

Voting System Examination Election Systems & Software (ES&S)

Prepared for the
Secretary of State of Texas

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Designee of the Attorney General

This report comprises the findings of the Attorney General's designee from an examination of the equipment listed, pursuant to Title 9, Chapter 122 of the Texas Election Code, section 122.036(b).

Examination Date	May 28, 2003
Report Date	May 28, 2003

ES&S offers a complete line of products for every aspect of conducting an election, including election setup, DRE, optical scanning, punch-card reading, tallying and reporting.

Components Examined	Type	Version	Suf*	NASED
iVotronic DRE Voting System	Voting	8.0.0.0	ZS	Submitted
Model 100 OMR Precinct Counter	Scanner	5.0.0.0		Submitted
Model 650	Scanner	1.2.0.0	Q	Submitted
Unity Election System Software	Setup & Tabulation	2.4		Submitted
Audit Manager	Part of Unity	7.0.2		Submitted
Ballot Image Manager	Part of Unity	7.2.0.0		Submitted
EDM – Election Data Manager – Election Setup	Part of Unity	7.2.0.0		Submitted
HPM – Hardware Program Manager – Programs PEBS, EPROMS, etc from election definition	Part of Unity	5.0.0.0		Submitted
DAM – Data Acquisition Manager (Client)	Part of Unity	5.0.0.0	M	Submitted
DAM – Data Acquisition Manager (Host)	Part of Unity	5.0.0.0	O	Submitted
ERM – Election Reporting Manager	Part of Unity	6.4.0.0	ZE	Submitted

* The "Suf" column is the suffix (if known) that is added to make the internal or development version number. See concern 1 below.

Note: The following were not submitted for re-certification because they are unchanged:

- Votronic DRE Voting System
- Model 150/550 OMR Scanner

Notes	<ul style="list-style-type: none"> • The Data Acquisition Manager is used in regional centers to collect precinct data for forwarding to central counting by modem or by carrying a PEB. • The Data Acquisition Manager does not need to know election-specific data or understand the results. It does not tabulate.
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Improvements

ES&S reports the following improvements to their products since the last examination:

Election Reporting Manager

- A reduction in the number of audit-log entries (for Bexar County). In my opinion, the reduced log is acceptable because the lines removed were not significant. The volume of printing in the old log could be unreasonable. There is still an entry in the log for each terminal, which is the critical information. The difference is that the precinct results are consolidated rather than being shown for each terminal.
- Printer pause and spool control (for Bexar County)
- Group name included in audit report record
- Update mode (replace or add) noted on each line
- Eliminated confusing page headings on real-time log
- Short (three row) heading printed upon each restart of the real-time log
- Greater detail on selection / parameter active during update process

Model 650 Central Tabulator

- Audit log notes number of ballots added and cumulative number, by precinct
- Audit log notes total ballots scanned, saved, and sorted
- Displays number of ballots cast, updated with each ballot processed

iVotronic DRE

- Able to print event log and candidate total (summarized from ballot images) directly from each terminal's audit data, with write-ins optional
- Poll-opening speed and usability improved (precinct, ballot style and spacing)
- Expanded election size, eliminating early-voting limitations
- Improved early-cast message
- Opening of polls with a PEB that has votes (purpose, warnings, audit)

Model 100 Scanner

- Improved scanning capabilities (skew and lateral ballot shift compensation)

Operating System Upgrades

- Supported on Windows 2000 and Windows XP
- Hardware Programming Manager now runs on Windows
- Data Acquisition Manager now runs on Windows

Notes

- I recommend that the Secretary of State approve the ES&S audit log of precinct consolidation activities. Although the log is not sent to the printer in real time, it is adequate in my opinion, given the difficulty of real-time printing.
- ES&S should be commended for improving their products and for addressing issues raised in past examinations. Overall, this was an excellent exam, and ES&S is making a lot of progress.

