



# Accessible and Verifiable Voting Technology: All Charts

The latest version of this chart appears at <http://www.verifiedvotingfoundation.org/accesscharts>

Some people are concerned that requirements for voter-verified paper records may delay implementation of the Help America Vote Act's (HAVA) provisions for accessible voting systems. Nothing could be farther from the truth. Equipment exists today offering both accessible and auditable voting for all voters; it is not necessary to choose between the two.

Not all accessible equipment is created equal, however. Some systems offer a wider range of options. Some offer accessible features on all units, while others provide those features only when required. Demonstrations of auditable and accessible voting equipment have taken place from New Jersey to Oregon in recent months. Some vendors have worked with accessibility advocates to develop cross-disability access and broaden the range of available features and options.

The first chart below summarizes which accessibility and verifiability categories each voting technology model makes available. The accessibility categories on the first chart link to separate charts showing more specific accessibility features for each accessibility category.

<a href="#">Vendor</a>	Model	<a href="#">Vision [chart]</a>	<a href="#">Dexterity [chart]</a>	<a href="#">Mobility [chart]</a>	<a href="#">Hearing [chart]</a>	<a href="#">Cognitive [chart]</a>	<a href="#">All Units Accessible</a>	<a href="#">VVPR on All?</a>
<a href="#">AccuPoll</a>	<a href="#">AVS 1000</a> <sup>1</sup>	partial	partial	minimal	complete	complete	yes	always
<a href="#">AutoMARK (ES&amp;S)</a>	<a href="#">ballot marking device</a> <sup>2</sup>	complete	complete	minimal	partial	partial	yes	always
<a href="#">Avante</a>	<a href="#">Vote Trakker</a> <sup>3</sup>	partial	partial	partial	none	minimal	yes	always
<a href="#">Avante</a>	<a href="#">Vote Trakker Full Face</a> <sup>4</sup>	partial	partial	minimal	none	minimal	yes	always
<a href="#">Diebold</a>	<a href="#">AccuVote TS</a> <sup>5</sup>	minimal	minimal	complete	complete	minimal	no	optional
<a href="#">Diebold</a>	<a href="#">AccuVote TSX</a> <sup>6</sup>	partial	minimal	partial	none	minimal	no	optional
<a href="#">ES&amp;S</a>	<a href="#">iVotronic</a> <sup>7</sup>	partial	minimal	partial	none	minimal	no	optional
<a href="#">ES&amp;S</a>	<a href="#">iVotronic LS</a> <sup>8</sup>	partial	minimal	none	partial	partial	no	optional
<a href="#">Hart Intercivic</a>	<a href="#">eSlate</a> <sup>9</sup>	partial	partial	partial	complete	complete	no	optional
<a href="#">Populex</a>	<a href="#">Digital Paper Ballot</a> <sup>10</sup>	partial	partial	none	partial	minimal	no	optional
<a href="#">Sequoia</a>	<a href="#">AVC Edge</a> <sup>11</sup>	partial	minimal	partial	minimal	partial	no	optional

### ***Key to Overview Chart:***

- A. "Vision" = The voting process shall be accessible to voters with visual disabilities, including partial vision, poor vision, color blindness, and blindness.<sup>12</sup>
- B. "Dexterity" = The voting process shall be accessible to voters who lack fine motor control or the use of their hands. All keys and controls should be operable with one hand and not require strong grasping, pinching, or twisting of the wrist.<sup>13</sup>
- C. "Mobility" = The voting process shall be accessible to voters who use mobility aids, including wheelchairs. All controls should be within reach of the voter.<sup>14</sup>
- D. "Hearing" = The voting process shall be accessible to voters with hearing disabilities, providing both audio and visual cues to the voter. Also no voting station will require speech for its operation.<sup>15</sup>
- E. "Cognitive" = The voting process shall be accessible to voters with cognitive disabilities. All voters should be able to negotiate the process effectively, efficiently, and comfortably.<sup>16</sup>
- F. "All Units Accessible" reflects whether the accessibility features are on each unit, or whether they are optional add-ons.
- G. "VVPR on All?" indicates whether the voter-verified paper record audit feature is available as part of every device, or whether it is an optional add-on.

### **Footnotes for Overview Chart:**

1. <http://www.accupoll.com/TheAccuPollAdvantage/Brochures/accessibility.pdf>
2. <http://www.essvote.com/HTML/docs/AutoMark.pdf> (Note: Some people maintain that ballot-marking devices are not accessible to mobility-impaired individuals and dexterity-impaired individuals because many of them are not able to move the paper ballot from the ballot-marking device to a secure ballot box. However, the AutoMARK ballot-marking device can release the marked ballot into a [privacy sleeve \(mirror\)](#) to maintain the secrecy of the vote during handling by a poll worker. A voter may also request a "visually impaired ballot" which has no plain text on it (Lou Dedier of Automark, San Francisco mock election, August 10, 2005). Many dexterity-impaired individuals use a gripper jaw to move paper ballots. Volume 1, Section 2.2.7.2.2.5, of the Election Assistance Commission's draft Voluntary Voting System Guidelines, states that voting technology vendors should make provisions for voters who are blind to submit the ballot themselves without the help of an election administrator.)
3. <http://www.vote-trakker.com/White%20Papers/ACCESSIBLE%20VOTING%20with%20voter%20verifiable%20paper%20records%20in%20DRE%20Voting%20System.pdf> and [http://www.vote-trakker.com/accessible\\_optical\\_voting.html](http://www.vote-trakker.com/accessible_optical_voting.html)

