardware type on tape
- Implemented the use of the 8-bit "Scanner ID" field to report the scanner board firmware
- Integrated ability to read and report Power Management Board firmware version
- Report motherboard version on configuration report and in log
- Modify HAL for new VIA motherboard

Datawin issued updates to their COTS firmware on the DS850. There were no proposed changes or modifications to the proprietary firmware on the DS850. The Datawin firmware change increased the rising and lowering speed of the input and output trays.

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1.0 INTRODUCTION (Continued)

1.3 Initial assessment

The DS200 Version 1.3 hardware has been submitted for testing in a previous state campaign for the State of Florida (FL EVS 4.5.0.0) concluded on September 18, 2013. Wyle Laboratories' personnel have analyzed the results of the EVS4500 testing, Wyle Test Report No. T71013.01-01, to determine prior testing acceptance. The details of this analysis are in Section 4.4.1 Hardware Qualitative Examination Design. Based on this analysis, all hardware testing from the FL EVS 4.5.0.0 test campaign was determined to be meet the requirements for reuse. As part of the EVS 5.0.1.0 test campaign, the DS200 hardware Version 1.3 shall be subjected to functional configuration audit (FCA), accuracy, maintainability, accessibility, usability, security, physical configuration audit (PCA), system integration, reliability, and electrical supply testing. In addition, to verify that the modifications to the DS200 do not introduce any nonconformities or instabilities, the EMS and DS200 shall be subjected to a system integration test to ensure all components interact properly.

The DS200 Version 1.2.3.0 hardware incorporates ECO1281 into the previously-certified (EVS 5.0.0.0) 1.2.1.0 hardware. ECO1281 was conditionally approved by the EAC on the condition that the change will be tested in the next EAC certification effort. Based on the EAC response to ECO1281, Wyle Laboratories will conduct accuracy and reliability tests.

The Datawin update will require testing to verify that the change does not cause to the DS850 to function improperly. A functional test will be designed to ensure the DS850 input and output trays function as described by ES&S.

The software utilized for the EVS 5.0.1.0 campaign will comprise of the certified EVS 5.0.0.0 software (taken from the Wyle Trusted Build) with the addition of the DS200 2.7.1.0 code changes. The DS200 code will be compared to the EVS 5.0.0.0 Version to determine the extent of the source code review required. Based on this examination, Wyle Laboratories' personnel will perform a software code review on all modified code to ensure that all applicable VVSG requirements are met and changes to the software do not introduce any new functions or features outside of the modifications detailed above.

An initial assessment has been performed on the TDP submitted by ES&S for EVS 5.0.1.0. The initial assessment determined that all required documents were delivered to enable the TDP review. The TDP is constructed with the EVS 5.0.0.0 certified TDP and the EVS 5.0.1.0 changes as an addendum.

1.4 References

The documents listed below were used in the development of the Test Plan and will be utilized to perform certification testing.

- Election Assistance Commission 2005 Voluntary Voting System Guidelines, Volume I, Version 1.0, "Voting System Performance Guidelines," and Volume II, Version 1.0, "National Certification Testing Guidelines," dated December 2005
- Election Assistance Commission Testing and Certification Program Manual, Version 1.0, effective date January 1, 2007
- Election Assistance Commission Voting System Test Laboratory Program Manual, Version 1.0, effective date July 2008
- National Voluntary Laboratory Accreditation Program NIST Handbook 150, 2006 Edition, "NVLAP Procedures and General Requirements (NIST Handbook 150)," dated February 2006

1.0 INTRODUCTION (Continued)

1.4 References (Continued)

- National Voluntary Laboratory Accreditation Program NIST Handbook 150-22, 2008 Edition, "Voting System Testing (NIST Handbook 150-22)," dated May 2008
- United States 107th Congress Help America Vote Act (HAVA) of 2002 (Public Law 107-252), dated October 2002
- Wyle Laboratories' Test Guidelines Documents: EMI-001A, "Wyle Laboratories' Test Guidelines for Performing Electromagnetic Interference (EMI) Testing," and EMI-002A, "Test Procedure for Testing and Documentation of Radiated and Conducted Emissions Performed on Commercial Products"
- Wyle Laboratories' Quality Assurance Program Manual, Current Revision
- ANSI/NCSL Z540-1, "Calibration Laboratories and Measuring and Test Equipment, General Requirements"
- ISO 10012-1, "Quality Assurance Requirements for Measuring Equipment"
- EAC Requests for Interpretation (listed on www.eac.gov)
- EAC Notices of Clarification (listed on www.eac.gov)
- EAC Quality Monitoring Program residing on:

  http://www.eac.gov/testing_and_certification/quality_monitoring_program.aspx
- Wyle Test Report No. T71013.01-01 – Hardware Compliance Testing of Election Systems and Software EVS 4.5.0.0 DS200 Hardware Version 1.3
- Wyle Test Report No. T59087.01-01 – National Certification Test Report of Election Systems and Software EVS 5.0.0.0

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1.0 INTRODUCTION (Continued)

1.5 Terms and Abbreviations

This subsection defines all terms and abbreviations applicable to the development of this Test Plan.

Table 1-3 Terms and Abbreviations

Term	Abbreviation	Definition
Americans with Disabilities Act of 1990	ADA	ADA is a wide-ranging civil rights law that prohibits, under certain circumstances, discrimination based on disability.
Configuration Management	CM	---
Commercial Off the Shelf	COTS	Commercial, readily available hardware or software.
United States Election Assistance Commission	EAC	Commission created per the Help America Vote Act of 2002, assigned the responsibility for setting voting system standards and providing for the voluntary testing and certification of voting systems.
ES&S Event Log Service	ELS	---
Election Management System	EMS	Within the EVS 5.0.1.0 Voting System, the EMS is comprised of five components: ElectionWare, ERM, ES&S Event Log Service, and VAT Previewer.
Election Reporting Manager	ERM	EVS EMS reporting component.
Election Systems and Software	ES&S	---
Equipment Under Test	EUT	Refers to the individual system component or multiple piece of the same component
ES&S Voting System	EVS	---
Functional Configuration Audit	FCA	Verification of system functions and combination of functions cited in the manufacturer's documentation.
Help America Vote Act	HAVA	Act created by United States Congress in 2002.
Intelligent Mark Recognition	IMR	Visible light scanning technology to detect completed ballot targets.
National Institute of Standards and Technology	NIST	Government organization created to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhances economic security and improves our quality of life.

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1.0 INTRODUCTION (Continued)

1.5 Terms and Abbreviations (Continued)

Table 1-3 Terms and Abbreviations (Continued)

Term	Abbreviation	Definition
Physical Configuration Audit	PCA	Review by accredited test laboratory to compare voting system components submitted for certification testing to the manufacturer's technical documentation, and confirmation the documentation meets national certification requirements. A witnessed build of the executable system is performed to ensure the certified release is built from tested components.
Quality Assurance	QA	–
System Under Test	SUT	Refers to the system as a whole (all components)
Secure File Transfer Protocol	SFTP	A network protocol that provides file access, file transfer, and file management functionality over any reliable data stream.
Technical Data Package	TDP	Manufacturer documentation related to the voting system required to be submitted as a precondition of certification testing.
Underwriters Laboratories Inc.	UL	---
Uninterruptible Power Supply	UPS	---
Voter Assist Terminal	VAT	The electronic ballot marking device component is the ES&S AutoMARK™.
Voluntary Voting System Guidelines	EAC 2005 VVSG	Published by the EAC, the third iteration of national level voting system standards.
Wyle Laboratories, Inc.	Wyle	---
Wyle Operating Procedure	WoP	Wyle Laboratories Test Method or Test Procedure.
Voting System Test Laboratory	VSTL	Wyle Laboratories
Voluntary Voting System Guidelines	VVSG	EAC Voluntary Voting System Guidelines V. 1.0

1.6 Testing Responsibilities

Prior to the development of this test plan, Wyle Laboratories evaluated test results from two previous test campaigns performed by Wyle Laboratories, EVS 5.0.0.0 and FL EVS 4.5.0.0. The purpose of this evaluation was to determine the scope of testing required for system certification. Following the review, Wyle Laboratories determined that testing from previous test campaigns could be utilized to satisfy the requirements of this test campaign. See section 2.1 and 4.4.1 for the details of this review. All other core and non-core software and hardware certification testing shall be conducted under the guidance of Wyle Laboratories' personnel verified by Wyle Laboratories to be qualified to perform the testing.

1.6.1 Project Schedule

This information is contained in a Wyle Laboratories' generated Microsoft Project schedule. This schedule is presented in Appendix A, "ES&S Project Schedule." The dates on the schedule are not firm dates but planned estimates presented for informational purposes.

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1.0 INTRODUCTION (Continued)

1.6 Testing Responsibilities (Continued)

1.6.2 Test Case Development

Wyle Laboratories will utilize the "Wyle Baseline Test Cases" for the Usability and System Integration Tests. These shall be augmented with specially-designed test cases tailored to the EVS 5.0.1.0 Voting System. Wyle Laboratories has designed specific election definition and test cases for the Operational Status Check and the Accuracy Tests.

1.6.3 Test Procedure Development and Validation

Wyle Laboratories will utilize the Wyle Operating Procedures (WoPs) during the duration of this test program. The validated WoPs have been previously submitted to the EAC for review.

1.6.4 Third-Party Tests

Wyle Laboratories will not utilize any 3rd party testing during performance of the EVS 5.0.1.0 test campaign.

1.7 Target of Evaluation Description

The following sections address the design methodology and product description of the EVS 5.0.1.0 Voting System as taken from the ES&S technical documentation.

1.7.1 System Overview

The ES&S EVS 5.0.1.0 Voting System is a comprehensive suite of vote tabulation equipment and software solutions providing end-to-end election management. The EVS 5.0.1.0 Voting System includes the following core system components detailed in Tables 1-4 and 1-5.

Table 1-4 EVS 5.0.1.0 Voting System Hardware Components

Component	Hardware Version	Firmware Version
DS200	1.3	2.7.1.0
DS200	1.2.1.0	2.7.1.0
DS200	1.2.3.0	2.7.1.0
AutoMARK™ A100	1.0	1.8.1.0
AutoMARK™ A200 (SBC 2.0)	1.1	1.8.1.0
AutoMARK™ A200 (SBC 2.5)	1.1	1.8.1.0
AutoMARK™ A300 (SBC 2.0)	1.3	1.8.1.0
AutoMARK™ A300 (SBC 2.5)	1.3	1.8.1.0
DS850	1.0	2.4.0.0

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1.0 INTRODUCTION (Continued)

1.7 Target of Evaluation Description (Continued)

1.7.1 System Overview (Continued)

Table 1-5 EVS 5.0.1.0 Voting System Software Components

Component	Version
ElectionWare	4.1.0.0
Election Reporting Manager (ERM)	8.6.0.0
ES&S Event Log Service	1.5.0.0
VAT Previewer	1.8.1.0
Removable Media Service	1.4.0.0

Precinct Ballot Tabulator: DS200

The precinct ballot tabulator component is the DS200. The DS200 is a digital scan paper ballot tabulator designed for use at the polling place level. After the voter marks a paper ballot, their ballot is inserted into the unit and immediately tabulated. The tabulator uses a high-resolution image-scanning device to image the front and rear of the ballot simultaneously. The resulting ballot images are then decoded by a proprietary recognition engine.

The system includes a 12-inch touch screen display providing voter feedback and poll worker messaging. Once a ballot is tabulated and the system updates internal vote counters, the ballot is dropped into an integrated ballot box. The DS200 includes an internal thermal printer for the printing of the zero reports, log reports, and polling place totals upon the official closing of the polls.

Electronic Ballot Marking Device: AutoMARK™ Voter Assist Terminal (VAT)

The electronic ballot marking device component is the ES&S AutoMARK™ Voter Assist Terminal (VAT). The AutoMARK™ VAT assists voters with disabilities by marking optical scan ballots.

The AutoMARK™ VAT includes two user interfaces to accommodate voters who are visually or physically impaired or voters who are more comfortable reading or hearing instructions and choices in an alternative language. The AutoMARK™ is equipped with a touch-screen and keypad. The touch-screen interface includes various colors and effects to prompt and guide the voter through the ballot marking process. Each key has both Braille and printed text labels designed to indicate function and a related shape to help the voter determine its use.

Regardless whether the voter uses the touch-screen or other interface, changes can be made throughout the voting process by navigating back to the appropriate screen and selecting the change. Voters can also alter selections at the mandatory vote summary screen that closes the ballot-marking session.

1.0 INTRODUCTION (Continued)

1.7 Target of Evaluation Description (Continued)

1.7.1 System Overview (Continued)

Tabulator: DS850

The DS850 is a high-speed, digital scan central ballot counter. During scanning, the DS850 prints a continuous audit log to a dedicated audit log printer and can print results directly from the scanner to a second connected printer. The scanner saves results internally and to results collection media (USB flash media) that officials can use to format and print results from a PC running Election Reporting Manager. The DS850 has an optimum throughput rate of 200 ballots per minute and uses cameras and imaging algorithms to image the front and back of a ballot, evaluate the results, and sort ballots into discrete bins to maintain continuous scanning.

EMS Client/Server Configuration

EVS 5.0.1.0 Voting System Election Management System (EMS) will be configured with a Server running Windows Server 2008 R2 and a combination of a client laptop and a client desktop running Windows 7 Professional.

1.7.2 System Software

The EVS 5.0.1.0 Voting System EMS is an application suite comprised of five components: ElectionWare, Election Reporting Manager (ERM), Removable Media Service (RMS), ES&S Event Log Service (ELS), and VAT Previewer.

ElectionWare

ElectionWare integrates the election administration functionality into a unified application. Its intended use is to define an election and create the resultant media files used by the DS200 tabulator, AutoMARK™ Voter Assist Terminal (VAT), the DS850 Central Ballot Scanner, and Election Reporting Manager (ERM). An integrated ballot viewer allows election officials to view the scanned ballot and captured ballot data side-by-side and produce ballot reports.

Election Reporting Manager (ERM)

Election Reporting Manager (ERM) generates paper and electronic reports for election workers, candidates, and the media. Jurisdictions can use a separate ERM installation to display updated election totals on a monitor as ballot data is tabulated, and send the results' reports directly to the media outlets.

ERM supports accumulation and combination of ballot results data from all ES&S tabulators. Precinct and accumulated total reports provide a means to accommodate candidate and media requests for totals and are available upon demand. High-speed printers are configured as part of the system accumulation/reporting stations PC and related software.

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1.0 INTRODUCTION (Continued)

1.7 Target of Evaluation Description (Continued)

1.7.2 System Software (Continued)

Removable Media Service (RMS)

Removable Media Service (RMS) is an application that runs in the background of the EMS client workstation and supports the installation and removal of election and results media.

ES&S Event Log Service (ELS)

ES&S Event Log Service is a Windows Service that runs in the background of any active ES&S Election Management software application to monitor the proper functioning of the Windows Event Viewer. The ES&S Event Log Service closes any active ES&S software application if the system detects the improper deactivation of the Windows Event Viewer.

VAT Previewer

The VAT Previewer is an application within the EMS program that allows the user to preview audio text and screen layout prior to burning Election Day media for the AutoMARK™.

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1.0 INTRODUCTION (Continued)

1.7 Target of Evaluation Description (Continued)

1.7.3 System Operational Concept

The operational flow and low-level system interfaces for the EVS 5.0.0.0 Voting System is illustrated in Figure 1-1.

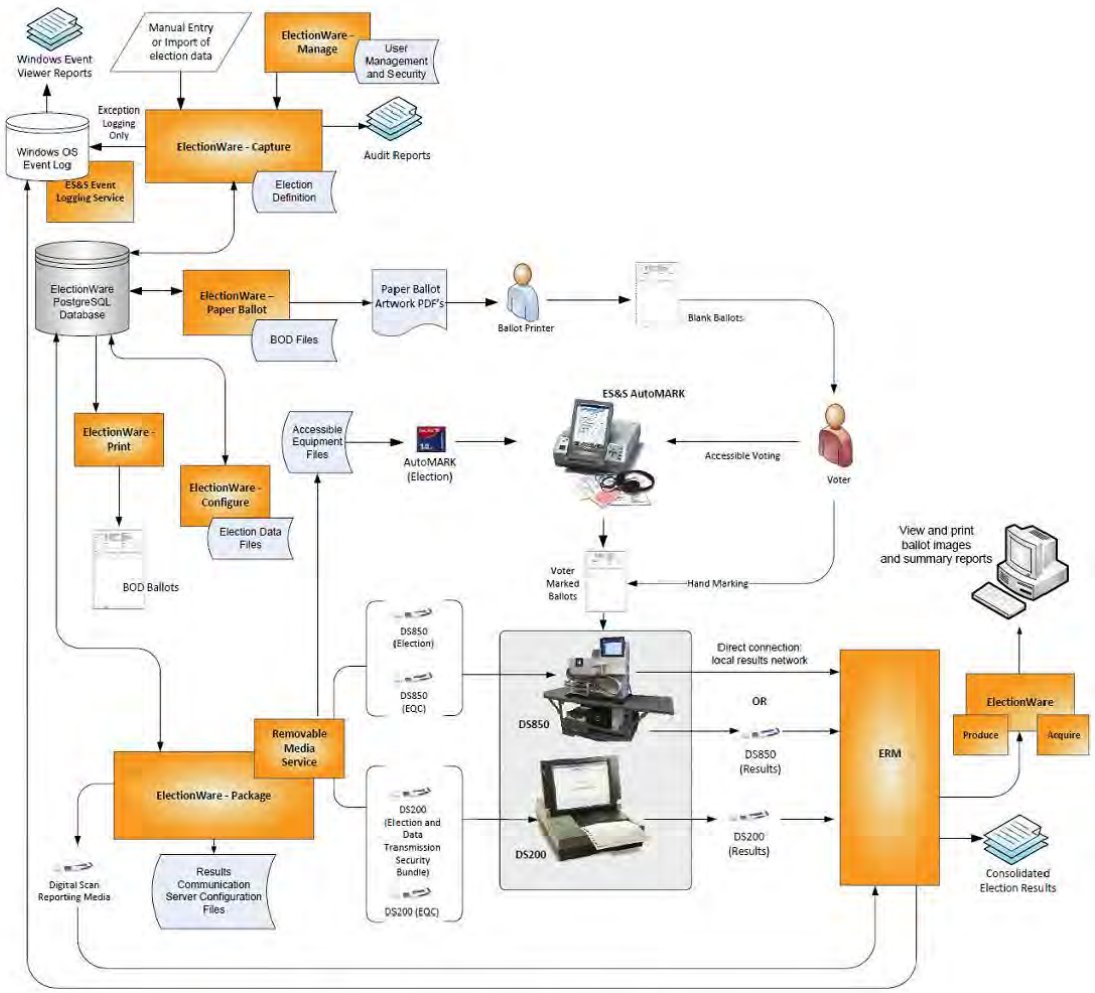

Figure 1-1 System Overview Diagram

2.0 PRE-CERTIFICATION TESTING AND ISSUES

Wyle Laboratories has conducted a pre-certification review, and findings indicate that all system changes are consistent with the change items documented in the EAC Application ESS1302.

2.1 Evaluation of Prior VSTL Testing

ES&S submitted the following test report to Wyle Laboratories for reuse consideration. The report and item requested for reuse are as follows:

- Wyle Test Report No. T71013.01-01
  - Electrical Power Disturbance
  - Electromagnetic Radiation
  - Electrostatic Disruption
  - Electrical Power Disturbance
  - Electromagnetic Susceptibility
  - Electrical Fast Transient
  - Lightning Surge
  - Conducted RF Immunity
  - Magnetic Fields Immunity
  - Product Safety Review, UL60950-1
  - Temperature Power
  - High/Low Temperature
  - Humidity
  - Vibration
  - Bench Handling

For details of the acceptance of the above items, refer to Section 4.4.1 of this test plan.

2.2 Known Field Issues

EVS 5.01.0 is a modification to EVS 5.0.0.0 and is included in the larger EVS family of products. There were no published systemic or significant issues traceable to the EVS family of systems.

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3.0 MATERIALS REQUIRED FOR TESTING

The materials required for certification testing of the EVS 5.0.1.0 Voting System include software, hardware, test materials, and deliverable materials to enable the test campaign to occur were shipped directly to Wyle Laboratories by ES&S. The equipment that will be used during this test is the same equipment used during the original certification campaign.

3.1 Software

Table 3-1 lists the software the manufacturer has submitted for testing. This section lists all software required for operation and testing of the voting system being certified. This includes the software used for testing accuracy and system integration; as well as supporting software required for the test environment. All COTS software is listed in Appendix B COTS Software

Table 3-1 EVS 5.0.1.0 Software Submitted for Testing

Software Required For Testing	Software Version
Proprietary Software	
ES&S Event Log Service	1.5.0.0
ElectionWare	4.1.0.0
Election Reporting Manager (ERM)	8.6.0.0
Removable Media Service	1.4.0.0
DS200	2.7.1.0
AutoMARK™	1.8.1.0
VAT Previewer	1.8.1.0

3.2 Equipment

This subsection categorizes the equipment the manufacturer submitted for testing listed in Table 3-2. Each test element is included in the list of equipment required for testing of that element, including system hardware, general purpose data processing and communications equipment, and any required test instrumentation.

