State of New York
# STATE BOARD OF ELECTIONS

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Date: May 20, 2006

To: Co-Chair Douglas A. Kellner
Co-Chair Neil W. Kelleher
Commissioner Evelyn J. Aquila
Commissioner Helena Moses Donohue

From: Anna E. Svizzero
Director of Election Operations

Re: Authorization Testing for HAVA Plan B Ballot Marking Devices:
Avante Vote-Trakker IVR (phone)
Avante Vote-Trakker Auto Ballot
ES & S - AutoMark
Inspire Vote by Phone (IVS)
Populex

Attached, please find documentation relating to the assessment of voting systems submitted by vendors who responded to the State Board of Elections' Invitation for Bid (OGS # 20414 ), for ballot marking devices, and reports of subsequent test findings. These systems, if authorized by the State Board of Elections, pursuant to Election Law Section 7-201.4, will be available for use in 2006, to provide voters with certain disabilities, the opportunity to cast their ballots privately and independently.

For the purposes of this Plan B implementation only, these devices will not tabulate ballots, and ballot programming by the vendor will be permitted.

Testing was scheduled and conducted as follows:

| | |
|---|---|
| May 8 and 9: | Avante's two systems - Vote-Trakker IVR and Auto Ballot |
| May 10: | system set-up day |
| May 11 and 12: | Populex and IVS Vote by Phone |
| May 17: | system set-up day |
| May 18 and 19: | AutoMark |

The State Board's Citizen Advisory Committee was invited to view the testing process, as were our County Boards of Elections, advocacy groups, and the general public (numbering 94). Sign-in sheets are available upon request. We do note that persons with disabilities did visit the test facility, and we did provide them with opportunities to test the various systems, so as to document feedback from persons who would actually be using these devices this year. Their comments are included in the aggregated summary of comments made by those present, which follow:

## GENERAL OVERVIEW

By way of summary, each of the systems

- marked ballots with 100% accuracy,
- allowed voters to vote in private, with minimal inspector assistance
- allowed voters to review ballots prior to printing them

Only three systems allowed voters to use the voting system to verify their ballot after it had been printed:

- AutoMark - verification happens at the voting station by re-feeding the voted ballot into the ballot marking device
- IVS - verification happens at voting station by listening to the ballot being read back to the voter via a bar code scan, after the ballot is printed
- Populex - verification happens at the voting station, via a bar code scan, after the ballot is printed

Both of Avante's submitted systems only allowed voters to review their ballot selections prior to printing. Voter verification after the printing of the ballot is visual, or the voter would require assistance at the poll site, in having their selections read back to them.

Each of the systems served voters with disabilities, though some served more disability needs than others:

- Avante Auto Ballot accommodates head sets, sip/puff, and a tactile keyboard
- Avante IVR accommodates head sets and sip/puff

- AutoMark accommodates head sets, sip/puff, and a paddle-style keyboard
- IVS accommodates head sets
- Populex accommodates head sets and sip/puff

## NUMBER OF VOTERS PER BALLOT MARKING DEVICE

It is incumbent upon each county board of elections to consider system features and select the system which best serves the needs of their constituencies. It is equally important that County Boards consider the numbers of voters who can be served by a single ballot marking device, when placing orders for their Plan B devices. The findings of our review on this important issue, are as follows:

| SYSTEM | TIME TO CAST VOTE | VOTERS ABLE TO BE SERVED ON AN AVERAGE ELECTION DAY - 15 Hours |
|---|---|---|
| Avante Vote-Trakker IVR | | |
| with head set | 30 minutes | 30 voters |
| with sip/puff | 45 minutes | 20 voters |
| Avante Vote-Trakker Auto Ballot | | |
| with head set | 20 minutes | 45 voters |
| with tactile keyboard | 41 minutes | 21 voters |
| with sip/puff device | 20 minutes | 45 voters |
| ES & S - AutoMark | | |
| with head set | 21 minutes | 42 voters |
| with paddle/switch | 18 minutes | 50 voters |
| with sip/puff device | 25 minutes | 36 voters |
| Inspire Vote by Phone (IVS) | 18 minutes | 50 voters |
| Populex, with head set | 30 minutes | 30 voters |
| with sip/puff device | 45 minutes | 20 voters |

## Public Comments - Avante Vote-Trakker Auto Ballot

**PRO**

- message of an under-voted race was welcomed and clear
- voter liked tactile keyboard but keys were too far apart for his needs
- system was easy to use by voters with needs similar to his

**CON**

- ballot review was continuous line of selections, not sectioned by race, and made review difficult
- could not see all candidates, thus voter does not know they missed any until they had completed voting
- display of candidates was confusing
- when 'cast ballot' is selected, system went straight to review, which voter did not expect

## Public Comments - Avante Vote-Trakker IVR

**PRO**

- directions were easy to understand
- it was easy to skip races
- clarity of the synthesized voice was good

**CON**

- keys are small, and it is easy to hit a wrong button, logging yourself out of the system
- there should be a help option at all times
- confusing - voter was not aware that he had finished voting, and accidentally hung-up without having his vote cast
- very time consuming and tedious
- system should advise voters in a multiple selection race, the number of candidates they have selected, and how many are left to select, for example: you have selected 3 of 5 candidates, so far
- easy to get confused when writing-in, and the help tools were not helpful
- the review process was repetitive and long

## Public Comments - POPULEX

**PRO**

- page-size magnifier provided by vendor was very helpful
- generally, instructions were presented well
- much more confident voting on this system than on phone-vote system
- could vote on this system without much reference to instructions
- fairly easy to use and navigate
- when using head set, voice was easy to listen to
- system has no time limits, so voter with disabilities feels no pressure to make quick decisions

**CON**

- numbers appearing after each candidate's name were distracting
- write-in keyboard in alpha-order, not keyboard order
- smart card might present inspector/administrative issues
- ballot was not full face - prefers to see whole ballot in a single viewing - multiple page screens hard to follow -
- review screen hard to follow, particularly instructions on how to de-select a candidate choice
- voter with certain disabilities was forced to vote using stylus
- system did not tell voter using head set how many candidates in certain race were left to be voted
- no candidate names appeared on voted ballot, only those names which had been written in - all other selections represented with a numeric code

## Public Comments - ES & S AutoMark

**PRO**

- review screen layout very friendly
- write-in feature easy to use - alpha order

- instructions and menu screen very easy to follow
- ballot verification feature very easy to use; liked that he could verify his own ballot, following the braille markings on the ballot feed path
- comfortable layout and easy to vote whole ballot
- could vote with finger or pen top (stylus)
- visually friendly

- served broader range of disability needs
- commands clear, could speed up voice if necessary, could jump to next race without scrolling through entire race, time allowed to make choices better than other systems
- liked the color-coding of the review process, distinguishing under-voted or skipped races from fully-voted races

**CON**

- 'advance to next screen' selection space very close to 'advance to next contest' selection space
- flashing message box alerts voter to scroll further - voter must pay close attention to screen messages
- finger pressure required on touch screen: highlighting a candidate name, with light pressure, did not ensure voting space was marked
- privacy screen seemed loose - flimsy
- the buttons used when voting via a head set are hard to press and tiring, and their purpose changes within the voting process, which may cause confusion

## Public Comments - IVS Inspire Vote by Phone

**PRO**

- voice was very clear
- able to move quickly through the races by pressing the six key
- directions were clear
- write-ins were easier, due to ability to skip ahead through the alphabet rapidly, and go backwards through the alphabet
- voice was human, not synthesized - comfortable to listen to

**CONS**

- there were many directions and it was easy to forget which keys were associated with which actions
- if I had not been warned by the 'inspector' to wait until the system said "You may now hang up the phone" I may have accidentally hung up the phone and walked away

## CONCLUSIONS / RECOMMENDATIONS

It became apparent to each of us who spoke with visitors at the test site over the past two weeks, that people felt more comfortable and confident using certain systems over others, and that elections officials felt a higher comfort and a higher level of confidence with certain systems more so than others. All participants were eager to share their thoughts and recommendations with us.

After reviewing each of the products submitted, and based upon our own findings, we recommend that the Board consider authorizing each system, identified as:

Avante Vote-Trakker IVR (phone)
Avante Vote-Trakker Auto Ballot
ES & S - AutoMark
Inspire Vote by Phone (IVS)
Populex,

for use at the 2006 September 12th Primary and the November 7th General Election. Each system marked ballots and did so accurately, and each system provided a method for voters to review their ballot prior to casting it. Visual verification of a voter's ballot was possible after each system had produced it, however only certain systems permitted voter verification of their printed ballot using the system itself.

While County Boards of Elections have chosen to provide voting on these ballot marking devices at central locations, rather than at each poll site, a system's features and the number of voters served by that device in an average election day must be considered by them when ordering such devices. While one central poll site may be acceptable, it is possible that just one device in that site, is not sufficient to serve a specific jurisdiction's community of voters with disabilities. County Board voter outreach efforts for Plan B should include a mailing to all voters in the county, and not just those who are currently voting by permanent absentee ballot. This mailing should include a postage-paid card which voters may complete and return to the Board, on which they indicate their intent to vote at the accessible site identified by the county. Perhaps aspects of Election Law Section 5-601 might be applied in this Plan B implementation, to allow for the moving of one's voting record to an accessible site. These steps would not only help identify the numbers of voters to be served in these sites, but would also enable County Boards to produce poll books for these central sites, which speaks to better election administration, accuracy and accountability.

# New York State

# Board of Elections

## Review of the

## Avante Vote Trakker Auto-Ballot Marking System

**May 22, 2006**

# Table of Contents



## Exhibits



# Authorization Test Report
# Avante Vote Trakker Auto-Ballot Marking System

## 1 Introduction

This test report presents the results of tests to validate the statutory and regulatory requirements of the New York State Board of Elections (NYSBoE) and provide the features specified by the vendor as outlined in their Technical Data Package(TDP). The test was performed during May 8, 2006 to May 12, 2006 at the "Clubhouse at Western Turnpike" (2350 Western Avenue, Guilderland, NY 12084). The following people were present during the testing:

- New York State Board of Elections (http://www.elections.state.ny.us)
  Anna Svizzero, Allison Carr, John Ferri, Ray Cecot, Phil Jorczak, Amit Shah
- CIBER, Inc. (http://www.ciber.com)
  Shawn Southworth, Jack Cobb
- Avante Vote Trakker Auto-Ballot Marking System (http://www.vote-trakker.com)
  Kevin Chung, Mike Ma
- Advisory Committee Members and members of the public were present to observe (sign-in sheets are available upon request.)

All observations are based upon performance testing during this period and compliance with applicable election law, regulations and technical specifications. The following sections describes the system, system operation, test operations, and system observations.

This report is restricted to the characteristics and performance of the system under test.

## 2 Applicable Documents

The following documents were used in the conduct of this test:

- Test Plan and procedure (Exhibit A)
- Test Ballots: primary/general/English/Spanish
- Operation and Setup manuals

## 3 System Description

The Avante Vote Trakker EVC308-SPR Accessible Auto-Ballot-Marking System, is a device which marks a paper ballot via touch-screen, audio or sip and puff interface. The Vote Trakker is a standalone device which can be used in a polling place providing accessibility and an independent means by which persons with certain disabilities can mark a ballot. The ballot is accessed via Smart Card coded with a randomly generated unique identifier via smart card reader/writer. The election database is loaded onto system via external media. The database contains all of the election data, ballot styles, and audio files necessary to configure system for election use. The device does not provide tally capability.

### 3.1 System Software and Control

The Avante Vote Trakker Accessible Auto-Ballot-Marking System employs an election management system(EMS) which is self-contained within each individual voting unit. The software is used for the following:

| EMS Mode | Description |
|---|---|
| **Ballot definition** | To correctly mark a pre-printed ballot |
| **Verification** | To verify/validate correctness of election data, contest identification and titles |
| **Audio files** | Wave files containing audio (synthesized voice) ballot and alternate language presentation |
| **System control** | provide utilities for setting passwords, etc. |

### 3.2 Hardware

The Avente Vote Trakker Auto-Ballot-Marking System is a self-contained, stand alone unit. In addition to the self-contained marking device, an accessibility table for wheelchair access, headphones, a privacy screen, paddles, and sip and puff attachment are also available to enable voters of varying disabilities the means to cast their ballot independently and privately.

The configuring tested consist of the following:

- Vote Trakker Auto-Ballot-Marking touch screen Firmware version 4.7.1.2
- Printer hp laserjet 1020
- Keyboard (color, touch and shape coded)
- Headphone
- Smart Card reader/writer
- Sip and Puff device

In addition to the alove list, the system requires the following additional material:

- 8 ½ x 11 standard printer paper
- Smart Cards
- Storage Media necessary to install/transfer database and voting information
- Headphone covers

## 4 Test Scope

The test has three principal objectives:

1) To demonstrate the ability to mark a ballot using the specified interfaces

2) To demonstrate the ability of the device to mark a ballot accurately
3) To demonstrate the ability of a ballot to be verified

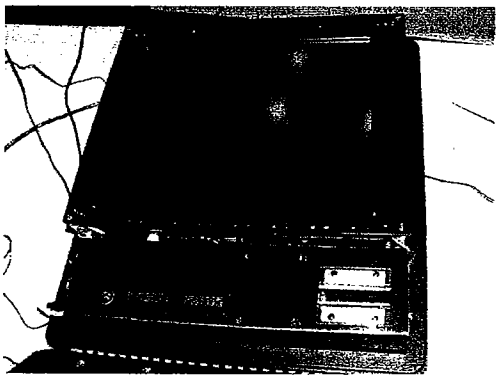
The test procedures were designed to demonstrate the functionality and to provide for a qualitative assessment of the device. The breadth of testing included the following:

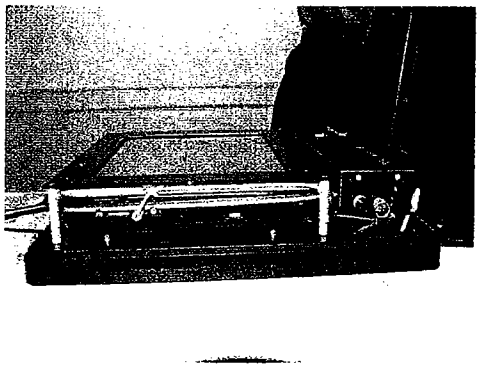
| Test type | Description |
|---|---|
| **Ballot Volume** | Casting ballots in quantities sufficient to replicate an actual voting day |
| **Accuracy** | Comparing the printed ballots against the predetermined test ballots |
| **Usability** | Ease with which the device provides for the ability to cast votes |
| **Recovery** | Recovery from anomalies encountered |
| **Data Recording** | Data recording, including audit logs/exception reports, printed ballots |
| **Changeability** | The ability of the voter to change the selection at any time |

## 5 Test Operations

The test cases were developed incorporating two primary elections and a general election with two ballot styles. The vendor prepared the election database and provided loadable media prior to the start of the test. Prior to conducting testing, photos were taken of the equipment's external and internal features. The test was conducted by a team consisting of NYSBoE and CIBER personnel. The test procedures are defined in Exhibit A.

### 5.1 Picture of internal system





### 5.2 Test Case: Primary

Three systems were set up to conduct the test. Equipment was powered up and self diagnostics performed. Software version and database/open poll report was printed. The device was

calibrated and ballot data loaded. Calibration aligns the coordinates reported by the touch screen into a set of coordinates that accurately represent the image on the display behind it. Calibration on the touch screen occurs from a poll worker accessible system menu. The poll worker is prompted to touch the screen in various specific target areas after which the system returns the display to the specified parameters.

Several test decks were created for each election which tested for the situations illustrated below.

| **Situations** |
|---|
| Write in candidates |
| Undervotes |
| Overvotes |
| Spanish language ballots |
| Changing selections |
| Spoiled ballot and re-vote |
| Invalid voter actions |
| "Sip and Puff" device |
| Audio Ballot |
| Printer disconnect |

Sample test deck ballots are attached as Exhibit B. Testing included using the various interfaces that accompanied the device and incorporated invalid voter selections, spoiling ballots and fleeing voter situations. Each system was loaded with multiple ballot styles. Testing employed toggling between ballot styles to verify multi-ballot capability.

### 5.3 Test Case: General

Three systems were utilized to conduct the test. The equipment was powered up and self diagnostics performed. Software version and database/ open poll report was printed. The device was calibrated and ballot data loaded. The database was verified against the certification ballot. Smart cards were prepared for each general election.

The first test conducted was a throughput test which included documenting the voters experience via an exit poll interview. The throughput test measured usability and the maximum number of votes the device would likely encounter during a fifteen hour election day. The cross section of voters included NYSBoE personnel, CIBER personnel, volenteers from county Board of Elections, members of the general public and various disability advocates.

The results from the throughput test was used in determining the amount of ballots needed for the

volume testing. The NYSBoE staff and CIBER personnel performed the volume testing using several test decks. These test deck incorporated instances of write-in candidates, undervotes, overvotes, Spanish language ballots, and cross-endorsed candidates. Testing included using the various interfaces that accompanied the device and incorporated invalid voter selections, spoiling ballots, and fleeing voter situations.

Anomalies and system generated errors were recorded and system accuracy was verified as each test deck was processed. A quality assurance person was part of each team whose responsibility was to verify the accuracy of the cast ballots against the test ballots.

Verification may be conducted by either reviewing the voter's selections on the system's screen prior to marking the ballot, by listening to an audio ballot review or by printing the marked ballot and feeding the marked ballot back into the system for visual review on the screen, or by using headphones, an audio review may be conducted.

## 6 Security

By the nature of the system design several security issues typical of systems that tally votes are non-existent.(manipulation/altering of vote totals etc.) The system uses smart-card technology to access the ballot. Each smart card uses a randomly generated code which expires the card after use, cards are password protected. The system provides for a dual password, (requiring two separate individuals to enter) a noteworthy security feature although entirely an option which procedurally, can be enforced.

## 7 Observations and Issues

The following list illustrates our observations:

- The review screen which appears at the end of the ballot prior to casting is confusing, contests are all jumbled together.

- Candidate select/deselect process not clearly articulated.

- Screens advance rapidly leaving no chance to do a contest level review prior to advancement to the next contest.

- Write ins produce extraneous characters (eg John Doe II produces John Doe@ II)

- One device timed out when a visually impaired voter attempted to review his ballot, preventing the voter from finishing the review and casting the ballot.

- 5 second time-outs impact usability : (there is a 5 second response time after a candidate is read which is the same interval as the screen change, if no choice is made system will automatically"skip choice").

• Two systems experienced reproducible anomalies when the screen choice was tapped more than once which caused the system to lockup. Recovery was simple on the first device, a simple reboot brought it back online. The recovery on the second device however was much more entailed, after several non-responsive reboots, and system generated error messages, system required a complete reinstall of software and a reinitialization. The system was out of service for at least one hour.

• The sip and puff interface was not tested during this period due to the fact that hardware was missing. After receiving the necessary hardware from the vendor, the sip and puff interface was tested, utilizing a general election test deck ballot containing write in candidates. The process of voting the ballot with the sip and puff interface took approximately twenty minutes.

### 7.1 Fleeing voter

The system displays a warning after five minutes of inactivity. Five minutes after the warning message, the ballot is nullified and the system returns to accepting a new voter. No spoiler ballot is printed for a fleeing voter.

### 7.2 Uninterruptible Power Supply

An Uninterruptible Power Supply (UPS) is required for the unit and will serve two purposes: 1) supply power to the unit in the event of power failure; and 2) protect the unit from power spikes. If there is an power outage, the UPS will start beeping to indicate the power interruption and begin supping power to the unit for approximately two to four hours. Depending on the type of UPS, there may be an indicator on the UPS which will display the approximate remaining battery capacity.

## 8 Conclusion

The Avante vote trakker auto-ballot-marking system is essentially a retrofitted DRE direct recording electronic voting system modified to serve as a ballot marking device. The system is a "pagination style"(one page at a time) touchscreen system which can be confusing to a sighted New York voter who is more familiar with a "Full Face" ballot. This is probably a non issue with a visually impaired voter. The use of access cards may not be fully embraced by the voter, elections inspector or purchasing jurisdictions for that matter.

The smart card writer requires additional expertise to operate not to mention some additional hardware.

The use of a COTS printer and plain paper for the printer, can be considered an asset as it negates the use of preprinted ballots and thus some of the security/accountability issues with preprinted ballots.

# New York State Board of Elections
# Software Test Report
## for
## Avante Vote-Trakker Auto-Ballot-Marking System

**Vendor: Avante International Technology, Inc.**

**System:**
**Vote-Trakker Auto-Ballot-Marking System**

**Prepared By: CIBER, Inc.**

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Change History

| Version | Date | Comment |
|---|---|---|
| 1.0 | 5/19/06 | Initial Release |
| 1.1 | 5/20/06 | Added audio ballot results |

## 1 Introduction

This document provides a report of software testing performed by Ciber, Inc. on two ballot marking systems submitted by Avante International, Inc. (Avante). The "Vote-Trakker Auto-Ballot-Marking System" provides assisted voting to impaired voters at the polling place. The objective of this testing was to validate that the systems met the requirements of the State of New York and provided the features specified by the Vendor in its technical data package.

### 1.1 Testing Agency Background

CIBER Inc. has been providing IT consulting services for over 20 years. Although the Independent Test Authority (ITA) division name has changed due to an aggressive acquisition and merger market, the ITA division of the company has had the same leadership in place since inception. Founded in 1974, the company's consultants now serve client businesses from 60 CIBER, 10 DigiTerra, 5 Solution Partners and 4 Enspherics offices in the U.S., Canada and Europe. With offices in 10 countries, CIBER's 6,000 IT specialists continuously build, test and upgrade our client's systems to "competitive advantage status." CIBER provides a single source for IT solutions, including:

Full-solution ASP services

- Applications maintenance and support
- Testing and IQA
- Web and database hosting
- Enterprise solutions, including SAP, Oracle and Peoplesoft
- Application outsourcing
- eBusiness, from architecture through execution
- Knowledge management and training

The company has been involved in numerous QA and IQA testing projects for commercial, state, and federal government customers.

### 1.2 Terms and Abbreviations

1. EMS – Election Management System provides software to create election ballots and tally election results.
2. Vote-Trakker Auto-Ballot-Marking System – The system is located at the polling place to provide assistance to disabled voters.
3. COTS – "Commercial Off-the-shelf" – Commercial available hardware equipment.

## 2 System Identification

The Avante EVC308-Auto Marking System consists of two modules: the touch screen voting machine and a COTS printer unit. The firmware used on the touch screen device was version 4.7.12.

## 3 Test Environment

All testing on these systems was performed at Western Turnpike Golf Course on Monday, May 8 2006 and Tuesday May 9, 2006.

The EVC308-Auto Marking System consisted of three touch screen voting units. All operated in a stand alone environment. Each unit had a HP Printer attached through a USB connection. The vendor supplied all smart cards. The programming of the smart cards was performed by the vendor using a vendor supplied laptop running Avante's EMS software version 5.3.0.

**Comment [RJC1]:** Define HP printer

## 4 Test Case Description

The following sections summarize three test cases using two elections to test the Avante Auto Marking System.

| **Test Case:** Primary_01 | **Configuration** |
|---|---|
| Closed Primary Election<br>Purpose: Test to see that the system can handle multiple ballots styles with multiple contest types in a single election. The system has to switch ballot styles depending on the voter's registration. An actual past New York State Election scenario was used as the input data. | 1. 2 Ballot Styles, Democratic and Conservative<br>2. 11 Democratic Contests<br>3. 4 Conservative Contests<br>4. 2 N of M Democratic Contests<br>5. 2 N of M Conservative Contests<br>6. Regular ballots<br>7. Write-ins<br>8. English<br>9. Spanish |

**Procedures:**

1. Load database for this election and generated election report
2. Open machine for voting
3. Voted and verified at least one ballot of each ballot style for each party
4. The voting included instances of:
    a. Candidate write-in
    b. Under-votes
    c. Spanish Language
    d. "Fleeing Voter"
    e. Change voting selection before casting
    f. Spoil ballot and revote
    g. Invalid voter actions
    h. "Sip and Puff" device
    i. Audio ballot
    j. Tactile Discernible Keyboard
    k. Disable the host printer and attempt to vote

| **Test Case:** General_01 | **Configuration** |
|---|---|
| General Election<br>Purpose: Test to see that the system can handle multiple ballots styles with multiple contest types in a single election. The system has to switch ballot styles depending on the voter's registration. An actual past New York State Election scenario was used as the input data. | 1. 2 Ballot styles, Cicero West (1) and Cicero East (2)<br>2. 13 Contests (Cicero West)<br>3. 14 Contests (Cicero East)<br>4. 6 Proposal Contests (Cicero West)<br>5. 6 Proposal Contests (Cicero East)<br>6. 2 N of M Contests (Cicero West)<br>7. 3 N of M Contests (Cicero East)<br>8. Regular ballots<br>9. Write-in<br>10. English<br>11. Spanish |

**Procedures:**

1. Load database for this election and generated election report
2. Open machine for voting
3. Voted and verified at least one ballot of each ballot style for each party
4. The voting included instances of:
    a. Candidate write-in
    b. Cross endorsed candidates (cross filing)
    c. Under-votes
    d. Spanish Language
    e. "Fleeing Voter"
    f. Change voting selection before casting
    g. Spoil ballot and revote
    h. Invalid voter actions
    i. "Sip and Puff" device
    j. Audio ballot
    k. Tactile Discernible Keyboard
    l. Disable the host printer and attempt to vote

| **Test Case:** Throughput Test | **Configuration** |
|---|---|
| Timed Voting Sample<br>Purpose: This test was used to determine the average amount of time it takes to cast a ballot on each system. A sample of 12 average voters with no prior experience with the system were timed voting the General Election Ballot used in Test Case General_01. The lowest and highest times were excluded and the rest of the sample times were averaged. | General Election Ballot from Test Case General_01 Cicero West Ballot Style 1 was used. |

**Procedures:**

1. Load database for this election
2. 12 smart cards were created and given to the "Voters"
3. Open machine for voting
4. "Voters" were asked to vote as though it were a real election
5. Time was started when the smart card was inserted and stopped after the ballot was reviewed
6. The times were averaged

## 5 Ballot Results and Statistics

Below is a table that contains the results of ballots cast for each system.

| **System**: Avante EVC308-Auto Marking System | |
|---|---|
| **Ballot Statistics:** | |
| ➢ Total Number of Ballot Positions: | 55,878 |
| ➢ Total Number of Ballots Cast: | 402 |
| ➢ Ballots Cast in General Election: | 102 |
| ➢ Ballots Cast in Primary Election: | 300 |
| **Time Statistics:** | |
| ➢ Average Time to Cast Ballot: | ~ 5 minutes |
| ➢ Number of Ballots in New York Election Day: | 180 |
| ➢ Time to Cast Ballot using Physical Disability Device (Audio Ballot): | ~20 minutes |
| Time to Cast Ballot using Physical Disability Device (Tactile Discernible Keyboard): | ~41 minutes |
| **Results:** All voted ballots were verified that the marked ballot was what the voter input into the system. The system recorded 100% accuracy rate. The only issue with the print ballots occurred if the write-in candidate's last name contained spaces. | |

## 6 Observation

This section describes the observations made by Ciber, Inc. during the course of testing. Items listed may be limitations of the facilities, non-testable items, or errors that occurred during testing.

**Avante EVC308-Auto Marking System**

Write-in candidates that contain spaces are not marked correctly. The space in the last name is replaced with a "@". An example of this would be the name "John Doe III" would appear on the printed ballot as "John Doe@III". The vendor stated this issue is configurable in the EMS software.

At any point during the voting process the voter can press the "Cast Ballot" key causing the ballot to under vote any contest not selected. The vote is not cast until the voter has the opportunity to review the ballot, but if this button is mistakenly selected the voter will have to return to the last race they selected and change all contest after that.

During testing the touch screen voting machine was subject to a "Tremor Test". This test simulates a person who has continuous shaking of the hands and touches the screen multiple times in the same place. An error was caused by this action causing the machine to be rebooted. The procedures were recreated on another machine. After both machines were brought back up one continued voting while the other encountered a second error while trying to cast the next ballot. This issue was resolved after an hour of down time. A representative of the vendor inserted a blank CD into the CD writer to save the last ballot cast.

