VSAP

VOTING SOLUTIONS FOR ALL PEOPLE

# Voting Solutions for All People Use Procedures for Version 3.0

VSAP-UPM-001

Version 3.1

04/01/2022

VSAP 3.0

## Document Revision History

| Date | Version | Section/Page | Update Description |
|---|---|---|---|
| 06/03/2019 | 1.1 | Document | Initial Publication |
| 07/15/2019 | 1.2 | Document | Miscellaneous updates |
| 10/14/2019 | 1.3 | Document | Miscellaneous updates |
| 11/2/2019 | 1.4 | Document | Miscellaneous updates |
| 12/2/2019 | 1.5 | Document | Miscellaneous updates |
| 1/31/2020 | 1.6 | Section 5. and 10.4. | Updated security procedures |
| 02/03/2020 | 1.7 | Cover page | Finalized certification version; document version number |
| 05/30/2020 | 1.8 | Document | More consistent formatting throughout document; updated graphics and pictures; removed redundant information or added section referral; revised section numbers/headings |
| 07/10/2020 | 1.9 | Document | Updated polling place procedures with system enhancements |
| 8/21/2020 | 1.10 | Document | Updated security procedures |
| 11/19/2021 | 3.0 | Document | Updated template to match corresponding documents; updated References; fixed section referrals; certification version |
| 04/01/2022 | 3.1 | Section 19 | Removed references to QMS system; no longer useful during post-manufacturing upgrades. |

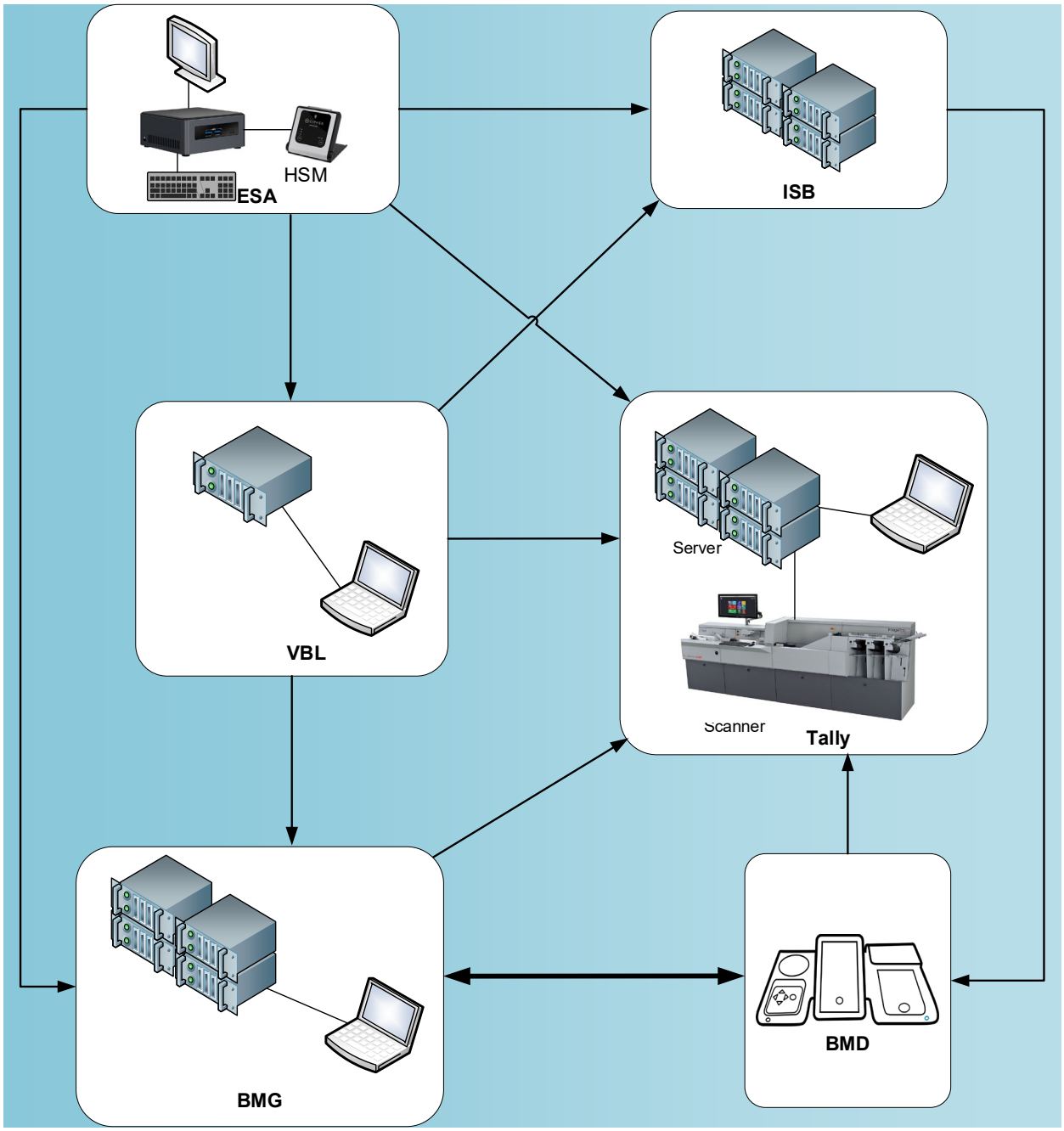
## References

| Document | Description | Owner | Location |
|---|---|---|---|
| California Voting System Standards (CVSS) | Describes the requirements for electronic components of voting systems | California Secretary of State | https://admin.cdn.sos.ca.gov/regulations/elections/california-voting-system-standards.pdf |
| VSAP-TDP-001 | System Overview | Los Angeles County | Within the TDP documentation package |
| VSAP-TDP-011 | Acronyms and Definitions | Los Angeles County | Within the TDP documentation package |
| VSAP-TDP-012 | Approved Parts List | Los Angeles County | Within the TDP documentation package |
| VSAP-USG-001 | ISB Preprocessor User Guide | Los Angeles County | Within the TDP documentation package |
| VSAP-USG-002 | BMD User Guide | Los Angeles County | Within the TDP documentation package |
| VSAP-USG-003 | BMG User Guide | Los Angeles County | Within the TDP documentation package |
| VSAP-USG-004 | ISB Client User Guide | Los Angeles County | Within the TDP documentation package |
| VSAP-USG-009 | Tally User Guide | Los Angeles County | Within the TDP documentation package |
| VSAP-USG-010 | VBL User Guide | Los Angeles County | Within the TDP documentation package |

# CONTENTS

# 1. Introduction

The VSAP voting system allows voters to engage in elections using interactive technology, mobile devices, touchscreen interfaces, QR code readers, and application-based candidate selection. The system is comprised of six core components: Ballot Marking Device (BMD), BMD Manager (BMG), Enterprise Signing Authority (ESA), Interactive Sample Ballot (ISB), Tally, and VSAP Ballot Layout (VBL). The following section provides an overview of VSAP, but more in-depth information can be found in the supplementary document VSAP-TDP-001 System Overview.




*VSAP components*

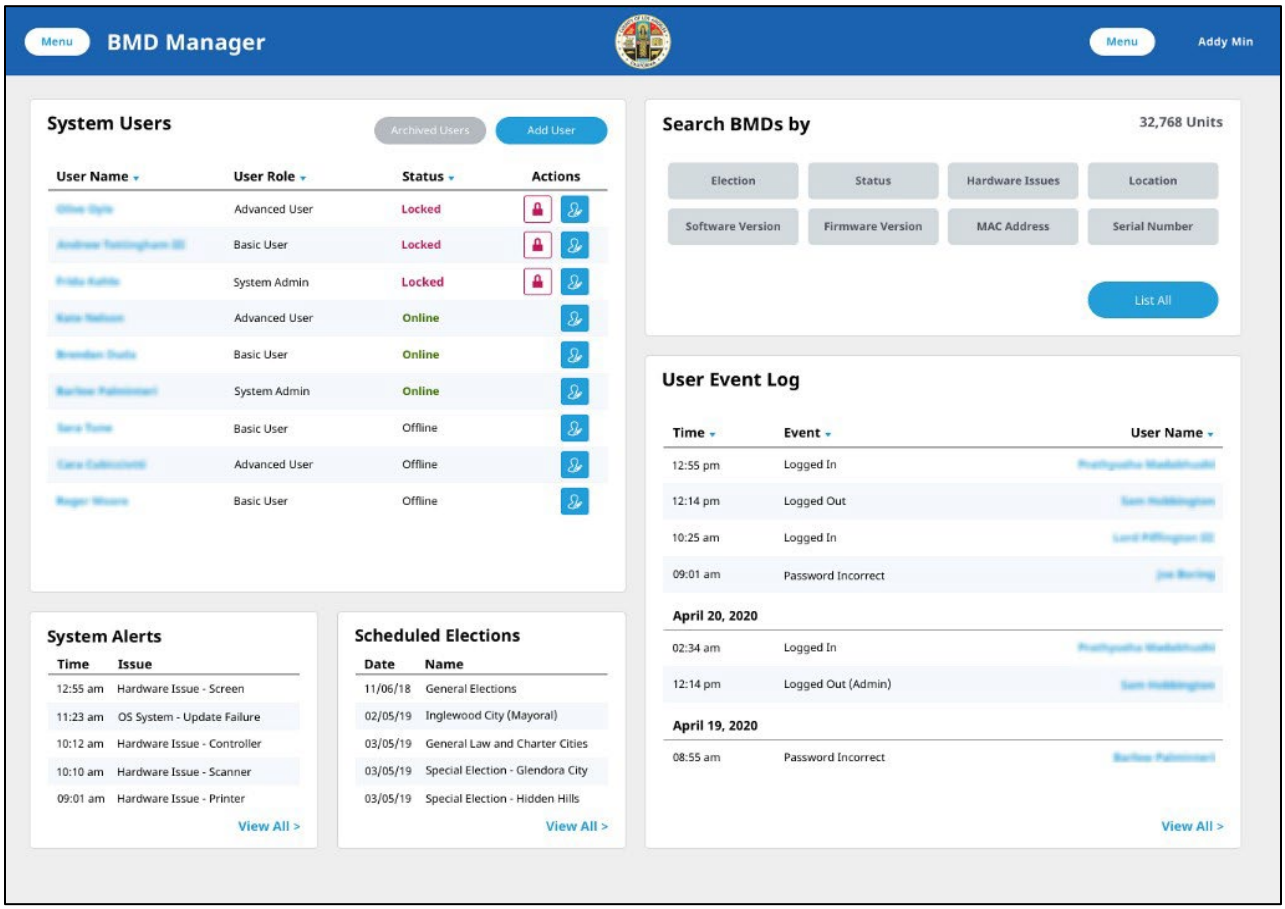
## 1.1. Ballot Marking Device

The BMD is the primary touchpoint for the voter and hub of the voting system, guiding users with screen prompts and symbols. The BMD features a touchscreen, an audio and tactile controller, and dual-switch input that voters use to generate, verify, and cast a paper ballot. Completed ballots are transferred to the Integrated Ballot Box, which can be detached for unloading. Through the BMD, voters participate in elections.

*BMD*

## 1.2. Ballot Marking Device Manager

The BMG manages and maintains the BMDs. It allows operators to manage software, configurations, and data. The BMG provides files necessary for BMDs to present election data such as candidate information, multi-lingual audio, and supporting text. The BMG is the manager and custodian of the voting system.




*BMG*

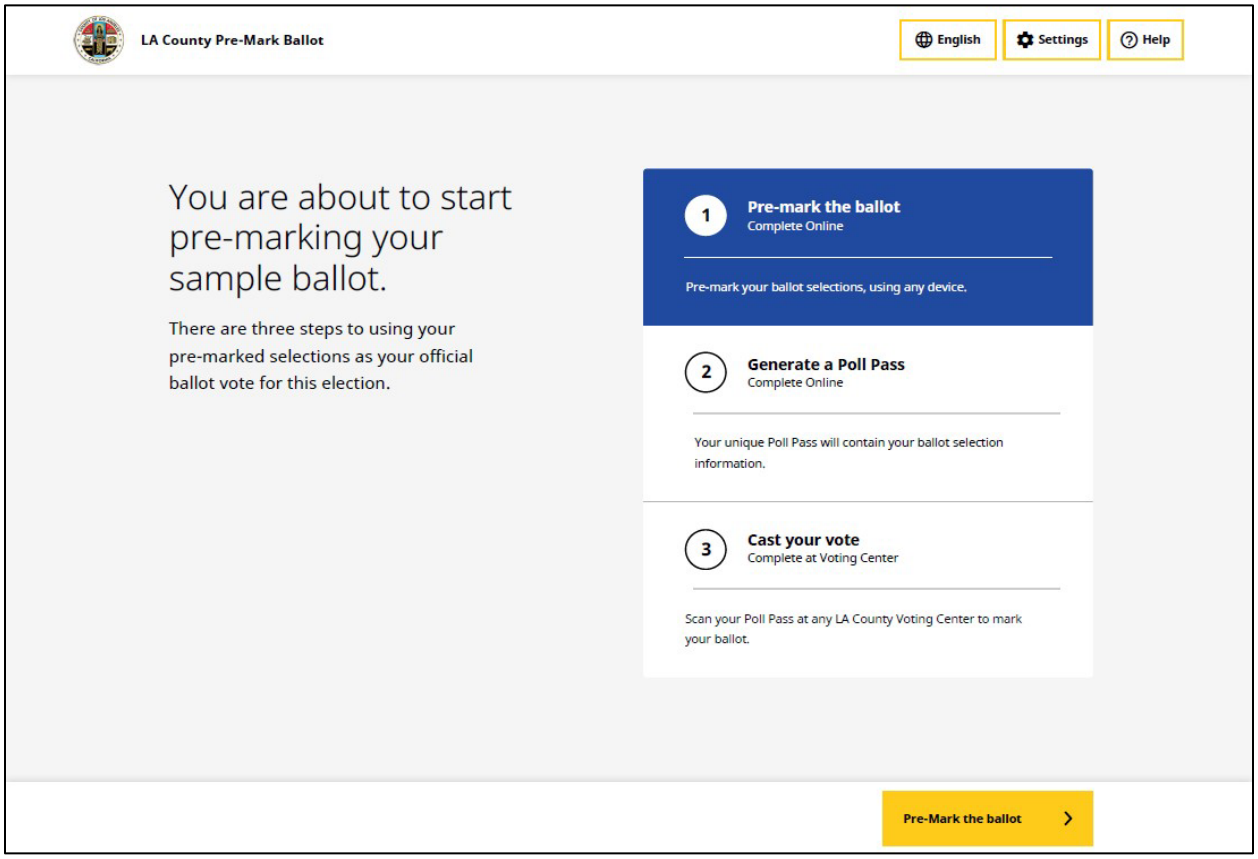
## 1.3. Enterprise Signing Authority

The ESA establishes the security root and chain of trust for the VSAP voting solution. This subsystem comprises the following processes: key management, distribution, and authentication. The ESA uses a cryptographic module to generate a public/private key pair, which authenticates devices and transactions. The ESA is the basis of the authorization, authentication, and data integrity for the voting system.

*ESA*

## 1.4. Interactive Sample Ballot

The ISB is a web-based application that allows voters to mark their selections on a sample ballot, either on their desktop or mobile device, prior to formally voting at a vote center. The ISB generates a Quick Response (QR) code called a Poll Pass, which pre-populates selections in the BMD. The ISB also supports Remote Accessible Vote by Mail (RAVBM) and the Overseas Citizens Absentee Voting Act (UOCAVA). The ISB is what voters use when they interact with the system on their computers or mobile devices.




*ISB*

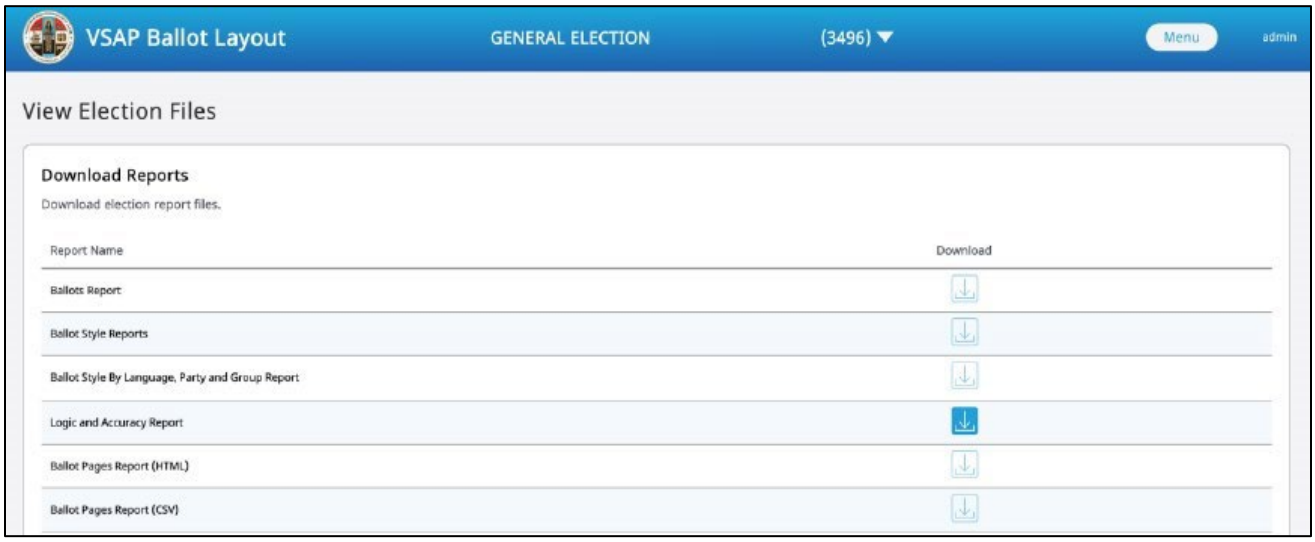
## 1.5. Tally

Tally captures and processes ballot images to digitally count voter selections from paper ballots. Tally scans and creates images of ballots, converts the images into Cast Vote Records (CVRs), tabulates them, and allows the election results to be exported. Tally is responsible for counting votes at the end of an election.


*Tally*

## 1.6. VSAP Ballot Layout

The VBL enables election managers to configure and generate ballot layouts. The VBL subsystem ingests election information files and generates ballot layout files to be used by other components of the system. The VBL makes setting up elections possible.



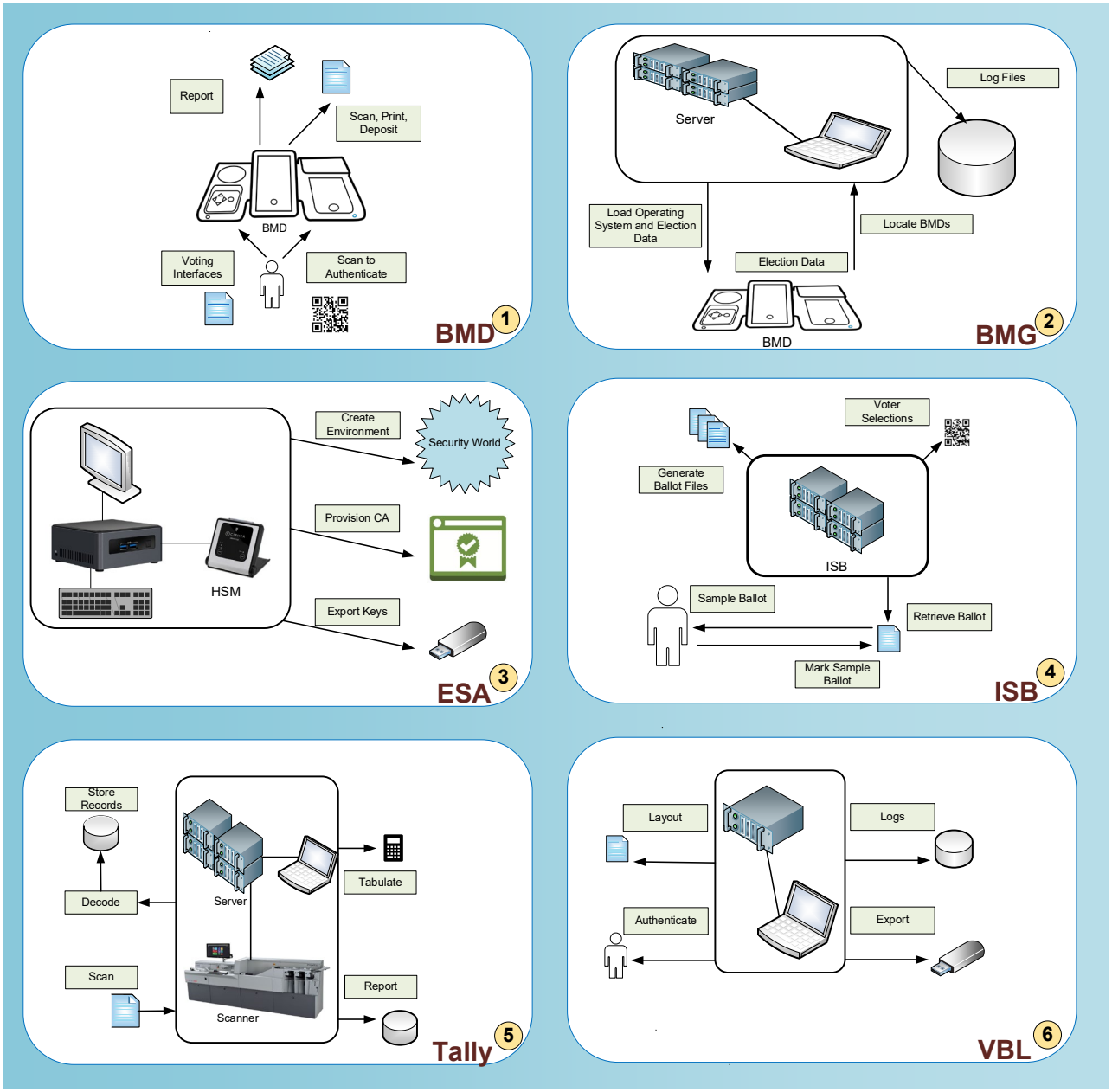

*VBL*

## 1.7. Terms and Definitions

Terms and definitions used in this document are described in the supplementary document VSAP-TDP-011 Acronyms and Definitions.

# 2. System Components: Definitions and Descriptions

## 2.1. Functional Components

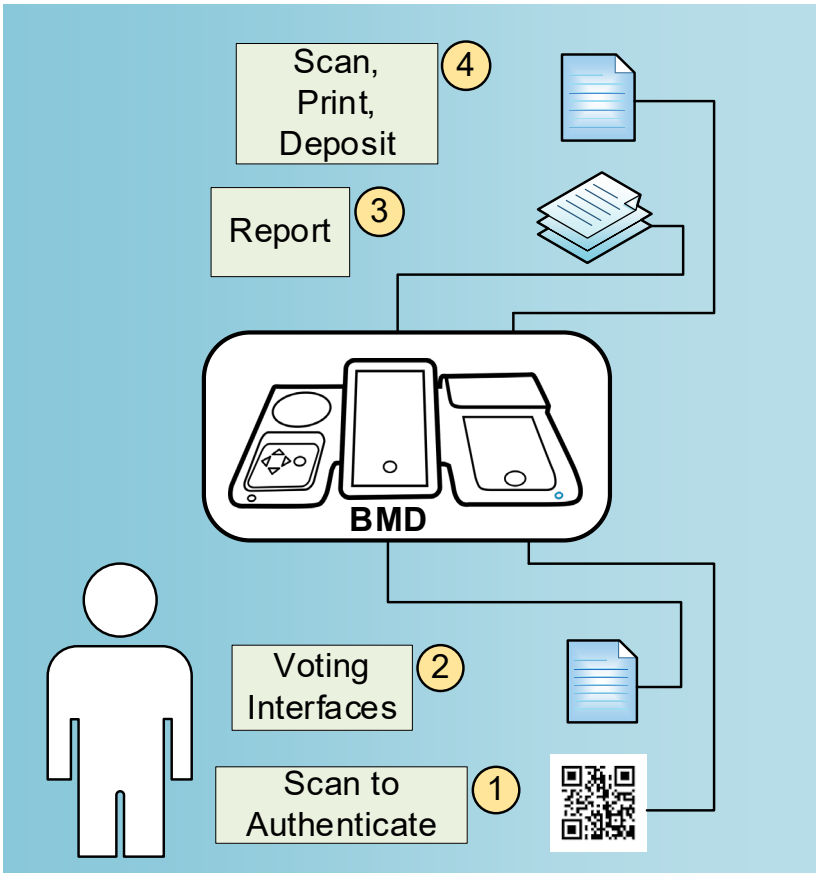



*VSAP functional components*

Each subsystem of the VSAP system is described at a high level in the following table:

| # | Subsystem | Description |
|---|---|---|
| 1 | BMD | The BMD is the primary touchpoint for the voter and the hub of the voting system. It includes a tablet touchscreen interface and several hardware peripherals supporting manual interaction, scanning, and printing capabilities. |
| 2 | BMG | The BMG allows operators to manage the software, configurations, and data on the BMDs. Although some diagnostics require manual intervention (e.g., scanner and printer diagnostics, which require paper), the BMG performs automated diagnostics on the BMD without physical access. |
| 3 | ESA | The Enterprise Signing Authority (ESA) is a cryptographic module used to ensure each component of the VSAP system is conforming to security standards and to validate the data passed to components are secure and authenticated. |
| 4 | ISB | The ISB is a digital version of the sample ballot. It is accessible as a web application that permits prospective voters to review election material and mark their selections on their desktop or mobile device. |
| 5 | Tally | The Tally system is responsible for capturing and processing ballot images so that voter selections originating from paper ballots are digitally represented and counted. |
| 6 | VBL | The VBL defines the ballot print formats for BMD, VBM, RAVBM and UOCAVA ballots, and generates data files and packages necessary to configure the BMD, BMG, ISB, and Tally. |

### 2.1.1. BMD Functional Components




*BMD functional components*

At the warehouse, the BMDs are connected to the BMG network using network cables. The BMDs run diagnostics, receive election and configuration files, and download election log files.

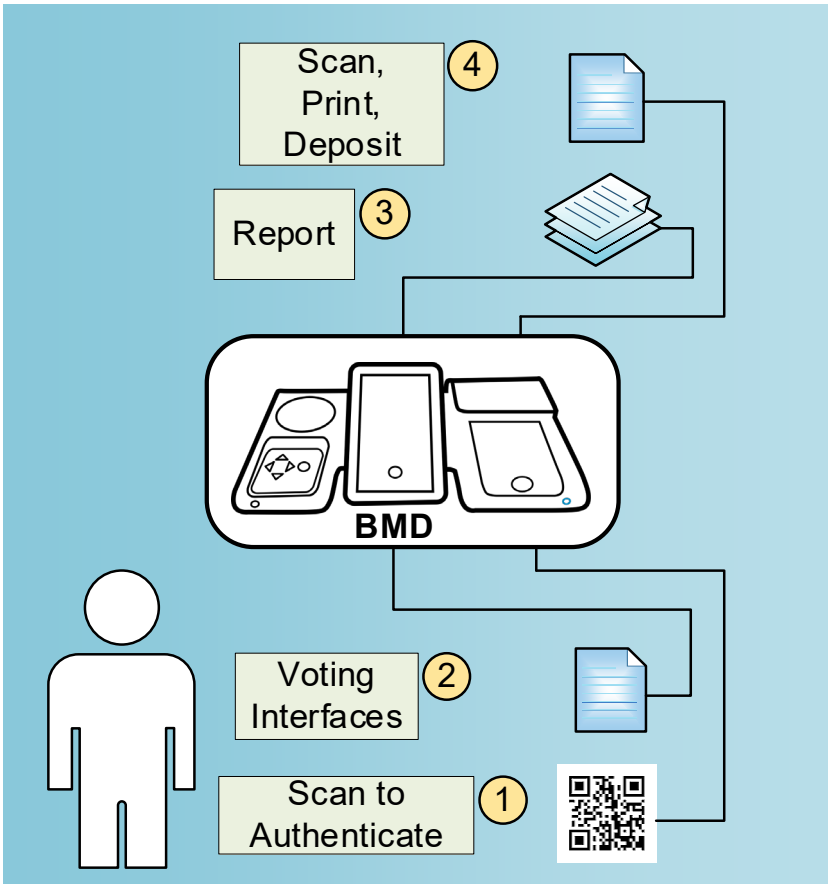
At the Vote Center, an election worker scans an authentication QR code and enters a personal identification number (PIN) to activate the BMD and perform the poll opening procedures. During the voting day, voters receive their ballot from the election workers. The BMD scans the ballot's Ballot Page Meta-data (BPM) QR code containing information used by the BMD to determine the appropriate ballot style to display. After making selections, the voter's ballot is printed with election information, voting selections, and a Selection Barcode Encoding (SBE) QR code containing their selections and BMD information. The voter has an opportunity to review and verify the printed ballot before the BMD deposits it in the ballot box. During the voting day, the election worker empties the ballot box as needed. At the end of the voting day, the election worker performs the poll closing procedures.

Following the election, the BMDs are returned to carts or cases and moved back to the warehouse. Once the BMDs are reconnected to the BMG network, the BMD log files are uploaded to the BMG.

Each function of the BMD system is described at a high level in the following table:

| # | Function Name | Description |
|---|---|---|
| 1 | User Authentication | Election workers scan a QR code and enter a PIN for system access |
| 2 | Voting | Voters interact with the BMD to mark their ballot selections using various interfaces including the touchscreen, controller, and dual-switch input device; to ensure privacy, headphones provide the audio interface |
| 3 | Ballot Management | The BMD scans the ballot BPM QR code, prints the voter's selections and SBE QR code, presents the printed ballot for voter approval, and deposits the approved ballot into the ballot box |
| 4 | Reports and Logs | The BMD creates Open Poll and Close Poll reports, election logs, and BMD interaction logs |

### 2.1.2. BMG Functional Components




*BMG functional components*

The BMD Manager (BMG) manages and maintains the BMDs and allows operators to manage software, configurations, and data.

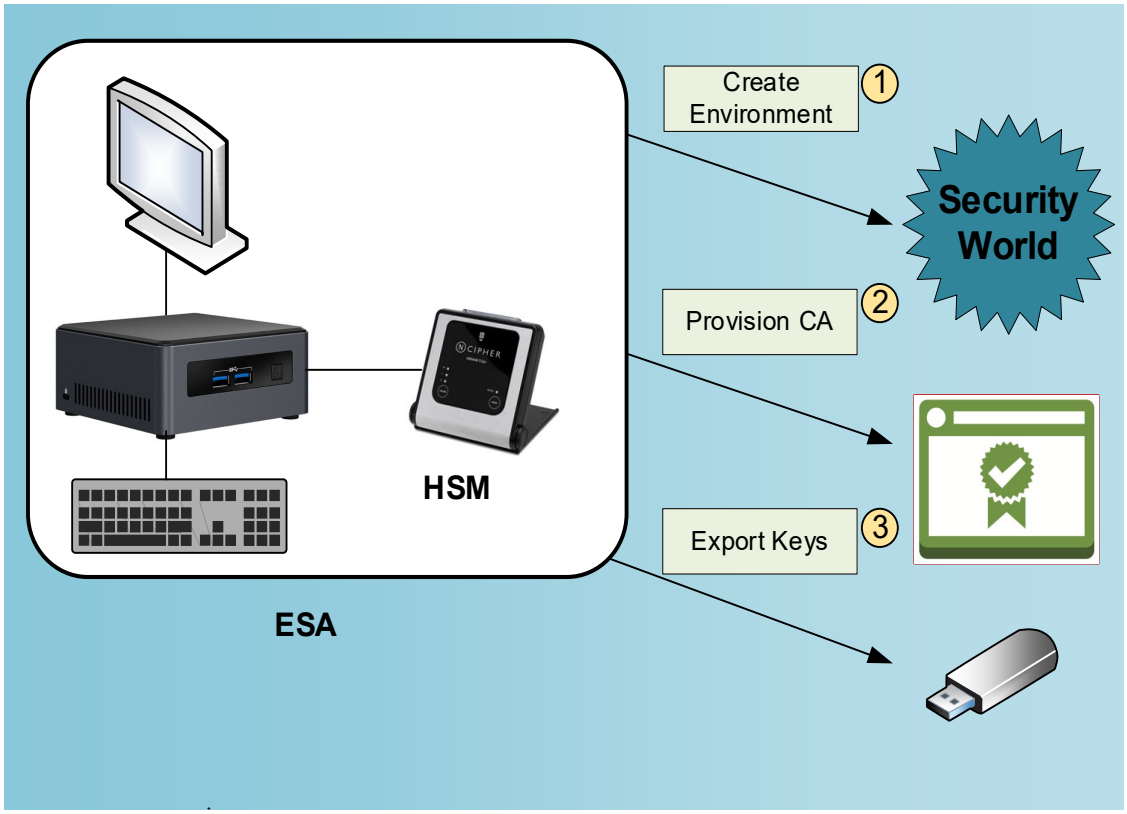
The BMG loads the operating system and the voting application onto the BMDs and conducts system verification. The BMG maintains the location information of the BMDs connected to the BMG network. Processes and interactions are logged. Additionally, the BMG also runs automated diagnostics of the BMDs.

Pre-election, the BMG uploads election data into its repository. The election data can then be loaded onto the BMDs that will be provisioned for an election. Post-election, the BMG downloads the public key files and the log files from the BMDs.