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3.0 MATERIALS REQUIRED FOR TESTING (Continued)

3.2 Equipment (Continued)

Table 3-2 EVS 5.0.1.0 Voting System Equipment Description

Equipment	Description	Serial Numbers/Designation
DS200 • Hardware v. 1.2.1 .0 • Firmware v. 2.7.1.0	Precinct Count Optical Scanner	ES0108340026
DS200 • Hardware v. 1.2 .1.0 • Firmware v. 2.7.1.0	Precinct Count Optical Scanner	DS0113340087
DS200 • Hardware v. 1.2.3.0 • Firmware v. 2.7.1.0	Precinct Count Optical Scanner	DS0113360186
DS200 • Hardware v. 1.3 • Firmware v. 2.7.1.0	Precinct Count Optical Scanner	DS0313350002
DS200 • Hardware v. 1.3 • Firmware v. 2.7.1.0	Precinct Count Optical Scanner	DS0313350010
AutoMARK™ A100 • Hardware v. 1.0 • Firmware v. 1.8.1.0	Accessible voting Station	AM0106431607
AutoMARK™ A200 • Hardware v. 1.1 • Firmware v. 1.8.1.0	Accessible voting Station	AM0308421809
Ballot Box Hardware v. 1.2 & 1.3	Plastic Ballot Box	Box1; Box 2; Box 3; Box 4; Box 5; Box 01; Box 02; E089; E099
Ballot Box Hardware v. 1.0, 1.1, & 1.2	Metal Box with Diverter	Box 12
Server PC	Dell PowerEdge T410	4D6BQM1
Server PC	Dell PowerEdge T710	JPZ6VR1
Client PC	Dell OptiPlex 980	3TZJFQ1
Client PC	Dell Latitude E6410	232F0M1
Transport Media (USB Flash Drives)	Delkin 512MB Delkin 1GB Delkin 2 GB Delkin 4GB Delkin 8GB	Wyle-assigned: TM-XXX*
Compact Flash	Delkin Devices 1 GB Compact Flash	Wyle-assigned: CF-XXX*
Report Printer	OKI B6300	USQX074394
Headphones	Avid FV 60	HP-57936-1- 9

3.0 MATERIALS REQUIRED FOR TESTING (Continued)

3.2 Equipment (Continued)

A list of equipment/materials used is available upon request to the EAC and will be made available to NVLAP and EAC audit teams.

3.3 Deliverable Materials

The materials listed in Table 3-3 are to be delivered as part of the EVS 5.0.1.0 Voting System to the users.

Table 3-3 Deliverable Materials

Deliverable Material	Version	Description
ERM	8.6.0.0	EMS
ElectionWare	4.1.0.0	EMS
ES&S Event Log Service	1.5.0.0	EMS
Removable Media Services	1.4.0.0	EMS
VAT Previewer	1.8.1.0	EMS
DS200	Firmware 2.7.1.0; Hardware 1.2.1.0	Precinct ballot scanner
DS200	Firmware 2.7.1.0; Hardware 1.2.3.0	Precinct ballot scanner
DS200	Firmware 2.7.1.0; Hardware 1.3	Precinct ballot scanner
AutoMARK™ A100	Firmware 1.8.1.0; Hardware 1.0	Voter Assist Terminal
AutoMARK™ A200	Firmware 1.8.1.0; Hardware 1.1	Voter Assist Terminal
AutoMARK™ A300	Firmware 1.8.1.0; Hardware 1.3	Voter Assist Terminal
DS850	Firmware 2.4.0.0; Hardware 1.0	Central ballot scanner
OKI Printer	B430dn and B431dn	Laser Report Printer
OKI Printer	Microline 420	Dot Matrix Printer
Headphones	Avid FV 60	Stereo headphones
Voting System Overview EVS 5.0.1.0	17.0	TDP Document
ES&S ElectionWare 4.1 Vol I: Administrator's Guide	4.8	TDP Document
ES&S ElectionWare 4.1 Vol II: Define User's Guide	4.0	TDP Document
ES&S ElectionWare 4.1 Vol III: Design User's Guide	3.2	TDP Document
ES&S ElectionWare 4.1 Vol IV: Deliver User's Guide	5.6	TDP Document

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3.0 MATERIALS REQUIRED FOR TESTING (Continued)

3.3 Deliverable Materials (Continued)

Table 3-3 Deliverable Materials (Continued)

Deliverable Material	Version	Description
ES&S ElectionWare 4.1 Vol V: Results User's Guide	1.5	TDP Document
ES&S DS200 System Operations Procedures Hardware version 1.2	10.1	TDP Document
ES&S DS200 System Operations Procedures Hardware version 1.3	1.0	TDP Document
ES&S DS850 System Operations Procedures	11.1	TDP Document
AutoMARK™ system Operations Procedures	5.0	TDP Document
ES&S ERM System Operations Procedures	13.1	TDP Document
Network Configuration Guide	3.1	TDP Document
EVS Event Logging Service System Operations Procedures	1.0	TDP Document
Voting System Security Specification EVS 5.0.0.0	3.1	TDP Document
Hardening the EMS PC Guide	4.3	TDP Document

4.0 TEST SPECIFICATIONS

Modification testing of the EVS 5.0.1.0 is the configuration submitted in the EAC application ESS1302. Wyle Laboratories' qualified personnel will ensure that all certification testing performed on the manufacturer's voting system follows Wyle Laboratories' procedures for testing and that the specific test cases are used to ensure the requirements of the EAC 2005 VVSG and EAC Testing and Certification Program Manual are met.

All RFI's and NOC's applicable, as of the date of this document, shall apply to this test campaign unless otherwise noted.

4.1 Requirements (Strategy of Evaluation)

To evaluate the system test requirements, each section of the EAC 2005 VVSG will be analyzed to determine the applicable tests. The EAC 2005 VVSG Volume I sections, along with the strategy for evaluation, are described below:

- **Section 2: Functional Requirements** – The requirements in this section will be tested during the FCA and System Integration test utilizing the "Wyle Baseline Test Cases" along with test cases specially designed for the ES&S EVS 5.0.1.0 per sections 4.4.3 and 4.4.4. The data input during these tests will be the predefined election definitions submitted as part of the Test Plan Package.
- **Section 3: Usability and Accessibility** – The requirements in this section will be tested during this test campaign on the DS200 tabulator. These tabulators were previously certified under the 2002 VSS, and during this campaign the tabulators will be verified to meet the Usability and Accessibility requirements of the 2005 VVSG.
- **Section 4: Hardware Requirements** – The requirements in this section will be evaluated utilizing data obtained during prior VSTL test campaigns.

4.0 TEST SPECIFICATIONS (Continued)

4.1 Requirements (Strategy of Evaluation) (Continued)

- **Section 5: Software Requirements** – The requirements in this section will be tested during source code review, TDP review, and FCA. A combination of review and functional testing will be performed to ensure these requirements are met.
- **Section 7: Security Requirements** – The requirements in this section will be tested during source code review, FCA, and Security Tests.

Wyle Laboratories' personnel shall maintain a test log of the procedure(s) employed. This log identifies the system and equipment by model and serial number. In the event that the project engineer deems it necessary to deviate from Wyle Test Cases or Wyle Operating Procedures (WoPs) pertaining to the test environment, the equipment arrangement and method of operation, the specified test procedure, or the provision of test instrumentation and facilities, shall be recorded in the test log. (A discussion of the reasons for the deviation and the effect of the deviation on the validity of the test procedure shall also be provided and approved by the Project Engineer and Program Manager.)

Wyle Laboratories utilizes an internal bug tracking system in order to capture and track all issues and discrepancies found during the testing campaign. This allows for all issues and discrepancies to be monitored for reoccurrence, tracks the root cause analysis, and provides a resolution status. Wyle Laboratories shall verify all items logged into the bug tracking system are resolved prior to the completion of testing and before any recommendation may be made for certification.

The designated WoPs for this program are listed below together with the identification and a brief description of the hardware and software to be tested and any special considerations that affect the test design and procedure.

The specific Wyle WoPs to be used during testing include the following:

- WoP 1 Operations Status Checks
- WoP 2 Receipt Inspection
- WoP 3 Technical Data Package Review
- WoP 4 Test Plan Preparation *(This document)*
- WoP 5a-d Source Code Review
- WoP 6a-d Security
- WoP 7 Trusted Build
- WoP 24 1 – 1g Usability
- WoP 25 Physical Configuration Audit
- WoP 26 Functional Configuration Audit
- WoP 27 Maintainability
- Wop 29 Electrical Supply
- WoP 30 System Integration Test
- WoP 34 Test Report
- WoP 36 Vote Recording Requirements
- WoP 41 Logic & Accuracy

4.0 TEST SPECIFICATIONS (Continued)

4.2 Hardware Configuration and Design

The EVS 5.0.1.0 Voting System is a paper-based precinct voting system using touch-screen and scan technology to scan and validate ballots, provide voter-assisted ballots, and tabulate precinct results. The Election Management System is an application suite consisting of ElectionWare, Election Reporting Manager (ERM), Removable Media Service (RMS), ES&S Event Log Service (ELS), and VAT Previewer. The precinct counting device is the DS200. It is responsible for scanning, validating and tabulating voter ballots at the precinct level. EVS 5.0.1.0 Voting System contains multiple voter assistance terminals. It can be configured with the AutoMARK™ Model A100, A200, or A300 to facilitate special needs voters. The DS850 is the high-speed digital scanner that processes large ballot batches at a central location. All EMS are functions handled by proprietary software running on COTS PC/laptops/servers. Wyle Laboratories has determined that these COTS PC/laptops/servers are not subject to hardware testing per the EAC 2005 VVSG. The provided PC/laptops/servers documented in Section 3, Materials Required for Testing, all contained CE, UL, and FCC labeling.

Each unit will be loaded with the Operational Status Check election definition configured for early voting. This will allow all the data generated for the Pre-operational, Operational, and Post-operational tests to be further analyzed, compiled and included in the Reliability and Availability Test results.

4.3 Software System Functions

The EVS 5.0.1.0 Voting System software is comprised of multiple applications written in many languages. The system software is broken down into four areas: EMS, Precinct tabulator software acting as firmware, central count software running as firmware and ADA device software running as firmware. The main components and their subcomponents are as follows:

- ElectionWare (Java)
- ElectionWare/SQL
- ElectionWare PaperBallot
- ERM
- Event Log Service
- Removable Media Service
- DS200
- DS850
- AutoMARK™

4.4 Test Case Design

Wyle Laboratories uses the V-Model Life Cycle as defined by the Institute of Electrical and Electronics Engineers (IEEE). The IEEE definition of the V-Model Life Cycle uses two concepts "Verification" and "Validation." Wyle Laboratorties' test approach is to incorporate the use of both "Verification" and "Validation". There are four basic levels of testing in the V-Model Life Cycle: Component, Integration, System, and Acceptance. Wyle Laboratories will be evaluating the ES&S EVS 5.0.1.0 to all four levels.

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4.0 TEST SPECIFICATIONS (Continued)

4.4 Test Case Design (Continued)

4.4.1 Hardware Qualitative Examination Design

ES&S submitted the results of previous testing in the form of the following test reports:

- Hardware Compliance Testing of the Election Systems & Software FL EVS 4.5.0.0 Voting System DS200 Hardware Version 1.3, Wyle Test Report No. T71013.01-01
- National Certification Test Report for Certification Testing of the Election Systems & Software EVS 5.0.0.0 Voting System, Wyle Test Report No. T59087.01-01

Wyle Laboratories performed a hardware qualitative examination to 1) assess if the testing was performed under the guidelines of the EAC program, 2) if the tests were performed per the EAC 2005 VVSG, and 3) determine if the scope of the engineering changes implemented since test performance. The results from this examination deemed that the hardware testing performed under the T71013.01 campaign were tested to the EAC 2005 VVSG and in accordance with the EAC Testing and Certification Program Manual. Wyle Laboratories recommends that reuse be approved for all hardware test requirements.

The summary of acceptable testing is provided in Table 4-1. Wyle Laboratories will verify all hardware during the PCA and those results will determine if the hardware is compliant with the previous tested versions. All testing that is deemed rejected shall be performed by Wyle Laboratories' personnel under this test campaign. The details of those tests are presented in Section 6.0.

Table 4-1 Hardware Test Examination Results

Test/EAC 2005 VVSG Section	Procedure/Description	EVS 5.0.1.0 Voting System Component
		DS200 1.3
Electromagnetic Radiation/4.1.2.9	FCC Part 15 Class B for both radiated and conducted emissions	Accept EVS 4.5.0.0
Low Temperature/4.1.2.14	MIL-STD-810D minimum temperature shall be -4°F	Accept EVS 4.5.0.0
Vibration/4.1.2.14	MIL-STD-810D, Method 514.3 physical shock and vibration during handling and transport	Accept EVS 4.5.0.0
Lightning Surge/4.1.2.7	IEC 61000-4-5 (1995-02)	Accept EVS 4.5.0.0
High Temperature/4.1.2.14	MIL-STD-810D, Method 501.2 maximum temperature shall be 140°F	Accept EVS 4.5.0.0
Bench Handling	MIL-STD-810D, Method 516.3 Procedure VI six 4" drops on each edge totaling 24 drops	Accept EVS 4.5.0.0
Electrical Fast Transient/4.1.2.6	IEC 61000-4-4 (2004)	Accept EVS 4.5.0.0

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4.0 TEST SPECIFICATIONS (Continued)

4.4 Test Case Design (Continued)

4.4.1 Hardware Qualitative Examination Design (Continued)

Table 4-1 Hardware Test Examination Results (Continued)

Test/EAC 2005 VVSG Section	Procedure/Description	EVS 5.0.1.0 Voting System Component
		DS200
Humidity Test/4.1.2.14	MIL-STD-810D, Method 501.2 ten 24 hour humidity cycles	Accept EVS 4.5.0.0
Electrostatic Disruption/4.1.2.8	IEC 61000-4-2 (1995-01) 15kV air discharge and 8kV contact discharge	Accept EVS 4.5.0.0
Electromagnetic Susceptibility/4.1.2.10	IEC 61000-4-3 (2006) electromagnetic field of 10V/m modulated by a 1kHZ, 80% AM modulation at 80MHz to 1000MHz frequency	Accept EVS 4.5.0.0
Conducted RF Immunity/4.1.2.11	IEC 61000-4-6 (1996-04) conducted radio frequency energy	Accept EVS 4.5.0.0
Magnetic Fields Immunity/4.1.2.12	IEC 61000-4-8 (1993-06) AC magnetic fields of 30 A/m at 60Hz	Accept EVS 4.5.0.0
Electrical Power Disturbance/4.1.2.5	IEC 61000-4-11 (1994-06) power surges and dips	Accept EVS 4.5.0.0
Temperature/Power Variation/4.1.2.13	MIL-STD-810D, Method 502.2 and Method 501.2 163 hours at 50°F to 95°F	Accept EVS 4.5.0.0
Safety/4.3.8	UL 60950-1 product safety review	Accept EVS 4.5.0.0

4.4.2 Software Module Test Case Design and Data

Wyle Laboratories implements Component Level Testing during the FCA for each component and subcomponent, exercising the functionality of each as designed and documented. Wyle Laboratories will utilize limited structural-based techniques (white-box testing) mainly in the area of Source Code Review, Compliance Builds, and Security Testing and Review. Wyle Laboratories will depend heavily on specification-based techniques (black-box testing) for the individual software components.

The most common specification-based techniques applied to the ES&S EVS 5.0.1.0 during the software testing portion of testing will be "equivalence partitioning" and "boundary value testing."

- "Equivalence partitioning" will be used to evaluate specific software functions and data entry points of the EVS 5.0.1.0 for valid and invalid data during the FCA. For software functions and data entry points, an entry will be made for a valid data requirement and at least one invalid data requirement to test for normal and abnormal conditions.

4.0 TEST SPECIFICATIONS (Continued)

4.4 Test Case Design (Continued)

4.4.2 Software Module Test Case Design and Data (Continued)

- "Boundary Value Testing" will be used to evaluate specific software functions and data entry points for minimums and maximums during the FCA. For software functions and data entry points, an entry will be made for all minimum and all maximum documented requirements to test for normal and abnormal conditions. This technique will be used for numeric ranges as well as non-numeric ranges.

Wyle Laboratories will document an expected result for each test. The ACCEPT/REJECT criteria at the Component Level will be based on the expected result. If the System Under Test (SUT) performs as expected, the results will be accepted. If the SUT does not perform as expected, the test will be evaluated for tester error. If it is determined there was no tester error, the test will be repeated in an attempt to reproduce the results. If the results can be reproduced and the expected results are not met, the SUT will have failed the test. If the results cannot be reproduced, the manufacturer and VSTL will determine the root cause of the error. If the root cause has been corrected and the SUT performs as expected, then the results will be accepted. If the root cause cannot be determined, the problem has not been corrected, or the SUT still does not perform as expected, the SUT will have failed the test.

Wyle Laboratories will document the error and track the error through resolution. Wyle Laboratories will not move to the next level of testing until all documented errors are resolved to try and minimize errors that might occur farther along in the test campaign. Engineering analysis will be performed to determine what effect the resolution has on the component. A determination will be made whether Regression Testing will be sufficient or a complete re-test is necessary. The factors for making this determination are:

- Is the requirement that was examined impacted by the error
- Does the resolution change the function in manner that the compliance to the requirement is in question
- Does the resolution introduce new functions or change a function that would impact a previously tested requirement

The test approach to be used for the ES&S EVS 5.0.1.0 will be a bottom-up approach where the lower-level components will be tested first and then used to facilitate the testing of higher-level components. The specification-based technique used by Wyle Laboratories at the Integration Level is "Use Case." The actors that have been identified to use the ES&S EVS 5.0.1.0 are the following:

- Election Administrator – the actor with responsibility of entering the election definition with translation and audio. This actor is also responsible for maintaining EMS users and the election database.
- Warehouse Technician – the actor responsible for loading the election definition onto DS200, AutoMARK™ VAT, and DS850. This actor also runs diagnostic test and maintains the units.
- Poll Worker- the actor at the precinct location to set up and close down the DS200, AutoMARK™ VAT, and DS850 on Election Day.
- Voter – the actor who physically casts the ballot on Election Day.
- ADA Voter – the actor with special needs who has to vote unassisted on Election Day.
- Election Official – the actor who reports and audits the election result post-Election Day.

4.0 TEST SPECIFICATIONS (Continued)

4.4 Test Case Design (Continued)

4.4.2 Software Module Test Case Design and Data (Continued)

"Use Case" will be used during the FCA with a single pass through each component using only valid data. This pass will be considered the "Master Copy" of data to be passed between interfacing points of applications during Integration level testing. If a component downstream in the test process needs data from previous processes, the "Master Copy" of data can be used or altered to accelerate the test process.

Known tests that will utilize the "Master Copy" of data at the Integration Level are Security, Telecommunication, and Usability. During test performance, if an error occurs between data interfaces or in the process flow, an engineering analysis will be performed to determine if the error is data, process, or tester error.

The ACCEPT/REJECT criteria for Integration Level testing is whether the components and applications interface using the documented process for each actor. If there is an error interfacing between components, the error will be documented and tracked through to resolution. Engineering analysis will be performed to determine what effect the resolution has on the component. A determination will be made whether Regression Testing will be sufficient or a complete re-test is necessary.

4.4.3 System Level Test Case Design

Wyle Laboratories implements System Level testing focusing on a complete system including all proprietary software, proprietary hardware, proprietary peripherals, COTS software, COTS hardware, and COTS peripherals in a configuration of the system's intended use. The ES&S EVS 5.0.1.0 is intended to support both large and small jurisdictions. Wyle Laboratories' approach for ES&S EVS 5.0.1.0 will be to execute System Level Testing with a variety of elections that include various combinations of jurisdictions, parties, and ballot styles.

Wyle Laboratories will test the function of all hardware, software, and peripherals of the complete system during System Level Testing. The ACCEPT/REJECT criteria for System Level testing is whether the system can continue in testing.

The two scenarios are: Accept or Reject. Accept is either 1) if no errors are found, or 2) if an error is encountered, but the system continues to operate and engineering analysis determines that the root cause does not affect testing. Reject if the system is too unstable to continue or engineering analysis determines the root cause could affect further testing.

Wyle Laboratories implements Acceptance Level testing focusing on all the data collected during the entire test campaign along with performing the "Trusted Build" for the system. All data from pre-testing, hardware testing, software testing, functional testing, security testing, telecommunication testing, usability testing, accessibility testing, and reliability testing activities will be combined to ensure all requirements that are supported by the ES&S EVS 5.0.1.0 in the EAC 2005 VVSG have been tested. All requirements will be checked against the test data to ensure the EAC 2005 VVSG requirements are met. Items not supported by ES&S EVS 5.0.1.0 will be documented. Any issues documented during testing will be resolved or annotated in the test report.

4.0 TEST SPECIFICATIONS (Continued)

4.4 Test Case Design (Continued)

4.4.3 System Level Test Case Design (Continued)

Wyle Laboratories will test every EAC 2005 VVSG requirement impacted by the ES&S EVS 5.0.1.0 Voting System modification. Wyle Laboratories will report all issues discovered during this test campaign to ES&S and the EAC. If Wyle Laboratories determine there is not enough data to ensure a requirement was met, the test plan will be altered and further testing will be done. The EAC has the final decision as to whether the system meets all the requirements for an EAC-certified system. Wyle Laboratories will either recommend approval, if the system meets all applicable sections of the VVSG or recommend disapproval, if the system does not meet all applicable sections of the VVSG.

4.5 TDP Evaluation

Wyle Laboratories' qualified personnel will perform a comprehensive review of the ES&S TDP to determine compliance to the EAC 2005 VVSG requirements and ES&S-specific requirements.

Wyle Laboratories' qualified personnel utilize a TDP Review Matrix which lists every EAC 2005 VVSG requirement pertaining to TDP review. Wyle Laboratories' qualified personnel will record the results of the review of each document to the applicable requirements listed in the TDP Review Matrix.

During the TDP review process, each document will be reviewed for completeness, clarity, and correctness, and continuity between the TDP documents. The review results will be formally reported to ES&S for resolution. If a revised document is received, it will be re-reviewed as discussed in this section. The TDP will be continued to be reviewed during the entire testing process as these documents will be utilized to set up the systems, verify correct operational results and numerous other tests. At the end of the TDP review process, an Anomaly Report will be issued listing the non-compliant items on a document-by-document basis, if applicable.

A listing of all documents contained in the ES&S EVS 5.0.1.0 System TDP is provided in Table 4-2.