4. <http://www.vote-trakker.com/White%20Papers/fullfaceballottouchscreensystem.pdf> and [http://www.vote-trakker.com/accessible\\_optical\\_voting.html](http://www.vote-trakker.com/accessible_optical_voting.html)
5. [http://www6.diebold.com/dieboldes/accuvote\\_ts.htm](http://www6.diebold.com/dieboldes/accuvote_ts.htm)
6. [http://www6.diebold.com/dieboldes/accuvote\\_tsx.htm](http://www6.diebold.com/dieboldes/accuvote_tsx.htm)
7. <http://www.essvote.com/HTML/docs/iVotronic.pdf>
8. [http://www.essvote.com/HTML/docs/ESS\\_iVotronic\\_LS.pdf](http://www.essvote.com/HTML/docs/ESS_iVotronic_LS.pdf)
9. [http://www.hartintercivic.com/files/accessible\\_DLA\\_12\\_rev.pdf](http://www.hartintercivic.com/files/accessible_DLA_12_rev.pdf)
10. [http://www.populex.com/DPB\\_Intro.htm](http://www.populex.com/DPB_Intro.htm)
11. <http://www.sequoiavote.com/docs/AVCEdge.pdf>
12. <http://www.verifiedvotingfoundation.org/downloads/v1s2.pdf> pp.16-18
13. <http://www.verifiedvotingfoundation.org/downloads/v1s2.pdf> p.25
14. <http://www.verifiedvotingfoundation.org/downloads/v1s2.pdf> p.26
15. <http://www.verifiedvotingfoundation.org/downloads/v1s2.pdf> p.30
16. <http://www.verifiedvotingfoundation.org/downloads/v1s2.pdf> pp.30,34

## Vision Chart:

<u>Vendor</u>	<u>Model</u>	<u>Display Font Size</u>	<u>Display Contrast</u>	<u>Display Color Shift</u>	<u>Audio Device</u>	<u>Audio Speed</u>	<u>Audio Volume</u>	<u>Voice Type</u>	<u>VVPR Readback</u>	<u>Tactile Keypad</u>	<u>Additional Features</u>	<u>All Units Accessible</u>	<u>VVPR on All?</u>
<a href="#">AccuPoll</a>	<a href="#">AVS 1000</a> <u>1</u>	yes <u>2</u>	yes <u>1</u>	yes <u>1</u>	yes <u>1</u>	no <u>3</u>	yes <u>4</u>	human <u>4</u>	yes <u>1</u>	yes <u>1</u>	braille keypad, <u>1</u> navigable audio ballot <u>1</u>	yes	always
<a href="#">AutoMARK (ES&amp;S)</a>	<a href="#">ballot marking device</a> <u>5</u>	yes <u>5</u>	yes <u>6</u>	yes <u>8</u>	yes <u>5</u>	yes <u>5</u>	yes <u>7</u>	synth <u>8</u>	yes <u>9</u>	yes <u>7</u>	instructions in braille, repeat key <u>6</u>	yes	always
<a href="#">Avante</a>	<a href="#">Vote Trakker</a> <u>10</u>	yes <u>11</u>	no <u>12</u>	yes <u>11</u>	yes <u>13</u>	yes <u>13</u>	no <u>12</u>	synth <u>12</u>	yes <u>14</u>	yes <u>11</u>	navigable audio ballot <u>15</u>	yes	always
<a href="#">Avante</a>	<a href="#">Vote Trakker Full Face</a> <u>16</u>	yes <u>17</u>	yes <u>16</u>	yes <u>16</u>	yes <u>16</u>	-	-	-	yes <u>16</u>	yes <u>16</u>	-	yes	always
<a href="#">Diebold</a>	<a href="#">AccuVote TS</a> <u>18</u>	yes <u>18</u>	no <u>19</u>	no <u>19</u>	optional <u>18</u>	no <u>12</u>	yes <u>20</u>	human <u>12</u>	-	no <u>21</u>	-	no	optional
<a href="#">Diebold</a>	<a href="#">AccuVote TSX</a> <u>22</u>	yes <u>22</u>	yes <u>23</u>	yes <u>23</u>	optional <u>22</u>	yes <u>24</u>	-	-	-	no <u>21</u>	-	no	optional
<a href="#">ES&amp;S</a>	<a href="#">iVotronic</a> <u>25</u>	yes <u>2</u>	no <u>12</u>	-	yes <u>25</u>	no <u>26</u>	no <u>26</u>	human <u>12</u>	-	yes <u>27</u>	braille keypad <u>27</u>	no	optional
<a href="#">ES&amp;S</a>	<a href="#">iVotronic LS</a> <u>28</u>	yes <u>28</u>	yes <u>28</u>	-	yes <u>28</u>	-	-	-	-	-	-	no	optional

<u>Vendor</u>	Model	<u>Display Font Size</u>	<u>Display Contrast</u>	<u>Display Color Shift</u>	<u>Audio Device</u>	<u>Audio Speed</u>	<u>Audio Volume</u>	<u>Voice Type</u>	<u>VVPR Readback</u>	<u>Tactile Keypad</u>	<u>Additional Features</u>	<u>All Units Accessible</u>	<u>VVPR on All?</u>
<a href="#">Hart Intercivic</a>	<a href="#">eSlate</a> <sup>29</sup>	yes <sup>2</sup>	yes <sup>30</sup>	-	optional <sup>31</sup>	no <sup>12</sup>	yes <sup>32</sup>	human <sup>12</sup>	-	yes <sup>30</sup>	-	no	optional
<a href="#">Populex</a>	<a href="#">Digital Paper Ballot</a> <sup>33</sup>	yes <sup>34</sup>	yes <sup>35</sup>	yes <sup>35</sup>	yes <sup>3</sup>	no <sup>3</sup>	yes <sup>35</sup>	synth <sup>3</sup>	yes <sup>35</sup>	-	-	yes	optional
<a href="#">Sequoia</a>	<a href="#">AVC Edge</a> <sup>36</sup>	planned <sup>37</sup>	no <sup>12</sup>	-	optional <sup>38</sup>	planned <sup>37</sup>	yes <sup>39</sup>	human <sup>12</sup>	no <sup>39</sup>	optional <sup>38</sup>	braille keypad <sup>40</sup> navigable audio ballot <sup>37</sup>	no	optional

**Key to Vision Chart:**

- A. "Display Font Size" = capability to enlarge font so that voters with limited vision can more easily read the text.
- B. "Display Contrast" = increase or change contrast so text stands out, for voters with color-blindness and/or limited vision.
- C. "Display Color Shift" varies the colors shown on the screen, for voters with color-blindness and/or limited vision.
- D. "Audio Device" refers to a feature which allows voters to hear the instructions and ballot choices read to them through headphones. Some systems use synthesized voice, while others use human voice.
- E. "Audio Speed" refers to a feature which allows voters to adjust the speed at which text is read to them through headphones.
- F. "Audio Volume" refers to a feature which allows voters to adjust the volume at which text is read to them through headphones.
- G. "Voice Type" refers to recorded human speech or synthesized computer speech.
- H. "VVPR Readback" is an audio readback of the voter-verified paper record (VVPR) enabling the visually impaired voters to verify that their votes are recorded as intended and to make changes as necessary. In order to provide this feature, audio readback must be from the paper record itself and not from the voting machine's internal memory.