Although the touch screen voting device is capable of connecting a "Sip and Puff" device it was not exercised during this test because the equipment used during testing did not have the proper connections.

# EXHIBIT A

# New York State Board of Elections
# Software Test Plan
## for
## Avante Vote-Trakker IVR Auto-Ballot-Marking System
## and
## Avante Vote-Trakker Auto-Ballot-Marking System

**Vendor: Avante International Technology, Inc.**

**System: Vote-Trakker IVR Auto-Ballot-Marking System**
**Vote-Trakker Auto-Ballot-Marking System**

**Prepared By: CIBER, Inc.**

Change History

| Version | Date | Comment |
|---|---|---|
| 1.0 | 4/26/06 | Initial Release |
| 1.1 | 5/02/06 | Incorporated changes requested by SBOE, changed 8 political parties to Multiple political parties. |
| 1.2 | 5/04/06 | Incorporated changes requested by SBOE to remove some items from the test cases |
| | | |
| | | |

# Functional Test Plan

## 1 Introduction

This document provides a plan for testing two ballot marking systems submitted by Avante International, Inc (Avante). The "IVR Auto-Ballot-Marking System" provides the capability to vote by phone/fax to a remotely (centrally) located ballot marking system. The "Vote-Trakker Auto-Ballot-Marking System" provides assisted voting to impaired voters at the polling place. The objective of this test is to validate that the systems meet the requirements of the State of New York and provide the features specified by the Vendor in its technical data package.

### 1.1 References

The following documents were provided by the vendor as a Technical Data Package (TDP) for evaluation and provide the specifications for the system as built by the vendor.

| Document Title | Doc. Date | Version |
|---|---|---|
| Vote-Trakker IVR Auto-Ballot-Marking System | 4/8/06 | 1.1.0 |
| Vote-Trakker Auto-Ballot-Marking System | 3/23/05 | 1.1.0 |
| EMS for Vote-Trakker Source Code (provided on CD) | 4/17/06 | 5.3.0 |
| Auto-Marking Vote-Trakker (AMVT) Source Code (provided on CD) | 4/17/06 | 1.0.0 |

### 1.2 Terms and Abbreviations

1. EMS – Election Management System provides software to create election ballots and tally election results.
2. Vote-Trakker IVR Auto-Ballot-Marking System - The system provides a voter the abilty to use a standard fax to access a central IVR processing unit, register his/her choices by pressing keys in response to voice prompts and print the marked ballot on the fax.
3. Vote-Trakker Auto-Ballot-Marking System – The system is located at the polling place to provide assistance to disadvantaged voters.

## 2. PreQualification Test

PreQualification testing is not applicable to this test.

# 3 Materials Required for Testing

## 3.1 Software

The system to be tested includes:

- Vote-Trakker IVR Auto-Ballot-Marking System
- Vote-Trakker Auto-Ballot-Marking System

## 3.2 Hardware

The configuration to be tested consists of the following equipment provided by the vendor:

- Vote-Trakker IVR Auto-Ballot-Marking System
  - Central IVR Processing System
  - Phone/Fax[1] (with test equipment sufficient to demonstrate the maximum number of simultaneous calls supported by the system.)
- Vote-Trakker Auto-Ballot-Marking System
  - Vote-Trakker ballot-marking touch screen voting machine
  - Printer
  - Keyboard
  - Headphone
  - Smart card reader/writer

## 3.3 Other Materials

The Vendor will provide the following for this test:

- Paper for printing of ballots
- Smart Cards as necessary to vote the Vote-Trakker Auto-Ballot-Marking System
- Storage Media as necessary to backup/transfer database and voting information

## 3.4 Deliverable Materials

The Vendor will deliver the following items prior to the start of the test:

1. A complete TDP that includes a description of the system hardware and software and operating manuals.
2. The Election Databases to be used in this test. These databases will be provided in source format which will allow modification and in "loadable" format.

## 3.5 Proprietary Data

All materials and deliverables provided by the vendor are considered company proprietary and the SBOE will protect against unauthorized distribution of those materials.

# 4 Test Specification

## 4.1 Requirements

The New York State Board of Elections (SBOE) will specify elections to be demonstrated and will conduct the test. The elections will include a variety of contest types, political parties and options that will demonstrate the functional capabilities presented in the Vendor's TDP.

The test may include any capabilities specified in the TDP and will include at least the following.

1. One General Election and two Closed Primary Elections
2. The following types of Contests in a General and a Primary Election
   a. Vote for n of m
   b. Vote for one

[1] The number of phone lines supported by a single IVR Processing System is not specified. The TDP uses the singular form of "phone/fax" in the text, so it is assumed that a System supports one phone line.

c. Propositions with yes/no or alternative text for voter selection
d. Judicial Contest

3. Multiple political parties
4. N of M contest and cumulative contest shall include:
   a. Multiple parties, each with n candidates
   b. Multiple parties, some with less than n candidates
   c. Multiple parties, some with more than n candidates
   d. Some parties with no candidates
5. Candidate Rotation
6. Printing of marked ballot (at fax machine and/or central site)

## 4.2 Hardware Configuration and Design

### 4.2.1 Vote-Trakker IVR Auto-Ballot-Marking System

Hardware will be provided by the vendor to support the elections specified by SBOE. The hardware will simulate a single host system located at the central office of a voting jurisdiction. The vendor will provide sufficient phone/fax equipment to demonstrate the maximum number of simultaneous callers supported by the system.

### 4.2.2 Vote-Trakker Auto-Ballot-Marking System

A single Voting unit will be provided by the vendor to support the elections specified by SBOE. The hardware configuration will include a printer and all peripherals necessary to successfully vote the specified elections.

## 4.3 System Functions

The Vendor must prepare the election databases and provide the loadable images to SBOE prior to the start of the test. As directed by the SBOE, the vendor will provide support and/or documentation necessary to load those databases so the test elections can be exercised. The test will include the loading of the election, casting votes and printing ballots. The vendor should prepare the databases so that all ballot formats from all precincts in a given election can be accessed after the "poll is open" without requiring reconfiguration of the system.

The test will include functions of most concern to the SBOE. However, the failure to include a function in this test does not imply that SBOE releases the vendor from providing that function. All functions described in the vendor's TDP are to function correctly.

## 4.4 Test Case Design

Test cases are created to demonstrate those capabilities determined to be of most concern to the SBOE but may be expanded to demonstrate any of the functionality claimed by the vendor in the TDP. The pass/fail criteria for each test is (1) that the test results are consistent with the expected result as specified in the TDP and (2) the test result conforms to the standards and procedures applicable to the State of New York and any subsidiary jurisdictions.

The following Sections summarize two test cases using two elections to test each of the Avante systems. The same elections are voted on both systems. The systems operate independent of each other and sufficiently different so that the test cases are presented in separate subsections that follow. SBOE may conduct the testing of both systems simultaneously or in sequence.

### 4.4.1 Vote-Trakker IVR Auto-Ballot-Marking System

The following tables summarize the test cases that are to be executed in this test. Each table indicates the minimum election parameters to be provided, the equipment to be included and a summary of the test procedure to be executed.

| **Test Case:** Setup and Verification | **Configuration** |
|---|---|
| Load database, setup Host Server and verify election ballot formats. | 1. Single Vote-Trakker IVR Auto-Ballot-Marking host server at Central Site.<br>2. Phone/Fax .<br>3. Ballot Database provided by Vendor |
| **Voting Devices Utilized:** PC, Phone line, Phone/Fax | |
| **Procedures:** | |
| 1. Power on all devices and monitor self-test messages<br>2. Load database to host (PC)<br>3. Tester (poll worker) initiates call, verifies sign-in security<br>4. Tester verifies election prompts.<br>5. Tester verifies error message received when attempting unauthorized access.<br>6. Inspect / print host sever log | |

| **Test Case:** Primary_01 | **Configuration** |
|---|---|
| Closed Primary Election | 1. Five precincts (multiple ballot styles)<br>2. Multiple political parties<br>3. Partisan Contest types: vote for one, N of M, cumulative<br>4. Regular ballots<br>5. English and Spanish Languages<br>6. Write-in |
| **Voting Devices Utilized:** PC, Phone/fax | |
| **Procedures:** | |
| 1. Load database for this election<br>2. Election Official opens poll<br>3. Poll worker calls in, attempts invalid sign on and then valid sign on<br>4. Poll worker responds to prompts and assumes role of voter when prompted (use multiple poll workers and telephone lines if available)<br>5. Vote and verify at least one ballot of each ballot style for each party. The voting must include instances of:<br>a. Candidate write-in<br>b. Under-votes<br>c. Spanish Language<br>d. "Fleeing Voter"<br>e. Change voting selection before casting<br>f. Spoil ballot and revote<br>g. Invalid voter actions<br>h. Print ballot at fax<br>i. Unexpected disconnect of phone line<br>6. Disable the host printer and attempt to vote.<br>7. Close poll<br>8. Print all reports available<br>9. Inspect (print) audit log | |

| **Test Case:** General_01 | **Configuration** |
|---|---|
| General Election | 1. Multiple precincts<br>2. Multiple political parties<br>3. Multiple ballot styles<br>4. Contest types: Partisan and Non-Partisan, Judicial, N of M, Cumulative<br>5. Regular ballots<br>6. Spanish Language<br>7. Write-in |
| **Voting Devices Utilized:** | |
| **Procedures:** PC, Phone/Fax | |

1. Election Official opens poll
2. Poll worker responds to prompts and assumes role of voter when prompted (use multiple poll workers and telephone lines if available)
3. Vote and verify at least one ballot of each ballot style. The voting must include instances of
    a. Candidate write-in
    b. Under-votes
    c. Spanish Language
    d. "Fleeing Voter"
    e. Simulate invalid voter actions
    f. Print ballot at fax
4. Close voting poll
5. Print all reports available
6. Inspect (print) audit logs

### 4.4.2 Vote-Trakker Auto-Ballot-Marking System

The following tables summarize the test cases that are to be executed in this test. Each table indicates the minimum election parameters to be provided, the equipment to be included and a summary of the test procedure to be executed.

| **Test Case:** Primary_01 | **Configuration** |
|---|---|
| Closed Primary Election | 1. Five precincts (multiple ballot styles)<br>2. Multiple political parties<br>3. Partisan Contest types: vote for one, N of M, cumulative<br>4. Regular ballots<br>5. English and Spanish Languages<br>6. Write-in |
| **Voting Devices Utilized:** PC, Phone/fax | |
| **Procedures:** | |
| 1. Power up hardware and observe self test diagnostics<br>2. Load election database<br>3. Preview one or more ballots<br>4. Record public counter<br>5. Election Official opens poll (inspect poll open reports)<br>6. Poll worker creates smart card for each "voter" that is to vote in this election.<br>7. Vote and verify at least one ballot of each ballot style for each party. The voting must include instances of:<br>a. Candidate write-in<br>b. Under-votes<br>c. Spanish Language<br>d. "Fleeing Voter"<br>e. Change voting selection before casting<br>f. Spoil ballot and revote<br>g. Invalid voter actions<br>h. Print ballot and verify marked choices<br>8. Close poll<br>9. Print all reports available<br>10. Inspect (print) audit log<br>11. Verify public counter | |

| **Test Case:** General_01 | **Configuration** |
|---|---|
| General Election | 1. Multiple precincts<br>2. Multiple political parties<br>3. Multiple ballot styles<br>4. Contest types: Partisan and Non-Partisan, Judicial, N of M, Cumulative<br>5. Regular ballots<br>6. Spanish Language<br>7. Write-in |
| **Voting Devices Utilized:** | |
| **Procedures:** PC, Phone/Fax | |

1. Power up hardware and observe self test diagnostics
2. Load election database
3. Test vote one or more ballots in "Test-Voting Mode"
4. Open poll
5. Poll worker prepares smart card for each voter that will vote in this election
6. Vote and verify at least one ballot of each ballot style . The voting must include instances of
    a. Touch screen and voice assisted voting
    b. Candidate write-in
    c. Under-votes
    d. Spanish Language
    e. "Fleeing Voter"
    f. Simulate invalid voter actions
    g. Print ballot
7. Close poll
8. Print all reports available
9. Inspect (print) audit logs

# 5 Test Data

## 5.1 Data Recording

The data to be recorded for each test will include:

- Audit log for each device
- Exceptions observed
- Observations for each step of the test script
- All available reports
- All Printed Ballots

## 5.2 Test Data Criteria

Test data will be evaluated against the specifications as stated in the vendor's TDP. Each ballot will be verified as it is created. The printed ballots will be examined and accepted or rejected by an SBOE representative. Audit logs will be validated by identifying startup and voting events in the audit log.

## 5.3 Test Data Reduction

All analysis to test data is by manual inspection of the reports and observation of events during the tests.

# 6 Test Procedure and Conditions

The test will be conducted by a test team consisting of, SBOE and CIBER personnel. The test team may specify alternate actions that are not defined in the test cases in this test plan. Invalid user (voter and poll worker) actions must be detected by the voting system and a notification given to the user and/or an effective recovery performed.

SBOE may direct additional test cases or steps to be executed that are not documented in this plan. The additional test cases may require that the election database be modified and reloaded.

## 6.1 Facility Requirements

The test configuration consists of the equipment described in Section 3.2. The vendor will provide the equipment at the facility specified by SBOE.

## 6.2 Test Set-up

The Vendor shall configure the hardware to support the elections provided by the SBOE. The hardware should be the same models that the vendor would install in jurisdictions that purchase the system.

## 6.3 Test Sequence

The "Setup and Verification" test is to be executed first. Other tests can be executed in any order as specified by SBOE at the time of testing.

# EXHIBIT B

22 District, 100, 1 (Ballot Type 1)

# OFFICIAL BALLOT

## General Election November 4, 1997

## Town of Onondaga, NY

Catherine DiCostanzo
CATHERINE DiCOSTANZO
County Clerk

**INSTRUCTION TO VOTERS**

To vote, completely darken the OVAL beside your choice. To vote for a person whose name is NOT on the ballot, write the candidate's name on the write-in line and darken the OVAL beside the name. If you wrongly mark, tear or deface this ballot, return it and request a new ballot.

**PLEASE FILL OVAL LIKE THIS:** ●

### Justice of the Supreme Court, 5th Judicial District
Vote for any Six

- ○ John JJ. Sullivan — DEMOCRATIC
- ○ Jerome B. Matthews — DEMOCRATIC
- ○ Neal P. O'Donnell — DEMOCRATIC
- ○ F. Dana Pierson — DEMOCRATIC
- ○ Milton P. Booker — DEMOCRATIC
- ○ Michael J. Castle — DEMOCRATIC
- ○ W. Bromley Squire — REPUBLICAN
- ○ Robert W. Murray — REPUBLICAN
- ○ Gerald Tillman — REPUBLICAN
- ○ Sandra J. Edwards — REPUBLICAN
- ○ Geoffrey J. Cummings — REPUBLICAN
- ○ Joseph A. Albright — REPUBLICAN
- ○ W. Bromley Squire — CONSERVATIVE
- ○ Robert W. Murray — CONSERVATIVE
- ○ Gerald Tillman — CONSERVATIVE
- ○ Sandra J. Edwards — CONSERVATIVE
- ○ Geoffrey J. Cummings — CONSERVATIVE
- ○ Joseph A. Albright — CONSERVATIVE
- ○ W. Bromley Squire — INDEPENDENCE
- ○ Thomas J. Tooley — INDEPENDENCE
- ○ Gerald Tillman — INDEPENDENCE
- ○ W. Bromley Squire — LIBERAL
- ○ Jerome B. Matthews — LIBERAL
- ○ Neal P. O'Donnell — LIBERAL
- ○ F. Dana Pierson — LIBERAL
- ○ Milton P. Booker — LIBERAL
- ○ Michael J. Castle — LIBERAL
- ● JOHN DOE — Write-In:
- ● JOHN DOE@II — Write-In:
- ● JOHN DOE@III — Write-In:
- ● JOHN DOE@IV — Write-In:
- ● JOHN DOE@V — Write-In:
- ● JOHN DOE@VI — Write-In:
- ○ Skip Choice(s)

### County Court Judge
Vote for One

- ○ Stephen A. Davidson — DEMOCRATIC
- ○ Alfred C. Crawford — REPUBLICAN
- ○ Alfred C. Crawford — CONSERVATIVE
- ○ Stephen A. Davidson — RIGHT TO LIFE
- ● JOHN DOE — Write-In:
- ○ Skip Choice(s)

### Family Court Judge
Vote for One

- ○ James F.X. Barrett — DEMOCRATIC
- ○ Kerry R. Schaefer — REPUBLICAN
- ○ Kerry R. Schaefer — CONSERVATIVE
- ○ James F.X. Barrett — RIGHT TO LIFE
- ● JOHN DOE — Write-In:
- ○ Skip Choice(s)

### District Attorney
Vote for One

- ○ Patrick K. Hammond — DEMOCRATIC
- ○ James M. Tompkins — REPUBLICAN
- ○ James M. Tompkins — CONSERVATIVE
- ○ Robert W. Russman — INDEPENDENCE
- ○ Patrick K. Hammond — RIGHT TO LIFE
- ● JOHN DOE — Write-In:
- ○ Skip Choice(s)

AVANTE
Vote-TRAKKER

## County Treasurer
Vote for One

- ○ Louis Newman — DEMOCRATIC
- ○ John C. Gallagher — REPUBLICAN
- ○ John C. Gallagher — CONSERVATIVE
- ○ Veronica Rutherford — INDEPENDENCE
- ○ Louis Newman — RIGHT TO LIFE
- ● JOHN DOE — Write-In:
- ○ Skip Choice(s)

## Sheriff
Vote for One

- ○ Charles F. Passmore — DEMOCRATIC
- ○ Patrick A. Friedman — REPUBLICAN
- ○ Patrick A. Friedman — CONSERVATIVE
- ○ Patrick A. Friedman — INDEPENDENCE
- ○ Charles F. Passmore — RIGHT TO LIFE
- ● JOHN DOE — Write-In:
- ○ Skip Choice(s)

## County Legislator 2nd District
Vote for One

- ○ George G. Johnston — DEMOCRATIC
- ○ William C. Abbott — REPUBLICAN
- ○ Margaret A. Thompson — CONSERVATIVE
- ○ George G. Johnston — FREEDOM
- ○ William C. Abbott — LABOR
- ● JOHN DOE — Write-In:
- ○ Skip Choice(s)

## Supervisor
Vote for One

- ○ Anthony Knight — DEMOCRATIC
- ○ Leonard W. Hamilton — REPUBLICAN
- ○ Leonard W. Hamilton — CONSERVATIVE
- ● JOHN DOE — Write-In:
- ○ Skip Choice(s)

## Town Clerk
Vote for One

- ○ Frederick W. Murray — DEMOCRATIC
- ○ M. Jobette Montgomery — REPUBLICAN
- ○ M. Jobette Montgomery — CONSERVATIVE
- ● JOHN DOE — Write-In:
- ○ Skip Choice(s)

## Superintendent of Highways
Vote for One

- ○ Christopher L. Bass — DEMOCRATIC
- ○ Charles F. Lemmon — FREEDOM
- ● JOHN DOE — Write-In:
- ○ Skip Choice(s)

## Town Justice
Vote for One

- ○ Catherine Noonan — DEMOCRATIC
- ○ Edward W. Brewster — REPUBLICAN
- ○ Edward W. Brewster — CONSERVATIVE
- ● JOHN DOE — Write-In:
- ○ Skip Choice(s)

## Councilman
Vote for any Two

- ○ Margaret F. Perkins — DEMOCRATIC
- ○ Russel S. Dwyer — DEMOCRATIC
- ○ Thomas E. Olson — REPUBLICAN
- ○ Nancy Barton — REPUBLICAN
- ● JOHN DOE@I — Write-In:
- ● JOHN DOE@II — Write-In:
- ○ Skip Choice(s)

## Assessor
Vote for One

- ○ Shella A. Sanders
- ○ Frederick L. Fuller
- ○ Frederick L. Fuller
- ● JOHN DOE
- ○ Skip Choice(s)

## BALLOT PROPOSAL NUMBER 1
AMENDMENT CONTRACTING, PAYING AND REFUNDING LOCAL DEBT

- ○ YES
- ○ NO
- ● Skip Choice(s)

## BALLOT PROPOSAL NUMBER 2
AN AMENDMENT DEBT LIMITS FOR SEWAGE FACILITIES

- ○ YES
- ○ NO
- ● Skip Choice(s)

## BALLOT PROPOSAL NUMBER 3
AN AMENDMENT CONTRACTING, PAYING AND REFUNDING STATE DEBTS

- ○ YES
- ○ NO
- ● Skip Choice(s)

## BALLOT PROPOSAL NUMBER 4
COUNTY PROPOSITION NUMBER ONE

- ○ YES
- ○ NO
- ● Skip Choice(s)

0001E0022M9G01DD5D0150 (Regular Ballot)

| BALLOT PROPOSAL NUMBER 5<br>COUNTY PROPOSITON NUMBER TWO |
| --- |
| ○ YES |
| ○ NO |
| ● Skip Choice(s) |
| **BALLOT PROPOSAL NUMBER 6**<br>COUNTY PROPOSITION NUMBER THREE |
| ○ YES |
| ○ NO |
| ● Skip Choice(s) |

SYRACUSE, ED 22, 1 (Ballot Type 1)

# OFFICIAL BALLOT (Conservative)

## Primary Election September 9, 1997

## COUNTY OF ONONDAGA, NY

**INSTRUCTION TO VOTERS**

To vote, completely darken the OVAL beside your choice. To vote for a person whose name is NOT on the ballot, write the candidate's name on the write-in line and darken the OVAL beside the name. If you wrongly mark, tear or deface this ballot, return it and request a new ballot.

**PLEASE FILL OVAL LIKE THIS:** ●

### Governor
Vote for One

- ○ Robert Quinion
- ● Douglas Stone
- ○ Write-In:_____
- ○ Skip Choice(s)

### State Senate
Vote for One

- ● Craig Janis
- ○ Brian Getz
- ○ Alieen Chao
- ○ Write-In:_____
- ○ Skip Choice(s)

### Member of State Committee (27th Congressional District)
Vote for no more than Ten

- ○ Joel Owens
- ● Homer H. Reamer
- ○ Anthony Suess
- ● Lois Perez
- ○ Robert Rocco
- ● William Menizer
- ○ Doris Shidles
- ● Douglas Miller
- ○ Richard House
- ● Thomas Pooler
- ○ Craig Oritz
- ● Lewis Tuohey
- ○ Gloria Mentero
- ● Mort Taverni
- ○ Alfred Rutkowski
- ● Andre Ninia
- ○ Howard Hwang
- ● Morton Maher
- ○ Robert Loeber
- ● Gloriz Rossi
- ○ Carol Koethen
- ○ Eugene Kessler
- ○ Paul Hodgkins
- ○ Heidi Hatzinger
- ○ Write-In:_____
- ○ Write-In:_____
- ○ Write-In:_____
- ○ Write-In:_____
- ○ Write-In:_____
- ○ Write-In:_____
- ○ Write-In:_____
- ○ Write-In:_____
- ○ Write-In:_____
- ○ Write-In:_____
- ○ Skip Choice(s)

### Councilman, 4th District
Vote for no more than Two

- ○ Harry James
- ● Betty Crooker
- ○ John King
- ○ Ned Song
- ○ Write-In:_____
- ○ Write-In:_____
- ● Skip Choice(s)

0001E221622704500E00V0 (Regular Ballot)

SYRACUSE, ED 22, 1 (Ballot Type 1)

# OFFICIAL BALLOT (Democratic)

## Primary Election September 9, 1997

## COUNTY OF ONONDAGA, NY

**INSTRUCTION TO VOTERS**

To vote, completely darken the OVAL beside your choice. To vote for a person whose name is NOT on the ballot, write the candidate's name on the write-in line and darken the OVAL beside the name. If you wrongly mark, tear or deface this ballot, return it and request a new ballot.

**PLEASE FILL OVAL LIKE THIS:** ●

### Governor
Vote for One

- ○ Donnaine Cliffs
- ● William Sullivan
- ○ Frances Odeen
- ○ Write-In:_____
- ○ Skip Choice(s)

### Comptroller
Vote for One

- ○ Marcia Clinton
- ● Antobelle Galka
- ○ Write-In:_____
- ○ Skip Choice(s)

### Attorney General
Vote for One

- ● Earl Garcia
- ○ Pamela Montgomery
- ○ Write-In:_____
- ○ Skip Choice(s)

### Representative in Congress
Vote for One

- ● Carmen Ortiz
- ○ Blas Olm
- ○ Write-In:_____
- ○ Skip Choice(s)

### State Senate, 49th
Vote for One

- ● Terrence Olfer
- ○ Rosaline Pozzi
- ○ Betty Polli
- ○ Write-In:_____
- ○ Skip Choice(s)

### Member of Assembly, 120th
Vote for One

- ○ Lisanne Price
- ● Connie McCord
- ○ Vaughn McFarland
- ○ Write-In:_____
- ○ Skip Choice(s)

### County Judge
Vote for no more than Four

- ○ Emmazine Liu
- ○ Luke Meola
- ○ Beverly Spath
- ○ Aaron Rytes
- ○ Jaccob Tenenni
- ○ Sandra Speed
- ○ Carmela Traubwein
- ○ Write-In:_____
- ○ Write-In:_____
- ○ Write-In:_____
- ○ Write-In:_____
- ● Skip Choice(s)

### District Attorney
Vote for One

- ● Kata Regula
- ○ Herman Will
- ○ Write-In:_____
- ○ Skip Choice(s)

### County Executive
Vote for One

- ● Elliott Satas
- ○ Lee Santulli
- ○ Write-In:_____
- ○ Skip Choice(s)

### County Legislator
Vote for One

- ● Guinevere Dipenna
- ○ Shlomo Archibald
- ○ Neil Bellert
- ○ Write-In:_____
- ○ Skip Choice(s)

### Councilman, 1st District
Vote for no more than Two

- ○ Celesie Cairo
- ○ Foster Brooks
- ○ Cheryl Sever
- ○ Uznnah Morin
- ○ Leon Oburchowski
- ○ Write-In:_____
- ○ Write-In:_____
- ● Skip Choice(s)

0001E1114NOT03510C00V0 (Regular Ballot)

# New York State

# Board of Elections

## Review of the

## Avante Vote-Trakker IVR Auto-Ballot Marking System

**May 22, 2006**

# Table of Contents



## Exhibits

# Authorization Test Report
# Avante Vote Trackker Auto-Ballot Marking System

## 1 Introduction

This test report presents the results of tests to validate the statutory and regulatory requirements of the New York State Board of Elections (NYSBoE) and provide the features specified by the vendor as outlined in their Technical Data Package(TDP). The test was performed during May 8, 2006 to May 12, 2006 at the "Clubhouse at Western Turnpike" (2350 Western Avenue, Guilderland, NY 12084). The following people were present during the testing:

- New York State Board of Elections (http://www.elections.state.ny.us)
  Anna Svizzero, Allison Carr, John Ferri, Ray Cecot, Phil Jorczak, Amit Shah
- CIBER, Inc. (http://www.ciber.com)
  Shawn Southworth, Jack Cobb
- Avante Vote Trackker Auto-Ballot Marking System (http://www.vote-trakker.com)
  Kevin Chung, Mike Ma
- Advisory Committee Members and members of the public were present to observe (sign-in sheets are available upon request.)

All observations are based upon performance testing during this period and compliance with applicable election law, regulations and technical specifications. The following sections describes the system, system operation, test operations, and system observations.

This report is restricted to the characteristics and performance of the system under test.

## 2 Applicable Documents

The following documents were used in the conduct of this test:

- Test Plan and procedure (Exhibit A)
- Test Ballots: primary/general/English/Spanish
- Operation and Setup manuals

## 3 System Description

The Avante Vote Trakker IVR Auto-Ballot Marking System, is a device which marks a paper ballot via a COTS phone-fax portal unit and the centrally located IVR processing system. The Vote Trakker IVR provides accessibility and an independent means by which persons with certain disabilities can mark a ballot (i.e. sip and puff attachment). The processing system contains all of the election data, ballot styles, and audio files necessary to configure system for election use. The device does not provide tally capability.