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4.0 TEST SPECIFICATIONS (Continued)

4.5 TDP Evaluation (Continued)

Table 4-2 EVS 5.0.1.0 Voting System TDP Documents

EVS 5.0.1.0 TDP Documents	Version	Doc #	Document Code
Voting System Overview	17.0	01-01	EVS5010_OVR00
System Functionality Description			
System Functionality Description – Voting System	9.0	02-01	EVS5010_SFD00
System Hardware Specification			
System Hardware Specification – DS850	3.0	03-01	EVS5000_SHS00_DS850
System Hardware Specification – DS200 HW 1.2	1.0	03-02	DS200HW_M_SPC_0312_HWSpec
System Hardware Specification – DS200 HW 1.3	3.0	03-03	DS200HW_M_SPC_0313_HWSpec
AutoMARK™ System Hardware Overview	5.0	03-04	AutoMARK™_ESS_System_Hardware_Overview_AQS-18-5002-000-S
AutoMARK™ System Hardware Specification	5.0	03-05	AutoMARK™_ESS_System_Hardware_Specification_AQS-18-5000-001-F
Software Design and Specification			
Software Design and Specification –ES&S Event Logging Service	1.0	04-01	EVS5000_SDS00_UELS
Software Design and Specification - ElectionWare	7.0	04-02	EVS5000_SDS00_ElectionWare

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4.0 TEST SPECIFICATIONS (Continued)

4.5 TDP Evaluation (Continued)

Table 4-2 EVS 5.0.1.0 Voting System TDP Documents (Continued)

EVS 5.0.1.0 TDP Documents	Version	Doc #	Document Code
Software Design and Specification – ERM	3.0	04-03	EVS5000_SDS00_ERM
Software Design and Specification – DS850	10.0	04-04	EVS5000_SDS00_DS850
Software Design and Specification – DS200	1.0	04-05	EVS5010_SDS00_DS200
Software Design and Specification – AutoMARK™	1.8	04-06	EVS5000_SDS00_AutoMARK™ SDS Overview
System Test/Verification Specification			
Voting System Test Plan	4.0	05-01	EVS5000_STP00
Test Cases - ElectionWare: Manage	4.1.0.0	05-02	EVS5000_TC00_ElectionWare01_Manage
Test Cases - ElectionWare: Define	4.1.0.0	05-03	EVS5000_TC00_ElectionWare02_Define
Test Cases - ElectionWare: Design	3.3	05-04	EVS5000_TC00_Electionware03_Design
Test Cases - ElectionWare: Deliver	4.1.0.0	05-05	EVS5000_TC00_Electionware04_Deliver
Test Cases - ElectionWare: Resolve	4.2.0.0	05-06	EVS5000_TC00_Electionware05_Resolve
Test Cases - ERM	8.6.0.0	05-07	EVS5000_TC00_ERM
Test Cases - DS850	2.4.0.0	05-08	EVS5000_TC00_DS850
Test Cases - DS200	2.7.0.0	05-09	EVS5000_TC00_DS200
Test Cases - AutoMARK™	1.8.1.0	05-10	EVS5000_TC00_AutoMARK™
System Security Specification			
System Security Specification	3.1	06-01	EVS5000_SSS00
AutoMARK™ System Security Specifications	6.0	06-02	AutoMARK™ ESS System Security Specification AQS-18-5002-001-S
System Operations Procedure			
System Operations Procedures - ELS	1.0	07-01	EVS5000_SOP00_ELS
User's Guide- ElectionWare Admin	4.8	07-02	EVS5000_SOP00_ElectionWare02_Admin
User's Guide- ElectionWare Define	4.0	07-03	EVS5000_SOP00_ElectionWare02_Define
User's Guide - ElectionWare Design	3.2	07-04	EVS5000_SOP00_ElectionWare03_Design
User's Guide - ElectionWare Deliver	5.6	07-05	EVS5000_SOP00_ElectionWare04_Deliver

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4.0 TEST SPECIFICATIONS (Continued)

4.5 TDP Evaluation (Continued)

Table 4-2 EVS 5.0.1.0 Voting System TDP Documents (Continued)

EVS 5.0.1.0 TDP Documents	Version	Doc #	Document Code
User's Guide - ElectionWare Results	1.5	07-06	EVS5000_SOP00_ElectionWare05_Results
User's Guide - ERM	13.1	07-07	EVS5000_SOP00_ERM
Operator's Guide - DS850	11.1	07-08	EVS5000_SOP00_DS850
Operator's Guide - DS200	1.0	07-09	EVS5010_SOP00_DS200
System Operations Procedures - AutoMARK™	5.0	07-10	EVS5000_SOP00_AMVAT
Network Configuration Guide	3.1	07-12	EVS5000_SOP00_NetworkConfigGuide
System Maintenance Manuals			
Maintenance Guide- DS850	3.1	08-01	EVS5000_SMM00_DS850
Maintenance Guide- DS200	1.0	08-02	EVS5010_SMM00_DS200
Maintenance Guide- AutoMARK™	4.0	08-03	EVS5000_SMM00_AMVAT
Personnel Deployment and Training			
Personnel Deployment and Training Program	1.0	09-01	ESSSYS_T_D_1000_TrainingProgram
Configuration Management Plan			
ES&S Configuration Management Program	1.0	10-1	ESSSYS_CM_P_1000_ESSCMProgram
CM Plan Appendices	---	10-2	Multiple Documents
QA Program			
Manufacturing Quality Assurance Plan	1.0	11-01	ESSSYS_M_P_1000_MNFQualityAssuranceePlan
Engineering Change Order Process	2.0	11-02	ESSSYS_M_P_0500_ECOProcess
Software Quality Assurance Program	1.0	11-03	ESSSYS_Q_P_0100_SoftwareQualityAssuranceProgram
Other TDP Documents			
ES&S Ballot Production Guide	4.0	13-01	EVS5000_ORPT02_BallotProductionGuide

4.6 Source Code Review

The strategy for evaluating EVS 5.0.1.0 will be based on the source code of the previously identified modification to the system. All code changes from EVS 5.0.0.0 (ESSEVS5000) will be reviewed to the EAC 2005 VVSG coding standards and the manufacturer-supplied coding standards **(ESSSYS_D_D_0100_Coding Standards)**.

As the source code is received, a SHA1 hash value will be created for each source code file. The source code team will conduct a visual scan of each line of source code for an initial review and every line of modified source code for acceptance of all languages other than Java. For applications written in Java, Wyle Laboratories will utilize automated tools (Checkstyle and NetBeans) to augment source code review. This is done to verify compliance of EAC 2005 VVSG coding standards or manufacturer -supplied coding standards. Each identified violation shall be recorded by making notes of the standards violation along with directory name, file name, and line number.

4.0 TEST SPECIFICATIONS (Continued)

4.6 Source Code Review (Continued)

All identified violations will be recorded by making notes of the standards violation along with the directory name, file name, and line number. A technical report of all identified violations will be sent to ES&S for resolution on a regular basis. All revised source code will be checked for corrections until the final issue is resolved. At the end of the Source Code review process, a Discrepancy Report will be issued listing all non-compliance on an individual basis to the EAC and ES&S. The results will be included in the final test report.

A "Compliance Build" shall be performed by Wyle Laboratories from the reviewed source code using the Compliance Build Procedure to build iterative builds throughout the test campaign. This process follows the documented procedures of a "Trusted Build" in the EAC Testing and Certification Program Manual, Version 1.0, effective date January 1, 2007. A Compliance Build differs from a Trusted Build because of two exceptions: The image products will not be submitted to the EAC, and no manufacturer representative shall be required to be present or on-site for these builds.

The final step in the source code review shall be to create a Trusted Build from the reviewed source code. The Trusted Build will be performed by completing the following tasks in the order listed:

- Clean the build machine of existing software
- Retrieve the compliant source code
- Construct the build environment
- Create digital signatures of the build environment
- Load the compliant source code into the build environment
- Create a digital signature of the pre build environment
- Create a disk image of the pre-build environment
- Build executable code
- Create a digital signature of executable code
- Create a disk image of the post-build environment
- Build installation media
- Create a digital signature of the installation media
- Install executable code onto the system and validate the software/firmware
- Deliver source code with digital signature, disk image of pre-build environment with digital signatures, disk image of post-build environment with digital signatures, executable code with digital signatures, and installation media with signatures to the EAC Approved Repository.

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4.0 TEST SPECIFICATIONS (Continued)

4.6 Source Code Review (Continued)

The "Trusted Build" for the ES&S EVS 5.0.1.0 includes source code, data, and script files, in clear text form. The build also includes COTS software on commercially available media, COTS software downloaded by the VSTL, COTS software verified by SHA1 from the software supplier, and picture and sound files in binary format provided by ES&S. The first step of the process is to clean the hard drives by writing data to every spot on the hard drive, so the drive is cleared of existing data. The appropriate operating system will then be loaded and the applications from the VSTL reviewed source along with the VSTL verified COTS software will be built. The final step is installing the applications on the hardware.

4.7 QA and CM System Review

The ES&S QA Plan and CM Plan will be reviewed to determine compliance with EAC 2005 VVSG Volume II Section 2, and Volume I Sections 8 and 9, with EAC stated requirements, and with the requirements of the internal ES&S documentation.

Also, the ES&S TDP documentation package will be reviewed to determine if the ES&S QA Plan and the CM Plan are being followed. The results of the TDP review will be entered on a spreadsheet as previously described in Section 4.6 TDP Evaluation. The results of the TDP review, including the QA and CM compliance results, will also be included in the final Test Report.

5.0 Test Data

5.1 Test Data Recording

All equipment utilized for test data recording shall be identified in the test data package. For hardware environmental and operational testing, the equipment will be listed on the Instrumentation Equipment Sheet for each test. The output test data will be recorded in an appropriate manner as to allow for data analysis.

For source code and TDP reviews, results will be compiled in output reports and discrepancies submitted to ES&S for resolution. Additionally, all test results, including functional test data, will be recorded on relevant Wyle Operating Procedures and Test Cases. Results will also be recorded real-time in engineering log books.

Wyle Laboratories, Inc. will evaluate all test results against the ES&S provided technical documentation for EVS 5.0.1.0 and the requirements set forth in the EAC 2005 VVSG. EVS 5.0.1.0 shall be evaluated for its performance against the EAC 2005 VVSG. The acceptable range for system performance and the expected results for each test case shall be derived from the EVS 5.0.1.0 documentation. Per the EAC 2005 VVSG, these parameters shall encompass the test tolerances and samples to define the minimum number of combinations or alternatives of input and output conditions that can be exercised to constitute an acceptable test of the parameters involved. The parameters will also include events which criteria define the maximum number of interrupts, halts, or other system breaks that may occur due to non-test conditions (excluding events from which recovery occurs automatically or where a relevant status message is displayed).

5.2 Test Data Reduction

Test data shall be processed and recorded in the relevant Wyle Operating Procedures and Test Cases. Results will also be recorded real-time in engineering log books.

6.0 TEST PROCEDURES AND CONDITIONS

The following subsections describe test procedures and a statement of the criteria by which readiness and successful completion shall be indicated and measured.

6.1 Facility Requirements

All testing will be conducted at Wyle Laboratories Huntsville, AL facility unless otherwise annotated. Hardware environmental non-operating (storage) and operating testing will be conducted utilizing an adequately sized environmental test chamber or dynamic vibration (shaker) system equipped with the required data gathering support equipment. All remaining operating hardware tests will be conducted at the appropriate test site with the required support equipment. All instrumentation, measuring, and test equipment used in the performance of this test program will be listed on the Instrumentation Equipment Sheet for each test and shall be calibrated in accordance with Wyle Laboratories' Quality Assurance Program, which complies with the requirements of ANSI/NCSL Z540-1 and ISO 10012-1.

Standards used in performing all calibrations are traceable to the National Institute of Standards and Technology (NIST) by report number and date. When no national standards exist, the standards are traceable to international standards or the basis for calibration is otherwise documented.

Unless otherwise specified herein, all remaining tests, including system level functional testing, shall be performed at standard ambient conditions:

- Temperature: 68 to 75° Fahrenheit (± 4°F)
- Relative Humidity: 20 to 90%
- Atmospheric Pressure: Local Site Pressure

Unless otherwise specified herein, the following tolerances shall be used:

- Time ± 5%
- Temperature ± 3.6°F (2°C)
- Vibration Amplitude ± 10%
- Vibration Frequency ± 2%
- Random Vibration Acceleration
  - 20 to 500 Hertz ± 1.5 dB
  - 500 to 2000 Hertz ± 3.0 dB
- Random Overall grms ± 1.5 dB
- Acoustic Overall Sound Pressure Level +4/-2 dB

Deviations to the above tolerances may be submitted by the responsible test laboratory with sufficient engineering information to substantiate the deviation request, but only when best effort technique and system limitations indicate the need for a deviation.

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6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.2 Test Set-Up

All voting machine equipment (hardware and software) shall be received and documented utilizing Wyle Laboratories' Receiving Ticket (WL-218, Nov'85) and proper QA procedures. When voting system hardware is received, Wyle Laboratories' Shipping and Receiving personnel will notify Wyle Laboratories' QA personnel. With Wyle Laboratories' QA personnel present, each test article will be unpacked and inspected for obvious signs of degradation and/or damage that may have occurred during transit. Noticeable degradation and/or damage, if present, shall be recorded, photographs shall be taken, and the ES&S representative shall be notified.

Wyle Laboratories' QA personnel shall record the serial numbers and part numbers. Comparison shall be made between those numbers recorded and those listed on the shipper's manifest. Any discrepancies noted shall be brought to the attention of the ES&S representative for resolution. TDP items, including all manuals, and all source code modules received will be inventoried and maintained by the Wyle Laboratories' Project Engineer assigned to testing.

For hardware test setup, the system will be configured as would for normal field use. This includes connecting all supporting equipment and peripherals. Wyle Laboratories' personnel will properly configure and initialize the system, and verify that it is ready to be tested, by following the procedures detailed in the EVS 5.0.1.0 technical documentation.

Wyle Laboratories will develop an operational status test to be performed prior to and immediately following each hardware test. Wyle Laboratories will develop the system performance levels to be measured during operational tests.

Wyle Laboratories has developed eight election definitions to be used during this test campaign.

Operational Status Check

This election definition will exercise the operational status of the EVS 5.0.1.0 System, prior to and immediately following all tests.

Accuracy

This test will exercise all possible voting positions for the ballot to verify that the EUT meets the accuracy requirements in section 4.1.1 or the 2005 VVSG.

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6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.2 Test Set-Up (Continued)

General Election: GEN-01

A basic election held in four precincts, one of which is a split precinct, containing nineteen contests compiled into four ballot styles. Five of the contests are in all four ballot styles. The other fifteen contests are split between at least two of the precincts with a maximum of four different contests spread across the four precincts. This election was designed to functionally test the handling of multiple ballot styles, support for at least two languages, support for common voting variations, and audio support for at least two languages.

The parameters of this election are listed below:

- Closed Primary: No
- Open Primary: No
- Partisan offices: Yes
- Non-Partisan offices: Yes
- Write-in voting: Yes
- Primary presidential delegation nominations: No
- Ballot Rotation: Yes
- Straight Party voting: Yes
- Cross-party endorsement: No
- Split Precincts: Yes
- Vote for N of M: Yes
- Recall issues, with options: No
- Cumulative voting: No
- Ranked order voting: No
- Provisional or challenged ballots: Yes
- Early Voting: No

In addition to the parameters listed above, audio input in an alternative language will be exercised for a basic voting pattern using an ADA device. Audio input to demonstrate support for write-in voting will be exercised using an ADA device. Spanish language input will be exercised for a basic voting pattern using Spanish. Spanish language input will be exercised to demonstrate support for write-in voting using Spanish.

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6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.2 Test Set-Up (Continued)

General Election: GEN-02

A basic election held in three precincts. This election contains fifteen contests compiled into three ballot styles. Ten of the contests are in all three ballot styles with the other five split across the three precincts. This election was designed to functionally test the handling of multiple ballot styles, support for ballot rotation, support for two languages, support for complex voting variations, and audio support for multiple languages.

The parameters of this election are listed below:

- Closed Primary: No
- Open Primary: No
- Partisan offices: Yes
- Non-Partisan offices: Yes
- Write-in voting: Yes
- Primary presidential delegation nominations: No
- Ballot Rotation: Yes
- Straight Party voting: No
- Cross-party endorsement: No
- Split Precincts: No
- Vote for N of M: Yes
- Recall issues, with options: Yes
- Cumulative voting: No
- Ranked order voting: Yes
- Provisional or challenged ballots: No
- Early Voting: Yes

In addition to the parameters listed above, this election will be an early voting election with at least one machine running all precincts. Voting options for Over-voting and Under-voting will be exercised. Spanish language voting will be exercised. Casting of ballots using the ADA Audio capability will be exercised.

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6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.2 Test Set-Up (Continued)

General Election: GEN-03

A basic election held in two precincts. This election contains eight contests compiled into two ballot styles. Four of the contests are in both ballot styles. The other four contests are split between the two precincts. This election was designed to functionally test the handling of multiple ballot styles, support for at least three languages including a character-based language, support for common voting variations, and audio support for at least three languages and an ADA binary input device.

The parameters of this election are listed below:

- Closed Primary: No
- Open Primary: No
- Partisan offices: Yes
- Non-Partisan offices: Yes
- Write-in voting: Yes
- Primary presidential delegation nominations: No
- Ballot Rotation: No
- Straight Party voting: No
- Cross-party endorsement: No
- Split Precincts: No
- Vote for N of M: Yes
- Recall issues, with options: No
- Cumulative voting: No
- Ranked order voting: No
- Provisional or challenged ballots: Yes
- Early Voting: No

In addition to the parameters listed above, input in the Spanish language with a basic voting pattern and a write-in will be exercised. Audio input using the Spanish language to demonstrate support for write-in voting using an ADA device will be exercised. A character-based language input with a basic voting pattern will be exercised. A character-based language using an ADA device will be exercised to demonstrate support for ADA device. A binary input to show support for ADA binary input device will be exercised. A binary input using an ADA audio device will be exercised to show support for binary input and ADA audio device.

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6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.2 Test Set-Up (Continued)

Primary Election: PRIM-01

A closed primary election in two precincts (one precinct is a split), containing thirty contests compiled into five ballot styles. Each ballot style contains six contests. This election was designed to functionally test an open primary with multiple ballot styles, support for two languages, and support for common voting variations.

The parameters of this election are listed below:

- Closed Primary: Yes
- Open Primary: No
- Partisan offices: Yes
- Non-Partisan offices: Yes
- Write-in voting: Yes
- Primary presidential delegation nominations: No
- Ballot Rotation: No
- Straight Party voting: No
- Cross-party endorsement: No
- Split Precincts: Yes
- Vote for N of M: Yes
- Recall issues, with options: No
- Cumulative voting: No
- Ranked order voting: No
- Provisional or challenged ballots: Yes
- Early Voting: No

In addition to the parameters listed above, input in an alternative language will be exercised with write-in voting. Input using an ADA audio device with write-in voting will be exercised. These inputs were selected to exercise the write-in functionality in a primary election.

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6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.2 Test Set-Up (Continued)

Primary Election: PRIM-02

A basic election held in two precincts. This election contains thirteen contests compiled into three ballot styles. One contest is in all three ballot styles and all other contests are independent. This election was designed to functionally test the handling of multiple ballot styles, support for Primary presidential delegation nominations, support for two languages, support for complex voting variations, and audio support for multiple languages.

The parameters of this election are listed below:

- Closed Primary: No
- Open Primary: Yes
- Partisan offices: Yes
- Non-Partisan offices: Yes
- Write-in voting: Yes
- Primary presidential delegation nominations: No
- Ballot Rotation: No
- Straight Party voting: No
- Cross-party endorsement: Yes
- Split Precincts: No
- Vote for N of M: Yes
- Recall issues, with options: No
- Cumulative voting: No
- Ranked order voting: No
- Provisional or challenged ballots: No
- Early Voting: No

In addition to the parameters listed above, this election will be an open primary election with one machine running for each precinct. Voting options for Over-voting, Under-voting and write-in voting will be exercised. Input in the Spanish language will be exercised. Casting of ballots using the ADA Audio capability will be exercised.

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6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.2 Test Set-Up (Continued)

Primary Election: PRIM-03

A basic election held in two precincts. This election contains ten contests and is compiled into two ballot styles. Two of the contests are in both ballot styles. The other eight contests are split between the two parties ballots. This election was designed to functionally test the handling of multiple ballot styles, support for at least three languages including an Ideographic based language, support for common voting variations, and audio support for at least three languages and an ADA binary input device.

The parameters of this election are listed below:

- Closed Primary: Yes
- Open Primary: No
- Partisan offices: Yes
- Non-Partisan offices: Yes
- Write-in voting: Yes
- Primary presidential delegation nominations: No
- Ballot Rotation: No
- Straight Party voting: No
- Cross-party endorsement: No
- Split Precincts: No
- Vote for N of M: Yes
- Recall issues, with options: No
- Cumulative voting: No
- Ranked order voting: No
- Provisional or challenged ballots: Yes
- Early Voting: No

In addition to the parameters listed above, input in the Spanish language with a basic voting pattern and a write-in will be exercised. Audio input using the Spanish language to demonstrate support for write-in voting using an ADA device will be exercised. A character-based language input with a basic voting pattern will be exercised. A character-based language using an ADA device will be exercised to demonstrate support for ADA device. A binary input to show support for ADA binary input device will be exercised. A binary input using an ADA audio device will be exercised to show support for binary input and ADA audio device.

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6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.3 Test Sequence

The components of the EVS 5.0.1.0 voting system will undergo testing to verify that the modification performs as describe by ES&S and meets the requirements of the 2005 VVSG. The following sections provide a list of each test and a brief description of each test. Wyle Laboratories will utilize a combination of functional testing and TDP reviews to evaluate the system performance. The list of tests is not in a specific sequence.

