

Overview of Types of Election Equipment

Optical Scanners – Paper Ballots

Overview. The voter marks selections on a paper ballot – either by filling in a bubble or by connecting the ends of an arrow. The ballot is fed into an optical scanner, which reads the marks on both sides of the ballot and tabulates the votes indicated by those marks.

Scanners can manage multiple precincts, and ballots can be fed into them in any direction. Scanners are pre-programmed before each election to read and tabulate the marks on the ballots for that specific election.

There are two main types of scanners.

- ◆ **Precinct scanner.** The voter feeds the completed ballot into the scanner at the precincts. The scanner reads the marks on the ballot in about one second.

If there are errors (such as too many votes for a contest), the scanner rejects the ballot by sliding it out the same slot into which it was inserted. The voter may then correct the ballot, ask for a new ballot, or ask the poll worker to override the scanner's rejection and accept the ballot anyway. Accepted ballots are automatically output into a ballot box under the scanner.

At the end of the day, poll workers print out the results tabulated by the scanner. The scanner also stores results electronically on a memory card to be read by the central computer at the elections office and/or the scanner transmits the results to the central office via modem.

Cost of one unit: \$6,000
Voters served: up to 3,000

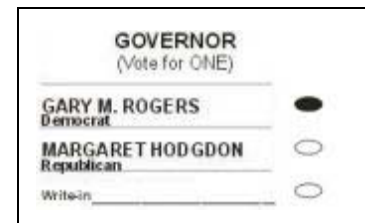
- ◆ **Central count scanner.** Ballots are collected at the precinct and carried to the central election office where this high-speed scanner resides. It is also used to scan absentee and vote-by-mail ballots. Elections office personnel feed all the ballots into the scanner, which reads the marks and tabulates the results.

The scanner separates ballots with errors or write-ins by outputting them to a special tray for personnel to examine.

Results are transferred to the central computer in the elections office, normally via cable.

Cost of one unit: \$70,000
Voters served: Unlimited

Election Management System software is required to set up the ballot definitions and aggregate the vote totals. Maintenance and software licensing fees are charged annually. Costs vary.



Precinct scanner



Central count scanner



Direct Record Electronic (DRE) Voting Machines – Electronic Ballots

Overview. The voter selects candidates from choices displayed on a computer, and when the voter presses a final button, the computer creates an electronic data record in its internal memory, and that electronic record (which the voter cannot verify) is counted as the voter’s ballot.

To begin, the poll worker provides the voter with a mechanism for accessing the correct ballot on the DRE – a programmed access card or cartridge for the voter to insert into the machine, or a number to enter on the keyboard. The voter chooses a language and then makes selections by following the instructions on the computer and taking the indicated actions, such as touching the screen and pressing buttons on the display or on a hand-held device.

Some DREs have features to assist people with disabilities, such as audio instructions for making selections and/or large buttons to press instead of touching the screen. With certain brands of DREs, the poll worker sets up the machine’s assistive features each time a voter chooses to vote with the computerized assistance. With other brands, the assistive features are available at all times.

Some DREs include a Voter-Verified Paper Audit Trail (VVPAT) printer intended to print each voter’s choices for the voter to approve before the choices are recorded electronically. However, the “electronic ballot” (which may not match the paper trail) is counted as the voter’s ballot.

Different types of DREs have different types of controls:

- ◆ **Touch screen system.** The voter touches locations on the screen to indicate their choices and touches special navigation buttons to move from one screen display to the next.

Cost of one unit with VVPAT printer:	\$4,000
Voters served:	200

- ◆ **Push button system.** The voter presses buttons next to the candidate names to indicate their choices. The entire ballot is provided in one display, so no navigation is necessary.

Cost of one unit with VVPAT printer:	\$11,000
Voters served:	300

- ◆ **Dial and button system.** The voter operates a dial and pushes buttons to make selections and navigate from one screen display to the next.

Cost of one unit with VVPAT printer:	\$3,500
Voters served:	200

Election Management System software and peripheral equipment are also required for these systems to set up the ballot definitions, provide voter access, and aggregate the vote totals. Maintenance and software licensing fees are charged annually. Costs vary.

Touch screen system
(screen – approx. 15”)



Pushbutton system



Dial & button system
(screen - approx. 15”)



Ballot Marking Devices for Disability Access – Paper Ballots

Overview. These devices assist voters in marking their choices on a paper ballot, which is then optically scanned or counted by hand.

Most ballot-marking devices are specifically designed to assist voters with disabilities. Some provide computerized accessibility similar to a DRE. Others offer low-tech solutions.

Computerized non-tabulating ballot marking devices. There are two such devices in use in the United States. Both offer language selection and high-tech computerized features for people with disabilities, comparable to the features offered by DREs, such as audio instructions for blind voters.

- ◆ The voter inserts a standard optical scan ballot into the AutoMARK and uses the buttons and touch screen to make selections. The machine prints marks in the appropriate locations on a ballot, which can then be tabulated by either a precinct scanner or a central count scanner, or by hand.

Cost of one unit (serves one precinct): \$5,700

- ◆ The voter inserts a special InkaVote ballot into the machine and makes selections, either by marking directly onto the ballot through the holes in the punch-card-like booklet, or by using the buttons and touch screens of the voter-assist component. The system includes its own precinct scanner for the special ballots.

Cost of one unit (serves one precinct): \$10,000

Election Management System software is required to set up the ballot definitions and aggregate the vote totals. Maintenance and software licensing fees are charged annually.

Low-tech ballot marking devices. Both non-computerized devices, the Vote-PAD and the Equalivote, provide features to assist voters with dexterity impairments as well as variations of the tactile ballot method that has been in use for many years by people who are blind or have low vision.

For both devices, the poll worker inserts a ballot into a plastic sleeve, and the voter marks the ballot through holes in the sleeve. Instructions are provided in audio, Braille, and large-print formats.

Blind voters can verify their selections through the use of a hand-held wand that vibrates when it senses a mark and is silent when it does not. The use of Braille and the vibrating wand provide independent voting for people who are both deaf and blind.

Cost of one Vote-PAD unit (serves one precinct): \$2,100

Cost of one Equalivote unit, includes booth (serves one precinct): \$3,500

No maintenance or licensing fees apply.

AutoMARK
(screen - approx. 15")



InkaVote



Vote-PAD



Equalivote

