



eSlate's PrecisionVote Navigation System: A Tough Screen, Not A Touch Screen

Why the eSlate System Doesn't Use a Touch Screen

One of the most distinctive features of Hart InterCivic's eSlate™ Electronic Voting System is the PrecisionVote™ Navigation System, the user-friendly dial that lets voters scroll through the ballot and select the candidate or proposition of their choice. The eSlate System uses a rotary optical encoder, incorporating an interface technology increasingly used by leading products to increase ease of use. eSlate's PrecisionVote Navigation System is easy to learn and use, providing precise, highly visible selection and confirmation. eSlate and PrecisionVote have also been acclaimed by national organizations representing persons with special needs or disabilities.

In designing eSlate, Hart InterCivic carefully examined the many different ways a voter might select his or her vote. By choosing a SELECT wheel, Hart InterCivic chose the easiest way to access the voting system -- one that is familiar, intuitive, and accurate.

SHORTCOMINGS IN TOUCH SCREENS

Among the alternatives Hart InterCivic evaluated was the touch screen. Many competitive Direct Record Electronic (DRE) voting systems use a touch screen interface. However, during development of the eSlate System, the Hart InterCivic Election Solutions Research & Development Group uncovered some potential problems in using touch screens as the voter interface for an election system:

- Concerns were documented that touch screens might be too fragile for use in the election environment.
- Product brochures describing touch screen systems raise concerns about their accuracy. Accuracy is paramount in designing a voting system. Several touch screen industry specification sheets, however, indicated that a 1% error rate for position accuracy was acceptable, and one specification even indicated that an error rate of up to 2% could be expected.
- Other research revealed the need to calibrate and re-calibrate touch screens during the period of their use. During the election period, election officials simply don't have the time or need to worry about re-calibrating a touch screen. In discussions with election officials who have experience using touch screens, some have indicated that touch screens must be calibrated every day or two and that machines that need to be calibrated might not register the intended vote. When calibration is lost, many touch screens tend to "drift," a situation in which the screen image does not match the touch points, creating confusion and inaccuracy.
- A manual prepared by one touch screen user includes the following description: "Unlike mouse or keyboard applications where the cursor is part of the image, a touch screen is a physical overlay with an independent coordinate system. Only by knowing the position of the image can the PC software convert touch screen coordinates into image coordinates.... Even changing video modes can affect the screen size. Perfect calibration cannot be achieved in all circumstances." This is one of the explanations for problems sometimes encountered in touch screens.

For example, on January 25, 2005, the Los Alamos Monitor reported on touch screen problems in the 2004 general election in New Mexico. The article cited that " voters in Cibola County were unable to make their votes register on touch screens, and in Sandoval County, low voltage conditions were responsible for miscalibrating the voting machines..."

- One cause of miscalibration in touch screens can be particularly troublesome for election officials. Some companies selling touch screen products recommend that users recalibrate the touch screen any time the video display changes or is repositioned. In some applications, such as in a restaurant cash register, this is not a problem, since the screens are static and consistent. For use during Early Voting, Absentee in Person, or No Excuse Absentee Voting, video displays are constantly changing or being repositioned with each new voter potentially requiring a different ballot style. The impact on the need for recalibration is very serious.
- Touch screens may require different pressures in order to activate the switch that makes the voter's selection. A voter may inadvertently fail to use sufficient pressure to complete his or her choice.
- Finally, touch screens are difficult for individuals who are visually or mobility impaired to use. For example, individuals with tremors find touch screens difficult to master, and may require voting assistance rather than exercising their right to vote independently.

Doubts about touch screen accuracy, reliability, accessibility, and durability, as well as the required ongoing maintenance, led Hart InterCivic to take a different approach.