### 3.1 System Software and Control

The Avante Vote Trakker IVR Auto-Ballot Marking System employs an election management system(EMS) which is contained within the central telephone voice server unit. The software is used for the following:

| EMS Mode | Description |
|---|---|
| **Ballot definition** | To correctly mark a pre-printed ballot |
| **Verification** | To verify/validate correctness of election data, contest identification and titles |
| **Audio files** | Wave files containing audio (synthesized voice) ballot and alternate language presentation |
| **System control** | provide utilities for setting passwords, etc. |

### 3.2 Hardware

The Avante Vote Trackker IVR Auto-Ballot Marking System makes use of a modified phone/fax machine to facilitate printing the marked ballot. The configuration tested consists of the following:

- Modified Panasonic KX-FL511 Phone/Fax
- Sip and Puff attachment

In addition to the above list, the system requires the following additional material:

- 8 ½ x 11 standard printer paper

## 4 Test Scope

The test has three principal objectives:

1) To demonstrate the ability to mark a ballot using the specified interfaces
2) To demonstrate the ability of the device to mark a ballot accurately
3) To demonstrate the ability of a ballot to be verified

The test procedures were designed to demonstrate the functionality and to provide for a qualitative assessment of the device. The breadth of testing included the following:

| Test type | Description |
|---|---|
| **Ballot Volume** | Casting ballots in quantities sufficient to replicate an actual voting day |
| **Accuracy** | Comparing the printed ballots against the predetermined test ballots |

| | |
|---|---|
| **Usability** | Ease with which the device provides for the ability to cast votes |
| **Recovery** | Recovery from anomalies encountered |
| **Data Recording** | Data recording, including audit logs/exception reports, printed ballots |
| **Changeability** | The ability of the voter to change the selection at any time |

## 5 Test Operations

The test cases were developed incorporating two primary elections and a general election with two ballot styles. The vendor prepared the election database and provided loadable media prior to the start of the test. Prior to conducting testing, photos were taken of the equipment's external and internal features. The test was conducted by a team consisting of NYSBoE and CIBER personnel. The test procedures are defined in Exhibit A.

### 5.1 Test Case: Primary

One system was set up to conduct the test. Equipment was powered up and self diagnostics performed . Software version and database/ open poll report was printed . The ballot data was loaded. The database was verified against the certification ballot.

Several test decks were created for each election which tested for the situations illustrated below.

| **Situations** |
|---|
| Write in candidates |
| Undervotes |
| Overvotes |
| Spanish language ballots |
| Changing selections |
| Spoiled ballot and re-vote |
| Invalid voter actions |
| "Sip and Puff" device |
| Audio Ballot |
| Printer disconnect |

Testing included using the various interfaces that accompanied the device and incorporated invalid voter selections, spoiling ballots and fleeing voter situations. Each system was loaded with multiple ballot styles. Testing employed toggling between ballot styles to verify multi-ballot

capability.

### 5.2 Test Case: General

One system was utilized to conduct the test. Equipment was powered up and self diagnostics performed . Software version and database/ open poll report was printed . The ballot data was loaded. The database was verified against the certification ballot.

The first test conducted was a throughput test which included documenting the voters experience via an exit poll interview. The throughput test measured usability and the maximum number of votes the device would likely encounter during a fifteen hour election day. The cross section of voters included NYSBoE personnel, CIBER personnel, volenteers from county Board of Elections, members of the general public and various disability advocates.

The results from the throughput test was used in determining the amount of ballots needed for the volume testing. The NYSBoE staff and CIBER personnel performed the volume testing using several test decks. These test deck incorrporated instances of write-in candidates, undervotes, overvotes, Spanish language ballots, and cross-endorsed candidates. Testing included using the various interfaces that accompanied the device and incorporated invalid voter selections, spoiling ballots, and fleeing voter situations.

System accuracy was verified as each test deck was processed. A quality assurance person was part of each team whose responsibility was to verify the accuracy of the cast ballots against the test ballots.

## 6 Security

The Avante Vote Trakker IVR Auto-Ballot Marking System uses the public phone network to call into the server and vote. Just like with the other vote-by-phone system tested, when a voter is making their selections via the designated phone, someone could connect another phone to the same phone line and manipulate the votes being cast. This was proven during the testing process.

A test was conducted to see if a voter could cast multiple ballots by using the re-dial feature on the phone/fax machine. When re-dial was pressed before the ballot was printed, the touch-tone was heard but nothing happened. When re-dial was pressed after the ballot had printed, the phone/fax machine called into the server and the caller was asked to enter the poll-worker security code. This test proved that a voter cannot cast multiple votes by using the re-dial feature.

## 7 Observations and Issues

The Avante Vote Trakker IVR Auto-Ballot Marking System seems to work as designed. It takes a long time to vote a ballot, especially when write-ins are used (average time roughly 30

minutes). Voting with the sip and puff feature took an average time of roughly 45 minutes per ballot.

When voting on the phone/fax machine, the "receive fax" button was very easy to press accidentally. If this button is pressed during the voting process, it will cancel the ballot being voted, causing the voter to start over from the beginning of the ballot.

During testing of the General Election (ballot style two) using the sip and puff attachment, an infinite loop was encountered which caused the fourth contest to be repeated continuously.

### 7.1 Fleeing voter

The system displays a warning after five minutes of inactivity. Five minutes after the warning message, the ballot is nullified and the system returns to accepting a new voter. No spoiler ballot is printed for a fleeing voter.

### 7.2 Uninterruptible Power Supply

An Uninterruptible Power Supply (UPS) is required for the unit and will serve two purposes: 1) supply power to the unit in the event of power failure; and 2) protect the unit from power spikes. If there is an power outage, the UPS will start beeping to indicate the power interruption and begin supping power to the unit for approximately two to four hours. Depending on the type of UPS, there may be an indicator on the UPS which will display the approximate remaining battery capacity.

## 8 Conclusion

In conclusion, this ballot marking device is simple to use but is slow and tedious. The issue stated above regarding the system getting stuck in an infinite loop will have to be corrected by the vendor.

# New York State Board of Elections
# Software Test Report
## for
## Avante Vote-Trakker IVR Auto-Ballot-Marking System

**Vendor: Avante International Technology, Inc.**

**System: Vote-Trakker IVR Auto-Ballot-Marking System**

**Prepared By: CIBER, Inc.**

Change History

| Version | Date | Comment |
|---|---|---|
| 1.0 | 5/19/06 | Initial Release |

## 1 Introduction

This document provides a report of software testing performed by Ciber, Inc. on two ballot marking systems submitted by Avante International, Inc. (Avante). The "IVR Auto-Ballot-Marking System" provides the capability to vote by phone/fax to a remotely (centrally) located ballot marking system. The objective of this testing was to validate that the systems met the requirements of the State of New York and provided the features specified by the Vendor in its technical data package.

### 1.1 Testing Agency Background

CIBER Inc. has been providing IT consulting services for over 20 years. Although the Independent Test Authority (ITA) division name has changed due to an aggressive acquisition and merger market, the ITA division of the company has had the same leadership in place since inception. Founded in 1974, the company's consultants now serve client businesses from 60 CIBER, 10 DigiTerra, 5 Solution Partners and 4 Enspherics offices in the U.S., Canada and Europe. With offices in 10 countries, CIBER's 6,000 IT specialists continuously build, test and upgrade our client's systems to "competitive advantage status." CIBER provides a single source for IT solutions, including:

Full-solution ASP services

- Applications maintenance and support
- Testing and IQA
- Web and database hosting
- Enterprise solutions, including SAP, Oracle and Peoplesoft
- Application outsourcing
- eBusiness, from architecture through execution
- Knowledge management and training

The company has been involved in numerous QA and IQA testing projects for commercial, state, and federal government customers.

### 1.2 Terms and Abbreviations

1. EMS – Election Management System provides software to create election ballots and tally election results.
2. Vote-Trakker IVR Auto-Ballot-Marking System - The system provides a voter the ability to use a standard fax to access a central IVR processing unit, register his/her choices by pressing keys in response to voice prompts and print the marked ballot on the fax.
3. COTS – "Commercial Off-the-shelf" – Commercial available hardware equipment.
4. POTS – "Plain Old Telephone Service" - Standard telephone service that is used in most homes.

## 2 System Identification

Avante Vote-Trakker IVR Auto-Ballot-Marking System uses a COTS phone-fax portal unit and the IVR processing system.

## 3 Test Environment

All testing on these systems was performed at Western Turnpike Golf Course on Monday, May 8 2006 and Tuesday May 9, 2006.

The Vote-Trakker IVR Auto-Ballot-Marking System used a non-dedicated phone line provided by the facility. The HP phone-fax was connected to the POTS network through this direct connection. The vendor supplied a phone-fax, but the IVR unit was located off site at the vendor's location. The vendor had to send the election information off site to have the elections

**Comment [RJC1]:** Define Phone-fax

loaded. The vendor also had to make the calls to an location to receive a ballot. A "Sip and Puff" accessory was attached to the device for some portions of the testing.

## 4 Test Case Description

The following sections summarize three test cases using two elections to test the Avante IVR system.

| **Test Case:** Primary_01 | **Configuration** |
|---|---|
| Closed Primary Election<br>Purpose: Test to see that the system can handle multiple ballots styles with multiple contest types in a single election. The system has to switch ballot styles depending on the voter's registration. An actual past New York State Election scenario was used as the input data. | 1. 2 Ballot Styles, Democratic and Conservative<br>2. 11 Democratic Contests<br>3. 4 Conservative Contests<br>4. 2 N of M Democratic Contests<br>5. 2 N of M Conservative Contests<br>6. Regular ballots<br>7. Write-ins<br>8. English<br>9. Spanish |
| **Procedures:** | |
| 1. Load database for this election and generated election report<br>2. Open machine for voting<br>3. Voted and verified at least one ballot of each ballot style for each party<br>4. The voting included instances of:<br>a. Candidate write-in<br>b. Under-votes<br>c. Spanish Language<br>d. "Fleeing Voter"<br>e. Change voting selection before casting<br>f. Spoil ballot and revote<br>g. Invalid voter actions<br>h. "Sip and Puff" device<br>i. Audio ballot<br>j. Disable the host printer and attempt to vote<br>k. Print ballot at fax<br>l. Unexpected disconnect of phone line | |

| **Test Case:** General_01 | **Configuration** |
|---|---|
| General Election<br>Purpose: Test to see that the system can handle multiple ballots styles with multiple contest types in a single election. The system has to switch ballot styles depending on the voter's jurisdiction. An actual past New York State Election scenario was used as the input data. | 1. 2 Ballot styles, Cicero West (1) and Cicero East (2)<br>2. 13 Contests (Cicero West)<br>3. 14 Contests (Cicero East)<br>4. 6 Proposal Contests (Cicero West)<br>5. 6 Proposal Contests (Cicero East)<br>6. 2 N of M Contests (Cicero West)<br>7. 3 N of M Contests (Cicero East)<br>8. Regular ballots<br>9. Write-in<br>10. English<br>11. Spanish |

**Procedures:**

1. Load database for this election and generated election report
2. Open machine for voting
3. Voted and verified at least one ballot of each ballot style for each party
4. The voting included instances of:
    m. Candidate write-in
    n. Cross endorsed candidates (cross filing)
    o. Under-votes
    p. Spanish Language
    q. "Fleeing Voter"
    r. Change voting selection before casting
    s. Spoil ballot and revote
    t. Invalid voter actions
    u. "Sip and Puff" device
    v. Audio ballot
    w. Disable the host printer and attempt to vote
    x. Print ballot at fax
    y. Unexpected disconnect of phone line

| **Test Case:** Throughput Test | **Configuration** |
|---|---|
| Timed Voting Sample<br>Purpose: This test was used to determine the average amount of time it takes to cast a ballot on each system. A sample of 12 average voters with no prior experience with the system were timed voting the General Election Ballot used in Test Case General_01. The lowest and highest times were excluded and the rest of the sample times were averaged. | General Election Ballot from Test Case General_01 Cicero West Ballot Style 1 was used. |

**Procedures:**

1. Load database for this election
2. 12 smart cards were created and given to the "Voters"
3. Open machine for voting
4. "Voters" were asked to vote as though it were a real election
5. Time was started when the smart card was inserted and stopped after the ballot was reviewed
6. The times were averaged

## 5 Ballot Results and Statistics

Below is a table that contains the results of ballots cast for each system.

| **System**: Avante Vote-Trakker IVR Auto-Ballot-Marking System | |
|---|---|
| **Ballot Statistics:** | |
| ➢ Total Number of Ballot Positions: | 3,336 |
| ➢ Total Number of Ballots Cast: | 24 |
| ➢ Ballots Cast in General Election: | 5 |
| ➢ Ballots Cast in Primary Election: | 19 |
| **Time Statistics:** | |
| ➢ Average Time to Cast Ballot: | ~ 30 minutes |
| ➢ Number of Ballots in New York Election Day: | 30 |
| ➢ Time to Cast Ballot using Physical Disability Device (Sip and Puff): | ~45 minutes |
| **Results:** All voted ballots were verified that the marked ballot was what the voter input into the system. The system recorded 100% accuracy rate. | |

## 6 Observation

This section describes the observations made by Ciber, Inc. during the course of testing. Items listed may be limitations of the facilities, non-testable items, or errors that occurred during testing.

**Avante Vote-Trakker IVR Auto-Ballot-Marking System**

The vendor recommends the phone line used with this system be a dedicated line phone. The facility in which testing occurred could not provide one. This issue caused testing to be delayed when other "user" outside the test environment accessed the phone line. The tester would be in the process of selecting candidates when an interruption would occur causing the tester to re-enter the entire ballot before casting a vote. This issue also caused a question of security: if a dedicated phone line is not used a third party can capture the analog vote signal or input a analog vote signal.

On the COTS HP Phone-fax used during testing, the receive fax button was easily accidentally pushed. If this is done during voting, this issue will cancel the ballot causing the voter to start over from the beginning of the ballot.

Using the "Sip and Puff" device the voter needs assistance entering their Voter ID and pressing the fax button to cast ballot. During the voting process the user can only access the "*" and "#" keys which are the "Select Candidate" and "Cast Ballot" keys. They can not skip to the next candidate or race. An indefinite loop was encountered during testing that caused the fourth race of the General Election Ballot Style 2 to be repeated continuously.

# EXHIBIT A

# New York State Board of Elections
# Software Test Plan
## for
## Avante Vote-Trakker IVR Auto-Ballot-Marking System
## and
## Avante Vote-Trakker Auto-Ballot-Marking System

**Vendor:** Avante International Technology, Inc.

**System:** Vote-Trakker IVR Auto-Ballot-Marking System
Vote-Trakker Auto-Ballot-Marking System

**Prepared By:** CIBER, Inc.

Change History

| Version | Date | Comment |
|---|---|---|
| 1.0 | 4/26/06 | Initial Release |
| 1.1 | 5/02/06 | Incorporated changes requested by SBOE, changed 8 political parties to Multiple political parties. |
| 1.2 | 5/04/06 | Incorporated changes requested by SBOE to remove some items from the test cases |
| | | |
| | | |

# Functional Test Plan

## 1 Introduction

This document provides a plan for testing two ballot marking systems submitted by Avante International, Inc (Avante). The "IVR Auto-Ballot-Marking System" provides the capability to vote by phone/fax to a remotely (centrally) located ballot marking system. The "Vote-Trakker Auto-Ballot-Marking System" provides assisted voting to impaired voters at the polling place. The objective of this test is to validate that the systems meet the requirements of the State of New York and provide the features specified by the Vendor in its technical data package.

## 1.1 References

The following documents were provided by the vendor as a Technical Data Package (TDP) for evaluation and provide the specifications for the system as built by the vendor.

| Document Title | Doc. Date | Version |
|---|---|---|
| Vote-Trakker IVR Auto-Ballot-Marking System | 4/8/06 | 1.1.0 |
| Vote-Trakker Auto-Ballot-Marking System | 3/23/05 | 1.1.0 |
| EMS for Vote-Trakker Source Code (provided on CD) | 4/17/06 | 5.3.0 |
| Auto-Marking Vote-Trakker (AMVT) Source Code (provided on CD) | 4/17/06 | 1.0.0 |

## 1.2 Terms and Abbreviations

1. EMS – Election Management System provides software to create election ballots and tally election results.
2. Vote-Trakker IVR Auto-Ballot-Marking System - The system provides a voter the abilty to use a standard fax to access a central IVR processing unit, register his/her choices by pressing keys in response to voice prompts and print the marked ballot on the fax.
3. Vote-Trakker Auto-Ballot-Marking System – The system is located at the polling place to provide assistance to disadvantaged voters.

## 2. PreQualification Test

PreQualification testing is not applicable to this test.

# 3 Materials Required for Testing

## 3.1 Software

The system to be tested includes:

- Vote-Trakker IVR Auto-Ballot-Marking System
- Vote-Trakker Auto-Ballot-Marking System

## 3.2 Hardware

The configuration to be tested consists of the following equipment provided by the vendor:

- Vote-Trakker IVR Auto-Ballot-Marking System
  - Central IVR Processing System
  - Phone/Fax[1] (with test equipment sufficient to demonstrate the maximum number of simultaneous calls supported by the system.)
- Vote-Trakker Auto-Ballot-Marking System
  - Vote-Trakker ballot-marking touch screen voting machine
  - Printer
  - Keyboard
  - Headphone
  - Smart card reader/writer

## 3.3 Other Materials

The Vendor will provide the following for this test:

- Paper for printing of ballots
- Smart Cards as necessary to vote the Vote-Trakker Auto-Ballot-Marking System
- Storage Media as necessary to backup/transfer database and voting information

## 3.4 Deliverable Materials

The Vendor will deliver the following items prior to the start of the test:

1. A complete TDP that includes a description of the system hardware and software and operating manuals.
2. The Election Databases to be used in this test. These databases will be provided in source format which will allow modification and in "loadable" format.

## 3.5 Proprietary Data

All materials and deliverables provided by the vendor are considered company proprietary and the SBOE will protect against unauthorized distribution of those materials.

# 4 Test Specification

## 4.1 Requirements

The New York State Board of Elections (SBOE) will specify elections to be demonstrated and will conduct the test. The elections will include a variety of contest types, political parties and options that will demonstrate the functional capabilities presented in the Vendor's TDP.

The test may include any capabilities specified in the TDP and will include at least the following.

1. One General Election and two Closed Primary Elections
2. The following types of Contests in a General and a Primary Election
   a. Vote for n of m
   b. Vote for one

[1] The number of phone lines supported by a single IVR Processing System is not specified. The TDP uses the singular form of "phone/fax" in the text, so it is assumed that a System supports one phone line.

c. Propositions with yes/no or alternative text for voter selection
d. Judicial Contest

3. Multiple political parties
4. N of M contest and cumulative contest shall include:
   a. Multiple parties, each with n candidates
   b. Multiple parties, some with less than n candidates
   c. Multiple parties, some with more than n candidates
   d. Some parties with no candidates
5. Candidate Rotation
6. Printing of marked ballot (at fax machine and/or central site)

## 4.2 Hardware Configuration and Design

### 4.2.1 Vote-Trakker IVR Auto-Ballot-Marking System

Hardware will be provided by the vendor to support the elections specified by SBOE. The hardware will simulate a single host system located at the central office of a voting jurisdiction. The vendor will provide sufficient phone/fax equipment to demonstrate the maximum number of simultaneous callers supported by the system.

### 4.2.2 Vote-Trakker Auto-Ballot-Marking System

A single Voting unit will be provided by the vendor to support the elections specified by SBOE. The hardware configuration will include a printer and all peripherals necessary to successfully vote the specified elections.

## 4.3 System Functions

The Vendor must prepare the election databases and provide the loadable images to SBOE prior to the start of the test. As directed by the SBOE, the vendor will provide support and/or documentation necessary to load those databases so the test elections can be exercised. The test will include the loading of the election, casting votes and printing ballots. The vendor should prepare the databases so that all ballot formats from all precincts in a given election can be accessed after the "poll is open" without requiring reconfiguration of the system.

The test will include functions of most concern to the SBOE. However, the failure to include a function in this test does not imply that SBOE releases the vendor from providing that function. All functions described in the vendor's TDP are to function correctly.

## 4.4 Test Case Design

Test cases are created to demonstrate those capabilities determined to be of most concern to the SBOE but may be expanded to demonstrate any of the functionality claimed by the vendor in the TDP. The pass/fail criteria for each test is (1) that the test results are consistent with the expected result as specified in the TDP and (2) the test result conforms to the standards and procedures applicable to the State of New York and any subsidiary jurisdictions.

The following Sections summarize two test cases using two elections to test each of the Avante systems. The same elections are voted on both systems. The systems operate independent of each other and sufficiently different so that the test cases are presented in separate subsections that follow. SBOE may conduct the testing of both systems simultaneously or in sequence.

### 4.4.1 Vote-Trakker IVR Auto-Ballot-Marking System

The following tables summarize the test cases that are to be executed in this test. Each table indicates the minimum election parameters to be provided, the equipment to be included and a summary of the test procedure to be executed.

| **Test Case:** Setup and Verification | **Configuration** |
|---|---|
| Load database, setup Host Server and verify election ballot formats. | 1. Single Vote-Trakker IVR Auto-Ballot-Marking host server at Central Site.<br>2. Phone/Fax .<br>3. Ballot Database provided by Vendor |
| **Voting Devices Utilized:** PC, Phone line, Phone/Fax | |
| **Procedures:** | |
| 1. Power on all devices and monitor self-test messages<br>2. Load database to host (PC)<br>3. Tester (poll worker) initiates call, verifies sign-in security<br>4. Tester verifies election prompts.<br>5. Tester verifies error message received when attempting unauthorized access.<br>6. Inspect / print host sever log | |

| **Test Case:** Primary_01 | **Configuration** |
|---|---|
| Closed Primary Election | 1. Five precincts (multiple ballot styles)<br>2. Multiple political parties<br>3. Partisan Contest types: vote for one, N of M, cumulative<br>4. Regular ballots<br>5. English and Spanish Languages<br>6. Write-in |
| **Voting Devices Utilized:** PC, Phone/fax | |
| **Procedures:** | |
| 1. Load database for this election<br>2. Election Official opens poll<br>3. Poll worker calls in, attempts invalid sign on and then valid sign on<br>4. Poll worker responds to prompts and assumes role of voter when prompted (use multiple poll workers and telephone lines if available)<br>5. Vote and verify at least one ballot of each ballot style for each party. The voting must include instances of:<br>a. Candidate write-in<br>b. Under-votes<br>c. Spanish Language<br>d. "Fleeing Voter"<br>e. Change voting selection before casting<br>f. Spoil ballot and revote<br>g. Invalid voter actions<br>h. Print ballot at fax<br>i. Unexpected disconnect of phone line<br>6. Disable the host printer and attempt to vote.<br>7. Close poll<br>8. Print all reports available<br>9. Inspect (print) audit log | |

| **Test Case:** General_01 | **Configuration** |
|---|---|
| General Election | 1. Multiple precincts<br>2. Multiple political parties<br>3. Multiple ballot styles<br>4. Contest types: Partisan and Non-Partisan, Judicial, N of M, Cumulative<br>5. Regular ballots<br>6. Spanish Language<br>7. Write-in |
| **Voting Devices Utilized:** | |
| **Procedures:** PC, Phone/Fax | |

1. Election Official opens poll
2. Poll worker responds to prompts and assumes role of voter when prompted (use multiple poll workers and telephone lines if available)
3. Vote and verify at least one ballot of each ballot style. The voting must include instances of
    a. Candidate write-in
    b. Under-votes
    c. Spanish Language
    d. "Fleeing Voter"
    e. Simulate invalid voter actions
    f. Print ballot at fax
4. Close voting poll
5. Print all reports available
6. Inspect (print) audit logs

### 4.4.2 Vote-Trakker Auto-Ballot-Marking System

The following tables summarize the test cases that are to be executed in this test. Each table indicates the minimum election parameters to be provided, the equipment to be included and a summary of the test procedure to be executed.

| **Test Case:** Primary_01 | **Configuration** |
|---|---|
| Closed Primary Election | 1. Five precincts (multiple ballot styles)<br>2. Multiple political parties<br>3. Partisan Contest types: vote for one, N of M, cumulative<br>4. Regular ballots<br>5. English and Spanish Languages<br>6. Write-in |
| **Voting Devices Utilized:** PC, Phone/fax | |
| **Procedures:** | |
| 1. Power up hardware and observe self test diagnostics<br>2. Load election database<br>3. Preview one or more ballots<br>4. Record public counter<br>5. Election Official opens poll (inspect poll open reports)<br>6. Poll worker creates smart card for each "voter" that is to vote in this election.<br>7. Vote and verify at least one ballot of each ballot style for each party. The voting must include instances of:<br>a. Candidate write-in<br>b. Under-votes<br>c. Spanish Language<br>d. "Fleeing Voter"<br>e. Change voting selection before casting<br>f. Spoil ballot and revote<br>g. Invalid voter actions<br>h. Print ballot and verify marked choices<br>8. Close poll<br>9. Print all reports available<br>10. Inspect (print) audit log<br>11. Verify public counter | |

| **Test Case:** General_01 | **Configuration** |
|---|---|
| General Election | 1. Multiple precincts<br>2. Multiple political parties<br>3. Multiple ballot styles<br>4. Contest types: Partisan and Non-Partisan, Judicial, N of M, Cumulative<br>5. Regular ballots<br>6. Spanish Language<br>7. Write-in |
| **Voting Devices Utilized:** | |
| **Procedures:** PC, Phone/Fax | |

1. Power up hardware and observe self test diagnostics
2. Load election database
3. Test vote one or more ballots in "Test-Voting Mode"
4. Open poll
5. Poll worker prepares smart card for each voter that will vote in this election
6. Vote and verify at least one ballot of each ballot style . The voting must include instances of
    a. Touch screen and voice assisted voting
    b. Candidate write-in
    c. Under-votes
    d. Spanish Language
    e. "Fleeing Voter"
    f. Simulate invalid voter actions
    g. Print ballot
7. Close poll
8. Print all reports available
9. Inspect (print) audit logs

# 5 Test Data

## 5.1 Data Recording

The data to be recorded for each test will include:

- Audit log for each device
- Exceptions observed
- Observations for each step of the test script
- All available reports
- All Printed Ballots

## 5.2 Test Data Criteria

Test data will be evaluated against the specifications as stated in the vendor's TDP. Each ballot will be verified as it is created. The printed ballots will be examined and accepted or rejected by an SBOE representative. Audit logs will be validated by identifying startup and voting events in the audit log.

## 5.3 Test Data Reduction

All analysis to test data is by manual inspection of the reports and observation of events during the tests.

# 6 Test Procedure and Conditions

The test will be conducted by a test team consisting of, SBOE and CIBER personnel. The test team may specify alternate actions that are not defined in the test cases in this test plan. Invalid user (voter and poll worker) actions must be detected by the voting system and a notification given to the user and/or an effective recovery performed.

SBOE may direct additional test cases or steps to be executed that are not documented in this plan. The additional test cases may require that the election database be modified and reloaded.

## 6.1 Facility Requirements

The test configuration consists of the equipment described in Section 3.2. The vendor will provide the equipment at the facility specified by SBOE.

## 6.2 Test Set-up

The Vendor shall configure the hardware to support the elections provided by the SBOE. The hardware should be the same models that the vendor would install in jurisdictions that purchase the system.

## 6.3 Test Sequence

The "Setup and Verification" test is to be executed first. Other tests can be executed in any order as specified by SBOE at the time of testing.

# EXHIBIT B

Nov 4,1997 DISTRICT 22, 101, 1 (Ballot Type 1)

# OFFICIAL BALLOT

## General Election, NOVEMBER 4, 1997

## ONONDAGA, NY

**INSTRUCTION TO VOTERS**

To vote, completely darken the OVAL beside your choice. To vote for a person whose name is NOT on the ballot, write the candidate's name on the write-in line and darken the OVAL beside the name. If you do not want to vote for the required number of choices in a contest, darken the OVAL beside the words "Skip Choice(s)". If you wrongly mark, tear or deface this ballot, return it and request a new ballot.

