

An Overview of Voting Equipment

The types of voting equipment in use in the US can be classified into general categories, based on how requirements of the Help America Vote Act (HAVA) of 2002 are fulfilled. Two requirements that affect voting equipment in precincts are:

1. The voter must be notified when s/he attempts to cast a vote for more than the maximum number of selections allowed in a contest (an overvote) and
2. Every polling place must have an Americans with Disabilities (ADA)-compliant piece of voting equipment.

In addition to the precinct equipment, every county uses scanners to count paper ballots. The scanner may be high speed or low speed, optical or digital, and scanners from different manufacturers provide different features, but the required function is that paper ballots be scanned. It is only at the precinct level that different technologies are in use.

Technologies in Use at the Precinct Level

Direct Register Electronic (DRE) voting machines, used in South Carolina, are special-purpose computers that record the voter's choices electronically in internal memories. The DRE prevents an overvote from occurring. Every precinct has a DRE with an attached audio capability in order to provide ADA-compliance for the visually impaired. Since the DRE does not use a paper ballot, recounts and audits are generally impossible.

A modification to some DREs provides an add-on paper tape roll, similar to a grocery store tape, where the voter's choice is printed each time the voter makes a selection (or de-selection).

Paper ballots together with an Accessible Ballot Marking Device (BMD) for ADA-compliance require a scanner at the precinct to notify the voter of overvotes. Accessible BMDs typically provide an extensive collection of mechanisms to assist voters with physical disabilities¹. The ballot size and contrast on the screen can also be changed. Voters who do not use the BMD mark their paper ballot by hand. All voters feed their ballots into a scanner, which rejects those ballots with overvotes and retains valid ballots. The voter can receive a new ballot to replace a rejected one.

Paper ballots that are seen by the voter and retained for a possible recount or audit constitute a Voter Verified Paper Audit Trail (VVPAT). The LWV position² includes a requirement for VVPAT.

Vote-by-Mail (VBM)

Because ballots are mailed to all registered voters, there is limited need for precincts. Voters return their ballots by mail or to drop boxes at designated collection places.

Disabled voters are provided with several means of voting, including receiving a CD of the ballot mailed to their home, where the voter can print a ballot from their own computer. Accessible Computer Stations (ACS) are available in voting centers or can be carried to a voter's residence by election workers. An ACS provides extensive capabilities for disabled voters.

Technology Under Development

The PRIME III, being developed at Clemson University, is software that turns any computer into an ADA-compliant voting machine. The PRIME III prints the voter's selections to a blank sheet of paper. (The BMD requires a pre-printed ballot.) The PRIME III detects an overvote before printing a summary ballot, which lists only those candidates selected by the voter and yes/no responses to referendums. A scanner uses character recognition to read the names printed on the paper ballot and retains the ballot for audit and/or recount.

Two VBM states, working together to improve voting for the disabled, are considering putting their software on the iPad.

The Old and the New

Mechanical lever machines are no longer in use anywhere in the U.S. and punch card voting systems, although outlawed by HAVA, are reported to still be in use in five counties. Many improvements in accessibility have been incorporated into voting machines since 2002 and the types of available assistance are becoming somewhat standardized. In order to protect against fraud and malfunctioning equipment, some state legislatures are requiring random audits of the vote. Such an audit generally requires a specific set of samples to be counted by hand and compared against the totals generated by the machine to provide a statistical confidence level in the machine results.

Any new system should meet or exceed the Federal Election Assistance Commission 2005 voting standards. (Our current system does not.) Examination of voting systems in other states and encouraging research in progress optimistically predict that our next voting system will be a vast improvement over the existing one.

Submitted by Eleanor Hare and Duncan Buell

¹ Audio for voters who are blind, sip/puff switches which allow the voter to use their breath to perform mouse clicks, joysticks, custom keypads with large buttons, and large print ballots.

² <http://lwvsc.org/files/electiontech.pdf>