eSlate™ Electronic Voting System

Product Description

Hart InterCivic

Election Solutions Group

1650 Coal Creek Drive, Suite E
Lafayette, Colorado 80026

Phone: 303.385.6440  Fax: 303.385.6477

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Hart InterCivic, Election Solutions Group is committed to election integrity and customer satisfaction. All products, components, and services provided to our customer shall be safe, secure, and effective for their intended use, and they shall meet or exceed the quality and reliability levels expected by the marketplace.
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About This Book

This book describes the Hart InterCivic Election Solutions Group's eSlate™ Electronic Voting System.

How this Manual is Organized

This manual contains suggested procedures for using the Hart InterCivic eSlate™ Electronic Voting System to run an election. The subjects covered include:

- Overview of the Hart InterCivic eSlate™ Electronic Voting System (see page 8)
- Technical Support (see page 17)
- Computer Security and Recovery (see page 19)
- The eSlate™ Electronic Voting System Election Cycle (see page 23)

Additional Reference Material

Manuals for the eSlate™ Electronic Voting System software and equipment from Hart InterCivic, Election Solutions Group include the following:

**eSlate™ Electronic Voting System Product Description (this book)**

This manual describes how the various software and equipment components of the eSlate Electronic Voting System are used to run an election.

**eSlate™ Ballot Origination Software System Operations Manual**

This manual describes how to use the Ballot Origination Software System™ software application, referred to as BOSS, to create an Election database from which you can create MBBS (Mobile Ballot Box™) for use with the eSlate Electronic Voting System.

**eSlate™ Precinct Voting System Election Day Manual**

This manual describes how to set up and use the eSlate™ Precinct Voting System (PVS) equipment in a polling place on Election Day.

**eSlate™ Precinct Voting System Early Voting Manual**

This manual describes how to set up and use the PVS equipment in Early Voting polling places.

**eSlate™ Precinct Voting System DAU 5000 Voting Unit Setup Manual**

This manual describes how to set up and use the DAU 5000™ voting units.

**Ballot Now Operations Manual**

This manual describes how to manage paper ballots for an election created from the eSlate Electronic Voting System.

**eSlate™ Tally System Operations Manual**

This manual describes how to use the Tally™ application software to read and tally the votes on MBBS that were used during an election.
1 Hart InterCivic eSlate™ Electronic Voting System

1.1 The eSlate™ Electronic Voting System Architecture

- BOSS Application
- TALLY Application
- MBB Flash-Card
- PVS Judges Booth Controller
- eSlate Voting Unit
- FastTrac Application
- Ballot Now Application
- Ballot Now Image Processing
- Preliminary Election Results Reports
- Tally Archived Data
- Election Results Reports
- Paper Ballots
- Voted Paper Ballots
- BOSS Data
1.2 System Overview

The Hart InterCivic eSlate™ Electronic Voting System is a completely integrated suite of products that offers the most streamlined and efficient method for conducting and reporting elections. The eSlate™ Electronic Voting System has three major components:

- The Ballot Origination Software System (BOSS)
- Precinct Voting System (PVS)
- Tally System (Tally)

1.2.1 BOSS

The Ballot Origination Software System (BOSS) is a software application that accepts user input of jurisdictional and election specific information. BOSS is a Windows-based program and uses a commercial database product to store and manipulate data. The ballot generation feature of BOSS creates electronic ballot styles based on the jurisdictional and election specific information supplied by the user. Ballot generation creates a single data file that is used to conduct the election at any polling location. The eSlate proprietary data file is written to multiple PC card memory devices called the Mobile Ballot Boxes (MBBs). MBBs are transported to the various polling locations throughout the county. Each MBB contains the same information so that they can be used in any location. In a polling place, the MBB is used to configure the Precinct Voting System (PVS) and supply ballot data for the election. The same MBB is used to return the ballot images captured by the PVS to Election Headquarters for tabulation by Tally. Once BOSS generates the file for the MBB, the BOSS database becomes locked so that no more changes can be made, thus protecting the integrity of the MBB data file. The BOSS database is subsequently used to initialize the Tally database.

1.2.2 Precinct Voting System

The Precinct Voting System (PVS) is a Direct Recording Electronic (DRE) voting system designed to manage and conduct polling place activities during an election. The PVS is used for Election Day polling places and early voting sites.

The PVS is electronically networked and is made up of a controller, called the Judges Booth Controller (Controller), and multiple voter-input devices, called the eSlate.
1.2.2.1 The Judges Booth Controller (Controller)

The Controller is a stand-alone device located at each precinct-polling place and controls from one to twelve eSlate voting units.

- A display for delivery of instructions and messages to the operator
- Selection buttons located on the perimeter of the display
- An alphanumeric keypad for entering precinct names, ballots styles and other data
- A built-in printer for printing ballot Access Code tickets, and test and election information
- A slot to insert a PC Card (Mobile Ballot Box [MBB])
- 12 status lights used to indicate the state of each of the connected eSlate voting units

1.2.2.2 eSlate Voting Unit

The eSlate voting unit is used for presenting the ballot to the voting public and accepting their selections.

- A Liquid Crystal Display (LCD) with a protective shield for displaying the ballot
- A user input area that includes a set of push buttons and a wheel for ballot navigation
- A battery area for a battery pack
1.2.2.3 Disabled Access Unit (DAU)

The DAU is an optional device that can be included in the eSlate and provides the following additional features:

- Audio output for "reading" the ballot to the voter
- A slot to insert a PC card containing audio data
- Remote switch input used for the physically disabled

1.2.2.4 The Mobile Ballot Box (MBB)

The MBB is a reusable, portable PC card memory device that is used for storing and transporting election information to and from the polling places. The MBB can have data stored to it many different times using FLASH memory, which does not require batteries to maintain the information written to it. The file created by the ballot generation process in BOSS is written to the MBBs and contains the following:

- All possible ballot styles for the jurisdiction
- A list of polling places and allowable ballot styles for each
- Ballot format information for display on the eSlate voting units and for Ballot Now to print ballots
- A list of serial numbers for registered eSlates and Controllers
- Passwords

During an election, the MBB is installed in the Controller and additional information specific to the voting location is written to the MBB. As voters cast their ballots, ballot images (Cast Vote Records [CVRs]) are written to the MBB as well as audit data associated with the election events.

