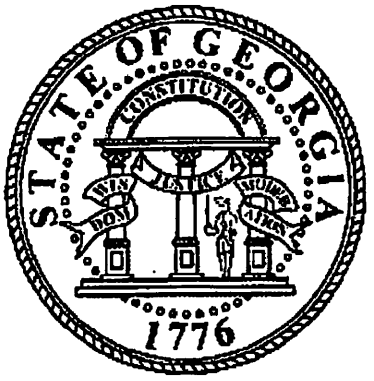


Certification Test of the

TSx Direct Record Electronic Voting System, Ballot Station 4.5.2! and WinCE 410.3.5

Prepared for:

Elections Division
Office of the Secretary of State
State of Georgia

Prepared by:

Center for Election Systems
Kennesaw State University
Kennesaw, Georgia 30144

April 1, 2015

GEMS 1.18.22G

Revision: 1.0

Election Systems & Software, LLC

Department Author: Quality Assurance
Released by: Director, Quality Assurance
Document ID: ESSSYS_GEMS_1'18'22G_REGRESSION

Disclaimer

Election Systems & Software does not extend any warranties by this document. All product information and material disclosure contained in this document is furnished subject to the terms and conditions of a purchase or lease agreement. The only warranties made by Election Systems & Software are contained in such agreements. Users should ensure that the use of this equipment complies with all legal or other obligations of their governmental jurisdictions.

All ES&S products and services described in this document are registered trademarks of Election Systems & Software. All other products mentioned are the sole property of their respective manufacturers.

Proprietary Information

ES&S has identified and appropriately marked relevant portions of this document, which it considers confidential and proprietary. We request confidential treatment by the EAC of such information and would expect that such information is exempt from required disclosure. In the event that a third party requests disclosure of information which ES&S considers confidential and proprietary, we would ask that the EAC notify ES&S of such requested disclosure in order to provide us with an opportunity to seek exemption from disclosure.

The document sections referenced below contain Election Systems and Software, LLC. (ES&S) confidential information, which is provided for the sole purpose of permitting the recipient, to evaluate the ES&S Voting System submitted herewith. The following sections are designated as "Proprietary and Confidential" by Election Systems & Software.

Document Security Level	Proprietary Commercial Information – Contains trade secret information, including, but not limited to, drawings, processes, methods or procedures developed by ES&S. Approved for internal and ES&S authorized VSTL use only.

Table of Contents

1. **Test Case Summary** 1

2. **Test Case Detail** 3

This page intentionally left blank.

Table of Changes

Version	Date	Notes
0.1	*02.05.2015*	*Initial draft. – CC*
1.0	*02.05.2015*	*Updated test case content. – TO*

This page intentionally left blank.

1. REGRESSION TEST CASE SUMMARY

R238: BallotStation Regression 4.5

Georgia - Ballot Station and WinCE

Created On	1/27/2015
Completed	No

Passed	Blocked	Untested	Retest	Failed
89% (16/18)	0% (0/18)	0% (0/18)	0% (0/18)	11% (2/18)

1. All Test Cases

ID	Title	Status
T9945	Pre-Election Mode - Download/Upload Elections	Passed
T9946	Pre-Election Mode - Create Voter Cards	Passed
T9947	Pre-Election Mode - Logic & Accuracy	Passed
T9948	Pre-Election Mode - View Ballot Results	Passed
T9949	Pre-Election Mode - Reporting	Passed
T9950	Pre-Election Mode - Accumulator	Passed
T9951	Pre-Election Mode - Challenged Voters	Passed
T9952	Pre-Election Mode - Clear Totals	Passed
T9953	Pre-Election Mode - Audit Log	Passed
T9954	Pre-Election Mode - Check Calibration	Passed
T9955	Election Mode	Passed
T9962	Voting using Security Keys	Failed
T9956	Post-Election Mode - Upload Results	Failed
T9957	Post-Election Mode - View Ballot Results	Passed
T9958	Post-Election Mode - Reporting	Passed
T9959	Post-Election Mode - Challenged Voters	Passed
T9960	Post-Election Mode - Accumulator	Passed
T9961	Post-Election Mode - Audit Log	Passed

2. REGRESSION TEST CASE DETAIL

R238: BallotStation Regression 4.5

Georgia - Ballot Station and WinCE

Created On	1/27/2015
Completed	No

Passed	Blocked	Untested	Retest	Failed
89% (16/18)	0% (0/18)	0% (0/18)	0% (0/18)	11% (2/18)

1. All Test Cases

T9945: Pre-Election Mode - Download/Upload Elections

Status	Type	Priority	Estimate
Passed	Functional	2 - Normal	None

Milestone	Automated
None	No

Description

This test case is to verify that the Download/Upload functionality behaves as expected in pre-election mode

Data Prep

1. Need to have the following elections set-up in GEMS to download to BS - General Election - Straight Party Election - Open Primary Election (Preference) - Closed Primary Election (Separate Ballots)

Assumptions

None.

Steps

	Step	Expected Result
1	Verify that you are able to Download/Upload successfully all 4 election types (LAN as connection type): - General Election - Straight Party Election - Open Primary (Preference) - Closed Primary (Separate Ballots) Note: cast at least one ballot per election; make sure the copy of print report reflects your vote selection and tallies are correct.	All Election types will be Downloaded/Uploaded successfully; you will be able to cast a ballot; the copy of print report will reflect your vote selection, and tallies will be correct.
2	In GEMS under GEMS tab open the following reports: 1) Election Summary Report 2) Statement of Votes Cast 3) Cards Cast Report. Verify the results and tallies are correct, and reflects voter selection made in the test case 2.1. Note: verify the results for one of the four election types.	All reports will contain correct results and tallies, and reflect voter selection made in the test case 2.1.

3	In GEMS under GEMS tab open "View Ballots". Verify ballot images are correct and reflect voter selection made in step 1 Note: verify ballots image for one of the four election types.	Ballot images will reflect voter selection made in step 1.
4	Verify that you are able to Download/Upload an election using multiple cards.	Download/Upload with multiple cards will be successful.
5	Verify that the paper label is printed after each successful download of election, contains the correct information on it.	The label will contain the following fields, which should match the GEMS Election Options screen: - Name of the election - Date of the Election - Name of the Vote Center - Vote Center ID - Machine id - Ballots station version being used - Download version # - Download copy #
6	Attempt to download/upload an election using LAN connection with the following scenarios: - no IP address - no network card - single number IP address - incorrect range 10.175.2.299 Verify the correct error is displayed on BS and system remains stable after error recovery.	The following msg will be displayed: 'The following error has been detected: GEMS server is unavailable' System will be functioning in a normal manner after error recovery.
7	Aborting download/upload and then re-download/upload. Attempt aborting at varies stages of downloading/uploading: 1) Unplug network card 2) Disconnect network cable 3) Press 'Abort' button Verify the correct errors are displayed on BS, and system remains stable after error recovery.	The following msg's will be displayed: 1) 'The following error has been detected: Timeout'. 2) 'The following error has been detected: Timeout' 3) 'The following has been detected: The connection was aborted.' System will be functioning in a normal manner after error recovery.
8	Remove the PCMCIA card while downloading. Verify the correct error message is displayed on BS, and system remains stable after error recovery.	Depends on what level of downloading an election you remove a PCMCIA card, one of the following error msg's will be displayed: 1) 'An unknown error occurred while accessing \Storage Card\Election Data\election.xtr' 2) 'To continue downloading please insert a new memory card. Press Done to return to the main menu'. 3) 'An unknown error occurred while accessing an unknown unnamed file.
9	Verify that you are able to Download/Upload a large db (realistic size db) successfully while performing the following steps: during Downloading/Uploading 1) Unplug power cable 2) Remove tablet from base NOTE: Use large db (realistic size db) for this test.	Ballot Station will be continuing operate on the battery power and DB will be successfully downloaded/uploaded.
10	Attempt to download an election without starting Port in	The following msg will be displayed 'The following

	AVServer dialog. Verify the correct error message is displayed on BS, and system remains stable after error recovery.	error has been detected: Connection refused' System will be functioning in a normal manner after error recovery.
11	Close the AVServer dialog during downloading an election. Verify the correct error message is displayed on BS, and system remains stable after error recovery	Election download will stop and the following message will be presented: "The following error has been detected: SSL read error:" System will be functioning in a normal manner after error recovery. **NOTE** This test relies on the timing because if you close the AVServer dialog, after all the information has been sent to the buffer, the election will continue to download.
12	Attempt to download an election when there is no VCenter queued or when ALL the VCenters are downloaded. AVServer Port should be started. Verify the correct error message is displayed on BS, and system remains stable after error recovery.	The following msg will be displayed: 'The following error has been detected: GEMS notification: Memory Card Not Queued' System will be functioning in a normal manner after error recovery.
13	Attempt to download an election onto a card that already has an election on it. Verify the correct message is displayed.	The following msg will be displayed 'All election data will be lost on \StorageCard\CurrentElection. Continue?'

Results

Passed

By **R. Dhami**
1/27/2015 7:52 PM

Assigned To
R. Dhami

Version
4.5.2!

Elapsed
1h

This test has been marked as 'Passed'.

Step Results

1 Verify that you are able to Download/Upload successfully all 4 election types (LAN as connection type):
- General Election
- Straight Party Election
- Open Primary (Preference)
- Closed Primary (Separate Ballots)

Note: cast at least one ballot per election; make sure the copy of print report reflects your vote selection and tallies are correct.

Expected Result

All Election types will be Downloaded/Uploaded successfully; you will be able to cast a ballot; the copy of print report will reflect your vote selection, and tallies will be correct.

2 In GEMS under GEMS tab open the following reports:
1) Election Summary Report
2) Statement of Votes Cast
3) Cards Cast Report.

Verify the results and tallies are correct, and reflects voter selection made in the test case 2.1.

Note: verify the results for one of the four election types.

Expected Result

All reports will contain correct results and tallies, and reflect voter selection made in the test case 2.1.

3 In GEMS under GEMS tab open "View Ballots".

Verify ballot images are correct and reflect voter selection made in step 1

Note: verify ballots image for one of the four election types.

Expected Result

Ballot images will reflect voter selection made in step 1.

4 Verify that you are able to Download/Upload an election using multiple cards.

Expected Result

Download/Upload with multiple cards will be successful.

5 Verify that the paper label is printed after each successful download of election, contains the correct information on it.

Expected Result

The label will contain the following fields, which should match the GEMS Election Options screen:
- Name of the election
- Date of the Election
- Name of the Vote Center
- Vote Center ID
- Machine id
- Ballots station version being used
- Download version #
- Download copy #

6 Attempt to download/upload an election using LAN connection with the following scenarios:
- no IP address
- no network card
- single number IP address
- incorrect range 10.175.2.299

Verify the correct error is displayed on BS and system remains stable after error recovery.

Expected Result

The following msg will be displayed:
'The following error has been detected: GEMS server is unavailable'

System will be functioning in a normal manner after error recovery.

7 Aborting download/upload and then re-download/upload.

Attempt aborting at varies stages of downloading/uploading:
1) Unplug network card
2) Disconnect network cable
3) Press 'Abort' button

Verify the correct errors are displayed on BS, and system remains stable after error recovery.

Expected Result

The following msg's will be displayed:
1) 'The following error has been detected: Timeout'.
2) 'The following error has been detected: Timeout'
3) 'The following has been detected: The connection was aborted.'

System will be functioning in a normal manner after error recovery.

8 Remove the PCMCIA card while downloading.

Verify the correct error message is displayed on BS, and system remains stable after error recovery.

Expected Result

Depends on what level of downloading an election you remove a PCMCIA card, one of the following error msg's will be displayed:

1) 'An unknown error occurred while accessing \Storage Card\Election Data\election.xtr'
2) 'To continue downloading please insert a new memory card. Press Done to return to the main menu'.
3) 'An unknown error occurred while accessing an unknown unnamed file.

9 Verify that you are able to Download/Upload a large db (realistic size db) successfully while performing the following steps: during Downloading/Uploading
1) Unplug power cable
2) Remove tablet from base

NOTE: Use large db (realistic size db) for this test.

Expected Result

Ballot Station will be continuing operate on the battery power and DB will be successfully downloaded/uploaded.

10 Attempt to download an election without starting Port in AVServer dialog.

Verify the correct error message is displayed on BS, and system remains stable after error recovery.

Expected Result

The following msg will be displayed 'The following error has been detected: Connection refused'

System will be functioning in a normal manner after error recovery.

11 Close the AVServer dialog during downloading an election.

Verify the correct error message is displayed on BS, and system remains stable after error recovery

Expected Result

Election download will stop and the following message will be presented: "The following error has been detected: SSL read error:"

System will be functioning in a normal manner after error recovery.

NOTE This test relies on the timing because if you close the AVServer dialog, after all the information has been sent to the buffer, the election will continue to download.

12 Attempt to download an election when there is no VCenter queued or when ALL the VCenters are downloaded. AVServer Port should be started.

Verify the correct error message is displayed on BS, and system remains stable after error recovery.

Expected Result

The following msg will be displayed:
'The following error has been detected: GEMS notification: Memory Card Not Queued'

System will be functioning in a normal manner after error recovery.

13 Attempt to download an election onto a card that already has an election on it.

Verify the correct message is displayed.

Expected Result

The following msg will be displayed
'All election data will be lost on \StorageCard\CurrentElection. Continue?'

T9946: Pre-Election Mode - Create Voter Cards

Status	Type	Priority	Estimate
Passed	Functional	2 - Normal	None

Milestone	Automated
None	No

Description

This test case is to verify that voter cards can be successfully created and voted on in Pre-Election Mode.

Assumptions

None.

Steps

	Step	Expected Result
1	Using Realistic size db Verify that you are able to create a Voter Cards. When creating the cards use different Voter Card Options: 1) All options unselected 2) Audio/Hide Ballot 3) Audio Ballot 4) Magnify Display 5) Provisional	All Voter Cards will be successfully created.
2	Verify that you are able to cast ballots using a voter cards created from the previous step.	The voter cards will be accepted in BS, and you will be able to cast them.

Results

Passed

By **R. Dhami**
1/27/2015 8:10 PM

Assigned To
R. Dhami

Version
4.5.2!

Elapsed
30m

This test has been marked as 'Passed'.

Step Results

1 Using Realistic size db
Verify that you are able to create a Voter Cards.
When creating the cards use different Voter Card Options:
1) All options unselected
2) Audio/Hide Ballot
3) Audio Ballot
4) Magnify Display
5) Provisional

Expected Result

All Voter Cards will be successfully created.

2 Verify that you are able to cast ballots using a voter cards created from the previous step.

Expected Result

The voter cards will be accepted in BS, and you will be able to cast them.

T9947: Pre-Election Mode - Logic & Accuracy

Status	Type	Priority	Estimate
Passed	Functional	2 - Normal	None

Milestone	Automated
None	No

Description

This test case is to verify that the Logic and Accuracy options in the Test Count screen, behave as expected.

Assumptions

None.

Steps

	Step	Expected Result
1	Perform a Logic & Accuracy Test with the following "Automated Test Settings": 1) Full L&A By Ballot 2) Full L&A By Precinct 3) Single Vote per Precinct 4) Using Rotation Verify that ballots will be voted at the correct order.	The following results per each option is expected: 1) A full set of ballots will be voted for every ballot on the memory card. 2) A full set of ballots will be voted for every precinct on the memory card. 3) A single ballot will be voted for every base precinct on the memory card. 4) The first candidate in the rotation is taken as the initial candidate in the marking sequence instead of the base rotation.
2	Perform a Logic & Accuracy Test with the "Manual" option selected. Verify correct passes are created.	The voter records are accurate. Manual L&A casts ballots in successively increasing amounts for each iteration, up to and including the number of candidates in the largest race on the ballot. The voter must manually vote the ballot for very iteration of the test.
3	Canceling midway of L&A run.	The current pass will be aborted and all previous passes created prior to canceling will be cast.
4	Run L&A with voter cards.	Manual L&A casts ballots in successively increasing amounts for each iteration, up to and including the number of candidates in the largest race on the ballot. The voter must manually vote the ballot for very iteration of the test.
5	Open Audit Log. Verify appropriate log entries were created for: - Beginning LA Test - Ending LA Test - Cancelling	In the Audit Log, there will be entries like - 'Start Automatic test' - 'End Automatic test' - 'Start Test Count' - 'Ballot cast' - 'End Test Count' - 'Ballot cancelled'

Results

Passed

By **R. Dhami**
1/27/2015 8:11 PM

Assigned To
R. Dhami

Version
4.5.21

Elapsed
30m

This test has been marked as 'Passed'.

Step Results

1 Perform a Logic & Accuracy Test with the following "Automated Test Settings":
1) Full L&A By Ballot
2) Full L&A By Precinct
3) Single Vote per Precinct
4) Using Rotation

Verify that ballots will be voted at the correct order.

Expected Result

The following results per each option is expected:
1) A full set of ballots will be voted for every ballot on the memory card.
2) A full set of ballots will be voted for every precinct on the memory card.
3) A single ballot will be voted for every base precinct on the memory card.
4) The first candidate in the rotation is taken as the initial candidate in the marking sequence instead of the base rotation.

2 Perform a Logic & Accuracy Test with the "Manual" option selected.

Verify correct passes are created.

Expected Result

The voter records are accurate.

Manual L&A casts ballots in successively increasing amounts for each iteration, up to and including the number of candidates in the largest race on the ballot. The voter must manually vote the ballot for very iteration of the test.

3 Canceling midway of L&A run.

Expected Result

The current pass will be aborted and all previous passes created prior to canceling will be cast.

4 Run L&A with voter cards.

Expected Result

Manual L&A casts ballots in successively increasing amounts for each iteration, up to and including the number of candidates in the largest race on the ballot. The voter must manually vote the ballot for very iteration of the test.