Each function of the BMG system is described at a high level in the following table:

| # | Function Name | Description |
|---|---|---|
| 1 | Configure BMDs | Initially, the BMG loads the operating system and BMD applications onto the BMDs. The BMG loads election data and configuration data onto the BMDs prior to an election |
| 2 | Inventory and Location | The BMG identifies the warehouse locations of the BMDs when they are attached to the BMG network |
| 3 | Event Logging | The BMG logs processes and interactions |
| 4 | Retrieve Election Data | Following an election, the BMG retrieves election logs, interaction logs, and the security keys from the BMDs |

### 2.1.3. ESA Functional Components



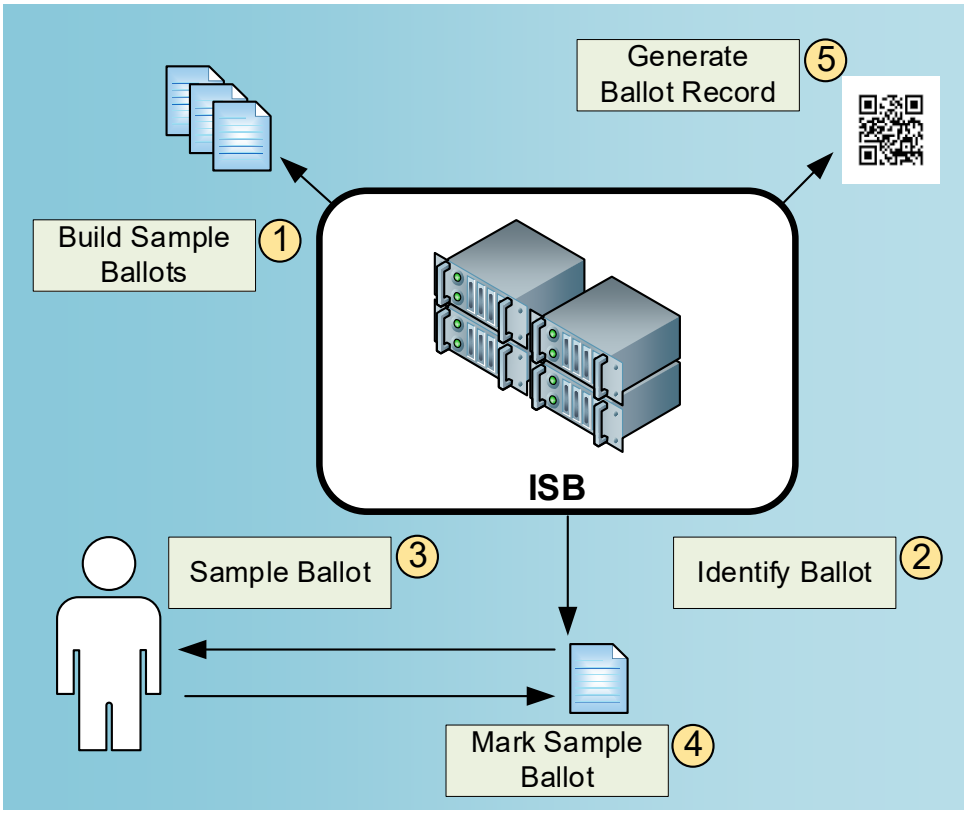
*ESA functional components*

The Enterprise Signing Authority (ESA) subsystem is a cryptographic module used to ensure each component of the VSAP system is conforming to security standards and to help ensure that the data being passed to components are secure and authenticated. The ESA creates a "security world" in the Hardware Security Module (HSM). The ESA sets up sets of operator cards to manage security keys. The ESA provision Certificate Authorities to establish the security root and chain of trust using a cryptographic module to generate a public/private key pair. Once this process is completed, the ESA generates public/private export key pairs for each component (VBL, ISB, BMG, Tally and the Trusted Environment), encrypts each key with its private key, and exports the keys for use in their target servers.

Each function of the ESA system is described at a high level in the following table:

| # | Function Name | Description |
|---|---|---|
| 1 | Create Secure Environment | The ESA creates a security world and operator cards |
| 2 | Provision Certificate Authorities | The ESA creates a single root CA key and intermediate CA keys |
| 3 | Generate and Export Keys | The ESA creates server keys that are exported to target servers in an encrypted state |

### 2.1.4. ISB Functional Components




*ISB functional components*

The Interactive Sample Ballot (ISB) is a software application that allows voters to review and mark their sample ballots, either on their desktop or mobile device, prior to voting at a vote center. The preprocessor takes the input files and generates data packages optimized for the ISB client application. A map assembles the data about precincts, ballot styles, and parties to associate the voter with the appropriate precinct and identify ballot style. The Voter Selection Manager tracks voter selections and enforces legal and business rules.

To set up the ISB session, the voter enters either their voter information (last name, date of birth, house number), or address only lookup, allowing the client application to identify the correct precinct and display the appropriate ballot. The voter marks their selections on the sample ballot on their mobile device or personal computer, then reviews their selections. The ISB generates a Poll Pass, which is a QR code representing the selected information. Voter selections can be saved locally on their mobile device for use at the Vote Center to populate their selections onto the BMD via the Poll Pass.

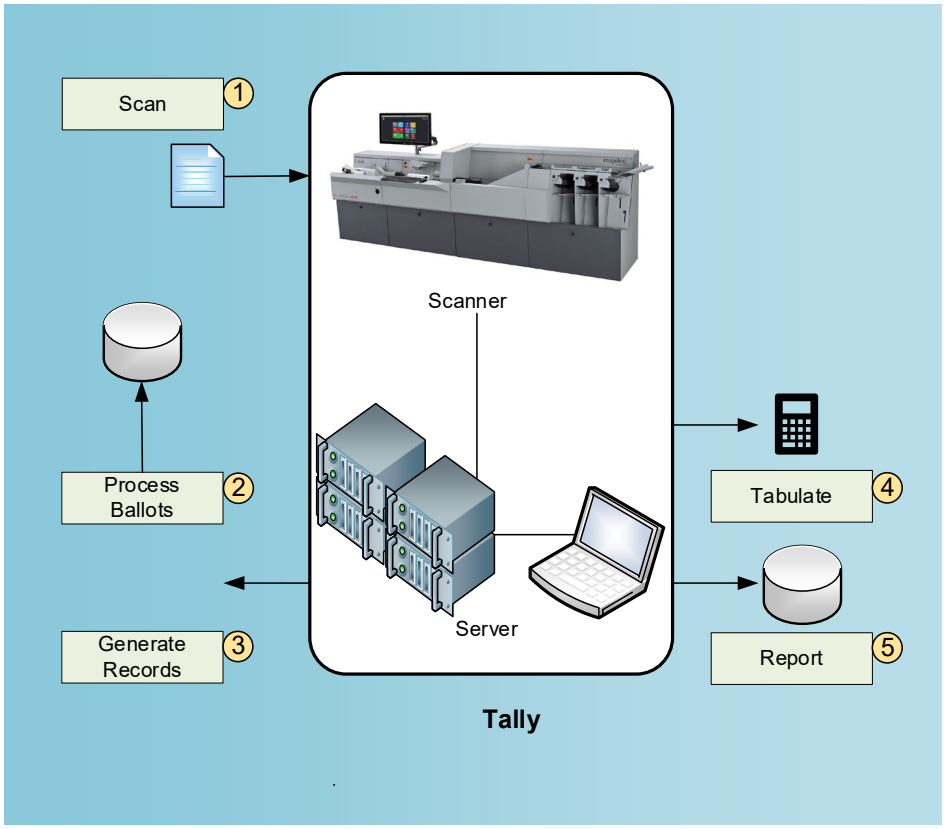
The ISB also enables Remote Accessible Vote by Mail (RAVBM) and Uniformed and Overseas Citizens Absentee Voting Act (UOCAVA).

Each function of the ISB system is described at a high level in the following table:

| # | Function Name | Description |
|---|---|---|

| | | |
|---|---|---|
| 1 | Build Sample Ballots | Generate data packages for the ISB client application, map precincts to ballot styles, publish ballot files |
| 2 | Identify Ballot | The ISB identifies and retrieves the appropriate ballot based on voter information and location |
| 3 | Present Sample Ballot | The ISB displays the sample ballot to the voter |
| 4 | Mark Sample Ballot | The voter marks their selections on the sample ballot |
| 5 | Generate Poll Pass | The ISB generates a QR code with the information about the election, ballot style, and precinct, as well as codes corresponding to the voter selections |

### 2.1.5. Tally Functional Components



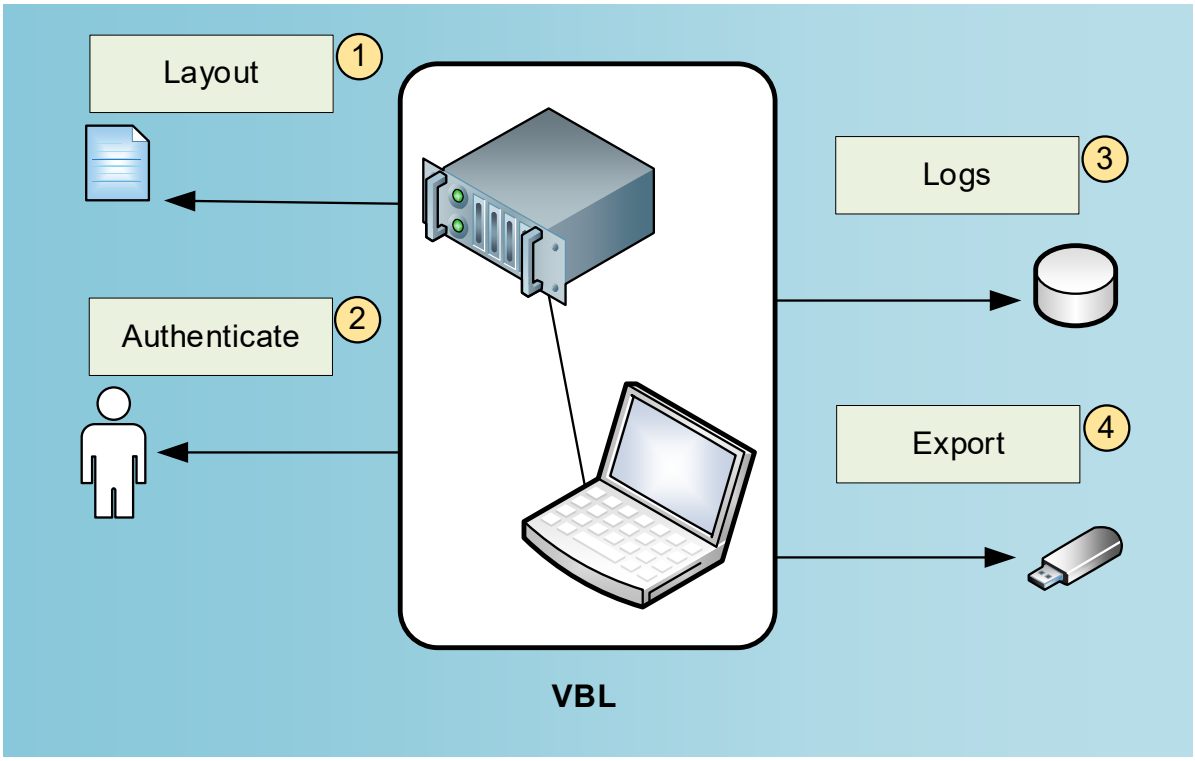

*Tally functional components*

The Tally system is responsible for capturing and processing ballot images so that voter selections from paper ballots (including BMD, VBM, RAVBM and UOCAVA ballots) may be digitally counted. There are, from the perspective of the software system architecture, four main Tally processes: (1) Ballots are scanned and images captured; (2) ballot images are converted into Cast Vote Records (CVRs); (3) CVRs are tabulated; and (4) Tabulated results are exported for reporting and auditing.

Each function of the Tally system is described at a high level in the following table:

| # | Function Name | Description |
|---|---|---|
| 1 | Scan | The scanning process captures a digital image of each paper ballot |
| 2 | Process Ballots | Tally processes the ballots to decode voter intent |
| 3 | Generate Ballot Record | The processed ballot data is saved as a tabulation-ready record in the database |
| 5 | Tabulate | Records in Tally database are refined and counted to determine election results |
| 6 | Report Data | The raw vote data produced by the tabulator is copied to an external database used by an external reporting system |

### 2.1.6. VBL Functional Components



*VBL functional components*

The VSAP Ballot Layout is an application that enables election managers to configure and generate ballot layouts.

The VBL application supports the logical layout and production of VBM Ballots and election files. These output files provide the rest of VSAP with a definition of the election and ballot layout information. The Auth Service is a standalone authentication service used to manage users, roles, and permissions. The log viewer provides a primary location that consolidates records of critical issues, errors, warnings, and other information.

Each function of the VBL system is described at a high level in the following table:

| # | Function Name | Description |
|---|---|---|
| 1 | Generate Ballot Layout | The VBL application produces the ballots and election configuration files (aka configuration files) |
| 2 | Logs | Events executed by VBL are captured and available for review |
| 3 | Export Ballot Layout | The Ballot Layout is exported to receiving subsystems |

# 3. Ballot Definition

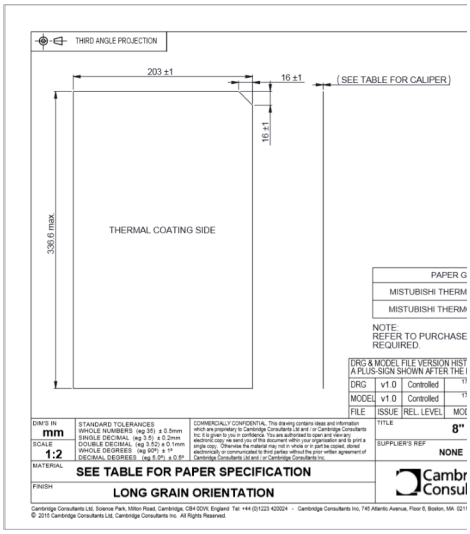
## 3.1. Overview Procedures to Operate Voter Ballot Layout

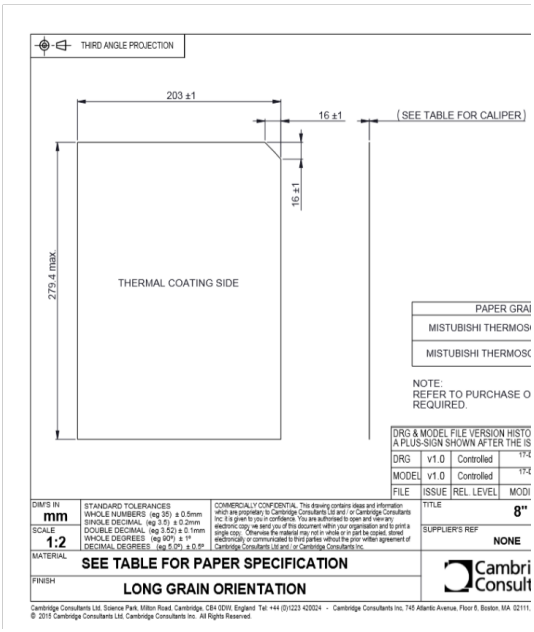
See VSAP-USG-010 VBL User Guide for instructions on how to configure and generate ballot layouts.

## 3.2. Paper and Printing Specifications

### 3.2.1. Specifications for Thermal Paper (BMD)

This section provides specific information about thermal paper. Use the specifications below for thermal Paper Grades, Substance GSM and Caliper MM.





THIRD ANGLE PROJECTION
203 ±1
16 ±1
(SEE TABLE FOR CALIPER)
16 ±1
279.4 max
THERMAL COATING SIDE
PAPER GRA
MISTUBISHI THERMOS
MISTUBISHI THERMOS
NOTE:
REFER TO PURCHASE O
REQUIRED.
DRG & MODEL FILE VERSION HISTO
A PLUS-SIGN SHOWN AFTER THE IS
DRG v1.0 Controlled
MODEL v1.0 Controlled
FILE ISSUE REL. LEVEL MODI
DIM'S IN mm
SCALE 1:2
STANDARD TOLERANCES
WHOLE NUMBERS (eg 35) ± 0.5mm
SINGLE DECIMAL (eg 3.5) ± 0.2mm
DOUBLE DECIMAL (eg 3.52) ± 0.1mm
WHOLE DEGREES (eg 60°) ± 1°
DECIMAL DEGREES (eg 5.0°) ± 0.5°
COMMERCIALLY CONFIDENTIAL
TITLE 8"
SUPPLIER'S REF NONE
MATERIAL SEE TABLE FOR PAPER SPECIFICATION
FINISH LONG GRAIN ORIENTATION
Cambri Consult
Cambridge Consultants Ltd, Science Park, Milton Road, Cambridge, CB4 0DW, England Tel: +44 (0)1223 420024 - Cambridge Consultants Inc, 745 Atlantic Avenue, Floor 6, Boston, MA 02111.
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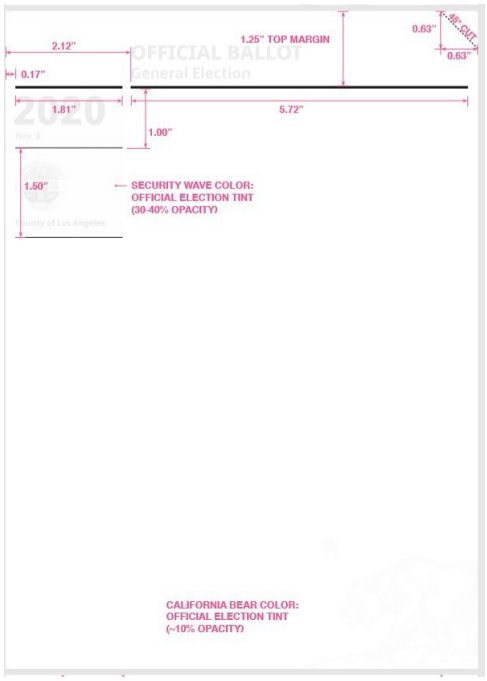
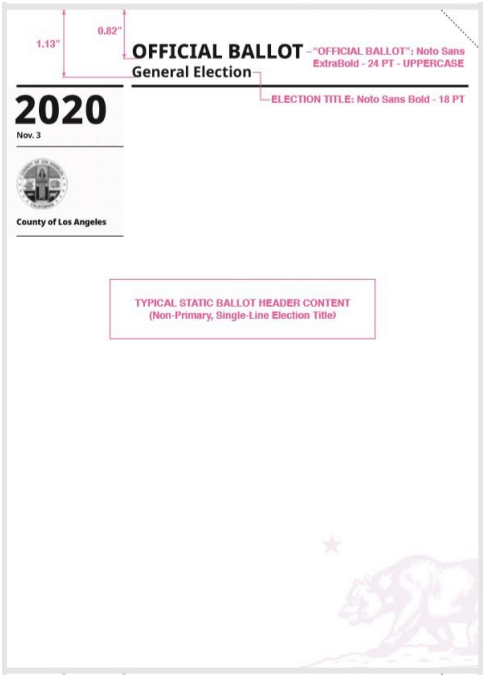
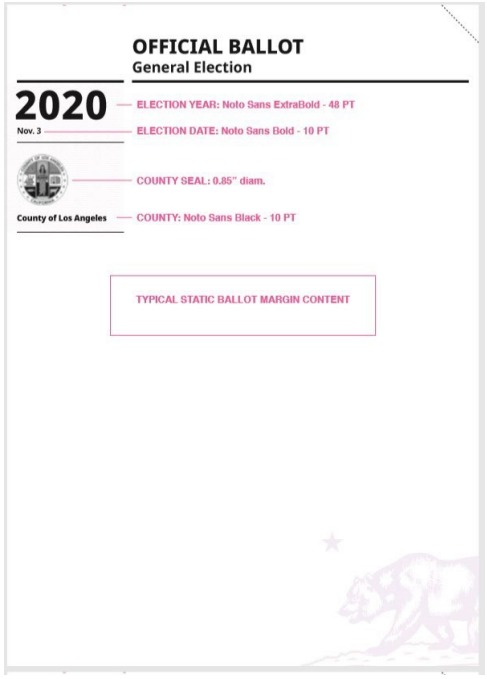
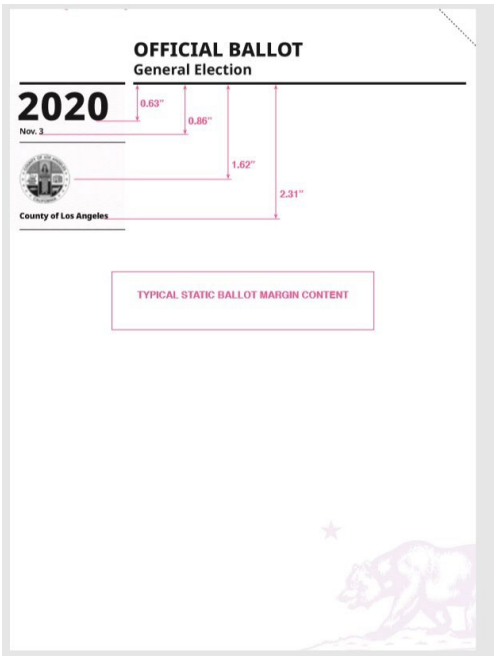

2.12"
0.17"
1.25" TOP MARGIN
0.63"
0.63"
1.81"
5.72"
1.00"
1.50"
SECURITY WAVE COLOR:
OFFICIAL ELECTION TINT
(30-40% OPACITY)
CALIFORNIA BEAR COLOR:
OFFICIAL ELECTION TINT
(~10% OPACITY)

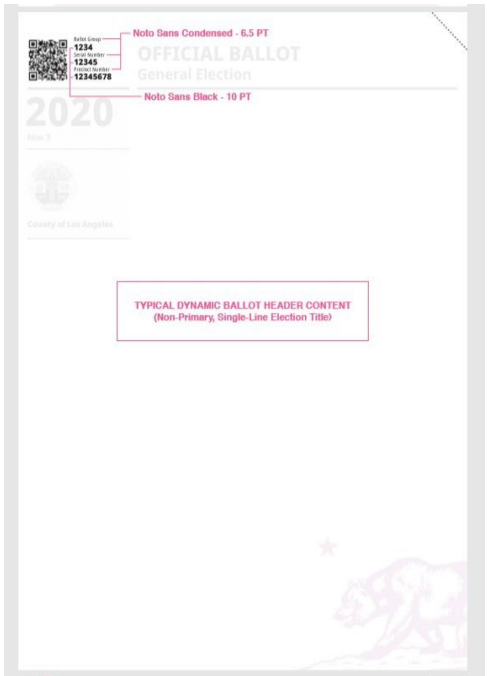

1.13"
0.82"
OFFICIAL BALLOT
General Election
"OFFICIAL BALLOT": Noto Sans ExtraBold - 24 PT - UPPERCASE
ELECTION TITLE: Noto Sans Bold - 18 PT
2020
Nov. 3
County of Los Angeles
TYPICAL STATIC BALLOT HEADER CONTENT
(Non-Primary, Single-Line Election Title)

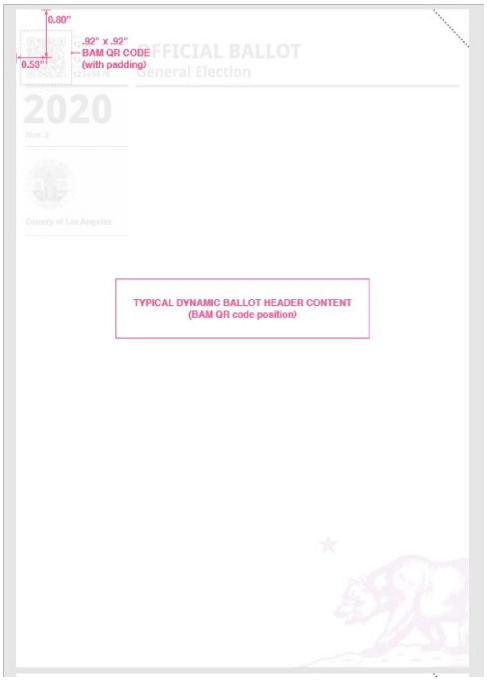

OFFICIAL BALLOT
General Election
2020
ELECTION YEAR: Noto Sans ExtraBold - 48 PT
Nov. 3
ELECTION DATE: Noto Sans Bold - 10 PT
COUNTY SEAL: 0.85" diam.
County of Los Angeles
COUNTY: Noto Sans Black - 10 PT
TYPICAL STATIC BALLOT MARGIN CONTENT

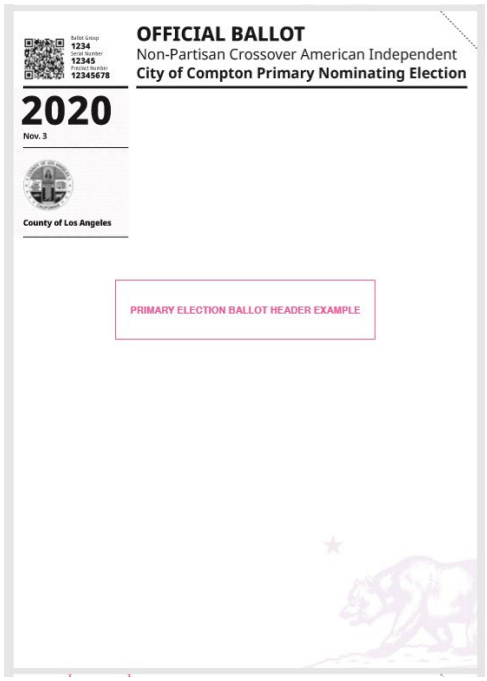

OFFICIAL BALLOT
General Election
2020
Nov. 3
County of Los Angeles
0.63"
0.86"
1.62"
2.31"
TYPICAL STATIC BALLOT MARGIN CONTENT

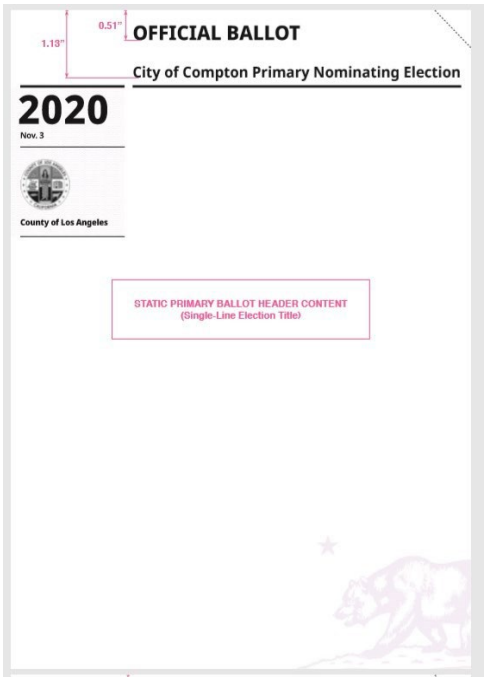

SAMPLE
SAMPLE

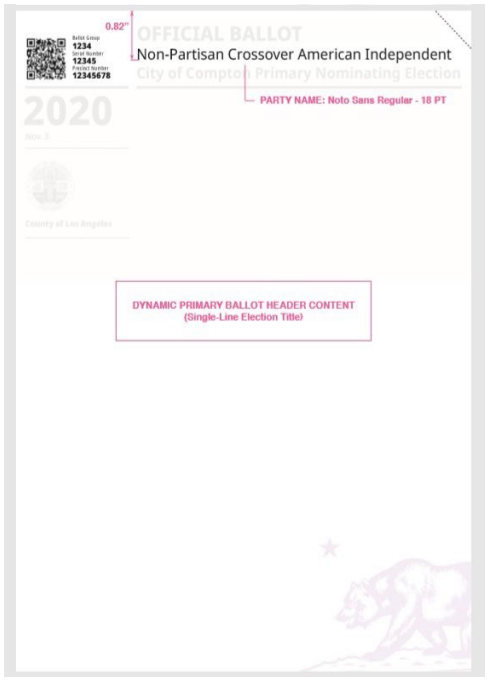

SAMPLE
SEAL COLOR:
OFFICIAL ELECTION TINT (100% OPACITY)
SAMPLE
EDGE TO EDGE COLOR:
OFFICIAL ELECTION TINT (~20% OPACITY)

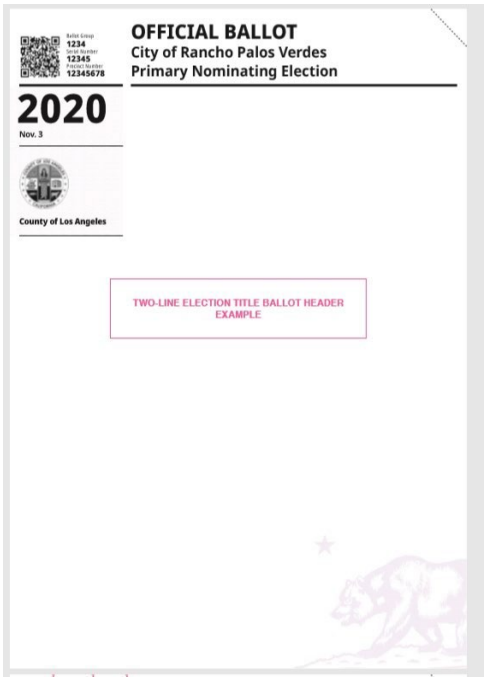

Noto Sans Condensed - 6.5 PT
1234
12345
12345678
OFFICIAL BALLOT
General Election
2020
Noto Sans Black - 10 PT
TYPICAL DYNAMIC BALLOT HEADER CONTENT
(Non-Primary, Single-Line Election Title)

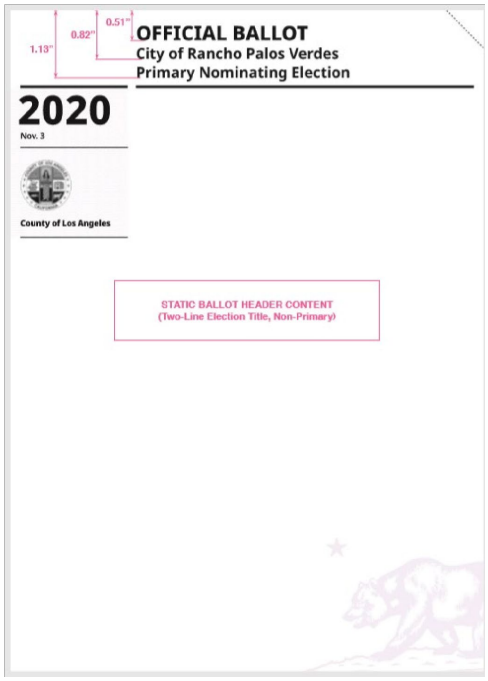

0.80"
.92" x .92"
BAM QR CODE
(with padding)
0.59"
TYPICAL DYNAMIC BALLOT HEADER CONTENT
(BAM QR code position)

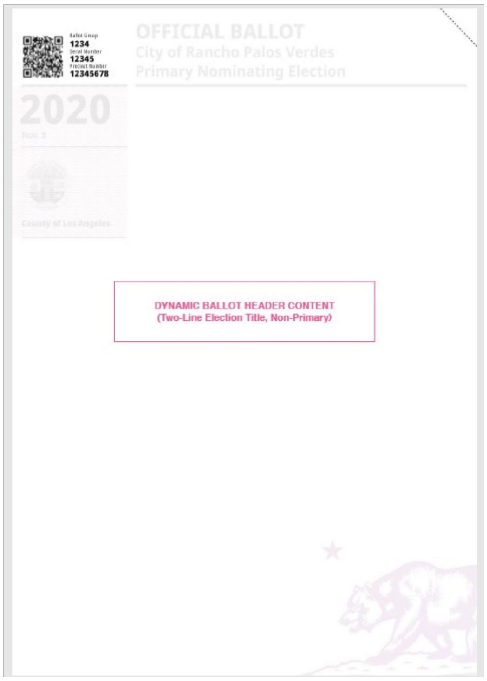

OFFICIAL BALLOT
Non-Partisan Crossover American Independent
City of Compton Primary Nominating Election
2020
Nov. 3
County of Los Angeles
PRIMARY ELECTION BALLOT HEADER EXAMPLE


0.51"
1.13"
OFFICIAL BALLOT
City of Compton Primary Nominating Election
2020
Nov. 3
County of Los Angeles
STATIC PRIMARY BALLOT HEADER CONTENT
(Single-Line Election Title)


0.82"
Non-Partisan Crossover American Independent
PARTY NAME: Noto Sans Regular - 18 PT
DYNAMIC PRIMARY BALLOT HEADER CONTENT
(Single-Line Election Title)




### 3.2.2. Specifications for Tally

Before beginning the system setup for Tally, there are two basic setups required: Single Node and Two Node.

#### 3.2.2.1. Single Node

The first required setup is Single Node deployment. The Single Node has two machines, one with a file system and the other is a machine comprised with Tally Node of services, Cassandra database and Kafka. Kafka is used for building real-time data pipelines and streaming applications.

#### 3.2.2.2. Two Node

The second setup requirement is a Two Node deployment, which has three machines:

1. File System - two machines comprising the Tally Node
2. Services
3. Cassandra database (and Kafka)

## 3.3. Layout Requirements and Specifications

See VSAP-USG-010 VBL User Guide for ballot layout specifications.

# 4. System Installation and Configuration

## 4.1. Programming and Configuration of Election Management System

See VSAP-USG-010 VBL User Guide for EMS details.

## 4.2. Hardware Requirements and Specifications

See VSAP-TDP-012 Approved Parts List; it provides a comprehensive list of all subsystems and their corresponding hardware used in VSAP.

## 4.3. Hardware and Network Setup and Configuration

This details the configuration and setup of each component of the VSAP voting system. See the following sections to learn how to set up each component.

### 4.3.1. BMG Hardware Installation

See VSAP-USG-033 BMG Initial Setup Guide for details regarding BMG hardware.

### 4.3.2. BMD Hardware Installation

The BMD is delivered as a turnkey appliance, with no hardware installation requirements.

### 4.3.3. ESA Hardware Installation

The ESA consists of an Intel NUC server, the nShield Hardware Security Module (HSM), as well as keyboard, mouse, and monitor.

To install the hardware, plug the peripherals and the HSM into the NUC in the appropriate ports. It is an air-gapped system, with no need or ability to connect to a network.

### 4.3.4. ISB Hardware Installation

ISB is a completely virtualized system running on the Amazon Web Services (AWS) cloud, without hardware installation requirements.

### 4.3.5. Tally Hardware Installation

See VSAP-USG-009 Tally User Guide and any corresponding build procedures for details regarding Tally hardware.

### 4.3.6. VBL Hardware Installation

See VSAP-USG-010 VBL User Guide and any corresponding build procedures for details regarding VBL hardware.

## 4.4. Software Installation and Configuration

The setup guides listed below include step-by-step procedures for installing and configuring software on each VSAP component.

**Note:** VSAP subsystems must be reformatted and installed from certified software after each election.

### 4.4.1. BMG Software Installation

See VSAP-USG-034 BMD Virtual Machine Tools and VSAP-035 BMD Deployment Guide for details regarding BMG software.

### 4.4.2. BMD Software Installation

See VSAP-USG-003 BMG User Guide for initial file uploads to BMDs.

### 4.4.3. ESA Software Installation

See VSAP-USG-044 ESA Server Build Guide for details regarding ESA software.

### 4.4.4. ISB Software Installation

As aforementioned, ISB uses AWS; see VSAP-USG-001 ISB Preprocessor User Guide for details regarding proper configurations.

### 4.4.5. Tally Software Installation

See VSAP-USG-009 Tally User Guide and any corresponding build procedures for details regarding Tally software.

### 4.4.6. VBL Software Installation

See VSAP-USG-010 VBL User Guide and any corresponding build procedures for details regarding VBL software.

## 4.5. Software and Firmware Upgrades

Upgrades and updates to software and firmware will use the same process as the initial installation. See Section 18.5 Installation Procedures for further details regarding security aspects of upgrades.

**Note:** Each VSAP system must be reformatted and installed from the certified software after every election.

# 5. Acceptance Testing

VSAP components must be tested for acceptance through the successful running of the tests specified in the System Test Specification documents. For each component, those documents which detail the tests required to successfully authenticate their acceptance and readiness for use are referenced here.