1.2.3 Ballot Now

Ballot Now is a software application that handles the output and input of paper-based ballots within the Hart InterCivic eSlate Electronic Voting System suite of products. Ballot Now receives data from BOSS via the Ballot Now MBB and delivers data to Tally via the Ballot Now MBB. The system receives input from the user and scanned ballots, and provides the user with reports.

Ballot Now is designed to support paper-based voting solutions, either as a stand-alone system for smaller entities or to complement the Hart InterCivic eSlate Electronic Voting System suite of products. Ballot Now manages a print-on-demand capability to print ballots for testing, sample ballots, and official ballots for delivery to the voter. The same information used to print the ballot is used to define a digital scanning template for processing ballots upon their return. Once the voter returns their marked ballot, Ballot Now uses a high-speed scanner for creating electronic images of the paper ballot, and then applies voting logic to the digital image and extracts the cast vote record.

Ballot Now provides functionality to:

- Apply voting logic to preview and resolve overvoted and undervoted ballots, and write-ins
- Electronically store election records
- Manage the process of writing Cast Vote Record (CVR's) into the MBB for transfer to Tally for tabulation
- Supply a variety of reports about the ballot processing and related activities that can be viewed and printed at any time

The Ballot Now application window displays Public and Private counters.

This system does not:

- Support maintenance of voter registration records
- Print ballot envelopes or labels
- Manage ballot return envelopes

1.2 System Overview
1.2.4 Tally

Tally is a software application that reads, stores, and tabulates the CVRs from the MBBs. At the close of polls on Election Day, all of the MBBs are returned to the central location, including early voting MBBs, and Tally copies the data stored on each. The MBBs contain CVRs captured by the PVS and audit trail data that authenticates the CVRs. Tally is initialized with the locked BOSS database that was used to create the election. This initialization "programs" Tally for tabulation. The only required task prior to beginning the tabulation process is to input any approved write-in candidate names.

1.2.5 Fast-trac

A software utility, Fast-trac, allows a summary of results to be sent to Election Headquarters from the precinct-based Controller to provide advanced, unofficial results. Fast-trac sums the results from the Controller so those preliminary totals may be reported as quickly as possible after the polls close. The utility is separate from the Tally application to protect Tally from possible outside intrusion.

1.3 Preparing for the Election

1.3.1 Election Preparation

Preparing for an election begins with entering information into BOSS. Typically, jurisdictional information such as precinct and polling place names is entered prior to an election cycle. Once an election cycle begins, election specific information is entered into BOSS. Ballot content is proofed using the reports produced by BOSS and once verified, ballot generation produces the electronic ballot data file that contains all the ballot styles necessary for the election. This file is written to the MBBs, which are distributed to the polling locations. Any MBB may be installed in the Controller at Election Headquarters or at the precinct-polling place.

If Ballot Now will be used to produce and record paper ballots, one MBB is reserved for use with Ballot Now.

With all possible ballot styles in the MBB, all Precinct Voting System (PVS) hardware is generic so that any Controller, MBB or eSlate may be used at any location.

Since the hardware for the PVS is generic, the distribution and delivery of equipment is greatly simplified. The equipment may be delivered prior to Election Day and securely stored at the site, or, because the hardware is highly portable, the polling place officials may transport it on the day of use.

1.3.2 Election Day and Early Voting

With the PVS, Election Day and Early Voting use the same processes except when closing the polls. The eSlates, Controller, MBB, and booths are either delivered or are brought to the precinct by the poll workers. The Controller is the host for a serial-connected network consisting of one Controller and from one (1) to twelve (12) eSlates, depending on the size of the precincts and the anticipated turnout of registered voters.

The polling process begins with a pre-election sequence that leads into the polls open operation. Once voting is complete, the polls are closed and the collected information is prepared for transport back to headquarters.

When power is applied to the Controller, a power on self-test is run by the internal software and a check is performed for the presence of the MBB. The MBB may have been installed at headquarters or can be installed at the polling place. The Controller reads the data on the MBB and verifies that the MBB contains the proper data.

The first step in pre-election-sequence requires the poll worker to input the polling location into the Controller and assign booth numbers to the eSlates. The Precinct Voting System is then configured for
voting by pressing the Enter button in each connected eSlate. At this point, a “zero count” tape is printed from the Controller and the polls are ready to open.

Only after the zero count tape is produced does the Controller display the option to open the polls. The poll worker selects “Open Polls” and then is prompted for an optional password.

The polls open and the Controller’s Booth Status Lights are green, indicating each connected eSlate is “Available.”

1.3.2.1 The Polling Process

To begin the voting sequence, a voter presents the necessary identification to the poll worker for validation of eligibility. The poll worker looks up the voter’s name, which has an alphanumeric ballot style or precinct number associated with it. The ballot style or precinct number can be input into the Controller directly by the poll worker or can be selected from a list provided by the Controller through a set of menu screens. If a ballot style is required, the ballot style number is entered and the Controller prints a ticket with an Access Code that is a random 4-digit string. The Access Code is displayed on the Controller screen and printed on a ticket by the Controller printer. The Access Code ticket is torn off and given to the voter. The voter now moves to the next available booth with their Access Code ticket.

The Access Code is valid for a time period set by BOSS, with the default being 30 minutes after it has been issued to the voter. Once a voter uses an Access Code, it cannot be re-used; the Controller invalidates a used Access Code. The voter steps into an available voting booth and the eSlate instructs the voter to enter their Access Code. Once the Access Code is input, the eSlate validates their Access Code with the Controller and loads the correct ballot style as previously assigned. With successful entry of the Access Code, the first page of the ballot is displayed on the eSlate and the Booth Status Light on the Controller turns red, indicating that the booth is in use.