6.3.1 Hardware Test Descriptions

The modification of the DS200 hardware may impact the EUT ability to meet the two-hour battery backup requirement in Section 4.1.2.4.c. The EUT shall be subjected to an operational status check before and after the testing to ensure the EUT functions properly.

Electrical Supply – This requirement addresses the battery power source for providing electrical supply during a power failure.

Maintainability – Maintainability represents the ease with which preventive and corrective maintenance actions can be performed based on the design characteristics of equipment and software and the processes the manufacturer and election officials have in place for preventing failures and for reacting to failures.

6.3.2 Software Test Description

The software tests include the following:

Source Code Compliance Review – Wyle Laboratories' personnel will compare the source code to the manufacturer's software design documentation to ascertain how completely the software conforms to the manufacturer's specifications. A listing of the TDP documents for Software Design and Specification can be found in Table 4-2 of this document. Source code inspection shall also assess the extent to which the code adheres to the requirements in Section 5 of Volumes I and II.

Compliance Build of the System Software, Firmware, and Utilities – Before testing can begin a compliance build of all the applications will be constructed by Wyle Laboratories' personnel using the build environment, build documentation and reviewed source code. This is to ensure the software being tested is constructed from the same source code that was reviewed.

COTS Source Code Review – Unmodified, general purpose COTS non-voting software (e.g., operating systems, programming language compilers, data base management systems, and Web browsers) is not subject to the detailed examinations specified in this section. However, Wyle Laboratories' personnel will examine such software to ensure that the specific version of software being used is identical to the design specification in order to confirm that the software has not been modified. Wyle Laboratories will verify by downloading the software directly from the manufacturer site, verifying against NRSL, or by being provided original OEM discs.

Portions of COTS software that have been modified by the manufacturer in any manner are subject to review. Unmodified COTS software is not subject to code examination. However, source code generated by a COTS package and embedded in software modules for compilation or interpretation will be provided in human readable form to Wyle Laboratories. Wyle Laboratories' personnel may inspect COTS source code units to determine testing requirements or to verify the code has not been modified.

6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.3 Test Sequence

6.3.2 Software Test Description (Continued)

Wyle Laboratories may inspect the COTS generated software source code in preparation of test plans and to provide some minimal scanning or sampling to check for embedded code or unauthorized changes. Otherwise, the COTS source code is not subject to the full code review and testing. For purposes of code analysis, the COTS units shall be treated as unexpanded macros.

Trusted Build – The trusted build is a process of converting the reviewed source code into machine-readable binary instructions for a computer. This test will follow Section 5.6 of the EAC Testing and Certification Program manual.

Table 6-1 EVS 5.0.1.0 Voting System Software Test Sequence

Test	Description	Procedure	Test Level	Specimen
Compliance Source Code Review	Source code review for compliance	WHVS07.2 WOP 5a	Component	Source Code
Compliance Build	Using the build documents and source code to construct the EMS	WHVS07.3 WOP 25	Component	Source Code
Source Code Functional Review	Source code review for functionality and high level software design	WHVS07.2 WOP5b	Component & Integration	Source Code

6.3.3 System Testing

Physical Configuration Audit – The Physical Configuration Audit compares the voting system components submitted for qualification to the manufacturer's technical documentation, and shall include the following activities:

- Establish a configuration baseline of software and hardware to be tested; confirm whether manufacturer's documentation is sufficient for the user to install, validate, operate, and maintain the voting system

6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.3 Test Sequence (Continued)

6.3.3 System Testing (Continued)

- Verify software conforms to the manufacturer's specifications; inspect all records of manufacturer's release control system; if changes have been made to the baseline version, verify manufacturer's engineering and test data are for the software version submitted for certification
- If the hardware is non-COTS, Wyle will review drawings, specifications, technical data, and test data associated with system hardware to establish system hardware baseline associated with software baseline
- Review manufacturer's documents of user acceptance test procedures and data against system's functional specifications; resolve any discrepancy or inadequacy in manufacturer's plan or data prior to beginning system integration functional and performance tests
- Subsequent changes to baseline software configuration made during testing, as well as system hardware changes that may produce a change in software operation are subject to re-examination

TDP Review – The technical data package must be submitted as a precondition of national certification testing. These items are necessary to define the product and its method of operation; to provide technical and test data supporting the manufacturer's claims of the system's functional capabilities and performance levels; and to document instructions and procedures governing system operation and field maintenance. Any information relevant to the system evaluation shall be submitted to include source code, object code, and sample output report formats.

Security Test – The security test is designed and performed to test the capabilities of the voting system against the requirements defined in Volume I, Section 7. These procedures shall focus on the ability of the system to detect, prevent, log, and recover from a broad range of security risks identified. This test will also examine system capabilities and safeguards claimed by ES&S in the TDP to go beyond these risks. The range of risks tested is determined by the design of the system and potential exposure to risk.

Usability/Accessibility – The usability test is a measure of the effectiveness, efficiency, and satisfaction achieved by a specified set of users with a given product in the performance of specified tasks. This test applies to the requirements for Volume I, Section 3 of the EAC 2005 VVSG.

Accuracy – The accuracy test ensures that each component of the voting system can each process 1,549,703 consecutive ballot positions correctly within the allowable target error rate. The Accuracy test is designed to test the ability of the system to "capture, record, store, consolidate and report" specific selections and absences of a selection. The required accuracy is defined as an error rate. This rate is the maximum number of errors allowed while processing a specified volume of data. For paper-based voting systems, the ballot positions on a paper ballot must be scanned to detect selections for individual candidates and contests and the conversion of those selections detected on the paper ballot converted into digital data.

In an effort to achieve this and to verify the proper functionality of the units under test, the following methods will be used to test each component of the voting system:

The accuracy requirements for the DS200 will be met by the execution of the standard accuracy test.

6.0 TEST PROCEDURES AND CONDITIONS (Continued)

6.3 Test Sequence (Continued)

6.3.3 System Testing (Continued)

- Stand-Alone Precinct Scanner – Tested by utilizing a combination of hand marked (70%) and pre-marked (30%) ballots to achieve accuracy rate greater than 1,549,703 correct ballot positions.

System Integration – System Level certification test address the integrated operation of both hardware and software, along with any telecommunication capabilities. Compatibility of the voting system software components or subsystems with one another, and with other components of the voting system environment, shall be determined through functional tests integrating the voting system software with the remainder of the system.

Additionally, the system shall be configured exactly as it would for normal field use. This includes connecting all supporting equipment and peripherals including ballot boxes, voting booths (regular and accessible), and any physical security equipment such as locks and ties. Wyle Laboratories personnel will properly configure and test the system by following the procedures detailed in the EVS 5.0.1.0 Voting System technical documentation.

Functional test to verify ECO1281 – This test will utilize the DS200 autocast mode to ensure that the changes in ECO1281 did not affect the reliability of the DS200. A total of 4000 ballots will be cast (each orientation of each ballot size will be cast 250 times).

Regression Testing – Regression Testing will be performed on all applicable system components to verify all firmware and application software modifications are working as expected.

Quality Assurance/Configuration Management – A limited QA/CM review will be performed on all applicable system components to verify that the submitted modifications follow ES&S documented QA/CM process. This review will concentrate on Functional Configuration Audit, Configuration Identification, Release Process and Quality Conformance Inspection as these are the areas impacted by modifications.

7.0 TEST OPERATIONS PROCEDURES

7.1 Proprietary Data

All proprietary data that is marked will be distributed only to those persons that the manufacturer or EAC identifies as needing the information to conduct qualification testing. The manufacturer is required to mark all proprietary documents as such. All organizations and individuals receiving proprietary documents will ensure those documents are not available to non-authorized persons.

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APPENDIX A

ES&S PROJECT SCHEDULE

Appendix A, Page No. A- 2 of 2
Certification Test Plan T71352.01 Rev A

Task Name	Duration	Start	Finish
EAC Application submitted	3 days	Fri 11/1/13	Tue 11/5/13
EAC Kickoff Meeting (Conference Call)	1 day	Wed 11/20/13	Wed 11/20/13
Source Code Review	**1 day**	**Wed 11/6/13**	**Wed 11/6/13**
DS200	1 day	Wed 11/6/13	Wed 11/6/13
Compliance Build	**14 days**	**Fri 11/8/13**	**Wed 11/27/13**
DS200	1 day	Fri 11/8/13	Fri 11/8/13
Load Compliance Builds Checkout	1 day	Wed 11/27/13	Wed 11/27/13
Test Plan	**56 days**	**Wed 11/6/13**	**Thu 1/30/14**
Draft Test Plan	15 days	Wed 11/6/13	Tue 11/26/13
Manufacturer Review	4 days	Wed 11/27/13	Wed 12/4/13
Draft Test Plan Update	1 day	Thu 12/5/13	Thu 12/5/13
Test Plan to EAC	1 day	Fri 12/6/13	Fri 12/6/13
EAC Review	20 days	Mon 12/9/13	Wed 1/8/14
Review TR's Comments	2 days	Thu 1/9/14	Fri 1/10/14
Revise Test Plan	2 days	Mon 1/13/14	Tue 1/14/14
Resubmit Test Plan to EAC	1 day	Wed 1/15/14	Wed 1/15/14
EAC approval	10 days	Thu 1/16/14	Thu 1/30/14
TDP Review of Changes	30 days	Wed 11/6/13	Thu 12/19/13
Equipment Check in and Set up	2 days	Mon 11/25/13	Tue 11/26/13
PCA	2 days	Wed 11/27/13	Mon 12/2/13
Electrical Supply	2 days	Tue 12/3/13	Wed 12/4/13
Functional	2 days	Thu 12/5/13	Fri 12/6/13
Accuracy	5 days	Mon 12/9/13	Fri 12/13/13
System Integration Testing	5 days	Mon 12/16/13	Fri 12/20/13
Final Trusted Build	**7 days**	**Mon 12/30/13**	**Wed 1/8/14**
Verify Build Environment	1 day	Mon 12/30/13	Mon 12/30/13
Trusted Build	2 days	Tue 12/31/13	Thu 1/2/14
Install and Verify System Build	1 day	Fri 1/3/14	Fri 1/3/14
Final Trusted Build Complete	1 day	Mon 1/6/14	Mon 1/6/14
Delivery of Images to EAC Repository	2 days	Tue 1/7/14	Wed 1/8/14
Regression Testing Final Build Loads	3 days	Thu 1/9/14	Mon 1/13/1
Certification Report	**33 days**	**Mon 12/23/13**	**Tue 2/11/14**
Initial Draft Report	10 days	Mon 12/23/13	Wed 1/8/14
Manufacturer Review	2 days	Thu 1/9/14	Fri 1/10/14
Submit Test Report to EAC	1 day	Mon 1/13/14	Mon 1/13/1
EAC Review	20 days	Tue 1/14/14	Tue 2/11/14

APPENDIX B

COTS Software Table

The EVS 5.0.1.0 System includes the following COTS software which has been delivered by ES&S:
* NOTE: All hashes for COTS software were obtained from the COTS provider and then verified by Wyle. All propriety software developed by the manufacture is built by Wyle and the hashes are provided by Wyle.

Software Product	Software Version	Filename	SHA1 Hash Value
Microsoft Windows 7, SP1	5.1	Original Disc	N/A
Micro Focus RM/COBOL Runtime	12.06	Original Disc	N/A
Microsoft Server 2008	R2	Original Disc	N/A
Adobe Acrobat Standard	9.0	Original Disc	N/A
AVG Business Edition	2012	TBD	TBD
Microsoft Excel 2003	TBD	TBD	TBD

Software Product	Software Version	Filename	SHA1 Hash Value
ElectionWare			
Microsoft Windows 7 Pro, SP1	5.1	Original Disk	NA
PostgreSQL	9.1	postgresql-9.1.2-1-windows.exe	b15aff7d85d26227d004c65cc35794272fb630b5
Oracle Java JDK	6u29	jdk-6u29-windows-i586.exe	41a8656f5bf2eb15f22fdcc01350e8da37fac7df
ElectionWarePaperBallot.exe			
Microsoft Windows 7 Pro, SP1	5.1	Original Disk	NA
Visual C++ 10.0 CRT (x86)	10.0.40219.1	msvcp100.dll	2ada702a0c143a7ae39b7de16a4b5cc994d2548b
	10.0.40219.1	msvcr100.dll	0b51fb415ec89848f339f8989d323bea722bfd70
Visual C++ 10.0 MFC (x86)	10.0.40219.1	mfc100u.dll	2771393d56ff167275bf03170377c43c28ee14e1
PostgreSQL	9.1.2	postgresql-9.1.2-1-windows-binaries.zip	73edb0239de58a64f30510d568c3a85a19816b75
	1.0.0.4	libeay32.dll	2e741c73bf6fc843eb74f15070084aeab9033b4f
	1.12.0.0	libiconv-2.dll	2e116fef19547ac5ea4d032f4a5bdad997766134
	0.17.0.0	libintl-8.dll	ad19cce12f2175c1fd1160f8cbb464f2f3de5fca
	9.1.2.11335	libpq.dll	85e03b03e00bc8ef7ef2fd77e50fa4641e820eb3
	1.0.0.4	ssleay32.dll	f6eee4c41027ded239023a7fe8ad9c0f81adf947
XercesC++ XML Parser Library	3.1.1	xerces-c_3_1.dll	Must be built from source. Hash will come from trusted build.

Software Product	Software Version	Filename	SHA1 Hash Value
Election Reporting Manager			
Microsoft Windows 7 Pro, SP1	5.1	Original Disk	NA
Micro Focus RM/COBOL Runtime	12.06		NA
	2.32	unzip.exe	e1652b058195db3f5f754b7ab430652ae04a50b8
InfoZip	5.5.2	zip.exe	55c5a72010291fca2275ccfb5b497dd0bac11a60
RoboHelp 2000	8.0.131.0	ROBOEX32.DLLL	964d83c7f4dede10241408de04e7d44cb599ef3d
RoboHelp X5	13.10.606.0	wh2robo.dll	4ff22cf837373459232906078dc1d4d1464598db
Shamir Optical	1.0.0.0	OpenSaveFile.ocx	47f736752a9894553ec11134bffcd5a4455e29ef
	3.0.0.1	ccme_base.dll	652f5069fea72f20faea001c887073b69c8281b0
	3.0.0.1	ccme_ecc.dll	1a2f71f2ae1b215739718f04b23a6cdf0eaaf432
	3.0.0.1	ccme_eccaccel.dll	0f90ec44c40227d9b59c9dbc7e1e3b51618513d0
	3.0.0.1	ccme_eccnistaccel.dll	6698462aa02d592cf9a5a9c9dad512f047d289d9
	3.0.0.1	cryptoccme2.dll	cc10515599cb629a1137cedbf68ba0c9ce445fe3
RSA Encryption Library	3.0.0.1	cryptoccme2.sig	61174bc0385d8a0e5a697f8e4148ff8114ba13a1
Dynamic linked library for Xerces-C	2.8.0.0	xerces-c_2_8_vc80.dll	2896bc1d9f6be38a2c34d76fdc674909f0395462
	10.0.40219.1	msvcp100.dll	2ada702a0c143a7ae39b7de16a4b5cc994d2548b
Visual C++ 10.0 CRT (x86)	10.0.40219.1	msvcr100.dll	0b51fb415ec89848f339f8989d323bea722bfd70
	10.0.40219.1	mfc100.dll	29dd7ca9af4085c689778c1afaadf59dd5d8b0e
	10.0.40219.1	mfc100u.dll	2771393d56ff167275bf03170377c43c28ee14e1
	10.0.40219.1	mfcm100.dll	432a2fddbb87bd13e4e40428e4c6a167eebf7bf1
Visual C++ 10.0 MFC (x86)	10.0.40219.1	mfcm100u.dll	e7fb9b6a36e2f9ad381d00d14e1a20b541c70d94
EventLog Service			
Microsoft Windows 7 Pro, SP1	5.1	Original Disk	NA
	10.0.40219.1	msvcp100.dll	2ada702a0c143a7ae39b7de16a4b5cc994d2548b
Visual C++ 10.0 CRT (x86)	10.0.40219.1	msvcr100.dll	0b51fb415ec89848f339f8989d323bea722bfd70
Removable Media Service			
Microsoft Windows 7 Pro, SP1	5.1	Original Disk	NA
	10.0.40219.1	msvcp100.dll	2ada702a0c143a7ae39b7de16a4b5cc994d2548b
Visual C++ 10.0 CRT (x86)	10.0.40219.1	msvcr100.dll	0b51fb415ec89848f339f8989d323bea722bfd70
AutoMARK™			
		nk.nb0	941cc95c9884e6073d5daa33f80b37bfc528d246ac7a9cb02e26e21bc05ddf57
		ADSApiDll.dll	7841640c8514ab4c8c8e457b4e1374cbb61c9a85ab3b0b3e0a64995e23693708
		FSHDRV.dll	f5e67f3c907fbc860b2662da3bb1038ec669cba003a8e9a0a9ddd441f5bd915d
Eurotech WinCE OS	5.00.20	sysUpgrad.exe	567da9e0f20dd3a13af9922d07adfa4995ce390fca190b549bf005f30fed5bd9
	5K509399ALA 2.0/1/3/0	bootloader.bin	7ee9258db57c37c2d5cbf7429a2e1774092b570e1bf98a0f83ad511b182cc02e
Ricoh SBC/Bootloader	5K509399BLA 2.5/1/3/1	bootloader.bin	9042589bad245c864e0cbe3d65aa5c552135e4a8cdb67c9116f0aed92372651d
DS200			
N/A	N/A	N/A	N/A
DS850			
N/A	N/A	N/A	N/A

Software Product	Software Version	Filename	SHA1 Hash Value
EMS Build Environment			
Apache Software Foundation Ant	1.7.1	apache-ant-1.7.1-bin.zip	a7e8fa7bc2102a8d8df99e64db73c2eae3d8b483
Apache Software Foundation Xerces-C++	3.1.1	xerces-c-3.1.1.zip	b61e2829f68d812d649bddaf5264a98f9837201a
CodeSynthesis XSD Including Apache Software Foundation Xerces C++ 2.8.0	3.1.0	xsd-3.1.msi	aa5f2fb2c815e8e1aa94314c08697751d056690b
Flexera Software (Macrovision) InstallShield	2008 Premier Edition	Original CD (two disk set)	N/A
Flexera Software (Macrovision) InstallShield Standalone Build Script Objects	2008 Premier Edition	installshieldinstallscriptobjects.exe	6cb960636c4474277fe12a51ee0d0704ee9246ed
MicroFocus (Liant) RM/COBOL Development System	12.06	rmcobol1206ds.exe	ff0c1a2cd06936eb12f860deb1a4d8cc6350832f
	12.06	wowext1206.exe	0d9bd6aa0c96dd4552656d54b677750655844761
Microsoft Visual Studio	2010 Premium (X86)	en_visual_studio_2010_premium_x86_dvd_509357.iso	a4e69966496ad0f704fe9d97fac2a723ef75a99b
	2010 Service Pack 1 (x86)	mu_visual_studio_2010_sp1_x86_dvd_651704.iso	61c2088850185ede8e18001d1ef3e6d12daa5692
Microsoft Windows	XP Professional with Service Pack 3	Original CD	N/A
	XP Professional Update (KB971513)	WindowsXP-KB971513-x86-ENU.exe	c18df80f512a6d9cea206825b981e33c0973abec
Microsoft Windows Driver Kit (WDK)	7.1.0.7600	GRMWDK_EN_7600_1.ISO	de6abdb8eb4e08942add4aa270c763ed4e3d8242
Oracle (NetBeans) NetBeans	6.9.1	netbeans-6.9.1-ml-javase-windows.exe	84d4a09937c8dcb3c199cf6281672aefe137f70e
Oracle (SDN) Java SE Development Kit	Version 6 Update 29	jdk-6u29-windows-i586.exe	41a8656f5bf2eb15f22fdcc01350e8da37fac7df
PostgreSQL Global Development Group PostgreSQL	9.1.2-1	postgresql-9.1.2-1-windows.exe	b15aff7d85d26227d004c65cc35794272fb630b5

Software Product	Software Version	Filename	SHA1 Hash Value
EMS Build Environment			
RSA BSAFE Crypto-C	Micro Edition (ME) 3	r_unpack.exe	5c48f05c4cf65784f3b129e15a0538361193f015
	Micro Edition (ME) 3	cryptocme-3_0_0_1-win32vc8.pkg	30fb23005a0e315a5eecee37cfbf64b3e3f62b20
SourceForge Boost C++ Libraries	1.46.1	boost_1_46_1.zip	62ae61cb2756abfc8515f842023ca572e733b2f2
	1.46.1	libboost_date_time-vc100-mt-1_46_1.zip	cdf7a788cc8c0e505fdb5fcf5bfb9da430a7dfee
	1.46.1	libboost_filesystem-vc100-mt-1_46_1.zip	e31498f488d644a6acdacb23c925cb956cd03f5e
	1.46.1	libboost_filesystem-vc100-mt-s-1_46_1.zip	dc2142b4ae049e2e1e577ddc9bbfa12e46852286
	1.46.1	libboost_program_options-vc100-mt-1_46_1.zip	07abf1aaa7548d1273b91afcda83d35bd35f1bcc
	1.46.1	libboost_system-vc100-mt-1_46_1.zip	3fa909d6e6fdcef0e9e5a5a668e85789ee202efa
	1.46.1	libboost_system-vc100-mt-s-1_46_1.zip	3970de2312ab82b7ea4fe29ad31aa622571b39d9
InfoZip	2.32	unzip.exe	e1652b058195db3f5f754b7ab430652ae04a50b8
	5.52	zip.exe	55c5a72010291fca2275ccfb5b497dd0bac11a60
MarshallSoft	0.0.0.0 Linker Rev 3	WSC32.DLL	ac0d9b7d7ac30e98af162735bc9e7b1b24c48d23
RoboHelp 2000	8.0.131.0	ROBOEX32.DLL	964d83c7f4dedc10241408de04e7d44cb599ef3d
RoboHelp X5	13.10.606.0	wh2robo.dll	4ff22cf837373459232906078dc1d4d1464598db
Shamir Optical	1.0.0.0	OpenSaveFile.ocx	47f736752a9894553ec11134bffcd5a4455e29ef