5 Open Audit Log.
Verify appropriate log entries were created for:
- Beginning LA Test
- Ending LA Test
- Cancelling

Expected Result

In the Audit Log, there will be entries like
- 'Start Automatic test'
- 'End Automatic test'
- 'Start Test Count'
- 'Ballot cast'
- 'End Test Count'
- 'Ballot cancelled'

T9948: Pre-Election Mode - View Ballot Results

Status	Type	Priority	Estimate
Passed	Functional	2 - Normal	None

Milestone	Automated
None	No

Description

This test case is to verify that the View Ballot Results Screen, lists the all the ballots that were voted on and the correct candidate selections are marked.

Assumptions

None.

Steps

	Step	Expected Result
1	Verify the all ballots that have been casted in BS are displayed in VIEW BALLOT RESULTS screen, and the list box contains correct: - Serial # - Ballot - Precinct name - Portion info - Seq # (ONLY for pre-election ballots)	The all casted ballots will match the number of ballots in VIEW BALLOT RESULTS screen. EACH ballot is displaying correct information in the list box. **Note** The ballots that were cast as a Challenged ballot will be marked as 'CHALLENGED VOTER' in the right hand side panel. It will also display a status of 'Counted' which will indicate if the challenged ballot was accepted or rejected. If accepted then the results will be included in the reports.

Results

Passed

By **R. Dhami**
1/27/2015 8:12 PM

Assigned To
R. Dhami

Version
4.5.2!

Elapsed
20m

This test has been marked as 'Passed'.

Step Results

1 Verify the all ballots that have been casted in BS are displayed in VIEW BALLOT RESULTS screen, and the list box contains correct:
- Serial #
- Ballot
- Precinct name
- Portion info
- Seq # (ONLY for pre-election ballots)

Expected Result

The all casted ballots will match the number of ballots in VIEW BALLOT RESULTS screen.
EACH ballot is displaying correct information in the list box.

Note The ballots that were cast as a Challenged ballot will be marked as 'CHALLENGED VOTER' in the right hand side panel. It will also display a status of 'Counted' which will indicate if the challenged ballot was accepted or rejected.

If accepted then the results will be included in the reports.

T9949: Pre-Election Mode - Reporting

Status	Type	Priority	Estimate
Passed	Functional	2 - Normal	None

Milestone	Automated
None	No

Description

This test case is to verify Reports can be printed and they contain accurate information in pre-election mode

Assumptions

None.

Steps

	Step	Expected Result
1	Press 'Reporting' button. Verify that user is able to print election result report.	An Election Result Report will be successfully printed. Depending on the amount of Report Precincts you have defined in a Vote Center (GEMS), you will have different print prompts such as: Print Long or Short Report, Print Full Totals Report, Print Summary Totals Only, and Print All Precinct Totals. For details of the each report contents and structure refer to ABasic User Guide.
2	Verify that user is able to Abort printing.	The printing will be aborted.
3	Verify results for: 1) X-endorsed candidates. 2) Rotated races. 3) Accepted provisional ballots accounted. 4) Rejected provisional ballots	The following results are expected: 1) The X-endorsed candidate results will match votes cast. 2) The results for the rotated races should match what the user had voted. 3) The accepted provisional ballots will be included in the election results tallies. 4) The rejected provisional ballots will NOT be accounted for in the election result tallies.
4	Verify the 'Yes', 'No' buttons in the 'Need Another Copy?' dialog are functioning.	The following results are expected: Pressing 'No' button will close dialog. Pressing 'Yes' button will initiate printing of another copy of the same report.

Results

Passed

By **R. Dhami**
1/27/2015 8:15 PM

Assigned To
R. Dhami

Version
4.5.21

This test has been marked as 'Passed'.

Step Results

1 Press 'Reporting' button.

Verify that user is able to print election result report.

Expected Result

Elapsed
30m

An Election Result Report will be successfully printed.

Depending on the amount of Report Precincts you have defined in a Vote Center (GEMS), you will have different print prompts such as: Print Long or Short Report, Print Full Totals Report, Print Summary Totals Only, and Print All Precinct Totals.
For details of the each report contents and structure refer to ABasic User Guide.

2 Verify that user is able to Abort printing.

Expected Result

The printing will be aborted.

3 Verify results for:
1) X-endorsed candidates.
2) Rotated races.
3) Accepted provisional ballots accounted.
4) Rejected provisional ballots

Expected Result

The following results are expected:
1) The X-endorsed candidate results will match votes cast.
2) The results for the rotated races should match what the user had voted.
3) The accepted provisional ballots will be included in the election results tallies.
4) The rejected provisional ballots will NOT be accounted for in the election result tallies.

4 Verify the 'Yes', 'No' buttons in the 'Need Another Copy?' dialog are functioning.

Expected Result

The following results are expected:
Pressing 'No' button will close dialog.
Pressing 'Yes' button will initiate printing of another copy of the same report.

T9950: Pre-Election Mode - Accumulator

Status	Type	Priority	Estimate
Passed	Functional	2 - Normal	None

Milestone	Automated
None	No

Description

This test case is to verify that the Accumulator functionality behaves as expected.

Assumptions

None.

Steps

	Step	Expected Result
1	Press 'Accumulator' button. Insure all the following columns are displaying correct information for each accumulated card: - Machine ID - Version - Ballot (Ballots cast, provisional ballots are counted)	The Results Accumulator screen will be displayed and the following message will be briefly displayed "Importing Election Results, Please Wait". The printer will print a timestamp and a log for the Results Accumulator activity. Once the vote center has been imported, the bottom of the screen will display the following information "Results loaded; please remove the memory card" The Results Accumulator screen will list the following information for the loaded election: - Election Title - Vote Center Name - Mode (indicates whether TEST mode or Election mode) The following information will be listed for each memory card that is loaded into the results accumulator - Machine ID of each memory card whose results have been imported to the AccuVote-TS unit - Version: the vote center/machine id download version of each memory card - Ballots: the total number of ballots cast on each memory card.
2	Accumulate results for multiple cards. Use the cards from the following voting devices: AccuVote-TS R6, AccuVote-TSX Verify that the results from all cards will be loaded to Accumulator, and they match the number of casted ballots.	The all results from the all voting devices will be successfully loaded to Accumulator and they will be matching the number of casted ballots.
3	Attempt to Upload all results to GEMS. Verify that the results, tallies, and ballot images are correct.	Results will be successfully uploaded to GEMS. Tallies and ballot images will be correct.
4	Verify that Export Results option in Accumulator will export all accumulated results from the PCMCIA cards to one PCMCIA card. Verify export data by inserting the pcmcia card into a second Ballot Station.	All the accumulated results will be exported into a PCMCIA card and successfully re-loaded on another Ballot Station. Message 'Export results complete' will be displayed.

5	Attempt to 'Clear' results. Verify that the selected card with results will be cleared.	The only selected card in Accumulator will be cleared.
6	Attempt to 'Clear All' results. Verify that the all card with results will be cleared.	The results will be permanently cleared from Accumulator. Results will no longer load automatically when re-entering Accumulator (except current results).
7	Attempt to 'Print Report'. Verify that reports will be printed and it reflects voter selection.	You will be prompted to print Election Result Report. Depending on the amount of report precincts you have defined in a vote center (GEMS), you will have different print prompts such as: Print Long or Short Report, Print Full Totals Report, Print Summary Totals Only, and Print All Precinct Totals. For details of the report contents and structure refer to ABasic User Guide.
8	Attempt to combine Test and Production results. Verify that the BS behaves correctly.	Only results for one mode at a time are displayed. The results are not mixed and the mode of the last card accumulated will be displayed. The 'Mode' field will display the current mode for the results (Production or Test)
9	Attempt to accumulate a card belonging to a different election database.	Only results for one election at a time will be displayed. The results are not mixed and the mode of the last card accumulated will be displayed.
10	Attempt to accumulate a card whose status is in election mode. Verify that the BS behaves correctly.	The results will not be loaded. The election must be in Post-Election or Pre-Election mode in order for accumulator to load the results. All accumulated results will be cleared.
11	When accumulator is trying to read the memory card, remove memory card.	Accumulator will not display the listing for the pcmcia card.
12	Attempt to accumulate the cards with: - different security keys Verify that the BS behaves correctly.	BS will not detect the election on memory card, and the following warning message will be displayed: 'No test mode data or live post-election results were found. Please remove the memory card.' Note: previously accumulated results remains there
13	Attempt to view 'Audit Log'. Verify that the all entries related to Accumulator activities performed in the previous test cases will be logged and reflects those activities.	There will be entries logged for - Accumulator starting - When accumulator is cleared - When a pcmcia card is accumulated, it will display the machine id and copy #
14	Attempt to print 'Audit Log'. Verify that the copy of printed report is printed out, and it corresponds to Audit Log screen.	Copy of audit log will be printed and correspond to Audit Log screen.

Results

Passed

By **R. Dhami**
1/28/2015 3:39 PM

Assigned To
R. Dhami

Version
4.5.21

Elapsed
45m

This test has been marked as 'Passed'.

Step Results

1 Press 'Accumulator' button.

Insure all the following columns are displaying correct information for each accumulated card:
- Machine ID
- Version
- Ballot (Ballots cast, provisional ballots are counted)

Expected Result

The Results Accumulator screen will be displayed and the following message will be briefly displayed "Importing Election Results, Please Wait".
The printer will print a timestamp and a log for the Results Accumulator activity.
Once the vote center has been imported, the bottom of the screen will display the following information "Results loaded; please remove the memory card"
The Results Accumulator screen will list the following information for the loaded election:
- Election Title
- Vote Center Name
- Mode (indicates whether TEST mode or Election mode)

The following information will be listed for each memory card that is loaded into the results accumulator
- Machine ID of each memory card whose results have been imported to the AccuVote-TS unit
- Version: the vote center/machine id download version of each memory card
- Ballots: the total number of ballots cast on each memory card.

2 Accumulate results for multiple cards.
Use the cards from the following voting devices: AccuVote-TS R6, AccuVote-TSX
Verify that the results from all cards will be loaded to Accumulator, and they match the number of casted ballots.

Expected Result

The all results from the all voting devices will be successfully loaded to Accumulator and they will be matching the number of casted ballots.

3 Attempt to Upload all results to GEMS.
Verify that the results, tallies, and ballot images are correct.

Expected Result

Results will be successfully uploaded to GEMS. Tallies and ballot images will be correct.

4 Verify that Export Results option in Accumulator will export all accumulated results from the PCMCIA cards to one PCMCIA card.

Verify export data by inserting the pcmcia card into a second Ballot Station.

Expected Result

All the accumulated results will be exported into a PCMCIA card and successfully re-loaded on another Ballot Station.
Message 'Export results complete' will be displayed.

5 Attempt to 'Clear' results.
Verify that the selected card with results will be cleared.

Expected Result

The only selected card in Accumulator will be cleared.

6 Attempt to 'Clear All' results.

Verify that the all card with results will be cleared.

Expected Result

The results will be permanently cleared from Accumulator. Results will no longer load automatically when re-entering Accumulator (except current results).

7 Attempt to 'Print Report'.
Verify that reports will be printed and it reflects voter selection.

Expected Result

You will be prompted to print Election Result Report. Depending on the amount of report precincts you have defined in a vote center (GEMS), you will have different print prompts such as: Print Long or Short Report, Print Full Totals Report, Print Summary Totals Only, and Print All Precinct Totals.

For details of the report contents and structure refer to ABasic User Guide.

8 Attempt to combine Test and Production results.

Verify that the BS behaves correctly.

Expected Result

Only results for one mode at a time are displayed. The results are not mixed and the mode of the last card accumulated will be displayed.

The 'Mode' field will display the current mode for the results (Production or Test)

9 Attempt to accumulate a card belonging to a different election database.

Expected Result

Only results for one election at a time will be displayed. The results are not mixed and the mode of the last card accumulated will be displayed.

10 Attempt to accumulate a card whose status is in election mode.

Verify that the BS behaves correctly.

Expected Result

The results will not be loaded. The election must be in Post-Election or Pre-Election mode in order for accumulator to load the results.

All accumulated results will be cleared.

11 When accumulator is trying to read the memory card, remove memory card.

Expected Result

Accumulator will not display the listing for the pcmcia card.

12 Attempt to accumulate the cards with:
- different security keys

Verify that the BS behaves correctly.

Expected Result

BS will not detect the election on memory card, and the following warning message will be displayed:
'No test mode data or live post-election results were found. Please remove the memory card.'

Note: previously accumulated results remains there

13 Attempt to view 'Audit Log'.

Verify that the all entries related to Accumulator activities performed in the previous test cases will be logged and reflects those activities.

Expected Result

There will be entries logged for
- Accumulator starting
- When accumulator is cleared
- When a pcmcia card is accumulated, it will display the machine id and copy #

14 Attempt to print 'Audit Log'.

Verify that the copy of printed report is printed out, and it corresponds to Audit Log screen.

Expected Result

Copy of audit log will be printed and correspond to Audit Log screen.

T9951: Pre-Election Mode - Challenged Voters

Status	Type	Priority	Estimate
Passed	Functional	2 - Normal	None

Milestone	Automated
None	No

Description

This test case is to verify that the Challenged Voters functionality behaves as expected.

Assumptions

None.

Steps

	Step	Expected Result
1	In 'Challenged Voters' screen verify the following: Valid Provisional Voter Ids are listed.	All provisional ballots cast will be displayed with corresponding provisional number that was assigned to them.
2	Select some provisional ballot and attempt to 'Reject' it. Verify that the ballot is being rejected, and it is not included in the election result tallies.	The Accept field will display 'No' and the ballot will not be included in the election result tallies. Note: by default Accept field will be set to 'No'
3	Verify 'OK' & 'Cancel' button are functional as expected.	'OK' button will save all changes and exit out of the Challenged Voters menu. 'Cancel' button will cancel all changes and exit out of the Challenged Voters menu without saving them.
4	Select some provisional ballots and attempt to 'Accept' it. Verify that the ballot is being accepted, and it is included in the election result tallies.	The Accept field will display YES and the ballot will be included in the election result tallies.
5	WITHOUT accepting or rejecting ballots a) Upload results to GEMS b) Verify tallies are correct c) Verify the same ballots are displayed in the GEMS' Challenge/Provisional board.	a) Results were uploaded to GEMS correctly; all the tallies were correct. b)Uploaded tallies are correct c) Identical Provisional ballots are displayed in the GEMS' Challenge/Provisional board.
6	a) Accept ALL provisional ballots in BS b) Save changes c) Reject a few ballots d) Upload results to GEMS e) Verify tallies are correct f) Verify the same ballots are displayed in the GEMS' Challenge/Provisional board.	a) to c) Certain ballots were accepted and/or rejected in BS d) & e) Results were uploaded to GEMS correctly; all the tallies were correct. f) Identical Provisional ballots are displayed in the GEMS' Challenge/Provisional board. Provisional Ballot status is correct.
7	Verify Audit Log entries are created for each accepted ballot.	The following entries will be displayed: 'Challenged voter accepted IDs: #, #, #, #'

Results

Passed

By R. Dhami
1/28/2015 3:39 PM

Assigned To
R. Dhami

Version
4.5.21

Elapsed
20m

This test has been marked as 'Passed'.

Step Results

1 In 'Challenged Voters' screen verify the following:

Valid Provisional Voter Ids are listed.

Expected Result

All provisional ballots cast will be displayed with corresponding provisional number that was assigned to them.

2 Select some provisional ballot and attempt to 'Reject' it.

Verify that the ballot is being rejected, and it is not included in the election result tallies.

Expected Result

The Accept field will display 'No' and the ballot will not be included in the election result tallies.

Note: by default Accept field will be set to 'No'

3 Verify 'OK' & 'Cancel' button are functional as expected.

Expected Result

'OK' button will save all changes and exit out of the Challenged Voters menu. 'Cancel' button will cancel all changes and exit out of the Challenged Voters menu without saving them.

4 Select some provisional ballots and attempt to 'Accept' it.

Verify that the ballot is being accepted, and it is included in the election result tallies.

Expected Result

The Accept field will display YES and the ballot will be included in the election result tallies.

5 WITHOUT accepting or rejecting ballots
a) Upload results to GEMS
b) Verify tallies are correct
c) Verify the same ballots are displayed in the GEMS' Challenge/Provisional board.

Expected Result

a) Results were uploaded to GEMS correctly; all the tallies were correct.
b)Uploaded tallies are correct
c) Identical Provisional ballots are displayed in the GEMS' Challenge/Provisional board.

6 a) Accept ALL provisional ballots in BS
b) Save changes
c) Reject a few ballots
d) Upload results to GEMS
e) Verify tallies are correct
f) Verify the same ballots are displayed in the GEMS' Challenge/Provisional board.

Expected Result

a) to c) Certain ballots were accepted and/or rejected in BS
d) & e) Results were uploaded to GEMS correctly; all the tallies were correct.
f) Identical Provisional ballots are displayed in the GEMS' Challenge/Provisional board. Provisional Ballot status is correct.

7 Verify Audit Log entries are created for each accepted ballot.

Expected Result

The following entries will be displayed:
'Challenged voter accepted IDs: #, #, #, #'

T9952: Pre-Election Mode - Clear Totals

Status	Type	Priority	Estimate
Passed	Functional	2 - Normal	None

Milestone	Automated
None	No

Description

This test case is to verify that Clear Results functionality behaves as expected in pre-election mode.

Assumptions

None.

Steps

	Step	Expected Result
1	Press 'Clear Totals' button. Verify the appropriate warning message appears.	The following message will be displayed: "Do you wish to clear totals?" 'Yes',' No' buttons will be available.
2	Verify the 'Yes',' No' buttons are functioning as expected.	The following behavior is expected: If selecting 'No' the ballot box will not be cleared. If select 'Yes' all results will be cleared.

Results

Passed

By **R. Dhami**
1/28/2015 3:40 PM

Assigned To
R. Dhami

Version
4.5.2!

Elapsed
5m

This test has been marked as 'Passed'.