1.3.2.2 Voting in the Voting Booth

The first page of the ballot is displayed with a header at the top and the election contests occupy the majority of the remaining display area. The user interface area of the eSlate includes a set of push buttons and a rotary input device or wheel. The push buttons and the wheel provide the voter with a set of dedicated functions they can use to navigate the ballot, enter selections, and cast their vote. These include:

- **Cast Ballot** – used when the voter has completed their selections and wants to record their vote.
- **Next** – takes the voter to the next page of the ballot.
- **Prev** – takes the voter to the previous page.
- **Help** – provides the voter with operating instructions and/or signals a poll worker that assistance is requested.
- **Enter** – when a selection is highlighted, activation causes the highlighted selection to be recorded.
- **Select** – rotary input device for moving the “cursor” or “Ballot Focus” through the ballot.

1.3 Preparing for the Election
Turning Select causes the highlighted area, or Ballot Focus, to move sequentially the ballot. While an element of the ballot is highlighted, pressing Enter will select the element for inclusion in the voter’s ballot image. Thus, the voter turns Select until their selection is highlighted and presses Enter to register their choice.

This process continues until all selections have been made, at which time the voter presses Cast Ballot and their ballot is electronically recorded as a Cast Vote Record (CVR). Up to the point the voter presses Cast Ballot, they are free to make any change to previously recorded selections. Using Select, Next and Prev, the voter can navigate backwards and forward through the ballot to change or review any selection.

For write-ins, ballot casting, and other special instructions, Help windows are displayed to communicate with the voter. Each Help window has options available in context with the type of action required by the voter.

1.3.2.3 Disabled Accessibility

With the Disabled Access Unit (DAU) option installed, the eSlate supports the ability of visually or physically challenged voters to cast a secret and private vote. The DAU can be factory installed or an eSlate can be upgraded in the field. When installed, the DAU has an accessible slot for a PC memory card and two audio jacks. The two audio jacks are for headphones and Accessible Switches used to interface with the ballot.

A disabled voter is authorized by the poll worker to vote in the same manner as other voters. Disabled voters may require assistance entering their Access Code, locating and fitting of the headphones, orientation with the user interface and Accessible Switches. Once these preliminary steps are completed the voter is able to vote unassisted.

Ballot navigation is accomplished in the same manner as other voters. The user interface is active and operates in the same manner. However, the voter may navigate the ballot by using the Accessible Switches. If the voter is wearing the headphones, as the highlight changes, the element is “read” to the voter. The audio component recorded by BOSS is natural recorded voice so the voter hears the text in a clear, comprehensible manner. When the voter presses Enter, the audio provides a confirmation of their selection and advances to the next race.

1.3.2.4 Curbside Voting

One or more eSlate DAU unit(s) from a Precinct Voting System can be designated for “curbside” voting. This unit may be temporarily detached from the network to allow voting at a nearby location, such as a parking space near the entrance to the polling place. The unit may be detached following entry of the Access Code and must be re-connected to the network to transmit the CVR to the Controller.
1.3.2.5 Provisional Ballots

The PVS supports the contested Voter situation that may arise during the open polls operation. Most States provide for a voter's right to vote to be challenged at the polling place at the time when a voter present their eligibility to cast their ballot. The voter is allowed to vote and a determination as to their eligibility is made after some investigation following the close of the polls. To be able to respond appropriately to the eligibility decision, the Controller prints a Voter Provisional Stub which the voter must sign before they are given their Access Code ticket so that if the voter's eligibility is later denied by election officials, their ballot is not counted.

1.3.2.6 Closing the Polls

When it is time for the poll worker to close the polls, a single-purpose function key is used to cause the Controller to initiate the closing process. Two steps are used to protect the integrity of the election information:

- First, the eSlates are frozen so that they cannot be accessed again for voting.
- The final public and private counter of the Controller, time of closing, and the electronic serial numbers of all devices and ballot types are stored and copied to the MBB and the MBB is closed.

All the above steps are performed automatically by the Controller. When the polls are closed, they cannot be re-opened. At this time, the Controller can print an un-official tabulation and/or modem results to Fast-trac. The MBB can now be removed and transported to the central location for cumulative tally.

Once the MBB is removed from the Controller, an exact copy of the data remains intact in the Controller as a back-up. This data is the sum of all eSlates that were connected and a third copy of the information is stored in each of the eSlates. Each eSlate maintains a copy of all votes it has written for
storage in the Controller. This stored data differs from the information stored in the Controller and Mobile Ballot Box in that it is not stored with images from the other eSlates.

1.3.2.7 Suspended Voting

Early voting can begin many days in advance of Election Day. The polling place ID indicates if the location can be an Early Voting site and gives the poll worker the option to select it. By pressing the “Close Polls” function on the Controller at an early voting site, the Controller presents the option to the poll worker to suspend voting or to close the polls. When suspend voting is selected, the Controller prints out the reports for the day. These reports include values for the public and private counters of the Controller, the serial numbers and public counters of each eSlate, time, date and location, and totals for Access Codes issued. The Controller writes an entry to the audit log that the unit is going into suspended voting mode and prints out a report with statistics concerning the election activity for the day (public and private counter of the Controller, time of suspension, the electronic serial numbers of all devices and ballot types stored and copied to the MBB).

For Early Voting to resume the next day, the network must be configured as if the equipment were being set up for the first time in the election. Once the Controller powers up, it checks the audit log and acknowledges that it was in suspend mode. On the final day of Early Voting, the Close Polls function is selected and instead of selecting the suspend option, the poll worker selects “Close Polls” and follows the process as described above.

1.3.3 Ballot Now

One BOSS MBB that was created especially for the election's paper ballots is read into Ballot Now to print each precinct's paper ballots on demand.

The Ballot Now application lets you:
- Set up user names and passwords
- Read ballot styles from an Election's Ballot Now MBB
- Print ballot proofs for the Election
- Print TEST, SAMPLE, and ELECTION paper ballots for the Election

1.3.4 Tally

On or before Election Day, the BOSS database for the election is used to initialize the Tally database for tallying the election. Acceptable write-in candidate names or aliases are input into Tally.

When all the polls have closed, the MBBs from Election Day and Early Voting sites are read into the Tally System. The unique serial number in the MBBs is used to prevent duplicate storage of the information in the MBB.