Software Product	Software Version	Filename	SHA1 Hash Value
AutoMARK™ Build Environment			
Autoit Consulting AutoIt	3.2.10.0	autoit-v3-setup.exe	bb913c21b1eeb8a580ea226d0a524f339d752596
Applied Data Systems Xscale	4.2	ADS_XSCALE_4_2_SDK.msi	991746a6251c28fe8b28b439c00565f23603f35e
Cosmic Software 68HC08 C Compiler	4.1h	Original CD	N/A
Keil µVision2 Note: CD is mislabeled µVision3	Release 04.2004	Original CD	N/A
Keil µVision2	Add-On Disk	Original 3.5" High-Density Floppy Diskette Note: Must transfer to a CD	N/A
MacroVision InstallShield Professional	10.5	Original CD	N/A
Microsoft Visual Studio	.Net 2003	Original CD	N/A
Microsoft Windows	XP Professional with Service Pack 3	Original CD	N/A
Microsoft Windows CE Platform Builder	5.0	Original CD	N/A
	Cumulative 2004 Update	WinCEPB50-041231-Product-Update-Rollup-Armv4I.msi	2a33a1540e25118e9360e7298af7c96da206006f
	Cumulative 2005 Update	WinCEPB50-051231-Product-Update-Rollup-Armv4I.msi	331f874c41fd2abe79ddc97ac9a47b91d203bdf9
	January 2006 Update	WinCEPB50-060131-2006M01-Armv4I.msi	884241dd89bd1fda9683fb6d6ba14f1c82cf9b2c
	February 2006 Update	WinCEPB50-060228-2006M02-Armv4I.msi	4695c80aff3707a1926ec54d0756af3a426d8e0f
	March 2006 Update	WinCEPB50-060331-2006M03-Armv4I.msi	39dc323b9736441893322fc1b159bc94dd2ec3b5
	April 2006 Update	WinCEPB50-060430-2006M04-Armv4I.msi	823c496b554f9d3d29cd491f80ffda9729176b89
	May 2006 Update	WinCEPB50-060531-2006M05-Armv4I.msi	29df27801c8bd2a3a68567cfa65c1ff54de8ae63
	June 2006 Update	WinCEPB50-060630-2006M06-Armv4I.msi	7421d73ec31cd1e9250e6c591e14f00a98988f59
	July 2006 Update	WinCEPB50-060731-2006M07-Armv4I.msi	f8ab5055a648ca23a64c3e89ef01e88ec9836b5c
	August 2006Update	WinCEPB50-060831-2006M08-Armv4I.msi	43b5d5a6f1be643e9dd4af970dc1785188bbe622
Microsoft Embedded Visual C++	4.0	Original CD	N/A

Software Product	Software Version	Filename	SHA1 Hash Value
AutoMARK™ Build Environment			
RSA BSAFE Crypto-C	Micro Edition (ME) 3	r_unpack.exe	5c48f05c4cf65784f3b129e15a0538361193f015
	Micro Edition (ME) 3	cryptocme-3_0_0_0-ppc2003.pkg	5ae651f5927f6cd8c16dce81e99df550441df9e6
Texas Instruments Code Composer Studio	v2 TMS320C5000 DSP Platform	Original CD	N/A
VAT_1.7.0.0t_Buildpkg_COTS.zip	N/A	N/A	N/A
Microsoft Visual Studio .NET 2003	N/A	cabwiz.ddf	dd44f51cdd27710a1ce6522764544316 72e4bd05
	1.00.0601	Makecab.exe	4825951d19c34deb658228822df95f7df5e1344e
Microsoft .NET Compact Framework	1.0.2268	Microsoft.WindowsCE.Forms.dll	939eb54fedb95782a73837c81ac201f2d638e9da
		MSCORLIB.DLL	8e57cbd267aea2085de258f3fceec0590de52f35
		System.Data.Common.dll	aa7bea9e02c545cc32d43b017fc68f3fbbe0fa90
SpeechWorks International, Inc. ETI-Eloquence TTS Engine	6.1.0.0	chs.syn	8a141d890adcd7acdd24f7aa2e3b798338dd9da4
		chsrom.dll	5c134deb10442e9394d96d3f3135909637e60383
		eci.dll	dc792ced3d1ae96f8f1d507e22ab600376a0d71e
		enu.syn	08dbcebe6cf27a253535fc1a0d7d8a27169049c5
		esm.syn	eaf755997ee001f37d17c4e152b1b40ed349e2a8
		jpn.syn	32ca16e5034918711e8d056b850cd5279871762a
		jpnrom.dll	0a6c13ad82b0f5c5106f40f9d040a8b7e7c7cda4
		kor.syn	8592386bfaa11c2e7196278240c8ca0afc96db2d
		korrom.dll	1de6f4a4250fecfe542a48acef7ad990f2d04beb
ATEN Technology Inc.	N/A	PL2303.CAT	a1bd69bdef67a0c90cdc1785015b62116c55976d
	N/A	SER2PL.INF	b682d49b5083fb58a4c7725884dfd0b173d0afc6
	N/A	SER2PL.SYS	60ea554d7e0695998fa83668fe6ae3d21e30cc47
VAT_1.7.0.0t_Source_COTS.zip	N/A	N/A	N/A
Enounce, Inc	1.3	enresult.h	026f14e00f2ffac65ff78ff219523ec702a8971c
	1.7	entypes.h	62f2e746d9e10e33167a8252523e72dc38489c0f
	1.7	tsmiface.h	45e4323d1c24134fea1d653072a116b330474742
	1.21	TSMStrmObj.h	d6bd6b1a0c6815c6935c3f7b5439baa5f879491e
	N/A	tstanmv4Llib	57f18b940f5cd0bf404f3cd10b003db40bfb4e7c
FTDI Ltd	1.0.1.3	FTD2XX.h	2d753f2d72fa3adab894b0dbf8c85a97466ec89c
		FTD2XX.lib	4685d678b54a7a0159b97b510fc2741cfa64fb5f
zlib	1.1.4	unzip.cpp	afbb534d029875028b7d4048e895083d6901ab32
		unzip.h	5d6a56bd1daab11ac05e801b8b5111d4736e88ed
VAT Preview_1.7.0.0t_Installpkg_COTS.zip	N/A	N/A	N/A
SpeechWorks International, Inc. ETI-Eloquence TTS Engine	6.1.0.0	chs.syn	ff7c1873b84256c25da601d70ad280333e5ce167
		chsrom.dll	f3ae8a1f7d0369d387b8f2ee0a47a76efee2bc2f
		eci.dll	7aa10851 74b7bce6016c8074297bc6cb40b823df
		enu.syn	3e69875d11e0a53c39c211c484cb6520f8d87f25
		esm.syn	d8037d86e5f677e89eca7834ae47fbd030a043aa
		jpn.syn	99a931e76e6008da9f01b91b4d91c116ece8f7d7
		jpnrom.dll	7557c00e8ace29affdabebddb73f466d0877a866
		kor.syn	f32f8ae286ed278320dbb829df338b97a2c846b5
		korrom.dll	76219d7f9f76f021b4815fa796f80e3ca49e3446

Software Product	Software Version	Filename	SHA1 Hash Value
DS200 Ancillary Devices Build Environment			
Keil µVision3	3.51	Original CD	N/A
Cypress EZ-USB Dev Kit	2.31	Original CD	N/A
IAR MSP430 Embedded Workbench	3.40A	Original CD	N/A
Microsoft Windows	XP Professional with Service Pack 3	Original CD	N/A
DS200			
Linux From Scratch	6.2-5	lfslivecd-x86-6.2-5.iso	b3e3947bf2c3616fa45541c0643a2adfa0618207
/lfs-sources (LFS Base Files from Live CD)			
autoconf	2.59	autoconf-2.59.tar.bz2	d366a07b2d99c95b7f24395aa8a8e023d8b93b69
automake	1.9.6	automake-1.9.6.tar.bz2	d205dbb274d3ff5be1cf6734f27fb452c7131866
bash	3.1	bash-3.1.tar.gz	766e3fd9384616d8a103f812f662fd8ec791c129
bash fixes	3.1	bash-3.1-fixes-8.patch	03d6781dd9ad6336eda906d5645c166e1641dd49
bash doc	3.1	bash-doc-3.1.tar.gz	9cacbbdf3b1be03819b1ea82cdaec0f5e61570c1
binutils	2.16.1	binutils-2.16.1.tar.bz2	5c80fd5657da47efc16a63fdd93ef7395319fbbf
bison	2.2	bison-2.2.tar.bz2	b01691e83cc0d08d3c03e32c494f6b03381ecd21
bzip2	1.0.3	bzip2-1.0.3.tar.gz	7e749510f65c86fbfff37b97144a02f1b8b8617f
bzip2 patch	1.0.3	bzip2-1.0.3-bzgrep_security-1.patch	56a29bf1278f21bc30c72d19e5766bfda5c74e5b
bzip2 docs patch	1.0.3	bzip2-1.0.3-install_docs-1.patch	ead85296356efe99db45529cf7aeb9f61dd33daa
coreutils	5.96	coreutils-5.96.tar.bz2	782379daf200427058ca94a408566d600f779823
coreutils patch	5.96	coreutils-5.96-i18n-1.patch	3ff73ceeae8ef66345cfed38f770e51db4d02199
coreutils patch	5.96	coreutils-5.96-suppress_uptime_kill_su-1.patch	a7dedf947b7651f882c8ede00eb6e56689bbb154
coreutils patch	5.96	coreutils-5.96-uname-1.patch	42cc795e56b96994a4dc9e8f2a8dd72b6a25665f
db	4.4.20	db-4.4.20.tar.gz	bb4e68a4afc14712eb2954b7991f5dc9fe93bf7b
db patch	4.4.20	db-4.4.20-fixes-1.patch	46886ccdf1ea6daab392e5c46b4923f7e71e7d55
dejagnu	1.4.4	dejagnu-1.4.4.tar.gz	fd82ffd396eba5b595f76d2f4a068cb7fcc6cffb
diffutils	2.8.1	diffutils-2.8.1.tar.gz	a4c467c3a6a08cde9f3d94d02067ec26436e7dc5
diffutils patch	2.8.1	diffutils-2.8.1-i18n-1.patch	2d88d693ab572f04990a3a28deb5e743e288b9da
expect	5.43.0	expect-5.43.0.tar.gz	854440d937c1d05103bf2d02f911005b739fa1e9

Software Product	Software Version	Filename	SHA1 Hash Value
DS200			
expect patch	5.43.0	expect-5.43.0-spawn-1.patch	ba903a7d04b4faa13c8b9db75e1537f55f28e82b
file	4.17	file-4.17.tar.gz	e03710a3fcb95db6d0ec9cfcdf88c19a5e525ee4
findutils	4.2.27	findutils-4.2.27.tar.gz	0655e10b20dc66b1ceddfa45e5d6c57a3cd312a2
flex	2.5.33	flex-2.5.33.tar.bz2	acdb8fff6455967ad1a5bfc71855dbcc1253ee56
gawk	3.1.5	gawk-3.1.5.tar.bz2	0d5694461f1c32f1eae41a1c0d7ba0939b47e369
gawk patch	3.1.5	gawk-3.1.5-segfault_fix-1.patch	8dde8415d03b1897f50d5b12b6c876feda15e0be
gcc	4.0.3	gcc-4.0.3.tar.bz2	5a94943d9ab823cf8d080cc7f9e8a4a91797afea
gcc patch	4.0.3	gcc-4.0.3-specs-1.patch	04d4b7d68bfd6b362e9b75678584641a2dde7c2f
gettext	0.14.5	gettext-0.14.5.tar.gz	68737eee1a6427044eef901dc88e4144d371fb6b
glibc	2.3.6	glibc-2.3.6.tar.bz2	82d0487419f1bdbf2dee439c344e89d6af47e558
glibc patch	2.3.6	glibc-2.3.6-inotify-1.patch	d282d10108a4f6b9c6eddc4351a83abe22a5b5b6
glibc patch	4.0.3	glibc-2.3.6-linux_types-1.patch	0bdf2b15e20c176caf3c85e5b6a7bc957f636d6a
glibc-libidn	2.3.6	glibc-libidn-2.3.6.tar.bz2	95d3a98495d4bd7138149fd312db88da56e735db
grep	2.5.1a	grep-2.5.1a.tar.bz2	2cd082775d30be463c0ac674a00595cb56fda22e
grep patch	2.5.1a	grep-2.5.1a-redhat_fixes-2.patch	6f7f1623d1909f07dc08a8a16a24cbce6be8dfc5
groff	1.18.1.1	groff-1.18.1.1.tar.gz	19c8c83e6ee29dd6041dae0daf1c1d0debd3d32a
groff patch	1.18.1.1	groff-1.18.1.1-debian_fixes-1.patch	39fb82b9673523cb2451a0491929693226ca97dd
grub	0.97	grub-0.97.tar.gz	2580626c4579bd99336d3af4482c346c95dac4fb
grub patch	0.97	grub-0.97-disk_geometry-1.patch	651801fe6d851c9f59ccd16b6bd49f1358c9594c
gzip	1.3.5	gzip-1.3.5.tar.gz	843272609b9bff1bdf2770a28d498d6519901e73
gzip patch	1.3.5	gzip-1.3.5-security_fixes-1.patch	3ab15ed9fa2b8b3e26b6f8d878f5cf43f822abca
iana-etc	2.10	iana-etc-2.10.tar.bz2	6a2960e42ccf3266680b7adb83f239c5a640220e
inetutils	1.4.2	inetutils-1.4.2.tar.gz	6b60d2c78702512e95afae36415f6fe3523dba77
inetutils patch	1.4.2	inetutils-1.4.2-gcc4_fixes-3.patch	77b063b0fcc15a55e28c18e1b30e1cdf5b1b7d3a
inetutils patch	1.4.2	inetutils-1.4.2-no_server_man_pages-1.patch	ccd3c59f9ed4eca6f7a8dffb494ed8916087bc50
iproute	2.6.16-060323	iproute2-2.6.16-060323.tar.gz	76d866bb3b46a7b2e73d79a4faf6fa8971527633
kbd	1.12	kbd-1.12.tar.bz2	65eaae4d98fca3f7ae7dfc9d9cb7c5a432c6475f
kbd patch	1.12	kbd-1.12-backspace-1.patch	39e332e42d5145dfc47786dba5eff63cda91d0ba
kbd patch	1.12	kbd-1.12-gcc4_fixes-1.patch	93ec9885a79ff79088f1533ec52f1a87dae69500
less	394	less-394.tar.gz	fa0d9aa30ec461866786e4080bb594fc3337bb02
lfs-bootscripts	6.2	lfs-bootscripts-6.2.tar.bz2	616ece5d67a79169c62547141f4181ca5150e348c
libtool	1.5.22	libtool-1.5.22.tar.gz	17353e66aeaac80ac188ea0a3a90609550ce3254
linux patch	2.6.16.27	linux-2.6.16.27-utf8_input-1.patch	1245a73e16a0d6d1b1adfa167bbee2c02ca92dd5
linux-libc-headers	2.6.12.0	linux-libc-headers-2.6.12.0.tar.bz2	e72c9b260995b269c9fb9248ed468c18fb01f3fd
linux-libc-headers patch	2.6.12.0	linux-libc-headers-2.6.12.0-inotify-3.patch	724f0340907df408d17650fd2e58448d0a9e1799
m4	1.4.4	m4-1.4.4.tar.gz	4861f40cb54b6c9e135d04b5fbf460ff57f969a5
make	3.80	make-3.80.tar.bz2	d2085842f08e57d58d3e1cd75a5f0342a60e5f45
man-db	2.4.3	man-db-2.4.3.tar.gz	a9f6ac22ccd97186005920cedb5f6611df3d4fa
man-pages	2.34	man-pages-2.34.tar.bz2	99278abd00613fa2409791f20c0ee175118a41d1
mktemp	1.5	mktemp-1.5.tar.gz	aa001fd61d13bbf128dc58ca4dc6d83311435bae

Software Product	Software Version	Filename	SHA1 Hash Value
DS200			
mktemp patch	1.5	mktemp-1.5-add_tempfile-3.patch	c4ca0c1d5993a44bf82e369d60f415e2cf92b95b
module-init-tools	3.2.2	module-init-tools-3.2.2.tar.bz2	b51e8ac170be23a1f2e301a1dddd47a47ec2186a
module-init-tools patch	3.2.2	module-init-tools-3.2.2-modprobe-1.patch	0caecb2078ce47c97e496e2e4717b8b82a52eb01
ncurses	5.5	ncurses-5.5.tar.gz	46414a72e91a62f63a8c9af00f0d65497f5ecc5a
ncurses patch	5.5	ncurses-5.5-fixes-1.patch	617e1de363a6dc2cfcaf5eaafd78cfe01ab34f48
patch	2.5.4	patch-2.5.4.tar.gz	a12d520eba0dc35d1c4d50ec75b7684451a40de9
perl	5.8.8	perl-5.8.8.tar.bz2	4aab490040727ca4419098720eca2ba4367df539
perl patch	5.8.8	perl-5.8.8-libc-2.patch	b72468149c5eee6faefde7f32bb05bda6e2a1c9d
procps	3.2.6	procps-3.2.6.tar.gz	91f44180eb50a94eb945c2598c0e849879e65893
psmisc	22.2	psmisc-22.2.tar.gz	1ae222803c5b5967a1b93e69f08330e0edc1a554
readline	5.1	readline-5.1.tar.gz	4b2ee2bc9c6dd1d238c84a58f7e6db173600b850
readline patch	5.1	readline-5.1-fixes-3.patch	f58bbd80c7aed462ab7e97e3ac4eae7cd9d1b835
sed	4.1.5	sed-4.1.5.tar.gz	8e575e8a44568392d5b6e089eab5da5cdbd45885
shadow	4.0.15	shadow-4.0.15.tar.bz2	0f7cd3366a032091fdffd2f8edf65056bd576cae
sysklogd	1.4.1	sysklogd-1.4.1.tar.gz	093775da0e429d0768cf195ceb20fdd6d96aeeea
sysklogd patch	1.4.1	sysklogd-1.4.1-8bit-1.patch	edc01eccb4ae7af3d6a02e23a4dacc8fcc50f3eb
sysklogd patch	1.4.1	sysklogd-1.4.1-fixes-1.patch	4fbd5e56c212c8e37f363eb48ba86a5ecca21f4a
sysvinit	2.86	sysvinit-2.86.tar.gz	3e78df609a2ff0fea6304cb662a7f10298d03667
tar	1.15.1	tar-1.15.1.tar.bz2	f861b7524a0867833056dc382e68085234cae6ff
tar patch	1.15.1	tar-1.15.1-gcc4_fix_tests-1.patch	ba780e0e88c7993a69d5a498912e135bf16e7df8
tar patch	1.15.1	tar-1.15.1-security_fixes-1.patch	93fd5a55bccf25d03bb7e18dffc0bce27c29d207
tar patch	1.15.1	tar-1.15.1-sparse_fix-1.patch	269dfcc556b6217d27d043ea623df75e19e3d8c9
tcl	8.4.13	tcl8.4.13-src.tar.gz	4af6bec9a941d7d798df4287eebece7ded67489c
texinfo	4.8	texinfo-4.8.tar.bz2	b19e906f7220294c1e8b087d583c50f5c4d7e420
texinfo patch	4.8	texinfo-4.8-multibyte-1.patch	b97ae3468c03f8389dbf5c9b6eed64f996f9ed5c
texinfo patch	4.8	texinfo-4.8-tempfile_fix-2.patch	2ead28cb8e2679cdb53e1e4908209f0a31397dfe
udev	096	udev-096.tar.bz2	8d15b89fdf93ba84e2d33ff6061e140aed0a4dce
udev-config	6.2	udev-config-6.2.tar.bz2	5cd22b8e9cf1e996871c2bc540d75e57a4f706a3
util-linux	2.12r	util-linux-2.12r.tar.bz2	740b7eb5ae1148b2200b2cd34a0a6c4b0db577e4
util-linux patch	2.12r	util-linux-2.12r-cramfs-1.patch	00f5192493b939c2c996df9c1f3f769abfa3fa8c
vim-7.0	7.0	vim-7.0.tar.bz2	38ef48cabf942d0dc804a794dcc6f002b9457fc8
vim-7.0 patch	7.0	vim-7.0-fixes-7.patch	caf8b4b5635cf72edd033b048a993f80c5a5aa7b
vim-7.0-lang	7.0	vim-7.0-lang.tar.gz	3db6b0004d213490cc00d361835e7a7c685adb52
vim-7.0-mandir patch	7.0	vim-7.0-mandir-1.patch	182f46dfacefdd3bf6f821dea71f90547d414230
vim-7.0-spellfile patch	7.0	vim-7.0-spellfile-1.patch	4e0cb489a9b8f989f154d14cadb50deba619dd2b
zlib	1.2.3	zlib-1.2.3.tar.gz	60faeaaf250642db5c0ea36cd6dcc9f99c8f3902
lfs_kernel-2.6.35.13-src.tar			
Linux Kernel	2.6.35.13	linux-2.6.35.13.tar.bz2	b828b1db449c88a00209b1588efc0d192fa960c1