## 5.1. Development Test Specifications

See attachments:

- BMD Test Plan
- BMG Test Plan
- ISB Test Plan
- VBL and Tally Test Plan

## 5.2. Logic Correctness, Data Quality, and Security

See attachments:

- BMD Test Plan
- BMD Test Cases
- BMG Test Plan
- BMG Test Cases
- ISB Test Plan
- ISB Test Cases
- VBL and Tally Test Plan
- Tally Test Cases
- VBL Test Cases

## 5.3. Test Identification and Design

See attachments:

- BMD Test Cases
- BMG Test Cases
- ISB Test Cases
- Tally Test Cases
- VBL Test Cases

### 5.3.1. Test Design

| Test | Structure | Sequence or Progression | Conditions |
|---|---|---|---|
| Unit Testing | Unit testing isolates the smallest testable parts of a build. Testing is performed on each module or block of code. | Tests written prior to code.<br>All unit tests are run against the build.<br>All tests need to pass before quality assurance testing. | Metrics are collected and reported at the end of every sprint. At the project level, the metrics are used to identify areas of improvement and address them. |
| Functional Testing | Functional testing checks all documented functions/requirements of the application/product. Functional testing is conducted by feeding inputs and validating expected outputs against observed outputs from the application. | Unit tests for code low-level modules (can overlap with engineering unit testing).<br>Integration testing with other products.<br>End-to-end functional testing for the overall solution, including input from stakeholders.<br>User experience testing by community stakeholders. A selection of people from different parts of the community will document all issues found and will convert the issues to "defects." Testing will be conducted at the end of Engineering Verification Testing (EVT), Development Verification Testing (DVT), and Production Verification Testing (PVT). | Metrics are collected and reported at the end of every sprint. At the project level, the metrics are used to identify areas of improvement and address them. Some of the metrics gathered are code coverage for unit tests, velocity, burndown, test progress per sprint, and functional breakdown of defects. |
| System Testing | System integration tests are performed on all components. The test cases will incorporate test scenarios that confirm continuity and accuracy | The tests follow the general assumptions for functional tests. The testers validate the input and output of each test and make sure they align with | Metrics are collected on an ongoing basis and reported at the end of every sprint. They include defect |

| Test | Structure | Sequence or Progression | Conditions |
|---|---|---|---|
| | across modules and accommodate testing of files produced by or for external systems. | the requirements/stories. The tests cover software, hardware, and any files consumed.<br>Non-functional tests like performance, compliance, accessibility, security, and design validation are also performed at this level. All issues are reported in Jira as defects. Performance tests in this context include scenarios like average response time on the Get and Post APIs. Security tests at this level will be, for example, secure communication between the different modules.<br>Smoke tests are a predefined set of tests that touch critical features of the system. When a new build is delivered to the test team, smoke testing can quickly give feedback to the testers on the status of the build. | and sprint summary reports with test/pass numbers. At the project level, the metrics are used to identify areas of improvement; they are also discussed during the sprint retrospective meeting with action items for the following sprint. Metrics gathered at the project level are code coverage for unit tests, velocity and burndown charts, and defects found by severity. Additional metrics can be considered if they help the team with continuous improvement. |
| Integration Testing | Integration test activities are performed on all the components and results from those tests are reported. The test cases incorporate test scenarios that confirm continuity and accuracy across modules and accommodate testing of files produced by or for external systems. | Verify the functional aspects of the integrated system including hardware, software, and consumables.<br>Verify the compliance of non-functional requirements such as performance targets and security for this level.<br>Report defects found in the integration tests.<br>Identify solution design problems. | Metrics are collected and reported at the end of every sprint. At the project level, the metrics are used to identify areas of improvement and address them. Some of the metrics gathered are code coverage for unit tests, velocity, burndown, test progress per sprint, and functional |

| Test | Structure | Sequence or Progression | Conditions |
|---|---|---|---|
| | | | breakdown of defects. |
| Hardware/Software Integration Testing | The QA team will verify functional and non-functional requirements of the system using hardware, so that any deviation from the expected behavior is identified to serve as information for possible hardware or software adjustments. | Tests are defined by the QA team and reviewed to ensure they meet VSAP requirements.<br>These reviews are at the end of every sprint or on a schedule established before testing begins. | Defect Summary Report: The defects found in a sprint along with their priority and impact.<br><br>Sprint Summary Report: Rollup of testing progress for the week, such as the daily report.<br><br>Daily and weekly Project Level Reports: Determined by the project manager; they may include overall velocity, burndown charts, hot spots, potential problem areas, and/or trending information. |
| User acceptance Testing | User acceptance tests are performed by the appropriate team using the test suites, test cases, and checklists as well as the information about the required data and environment.<br>Acceptance testing validates that business functions are operating in a manner suited to real-world circumstances and usage. It also gives a chance for stakeholders to review the | Tests are defined by the QA team and reviewed to ensure they meet VSAP requirements.<br>These reviews are at the end of every sprint or on a schedule established before testing begins. | Defect Summary Report: The defects found in a sprint along with their priority and impact.<br><br>Sprint Summary Report:<br>Rollup of testing progress for the week, like the daily report.<br><br>Daily and Weekly Project Level Reports: |

| Test | Structure | Sequence or Progression | Conditions |
|---|---|---|---|
| | product before starting production. | | Determined by the project manager; they may include overall velocity, burndown charts, hot spots, potential problem areas, and/or trending information. |
| Pre-certification Testing | This testing is integral to the overall successful development of the VSAP solution. The pre-certification testing encompasses both in- and out-of-scope VSAP components. | The first step of pre-certification testing is to ensure all requirements are accounted for in the development process. Certification specialists will be present at scrum meetings to ensure the CVSS requirements are being considered prior to coding. They participate in code reviews to ensure proper coding conventions are adhered to.<br><br>During the EVT and DVT stages, State-Approved Testing Agency (S-ATA) resources are integrated into the QA teams. As builds are completed, they are verified by the compliance team, and copies of the build are provided to the S-ATA for review. | As builds are completed, they are verified by the compliance team, and copies of the build are provided to the S-ATA for review. |
| Non-functional Testing | Non-functional testing is performed to check non-functional requirements of the application/product. This testing is conducted by validating expected outputs against observed | Performance testing<br>Usability testing | As builds are completed, they are verified by the compliance team, and copies of the build are provided to the S-ATA for review. |

| Test | Structure | Sequence or Progression | Conditions |
|---|---|---|---|
| | outputs from the application. | | |

## 5.4. Standard and Special Purpose Test Procedures

See attachments:

- BMD Test Cases
- BMG Test Cases
- ESA Test Cases
- ISB Test Cases
- Tally Test Cases
- VBL Test Cases

## 5.5. Test Details

| Test | Test Data (Source, Real or Simulated, Controls) | Expected Results | Evaluation Criteria |
|---|---|---|---|
| Unit Testing | Source: Software specific<br><br>Type: Simulated<br><br>Controls: User defined | Verify the functional aspects of the integrated system including hardware, software, and consumables<br>Verify the compliance of non-functional requirements such as performance targets and security for this level<br>Report defects<br>Identify solution design problems | Planning phase is completed<br>System design, technical design, and other relevant documents are properly reviewed, analyzed, and approved<br>Business and functional requirements are defined and approved<br>Testable codes or units are available<br>Test environment is available |
| Functional Testing | Source: Software specific<br><br>Type: Real | Verify the functional aspects of the integrated system including hardware, software, and consumables | Unit testing phase is complete<br>Priority bugs found during unit testing have been fixed and closed |

| Test | Test Data (Source, Real or Simulated, Controls) | Expected Results | Evaluation Criteria |
|---|---|---|---|
| | Controls: User defined | Verify the compliance of non-functional requirements such as performance targets and security for this level<br>Report defects<br>Identify solution design problems | Integration plan and test environment to carry out integration testing are ready<br>Unit testing for each module is complete |
| System Testing | Source: Software specific<br><br>Type: Real<br><br>Controls: User defined | Verify the functional aspects of the integrated system including hardware, software, and consumables<br>Verify the compliance of non-functional requirements such as performance targets and security for this level<br>Report defects<br>Identify solution design problems | Integration testing completed successfully<br>Priority bugs found during previous testing activities are fixed and closed<br>The system testing environment is available<br>Test cases are available to execute |
| Integration Testing | Source: Software specific<br><br>Type: Real<br><br>Controls: User defined | Verify the functional aspects of the integrated system including hardware, software, and consumables<br>Verify the compliance of non-functional requirements such as performance targets and security for this level<br>Report defects<br>Identify solution design problems | Stress, performance, and load tests have executed satisfactorily<br>Priority bugs are fixed and closed |
| Hardware/Software Integration Testing | Source: Software specific<br><br>Type: Real | Verify the functional aspects of the integrated system including hardware, software, and consumables | Stress, performance, and load tests have executed satisfactorily<br>Priority bugs are fixed and closed |

| Test | Test Data (Source, Real or Simulated, Controls) | Expected Results | Evaluation Criteria |
|---|---|---|---|
| | Controls: User defined | Verify the compliance of non-functional requirements such as performance targets and security for this level<br>Report defects<br>Identify solution design problems | |
| User acceptance testing | Source: Software specific<br><br>Type: Real<br><br>Controls: User defined | Verify the functional aspects of the integrated system including hardware, software, and consumables<br>Verify the compliance of non-functional requirements such as performance targets and security for this level<br>Report defects<br>Identify solution design problems | The user acceptance tests have executed successfully<br>Management has approved user acceptance testing completion<br>Business requirements are fulfilled<br>No critical defects are remaining<br>Acceptance testing signed off |
| Pre-certification testing | Source: Software specific<br><br>Type: Real<br><br>Controls: User defined | Verify the functional aspects of the integrated system including hardware, software, and consumables<br>Verify the compliance of non-functional requirements such as performance targets and security for this level<br>Report defects<br>Identify solution design problems | Hardware and software received.<br>TDP documentation completed<br>User and installation guides completed<br>User defined procedures followed |
| Non-functional testing | Source: Software specific<br><br>Type: Real | Verify the functional aspects of the integrated system including hardware, software, and consumables | User defined |

| Test | Test Data (Source, Real or Simulated, Controls) | Expected Results | Evaluation Criteria |
|---|---|---|---|
| | Controls: User defined | Verify the compliance of non-functional requirements such as performance targets and security for this level<br>Report defects<br>Identify solution design problems | |

See VSAP-CMP-001 Configuration Management Plan for further details about tests.

### 5.5.1. Test Specifications

#### 5.5.1.1. Specifications

Procedures for the verification and validation of overall software performance have been based on CVSS requirements and are included in the test cases. These tests provide procedures for assessing and demonstrating the suitability of the software for election use.

#### 5.5.1.2. Control and Data Input/Output

As multiple features/functions are combined to simulate an election, testing is performed on those sets of features and functions with a set of steps and procedures. The data entry process is defined by the "Steps" section listed for each test case.

#### 5.5.1.3. Acceptance Criteria

The features/functions under test are known before the start of the election and are integrated into the design of the test. When the test is performed, these features/functions are examined and must meet the expected results described in each test case.

#### 5.5.1.4. Processing Accuracy

Every feature and function tested must meet acceptance criteria as described in each test case.

#### 5.5.1.5. Data Quality Assessment and Maintenance

Data quality and accuracy is measured by determining the expected results of the simulation before any voting is performed. Test results are inspected to ensure they match the expected outcome for the specific input. The data is always within the boundaries of the election system, so any maintenance is inherent in the assessment of data quality.

#### 5.5.1.6. Ballot Interpretation Logic

Ballot interpretation logic is defined before the start of the test. The results of the voting and the response of the system to the voting variations are then known beforehand and listed in the "Expected Results" section of test cases.

#### 5.5.1.7. Exception Handling

Exception handling is verified using the test cases that check for correct handling of exceptions. These test cases represent Error or Exception Handling test scenarios, or the exception handling addressed in individual test cases if the possible exceptions are within scope.

#### 5.5.1.8. Security

Security is an overall functionality tested independently of voting variations. The security aspects are tested within individual test cases.

#### 5.5.1.9. Production of Audit Trails and Statistical Data

Statistical data in the form of election results may be used for determining accuracy and data quality. In each election test, all election test results are produced and examined. Audit trail production is an overall functionality that can be tested independently of voting variations. The election results or statistical data tests steps are addressed in an individual test if the tabulation of results are within scope.

#### 5.5.1.10. Procedures for Assessing Suitability for Election Use

Suitability for election use is controlled by the CVSS. All equipment, hardware, and software are assessed and only items that meet the requirements are employed in the VSAP system. This determination is developed via the design and architecture documentation for each sub-system where requirements are outlined and component selection is controlled, and the requirements are analyzed by the corresponding conformity matrices; see attachments:

See attachments:

- BMD Software Architecture Document
- BMD Software Design Document
- BMD Test Cases
- BMD Test Plan
- BMG Software Architecture Document
- BMG Software Design Document
- BMG Test Cases
- BMG Test Plan
- Designing and Using the BMD
- ESA Security Architecture
- ISB Software Architecture Document
- ISB Software Design Document
- ISB Test Cases
- ISB Test Plan
- Tally and VBL Software Design and Specification
- Tally and VBL Software Functional Specification
- Tally Test Cases
- VBL and Tally Test Plan
- VBL Test Cases

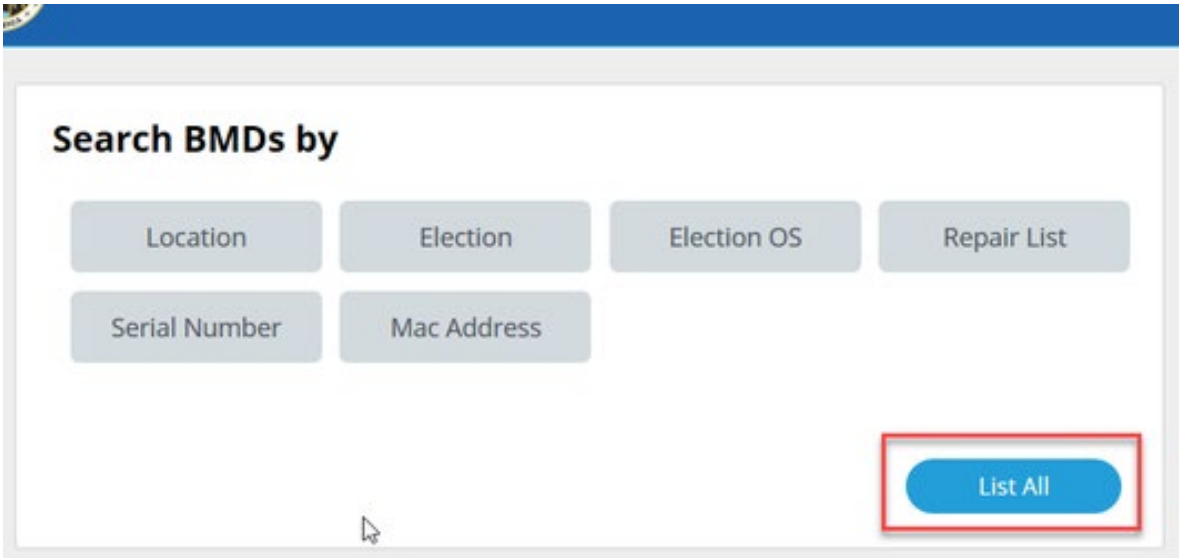
# 6. Election Setup and Definition

## 6.1. Programming and Configuration of Vote Recording Tabulation Device – Tally

See VSAP-USG-009 Tally User Guide and any corresponding build procedures for instructions on building and configuring Tally devices.

# 7. System Diagnostic Testing Procedures

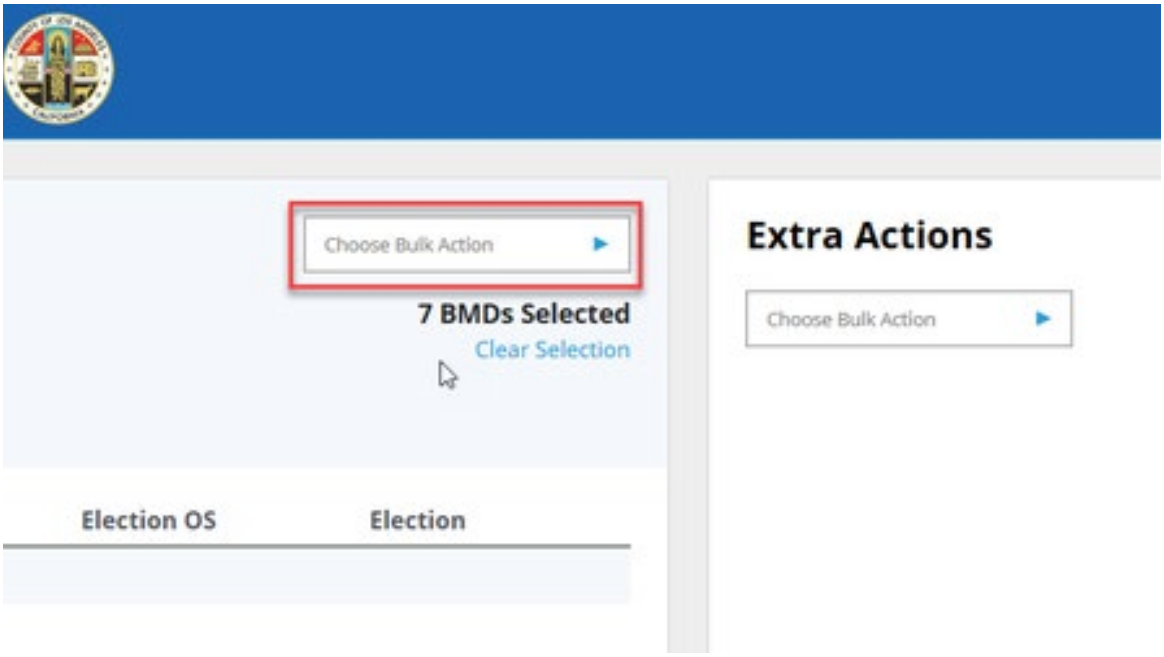
Diagnostics can be run on any individual BMD, a filtered group of BMDs, or all BMDs simultaneously using the BMG; the following steps give examples of these features.




1. From the BMG main page, in the Search BMDs by menu, click List All or choose specific search filters to isolate a group of BMDs, or a single BMD

ⓘ A list of BMDs, filtered by your search criteria appears

2. Check the boxes next to any BMD or check the box at the top of the list to select all BMDs




3. Using the first **Choose Bulk Action** dropdown, select **Run Diagnostics**
4. Click Submit

ⓘ You'll be brought to a new page where you'll see a status list of the command you've just run. You'll see either the "SUCCESS", or "FAILURE" test results in the "Status" column, along with details in the "Description" column

# 8. System Proofing

The components of VSAP need to be system proofed to ensure they are working properly and securely. Each component has its own method of system proofing; see below for details.

## 8.1. Generate VBM L&A Ballot Decks

This process includes generating a Logic and Accuracy deck based on set configurations. It creates archives of generated L&A decks to be retrieved and used for the appropriate testing scenarios on other systems.

### 8.1.1. Generation Process for VBM L&A Ballot Decks:

1. Navigate to the VBM L&A page from the menu drawer
2. The page displays the current configuration set for Logic and Accuracy. Make sure that this is your desired configuration
3. If not, navigate back to Configure Logic and Accuracy
4. Click the Generate button

ⓘ A message on the Dashboard in Active Processes displays the progress of the generation

5. When generation has completed return to Generate Logic and Accuracy. The configured deck is a new row in the table
6. To access the deck, click the icon in the Create PDF Archive column. This creates a zipped folder on the main VBL server that can be accessed manually following the path defined under Archive Location
7. To convert the deck from PDF to JPEG format, click the icon in the Convert to JPEG column
8. Once the conversion completes, click Create JPEG Archive to create a zipped folder on the main VBL server

**Note:** The Undervote deck is created during VBM Generation.

## 8.2. Generate BMD L&A Poll Passes

To execute Logic and Accuracy on the BMDs, VBL produces poll passes following configurable vote patterns. These are produced as sets of PDFs with 4 poll passes per PDF.

Once the L&A poll passes have been scanned and printed, these selection ballots will then have to be scanned into the Tally system to get tabulated. Tally can then print out the list summary of the test results and compare it to the list summary generated by the VBL system to ensure that the results from the BMD match those of the predetermined totals.

### 8.2.1. Generation Process BMD L&A Poll Passes:

1. Navigate to the BMD L&A page from the menu drawer
2. The page displays the current configuration set for Logic and Accuracy. Make sure that this is your desired configuration.

3. If not, navigate back to Configure Logic and Accuracy
4. Click the Generate button

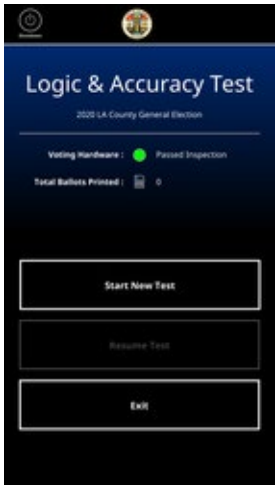
ⓘ A message on the Dashboard in Active Processes displays the progress of the generation

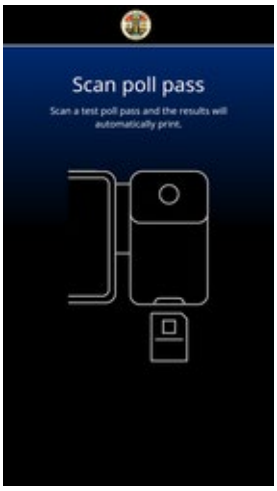
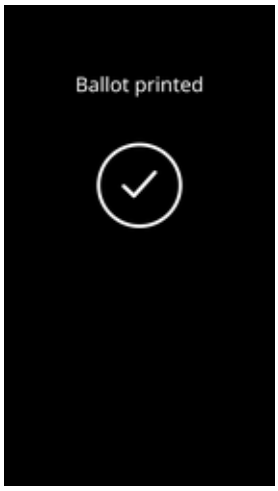
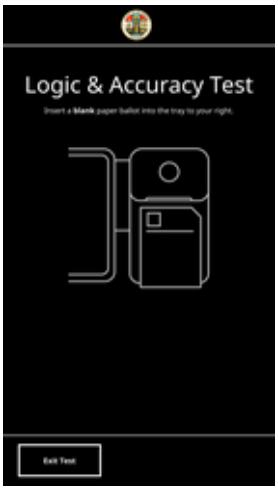
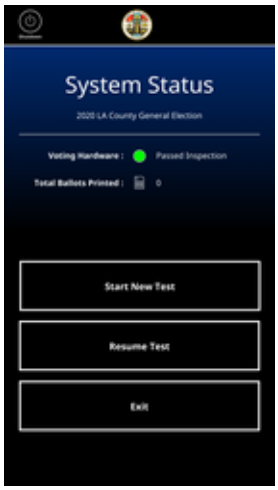
5. When generation has completed return to BMD L&A. The configured deck is a new row in the table
6. To access the deck, click the icon in the Archive column. This creates a zipped folder on the main VBL server that can be accessed manually following the path defined under Archive Location.

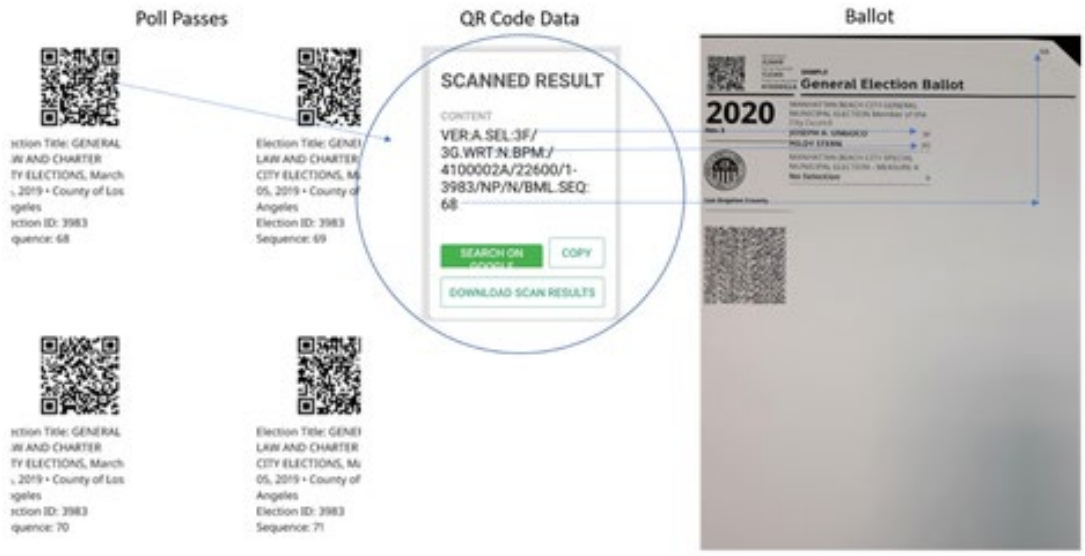
## 8.3. Using L&A on the BMD

Prior to an election, Logic and Accuracy testing must be done on a BMD to ensure the ballot layouts are correct. In order to perform this procedure, you need to switch a BMD to L&A mode. Follow the steps below to perform Logic and Accuracy testing using a BMD.

A BMD can't be put into L&A mode if the BMD is in Vote mode. Further, Logic and Accuracy testing can only be done by an election worker whose credentials activate L&A mode. Scanning these credentials automatically puts the BMD into L&A mode, given that the BMD is not in Vote mode.

<table>
<tr><td>1. Scan and enter Credentials, then tap Return To Start.</td><td>2. Tap Start New Test.</td><td>3. Insert a blank paper ballot.</td></tr>
<tr><td> 
</td><td> 
</td><td> 
</td></tr>
<tr><td>4. Scan L&A poll pass.</td><td colspan="2">The ballot prints and drops into the ballot box, then returns to the insert a blank paper ballot page.</td></tr>
</table>

<table>
<tr>
<td> 
</td>
<td> 
</td>
<td> 
</td>
</tr>
<tr>
<td>5. Tap Exit Test to return to the L&A test page.</td>
<td colspan="2">6. Tap New Test to start a new test or tap Exit to exit L&A mode.</td>
</tr>
<tr>
<td> 
</td>
<td colspan="2"> 
</td>
</tr>
</table>




## 8.4. Lab Test Mode

Lab Tests are used by the Certification Lab to perform the environmental test on the BMD. This mode can be accessed at any BMD and the status can be not open, opened or closed. Only Lab Test Operators have access to this mode. The credentials for the Lab Test are generated in the BMG.

To simulate the Voting Process:

1. Scan and park
2. Print image
3. Eject and hold; repeat

The paper handler test has a counter of how many cycles have been done. During the paper handler diagnostic, all LEDs must turn white and the QR scanner must come on. The time between the cycles must be 10-seconds.

Prior to an election, Logic and Accuracy testing must be completed on a BMD to ensure the ballot layouts are correct. In order to perform this procedure, you need to switch a BMD to Logic and Accuracy mode.

## 8.5. Remake Mode

The Remake Mode is used to remake a ballot that has incurred damage and cannot be tabulated by Tally; only Remake operators have access to this mode. The BMG generates credentials for Remake operators. Remake operators can go through the full voting process in order to reprint voter ballots. The Remake Mode can be activated on any BMD from the voting application.

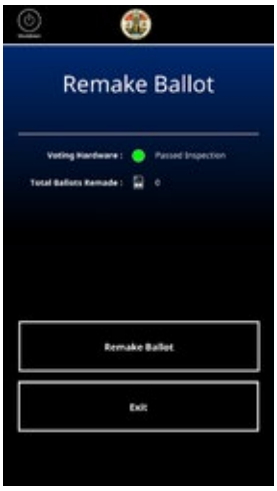
### 8.5.1. Activating the Remake Mode on the BMD

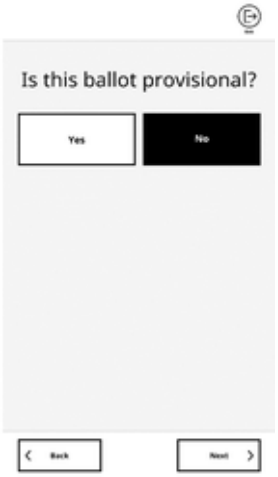
To activate the Remake Mode on the BMD, an operator with the appropriate authorization will scan their two-factor authentication credentials using the bar code scanner to scan their QR Code, and inputting their

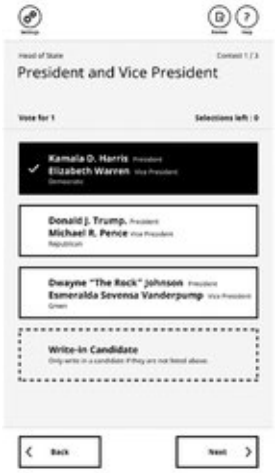
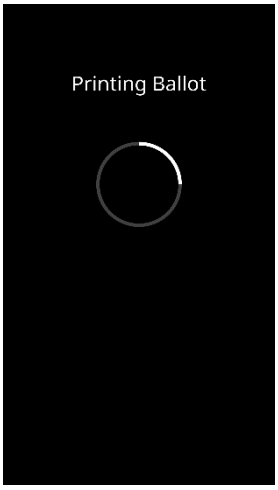
PIN using the touchscreen. Authorizations are established within the BMG. The activation is initialized in either the open or closed poll status. After the operator has entered their proper credentials, the operator will be prompted to insert a blank ballot in the BMD and then must scan the SBE from the unusable ballot. The voter selections will be reviewed.

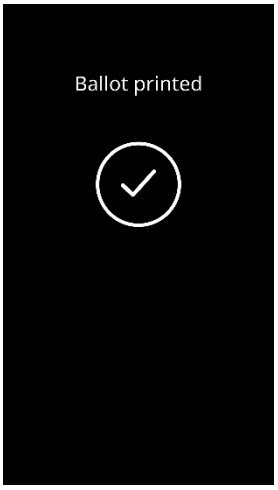
**Note:** This information is always in English.

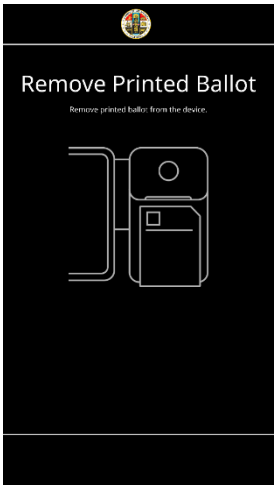
After reviewing the information, a new ballot with a unique ID and sequence number will be generated and then printed. The unique ID is located on the upper right-hand corner of the ballot. All Remake ballots are composed by BMD ID + Sequence.

| 1. Select Remake Ballot | 2. Insert Blank Ballot | 3. Ballot Loaded |
|---|---|---|
|  |  |  |
| 4. The precinct can be entered by scanning the BPM of the damaged ballot (the BPM includes Precinct, Provisionality, and Party), or by manually inputting the data, and selecting Next.<br>**Note:** When using the BPM these screens will not be displayed | 5. Precinct validation will be displayed, select Next to continue | 6. Select Yes or No for Provisional voting, then select Next |

| | | |
|---|---|---|
|  |  |  |
| 7. Select your party, then select Next.<br><br>**Note:** When using the BPM this screen will not be displayed | 8. Precinct loaded will display briefly | 9. The ballot can be remade by scanning the SBE QR code of the damaged ballot, which will include all contest selections, or by manually entering the contests |
|  |  |  |
| 10. **Series of contest** | 11. Let's review | 12. Review your selections |

<table>
<tr><td> 
</td><td colspan="2"> 
</td><td> 
</td></tr>
<tr><td>13. Select Yes - Ready to Print, then select Print</td><td colspan="3">14. Printing Ballot & Ballot printed will display briefly</td></tr>
<tr><td> 
</td><td colspan="3"> 


</td></tr>
<tr><td>15. Please remove the ballot</td><td colspan="3">16. The remake ballot will be printed with a unique code in upper right-hand corner (highlighted in Yellow)</td></tr>
</table>


Remove Printed Ballot
Remove printed ballot from the device.


00001234560001
General Election Ballot
2020

# 9. Multiple Elections

All BMDs are designed to accept multiple elections. When a BMD is loaded with multiple elections, a welcome screen displays the name of all elections configured on the BMD. In this configuration, all activation counters will be stored by the election.

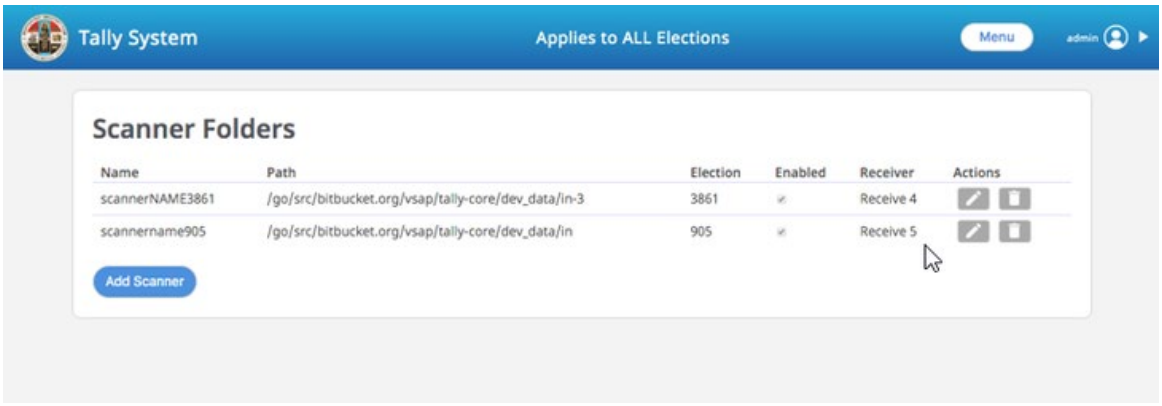
# 10. Ballot Tally Programs

The Tally Scanners need to be connected to the Tally system and a directory needs to be specified to receive scanned ballots. Follow the directions below to connect a Tally Scanner to the Tally system.

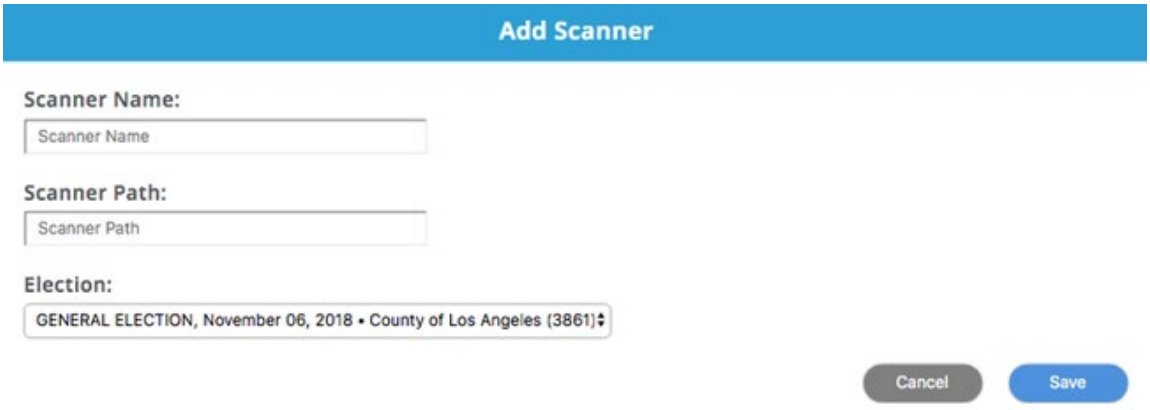
## 10.1. Tally Connection Process

Once an election is configured, specify which directory will be used to receive the scanned ballot images.

