

# Electronic Voting Machine Information Sheet

## Sequoia Voting Systems — AVC Edge

**Name / Model:** AVC / Edge<sup>1</sup>

**Vendor:** Sequoia Voting Systems, Inc.

**Federally-Qualified Voter-Verified Paper Audit Trail Capability:** Yes.<sup>2</sup>



**Brief Description:** The Sequoia AVC Edge is a voter-activated multilingual touchscreen system that records votes on internal flash memory. Voters insert a "smart-card" into the machine and then make their choices by touching an area on a computer screen, much in the same way that modern ATMs work. The votes are then recorded to internal electronic flash memory. When polls close, the votes for a particular machine are written to a "PCMCIA card" which are removed from the system and either physically transported to election headquarters or their contents transmitted via computer network.

**Detailed Voting Process:** When the voter enters the precinct, he or she is given a "smart-card" by a poll worker after confirming the voter is registered. A "smart-card" is a card the size and shape of a credit-card which contains a computer chip, some memory and possibly basic data such as the voter's political party. The voter then takes the smart-card to a voting machine and inserts the smart-card into the yellow slot visible in the middle picture above. The first screen presented to the voter is one that allows him or her to choose the ballot language. After using the touchscreen to vote, 1) the record of the vote is directly recorded electronically to two flash memory cards and 2) the voter's smart card is reset to ensure that the voter can only vote once. The AVC Edge may also be equipped in some precincts to print a voter-verified paper audit trail using the VeriVote printer. In this case, the voter will inspect the printout which is displayed underneath glass. If the paper accurately reflects the vote, the voter indicates so using the

<sup>1</sup> See: <http://www.sequoiavote.com/productguide.php?product=AVC%20Edge>

<sup>2</sup> This is when equipped with a VeriVote printer.

Version 0.8 of August 17, 2004



# Electronic Voting Machine Information Sheet

touchscreen and casts the vote; the printed paper is withdrawn into the machine to protect privacy. If the paper is incorrect, the voter may mark it as spoiled and change his or her vote using the touchscreen interface. After the vote is cast, the smart-card pops out of the machine and the voter returns it to a poll worker.

When the polls close, a poll worker or election official inserts a different-type of smart card, an administrator card, into each voting machine and puts the machine into a postelection mode where it will no longer record votes. At this point, the machine writes the votes from its internal memory to flash memory on a "PCMCIA card." The PCMCIA card is merely a removable form of flash memory. A printed tape of all votes cast or vote totals for the voting machine can also be printed out at this time depending on local procedure and regulations.

The PCMCIA cards are removed from each machine and either taken to a central tabulation facility or to remote tabulation facilities. At the tabulation facility the votes are copied from the PCMCIA cards and into a central computer database where precincts are combined to result in an aggregate vote. The votes may also be transmitted to the central tabulation facility via a closed "Intranet", the Internet or modem. The PCMCIA cards and possible any printouts from the voting machines can then become part of the official record of the election.

## Past Problems

**June 2004:** *New Jersey.* In Morris County, the central tabulation system could not read the data from the PCMCIA cards. The system showed zeros.<sup>3</sup>

**November 2003:** *California.* After a battery problem occurred during the election in Santa Clara County, Sequoia technicians worked on the machines without oversight from county officials. Following November's election in Santa Clara County, Sequoia sent over a group of technicians to make adjustments to voting machines that experienced battery problems.<sup>4</sup>

**November 2002:** *New Mexico.* In Bernalillo County, 48,000 people voted early but no race showed more than 36,000 votes. The cause was a software bug.<sup>5</sup>

**April 2002:** *Florida.* In Hillsborough County, one precinct could not transfer data on 24 out of 26 PCMCIA cards. Results summaries were faxed in and entered by hand.<sup>6</sup> In

<sup>3</sup> "Montville and Chatham mayors ousted." NEW JERSEY STAR-LEDGER, June 9, 2004.

<sup>4</sup> "Electronic voting's hidden perils." SAN JOSE MERCURY NEWS. February 1, 2004.

<sup>5</sup> "Election results certified after software blamed." ALBUQUERQUE TRIBUNE, November 19, 2002.

<sup>6</sup> "Officials still searching for election glitch: The new system could not send the tabulations to the elections office." ST. PETERSBURG TIMES, April 6, 2002.

Version 0.8 of August 17, 2004



# Electronic Voting Machine Information Sheet

March 2003, a similar problem plagued 2 out of 678 PCMCIA cards.<sup>7</sup>

**March 2002: Florida.** In Palm Beach County much went wrong. When voters selected their language, the Edge froze up. Other reports indicate votes registering for wrong candidate.<sup>8</sup> 15 PCMCIA cards were temporarily lost and central system would not report result. In a race won by 4 votes, 78 were blank; voters reported erratic machine behavior.<sup>9</sup>

**November 2000: California.** During the 2000 presidential election in Riverside County, a computer from Sequoia began dropping touch-screen ballots from the vote tally. A Sequoia salesman who was on hand intervened and fixed the problem.<sup>10</sup>

## NASED Qualification Status:<sup>11</sup>

**06/09/99:** Sequoia AVC Edge DRE (firmware 1.0)

**01/30/01:** Sequoia AVC Edge DRE (firmware 1.02, 1.02B)

**07/16/04:** VeriVote voter-verifiable printer subsystem.<sup>12</sup>

## References:

“DRE Security Assessment, Volume 1, Computerized Voting Systems, Summary of Findings and Recommendations,” InfoSENTRY, 21 Nov. 2003. See:

<http://www.sos.state.oh.us/sos/hava/files/InfoSentry1.pdf>

“Direct Recording Electronic (DRE) Technical Security Assessment Report,” Compuware Corporation, 21 Nov. 2003. See: <http://www.sos.state.oh.us/sos/hava/files/compuware.pdf>

---

(cc) 2004 Electronic Frontier Foundation, some rights reserved. This work is licensed under a Creative Commons Attribution License. <http://creativecommons.org/licenses/by/2.0/>. Joseph Lorenzo Hall (jhall@sims.berkeley.edu) authored this Electronic Voting Machine Information Sheet with support from American Families United, the Electronic Frontier Foundation and the Verified Voting Foundation.

---

<sup>7</sup> "Elections Chief Sees Nearly Flawless Vote." ST. PETERSBURG TIMES, March 5, 2003.

<sup>8</sup> "Human goofs, not machines, drag vote tally into next day." PALM BEACH POST, 14 March 2002.

<sup>9</sup> "Out of Touch: You press the screen. The machine tells you that your vote has been counted. But how can you be sure?" NEW TIMES, April 24, 2003.

<sup>10</sup> *Id.*, note 2.

<sup>11</sup> *NASED Qualified Voting Systems (06/30/2004)*. National Association of State Election Directors. See: <http://www.nased.org/certification.htm>.

<sup>12</sup> "Sequoia Voting Systems Successfully Passes Federal Testing of VeriVote Printer Upgrade for Touch Screen Voting System." July 16, 2004. See <http://www.businesswire.com/webbox/bw.071604/241985509.htm>

Version 0.8 of August 17, 2004