Software Product	Software Version	Filename	SHA1 Hash Value
DS200			
lfs_cots-3.0-rhel30-src.tar			
cryptocme	3.0-rhel30	cryptocme-3.0-rhel30.tar.gz	4fc8c6a6ddbf524cfa88e3c6cf195447afc67977
lfs_enhanced-2.7.0.0v-src.tar			
alsa-lib	1.0.13	alsa-lib-1.0.13.tar.bz2	82fa9a7fcb43b319524b18451ca86d691a20f4a3
alsa-utils	1.0.13	alsa-utils-1.0.13.tar.bz2	05b460a0e7ae6519ea37240476f026b59dbc710d
aumix	2.8	aumix-2.8.tar.bz2	5cea563ae91f628433a1950a36efd23681da4bf4
beecrypt	4.1.2	beecrypt-4.1.2.tar.gz	71cebd3329bb2561ffba24a2004dfac50b143f59
blfs-bootscripts	20060910	blfs-bootscripts-20060910.tar.bz2	58ff10492f9abceed6ca4a105c479d5f2e3e8002
BLFS-ca-bundle	3.12.5	BLFS-ca-bundle-3.12.5.tar.bz2	8cf4be3072184940f8cfc3888ef0ba1cb58a5377
boost	1.43.0	boost_1_43_0.tar.bz2	b8257b7da2a7222739314f8d1e07e217debe71d6
coreutils	6.9	coreutils-6.9.tar.bz2	10310a78c4e1d9f742f3815ac28e9bf1086a5885
cpio	2.6	cpio-2.6.tar.gz	5a4ea156519909994fe05933dc823abcf07e3e21
cpio-security_fixes-1	2.6	cpio-2.6-security_fixes-1.patch	d8445256032b903bbd3cee2694e87412e7dca843
ctags	5.6	ctags-5.6.tar.gz	930afaa138624717393fe475201f795251bd5e5e
curl	7.15.3	curl-7.15.3.tar.bz2	7e764126ce564429fe2f142428a27cbfc8fb69ee
cvs	1.11.22	cvs-1.11.22.tar.bz2	5dfa11da84a890d7d61516fd450c001dc24bcc0d
cvs-zlib-1	1.11.22	cvs-1.11.22-zlib-1.patch	0d20bab8a6b6e419a8e900d082b487ad6a3aec38
docbook-xsl	1.69.1	docbook-xsl-1.69.1.tar.bz2	aaabf0e274609134e187a6c36d2be23f3471f507
dosfstools	2.11	dosfstools-2.11.src.tar.gz	b0d8714475ca7c7a96a46adf7c4839d69ce2f412
e2fsprogs	1.41.14	e2fsprogs-1.41.14.tar.gz	24f9364fa3d4c0d7d00cb627b819d0e51055d6c5
expat	2.0.1	expat-2.0.1.tar.gz	663548c37b996082db1f2f2c32af060d7aa15c2d
fuse	2.8.5	fuse-2.8.5.tar.gz	862320b56d6bc4ad5e7be2b1e0b5029166aae09b
fuse	0.2.12	fuse-zip-0.2.12.tar.gz	fe6f1a32d7fbc0d8c8598b8c7f56129fe5ebc173
gnupg	1.4.3	gnupg-1.4.3.tar.bz2	9e96b36e4f4d1e8bc5028c99fac674482cbdb370
gpm	1.20.1	gpm-1.20.1.tar.bz2	c48d937e62abb438c2f6439b34ef3332c89af8d1
gpm-segfault-1	1.20.1	gpm-1.20.1-segfault-1.patch	da53bf78a0ebaa5020e332aa6d68611591706ed86
gpm-silent-1	1.20.1	gpm-1.20.1-silent-1.patch	8899a212eadfbda201d8da3e44590bd05b97f9f6
libao	0.8.6	libao-0.8.6.tar.gz	2050e008ffcfd6803e2c2c03c7d5f469b6d8379e
libogg	1.1.3	libogg-1.1.3.tar.gz	a3e495a8baf6939efad7e0bd11cc0e466838c3db
libusb	0.1.12	libusb-0.1.12.tar.gz	599a5168590f66bc6f1f9a299579fd8500614807
libvorbis	1.1.2	libvorbis-1.1.2.tar.gz	26289fc41aa5436b1a277d726bb5cb106d675c35
libxml2	2.6.26	libxml2-2.6.26.tar.gz	094ac2aae1c295fc227d88c803013557a269358a
libxslt	1.1.17	libxslt-1.1.17.tar.gz	5b36ab3e1ed85ed0862a10ce22ca03e1084d9121
libzip	0.9.3	libzip-0.9.3.tar.bz2	16e94bc0327f1a76a0296a28908cf6439b0a0a67
net-tools	1.60	net-tools-1.60.tar.bz2	944fb70641505d5d1139dba3aeb81ba124574b83
net-tools-gcc34-3	1.60	net-tools-1.60-gcc34-3.patch	a92286932a423fc987f2a152931d05b0a9a312bd
net-tools-kernel_headers-2	1.60	net-tools-1.60-kernel_headers-2.patch	3e59577e904582503b25c7b21f6e3b77b165f84a
net-tools-mii_ioctl-1	1.60	net-tools-1.60-mii_ioctl-1.patch	912613acbf3a000a2935391a14e55b5ccdeeae6b
ntfsprogs	1.13.1	ntfsprogs-1.13.1.tar.gz	a4e50f6fc10fcc1e1f562ad64bcbf9a0d46ca72a
openssh-4.5	4.5p1	openssh-4.5p1.tar.gz	2eefcbbeb9e4fa16fa4500dec107d1a09d3d02d7
openssl-5.8	5.8p1	openssh-5.8p1.tar.gz	adebb2fan9aba2a3a3c8b401b2b19677nb53f0de
openssl-fix_manpages-1	0.9.8r	openssl-0.9.8r.tar.gz	a02411e5f4d463cac4a2d4a357a4a0b93bf65e72

Software Product	Software Version	Filename	SHA1 Hash Value
DS200			
openssl-fips	1.2.2	openssl-fips-1.2.2.tar.gz	e7f94222ec24a5fe6c39b80ac2e5529760de3c33
openssl-fips	1.2.2	openssl-fips-1.2.2.tar.gz.asc	f9fd60bf106e5a98e834b09b1f072ff4341ebf31
pkg-config	0.22	pkg-config-0.22.tar.gz	3ec40bda9864d7aa3c912c6ae87a750fd8b6e420
popt	1.10.4	popt-1.10.4.tar.gz	10e6649c4c37ecfb6fb4296aeca609b5fdd5e34d
ppp	2.4.4	ppp-2.4.4.tar.gz	9b91b0117e0a8baf8c4e894af79e0960dd36259
Python	2.4.4	Python-2.4.4.tar.bz2	9e0971f93df8acbd947378d0d16a32fcc8897ba2
Python-gdbm-1	2.4.4	Python-2.4.4-gdbm-1.patch	34c3973ba2e519eaf1fd0ecf28ec465ed08bb96d
soundtouch	1.3.1	soundtouch-1.3.1.zip	d13437848ebe94b46b73fd5b05ba4420d4667527
unzip-security_fix-1	5.52	unzip-5.52-security_fix-1.patch	7f6a287c0b480bc4748abdf69429dfc76383e1d6
unzip552	5.52	unzip552.tar.gz	1831bd59b9e607a69052f83b263384895e2d4a19
usbutils	0.72	usbutils-0.72.tar.gz	891b8825d964880146d5c980e52bb9e23d92fe2b
vorbis-tools	1.1.1	vorbis-tools-1.1.1.tar.gz	a1394b39905b389d72f12c2a9f0c86a33d07a487
vorbis-tools-utf8-1	1.1.1	vorbis-tools-1.1.1-utf8-1.patch	35db6e412cc9df5d8b88b58cae5f2e514bc17823
xerces-c-src	2.8.0	xerces-c-src_2_8_0.tar.gz	f0803b1330daec3f44b17dee64c3c99de6b3cd3e
xsd	3.1.0	xsd-3.1.0-i686-linux-gnu.tar.bz2	a7bf9b26ff5ab577fcfeccc9ea76134da88ec7e2
zip232	2.32	zip232.tar.gz	5bc562bf95d9aee0cb6625e6038898e1f191a1aa
lfs_graphics-2.7.0.0v-src.tar			
apache ant	1.7.0	apache-ant-1.7.0-bin.zip	81aeb13c75edeee51dd5bb1c62001fac47b127a5
atk	1.18.0	atk-1.18.0.tar.bz2	d58dfc3dbdad49d8c446e0bd4a0b6260d315ceb0
bdftopcf	1.0.2	bdftopcf-1.0.2.tar.bz2	245778068b5e5ccde07151635ded50da90333524
bigreqsproto	1.1.0	bigreqsproto-1.1.0.tar.bz2	32ae0505ec963cc5c0e3ee9258b126e6865d1b1b
cairo	1.8.10	cairo-1.8.10.tar.gz	fd5e8ca82ff0e8542ea4c51612cad387f2a49df3
compositeproto	0.4.1	compositeproto-0.4.1.tar.bz2	fb1ae34418855c313a75e8e697b414a4935e13d6
damageproto	1.2.0	damageproto-1.2.0.tar.bz2	ffe177a6ae2cf023d41e015aa6ece2b191cb8a8a
DirectFB	0.9.22	DirectFB-0.9.22.tar.gz	f3a586c654086c287cd1bcc683be0f234973ee17
dmxproto	2.3	dmxproto-2.3.tar.bz2	a3636d1b54d7bbf273f28c0d3c44101777047865
dri2proto	2.2	dri2proto-2.2.tar.bz2	21e9c0c7e0be5fe971f51589d0573b0273202b7f
encodings	1.0.3	encodings-1.0.3.tar.bz2	615b8367ee20fc50688e4876aa250419927d64cc
fixesproto	4.1.1	fixesproto-4.1.1.tar.bz2	fb47920c629e08a56442a51968a02a22733085e5
font-adobe-100dpi	1.0.1	font-adobe-100dpi-1.0.1.tar.bz2	814baccf5cf6c6545b7e8f3bbbad377be369042d
font-adobe-75dpi	1.0.1	font-adobe-75dpi-1.0.1.tar.bz2	3cbcd8a4a3a6bbe6ccd3d6c07a238f8c9ab7a26c
font-adobe-utopia-100dpi	1.0.2	font-adobe-utopia-100dpi-1.0.2.tar.bz2	e692c3d3933c47c69656bc0fd0f06218c2db138d
font-adobe-utopia-75dpi	1.0.2	font-adobe-utopia-75dpi-1.0.2.tar.bz2	2db08c2e0186831e4d68f7a2ffb2f9fe598a7280
font-adobe-utopia-type1	1.0.2	font-adobe-utopia-type1-1.0.2.tar.bz2	565cb66523f59f02da02aa9e74604634a2113643
font-alias	1.0.2	font-alias-1.0.2.tar.bz2	9a0e97d974349e3a943b0ab77015f115f15d34c3
font-arabic-misc	1.0.1	font-arabic-misc-1.0.1.tar.bz2	d11a7bdce7500c3ccc2fe59505f2bc89e4c7aa2a
font-bh-100dpi	1.0.1	font-bh-100dpi-1.0.1.tar.bz2	4f3edda5dd35145cbd1ce8759e0a999b3a04f9c0
font-bh-75dpi	1.0.1	font-bh-75dpi-1.0.1.tar.bz2	7b891d5bfd966c405c19574bca8f87b8803146d1

Software Product	Software Version	Filename	SHA1 Hash Value
DS200			
font-bh-lucidatypewriter-100dpi	1.0.1	font-bh-lucidatypewriter-100dpi-1.0.1.tar.bz2	a1c9d28a619358092f7196473ff3e0f0dc5304d0
font-bh-lucidatypewriter-75dpi	1.0.1	font-bh-lucidatypewriter-75dpi-1.0.1.tar.bz2	26efd25d2802c8406a96ccc3240b2c14e511d49f
font-bh-ttf	1.0.1	font-bh-ttf-1.0.1.tar.bz2	0e9ffbc738072ca832cdf5f82bff071c67b71825
font-bh-type1	1.0.1	font-bh-type1-1.0.1.tar.bz2	b960d8523b02d4401dc6e1257f68dc120761ee4b
font-bitstream-100dpi	1.0.1	font-bitstream-100dpi-1.0.1.tar.bz2	ba163df365a591de5eb9e45fa302059d572dd171
font-bitstream-75dpi	1.0.1	font-bitstream-75dpi-1.0.1.tar.bz2	43344b8ff3b2e2fda8d4cdbcc12e0688b2e04789
font-bitstream-type1	1.0.1	font-bitstream-type1-1.0.1.tar.bz2	53800b904fc3ead6b577a34fb7c1f96e1af4423f
fontconfig	2.8.0	fontconfig-2.8.0.tar.gz	570fb55eb14f2c92a7b470b941e9d35dbfafa716
font-cronyx-cyrillic	1.0.1	font-cronyx-cyrillic-1.0.1.tar.bz2	dfff5974629dab97677a70fa20e21c2ef48071a0
font-cursor-misc	1.0.1	font-cursor-misc-1.0.1.tar.bz2	5087a94e74f8157cb6989f71fb3b4815b236065a
font-daewoo-misc	1.0.1	font-daewoo-misc-1.0.1.tar.bz2	d169cec4e92fe1e99f3ff6766d4c6edcbb808860
font-dec-misc	1.0.1	font-dec-misc-1.0.1.tar.bz2	2489d19650f2a787b476dab2fa2412d20b95f38e
font-ibm-type1	1.0.1	font-ibm-type1-1.0.1.tar.bz2	9bcf72bcabfcbe218ad3a96ba2a45e92ef9efbc3
font-isas-misc	1.0.1	font-isas-misc-1.0.1.tar.bz2	13fe07a669dd93dfdb08717a03efe47936ab9cea
font-jis-misc	1.0.1	font-jis-misc-1.0.1.tar.bz2	adb3275d19e71e9553aa8a5fdc3b2c647277d8d4
font-micro-misc	1.0.1	font-micro-misc-1.0.1.tar.bz2	74a8be2b0b6ace97d8841356e88570f5fa3faad6
font-misc-cyrillic	1.0.1	font-misc-cyrillic-1.0.1.tar.bz2	c178f8a8b6897a8382a0f4315a5b577760ba703c
font-misc-ethiopic	1.0.1	font-misc-ethiopic-1.0.1.tar.bz2	2677191fd8b515c53bde6402513249fc0f48d53a
font-misc-meltho	1.0.1	font-misc-meltho-1.0.1.tar.bz2	d20d9f8ffdeb88b62842b021d5d3d2a8cc31ea2c
font-misc-misc	1.1.0	font-misc-misc-1.1.0.tar.bz2	83e14111b5727c26e52eb915b66dc6c9eba4c458
font-mutt-misc	1.0.1	font-mutt-misc-1.0.1.tar.bz2	b677831b477027f56ad3f35c95ef3cd6711f87ac
font-schumacher-misc	1.1.0	font-schumacher-misc-1.1.0.tar.bz2	ea7e009e222379fa31a16bdbd4ca5b1e9d412944
font-screen-cyrillic	1.0.2	font-screen-cyrillic-1.0.2.tar.bz2	4795ea77e14246122d21bc0fa68a3c0d5261e39d
font-sony-misc	1.0.1	font-sony-misc-1.0.1.tar.bz2	e9717546682382ebf3e6e7039766fe52bdb8846c
fontsproto	2.1.0	fontsproto-2.1.0.tar.bz2	395b300fd5120a7ff90cb8fea4e2356b9632dc3e
font-sun-misc	1.0.1	font-sun-misc-1.0.1.tar.bz2	fc91999e66fe479d07ea74e5dd2d950ff02ccb80
font-util	1.1.1	font-util-1.1.1.tar.bz2	6ee3af5466de84d61411e173e578a256aeb1074d
font-winitzki-cyrillic	1.0.1	font-winitzki-cyrillic-1.0.1.tar.bz2	d19f476710783d784dfdbcb6a1f34ef7746d3439
font-xfree86-type1	1.0.2	font-xfree86-type1-1.0.2.tar.bz2	09a1c9b8455f3f1954bfc9dd991d7fd1d0f5595a
freetype	2.3.12	freetype-2.3.12.tar.bz2	ebf0438429c0bedd310059326d91646c3c91016b
giflib	4.1.4	giflib-4.1.4.tar.bz2	2f9aed5d20d862270008bd2f8d4c91cf14c6067b
glib	2.12.12	glib-2.12.12.tar.bz2	527bced2e6d38169c08c8712d5e3b6ebb0dc46b5
glproto	1.4.11	glproto-1.4.11.tar.bz2	7c2a723d488dc0e09e7e0e28bde838502d774b16
gtk+	2.10.13	gtk+-2.10.13.tar.bz2	8d00b928a8788ff86d97197c20c18d41f9a1b1cd
iceauth	1.0.3	iceauth-1.0.3.tar.bz2	b75b87fed108bc4fe14ef06f76025016fa54299a
ImageMagick	6.2.8-0	ImageMagick-6.2.8-0.tar.bz2	637569bbcb331233c86258f6c681d5a7c849cba0
inputproto	2.0	inputproto-2.0.tar.bz2	3ed9879b7dd3c14ae2283959f5962162fc01c219
intltool	0.40.6	intltool-0.40.6.tar.bz2	4f6469e09e2c06a8072dffff36f84ff401d7ea75

Software Product	Software Version	Filename	SHA1 Hash Value
DS200			
jdk-6u27	6u27	jdk-6u27-linux-i586.bin	7a01bf274b265662acafacdd7b5740d1a3ab0539
jpeg-6b-destdir-1	v6b	jpeg-6b-destdir-1.patch	7b86d4e94a6350fc03f56b09565d780aa1f0eda4
jpegsrc	v6b	jpegsrc.v6b.tar.gz	7079f0d6c42fad0cfba382cf6ad322add1ace8f9
jre-6u27	6u27	jre-6u27-linux-i586.bin	5a3d2e304d6cf62ee6a56cce322014cf3ceab2ad
kbproto	1.0.4	kbproto-1.0.4.tar.bz2	d300745389d3a80d90c9a3c989651f228db486e5
libdmx	1.1.0	libdmx-1.1.0.tar.bz2	8719434f167d476d53fca57c5be516c153354d60
libdrm	2.4.14	libdrm-2.4.14.tar.bz2	a18cc2cdfd02b8ba1c91c3e9ac609521ad3e2fe9
libfontenc	1.0.5	libfontenc-1.0.5.tar.bz2	e71370c349e93ba70f91ad1148ca9e5cabfcca4f
libFS	1.0.2	libFS-1.0.2.tar.bz2	41cf53fae37210acaa034199f01f36af3f3ec548
libICE	1.0.6	libICE-1.0.6.tar.bz2	ac1f702ea580bd496610266b13434858b62df9e1
libpciaccess	0.11.0	libpciaccess-0.11.0.tar.bz2	bcebba8b8441af151b59b63e8e91e66133b64158
libpng	1.2.42	libpng-1.2.42.tar.bz2	e41cea7a6f5e3065f4289de3742db87ded05b99d
libpthread-stubs	0.1	libpthread-stubs-0.1.tar.bz2	34ef40880d0112dc6d32b386d59ce94f2c139eef
librsvg	2.14.4	librsvg-2.14.4.tar.bz2	9314f0d44dbfe672dc1f1a65b66821593c3bf1cc
libSM	1.1.1	libSM-1.1.1.tar.bz2	dc535af7328dee9a6121b85c3f804165681a195
libX11	1.3.3	libX11-1.3.3.tar.bz2	2a19724ccf78b5bb5a8eba9159d2b95e640e7b11
libXau	1.0.5	libXau-1.0.5.tar.bz2	b1c68843edf7e80ce952f7ee0541448f41bac202
libXaw	1.0.7	libXaw-1.0.7.tar.bz2	0e5effe33c4c44d960132e3dd50370134a28f8b2
libXcomposite	0.4.1	libXcomposite-0.4.1.tar.bz2	959180b067c64f3f7ac06e85400bd265e5579031
libXcursor	1.1.10	libXcursor-1.1.10.tar.bz2	096d0e538d37fd865705e5f45b0c96c7294c1f2f
libXdamage	1.1.2	libXdamage-1.1.2.tar.bz2	dc1fbc938e9bbc859c70cf2087440fc15b00bb1e
libXdmcp	1.0.3	libXdmcp-1.0.3.tar.bz2	7efd71d29d6cfba797b8791398e4d81ade677d77
libXext	1.1.1	libXext-1.1.1.tar.bz2	c2eb8d8d760c6881e51c938812764d1d6cefd51c
libXfixes	4.0.4	libXfixes-4.0.4.tar.bz2	3f2d1c473855ba0cf13137a80d585df7fe37111c
libXfont	1.4.1	libXfont-1.4.1.tar.bz2	f8dc669760975b41885143f828b54164224c8a31
libXft	2.1.14	libXft-2.1.14.tar.bz2	e08ae6b1f56e160179b9f141b4ab799333ec725e
libXi	1.3	libXi-1.3.tar.bz2	7685f2881ce40b13028d9409eedbb9cf1ed0d8ef
libXinerama	1.1	libXinerama-1.1.tar.bz2	5f445194ef3318f66c287c0c69f778988a3f9266
libxkbfile	1.0.6	libxkbfile-1.0.6.tar.bz2	6364c0679eb893d6fbb6adcf0e8230cfdefe0b68
libXmu	1.0.5	libXmu-1.0.5.tar.bz2	e7ff5960f2374852b941f909cdbdeafe7d29322f
libXpm	3.5.8	libXpm-3.5.8.tar.bz2	3bfc833ed4527f74b1c66c386da62271d0313413
libXrandr	1.3.0	libXrandr-1.3.0.tar.bz2	33dd2f67060465f872db9ea03f597e28517f0c8e
libXrender	0.9.5	libXrender-0.9.5.tar.bz2	278f762feb8c754aa5214175abf580ff486281f7
libXres	1.0.4	libXres-1.0.4.tar.bz2	d5ee9560a61666e6bb3d2285b9634fccd7211d65
libXScrnSaver	1.2.0	libXScrnSaver-1.2.0.tar.bz2	ea2935eb67efa77fd90372337f2d782a8ef74cea
libXt	1.0.7	libXt-1.0.7.tar.bz2	3c285b9c04a393dec1cc3d60cf5582d798eb3272
libXtst	1.1.0	libXtst-1.1.0.tar.bz2	4363e9285bfb5a884073efacc50d39edb803a1a5
libXv	1.0.5	libXv-1.0.5.tar.bz2	3936dd661e75d173b9fd1da9d97e5720e9657254
libXvMC	1.0.5	libXvMC-1.0.5.tar.bz2	153b85884f22b882cecb9fc462fe24c669a80dbd
libXxf86dga	1.1.1	libXxf86dga-1.1.1.tar.bz2	a93004cfbe4fd6bc37c6645705d5a6d90c0940b7