**PLEASE FILL OVAL LIKE THIS:** ●

### Justice of the Supreme Court
Vote for no more than Six

- John JJ. Sullivan — DEMOCRATIC ●
- Jerome B. Matthews — DEMOCRATIC ●
- Neal P. O'Donnell — DEMOCRATIC ●
- F. Dana Pierson — DEMOCRATIC ●
- Milton P. Booker — DEMOCRATIC ●
- Michael J. Castle — DEMOCRATIC ●
- W. Bromley Squire — REPUBLICAN ○
- Robert W. Murray — REPUBLICAN ○
- Gerald Tillman — REPUBLICAN ○
- Sandra J. Edwards — REPUBLICAN ○
- Geoffery J. Cummings — REPUBLICAN ○
- Joseph A. Albright — REPUBLICAN ○
- W. Bromley Squire — CONSERVATIVE ○
- Robert W. Murray — CONSERVATIVE ○
- Gerald Tillman — CONSERVATIVE ○
- Sandra J. Edwards — CONSERVATIVE ○
- Geoffery J. Cummings — CONSERVATIVE ○
- Joseph A. Albright — CONSERVATIVE ○
- W. Bromley Squire — INDEPENDENCE ○
- Thomas J. Tooley — INDEPENDENCE ○
- Gerald Tillman — INDEPENDENCE ○
- W. Bromley Squire — LIBERAL ○
- Jerome B. Matthews — LIBERAL ○
- Neal P. O'Donnell — LIBERAL ○
- F. Dana Pierson — LIBERAL ○
- Milton P. Booker — LIBERAL ○
- Michael J. Castle — LIBERAL ○
- _____ Write-In: ○
- _____ Write-In: ○
- _____ Write-In: ○
- _____ Write-In: ○
- _____ Write-In: ○
- Skip Choice(s) ○

### County Court Judge
Vote for One

- Stephen A. Davidson — DEMOCRATIC ●
- Alfred C. Crawford — REPUBLICAN ○
- Alfred C. Crawford — CONSERVATIVE ○
- Steven A. Davidson — RIGHT TO LIFE ○
- _____ Write-In: ○
- Skip Choice(s) ○

### Family Court Judge
Vote for One

- James F.X. Barrett — DEMOCRATIC ●
- Kerry R. Schaefer — REPUBLICAN ○
- Kerry R. Schaefer — CONSERVATIVE ○
- James F.X. Barrett — RIGHT TO LIFE ○
- _____ Write-In: ○
- Skip Choice(s) ○

### District Attorney
Vote for One

- Patrick Kevin Hammond — DEMOCRATIC ●
- James M. Tompkins — REPUBLICAN ○
- James M. Tompkins — CONSERVATIVE ○
- Robert W. Russman — INDEPENDENCE ○
- Patrick Kevin Hammond — RIGHT TO LIFE ○
- _____ Write-In: ○
- Skip Choice(s) ○

AVANTE IVR

## Trustee

Vote for no more than Nine

| | | | |
|---|---|---|---|
| **Anthony S. Zimmer** DEMOCRATIC | ● | **Theodore W. Josey** CONSERVATIVE | ○ |
| **Joseph(Joe) Childs** DEMOCRATIC | ● | **William G. Saxton** CONSERVATIVE | ○ |
| **Dennis Zeldin** DEMOCRATIC | ● | _____ Write-In: | ○ |
| **John B. Yonkers** DEMOCRATIC | ● | _____ Write-In: | ○ |
| **Richard Schmill** DEMOCRATIC | ● | _____ Write-In: | ○ |
| **Betty G. Rabbit** DEMOCRATIC | ● | _____ Write-In: | ○ |
| **Craig D. Squire** DEMOCRATIC | ● | _____ Write-In: | ○ |
| **Rossetta Gambella** DEMOCRATIC | ● | _____ Write-In: | ○ |
| **Walter Northrup** DEMOCRATIC | ● | _____ Write-In: | ○ |
| **Frederick L. Fuller** REPUBLICAN | ○ | _____ Write-In: | ○ |
| **Diane E. Clayman** REPUBLICAN | ○ | _____ Write-In: | ○ |
| **John G. Bryant** REPUBLICAN | ○ | **Skip Choice(s)** | ○ |
| **Robert E. Clifford** REPUBLICAN | ○ | | |
| **Joshua B. Morehouse** REPUBLICAN | ○ | | |
| **James J. Nicholas** REPUBLICAN | ○ | | |
| **Deborah S. Watson** REPUBLICAN | ○ | | |
| **Leon X. Havlland** REPUBLICAN | ○ | | |
| **Theodore W. Josey** REPUBLICAN | ○ | | |
| **William G. Saxton** REPUBLICAN | ○ | | |
| **Frederick L. Fuller** CONSERVATIVE | ○ | | |
| **Diane E. Clayman** CONSERVATIVE | ○ | | |
| **John G. Bryant** CONSERVATIVE | ○ | | |
| **Robert E. Clifford** CONSERVATIVE | ○ | | |
| **Joshua B. Morehouse** CONSERVATIVE | ○ | | |
| **James J. Nicholas** CONSERVATIVE | ○ | | |
| **Deborah S. Watson** CONSERVATIVE | ○ | | |
| **Leon X. Havlland** CONSERVATIVE | ○ | | |

## BALLOT PROPOSAL ONE

AN AMENDMENT CONTRACTING, PAYING AND REFUNDING LOCAL DEBT

The proposed amendment to Section 2 of Article B of the State Constitution amends the manner of contracting, paying and refunding debts of any county, city, town, village or school district. Currently, localities of school districts may not contract debt for longer then the period of probable usefulness of the object or purpose which the debt finances, and must repay such debt in annual installments meeting specific requirements. As alternatives, the proposed amendment authorizes localities and school districts to contract debt for no longer than the weighted average period of probable usefulness of all projects financed by such debt, and to repay their debt with level of declining debt service. The proposed amendment also authorizes localities and school districts to issue debt which does not pay interest annually and provides that when debt is issued at a discount, only the amount received would could towards constitutional debt limits. Shall the proposed amendment be approved?

| | |
|---|---|
| **YES** | ● |
| **NO** | ○ |
| **Skip Choice(s)** | ○ |

## BALLOT PROPOSAL TWO

AN AMENDMENT DEBT LIMITS FOR SEWAGE FACILITIES

The proposed amendment to Article 8, Section 5 of the constitution would extend for 10 years, until January 1, 2004, the authority of counties, cities, towns and villages to exclude from their constitutional debt limits indebtedness contracted for the construction or reconstruction of sewage facilities. Shall the proposed amendment be approved?

| | |
|---|---|
| **YES** | ● |
| **NO** | ○ |
| **Skip Choice(s)** | ○ |

## BALLOT PROPOSAL THREE

AND AMENDMENT CONTRACTING, PAYING AND REFUNDING STATE DEBTS

The proposed amendment to Section 11, 12, 13 and 16 of Article 7 of the State Constitution amends the manner of contracting, paying and refunding State debts. Article 7 presently requires that certain State debt be paid in equal annual installments. The proposed amendment authorizes, as an alternative, priciple payment of contributions to a sinking fund in installments that result in substantially level or declining debt service payments. In addition, the proposed amendment expands Article 7's existing provision regarding the refunding of State debt by specifying when refunding bonds may be issued by the State and what restrictions must be observed. Shall the proposed amendment be approved?

| | |
|---|---|
| **YES** | ● |
| **NO** | ○ |
| **Skip Choice(s)** | ○ |

0001E0D3000400005B02F3

## BALLOT PROPOSAL FOUR

COUNTY PROPOSITION NUMBER ONE

Shall Resolution No. 358-1993, Adopting a Charter Law to provide management of the One-quarter Per Cent (1/4%) Drinking Water Protection Program by the County Division of Real Estate, be adopted?

| | |
|---|---|
| **YES** | ● |
| **NO** | ○ |
| **Skip Choice(s)** | ○ |

## BALLOT PROPOSAL FIVE

COUNTY PROPOSAL NUMBER TWO

Shall resloution No. 378-1993, Adopting a Charter Law to establish a Taxpayer-Financed Program of Public Financing for the Election of County Officials, Funded from Suffolk County Tax Revenues, including Property Taxes, Coupled with campaign contribution and spending limits, the Participation in which Program is optional for candidates for Election to County Office, be approved?

| | |
|---|---|
| **YES** | ● |
| **NO** | ○ |
| **Skip Choice(s)** | ○ |

## BALLOT PROPOSAL SIX

COUNTY PROPOSITION NUMBER THREE

Shall resolution No. 580-1993, Adopting a Charter Law to Restrict the influence of Special Interests by limiting terms of office of County Legislators and County-wide Elected Officials to Twelve 912) Successive Years, be approved?

| | |
|---|---|
| **YES** | ● |
| **NO** | ○ |
| **Skip Choice(s)** | ○ |

0001E0D40004000005BD2F3

Sep 9, 1997 SYRACUSE, 102, 1 (Ballot Type 1)

# OFFICIAL BALLOT (CONSERVATIVE)

## Primary Election, September 9,1997

## Onondaga, NY

**INSTRUCTION TO VOTERS**

To vote, completely darken the OVAL beside your choice. To vote for a person whose name is NOT on the ballot, write the candidate's name on the write-in line and darken the OVAL beside the name. If you do not want to vote for the required number of choices in a contest, darken the OVAL beside the words "Skip Choice(s)". If you wrongly mark, tear or deface this ballot, return it and request a new ballot.

**PLEASE FILL OVAL LIKE THIS:** ●

| Governor<br>Vote for One | |
|---|---|
| Robert Quinlon | ● |
| Douglas Stone | ○ |
| Write-In:_ _ _ _ _ _ _ _ | ○ |
| Skip Choice(s) | ○ |

| State Senate, 48th<br>Vote for One | |
|---|---|
| Craig Janis | ● |
| Brian Getz | ○ |
| Alisan Chao | ○ |
| Write-In:_ _ _ _ _ _ _ _ | ○ |
| Skip Choice(s) | ○ |

| Member of State Committee<br>Vote for no more than Ten | |
|---|---|
| Joel Owens | ● |
| Homer H. Reamer | ● |
| Anthony Suess | ● |
| Lois Perez | ● |
| Robert Rocco | ● |
| William Menzler | ● |
| Doris Shidles | ● |
| Douglas Miller | ● |
| Richard House | ● |
| Thomas Poolez | ● |
| Craig Ortiz | ○ |
| Lewis Tuchey | ○ |
| Gloria Montero | ○ |
| Mort Taverni | ○ |
| Alfred Ruthowski | ○ |
| Andre Ninia | ○ |
| Howard Hwang | ○ |
| Morton Maher | ○ |
| Robert Loeber | ○ |
| Gloria Rossi | ○ |
| Carol Koethen | ○ |
| Eugene Kessler | ○ |
| Paul Hodgkins | ○ |
| Heidi Hatzinger | ○ |
| Write-In:_ _ _ _ _ _ _ _ | ○ |
| Write-In:_ _ _ _ _ _ _ _ | ○ |
| Write-In:_ _ _ _ _ _ _ _ | ○ |
| Write-In:_ _ _ _ _ _ _ _ | ○ |
| Write-In:_ _ _ _ _ _ _ _ | ○ |
| Write-In:_ _ _ _ _ _ _ _ | ○ |
| Write-In:_ _ _ _ _ _ _ _ | ○ |
| Write-In:_ _ _ _ _ _ _ _ | ○ |
| Write-In:_ _ _ _ _ _ _ _ | ○ |
| Write-In:_ _ _ _ _ _ _ _ | ○ |
| Skip Choice(s) | ○ |

| Councilman, 4stDistrict<br>Vote for no more than Two | |
|---|---|
| Henry James | ● |
| Betty Crooker | ● |
| John King | ○ |
| Ned Song | ○ |
| Write-In:_ _ _ _ _ _ _ _ | ○ |
| Write-In:_ _ _ _ _ _ _ _ | ○ |
| Skip Choice(s) | ○ |

0001E221000500005C02F3

22 District, 100, 1 (Ballot Type 1)

# BOLETA OFFICIAL

## General Election November 4, 1997

## Town of Onondaga, NY

Catherine DiCostanzo
CATHERINE DICOSTANZO
County Clerk

**INSTRUCCIONES PARA EL VOTANTE**

Para votar por su candidato de preferencia, oscure completamente la parte ovalada ala isquierda del nombre de su candidato. Para votar por una persona que qullo nombre "NO" se encuentra en la boleta , escriba el nombre de su candidato en la linia designada para candidato inscrito y oscure completamente la parte isquerda ovalada. Para votar a favor o acontra de una propuesta, oscure completamente la parte ovalada asia la isquierda de su seleccion. Si acidentalmente ase una marca, rompidura, o error esto aria su boleta invalida. Por favor si esto llega a pasar regrese su boleta y le daran otra. Si no desea votar para ningun candidato oscure la parte ovalada a la isquierda de la frace "Omita el certamen"

**POR FAVOR VOTE ASI:** ●

### Justice of the Supreme Court, 5th Judicial District
No vote por mas de Six

- ○ **John JJ. Sullivan** DEMOCRATIC
- ● **Jerome B. Matthews** DEMOCRATIC
- ● **Neal P. O'Donnell** DEMOCRATIC
- ○ **F. Dana Pierson** DEMOCRATIC
- ○ **Milton P. Booker** DEMOCRATIC
- ○ **Michael J. Castle** DEMOCRATIC
- ○ **W. Bromley Squire** REPUBLICAN
- ○ **Robert W. Murray** REPUBLICAN
- ○ **Gerald Tillman** REPUBLICAN
- ○ **Sandra J. Edwards** REPUBLICAN
- ○ **Geoffrey J. Cummings** REPUBLICAN
- ○ **Joseph A. Albright** REPUBLICAN
- ○ **W. Bromley Squire** CONSERVATIVE
- ○ **Robert W. Murray** CONSERVATIVE
- ○ **Gerald Tillman** CONSERVATIVE
- ● **Sandra J. Edwards** CONSERVATIVE
- ○ **Geoffrey J. Cummings** CONSERVATIVE
- ● **Joseph A. Albright** CONSERVATIVE
- ○ **W. Bromley Squire** INDEPENDENCE
- ○ **Thomas J. Tooley** INDEPENDENCE
- ○ **Gerald Tillman** INDEPENDENCE
- ○ **W. Bromley Squire** LIBERAL
- ○ **Jerome B. Matthews** LIBERAL
- ○ **Neal P. O'Donnell** LIBERAL
- ○ **F. Dana Pierson** LIBERAL
- ○ **Milton P. Booker** LIBERAL
- ○ **Michael J. Castle** LIBERAL
- ○ _____ Candidato Inscrito
- ○ _____ Candidato Inscrito
- ○ _____ Candidato Inscrito
- ○ _____ Candidato Inscrito
- ○ _____ Candidato Inscrito
- ○ _____ Candidato Inscrito
- ● **Omita el Certamen**

### County Court Judge
Vote por One

- ○ **Stephen A. Davidson** DEMOCRATIC
- ○ **Alfred C. Crawford** REPUBLICAN
- ○ **Alfred C. Crawford** CONSERVATIVE
- ○ **Stephen A. Davidson** RIGHT TO LIFE
- ○ _____ Candidato Inscrito
- ● **Omita el Certamen**

### Family Court Judge
Vote por One

- ○ **James F.X. Barrett** DEMOCRATIC
- ○ **Kerry R. Schaefer** REPUBLICAN
- ○ **Kerry R. Schaefer** CONSERVATIVE
- ○ **James F.X. Barrett** RIGHT TO LIFE
- ○ _____ Candidato Inscrito
- ● **Omita el Certamen**

### District Attorney
Vote por One

- ○ **Patrick K. Hammond** DEMOCRATIC
- ○ **James M. Tompkins** REPUBLICAN
- ○ **James M. Tompkins** CONSERVATIVE
- ○ **Robert W. Russman** INDEPENDENCE
- ○ **Patrick K. Hammond** RIGHT TO LIFE
- ○ _____ Candidato Inscrito
- ● **Omita el Certamen**

0001S0012Z9T021F3A0150 (Regular Ballot)

## County Treasurer
Vote por One

- ○ **Louis Newman** DEMOCRATIC
- ○ **John C. Gallagher** REPUBLICAN
- ○ **John C. Gallagher** CONSERVATIVE
- ○ **Veronica Rutherford** INDEPENDENCE
- ○ **Louis Newman** RIGHT TO LIFE
- ○ _____ Candidato Inscrito
- ● **Omita el Certamen**

## Sheriff
Vote por One

- ○ **Charles F. Passmore** DEMOCRATIC
- ○ **Patrick A. Friedman** REPUBLICAN
- ○ **Patrick A. Friedman** CONSERVATIVE
- ○ **Patrick A. Friedman** INDEPENDENCE
- ○ **Charles F. Passmore** RIGHT TO LIFE
- ○ _____ Candidato Inscrito
- ● **Omita el Certamen**

## County Legislator 2nd District
Vote por One

- ○ **George G. Johnston** DEMOCRATIC
- ○ **William C. Abbott** REPUBLICAN
- ○ **Margaret A. Thompson** CONSERVATIVE
- ○ **George G. Johnston** FREEDOM
- ○ **William C. Abbott** LABOR
- ○ _____ Candidato Inscrito
- ● **Omita el Certamen**

## Supervisor
Vote por One

- ○ **Anthony Knight** DEMOCRATIC
- ○ **Leonard W. Hamilton** REPUBLICAN
- ○ **Leonard W. Hamilton** CONSERVATIVE
- ○ _____ Candidato Inscrito
- ● **Omita el Certamen**

## Town Clerk
Vote por One

- ○ **Frederick W. Murray** DEMOCRATIC
- ○ **M. Jobette Montgomery** REPUBLICAN
- ○ **M. Jobette Montgomery** CONSERVATIVE
- ○ _____ Candidato Inscrito
- ● **Omita el Certamen**

## Super- intendent of Highways
Vote por One

- ○ **Christopher L. Bass** DEMOCRATIC
- ○ **Charles F. Lemmon** FREEDOM
- ○ _____ Candidato Inscrito
- ● **Omita el Certamen**

## Town Justice
Vote por One

- ○ **Catherine Noonan** DEMOCRATIC
- ○ **Edward W. Brewster** REPUBLICAN
- ○ **Edward W. Brewster** CONSERVATIVE
- ○ _____ Candidato Inscrito
- ● **Omita el Certamen**

## Councilman
No vote por mas de Two

- ○ **Margaret F. Perkins** DEMOCRATIC
- ○ **Russel S. Dwyer** DEMOCRATIC
- ○ **Thomas E. Olson** REPUBLICAN
- ○ **Nancy Barton** REPUBLICAN
- ○ _____ Candidato Inscrito
- ○ _____ Candidato Inscrito
- ● **Omita el Certamen**

## Assessor
Vote por One

- ○ **Shella A. Sanders**
- ○ **Frederick L. Fuller**
- ○ **Frederick L. Fuller**
- ○ **Candidato Inscrito**_____
- ● **Omita el Certamen**

## BALLOT PROPOSAL NUMBER 1
AMENDMENT CONTRACTING, PAYING AND REFUNDING LOCAL DEBT.

- ○ **YES**
- ○ **NO**
- ● **Omita el Certamen**

## BALLOT PROPOSAL NUMBER 2
AN AMENDMENT DEBT LIMITS FOR SEWAGE FACILITIES

- ○ **YES**
- ○ **NO**
- ● **Omita el Certamen**

## BALLOT PROPOSAL NUMBER 3
AN AMENDMENT CONTRACTING, PAYING AND REFUNDING STATE DEBTS

- ○ **YES**
- ○ **NO**
- ● **Omita el Certamen**

## BALLOT PROPOSAL NUMBER 4
COUNTY PROPOSITION NUMBER ONE

- ○ **YES**
- ○ **NO**
- ● **Omita el Certamen**

0001S0022Z9T021F3A0150 (Regular Ballot)

| BALLOT PROPOSAL NUMBER 5<br>COUNTY PROPOSITON NUMBER TWO |
| --- |
| ◯ YES |
| ◯ NO |
| ● Omita el Certamen |
| **BALLOT PROPOSAL NUMBER 6**<br>COUNTY PROPOSITION NUMBER THREE |
| ◯ YES |
| ◯ NO |
| ● Omita el Certamen |

# New York State

# Board of Elections

## Review of the

## ES&S/Automark Voter Assist Terminal

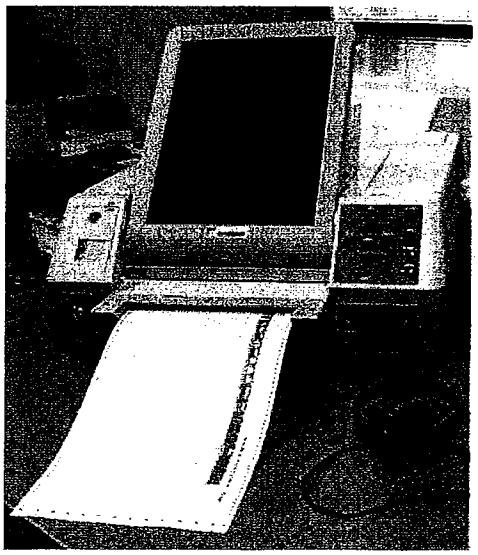
**May 22, 2006**

# Table of Contents



## Exhibits





# Authorization Test Report
# ES&S Automark

## 1 Introduction

This test report presents the results of tests to validate the statutory and regulatory requirements of the New York State Board of Elections (NYSBoE) and provide the features specified by the vendor as outlined in their Technical Data Package(TDP). The test was performed during May 8, 2006 to May 12, 2006 at the "Clubhouse at Western Turnpike" (2350 Western Avenue, Guilderland, NY 12084). The following people were present during the testing:

- New York State Board of Elections (http://www.elections.state.ny.us)
  Anna Svizzero, Allison Carr, John Ferri, Ray Cecot, Phil Jorczak, Amit Shah
- CIBER, Inc. (http://www.ciber.com)
  Shawn Southworth, Jack Cobb
- ES&S/Automark (http://http://www.essvote.com)
- Advisory Committee Members and members of the public were present to observe (sign-in sheets are available upon request.)

All observations are based upon performance testing during this period and compliance with applicable election law, regulations and technical specifications. The following sections describe the system, system operation, test operations, and system observations.

This report is restricted to the characteristics and performance of the system under test.

## 2 Applicable Documents

The following documents were used in the conduct of this test:

- Test Plan and procedure (Exhibit A)
- Test Ballots: primary/general/English/Spanish
- Pre-printer ballots
- Operation and Setup manuals

## 3 System Description

The ES&S (Election Systems and Software)/Automark is a ballot marking device which marks a pre-printed paper ballot via a touch-screen, paddle interface, audio feature, and sip and puff attachment. The voter inserts a pre-printed ballot into the device, navigates through the ballot via a series of menu-driven voting choices, and then casts the ballot. The device does not provide tally capability.

### 3.1 System Software and Control

The ES&S Automark voting system employs an election management system(EMS) which is

self-contained within each individual voting unit. The software is used for the following:

| EMS Mode | Description |
|---|---|
| **Ballot definition** | To correctly mark a pre-printed ballot |
| **Verification** | To verify/validate correctness of election data, contest identification and titles |
| **Audio files** | Wave files containing audio (synthesized voice) ballot and alternate language presentation |
| **System control** | provide utilities for setting passwords, etc. |

Two keys are provided. The first key opens a latch where a memory card can be inserted which will load the EMS. The second key operates a switch which puts the unit into a voting station mode or a test mode. The test mode is used for system maintenance, screen calibration, printer calibration, ballot ejection, and other system functions.

### 3.2 Hardware

The ES&S Automark voting system is a self-contained, stand alone unit. In addition to the self-contained marking device, an accessibility table for wheelchair access, headphones, a privacy screen, paddles, and sip and puff attachment are also available to enable voters of varying disabilities the means to cast their ballot independently and privately.

The ES&S Automark voting system requires the following additional materials to operate:

- 8 ½ x 18 pre-printed ballots available from ES&S

## 4 Test Scope

The test has three principal objectives:

1) To demonstrate the ability to mark a ballot using the specified interfaces
2) To demonstrate the ability of the device to mark a ballot accurately
3) To demonstrate the ability of a ballot to be verified

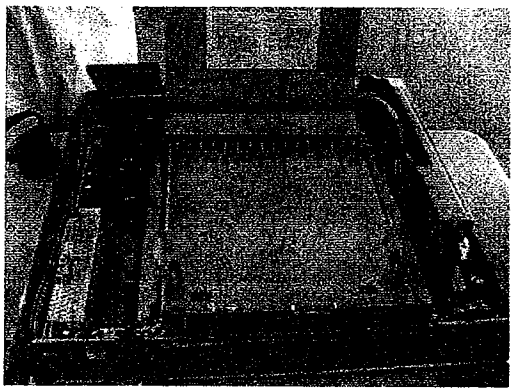
The test procedures were designed to demonstrate the functionality and to provide for a qualitative assessment of the device. The breadth of testing included the following:

| Test type | Description |
|---|---|
| **Ballot Volume** | Casting ballots in quantities sufficient to replicate an actual voting day |
| **Accuracy** | Comparing the printed ballots against the predetermined test ballots |
| **Usability** | Ease with which the device provides for the ability to cast votes |
| **Recovery** | Recovery from anomalies encountered |
| **Data Recording** | Data recording, including audit logs/exception reports, printed ballots |
| **Changeability** | The ability of the voter to change the selection at any time |

## 5 Test Operations

The test cases were developed incorporating two primary elections and a general election with two ballot styles. The vendor prepared the election database and provided loadable media prior to the start of the test. Prior to conducting testing, photos were taken of the equipment's external and internal features. The test was conducted by a team consisting of NYSBoE and CIBER personnel. The test procedures are defined in Exhibit A.

### 5.1 Picture of internal system



### 5.2 Test Case: Primary

Three systems were set up to conduct the test. Equipment was powered up and self diagnostics performed. Software version and database/open poll report was printed. The device was calibrated and ballot data loaded. Calibration aligns the coordinates reported by the touch screen into a set of coordinates that accurately represent the image on the display behind it. Calibration on the touch screen occurs from a poll worker accessible system menu. The poll worker is prompted to touch the screen in various specific target areas after which the system returns the display to the specified parameters.

Several test decks were created for each election which tested for the situations illustrated below:

| Situations |
|---|
| Write in candidates |
| Undervotes |
| Overvotes |
| Spanish language ballots |
| Changing selections |
| Spoiled ballot and re-vote |
| Invalid voter actions |
| "Sip and Puff" device |
| Paddle device |
| Audio Ballot |
| Printer disconnect |

Sample test deck ballots are attached as Exhibit B. Testing also included using the various interfaces that accompanied the device and incorporated invalid voter selections spoiling ballots and fleeing voter situations. The system utilizes pre-printed ballots available from ES&S. Samples of both blank and marked pre-printed ballots are attached as Exhibits C and D, respectively.

### 5.3 Test Case: General

Three systems were utilized to conduct the test. The equipment was powered up and self diagnostics performed. Software version and database/ open poll report was printed. The device was calibrated and ballot data loaded. The database was verified against the certification ballot. Smart cards were prepared for each general election.

The first test conducted was a throughput test which included documenting the voters experience via an exit poll interview. The throughput test measured usability and the maximum number of votes the device would likely encounter during a fifteen hour election day. The cross section of voters included NYSBoE personnel, CIBER personnel, volunteers from county Board of Elections, members of the general public and various disability advocates.

The results from the throughput test were used in determining the amount of ballots needed for the volume testing. The NYSBoE staff and CIBER personnel performed the volume testing using several test decks. These test deck incorporated instances of write-in candidates, undervotes, overvotes, Spanish language ballots, and cross-endorsed candidates. Testing included using the various interfaces that accompanied the device and incorporated invalid voter selections, spoiling ballots, and fleeing voter situations.

System accuracy was verified as each test deck was processed. A quality assurance person was part of each team, whose responsibility was to verify the accuracy of the cast ballots against the test ballots.