1. From the Home page, select **System Management** > **Scanners** from the menu




2. From the **Scanner Folders** page, click **Add Scanner**




3. Set the scanner name and path to the directory on the file system and select the election to be associated with the scanner
4. Click **OK**

ⓘ Multiple scanners can be configured either for a single election or for multiple concurrent elections

# 11. Election Observer Panel

The purpose of the Election Observer Panel is to:

- Provide an avenue for public observation of and input into the election process
- Assist in ensuring the integrity of the election process
- Encourage participation and build voter confidence in the election process

## 11.1. Invitation

Between E-60 and E-30, prepare a media release and letters of invitation (see samples attached) to parties likely to participate, such as the following:

- County Grand Jury
- Political Party Central Committee Members
- Language Advocacy Groups
- Community Based Organizations
- Media
- Other groups or individuals expressing an interest in observing election day activities may also be included in the observer panel, as deemed appropriate

## 11.2. Group Presentations

After letters of invitation have been sent out, offer to attend group meetings to provide an opportunity for the groups to ask questions about the process. Groups should be contacted to arrange time on their agendas for staff presentations. This is optional at the request of the group, but staff should make every effort to contact the groups and offer this service.

## 11.3. Appointment Letters

After the groups have provided the names of interested panelists, prepare letters of introduction (see sample attached) for the panelists to use when visiting polling places on Election Day. Materials to be prepared for each panelist will include a listing of all polling places within the county for that specific election as well as the central counting site location and hours of operation.

## 11.4. Mechanism for Feedback

Observers attend training at government facilities, where they can ask questions about the process.

General Rules for Observers

- Observe the proceedings at the polls, including the opening and closing procedures
- Obtain information from the precinct index that is posted near the entrance
- Make notes and watch all procedures
- View all activities at the central counting site on election day
- View the canvass of the vote activities following the election
- View absentee and provisional ballot processing
- Ask questions of staff or voters at the polls
- Ask questions of supervisors at the central counting site

Observer Responsibilities

- Check in at each site, whether polling place or central counting site
- Wear an identification badge
- Maintain a professional manner while observing the election processes
- Ensure they do not interfere with the elections process

Observer Prohibitions

- Interfere in any way with the conduct of the election
- Touch any voting materials or equipment or sit at the official worktables
- Converse with voters (within 100 feet of the entrance to a polling place) regarding the casting of a vote, or speak to a voter regarding his or her qualifications to vote
- Display any election material or wear campaign badges, buttons or apparel
- Wear the uniform of a peace officer, a private guard, or security personnel
- Use cellular phones, pagers, or two-way radios inside the polling place and/or within 100 feet of the entrance to the polling place
- Talk to central counting site workers while they are processing ballots
- Use the telephones, computers or other polling place facilities at polling places or the central counting site
- Touch election personnel
- Eat or drink in the polls or the central counting site
- Assist in operations at any polling place

# 12. Hardware Maintenance and Preparation for Use

The purpose of this document is to provide the end-user with a maintenance schedule to minimize system component downtime and failure.

## 12.1. Preventative Maintenance Schedule by System

The routine inspection of system components reduces the risk of major system failures. By implementing a preventative maintenance regimen, minor issues can be detected and addressed before failure occurs and renders the system unusable. The following table lists maintenance items that are usage and calendar based. Perform the maintenance items in the interval or time specified for each system component.

| System Component | Action Name | Schedule/Timing | Action/Comments |
|---|---|---|---|
| **BMG** | Archive/back-up, clear logs | Post-election | Per BMG User Guide |
| | Clean/dust the computing equipment and networking equipment; check any tamper evident seals | Every six months | Do not use canned air or similar, or liquids, on the equipment. Follow County incident response procedure regarding tampered seals |
| | Run diagnostics | Every six months and 30 days before pre-LAT, whichever is more frequent | |
| **BMD** | Complementary Metal Oxide Semiconductor (CMOS) battery change | Every three years or upon battery depleted indication | See VSAP-USG-002 BMD User Guide |
| | Clean for any spills, dust, other contaminants - before every election | Every election cycle, either as part of pre-LAT or upon equipment return | Clean the BMD touchscreen using a lint free alcohol wipe before and after every election. Spot clean the screen using a lint free cloth every time the ballot box is emptied as well |
| | Printer | Every time the ballot box is emptied, or every 200 ballots cast whichever comes first | Open the lid, visually inspect for debris, loose printer parts, clean using compressed air and then a lint free, dust attracting cloth to remove any dust; clean the Contact Image Sensor (CIS, |

| System Component | Action Name | Schedule/Timing | Action/Comments |
|---|---|---|---|
| | | | internal scanner) with lint free alcohol wipes |
| | Privacy Flaps | Before every election | Clean for any spills, dust, other contaminants; inspect for visible damage |
| | Bar code reader | Before every election | Clean using a lint free, dust attracting cloth to remove any dust; check for scratches/damage to the lens |
| | Ballot box | Before every election | Clean any spills, dust, other contaminants; inspect for visible damage |
| | Legs | Every election cycle, either as part of pre-LAT or upon equipment return | Inspect for visible damage; repair/replace if needed |
| **ISB** | Archive/back-up, clear logs | Post-election | Per ISB Preprocessor User Guide |
| | Run diagnostics | Every six months and 30 days before pre-LAT; whichever lends the greater frequency | Per ISB Preprocessor User Guide |
| | Check AWS Agreements to ensure proper account settings, S3 bucket availability as well as correct expected capacity, and verify configuration of CloudFront (CDN) | Every six months and 30 days before pre-LAT | Per County AWS Agreement |

# 13. Polling Place Procedures

## 13.1. Voting Center Supplies, Delivery, and Inspection

This section lists the supplies required to setup the voting location with an emphasis on setting up the Ballot Marking Device (BMD).

- Cart containing five BMDs or a case with a single BMD
- BMD peripherals (including stand, privacy shield, headphones, and ballot box)
- Cleaning cloths to wipe the BMD Touchscreen
- Paper ballots shall be in the quantity and manner required by the California Elections Code
- General purpose supplies as provided in the California Elections Code
- Sample ballot booklets of each ballot style if required by the California Elections Code
- Seals and any other supplies and forms
- Tables and chairs
- Power surge protectors
- Power extension cords
- UPS (uninterruptible power supply) if required per jurisdiction procedure

After the carts and containers have arrived, and before the vote center location opens, Election workers will perform the following actions:

- Perform a visual inspection of all carts and containers. Inspect and record that all seals are intact on the outside of all carts and containers as per LA County procedure
- Perform a visual inspection of all BMDs. Inspect and record all seals are intact on all BMDs as per LA County procedure
- Set up the BMDs as described in Section 13 Polling Place Procedures

## 13.2. BMD Set Up

The Ballot Marking Device (BMD) is used by voters to mark and cast a ballot. BMDs will arrive at the Vote Center in carts, with each cart containing five BMDs.

The BMD is comprised of the following components:

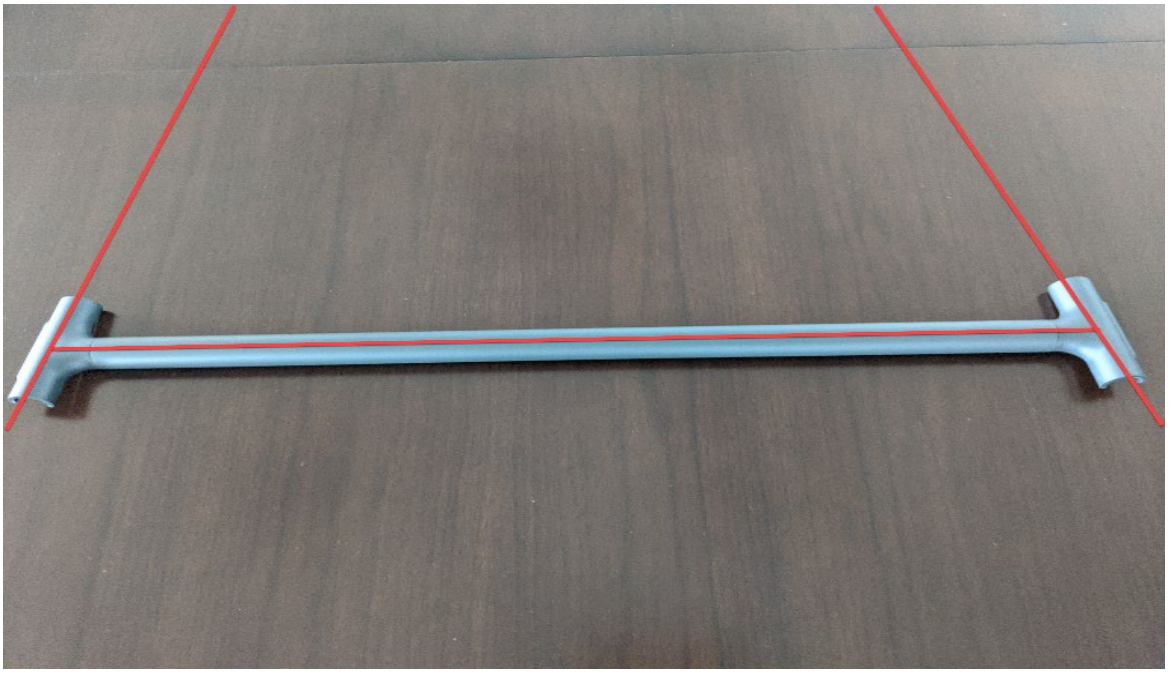
- Integrated Ballot Box
- Cross-support bar
- Headphones
- Leg stand
- Power cord
- Power module
- Power module bracket
- Privacy shield
- BMD top module
- Handheld controller
- BMD cabinet

The BMD has a headphone jack and auxiliary port for voter's use. There are two headphone jacks located on the BMD: the first is located on the left-side front of the BMD; the other is located in the back left-side of the BMD, next to the power button. The auxiliary port is located on the lower-right side of the BMD.

The BMD Technician will assemble the BMD using the following instructions:

1. Remove the folded leg stand from the peripherals container.

2. Open the legs by lifting up from the center. Each leg has a spring-loaded feature that allows it to lock securely into place.



3. Remove the cross-support bar from the container.

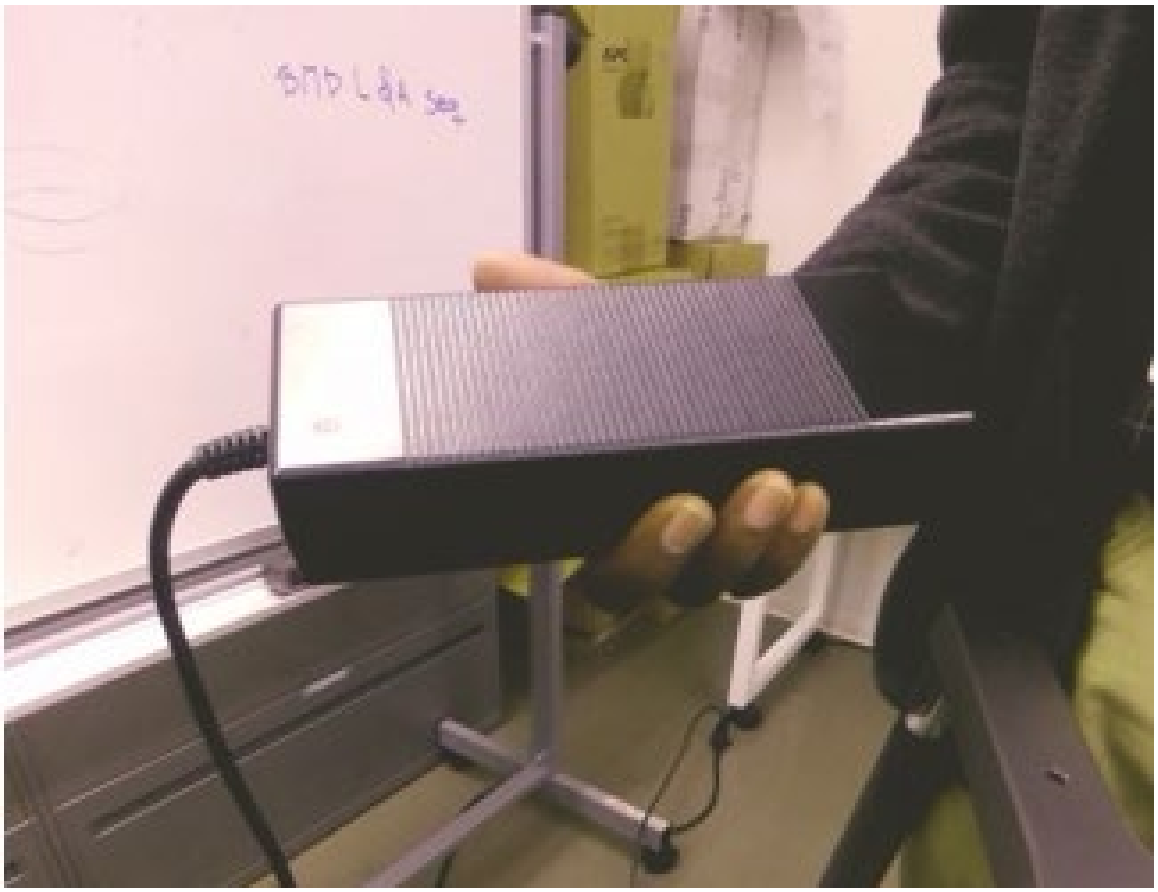
**Note:** The cross-support bar should taper inward like the letter A.

4. Line up the grooves on each end of the cross-support bar with the attachment point on the back legs of the stand. Then, use the palm of your hand to gently snap both ends into place, one at a

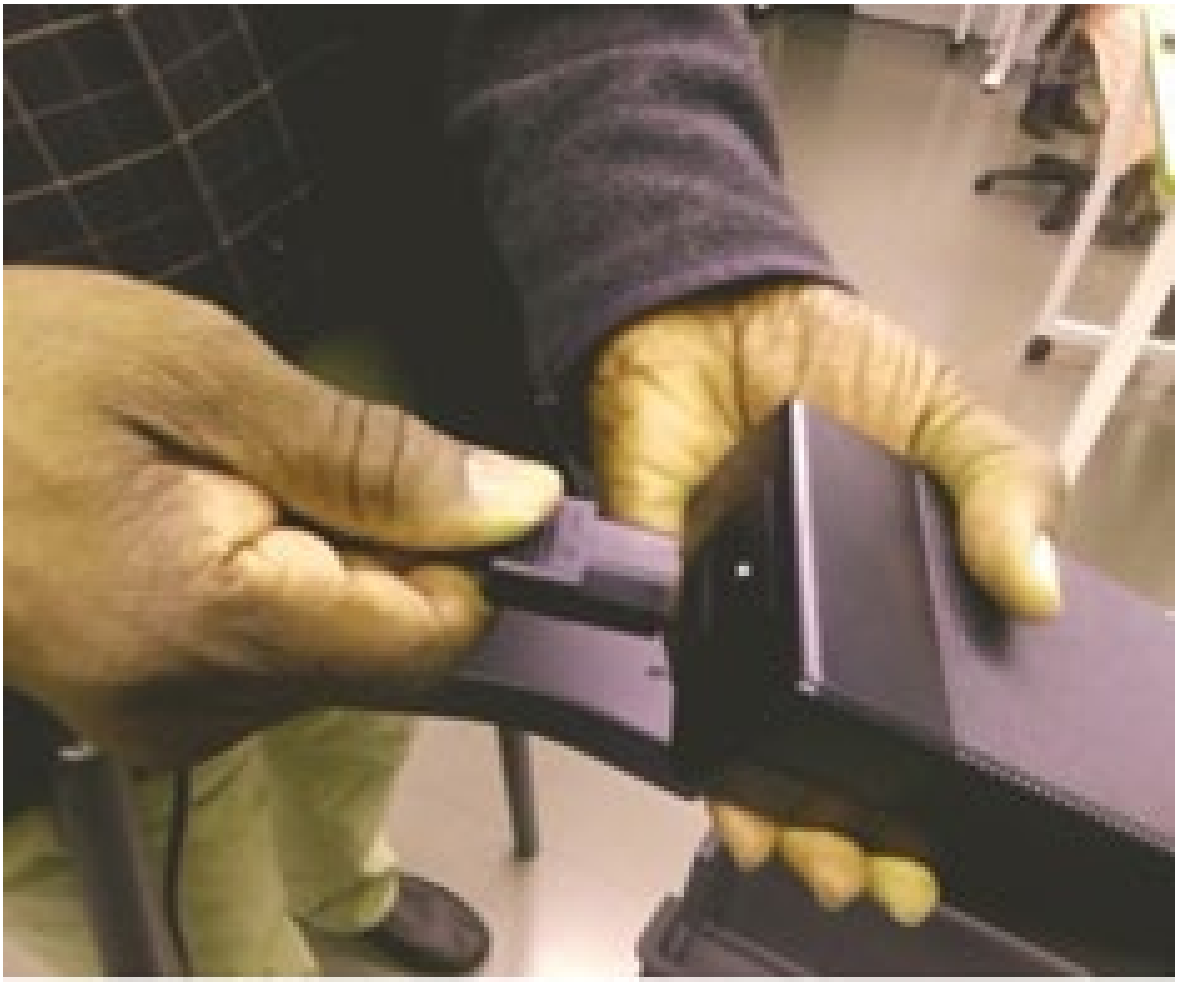
time. There will be a slight clicking sound that indicates that the cross-support bar is securely in place.

ⓘ The stand is ready to have the power cord attached.

5. Remove the power module bracket from the container.
6. Snap the hooks of the Power Module Bracket onto the Leg Stand.



7. Remove the power module and the power cord from the cart.



8. Connect the power cord to the base of the power module.

9. Place the power module inside the power bracket, placing the larger power cord in the larger square opening and the smaller cord in the smaller round opening.

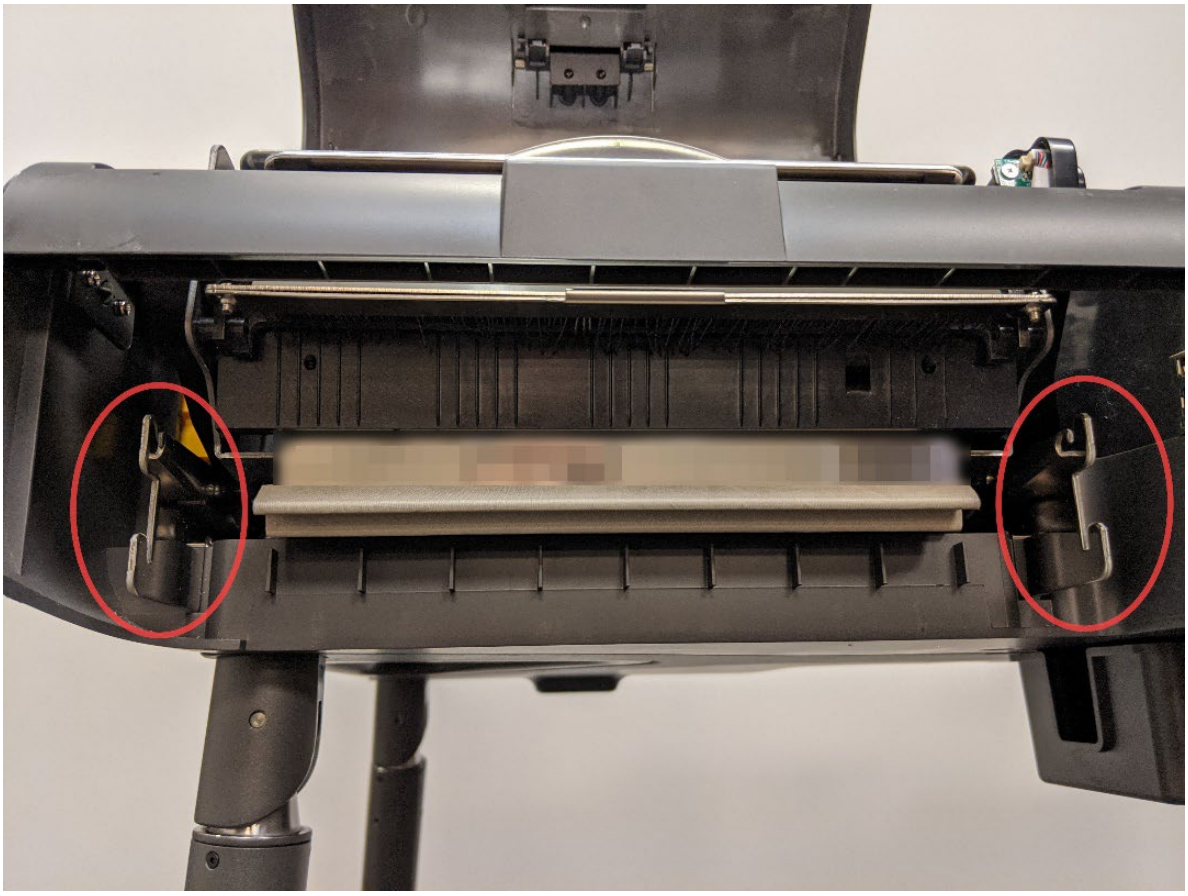
**Note:** It is necessary to install the power module prior to adding the BMD top module. ⃠ Do not connect the other end of the power cord into the wall yet.

10. Attach the BMD top module to the leg stand by aligning the grooves underneath the BMD top module.

**Note:** This is a 2-person job.

11. To attach the Integrated Ballot Box, first open the plastic printer cover.

12. Remove the Integrated Ballot Box from the peripheral's container.



13. Line up the openings on the back of the Integrated Ballot Box with the hooks on the BMD top module, ensuring that the openings are lined up and securely fit together.
14. Slide the Integrated Ballot Box onto both hooks on the lower end of the BMD top module, then tilt the Integrated Ballot Box slightly upward to snap it into place.



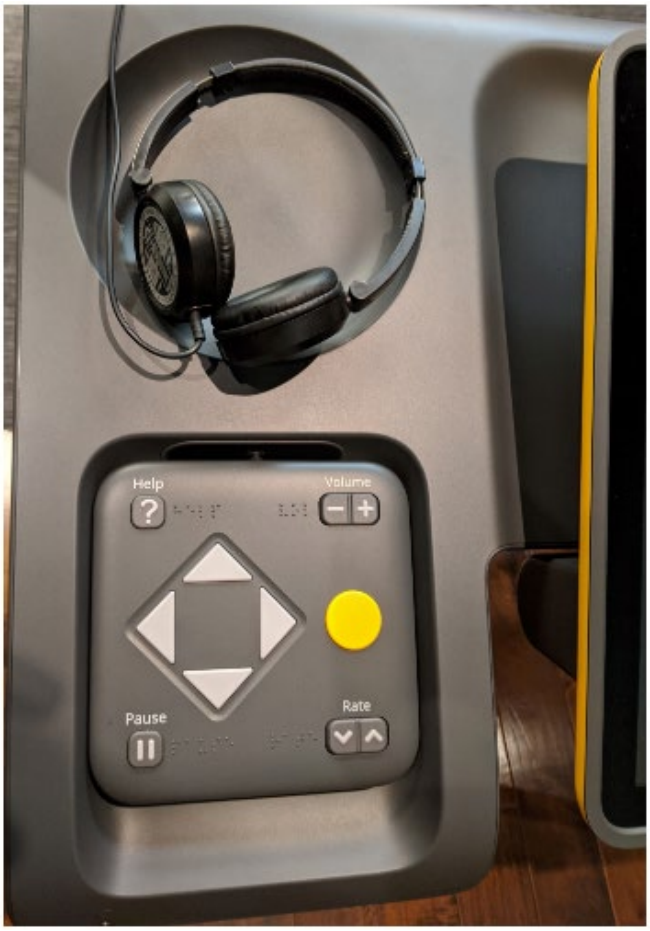
15. Attach and tightly cinch the Zip Tie to secure the IBB. Place the tamper-evident seal over the seam of the IBB and record the seal and Zip Tie in the Chain of Custody per LA County procedure.

16. Remove the privacy shield from the BMD container.

17. Unfold the privacy shield flaps and attach it to the slotted holes on the sides of the BMD top module, one side at a time.

**Note:** This is a 2-person job.

18. Gently insert the six-pronged end of the power cord into the six-pronged socket found on the back of the BMD top module.
19. Plug the power cord into the wall outlet.




20. Remove the headphones from the BMD container. Place them on the left-hand side of the BMD top module.

21. Plug the headphone cord into the rear audio port of the BMD.

## 13.3. Additional Ports

### Sip and Puff/Dual-Switch Device

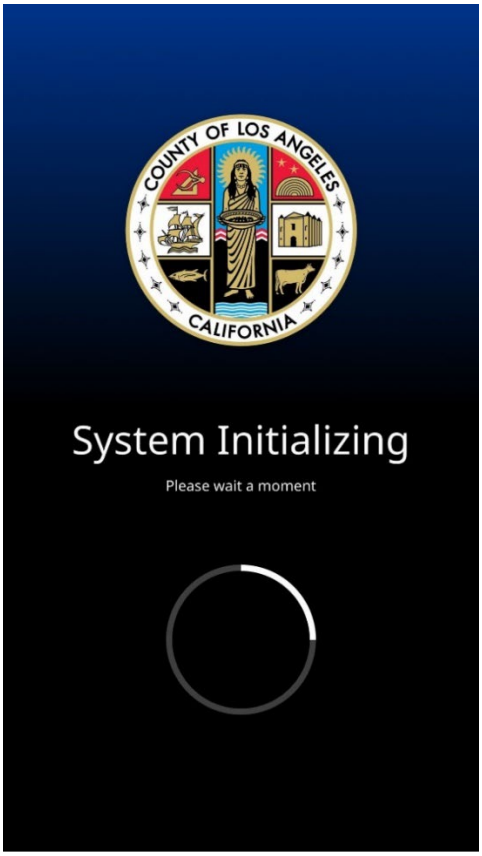
There is an additional port in the lower right-hand corner of the BMD top module that serves as a place to connect personal assistive devices. (Example: Sip and Puff unit or a dual-switch.)

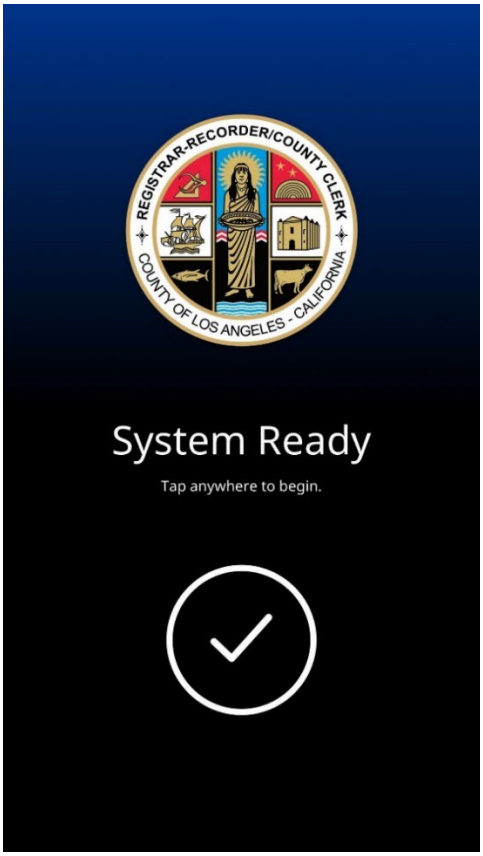
### Additional Headphones Port:

There is an additional Headphones Auxiliary Port on the front of the BMD top module to plug in another set of headphones for another person to assist a voter who's already using the other port.

## 13.4. Setup Completion

1. Press the Power Button to turn on the BMD.




ⓘ An auto-diagnostics test of the system will occur.

2. In the event the system fails, an error message (#4422) will display on the screen. Shut down the BMD and reboot. If the system fails again after rebooting, the Election Worker will shut down the BMD and report the issue to the Election Worker Lead.

## 13.5. Cleaning the BMD Scanner and Touchscreen

To maintain and clean the Touchscreen, use lint free alcohol wipes.Avoid other chemical agents (except for alcohol) to clean the Touchscreen. Do not spray other cleaning agents directly onto the Touchscreen, as the liquids may seep into the screen or contaminate the front bezel.


1. Wipe the Touchscreen using gentle wiping motions.

⃠ Do not wipe or press the Touchscreen with excessive force.

## 13.6. Scanners

There are two scanners on the BMD; the Poll Pass/Security Pass scanner underneath the right front corner, and the Ballot scanner located within the Paper Handler.

### 13.6.1. Bar Code Reader

1. To clean the Poll Pass/Security Pass scanner, first locate the glass scanner lens underneath the front right-side of the BMD.
2. The election worker uses compressed air to remove external dust, followed by polishing the glass surface with a clean dry cloth.
3. If further cleaning is necessary, use a soft cloth dampened with isopropyl alcohol to wipe the scanner glass. ⃠ Do not spray liquid directly on the scanner surface. ⃠ Do not use any other cleaning solvents.

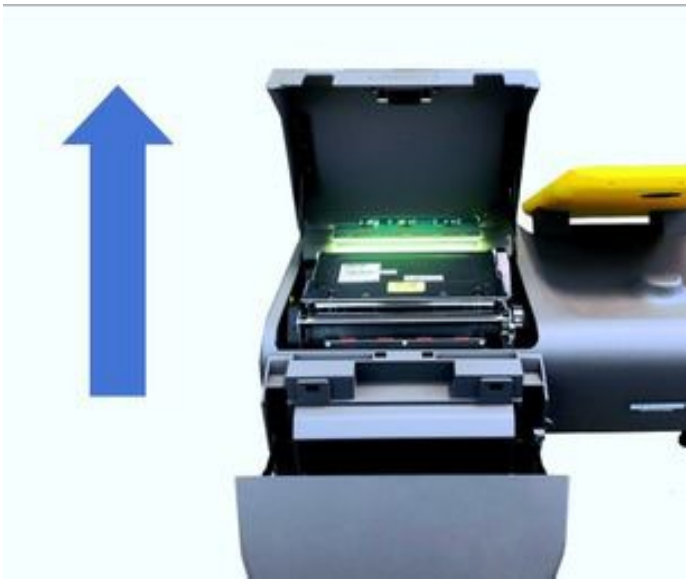
### 13.6.2. Ballot Scanner and Printer Rollers

To clean the Ballot Scanner and Printer Rollers, it is necessary to break the Zip Tie, open the Integrated Ballot Box, and open the Paper Handler to get access to the scanner.

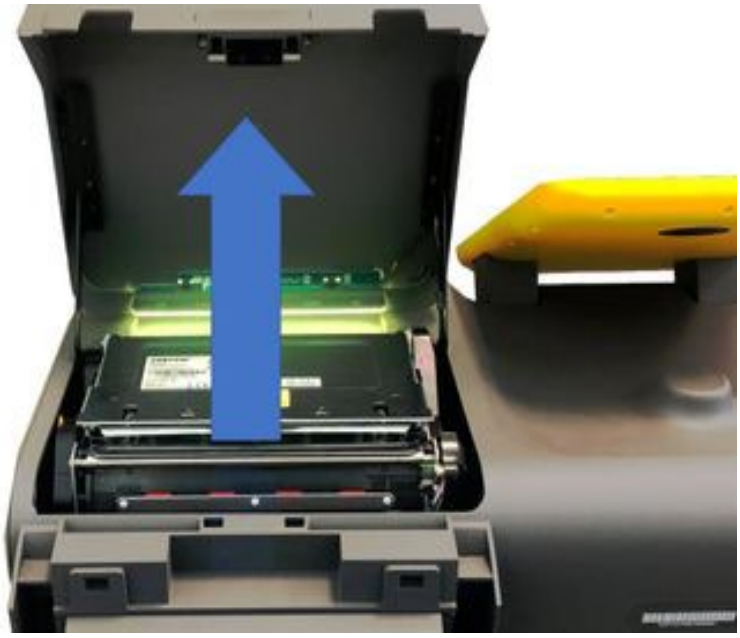
1. Press the Power Button to turn off the BMD.


2. Remove the security seal on the Integrated Ballot Box. Follow LA County procedure for removing Zip Ties.


3. Push the button on the upper-left side of the Integrated Ballot Box and pull the back of the Integrated Ballot Box.

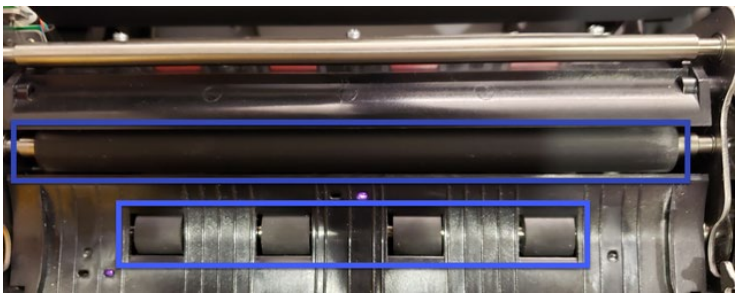


4. Press the button at the center of the plastic printer cover and pull the cover upward.



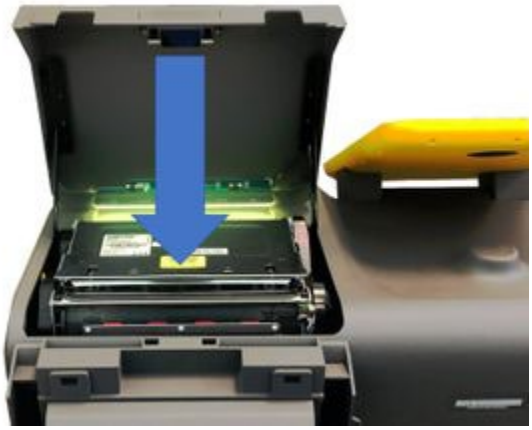
5. Pull the metal printer cover upward.

6. Use compressed air to remove external dust.



7. Using lint free alcohol wipes, clean the surfaces of the Ballot Scanner Lens and each Printer Roller. Manually rotate the rollers to ensure that the entire surface of each roller gets cleaned.

**Note:** Use gentle wiping motions to remove dust. ⃠ Do not spray liquid directly on the scanner surface. ⃠ Do not use any other cleaning solvents.