Step Results

1 Press 'Clear Totals' button.

Verify the appropriate warning message appears.

Expected Result

The following message will be displayed:
"Do you wish to clear totals?"

'Yes',' No' buttons will be available.

2 Verify the 'Yes',' No' buttons are functioning as expected.

Expected Result

The following behavior is expected:

If selecting 'No' the ballot box will not be cleared.

If select 'Yes' all results will be cleared.

T9953: Pre-Election Mode - Audit Log

Status	Type	Priority	Estimate
Passed	Functional	2 - Normal	None

Milestone	Automated
None	No

Description

This test case is to verify that the Audit Log functionality behaves as expected.

Assumptions

None.

Steps

	Step	Expected Result
1	From Supervisor Mode, press the Audit button.	
2	From the drop down box select 'election.adt' Verify log entries. Verify activities relating to the election database were recorded automatically whenever Ballot Station is on (including power disruption).	The audit log will be displayed
3	Verify Audit logs are permanent and cannot be deleted or altered.	Audit logs are permanent
4	Verify that you can print the audit log. Verify accuracy	The audit log will print successfully and will match the entries on the screen.
5	At the Middle of printing Audit Log test for losing Printer connection as follows: - opening printer cover - removing tablet - out of paper	The following error has been detected: Failed to open file \FFX\AccuVote-TS\Ballotstation\CurrentElection\election.adt 32" and clicking on 'OK will display the following message "The following error has been detected: Failed to open file \Storage Card\CurrentElection\election.adt 32"

Results

Passed

By **R. Dhami**
1/28/2015 3:47 PM

Assigned To
R. Dhami

Version
4.5.2!

Elapsed
20m

This test has been marked as 'Passed'.

Step Results

1 From Supervisor Mode, press the Audit button.

2 From the drop down box select 'election.adt'

Verify log entries.

Verify activities relating to the election database were recorded automatically whenever Ballot Station is on (including power disruption).

Expected Result

The audit log will be displayed

3 Verify Audit and System logs are permanent and cannot be deleted or altered.

Expected Result

Audit and system logs are permanent

4 Verify that you can print the audit log. Verify accuracy

Expected Result

The audit log will print successfully and will match the entries on the screen.

5 At the Middle of printing Audit Log test for losing Printer connection as follows:
- opening printer cover
- removing tablet
- out of paper

Expected Result

The following error has been detected: Failed to open file \FFX\AccuVote-TS\Ballotstation\CurrentElection\election.adt 32" and clicking on 'OK will display the following message "The following error has been detected: Failed to open file \Storage Card\CurrentElection\election.adt 32"

T9954: Pre-Election Mode - Check Calibration

Status	Type	Priority	Estimate
Passed	Functional	2 - Normal	None

Milestone	Automated
None	No

Description

This test case is to verify that the Calibration functionality works as expected.

Assumptions

None.

Steps

	Step	Expected Result
1	From Supervisor mode, Press the "Calibrate" button. Verify that the Instruction screen is displayed.	The following instructions on how to use calibration will be displayed: "Carefully press and briefly hold stylus on the center of the target. Repeat as the target moves around the screen"
2	Follow the instructions and press the X.	The following message will be displayed upon completion: "New calibration settings have been measured. Tap the screen to register saved data. Wait for 30 seconds to cancel saved data and keep the current setting."
3	Don't touch the screen and verify behavior after 30 seconds.	You will return to the System Setup screen.
4	Repeat steps 1-2 and then tap the screen at the end.	The new calibration settings will be saved and you will return to the System Setup screen.

Results

Passed

By **R. Dhami**
1/28/2015 3:56 PM

Assigned To
R. Dhami

Version
4.5.21

Elapsed
4m

This test has been marked as 'Passed'.

Step Results

1 From Supervisor mode,
Press the "Calibrate" button.

Verify that the Instruction screen is displayed.

Expected Result

The following instructions on how to use calibration will be displayed:

"Carefully press and briefly hold stylus on the center of the target. Repeat as the target moves around the screen"

2 Follow the instructions and press the X.

Expected Result

The following message will be displayed upon completion:

"New calibration settings have been measured. Tap the screen to register saved data. Wait for 30 seconds to cancel saved data and keep the current setting."

3 Don't touch the screen and verify behavior after 30 seconds.

Expected Result

You will return to the System Setup screen.

4 Repeat steps 1-2 and then tap the screen at the end.

Expected Result

The new calibration settings will be saved and you will return to the System Setup screen.

T9955: Election Mode

Status	Type	Priority	Estimate
Passed	Functional	2 - Normal	None

Milestone	Automated
None	No

Description

This test case is to verify that Election Mode functionality behaves as expected.

Assumptions

None.

Steps

	Step	Expected Result
1	Download a realistic database into BS.	The database will be successfully downloaded into BS.
2	Verify that the Ballot Station displays an appropriate warning message when you attempt to 'Set For Election'.	The following message will be displayed: 'Okay to Set For Election and Clear the counts?'
3	Verify that the Ballot Station displays an appropriate warning messages when you Insert the following type of incorrect cards: 1) Voter Access Card 2) Card upside down 3) Security Key Card 4) Supervisor Card encrypted with different smart card key 5) Dead card	The following messages will be displayed: 1) 'Invalid card. Please remove the card from the reader'. 2) 'Card upside down or not inserted correctly. Please remove the Voter Access Card and try again or press Cancel to abort' 3) 'Card could not be authenticated. Please remove the Voter Access Card and try again or press Cancel to abort' 4) 'Card could not be authenticated. Please remove the Voter Access Card and try again or press Cancel to abort' 5) The card has been permanently disabled. Please remove the Voter Access Card and try again or press Cancel to abort'
4	Verify that the 'Enter Password' window is displayed when inserting a valid Supervisor Card.	'Enter Password' dialog will be displayed, prompting the user for a PIN code.
5	Verify valid and invalid password: 1) Incorrect PIN code 2) Correct PIN code	1) 'Incorrect PIN number' will be displayed in 'Password' field. 2) Valid PIN will be accurately accepted and then the corresponding screen will be displayed.
6	Verify that you can print an additional copy of Election Zero Report by selecting 'Yes' under the 'NEED ANOTHER COPY?' prompt.	Additional copy of the Election Zero Report will be successfully printed as needed.
7	Verify the Election Zero Total Report counter is reset to zero.	The copy of the Election Zero Report will contain ZEROs total for all fields.
8	Verify the following: 1) Remove the PCMCIA card in Election Mode and then insert	) Election will be unloaded. 'Turn unit off or press OK to resume' message will

	it back. 2) Shutdown BS in Election Mode using power button and then power it on.	appear. After pressing OK button, the election will be re-loaded, the Election Zero Report will be printed and then the 'Insert Card to Begin Voting' screen will be displayed. 2) The election will be re-loaded, the Election Zero Report will be printed and then the 'Insert Card to Begin Voting' screen will be displayed.
9	Verify that BS can operate on battery power. Perform the following steps in Election Mode: 1) Remove tablet from the base, and then put it back. 2) Unplug the power cable, and then plug it back.	Both cases will not affect voting on BS. BS is able to operate accurately on a battery power.
10	From Election Mode > 'Insert Card to Begin Voting' screen, insert the following cards: 1) Card with different security keys 2) Dead card 3) Card in a wrong way 4) Security card 5) Blank card 6) Card encoded to a different election Verify that BS displays the correct message while the card is inserted.	The following warning messages will be displayed: 1) 'Card could not be authenticated - please remove card' 2) 'The card has been permanently disabled - please remove card'. 3) 'Card upside down or not inserted correctly - please remove card'. 4) 'Remove Invalid Card' 5) 'Remove Invalid Card' 6) 'Incorrect election or vote center – please remove card'
11	Confirm that BS accepts the Voter Access Cards created in Create Voter Cards Test Case. Verify ability to cast the ballots with different voting options in Election Mode. Verify that under the Supervisor screen in Election Mode you will be able to: 1) Resume Voting 2) Create Voter Cards 3) View Audit Log 4) End Voting 5) Shutdown	Voter Access Cards created in Create Voter Cards test case, will be successfully accepted in BS, and you will be able to cast them in Election Mode. 1) After pressing 'Resume Voting" button, 'Insert Card to Begin Voting' screen is displayed. 2) After pressing 'Create Voter Cards" button, 'CREATE VOTER ACCESS CARD' screen is displayed. 3) After pressing 'View Audit Log' button, 'View Audit' screen is displayed. 4) After pressing 'End Election' button, 'WARNING: This will end the voting process for this election. No more votes can be cast after this point. Press Ok to proceed or Cancel to exit.' Warning message is displayed. 'OK' and 'Cancel' buttons are available. 5) After pressing 'Shutdown' button, 'Turn unit off or press OK to resume' message is displayed. System will be functioning accordingly under all specified actions.
12	Verify that 'OK' and 'Cancel' buttons behave as expected.	If pressing 'Cancel' button, the warning message will be closed and the Supervisor screen remains displayed. If pressing 'OK' button, you will be prompted to print Election Result Report. After report is properly printed, the election is getting ended and then the 'Post Election Mode' screen will be displayed.

Results

Passed

This test has been marked as 'Passed'.

By **R. Dhami**
1/29/2015 12:35 PM

Assigned To
I. Goldin

Version
4.5.2I

Elapsed
1h 5m

Step Results

1 Download a realistic database into BS.

Expected Result

The database will be successfully downloaded into BS.

2 Verify that the Ballot Station displays an appropriate warning message when you attempt to 'Set For Election'.

Expected Result

The following message will be displayed:
'Okay to Set For Election and Clear the counts?'

3 Verify that the Ballot Station displays an appropriate warning messages when you Insert the following type of incorrect cards:
1) Voter Access Card
2) Card upside down
3) Security Key Card
4) Supervisor Card encrypted with different smart card key
5) Dead card

Expected Result

The following messages will be displayed:
1) 'Invalid card. Please remove the card from the reader'.
2) 'Card upside down or not inserted correctly. Please remove the Voter Access Card and try again or press Cancel to abort'
3) 'Card could not be authenticated. Please remove the Voter Access Card and try again or press Cancel to abort'
4) 'Card could not be authenticated. Please remove the Voter Access Card and try again or press Cancel to abort'
5) The card has been permanently disabled. Please remove the Voter Access Card and try again or press Cancel to abort'

4 Verify that the 'Enter Password' window is displayed when inserting a valid Supervisor Card.

Expected Result

'Enter Password' dialog will be displayed, prompting the user for a PIN code.

5 Verify valid and invalid password:
1) Incorrect PIN code
2) Correct PIN code

Expected Result

1) 'Incorrect PIN number' will be displayed in 'Password' field.
2) Valid PIN will be accurately accepted and then the corresponding screen will be displayed.

6 Verify that you can print an additional copy of Election Zero Report by selecting 'Yes' under the 'NEED ANOTHER COPY?' prompt.

Expected Result

Additional copy of the Election Zero Report will be successfully printed as needed.

7 Verify the Election Zero Total Report counter is reset to zero.

Expected Result

The copy of the Election Zero Report will contain ZEROs total for all fields.

8 Verify the following:
1) Remove the PCMCIA card in Election Mode and then insert it back.

2) Shutdown BS in Election Mode using power button and then power it on.

Expected Result

) Election will be unloaded.
'Turn unit off or press OK to resume' message will appear.
After pressing OK button, the election will be re-loaded, the Election Zero Report will be printed and then the 'Insert Card to Begin Voting' screen will be displayed.

2) The election will be re-loaded, the Election Zero Report will be printed and then the 'Insert Card to Begin Voting' screen will be displayed.

9 Verify that BS can operate on battery power.

Perform the following steps in Election Mode:
1) Remove tablet from the base, and then put it back.
2) Unplug the power cable, and then plug it back.

Expected Result

Both cases will not affect voting on BS.

BS is able to operate accurately on a battery power.

10 From Election Mode > 'Insert Card to Begin Voting' screen, insert the following cards:
1) Card with different security keys
2) Dead card
3) Card in a wrong way
4) Security card
5) Blank card
6) Card encoded to a different election

Verify that BS displays the correct message while the card is inserted.

Expected Result

The following warning messages will be displayed:
1) 'Card could not be authenticated - please remove card'
2) 'The card has been permanently disabled - please remove card'.
3) 'Card upside down or not inserted correctly - please remove card'.
4) 'Remove Invalid Card'
5) 'Remove Invalid Card'
6) 'Incorrect election or vote center – please remove card'

11 Confirm that BS accepts the Voter Access Cards created in Create Voter Cards Test Case.

Verify ability to cast the ballots with different voting options in Election Mode.

Verify that under the Supervisor screen in Election Mode you will be able to:
1) Resume Voting
2) Create Voter Cards
3) View Audit Log
4) End Voting
5) Shutdown

Expected Result

Voter Access Cards created in Create Voter Cards test case, will be successfully accepted in BS, and you will be able to cast them in Election Mode.

1) After pressing 'Resume Voting" button, 'Insert Card to Begin Voting' screen is displayed.
2) After pressing 'Create Voter Cards" button, 'CREATE VOTER ACCESS CARD' screen is displayed.
3) After pressing 'View Audit Log' button, 'View Audit' screen is displayed.

4) After pressing 'End Election' button, 'WARNING: This will end the voting process for this election. No more votes can be cast after this point. Press Ok to proceed or Cancel to exit.' Warning message is displayed. 'OK' and 'Cancel' buttons are available.
5) After pressing 'Shutdown' button, 'Turn unit off or press OK to resume' message is displayed.

System will be functioning accordingly under all specified actions.

3.2 Verify that 'OK' and 'Cancel' buttons behave as expected.

Expected Result

If pressing 'Cancel' button, the warning message will be closed and the Supervisor screen remains displayed.

If pressing 'OK' button, you will be prompted to print Election Result Report. After report is properly printed, the election is getting ended and then the 'Post Election Mode' screen will be displayed.

T9962: Voting using Security Keys

Status	Type	Priority	Estimate
Failed	Functional	2 - Normal	None

Milestone	Automated
None	No

Assumptions

NOTES

1. The appropriate GEMS and Ballot Station releases with implemented 'SSL File Transfer' security feature should be used in order to fulfill this Test Case.
2. Two Security Key Cards with a different media keys and updated Supervisor Cards should be defined by using the Key Card Tool.

Steps

	Step	Expected Result
1	From GEMS > Setup > AccuVote-TS Options screen, verify that the 'SSL/TLS File Transfer' option is selected as a default and enabled.	The 'SSL/TLS File Transfer' option should be selected as a default and enabled when the election status is 'Set For Election'.
2	Turn on the AccuVote-TS unit without a PCMCIA card inserted.	The following message will be displayed: "Please insert the election media or a security key card. Press CANCEL to shutdown."
3	Insert the first Security Key Card into the card reader.	The following message will be displayed: "BallotStation security settings have been initialized. Please remove the security key card."
4	Remove the Key Card from the card reader and insert a blank PCMCIA card.	The inserted PCMCIA card will be encoded with the current security settings corresponding to the first Key Card and the Download Election screen will be displayed.
5	From GEMS > Setup > AccuVote-TS Options dialog box, make sure the 'SSL/TLS File Transfer' option is selected, and download the election.	The Election will be successfully transferred and loaded.
6	Insert the updated Supervisor Card into the card reader, enter the updated PIN number in the 'Password' field under the displayed 'Password' screen, and confirm it by clicking on 'OK' button.	The updated PIN number will be accepted, AccuVote-TS will be synchronized with the updated Supervisor Card and the 'Supervisor Mode' screen will be displayed.
7	Follow the following steps: 1. Create some voter cards 2. Set for Election 3. Cast the ballots	The first encoded PCMCIA card with corresponding election voting results will be defined.
8	Remove this PCMCIA card from the AccuVote-TS.	The appropriate prompt message "Please insert the election media or a security key card. Press CANCEL to shutdown." will be displayed.
9	Repeat steps 3-4 with the second Security Key Card with a different Election Media key for the same Election	The following message will be displayed: "BallotStation security settings have been initialized. Please remove the security key card."

10	Insert the second PCMCIA card and repeat steps 7-8.	The second PCMCIA card will be encoded with new security keys.
11	Insert the first encoded PCMCIA card into the AccuVote-TS unit.	The following prompt message will be displayed "The digital database signature doesn't match the expected value. Press OK to delete the file and re-download, or replace the memory card."
12	Follow the following steps: 1. Remove the first PCMCIA card 2. Insert the second PCMCIA card 3. Create Voter Access Cards using different options (Challenged, VIBS, and Magnify).	The Voter Access Cards will be created with corresponding security keys.
13	Follow the following steps: 1. Remove the second PCMCIA card, 2. Initialize the security settings for the first PCMCIA card by inserting the first Security Key Card 3. Insert the first PCMCIA card.	The Security keys encoded for the first PCMCIA card will be loaded.
14	Create Voter Access Cards using different options (Challenged, VIBS, and Magnify).	The Voter Access Cards will be created with security keys corresponding to the second Security Key Card settings.
15	Remove the first PCMCIA card, initialize the security settings for the second PCMCIA card by inserting the second Security Key Card, and insert the second PCMCIA card.	The Security keys will be encoded for the second PCMCIA card that was used.
16	Insert a voter card created from step 14 (for first pcmcia card).	The following error msg will be displayed and the voter card will be ejected. "Card could not be authenticated - please remove card"
17	Bring up the 'Create Voter Access Card' screen and insert the the Voter Access Card from to step above.	The voter card will be ejected and the following error message will be displayed "Card could not be authenticated. Please remove the voter access card and try another or press Cancel to abort"
18	Remove Voter Access Card as well as the PCMCIA card.	The following message will be displayed: "Please insert the election media or a security key card. Press CANCEL to shutdown."
19	Re-insert the PCMCIA Card.	The Election will be loaded.

Results

Failed

By **R. Dhami**
1/28/2015 4:00 PM

Assigned To
R. Dhami

Version
4.5.21

Elapsed
37m

This test has been marked as 'Failed'.