Concerns

<p>All Components</p>	<p>1. ES&S uses a very unusual version-numbering scheme that can be misleading if not completely understood. The best way to understand it is to consider an example. The documentation provided by ES&S for this examination says that we will be examining version 8.0.0.0 of the iVotronic DRE. The version they actually ship will also be version number 8.0.0.0, <i>even though it will probably be different from what was examined</i>. This is because the version examined was not actually 8.0.0.0, but 8.0.0.0zs. The "zs" suffix will be dropped when the product ships.</p> <p>Recommendation: I believe it is critical to know exactly what version is being examined, and that no equipment should be certified without an exact, unique version number. Therefore ES&S should be required to provide the complete version number, including the development suffix, of each product examined. Certification should be withheld until this information is provided. I have indicated the complete version numbers that I was able to glean during the examination.</p> <p>Justification: If ES&S does not know the exact versions they brought for certification, how can they tell us in the future what the changes have been made since that version? If they do know, why do they not disclose the information to us?</p>
<p>iVotronic</p>	<p>2. The messages provided for the "Early Cast" feature are confusing, and should be revised. The "Early Cast" feature allows the voter who selects a straight party to choose whether to review the individual partisan races, in case he wants to cross over.</p> <p>The current messages read as follows:</p> <p>Press here to review or change partisan selections or Press here to bypass partisan contests</p> <p>Recommendation: I suggest something like this: "You have voted for all the REPUBLICAN candidates. Would you like to see the individual races, in case you want to change some of your REPUBLICAN votes? Yes No"</p> <p>Question: What happens if the voter selects a straight Republican ticket and there are races with no Republicans? I suggest that those races should be shown even when the voter selects the "Early Cast" option.</p>

Voting: Characteristics of the Votronic and iVotronic DRE

Election Setup	Personalized Electronic Ballots (PEB) and separate flash memory cards are created with Unity software. Nothing is pre-programmed in the terminals; all the election information is in the PEB and flash memory. Anything that is precinct specific goes in the PEB. The flash memory is only required if the election is large or there are image or audio files.
Zero-total report	On the thermal printer in the communication pack.
Authorization to vote / Ballot selection	There are two modes: <ul style="list-style-type: none"> • Voter inserts a PEB, which is created at a Supervisor station using a supervisor PEB, both of which are red to distinguish them from voting stations. The voter's PEB cannot be reused without re-activation. • Poll worker inserts a PEB, immediately removes it, and selects the appropriate ballot. The PEB is retained by the poll worker and is reusable without re-activation.
View / Vote	LCD display / touch screen
Vote Storage	Three redundant flash memories
Precinct Consolidation	Allowed using PEB's. An audit log of this is kept in memory and can be printed at the precinct.
Transfer Results	PEB transported or data transmitted by modem to Unity software (or a regional site from which data is sent to the Unity software at central counting). The data is protected by a Cyclical Redundancy Check (CRC).
Print precinct results	On the thermal printer in the communication pack.
Straight party / crossover	Yes. A straight-party vote cannot cancel crossover votes that have already been selected, which protects the voter against mistakenly canceling a crossover vote.
ADA	Yes. Because it is battery-powered, the iVotronic can be taken to the curbside for voting. However, this was not demonstrated, because the Secretary of State verifies ADA compliance.

Setup & Tabulation: Characteristics of the Unity System

Tamper Resistance	Cyclical Redundancy Check (CRC) on each record in the election files.
OS access	Not permitted during tabulation.
Real-Time Audit Log	Yes.
Data Integrity	There are no special transaction-processing features. However, according to ES&S, there is no need, because all the data is written in a single write statement, making it impossible for partial results to be entered into the database. Also, it is easy to recalculate everything if a problem is suspected, and everything is automatically re-calculated when you request a canvass report. Since a canvass report would always be requested, this is satisfactory. In short, it is nearly impossible to get an incorrect result and not know it.