8. Close the metal printer cover.

9. Close the plastic top cover.

10. Close the Integrated Ballot Box.

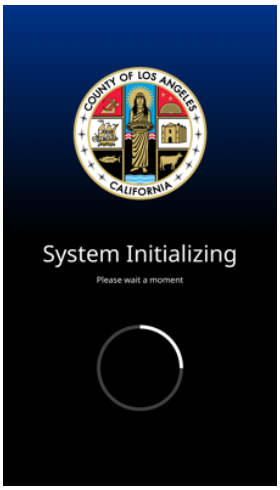
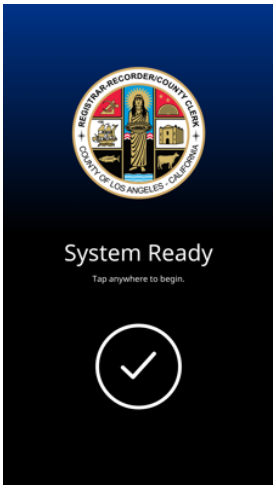

11. Attach the Zip Tie per LA County procedure

12. Press the Power Button to turn the BMD back on.

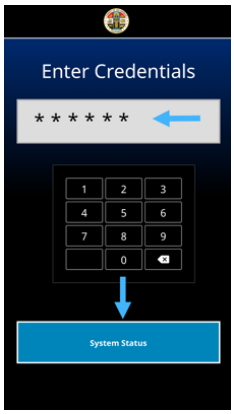
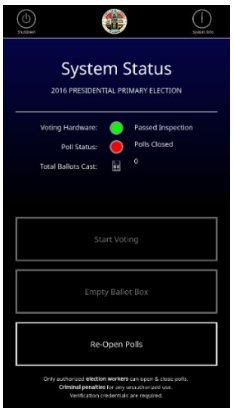
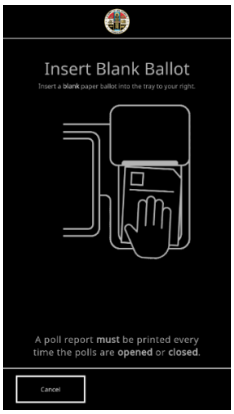
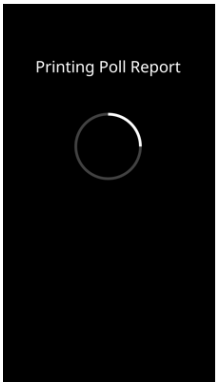
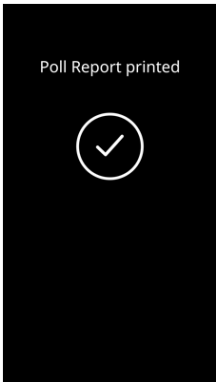
## 13.7. Opening the Polls

This procedure describes how two Election Workers can "open the poll" to enable voting on each BMD. Opening the polls requires proper Credentials which incorporate a 2-factor security process. These Credentials consist of a six-digit PIN and a QR coded Security Pass that is generated by the BMG and issued to Election Workers. These Credentials are secured and passed out per jurisdictional procedure.

<table>
<tr><td>1. Following jurisdictional procedure, check the Zip Tie and the tamper-evident seal placed over the seam of the IBB; verify they have not been tampered with</td><td>2. Press the Power Button</td><td>3. The system initializes</td></tr>
<tr><td> 

</td><td>  </td><td> 
</td></tr>
<tr><td>4. Tap anywhere to begin</td><td colspan="2">5. Scan the Security Pass with the bar code scanner, located under the BMD on the lower right side</td></tr>
<tr><td> 
</td><td colspan="2"> 

 </td></tr>
</table>

| | | |
|---|---|---|
| 6. Enter **Credentials**<br>7. Tap **System Status** | 8. Tap **Open Polls**<br>(After the first day of an election, this button will read Re-open Polls) | 9. Insert blank **thermal paper** |
|  |  |  |
| 10. The **Open Poll Report** is printed. Two **Election Workers** should verify the report per jurisdictional procedure<br>See samples of **Open Poll Reports** below | | 11. Remove the Poll Report from the paper tray |
|   | |  |
| 12. Tap **Start Voting** | 12. Voting is enabled | |



### 13.7.1. Open Poll Report

The following information is found in the Open Poll Report:

Date - The date of the Open Poll Report.

Time - The time the Open Poll Report is printed.

BMD ID - Each BMD has its own unique ID number

Ballot Full Count – Ballot Box Limit set by the BMG Administrator

HW Test Results - Indicates whether or not the hardware passed the inspection for the BMD to properly function.

Election Title - The title for the election, i.e. - Presidential Primary Election

Election Jurisdiction - The jurisdiction of the election

Software version - The BMD software version.

OS Version - The BMD Operating System version.

Totals:

Cumulative*

Total Ballots Printed

Total Ballots Cast

Total Emptied Ballot Box

Total ReOpened

*When Polls are Re-Opened, Cumulative Totals must be reconciled against the previous day's Closing Poll Report.

These totals should match those on the Close Poll Report with one exception - the Total ReOpened should equal one plus the previous day's total.

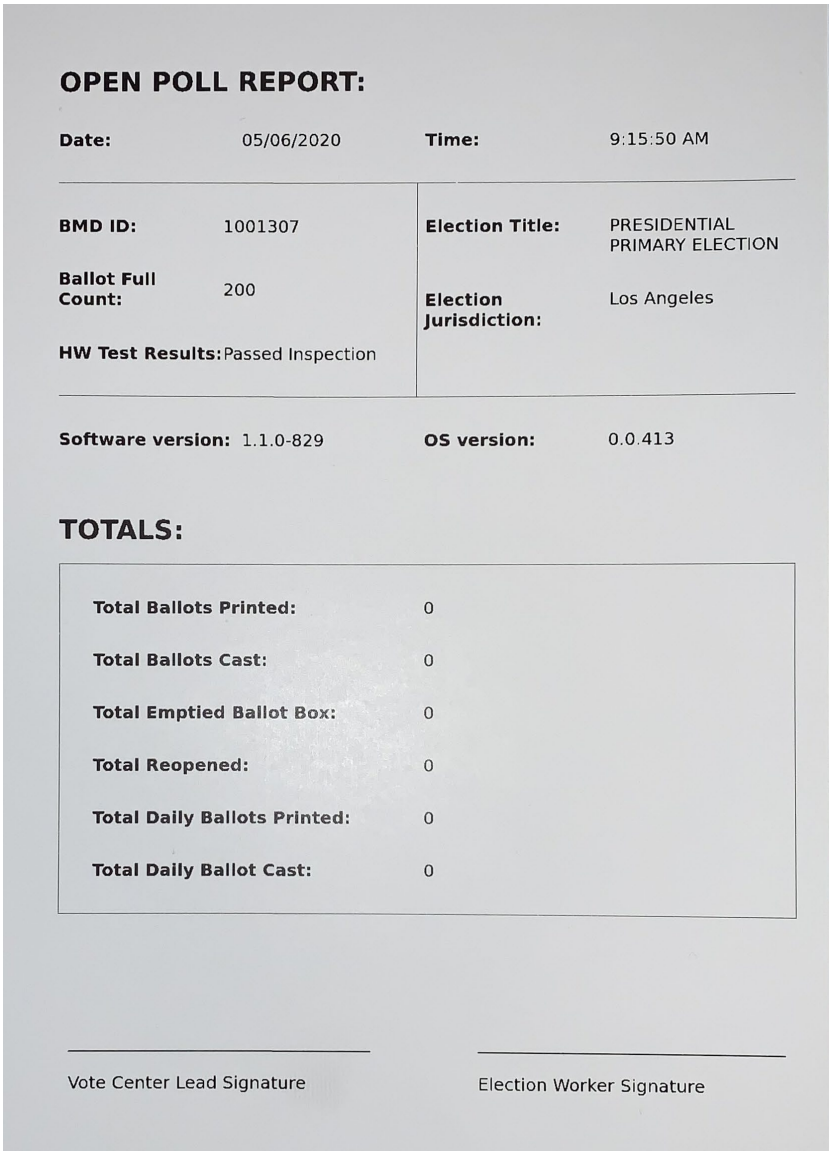
Daily*

Total Daily Ballots Printed

Total Daily Ballots Cast

*Daily totals should equal zero - unless polls are opened more than once on the same day.

**Sample Open Poll Report for the first day of an election:**



## OPEN POLL REPORT:

| | | | |
|---|---|---|---|
| **Date:** | 05/06/2020 | **Time:** | 9:15:50 AM |
| **BMD ID:** | 1001307 | **Election Title:** | PRESIDENTIAL PRIMARY ELECTION |
| **Ballot Full Count:** | 200 | **Election Jurisdiction:** | Los Angeles |
| **HW Test Results:** | Passed Inspection | | |
| **Software version:** | 1.1.0-829 | **OS version:** | 0.0.413 |

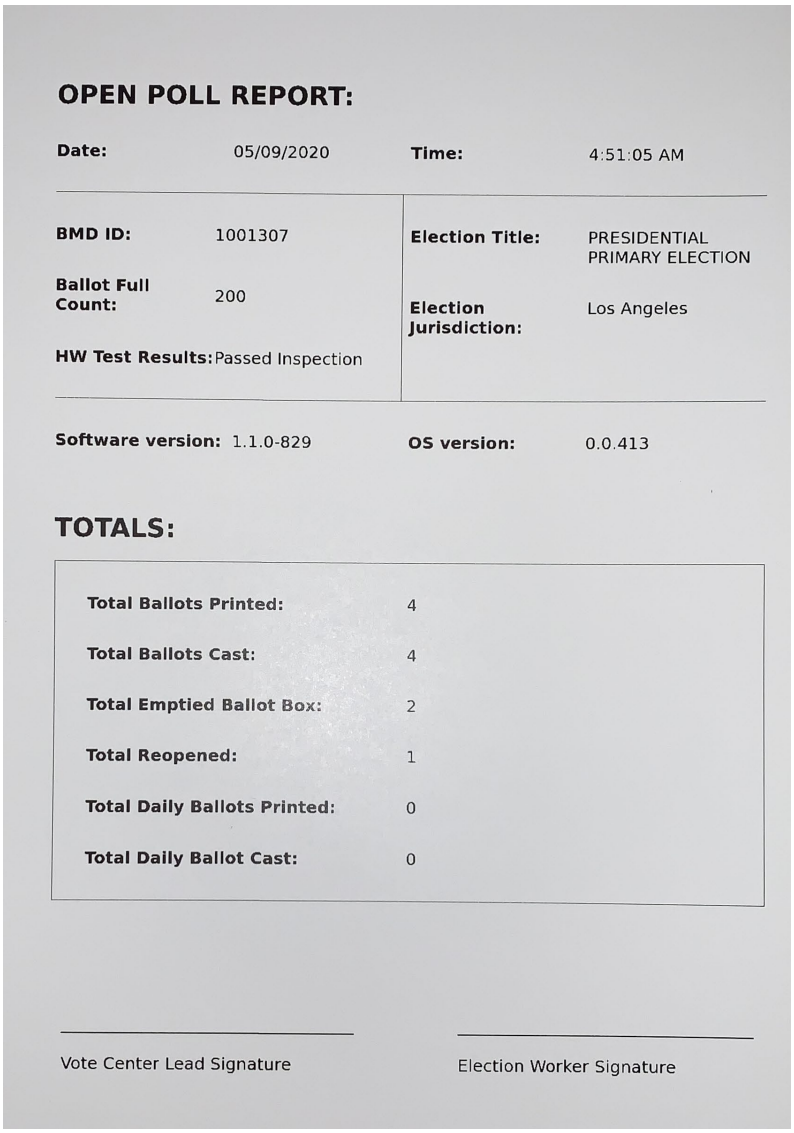
## TOTALS:

| | |
|---|---|
| **Total Ballots Printed:** | 0 |
| **Total Ballots Cast:** | 0 |
| **Total Emptied Ballot Box:** | 0 |
| **Total Reopened:** | 0 |
| **Total Daily Ballots Printed:** | 0 |
| **Total Daily Ballot Cast:** | 0 |

Vote Center Lead Signature

Election Worker Signature

**Sample Open Poll Report when polls are re-opened:**



**OPEN POLL REPORT:**

| | | | |
|---|---|---|---|
| **Date:** | 05/09/2020 | **Time:** | 4:51:05 AM |
| **BMD ID:** | 1001307 | **Election Title:** | PRESIDENTIAL PRIMARY ELECTION |
| **Ballot Full Count:** | 200 | **Election Jurisdiction:** | Los Angeles |
| **HW Test Results:** | Passed Inspection | | |
| **Software version:** | 1.1.0-829 | **OS version:** | 0.0.413 |

**TOTALS:**

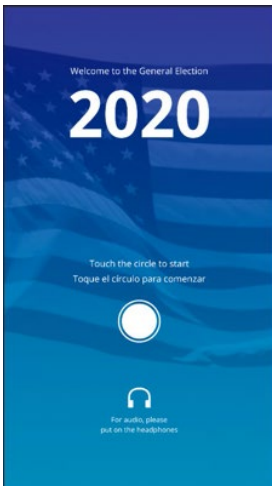
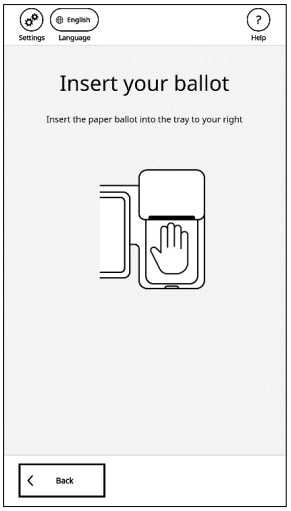
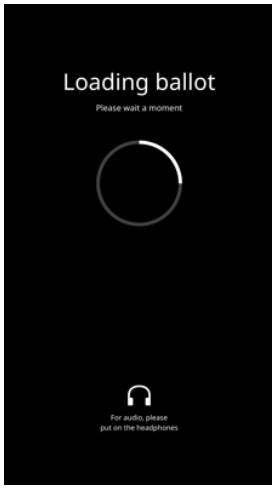
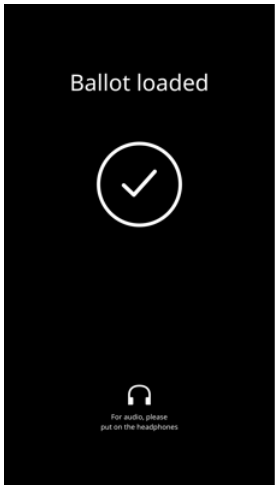
| | |
|---|---|
| **Total Ballots Printed:** | 4 |
| **Total Ballots Cast:** | 4 |
| **Total Emptied Ballot Box:** | 2 |
| **Total Reopened:** | 1 |
| **Total Daily Ballots Printed:** | 0 |
| **Total Daily Ballot Cast:** | 0 |

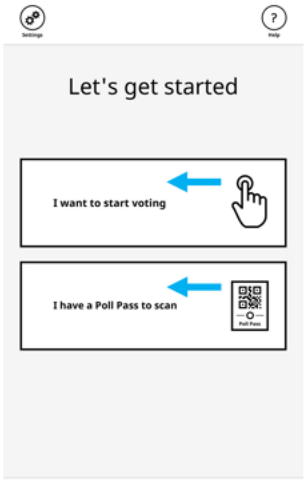
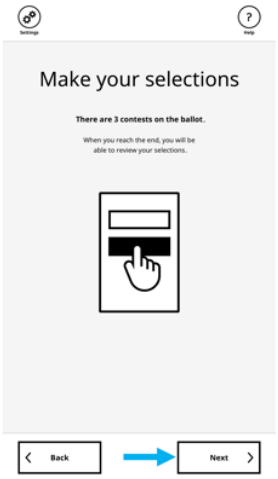
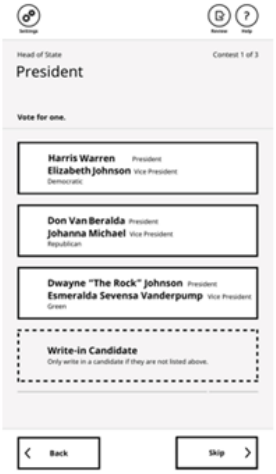
Vote Center Lead Signature

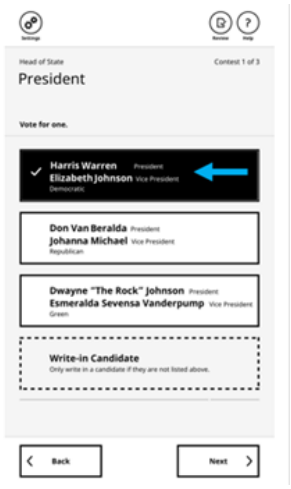
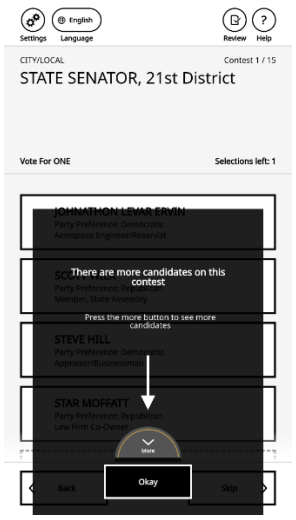
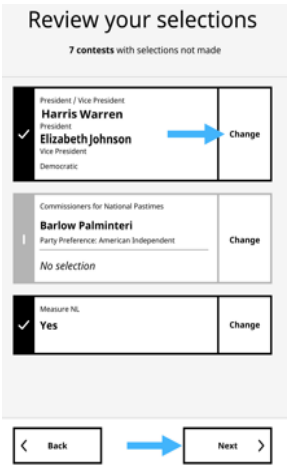
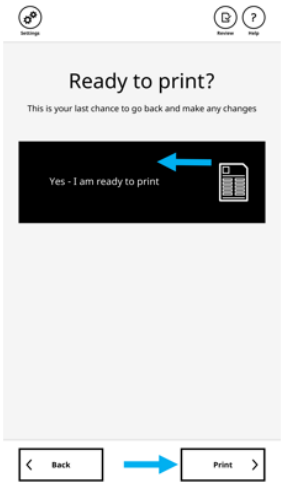
Election Worker Signature

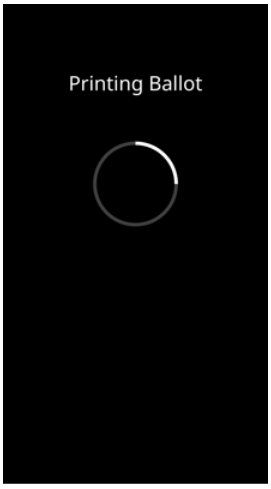
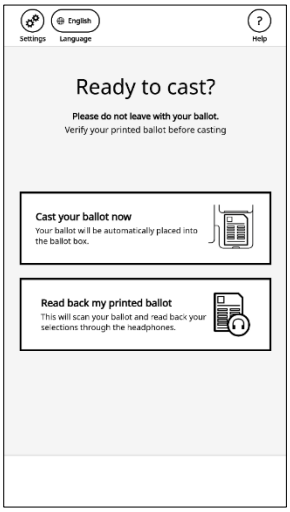
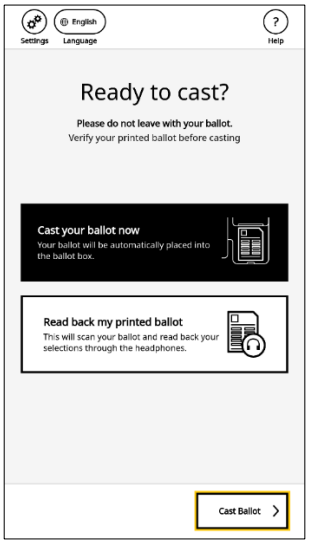
## 13.8. Polling Procedures

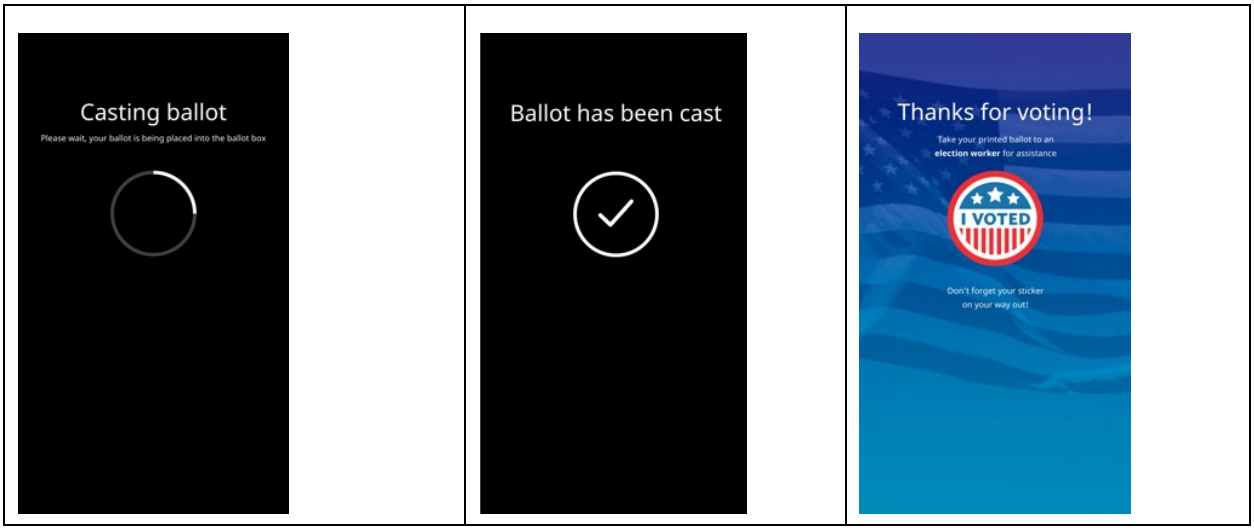
### 13.8.1. Voting Using the BMD Touchscreen

| | | |
|---|---|---|
| 1. The Election Worker provides the voter with an official paper ballot and directs them to the BMD<br>The BMD displays a blue screen with the year and type of election (general or primary)<br>2. Touch the circle to start | 3. Choose language of preference<br>4. Tap Next | 5. A message instructs the voter to Insert your ballot |
|  |  |  |
| 6. The voter inserts their ballot into the tray on the right-hand-side of the BMD | 7. Loading ballot is displayed | 8. Ballot loaded is displayed |
|  |  |  |

| | | |
|---|---|---|
| 9. The Let's get started screen displays two options:<br>a. I want to start voting – Brings the voter to the Make your selections screen<br>b. I have a Poll Pass to scan – Asks the voter to Scan your Poll Pass | 10. The Make your selections screen displays the following message:<br>There are x contests on today's ballot. When you reach the end, you will be able to review your selections<br>11. Tap Next to begin voting | 12. To make a selection, tap the Candidate Name or Yes/No for a Proposition or Measure.<br>13. Tap Next to move to the next contest<br>**Note:** The voter can move past a contest without marking a selection by tapping Skip. |
|  |  |  |
| 14. Marked selections will be highlighted with a check mark<br>To deselect, tap the marked selection - which will remove the highlighting and check mark | When the voter encounters any multi-page contest for the first time, a screen overlay with instructions for the More button appears.<br>15. Tap Okay (or on any area) to clear the overlay. | 16. After all selections are made, the Let's Review screen is displayed to notify the voter they can review their selections<br>17. Tap Next |

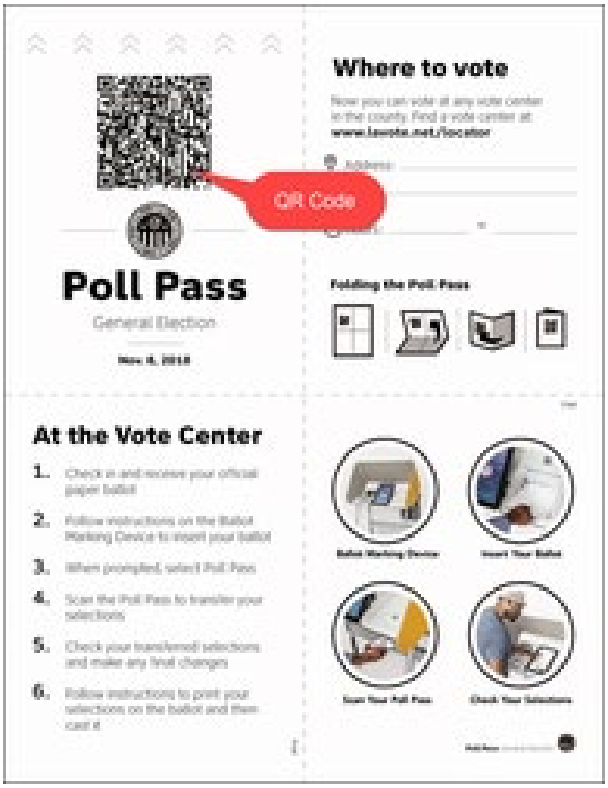
| | | |
|---|---|---|
|  |  |  |
| 18. The Review your selections screen opens displaying the voter's selections; voters can tap the Change button to make a new selection<br>19. Tap Next when finished | 20. The Ready to print? screen displays the following message:<br>This is the voter's last chance to go back and make any changes | 21. Tap Yes - I am ready to print<br>22. Tap Print |
|  |  |  |
| 21. Printing Ballot is displayed | 22. Ballot printed is displayed | Once the ballot is printed, the Ready to cast? screen appears |

| | | |
|---|---|---|
|  |  | and the voter can do the following:<br>Cast your ballot now – See the steps below<br>Read back my printed ballot – Re-scans the ballot and reads back the voter's selections through the headphones<br>Make a change on the printed ballot – the voter must contact an Election worker; the Election worker will spoil the ballot and provide the voter with a new ballot per jurisdictional procedure. |
| 23. The Ready to cast? screen displays the following message: Verify your printed ballot before casting | 24. Tap Cast your ballot now<br>25. Tap Next | 26. Reinsert the ballot into the BMD |
|  |  |  |
| 27. The Casting ballot screen displays the following message:<br>Please wait, your ballot is being placed into the ballot box | 28. Ballot has been cast is displayed | 29. The Thanks for voting! screen displays the following message:<br>Take your printed ballot to an Election worker for assistance |




### 13.8.2. Using a Poll Pass

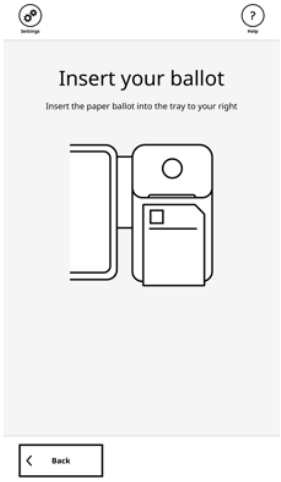
A voter can go online and access their sample ballot and digitally mark it using a computer or mobile device, such as a smart phone or tablet, prior to going to a Vote Center. Voter selections are captured in a QR code called a Poll Pass that can either be printed onto paper or downloaded to their mobile device. A sample of the Poll Pass is shown below. When the voter arrives at the Vote Center, they must check in using the normal check-in process.

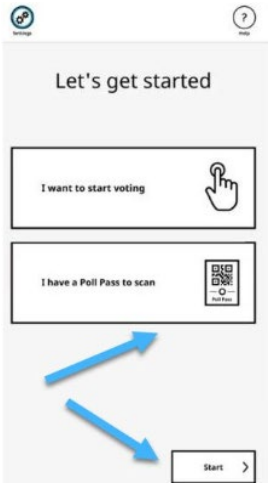
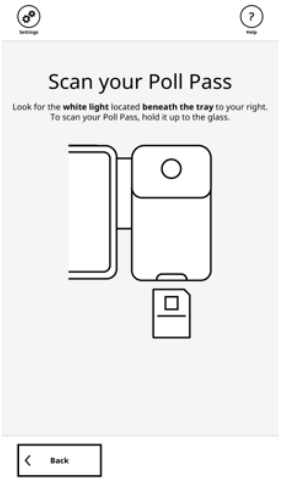


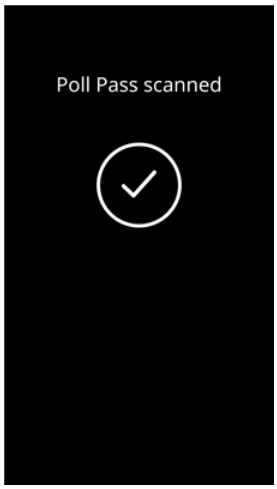
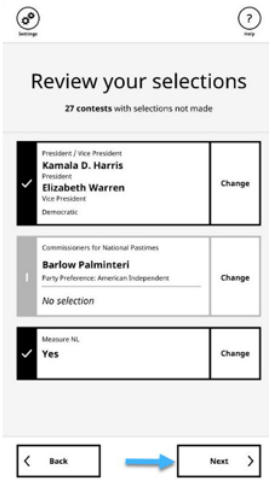

*Printed Poll Pass*


*Mobile Device Poll Pass*

After the voter has checked in and received a blank ballot, they will scan their Poll Pass at a BMD to transfer their selections to the BMD for validation before printing on a paper ballot.

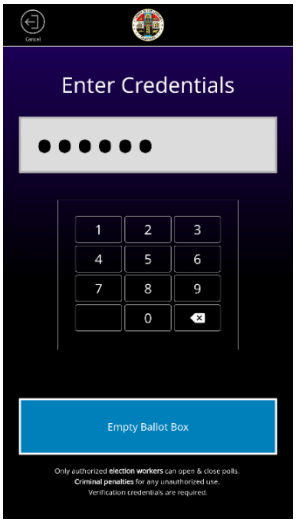
| 1. Touch the circle to start the voting process | 2. Tap a language | 3. Insert ballot |
|---|---|---|
|  |  |  |

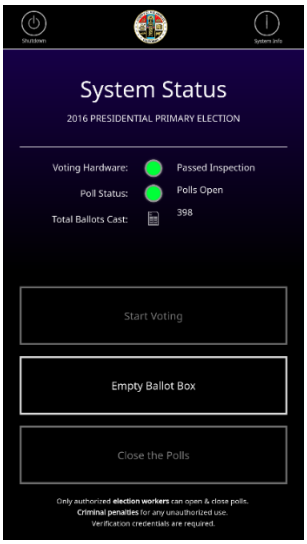
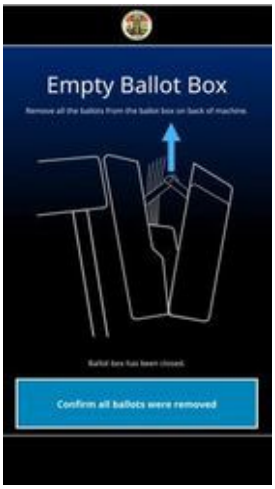
| 4. After loading the blank ballot in the BMD, Ballot loaded is displayed | 5. Tap I have a Poll Pass to scan and then click Start | 6. Scan your Poll Pass screen will appear |
|---|---|---|
|  |  |  |
| 7. Place your mobile Poll Pass or printed copy of a Poll Pass directly beneath the scanner located below the BMD paper deck | 8. Message: Poll Pass scanned | 9. Review and change selections as desired. Then tap Next |

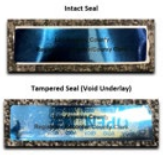
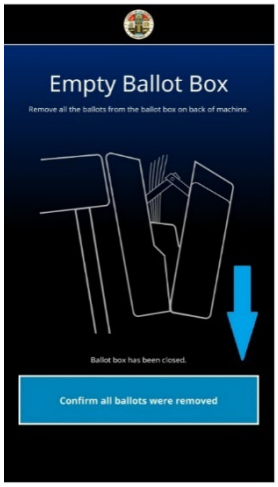
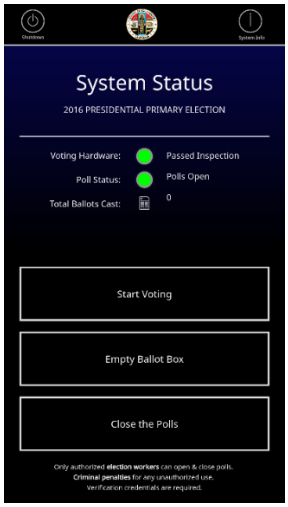
| | | |
|---|---|---|
|  |  |  |

### 13.8.3. Emptying the Ballot Box During the Day

The Integrated Ballot Box is full when 200 ballots (limits set by BMG administrator) are cast into the Integrated Ballot Box. The BMD screen displays Ballot Box is full. Once the Integrated Ballot Box is full, an Election Worker empties the Integrated Ballot Box using the procedure below and secures the ballots according to jurisdictional procedure.

| | | |
|---|---|---|
| Screen will display Integrated Ballot Box is full | Scan Security Pass under the right-side of BMD | Enter Six-Digit Pin.<br>Tap Empty Ballot Box. |
|  |  |  |

| | | |
|---|---|---|
| Tap Empty Ballot Box on the System Status menu | Remove the tamper-evident seal from seam of the IBB and the Zip Tie on the Integrated Ballot Box per jurisdictional procedure; record removal by logging the serial number into the Chain of Custody | Push the button on the upper-left side of the Integrated Ballot Box and pull the back of the Integrated Ballot Box outward |
|  |  <br>  <br>  |  |
| Remove ballots from Integrated Ballot Box | | Close Integrated Ballot Box and listen for a clicking sound, which indicates the Integrated Ballot Box is properly closed |
|  |  |  |
| Place a new tamper-evident seal on the seam of the IBB and Zip | Tap Confirm all ballots were removed | Tap Start Voting from the menu |

| | | |
|---|---|---|
| Tie per jurisdictional procedure and log it into the Chain of Custody. Be sure to tightly cinch the Zip Tie to ensure the IBB is secured | | |
|  <br>  <br>  <br> |  |  |

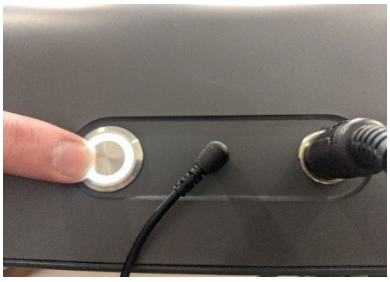
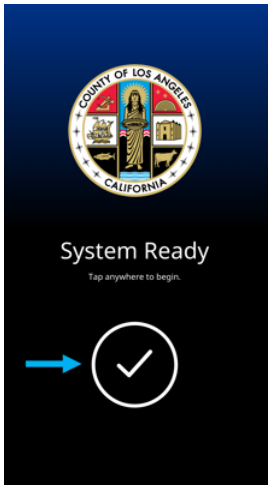
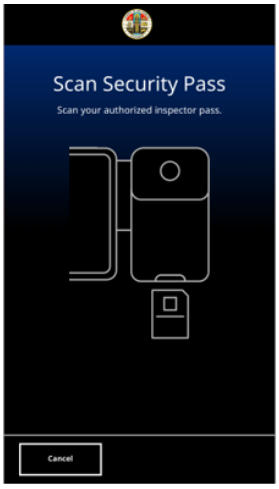
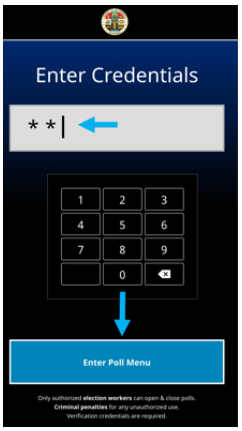
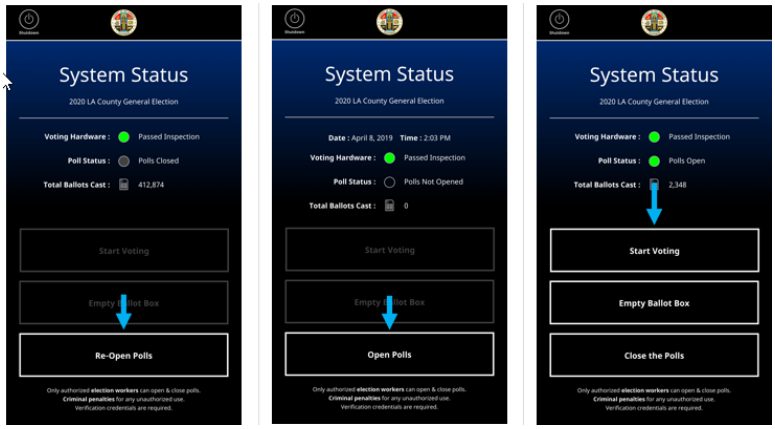
## 13.9. Restarting BMD After Interruption

When a BMD is restarted, it keeps the last status prior to the interruption. If the BMD is interrupted during the day, for example, by a power failure, one of the following status messages is displayed on the BMD screen:

- Re-Open Polls
- Open Polls
- Start Voting

If a ballot was left in the BMD when an interruption occurred, the ballot is ejected from the BMD when the power is restored. The ballot is handled according to LA County procedures. To restart a BMD after an interruption, follow this procedure.

