



ELECTION PROTECTION **YOU HAVE THE RIGHT TO VOTE**
1-866-OUR-VOTE

Electronic Voting Machine Information Sheet

Hart InterCivic — eSlate 3000

Name / Model: eSlate 3000¹

Vendor: Hart InterCivic, Inc.

Voter-Verifiable Paper Trail Capability: Yes



Brief Description: Hart InterCivic's eSlate is a multilingual voter-activated electronic voting system where the voter turns a Select Wheel and pushes a button to indicate his/her preference. The eSlate is connected via serial cable to the Judge's Booth Controller (JBC; image above) which provides vote activation and vote storage for up to twelve eSlates. A poll worker issues a four digit, randomly generated Access Code to the voter using the JBC. The voter enters the Access Code on the eSlate and votes using the select Wheel and Buttons. Once the ballot is cast, the votes are stored in redundant and physically separate areas of the eSlate System, including the eSlate, JBC and flash memory. The votes are transmitted via a cable to the JBC, and are stored on the JBC and on a flash memory card (Mobile Ballot Box or MBB) inside the JBC. Then the MBB is physically transported to election headquarters for tabulation.

Checking the Voter-Verifiable Paper Trail: The voter-verifiable paper trail for the eSlate is called the Verified Ballot Option (VBO). The VBO printer is a reel-to-reel, cash-register style of printer. The VBO printout is found to the left of the display screen under transparent plastic. The VBO is a sealed unit that must be changed entirely when the unit runs out of paper, jams, etc. Where the VBO is available, voters should be urged to check the printout to make sure it correctly reflects their choices, before they cast their ballot. Jurisdictions that use the eSlate *without* the VBO printer include Cass County, IN,

¹ See: <http://www.hartintercivic.com/innerpage.php?pageid=26>



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Kentucky (primarily for accessible voting), four counties in Pennsylvania, a number of counties in Tennessee and Texas, and a few jurisdictions in Virginia.

Detailed Voting Process: When the voter enters the precinct, poll workers first confirm that the voter is properly registered. Then, a poll worker using the Judge's Booth Controller (JBC) prints out a piece of paper with a four digit, randomly generated Access Code. This number does not tie to the voter's identity but ties to the voter's precinct so that the proper ballot style for each voter will appear on the eSlate after a voter enters his/her Access Code. A voter is NOT assigned to any specific voting terminal. A voter can proceed to any open eSlate booth.

The voter takes the piece of paper with the Access Code to any open eSlate booth and enters the number into the eSlate device using the Select Wheel and Enter button. This Access Code number permits the voter to vote once; the Access Code will not work a second time. The voter makes his or her selections using the buttons and Select Wheel on the bottom of the eSlate. The Select Wheel allows the voter to navigate through the ballot. When the voter is finished, he or she presses the red "Cast Ballot" button at the lower left-hand corner of the eSlate to cast his/her ballot. Access Codes cannot be reissued by the JBC.

It is possible for a voter to ask a poll-worker if his/her Access Code has registered a ballot on the JBC. If the voter has completed the voting process and cast a ballot, the pollworker can print off a piece of paper similar to the Access Code that lists the voter's Access Code number and reads "Assigned and Cast." Again the Access Code is a randomly generated number and does not tie to the identity of the voter.

The ballot is then transmitted over the cable that connects the eSlate to the JBC on a closed, private network. This cable is a "serial" cable and carries both power and data. Up to twelve eSlates can be connected via this serial cable to the JBC. The JBC records and stores the ballot internally and on a flash memory card or Mobile Ballot Box (MBB). Additionally, each ballot is stored on the individual eSlate voting unit so that all ballots are stored redundantly in separate areas of the eSlate System. The MBB is a removable PCMCIA computer card that stores vote data as well as the ballot definitions and election-specific information needed to open the polls for an election. The PCMCIA card is a credit card-sized device containing flash memory that is sealed into a slot on the JBC.

Once the balloting is closed, the poll workers use the printer on the JBC to print summary results on to paper. Then the poll workers either remove the MBB and physically transport it with any printouts to a central tabulation facility or they can transport the JBC itself depending on local regulations and procedures.