## 6 Security

Once the ballot definition code is loaded into the voting system via a flash card, it is impossible to vote a wrong ballot. The software reads the pre-printed ballot to ensure that the pre-printed ballot matches the coded ballot style, and the voter is then able to vote that ballot on the system. If it is found that the ballot is not recognized, the system will eject the ballot, advising the voter that the ballot was not recognized, and therefore, could not be voted.

## 7 Observations and Issues

The ES&S Automark voting system worked as intended, allowing votes to be cast and ballots were marked with no errors. The voting process is easy and straightforward, and the write-in feature is easy to use. The system could be voted either by touch screen or by use of a pen or other stylus.

Amit Shah of NYSBoE tested the sip and puff device to cast a ballot with several write ins. The device operated as designed.

The system provided warnings to the voter whenever the voter overvoted, undervoted, or failed to view all candidates for a particular race. The voter was required to affirmatively make a selection to either go back and review his selection or continue on to the next race.

Verification may be conducted by either reviewing the voter's selections on the system's screen prior to marking the ballot, by listening to an audio ballot review or by printing the marked ballot and feeding the marked ballot back into the system for visual review on the screen, or by using headphones, an audio review may be conducted.

### 7.1 Fleeing voter

In the case of a fleeing voter, after 5 minutes of inactivity, a warning is displayed, advising the voter to perform a function. If after an additional 5 minute period no action is taken by the voter, the screen goes blank, requiring pollworker intervention. The pollworker inserts a key, turns to test mode and follows the instructions on the screen to eject the unmarked ballot is ejected. The ejected ballot is not stored in any way and must be recast.

### 7.2 Uninterruptible Power Supply

One of the voting systems was unplugged and allowed to operate on its lithium ion battery pack. The system operated without incident for approximately 2 hours and 50 minutes, at which time a warning was displayed on the screen, advising the voter that the battery life was about to expire and that the system should either be plugged into a power source or the battery should be

replaced. The voter was unable to continue voting, however the voter was not advised by the system that he or she should contact a pollworker for assistance. The system required the pollworker to use the system's key to access the system's menu. The "eject ballot" option was selected and the system was returned to its normal voting position. The system was plugged into a power source and resumed operation. The system did not retain any memory of the voter's selections. The voter was provided with a new blank ballot and instructed to re-vote the ballot.

## 8 Conclusion

The ES&S Automark voting system allowed for error-free casting of ballots and received many positive comments regarding its ease of use.

# New York State Board of Elections
# Software Test Report
## for
## Automark Voter Assist Terminal

**Vendor: Automark Technical Systems LLC.**

**System: Voter Assist Terminal (VAT) Version 1.3**

**Prepared By: CIBER, Inc.**

Change History

| Version | Date | Comment |
|---|---|---|
| 1.0 | 5/19/06 | Initial Release |
| 1.1 | 5/19/06 | NY BOE input added |
| 1.2 | 5/20/06 | Added audio ballot results |

## 1 Introduction

This document provides a report of software testing performed by Ciber, Inc. on the voting system submitted by Automark Technical Systems LLC to the State of New York State Board of Elections (SBOE). The AutoMARK Voter Assist Terminal provides assisted voting to impaired voters at the polling place. The objective of this test is to validate that the software meets the requirements of the State of New York and provides the features specified by the Vendor in its technical data package.

### 1.1 Testing Agency Background

CIBER Inc. has been providing IT consulting services for over 20 years. Although the Independent Test Authority (ITA) division name has changed due to an aggressive acquisition and merger market, the ITA division of the company has had the same leadership in place since inception. Founded in 1974, the company's consultants now serve client businesses from 60 CIBER, 10 DigiTerra, 5 Solution Partners and 4 Enspherics offices in the U.S., Canada and Europe. With offices in 10 countries, CIBER's 6,000 IT specialists continuously build, test and upgrade our client's systems to "competitive advantage status." CIBER provides a single source for IT solutions, including:

Full-solution ASP services

- Applications maintenance and support
- Testing and IQA
- Web and database hosting
- Enterprise solutions, including SAP, Oracle and Peoplesoft
- Application outsourcing
- eBusiness, from architecture through execution
- Knowledge management and training

The company has been involved in numerous QA and IQA testing projects for commercial, state, and federal government customers.

### 1.2 Terms and Abbreviations

1. VAT – The Voter Assist Terminal is the voting station to be tested. It includes hardware and firmware to assist voters with impaired visual or physical abilities.
2. AIMS – The Automark Information Management System provides the ability to prepare election databases for use in the VAT. It is available from the vendor, but is not included in this test.

## 2 System Identification

The AutoMARK Voter Assist Terminal Version 1.3 (actual version 1.3.2322) was a single unit, and consists of a touch screen monitor, scanner and an integral ballot printer.

## 3 Test Environment

All testing on these systems was performed at Western Turnpike Golf Course on Thursday, May 17, 2006 and Friday, May 18, 2006.

The AutoMARK VAT System consisted of four touch screen units. All units were operating in a stand alone environment. The vendor supplied the pre-printed ballots and the memory cards that contained the elections programmed using the Automark AIMS software.

## 4 Test Case Description

**Comment [C1]:** Test configuration for the machines

The following sections summarize three test cases using two elections to test the Automark VAT system.

| **Test Case:** Primary_01 | **Configuration** |
|---|---|
| Closed Primary Election<br>Purpose: Test to see that the system can handle multiple ballots styles with multiple contest types in a single election. The system has to switch ballot styles depending on the voter's registration. An actual past New York State Election scenario was used as the input data. | 1. 2 Ballot Styles, Democratic and Conservative<br>2. 11 Democratic Contests<br>3. 4 Conservative Contests<br>4. 2 N of M Democratic Contests<br>5. 2 N of M Conservative Contests<br>6. Regular ballots<br>7. Write-ins<br>8. English<br>9. Spanish |

**Procedures:**

1. Load database for this election and generated election report
2. Open machine for voting
3. Voted and verified at least one ballot of each ballot style for each party
4. The voting included instances of:
    a. Candidate write-in
    b. Under-votes
    c. Spanish Language
    d. "Fleeing Voter"
    e. Change voting selection before casting
    f. Spoil ballot and revote
    g. Invalid voter actions
    h. "Sip and Puff" Device
    i. Paddle/Two Way Switch Device
    j. Audio ballot

| **Test Case:** General_01 | **Configuration** |
|---|---|
| General Election<br>Purpose: Test to see that the system can handle multiple ballots styles with multiple contest types in a single election. The system has to switch ballot styles depending on the voter's jurisdiction. An actual past New York State Election scenario was used as the input data. | 1. 2 Ballot styles, Cicero West (1) and Cicero East (2)<br>2. 13 Contests (Cicero West)<br>3. 14 Contests (Cicero East)<br>4. 6 Proposal Contests (Cicero West)<br>5. 6 Proposal Contests (Cicero East)<br>6. 2 N of M Contests (Cicero West)<br>7. 3 N of M Contests (Cicero East)<br>8. Regular ballots<br>9. Write-in<br>10. English<br>11. Spanish |

**Procedures:**

1. Load database for this election and generated election report
2. Open machine for voting
3. Voted and verified at least one ballot of each ballot style for each party
4. The voting included instances of:
    k. Candidate write-in
    l. Cross endorsed candidates (cross filing)
    m. Under-votes
    n. Spanish Language
    o. "Fleeing Voter"
    p. Change voting selection before casting
    q. Spoil ballot and revote
    r. Invalid voter actions
    s. "Sip and Puff" device
    t. Paddle/Two Way Switch Device
    u. Audio ballot

| **Test Case:** Throughput Test | **Configuration** |
|---|---|
| Timed Voting Sample<br>Purpose: This test was used to determine the average amount of time it takes to cast a ballot on each system. A sample of 12 average voters with no prior experience with the system were timed voting the General Election Ballot used in Test Case General_01. The lowest and highest times were excluded and the rest of the sample times were averaged. | General Election Ballot from Test Case General_01 Cicero West Ballot Style 1 was used. |

**Procedures:**

1. Load database for this election
2. Open poll
3. "Voters" were asked to vote as though it were a real election
4. Time was started when the voter inserted the ballot and stopped after the ballot was reviewed
5. The times were averaged

## 5 Ballot Results and Statistics

Below is a table that contains the results of ballots cast for Automark Technical Systems VAT system.

| **System**: AutoMARK Voter Assist Terminal Version 1.3 | |
|---|---|
| **Ballot Statistics:** | |
| ➢ Total Number of Ballot Positions: | 32943 |
| ➢ Total Number of Ballots Cast: | 237 |
| ➢ Ballots Cast in General Election: | 105 |
| ➢ Ballots Cast in Primary Election: | 120 |
| **Time Statistics:** | |
| ➢ Average Time to Cast Ballot: | ~ 9 minutes |
| ➢ Number of Ballots in New York Election Day: | 93 |
| ➢ Time to Cast Ballot using Physical Disability Device (Sip and Puff): | ~ 25 minutes |
| ➢ Time to Cast Ballot using Physical Disability Device (Paddle/ Two Way Switch): | ~ 18 minutes |
| ➢ Time to Cast Ballot using Physical Disability Device (Audio Ballot): | ~21minutes |
| **Results:** All voted ballots were verified that the marked ballot was what the voter input into the system. The system recorded 100% accuracy rate. Three ballots were noted as skewed, but the voter intent was still obvious to the testers. | |

## 6 Observation

This section describes the observations made by Ciber, Inc during the course of testing. Items listed limitations of the facilities, non-testable items, or errors that occurred during testing.

**AutoMARK Voter Assist Terminal Version 1.3**

The Primary Election was set up as two separate elections instead of one election with two ballot styles. The vendor added a Republican ballot style to the "Conservative Election" to demonstrate this feature.

Inputting a write-in candidate the touch screen would allow the same name to be input multiple times in an N of M contest.

The print feature encountered three paper jams during the course of testing. Two jams occurred on a single machine and the tester requested the unit to be cleaned by the vendor after the second jam. Once cleaned the unit did not receive any more paper jams. The other unit only had a single issue. All the paper issues were able to be resolved.

A "Battery Power Test" was performed. After the unit functioned for 2 hours and 50 minutes, a screen appeared telling the user to attach the power cable or change batteries. This occurred with a ballot in the machine. No messaging was provided to instruct the poll worker that a ballot was in the unit. Once the power was restored, the voter could not insert a ballot because it was already in the unit. The solution for this was to restore power and use the poll worker access key

to eject the un-voted ballot. The unit was return to a voting status and the voter re-voted the ballot.

# EXHIBIT A

# New York State Board of Elections
# Software Test Plan
## for
## Automark Voter Assist Terminal

**Vendor: Automark Technical Systems LLC.**

**System: Voter Assist Terminal (VAT) Version 1.3**

**Prepared By: CIBER, Inc.**

Change History

| Version | Date | Comment |
|---|---|---|
| 1.0 | 5/12/06 | Initial Release |
| 1.1 | 5/12/06 | Modifications to test cases |
| 1.2 | 5/12/06 | Changed precinct to election districts, changed open primary to closed primary |
| | | |
| | | |

# Functional Test Plan

## 1 Introduction

This document provides a plan for testing the Voter Assist Terminal (VAT) system submitted by Automark Technical Systems LLC to the State of New York State Board of Elections (SBOE). The objective of this test is to validate that the system meets the requirements of the State of New York and provides the features specified by the Vendor in its technical data package.

The AutoMARK Voter Assist Terminal comprises a touch screen monitor and an integral ballot printer. To use the device, the voter inserts a preprinted blank ballot. The content of the ballot is presented on a touch sensitive screen or an audio device. The voter indicates the desired choices by touching the screen or specially designed buttons or using a Sip and Puff device. The system allows the voter to confirm the selections and then marks the ballot and returns the completed ballot to the voter.

## 1.1 References

The VAT Technical Data Package (TDP) describes the operation, maintenance and specifications of the VAT. The table in this Section lists the file name and file date of each document included in that TDP. The vendor also provided a separate TDP for the Automark Information Management System (AIMS) Software. The scope of this test is limited to the VAT and does not include the AIMS Software. However, in that TDP, the Election Officials Guide identifies the types of elections and contests that the VAT is designed to accept, so that one document from the AIMS TDP is included in the table.

| File Date | Document File Name |
|---|---|
| 04/28/2006 | AIMS 3010 Sect05 Election Officials Guide AQS-13-5001-208-R.doc |
| 04/28/2006 | ATS 3010 Corrective Action Log AQS-13-5011-004-R.doc |
| 04/28/2006 | ATS 3010 Design Review Attendance Form AQS-13-2020-005-R.doc |
| 04/28/2006 | ATS 3010 Design Review Minutes Form AQS-13-2020-004-R.doc |
| 04/28/2006 | ATS 3010 DocChange Order Form AQS-13-2020-001-F.doc |
| 04/28/2006 | ATS 3010 Document Change Control Form AQS-13-2020-006-R.doc |
| 04/28/2006 | ATS 3010 Engineering Change Order Change Request Form AQS-13.DOC |
| 04/28/2006 | ATS 3010 System Bug Report form online version AQS-13-2020-0.doc |
| 04/28/2006 | AutoMARK 3010 Quality Systems Audit Schedule AQS-13-5020-00.doc |
| 04/28/2006 | AutoMARK 3010 QSP Master List AQS-13-5010-008-F.doc |
| 04/28/2006 | Bug Report 3010 hard copy AQS-13-2020-003-R.doc |
| 04/28/2006 | AutoMARK 3010 Requirement Trace Matrix AQS-13-5000-003-F.doc |
| 04/28/2006 | AutoMARK 3010 System Change Notes AQS-13-3010-001-A.doc |
| 04/28/2006 | AutoMARK 3010 TDP TOC.doc |
| 04/28/2006 | AutoMARK 3010 System Introduction AQS-13-5001-000-R.doc |
| 04/28/2006 | AutoMARK 3010 System_Overview AQS-13-5002-000-S.doc |
| 04/28/2006 | AutoMARK 3010 System Functionality AQS-13-5001-001-R.doc |
| 04/28/2006 | AutoMARK System Hardware Specification AQS-31-5000-001-F.doc |
| 04/28/2006 | CABLE_PHASE2.pdf |
| 04/28/2006 | PEB_RevB.pdf |
| 04/28/2006 | PSB_RevB.pdf |
| 04/28/2006 | SBC_640117-4000C-2AGP.pdf |
| 04/28/2006 | Scanner_PI211MC-B4DR May04.pdf |
| 04/28/2006 | SD_GGB_REV_A.PDF |
| 04/28/2006 | SIB_A3.pdf |

| | |
|---|---|
| 04/28/2006 | USD-A-SCH.PDF |
| 04/28/2006 | AutoMARK 3010 Ballot Image Processing Specification AQS-13-5.doc |
| 04/28/2006 | AutoMARK 3010 Ballot Scanning and Printing Specification AQS.doc |
| 04/28/2006 | AutoMARK 3010 Driver API Specification AQS-13-5000-002-F.doc |
| 04/28/2006 | AutoMARK 3010 Embedded Database Interface Specifications AQS.doc |
| 04/28/2006 | AutoMARK 3010 GUI Design Specifications AQS-13-5001-005-R.doc |
| 04/28/2006 | AutoMARK 3010 Operating Software Design Specifications AQS-1.doc |
| 04/28/2006 | Automark 3010 Programming Specifications Details AQS-13-5001.doc |
| 04/28/2006 | AutoMARK 3010 RAD Methodology AQS-13-5001-010-R.doc |
| 04/28/2006 | AutoMARK 3010 Software Design Spec AQS-13-5001-004-S.doc |
| 04/28/2006 | AutoMARK 3010 Software Development Environment AQS-13-5001-0.doc |
| 04/28/2006 | AutoMARK 3010 Software Diagnostics Specifications AQS-13-500.doc |
| 04/28/2006 | AutoMARK 3010 Software Standards Specification AQS-13-4000-0.doc |
| 04/28/2006 | AutoMARK 3010 System Security Specification AQS-13-5002-001-.doc |
| 04/28/2006 | AutoMARK 3010 System Security Test Cases AQS-13-5030-005-S.doc |
| 04/28/2006 | AutoMARK 3010 System Security Test Procedures AQS-13-5012-000.doc |
| 04/28/2006 | AutoMARK 3010 Environmental Test Cases AQS-13-5030-001-F.doc |
| 04/28/2006 | AutoMARK 3010 Environmental Test Plan AQS-13-5020-001-F.doc |
| 04/28/2006 | AutoMARK 3010 Environmental Test Procedure AQS-13-5010-013-F.doc |
| 04/28/2006 | AutoMARK 3010 Operations and Diagnostic Log Specs AQS-13-500.doc |
| 04/28/2006 | AutoMARK 3010 Operations Log Test Cases AQS-13-5032-005-S.doc |
| 04/28/2006 | AutoMARK 3010 Operations Log Test Procedures AQS-13-5012-004.doc |
| 04/28/2006 | AutoMARK 3010 SQA Test Plan AQS-13-5021-000-R.doc |
| 04/28/2006 | AutoMARK 3010 SQA_Test_Cases AQS-13-5031-000-R.doc |
| 04/28/2006 | AutoMARK 3010 SQA_Test_Procedures AQS-13-5011-001-R.doc |
| 04/28/2006 | AutoMARK 3010 System Level Test Cases AQS-13-5030-000-F.doc |
| 04/28/2006 | AutoMARK 3010 System Level Test Plan AQS-13-5020-002-F.doc |
| 04/28/2006 | AutoMARK 3010 System Level Test Procedures AQS-13-5010-000-F.doc |
| 04/28/2006 | AutoMARK 3010 Jurisdiction Guide AQS-13-5061-003-R.doc |
| 04/28/2006 | AutoMARK 3010 Poll Workers Guide AQS-13-5061-002-R.doc |
| 04/28/2006 | AutoMARK 3010 Voters Guide AQS-13-5061-001-R.doc |
| 04/28/2006 | AutoMARK 3010 System Installation and Maintenance Guide AQS-.doc |
| 04/28/2006 | ATS 3010 Employee Training Procedure AQS-13-5010-012-F.doc |
| 04/28/2006 | AutoMARK 3010 Personnel Deployment and Training AQS-13-5000-.rtf |
| 04/28/2006 | ATS 3010 Software Release Process AQS-13-2011-000-R.doc |
| 04/28/2006 | ATS 3010 Configuration Management Policy AQS-13-2000-004-F.doc |
| 04/28/2006 | AutoMARK 3010 Configuration Management Plan AQS-13-5020-000-.doc |
| 04/28/2006 | AutoMARK 3010 Initial Software Installation Procedure AQS-13.doc |
| 04/28/2006 | AutoMARK VAT Software and Firmware Compilation Instructions .doc |
| 04/28/2006 | ATS 3010 Component Storage and Handling Procedure AQS-13-501.doc |
| 04/28/2006 | ATS 3010 Design Review Policy AQS-13-2000-002-F.doc |
| 04/28/2006 | ATS 3010 Document Change and Issue Procedure AQS-13-5010-004.doc |
| 04/28/2006 | ATS 3010 Document Control Policy AQS-13-2000-007-F.doc |
| 04/28/2006 | ATS 3010 Engineering Change Request Change Order Process AQS.doc |
| 04/28/2006 | ATS 3010 Engineering Development Policy AQS-13-2000-003-F.doc |
| 04/28/2006 | ATS 3010 Purchasing Procedure AQS-13-5010-011-F.doc |
| 04/28/2006 | ATS 3010 Quality Assurance Policy AQS-13-2000-001-F.doc |
| 04/28/2006 | ATS 3010 Quality System Audit Process AQS-13-2010-001-F.doc |
| 04/28/2006 | ATS 3010 Receiving Process AQS-13-5010-005-F.doc |
| 04/28/2006 | ATS 3010 System Bug Reporting Procedure AQS-13-5010-006-F.doc |

## 1.2 Terms and Abbreviations

1. VAT – The Voter Assist Terminal is the voting station to be tested. It includes hardware and firmware to assist voters with impaired visual or physical abilities.
2. AIMS – The Automark Information Management System provides the ability to prepare election databases for use in the VAT. It is available from the vendor, but is not included in this test.
3. Preference Race – An open primary in which the first contest is a list of parties. The voter selects the party from the list and is presented with the contests for that party and any non-partisan contests.
4. Navigation Race – An open primary in which the voters first selection automatically limits him/her to the contests for the party associated with that selection and any non-partisan contests.

## 2. PreQualification Test

PreQualification testing is not applicable to this test.

## 3 Materials Required for Testing

### 3.1 Software

The software to be tested includes:

- VAT Firmware Version 1.3

### 3.2 Hardware

The vendor will provide three VAT unit(s) on which to conduct the test. The unit will include components necessary for Audio assisted voting and Sip and Puff voting.

### 3.3 Other Materials

The vendor will provide the following for this test:

- Blank paper ballots to be voted.
- Storage Media as necessary to backup/transfer database and voting information
- A CD with all software (firmware) to be installed on the VAT.

### 3.4 Deliverable Materials

The vendor will deliver the following items prior to the start of the test:

1. A complete TDP that provides a description of the system and its operational functionality.
2. VAT readable storage media with the Election Databases that are used in this test. The databases will be provided in both the loadable form and in the "source" form that is modifiable using the vendors Ballot Preparation Software.

### 3.5 Proprietary Data

All materials and deliverables provided by the vendor are considered company proprietary and the SBOE will protect against unauthorized distribution of those materials.

## 4 Test Specification

### 4.1 Requirements

The vendor will demonstrate the ability to conduct the elections specified by the New York State Board of Elections (SBOE). The elections will include a variety of contest types, political parties and options that will demonstrate the functional capabilities presented in the Vendor's TDP. The primary documents used to define test cases for this test are:

1. AutoMARK System Overview, Doc. No AQS-13-5002-000-S
2. AutoMARK System Functionality, Doc. No. AQS-13-5001-001-R
3. AIMS 3010 Election Officials Guide, Doc. No. AQS-13-5001-208-R.doc
4. AutoMARK 3010 Jurisdiction Guide, Doc. No. AQS 13-5061-005-R
5. AutoMARK 3010 Poll Worker's Guide, Doc. No. AQS-13-5061-002-R

The test may include any capabilities specified in the TDP and will include at least the following.

1. One General Election and one Closed Primary Election (with preference race)
2. The following types of Contests in a General and a Primary Election
    a. Vote for n of m
    b. Vote for one
    c. Propositions with yes/no or alternative text for voter selection
3. Multiple political parties
4. N of M contest shall include:
    a. Multiple parties, each with n candidates

b. Multiple parties, some with less than n candidates
c. Multiple parties, some with more than n candidates
d. Some parties with no candidates

The following are NOT included in this test:

- Candidate rotation logic is not implemented in VAT.
- Cumulative voting is not supported by the system.
- Ranked Contests are not supported by the system.
- Recall contest and straight ticket are not supported in the same election.
- Provisional ballots are not included because the system makes no distinction from regular ballots.

## 4.2 Hardware Configuration and Design

Hardware will be configured by the vendor as necessary to support the elections specified by SBOE. The vendor will provide the hardware and software components necessary to simulate the voting of ballots at a single polling place that includes multiple election districts and ballot types.

## 4.3 Software System Functions

The test will include functions of most concern to the SBOE. However, the failure to include a function in this test does not imply that SBOE releases the vendor from providing that function. All functions described in the vendor's TDP are to function correctly.

## 4.4 Test Case Design

Test cases are created to demonstrate those capabilities determined to be of most concern to the SBOE but may be expanded to demonstrate any of the functionality claimed by the vendor in the TDP. The pass/fail criteria for each test is (1) that the test results are consistent with the expected result as specified in the TDP and (2) the test result conforms to the standards and procedures applicable to the State of New York and any subsidiary jurisdictions.

The following tables summarize the test cases that are to be executed in this test. Each table indicates the minimum election parameters to be provided, the equipment to be included and a summary of the test procedure to be executed.

| Test Case: Self Verification | Configuration |
|---|---|
| Load election and verify security mechanisms and self-test capability. (See AutoMARK 3010 Jurisdiction Guide, Section 5) | 1. Single Voting Assist Terminal<br>2. Passwords, Physical Access Key |
| **Voting Devices Utilized:** VAT | |
| **Procedures:** | |
| 1. Install firmware from installation CD<br>2. Load election database into from flash memory card.<br>3. Print Test Ballot(s)<br>4. Preview at least one ballot format on the touch screen<br>5. Preview audio presentation of one ballot format<br>6. Verify Sip and Puff operation<br>7. Respond to equipment test prompts, force failure when practical<br>8. Activate VAT for voting and verify machine is ready to accept a ballot in vote mode.<br>9. Inspect and print audit log | |

| Test Case: Primary_01 | Configuration |
|---|---|
| Closed Primary Election | 1. Multiple election districts (multiple ballot styles)<br>2. Multiple political parties<br>3. Partisan Contest types: vote for one, N of M<br>4. English and Spanish text and voice recording<br>5. Audio Assisted voting<br>6. Sip and Puff voting<br>7. N of M write-ins |
| **Voting Devices Utilized:** VAT | |
| **Procedures:** | |
| 1. Load Primary election database specified by SBOE<br>2. Open VAT<br>3. View each ballot style.<br>4. Vote at least one ballot of each ballot style for each party. The voting must include instances of:<br>a. Candidate write-in<br>b. Audio Assisted voting (English and Spanish)<br>c. Sip and Puff voting<br>d. Under-votes<br>e. Spanish text<br>f. "Fleeing Voter"<br>g. Change voting selection before casting<br>h. Invalid ballot inserted<br>i. Simulate invalid voter actions<br>5. Close VAT<br>6. Print all reports available<br>7. Inspect (print) audit log | |

| **Test Case: General_01** | **Configuration** |
|---|---|
| General Election | 1. Multiple election districts<br>2. Multiple political parties<br>3. Multiple ballot styles<br>4. Contest types: Partisan and Ballot Propositions, N of M,<br>5. English and Spanish text and voice recording<br>6. Audio Assisted Voting<br>7. Sip and Puff voting<br>8. N of M write-ins |
| **Voting Devices Utilized:** VAT | |
| **Procedures:** | |

1. Load VAT with General election database specified by SBOE
2. Open VAT for Voting
3. Vote at least one ballot of each ballot style. The voting must include instances of:
    a. Candidate write-in
    b. Audio Assisted voting (English and Spanish)
    c. Sip and Puff voting
    d. Under-votes
    e. Spanish text
    f. "Fleeing Voter"
    g. Change voting selection before casting
    h. Invalid ballot
    i. Simulate invalid voter actions
4. Close VAT
5. Print all reports available
6. Inspect (print) audit log

# 5 Test Data

## 5.1 Data Recording

The data to be recorded for each test will include:

- Audit logs
- Exceptions observed
- Observations for each step of the test script
- All available reports
- All Ballots that were used (marked) for each test

## 5.2 Test Data Criteria

Test data will be evaluated against the specifications as stated in the vendor's TDP. Each marked ballot will be viewed and accepted or rejected by an SBOE representative. Audit logs will be validated by identifying startup and voting events in the audit log.

## 5.3 Test Data Reduction

All analysis to test data is by manual inspection of the reports and observation of events during the tests.

# 6 Test Procedure and Conditions

The test will be conducted by a test team consisting of SBOE and CIBER personnel. The test team may specify alternate actions that are not defined in the test cases in this test plan. Invalid user (voter and poll worker) actions must be detected by the voting system and a notification given to the user and/or an effective recovery performed.

SBOE may direct additional test cases or steps to be executed that are not documented in this plan. The additional test cases may require that the election database be modified and reloaded.

## 6.1 Facility Requirements

The test configuration consists of the equipment described in Section 3.2. The vendor will provide the equipment at the facility specified by SBOE.

## 6.2 Test Set-up

The Vendor shall configure the hardware to simulate a polling place capable of supporting the elections defined by the SBOE. The "source" database must be provided to SBOE in a form that allows the vendor to apply changes during the testing if so directed by SBOE.

## 6.3 Test Sequence

The "Self Verification" test is to be executed first. Other tests can be executed in any order as specified by SBOE at the time of testing.