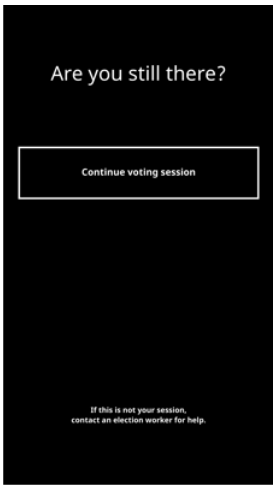
| | | |
|---|---|---|
| 1. Press the Power Button | 2. After the system initializes, tap the check mark on the System Ready screen. The Enter Credentials screen displays | 3. Scan Security Pass |

| | | |
|---|---|---|
|  |  |  |
| 4. Enter Credentials, and then tap Enter Poll Menu | 5. One of the three screens below will be shown. Tap either Re-Open Polls, Open Polls, or Start Voting | |
|  |  | |

### 13.9.1. Dealing with Fleeing Voters

This procedure details what an Election Worker should do when a voter has left before casting their ballot.

| | | |
|---|---|---|
| 1. If during a voting session, the voter stops interacting with the BMD for an administrator-specified period of time, the system will display the screen below. | 2. After a period of time (set by the BMG administrator), the BMD will lockout. The LED will flash yellow indicating the BMD has timed out. At the bottom of the screen, the system | 3. The Election Worker will enter their Credentials and select Enter Poll Menu |

| | | |
|---|---|---|
| **Note:** If the voter has not fled, the voter can select Continue voting session | will say: Notify an authorized election worker | |
|  |  |  |
| 4. The system automatically ejects the ballot and returns to the Welcome Screen.<br>Follow LA County procedures to cast the ballot | | |

## 13.10. Voters with Disabilities and Voters using Audio Features

This section describes procedures for voters utilizing the audio feedback, handheld controller, and customized screen settings.

### 13.10.1. Auxiliary Device and Ports

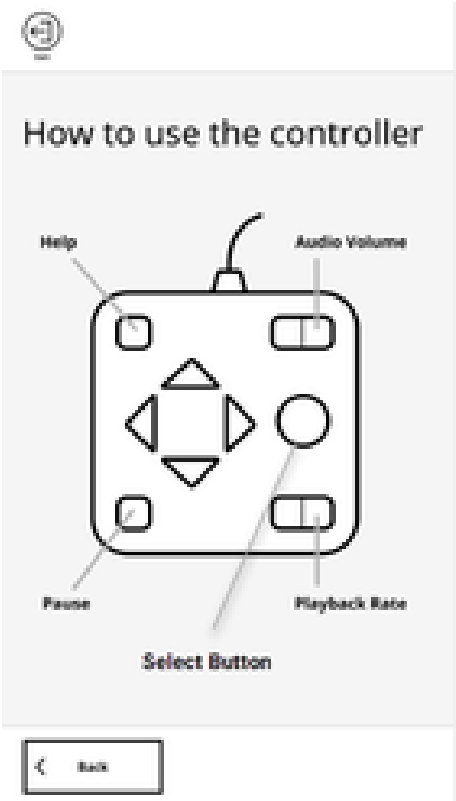
The BMD has two auxiliary ports, and one connected device which enables voters to mark and cast their ballots:

- Handheld Controller
- Headphones Jack
- Dual-Switch Port

### 13.10.2. Handheld Controller

The Handheld Controller allows the voter to use the BMD without having to touch the screen to navigate and mark their selections on the ballot. Braille is provided for voters with a visual impairment. The Handheld Controller has several components available for the voter, such as Help, Audio Volume, Pause, and Playback Rate. There are also four directional arrow buttons used to navigate and a round button used to mark selections.

Handheld Controller




See table below for controller functionality:

| Component/Location | Use/Functionality | Braille |
|---|---|---|
| Help | Press this button to access the help menu | Yes |
| Audio Volume | Press the audio button to increase or decrease the volume | Yes |
| Pause | Press the pause button to pause the voting process | Yes |
| Select Button | Press to select Candidate/Measure | No |
| Rate | Press the rate buttons to increase or decrease the rate of speed for listening to the ballot | Yes |
| Arrow Up | Press the arrow up to listen to the contest name above current candidate, Proposition/Measure | No |

| Component/Location | Use/Functionality | Braille |
|---|---|---|
| Arrow Down | Press the arrow down to listen to the contest name below the current candidate, Proposition/Measure | No |
| Arrow Right | Press the arrow to the right to make a selection to the right | No |
| Arrow Left | Press the arrow to the left to make a selection to the left | No |

### 13.10.3. Headphone Ports

Headphones are located on the top left corner of the BMD and are plugged into the Headphones Jack located on the rear left-hand side, which automatically and continuously plays the audio voting instructions. There is an additional audio port provided at the left front of the BMD where a voter may plug in their own headphones. Both audio ports always remain active in case the voter desires a helper to listen to the voting session at the same time. The two audio ports are always at the same volume level and playback speed—changing the volume level or playback speed always affects both audio ports. The voter can plug in or unplug Headphones from either of the headphone jacks at any time, with no resulting message displayed by the BMD application. The audio can only be played in the language displayed on the screen.

### 13.10.4. Dual-Switch Port

The right-front port is for connecting any dual-switch compatible device, such as a Sip and Puff assistive technology controller. The BMD application detects when a device is plugged into the port and shows a dual-switch specific configuration page that also informs the voter that if they are trying to plug in headphones, they should use the headphones jack. The audio will always be available when using the system regardless of what voting method is being used, i.e.: Touchscreen, Audio, or Poll Pass. The language displayed on the Touchscreen will be the same language used when using the audio voting feature.

## 13.11. Provisional Voters

This section details the procedure for assisting provisional voters. These voters receive a ballot containing a QR code indicating the vote is provisional. The voter's experience is the same with one exception - the voter cannot cast their ballot into the Integrated Ballot Box. Instead, they place their ballot in an envelope and return it to an Election Worker who will place the envelope in the Integrated Ballot Box per LA County procedure.

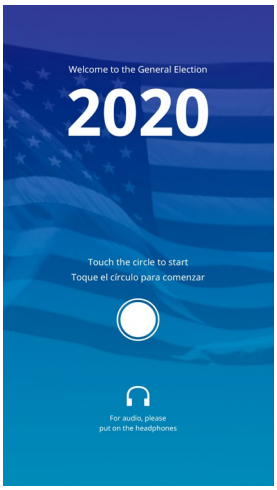
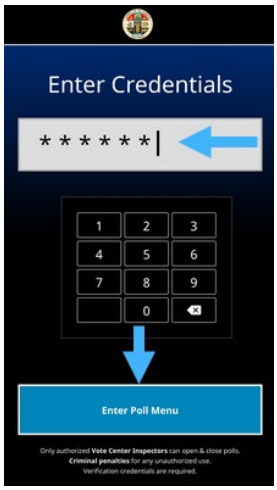
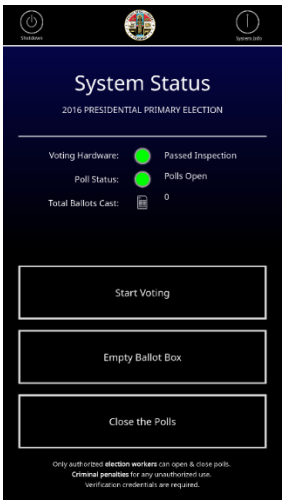
**Note:** The same procedure is used across precincts.

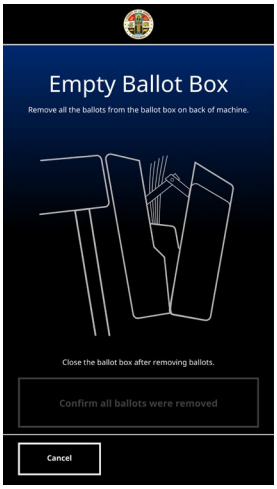
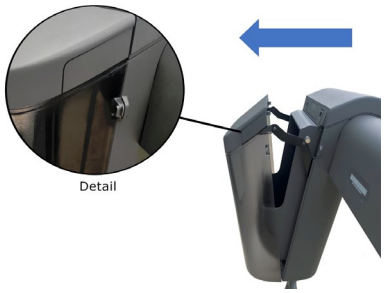
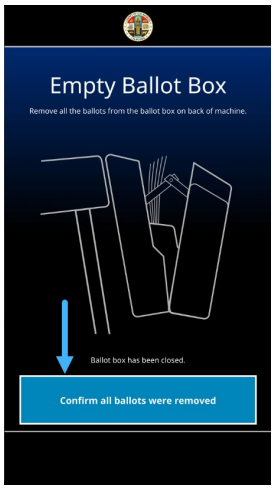
After marking their selections using the BMD, the voter will follow the steps below:

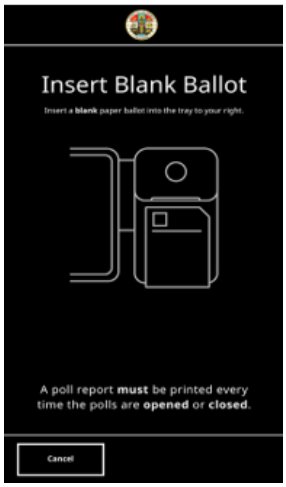
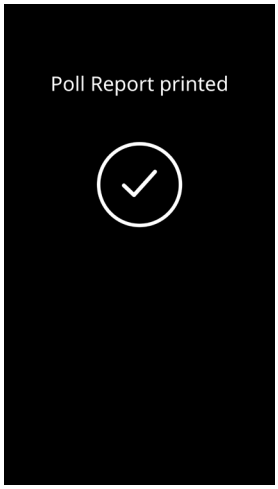
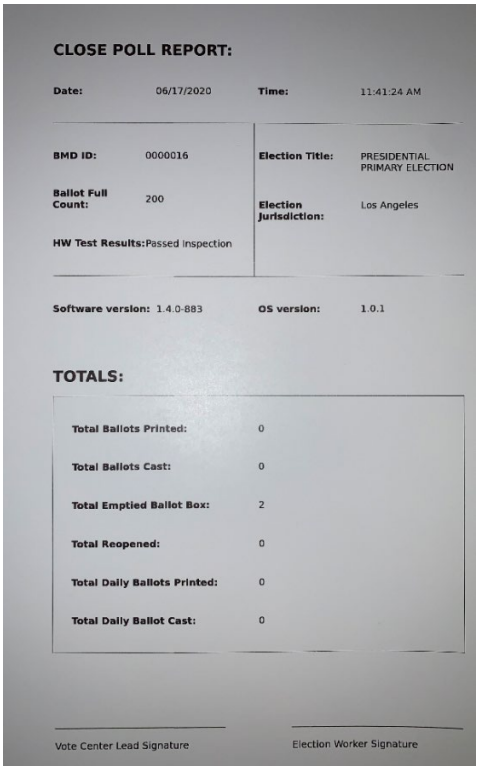
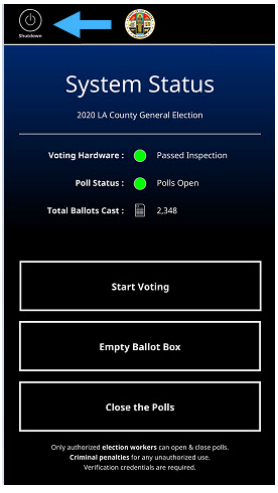
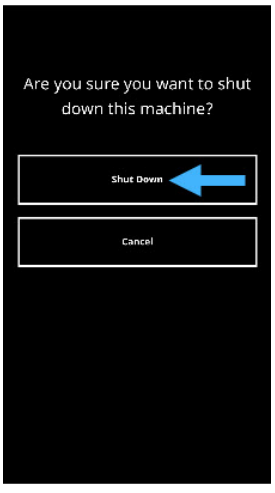
| 1. Tap Complete voting session on the Ready to cast? screen<br>2. Tap Next | 3. Remove the provisional ballot and return it to an Election Worker | 4. The screen displays Thanks for voting! |
|---|---|---|
|  |  |  |

## 13.12. Closing the Polls and Vote Reporting

Follow the steps below when Closing the Polls at the end of each election day. Closing the Polls requires an Election Worker to insert thermal printer paper to print a Close Poll Report (see example below). The Integrated Ballot Box is also emptied when Closing the Polls. After closing the polls, a Close the Polls report is printed. The Close the Polls report will include cumulative and daily totals for the BMD. Election Workers must use this report to reconcile with the Open Polls report the following morning. This procedure must be used at each BMD.

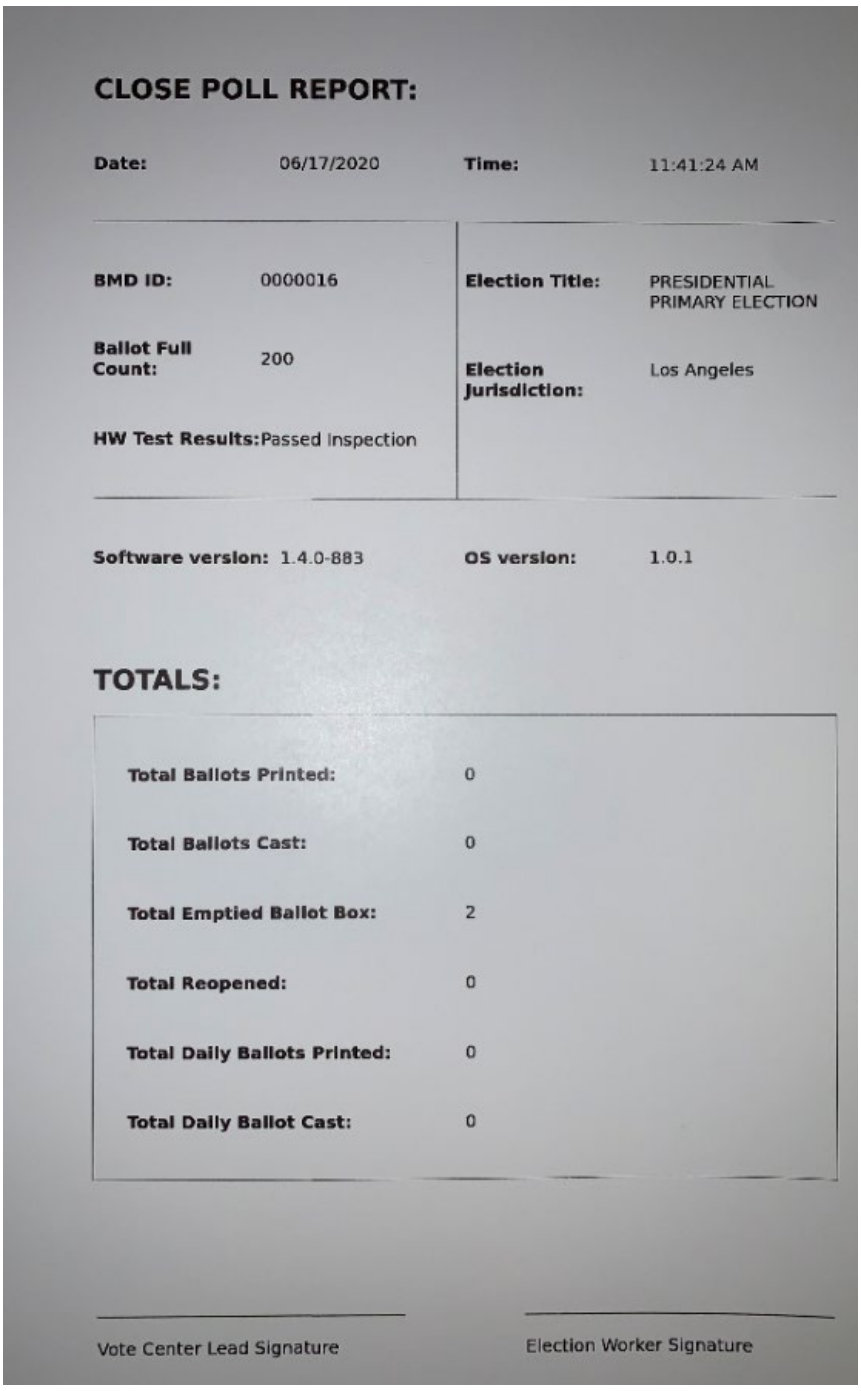
| | | |
|---|---|---|
| 1. Scan a Security Pass with the bar code scanner, located under the BMD on the lower-right side | 2. Enter Credentials<br>3. Tap Enter Poll Menu | 4. Tap Close the Polls |
|  <br>  |  |  |
| 5. System message: **Empty Ballot Box**. | 6. Remove the tamper-evident seal from seam of the IBB and the Zip Tie on the Integrated Ballot Box per jurisdictional procedure; record removal by logging the serial number into the Chain of Custody | 7. Push the button on the upper-left side of the Integrated Ballot Box and pull the back of the Integrated Ballot Box outward |

| | | |
|---|---|---|
|  |  <br>  |  |
| 8. Remove all ballots from the Integrated Ballot Box | 9. Close the Integrated Ballot Box and listen for a clicking sound, which indicates the Integrated Ballot Box is properly closed.<br>10. Place a new tamper-evident seal on the seam of the IBB and Zip Tie per LA County procedure and log it into the Chain of Custody | 11. Tap Confirm all ballots were removed |
|  |  |  |

| 12. Insert a blank sheet of thermal paper | 13. The Close Poll Report is printed | **Note:** This Close Poll Report must be signed by two Election Workers and reconciled per jurisdictional procedure |
|---|---|---|
|  |  |  |
| 14. Tap the Shutdown icon located in the upper-left side | 15. Tap **Shut Down** to power down the **BMD** | |
|  |  | |

### 13.12.1. Close Poll Report

**Note:** This Close Poll Report must be signed by two Election workers and reconciled per jurisdictional procedure.



**CLOSE POLL REPORT:**

| | | | |
|---|---|---|---|
| **Date:** | 06/17/2020 | **Time:** | 11:41:24 AM |
| **BMD ID:** | 0000016 | **Election Title:** | PRESIDENTIAL PRIMARY ELECTION |
| **Ballot Full Count:** | 200 | **Election Jurisdiction:** | Los Angeles |
| **HW Test Results:** | Passed Inspection | | |
| **Software version:** | 1.4.0-883 | **OS version:** | 1.0.1 |

**TOTALS:**

| | |
|---|---|
| **Total Ballots Printed:** | 0 |
| **Total Ballots Cast:** | 0 |
| **Total Emptied Ballot Box:** | 2 |
| **Total Reopened:** | 0 |
| **Total Daily Ballots Printed:** | 0 |
| **Total Daily Ballot Cast:** | 0 |

Vote Center Lead Signature

Election Worker Signature

## 13.13. Securing Audit Logs and Backup Records

See Section 19. Audit Trails for further details.

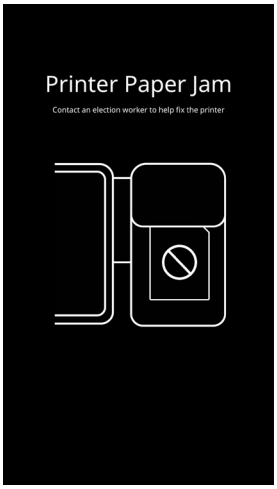
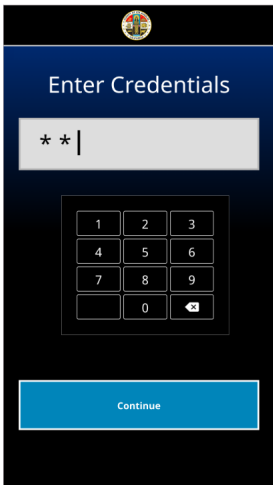
## 13.14. Troubleshooting and Problem Resolution

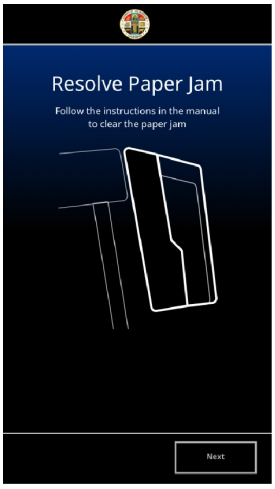
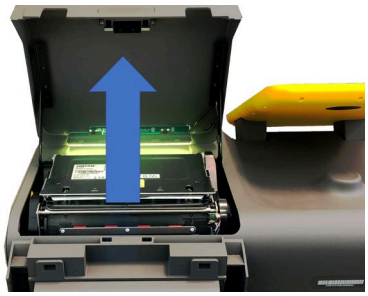
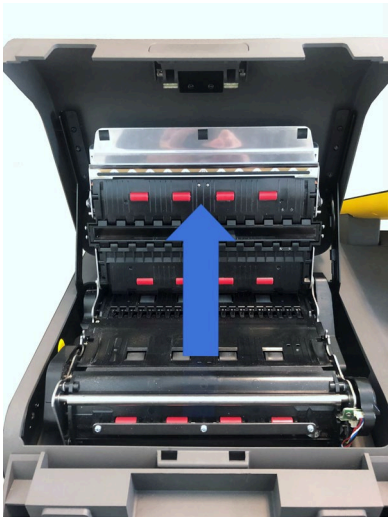
This procedure details how an Election worker can troubleshoot the following issues:

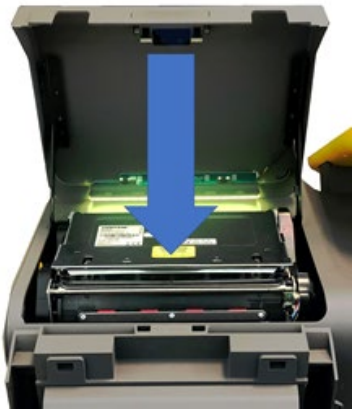
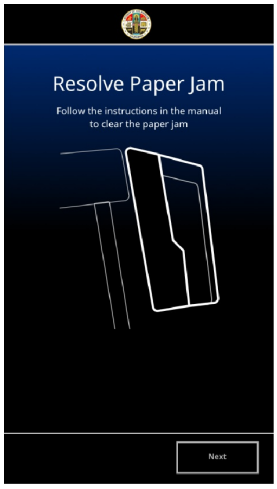
- Printer has a paper jam
- BMD cannot read a Ballot
- BMD Touchscreen is frozen
- Headphones are not working

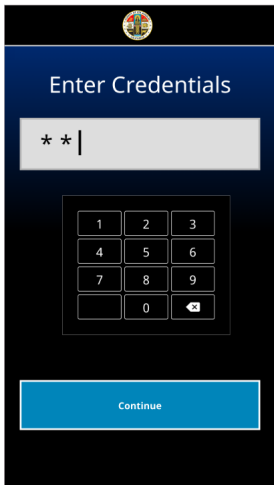
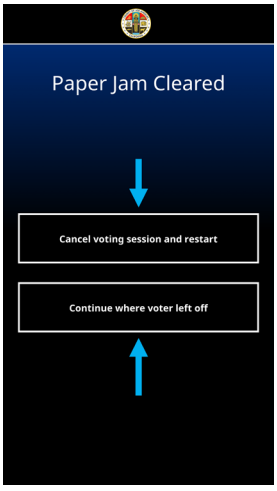
### 13.14.1. Problem: Printer Has a Paper Jam

If a paper jam occurs in the scanner/printer, the BMD will display an error screen notifying the voter there is a Printer Paper Jam. Call an Election worker for assistance. The screen will display instructions to the Election worker on how to manually remove the jammed ballot.

| | | |
|---|---|---|
| When there is a paper jam, the BMD screen will display Printer Paper Jam | Scan Security Pass | Enter Credentials and Press Continue |
|  |  |  |
| The following screen will appear, Resolve Paper Jam | Remove the tamper-evident seal from seam of the IBB and the Zip Tie on the Integrated Ballot Box per jurisdictional procedure; record removal by logging the serial number into the Chain of Custody | Push the button on the upper-left side of the Integrated Ballot Box and pull the back of the Integrated Ballot Box outward |

| | | |
|---|---|---|
|  |  |  |
| Press the button at the center of the plastic top cover and pull it outward | Open the metal printer cover upward | Pull the entire metal printer tray upward |
|  |  |  |
| Remove the jammed paper from the printer | Close the metal printer tray | Close the Plastic Top Cover |

<table>
<tr><td>  </td><td>  </td><td>  </td></tr>
<tr><td>Close the Integrated Ballot Box</td><td>Place a new tamper-evident seal on the seam of the IBB and Zip Tie per jurisdictional procedure and log it into the Chain of Custody. Be sure to tightly cinch the Zip Tie to ensure the IBB is secured</td><td>Tap Next on the Resolve Paper Jam screen</td></tr>
<tr><td>  </td><td>    </td><td>  </td></tr>
<tr><td colspan="2">The Touchscreen will prompt the Election Worker to scan their Security Pass</td><td>Enter Credentials<br><br>Tap Continue</td></tr>
</table>

<table>
<tr>
<td> 
</td>
<td>  </td>
<td> 
</td>
</tr>
<tr>
<td>If the Ballot jammed as the voter was printing the Ballot, tap Continue where voter left off. Selecting this option will prompt the BMD to reprint the voter's ballot. If the Ballot jammed when entering the BMD, tap Cancel voting session and restart.<br><br>Note: The screen below will only display this option</td>
<td colspan="2">Escort the voter to the Check-in Clerk where a replacement ballot will be printed and given to the voter. Follow LA County procedure to spoil the damaged Ballot. Load the new blank ballot into the BMD. If the paper jammed while the ballot was printing, the BMD will reprint the ballot at this stage</td>
</tr>
<tr>
<td> 
</td>
<td colspan="2"> 
</td>
</tr>
</table>

### 13.14.2. Problem: BMD Cannot Read a Ballot

1. Unlock BMD with security credentials and retrieve Ballot
2. Check if the ballot is damaged
3. If the ballot is damaged, spoil the ballot and issue a new ballot
4. If the ballot is undamaged insert the ballot again
5. If the error message happens again, move voter to a second BMD
6. If the ballot cannot be read on the second BMD, spoil the ballot, and issue a new ballot
7. If the ballot can be read on the second BMD, clean the Scanner on the first BMD,
8. If the first BMD cannot read another ballot, remove it from service

### 13.14.3. Problem: BMD Touchscreen is Frozen

If the Touchscreen froze due to voter interaction (such as inserting a Ballot with a faded or out of position BPM QR Code):

1. Retrieve the voter's Ballot and move the voter to another BMD
2. Power off the BMD
3. Turn back on
4. If the error did not clear out, remove from service

If the Touchscreen is frozen for any other reason:

1. Power off
2. Remove from service
3. Note in Help Desk Ticket that the "Image may need to be taken"

### 13.14.4. Problem: Headphones Are Not Working

| | | |
|---|---|---|
| 1. If the headphones are not working, ensure they are plugged into an audio port | 2. If the headphones still do not work, plug them into the other audio port | 3. If the headphones still do not work, try a new pair of headphones |
|  |  | |
| 4. If the new headphones do not work, try them on another BMD. If the headphones function properly in the new BMD, the voter will move to the new BMD and continue voting from there | 5. The Election Worker will power down the original BMD. | 6. If the headphones continue to malfunction with the original BMD, the Election Worker removes the BMD from service |
| |  | |

# 14. Absentee/Mail Ballot Procedures

## 14.1. System Startup and Pre-Tabulation Report Procedures

This section covers the main installation process for Tally. It can be executed either as a step-by-step walk through or by command flags. For new users, the step-by-step mode is recommended.

```
# run command to preserve the output
script /tmp/`date "+%Y%m%d-%H%M"`-installer.script

# go into the scripts directory on the deployment system
cd /tmp/tally_deployment/scripts
# to run the installer, /ssh-user is a user that has been granted ssh access to all
nodes in the cluster.
./installer ssh-user flags
```

## 14.2. Configuration

When the main installer starts, it will require the user to specify the nodes that will be included in the cluster, as well as their type.

The first node to be setup will be the deployment system. The deployment system configuration cannot be changed once in the current version of the installer, so double check the inputted values before submitting the information. Also, the first node is where HA proxy is deployed and will be the entry point for Tally through the web browser.

```
# enter the deployment system hostname
Enter the hostname configured for this master system
Enter a value: deployment-system-hostname

Enter the ip address configured for this master system
Enter a value: deployment-system-ip-address
```

Below is an example configuration once the first master system has been setup:

```
-------------------------------------------------------
|  Node Type       |  Hostname        |  IP            |
|------------------|------------------|----------------|
|  MASTER          |  lac-df-master1  |  10.0.5.151    |
-------------------------------------------------------
```

Next you will have the option to: 1) Enter a new node, 2) remove an existing node, 3) Finished. If the only node that has been setup is the deployment node, you will not be able to remove an existing node. Entering a new node will lead to a multi-node cluster and finishing the setup will lead to a single-node cluster.

On a multi-node cluster, it is mandatory to set at least one:

- Master node
- Compute node
- Provider node

If a file node is not added to the configuration, then the file sharing steps will be skipped altogether.

Below is an example of a valid multi-node cluster setup, which appears once you finish the setup:

```
-------------------------------------------------------------
|  Node Type          |  Hostname           |  IP             |
|---------------------|---------------------|-----------------|
|  MASTER*            |  lac-df-master1     |  10.0.5.151     |
|  COMPUTE            |  lac-df-compute1    |  10.0.5.161     |
|  PROVIDER           |  lac-df-provider1   |  10.0.5.171     |
|  FILE               |  lac-df-compute1    |  10.0.5.161     |
-------------------------------------------------------------
* = This node (the build system)
```

The output above will be paired with the following prompt:

```
The above are the nodes that you have configured, is this correct? (y/n)
```

```
Enter a value:
```

Entering 'y' will end the configuration and proceed to the next step in the installer. Entering 'n' will allow you to make changes to the configuration. As a reminder, the only node that cannot be modified is the first master system.

The last step in node configuration is to name the configuration:

```
What is the name of this cluster?
Enter a value: cluster-name
```

Keep track of the name you use for the cluster. If the installation is interrupted past this prompt, you will need to input the name to continue with the installation of Tally. Otherwise, you will need to redo the node configuration.

## 14.3. Starting Tally

Once the cluster and its various nodes have been set up and the Docker registry has been loaded onto the cluster, the Tally system can be started by running the create_all script.

To do this, run the following:

```
cd /tmp/tally_deployment/scripts
./create_all -k
What is the name of the configured cluster to use?
Enter a value:
```

After this process is complete, check kubernetes system pods and the cluster nodes to check the cluster's status:

```
# check the pods running the kubernetes system
kubectl get pods -n kube-system
# check the pods updating in realtime
kubectl get pods -n tally -w
# check the status posted by each node
kubectl get nodes
```

The [deployment-system-hostname] can be referenced in the example configuration output. This will compile template files for the tally system into .yaml files to create kubernetes pods.

This process includes 3 flags: --node-color , --kube-create, and --development.

-k --kube-create indicates that the process should also create k8s pods based on the compiled .yml files, which will start the Tally system.

Regardless of deployment type, the system may take several minutes to start.

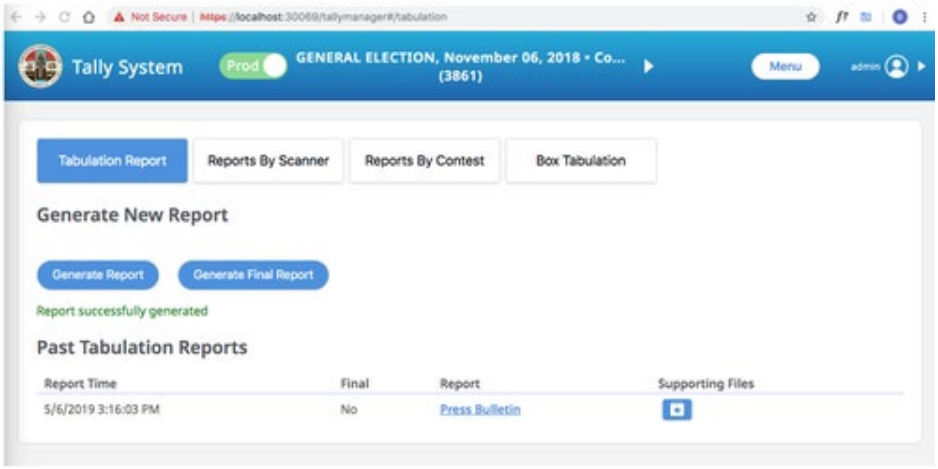
```
# check the status of the pods
kubectl get pods -n tally
```

To determine when the system is ready for viewing, check the tallymanager-deployment pod's log to determine if tallymanager is completely spun up yet:

```
kubectl logs [tallymanager-deployment-pod-name] -n tally
```

## 14.4. Tabulation Procedures

After all the ballots have gone through Receive, Recognize, and Refine, the user can view reports. From the Home page header, navigate via the main menu drop-down to Reports > Tabulation. A tabulator's first tabulation event must not happen before 8 p.m. local time on the night of the election. This is fully managed through the election process.



### 14.4.1. Generate Report:

1. From the heading drop-down, select the election that needs reports run
2. Set the test/production toggle to match the type of ballots processed
3. Refresh the page
4. Select the type of report needed -- Tabulation (overall), by scanner, by contest, or box tabulation
5. For Tabulation Report, click the “Generate Reports” button, and after a short time a new Press Bulletin link will be generated along with supporting downloadable files. Click on the Press Bulletin link and review the Semi-Final Election results that display in a new browser tab

### 14.4.2. Generate Final Report:

1. Select the type of report needed and click on the “Generate Final Reports” button. After a short time, a new Press Bulletin link will be generated with a “Yes” in the Final column
2. Click on the Press Bulletin link and review the Final Election results that display in a new browser tab

## 14.5. Post-Tabulation Report and Shutdown Procedures

To stop the tally system and delete running services, run

```
# go into the installer directory on the deployment system
cd /tmp/tally_deployment/scripts/
# delete the tally resources
./delete
```

This will delete all resources generated by files found in the configuration dist directory.

To check that all resources have been deleted, run the following command:

```
kubectl get all -n tally
```

# 15. Semi-Official Canvass

Officials will comply with the Use Procedures approved by the Secretary of State for the VSAP Voting System.

## 15.1. System Start-up and Pre-tabulation Reports

Once the Tally System Environment is set up and the election is configured you can start the system for tabulation.

### 15.1.1. Start Tally Services

The first step is to start the Tally System services. To start the services you provide a start script. There are several command line options that will need to be provided for different setups.

The following are the individual commands that can be run to start the services:

```
sudo python scripts/run.py # single node Tally machine deployment
sudo python scripts/run.py -t services # services machine deployment
sudo python scripts/run.py -t providers # providers machine deployment
```

The -t/--type argument accepts two valid options, “services” and “providers”. If the type parameter is not passed, the run script will assume it is being executed on the single Tally machine deployment. The scripts are run from the /opt/tally directory.

If this is the first time starting the environment, or if the database has been cleared, provide the -seed argument (or --seed-db argument) to empty and recreate the base schema for tally in the database. This will erase all existing database data. For single node deployment, the script should be run on the Tally System machine. For the two-node deployment, the script should be run on provider’s machine.