Step Results

1 From GEMS > Setup > AccuVote-TS Options screen, verify that the 'SSL/TLS File Transfer' option is selected as a default and enabled.

Expected Result

The 'SSL/TLS File Transfer' option should be selected as a default and enabled when the election status is 'Set For Election'.

2 Turn on the AccuVote-TS unit without a PCMCIA card inserted.

Expected Result

The following message will be displayed: "Please insert the election media or a security key card. Press CANCEL to shutdown."

3 Insert the first Security Key Card into the card reader.

Expected Result

The following message will be displayed: "BallotStation security settings have been initialized. Please remove the security key card."

4 Remove the Key Card from the card reader and insert a blank PCMCIA card.

Expected Result

The inserted PCMCIA card will be encoded with the current security settings corresponding to the first Key Card and the Download Election screen will be displayed.

5 From GEMS > Setup > AccuVote-TS Options dialog box, make sure the 'SSL/TLS File Transfer' option is selected, and download the election.

Expected Result

The Election will be successfully transferred and loaded.

6 Insert the updated Supervisor Card into the card reader, enter the updated PIN number in the 'Password' field under the displayed 'Password' screen, and confirm it by clicking on 'OK' button.

Expected Result

The updated PIN number will be accepted, AccuVote-TS will be synchronized with the updated Supervisor Card and the 'Supervisor Mode' screen will be displayed.

7 Follow the following steps:
1. Create some voter cards
2. Set for Election
3. Cast the ballots

Expected Result

The first encoded PCMCIA card with corresponding election voting results will be defined.

8 Remove this PCMCIA card from the AccuVote-TS.

Expected Result

The appropriate prompt message "Please insert the election media or a security key card. Press CANCEL to shutdown." will be displayed.

9 Repeat steps 3-4 with the second Security Key Card with a different Election Media key for the same Election

Expected Result

The following message will be displayed: "BallotStation security settings have been initialized. Please remove the security key card."

10 Insert the second PCMCIA card and repeat steps 7-8.

Expected Result

The second PCMCIA card will be encoded with new security keys.

11 Insert the first encoded PCMCIA card into the AccuVote-TS unit.

Expected Result

The following prompt message will be displayed "The digital database signature doesn't match the expected value. Press OK to delete the file and re-download, or replace the memory card."

12 Follow the following steps:
1. Remove the first PCMCIA card
2. Insert the second PCMCIA card
3. Create Voter Access Cards using different options (Challenged, VIBS, and Magnify).

Expected Result

The Voter Access Cards will be created with corresponding security keys.

13 Follow the following steps:
1. Remove the second PCMCIA card,
2. Initialize the security settings for the first PCMCIA card by inserting the first Security Key Card
3. Insert the first PCMCIA card.

Expected Result

The Security keys encoded for the first PCMCIA card will be loaded.

14 Create Voter Access Cards using different options (Challenged, VIBS, and Magnify).

Expected Result

The Voter Access Cards will be created with security keys corresponding to the second Security Key Card settings.

15 Remove the first PCMCIA card,
initialize the security settings for the second PCMCIA card by inserting the second Security Key Card, and insert the second PCMCIA card.

Expected Result

The Security keys will be encoded for the second PCMCIA card that was used.

16 Insert a voter card created from step 14 (for first pcmcia card).

Expected Result

The following error msg will be displayed and the voter card will be ejected. "Card could not be authenticated - please remove card"

17 Bring up the 'Create Voter Access Card' screen and insert the the Voter Access Card from to step above.

Expected Result

The voter card will be ejected and the following error message will be displayed "Card could not be authenticated. Please remove the voter access card and try another or press Cancel to abort"

18 Remove Voter Access Card as well as the PCMCIA card.

Expected Result

The following message will be displayed: "Please insert the election media or a security key card. Press CANCEL to shutdown."

Actual Result

Known issue. Removing PCMCIA card displays an exception error msg. Issue is fixed in 4.6.1 bug#3659

19 Re-insert the PCMCIA Card.

Expected Result

The Election will be loaded.

Passed

By **R. Dhami**
1/28/2015 3:57 PM

Assigned To
R. Dhami

Version
4.5.21

Elapsed
37m

This test has been marked as 'Passed'.

Step Results

1 From GEMS > Setup > AccuVote-TS Options screen, verify that the 'SSL/TLS File Transfer' option is selected as a default and enabled.

Expected Result

The 'SSL/TLS File Transfer' option should be selected as a default and enabled when the election status is 'Set For Election'.

2 Turn on the AccuVote-TS unit without a PCMCIA card inserted.

Expected Result

The following message will be displayed: "Please insert the election media or a security key card. Press CANCEL to shutdown."

3 Insert the first Security Key Card into the card reader.

Expected Result

The following message will be displayed: "BallotStation security settings have been initialized. Please remove the security key card."

4 Remove the Key Card from the card reader and insert a blank PCMCIA card.

Expected Result

The inserted PCMCIA card will be encoded with the current security settings corresponding to the first Key Card and the Download Election screen will be displayed.

5 From GEMS > Setup > AccuVote-TS Options dialog box, make sure the 'SSL/TLS File Transfer' option is selected, and download the election.

Expected Result

The Election will be successfully transferred and loaded.

6 Insert the updated Supervisor Card into the card reader, enter the updated PIN number in the 'Password' field under the displayed 'Password' screen, and confirm it by clicking on 'OK' button.

Expected Result

The updated PIN number will be accepted, AccuVote-TS will be synchronized with the updated Supervisor Card and the 'Supervisor Mode' screen will be displayed.

7 Follow the following steps:
1. Create some voter cards
2. Set for Election
3. Cast the ballots

Expected Result

The first encoded PCMCIA card with corresponding election voting results will be defined.

8 Remove this PCMCIA card from the AccuVote-TS.

Expected Result

The appropriate prompt message "Please insert the election media or a security key card. Press CANCEL to shutdown." will be displayed.

9 Repeat steps 3-4 with the second Security Key Card with a different Election Media key for the same Election

Expected Result

The following message will be displayed: "BallotStation security settings have been initialized. Please remove the security key card."

10 Insert the second PCMCIA card and repeat steps 7-8.

Expected Result

The second PCMCIA card will be encoded with new security keys.

11 Insert the first encoded PCMCIA card into the AccuVote-TS unit.

Expected Result

The following prompt message will be displayed "The digital database signature doesn't match the expected value. Press OK to delete the file and re-download, or replace the memory card."

12 Follow the following steps:
1. Remove the first PCMCIA card
2. Insert the second PCMCIA card
3. Create Voter Access Cards using different options (Challenged, VIBS, and Magnify).

Expected Result

The Voter Access Cards will be created with corresponding security keys.

13 Follow the following steps:
1. Remove the second PCMCIA card,
2. Initialize the security settings for the first PCMCIA card by inserting the first Security Key Card
3. Insert the first PCMCIA card.

Expected Result

The Security keys encoded for the first PCMCIA card will be loaded.

14 Create Voter Access Cards using different options (Challenged, VIBS, and Magnify).

Expected Result

The Voter Access Cards will be created with security keys corresponding to the second Security Key Card settings.

15 Remove the first PCMCIA card,
Initialize the security settings for the second PCMCIA card by inserting the second Security Key Card, and insert the second PCMCIA card.

Expected Result

The Security keys will be encoded for the second PCMCIA card that was used.

16 Insert a voter card created from step 14 (for first pcmcia card).

Expected Result

The following error msg will be displayed and the voter card will be ejected.
"Card could not be authenticated - please remove card"

17 Bring up the 'Create Voter Access Card' screen and insert the the Voter Access Card from to step above.

Expected Result

The voter card will be ejected and the following error message will be displayed "Card could not be authenticated. Please remove the voter access card and try another or press Cancel to abort"

18 Remove Voter Access Card as well as the PCMCIA card.

Expected Result

The following message will be displayed: "Please insert the election media or a security key card. Press CANCEL to shutdown."

Actual Result

Known issue. Removing PCMCIA card displays an exception error msg. Issue is fixed in 4.6.1 bug#3659

19 Re-insert the PCMCIA Card.

Expected Result

The Election will be loaded.

T9956: Post-Election Mode - Upload Results

Status	Type	Priority	Estimate
Failed	Functional	2 - Normal	None

Milestone	Automated
None	No

Description

This test case is to verify that Upload Results functionality in Post-Election Mode behaves as expected.

Assumptions

None.

Steps

	Step	Expected Result
1	Verify ability to upload election results using LAN as a connection type.	Election results are accurately uploaded using LAN.
2	Using the following GEMS reports: 1) Election Summary Report 2) Statement of Votes Cast 3) Cards Cast Report Verify that the uploaded election results are accurate and reflects voter selection made in step 11 of Election Mode Test Case.	All reports will contain accurate results and reflect voter selection made in step 11 of Election Mode Test Case, step
3	Using GEMS > View Ballots function, Verify ballot images are accurate and reflect voter selection made in the step 11 of Election Mode Test Case.	Ballot images will reflect voter selection made in step 11 of Election Mode Test Case.
4	Attempt to upload election results using LAN connection with the following scenarios: 1) IP address is not specified 2) No network card 3) Incorrect IP address range (e.g. 10.175.2.299) Verify that an appropriate error message will be accurately displayed accordingly.	The following error messages will be displayed: 1) The following error has been detected: Cannot assign requested address 2) The following error has been detected: No route to host 3) The following error has been detected: Connection refused System will be functioning in a normal manner after error recovery.
5	Verify ability to upload election results using multiple PCMCIA cards.	Results are accurately uploaded using multiple PCMCIA cards.
6	Aborting upload scenarios: 1) Aborting upload using 'Abort' button 2) Aborting upload and then re-upload 3) Attempt aborting at varies stages of uploading: a) Reject network card b) Disconnect network cable	1) The following error has been detected: Aborted 2) After aborting, the results are getting accurately re-uploaded. 3) The following error messages will be displayed: a) The following error has been detected: Timeout b) The following error has been detected: Timeout

		System will be functioning in a normal manner after error recovery.
7	Remove the PCMCIA card while uploading.	Depending on what step of Uploading an election you remove a PCMCIA card, one of the following error messages will be displayed: 1) An unknown error occurred while accessing \Storage Card\Election Data\election.xtr. 2) To continue Uploading please insert a new memory card. Press Done to return to the main menu. 3) An unknown error occurred while accessing an unknown unnamed file. System will be functioning in a normal manner after error recovery.
8	Attempt to upload results without starting Port in GEMS > AV Server dialog.	The following message will be displayed: 'The following error has been detected: Connection refused' System will be functioning in a normal manner after error recovery.
9	Close GEMS > AV Server dialog during uploading.	Upload process will stop and the following error message will be displayed: 'The following error has been detected: Connection refused' System will be functioning in a normal manner after error recovery.
10	Attempt to upload results while ALL the VCenters are already uploaded.	The following error message will be displayed: 'Error sending <Vote Center and Memory Card Number>. Already uploaded. Continue with rest of upload?' System will be functioning in a normal manner after error recovery.

Results

Failed

By **R. Dhami**
1/29/2015 12:36 PM

Assigned To
I. Goldin

Version
4.5.21

Elapsed
1h 5m

This test has been marked as 'Failed'.

Step Results

1 Verify ability to upload election results using LAN as a connection type.

Expected Result

Election results are accurately uploaded using LAN.

2 Using the following GEMS reports:
1) Election Summary Report
2) Statement of Votes Cast
3) Cards Cast Report

Verify that the uploaded election results are accurate and reflects voter selection made in step 11 of Election Mode Test Case.

Expected Result

All reports will contain accurate results and reflect voter selection made in step 11 of Election Mode Test Case, step

3 Using GEMS > View Ballots function,

Verify ballot images are accurate and reflect voter selection made in the step 11 of Election Mode Test Case.

Expected Result

Ballot images will reflect voter selection made in step 11 of Election Mode Test Case.

4 Attempt to upload election results using LAN connection with the following scenarios:
1) IP address is not specified
2) No network card
3) Incorrect IP address range (e.g. 10.175.2.299)

Verify that an appropriate error message will be accurately displayed accordingly.

Expected Result

The following error messages will be displayed:

1) The following error has been detected: Cannot assign requested address
2) The following error has been detected: No route to host
3) The following error has been detected: Connection refused

System will be functioning in a normal manner after error recovery.

5 Verify ability to upload election results using multiple PCMCIA cards.

Expected Result

Results are accurately uploaded using multiple PCMCIA cards.

Actual Result

Uploading multiple memory cards causes different errors.
Known issue in BS 4.5.

6 Aborting upload scenarios:
1) Aborting upload using 'Abort' button
2) Aborting upload and then re-upload
3) Attempt aborting at varies stages of uploading:
a) Reject network card
b) Disconnect network cable

Expected Result

1) The following error has been detected: Aborted
2) After aborting, the results are getting accurately re-uploaded.
3) The following error messages will be displayed:
a) The following error has been detected:

Timeout
b) The following error has been detected: Timeout

System will be functioning in a normal manner after error recovery.

7 Remove the PCMCIA card while uploading.

Expected Result

Depending on what step of Uploading an election you remove a PCMCIA card, one of the following error messages will be displayed:

1) An unknown error occurred while accessing \Storage Card\Election Data\election.xtr.
2) To continue Uploading please insert a new memory card. Press Done to return to the main menu.

3) An unknown error occurred while accessing an unknown unnamed file.
System will be functioning in a normal manner after error recovery.

8 Attempt to upload results without starting Port in GEMS > AV Server dialog.

Expected Result

The following message will be displayed:
'The following error has been detected: Connection refused'

System will be functioning in a normal manner after error recovery.

9 Close GEMS > AV Server dialog during uploading.

Expected Result

Upload process will stop and the following error message will be displayed:
'The following error has been detected: Connection refused'

System will be functioning in a normal manner after error recovery.

10 Attempt to upload results while ALL the VCenters are already uploaded.

Expected Result

The following error message will be displayed:
'Error sending <Vote Center and Memory Card Number>. Already uploaded.
Continue with rest of upload?'
System will be functioning in a normal manner after error recovery.

T9957: Post-Election Mode - View Ballot Results

Status	Type	Priority	Estimate
Passed	Functional	2 - Normal	None
Milestone	**Automated**		
None	No		

Description

This test case is to verify that the View Ballot Results functionality in Post-Election mode behaves as expected.

Assumptions

None.

Steps

	Step	Expected Result
1	Verify that all ballots that have been cast in BS are displayed in the 'View Ballots' screen, and the list box contains correct: - Serial # - Ballot - Precinct name - Portion info	The ballots cast will match the number of ballots in the 'View Ballot Results' screen. The right hand panel will display the voter selections that were made on the ballot.
2	Verify that the ballots displayed in 'View Ballot Results' correspond to the ballots that you voted.	The ballots displayed in 'View Ballot Results' screen will correspond to the voter selections that the voter had made.

Results

Passed

By **R. Dhami**
1/29/2015 12:37 PM

Assigned To
I. Goldin

Version
4.5.2!

Elapsed
35m

This test has been marked as 'Passed'.

Step Results

1 Verify that all ballots that have been cast in BS are displayed in the 'View Ballots' screen, and the list box contains correct:
- Serial #
- Ballot
- Precinct name
- Portion info

Expected Result

The ballots cast will match the number of ballots in the 'View Ballot Results' screen.

The right hand panel will display the voter selections that were made on the ballot.

2 Verify that the ballots displayed in 'View Ballot Results' correspond to the ballots that you voted.

Expected Result

The ballots displayed in 'View Ballot Results' screen will correspond to the voter selections that the voter had made.

T9958: Post-Election Mode - Reporting

Status	Type	Priority	Estimate
Passed	Functional	2 - Normal	None

Milestone	Automated
None	No

Description

This test case is to verify that the Reporting functionality in post-election mode behaves as expected.

Assumptions

None.

Steps

	Step	Expected Result
1	Press 'Reporting' button. Verify that user is able to print 'Election Results Report'.	An 'Election Result Report' will be successfully printed. Depending on the amount of Report Precincts you have defined in a Vote Center (GEMS), you will have different print prompts such as: Print Long or Short Report, Print Full Totals Report, Print Summary Totals Only, and Print All Precinct Totals. For details of the each report contents and structure refer to ABasic User Guide.
2	Verify that user is able to abort report printing.	The report printing will be successfully aborted. As a result, the following status message is getting displayed: 'Printing was canceled by user request.'
3	Verify that printing is accurately terminated when printer running out of paper.	The following message will be displayed to the user indicating printing termination: 'Failed to write to printer' with 'RETRY' and 'Cancel' button. If pressing 'RETRY' button, printing will be re-tried accordingly. If pressing 'Cancel' button, printing will be properly stopped. As a result, the following status message will be displayed: 'Printer aborted due to error'
4	Verify results for: 1) X-endorsed candidates. 2) Rotated races. 3) Accepted provisional ballots accounted. 4) Rejected provisional ballots.	The following results are expected: 1) The X-endorsed candidate results will match votes cast. 2) The results for the rotated races should match what the user had voted. 3) The accepted provisional ballots will be included in the election results tallies. 4) The rejected provisional ballots will NOT be accounted for in the election result tallies.

5	Verify the 'Yes' and 'No' buttons functionality in the 'Need Another Copy?' dialog.	The following results are expected: Pressing 'No' button will close dialog and then will stop printing. Pressing 'Yes' button will initiate printing of another copy of the same report (using initially specified settings).

Results

Passed

By **R. Dhami**
1/29/2015 12:38 PM

Assigned To
I. Goldin

Version
4.5.21

Elapsed
35m

This test has been marked as 'Passed'.

Step Results

1. Press 'Reporting' button.

   Verify that user is able to print 'Election Results Report'.

   Expected Result

   An 'Election Result Report' will be successfully printed.