# EXHIBIT B

**TOWN OF ONONDAGA**
Election District ____
November 4, 1997

*Commissioners of Elections*

**MARKING INSTRUCTIONS:** Correct Mark: ● Incorrect Marks: ⊘ ⊖ ⊗ ○

- Mark in blue or black pen or pencil
- To vote for a candidate whose name is printed on the ballot, completely fill in one oval above the name of the candidate.
- To vote for a person whose name is not imprinted on this ballot, write the name and fill in the oval in the blank space which appears at the bottom of the column under the title of the office.
- To vote on a proposal located on the reverse side of this ballot, completely fill in the "Yes" or "No" oval contained in the box setting forthsuch proposal.
- Any other mark or writing, or erasure made on this ballot outside the voting ovals or blank spaces provided for write-in may void this entire ballot.

NOTE: All Absentee Ballots postmarked by November 3 and received by the Board of Elections no later than November 11, will be cast and counted.

**PROPOSITIONS ARE LOCATED ON THE REVERSE SIDE OF THIS BALLOT**

Sheet No. 5
22 Election Districts
County of Onondaga
Town of: Onondaga
E.D. (s): 1-22

| 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Justice of the Supreme Court 5th Judicial District (Vote for any SIX) | | | | | County Court Judge (Vote for ONE) | Family Court Judge (Vote for ONE) | District Attorney (Vote for ONE) | County Treasurer (Vote for ONE) | Sheriff (Vote for ONE) | County Legislator 2nd District (Vote for ONE) | Supervisor (Vote for ONE) | Town Clerk (Vote for ONE) | Super-intendent of Highways (Vote for ONE) | Town Justice (Vote for ONE) | Councilman (Vote for any TWO) | | Assessor (Vote for ONE) | | | Trustee (Vote for any NINE) | | | | | | | |
| 2A Democratic Jerome B. Matthews | 3A Democratic Neal P. O Donnell | 4A Democratic F. Dana Pierson | 5A Democratic Milton P. Booker | 6A Democratic Michael J. Castle | 7A Democratic Stephen A. Davidson | 8A Democratic James F.X. Barrell | 9A Democratic Patrick Kevin Hammond | 10A Democratic Louis Newman | 11A Democratic Charles F. Passmore | 12A Democratic George G. Johnston | 13A Democratic Tony Knight | 14A Democratic Frederick W. Murray | 15A Democratic Christopher L. Bass | 16A Democratic Catherine Hoonan | 17A Democratic Margaret F. Perkins | 18A Democratic Russel S. Dwyer | 19A Democratic Sheila A. Sanders | 20A Democratic Anthony S. Zimmer | 21A Democratic Joseph (Job) Childs | 22A Democratic Dennis Zeldin | 23A Democratic John B. Yonkers | 24A Democratic Richard Schmill | 25A Democratic Betty G. Rabbit | 26A Democratic Gregg G. Squire | 27A Democratic Rossafi Gambella | 28A Democratic Walter Northrup |
| 2B Republican Robert W. Murray | 3B Republican Gerald Tillman | 4B Republican Sandra J. Edwards | 5B Republican Geoffrey J. Cummings | 6B Republican Joseph A. Albright | 7B Republican Alfred C. Crawford | 8B Republican Kerry A. Schaefer | 9B Republican James M. Tompkins | 10B Republican John C. Gallagher | 11B Republican Patrick A. Friedman | 12B Republican William C. Abbott | 13B Republican Leonard C. Hamilton | 14B Republican M. Jobette Montgomery | | 16B Republican Edward W. Brewster | 17B Republican Thomas E. Olson | 18B Republican Nancy Barton | 19B Republican Frederick L. Fuller | 20B Republican Diane E. Clayman | 21B Republican John G. Bryant | 22B Republican Robert E. Clifford | 23B Republican Joshua B. Morehouse | 24B Republican James J. Nicholas | 25B Republican Deborah S. Watson | 26B Republican Leon K. Haviland | 27B Republican Theodore W. Josey | 28B Republican William G. Saxton |
| 2C Conservative Robert W. Murray | 3C Conservative Gerald Tillman | 4C Conservative Sandra J. Edwards | 5C Conservative Geoffrey J. Cummings | 6C Conservative Joseph A. Albright | 7C Conservative Alfred C. Crawford | 8C Conservative Kerry A. Schaefer | 9C Conservative James M. Tompkins | 10C Conservative John C. Gallagher | 11C Conservative Patrick A. Friedman | 12C Conservative Margaret A. Thompson | 13C Conservative Leonard C. Hamilton | 14C Conservative M. Jobette Montgomery | | 16C Conservative Edward W. Brewster | | | 19C Conservative Frederick L. Fuller | 20C Conservative Diane E. Clayman | 21C Conservative John G. Bryant | 22C Conservative Robert E. Clifford | 23C Conservative Joshua B. Morehouse | 24C Conservative James J. Nicholas | 25C Conservative Deborah S. Watson | 26C Conservative Leon K. Haviland | 27C Conservative Theodore W. Josey | 28C Conservative William G. Saxton |
| 2D Independence Thomas J. Tooley | 3D Independence Gerald Tillman | | | | | | 9D Independence Robert W. Russman | 10D Independence Veronica Rutherford | 11D Independence Patrick A. Friedman | | | | | | | | | | | | | | | | | |
| 2E Liberal Jerome B. Matthews | 3E Liberal Neal P. O Donnell | 4E Liberal F. Dana Pierson | 5E Liberal Milton P. Booker | 6E Liberal Michael J. Castle | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | 7F Right To Life Stephen A. Davidson | 8F Right To Life James F.X. Barrell | 9F Right To Life Patrick Kevin Hammond | 10F Right To Life Louis Newman | 11F Right To Life Charles F. Passmore | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | 12G Freedom George G. Johnston | | | 15G Freedom Charles F. Lemon | | | | | | | | | | | | | |
| | | | | | | | | | | 12H Labor William C. Abbott | | | | | | | | | | | | | | | | |
| Write-In | Write-In | Write-In | Write-In | Write-In | Write-In | Write-In | Write-In | Write-In | Write-In | Write-In | Write-In | Write-In | Write-In | Write-In | Write-In | Write-In | Write-In | Write-In | Write-In | Write-In | Write-In | Write-In | Write-In | Write-In | Write-In | Write-In |

# EXHIBIT C

rect Mark: ●
orrect
rks: ⊘ ⊖ ⊗ ○

- Mark in blue or black pen or pencil
- To vote for a candidate whose name is printed on the ballot, completely fill in one oval above the name of the candidate.

- To vote for a person whose name is not printed on the ballot, write the name and fill in the oval in the blank space which appears at the bottom of the column under the title of the office.

- To vote on a proposal located on the reverse side of this ballot, completely fill in the "Yes" or No" oval contained in the box setting forth such proposal.

- Any other mark or writing, or erasure made on this ballot outside the voting ovals or blank spaces provided for write-in may void this entire ballot.

NOTE: All Absentee Ballots postmarked by November 3 and received by the Board of Elections no later than November 11, will be cast and counted.

| R NE | SUPREME COURT JUDGE Vote For ONE | SURROGATE COURT Vote For ONE | FAMILY COURT JUDGE Vote For TWO | | COUNTY EXECUTIVE Vote For ONE | 2ND LEGISLATIVE DIST. Vote For ONE | CHEEKTOWAGA SUPERVISOR Vote For ONE | CHEEKTOWAGA COUNCILMAN Vote For THREE | | | CHEEKTOWAGA TOWN CLERK Vote For ONE | CHEEKTOWAGA TOWN JUSTICE Vote For ONE | CHEEKTOWAGA SUPER HIGHWAY Vote For ONE | ALDERMAN Vote For THREE | | | SHERIFF Vote For ONE | CORONER Vote For ONE | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2A Republican Sharon S Townsend | 3A Republican Barbara Howe | 4A Republican Rosalie S Bailey | 5A Republican John L Michalski | 6A Republican Joel A Giambra | 7A Republican Stef Berbro | 8A Republican Roger Heymanow | 9A Republican Mary Ann Kochers | 10A Republican Sean D Kalota | 11A Republican Scott A Weaver | 12A Republican Keith Boyce | 13A Republican Thomas S Kolbert | 14A Republican John Carson | 15A Republican Justin Hankins | 16A Republican Dan Smith | 17A Republican Sam Collicot | 18A Republican Sam Phillips | 19A Republican Pat Steiert | | | |
| | 2B Democratic Sharon S Townsend | 3B Democratic Barbara Howe | 4B Democratic Rosalie S Bailey | 5B Democratic Paul Buchanan | 6B Democratic Daniel Ward | 7B Democratic Mark J Schroeder | 8B Democratic Dennis H Gabryszak | 9B Democratic Thomas M Johnson Jr | 10B Democratic Jeff. Swiatek | 11B Democratic James J Jankowiak | 12B Democratic Mary Holtz | 13B Democratic Thomas S Kolbert | 14B Democratic Chris J Kowal | 15B Democratic Shari Little | 16B Democratic Stephen Waldron | 17B Democratic Greg Slader | 18B Democratic Carol Miller | 19B Democratic Cliff Pattison | | | |
| | 2C Independence Robert E Whelan | 3C Independence Barbara Howe | 4C Independence Rosalie S Bailey | 5C Independence Margaret O Szczur | 6C Independence Joel A Giambra | 7C Independence Richard C Pawarski | 8C Independence Dennis H Gabryszak | 9C Independence Thomas M Johnson Jr | 10C Independence Jeff. Swiatek | 11C Independence James J Jankowiak | 12C Independence Mary Holtz | 13C Independence Thomas S Kolbert | 14C Independence Chris J Kowal | 15C Independence Pat Sproat | 16C Independence Lian Fuller | 17C Independence Pete Chance | 18C Independence Jenny Jones | 19C Independence Gabriel Quitslund | | | |
| | 2D Conservative Holly McDonald | 3D Conservative Barbara Howe | 4D Conservative Rosalie S Bailey | 5D Conservative Paul Buchanan | 6D Conservative Joel A Giambra | 7D Conservative Mark J Schroeder | 8D Conservative Dennis H Gabryszak | 9D Conservative Thomas M Johnson Jr | 10D Conservative Jeff. Swiatek | 11D Conservative James J Jankowiak | 12D Conservative Mary Holtz | 13D Conservative Thomas S Kolbert | 14D Conservative Chris J Kowal | 15D Conservative Sally Hogzett | 16D Conservative Samantha Wall | 17D Conservative Mathew Cox | 18D Conservative Ruby Rioja | 19D Conservative Sharon Reynolds | | | |
| | 2E Working Families Robert E Whelan | 3E Working Families Barbara Howe | 4E Working Families Rosalie S Bailey | 5E Working Families Margaret O Szczur | 6E Working Families Daniel Ward | 7E Working Families Mark J Schroeder | 8E Working Families James A Jr Duncan | 9E Working Families Anne Turnso | 10E Working Families Bill Thomas | 11E Working Families John Tobin | 12E Working Families Rich Hartmann | 13E Working Families Kit Kaboodle | 14E Working Families Tom Wilson | 15E Working Families Mike Spoon | 16E Working Families Beth Suing | 17E Working Families Betty Crane | 18E Working Families Albert Van Nuys | 19E Working Families Carmine Iaccarino | | | |
| | 2F Green Joanne Zuppa | 3F Green Richard Natuzzi | 4F Green James P Hunte | 5F Green Leigh Taylor | 6F Green Denny Antonious | 7F Green B ruce Synder | 8F Green William Hedig | 9F Green James Lorinon | 10F Green Daniel D Smith | 11F Green Patrick Suparc | 12F Green Scott McLeod | 13F Green Peter Kaplan | 14F Green Bob Lamb | 15F Green Brad Kaplan | 16F Green Marie Boyle | 17F Green David Leung | 18F Green Barbara McKee | 19F Green Aldis Jatnicks | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | Write-in | Write-in | Write-in | Write-in | Write-in | Write-in | Write-in | Write-in | Write-in | Write-in | Write-in | Write-in | Write-in | Write-in | Write-in | Write-in | Write-in | Write-in | | | |

# EXHIBIT D

Sheet number 5-Conservative
30 Election Districts
County of Onondaga
City of Syracuse
Ward 5-E.D. (s): 1-12
Ward 12-E.D. (s): 2
Ward 17-E.D. (s): 1-17

**CITY OF SYRACUSE**
**Election District ____**
**September 9, 1997**
*Commissioner of Elections*

**MARKING INSTRUCTIONS:** Correct Mark: ● Incorrect Marks: ⊘ ⊖ ⊗ ⊙

- Mark in blue or black pen or pencil
- To vote for a candidate whose name is printed on the ballot, completely fill in one oval above the name of the candidate.
- To vote for a person whose name is not imprinted on this ballot, write the name and fill in the oval in the blank space which appears at the bottom of the column under the title of the office.
- To vote on a proposal located on the reverse side of this ballot, completely fill in the "Yes" or No" oval contained in the box setting forthsuch proposal.
- Any other mark or writing, or erasure made on this ballot outside the voting ovals or blank spaces provided for write-in may void this entire ballot.

NOTE: All Absentee Ballots postmarked by November 3 and received by the Board of Elections no later than November 11, will be cast and counted.

| OFFICE | 1 Governor (Vote for ONE) | 2 | 3 State Senate 48th (Vote for ONE) | 4 | 5 |
|---|---|---|---|---|---|
| CONSERVATIVE C | 1C Robert Quinion | 2C Douglas Stone | 3C Craig Janis | 4C Brian Getz | 5C Aileen Chao |
| Write-In | | ONE ONLY Write-In | | | TWO ONLY Write-In |

| OFFICE | Rows 9C Thru 32C Member of State Committee (27th Congressional District) (Vote for any TEN) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| CONSERVATIVE C | 9C Joel Owens | 10C Homer H. Reamer | 11C Anthony Suess | 12C Lois Perez | 13C Robert Rocco | 14C William Mentzer | 15C Doris Shidles | 16C Douglas Miller | 17C Richard House | 18C Thomas Pooler |
| CONSERVATIVE C | 19C Craig Ortiz | 20C Lewis Tuohey | 21C Gloria Montoro | 22C Mort Taverni | 23C Alfred Rutkowski | 24C Andre Ninia | 25C Howard Hwang | 26C Morton Maher | 27C Robert Loeber | 28C Gloria Rossi |
| CONSERVATIVE C | 29C Carol Koethen | 30C Eugene Kessler | 31C Paul Hodgkins | 32C Heidi Halzinger | | | | | | |
| Write-In | THREE THREE Write-In | FOUR FOUR Write-In | FIVE FIVE Write-In | SIX SIX Write-In | SEVEN SEVEN Write-In | EIGHT EIGHT Write-In | NINE NINE Write-In | TEN TEN Write-In | ELEVEN ELEVEN Write-In | TWELVE TWELVE Write-In |

| OFFICE | 33 34 35 36 Councilman 4th District (Vote for any TWO) | | | |
|---|---|---|---|---|
| CONSERVATIVE C | 33C Harry James | 34C Betty Crooker | 35C John King | 36C Ned Song |
| Write-In | | | FIFTEEN FIFTEEN Write-In | FOURTEEN FOURTEEN Write-In |

ES&S
AUTOMARK

# New York State

# Board of Elections

## Review of the

## IVS Inspire Vote-by-Phone Voting System

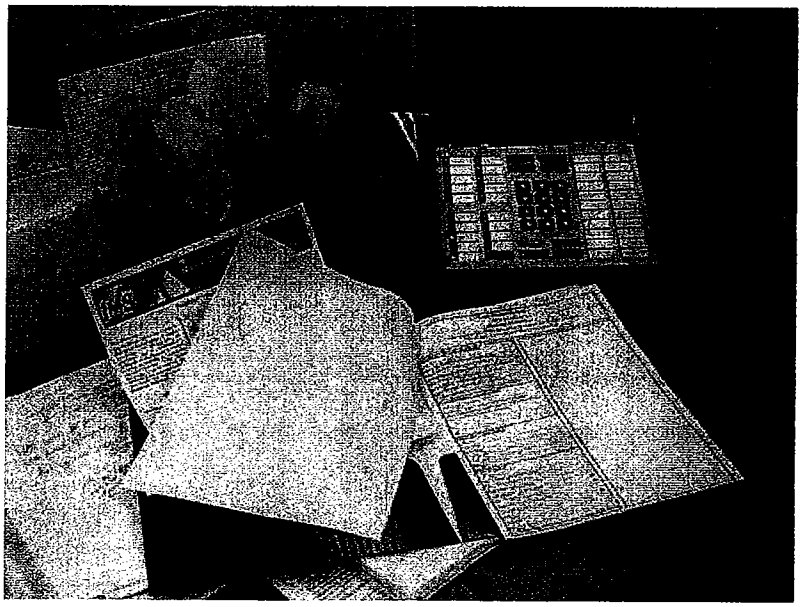
**May 22, 2006**

# Table of Contents



## Exhibits





# Authorization Test Report
# IVS Inspire Vote-by-Phone Voting System

## 1 Introduction

This test report presents the results of tests to validate the statutory and regulatory requirements of the New York State Board of Elections (NYSBoE) and provide the features specified by the vendor as outlined in their Technical Data Package(TDP). The test was performed during May 8, 2006 to May 12, 2006 at the "Clubhouse at Western Turnpike" (2350 Western Avenue, Guilderland, NY 12084). The following people were present during the testing:

- New York State Board of Elections (http://www.elections.state.ny.us)
  Anna Svizzero, Allison Carr, John Ferri, Ray Cecot, Phil Jorczak, Amit Shah
- CIBER, Inc. (http://www.ciber.com)
  Shawn Southworth, Jack Cobb
- IVS (http://www.ivsllc.com)
  Tim Gooch
- Advisory Committee Members and members of the public were present to observe (sign-in sheets are available upon request.)

All observations are based upon performance testing during this period and compliance with applicable election law, regulations and technical specifications. The following sections describes the system, system operation, test operations, and system observations.

This report is restricted to the characteristics and performance of the system under test.

## 2 Applicable Documents

The following documents were used in the conduct of this test:

- Test Plan and procedure (Exhibit A)
- Test Ballots: primary/general/English/Spanish
- Operation and Setup manuals

## 3 System Description

The IVS Inspire Vote-By-Phone Voting System is a ballot marking device which produces a paper ballot when the voter calls into a server from a polling location. The designated poll site phone number must be pre-registered in the voting system's server. The poll-worker uses that designated telephone line to place a call into a server located at the county board of elections. The server calls the poll site back, after authenticating the number, the poll-worker is prompted to enter his or her "Poll Worker ID" and "Ballot Access ID" numbers to bring up the appropriate ballot for the voter, then hands the phone to the voter. The voter makes his or her selections via the telephone key-pad. After pressing a button to mark his or her ballot, the ballot is printed on paper at the county board. The printed ballot contains a bar code. The voter, still on the line, is

advised that his or her ballot has printed and is asked whether he or she would like the ballot read back to verify the results. The voter is then asked to cast his or her ballot. The voter is advised that the ballot has been cast and the voter is instructed to hang up the phone. The device does not provide tally capability.

### 3.1 System Software and Control

The IVS Inspire System employs an election management system(EMS) which is self-contained within each individual voting unit. The software is used for the following:

| EMS Mode | Description |
|---|---|
| **Ballot definition** | To correctly mark a pre-printed ballot |
| **Verification** | To verify/validate correctness of election data, contest identification and titles |
| **Audio files** | Wave files containing audio (synthesized voice) ballot and alternate language presentation |
| **System control** | provide utilities for setting passwords, etc. |

### 3.2 Hardware

The IVS Inspire Vote-By-Phone Voting System makes use of a commercial of the shelf printer (COTS) to facilitate printing the marked ballot. The configuration tested consists of the following:

The configuring tested consist of the following:

- Dell Dimension PC SN: CN0X6252-70821-527-F1DT (Including USB keyboard, USB mouse)
- Brother HL-5170 DN Printer
- USB Scanner
- Netgear Hub and power supply transformer
- Ethernet cables
- Phone cable and equipment (dial tone simulator) necessary to conduct testing twenty-four (24) phones simultaneously
- Twenty-four (24) telephones

In addition to the above list, the system requires the following additional material:

- 8 ½ x 11 standard printer paper
- Storage Media necessary to install/transfer database and voting information

## 4 Test Scope

The test has three principal objectives:

1) To demonstrate the ability to mark a ballot using the specified interfaces
2) To demonstrate the ability of the device to mark a ballot accurately
3) To demonstrate the ability of a ballot to be verified

The test procedures were designed to demonstrate the functionality and to provide for a qualitative assessment of the device. The breadth of testing included the following:

| Test type | Description |
|---|---|
| **Ballot Volume** | Casting ballots in quantities sufficient to replicate an actual voting day |
| **Accuracy** | Comparing the printed ballots against the predetermined test ballots |
| **Usability** | Ease with which the device provides for the ability to cast votes |
| **Recovery** | Recovery from anomalies encountered |
| **Data Recording** | Data recording, including audit logs/exception reports, printed ballots |
| **Changeability** | The ability of the voter to change the selection at any time |

## 5 Test Operations

The test cases were developed incorporating two primary elections and a general election with two ballot styles. The vendor prepared the election database and provided loadable media prior to the start of the test. Prior to conducting testing, photos were taken of the equipment's external and internal features. The test was conducted by a team consisting of NYSBoE and CIBER personnel. The test procedures are defined in Exhibit A.

### 5.1 Test Case: Primary

One system was set up to conduct the test along with twenty-four telephones. Equipment was powered up and self diagnostics performed . Software version and database/system initialization report was printed . The data was loaded. The database was verified against the certification ballot.

Several test decks were created for each election which tested for the situations illustrated below.

| Situations |
|---|
| Write in candidates |

| |
|---|
| Undervotes |
| Overvotes |
| Spanish language ballots |
| Changing selections |
| Spoiled ballot and re-vote |
| Invalid voter actions |
| Audio Ballot |

Sample test deck ballots are attached here as Exhibit B. Testing included using the various interfaces that accompanied the device and incorporated invalid voter selections spoiling ballots and fleeing voter situations. In a fleeing voter situation, the system times out after five minutes and prints a spoiler sheet for the session. The spoiler sheet contains the ballot style, the election and an identifier.

### 5.2 Test Case: General

One system was utilized to conduct the test. Equipment was powered up and self diagnostics performed. Software version and database/system initialization report was printed. The data was loaded. The database was verified against the certification ballot.

The first test conducted was a throughput test which included documenting the voters experience via an exit poll interview. The throughput test measured usability and the maximum number of votes the device would likely encounter during a fifteen hour election day. The cross section of voters included NYSBoE personnel, CIBER personnel, volunteers from county Board of Elections, members of the general public and various disability advocates.

The results from the throughput test was used in determining the amount of ballots needed for the volume testing. The NYSBoE staff and CIBER personnel performed the volume testing using several test decks. These test deck incorporated instances of write-in candidates, undervotes, overvotes, Spanish language ballots, and cross-endorsed candidates. Testing included using the various interfaces that accompanied the device and incorporated invalid voter selections, spoiling ballots, and fleeing voter situations.

System accuracy was verified as each test deck was processed. A quality assurance person was part of each team whose responsibility was to verify the accuracy of the cast ballots against the test ballots.

## 6 Security

By the nature of this system design, several security issues typical of systems that *tally* votes are non-existent (manipulation/altering of vote totals, etc.). This system requires the poll worker to enter both a Poll Worker ID and a Ballot Access ID. Each poll worker would receive a unique

Poll Worker ID. This ballot marking system incorporates a "call-back" feature which requires the poll worker to hang up the phone prior to entering their ID codes, the server calls back, then the ID codes are entered by the poll worker and the voter begin voting.

The fact that this system uses an analog phone over the public telephone network means that there is the possibility that the voting process could be compromised. For example, if a voter is making their selections via the designated phone, someone could connect another phone to the same phone line and manipulate the votes being cast. This was proven during the testing process.

## 7 Observations and Issues

The IVS Inspire Vote-By-Phone Voting System seemed to work as intended, allowing votes to be cast and ballots printed with no errors. The voting process is easy and straightforward with the exception of doing a write-in, which can be tedious. There are a couple issues: this system does not have a sip and puff option and the pre-mentioned security problem with the use of the public telephone network.

The public appeared to have no problems voting on this system.

### 7.1 Fleeing Voter

Fleeing voter situations are handled as follows on the IVS system: If the voter hangs up the phone before casting his or her ballot, a spoiler ballot is printed and the voter must start over. If the voter simply walks away from the telephone without hanging up, then after a two minute period, a spoiler ballot is printed.

Multiple votes were cast using two different outside phone lines. We conducted a test to see if multiple votes could be cast by a single voter by using the redial button. In one of the voting sessions, after the vote was cast and the voter was prompted by the system to hang up the phone, the redial button was pressed before hanging up the telephone which resulted in no response from the system. The system acted as if no button was pressed at all. In that same voting session, the voter hung up the phone, picked it up again and proceeded to press the redial button. The telephone dialed the string of keys pressed during the last voting session which resulted in the voter hearing a pre-recorded message from the local telephone company saying that the call could not be made as dialed. This test proved that a voter can not vote multiple times on the system by using the redial button.

### 7.2 Uninterruptible Power Supply

An Uninterruptible Power Supply (UPS) may be required for a telephone which needs to be connected to an outlet. The UPS for the telephone will serve two purposes: 1) supply power to the telephone in the event of power failure; and 2) protect the telephone from power spikes. If there is an power outage, the UPS will start beeping to indicate the power interruption and begin supping power to the unit for approximately two to four hours. There may be an indicator on the UPS which will display the approximate remaining battery capacity.

### 7.3 Called ID

Any county that plans to use the IVS Inspire Vote-by-Phone system should be aware that they must use dedicated outside phone lines with caller ID. Also, if the IVS voting system is connected to a PBX type telephone system then the county will have to make sure that it is set up to allow for Caller ID information to pass through the PBX.

## 8 Conclusion

The IVS Inspire Vote-By-Phone Voting System allowed for error free casting of ballots and received many positive comments regarding it's ease of use. Other than the issues already stated, everything worked as designed.

# New York State Board of Elections
# Software Test Report
## for
## Inspire Vote-by-Phone Voting System

**Vendor: IVS LLC**

**System: Inspire Vote-by-Phone System (IVPS)**

**Prepared By: CIBER, Inc.**

Change History

| Version | Date | Comment |
|---|---|---|
| 1.0 | 5/16/06 | Initial Release |
| 1.1 | 5/19/06 | NY BOE input added |

## 1 Introduction

This document provides a report of software testing performed by Ciber, Inc. on the voting system submitted by IVS LLC to the State of New York State Board of Elections (SBOE). The Inspire Vote-by-Phone System provides capability to vote by phone to a remotely (centrally) located ballot marking system. The objective of this test is to validate that the software meets the requirements of the State of New York and provides the features specified by the Vendor in its technical data package.

### 1.1 Testing Agency Background

CIBER Inc. has been providing IT consulting services for over 20 years. Although the Independent Test Authority (ITA) division name has changed due to an aggressive acquisition and merger market, the ITA division of the company has had the same leadership in place since inception. Founded in 1974, the company's consultants now serve client businesses from 60 CIBER, 10 DigiTerra, 5 Solution Partners and 4 Enspherics offices in the U.S., Canada and Europe. With offices in 10 countries, CIBER's 6,000 IT specialists continuously build, test and upgrade our client's systems to "competitive advantage status." CIBER provides a single source for IT solutions, including:

Full-solution ASP services

- Applications maintenance and support
- Testing and IQA
- Web and database hosting
- Enterprise solutions, including SAP, Oracle and Peoplesoft
- Application outsourcing
- eBusiness, from architecture through execution
- Knowledge management and training

The company has been involved in numerous QA and IQA testing projects for commercial, state, and federal government customers.

### 1.2 Terms and Abbreviations

1. IVSP- Inspire Vote-by-Phone System
2. Printer and Scanner Station (PASS) –This component scans (or receives) the machine readable (barcode) representation of the marked ballot, prints that human readable paper ballot, a ballot cover page and the barcode representation of the ballot. It automatically scans the printed ballot and provides the marked ballot back to the TVS for the voter to review.
3. Telephone Voting Server (TVS) –This device hosts the telephone interface, managing ballot presentation and marking of the electronic ballot. The TVS provides the voters' selections in barcode form to the PASS, which returns the selections as scanned from the printed ballot.
4. EMS – Election Management Software (election database)
5. COTS – "Commercial Off-the-shelf" – Commercial available hardware equipment.
6. POTS – "Plain Old Telephone Service" - Standard telephone service that is used in most homes.