Single node Tally System machine:

```
sudo python scripts/run.py -seed
```

Two-node provider’s machine:

```
sudo python scripts/run.py -seed -t providers
```

If the -d/--detached argument is passed, the Tally System will start detached from terminal, running as a background process:

```
sudo python scripts/run.py -d
```

### 15.1.2. VSAP Tally Manager

The Tally Manager is the Tally System user interface. It is designed to work on the Google Chrome browser. Other browsers are not supported.

1. Open the Chrome Browser
2. Enter address "192.168.7.80"
3. Log in

### 15.1.3. Processing VBM Ballots

All staff processing VBM ballots are required to check in with a Tally System supervisor and sign a log in sheet with date, time and scan station. When work is completed or assignments change, staff are to sign out with date, time and scan station.

VBM ballot processing roles per scanner:

- One staff operating the scanner. Role includes loading, removing, and starting the scanner
- One supervisor is responsible for managing and monitoring a scanner
- Input runners are used for moving boxes of unprocessed ballots to scanners and assist preparing ballots for scanner operator including unboxing and jogging ballots
- Output runners used to box processed ballots and move them to staging area for ballot storage
- One snag Operator for every two scanners. Manages ballots not able to be processed by the scanner and reports them to ballot remakes
- Ballot storage operators scan processed ballot boxes with a storage location

Instructions on operating the ballot scanners are available in the System Operation Manual.

## 15.2. Processing vote reports

Once all the ballots have gone through Receive, Recognize, and Refine and have returned to IDLE status, the user can view reports.

From the Home page header, click on a menu tab labeled Tabulate/Reports . This displays a page with two subsections: Generate New Reports and Past Tabulation Reports.


1. Click the Generate Reports button, and after a short time a new Tabulation ID link will be generated.
2. Click on the Tabulation ID link and review the Semi-Final Election results that display in a new browser tab.
3. Navigate back to the Tabulate/Reports tab and click on the Generate Final Reports button, and after a short time, a new Tabulation ID link will be generated.
4. Click on the Tabulation ID link and review the Final Election results that display in a new browser tab.

Once both the Semi-Final Election Results and Final Election Results pages have been reviewed, you may close the browser tabs. Navigating back to the Reports browser tab, you may reload the page and see that new entries under Past Tabulation Reports now display. These were the reports that you previously generated.

## 15.3. Central tabulation

Tabulation can begin once the Tally System is configured, services have started, and the Tally Manager is logged on.

## 15.4. Precinct Tabulation

Not applicable as ballots are tabulated centrally.

## 15.5. Integration with Other Systems and Calvoter Aggregator Application

The Aggregator Application integrates election results between the MTS system with the Tally System. The Aggregator Application is a command line driven application. Below are the basic commands to aggregate totals.

For help on available commands and syntax type:

```
./aggregate -help
```

The mts_summary.dat (MTS results file) and vsap.json (Tally System results file) that need to be aggregated are put into the “inputs” folder. These files are copied using removable digital media.

Type the following to start aggregating the totals:

```
./aggregate
```

The following result files are put into the output and archive folder:

- Mts_summary.dat - New aggregated results in MTS result file format
- Press.html - Semi-Official Results Press Bulletin
- Lna.html - Logic and Accuracy Results Report. Contains a matrix of counter and value
- Vsap.json - New aggregated results in Tally System results file format

To create a version of Final Official Press Bulletin enter the following command:

```
./aggregate -final=true
```

### 15.5.1. CalVoter

Officials' MTS and ECBMS complies with election night vote reporting using electronic files. These reports are put in the Secretary of State CalVoter II system sftp. The CalVoter II system retrieve the report, transfer the data to the database, and process the information into the elections reporting system.

# 16. Official Canvass and Post-Election Procedures

## 16.1. Election Observer Panel

The purpose of Election Observers is to:

- Provide an avenue for public observation of and input into the election process
- Assist in ensuring the integrity of the election process
- Encourage participation and build voter confidence in the election process

### 16.1.1. Invitation

Between E-60 and E-30, prepare a media release and letters of invitation (see samples attached) to parties likely to participate, such as the following:

- County Grand Jury
- Political Party Central Committee Members
- Language Advocacy Groups
- Community Based Organizations
- Media

Other groups or individuals expressing an interest in observing election day activities may also be included in the observer panel, as deemed appropriate.

### 16.1.2. Group Presentations

After letters of invitation have been sent out, offer to attend group meetings to provide an opportunity for the groups to ask questions about the process. Groups should be contacted to arrange time on their agendas for staff presentations. This is optional at the request of the group, but staff should make every effort to contact the groups and offer this service.

#### Appointment Letters (for introduction to precinct workers)

After the groups have provided the names of interested panelists, prepare letters of introduction (see sample attached) for the panelists to use when visiting polling places on Election Day. Materials to be prepared for each panelist will include a listing of all polling places within the county for that specific election as well as the central counting site location and hours of operation.

### 16.1.3. Mechanism for Feedback

Observers attend training at government facilities, where they can ask questions about the process.

### 16.1.4. General Rules for Observers

Observers may:

- Observe the proceedings at the polls, including the opening and closing procedures
- Obtain information from the precinct index that is posted near the entrance
- Make notes and watch all procedures
- View all activities at the central counting site on election day
- View the canvass of the vote activities following the election
- View absentee and provisional ballot processing
- Ask questions of staff or voters at the polls
- Ask questions of supervisors at the central counting site

Observers are responsible for:

- Checking in at each site, whether polling place or central counting site
- Wearing an identification badge
- Maintaining a professional manner while observing the election processes
- Ensuring they do not interfere with the elections process

Observers may not:

- Interfere in any way with the conduct of the election
- Touch any voting materials or equipment or sit at the official worktables
- Converse with voters (within 100 feet of the entrance to a polling place) regarding the casting of a vote, or speak to a voter regarding his or her qualifications to vote
- Display any election material or wear campaign badges, buttons or apparel
- Wear the uniform of a peace officer, a private guard, or security personnel
- Use cellular phones, pagers, or two-way radios inside the polling place and/or within 100 feet of the entrance to the polling place
- Talk to central counting site workers while they are processing ballots
- Use the telephones, computers or other polling place facilities at polling places or the central counting site
- Touch election personnel
- Eat or drink in the polls or the central counting site
- Assist in operations at any polling place

## 16.2. Canvassing Precinct Returns

### 16.2.1. Time for Conducting Canvass

The canvass shall commence no later than the Thursday following the election, shall be open to the public, and, for state or statewide elections, shall result in a report of results to the Secretary of State. The canvass shall be continued daily, Saturdays, Sundays, and holidays excepted, for not less than six hours each day until completed.

### 16.2.2. Tasks of the Official Canvass

The official canvass shall include, but not be limited to, the following tasks:

- An inspection of all materials and supplies returned by poll workers
- A reconciliation of the number of signatures on the roster with the number of ballots recorded on the ballot statement
- In the event of a discrepancy in the reconciliation, the number of ballots received from each polling place shall be reconciled with the number of ballots cast, as indicated on the ballot statement
- A reconciliation of the number of ballots counted, spoiled, canceled, or invalidated due to identifying marks, overvotes, or as otherwise provided by statute, with the number of votes recorded, including vote by mail and provisional ballots, by the vote counting system
- Processing and counting any valid vote by mail and provisional ballots not included in the semifinal official canvass
- Counting any valid write-in votes
- Reproducing any damaged ballots, if necessary
- Reporting final results to the governing board and the Secretary of State, as required

### 16.2.3. Examination of Materials Returned from Precincts

In jurisdictions using a central counting place, the elections official may appoint not less than three deputies to open the envelopes or containers with the materials returned from the precincts. If, after examination, any of the materials are incomplete, ambiguous, not properly authenticated, or otherwise defective, the precinct officers may be summoned before the elections official and examined under oath to describe polling place procedures and to correct the errors or omissions.

## 16.3. Canvassing Absentee Ballots

### 16.3.1. Processing and Counting Vote by Mail Ballots

Vote by mail ballots and mail ballot precinct ballots returned to the elections office and to the polls on or before election day that are not included in the semifinal official canvass phase of the election, including any ballots returned to another jurisdiction in the state and forwarded to the elections official who issued the ballot, shall be processed and counted during the official canvass as described below.

### 16.3.2. Processing Vote by Mail Ballots

- Any jurisdiction in which vote by mail ballots are cast may begin to process vote by mail ballot return envelopes beginning 29 days before the election. Processing vote by mail ballot return envelopes may include verifying the voter's signature on the vote by mail ballot return envelope and updating voter history records.
- Any jurisdiction having the necessary computer capability may start to process vote by mail ballots on the 10th business day before the election. Processing vote by mail ballots includes opening vote by mail ballot return envelopes, removing ballots, duplicating any damaged ballots, and preparing the ballots to be machine read, or machine reading them, including processing write-in votes so that they can be tallied by the machine, but under no circumstances may a vote count be accessed or released until 8 p.m. on the day of the election. All other jurisdictions shall start to process vote by mail ballots at 5 p.m. on the day before the election.

- Results of any vote by mail ballot tabulation or count shall not be released before the close of the polls on the day of the election.

### 16.3.3. Observation of Vote by Mail Ballot Processing and Counting

- The processing of vote by mail ballot return envelopes, and the processing and counting of vote by mail ballots, shall be open to the public, both prior to and after the election.
- A member of the county grand jury, and at least one member each of the Republican county central committee, the Democratic county central committee, and of any other party with a candidate on the ballot, and any other interested organization, shall be permitted to observe and challenge the manner in which the vote by mail ballots are handled, from the processing of vote by mail ballot return envelopes through the counting and disposition of the ballots.
- The elections official shall notify vote by mail voter observers and the public at least 48 hours in advance of the dates, times, and places where vote by mail ballots will be processed and counted.
- Vote by mail voter observers shall be allowed sufficiently close access to enable them to observe the vote by mail ballot return envelopes and the signatures thereon and challenge whether those individuals handling vote by mail ballots are following established procedures, including all of the following:
    - Verifying signatures and addresses on the vote by mail ballot return envelopes by comparing them to voter registration information.
    - Duplicating accurately damaged or defective ballots.
    - Securing vote by mail ballots to prevent tampering with them before they are counted on election day.
- A vote by mail voter observer shall not interfere with the orderly processing of vote by mail ballot return envelopes or the processing and counting of vote by mail ballots, including the touching or handling of the ballots.

### 16.3.4. Challenges

Prior to processing and opening the identification envelopes of vote by mail voters, the elections official shall make available a list of vote by mail voters for public inspection, from which challenges may be presented. Challenges may be made for the same reasons as those made against a voter voting at a polling place. In addition, a challenge may be entered on the grounds that the ballot was not received within the time provided by this code or that a person is imprisoned for a conviction of a felony. All challenges shall be made prior to the opening of the identification envelope of the challenged vote by mail voter.

Except as otherwise provided, the processing of vote by mail ballot return envelopes, the processing and counting of vote by mail ballots, and the disposition of challenges of vote by mail ballots shall be according to the laws now in force pertaining to the election for which they are cast. Because the voter is not present, the challenger shall have the burden of establishing extraordinary proof of the validity of the challenge at the time the challenge is made.

If a challenge is overruled, the board shall open the identification envelope without defacing the affidavit printed on it or mutilating the enclosed ballot and, without viewing the ballot, remove it and destroy the numbered slip, if any remains, and store the ballots in a secure location.

If a challenge is allowed, the board shall endorse on the face of the identification envelope the cause of the challenge and its action thereon.

### 16.3.5. Comparing Signatures

(a) (1) Upon receiving a vote by mail ballot, the elections official shall compare the signature on the identification envelope with either of the following to determine if the signatures compare:

(A) The signature appearing on the voter's affidavit of registration or any previous affidavit of registration of the voter.

(B) The signature appearing on a form issued by an elections official that contains the voter's signature and that is part of the voter's registration record.

(2) In comparing signatures pursuant to this section, the elections official may use facsimiles of voters' signatures, provided that the method of preparing and displaying the facsimiles complies with the law.

(3) In comparing signatures pursuant to this section, an elections official may use signature verification technology. If signature verification technology determines that the signatures do not compare, the elections official shall visually examine the signatures and verify that the signatures do not compare.

(4) The variation of a signature caused by the substitution of initials for the first or middle name, or both, is not grounds for the elections official to determine that the signatures do not compare.

(b) If upon conducting the comparison of signatures pursuant to subdivision (a) the elections official determines that the signatures compare, he or she shall deposit the ballot, still in the identification envelope, in a ballot container in his or her office.

(c) If upon conducting the comparison of signatures pursuant to subdivision (a) the elections official determines that the signatures do not compare, the identification envelope shall not be opened and the ballot shall not be counted. The elections official shall write the cause of the rejection on the face of the identification envelope only after completing the procedures described in subdivision (d).

(d) (1) A minimum of eight days prior to the certification of the election, the elections official shall provide notice to all voters identified pursuant to subdivision (c) of the opportunity to verify their signatures no later than 5 p.m. two days prior to the certification of the election.

(2) The notice and instructions shall be in substantially the following form:

| |
|---|
| "READ THESE INSTRUCTIONS CAREFULLY. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY CAUSE YOUR VOTE BY MAIL BALLOT NOT TO COUNT. |
| |
| 1. We have determined that the signature you provided on your vote by mail ballot does not match the signature(s) on file in your voter record. In order to ensure that your vote by mail ballot will be counted, the signature verification statement must be completed and returned as soon as possible. |
| 2. The signature verification statement must be received by the elections official of the county where you are registered to vote no later than 5 p.m. two days prior to certification of the election. |
| 3. You must sign your name where specified on the signature verification statement (Voter's Signature). |
| 4. Place the signature verification statement into a mailing envelope addressed to your local elections official. Mail, deliver, or have the completed statement delivered to the elections official. Be sure there is sufficient postage if mailed and that the address of the elections official is correct. |

| |
|---|
| 5. If you do not wish to send the signature verification statement by mail or have it delivered, you may submit your completed statement by email or facsimile transmission to your local elections official using the information provided.” |

(3) The elections official shall not reject a vote by mail ballot identified pursuant to subdivision (c) if each of the following conditions is satisfied:

(A) The voter delivers, in person, by mail, by fax, or by email, a signature verification statement signed by the voter and the elections official receives the statement no later than 5 p.m. two days prior to the certification of the election, or the voter, before the close of the polls on election day, completes and submits a signature verification statement to a polling place within the county or a ballot dropoff box.

(B) Upon receipt of the signature verification statement, the elections official shall compare the signature on the statement with the signature on file in the voter’s record.

(i) If upon conducting the comparison of signatures the elections official determines that the signatures compare, he or she shall deposit the ballot, still in the identification envelope, in a ballot container in his or her office.

(ii) If upon conducting the comparison of the signatures the elections official determines that the signatures do not compare, the identification envelope shall not be opened and the ballot shall not be counted. The elections official shall write the cause of the rejection on the face of the identification envelope.

(4) The signature verification statement shall be in substantially the following form and may be included on the same page as the notice and instructions specified in paragraph (2):

| |
|---|
| “SIGNATURE VERIFICATION STATEMENT |
| |
| I,, am a registered voter of _____ County, |
| State of California. I declare under penalty of perjury that I requested and returned a vote by mail ballot. I am a resident of the precinct in which I have voted, and I am the person whose name appears on the vote by mail ballot envelope. I understand that if I commit or attempt any fraud in connection with voting, or if I aid or abet fraud or attempt to aid or abet fraud in connection with voting, I may be convicted of a felony punishable by imprisonment for 16 months or two or three years. I understand that my failure to sign this statement means that my vote by mail ballot will be invalidated. |
| Voter’s Signature |
| Address” |

(5) An elections official shall include the vote by mail ballot signature verification statement and instructions provided in this subdivision on his or her Internet Web site, and shall provide the election official’s mailing address, email address, and facsimile transmission number on the Internet Web page containing the statement and instructions.

(6) If the elections official determines that the signatures compare, the official shall use the signature in the signature verification statement, even if returned untimely, to update the voter's signature for future elections.

(e) (1) (A) Notwithstanding any other law, if an elections official determines that a voter has failed to sign the identification envelope, the elections official shall not reject the vote by mail ballot if the voter does any of the following:

(i) Signs the identification envelope at the office of the elections official during regular business hours before 5 p.m. on the eighth day after the election.

(ii) Before 5 p.m. on the eighth day after the election, completes and submits an unsigned ballot statement in substantially the following form:

| |
|---|
| "UNSIGNED BALLOT STATEMENT |
| |
| I,, am a registered voter of _____ County, |
| State of California. I declare under penalty of perjury that I requested and returned a vote by mail ballot and that I have not and will not vote more than one ballot in this election. I am a resident of the precinct in which I have voted, and I am the person whose name appears on the vote by mail ballot envelope. I understand that if I commit or attempt any fraud in connection with voting, or if I aid or abet fraud or attempt to aid or abet fraud in connection with voting, I may be convicted of a felony punishable by imprisonment for 16 months or two or three years. I understand that my failure to sign this statement means that my vote by mail ballot will be invalidated. |
| Voter's Signature |
| Address" |

(iii) Before the close of the polls on election day, completes and submits an unsigned ballot statement, in the form described in clause (ii), to a polling place within the county or a ballot dropoff box.

(B) If timely submitted, the elections official shall accept any completed unsigned ballot statement. Upon receipt of the unsigned ballot statement, the elections official shall compare the voter's signature on the statement in the manner provided by this section.

(i) If the elections official determines that the signatures compare, he or she shall attach the unsigned ballot statement to the identification envelope and deposit the ballot, still in the identification envelope, in a ballot container in his or her office.

(ii) If the elections official determines that the signatures do not compare, the identification envelope shall not be opened and the ballot shall not be counted.

(C) An elections official may use methods other than those described in subparagraph (A) to obtain a voter's signature on an unsigned identification envelope.

(2) Instructions shall accompany the unsigned ballot statement in substantially the following form:

| |
|---|
| "READ THESE INSTRUCTIONS CAREFULLY BEFORE COMPLETING THE STATEMENT. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY CAUSE YOUR BALLOT NOT TO COUNT. |
| 1. In order to ensure that your vote by mail ballot will be counted, your statement should be completed and returned as soon as possible so that it can reach the elections official of the county in which your precinct is located no later than 5 p.m. on the eighth day after the election. |
| 2. You must sign your name on the line above (Voter's Signature). |
| 3. Place the statement into a mailing envelope addressed to your local elections official. Mail, deliver, or have delivered the completed statement to the elections official. Be sure there is sufficient postage if mailed and that the address of the elections official is correct. |
| 4. If you do not wish to send the statement by mail or have it delivered, you may submit your completed statement by facsimile or email transmission to your local elections official, or submit your completed statement to a polling place within the county or a ballot drop-off box before the close of the polls on election day." |

(3) An elections official shall include the unsigned ballot statement and instructions described in this subdivision on his or her Internet Web site, and shall provide the elections official's mailing address, email address, and facsimile transmission number on the Internet Web page containing the statement and instructions.

(f) A ballot shall not be removed from its identification envelope until the time for processing ballots. A ballot shall not be rejected for cause after the identification envelope has been opened.

## 16.4. Canvassing Provisional Ballots

### 16.4.1. Voting a Provisionally Cast Ballot

(a) At all elections, a voter claiming to be properly registered, but whose qualification or entitlement to vote cannot be immediately established upon examination of the roster for the precinct or upon examination of the records on file with the county elections official, shall be entitled to vote a provisional ballot as follows:

(1) An elections official shall advise the voter of the voter's right to cast a provisional ballot.

(2) The voter shall be provided a provisional ballot, written instructions regarding the process and procedures for casting the ballot, and a written affirmation regarding the voter's registration and eligibility to vote. The written instructions shall include the information set forth in subdivisions (c) and (d).

(3) The voter shall be required to execute, in the presence of an elections official, the written affirmation stating that the voter is eligible to vote and registered in the county where the voter desires to vote.

### 16.4.2. Handling of Ballot

(b) Once voted, the voter's ballot shall be sealed in a provisional ballot envelope, and the ballot in its envelope shall be deposited in the ballot box. All provisional ballots voted shall remain sealed in their envelopes for return to the elections official in accordance with the elections official's instructions. The provisional ballot envelopes specified in this subdivision shall be of a color different than the color of, but printed substantially similar to, the envelopes used for vote by mail ballots, and shall be completed in the same manner as vote by mail envelopes.

(c) (1) During the official canvass, the elections official shall examine the records with respect to all provisional ballots cast. Using the procedures that apply to the comparison of signatures on vote by mail ballots, the elections official shall compare the signature on each provisional ballot envelope with the signature on the voter's affidavit of registration or other signature in the voter's registration record. If the signatures do not compare or the provisional ballot envelope is not signed, the ballot shall be rejected. A variation of the signature caused by the substitution of initials for the first or middle name, or both, shall not invalidate the ballot.

(2) (A) Provisional ballots shall not be included in any semiofficial or official canvass, except under one or more of the following conditions:

(i) The elections official establishes prior to the completion of the official canvass, from the records in his or her office, the claimant's right to vote.

(ii) The provisional ballot has been cast and included in the canvass.

(iii) Upon the order of a superior court in the county of the voter's residence.

(B) A voter may seek the court order specified in this paragraph regarding his or her own ballot at any time prior to completion of the official canvass. Any judicial action or appeal shall have priority over all other civil matters. A fee shall not be charged to the claimant by the clerk of the court for services rendered in an action under this section.

(3) The provisional ballot of a voter who is otherwise entitled to vote shall not be rejected because the voter did not cast his or her ballot in the precinct to which he or she was assigned by the elections official.

(A) If the ballot cast by the voter contains the same candidates and measures on which the voter would have been entitled to vote in his or her assigned precinct, the elections official shall count the votes for the entire ballot.

(B) If the ballot cast by the voter contains candidates or measures on which the voter would not have been entitled to vote in his or her assigned precinct, the elections official shall count only the votes for the candidates and measures on which the voter was entitled to vote in his or her assigned precinct.

## 16.5. Canvassing Write-in Votes

### 16.5.1. Counting Write-In Votes

Any name written upon a ballot for a qualified write-in candidate, including a reasonable facsimile of the spelling of a name, shall be counted for the office, if it is written in the blank space provided and voted as specified below:

(a) For voting systems in which write-in spaces appear directly below the list of candidates for that office and provide a voting space, no write-in vote shall be counted unless the voting space next to the write-in space is marked or slotted as directed in the voting instructions, except as provided in subdivision (f).

(b) For voting systems in which write-in spaces appear separately from the list of candidates for that office and do not provide a voting space, the name of the write-in candidate, if otherwise qualified, shall be counted if it is written in the manner described in the voting instructions.

(c) The use of pressure-sensitive stickers, glued stamps, or any other device not provided for in the voting procedures for the voting systems approved by the Secretary of State to indicate the name of the write-in candidate are not valid, and a name indicated by these methods shall not be counted.

(d) Neither a vote cast for a candidate whose name appears on the ballot nor a vote cast for a write-in candidate shall be counted if the voter has indicated, by a combination of marking and writing, a choice of more names than there are candidates to be nominated or elected to the office.

(e) All valid write-in votes shall be tabulated and certified to the elections official on forms provided for this purpose, and the write-in votes shall be added to the results of the count of the ballots at the counting place and be included in the official returns for the precinct.

(f) (1) In an election that uses a voting system described in subdivision (a), after tallying all eligible votes but prior to completion of the official canvass and the issuance of the certified statement of the results pursuant to this chapter, the elections official, upon the request of a qualified write-in candidate for an office being voted on in that election for an examination of undervotes that is received within five days of completion of the semiofficial canvass, may hand tally the remaining undervotes if any of the following is applicable:

(A) In the case of a primary election or a special election, the sum of the total number of votes cast for the write-in candidate and the total number of undervotes cast for the office but not examined pursuant to a hand tally is equal to or greater than the total number of votes cast for the candidate receiving the second highest number of votes for that office.

(B) In the case of a general election or a special runoff election, the sum of the total number of votes cast for the write-in candidate and the total number of undervotes cast for the office but not examined pursuant to a hand tally is equal to or greater than the total number of votes cast for the candidate receiving the highest number of votes for that office.

(C) In the case of an office for which a voter may vote for more than one candidate, the sum of the total number of votes cast for the write-in candidate and the total number of undervotes cast for the office but not examined pursuant to a hand tally is equal to or greater than the total number of votes cast for the candidate receiving the least number of votes that would be sufficient in order to be elected.

(2) The elections official may stop a hand tally conducted pursuant to this subdivision when the official determines that the applicable condition in any of subparagraphs (A) to (C), inclusive, of paragraph (1) is no longer applicable, or when all of the undervotes for the office have been examined.

(3) In conducting a hand tally pursuant to this subdivision, the elections official shall count a vote for the office if the intent of the voter can be determined, regardless of whether the voter has complied with the voting instructions. The elections official shall include the results of a hand tally conducted pursuant to this subdivision in the official canvass of the election.

(4) For purposes of this subdivision, “undervote” means a ballot on which a voter failed to cast any vote for a specific office or failed to cast the maximum number of votes permitted, as detected by an electronic, mechanical, or other vote-tabulating device.

## 16.6. Manual Tally Procedures

### 16.6.1. Manual Tally Using a Voting System

(a) During the official canvass of every election in which a voting system is used, the official conducting the election shall conduct a public manual tally of the ballots tabulated by those devices, including vote by mail ballots, using either of the following methods:

(1) (A) A public manual tally of the ballots canvassed in the semifinal official canvass, including vote by mail ballots but not including provisional ballots, cast in 1 percent of the precincts chosen at random by the elections official. If 1 percent of the precincts is less than one whole precinct, the tally shall be conducted in one precinct chosen at random by the elections official.

(B) (i) In addition to the 1 percent manual tally, the elections official shall, for each race not included in the initial group of precincts, count one additional precinct. The manual tally shall apply only to the race not previously counted.

(ii) The elections official may, at his or her discretion, select additional precincts for the manual tally, which may include vote by mail and provisional ballots.

(2) A two-part public manual tally, which includes both of the following:

(A) A public manual tally of the ballots canvassed in the semifinal official canvass, not including vote by mail or provisional ballots, cast in 1 percent of the precincts chosen at random by the elections official and conducted pursuant to paragraph (1).

(B) (i) A public manual tally of not less than 1 percent of the vote by mail ballots canvassed in the semifinal official canvass. Batches of vote by mail ballots shall be chosen at random by the elections official.

(ii) For purposes of this section, a “batch” means a set of ballots tabulated by the voting system devices, for which the voting system can produce a report of the votes cast.

(iii) (I) In addition to the 1 percent manual tally of the vote by mail ballots, the elections official shall, for each race not included in the initial 1 percent manual tally of vote by mail ballots, count one additional batch of vote by mail ballots. The manual tally shall apply only to the race not previously counted.

(II) The elections official may, at his or her discretion, select additional batches for the manual tally, which may include vote by mail and provisional ballots.

(b) If vote by mail ballots are cast on a direct recording electronic voting system at the office of an elections official or at a satellite location of the office of an elections official pursuant to Section 3018, the official conducting the election shall either include those ballots in the manual tally conducted pursuant to paragraph (1) or (2) of subdivision (a), or conduct a public manual tally of those ballots cast on no fewer than 1 percent of all the direct recording electronic voting machines used in that election chosen at random by the elections official.

(c) The elections official shall use either a random number generator or other method specified in regulations that shall be adopted by the Secretary of State to randomly choose the initial precincts, batches of vote by mail ballots, or direct recording electronic voting machines subject to the public manual tally.

(d) The elections official shall not randomly choose the initial precincts or select an additional precinct for the manual tally until after the close of the polls on election day.

(e) The manual tally shall be a public process, with the official conducting the election providing at least a five-day public notice of the time and place of the manual tally and of the time and place of the selection

of the precincts, batches, or direct recording electronic voting machines subject to the public manual tally before conducting the selection and tally.

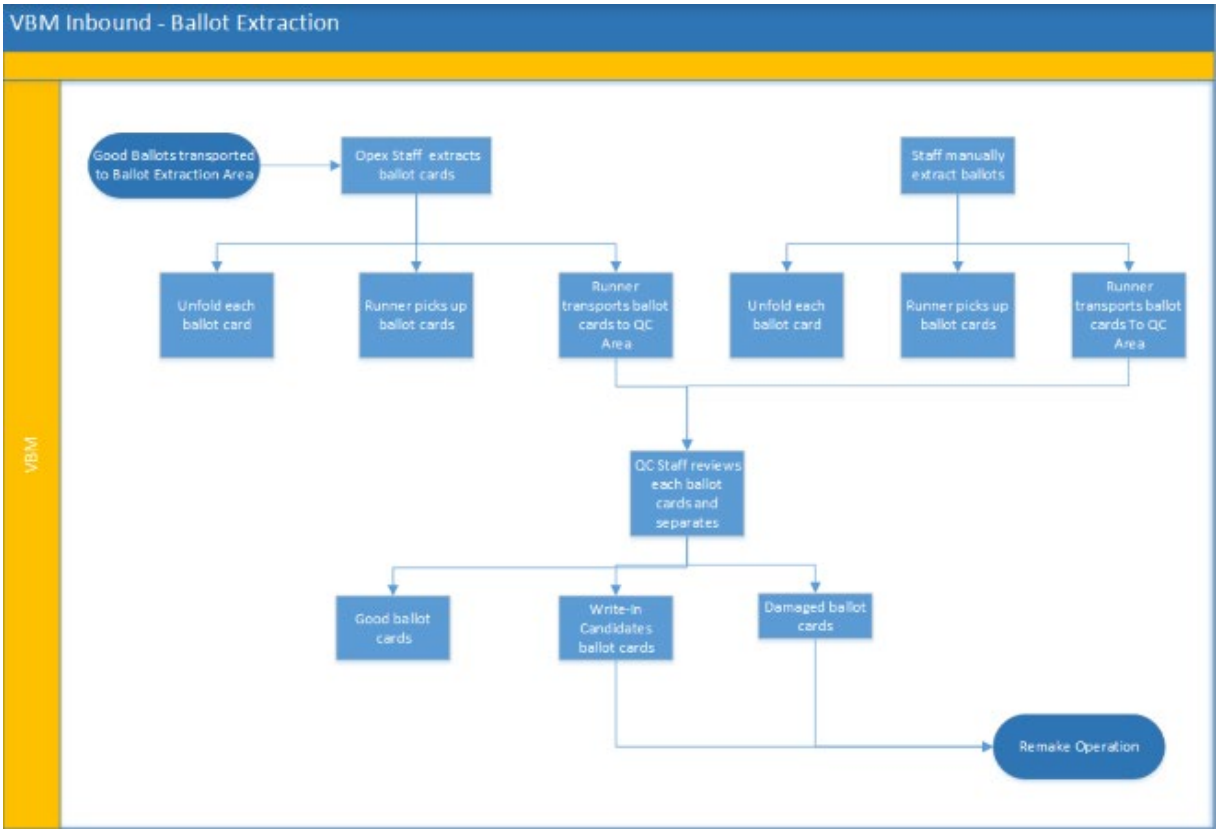
(f) The official conducting the election shall include a report on the results of the 1 percent manual tally in the certification of the official canvass of the vote. This report shall identify any discrepancies between the machine count and the manual tally and a description of how each of these discrepancies was resolved. In resolving a discrepancy involving a vote recorded by means of a punch card voting system or by electronic or electro-mechanical vote tabulating devices, the voter verified paper audit trail shall govern if there is a discrepancy between it and the electronic record.

## 16.7. Handling Ballot Exceptions

VBM ballot extraction begins e-14. During this process QC Staff reviews each ballot and separates good ballots with ones that need further review.

QC tasks include:

- Remove any portion of the ballot stub, such as an incompletely detached perforation, that remains attached to a ballot card
- Jog cards for static electricity removal
- Inspect the ballots for tears, folds, or damage
- Damaged ballots are to be placed in the ballot remake box
- Inspect the ballots for any identifying marks, such as a person’s name, as instructed
- Ballots with identifying marks are placed in the ballot remake box
- Inspect the marks on all ballots as instructed
- When all ballots have been inspected align them so the printed black corner is in the upper right corner




Tally System vote mark detector is an operation that determines if the vote mark is selected or not. Vote mark detector depends on the Tally Layout Definition File (TLDF) to inform how it will be run. The TLDF also lists out the vote marks that need to be processed by ballot style id. When calculating whether a vote mark should be considered as selected or not, the number of pixels counted is compared against this total number of pixels. The target zone of is 113 x 113 pixels with a total of 12,769 pixels, each pixel accounts for about 0.0078% of the total target area. The current configuration for the percentage threshold is 8.1%-100% of the target area. This amounts to at least 1,034px of the 12,769px. If there are more than that many pixels, then the vote mark is counted as a selection.

## 16.8. Post-Election Logic and Accuracy Testing

After an election, Logic and Accuracy testing must be done on to ensure the ballot layouts are correct. See Section 8. System Proofing for details regarding testing.

## 16.9. Final Reporting of Official Canvass

### 16.9.1. Sealing of Ballots

After ballots are counted and sealed, the elections official may not open any ballots nor permit any ballots to be opened except as permitted by law or in the event of a recount.

### 16.9.2. Results

Upon completion of the count, the elections official shall add to the results as so determined, the results of the write-in votes and any paper ballots used as certified by the precinct board, and thereupon shall declare the vote, and forthwith post one copy at the counting place for public inspection.

(a) The elections official shall prepare a certified statement of the results of the election and submit it to the governing body within 30 days of the election or, in the case of school district, community college district, county board of education, or special district elections conducted on the first Tuesday after the first Monday in November of odd-numbered years, no later than the last Monday before the last Friday of that month.

(b) The elections official shall post the certified statement of the results of the election on his or her Internet Web site in a downloadable spreadsheet format that may include, but is not limited to, a comma-separated values file or a tab-separated values file and that is compatible with a spreadsheet software application that is widely used at the time of the posting. The certified statement of the election results shall be posted and maintained on the elections official's Internet Web site for a period of at least 10 years following the election. This subdivision shall apply only to an elections official who uses a computer system that has the capability of producing the election results in a downloadable spreadsheet format without requiring modification of the computer system.

When ballots are counted, the result of the vote shall be shown by precinct.

(a) The statement of the result shall show all of the following:

(1) The total number of ballots cast.

(2) The number of votes cast at each precinct for each candidate and for and against each measure.

(3) The total number of votes cast for each candidate and for and against each measure.

(b) The statement of the result shall also show the number of votes cast in each city, Assembly district, congressional district, senatorial district, State Board of Equalization district, and supervisorial district located in whole or in part in the county, for each candidate for the offices of presidential elector and all statewide offices, depending on the offices to be filled, and on each statewide ballot proposition.

### 16.9.3. Transmission to Secretary of State

The elections official shall send to the Secretary of State within 31 days of the election in an electronic format in the manner requested one complete copy of all results as to all of the following:

(a) All candidates voted for statewide office.

(b) All candidates voted for the following offices:

(1) Member of the Assembly.

(2) Member of the Senate.

(3) Member of the United States House of Representatives.

(4) Member of the State Board of Equalization.

(5) Justice of the Court of Appeal.

(6) Judge of the superior court.