   Depending on the amount of Report Precincts you have defined in a Vote Center (GEMS), you will have different print prompts such as: Print Long or Short Report, Print Full Totals Report, Print Summary Totals Only, and Print All Precinct Totals.

   For details of the each report contents and structure refer to ABasic User Guide.

2. Verify that user is able to abort report printing.

   Expected Result

   The report printing will be successfully aborted.

   As a result, the following status message is getting displayed:
   'Printing was canceled by user request.'

3. Verify that printing is accurately terminated when printer running out of paper.

   Expected Result

   The following message will be displayed to the user indicating printing termination:
   'Failed to write to printer' with 'RETRY' and 'Cancel' button.

   If pressing 'RETRY' button, printing will be re-tried accordingly.

   If pressing 'Cancel' button, printing will be properly stopped. As a result, the following status message will be displayed:
   'Printer aborted due to error'

4. Verify results for:
   1) X-endorsed candidates.
   2) Rotated races.
   3) Accepted provisional ballots accounted.
   4) Rejected provisional ballots.

   Expected Result

   The following results are expected:
   1) The X-endorsed candidate results will match votes cast.
   2) The results for the rotated races should match what the user had voted.
   3) The accepted provisional ballots will be included in the election results tallies.

4) The rejected provisional ballots will NOT be accounted for in the election result tallies.

Verify the 'Yes' and 'No' buttons functionality in the 'Need Another Copy?' dialog.

Expected Result

The following results are expected:
Pressing 'No' button will close dialog and then will stop printing.

Pressing 'Yes' button will initiate printing of another copy of the same report (using initially specified settings).

T9959: Post-Election Mode - Challenged Voters

Status	Type	Priority	Estimate
Passed	Functional	2 - Normal	None

Milestone	Automated
None	No

Description

This test case is to verify that Challenged screen functionality in post-election mode behaves as expected.

Assumptions

None.

Steps

	Step	Expected Result
1	In the Supervisor Mode > Challenged Voters screen, verify the Provisional Voter ID(s).	All cast provisional ballots will be displayed with corresponding provisional/challenged number(s).
2	Verify that Provisional ballot is NOT included in the election result tallies by default.	By default, the 'Accept' field is set to 'No'. Tallies will not be presented in the Election Result Report.
3	Verify the 'OK', 'Cancel' and 'Select All' buttons functionality.	Pressing the 'OK' will save all changes and exit out of the Provisional ballot menu. Pressing the 'Cancel' button will cancel all changes and exit out of the Provisional ballot menu without saving changes. Pressing the 'Select All' button will select all listed ballots.
4	Select any provisional ballot and attempt to accept it using 'Accept' button.	The 'Accept' field will display 'Yes'. Tallies will not be presented in the Election Result Report.
5	Select any accepted provisional ballot and attempt to reject it using 'Reject' button and then press OK to save an updated status.	The 'Accept' field will display 'No' and the ballot will not be included in the election result tallies.
6	1) Using Ballot Station: Accept ALL provisional ballots and then save changes. Reject a few ballots and then save changes. 2) Upload election results to GEMS. Verify tallies. 3) Verify that the same ballots are displayed in the GEMS > Challenge Board.	1) BS > Ballots are accurately accepted/rejected accordingly. 2) GEMS > Results are successfully uploaded. Tallies are accurate. 3) Identical Provisional ballots are displayed in the GEMS > Challenge Board. Provisional Ballot status for corresponding ballot(s) is accurate.
7	Verify Audit Log entries are created for each accepted and rejected provisional ballot	The following entries will be displayed: 'Challenged voter accepted IDs: #' 'Challenged voter rejected IDs: #'

Results

Passed

By **R. Dhami**
1/29/2015 12:38 PM

Assigned To
I. Goldin

Version
4.5.2!

Elapsed
45m

This test has been marked as 'Passed'.

Step Results

1 In the Supervisor Mode > Challenged Voters screen, verify the Provisional Voter ID(s).

Expected Result

All cast provisional ballots will be displayed with corresponding provisional/challenged number(s).

2 Verify that Provisional ballot is NOT included in the election result tallies by default.

Expected Result

By default, the 'Accept' field is set to 'No'.
Tallies will not be presented in the Election Result Report.

3 Verify the 'OK', 'Cancel' and 'Select All' buttons functionality.

Expected Result

Pressing the 'OK' will save all changes and exit out of the Provisional ballot menu.
Pressing the 'Cancel' button will cancel all changes and exit out of the Provisional ballot menu without saving changes.
Pressing the 'Select All' button will select all listed ballots.

4 Select any provisional ballot and attempt to accept it using 'Accept' button.

Expected Result

The 'Accept' field will display 'Yes'.
Tallies will not be presented in the Election Result Report.

5 Select any accepted provisional ballot and attempt to reject it using 'Reject' button and then press OK to save an updated status.

Expected Result

The 'Accept' field will display 'No' and the ballot will not be included in the election result tallies.

6 1) Using Ballot Station:
Accept ALL provisional ballots and then save changes.
Reject a few ballots and then save changes.
2) Upload election results to GEMS.
Verify tallies.
3) Verify that the same ballots are displayed in the GEMS > Challenge Board.

Expected Result

1) BS > Ballots are accurately accepted/rejected accordingly.
2) GEMS > Results are successfully uploaded.
Tallies are accurate.
3) Identical Provisional ballots are displayed in the GEMS > Challenge Board.
Provisional Ballot status for corresponding ballot(s) is accurate.

7 Verify Audit Log entries are created for each accepted and rejected provisional ballot

Expected Result

The following entries will be displayed:
'Challenged voter accepted IDs: #'
'Challenged voter rejected IDs: #'

T9960: Post-Election Mode - Accumulator

Status	Type	Priority	Estimate
Passed	Functional	2 - Normal	None

Milestone	Automated
None	No

Description

This test case is to verify that the Accumulator functionality behaves as expected in post-election mode

Assumptions

None.

Steps

	Step	Expected Result
1	Press the 'Accumulator' button. Insure all the following columns present correct information for each accumulated card: - Machine ID - Version - Ballot (provisional ballots are counted)	All columns will contain accurate information.
2	Accumulate results for multiple cards. Verify that the results from all cards will be loaded to Accumulator, and they match the number of cast ballots	Accumulated results will be successfully loaded and will match the number of cast ballots accordingly.
3	Attempt to upload accumulated results to GEMS. Verify that the results, tallies, and ballot images are correct.	The following status message will be displayed: 'A total of <Number> result files were successfully uploaded.' Results will be successfully uploaded to GEMS. GEMS > Tallies and ballot images are accurate. BS > Upload status report will be printed listing the following information: a) Election Name and date b) Current date/time c) Number of files d) Number of files uploaded In addition, the following information will be printed for each memory card: a) Vote Center label b) Status of the upload for c) MID d) Version and Copy number of e) Total # of ballots that were uploaded from the memory card
4	Verify that the 'Export' option is exporting all accumulated cards to one PCMCIA card. Verify export data on another Ballot Station.	The selected card ONLY will be cleared. Results will no longer load automatically when re-entering Accumulator (except current results). The "<Time> Cleared MID <Number>, CPY <Number>" record will be printed for each cleared card.

5	Attempt to clear all accumulated results using 'Clear All' button. Verify that the all card with results will be cleared.	The results will be permanently cleared from Accumulator. Results will no longer load automatically when re-entering Accumulator (except current results).
6	Attempt to print accumulated results using 'Print Report' button. Verify that reports will be printed and it reflects voter selection.	You will be prompted to print Election Result Report. Depend on the amount of report precincts you have defined in a vote center (GEMS), you will have different print prompts such as: Print Long or Short Report, Print Full Totals Report, Print Summary Totals Only, and Print All Precinct Totals. For details of the report contents and structure refer to ABasic User Guide.
7	Attempt to accumulate a card with a different election.	Current election will be un-loaded. Election Name and Vote Center Name of loaded election will be displayed accordingly. Results from a different election will be accurately loaded. The following records will be printed: "<Time> Accumulator cleared" "<Time> Accumulating <Vote Center> (VC <Number>, VER <Number>)" "<Time> Accumulated MID < Number>, CPY <Number>"
8	Attempt to accumulate a card with election status as 'Election' (Election is NOT completed/closed). Verify that the BS behaves correctly	he results will NOT be loaded. The following message will be displayed: 'No test mode data or live post-election results were found. Please remove the memory card' with 'OK' button. After pressing OK, the message will be closed and then Accumulator screen with existing results will be displayed.
9	While importing results from inserted memory card, remove this memory card.	The following error message will be displayed: 'The following error has been detected: Failed to create directory \Storage Card\CurrentElection\' with 'OK' button. After pressing OK, the message will be closed. Accumulator recovers and continues without errors. Accumulated results will remain intact. System will be functioning in a normal manner after error recovery.
10	Attempt to accumulate the cards encrypted with different Security Keys.	BS will not detect the election on memory card. The following message will be displayed: 'No test mode data or live post-election results were found. Please remove the memory card' with 'OK' button. After pressing OK, the message will be closed and then Accumulator screen with existing results will be displayed.

11	Attempt to view Audit Log using 'Audit Log' button. Verify that all entries related to Accumulator activities performed in the previous test cases are logged.	The 'View Audit' screen will be displayed. All results accumulation related audit transactions will be accurately logged. Logs for individual machines will be properly displayed.
12	Attempt to print Audit Log using 'Print' button in the 'View Audit' screen. Verify that the copy of printed report is printed out, and it corresponds to Audit Log screen. NOTE: The 'Log to Printer' option under the AccuVote-TS Options in GEMS should be selected. It will allow printing Audit Log entries to the AccuVote-TS printer.	All results accumulation related audit transactions will be accurately printed.

Results

Passed

By **R. Dhami**
1/29/2015 12:32 PM

Version
4.5.21

Elapsed
1h 30m

This test has been marked as 'Passed'.

Step Results

1 Press the 'Accumulator' button.
Insure all the following columns present correct information for each accumulated card:
- Machine ID
- Version
- Ballot (provisional ballots are counted)

Expected Result

All columns will contain accurate information.

2 Accumulate results for multiple cards.
Verify that the results from all cards will be loaded to Accumulator, and they match the number of cast ballots

Expected Result

Accumulated results will be successfully loaded and will match the number of cast ballots accordingly.

3 Attempt to upload accumulated results to GEMS.
Verify that the results, tallies, and ballot images are correct.

Expected Result

The following status message will be displayed:
'A total of <Number> result files were successfully uploaded.'
Results will be successfully uploaded to GEMS.

GEMS > Tallies and ballot images are accurate.

BS > Upload status report will be printed listing the following information:
a) Election Name and date
b) Current date/time
c) Number of files
d) Number of files uploaded

In addition, the following information will be printed for each memory card:
a) Vote Center label
b) Status of the upload for
c) MID

d) Version and Copy number of
e) Total # of ballots that were uploaded from the memory card

4 Verify that the 'Export' option is exporting all accumulated cards to one PCMCIA card.
Verify export data on another Ballot Station.

Expected Result

The selected card ONLY will be cleared.

Results will no longer load automatically when re-entering Accumulator (except current results).
The "<Time> Cleared MID <Number>, CPY <Number>" record will be printed for each cleared card.

5 Attempt to clear all accumulated results using 'Clear All' button.

Verify that the all card with results will be cleared.

Expected Result

The results will be permanently cleared from Accumulator.

Results will no longer load automatically when re-entering Accumulator (except current results).

6 Attempt to print accumulated results using 'Print Report' button.

Verify that reports will be printed and it reflects voter selection.

Expected Result

You will be prompted to print Election Result Report. Depend on the amount of report precincts you have defined in a vote center (GEMS), you will have different print prompts such as: Print Long or Short Report, Print Full Totals Report, Print Summary Totals Only, and Print All Precinct Totals.

For details of the report contents and structure refer to ABasic User Guide.

7 Attempt to accumulate a card with a different election.

Expected Result

Current election will be un-loaded.

Election Name and Vote Center Name of loaded election will be displayed accordingly.

Results from a different election will be accurately loaded.

The following records will be printed:
"<Time> Accumulator cleared"
"<Time> Accumulating <Vote Center> (VC <Number>, VER <Number>)"
"<Time> Accumulated MID < Number>, CPY <Number>"

8 Attempt to accumulate a card with election status as 'Election' (Election is NOT completed/closed).
Verify that the BS behaves correctly

Expected Result

he results will NOT be loaded.
The following message will be displayed:

'No test mode data or live post-election results were found. Please remove the memory card'
with 'OK' button.

After pressing OK, the message will be closed and then Accumulator screen

with existing results will be displayed.

9 While importing results from inserted memory card, remove this memory card.

Expected Result

The following error message will be displayed:
'The following error has been detected: Failed to create directory \Storage Card\CurrentElection\' with 'OK' button.

After pressing OK, the message will be closed.
Accumulator recovers and continues without errors.
Accumulated results will remain intact.

System will be functioning in a normal manner after error recovery.

10 Attempt to accumulate the cards encrypted with different Security Keys.

Expected Result

BS will not detect the election on memory card.
The following message will be displayed:
'No test mode data or live post-election results were found. Please remove the memory card'
with 'OK' button.

After pressing OK, the message will be closed and then Accumulator screen with existing results will be displayed.

11 Attempt to view Audit Log using 'Audit Log' button.

Verify that all entries related to Accumulator activities performed in the previous test cases are logged.

Expected Result

The 'View Audit' screen will be displayed.

All results accumulation related audit transactions will be accurately logged.

Logs for individual machines will be properly displayed.

12 Attempt to print Audit Log using 'Print' button in the 'View Audit' screen. Verify that the copy of printed report is printed out, and it corresponds to Audit Log screen.

NOTE:
The 'Log to Printer' option under the AccuVote-TS Options in GEMS should be selected. It will allow printing Audit Log entries to the AccuVote-TS printer.

Expected Result

All results accumulation related audit transactions will be accurately printed.

T9961: Post-Election Mode - Audit Log

Status	Type	Priority	Estimate
Passed	Functional	2 - Normal	None

Milestone	Automated
None	No

Description

This test case is to verify that the Audit Log functionality behaves as expected in post-election mode.

Assumptions

None.

Steps

	Step	Expected Result
1	From the drop down box select 'election.adt' Verify log entries. Verify activities relating to the election database were recorded automatically whenever Ballot Station is on (including power disruption).	The audit log will be displayed and will display entries related to events that have occurred.
2	Verify Audit log is permanent and cannot be deleted or altered.	Audit logs are permanent
3	Verify that you can print the audit log. Verify accuracy	The audit log will print successfully and will match the entries on the screen.

Results

Passed

By **R. Dhami**
1/29/2015 12:31 PM

Assigned To
I. Goldin

Version
4.5.2!

Elapsed
20m

This test has been marked as 'Passed'.

Step Results

1 From the drop down box select 'election.adt'

Verify log entries.

Verify activities relating to the election database were recorded automatically whenever Ballot Station is on (including power disruption).

Expected Result

The audit log will be displayed and will display entries related to events that have occurred.

2 Verify Audit log is permanent and cannot be deleted or altered.

Expected Result

Audit logs are permanent

3 Verify that you can print the audit log. Verify accuracy

Expected Result

The audit log will print successfully and will match the entries on the screen.

GEMS 1.18.22G

Revision: 1.0

Election Systems & Software, LLC

Department Author: Quality Assurance

Released by: Director, Quality Assurance

Document ID: ESSSYS_GEMS_1'18'22G_TESTRUN

Disclaimer

Election Systems & Software does not extend any warranties by this document. All product information and material disclosure contained in this document is furnished subject to the terms and conditions of a purchase or lease agreement. The only warranties made by Election Systems & Software are contained in such agreements. Users should ensure that the use of this equipment complies with all legal or other obligations of their governmental jurisdictions.

All ES&S products and services described in this document are registered trademarks of Election Systems & Software. All other products mentioned are the sole property of their respective manufacturers.

Proprietary Information

ES&S has identified and appropriately marked relevant portions of this document, which it considers confidential and proprietary. We request confidential treatment by the EAC of such information and would expect that such information is exempt from required disclosure. In the event that a third party requests disclosure of information which ES&S considers confidential and proprietary, we would ask that the EAC notify ES&S of such requested disclosure in order to provide us with an opportunity to seek exemption from disclosure.

The document sections referenced below contain Election Systems and Software, LLC. (ES&S) confidential information, which is provided for the sole purpose of permitting the recipient, to evaluate the ES&S Voting System submitted herewith. The following sections are designated as "Proprietary and Confidential" by Election Systems & Software.

Document Security Level	Proprietary Commercial Information – Contains trade secret information, including, but not limited to, drawings, processes, methods or procedures developed by ES&S. Approved for internal and ES&S authorized VSTL use only.

Table of Contents

1. **Test Case Summary** 1

2. **Test Case Detail** 3

This page intentionally left blank.

Table of Changes

Version	Date	Notes
0.1	*02.05.2015*	*Initial draft. – CC*
1.0	*02.05.2015*	*Updated test case content. – TO*

This page intentionally left blank.