The Tally System tabulates the CVRs from the PVS system MBBs and from the Ballot Now MBB, and generates reports that can be viewed on screen and/or printed.

When all MBBs have been read by Tally, the election officials resolve write-in votes and Provisional Ballots from contested voters.

The Tally database is closed and archived when the officials determine all information for the election has been stored and resolved in the Tally System.

1.3.5 Resetting MBBs and Controllers

When the PVS equipment is required for use in a new election, the MBBs and Controllers can be initialized to erase all previously recorded information, with the exception of the Private Counter in the Controller, which remains at its existing count to provide a usage record for the Controller.
2 Technical Support

2.1 Contact Information

Each customer's requirements are different and the Hart InterCivic eSlate™ Electronic Voting System technical support program is tailored to those particular needs. The purchase agreement under which your eSlate™ Electronic Voting System was purchased contains the specifics of your support agreement. General contact information is provided below, but please refer to your purchase contract for more specific information.

Scott Flom  
Director, Election Solutions Group - Austin  
Hart InterCivic  
P.O. Box 80649  
Austin, TX 78708-0649  
(888) 223-HART

Neil McClure  
Vice President & General Manager  
Hart InterCivic, Election Solutions Group  
1650 Coal Creek Drive, Suite E  
Lafayette, Colorado 80026  
303-385-6442

2.2 Acquisition and System Installation

Acquisition of the eSlate™ Electronic Voting System occurs through either bid process or negotiated sale. Regardless of which process is used, specific requirements of the sale are defined in the purchase agreement or contract. As such, the purchase agreement takes precedence over this manual and should be referred to for specific information relative to all sections in this Technical Support section. The Technical Support section of this manual should be used for reference only and to point to areas in your purchase agreement that contains specific information.

System installation is performed by Hart InterCivic employees at your site. This is the first step in the on-site training that is standard with your system acquisition.

2.3 Acceptance Test

The specific requirements of acceptance tests for your purchase of the eSlate™ Electronic Voting System are given in your purchase agreement. Generally, Hart InterCivic employees will be on-site to install computer systems and assist in the delivery of your equipment. As part of this process, acceptance testing is performed to verify all systems are functioning properly. The acceptance testing is actually part of the on-site training that is standard with your purchase. The acceptance tests involve the entire system and require conducting a complete mock election cycle as described in this manual. This includes entering data into BOSS, producing MB2s, casting ballots on the PVS and verifying the results using Tally. Any options or utilities you have purchased will be included in the testing as well.
2.4 System Maintenance

2.4.1 Precinct Voting System Hardware

All hardware for the Precinct Voting System are Field Replaceable Units (FRUs). As such, any device that requires repair is returned to Hart InterCivic. The specifics of your service contract is part of your purchase agreement and should referenced for a complete description.

2.4.2 Databases

The eSlate™ Electronic Voting System has two primary software applications, BOSS and Tally, which are database applications developed by Hart InterCivic using a commercial database product. The database "engine" is incorporated into the eSlate™ Electronic Voting System applications and was selected for its low maintenance requirements. By database standards, the amount of data required to conduct and report an election is very small and coupled with the fact that each new election starts with a new database, there is no database maintenance required by the user.

2.5 Software Upgrades and Correction of Defects

Refer to your purchase agreement for specific information about software upgrades and correction of defects. This service is typically covered under a software maintenance agreement that defines the software upgrade program. Unless otherwise stated in the software maintenance agreement, correction of defects is at the sole discretion of Hart InterCivic.

2.6 Training

Training begins with the on-site installation of the eSlate™ Electronic Voting System. Refer to your purchase agreement for specific information about the training program purchased by your county. Training can range from a two-day, on-site installation and acceptance test to a one-week program with multiple sessions.

2.6.1 Standard Training Courses

The eSlate Training Services Manager can customize training packages to suit the needs of your jurisdiction.

The standard eSlate training courses are:

- Ballot Origination Software System (BOSS) Course
- Polling Place Operations Course
- Poll Workers & Voter Education Course
- Ballot Now Course
- Tally Tabulation Software Course
- eSlate EVS Warehouse Utilities & Management Course
3 Computer Security and Recovery

3.1 General Security Considerations

The idea of computer security is to secure your computer and your eSlate™ Electronic Voting System software application against unauthorized use, alteration, or deletion. The people against whom you are securing your computer vary from the co-worker who wants to surf the Internet to hackers attempting to subvert elections. Computer security is always a balancing act between security and ease of use. In the following you will find tips and techniques towards maintaining a secure computer environment. It is up to the election administrator to choose and implement the appropriate level of computer security.

The following topics were discussed as part of your system acquisition and are repeated here for review and awareness. Any options that require system support are delivered as part of your installed system and are a result of your administrator electing to implement the particular security feature.

3.1.1 Physical Security

3.1.1.1 Controlled Access Environment

Computers should be operated in a room that is limited to only authorized personnel. The room should be locked except during working hours.

3.1.1.2 Lock Your Computer to a Desk

Computers should be locked to a desk, table, or stanchion using a Kensington or similar lock. The cost of recreating the data lost in a stolen election computer could be many times the cost of the computer itself.

3.1.1.3 Lock Your Computer Housing

The housing of a computer should be locked to prevent unauthorized people from accessing the computer boards, memory and hard drives. No data is safe from talented intruders with access to the inside of your computer.

3.1.1.4 Lock Your Floppy Drive and CD Drive

The floppy drive and CD drive of your computer should be physically locked against unauthorized use. Hackers that can boot your machine onto their floppy or CD may be able to install malicious software on your computer, read your hard drive, or alter your BIOS settings.

3.1.1.5 No Network

The computer running the eSlate™ Electronic Voting System election software should not be connected to a county's computer network. Most computer security attacks are through a network, which allows a hacker to work anonymously and provides a handy access path to your computer.

3.1.1.6 No Internet Access

The computer running the eSlate™ Electronic Voting System election software should not have access to the Internet. Computer security attacks can be made through active Internet connections. In addition, even an employee innocently browsing the web can unknowingly download malicious viruses.
3.1.2 Disaster Security

3.1.2.1 Back Up Your Data
Frequently back up important election data created using eSlate™ Electronic Voting System election software. Properly label back-up data disks and store them in a secure location. Refer to the section on back-up and archiving in this manual.