(c) All persons voted for at the presidential primary. The results for all persons voted for at the presidential primary for delegates to national conventions shall be canvassed and shall be sent within 28 days after the election.

(d) The vote given for persons for electors of President and Vice President of the United States. The results for presidential electors shall be endorsed “Presidential Election Returns” and shall be canvassed and sent within 28 days after the election.

(e) All statewide measures.

(f) The total number of ballots cast.

The elections official shall deliver a duplicate of the certified statement of the result of votes cast to the chairperson of the county central committee of each party.

### 16.9.4. Announcement of Results

The governing body shall declare elected or nominated to each office voted on at each election under its jurisdiction the person having the highest number of votes for that office, or who was elected or nominated under the exceptions noted in law. The governing board shall also declare the results of each election under its jurisdiction as to each measure voted on at the election.

The elections official shall make out and deliver to each person elected or nominated, as declared by the governing body, except those elected to a central committee, a certificate of election or nomination, signed and authenticated by the elections official.

(a) Whenever a candidate whose name appears upon the ballot at any election for an office other than a voter-nominated office dies after the 68th day before the election, the votes cast for the deceased candidate shall be counted in determining the results of the election for the office for which the decedent was a candidate. If the deceased candidate receives a majority of the votes cast for the office, he or she shall be considered elected and the office to which he or she was elected shall be vacant at the beginning of the term for which he or she was elected. The vacancy thus created shall be filled in the same manner as if the candidate had died subsequent to taking office for that term.

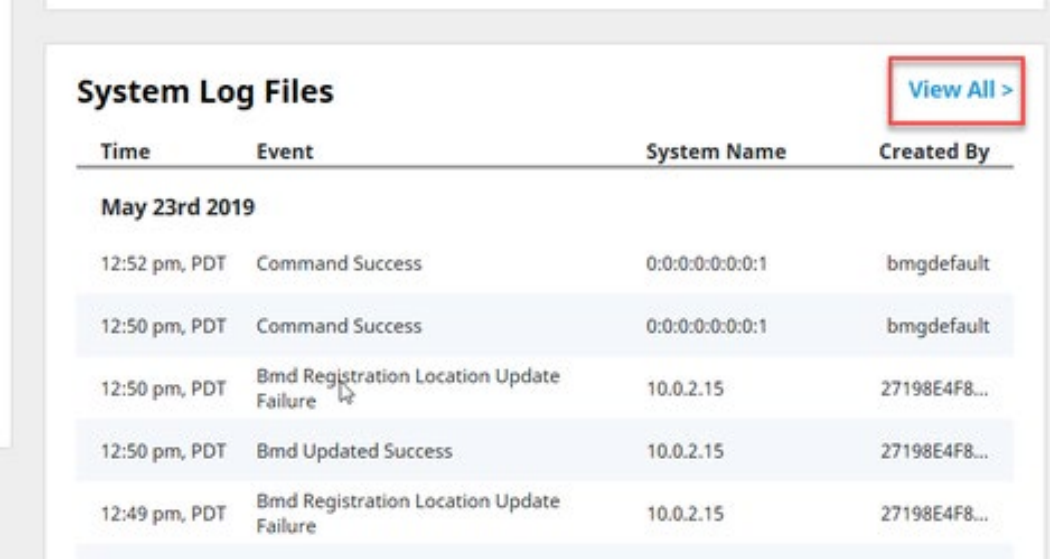
(b) Whenever a candidate whose name appears on the ballot at any election for a voter-nominated office dies, the votes cast for the deceased candidate shall be counted in determining the results of the election for the office for which the decedent was a candidate. If the deceased candidate receives a majority of the votes cast for the office at the general election, he or she shall be considered elected and the office to which he or she was elected shall be vacant at the beginning of the term for which he or she was elected. The vacancy thus created shall be filled in the same manner as if the candidate had died subsequent to taking office for that term.

## 16.10. Backup and Retention of Election Material

After an election, there are some logs and files that must be downloaded and saved. See below to learn how.

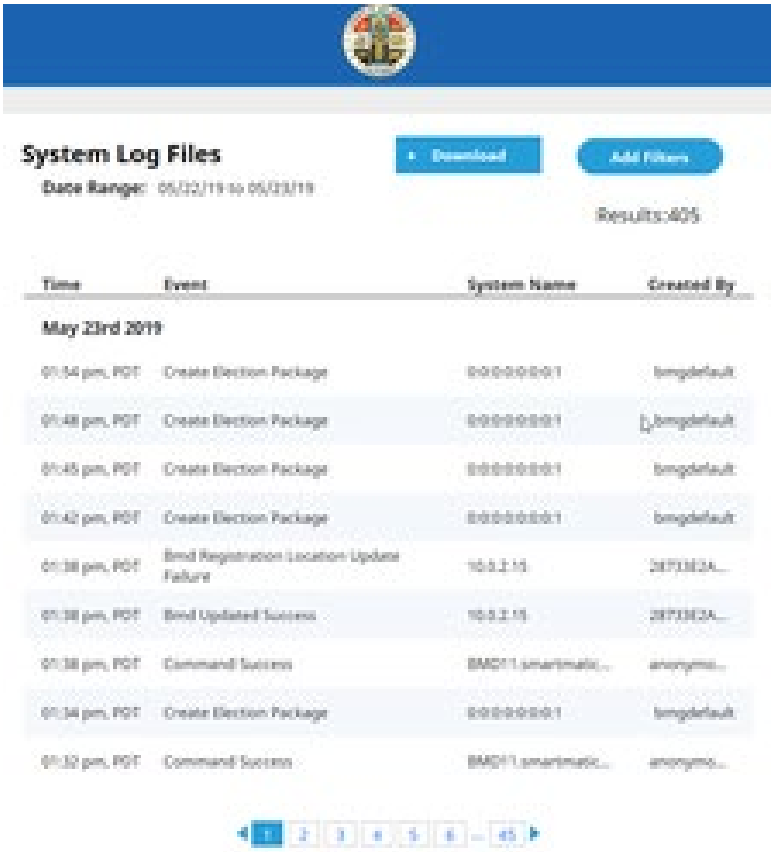
### 16.10.1. BMG

You can download a system log of events that took place in BMG. An Event is defined as any sort of system action that occurred on BMG. This includes any and all actions that were run on BMG, from user log-ins, diagnostic checks, BMD uploads and downloads, or any other actions taken on the BMG system. You can view and download these logs, filtered by certain criteria, by following the instructions below.




A list of all system events appears with a description of the event, the time it occurred, and who performed the event

1. From the BMG home page, in the "System Log Files" section, click View All



2. Click Download and choose a log file format, or click Add Filters. If no filter specification is selected, the system downloads a log of every single action by default

3. Click the dropdown button below to learn more about the different filters you can use

#### 16.10.1.1. Filter Types

**Filter by Date**

You can specify a specific date range for the logs you'd like to see.

**Filter By Created By**

You can see a log of actions performed by a specific user.

**Filter By System Name**

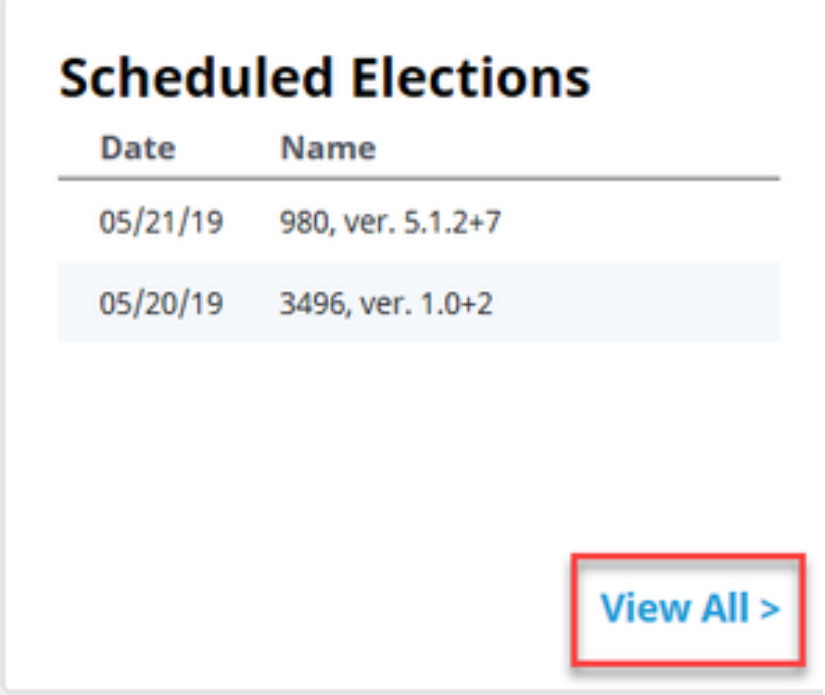
Each type of action is given a specific system name by the BMG system. If you know the system name for the type of action you're looking for, you can enter it here.

**Filter By Events**

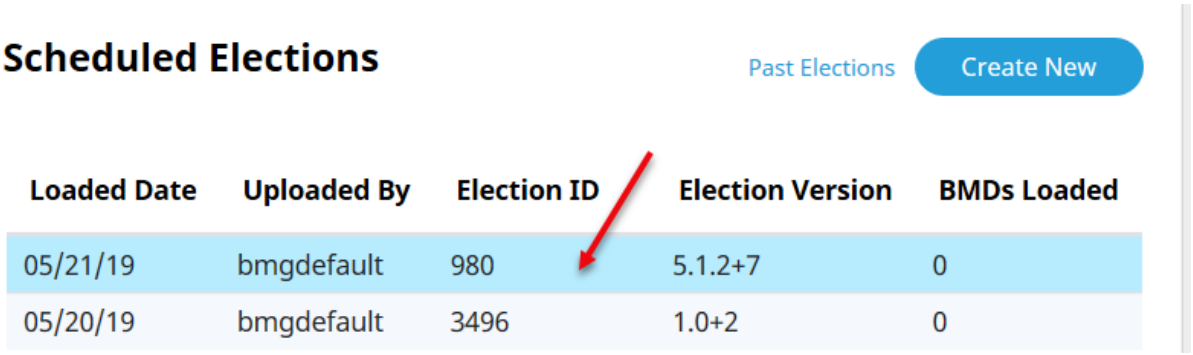
There is a filter by the type of action taken.

### 16.10.2. BMD Logs

After an election is over and the BMD devices have returned, it's time to download the election logs and keys from the devices. The election logs don't record any personal voter data, or any of their ballot selections during the voting process. The logs are simply a collection of the different BMD settings that were made by users, such as volume level, screen brightness, language settings, etc. Reviewing these logs allows developers to enhance the voting experience during the next election by gaining a sense for which BMD functionality settings might need to be updated to be more in line with the settings selections of the average user. The following steps describe how to collect logs using the BMG.




1. From the BMG main page, in the "Scheduled Elections" section, click View All




A page opens with a list of all upcoming elections that have already been scheduled

2. Click on the election ID and version whose logs or keys you'd like to download
3. Click Show Previous to view a list of elections that have already passed
4. Click either Aggregate Keys, or Aggregate Logs

If logs or keys are available for download, a new page opens with the option to download the files

5. Click Download
6. Depending on your computer settings, you will be asked to either download the file, or open it without downloading it
7. Transfer the files to a USB and give it to a Tally representative for processing

# 17. Manual Recount Procedures

Manual Recount Requests should be made in accordance with the California Elections Code and California Code of Regulations Chapter 8.1, including the jurisdictions Recount Procedures that are on file with the Secretary of State.

To validate the accuracy of the vote count, a public manual recount of at least one percent of the total ballots cast, chosen at random, shall be conducted within fifteen days if requested.

All the original ballots will be reviewed for each contest. Votes will be recorded on tally sheets.

The process for Manual Recounts is as follows:

- Tally board is prepared with ballots from a batch and tally sheets
- For each contest the selection from every ballot is read aloud
- Any voter may request a recount pursuant to the Election Code sections 15620, 15621 or 15623
- The other party records each vote on the tally sheet with one pencil stroke per vote. Includes any under or voter voted contests
- The total of all pencil strokes for each candidate is counted and written into the proper box on the tally sheet

# 18. Security

## 18.1. Physical Security of System and Components

The System Security describes the voting system security. The system features access control mechanisms, equipment and data security, software installation and security policies, air gap policies, event logging details, physical security structures, specifications, standards, and regulations designed to protect the voting process from malicious attacks, data breaches, and accidental security incidents.

Network - The network domain that hosts election definition and ballot layout functions is physically separate from system and does not have inter-connectivity of traffic between domains. Data is transferred through a manual process under human control. The system is hosted on a separate network domain that is not physically connected to any other County LAN and no physical interconnections exist between the system and any other network or end-point device that connects to the Internet.

Protective Barrier - The placement and design of the room where the system and components are housed must allow for a secure environment that aims to deter or delay any attempt to disrupt operations while providing a means for interested parties to observe.

Rack-mounted Equipment - Hardware components such as scanners, servers and network devices must be housed in locked enclosures that contain racks for servers, network switches, power distribution units, and other components or peripherals. Serialized tamper-evident seals are used on removable panels. Removal and replacement of seals must be witnessed by at least two election staff members and documented using a log with signatures by both parties.

Access Control - Entry and Exit doors should be restricted. A security guard should ensure that only employees with badges or escorted visitors are allowed to enter the facility. Policies and procedures for access control to the tabulation room must be defined and implemented.

| System | Method | Description | Specifications |
|---|---|---|---|
| BMD | Trusted Platform Module (TPM) | The trusted platform module prevents unsigned software from signing onto the system | The TPM, a secure crypto-processor, integrates cryptographic keys into the BMD |
| BMG | Network Access Control | HP Aruba ClearPass: MAC address control, prevents non-authorized computers from accessing network | Tracks the machine MAC addresses of all computer network cards present on the network and removes any unauthorized network card MAC address from a network |
| ESA | Two-factor authentication with smart card | Radio Frequency Identification (RFID) limits access to the HSM | The smart card RFID is issued to an authorized individual, which serves as a part of two-factor authentication. |
| ISB | Network Access Control | HP Aruba ClearPass: MAC address control, prevents | Tracks the machine MAC addresses of all computer network cards present on the network and removes any |

| System | Method | Description | Specifications |
|---|---|---|---|
| | | non-authorized computers from accessing network | unauthorized network card MAC address from a network |
| Tally | Network Access Control | HP Aruba ClearPass: MAC address control, prevents non-authorized computers from accessing network | Tracks the machine MAC addresses of all computer network cards present on the network and removes any unauthorized network card MAC address from a network |
| VBL | Network Access Control | HP Aruba ClearPass: MAC address control, prevents non-auth computers from accessing network | Tracks the machine MAC addresses of all computer network cards present on the network and removes any unauthorized network card MAC address from a network |

## 18.2. Logical Security of System and Components

### 18.2.1. Essential and Non-Essential Services and Ports

Unused USB data ports are covered with serialized tamper evident seals on the VSAP servers and related components. The serialized tamper evident seals are manually logged with an operator signature, seal number, location, date, and time.

| Component | Ports and Access Points |
|---|---|
| BMD | USB port, Ethernet port, 3 x 3.5 mm ports |
| BMG | USB port, Ethernet port, 3.5 mm audio, HDMI, SD card reader, and VGA<br>HPE ProLiant DL830 Gen10: Display Port 1, 8 LFF chassis standard Flexible LOM Network Ports, 4 x 1 Gb ports, HPE iLO Remote Management Network Port, 1 Gb Dedicated Front iLO Service Port, Micro SD Slot 1 Micro SD, USB 3.0: 1 front, 2 rear, 2 internal (secure) HP 8320 JL479A: 48p 10G SFP/SFP+ and 6p 40G QSFP+ Switch HP8320 JL579A: 32p 40G QSFP+ HP3810M JL075A: 16 SFP+ fixed 1000/10000 SFP+ ports; Duplex: 100BASE-TX: half or full; 1000BASE-T: full only; Ports 1 – 16 support MACSec HP2930F JL253A: 24 RJ-45 autosensing 10/100/1000 ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T); Duplex: 10BASE-T/ 100BASE-TX: half or full; 1000BASE-T: full only; 4 SFP+ 1/10GbE ports; PHY-less HP2530-8G JL9777A: 8 RJ-45 autosensing 10/100/1000 ports (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T); Media Type: Auto-MDIX; Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T: full only; 2 dual-personality ports; each port can be used as either an RJ-45 10/100/1000 port (IEEE 802.3 Type 10Base-T; IEEE 802.3u Type 100Base-Tx; IEEE 802.3ab 1000Base-T Gigabit Ethernet) or as a SFP slot (for use with SFP transceivers) ports |

| Component | Ports and Access Points |
|---|---|
| ESA | Intel NUC7i7DNHE: USB, SATA, Ethernet nShield Edge F2 HSM: SD card reader and USB |
| ISB | USB port, Ethernet port, 3.5 mm audio, HDMI, SD card reader, and VGA |
| Tally | Compute servers: USB, Ethernet, Video/display, PS2, Audio Scanner machines and scanner support machines: Ethernet, Video/display, PS2, Audio Storage Appliance: Ethernet, Audio Workstations: USB, Ethernet, Video/display, PS2, Audio Switches: Various network |
| VBL | Compute server: USB, Ethernet, Video/display, PS2, Audio Workstations: USB, Ethernet, Video/display, PS2, Audio Switches: Various network |

### 18.2.2. User-Level Security

The system has numerous access controls to deter unauthorized users from accessing the system. There are three role types in the system. The first role is the Linux administrator. The Linux administrator can configure the system, setup new users, set up configuration files, configure the system, and view logs. Second is the application admin. The application administrator can manage running services in the system, tabulate elections, view errors, and conduct all necessary election night operations. Finally, is the view-only user who can look at the Manager interface, but cannot physically affect the system.

The system is only accessible to individuals who have a username and password. Usernames and passwords are managed via process by the system administrator. User passwords are never stored in clear text or reversible formats. There is a system tool for generating password entries. All user passwords are stored with password encoder software. These files are protected via file permissions.

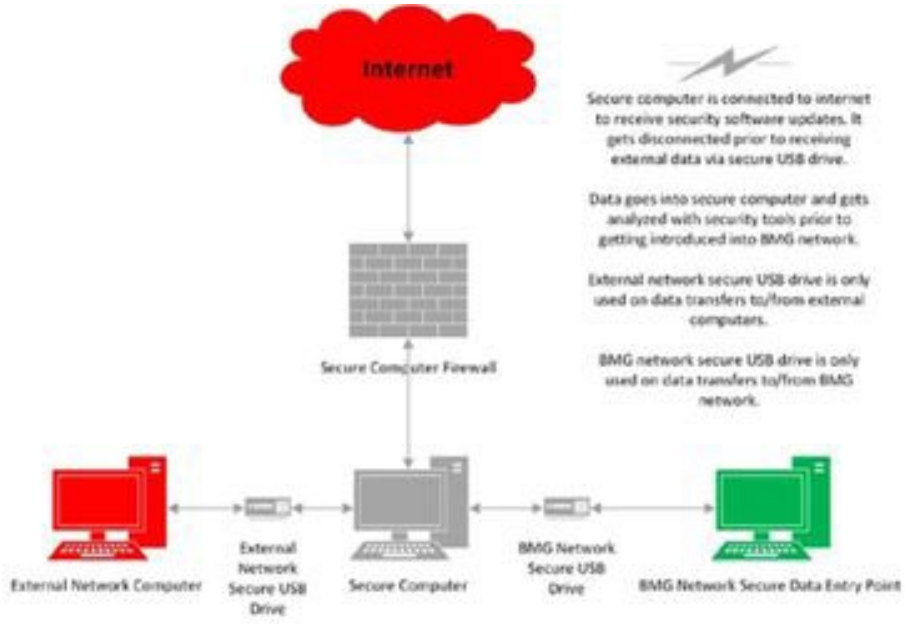
### 18.2.3. Anti-Virus Protection

System security in an air-gapped environment:

- Carbon Black Protect Software (CB Protect): This software once installed, takes away elevated privileges on any operating system. All software on a computer system with CB protect installed is subject to permission from it to execute. This software functionality reduces the chances of malicious software to run on a computer. However, it is strongly advised to have Smartmatic assist in the install of this product in the air-gap environments and for CVSS testing. Any mis-configuration can interfere with the proper operation of software on a computer system.
- HP Aruba ClearPass: tracks the machine (MAC) addresses of all computer network cards present on a computer network. The software, in addition to monitoring MAC addresses, can remove any network card MAC address from a network that is not authorized to be on that network. This software function disrupts any attacker from placing implants or connecting workstations to any air-gap network without authorization.

It is recommended that Smartmatic personnel assist in the installation of this software to any air-gapped network. This software improperly configured can also like CB Protect disrupt proper operation of the computer network.

- Snare System Information and Event Management (SIEM): The Snare SIEM tracks all computer system and network activities and records them for a retention period of up to several years provided there is adequate storage. SIEM will be the method by which all network activity will be tracked for review in the event of an attack or issue. Once a SIEM record is created it is locked in the system and cannot be tampered with or changed. Smartmatic recommends that Smartmatic personnel assist or take the lead in the installation of this software inside the air gaps.




### 18.2.4. Verifying, Checking, and Installing Essential Updates and Changes

Changes are primarily for installing critical updates to operating system, anti-virus protection or other third-party elements related to security and error correction.

## 18.3. Event Logging Capabilities

### 18.3.1. BMD

A usage data collection log file records executed events on the device; audit logs will record every event triggered in the BMD as one of the following types: info, error, warn, fatal, and debug. Logging is performed in the voting app. The BMD Interaction Data (BID) is a fixed-sized usage log that counts ballots cast. The BMD Election Log (BEL) is an audit log that creates separate records for each user interaction.

The BMD allows multiple BELs for multiple elections. All logs are written to the data partition. The BMD employs the SIEM to capture system events.

### 18.3.2. BMG

The BMG contains a file-based audit logging system. Timestamps will be generated in the format ISO8601 including time zone (e.g. 2017-09-26T01:57:58+00:00). Event logs are stored and reported through ElasticSearch. The BMG employs the SIEM to capture system events.

### 18.3.3. ESA

The ESA uses a file-based logging system. The ESA program and scripts write system logs to a text file located on a central Unix directory. Log files can be read using standard Unix text processing commands such as less and cat. Since the ESA is intended to be used only occasionally and for limited numbers of tasks, log files are not expected to grow significantly, eliminating any need for rotating files.

### 18.3.4. ISB

The ISB logs specific events to a log file, including:

- System ID
- Unique event ID and/or type
- Timestamp
- Success or failure of event, if applicable
- User ID trigger the event, if applicable
- Resources requested, if applicable

The ISB will use AWS S3 for storage of the statically hosted log files. It will employ encryption and will have AWS CloudTrail logs enabled.

### 18.3.5. Tally

Tally employs the SIEM to capture system events.

### 18.3.6. VBL

The VBL employs the SIEM to capture system events.

## 18.4. Event Logging Design and Implementation

### 18.4.1. BMD

To facilitate security and traceability of the BMD, logging capabilities are designed to capture information about each unique event, including: sequence number, unique event ID, transaction results, user and event types, average voting session time, and event occurrences.

SSD has four partitions, one of which stores logs (Data partition). Diagnostic (pre-setup) has logs, then logs are captured while users are voting; then they’re unpacked or read back at the warehouse when connected to BMG.

### 18.4.2. BMG

Elastic Search: for daily logs are aggregated into CSV files for export for any period longer than 24 hours

Design = Database (SQL) maybe built into Elastic Search.

The system information and event management (SIEM) software provides an audit trail through continuous logging of network activity. The system uses Snare as its SIEM, in conjunction with the

network traffic monitor LANGuardian, providing up to one year of highly detailed log data for the network. This data is suitable to provide actionable intelligence and critical insight both for security monitoring and incident response forensics. These products are also capable of reporting a summary overview.

### 18.4.3. ESA

Testing output, event logs, and error logs are all stored in a local log file.

### 18.4.4. ISB

AWS access logs stored in the S3 bucket.

### 18.4.5. Tally

Each Tally service logs events to the file system and makes them available through the Log Viewer page, which is accessible on the Tally environment. The logs are preserved for auditing and are included in an archive of the election. The archive of the logs includes all election specific logs and general logs that have been generated at the moment the archive is requested. Logs are created and use signed log-chaining to ensure the validity of the audit log and to help discover any logs which have been maliciously added. Rotation of logs is set for each service and is used to preserve disk space as logs grow over time. Log viewer is not a generic tool that can pull in logs from any system. Due to that, third party tools such as Kafka and Cassandra log via their native logging patterns. Those logs are not readily accessible through the Tally UI.

### 18.4.6. VBL

Each VBL service logs events to logs on the file system. The logs will be preserved for auditing. Logs are created and use signed log-chaining to ensure the validity of the audit log and to help discover any logs which have been maliciously added. Logging also includes rotation of files in order to preserve disk space as logs grow over time.

## 18.5. Installation Procedures

The system is hosted on a separate network domain that is not physically connected to any other County LAN and has no physical interconnections existing between the system and any other network or end-point device that connects to the Internet. The application runs on a standalone COTS PC and is physically separated from the system. Data between the two systems is transferred through a manual process under human control and performed by trusted staff. Installation of updates is performed through a set of manual procedures overseen by trusted election managers. Installation activities are documented with at least two staff members performing updates. Documentation includes, date-time of update, person who performed activity, person who witnessed the activity, and certification that update installed was previously approved.

### 18.5.1. Acceptance Testing After the Installation

Before each election, version control testing will be conducted to make sure that each component of the electronic voting system is using a certified version of the vendor’s software and firmware.

The California Secretary of State’s Office requires parallel testing of voting devices on Election Day. The parallel testing procedure includes the random selection of voting devices the morning of the election from various precincts within the county. Once selected, the voting devices are thoroughly tested for accuracy and reliability by designated California Secretary of State election personnel. The accuracy

testing runs the entire duration of the election. Election result reports are then generated from each devices unit once the election concludes so the accuracy of the system can be validated.

## 18.6. Security Procedures for the BMD Warehouse

Physical security standards for all persons working or entering the BMD Warehouse. These policies comply with NIST 800-171 Physical Protection, Media, and Personal Security Policies.

Authorization is required to enter the BMD Warehouse. The following are the only authorized personnel:

- Select, jurisdictionally appropriate, personnel
- Approved contractors
- Building maintenance personnel

The following personnel are authorized, but may be subject to the jurisdiction's escort and monitor policy:

- Vendors (including delivery personnel)
- Visitors

Valid ID badges are required to enter the BMD warehouse and must be worn and visible when one is inside the building. Visitors will be expected to have temporary badges distributed from the visitor management system. Any person without a badge showing authorization is considered an adversary and will be escorted to the security desk immediately.

Employees will report a badge that's been lost, stolen, or compromised in any way, to the security office.

Refer to jurisdictional procedure guides for further information on existing guidelines governing identification of personnel entering Information Technology areas.

Cameras will monitor all areas of security concern:

- Truck and delivery yard
- Employee parking
- Visitor center entrances
- Employee entrances
- Warehouse for BMDs
- BMD repair facility
- Kitting area

The facility will create protected yards for employee parking, and facilities for trucks and large equipment.

- Gates and fences will protect the warehouse loading bays from being penetrated by unauthorized persons
- Gates will be monitored by site security personnel

Employee physical access will account for tailgating, which is when an unauthorized person gains access by trailing behind authorized personnel.

- The employee entrance area will also be monitored by cameras. In addition to monitoring, these cameras will remind employees to be vigilant regarding security while inside the facility

Video will be accessible from inside from inside the facility. Proper authentication will allow for secure access by jurisdictionally appropriate security personnel and the local sheriff's office, as well as from inside the facility.

A burglar alarm will be configured to detect any unauthorized entrance to the facility. The final design of the security system will be determined based on the characteristics of the facility selected for the BMD warehouse.

All USB media are to be serialized and tracked to individual users via a checkout sheet maintained by the IT Security Staff.

The server\switching rooms shall have restrictions on phones and employee-owned personal electronics inside those areas. The individual devices restriction policy shall be enforced by BMD warehouse staff via written policy. No employee-owned smartphone or personal electronic device will be allowed inside critical air-gapped server rooms or server areas connected to the electronic poll books. All employee-owned electronic devices shall be kept in lockers placed outside of the server rooms. Failure to follow the policy should result in disciplinary action from the BMD warehouse management staff.

- Employee-owned electronic devices can be compromised by improper security, or by the term of service agreements for applications on the phone.
- Terms of service or improper activity may cause cameras, microphones, and the GPS data in the device to be turned on and used for surveillance of restricted sites, without the knowledge or permission of the owner.

Adherence to the following procedures is required:

- All BMD Warehouse employees are expected to keep a clean workstation area
- Any documents related to the voting operations will be in a locked drawer or other secure areas when not in use
- Workstations screens are to be locked when employees are away from their computers by Windows group policy of no longer than five minutes
- Any removable storage devices must be locked in a protected area
- Any documents to be discarded must be shredded

Employees are not allowed to use personal devices to audio- or video-record any activity within the BMD Warehouse. Management must be notified to find a solution if an employee requires audio or video recordings. As stated earlier, it is possible via a term of service for photographs taken on a smartphone to be shared without the user's knowledge.

Only jurisdictionally appropriate or Smartmatic issued computers are allowed to connect to the VSAP network facilities at any time.

All computers must be registered to the network access solution protecting the VSAP network. Any computer not known to the network access software will be restricted, and alerts will be sent to IT security staff immediately.

Personal storage and media devices are not allowed to be connected to computers. Security software will only allow connections by USB to devices designated by an appropriate local, state, or federal jurisdiction personnel. Restricted storage and media devices include:

- USB drives
- Flash drives
- Mobile phones
- Any other devices capable of recording

A vendor who brings these devices into the BMD warehouse must present them to IT security for malware scanning by the designated AI antivirus software. Any necessary or required data will be copied to a USB storage device issued by an appropriate local, state, or federal jurisdiction and provided to the vendor for the work required and returned at the completion of the work to the security desk. This

provided storage device must be returned to IT security once the vendor has completed their task. The vendor then will retrieve their personal device. Any vendor who violates these rules will be subject to immediate removal from the BMD warehouse.

In some cases, IT security may authorize, issue, clear, and track media devices that connected to BMD warehouse computers and servers. Any USB device or media shall be purchased by the appropriate local, state, or federal jurisdiction and security tested by IT security personnel prior to use in the network. Devices will then be assigned random serial numbers to verify they are safe to use.

Only serialized USB storage media managed and tracked by BMD warehouse security staff will be connected to VSAP equipment.

All computers not requiring a USB media connection, as determined by BMD warehouse security staff, will have their USB ports disabled by an endpoint security software or physically.

Any device used to connect to VSAP equipment without a serial number must be turned in to IT security for examination.

Every quarter, the security staff will perform random tests to assess physical security and compliance with access procedures. It is strongly recommended that a "red team" of security evaluators test the facility after each election to determine security compliance.

## 18.7. Security Procedures for Vote Center

### 18.7.1. BMD Vote Center Storage and Security Seal

BMD devices will be delivered to the Vote Centers prior to Election Day. During transit, carts and storage containers are sealed with evidence tape and/or tamper evident seals. Access points to the BMD are outfitted with tamper evident seals with either or both tamper evident residue or visual appearance change to the seal itself to reveal modification or removal and to help prevent access or theft (see pictures below). The BMD ballot boxes are also outfitted with tamper evident zip-tie style seals utilizing signaling evident technology to reveal modification and/or removal. In addition, a tamper-evident seal is also placed over the seam of the IBB (see picture below of tamper-evident seal). Removing, creasing, scratching of laminating the factory applied film exposes prominent "OPEN VOID" messages. Seals use Secure ID technology that has a distinctive metallic finish which serves as an anti-counterfeiting and authentication feature. In addition, BMDs will be kept in a secure location at each Vote Center. During overnight storage, BMDs should be stored in rooms that are sealed with evidence tape at access points and/or in rooms that can be locked with a key.


*Integrated Ballot Box security seal*

*USB and Ethernet port security seal*

All tamper evident seals are serialized and logged via established "chain-of-custody" procedures; this includes replacing and logging any need to break seal(s) for reason of entering a storage area, room, ballot box, or any other secured locale. An election inspector / overseer will verify that the correct seals are intact on the BMD containers, carts, and devices prior to set up, and use in the election.

### 18.7.2. Ballot QR Codes

The Ballot Page Metadata (BPM) QR code in the upper left-hand corner of the ballot contains information about current election status and indicates the ballot's originating BMD. BMDs assigned to the election pass their security keys to Tally; BMDs that are not officially part of the election will produce an error.

Additional security measures:

- An audit of each precinct's electronic tally of the number of votes cast will be conducted against the number of signatures in the precinct's ePollbook
- Vote center officials will be required to certify in writing that the proper locks and seals were found intact on the BMD devices, carts, and containers before the polls open. Exceptions and discrepancies will be reported to the Help Desk immediately upon discovery
- A physical inventory of all BMD devices will be conducted before and after each election to ensure custody of all devices is maintained and/or accounted for; there are functions within the BMG that can be used to aid in this inventory (for more information see VSAP-USG-003 BMG User Guide)

# 19. Audit Trails

Election audit trails are vital to validating the accuracy of election results. All system components create an audit log anytime the system is accessed, or data is changed. Audit logs can be opened and printed to hard copy if needed.

## 19.1. BMD Log Files

The BMD logs significant system events during elections and anonymous usage data. This information is useful for auditing purposes and for ongoing user experience analysis. These logs are retrieved using the BMG.

Per federal law, County personnel must ensure retention for a 22-month minimum period of all election artifacts. This includes electronic records collected by the VSAP system such as: VBL, BMG, and Tally event logs and the aggregated BMD event logs.

| Log File | Type | What it Tracks |
|---|---|---|
| BID - BMD Election Interaction Data | Audit | Information about the interactions between the voter and the system, such as:<br>• Font size<br>• Language<br>• Voting system time<br>• Only aggregate interaction data is recorded, not individual voter choices |
| BEL - BMD Election Logs | Usage | Each event triggered during the voting experience at the BMD, such as:<br>• Shutdown<br>• Empty ballot box<br>• Cancel voting session |

# 20. Biennial Hardware Certification and Notification

California Elections Code requires jurisdictions to inspect voting systems and certify their accuracy once every two years. All ballot marking devices, tabulators, scanners, elections management software, and supplementary equipment must be certified by California's Secretary of State prior to their use in any election taking place in California. In addition, all specialized tally equipment must be certified for use in elections by the Secretary of State prior to use in any election.

## 20.1. Notification of Equipment

For each statewide election, the responsible county Election Official prepares a list, including quantities, of all equipment to be used to tabulate votes during the semi-official and official canvass. Seven days before each statewide election, the Election Official shall certify to the Secretary of State the results of the logic tests, as well as the accurate functioning of all ballot tally equipment. This certification shall also affirm the use of the same equipment for the Pre-Election Logic and Accuracy test, and for semi-official and official vote canvasses.

In the event of a change to the ballot tally program after certification, an amended certificate shall be submitted no later than the day before the election. In the event any equipment is repaired, altered or replaced following the certification specified in this section, and prior to completion of the official canvass of the vote, an amended certification of Logic and Accuracy testing and a revised list of equipment used must be submitted to the Secretary of State no later than official canvass submission.