I. "Tactile Keypad" refers to manual controls which may include Braille, specially raised or shaped buttons, etc., to facilitate the selection of choices as the voter goes through the ballot.

### Footnotes for Vision Chart:

1. <http://www.accupoll.com/TheAccuPollAdvantage/Brochures/accessibility.pdf>
2. [http://www.capc.umd.edu/rpts/md\\_evote\\_ContempVotingMach.pdf](http://www.capc.umd.edu/rpts/md_evote_ContempVotingMach.pdf) p.7
3. Missouri Assistive Technology Council (<http://www.at.mo.gov/>) accessibility comparison table created by Diane Cordry Golden, Spring 2005.
4. <http://www.accupoll.com/TheAccuPollAdvantage/WhitePapers/Accessible.pdf>
5. <http://www.essvote.com/HTML/docs/AutoMark.pdf> (Note: Some people maintain that ballot-marking devices are not accessible to mobility-impaired individuals and dexterity-impaired individuals because many of them are not able to move the paper ballot from the ballot-marking device to a secure ballot box. However, the AutoMARK ballot-marking device can release the marked ballot into a [privacy sleeve \(mirror\)](#) to maintain the secrecy of the vote during handling by a poll worker. A voter may also request a "visually impaired ballot" which has no plain text on it (Lou Dedier of Automark, San Francisco mock election, August 10, 2005). Many dexterity-impaired individuals use a gripper jaw to move paper ballots. Volume 1, Section 2.2.7.2.2.5, of the Election Assistance Commission's draft Voluntary Voting System Guidelines, states that voting technology vendors should make provisions for voters who are blind to submit the ballot themselves without the help of an election administrator.)
6. [http://www.solidworks.com/pages/popups/viewrelease.html?prfile=11\\_01\\_2004.html](http://www.solidworks.com/pages/popups/viewrelease.html?prfile=11_01_2004.html)
7. <http://www.automarkts.com/> under tutorial under navigation
8. <http://www.johnson-county.com/auditor/min/050502vote.htm>
9. <http://vote.nist.gov/NISTEACResaultest.pdf> under ?ensuring access to voting?
10. <http://www.vote-trakker.com/White%20Papers/ACCESSIBLE%20VOTING%20with%20voter%20verifiable%20paper%20records%20in%20DRE%20Voting%20System.pdf> and [http://www.vote-trakker.com/accessible\\_optical\\_voting.html](http://www.vote-trakker.com/accessible_optical_voting.html)
11. [http://www.uhavavote.org/vendorfair/survey\\_results/avante\\_4.5.doc](http://www.uhavavote.org/vendorfair/survey_results/avante_4.5.doc)
12. <http://www.cvfieldsmbp.org/Voting%20Technology%20for%20People%20With%20Disabilities.pdf> p.32 of the document and p.42 of the PDF file.

13. <http://www.afb.org/afbp/press/pub.asp?DocID=aw050404&select=1#1> under Voting Machines: Vote-Trakker
14. <http://www.votersunite.org/info/ElectronicVotingInBrief.pdf> p. 3
15. [http://www.verifiedvoting.org/downloads/Avante\\_AccessibleVVPB.pdf](http://www.verifiedvoting.org/downloads/Avante_AccessibleVVPB.pdf) p.4
16. <http://www.vote-trakker.com/White%20Papers/fullfaceballottouchscreensystem.pdf> and [http://www.vote-trakker.com/accessible\\_optical\\_voting.html](http://www.vote-trakker.com/accessible_optical_voting.html)
17. <http://www.vote-trakker.com/evc308sprff.html>
18. [http://www6.diebold.com/dieboldes/accuvote\\_ts.htm](http://www6.diebold.com/dieboldes/accuvote_ts.htm)
19. [Email letter from Carrie Frank at Diebold Corporation](#), July 5, 2005 (with attached chart).
20. <http://www.cs.umd.edu/~bederson/voting/umd-dre-report.pdf>
21. Diebold claims that their machines have a tactile keyboard, but in their letters they describe it as a telephone keypad with a dotted five key, which is a regular telephone keypad.
22. [http://www6.diebold.com/dieboldes/accuvote\\_tsx.htm](http://www6.diebold.com/dieboldes/accuvote_tsx.htm)
23. [Email letter from Buck Jones at Diebold Corporation](#), July 3, 2005.
24. [http://www.tbpc.state.tx.us/cat\\_page/578-N1DieboldAccuVoteTSX.pdf](http://www.tbpc.state.tx.us/cat_page/578-N1DieboldAccuVoteTSX.pdf) p. 3
25. <http://www.essvote.com/HTML/docs/iVotronic.pdf>
26. <http://www.cvfieldsmbp.org/Voting%20Technology%20for%20People%20With%20Disabilities.pdf> p.12 of the document and p.22 of the PDF file
27. <http://www.essvote.com/HTML/products/ivotronic.html> right column
28. [http://www.essvote.com/HTML/docs/ESS\\_iVotronic\\_LS.pdf](http://www.essvote.com/HTML/docs/ESS_iVotronic_LS.pdf)
29. [http://www.hartintercivic.com/files/accessible\\_DLA\\_12\\_rev.pdf](http://www.hartintercivic.com/files/accessible_DLA_12_rev.pdf)
30. [http://www.uhavavote.org/vendorfair/survey\\_results/hart\\_4.5.doc](http://www.uhavavote.org/vendorfair/survey_results/hart_4.5.doc) p.1