3.1.3 Operational Security

3.1.3.1 Always Log Off Computer
Log off your computer anytime you are not actively using the eSlate™ Electronic Voting System election software, even if you leave your terminal for just a few minutes.

3.1.3.2 Never Give Administration Privileges
If the county is given administration passwords with the computer hosting the eSlate™ Electronic Voting System election software, administrators must never give the administration password to any regular operator. A regular election worker can perform his or her work well without the use of administrator passwords. An election official should never log in as an administrator unless they need to perform a function only available as an administrator.

3.1.4 Data Security

3.1.4.1 Never Run Personal Software on Computer
No personal software of any kind should be run on computers hosting eSlate™ Electronic Voting System election software. Even seemingly innocent software can introduce viruses into your computer.

3.1.4.2 Protect Against Viruses
Regularly run the anti-virus software that comes standard on your eSlate™ Electronic Voting System computer. Register the computer with your county's computer support specialist so they can provide anti-virus software updates as they become available.

3.2 Password Security

Selecting, storing, and changing your password properly is vital to computer security. A typical 8-character password has trillions of possible combinations and, if properly picked and managed, can help keep your computer be secure. But passwords that are taped to the screen or keyboard, passwords that the user has used on their primary desktop machine, or passwords like “bob2” are not very secure at all.

3.2.1 Change Your Password Frequently
Your password should be changed at least every 6 months. Immediately change the password when it is given to you initially by the administrator. Administrators should remove usernames and passwords when employees are no longer engaged in election business.

3.2.2 Where Not to Store Your Password
Do not store your password anywhere near your work area. Do not tape it to the bottom of the keyboard, to the monitor or store it in the desk drawer. If possible, do not store your password anywhere, simply memorize it.

20 3 Computer Security and Recovery
3.2.3 What Not to Do with Your Password

Do not email your password to anyone. Do not use your election password for anything else. Never store your password in a computer file. Don’t share your password with anyone.

3.2.4 Picking a Secure Password

When picking your password –

Don’t Use:

- Any password you used previously
- Any word found in an English or foreign-language dictionary
- Any string of three characters repeated or reversed
- Any character repeated more than twice
- Your name or initials
- Your user ID in any form (i.e., reversed, capitalized, doubled, etc.)
- The names of relatives, birthdays, phone numbers or company name
- The number for this year, last year or next year or the three-character abbreviations for the months
- Telephone number or car license plate number
- Common mathematical values (like pi, gamma, and natural log)

Do Use:

- A combination of upper and lower case letters and numbers
- A password that is at least eight characters long
- A new password every six months
- Random characters you’ll remember

Here are some tips on generating a good user password for yourself:

- You might want to consider a password created from the first letters of a memorable phrase. For example, the phrase “I was born in Brooklyn some years ago” yields IWBIBSYA as a password. Imaginative and easy-to-remember phrases are easy to think up.
- Another scheme is to use a meaningless but easy-to-remember phrase such as “I like noodles!”.
- A combination of letters and numbers can be good. For example, if your pet dog’s name is Rover and your friend’s apartment number is 192, your password could be Ro192ver.

3.3 Abnormal System State

Software is not bug-free. The most popular computer operating system in the world still has software bugs in it that can cause your computer to produce an error or lock-up. The same is possible for your eSlate™ Electronic Voting System election software. The eSlate™ Electronic Voting System election software has an extensive list of error messages that are displayed in clear English and are related to whatever action you were involved in at the time of its occurrence. This is not an abnormal system state and is resolved by acknowledging the error and correcting the condition. An abnormal system state results in a cryptic “computer-type” message.

Given the combination of the operating system (Windows NT) and the eSlate™ Electronic Voting System applications, you may encounter an abnormal system state. If such a state occurs within one of your eSlate™ Electronic Voting System election software applications, your data is safe. The applications are designed to require frequent “saves” of your data, so should an error or lock-up occur, the data that existed at the time of your last save action is secure. In all cases, write down the exact error message, the conditions under which it occurred, and forward the information to your customer service contact.
In most instances, you will be able to continue working by resolving the error or power cycling the computer. Match your condition to those given below and follow the steps given for each.

- **Error message with “OK” button**
  Read the error message and write it down. If the message contains any information about the data that you were entering at the time, it should indicate the problem, select “OK” and correct the data or re-try the event. If no description is given, select “OK” and continue with your task. If the problem persists, contact customer service.

- **Application locks-up**
  If the application locks-up, the mouse pointer or the keyboard will not respond. By pressing CONTROL-ALT-DELETE, the Windows NT Task Manager will come up and allow you to shut down the application. Again, data entered and saved is safe. If the problem persists, contact customer service.

- **Windows NT error or locks-up**
  Windows errors or lock-up are best resolved by either shutting down the task causing the problem as described above, or by power-cycling the computer. Power cycling requires the power be turned off and then back on again. When Windows is shut down in this manner and subsequently turned back on, Windows will run a series of diagnostics that you may have to respond to. If the problem persists, contact customer service.
4 The eSlate™ Electronic Voting System Election Cycle

4.1 Pre-Election Activities

4.1.1 Create the BOSS Election Database

The eSlate Ballot Origination Software System (BOSS) from the Election Solutions Group of Hart Interivic is a software application for creating election databases that contain ballot definitions specific to a jurisdiction and an election.

The target users for this product are county-level election offices that define and produce their own ballots. BOSS can be used by election officials that may have very little training in the software and don't use it very often. The user interface is simple, yet powerful and flexible enough to do the job of defining an election ballot in a manner that can easily be assimilated by the user with election knowledge.

The election database created in BOSS is used in conjunction with the Precinct Voting System (PVS) and Tally software. BOSS' primary function is to generate ballot definition information that can be used in these other products.

4.1.2 Features of the BOSS Election Database

BOSS allows users to enter information about different elections for the many jurisdictions they provide ballots. Once all election information is entered, BOSS allows the user to generate ballots.