## 2 System Identification

IVS Inspire Vote-by-Phone System uses a COTS telephone and Demo module consisting of TVS version 2.3.1.7, PASS version 2.3.1.7, and EMS version 2.3.1.7 proprietary modules.

## 3 Test Environment

All testing on these systems was performed at Western Turnpike Golf Course on Monday, May 11, 2006 and Tuesday May 12, 2006.

The vendor recommends that each module: TVS, PASS and EMS run on a separate PC for operational use. Because of logistic constraints all modules were loaded on a single PC. The IVPS system was configured in a simulated environment. A Skutch - CK 4 telephone line simulators were connected to 24 telephones and to the PC running the three modules.

## 4 Test Case Description

The following sections summarize three test cases using two elections to test the IVS IVPS system.

| **Test Case:** Primary_01 | **Configuration** |
|---|---|
| Closed Primary Election<br>Purpose: Test to see that the system can handle multiple ballots styles with multiple contest types in a single election. The system has to switch ballot styles depending on the voter's registration. An actual past New York State Election scenario was used as the input data. | 1. 2 Ballot Styles, Democratic and Conservative<br>2. 11 Democratic Contests<br>3. 4 Conservative Contests<br>4. 2 N of M Democratic Contests<br>5. 2 N of M Conservative Contests<br>6. Regular ballots<br>7. Write-ins<br>8. English<br>9. Spanish |

**Procedures:**

1. Load database for this election and generated election report
2. Open machine for voting
3. Poll worker id and ballot id were entered
4. Voted and verified at least one ballot of each ballot style for each party
5. The voting included instances of:
    a. Candidate write-in
    b. Under-votes
    c. Spanish Language
    d. "Fleeing Voter"
    e. Change voting selection before casting
    f. Spoil ballot and revote
    g. Invalid voter actions
    h. Audio ballot
    i. Unexpected disconnect of phone line
    j. Use of phone memory options
    k. Simultaneous phone call load

| **Test Case:** General_01 | **Configuration** |
|---|---|
| General Election<br>Purpose: Test to see that the system can handle multiple ballots styles with multiple contest types in a single election. The system has to switch ballot styles depending on the voter's jurisdiction. An actual past New York State Election scenario was used as the input data. | 1. 2 Ballot styles, Cicero West (1) and Cicero East (2)<br>2. 13 Contests (Cicero West)<br>3. 14 Contests (Cicero East)<br>4. 6 Proposal Contests (Cicero West)<br>5. 6 Proposal Contests (Cicero East)<br>6. 2 N of M Contests (Cicero West)<br>7. 3 N of M Contests (Cicero East)<br>8. Regular ballots<br>9. Write-in<br>10. English<br>11. Spanish |

**Procedures:**

1. Load database for this election and generated election report
2. Open machine for voting
3. Poll worker id and ballot id were entered
4. Voted and verified at least one ballot of each ballot style for each party
5. The voting included instances of:
    l. Candidate write-in
    m. Cross endorsed candidates (cross filing)
    n. Under-votes
    o. Spanish Language
    p. "Fleeing Voter"
    q. Change voting selection before casting
    r. Spoil ballot and revote
    s. Invalid voter actions
    t. Disable the host printer and attempt to vote

| **Test Case:** Throughput Test | **Configuration** |
|---|---|
| Timed Voting Sample<br>Purpose: This test was used to determine the average amount of time it takes to cast a ballot on each system. A sample of 12 average voters with no prior experience with the system were timed voting the General Election Ballot used in Test Case General_01. The lowest and highest times were excluded and the rest of the sample times were averaged. | General Election Ballot from Test Case General_01 Cicero West Ballot Style 1 was used. |

**Procedures:**

1. Load database for this election
2. Open for machine
3. "Voters" were asked to vote as though it were a real election
4. Time was started when the phone was handed to the "Voter" and stopped after the printed ballot was reviewed
5. The times were averaged

## 5 Ballot Results and Statistics

Below is a table that contains the results of ballots cast on the IVS IVPS system.

| **System**: IVS Inspire Vote-by-Phone System | |
|---|---|
| **Ballot Statistics:** | |
| ➢ Total Number of Ballot Positions: | 27,939 |
| ➢ Total Number of Ballots Cast: | 213 |
| ➢ Ballots Cast in General Election: | 71 |
| ➢ Ballots Cast in Primary Election: | 130 |
| **Time Statistics:** | |
| ➢ Average Time to Cast Ballot: | ~ 18 minutes |
| ➢ Number of Ballots in New York Election Day: | 50 per phone |
| **Results:** All voted ballots were verified that the marked ballot was what the voter input into the system. The system recorded 100% accuracy rate. | |

## 6 Observation

This section describes the observations made by Ciber, Inc. during the course of testing. Items listed limitations of the facilities, non-testable items, or errors that occurred during testing.

**IVS Inspire Vote-by-Phone System**

The configuration used during testing was a simulated telephone network environment. The environment was simulated because 24 dedicated phone lines could not be supplied at this facility. The vendor recommends the telephone line used with this system be a dedicated line phone. This configuration did not allow some of the security features to be verified during testing. The features that could not be verified are as follows:

- The Caller Id call callback feature is used to return a call back to the location where the call originated. This feature could not be verified in the test environment.
- The telephones used in this test stored the last dialed numbers in memory and allowed them to be resent as a second vote. The vendor stated that this issue would not occur in a real environment because the originating phone call would have to be answered at and returned by the central site to allow voting to proceed.

The NYS BOE staff conducted a real time Election Day scenario test in which memory and call back features were tested. Finding will be reported by NYS BOE

# EXHIBIT A

# New York State Board of Elections
# Software Test Plan
## for
## Inspire Vote-by-Phone Voting System

**Vendor: IVS LLC**

**System: Inspire Vote-by-Phone System (IVPS)**

**Prepared By: CIBER, Inc.**

Change History

| Version | Date | Comment |
|---|---|---|
| 1.0 | 4/21/06 | Initial Release |
| 1.1 | 4/24/06 | Incorporated changes requested by SBOE |
| 1.2 | 5/02/06 | Incorporated changes requested by SBOE, changed 8 political parties to Multiple political parties. |
| 1.3 | 5/04/06 | Incorporated changes requested by SBOE to remove some items from test cases |
| | | |

# Functional Test Plan

## 1 Introduction

This document provides a plan for testing the voting system submitted by IVS LLC to the State of New York State Board of Elections (SBOE). The objective of this test is to validate that the software meets the requirements of the State of New York and provides the features specified by the Vendor in its technical data package.

### 1.1 References

The following documents were provided by the vendor as a Technical Data Package (TDP) for evaluation and provide the specifications for the system as built by the vendor.

| Document Title | Doc. Date | Version |
|---|---|---|
| Software Requirements Specification for Inspire Vote-by-Phone System | 4/7/06 | 2.3.1.5 |
| Inspire Vote-by-Phone Administrators Manual | 2005 | A.3* |
| IVS Glossary & Acronym List | None | None |
| Informal Documentation – "How to setup the IVS system for demonstration operation" | None | None |

* The title page indicated version A.2, but the footer on all other pages indicated A.3
* Note: A user manual was referenced, but not provided.

### 1.2 Terms and Abbreviations

1. IVPS – Inspire Vote-by-Phone System
2. Printer and Scanner Station (PASS) – According to the Administrator Manual, this component scans (or receives) the machine readable (barcode) representation of the marked ballot, prints that human readable paper ballot, a ballot cover page and the barcode representation of the ballot. It automatically scans the printed ballot and provides the marked ballot back to the TVS for the voter to review. (The Software Requirements Specification does not identify a separate PASS component and none of the TDP provides a description of the exact functions allocated to it or its interface with other system components.)
3. Telephone Voting Server (TVS) – According to the Administrator Manual this device hosts the telephone interface, managing ballot presentation and marking of the electronic ballot. The TVS provides the voters' selections in barcode form to the PASS, which returns the selections as scanned from the printed ballot. (The Software Requirements Specification does not identify a separate TVS component and none of the TDP provides a description of the exact functions allocated to it or its interface with other system components.)
4. Poll worker – located at the polling place and assists voter in use of the IVPS.
5. Election Official – located at central location to setup system prior to use and to monitor and control system during pre-election and election operation.
6. Ballot Handler – located at the central site to process paper ballots as they are printed

## 2. PreQualification Test

PreQualification testing is not applicable to this test.

# 3 Materials Required for Testing

## 3.1 Software

The software to be tested includes:

- Inspire Vote-by-Phone System (Version: To Be Specified):

## 3.2 Hardware

The configuration to be tested[1] consists of the following equipment provided by the vendor:

- Dell Dimension PC SN# CN0X6252-70821-527-F1DT (Including USB keyboard, USB mouse) Brother HL-5170 DN Printer
- USB Scanner
- Netgear Hub and power supply transformer
- Ethernet cables
- 24 phones
- Phone cables and equipment (Dial Tone Generator) necessary to conduct testing with 24 simultaneous callers.

## 3.3 Other Materials

The Vendor will provide the following for this test:

- Paper for printing of ballots
- Storage Media as necessary to backup/transfer database and voting information

## 3.4 Deliverable Materials

The Vendor will deliver the following items prior to the start of the test:

1. A complete TDP that includes a description of the system hardware and software and operating manuals.
2. The Election Databases to be used in this test. These databases will be provided in its source format which will allow modification and in its "loadable" format.

## 3.5 Proprietary Data

All materials and deliverables provided by the vendor are considered company proprietary and the SBOE will protect against unauthorized distribution of those materials.

# 4 Test Specification

## 4.1 Requirements

The New York State Board of Elections (SBOE) will specify elections to be demonstrated and will conduct the test. The elections will include a variety of contest types, political parties and options that will demonstrate the functional capabilities presented in the Vendor's TDP.

The test may include any capabilities specified in the TDP and will include at least the following.

1. One General Election and two Closed Primary Elections
2. The following types of Contests in a General and a Primary Election
    a. Vote for n of m
    b. Vote for one
    c. Propositions with yes/no or alternative text for voter selection
    d. Judicial Contest

[1] The IVPS Administrators Manual indicates that a TVS component provides telephone and printer interface and is connected through the LAN to a PASS component. In this test, the PC provides the functions that are allocated to the TVS and PASS in the Vendors Specifications. This configuration differs from the documented configuration of the operational system.

3. Multiple political parties
4. N of M contest and cumulative contest shall include:
    a. Multiple parties, each with n candidates
    b. Multiple parties, some with less than n candidates
    c. Multiple parties, some with more than n candidates
    d. Some parties with no candidates
5. Candidate Rotation
6. Printed of ballot to printer at central site

## 4.2 Hardware Configuration and Design

Hardware will be provided by the vendor to support the elections specified by SBOE. The hardware will simulate a single host system located at the central office of a voting jurisdiction. The hardware configuration must be capable of supporting the number of simultaneous users specified by the SBOE up to a maximum of 24.

The Vendor delivered the hardware listed in Section 3.2 to demonstrate system operation. However, it appears to differ from the IVPS system configuration specified in the IVPS Administrator Manual. The manual identifies TVS and PASS components and indicates that a minimum configuration must contain at least two of each. The Software Requirements Specification and the Vendors setup instructions do not mention the PASS or TVS, but integrate all requirements into a single software application operating on a PC. The test system configuration (Section 3.2) is acceptable for "demonstration" of system capabilities; however, if the administrator manual is accurate, that hardware does not provide an adequate system configuration for an evaluation of the operation and performance of the IVS voting system. If the hardware provided and listed in Section 3.2 is an accurate representation of an installable IVPS, then the Administrator Manual should be modified to explain the apparent discrepancies.

## 4.3 Software System Functions

The vendor indicates that this system is to provide HAVA compliant voting features to a system that is already in use. As such, the IVPS does not include ballot preparation software necessary to create an electronic ballot. Rather, the documentation indicates that it provides "conversion" capability that allows the jurisdiction to convert the election database created with their existing system into a format that is used by the IVPS. The test cases defined below assume the SBOE creates an electronic ballot database using ballot preparation software of their choice, which can then be provided to the vendor to be converted. The conversion of the database from its source format to a format that can be used by the IVPS is a significant step in demonstrating the operability of that system. Alternately, the SBOE could require the Vendor to create the database, specifying the ballot preparation software that is used.

The test will include functions of most concern to the SBOE. However, the failure to include a function in this test does not imply that SBOE releases the vendor from providing that function. All functions described in the vendor's TDP are to function correctly.

## 4.4 Test Case Design

Test cases are created to demonstrate those capabilities determined to be of most concern to the SBOE but may be expanded to demonstrate any of the functionality claimed by the vendor in the TDP. The pass/fail criteria for each test is (1) that the test results are consistent with the expected result as specified in the TDP and (2) the test result conforms to the standards and procedures applicable to the State of New York and any subsidiary jurisdictions.

All test cases can be executed with one phone line to the IVPS host PC. However, the amount of time required to conduct these test cases using only one phone line may be excessive. The test configuration should include as many phone lines connected to the PC as is practical within the test facility (up to 24). A human tester must perform the role of poll worker/voter at each phone line, so that up to 24 persons would be required to productively use 24 phone lines.

The following tables summarize the test cases that are to be executed in this test. Each table indicates the minimum election parameters to be provided, the equipment to be included and a summary of the test procedure to be executed.

| **Test Case:** Setup and Verification | **Configuration** |
|---|---|
| Convert source database, setup Host Server and verify election ballot formats. | 1. Single IVPS host server at Central Site.<br>2. Single phone line.<br>3. Ballot Database provided by SBOE |
| **Voting Devices Utilized:** PC, LAN, Phone line, Phone | |
| **Procedures:** | |
| 1. Convert the database provided by SBOE to format acceptable to IVPS<br>2. Power on all devices and monitor self-test messages (refer to Administrator manual – this may not apply for test configuration)<br>3. Load database to IVPS host (PC)<br>4. Election official log-in (verify security)<br>5. Election official generates poll worker IDs for all testers<br>6. Election official sets up polling place phone numbers<br>7. Election Official verifies system status as displayed on host monitor.<br>8. Election Official initiates "Preview and Practice" mode.<br>9. Tester initiates call, verifies sign-in security and that mode is clearly stated as "preview/practice"<br>10. Tester listens to voice response for each possible prompt. (contest, candidate, etc.)<br>11. Election Official closes poll<br>12. Tester verifies error message received when attempting to call.<br>13. Inspect / print host sever log | |

| **Test Case:** Primary_01 | **Configuration** |
|---|---|
| Closed Primary Election | 1. Five precincts (multiple ballot styles)<br>2. Multiple political parties<br>3. Partisan Contest types: vote for one, N of M, cumulative<br>4. Regular ballots<br>5. English and Spanish Languages<br>6. Write-in |
| **Voting Devices Utilized:** PC, LAN, Phone line, Phone, fax (optional) | |
| **Procedures:** | |
| 1. Election Official opens poll, monitors status screen<br>2. Poll worker calls in, attempts invalid sign on and then valid sign on<br>3. Poll worker responds to prompts and assumes role of voter when prompted (use multiple poll workers and telephone lines if available)<br>4. Vote and verify at least one ballot of each ballot style for each party. The voting must include instances of:<br>a. Candidate write-in<br>b. Under-votes<br>c. Spanish Language<br>d. "Fleeing Voter"<br>e. Change voting selection before casting<br>f. Spoil ballot and revote<br>g. Invalid voter actions<br>h. Print ballot at central printer<br>i. Print ballot at fax<br>5. Disable the host printer and scanner and attempt to vote.<br>6. Close poll<br>7. Print all reports available<br>8. Inspect (print) audit log | |

| **Test Case:** General_01 | **Configuration** |
|---|---|
| General Election | 1. Multiple precincts<br>2. Multiple political parties<br>3. Multiple ballot styles<br>4. Contest types: Partisan and Non-Partisan, Judicial, N of M, Cumulative<br>5. Regular ballots<br>6. Spanish Language<br>7. Write-in |
| **Voting Devices Utilized:** | |
| **Procedures:** PC, LAN, Phone line, Phone. Fax (optional) | |

1. Election Official opens poll, monitors status screen
2. Poll worker responds to prompts and assumes role of voter when prompted (use multiple poll workers and telephone lines if available)
3. Vote and verify at least one ballot of each ballot style. The voting must include instances of
    a. Candidate write-in
    b. Under-votes
    c. Spanish Language
    d. "Fleeing Voter"
    e. Simulate invalid voter actions
    f. Print ballot at central printer
    g. Print ballot at fax
4. Close voting poll
5. Process two "last minute" voters
6. Print all reports available
7. Inspect (print) audit logs

# 5 Test Data

## 5.1 Data Recording

The data to be recorded for each test will include:

- Audit log for each device
- Exceptions observed
- Observations for each step of the test script
- All available reports
- All Printed Ballots

## 5.2 Test Data Criteria

Test data will be evaluated against the specifications as stated in the vendor's TDP. Each ballot will be verified as it is created. The printed ballots will be examined and accepted or rejected by an SBOE representative. Audit logs will be validated by identifying startup and voting events in the audit log.

## 5.3 Test Data Reduction

All analysis to test data is by manual inspection of the reports and observation of events during the tests.

# 6 Test Procedure and Conditions

The test will be conducted by a test team consisting of IVS, SBOE and CIBER personnel. The test team may specify alternate actions that are not defined in the test cases in this test plan. Invalid user (voter and poll worker) actions must be detected by the voting system and a notification given to the user and/or an effective recovery performed.

SBOE may direct additional test cases or steps to be executed that are not documented in this plan. The additional test cases may require that the election database be modified and reloaded.

## 6.1 Facility Requirements

The test configuration consists of the equipment described in Section 3.2. The vendor will provide the equipment at the facility specified by SBOE.

## 6.2 Test Set-up

The Vendor shall configure the hardware to support the elections provided by the SBOE. The hardware should be the same models that the vendor would install in jurisdictions that purchase the system.

## 6.3 Test Sequence

The "Setup and Verification" test is to be executed first. Other tests can be executed in any order as specified by SBOE at the time of testing.

# EXHIBIT B

**NEW YORK STATE**

**TEST ELECTIONS MAY 11, 2006**

1011

CITY OF SYRACUSE, WARD 1 (DEMOCRATIC PARTY)

# POLLS OPEN: 5/12/2006 9:28:39 AM

960-684-992

# OFFICIAL PRIMARY NOMINATING BALLOT
# CITY OF SYRACUSE, WARD 1 (DEMOCRATIC PARTY)
# MAY 11, 2006

**GOVERNOR**
*VOTE FOR ONE*

| | |
|---|---|
| DONNARNE OIFFR | ○ |
| WILLIAM SULLIVAN | ● |
| FRANCES ODEEN | ○ |
| Write-in: | ○ |

**COMPTROLLER**
*VOTE FOR ONE*

| | |
|---|---|
| MARCIA CLINTON | ● |
| ANTOINETTE GALKA | ○ |
| Write-in: | ○ |

**ATTORNEY GENERAL**
*VOTE FOR ONE*

| | |
|---|---|
| EARL GARCIA | ○ |
| PAMELA MONTGOMERY | ○ |
| Write-in: | ○ |

**REPRESENTATIVE IN CONGRESS**
*VOTE FOR ONE*

| | |
|---|---|
| CARMEN ORTIZ | ● |
| BLAS OLM | ○ |
| Write-in: | ○ |

**STATE SENATE 49TH**
*VOTE FOR ONE*

| | |
|---|---|
| TERRENCE OIFER | ○ |
| ROSALINE POZZI | ○ |
| BETTY POLLI | ● |
| Write-in: | ○ |

**MEMBER OF ASSEMBLY 120TH**
*VOTE FOR ONE*

| | |
|---|---|
| LISANNE PRICE | ○ |
| CONNIE MCCORD | ○ |
| VAUGHN MCFARLAND | ● |
| Write-in: | ○ |

**COUNTY JUDGE**
*VOTE FOR FOUR*

| | |
|---|---|
| EMMAZINE LIU | ● |
| LUKE MEOLA | ○ |
| BEVERLY SPATH | ○ |
| AARON RYLES | ○ |
| JACCOB TENENNI | ○ |
| SANDRA SPEED | ○ |
| CARMELA TRAUTWEIN | ○ |
| Write-in: | ○ |
| Write-in: | ○ |
| Write-in: | ○ |
| Write-in: | ○ |

**DISTRICT ATTORNEY**
*VOTE FOR ONE*

| | |
|---|---|
| KALA REGULA | ○ |
| HERMAN WILL | ○ |
| Write-in: | ○ |

**COUNTY EXECUTIVE**
*VOTE FOR ONE*

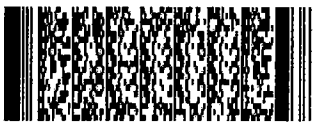
| | |
|---|---|
| ELLIOTT SATAS | ○ |
| LEE SANTULLI | ● |
| Write-in: | ○ |

**COUNTY LEGISLATOR**
*VOTE FOR ONE*

| | |
|---|---|
| GUINEVERE DIPERNA | ○ |
| SHIOMO ARCHIBALD | ○ |
| NEIL BELFORT | ● |
| Write-in: | ○ |

**COUNCILMAN**
*VOTE FOR ANY TWO*

| | |
|---|---|
| CELESTE CAIRO | ○ |
| FOSTER BROOKS | ○ |
| CHERYL SEVER | ● |
| UANNAH MORIN | ○ |
| LEON OBUCHOWSKI | ○ |
| Write-in: | ○ |
| Write-in: U | ● |



1 of 1

**NEW YORK STATE**

**TEST ELECTIONS MAY 11, 2006**

202

CICERO WEST

# POLLS OPEN: 5/11/2006 1:30:50 PM

# SPOILER

567-080-448

1 V S

**NEW YORK STATE**

**TEST ELECTIONS MAY 11, 2006**

202

CICERO WEST

# POLLS OPEN: 5/11/2006 1:30:50 PM

609-800-448

**BALLOT PROPOSAL NUMBER SIX - COUNTY PROPOSITION NUMBER THREE**

*CHOOSE ONE RESPONSE*

Shall Resolution No. 580-1993, Adopting a Charter Law to Restrict the influence of Special Interests by Limiting Terms of Office of County Legislators and County-wide Elected Officials to Twelve (12) Sucessive Years, be approved?

| | |
|---|---|
| **YES** | ● |
| **NO** | ○ |

1 of 1

# New York State

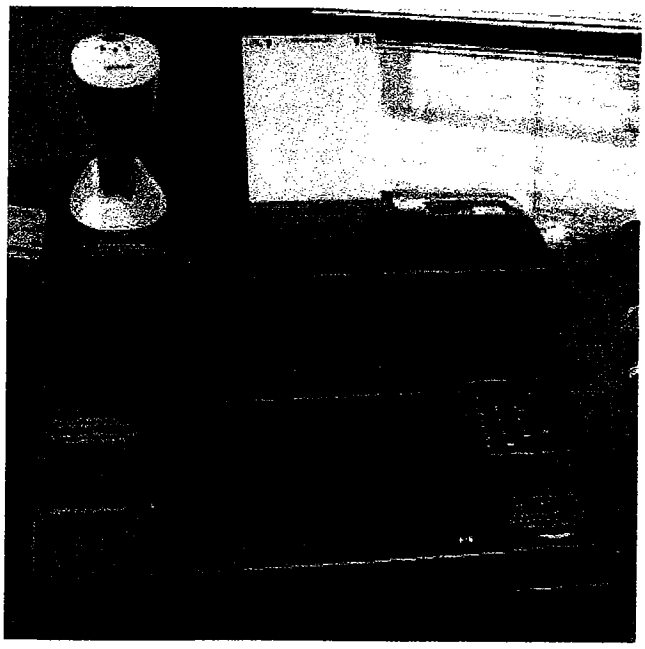
# Board of Elections

## Review of the

## Populex Digital Paper Ballot™

# Table of Contents





# Authorization Test Report
# Populex

## 1 Introduction

This test report presents the results of tests to validate the statutory and regulatory requirements of the New York State Board of Elections (NYSBoE) and provide the features specified by the vendor as outlined in their Technical Data Package(TDP). The test was performed during May 8, 2006 to May 12, 2006 at the "Clubhouse at Western Turnpike" (2350 Western Avenue, Guilderland, NY 12084). The following people were present during the testing:

- New York State Board of Elections (http://www.elections.state.ny.us)
  Anna Svizzero, Allison Carr, John Ferri, Ray Cecot, Phil Jorczak, Amit Shah
- CIBER, Inc. (http://www.ciber.com)
  Shawn Southworth, Jack Cobb
- Populex (http://www.populex.com)
  Sanford Morganstein, Nicole Lohmar

Observations are based upon performance testing during this period and compliance with applicable election law, regulations and technical specifications. The following sections describes the system, system operation, test operations, and system observations.

This report is restricted to the characteristics and performance of the system under test.

## 2 Applicable Documents

The following documents were used in the conduct of this test:

- Test Plan and procedure (Exhibit A)
- Test Ballots: primary/general/english/spanish
- Unmarked special ballot stock
- Operation and Setup manuals

## 3 System Description

The Populex Digital Paper Ballot™ is a standalone device which marks a paper ballot via touch-screen, audio or sip and puff interface. The Populex can be used in a polling place to provide accessible and independent means by which persons with disabilities can mark a ballot. The ballot is accessed via Smart Card coded with a randomly generated unique identifier via smart card reader.

The smart card is disabled as soon as the voter starts voting and the card can no longer be used to cast another ballot - unless it is reset by an voting inspector.

The election database is loaded onto system via external media prior to the election. This database will contain all of the election data, ballot styles, and audio files necessary to voting station operation.

The touch screen operates using a touch pen, which is attached to the system using a steel cable. The screen can not be operated using any other touch device (finger, pen, pencil erasor, etc).

The system can be put in a voice mode by selecting the appropiate option by the voting official. A mini-phone jack is provided to enable the voter to plug in a headphone. The keypad can then be used to navigate through the selection process. The keypad can be used to increase or decrease the rate of speech along with changing the background colors.

The disability functionality are as follows:

| Function | Description |
|---|---|
| **Headphone jack** | Provided to allow users to connect their own headphone |
| **Sip and puff device** | Provided to allow users to use this type of input for the voting selection |
| **Audio speed** | Audio speed can be accelerated/decelerated |
| **Magnify function** | Function on the device which allows portion of the screen to be magnified |
| **Magnifier** | A magnifier sheet is provided |
| **Screen color** | Can be varied to suit the visual needs |

## 3.1 System Software and Control

The Populex system can be utilized in the station types listed below. In order to switch into different type, three levels of passwords and three different smartcards are utilized.

| Station Type | Description |
|---|---|
| **Voting Station** | Normal operation for ballot marking |
| **Judge's Check-in Station** | To enable and assign elections to a smartcard |
| **Ballot Counting Station** | To count the printed ballots using a hand held scanner |

## 3.2 Hardware

The Populex unit uses commercial of the shelf (COTS) components for the internal system

components enclosed in a self-contained box. These internal components are composed of: HP Compaq Tablet PC TC1100, Lexmark Z600 series printer, swifty switch interface, Berklin numeric keypad, and a smart card reader/writer. One external component is the Symbol bar code reader which verifies that the printed ballot is valid.

An Uninterruptible Power Supply (UPS) is required for the unit and will serve two purposes: 1) supply power to the unit in the event of power failure; and 2) protect the unit from power spikes. If there is an power outage, the UPS will start beeping to indicate the power interruption and begin supping power to the unit for approximately two to four hours. Depending on the type of UPS, there may be an indicator on the UPS which will display the approximate remaining battery capacity.

The system requires custom ballot marking paper for marking the ballots once the vote has been cast.