31. <http://www.hartintercivic.com/innerpage.php?pageid=26> DAU section
32. <http://www.cvfieldsmbp.org/Voting%20Technology%20for%20People%20With%20Disabilities.pdf> p.17 of the document and p.27 of the PDF file
33. [http://www.populex.com/DPB\\_Intro.htm](http://www.populex.com/DPB_Intro.htm)
34. <http://www.advocacyla.org/whatsnew.html>
35. [http://www.populex.com/DPB\\_Features.htm](http://www.populex.com/DPB_Features.htm) in "Allows blind and visually impaired voting" section
36. <http://www.sequoiavote.com/docs/AVCEdge.pdf>
37. Sequoia presentation by Sheree Noell at a mock election sponsored by San Francisco Department of Elections, August 10, 2005.
38. [http://www.dcboee.org/pdf\\_files/AVC\\_Edge\\_Web\\_Instructions.pdf](http://www.dcboee.org/pdf_files/AVC_Edge_Web_Instructions.pdf) p.5
39. <http://www.cvfieldsmbp.org/Voting%20Technology%20for%20People%20With%20Disabilities.pdf> p.33
40. [http://www.capc.umd.edu/rpts/md\\_evote\\_ContempVotingMach.pdf](http://www.capc.umd.edu/rpts/md_evote_ContempVotingMach.pdf)

**Dexterity Chart:**

<u>Vendor</u>	<u>Model</u>	<u>Touchscreen</u>	<u>Dual Switch</u>	<u>Foot Pedal</u>	<u>Jelly Switch</u>	<u>Additional Features</u>	<u>All Units Accessible</u>	<u>VVPR on All?</u>
<a href="#">AccuPoll</a>	<a href="#">AVS 1000</a> <sup>1</sup>	yes <sup>2</sup>	yes <sup>1</sup>	-	yes <sup>3</sup>	-	yes	always
<a href="#">AutoMARK (ES&amp;S)</a>	<a href="#">ballot marking device</a> <sup>4</sup>	yes <sup>4</sup>	yes <sup>4</sup>	yes <sup>5</sup>	-	write-in capability <sup>6</sup>	yes	always
<a href="#">Avante</a>	<a href="#">Vote Trakker</a> <sup>7</sup>	yes <sup>8</sup>	yes <sup>9</sup>	-	-	-	yes	always
<a href="#">Avante</a>	<a href="#">Vote Trakker Full Face</a> <sup>10</sup>	yes <sup>11</sup>	yes <sup>9</sup>	-	-	-	yes	always
<a href="#">Diebold</a>	<a href="#">AccuVote TS</a> <sup>12</sup>	yes <sup>12</sup>	no <sup>5</sup>	no <sup>5</sup>	no <sup>5</sup>	-	no	optional
<a href="#">Diebold</a>	<a href="#">AccuVote TSX</a> <sup>13</sup>	yes <sup>13</sup>	planned <sup>14</sup>	no <sup>5</sup>	no <sup>5</sup>	tethered telephone keypad <sup>15</sup>	no	optional
<a href="#">ES&amp;S</a>	<a href="#">iVotronic</a> <sup>16</sup>	yes <sup>2</sup>	no <sup>17</sup>	-	-	-	no	optional
<a href="#">ES&amp;S</a>	<a href="#">iVotronic LS</a> <sup>18</sup>	yes <sup>18</sup>	-	-	-	-	no	optional
<a href="#">Hart Intercivic</a>	<a href="#">eSlate</a> <sup>19</sup>	no <sup>2</sup>	optional <sup>20</sup>	-	optional <sup>20</sup>	optional blink device <sup>21</sup>	no	optional
<a href="#">Populex</a>	<a href="#">Digital Paper Ballot</a> <sup>22</sup>	yes <sup>23</sup>	yes <sup>23</sup>	-	-	-	no	optional
<a href="#">Sequoia</a>	<a href="#">AVC Edge</a> <sup>24</sup>	yes <sup>2</sup>	planned <sup>25</sup>	-	-	-	no	optional

***Key to Dexterity Chart:***

A. "Touchscreen" refers to a computer monitor screen which allows a voter to make selections by touching the screen. Example:  
<http://www.emi-marine.com/products/dps/images/touchscreen%20to%20night%20mode.jpg>



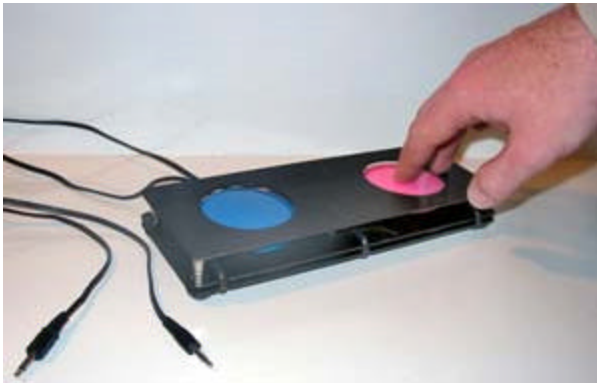
*Photo credit: Touchscreen from Engine Motor, Inc. ([www.emi-marine.com](http://www.emi-marine.com))*

B. A "Dual Switch" interface is a 3.5 mm "stereo jack" that dual switch devices plug into. These devices include joysticks and sip/puff devices.

C. "Foot Pedal" refers to device that permits a voter to make selections using his/her foot. Example:  
<http://www.atpm.com/9.01/images/kinesis-foot-pedal.jpg>



D. "Jelly Switch" refers to a single input switch which has a large surface area and is very sensitive to the touch. Example:  
<http://www.tecsol.com.au/images/JBx2-Holder.jpg>



*Photo credit: Disability Access Switch from Technical Solutions Australia ([www.tecsol.com.au](http://www.tecsol.com.au))*

E. "Joystick" refers to a hand-controlled lever which enables a voter to make selections by pressing on it in different directions. Example:  
<http://www.aerotech.com/products/accessories/pics/joystick.jpg>



F. "Sip/Puff" refers to a straw-like accessory which enables a voter to make selections by either sucking from or blowing into the device. Example:  
[http://www.orin.com/access/images/sip\\_pufED.jpg](http://www.orin.com/access/images/sip_pufED.jpg)



*Photo credit: Sip and puff device from Origin Instruments Corp. (<http://www.orin.com/index.htm>)*