The information in the election database is used to:
- store precinct names/numbers/descriptions/number of registered voters
- store polling place names/numbers/descriptions
- support both Early and Election Day voting
- create all ballot styles necessary for the election
- record audio of ballot content for use with DAU voting units by visually impaired voters
- copy to MBBS (Mobile Ballot Boxes) which configure the PVS in the polling places
- support three levels of user access passwords:
  - read only
  - read/write/edit
  - administrator (read/write/edit, create users, and create new databases)

4.1.3 Computer System for Running BOSS

The computer system supplied for using BOSS has the following minimum features:
- Single processor, Pentium (500 MHz clock speed or better)
- 128 MB RAM, with at least 256MB/512MB swap files
- 10 GB Hard disk (minimum)
- Floppy Drive
- Parallel interface (2 if used for Tally) (one must be EPP-compliant)
- Read/Write CD drive
- PC Card (PCMCIA) slot
- Monitor - Screen Resolution set to 1024 x 768 pixels
- 2-Button Mouse pointing device (no middle button or wheel)
- Microsoft NT 4.0 Server
- (1) Uninterruptible power supply (UPS) sufficient to power the BOSS machine for five minutes
- Report printer (fast Inkjet or Laser)
4.1.4 Security Procedures

To access the data contained within the BOSS application, the user must first enter their user ID and password, and then a particular BOSS data file must be selected. Once a BOSS data file has been chosen, the user may view and, if their access level and the lock status of the BOSS data file permit, edit BOSS data. This includes election definition data, ballot formatting, and user administrative functions.

User security data is contained in the BOSS security database, which is a single-user database file. This data includes the BOSS authority level of the user and the BOSS database to which the user was last connected. The database information includes a user-defined description of the BOSS Data file, its DOS filepath and lock status.

Users of the BOSS application can be assigned one of the following authorities:
- **ALL** - Access rights to modify the election database and perform non-election tasks. This equates to the administration privileges and should be granted to a single user with the jurisdiction.
- **UPDATE** - Access rights to modify the election database.
- **VIEW** - Access rights to view the election database.

**REFER TO:** eSlate™ Ballot Origination Software System Operations Manual for procedures to authorize additional users of the software. See section on Security in this manual.

4.1.5 Data Entry into the BOSS Election Database

The steps for creating a BOSS election database include:
- Gather data for creating the BOSS election database.
- Enter all jurisdiction information into the BOSS election database. (Entering jurisdiction information should be done in advance of an election cycle. This information can be saved as a starting point for future elections.)
- Enter all election information into the BOSS election database.
- Proofread all information entered into the BOSS election database.
- Create test or official MBGs.

4.1.6 Gather Data for Creating the BOSS Election Database

4.1.6.1 Data Items Needed

You will need to gather the following election information for data entry into the BOSS election database.
- Type of Election (Primary, General, Special, etc.)
- Election Date
- Election Title
- Languages on Ballot (English, Spanish, etc.)
- Name of Jurisdiction
- State
- Instructions to Voters
- Precinct Name List
- Split Precinct Names
- # of Registered Voters by Precinct/or Split
4.1 Pre-Election Activities

4.1.6.2 Organize the Data
Take the time to organize your data before you begin entering information into BOSS. You may want to use worksheets or other methods to organize your election data so that you can keep track of your data entry process.

4.1.7 Enter Data into the BOSS Election Database
The instructions for creating a BOSS election database and entering information for an election are provided in the Ballot Origination Software System Operations Manual. When all the information is saved in the BOSS election database, the ballot generation creates the ballot styles, which are copied to MBBs.

REFER TO: eSlate™ Ballot Origination Software System Operations Manual for these procedures.

4.1.8 Verify the Data in the BOSS Election Database
- Generate BOSS reports and compare the data to the information you gathered and organized prior to data entry.
- Check for all Contests on ballot and candidate/proposition spelling is correct
- Verify the correct number of votes allowed in each contest
- Verify that write-in positions are correct

REFER TO: eSlate™ Ballot Origination Software System Operations Manual for these procedures.

4.1.9 Mobile Ballot Boxes (MBBs)
When the BOSS election database is complete, and you have created ballot formats, BOSS will write the ballot information to the MBBS for use in the PVS Controller or for Ballot Now.

REFER TO: eSlate™ Ballot Origination Software System Operations Manual for these procedures.
4.1.10 Field Size

The eSlate™ Electronic Voting System begins with BOSS and it establishes text field size limits that are used throughout the election system. This enables generation of ballots for presentation of the ballot on the PVS, in Ballot Now, and for tabulation.

4.1.10.1 Text Field Length

Ballot generation is performed by the BOSS application. Certain limits apply to the length of text fields present on a ballot. These limits are applicable in two different scenarios during ballot generation and subsequent ballot use by the PVS system and Ballot Now.

The first limitation, termed the 'hard limit', is enforced by the BOSS data entry windows. During data entry, BOSS will not allow entering of more characters than are specified by the hard limit.

The second limitation comes about during ballot generation. Proportional fonts are used to display the ballot text on the PVS hardware. Therefore, the amount of text that can be displayed on the PVS hardware depends upon the actual characters in the text. For example, in the space where 5 i's can be displayed, perhaps only 3 w's will fit in the same field. Because of this display characteristic of the PVS, it is not possible to place hard limits on the number of characters that can be displayed for a field on the PVS. However, there are a typical number of characters that can be displayed on a two-column PVS ballot page. This number is called the 'soft limit', and again is just a typical number. It is the responsibility of the BOSS operator to proofread the ballot on the PVS to ensure that it has been generated to display in a satisfactory manner.

4.1.10.2 Multiple Entry Fields

Besides the hard and soft limits for text fields, there are also hard and soft limits for multiple entry fields, such as the number of options in a contest, the number of delegates for a candidate, or the number of write-ins in a contest, etc. BOSS enforces hard limits during data entry, and again soft limits are data dependent because of the display space limitation of the PVS. For example, the display space limitation limits the number of options in a contest. The soft limit for the number of contest option lines, which can include contest name, contest instruction text, candidate names, candidate party affiliation, write-in instruction text, and write-in candidates has a variable practical limit shown in the table below as the soft limit. Again, it is the responsibility of the BOSS operator to proofread the ballot on the PVS to ensure that it was generated to display in a satisfactory manner.