1. REGRESSION TEST CASE SUMMARY

R233: Test Run - WinCE 410.3.5

Georgia - Ballot Station and WinCE

Created On	1/12/2015
Completed	No

Passed	Blocked	Untested	Retest	Failed
100% (3/3)	0% (0/3)	0% (0/3)	0% (0/3)	0% (0/3)

1. All Test Cases

ID	Title	Status
T9346	Upgrading WinCE operating system on AccuVote TSX	Passed
T9348	Volume/Stress Test	Passed
T9350	PCMCIA card detection	Passed

2. REGRESSION TEST CASE DETAIL

R233: Test Run - WinCE 410.3.5

Georgia - Ballot Station and WinCE

Created On 1/12/2015

Completed No

Passed	Blocked	Untested	Retest	Failed
100% (3/3)	0% (0/3)	0% (0/3)	0% (0/3)	0% (0/3)

1. All Test Cases

T9346: Upgrading WinCE operating system on AccuVote TSX

Status	Type	Priority	Estimate
Passed	Functional	2 - Normal	None

Milestone	Automated
None	No

Assumptions

AVTSX unit is configured using the following:
1. WinCE: WCER7-410.3.4
2. Ballot Station: 4.5.2!
3. PCMCIA card with the following WCER7-410.3.5 installation files:
- eboot.nb0
- nk.bin
- erasereg.des

Steps

	Step	Expected Result
1	Make sure that the AVTSX unit is turned off, insert created PCMCIA card (with WCER7-410.3.5 installation files) into the upper card slot and then turn unit on.	AVTSX unit is turned on and then the installation process will be initialized. The following status messages will appear accordingly: Copyright © Diebold Election Systems 2003-2005 B/L Version: BLR7-1.3.3 Extracting EBOOT.MBO... Loaded file matches flash ERASEREG.DES found... Erasing Flash... Extracting NK.BIN... Erasing Flash... Writing Flash... Successful write to image of flash Erasing Flash... Writing Flash... Copying OS image... Launching OS... Following the Bootup screen, the Calibration screen will appear.
2	Complete and save the screen calibration settings.	Calibration is saved and then the following initial setup prompt message will appear: "First time setup. Need to set machine Serial number and date"

3	In the displayed setup message, press OK button.	Setup message is getting closed and then the 'System Setup' screen will be displayed.
4	In the 'System Setup' screen, enter an appropriate machine serial number in 'MachineSN' field. Using 'Set Date' function, update the time/date (if required). Press OK button.	Initial setup is saved, the 'System Setup' screen will be closed and then the dialog to download election will appear.
5	Using step 1, re-install the same version of WinCE (410.3.5).	AVTSX unit is turned on and then the installation process will be initialized. The following status messages will appear accordingly: Copyright © Diebold Election Systems 2003-2005 B/L Version: BLR7-1.3.3 Extracting EBOOT.MBO... Loaded file matches flash ERASEREG.DES found... Erasing Flash... Extracting NK.BIN... Erasing Flash... Writing Flash... Loaded image matches flash Erasing Flash... Writing Flash... Copying OS image... Launching OS... Following the Bootup screen, the Calibration screen will appear.
6	Complete the screen calibration settings. Complete the initial setup.	As a result, the dialog to download election will be displayed.
7	Verify that the WinCE upgrade can be accomplished using lower slot for PCMCIA card.	WinCE is getting installed properly.

Results

Passed

By I. Goldin
1/20/2015 5:44 PM

Version
410.3.5

This test has been marked as 'Passed'.

Step Results

1 Make sure that the AVTSX unit is turned off, insert created PCMCIA card (with WCER7-410.3.5 installation files) into the upper card slot and then turn unit on.

Expected Result

AVTSX unit is turned on and then the installation process will be initialized.
The following status messages will appear accordingly:

Copyright © Diebold Election Systems 2003-2005
B/L Version: BLR7-1.3.3
Extracting EBOOT.MBO...
Loaded file matches flash
ERASEREG.DES found...
Erasing Flash...
Extracting NK.BIN...
Erasing Flash...
Writing Flash...

Successful write to image of flash
Erasing Flash...
Writing Flash...
Copying OS image...
Launching OS...

Following the Bootup screen, the Calibration screen will appear.

2 Complete and save the screen calibration settings.

Expected Result

Calibration is saved and then the following initial setup prompt message will appear:
"First time setup. Need to set machine Serial number and date"

3 In the displayed setup message, press OK button.

Expected Result

Setup message is getting closed and then the 'System Setup' screen will be displayed.

4 In the 'System Setup' screen, enter an appropriate machine serial number in 'MachineSN' field.
Using 'Set Date' function, update the time/date (if required).
Press OK button.

Expected Result

Initial setup is saved, the 'System Setup' screen will be closed and then the dialog to download election will appear.

5 Using step 1, re-install the same version of WinCE (410.3.5).

Expected Result

AVTSX unit is turned on and then the installation process will be initialized.
The following status messages will appear accordingly:

Copyright © Diebold Election Systems 2003-2005
B/L Version: BLR7-1.3.3
Extracting EBOOT.MBO...
Loaded file matches flash
ERASEREG.DES found...
Erasing Flash...
Extracting NK.BIN...
Erasing Flash...
Writing Flash...
Loaded image matches flash
Erasing Flash...
Writing Flash...
Copying OS image...
Launching OS...

Following the Bootup screen, the Calibration screen will appear.

6 Complete the screen calibration settings.
Complete the initial setup.

Expected Result

As a result, the dialog to download election will be displayed.

7 Verify that the WinCE upgrade can be accomplished using lower slot for PCMCIA card.

Expected Result

WinCE is getting installed properly.

Assigned

This test has been assigned to Igor Goldin.

By I. Goldin
1/20/2015 5:42 PM

Assigned To
I. Goldin

Assigned

This test has been assigned to Ravina Dhami.

By T. Omel
1/12/2015 5:08 PM

Assigned To
R. Dhami

T9348: Volume/Stress Test

Status	Type	Priority	Estimate
Passed	Functional	2 - Normal	None

Milestone	Automated
None	No

Assumptions

Macro (Recording/Playback) functionality is enabled (in Supervisor Mode).

Steps

	Step	Expected Result
1	Conduct Volume test using the following modes: - VIBS & Magnify - Non-VIBS	20000 votes can be cast without any failures using Macro playback.

Results

Passed

By **I. Goldin**
1/29/2015 11:37 AM

Version
410.3.5

This test has been marked as 'Passed'.

Step Results

1 Conduct Volume test using the following modes:
- VIBS & Magnify
- Non-VIBS

Expected Result

20000 votes can be cast without any failures using Macro playback.

Assigned

By **I. Goldin**
1/20/2015 5:42 PM

Assigned To
I. Goldin

This test has been assigned to Igor Goldin.

Assigned

By **T. Omel**
1/12/2015 5:08 PM

Assigned To
R. Dhami

This test has been assigned to Ravina Dhami.

T9350: PCMCIA card detection

Status	Type	Priority	Estimate
Passed	Functional	2 - Normal	None

Milestone	Automated
None	No

Assumptions

None.

Steps

	Step	Expected Result
1	Detect varies brand & model of PCMCIA cards - SanDisk - SMART Modular Technologies ATA - Diebold branded at the following stages: 1. Boot up 2. Ejection/Insertion	All brands of PCMCIA cards are properly detected.
2	Attempt to boot up the AVTSX unit with NO PCMCIA card inserted.	AVTSX successfully boots up.

Results

Passed

By **I. Goldin**
1/20/2015 5:45 PM

Version
410.3.5

This test has been marked as 'Passed'.

Step Results

1 Detect varies brand & model of PCMCIA cards
- SanDisk
- SMART Modular Technologies ATA
- Diebold branded

at the following stages:
1. Boot up
2. Ejection/Insertion

Expected Result

All brands of PCMCIA cards are properly detected.

2 Attempt to boot up the AVTSX unit with NO PCMCIA card inserted.

Expected Result

AVTSX successfully boots up.

Assigned

By **I. Goldin**
1/20/2015 5:42 PM

Assigned To
I. Goldin

This test has been assigned to Igor Goldin.

Assigned

This test has been assigned to Ravina Dhami.

By **T. Omel**
1/12/2015 5:08 PM

Assigned To
R. Dhami

Certification Test Plan
For the
TSx DRE running Ballot Station 4.5.2! and WinCE 410.3.5

Introduction

During the Logic and Accuracy testing of the November 2014 General Election ballot, it was noted that some TSx units failed to complete the printing of the summary report. The units would discontinue printing when a specific race in the election was encountered. The anomaly did not impact the long report version of the pre- and post-election tapes, nor did it impact vote capture or vote tabulation.

The anomaly was traced to a buffer interrupt issue within the installed version of the Windows operating system on the DRE: WinCE 410.3.4. Tests at the Center for Election Systems and at Election Systems & Software (ES&S) confirmed the presence of the error in the interrupt handling routines of WinCE 410.3.4. This anomaly was addressed in a subsequent release of WinCE: WinCE 410.3.5.

When the operating system was updated to WinCE 410.3.5, the anomaly no longer manifested itself. No modifications to the TSx application, Ballot Station 4.5.2! or to the TSx hardware or firmware were required. The TSx units were tested separately and as part of the overall voting system.

Subsequent tests, including a pilot test in Rabun County during the March 17, 2015 election, indicate that the interrupt handling routines are executing properly and that the application software, operating system, hardware, and functionality of the DRE are consistent with Georgia statutes, rules, and regulations regarding voting system components.

Conclusion

The TSx DRE, with Ballot Station 4.5.2! and WinCE 410.3.5 installed, is in conformance with Official Code of the State of Georgia statutes related to voting machines and election administration and the applicable Rules of the State Election Board and Rules of the Secretary of State of Georgia. The source code, updated version of the operating system and related documentation, is consistent with industry standards and is held in escrow at the Center for Election Systems, Kennesaw State University.

The TSx successfully passed all tests in the Test Plan, including the March 17, 2015 election pilot test in Rabun County, Georgia.

Product Description

TSx Direct Record Electronic (DRE) Voting System Unit

- D Tablet
- Ballot Station 4.5.2!
- WinCE 410.3.5
- PCMCIA Memory Card

The TSx DREs used in the test were manufactured by Diebold, Inc. and Premier Election Solutions between 2006 and 2008. All units used were purchased from Premier Election Solutions or ES&S. Memory cards were acquired at purchase and are the standard PCMCIA cards used throughout the state of Georgia. The install program, provided by ES&S, contained an installer and the certified version of Ballot Station 4.5.2!, associated SSL certificate, and WinCE 410.3.5. The install program was validated by comparing hash signatures.

The preparation of election databases and subsequent tabulation of the memory cards was done on a certified and acceptance tested installation of GEMS 1.18.22G!

Overview of the Certification Test

The DRE was tested with the following configurations:

- ExpressPoll 4000, running ExpressPoll software version 2.1.2
- ExpressPoll 5000, running ExpressPoll software version 2.1.2
- The November 2014 voters list for the state of Georgia, including existing Drivers license numbers and voter registration numbers
- Premier Election Solutions TSx units (D tablet), running Ballot Station 4.5.2! and WinCE 410.3.5
- Vision Server, Windows 2000 SP 4, running GEMS 1.18.22G!

Seven (7) TSx DRE units were prepared for the test with validated versions of the Ballot Station 4.5.2! and WinCE 410.3.4 installed. All software was validated through hash signature comparisons. The units were acceptance tested to ensure they conformed to the state certified version. All units passed the state of Georgia DRE acceptance test. Memory cards were prepared with the November 2014 General Election database, used in Gwinnett County.

All units manifested the error condition when attempting to print the summary report.

The DREs were then upgraded to WinCE 410.3.5. All units were acceptance tested and passed. The Certification Tests were repeated. No units manifested errors – all reports were properly initiated and completed.

The units were then downgraded to WinCE 410.3.4 and all tests repeated. All units manifested the error condition.

All units were then upgraded to WinCE 410.3.5 and all tests repeated. No errors were manifested.

The Center staff reviewed testing documentation and results provided by ES&S. All KSU testing methods and test results were compared with those provided by ES&S. The testing at ES&S confirmed the results and conclusions of those tests performed by the Center at KSU.

ES&S Documentation

- Communication Port Interrupt Analysis
- Test Cases: Regression Testing
- Test Cases: Test Run
- System Test Plan

APPENDIX A

Certification Test Plan
of the
TSx DRE with Ballot Station 4.5.2! and WinCE 410.3.5

Overall Objective

The purpose of the test was to verify that 1) an updated version of the DRE's operating system (OS) would correct a printing anomaly; 2) the updated version of the OS had no negative impact on the functionality of the DRE; and 3) the updated DRE worked properly with the rest of the certified voting system.

Phase I: Functionality

The purpose of these tests is to verify that the updated version of the OS permitted the DRE to perform all required DRE functions: vote capture, tabulation, and report printing.

1. Verify that all DREs used in the test pass Georgia's DRE acceptance test.
2. Verify that all DREs used in the test will consistently manifest the printing anomaly when running Ballot Station 4.5.2! and WinCE 410.3.4.
3. Update the DRE OS to WinCE 410.3.5.
4. Verify that the updated DREs pass the Georgia DRE acceptance test.
5. Load November 2014 General Election ballots onto clean memory cards from GEMS 1.18.22G! server.
6. Install memory cards and load elections on DREs.
7. Check summary reports and long reports
8. Vote a set of Logic and Accuracy (L&A) pattern ballots (every position on the ballot, including blank ballots are voted) using standard user interface.
9. Vote L&A ballot set using VIBs (vision impaired ballot) kit.
10. Vote L&A ballot set in magnified screen setting.
11. End the election and verify correct DRE reports
12. Upload memory cards to server and tabulate.
13. Compare vote totals on DREs and Server-generated reports.
14. Restore DREs to 410.3.4 OS.
15. Repeat steps 1 through 13.

Phase II: Interoperability

1. Test DREs with voter access cards created on a DRE.

2. Test DREs with voter access cards created by an ExpressPoll running EZRoster 2.1.2.

3. Test DREs with GEMS servers

4. Test DREs with VIBs kit.

Phase III: Pilot

Fifteen (15) TSx DREs were upgraded to WinCE 410.3.5 and used in the March 17, 2015 election in Rabun County. All units were acceptance tested and all units performed correctly during Logic and Accuracy testing, advanced voting, and Election Day.

Hardware Definition

TSx DREs

- 262912
- 271708
- 280273
- 286367
- 289097
- 289618
- 295211

ExpressPoll 5000

- SOGV013A

Vision Server

- 2138650

Georgia Voter Access Cards

All hardware and software use in this test were Acceptance Tested.

Software Definition

ExpressPoll 2.1.2
Security Key 4.5+
Ballot Station 4.5.2! with WinCE 410.3.4
Ballot Station 4.5.2! with WinCE 410.3.5
GEMS 1.18.22G!

Data Files

The Georgia Acceptance Test Database
State of Georgia Voter Registration List implemented on ExpressPoll
November 2014 General Election database for Gwinnett County

Background

Ballot Station 4.5.2 communicates with the printer through the communication port. While running on WinCE 410.3.4, it was observed that during the printing of the summary report, the data buffer can't be written to the communication port as fast as the baud rate permits. The buffer transfer rate was 16 bytes every two seconds.

Further analysis determined the cause of this problem is within WinCE 410.3.4 and related to the configuration of the Communication Port Interrupts.

The issue was manifested while cleaning up the platform SDK source code. A snippet of code that explicitly disables interrupts was left in the source code repository. This caused the UART to receive an incorrect interrupt status.

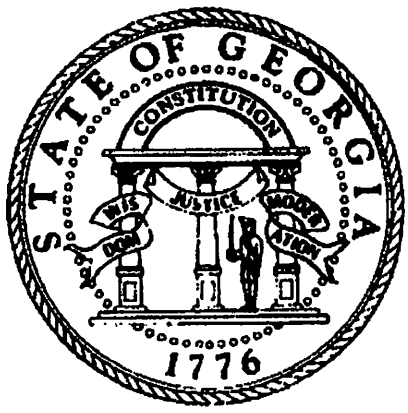
The external UARTS (COM4 and COM5) look for interrupts that come in on the IRQ line. They do this by looking for a rising edge (i.e. off / on, not interrupt / interrupt). When they see this transition, they stop monitoring this line until they complete the action caused by the interrupt. When complete, they go back to monitoring the interrupt line – that is, looking for the transition from off to on. Unfortunately, if another interrupt has occurred in the meantime (that is, turned the line on), it is not detected because the UART missed the transition from off to on. The code change mentioned above, effectively forced the UART to check the actual state of the interrupt and not the transition from off to on.

Resolution

The issue described above was corrected in WinCE 410.3.5. This version removes the two lines of code associated with Rising Edge detection of the interrupt.

The target source code file is Interrupt.c, located in the AVTSWildCat410/Platform/WildCat/Kernel/Hal directory.

Certification Test Of the Global Election Systems, Inc. AccuVote TS R6 Voting System



Prepared for:

Elections Division
Office of the Secretary of State
State of Georgia

Prepared by:

Britain J. Williams, Ph.D.
Department of Computer Science and Information Systems
Kennesaw State University
Kennesaw, Georgia, 30144

August 20, 2001

Contents

1.	Introduction		2
2.	Conclusions		2
3.	System Description		2
	3.1	System Hardware/Firmware	3
	3.2	System Software/Election Management System	3
	3.3	System and Test Documentation	3
	3.4	Overview of System Operation	4
4.	Compliance With Applicable Statues and Standards		5
	4.1	Federal Election Commission Voting System Standards	5
	4.2	Georgia Election Code	6
5.	Certification Test		8
	5.1	Test System	8
	5.2	Election Definition, Setup, and Execution	8
	5.3	Situation Tests	8
6.	Observations and Comments		9
	6.1	Absentee Voting	9
	6.2	External Audit Trail	9
	6.3	Built-in Checks and Balances	10
	6.4	Challenged Voters	10
	6.5	Ease of Use	10
		Proprietary Data Transfer Device	10
Appendix A:	Certification Test Plan		11
Appendix B:	Participants/Attendees		14

1. Introduction

Certification Tests of the Global AccuVote TS R6 Voting System were conducted at Kennesaw State University on July 25 and 26, 2001. The purpose of these tests was to determine the extent to which the AccuVote TS R6 Voting System complies with the provisions of the Georgia Election Code, the Rules of the Georgia Election Board, and the Rules of the Secretary of State. The Test Plan that was followed is contained in Appendix A.

Britain J. Williams, election officials from several Georgia counties, and representatives from Global Election Systems, Inc. conducted these tests. A list of the test participants is contained in Appendix B.

2. Conclusions

The Global AccuVote TS Voting System was found to be in compliance with the applicable provisions of the Georgia Election Code, the Rules of the Georgia Election Board, and the Rules of the Secretary of State.