## Footnotes for Dexterity Chart:

1. <http://www.accupoll.com/TheAccuPollAdvantage/Brochures/accessibility.pdf>
2. [http://www.capc.umd.edu/rpts/md\\_evote\\_ContempVotingMach.pdf](http://www.capc.umd.edu/rpts/md_evote_ContempVotingMach.pdf) p.7
3. [Email letter from Frank Wiebe](#), AccuPoll Media Relations, July 7, 2005
4. <http://www.essvote.com/HTML/docs/AutoMark.pdf> (Note: Some people maintain that ballot-marking devices are not accessible to mobility-impaired individuals and dexterity-impaired individuals because many of them are not able to move the paper ballot from the ballot-marking device to a secure ballot box. However, the AutoMARK ballot-marking device can release the marked ballot into a [privacy sleeve \(mirror\)](#) to maintain the secrecy of the vote during handling by a poll worker. A voter may also request a "visually impaired ballot" which has no plain text on it (Lou Dedier of Automark, San Francisco mock election, August 10, 2005). Many dexterity-impaired individuals use a gripper jaw to move paper ballots. Volume 1, Section 2.2.7.2.2.5, of the Election Assistance Commission's draft Voluntary Voting System Guidelines, states that voting technology vendors should make provisions for voters who are blind to submit the ballot themselves without the help of an election administrator.)
5. [http://electionarchive.net/doc\\_other/dopp/AdviceReDiebolds.pdf](http://electionarchive.net/doc_other/dopp/AdviceReDiebolds.pdf) pp.8,9
6. <http://www.automarkts.com/> under tutorial under write-in screen
7. <http://www.vote-trakker.com/White%20Papers/ACCESSIBLE%20VOTING%20with%20voter%20verifiable%20paper%20records%20in%20DRE%20Voting%20System.pdf> and [http://www.vote-trakker.com/accessible\\_optical\\_voting.html](http://www.vote-trakker.com/accessible_optical_voting.html)
8. <http://www.afb.org/afbpress/pub.asp?DocID=aw050404&select=1#1>
9. [Email letter from Cynthia Chu](#) of Avante, August 4, 2005, and attached "["DRE" & "ACCESSIBLE OPTICAL MARKSENSE" VOTE-TRAKKER? Provides Real and Full Accessibility](#)" chart from Avante.
10. <http://www.vote-trakker.com/White%20Papers/fullfaceballottouchscreensystem.pdf> and [http://www.vote-trakker.com/accessible\\_optical\\_voting.html](http://www.vote-trakker.com/accessible_optical_voting.html)
11. <http://www.vote-trakker.com/evc308sprff.html>
12. [http://www6.diebold.com/dieboldes/accuvote\\_ts.htm](http://www6.diebold.com/dieboldes/accuvote_ts.htm)
13. [http://www6.diebold.com/dieboldes/accuvote\\_tsx.htm](http://www6.diebold.com/dieboldes/accuvote_tsx.htm)
14. [Email letter from Carrie Frank at Diebold Corporation](#), July 5, 2005 (see also [attached chart](#)).

15. [Email letter from Buck Jones at Diebold Corporation](#), July 3, 2005.
16. <http://www.essvote.com/HTML/docs/iVotronic.pdf>
17. <http://www.sdsos.gov/3-20-03min.htm>
18. [http://www.essvote.com/HTML/docs/ESS\\_iVotronic\\_LS.pdf](http://www.essvote.com/HTML/docs/ESS_iVotronic_LS.pdf)
19. [http://www.hartintercivic.com/files/accessible\\_DLA\\_12\\_rev.pdf](http://www.hartintercivic.com/files/accessible_DLA_12_rev.pdf)
20. <http://www.hartintercivic.com/innerpage.php?pageid=26> DAU section
21. <http://www.cvfieldsmbp.org/Voting%20Technology%20for%20People%20With%20Disabilities.pdf> p.28 of the document and p.38 of the PDF file.
22. [http://www.populex.com/DPB\\_Intro.htm](http://www.populex.com/DPB_Intro.htm)
23. <http://www.advocacyla.org/whatsnew.html>
24. <http://www.sequoiavote.com/docs/AVCEdge.pdf>
25. Sequoia presentation by Sheree Noell at the mock election sponsored by the San Francisco Department of Elections, August 10, 2005

## Mobility Chart:

<u>Vendor</u>	Model	<u>Height Adjustment</u>	<u>Tilt Adjustment</u>	<u>Booth Size</u>	<u>Lap Voting</u>	<u>Curbside Voting</u>	<u>Additional Features</u>	<u>All Units Accessible</u>	<u>VVPR on All?</u>
<u>AccuPoll</u>	<u>AVS 1000</u> <sup>1</sup>	no <sup>2</sup>	-	-	keyboard only <sup>2</sup>	yes <sup>3</sup>	-	yes	always
<u>AutoMARK (ES&amp;S)</u>	<u>ballot marking device</u> <sup>4</sup>	no <sup>5</sup>	yes <sup>5</sup>	-	keyboard only <sup>5</sup>	-	-	yes	always
<u>Avante</u>	<u>Vote Trakker</u> <sup>6</sup>	yes <sup>7</sup>	no <sup>7</sup>	-	keyboard only <sup>8</sup>	no <sup>7</sup>	-	yes	always
<u>Avante</u>	<u>Vote Trakker Full Face</u> <sup>9</sup>	yes <sup>6</sup>	no <sup>8</sup>	-	keyboard only <sup>8</sup>	no <sup>7</sup>	-	yes	always
<u>Diebold</u>	<u>AccuVote TS</u> <sup>10</sup>	yes <sup>7</sup>	yes <sup>7</sup>	-	yes <sup>7</sup> 10 lbs. <sup>11</sup>	no <sup>7</sup>	-	no	optional
<u>Diebold</u>	<u>AccuVote TSX</u> <sup>12</sup>	-	yes <sup>13</sup>	-	yes 10 lbs. <sup>12</sup>	yes <sup>12</sup>	-	no	optional
<u>ES&amp;S</u>	<u>iVotronic</u> <sup>14</sup>	yes <sup>7</sup>	no <sup>7</sup>	-	yes <sup>7</sup> 14 lbs. <sup>14</sup>	yes <sup>7</sup>	-	no	optional
<u>ES&amp;S</u>	<u>iVotronic LS</u> <sup>15</sup>	-	-	-	-	-	-	no	optional
<u>Hart Intercivic</u>	<u>eSlate</u> <sup>16</sup>	yes <sup>7</sup>	no <sup>7</sup>	-	yes <8 lbs. <sup>17</sup>	yes <sup>7</sup>	-	no	optional
<u>Populex</u>	<u>Digital Paper Ballot</u> <sup>18</sup>	-	-	-	-	-	-	no	optional
<u>Sequoia</u>	<u>AVC Edge</u> <sup>19</sup>	yes <sup>7</sup>	yes <sup>7</sup>	28x28x60 <sup>20</sup>	audio only <sup>21</sup>	yes <sup>7</sup>	-	no	optional