These limits are shown in the following table.
<table>
<thead>
<tr>
<th>Text Field Length</th>
<th>Hard Limit</th>
<th>Soft Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Election Title</td>
<td>100</td>
<td>32</td>
</tr>
<tr>
<td>Jurisdiction Name</td>
<td>50</td>
<td>N/A - not used on PVS</td>
</tr>
<tr>
<td>Precinct Name</td>
<td>15</td>
<td>same</td>
</tr>
<tr>
<td>Contest Title</td>
<td>100</td>
<td>N/A - wraps on PVS</td>
</tr>
<tr>
<td>Polling Place Name</td>
<td>60</td>
<td>32</td>
</tr>
<tr>
<td>Polling Place Description</td>
<td>60</td>
<td>N/A - not used on PVS</td>
</tr>
<tr>
<td>Write-in Text Instruction</td>
<td>30</td>
<td>same</td>
</tr>
<tr>
<td>Proposition Text Instruction</td>
<td>30</td>
<td>same</td>
</tr>
<tr>
<td>Candidate Name</td>
<td>50</td>
<td>26</td>
</tr>
<tr>
<td>Proposition Text</td>
<td>2000</td>
<td>same</td>
</tr>
<tr>
<td>Instruction Text</td>
<td>500</td>
<td>same</td>
</tr>
<tr>
<td>Delegate Name</td>
<td>50</td>
<td>26</td>
</tr>
<tr>
<td>Party Name</td>
<td>50</td>
<td>26</td>
</tr>
</tbody>
</table>

### Multiple Field Entries

<table>
<thead>
<tr>
<th></th>
<th>Hard Limit</th>
<th>Soft Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Precincts</td>
<td>Unlimited</td>
<td>3000</td>
</tr>
<tr>
<td>Number of Contests</td>
<td>99</td>
<td>N/A - ballot will grow as necessary</td>
</tr>
<tr>
<td>Number of Polling Places</td>
<td>99,999</td>
<td>N/A - ballot will grow as necessary</td>
</tr>
<tr>
<td>Number of Parties</td>
<td>31</td>
<td>6 (Tally report limitation)</td>
</tr>
<tr>
<td>Number of Options in a contest</td>
<td>99</td>
<td>*</td>
</tr>
<tr>
<td>Number of Delegates in a contest</td>
<td>99</td>
<td>*</td>
</tr>
<tr>
<td>Number of Write-ins in a contest</td>
<td>99</td>
<td></td>
</tr>
</tbody>
</table>

* Sums to 12 for a two line entry in one column of a two column eSlate ballot.

---

### 4.1 Pre-Election Activities
4.1.11 Import Files and Verification

If you choose to utilize the import file feature of BOSS, you must first verify your import file format is compatible with the BOSS import requirements. BOSS accepts standard ASCII data but the information must be organized in the order that BOSS expects to receive it. An ASCII text file can be viewed with any text editor (i.e., NotePad). Refer to the BOSS Operations Manual for details of the specific file format and the order in which the data must appear.

If you expect to use this feature repeatedly as part of your regular election cycle and the source of your election data does not output the data in a format compatible with BOSS, contact customer service. The knowledge people at the Election Solutions Group - Colorado will be able to help streamline your operation.

4.1.12 Readiness Testing/LATs

Readiness testing or Logic and Accuracy Tests (LATs) are required by law in some states and the eSlate™ Electronic Voting System supports two methods to satisfy this requirement.

4.1.12.1 Live Data

If you are required to conduct a readiness test using “live” election data, the eSlate™ Electronic Voting System is designed to cleanly separate readiness testing from live election voting. A readiness test or Logic and Accuracy Test (LAT) requires that votes be cast and tabulated to verify the data is correct and the equipment is functioning properly. By completing this “election cycle” all equipment must be reset and databases copied forward causing any cast votes to be cleared. You can not complete an election cycle without placing the equipment and software systems in a state that requires clearing of totals before it can be used again. Follow the instructions in the BOSS, Ballot Now, Tally, and PVS Operations Manuals for conducting an election to produce a readiness test.

4.1.12.2 Test MBB

BOSS allows you to create “Test MBBs” which are identical in every aspect except all data generated from the use of the test MBB is labeled as “TEST.” All printouts from the Controller are labeled “Test Mode” and the results in Tally are read in and reported as “Test Mode.” This feature is offered as an extra measure of security to prevent mixing live data with test data, but most importantly, all records that result from this test run are labeled as such, providing clear documentation trail of the readiness test.

4.1.13 Ballot Proof Retention

As part of your election preparation, you will use Ballot Proof reports as described in the eSlate™ Ballot Origination Software System Operations Manual. It is recommended that you retain your final Ballot Proof reports that you generate prior to writing MBBs. These reports represent the final data that will be displayed to voters on the eSlate and become part of your election records.
4.2 Create Official MBBs

The steps for creating official election MBBs include:

- Make any necessary corrections to the BOSS election database.
- Create required number of official election MBBs and spare MBBs.
- Label and package official election MBBs and spare MBBs.

4.2.1 Make Corrections to the BOSS Election Database

Use the BOSS reports to verify that all ballot styles, contests and candidates, proposition position, text and content is correct. If necessary, make corrections to the BOSS Election database.

REFER TO: eSlate™ Ballot Origination Software System Operations Manual for these procedures.

4.2.2 Create Required Number of Official Election MBBs

When the BOSS Election database is “election-ready,” refer to the Ballot Origination Software System Operations Manual for performing the following operations:

- Lock the BOSS Election database.
- Create the required number of MBBs.

It is recommended that you create spare MBBs to use in the event that any MBBs are damaged or misplaced.

- The number of MBBs created for actual voting should equal the number of Polling Places active or the number of Precinct Voting System Controllers deployed, whichever is greater.
- It is recommended that the number of spare MBBs created is equal to 2% of the total number created for actual voting.