3. System Description

The system tested was the **AccuVote TS Voting System**, presented by Global Election Systems, Inc., 1611 Wilmeth Road, McKinney, Texas, 75069-8250. This system is composed of the **AccuVote TS R6 Voting Station** and its associated software, the **Precinct Card Manager**, and a commercial notebook computer running the **Global Election Management System (GEMS)**.

3.1 System Hardware/Firmware

The hardware tested consisted of:

- A **commercial notebook computer** supporting the **Global Election Management System (GEMS)**. This computer was a standard, off-the-shelf personal computer with no modifications.

Four **AccuVote TS R6 Voting Stations** provided the voter interface. This device is a custom-designed, microprocessor-based voting machine. The Ballot Station is approximately 24" by 14" by 6". Contests and issues are displayed on a touch-sensitive screen on the face of the device and the voter makes their selection by pressing indicated spots on the screen. Write-in candidates are entered on an alphabetic keyboard which appears on the face of the Ballot Station when a write-in is selected. The device is programmed for an election by a PCMCIA card prepared by the Global Election Management System (GEMS) and is activated for each voter by the use of a smart card prepared by the precinct worker.

The **Precinct Card Manager** is a small, hand held device about 4" x 5" by 0.5" that is used to program the smart cards for the voters.

3.2 System Software/Election Management System

Windows CE is the operating system used by the personal computers which support the Global Election Management System and the Poll Book systems. Windows CE is also the operating system that controls the functions of the Voting Stations.

The **Global Election Management System (GEMS)**, Version 1.17.15, is a Global proprietary system which runs on a standard personal computer and performs the following pre-election functions: setup the election data base, create a new election, enter contests and issues, define ballot styles, and produce the PCMCIA cards that are used to program the voting stations in the precincts and the absentee ballot scanners. After the polls close, this system reads the PCMCIA cards from the precincts, tallies the votes, and prints the various reports and audit data.

AVTS, Version 4.0.6 is a Global proprietary system which runs the voting stations.

3.3 System and Test Documentation

GEC Technical Data Package for Global Election Systems GEMS Software, GEMS Version 1-17, Global Election Systems, April 20, 2001

GEMS FEC Compliance Overview, GEMS Version 1-17, Revision 1.0, Global Election Systems, April 1, 2001

AccuVote-TS R6 FEC Compliance Overview, Document Revision 1.0, Global

Election Systems, April 30, 2001
AccuVote-TS R6 System Hardware Specification, Document Revision 1.0, Global Election Systems, April 30, 2001

AccuVote-TS Hardware Guide, Document Revision 1.0, Global Election Systems, April 30, 2001

AccuVote-TS User's Guide, GEMS Touch Screen Client 4.1, Document Revision 1.0, Global Election Systems, April 30, 2001

AccuVote-TS R6 System Software Specification, Document Revision 1.0, Global Election Systems, April 30, 2001

Global Election Systems, Inc. Software Qualification Test Report GEMS 1-17-15, Metamor Independent Test Authority, June 28, 2001

GEMS User Guide, GEMS Version 1.0, Document Revision 1.0, Global Election Systems, April 1, 2001

Source Code, GEMS Version 1-17-15, Global Election Systems, May 1, 2001

Source Code, ATVS Version 4.0, Global Election Systems, May 1, 201

3.4 Overview of System Operation

Election Definition: The following functions are performed by the Global Election Management System (GEMS).

Create the election database.

Enter races and candidates, issues and options that are to appear in the election

Select the races and issues that are to appear on each ballot style.

Enter headings and instructions as they are to appear on the ballots.

Format the ballots.

Hardware Progarmming: Once the election definition is complete, the PCMCIA cards can be prepared to control the AccuVote TS voting stations and

the AccuVote OS optical scan ballot scanners. A PCMCIA card must be prepared for each voting station and each ballot scanner.

Precinct Setup: The voting stations and ballot scanners are prepared for the election by inserting the PCMCIA cards and powering up the device. The device performs a self test and is then ready for pre-election testing.

Election Day (Precinct) Activities: As the polls are opened and each device is powered up, the device performs a self test and presents a menu with the various options allowed at the polling place. If the 'open polls' option is selected, the registers are set to zero and a 'zero totals' tape is printed.

When the polls are closed, the vote totals from each device are recorded to the PCMCIA cards. These cards are then transported to a central counting location for entry into the GEMS system for tallying and reporting. If desired, unofficial results from the precincts can be transmitted to the central location via modem.

Vote Tallying/Report Printing: The PCMCIA cards from each precinct are returned to the central facility where they are loaded into the GEMS. During this step, any known errors can be manually corrected and absentee votes can be entered.

At any time during the tally of the votes or at the completion of vote tallying, election result can be printed by precinct or overall. These reports can also be exported to other systems or posted on the Internet.

The system administrator can use the GEMS to print the various audit logs.

4. Compliance With Applicable Statues and Standards

4.1 Federal Election Commission Voting System Standards

Hardware/Firmware: The AccuVote TS R6 Voting System hardware and firmware was examined by Wyle Laboratories, Huntsville, Alabama and found to be in compliance with the hardware specifications contained in the FEC Voting System Standards. Wyle is an Independent Test Agency approved by the National Association of State Election Directors (NASED).

Software: The GEMS election management software was examined by MetaMore, Inc., Huntsville, Alabama and found to be in compliance with the software specifications contained in the FEC Voting System Standards. MetaMore, Inc. is an Independent Test Agency approved by the National

Association of State Election Directors.

4.2 Georgia Election Code

The AccuVote TS R6 Voting System is classified as a direct recording electronic voting system. The Georgia Election Code, Section 21-3-379.1, regulates systems of this type.

No direct electronic recording voting system shall be adopted or used unless it shall, at the time, satisfy the following requirements:

(i) It shall provide facilities for voting for such candidates as may be nominated and upon such questions as may be submitted;

The AccuVote TS R6 Voting System satisfies this requirement.

(ii) It shall permit each elector, in one operation, to vote for all candidates of one party of body for presidential electors;

The AccuVote TS R6 Voting System satisfies this requirement.

(1) Except as provided in paragraph (2) of this Code section for presidential electors, it shall permit each elector, at other than primaries, to vote a ticket selected from nominees of any and all parties or bodies, from independent nominations, and from persons not in nomination;

The AccuVote TS R6 Voting System satisfies this requirement.

(2) It shall permit each elector to vote, at any election, for any person and for any office for whom and for which he or she is lawfully entitled to vote, whether or not the name of such person or persons appears as a candidate for election, to vote for as many persons for an office as he or she is entitled to vote for; and to vote for or against any question upon which he or she is entitled to vote;

The AccuVote TS R6 Voting System satisfies this requirement. Tests included multiple candidates for a single office and write-in candidates.

(3) It shall preclude the counting of votes for any candidate or upon any question for whom or upon which an elector is not entitled to vote; shall preclude the counting of votes for more persons for any office than he or she is entitled to vote for; and shall preclude the counting of votes for any candidate for the same office or upon any question more than once;

The AccuVote TS R6 Voting System satisfies this requirement. Tests indicated that the voter was only able to see and vote on the assigned ballot style. The system does not allow over-votes. Once the allowed number of candidates has been selected, the voter cannot select another candidate without first releasing one of the previously selected candidates. Tests were conducted to ensure that a voter could not write in the same name multiple times in a multi-candidate contest.

(4) *It shall permit voting in absolute secrecy so that no person can see or know for whom any other elector has voted or is voting save an elector whom he or she has assisted or is assisting in voting, as prescribed by law.*

The AccuVote TS R6 Voting System satisfies this requirement.

(5) *It shall be constructed of material of good quality in a neat and workmanship like manner;*

The AccuVote TS R6 Voting System satisfies this requirement. The quality of the materials and workmanship was reviewed by the hardware/firmware ITA, Wyle Laboratories.

(6) *It shall, when properly operated, record correctly and accurately every vote cast;*

The AccuVote TS R6 Voting System satisfies this requirement. The hardware ITA, Wyle Laboratories, and the software ITA, MetaMore, Inc., extensively tested this requirement. The State certification tests included logic and accuracy tests, but with a smaller number of ballots that the tests conducted by the ITAs.

(7) *It shall be so constructed that an elector may readily learn the method of operating it;*

In order to vote, the voter must press a pressure sensitive spot beside the name of the candidate. When the spot is pressed, a lighted square contining a large X appears beside the candidate's name. The election officials, listed in Appendix B, that participated in these tests did not have undue difficulty voting on the AccuVote TS R6 Voting System.

(8) *It shall be safely transported.*

The portion of the system that is installed in the precinct, the AccuVote TS

R6 voting stations Precinct Card Manager are small and easily transported. See Section 3.2, System Hardware/Firmware.

5. Certification Test

The certification test was designed to test the AccuVote TS R6 Voting System for compliance with the Georgia Election Code, the Rules of the Georgia Election Board, and the Rules of the Secretary of State. The following sections contain an overview of the outcome of these tests. The Test Plan is contained in Appendix A.

5.1 Test System

The GEMS System was supported on a personal computer running Windows CE. Four AccuVote TS R6 voting stations were arranged in two precincts.

5.2 Election Definition, Setup, and Execution

These tests were designed to simulate the scenarios and environments typically encountered in the State of Georgia. A primary and a general election consisting of eight precincts were defined. Georgia election officials set up the general election, opened the polls, voted a pre-specified set of ballots, closed the polls, tallied the results, and printed the reports.

These tests were successfully completed.

5.3 Situation Tests

These tests were designed to test and evaluate the AccuVote TS R6 Voting System under various conditions that may be encountered.

Logic and Accuracy: This test is similar to the 'Logic and Accuracy' test that is performed in a precinct prior to the start of voting. The AccuVote TS R6 Voting System successfully passed this test.

Handicapped Access Tests: A AccuVote TS R6 Voting Station may be unplugged and placed in a voters lap or taken to the curbside to accommodate an impaired voter.

The ballot image can be displayed in large type to accommodate a visually impaired voter.

Simulate Typical Voter Errors: The AccuVote TS R6 Voting System was set up for voting and typical voter errors were attempted. The system successfully prevented all attempts to violate the system via the voter interface.

Simulate Typical Election Setup/Tallying Errors: Attempts were made to violate the election management system during election setup and post election tallying and reporting. The AccuVote TS R6 Voting System performed as expected in each of these tests.

6. Observations and Comments

The following features and characteristics of the AccuVote TS R6 Voting System should be considered by anyone planning to use the system.

6.1 Absentee Voting

The AccuVote TS R6 Voting System has a provision for absentee voting using optical scan ballots The GEMS system can prepare PCMCIA cards to program the AccuVote OS ballot scanners for use as an absentee voting system. The AccuVote OS ballot scanners have been previously certified for use in Georgia and are currently in use in several counties.

6.2 External Audit Trail

The AccuVote TS R6 system does not have the capability to print a copy of each voter's ballot choices in a format that is suitable for use as a voter verified audit trail.

6.3 Recount of an Election

The lack of a written copy of the voters choices means that a re-count of an election can only be accomplished by re-reading and listing the internal memory storage areas of the system. If this data has been recorded incorrectly, then *all* subsequent printouts of this data will reflect this incorrectness.

6.4 Challenged Voter

The AccuVote TS R6 Voting System's has a built-in facility for allowing a challenged voter to vote on the touch screen system. However, during these tests this feature did not work properly. The absentee system can be used for challenged voters.

Appendix A.

Global Election Systems
Certification Test Plan
for the
State of Georgia

This Test Plan is designed to test the Global AccuVote TS R6 Voting System and its associated software and firmware for compliance with the Georgia Election Code, the Rules of the Georgia Election Board, and the Rules of the Georgia Secretary of State.

PHASE I: Election Definition, Setup, and Execution. The following tests are designed to simulate election scenarios and environments typically encountered in the State of Georgia..

A. ELECTION DEFINITION TEST: This test will perform the election definition for a primary and general election for up to ten precincts and create an administrative database. The State of Georgia will provide the election definitions.

Define a primary and general election.
Define ballot images.
Program memory cards and/or PROMS for each precinct.
Print all reports available to audit the process.

B. PRIMARY ELECTION: Simulate the primary election defined in Phase I.A.

1. Setup and prepare the precinct systems for the primary election.
2. Cast the ballots for each precinct.
3. Simulate the end of the election and close all precincts.
4. Print all logs and reports.
5. Print results and audit results against predetermined results.

C. GENERAL ELECTION: Simulate the general election defined in Phase I.A.

1. Setup and prepare the precinct systems for the general election.
2. Cast the ballots for each precinct.
3. Demonstrate Early Voting on the system.
4. Demonstrate Absentee Voting on the system.
5. Simulate the end of the election and close all precincts.
6. Print all logs and reports.
7. Print results and audit results against predetermined results.

PHASE II: Situation Tests. The following tests are designed to test the performance of the Global AccuVote TS R6 Voting System under various conditions that may be encountered.

A. ALL POSITIONS TEST: This test is designed to demonstrate that the voting station will accurately read and record votes cast in every possible voting position.

1. Setup and prepare the system for the all positions test.
2. Load an election definition that will test the system's ability to read and tabulate all possible voting positions.
3. Cast ballots that utilize all voting positions.
4. Simulate the end of the election.
5. Print all logs and audit reports.
6. Print all election reports and audit results against the predetermined results.

B. HANDICAPPED ACCESS TESTS: These tests are designed to test the system's capability to accommodate persons with disabilities.

1. Setup and prepare the system for handicapped access tests.
2. Load an election definition provided by Global that will test the ability of the system to accommodate handicapped voters.
3. Cast ballots using the various handicapped access methods.
4. Simulate the end of the election.
5. Print all logs and audit reports.
6. Verify all election reports and audit results against the predetermined results.

C. SIMULATE TYPICAL VOTER ERRORS: These tests are designed to test the system's response to the various errors that are typically encountered on Election Day.

1. Setup and prepare the system for one precinct.
2. Load one of the election definitions defined in Phase I.
3. Cast ballots simulating various error conditions.
4. Simulate typical election-day errors and attempts to defeat system controls.
5. Simulate the end of the election.
6. Print all logs and audit reports.
7. Print all election reports and audit results against the predetermined results.

D. SIMULATE TYPICAL ELECTION SETUP ERRORS: These tests are designed to test the system's response to the various errors typically encountered during pre-election setup and post-election tallying and reporting.

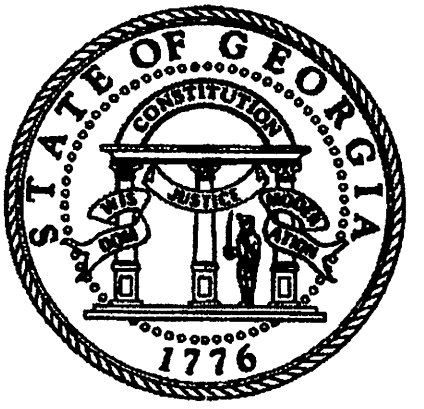
1. Use one of the election definitions described in Phase I to perform the following.
2. Simulate typical election setup errors and demonstrate the steps required to correct each error.
3. Load the election definition into a precinct system and demonstrate that all errors were successfully corrected.
4. Simulate typical poll worker errors and demonstrate the steps required to correct each error.
5. Cast enough ballots to demonstrate that the errors were successfully corrected.
6. Simulate typical errors that occur during the close of the election, inclusion of absentee ballots, and tally of the election and demonstrate the steps required to correct each error.
7. Print reports and verify that all errors were successfully corrected.

Appendix B. Participants/Attendees

The following people were present at one or both days of the tests.

Brit Williams	Professor	Kennesaw State University
Lectra Lawhorne	MSIS Student	Kennesaw State University
Bill Atkinson	Deputy Sec.	Virginia State Election Bd.
Greg Roginson	Voter Reg. Liason	Virginia State Election Bd.
Wes Krivanek		Global Election Systems
Jeff Hintz		Global Election Systems
Robert Prichett		Global Election Systems
Beth Nation	Ga. Director	League of Women Vtrs.
Patti Brown	Election Supervisor	Carroll County
Parks Burton	Board of Elections	Carroll County
Beth Kish	Voter Reg. Coordinator	Cobb County
Sharon Wingfield	Director of Elections	Cobb County
David Leming	Elections Coordinator	Cobb County
Linda Latimore	Elections Supervisor	DeKalb County
Cynthia Montgomery	IS Programmer	DeKalb County
Dwight Brown	Election Polls	DeKalb County
Ellen House	Election Supervisor	DeKalb County
Norma Lyons	Elections Supervisor	Gwinnett County
Barbara Luth		Gwinnett County
Carolyn Guthrie	Election Assistant	Gwinnett County
Gary Brooks	Systems Analyst	Fulton County
Barney Thomas	Elec. Network Mgr	Fulton County
Mike Bracewell	Probate Judge	Morgan County

Certification Test Of the



Diebold Election Systems Voting System

Prepared for:

Elections Division
Office of the Secretary of State
State of Georgia

Prepared by:

Center for Election Systems
Kennesaw State University
Kennesaw, Georgia, 30144
January 30, 2003
Revised: February 3, 2003

Contents

1.	Introduction		3
2.	Summary of Findings		3
3.	System Description		5
	3.1	System Hardware/Firmware	5
	3.2	System Software/Election Management System	6
	3.3	System and Test Documentation	6
	3.4	Overview of System Operation	7
Appendix A: Certification Test Plan			9
Appendix B: Participants			11
Appendix C: Test Equipment			12

1. Introduction

Certification Tests of the Diebold AccuVote TS R6 Voting System were conducted at Kennesaw State University during the period January 10 through January 30, 2003. A primary purpose of these tests was to verify that the modifications made to the system by Diebold did, in fact, correct the various problems that were encountered during the general election in 2002. The Test Plan that was followed is contained in Appendix A.

Britain J. Williams, members of the Kennesaw University Center for Election Systems, and election officials from several Georgia counties participated in these tests. A list of the test participants is contained in Appendix B.