### **Key to Mobility Chart:**

- A. "Height Adjustment" = A mobility disabled voter can adjust the height of the booth.
- B. "Tilt Adjustment" = A mobility disabled voter can adjust the tilt of the screen.
- C. "Booth Size" = These measurements are the dimensions of the voting booth in inches.
- D. "Lap Voting" = Voters can place the entire machine in their laps to make the voting process easier. "Keyboard Only" = Voters can place the keyboard, but not the screen, in their laps. "Audio Only" = Voters can place the keyboard in their laps, but they can use the keyboard only with the audio ballot.
- E. "Curbside Voting" = Voters whose disability prevents them from entering the polling place or standing in line may vote outside the polling place, usually from a vehicle parked at the curb.

### **Footnotes for Mobility Chart:**

1. <http://www.accupoll.com/TheAccuPollAdvantage/Brochures/accessibility.pdf>
2. [Email letter from Frank Wiebe of AccuPoll](#), July 25, 2005.
3. <http://www.johnson-county.com/auditor/min/050503vote.htm>
4. <http://www.essvote.com/HTML/docs/AutoMark.pdf> (Note: Some people maintain that ballot-marking devices are not accessible to mobility-impaired individuals and dexterity-impaired individuals because many of them are not able to move the paper ballot from the ballot-marking device to a secure ballot box. However, the AutoMARK ballot-marking device can release the marked ballot into a [privacy sleeve \(mirror\)](#) to maintain the secrecy of the vote during handling by a poll worker. A voter may also request a "visually impaired ballot" which has no plain text on it (Lou Dedier of Automark, San Francisco mock election, August 10, 2005). Many dexterity-impaired individuals use a gripper jaw to move paper ballots. Volume 1, Section 2.2.7.2.2.5, of the Election Assistance Commission's draft Voluntary Voting System Guidelines, states that voting technology vendors should make provisions for voters who are blind to submit the ballot themselves without the help of an election administrator.)
5. Demonstrated by Lou Dedier of ES&S at the mock election sponsored by San Francisco Department of Elections, August 10, 2005.
6. <http://www.vote-trakker.com/White%20Papers/ACCESSIBLE%20VOTING%20with%20voter%20verifiable%20paper%20records%20in%20DRE%20Voting%20System.pdf> and [http://www.vote-trakker.com/accessible\\_optical\\_voting.html](http://www.vote-trakker.com/accessible_optical_voting.html)
7. <http://www.cvfieldsmbp.org/Voting%20Technology%20for%20People%20With%20Disabilities.pdf> p.27 of document and p.37 of PDF file

8. [Email letter from Rick Gleim of Avante](#), August 1, 2005.
9. <http://www.vote-trakker.com/White%20Papers/fullfaceballottouchscreensystem.pdf> and [http://www.vote-trakker.com/accessible\\_optical\\_voting.html](http://www.vote-trakker.com/accessible_optical_voting.html)
10. [http://www6.diebold.com/dieboldes/accuvote\\_ts.htm](http://www6.diebold.com/dieboldes/accuvote_ts.htm)
11. [http://www.ss.ca.gov/elections/vsp\\_min\\_111003.pdf](http://www.ss.ca.gov/elections/vsp_min_111003.pdf)
12. [http://www6.diebold.com/dieboldes/accuvote\\_tsx.htm](http://www6.diebold.com/dieboldes/accuvote_tsx.htm)
13. [http://www.tbpc.state.tx.us/cat\\_page/578-N1DieboldAccuVoteTSX.pdf](http://www.tbpc.state.tx.us/cat_page/578-N1DieboldAccuVoteTSX.pdf) under "accessibility"
14. <http://www.essvote.com/HTML/docs/iVotronic.pdf>
15. [http://www.essvote.com/HTML/docs/ESS\\_iVotronic\\_LS.pdf](http://www.essvote.com/HTML/docs/ESS_iVotronic_LS.pdf)
16. [http://www.hartintercivic.com/files/accessible\\_DLA\\_12\\_rev.pdf](http://www.hartintercivic.com/files/accessible_DLA_12_rev.pdf)
17. [http://www.hartintercivic.com/files/accessible\\_DLA\\_12\\_rev.pdf](http://www.hartintercivic.com/files/accessible_DLA_12_rev.pdf) under "lightweight and portable"
18. [http://www.populex.com/DPB\\_Intro.htm](http://www.populex.com/DPB_Intro.htm)
19. <http://www.sequoiavote.com/docs/AVCEdge.pdf>
20. <http://sequoiavote.com/productguide.php?product=AVC%20Edge&type=Specifications>
21. Demonstrated by Sheree Noell of Sequoia at the mock election sponsored by the San Francisco Department of Elections, August 10, 2005