If the election will use Ballot Now paper ballots, one BOSS MBB that was created especially for the election’s paper ballots is read into Ballot Now to print each precinct’s paper ballots on demand.

REFER TO: Ballot Now Operations Manual for a description of these procedures.

4.2.3 Identify the MBBs

It is recommended that an area be provided on the MBBs so that polling place officials can label the MBB at the conclusion of the voting day. As all MBBs are generic prior to the election, once the polls are closed and prior to transport, the polling place ID should be written on the MBB. This will aid in identification of which MBBs have yet to be returned for tabulation at the Election Headquarters. Tally will report which MBBs have been returned.

4.3 Early Voting Activities

Procedures for Early Voting will vary, depending on your election laws, requirements, and Early Voting location(s). The PVS equipment can be left set up with the power removed (refer to the PVS Manual) only if the voting location can be locked and secured. If the security of the site is uncertain, the PVS equipment should be disconnected and stored in a secure manner.
4.4 Election Day Activities

4.4.1 Election Headquarters Personnel

During the voting periods, county election personnel should be available by telephone to support the poll workers using the PVS equipment in the polling places. Hart InterCivic personnel will be available according to the terms given in the election support section of your purchase agreement.

4.4.1.1 Before the Polls are Closed

Election officials can initialize the Tally System with the BOSS database, then configure the election in Tally:

- Input names and aliases of write-in candidates that will be allowed for the election.
- Read CVRs from Early Voting and Ballot Now MBBs.

Refer To: eSlate™ Tally System Operations Manual for a description of these procedures.

If the election used Ballot Now paper ballots, the voted paper ballots are scanned into Ballot Now and the CVRs are written back to the Ballot Now MBB. That Ballot Now MBB is then read into the eSlate Tally™ application for tallying the votes collected from the paper ballots.

Refer To: Ballot Now Operations Manual for a description of these procedures.

4.4.1.2 After the Polls are Closed

- When MBBs arrive from the polling places, the CVRs on the MBBs can be read into Tally.
- Write-in names and provisional ballots can be resolved.
- Unofficial results can be tabulated as needed using Fast-trac if the CVRs were modem from the polling places to Election Headquarters.
- After all MBBs have been read into Tally, the election officials will close the tabulation process.
- When the Tally election database has the CLOSED status, remaining provisional ballots can be resolved.
- Official reports will be printed.

Refer To: eSlate™ Tally System Operations Manual for a description of these procedures.

4.4.2 Poll Workers

4.4.2.1 Running the Polling Place

When the poll workers arrive at the polling places, they will follow the set-up, open-polls, voting, and close-polls instructions provided in the Precinct Voting System Manual and the Precinct Voting System DAU 5000 Voting Unit Setup Manual to accommodate voters.

4.4.2.2 After the Polls are Closed

After the polls are closed, each MBB in a polling place will contain all the CVRs from the day's voting.

- The county has the option of having the poll workers modem the CVRs to Election Headquarters to provide advanced, unofficial results (see 1.2.5 Fast-trac on page 12).
- The poll workers will transport MBBs to Election Headquarters for tabulation of the CVRs.
4.5 Post-Election Activities

When the Tally election database has the CLOSED status, the database and copies of reports can be archived to the Tally/Database/Archive directory on the Hart InterCivic eSlate™ Electronic Voting System computer. This directory is copied to a CD-R disc as described in 4.5.2 Archiving on page 31.

Refer to: eSlate™ Tally System Operations Manual for a description of these procedures.

4.5.1 Audit Trail

4.5.1.1 BOSS Audit Log

The BOSS Audit Trail report provides audit trail data of activity in the BOSS database for an election. The date, time, event name, transaction type, and user ID is included for each event printed in the BOSS Audit Trail report.

The operator can view and/or print the BOSS Audit Trail report at any time during the creation of an election. The primary sort order for the report is alphanumeric by timestamp; the secondary sort order for the report is alphanumeric by action.


4.5.1.2 PVS Audit Log

The Precinct Voting System maintains a complete electronic audit trail of all events that occur during the voting process. From the point that the Controller receives power to begin the voting process, entries are made to the Audit Log. Beginning with the results of the power on self-test through to the time that power was removed, any event that changes the state of the system or data is recorded with a time and date stamp. The detail contained in the resulting Audit Log is very specific and includes the time and date that each vote was cast (but not the ballot itself). A complete network Audit Log is saved both in the Controller internal memory and in the MBB as events occur. Each eSlate connected to the network maintains its own, separate Audit Log of events, specific to that eSlate. All Audit Log entries are saved in FLASH memory so therefore are unaffected by power cycling.

4.5.1.3 Tally Audit Log – Real-Time Print-Out

The Tally System application prints a real-time audit log to the system line printer.

The real-time audit messages include a log of the operators activities with the Tally System application and error messages presented during a session.

The date, time, event name, and user ID is included for each event printed in the audit log.

Refer to: eSlate™ Tally System Operations Manual for a description of the Tally Audit Log.

4.5.2 Archiving

Archiving of data is a simple process of copying information to a CD. The Tally application stores the complete record of the election. The BOSS database is used to initiate Tally, and when the MBBs are read into Tally, all CVRs and PVS audit data are stored by Tally. By copying the Tally database to CD you have archived the entire election.

It is recommended, however, to archive the BOSS database separately, as well, so that both ends of the election cycle are distinct datasets. This will aid any subsequent review process that may be required.

The data is copied to a CD-R disc (a read-only CD) using standard CD-writing software. Once the write process closes the CD-R disc, no additional information can be written to the disc, and the disc will function as a read-only disc.
4.5.3 System Back-Up

Back-up copies of the BOSS directory and the Tally directory on the Hart InterCivic eSlate™ Electronic Voting System computer should be created at regular intervals during the election cycle. It is recommended that the BOSS jurisdiction information be backed-up in advance of the first election cycle, since this information can be saved as a starting point for future elections.

The directories are copied to one or more CD-R discs (read-only CDs) using standard CD-writing software. Once the write process closes the CD-R disc, no additional information can be written to the disc, and the disc will function as a read-only disc.