Software Product	Software Version	Filename	SHA1 Hash Value
DS200			
libXxf86vm	1.1.0	libXxf86vm-1.1.0.tar.bz2	f5ce7854f201d9c69dfcdd13123b51f497b69a47
makedepend	1.0.2	makedepend-1.0.2.tar.bz2	57e092856580d9984e47c4b1433b69391de07df3
mkfontdir	1.0.5	mkfontdir-1.0.5.tar.bz2	971728b0f453ea5df028aa5d54fe3fbdb8e99a7d
mkfontscale	1.0.7	mkfontscale-1.0.7.tar.bz2	0a0c25da68c87380e2c013c808a6e0cc0983fae9
pango	1.16.4	pango-1.16.4.tar.bz2	6a21126632ed99950818c64d8598b6e92fa7da58
pixman	0.15.20	pixman-0.15.20.tar.gz	a5f973b6895e269731964fbe328f61a8cbfdc931
randrproto	1.3.1	randrproto-1.3.1.tar.bz2	36731bae6e815453af4b055c26ad8e9e2653ca05
recordproto	1.14	recordproto-1.14.tar.bz2	2129285728986d150366c6026e2694b193f19f79
renderproto	0.11	renderproto-0.11.tar.bz2	d30cf508b1a1b5f0deb1c6db41ba2f4e57680637
resourceproto	1.1.0	resourceproto-1.1.0.tar.bz2	36b86840005c15e393c86d7075688d430ab2a11d
scrnsaverproto	1.2.0	scrnsaverproto-1.2.0.tar.bz2	c734cfe9a1ce57fd42957389dcc90518fd7ca6b6
sessreg	1.0.5	sessreg-1.0.5.tar.bz2	d1dac6a398b23ed44bb67286ec083e9071bd00e7
setxkbmap	1.1.0	setxkbmap-1.1.0.tar.bz2	f02f93a08ac060d760566693c748e0fba3db8a06
smproxy	1.0.3	smproxy-1.0.3.tar.bz2	1ba44a4a58b05d6a6f7c4b1f67b793dce2ccf2ba
splashy	0.3.12	splashy-0.3.12.tar.gz	4c721222b20b8fd3fbb8c845ed5c0f05cccad68a
tiff	3.8.2	tiff-3.8.2.tar.gz	549e67b6a15b42bfcd72fe17cda7c9a198a393eb
twm	1.0.4	twm-1.0.4.tar.bz2	7456e90f19e4747e1785f596b93f692d68a9f079
util-macros	1.5.0	util-macros-1.5.0.tar.bz2	ac61387be2a0b97f839041832bd8d06e03cfc942
videoproto	2.3.0	videoproto-2.3.0.tar.bz2	4acf2b438d45b3ab75e640996ce1267d3468f48c
x11perf	1.5.1	x11perf-1.5.1.tar.bz2	d1f85da3df5b216b64c1735d1093802147872 22d
xauth	1.0.4	xauth-1.0.4.tar.bz2	90d32f28bb61ca6d831dcc35429a5ad53be73283
xbacklight	1.1.1	xbacklight-1.1.1.tar.bz2	3541ab5e0956b4f0c97b1200dc32a35d2ccb0f0f
xbitmaps	1.1.0	xbitmaps-1.1.0.tar.bz2	845b825f7e6d193d47db8b67ae8332d87ef8c2b3
xclock	1.0.4	xclock-1.0.4.tar.bz2	1987cafb3163c6b68bc7ecfbe143c8cd373d64bb
xcmiscproto	1.2.0	xcmiscproto-1.2.0.tar.bz2	1a55e042b33c0e0aaf2299942315a5208d644707
xcmsdb	1.0.2	xcmsdb-1.0.2.tar.bz2	8341f7219a5720da758b0571eb1f4d9072265485
xcursorgen	1.0.3	xcursorgen-1.0.3.tar.bz2	7df26b371476654dc191c45e7d20ae3a5e0cad87
xcursor-themes	1.0.2	xcursor-themes-1.0.2.tar.bz2	12b865c17c65e70a6bc20300dfa660fe8faaa0a4
xdpyinfo	1.1.0	xdpyinfo-1.1.0.tar.bz2	01971f007048a46a4a31a69c661bc3a378de60f0
xdriinfo	1.0.3	xdriinfo-1.0.3.tar.bz2	d211d6f12f4c801d2f4cf184c6daac37aa5858ff
xev	1.0.4	xev-1.0.4.tar.bz2	4f62e131ba96842eef1660e8869533cd3923ac35
xextproto	7.1.1	xextproto-7.1.1.tar.bz2	1bb4bd12d65a17b3168dc9b4e028b33a2f7b2cad
xf86bigfontproto	1.2.0	xf86bigfontproto-1.2.0.tar.bz2	312a2ea708b257520c1af4393b69d73a393a478f
xf86dgaproto	2.1	xf86dgaproto-2.1.tar.bz2	97a06120e7195c968875e8ba42e82c90ab54948b
xf86driproto	2.1.0	xf86driproto-2.1.0.tar.bz2	0dfc6616ffc68ca3c3b5decb1e365aaa93be8548
xf86-input-keyboard	1.4.0	xf86-input-keyboard-1.4.0.tar.bz2	5061fdaff8b7ddcbcca82f065c4abbfff255a1da
xf86-input-mouse	1.5.0	xf86-input-mouse-1.5.0.tar.bz2	b9213bf745b793a3da2c946ea4d8ee5768e560f4
xf86-video-vesa	2.3.0	xf86-video-vesa-2.3.0.tar.bz2	4689b7c295d7a8d7326302dafecb812739617134
xf86vidmodeproto	2.3	xf86vidmodeproto-2.3.tar.bz2	22d034c2f66985f8541b9ea3421096ceaa006355

Software Product	Software Version	Filename	SHA1 Hash Value
DS200			
Xgamma	1.0.3	xgamma-1.0.3.tar.bz2	f9c7d93f4b271bab41ee3c91b371d52572e4e08c
xhost	1.0.3	xhost-1.0.3.tar.bz2	ebcdccdc908e642c527cebbdc6ba8084d90c04f6
xineramaproto	1.2	xineramaproto-1.2.tar.bz2	3c397c9ea38aaac785dd7901f250891dfa7f3249
xinit	1.2.0	xinit-1.2.0.tar.bz2	85a838c2010f27ef6d09d6ec4b1208a66cc8d697
xinput	1.5.0	xinput-1.5.0.tar.bz2	02d1ccc83007aa7848b1b024ac64c310303f973e
xkbcomp	1.1.1	xkbcomp-1.1.1.tar.bz2	aeb733c495d7afd42136bf8ae5c6e792c63f0b4b
xkbevd	1.1.0	xkbevd-1.1.0.tar.bz2	b510b4a1b7486beacb5570c204f7fdd4b61f0ab4
xkbutils	1.0.2	xkbutils-1.0.2.tar.bz2	2c025038ca12ee2494b2401ea2cf2c74fe88bf91
xkeyboard-config	1.7	xkeyboard-config-1.7.tar.bz2	d6df43bfc0596be04865f2be7c4e794e198358c8
xkill	1.0.2	xkill-1.0.2.tar.bz2	90f08652859daf71b682c3b9163ebf72ce88c4bc
xlsatoms	1.0.2	xlsatoms-1.0.2.tar.bz2	3855734b5ec0d43b5886ac0ffa58d7cf96f46926
xlsclients	1.0.2	xlsclients-1.0.2.tar.bz2	5cde39a28c5352d1d555714836f57c05197e419d
XML-Parser	2.36	XML-Parser-2.36.tar.gz	74acac4f939ebf788d8ef5163cbc9802b1b04bfa
xmodmap	1.0.4	xmodmap-1.0.4.tar.bz2	9b49388bb527a8f7b7e86c4aa4c75a83372f6baa
xorg-server	1.7.1	xorg-server-1.7.1.tar.bz2	d31e259b3ab975e2c1baea8f7310b57152ae3c62
xpr	1.0.3	xpr-1.0.3.tar.bz2	9dbd0ff136b612285e00d92d0c7675a4207b1c4a
xprop	1.1.0	xprop-1.1.0.tar.bz2	16b377c76a4a010200063a056e7a5e244ab6ff00
xproto	7.0.16	xproto-7.0.16.tar.bz2	0eda5588d42f2c810d8491da44fe84a4093e12bc
xrandr	1.3.2	xrandr-1.3.2.tar.bz2	0e49b0a0889ae8a590452c6cd0d60a2253a8d940
xrdb	1.0.6	xrdb-1.0.6.tar.bz2	e4faff5e02b3027298dc589c318a6dc7eb30a6d5
xrefresh	1.0.3	xrefresh-1.0.3.tar.bz2	3f34ceca9509f47e60ddfe14a98225eaffeba705
xset	1.1.0	xset-1.1.0.tar.bz2	ff429544821826092b17248c1ad65e16cd860ef
xsetroot	1.0.3	xsetroot-1.0.3.tar.bz2	56ed1df9834627a107550475629df51275cd0c44
xterm	254	xterm-254.tgz	934811737745b76ca75bf940feb975943bf1084d
xtrans	1.2.5	xtrans-1.2.5.tar.bz2	e8c4ce58b42d05e613fe535319a7d7f45f30f3e9
xvinfo	1.1.0	xvinfo-1.1.0.tar.bz2	8695bfb597dbf3ed8e3277fddda4722da21baaa3
xwd	1.0.3	xwd-1.0.3.tar.bz2	f6708d14040630d1d3255987c28efcbf7aee05aa
xwininfo	1.0.5	xwininfo-1.0.5.tar.bz2	9730db0d1bd75b8bc5bc399f56cab9f5aee3bcfc
xwud	1.0.2	xwud-1.0.2.tar.bz2	15a6c5e3ffc03b7e8e597947061940fee6c0a9fc

Software Product	Software Version	Filename	SHA1 Hash Value
DS850			
BAPIS	412	COTS-412.tar.bz2	07e4317efb1eee055046a2a55bacb2a0b1b92608
cryptocme	3.0	cryptocme-3.0-rhel30.tar.gz	4fe8c6a6ddbf524cfa88e3e6cf195447afc67977
Linux From Scratch	6.2.5	lfslivecd-x86-6.2-5.iso	b3e3947bf2c3616fa45541c0643a2adfa0618207
lfs_enhanced-2.4.0.0m-src.tar			
alsa-lib	1.0.13	alsa-lib-1.0.13.tar.bz2	82fa9a7feb43b319524b18451ca86d691a20f4a3
alsa-utils	1.0.13	alsa-utils-1.0.13.tar.bz2	05b460a0e7ae6519ea37240476f026b59dbe710d
aumix	2.8	aumix-2.8.tar.bz2	5cea563ae91f628433a1950a36efd23681da4bf4
beecrypt	4.1.2	beecrypt-4.1.2.tar.gz	71cebd3329bb2561ffba24a2004dfac50b143f59
blfs-bootscripts	20060910	blfs-bootscripts-20060910.tar.bz2	58ff10492f9abceed6ca4a105c479d5f2e3e8002
BLFS-ca-bundle	3.12.5	BLFS-ca-bundle-3.12.5.tar.bz2	8cf4be3072184940f8cfc3888ef0ba1cb58a5377
boost	1.43.0	boost_1_43_0.tar.bz2	b8257b7da2a7222739314f8d1e07e217debe71d6
chkrootkit	0.49	chkrootkit-0.49.tar.gz	cec1a3c482b95b20d3a946b07fffb23290abc4a6
coreutils	6.9	coreutils-6.9.tar.bz2	10310a78c4e1d9f742f3815ac28e9bf1086a5885
cpio	2.6	cpio-2.6.tar.gz	5a4ea156519909994fe05933dc823abcf07e3e21
cpio-security_fixes-1	2.6	cpio-2.6-security_fixes-1.patch	d8445256032b903bbd3cee2694e87412e7dca843
ctags	5.6	ctags-5.6.tar.gz	930afaa138624717393fe475201f795251bd5e5e
curl	7.15.3	curl-7.15.3.tar.bz2	7e764126ce564429fe2f142428a27ebfc8fb69ee
cvs	1.11.22	cvs-1.11.22.tar.bz2	5dfa11da84a890d7d61516fd450c001dc24bcc0d
cvs-zlib-1	1.11.22	cvs-1.11.22-zlib-1.patch	0d20bab8a6b6e419a8c900d082b487ad6a3aec38
dmidecode	2.9	dmidecode-2.9.tar.bz2	0346690d32120b9fff22accd5b1e731414a3676b
docbook-xsl	1.69.1	docbook-xsl-1.69.1.tar.bz2	aaabf0e274609134e187a6c36d2be23f3471f507
dosfstools	2.11	dosfstools-2.11.src.tar.gz	b0d8714475ca7c7a96a46adf7c4839d69ce2f412
expat	2.0.1	expat-2.0.1.tar.gz	663548c37b996082db1f2f2c32af060d7aa15c2d
fuse	2.6.1	fuse-2.6.1.tar.gz	85ec4458d0ab2647b6b43605f0200006d89981ed
gnupg	1.4.3	gnupg-1.4.3.tar.bz2	9e96b36e4f4d1e8bc5028c99fac674482cbdb370
gpm	1.20.1	gpm-1.20.1.tar.bz2	c48d937e62abb438c2f6439b34ef3332c89af8d1
gpm-segfault-1	1.20.1	gpm-1.20.1-segfault-1.patch	da53bf78a0ebaa5020e332aa6d6861159170ed86
gpm-silent-1	1.20.1	gpm-1.20.1-silent-1.patch	8899a212eadfbda201d8da3e44590bd05b97f9f6
libao	0.8.6	libao-0.8.6.tar.gz	2050e008ffcfd6803e2c2c03c7d5f169b6d8379e
libogg	1.1.3	libogg-1.1.3.tar.gz	a3e495a8baf6939efad7e0bd11cc0e466838c3db
libusb	0.1.12	libusb-0.1.12.tar.gz	599a5168590f66bc6f1f9a299579fd8500614807
libvorbis	1.1.2	libvorbis-1.1.2.tar.gz	26289fc41aa5436b1a277d726bb5cb106d675c35
libxml2	2.6.31	libxml2-2.6.31.tar.gz	97233a210425bad96b35e52aa3e0010ac11bbcc9
libxslt	1.1.22	libxslt-1.1.22.tar.gz	55ce4dc659681d9a5ba2322c45cbdfe75b46639c
logrotate	3.7.8	logrotate-3.7.8.tar.gz	5742dc0d9541ac59eba5f5718520f7504aea2159
LPRng	3.8.28	LPRng-3.8.28.tgz	f4373004adb1439819600701bb98517137daf1fc
net-tools	1.60	net-tools-1.60.tar.bz2	944fb70641505d5d1139dba3aeb81ba124574b83
net-tools	1.60	net-tools-1.60.tar.gz	4e8100957be645241d685055ebdde9d5c744cb54
net-tools-gcc34-3	1.60	net-tools-1.60-gcc34-3.patch	a92286932a423fc987f2a152931d05b0a9a312bd
net-tools-gcc34-3	1.60	net-tools-1.60-gcc34-3.patch	a92286932a423fc987f2a152931d05b0a9a312bd
net-tools-kernel_headers-2	1.60	net-tools-1.60-kernel_headers-2.patch	3e59577e90458250 3b25c7b21f6e3b77b165f84a

Software Product	Software Version	Filename	SHA1 Hash Value
DS850			
net-tools-kernel_headers-2	1.60	net-tools-1.60-kernel_headers-2.patch	3e59577e904582503b25c7b21f6e3b77b165f84a
net-tools-mii_ioctl-1	1.60	net-tools-1.60-mii_ioctl-1.patch	912613acbf3a000a2935391a14e55b5ccdeeae6b
net-tools-mii_ioctl-1	1.60	net-tools-1.60-mii_ioctl-1.patch	912613acbf3a000a2935391a14e55b5ccdeeae6b
ntfsprogs	1.13.1	ntfsprogs-1.13.1.tar.gz	a4c50f6fc10fcc1e1f562ad64bcbf9a0d46ca72a
nut	2.2.2	nut-2.2.2.tar.gz	f54cc909b229931fb91b4a360f0447b539d4ea6b
openssh	4.5p1	openssh-4.5p1.tar.gz	2eefcbbeb9e4fa16fa4500dec107d1a09d3d02d7
openssl	0.9.8n	openssl-0.9.8d-fix_manpages-1.patch	afb498051e466131ae90dfc678234e8876af88a4
openssl-fix_manpages-1	0.9.8n	openssl-0.9.8n.tar.gz	595f5ebf592568515964f0adc62239e7012ef08b
pkg-config	0.22	pkg-config-0.22.tar.gz	3ec40bda9864d7aa3c912c6ae87a750fd8b6e420
popt	1.10.4	popt-1.10.4.tar.gz	10e6649c4c37ecfb6fb4296aeca609b5fdd5e34d
ppp	2.4.4	ppp-2.4.4.tar.gz	9b91b0117e0a8bfaf8c4e894af79e0960dd36259
Python	2.4.4	Python-2.4.4.tar.bz2	9e0971f93df8acbd947378d0d16a32fcc8897ba2
Python-gdbm-1	2.4.4	Python-2.4.4-gdbm-1.patch	34c3973ba2e519eaf1fd0ecf28ec465ed08bb96d
unzip552	5.52	unzip-5.52-security_fix-1.patch	7f6a287c0b480bc4748abdf69429dfc76383e1d6
unzip-security_fix-1	5.52	unzip552.tar.gz	1831bd59b9e607a69052f83b263384895e2d4a19
usbutils	0.72	usbutils-0.72.tar.gz	891b8825d9648801466d5c980e52bb9e23d92fe2b
vorbis-tools	1.1.1	vorbis-tools-1.1.1.tar.gz	a1394b39905b389d72f12c2a9f0c86a33d07a487
vorbis-tools-utf8-1	1.1.1	vorbis-tools-1.1.1-utf8-1.patch	35db6e412cc9df5d8b88b58cae5f2e514bc17823
xerces-c-src	2.8.0	xerces-c-src_2_8_0.tar.gz	f0803b1330daec3f44b17dee64e3c99de6b3cd3e
xsd	3.1.0-i686-linux-gnu	xsd-3.1.0-i686-linux-gnu.tar.bz2	a7bf9b26ff5ab577fcfeccc9ea76134da88ec7e2
zip232	2.32	zip232.tar.gz	5bc562bf95d9aee0cb6625e6038898e1f191a4aa
lfs_graphics-2.4.0.0m-src.tar			
a2ps	4.14	a2ps-4.14.tar.gz	365abbbe4b7128bf70dad16d06e23c5701874852
atk	1.18.0	atk-1.18.0.tar.bz2	d58dfc3dbdad49d8c446e0bd4a0b6260d315eb0
bdftopcf	1.0.2	bdftopcf-1.0.2.tar.bz2	245778068b5e5ccde07151635ded50da90333524
bigreqsproto	1.1.0	bigreqsproto-1.1.0.tar.bz2	32ae0505ec963cc5c0e3ee9258b126e6865d1b1b
cairo	1.4.14	cairo-1.4.14.tar.gz	63310243ba8af949060b06c01fc28ee5471ed5a4
compositeproto	0.4.1	compositeproto-0.4.1.tar.bz2	fb1ae34418855c313a75e8e697b414a4935e13d6
damageproto	1.2.0	damageproto-1.2.0.tar.bz2	ffe177a6ac2cf023d41c015aa6ece2b191cb8a8a
DirectFB	0.9.22	DirectFB-0.9.22.tar.gz	f3a586c654086c287cd1bcc683be0f234973ee17
dmxproto	2.3	dmxproto-2.3.tar.bz2	a3636d1b54d7bbf273f28c0d3c44101777047865
dri2proto	2.2	dri2proto-2.2.tar.bz2	21e9c0c7e0be5fe971f51589d0573b0273202b7f
encodings	1.0.3	encodings-1.0.3.tar.bz2	615b8367ee20fc50688e4876aa250419927d64cc
fbida	2.07	fbida-2.07.tar.gz	4758178299e09d5251b9cf20337a81cc20553d45
fixesproto	4.1.1	fixesproto-4.1.1.tar.bz2	fb47920c629e08a56442a51968a02a22733085e5
font-adobe-100dpi	1.0.1	font-adobe-100dpi-1.0.1.tar.bz2	814baccf5cf6c6545b7e8f3bbbad377be369042d
font-adobe-75dpi	1.0.1	font-adobe-75dpi-1.0.1.tar.bz2	3cbed8a4a3a6bbe6ccd3d6e07a238f8c9ab7a26c