## Hearing Chart:

<u>Vendor</u>	Model	<u>Written Help and Instructions</u>	<u>Synched Audio &amp; Video</u>	<u>Additional Features</u>	<u>All Units Accessible</u>	<u>VVPR on All?</u>
<u>AccuPoll</u>	<u>AVS 1000</u> <sup>1</sup>	yes <sup>2</sup>	yes <sup>1</sup>	-	yes	always
<u>AutoMARK (ES&amp;S)</u>	<u>ballot marking device</u> <sup>3</sup>	instructions only <sup>4</sup>	yes <sup>5</sup>	-	yes	always
<u>Avante</u>	<u>Vote Trakker</u> <sup>6</sup>	yes <sup>7</sup>	no <sup>8</sup>	-	yes	always
<u>Avante</u>	<u>Vote Trakker Full Face</u> <sup>9</sup>	-	no <sup>10</sup>	-	yes	always
<u>Diebold</u>	<u>AccuVote TS</u> <sup>11</sup>	yes <sup>12</sup>	no <sup>12</sup>	-	no	optional
<u>Diebold</u>	<u>AccuVote TSX</u> <sup>13</sup>	-	-	-	no	optional
<u>ES&amp;S</u>	<u>iVotronic</u> <sup>14</sup>	no <sup>2</sup>	no <sup>18</sup>	-	no	optional
<u>ES&amp;S</u>	<u>iVotronic LS</u> <sup>15</sup>	yes <sup>15</sup>	-	-	no	optional
<u>Hart Intercivic</u>	<u>eSlate</u> <sup>16</sup>	yes <sup>2</sup>	yes <sup>8</sup>	-	no	optional
<u>Populex</u>	<u>Digital Paper Ballot</u> <sup>17</sup>	-	yes <sup>18</sup>	-	no	optional
<u>Sequoia</u>	<u>AVC Edge</u> <sup>19</sup>	instructions only <sup>20</sup>	planned <sup>21</sup>	-	no	optional

### **Key to Hearing Chart:**

- A. "Written Help and Instructions" = The computer screen displays written help and instructions to aid the voter.
- B. "Synched Audio & Video" = When the voter uses the audio option, text will appear on the screen at the same time it is played through the audio.

### **Footnotes for Hearing Chart:**

1. <http://www.accupoll.com/TheAccuPollAdvantage/Brochures/accessibility.pdf>
2. [http://www.capc.umd.edu/rpts/md\\_evote\\_ContempVotingMach.pdf](http://www.capc.umd.edu/rpts/md_evote_ContempVotingMach.pdf) p.9

3. <http://www.essvote.com/HTML/docs/AutoMark.pdf> (Note: Although some maintain that ballot-marking devices are not accessible to mobility-impaired and dexterity-impaired individuals due to the need to move the paper ballot from the device to the secure ballot box, in most areas election workers insert the ballots into the ballot box for all voters, and since it is possible to use privacy sleeves to maintain ballot secrecy for all voters, the ballot-marking devices provide as much accessibility to mobility-impaired and dexterity-impaired voters as to all other voters. However, the Election Assistance commissions draft Voluntary Voting System Guidelines, Volume 1, Section 2.2.7.2.2.5, states that the vendor should make provisions for voters who are blind to submit the ballot themselves without the help of an election official.)
4. <http://www.automarkts.com> under tutorial
5. <http://vote.nist.gov/NISTEACResaultitest.pdf>
6. <http://www.vote-trakker.com/White%20Papers/ACCESSIBLE%20VOTING%20with%20voter%20verifiable%20paper%20records%20in%20DRE%20Voting%20System.pdf> and [http://www.vote-trakker.com/accessible\\_optical\\_voting.html](http://www.vote-trakker.com/accessible_optical_voting.html)
7. [Email letter from Cynthia Chu](#) of Avante, August 4, 2005, and attached "[DRE](#)" & "[ACCESSIBLE OPTICAL MARKSENSE](#)" [VOTE-TRAKKER? Provides Real and Full Accessibility](#) chart from Avante.
8. <http://www.cvfieldsmbp.org/Voting%20Technology%20for%20People%20With%20Disabilities.pdf> p.32 of the document and p.42 of the PDF file.
9. <http://www.vote-trakker.com/White%20Papers/fullfaceballottouchscreensystem.pdf> and [http://www.vote-trakker.com/accessible\\_optical\\_voting.html](http://www.vote-trakker.com/accessible_optical_voting.html)
10. [Email letter from Rick Gleim of Avante](#), August 1, 2005.
11. [http://www6.diebold.com/dieboldes/accuvote\\_ts.htm](http://www6.diebold.com/dieboldes/accuvote_ts.htm)
12. <http://www.cs.umd.edu/~bederson/voting/umd-dre-report.pdf>
13. [http://www6.diebold.com/dieboldes/accuvote\\_tsx.htm](http://www6.diebold.com/dieboldes/accuvote_tsx.htm)
14. <http://www.essvote.com/HTML/docs/iVotronic.pdf>
15. [http://www.essvote.com/HTML/docs/ESS\\_iVotronic\\_LS.pdf](http://www.essvote.com/HTML/docs/ESS_iVotronic_LS.pdf)
16. [http://www.hartintercivic.com/files/accessible\\_DLA\\_12\\_rev.pdf](http://www.hartintercivic.com/files/accessible_DLA_12_rev.pdf)
17. [http://www.populex.com/DPB\\_Intro.htm](http://www.populex.com/DPB_Intro.htm)

18. Missouri Assistive Technology Council (<http://www.at.mo.gov/>) accessibility comparison table created by Diane Cordry Golden, Spring 2005.
19. <http://www.sequoiavote.com/docs/AVCEdge.pdf>
20. <http://www.sequoiavote.com/bAVCEdge.php>
21. Sequoia presentation by Sheree Noell at the mock election sponsored by the San Francisco Department of Elections, August 10, 2005.