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Things to Look Out For

- **Security Seals.** Ideally, the eSlate's and JBC's exposed ports, memory card access areas and case seams would be covered with tamper-evident security seals. The integrity of these seals should be maintained at all times, and only breached under controlled, explained circumstances. A voided seal looks like this: <http://www.flickr.com/photos/joebeone/2247733620/> . Seals should be logged to maintain chain of custody of sensitive materials.
- **Cables must be secured.** The eSlate system is daisy-chained system where the JBC controls multiple eSlate terminals. The places where the first cable connects to the JBC as well as the area on the top of each eSlate where two of these cables connect are particularly sensitive. The last eslate on the "daisy-chain" – likely the eSlate farthest from the JBC – is especially sensitive as it will have one cable coming from another eSlate, but will also have an exposed serial cable port. A malicious party could connect their own cable or device to this exposed port and essentially take control of the election, the software in the eSlate and JBC as well as vote data stored locally on each eSlate and remotely on the JBC. Ideally, this last exposed serial port will be covered or otherwise disabled. Jurisdiction should use security seals or protected serial cables that cannot be easily disconnected by voters (granted, this might make them difficult for pollworkers to connect and disconnect).
- **VBO is Sensitive and Sealed.** The VBO, Hart's VVPAT subsystem, is a sealed unit that stores official vote data. The unit should not be opened or serviced except infrequently under monitored and controlled circumstances so that all security seals are logged and reapplied. The entire VBO unit should be replaced when an error or jam occurs. The VBO, if jostled out of its place, can be made to interrupt or duplicate printing.
- **JBC and JBC Ports are Sensitive.** The JBC controller and the ports on the back of the JBC are sensitive. With access to the JBC, access codes can be printed out to allow duplicate voting. The ports on the back of the JBC should be covered or otherwise disabled. With access to these ports, a malicious party could take control of the election, activate arbitrary numbers of voter Access Codes, cast votes, erase votes and other things. Access to the JBC and to the area in the back of the JBC control panel where these ports reside should be monitored and controlled at all times.
- **The MBB Memory Card is Sensitive.** Corrupt MBB cards can introduce viruses, cause the main election server to crash and falsify votes. Access to the MBB memory card should be controlled, monitored and logged at all times.



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Past Problems

October 2008: *Tennessee.* The Ballot Summary Page displays only the first three letters of the candidates' names, confusing some voters.²

December 2007: An expert review commissioned by the Secretary of State of Ohio finds there are “insufficient protections within the Hart voting equipment and software to prevent a motivated adversary from compromising an entire election.”³

August 2007: An expert review commissioned by the Secretary of State of California finds serious security issues in the eSlate and the supporting county server system. The Secretary allows the eSlate to remain a primary voting systems with new chain of custody and manual auditing requirements.⁴

October 2006: *California.* Trained personnel entering test votes on the eSlate made errors on 40% of the test ballots in the first day of testing; 25% of the ballots the second day; and 14% the third day.⁵

March 2006: *Texas.* Computer programming errors added 100,000 votes to the final tallies in both primaries, leading to multiple candidate requests for recounts.⁶

October 2004: *Texas.* A "default" selection is a selection automatically pre-set by the software. It remains selected unless the user specifically chooses to change it. To provide a default selection on a DRE voting machine is to give a voter a ballot with a candidate already marked. Yet, election officials in Austin set up the eSlate DREs with Bush/Cheney as the default choice for president/vice-president. Voters who voted a straight party Democratic ticket watched their presidential votes changed to Bush on the review screen. Officials said voters caused this by pressing the “Enter” button on the second screen of the eSlate machine.⁷

September 2004: *Hawaii.* Precincts offered both optical scan ballots and new eSlate paperless machines. eSlate malfunctions disenfranchised at least one voter. Most people

² “Voting machine issue confusing to some voters.” Knoxnews.com, October 22, 2008, <http://www.knoxnews.com/news/2008/oct/22/voting-machine-issue-confusing-some/>

³ EVEREST Voting System Review, Academic Team findings, Secretary of State of Ohio, p. 213 (p.231 of pdf). <http://www.sos.state.oh.us/sos/info/EVEREST/14-AcademicFinalEVERESTReport.pdf>

⁴ Hart InterCivic Voting System, Withdrawal of Approval/Conditional Reapproval, Secretary of State of California, December 6, 2007 Revision, http://www.sos.ca.gov/elections/voting_systems/ttbr/hart_amended_recert_final_120707.pdf

⁵ See <http://www.votersunite.org/info/Hartinthenews.pdf>

⁶ Id.

⁷ Id.



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chose not to use the eSlates. New eSlate electronic voting machines allowed voters to choose a Green Party ballot, even though there were no Green Party candidates. 22 voters were disenfranchised by the error.⁸

March 2004: California. Hundreds of voters in Orange County were turned away when one eSlate machine broke down. It is not clear from reports if this was a JBC or eSlate.⁹

March 2004: California. Approximately 7,000 voters were presented with the wrong ballots due to problems with poll workers' understanding the eSlate system. In 21 precincts where the problem was most acute, more ballots were cast than there were registered voters. Tallies at an additional 55 polling places with turnouts more than double the county average of 37% suggest at least 5,500 voters had their ballots tabulated for the wrong precincts.¹⁰

February 2004. Virginia. Voters had to cast paper ballots when the JBC unit at one precinct "fried," rendering all the eSlate machines unusable.¹¹

November 2003: Texas. Poll workers in Harris County, confused by the eSlate system's complexity, could not get the machines to work properly. Subsequent investigation revealed they had been assigning the wrong ballots to voters using the JBC.¹²

⁸ Id.

⁹ "Voters Decide Record Bond Issue; Edwards Quits." NBC4TV, March 2, 2004.

¹⁰ "7,000 Orange County Voters Were Given Bad Ballots." LOS ANGELES TIMES, March 8, 2004.

¹¹ "Polling places report light turnout here," RICHMOND TIMES-DISPATCH, February 11, 2004.

¹² "ESlate voting proves smooth, not flawless." HOUSTON CHRONICLE, Nov. 5, 2003.