The configuration tested for this unit consists of the following items:

- Populex Digital Paper Ballot™
- Headphone
- Sip and Puff device
- Custom ballot marking paper
- Smart Cards

## 4 Test Scope

The test has three principal objectives:

1) To demonstrate the ability to mark a ballot using the specified interfaces
2) To demonstrate the ability of the device to mark a ballot accurately
3) To demonstrate the ability of the voter to verify their ballot

The test procedures were designed to demonstrate the functionality and to provide for a qualitative assessment of the device. The breadth of testing included the following:

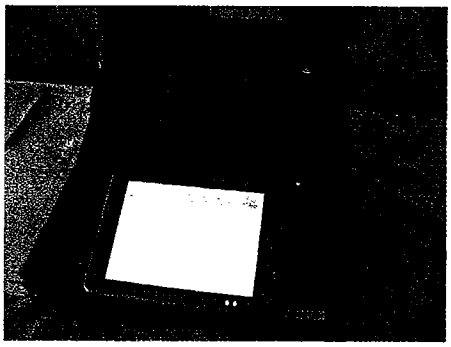
| Test Type | Description |
|---|---|
| **Ballot Volume** | Casting ballots in quantities sufficient to replicate an actual voting day |
| **Accuracy** | Comparing the printed ballots against the predetermined test ballots |
| **Usability** | Ease with which the device provides for the ability to cast votes |
| **Recovery** | Recovery from anomalies introduced by voters |
| **Data Recording** | Data recording, including audit logs/exception reports, printed ballots |

| | |
|---|---|
| **Changeability** | The ability of the voter to change the selection at any time |

## 5 Test Operations

The test cases were developed incorporating two primary elections and a general election with two ballot styles. The vendor prepared the election database and provided loadable media prior to the start of the test. Prior to conducting testing photos were taken of equipment and internals. The test was conducted by a test team consisting of NYSBoE and CIBER personnel.

### 5.1 Picture of internal system



### 5.2 Test Case: Primary

Three systems were set up to conduct the test. Equipment was powered up and self diagnostics performed. Software version and database/open poll report was printed. The device was calibrated and ballot data loaded. Calibration aligns the coordinates reported by the touch screen into a set of coordinates that accurately represent the image on the display behind it. Calibration on the touch screen occurs from a poll worker accessible system menu. The poll worker is prompted to touch the screen in various specific target areas after which the system returns the display to the specified parameters.

The database was verified against the certification ballot. Smart cards were prepared for each primary election.

Several test decks were created for each election which tested for the situations illustrated below.

| Situations |
|---|
| Write in candidates |
| Undervotes |
| Overvotes |
| Spanish language ballots |

| |
|---|
| Changing selections |
| Spoiled ballot and revote |
| Invalid voter actions |
| "Sip and Puff" device |
| Audio Ballot |
| Printer disconnect |

Testing also included using the various interfaces that accompanied the device and incorporated invalid voter selections spoiling ballots and fleeing voter situations.

The fleeing voter is handled by the poll inspector. The poll inspector needs to intervene and select 'Perform Administrative Function' on the Populex unit. Then select 'Close Poll' to eliminate the fleeing voter ballot. This erases the vote and no ballot is printed. Once this is done, 'Start Poll' is selected to return the unit into the 'Polling Station' mode.

Shawn Southworth of CIBER tested the sip and puff device to cast a ballot with several write ins. The device operated as designed.

### 5.3 Test Case: General

Three systems were utilized to conduct the test. The equipment was powered up and self diagnostics performed. Software version and database/ open poll report was printed. The device was calibrated and ballot data loaded. The database was verified against the certification ballot. Smart cards were prepared for each general election.

The first test conducted was a throughput test which included documenting the voters experience via an exit poll interview. The throughput test measured usability and the maximum number of votes the device would likely encounter during a fifteen hour election day. The cross section of voters included NYSBoE personnel, CIBER personnel, volenteers from county Board of Elections, members of the general public and various disability advocates.

The results from the throughput test was used in determining the amount of ballots needed for the volume testing. The NYSBoE staff and CIBER personnel performed the volume testing using several test decks. These test deck incorrporated instances of write-in candidates, undervotes, overvotes, spanish language ballots, and cross-endorsed candidates. Testing included using the various interfaces that accompanied the device and incorporated invalid voter selections spoiling ballots and fleeing voter situations.

Anomalies and system generated errors were recorded and system accuracy was verified as each test deck was processed. A quality assurance person was part of each team whose responsibility was to verify the accuracy of the cast ballots against the test ballots.

## 6 Security

Three levels of passwords and three different smartcards are utilized to enable high security and to isolate the various functions to the passwords and smartcards. Each smart card uses a one time coded signiture which expires after use. The smartcard can only be re-enabled using a custom program by Populex or setting the Populex operational mode into 'inspectors station'.

A locking bolt is provided so that the system can be locked and sealed. This will prevent anyone from tampering with the internal components.

The touch pen which is essential to the operation of the touch screen is attached to the system using a steel cable.

## 7 Observations and Issues

The system functioned as designed. If there is a paper jam or a problem with the print head, the unit needs to be opened up to resolve the issue. If there is a replacement or a backup unit, it can be quickly setup as a voting station.

The system can only be turned on by opening the unit and powering on the tablet. There is no external switch for the tablet. The printer has an external switch.

The touch screen can only be operated using the special touch pen attached to the unit. It does not operate using any other touch device.

Voter verification occurs by reviewing selections on screen or though headphone prior to printing the ballot. After the ballot is printed, the voter may verify the readability of the ballot by passing the ballot under the barcode reader. If the barcode reader 'beeps', this verifies that the ballot can be read by the tabulating station.

The printed ballot contains the selection codes along with the write in selections.

## 8 Conclusion

The audiovisual functions in addition with the sip and puff device allowed people with varying disabilities to independently cast ballots. There were no errors in ballot casting detected in the testing of the device.

The Populex unit was successfully used to cast test ballots by people with various disabilities.

# New York State Board of Elections
# Software Test Report
## for
## Populex Corporation Digital Paper Ballot Voting System

**Vendor: Populex**

**System: Populex Digital Paper Ballot System 9.21**

**Prepared By: CIBER, Inc.**

Change History

| Version | Date | Comment |
|---|---|---|
| 1.0 | 5/17/06 | Initial Release |
| 1.1 | 5/19/06 | NY BOE input added |
| | | |

# 1 Introduction

This document provides a report of software testing performed by Ciber, Inc. on the voting system submitted by Populex to the State of New York State Board of Elections (SBOE). The Populex Digital Paper Voting System (DPVS), Polling Place Functions (Version 9.21) provides assisted voting to impaired voters at the polling place. The objective of this test is to validate that the software meets the requirements of the State of New York and provides the features specified by the Vendor in its technical data package.

## 1.1 Testing Agency Background

CIBER Inc. has been providing IT consulting services for over 20 years. Although the Independent Test Authority (ITA) division name has changed due to an aggressive acquisition and merger market, the ITA division of the company has had the same leadership in place since inception. Founded in 1974, the company's consultants now serve client businesses from 60 CIBER, 10 DigiTerra, 5 Solution Partners and 4 Enspherics offices in the U.S., Canada and Europe. With offices in 10 countries, CIBER's 6,000 IT specialists continuously build, test and upgrade our client's systems to "competitive advantage status." CIBER provides a single source for IT solutions, including:

Full-solution ASP services

- Applications maintenance and support
- Testing and IQA
- Web and database hosting
- Enterprise solutions, including SAP, Oracle and Peoplesoft
- Application outsourcing
- eBusiness, from architecture through execution
- Knowledge management and training

The company has been involved in numerous QA and IQA testing projects for commercial, state, and federal government customers.

## 1.2 Terms and Abbreviations

1. DPVS - Digital Paper Ballot Voting System (Polling Place Functions Only) Version 9.21
2. Populex Slate – the multipurpose component used for one or more of the following functions: voting, creating magnetic voting cards, verifying a ballot and tabulating precinct votes.
3. Judges Check-in Station – the polling place component used to enable voting by issuing a smart card for each voter.
4. Voting Station – The voter views the ballot and marks a paper ballot by selecting his choices on a touch screen and then printing the marked ballot.
5. Personal Verification Station – the station provides the ability to scan a marked ballot and display the voter's choices as they appear on the ballot. (The voter verification station can physically be the same device as the Voting machine or may be a separate device.)

# 2 System Identification

Populex Digital Paper Ballot Voting System (Polling Place Functions Only) Version 9.21 consists of a single Populex Slate and a Personal Verification Station per polling place.

# 3 Test Environment

All testing on these systems was performed at Western Turnpike Golf Course on Monday, May 11 2006 and Tuesday May 12, 2006.

The DVPS consisted of three touch screen voting units. All operated in a stand alone environment. The vendor supplied all smart cards. The programming of the smart cards was performed by the vendor using a vendor supplied laptop running Judge Check-in Station.

## 4 Test Case Description

The following sections summarize three test cases using two elections to test the Populex DVPS system.

| **Test Case:** Primary_01 | **Configuration** |
|---|---|
| Closed Primary Election<br>Purpose: Test to see that the system can handle multiple ballots styles with multiple contest types in a single election. The system has to switch ballot styles depending on the voter's registration. An actual past New York State Election scenario was used as the input data. | 1. 2 Ballot Styles, Democratic and Conservative<br>2. 11 Democratic Contests<br>3. 4 Conservative Contests<br>4. 2 N of M Democratic Contests<br>5. 2 N of M Conservative Contests<br>6. Regular ballots<br>7. Write-ins<br>8. English<br>9. Spanish |

**Procedures:**

1. Load database for this election and generated election report
2. Open machine for voting
3. Voted and verified at least one ballot of each ballot style for each party
4. The voting included instances of:
    a. Candidate write-in
    b. Under-votes
    c. Spanish Language
    d. "Fleeing Voter"
    e. Change voting selection before casting
    f. Spoil ballot and revote
    g. Invalid voter actions
    h. "Sip and Puff" device
    i. Audio ballot
    j. Disable the host printer and attempt to vote
    k. Print ballot at fax
    l. Unexpected disconnect of phone line

| **Test Case:** General_01 | **Configuration** |
|---|---|
| General Election<br>Purpose: Test to see that the system can handle multiple ballots styles with multiple contest types in a single election. The system has to switch ballot styles depending on the voter's registration. An actual past New York State Election scenario was used as the input data. | 1. 2 Ballot styles, Cicero West (1) and Cicero East (2)<br>2. 13 Contests (Cicero West)<br>3. 14 Contests (Cicero East)<br>4. 6 Proposal Contests (Cicero West)<br>5. 6 Proposal Contests (Cicero East)<br>6. 2 N of M Contests (Cicero West)<br>7. 3 N of M Contests (Cicero East)<br>8. Regular ballots<br>9. Write-in<br>10. English<br>11. Spanish |

**Procedures:**

1. Load database for this election and generated election report
2. Open machine for voting
3. Voted and verified at least one ballot of each ballot style for each party
4. The voting included instances of:
    m. Candidate write-in
    n. Cross endorsed candidates (cross filing)
    o. Under-votes
    p. Spanish Language
    q. "Fleeing Voter"
    r. Change voting selection before casting
    s. Spoil ballot and revote
    t. Invalid voter actions
    u. "Sip and Puff" device
    v. Audio ballot
    w. Disable the host printer and attempt to vote
    x. Print ballot at fax
    y. Unexpected disconnect of phone line

| **Test Case:** Throughput Test | **Configuration** |
|---|---|
| Timed Voting Sample<br>Purpose: This test was used to determine the average amount of time it takes to cast a ballot on each system. A sample of 12 average voters with no prior experience with the system were timed voting the General Election Ballot used in Test Case General_01. The lowest and highest times were excluded and the rest of the sample times were averaged. | General Election Ballot from Test Case General_01 Cicero West Ballot Style 1 was used. |

**Procedures:**

1. Load database for this election
2. 12 smart cards were created and given to the "Voters"
3. Open machine for voting
4. "Voters" were asked to vote as though it were a real election
5. Time was started when the smart card was inserted and stopped after the ballot was reviewed
6. The times were averaged

## 5 Ballot Results and Statistics

Below is a table that contains the results of ballots cast for Populex DVPS system.

| **System**: Populex Digital Paper Ballot Voting System (Polling Place Functions Only) Version 9.21 | |
|---|---|
| **Ballot Statistics:** | |
| ➢ Total Number of Ballot Positions: | 43,646 |
| ➢ Total Number of Ballots Cast: | 314 |
| ➢ Ballots Cast in General Election: | 150 |
| ➢ Ballots Cast in Primary Election: | 152 |
| **Time Statistics:** | |
| ➢ Average Time to Cast Ballot: | ~ 6 minutes |
| ➢ Number of Ballots in New York Election Day: | 150 |
| ➢ Time to Cast Ballot using Physical Disability Device (Sip and Puff): | ~45 minutes |
| ➢ Time to Cast Ballot using Physical Disability Device (Audio Ballot): | ~30 minutes |
| **Results:** All voted ballots were verified that the marked ballot was what the voter input into the system. The system recorded 100% accuracy rate. | |

## 6 Observation

This section describes the observations made by Ciber, Inc during the course of testing. Items listed limitations of the facilities, non-testable items, or errors that occurred during testing.

**Populex Digital Paper Ballot Voting System (Polling Place Functions Only) Version 9.21**
The General_01 test case from above was setup to accept cross endorsed candidates as cumulative voting thus allowing the same candidate to be selected in an N of M race. This is a configurable option in the ballot setup.

When reviewing a ballot, if a contest with a write-in candidate selected is then selected for change, the write-in option is deselected completely thus causing the voter to re enter their write-in. The system stores the name, but it does not appear on the race screen, just in the write-in screen. This only happens in large N of M contests. In a vote for one contest this issue does not exist.

# EXHIBIT A

# New York State Board of Elections
# Software Test Plan
## for
## Populex Corporation Digital Paper Ballot Voting System

**Vendor: Populex**

**Software: Populex Digital Paper Ballot System 9.21**

**Prepared By: CIBER, Inc.**

Change History

| Version | Date | Comment |
|---|---|---|
| 1.0 | 4/20/06 | Initial Release |
| 1.1 | 4/24/06 | Incorporated changes requested by SBOE |
| 1.2 | 5/02/06 | Incorporated changes requested by SBOE, changed 8 political parties to Multiple political parties. |
| 1.3 | 5/04/06 | Incorporated changes requested by SBOE to remove items for test cases |
| | | |

# Functional Test Plan

## 1 Introduction

This document provides a plan for testing the voting system submitted by Populex to the State of New York State Board of Elections (SBOE). The objective of this test is to validate that the software meets the requirements of the State of New York and provides the features specified by the Vendor in its technical data package.

### 1.1 References

The following documents were provided by the vendor as a Technical Data Package for evaluation and provide the specifications for the system as built by the vendor.

| Document Title | Ref. Num. | Version |
|---|---|---|
| Populex Digital Paper Ballot™ ***System Overview*** | 2* | 1.10 |
| Populex GUI | 4 | 1.2 |
| Populex Digital Paper Ballot System. ***Detailed Description*** | 3* | 1.8 |
| Populex Digital Paper Ballot System. ***System Performance*** | 8 | 1.6 |
| Populex Digital Paper Ballot System. ***Hardware requirements and Specification*** | 18* | 1.12 |
| Populex Digital Paper Ballot System. ***Ballot Counting Reports*** | 5 | 1.7 |
| Populex Digital Paper Ballot System. ***Software Specification*** | 14 | 1.9 |
| ***Populex EMS Verification Test*** | 23A | 1.5 |
| ***Populex PPF Verification Test*** | 23B | 1.5 |
| ***Populex System-Level Verification Test*** | 23C | 1.1 |
| ***Voter's Guide (Voters Guide - English)*** | 6E | 2.8 |
| ***Voter's Guide (Voter's Guide – Spanish)*** | 6S | 2.8 |
| ***Precinct Setup, Operation and Training*** | 7 | 2.04 |
| ***In-Precinct Set-Up Checklist*** | 19 | 1.4 |
| ***Centralized Counting Training and Operations Manual*** | 20 | 1.4 |
| ***Ballot Preparation Manual*** | 9 | 1.9 |
| ***Lexmark Printer Manufacturer's Manual*** | 21L | |
| ***Maintenance Procedures*** | 21 | 1.6 |
| ***Precinct Setup Manual*** | 7 | 2.04 |
| ***Centralized Counting Training and Operations Manu*** | 20 | 1.12 |
| Populex Corporation ***QAP Manual*** | 16 | 1.2 |
| ***Populex Corporation Digital Paper Ballot System: Relational Database*** | 13 | 1.6 |
| ***Training Modules*** | 24 | 1.1 |

### 1.2 Terms and Abbreviations

1. DPVS - Digital Paper Ballot Voting System (Polling Place Functions Only) Version 9.21
2. Populex Slate – the multipurpose component used for one or more of the following functions: voting, creating magnetic voting cards, verifying a ballot and tabulating precinct votes.
3. Judges Check-in Station – the polling place component used to enable voting by issuing a smart card for each voter.
4. Voting Station – The voter views the ballot and marks a paper ballot by selecting his choices on a touch screen and then printing the marked ballot.
5. Personal Verification Station – the station provides the ability to scan a marked ballot and display the voter's choices as they appear on the ballot. (The voter verification station can physically be the same device as the Voting machine or may be a separate device.)

## 2. PreQualification Test

PreQualification testing is not applicable to this test.

## 3 Materials Required for Testing

### 3.1 Software

The software to be tested includes:

- Populex Digital Paper Voting System (DPVS), Polling Place Functions (Version 9.21):

### 3.2 Hardware

The configuration to be tested consists of the following equipment to be provided by the vendor:

- Judges' Check-In Station
- Voting Machine
- Voter's Verification Station
- Smart Card Reader/Writer (ACS Model ACR30U-PNC)

The SBOE reserves the option to demonstrate the capability to utilize a standard PC for the Judges Check-in station. To exercise this option, the SBOE will provide the following equipment:

- Laptop or Desktop PC containing at least the following:
  - 128 megabytes RAM memory
  - 2 Gigabytes Hard Drive
  - 2 USB ports (1.1 or 2.0)
  - 2 hour battery backup
  - 10 inch screen
  - One PCMCIA expansion slot
  - Windows XP Operating System (Pro)

### 3.3 Other Materials

The vendor will provide the following for this test.

- Blank paper ballots to be marked
- Storage Media as necessary to backup/transfer database and voting information
- Magnetic cards necessary to conduct the voting
- A CD with all software (firmware) to be installed on the Judges Voting Station, Voting Machine and the Voter Verification Station.

### 3.4 Deliverable Materials

The vendor will deliver the following items prior to the start of the test:

1. A complete TDP that provides a description of the system and its operational functionality.
2. A CD with the Election Databases that are used in this test. The databases will be provided in both the loadable form and in the "source" form that is modifiable using the vendors Ballot Preparation Software.

### 3.5 Proprietary Data

All materials and deliverables provided by the vendor are considered company proprietary and the SBOE will protect against unauthorized distribution of those materials.

## 4 Test Specification

### 4.1 Requirements

The vendor will demonstrate the ability to conduct the elections specified by the New York State Board of Elections (SBOE). The elections will include a variety of contest types, political parties and options that

will demonstrate the functional capabilities presented in the Vendor's TDP. The primary documents used to define test cases for this test are:

1. System Overview (TDP Document #2)
2. Hardware Requirements and Specification (TDP Document #18)
3. Detailed Description (TDP Document #3)

The test may include any capabilities specified in the TDP and will include at least the following.

1. One General Election and two Closed Primary Elections
2. The following types of Contests in a General and a Primary Election
    a. Vote for n of m
    b. Vote for one
    c. Propositions with yes/no or alternative text for voter selection
    d. Judicial Contest
3. Multiple political parties
4. N of M contest and cumulative contest shall include:
    a. Multiple parties, each with n candidates
    b. Multiple parties, some with less than n candidates
    c. Multiple parties, some with more than n candidates
    d. Some parties with no candidates

The following are NOT included in this test:

- Candidate rotation is not supported by the system.
- Ranked Contests are not supported by the system.

## 4.2 Hardware Configuration and Design

Hardware will be configured by the vendor as necessary to support the elections specified by SBOE. The vendor will provide the hardware and software components necessary to simulate the voting of ballots at a single polling place that includes multiple precincts and ballot types.

## 4.3 Software System Functions

The test will include functions of most concern to the SBOE. However, the failure to include a function in this test does not imply that SBOE releases the vendor from providing that function. All functions described in the vendor's TDP are to function correctly.

## 4.4 Test Case Design

Test cases are created to demonstrate those capabilities determined to be of most concern to the SBOE but may be expanded to demonstrate any of the functionality claimed by the vendor in the TDP. The pass/fail criteria for each test is (1) that the test results are consistent with the expected result as specified in the TDP and (2) the test result conforms to the standards and procedures applicable to the State of New York and any subsidiary jurisdictions.

The following tables summarize the test cases that are to be executed in this test. Each table indicates the minimum election parameters to be provided, the equipment to be included and a summary of the test procedure to be executed.

| Test Case: Open Polling Place | Configuration |
|---|---|
| Load election and verify security mechanisms and self-test capability. (See TDP Doc. # 3, Section 5.1 for expected results of each step.) | 1. Single Voting Place with voting station, voting verification station and Judges Check-in Station.<br>2. Election Judge and Administrator Passwords<br>3. Administrator Code<br>4. Judges Key Smart Card |
| **Voting Devices Utilized:** Judges Check-in Station, Voting Station, Voter Verification Station | |
| **Procedures:** | |
| 1. Install firmware from installation CD<br>2. Sign into the Judges Station (attempt to sign in without card then insert and sign in)<br>3. Load election database into Judges Station<br>4. Set Station type to "Judges Check-in Station"<br>5. Test smart card reader with no card, invalid card and valid card.<br>6. Enter precinct number in Judges Check-in Station<br>7. Activate station and confirm "main menu" appears for Judges Check-in Station<br>8. Repeat steps 1-5 for the voting station, selecting "Voting Station" in step 4.<br>9. Respond to equipment test prompts, force failure when practical<br>10. Activate Voting Station and verify Voting Station Main Menu appears<br>11. Repeat steps 1-5, but select Station type as "Personal Verification Station" in step 4<br>12. Respond to equipment test prompts, force failure when practical<br>13. Activate Voter Verification station and verify main menu appears for Voter Verification Station<br>14. Inspect audit logs on all devices. | |

| Test Case: Primary_01 | Configuration |
|---|---|
| Closed Primary Election<br>(For expected results, see TDP #2, TDP #3, TDP #6E, TDP #6F) | 1. Five precincts (multiple ballot styles)<br>2. Multiple political parties<br>3. Partisan Contest types: vote for one, N of M, cumulative<br>4. Regular ballots<br>5. English and Spanish text and voice recording<br>6. Audio Assisted voting<br>7. Write-in |
| **Voting Devices Utilized:** Judges Check-in Station, Combined Voting Machine and Voter Verification Station) | |
| **Procedures:** | |
| 1. Load Judges Check-in Station, Combined Voter Machine and Verification Station with Primary election database specified by SBOE<br>2. Open Judges Check-in Station<br>3. View each ballot style.<br>4. Open combined voter station/voter verification station<br>5. Vote at voting station and view at verification station at least one ballot of each ballot style for each party. The voting must include instances of:<br>a. Candidate write-in<br>b. Audio Assisted voting (English and Spanish)<br>c. Under-votes<br>d. Spanish text<br>e. "Fleeing Voter"<br>f. Change voting selection before casting<br>g. Invalid voter key card<br>h. Simulate invalid voter actions<br>6. Close voting stations<br>7. Print all reports available<br>8. Inspect (print) audit logs | |

| Test Case: General_01 | Configuration |
|---|---|
| General Election | 1. Multiple precincts<br>2. Multiple political parties<br>3. Multiple ballot styles<br>4. Contest types: Partisan and Non-Partisan, Judicial, N of M, Cumulative<br>5. Regular ballots<br>6. English and Spanish text and voice recording<br>7. Audio Assisted Voting<br>8. Write-in |
| **Voting Devices Utilized:** Judges Check-in Station, Voting Machine, Voter Verification Station (Optionally utilize SBOE provided PC for Judges Check-in Station) | |
| **Procedures:** | |

1. Load Judges Check-in Station, Combined Voter Machine and Verification Station with Primary election database specified by SBOE
2. Open Judges Check-in Station
3. View each ballot style.
4. Open combined voter station/voter verification station
5. Vote at voting station and view at verification station at least one ballot of each ballot style. The voting must include instances of:
    a. Candidate write-in
    b. Audio Assisted voting (English and Spanish)
    c. Under-votes
    d. Spanish text
    e. "Fleeing Voter"
    f. Change voting selection before casting
    g. Invalid voter key card
    h. Simulate invalid voter actions
6. Close voting stations
7. Print all reports available
8. Inspect (print) audit logs

# 5 Test Data

## 5.1 Data Recording

The data to be recorded for each test will include:

- Audit log for each device
- Exceptions observed
- Observations for each step of the test script
- Selected reports available from each application (in .pdf format)
- All Ballots that were used (marked) for each test

## 5.2 Test Data Criteria

Test data will be evaluated against the specifications as stated in the vendor's TDP. Each ballot will be viewed at the Voter Verification Station and accepted or rejected by an SBOE representative. Audit logs will be validated by identifying startup and voting events in the audit log.

## 5.3 Test Data Reduction

All analysis to test data is by manual inspection of the reports and observation of events during the tests.

# 6 Test Procedure and Conditions

The test will be conducted by a test team consisting of Populex, SBOE and CIBER personnel. The test team may specify alternate actions that are not defined in the test cases in this test plan. Invalid user (voter and poll worker) actions must be detected by the voting system and a notification given to the user and/or an effective recovery performed.

SBOE may direct additional test cases or steps to be executed that are not documented in this plan. The additional test cases may require that the election database be modified and reloaded.

## 6.1 Facility Requirements

The test configuration consists of the equipment described in Section 3.2. The vendor will provide the equipment at the facility specified by SBOE.

## 6.2 Test Set-up

The Vendor shall configure the hardware to simulate a polling place capable of supporting the elections defined by the SBOE. The vendor may pre-install the firmware, but must provide the installable firmware on CD to allow SBOE the option of providing a host PC or laptop for the Judges Check-in Station. The vendor must prepare the database specified by the SBOE prior to this test. The "source" database must be provided to SBOE in a form that allows the vendor to apply changes during the testing if so directed by SBOE.

## 6.3 Test Sequence

The "Poll Open" test is to be executed first. Other tests can be executed in any order as specified by SBOE at the time of testing.

# EXHIBIT B

:IAL BALLOT

Either End Up

ARY ELECTION
OARD OF ELECTIONS
ep 09, 1997
Precinct WARD 5

ctions to Voters

ntil this card is placed in the ballot box. If you tear, soil,
election judge for the procedure to prepare a new ballot.

7,278,237

Either End Up

Judge

OFFICIAL BALLOT

Either End Up

PRIMARY ELECTION
NEW YORK BOARD OF ELECTIONS
Sep 09, 1997
Ballot Style 1 Precinct WARD 1

**Instructions to Voters**

This is your ballot. You have not cast your ballot until this card is placed in the ballot box. If you tear, soil, deface or otherwise spoil this ballot, please see an election judge for the procedure to prepare a new ballot.

**Here are the choices you made:**
131,141,162,171,173,176,179,222,211,232,235,153

> COUNTY JUDGE
[x] 179: SAM SPADE

Populex

Judge

OFFICIAL BA

Either End Up

Either End Up

OFFICIAL BALLOT

Either End Up

:FICIAL BALLOT

Either End Up

Either End Up

OFFICIAL BALLOT

Either End Up

NERAL ELECTION
(BOARD OF ELECTIONS
Nov 04, 1997
WARD Ward 1

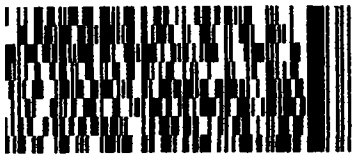
Judge

_____

:tructions to Voters

llot until this card is placed in the ballot box. If you tear, soil,
e an election official for the procedure to prepare a new ballot.

,524,532,542,552,561,571,591,581,1000



OFFICIAL BALLOT

Either End Up

Either End Up

OFFICIAL BALLOT

Either End Up