Software Product	Software Version	Filename	SHA1 Hash Value
DS850			
font-adobe-utopia-100dpi	1.0.2	font-adobe-utopia-100dpi-1.0.2.tar.bz2	e692c3d3933c47c69656be0fd0f06218c2db138d
font-adobe-utopia-75dpi	1.0.2	font-adobe-utopia-75dpi-1.0.2.tar.bz2	2db08c2e0186831e4d68f7a2ffb2f9fe598a7280
font-adobe-utopia-type1	1.0.2	font-adobe-utopia-type1-1.0.2.tar.bz2	565cb66523f59f02da02aa9e74604634a2113643
font-alias	1.0.2	font-alias-1.0.2.tar.bz2	9a0e97d974349e3a943b0ab77015f115f15d34c3
font-arabic-misc	1.0.1	font-arabic-misc-1.0.1.tar.bz2	d11a7bdce7500c3ccc2fe59505f2bc89e4c7aa2a
font-bh-100dpi	1.0.1	font-bh-100dpi-1.0.1.tar.bz2	4f3edda5dd35145cbd1ce8759e0a999b3a04f9c0
font-bh-75dpi	1.0.1	font-bh-75dpi-1.0.1.tar.bz2	7b891d5bfd966c405c19574bca8f87b8803146d1
font-bh-lucidatypewriter-100dpi	1.0.1	font-bh-lucidatypewriter-100dpi-1.0.1.tar.bz2	a1c9d28a619358092f7196473ff3e0f0dc5304d0
font-bh-lucidatypewriter-75dpi	1.0.1	font-bh-lucidatypewriter-75dpi-1.0.1.tar.bz2	26efd25d2802c8406a96ccc3240b2c14e511d49f
font-bh-ttf	1.0.1	font-bh-ttf-1.0.1.tar.bz2	0e9ffbc738072ca832cdf5f82bff071c67b71825
font-bh-type1	1.0.1	font-bh-type1-1.0.1.tar.bz2	b960d8523b02d4401dc6e1257f68dc120761ee4b
font-bitstream-100dpi	1.0.1	font-bitstream-100dpi-1.0.1.tar.bz2	ba163df365a591de5eb9e45fa302059d572dd171
font-bitstream-75dpi	1.0.1	font-bitstream-75dpi-1.0.1.tar.bz2	43344b8ff3b2c2fda8d4cdbcc12c0688b2e04789
font-bitstream-type1	1.0.1	font-bitstream-type1-1.0.1.tar.bz2	53800b904fc3ead6b577a34fb7c1f96c1af4423f
fontconfig	2.8.0	fontconfig-2.8.0.tar.gz	570fb55eb14f2c92a7b470b941e9d35dbfafa716
font-cronyx-cyrillic	1.0.1	font-cronyx-cyrillic-1.0.1.tar.bz2	dfff5974629dab97677a70fa20e21c2cf48071a0
font-cursor-misc	1.0.1	font-cursor-misc-1.0.1.tar.bz2	5087a94e74f8157cb6989f71fb3b4815b236065a
font-daewoo-misc	1.0.1	font-daewoo-misc-1.0.1.tar.bz2	d169ccc4e92fe1e99f3ff6766d4c6edcbb808860
font-dec-misc	1.0.1	font-dec-misc-1.0.1.tar.bz2	2489d19650f2a787b476dab2fa2412d20b95f38e
font-ibm-type1	1.0.1	font-ibm-type1-1.0.1.tar.bz2	9bcf72bcabfcbe218ad3a96ba2a45e92ef9efbc3
font-isas-misc	1.0.1	font-isas-misc-1.0.1.tar.bz2	13fe07a669dd93dfdb08717a03efe47936ab9cea
font-jis-misc	1.0.1	font-jis-misc-1.0.1.tar.bz2	adb3275d19e71e9553aa8a5fdc3b2c647277d8d4
font-micro-misc	1.0.1	font-micro-misc-1.0.1.tar.bz2	74a8be2b0b6ace97d8841356e88570f5fa3faad6
font-misc-cyrillic	1.0.1	font-misc-cyrillic-1.0.1.tar.bz2	c178f8a8b6897a8382a0f4315a5b577760ba703c
font-misc-ethiopic	1.0.1	font-misc-ethiopic-1.0.1.tar.bz2	2677191fd8b515c53bde6402513249fc0f48d53a
font-misc-meltho	1.0.1	font-misc-meltho-1.0.1.tar.bz2	d20d9f8ffdeb88b62842b021d5d3d2a8cc31ea2c
font-misc-misc	1.1.0	font-misc-misc-1.1.0.tar.bz2	83c44111b5727c26e52eb915b66dc6c9eba4c458
font-mutt-misc	1.0.1	font-mutt-misc-1.0.1.tar.bz2	b677831b477027f56ad3f35c95ef3cd6711f87ac
font-schumacher-misc	1.1.0	font-schumacher-misc-1.1.0.tar.bz2	ea7e009e222379fa31a16bdbd4ca5b1e9d412944
font-screen-cyrillic	1.0.2	font-screen-cyrillic-1.0.2.tar.bz2	4795ca77e14246122d21bc0fa68a3c0d5261e39d
font-sony-misc	1.0.1	font-sony-misc-1.0.1.tar.bz2	c9717546682382ebf3e6e7039766fe52bdb8846c
fontsproto	2.1.0	fontsproto-2.1.0.tar.bz2	395b300fd5120a7ff90eb8fea4e2356b9632dc3e
font-sun-misc	1.0.1	font-sun-misc-1.0.1.tar.bz2	fc91999e66fe479d07ea74e5dd2d950ff02ccb80
font-util	1.1.1	font-util-1.1.1.tar.bz2	6ee3af5466de84d61411e173e578a256aeb1074d
font-winitzki-cyrillic	1.0.1	font-winitzki-cyrillic-1.0.1.tar.bz2	d19f476710783d784dfdbcb6a1f34ef7746d3439
font-xfree86-type1	1.0.2	font-xfree86-type1-1.0.2.tar.bz2	09a4c9b8455f3f4954bfe9dd991d7fd1d0f5595a

Software Product	Software Version	Filename	SHA1 Hash Value
DS850			
Freetype	2.3.12	freetype-2.3.12.tar.bz2	ebf0438429c0bedd310059326d91646c3c91016b
giflib	4.1.4	giflib-4.1.4.tar.bz2	2f9aed5d20d862270008bd2f8d4c91cf14c6067b
glib	2.12.12	glib-2.12.12.tar.bz2	527bced2e6d38169c08c8712d5e3b6ebb0dc46b5
glproto	1.4.11	glproto-1.4.11.tar.bz2	7c2a723d488dc0e09e7e0e28bde838502d774b16
gperf	3.0.3	gperf-3.0.3.tar.gz	3c535d2727eb0dca10ca87cefa03720a8280c7a2
gtk+	2.10.13	gtk+-2.10.13.tar.bz2	8d00b928a8788ff86d97197c20c18d41f9a1b1cd
iceauth	1.0.3	iceauth-1.0.3.tar.bz2	b75b87fed108bc4fe14ef06f76025016fa54299a
ImageMagick	6.2.8-0	ImageMagick-6.2.8-0.tar.bz2	637569bbcb331233c86258f6c681d5a7c849cba0
inputproto	2.0	inputproto-2.0.tar.bz2	3ed9879b7dd3c14ae2283959f5962162fc01c219
intltool	0.40.6	intltool-0.40.6.tar.bz2	4f6469e09e2c06a8072dfff36f84ff401d7ea75
jpeg-6b-destdir-1	v6b	jpeg-6b-destdir-1.patch	7b86d4e94a6350fc03f56b09565d780aa1f0eda4
jpegsrc	v6b	jpegsrc.v6b.tar.gz	7079f0d6c42fad0cfba382cf6ad322add1ace8f9
kbproto	1.0.4	kbproto-1.0.4.tar.bz2	d300745389d3a80d90c9a3c989651f228db486e5
libdmx	1.1.0	libdmx-1.1.0.tar.bz2	871943 4f167d476d53fca57c5bc516c153354d60
libdrm	2.4.14	libdrm-2.4.14.tar.bz2	a18cc2cdfd02b8ba1c91c3e9ac609521ad3e2fe9
libexif	0.6.19	libexif-0.6.19.tar.bz2	820f07ff12a8cc720a6597d46277f01498c8aba4
libfontenc	1.0.5	libfontenc-1.0.5.tar.bz2	e71370c349e93ba70f91ad1148ca9e5cabfcca4f
libFS	1.0.2	libFS-1.0.2.tar.bz2	41cf53fae37210acaa034199f01f36af3f3ec548
libICE	1.0.6	libICE-1.0.6.tar.bz2	ac1f702ea580bd496610266b13434858b62df9e1
libpciaccess	0.11.0	libpciaccess-0.11.0.tar.bz2	bcebba8b8441af151b59b63e8e91e66133b64158
libpng	1.2.42	libpng-1.2.42.tar.bz2	e41cea7a6f5e3065f4289de3742db87ded05b99d
libpthread-stubs	0.1	libpthread-stubs-0.1.tar.bz2	34ef40880d0112dc6d32b386d59ce94f2c139eef
librsvg	2.14.4	librsvg-2.14.4.tar.bz2	9314f0d44dbfe672dc1f1a65b66821593c3bf1ce
libSM	1.1.1	libSM-1.1.1.tar.bz2	dc535af7328dee9a6121b85c3f8041656681a195
libX11	1.3.3	libX11-1.3.3.tar.bz2	2a19724ccf78b5bb5a8eba9159d2b95e640e7b11
libXau	1.0.5	libXau-1.0.5.tar.bz2	b1c68843edf7e80ce952f7ee0541448f41bac202
libXaw	1.0.7	libXaw-1.0.7.tar.bz2	0e5effe33c4c44d960132e3dd50370134a28f8b2
libXcomposite	0.4.1	libXcomposite-0.4.1.tar.bz2	959180b067c64f3f7ac06e85400bd265e5579031
libXcursor	1.1.10	libXcursor-1.1.10.tar.bz2	096d0e538d37fd865705e5f45b0e96c7294c1f2f
libXdamage	1.1.2	libXdamage-1.1.2.tar.bz2	dc1fbc938e9bbc859c70cf2087440fc15b00bb1e
libXdmcp	1.0.3	libXdmcp-1.0.3.tar.bz2	7efd71d29d6cfba797b8791398e4d81ade677d77
libXext	1.1.1	libXext-1.1.1.tar.bz2	c2eb8d8d760c6881e51c938812764d1d6cefd51c
libXfixes	4.0.4	libXfixes-4.0.4.tar.bz2	3f2d1c473855ba0cf13137a80d585df7fe37111c
libXfont	1.4.1	libXfont-1.4.1.tar.bz2	f8dc669760975b41885143f828b54164224c8a31
libXft	2.1.14	libXft-2.1.14.tar.bz2	e08ae6b1f56e160179b9f141b4ab799333ec725e
libXi	1.3	libXi-1.3.tar.bz2	7685f2881ce40b13028d9409eedbb9cf1ed0d8ef
libXinerama	1.1	libXinerama-1.1.tar.bz2	5f445194ef3318f66c287c0c69f778988a3f9266
libxkbfile	1.0.6	libxkbfile-1.0.6.tar.bz2	6364e0679eb893d6fbb6adcf0e8230cfdefe0b68

Software Product	Software Version	Filename	SHA1 Hash Value
DS850			
LibXmu	1.0.5	libXmu-1.0.5.tar.bz2	e7ff5960f2374852b941f909cdbdeafe7d29322f
libXpm	3.5.8	libXpm-3.5.8.tar.bz2	3bfc833cd4527f74b1c66c386da62271d0313413
libXrandr	1.3.0	libXrandr-1.3.0.tar.bz2	33dd2f67060465f872db9ea03f597e28517f0c8e
libXrender	0.9.5	libXrender-0.9.5.tar.bz2	278f762feb8e754aa5214175abf580ff486281f7
libXres	1.0.4	libXres-1.0.4.tar.bz2	d5ee9560a61666e6bb3d2285b9634fccd7211d65
libXScrnSaver	1.2.0	libXScrnSaver-1.2.0.tar.bz2	ea2935eb67efa77fd90372337f2d782a8ef74cea
libXt	1.0.7	libXt-1.0.7.tar.bz2	3c285b9c04a393dec1cc3d60cf5582d798eb3272
libXtst	1.1.0	libXtst-1.1.0.tar.bz2	4363e9285bfb5a884073efacc50d39edb803a1a5
libXv	1.0.5	libXv-1.0.5.tar.bz2	3936dd661e75d173b9fd1da9d97e5720e9657254
libXvMC	1.0.5	libXvMC-1.0.5.tar.bz2	153b85884f22b882cecb9fc462fe24c669a80dbd
libXxf86dga	1.1.1	libXxf86dga-1.1.1.tar.bz2	a93004cfbe4fd6bc37c6645705d5a6d90c0940b7
libXxf86vm	1.1.0	libXxf86vm-1.1.0.tar.bz2	f5ce7854f201d9c69dfcdd13123b51f497b69a47
makedepend	1.0.2	makedepend-1.0.2.tar.bz2	57e092856580d9984e47c4b1433b69391de07df3
mkfontdir	1.0.5	mkfontdir-1.0.5.tar.bz2	971728b0f453ea5df028aa5d54fe3fbdb8e99a7d
mkfontscale	1.0.7	mkfontscale-1.0.7.tar.bz2	0a0c25da68c87380e2c013c808a6e0cc0983fae9
pango	1.16.4	pango-1.16.4.tar.bz2	6a21126632ed99950818c64d8598b6e92fa7da58
pixman	0.15.20	pixman-0.15.20.tar.gz	a5f973b6895e269731964fbe328f61a8cbfdc931
qt-x11-opensource-src	4.5.0	qt-x11-opensource-src-4.5.0.tar.gz	503842349b644fb6af6e6c735bec7174ebcd6245
randrproto	1.3.1	randrproto-1.3.1.tar.bz2	36731bae6e815453af4b055c26ad8e9e2653ca05
recordproto	1.14	recordproto-1.14.tar.bz2	212928572898ed150366c6026e2694b193ff9f79
renderproto	0.11	renderproto-0.11.tar.bz2	d30cf508b1a1b5f0deb1c6db41ba2f4e57680637
resourceproto	1.1.0	resourceproto-1.1.0.tar.bz2	36b86840005c15e393e86d7075688d430ab2a11d
scrnsaverproto	1.2.0	scrnsaverproto-1.2.0.tar.bz2	c734efe9a1ce57fd42957389dcc90518fd7ca6b6
sessreg	1.0.5	sessreg-1.0.5.tar.bz2	d1dac6a398b23ed44bb67286ec083e9071bd00e7
setxkbmap	1.1.0	setxkbmap-1.1.0.tar.bz2	f02f93a08ac060d760566693c748e0fba3db8a06
smproxy	1.0.3	smproxy-1.0.3.tar.bz2	1ba44a4a58b05d6a6f7c4b1f67b793dce2ccf2ba
splashy	0.3.12	splashy-0.3.12.tar.gz	4e721222b20b8fd3fbb8c845ed5c0f05ccead68a
tiff	3.8.2	tiff-3.8.2.tar.gz	549e67b6a15b42bfcd72fe17cda7c9a198a393eb
twm	1.0.4	twm-1.0.4.tar.bz2	7456e90f19e4747e1785f596b93f692d68a9f079
util-macros	1.5.0	util-macros-1.5.0.tar.bz2	ac61387be2a0b97f839041832bd8d06e03cfc942
videoproto	2.3.0	videoproto-2.3.0.tar.bz2	4aef2b438d15b3ab75e640996ce1267d3468f48c
x11perf	1.5.1	x11perf-1.5.1.tar.bz2	d1f85da3df5b216b64c1735d1093802147872222d
xauth	1.0.4	xauth-1.0.4.tar.bz2	90d32f28bb61ca6d831dcc35429a5ad53be73283
xbacklight	1.1.1	xbacklight-1.1.1.tar.bz2	3541ab5e0956b4f0c97b1200dc32a35d2ecb0f0f
xbitmaps	1.1.0	xbitmaps-1.1.0.tar.bz2	845b825f7e6d193d47db8b67ae8332d87ef8c2b3
xclock	1.0.4	xclock-1.0.4.tar.bz2	1987cafb3163c6b68bc7ecfbe143c8cd373d64bb
xcmiscproto	1.2.0	xcmiscproto-1.2.0.tar.bz2	1a55e042b33c0e0aaf2299942315a5208d644707
xcmsdb	1.0.2	xcmsdb-1.0.2.tar.bz2	8341f7219a5720da758b0571eb1f4d9072265485
xcursorgen	1.0.3	xcursorgen-1.0.3.tar.bz2	7df26b371476654dc191c45e7d20ae3a5e0cad87
xcursor-themes	1.0.2	xcursor-themes-1.0.2.tar.bz2	12b865c17c65e70a6bc20300dfa660fe8faaa0a4
xdpyinfo	1.1.0	xdpyinfo-1.1.0.tar.bz2	01971f007048a46a4a31a69c661bc3a378de60f0
xdriinfo	1.0.3	xdriinfo-1.0.3.tar.bz2	d211d6f12f4c801d2f4cf184c6daae37aa5858ff
xev	1.0.4	xev-1.0.4.tar.bz2	4f62e131ba96842eef1660e8869533cd3923ac35

Software Product	Software Version	Filename	SHA1 Hash Value
DS850			
Xextproto	7.1.1	xextproto-7.1.1.tar.bz2	1bb4bd12d65a17b3168dc9b4e028b33a2f7b2cad
xf86bigfontproto	1.2.0	xf86bigfontproto-1.2.0.tar.bz2	312a2ca708b257520c1af4393b69d73a393a478f
xf86dgaproto	2.1	xf86dgaproto-2.1.tar.bz2	97a06120c7195c968875c8ba42e82c90ab54948b
xf86driproto	2.1.0	xf86driproto-2.1.0.tar.bz2	0dfc6616ffc68ca3c3b5decb1e365aaa93be8548
xf86-input-keyboard	1.4.0	xf86-input-keyboard-1.4.0.tar.bz2	5061fdaff8b7ddcbcca82f065c4abbfff255a1da
xf86-input-mouse	1.5.0	xf86-input-mouse-1.5.0.tar.bz2	b9213bf745b793a3da2c946ea4d8ee5768e560f4
xf86-video-vesa	2.3.0	xf86-video-vesa-2.3.0.tar.bz2	4689b7e295d7a8d7326302dafecb812739617134
xf86vidmodeproto	2.3	xf86vidmodeproto-2.3.tar.bz2	22d034c2f66985f8541b9ea3421096ceaa006355
xgamma	1.0.3	xgamma-1.0.3.tar.bz2	f9c7d93f4b271bab41ee3c91b371d52572e4e08c
xhost	1.0.3	xhost-1.0.3.tar.bz2	ebcdccdc908e642e527eebbde6ba8084d90c04f6
xineramaproto	1.2	xineramaproto-1.2.tar.bz2	3e397c9ea38aaae785dd7901f250891dfa7f3249
xinit	1.2.0	xinit-1.2.0.tar.bz2	85a838c2010f27ef6d09d6ec4b1208a66cc8d697
xinput	1.5.0	xinput-1.5.0.tar.bz2	02d1ccc83007aa7848b1b024ac64c310303f973e
xkbcomp	1.1.1	xkbcomp-1.1.1.tar.bz2	aeb733c495d7afd42136bf8ac5c6c792c63f0b4b
xkbevd	1.1.0	xkbevd-1.1.0.tar.bz2	b510b4a1b7486beacb5570c204f7fdd4b61f0ab4
xkbutils	1.0.2	xkbutils-1.0.2.tar.bz2	2c025038ca12ee2494b2401ea2c12c74fe88bf91
xkeyboard-config	1.7	xkeyboard-config-1.7.tar.bz2	d6df43bfc0596bc04865f2be7c4e794e198358c8
xkill	1.0.2	xkill-1.0.2.tar.bz2	90f08652859daf71b682c3b9163ebf72ce88c4bc
xlsatoms	1.0.2	xlsatoms-1.0.2.tar.bz2	3855734b5ec0d43b5886ac0ffa58d7cf96f46926
xlsclients	1.0.2	xlsclients-1.0.2.tar.bz2	5cdc39a28c5352d1d555714836f57c05197e419d
XML-Parser	2.36	XML-Parser-2.36.tar.gz	74acac4f939ebf788d8ef5163cbc9802b1b04bfa
xmlroff	0.6.2	xmlroff-0.6.2.tar.gz	4a540b067881e069d389cce40bc79578cffc7c9b
xmodmap	1.0.4	xmodmap-1.0.4.tar.bz2	9b49388bb527a8f7b7e86c4aa4c75a83372f6baa
xorg-server	1.7.1	xorg-server-1.7.1.tar.bz2	d31e259b3ab975e2c1baea8f7310b57152ae3c62
xpr	1.0.3	xpr-1.0.3.tar.bz2	9dbd0ff136b612285e00d92d0c7675a4207b1c4a
xprop	1.1.0	xprop-1.1.0.tar.bz2	16b377c76a4a01020063a056e7a5e244ab6ff00
xproto	7.0.16	xproto-7.0.16.tar.bz2	0eda5588d42f2c810d8491da44fe84a4093e12bc
xrandr	1.3.2	xrandr-1.3.2.tar.bz2	0e49b0a0889ae8a590452c6cd0d60a2253a8d940
xrdb	1.0.6	xrdb-1.0.6.tar.bz2	e4faff5e02b3027298dc589c318a6dc7eb30a6d5
xrefresh	1.0.3	xrefresh-1.0.3.tar.bz2	3f34ceca9509f47e60ddfe14a98225eaffeba705
xset	1.1.0	xset-1.1.0.tar.bz2	ff429544821826092b17248c1ad65e16cd860ef
xsetroot	1.0.3	xsetroot-1.0.3.tar.bz2	56ed1df9834627a107550475629df51275cd0c44
xterm	254	xterm-254.tgz	934811737745b76ca75bf940feb975943bf1084d
xtrans	1.2.5	xtrans-1.2.5.tar.bz2	e8c4ce58b42d05e613fe535319a7d7f45f30f3e9
xvinfo	1.1.0	xvinfo-1.1.0.tar.bz2	8695bfb597dbf3ed8e3277fddda4722da21baaa3
xwd	1.0.3	xwd-1.0.3.tar.bz2	f6708d14040630d1d3255987c28efcbf7aee05aa
xwininfo	1.0.5	xwininfo-1.0.5.tar.bz2	9730db0d1bd75b8bc5bc399f56cab9f5aee3bcfc
xwud	1.0.2	xwud-1.0.2.tar.bz2	15a6c5e3ffc03b7e8e597947061940fee6c0a9fc
lfs_kernel-2.6.22.19-src.tar			
linux kernel	2.6.22.9	linux-2.6.22.19.tar.bz2	fd0767105a5bac3010562692cd53c8506814e9ff