## Cognitive Chart:

<u>Vendor</u>	Model	<u>Synched Audio &amp; Video</u>	<u>Help Button</u>	<u>Language Translations</u>	<u>Additional Features</u>	<u>All Units Accessible</u>	<u>VVPR on All?</u>
<a href="#">AccuPoll</a>	<a href="#">AVS 1000</a> <sup>1</sup>	yes <sup>1</sup>	yes <sup>2</sup>	yes <sup>3</sup>	-	yes	always
<a href="#">AutoMARK (ES&amp;S)</a>	<a href="#">ballot marking device</a> <sup>4</sup>	yes <sup>5</sup>	-	yes <sup>6</sup>	-	yes	always
<a href="#">Avante</a>	<a href="#">Vote Trakker</a> <sup>7</sup>	no <sup>8</sup>	no <sup>2</sup>	yes <sup>7</sup>	-	yes	always
<a href="#">Avante</a>	<a href="#">Vote Trakker Full Face</a> <sup>9</sup>	no <sup>10</sup>	no <sup>2</sup>	yes <sup>9</sup>	-	yes	always
<a href="#">Diebold</a>	<a href="#">AccuVote TS</a> <sup>11</sup>	no <sup>8</sup>	no <sup>12</sup>	yes <sup>11</sup>	-	no	optional
<a href="#">Diebold</a>	<a href="#">AccuVote TSX</a> <sup>13</sup>	-	-	yes <sup>13</sup>	-	no	optional
<a href="#">ES&amp;S</a>	<a href="#">iVotronic</a> <sup>14</sup>	no <sup>8</sup>	no <sup>2</sup>	yes <sup>15</sup>	-	no	optional
<a href="#">ES&amp;S</a>	<a href="#">iVotronic LS</a> <sup>16</sup>	-	yes <sup>16</sup>	yes <sup>16</sup>	full-face ballot	no	optional
<a href="#">Hart Intercivic</a>	<a href="#">eSlate</a> <sup>17</sup>	yes <sup>8</sup>	yes <sup>2</sup>	yes <sup>18</sup>	-	no	optional
<a href="#">Populex</a>	<a href="#">Digital Paper Ballot</a> <sup>19</sup>	yes <sup>20</sup>	-	yes <sup>19</sup>	-	no	optional
<a href="#">Sequoia</a>	<a href="#">AVC Edge</a> <sup>21</sup>	planned <sup>22</sup>	yes <sup>2</sup>	yes <sup>23</sup>	-	no	optional

### **Key to Cognitive Chart:**

- A. "Synched Audio & Video" = When the voter uses the audio option, text will appear on the screen at the same time it is played through the audio.
- B. "Help Button" = A button on the voting machine, usually labeled help, that voters can press to call a poll worker for assistance.
- C. "Language Translations" = A language translation option for voters who speak languages other than english. Regardless of the language, candidate names shall be displayed or pronounced in English on all ballots. For written languages that do not use Roman characters, the ballot shall include transliteration of candidate names into the relevant language.

## Footnotes for Cognitive Chart:

1. <http://www.accupoll.com/TheAccuPollAdvantage/Brochures/accessibility.pdf>
2. [http://www.capc.umd.edu/rpts/md\\_evote\\_ContempVotingMach.pdf](http://www.capc.umd.edu/rpts/md_evote_ContempVotingMach.pdf) p.9
3. <http://www.accupoll.com/TheAccuPollAdvantage/Brochures/avs1000.pdf> p.2
4. <http://www.essvote.com/HTML/docs/AutoMark.pdf> (Note: Some people maintain that ballot-marking devices are not accessible to mobility-impaired individuals and dexterity-impaired individuals because many of them are not able to move the paper ballot from the ballot-marking device to a secure ballot box. However, the AutoMARK ballot-marking device can release the marked ballot into a [privacy sleeve \(mirror\)](#) to maintain the secrecy of the vote during handling by a poll worker. A voter may also request a "visually impaired ballot" which has no plain text on it (Lou Dedier of Automark, San Francisco mock election, August 10, 2005). Many dexterity-impaired individuals use a gripper jaw to move paper ballots. Volume 1, Section 2.2.7.2.2.5, of the Election Assistance Commission's draft Voluntary Voting System Guidelines, states that voting technology vendors should make provisions for voters who are blind to submit the ballot themselves without the help of an election administrator.)
5. <http://vote.nist.gov/NISTEACResaultest.pdf>
6. <http://www.essvote.com/HTML/products/automark.html>
7. <http://www.vote-trakker.com/White%20Papers/ACCESSIBLE%20VOTING%20with%20voter%20verifiable%20paper%20records%20in%20DRE%20Voting%20System.pdf> and [http://www.vote-trakker.com/accessible\\_optical\\_voting.html](http://www.vote-trakker.com/accessible_optical_voting.html)
8. <http://www.cvfieldsmbp.org/Voting%20Technology%20for%20People%20With%20Disabilities.pdf> p.32 of the document and p.42 of the PDF file
9. <http://www.vote-trakker.com/White%20Papers/fullfaceballottouchscreensystem.pdf> and [http://www.vote-trakker.com/accessible\\_optical\\_voting.html](http://www.vote-trakker.com/accessible_optical_voting.html)
10. [Email letter from Rick Gleim of Avante](#), August 1, 2005.
11. [http://www6.diebold.com/dieboldes/accuvote\\_ts.htm](http://www6.diebold.com/dieboldes/accuvote_ts.htm)
12. <http://www.cs.umd.edu/~bederson/voting/umd-dre-report.pdf>
13. [http://www6.diebold.com/dieboldes/accuvote\\_tsx.htm](http://www6.diebold.com/dieboldes/accuvote_tsx.htm)
14. <http://www.essvote.com/HTML/docs/iVotronic.pdf>

15. [http://www.srqelections.com/ivotronic/ivotronic\\_details.htm](http://www.srqelections.com/ivotronic/ivotronic_details.htm)
16. [http://www.essvote.com/HTML/docs/ESS\\_iVotronic\\_LS.pdf](http://www.essvote.com/HTML/docs/ESS_iVotronic_LS.pdf)
17. [http://www.hartintercivic.com/files/accessible\\_DLA\\_12\\_rev.pdf](http://www.hartintercivic.com/files/accessible_DLA_12_rev.pdf)
18. [http://www.uhavavote.org/vendorfair/survey\\_results/hart\\_4.5.doc](http://www.uhavavote.org/vendorfair/survey_results/hart_4.5.doc) p.1
19. [http://www.populex.com/DPB\\_Intro.htm](http://www.populex.com/DPB_Intro.htm)
20. Missouri Assistive Technology Council (<http://www.at.mo.gov/>) accessibility comparison table created by Diane Cordry Golden, Spring 2005.
21. <http://www.sequoiavote.com/docs/AVCEdge.pdf>
22. Sequoia presentation by Ross Travis at the mock election sponsored by the San Francisco Department of Elections, August 10, 2005.
23. <http://www.acb.org/resources/votingbook1.html#ar14> Sequoia AVC Edge factsheet

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