2. Summary of Findings

The Global AccuVote TS Voting System was found to be in compliance with the applicable provisions of the Georgia Election Code, the Rules of the Georgia Election Board, and the Rules of the Secretary of State.

Inoperable "Charging" Function: The charging function indicates whether or not AC power is present and shows the percent charge left on the battery. The indicator is yellow when AC power is present and red when the TS unit is operating on the battery. In either case the percent charge left on the battery is listed in the center of the indicator.

Screen Freeze: Only one screen freeze occurred during approximately 1000 hours of operation during which over 4500 ballots were entered manually and over 240,000 ballots were generated electronically. The frozen unit was restarted and continued to operate correctly .

Memory Critically Low: The 2002 general election setup from Pierce and Clayton Counties were used in the general election tests. The ballots were presented on six screens. Two hundred fifty ballots were manually entered on six TS units loaded with the Clayton County ballots and five hundred ballots were manually entered on six other TS units loaded with the Pierce County ballots. No low memory errors occurred during this test.

High volume tests were conducted to determine the ability of the system to accommodate the number of ballots that might be entered during in-person early voting. For this test the Pierce County ballots were loaded on six TS ballot stations. The automatic L & A feature was used to generate the ballots. All six TS units halted with a low memory error when the volume of ballots entered reached approximately 40,000 ballots. Once the TS units halted we were unable to restart them and continue voting or to recover the ballots cast on them.

Vote Selection 'Jumping': This error was not encountered during these tests. All of the TS voting stations used in these tests were calibrated prior to the beginning of the tests. Thus, there is evidence that the vote selection 'jumping' encountered in the 2002 general election resulted from poorly calibrated TS units. Calibrating the units prior to each election can eliminate this problem.

Memory Cards: 128 M PCMCIA, 64 M Flash, and 128 M Flash memory cards were used as program memory cards. There were no errors encountered with any memory card.

Challenged/Provisional Ballots: The ability to cast challenged/provisional ballots on the TS ballot stations was tested. Challenged/provisional voter cards were created on the Encoders and on the TS ballot stations. The challenged/provisional Voter Cards created on the TS units functioned properly. The challenged/provisional voter cards created on the Encoder work properly, however, resolving the challenge is a multi-step process.

Ballots were cast using the valid challenged voter cards created on the TS Ballot Station. Resolution of the validity of these ballots was examined on both the TS ballot station and the GEMS.

The TS Ballot Station has excellent features for resolving challenged/provisional ballots. The ballots are listed along with the assigned identification number. The operator (usually the Registrar) can elect to accept all of the ballots or can individually accept or reject ballots.

If the challenged ballots are uploaded to GEMS for resolution the procedure is awkward. The problem lies in the fact that the same identification number for a challenged ballot may be issued in two or more precincts. The following steps are required to identify the individual voters associated with challenged ballots with the same identification number.

1. After the ballots from all precincts have been uploaded to the GEMS server, open the 'Challenge Board' window under the GEMS menu.
2. Load the challenged ballots. This will enable you to see the serial numbers associated with each ballot.
3. For each challenged ballot, click on the serial number and choose 'Review'. Then close this window.
4. Open the 'View Ballots' window under the GEMS menu. In this window you can identify the ballot serial numbers that originated in each precinct. Close this window.
5. Open the 'Challenge Board' window under the GEMS menu.
6. When you click on the serial number the voter identification number entered on the Encoder will be display ed.

Also, there is no provision to accept all or a block of ballots so each ballot must be individually accepted or rejected.

3. System Description

The system tested was the **AccuVote TS Voting System**, presented by Diebold Election Systems, Inc., 1611 Wilmeth Road, McKinney, Texas, 75069-8250. This system is composed of the **AccuVote TS R6 Voting Station**, the **AccuVote OS Ballot Scanner**, the **Voting Card Encoder**, and a commercial computer running the **Global Election Management System (GEMS)**. A complete list of the system tested is contained in Appendix C.

The GEMS, Version 1.18.15 system was qualification tested by Ciber, Inc. for compliance with the FEC Voting Systems Standards, Version 1990 and issued NASED qualification number N03060011815.

The Ballot Station System, Version 4.3.14 was qualification tested by Wyle Laboratories, Inc. for compliance with the FEC Voting Systems Standards, Version 1990. We have been notified that the system passed qualification testing; however, as of the date of this report the ITA Qualification Report is not available and a qualification number has not been assig ned.

Qualification testing of the Encoder, Version 1.4.1 was conducted in conjunction with the qualification testing of the GEMS and the B allot Station.

3.1 System Hardware

The hardware tested consisted of:

- A **"Large County" GEMS computer** provided by Diebold under the State contract.

  Twelve **AccuVote TS R6 1.0.2 Voting Stations** provided the voter interface.

  Eight **Voter Card Encoders** were used to prog ram the voter cards.

  One **AccuVote OS Ballot Scanner** was used to process absentee and provisional/challeng ed ballots.

  128 M Memory Cards, 64 M and 128M Flash Memory Cards were used in the TS units.

  Smart Cards were used for voter cards and supervisor cards.

A list of the specific hardware used in the certification tests is contained in Appendix C.

3.2 System Software/Firmware

The Global Election Management System (GEMS) runs on a standard commercial personal computer running under the **Windows NT 4.0.1381** operating system. The AccuVote TS R6 Precinct Ballot Station runs under the **Windows CE 3.0, 8/09/02** operating system.

The **Global Election Management System (GEMS), Version 1.18.15,** is a Diebold proprietary system which runs on a standard personal computer and performs the following pre-election functions: setup the election data base, create a new election, enter contests and issues, define ballot styles, and produce the PCMCIA cards that are used to program the voting stations in the precincts and the absentee ballot scanners. After the polls close, this system reads the memory cards from the precincts, tallies the votes, and prints the various reports and audit data.

BS, Version 4.3.14 is a Diebold proprietary system that controls the AccuVote TS R6 Ballot Stations.

OS, Version 194w is a Diebold proprietary system that controls the AccuVote OS Ballot Scanner.

Encoder, Version 1.4.1 is a Diebold proprietary system that controls the Voter Card Encoder.

3.3 System and Test Documentation

AccuVote-TS Hardware Guide, Document Revision 1.0, Diebold Election Systems, April 26, 2002

AccuVote-TS Ballot Station v4.3 User's Guide, Revision 1.0, Diebold Election Systems, April 18, 2002

AccuVote OS Precinct Count 1.96, User's Guide, Revision 1.0, Diebold Election Systems, August 27, 2002

AccuVote Operators Guide, Diebold Election Systems, Revision 1, November 11, 2001

Voter Card Encoder User's Guide, Revision 1.2, Diebold Election Systems, August 16, 2002

GEMS System Administrator's Guide, Revision 1.0, Diebold Election Systems, August 15, 2002

GEMS 1.18 User Guide, Revision 4.0, Diebold Election Systems, November 1, 2002

State of Georgia GEMS Training Guide, Diebold Election Systems, undated

VCProgrammer 4.1 User's Guide, Revision 2.0, Diebold Election Systems, September 24, 2002

Global Election Systems, Inc. Software Qualification Test Report GEMS 1-18-15, Ciber Independent Test Authority, January 3, 2003

Performance and Test Standards for Punchcard, Marksense, and Direct Recording Electronic Voting Systems, Federal Election Commission, January 1990.

3.4 Overview of System Operation

Election Definition: The following functions are performed by the Global Election Management System (GEMS).

Create the election database.

Enter races and candidates, issues and options that are to appear in the election

Select the races and issues that are to appear on each ballot sty le.

Enter headings and instructions as they are to appear on the ballots.

Format the ballots.

Hardware Programming: Once the election definition is complete, the PCMCIA cards can be prepared to control the AccuVote TS voting stations and the AccuVote OS optical scan ballot scanners. A PCMCIA card must be prepared for each voting station and each ballot scanner.

Precinct Setup: The voting stations and ballot scanners are prepared for the election by inserting the PCMCIA cards and powering up the device. The device performs a self-test and is then ready for pre-election testing.

Election Day (Precinct) Activities: As the polls are opened and each device is powered up, the device performs a self-test and presents a menu with the various options allowed at the polling place. If the 'open polls' option is selected, the registers are set to zero and a 'zero totals' tape is printed.

When the polls are closed, the vote totals from each device are recorded to the PCMCIA cards. These cards are then transported to a central counting location for entry into the GEMS system for tallying and reporting. If desired, unofficial results from the precincts can be transmitted to the central location via modem.

Challenged and provisional ballots are resolved and counted using an AccuVote Ballot Scanner. Absentee ballots are counted using an AccuVote Ballot Scanner.

Vote Tallying/Report Printing: The PCMCIA cards from each precinct are returned to the central facility. Memory cards from the precincts and from the absentee and provisional/conditional ballot scanners are loaded into the GEMS. During this step, any known errors can be manually corrected.

At any time during the tally of the votes or at the completion of vote tallying, election result can be printed by precinct or overall. These reports can also be exported to other systems or posted on the Internet.

The system administrator can use the GEMS to print the various audit logs.

Appendix A

Georgia Certification Test Plan

This test plan will be used to test the Diebold TS Voting System for certification for use in the State of Georgia. The specific version to be tested consists of GEMS, Version 1.18.15 and TS Firmware, Version 4.3.13. The scope of the test will include the OS ballot scanner, the voter card encoder, 128M memory cards, and compact flash memory cards. This system has successfully completed Qualification Testing for compliance with the FEC Voting System Standards, 1990 Version. The previous version of the system has completed Certification Testing in the State. The changes to the present version involve changes to the software only.

The previous version of the system was used in the 2002 general election in Georgia. During this election several anomalies occurred. These tests will be directed primarily toward determining whether or not these anomalies are corrected in the test versions.

Overview of Test Plan: The election setup used for these tests will consist of four precincts, two precincts from each of two counties. The counties selected are Clayton and Pierce. Clayton was selected to represent the counties that experienced calibration problems in the 2002 general election. Pierce was selected to represent counties that experienced memory problems. One of the precincts selected from each county will contain at least one split district. The hardware in each test precinct will consist of three voting stations and two encoders.

The following are the specific components of the test.

Documentation Review: Documents in the Technical Data Package will be reviewed for accuracy and completeness. Particular attention will be directed toward user-oriented documentation: User Manuals, Operations Manuals, Training Manuals, etc.

Software Review: The test software/firmware will be examined to ensure that the software/firmware used in the Certification Tests is identical to the software/firmware examined by the ITAs during Qualification Testing.

Election Definition and Setup: The test election will be setup using the Global Election Management System (GEMS). The test election will consist of two precincts selected from each of two counties (four precincts total). One precinct from each county will contain at least one split. These precincts will be selected to maximize the possibility of duplicating the primary errors that occurred during the previous general election. Following election setup, memory cards will be programmed for the test precincts and absentee ballots will be printed as required.

The election setup will include the creation of TS ballots, audio ballots, and absentee ballots.

Logic and Accuracy Simulation: Three voting stations will be used in each test precinct. Each Voting Station will be calibrated prior to its use. Standard Logic and Accuracy Tests will be performed using the Touch Screen Voting Stations that are to be used for the General Election Simulation and the High Volume Simulation.

General Election Simulation: The Touch Screen Voting Stations will be programmed for a general election using the memory cards prepared during Election Definition and Setup. Approximately 500 ballots will be manually entered into each Touch Screen Voting Station. Audio ballots will be cast in each precinct. The polls will be closed and the memory cards returned to the GEMS for tallying and printing of reports and audit trails.

Absentee ballots and Provisional ballots will be cast for each of the test precincts and included in the final tally.

High Volume Simulation: The memory cards used in the General Election Simulation will be reset to the pre-election status and the voting stations will be initialized as for the General Election Simulation. The automatic Logic and Accuracy feature on the voting stations will be used to cast approximately 200,000 ballots on each voting station. The polls will be closed and the memory cards returned to the GEMS for tallying and printing of reports and audit trails.

Poll Worker and Voter Error Simulation: Various poll worker and voter errors will be simulated to determine the systems ability to resist and recover from these errors. In addition,

1. Calibration of the voting stations will be progressively degraded to determine the point at which the voting station will indicate an incorrect selection.
2. The Touch Screen support for provisional and challenged ballots will be tested.

Appendix B
Test Participants

Brit Williams	Professor Emeritus	KSU CSIS[1]
Merle King	Chairman	KSU CSIS
Russell Cosgrove	Student	KSU CSIS
Jeff Sexton	Student	KSU CSIS
Steven Setzer	Student	KSU CSIS
Bruce Lee	Student	KSU CSIS
Tara Robie	Training Manager	KSU Election Center[2]
Anthony Peel	Technical Manager	KSU Election Center
Robbie Robinson	Web Site Adm.	Carroll County
David Leming	Election Manager	Cobb County
Marty Richardson	Admin Tech	Cobb County
Beth Kish	Reg. Mgr.	Cobb County
Carol Bowen		Cobb County
Katrina Richard	Training Specialist	Cobb County
Dwight Brown	Elections Coordinator	DeKalb County

[1] Kennesaw State University, Department of Computer Science and Information Systems
[2] Kennesaw State University, Center for Election Systems

Test Equipment

GEMS Computer

Dell PowerEdge 4600, 9HZBJ11

Voter Card Encoders

Serial Number	Voter Cards Created
115657	881
115651	698
119134	751
119137	847
119135	433
119138	350
115656	404
119136	395

TS Ballot Stations

Serial Number	Manual Ballots	Automatic Ballots
145628	250	N/A
142442	250	N/A
113303	250	N/A
123947	250	N/A
124448	250	N/A
143565	250	N/A
109431	500	44275
114187	500	437354
143732	500	44354
116505	500	43934
106545	500	44302
120585	500	37499[3]

[3] Unit halted with a 'Low Memory' error when the operator inadvertently pushed the 'Display Ballots' button.

Certification Test of the

Diebold Election Systems Voting System

Prepared for:

Elections Division
Office of the Secretary of State
State of Georgia

Prepared by:

Center for Election Systems
Kennesaw State University
Kennesaw, Georgia, 30144

December 29, 2004

Contents

1.	Introduction		3
2.	Summary of Findings		3
3.	System Description		3
	3.1	System Hardware	4
	3.2	System Software/Firmware	4
	3.3	System and Test Documentation	5
	3.4	Overview of System Operation	6
4.	Compliance With Applicable Statues and Standards		7
	4.1	Election Assistance Administration Voting System Standards	7
	4.2	Help America Vote Act of 2002	7
	4.3	Georgia Election Code	9
Appendix A: Certification Test Plan			13

1. Introduction

Certification Tests of the Diebold AccuVote TS R6 Voting System were conducted at Kennesaw State University during the months of September, November, and December, 2004. The Test Plan that was followed is contained in Appendix A.

These tests were conducted by the staff of the Kennesaw State University Center for Election Systems under the direction of Dr. Brit Williams.

2. Summary of Findings

The Diebold AccuVote TS Voting System was found to be in compliance with the applicable provisions of the Help America Vote Act of 2002, the Georgia Election Code, the Rules of the Georgia Election Board, and the Rules of the Secretary of State.

The following features are enhancements of the tested system over the previous system.

Encryption of the data files transmitted via modem: When the polls close on election night the poll manager has the ability to transmit unofficial results to the county elections office. The previous version of the voting system did not encrypt this file prior to transmission. The tested version of the voting system encrypts this file prior to transmission.

Randomization of all internal ballot image files: The previous version of the voting system contained one ballot image file that was not randomized. The tested version of the voting system randomizes all internal ballot image files.

Dynamic password on Poll Manager Card: In previous version of the voting system the password on the Poll Manager Card was a static four digit number. The tested version of the system has a six digit password and allows this password to be changed as often as desired.

Dynamic password on Voter Cards: In the previous version of the voting system the password contained in the hand-shaking routine between the voter card and the voting station was static. The tested version of the system allows this password to be changed as often as desired.

3. System Description

The system tested was the **AccuVote TS Voting System**, presented by Diebold Election Systems, Inc., 1611 Wilmeth Road, McKinney, Texas, 75069-8250. This system is composed of the **AccuVote TS R6 Voting Station**, the **AccuVote**

OS Ballot Scanner, the **Voting Card Encoder**, and a commercial computer running the **Global Election Management System (GEMS)**. A complete list of the system tested is contained in Appendix A.

3.1 System Hardware

The hardware tested consisted of:

- A **"Large County" GEMS computer** provided by Diebold under the State contract.

  Thirteen **AccuVote TS R6 Voting Stations** provided the voter interface.

  Four **Voter Card Encoders** were used to program the voter cards.

  One **AccuVote OS Ballot Scanner** was used to process absentee and provisional/challenged ballots.

  Smart Cards were used for voter cards and supervisor cards.

The specific devices used during the certification tests are listed in the Test Plan, Appendix A.

3.2 System Software/Firmware

The operating system used by the personal computers that support the Global Election Management System and the Poll Book systems is **Windows CE**. Windows CE is also the operating system that controls the functions of the Voting Stations.

The **Global Election Management System (GEMS), Version 1.18.22G**, is a Diebold proprietary system which runs on a standard personal computer and performs the following pre-election functions: setup the election data base, create a new election, enter contests and issues, define ballot styles, and produce the PCMCIA cards that are used to program the voting stations in the precincts and the absentee ballot scanners. After the polls close, this system reads the PCMCIA cards from the precincts, tallies the votes, and prints the various reports and audit data.

BS, Version 4.5.2 is a Diebold proprietary system that controls the voting stations.

OS, Version 194w is a Diebold proprietary system that controls the OS Ballot Scanner.

Encoder Firmware 1.32 is a Diebold proprietary system that controls the voter card encoder.

Key Card Tool 1.01 is a Diebold Proprietary system that enables the election official to change the passwords on the Voter Cards and the Poll Manager's Card.

3.3 System and Test Documentation

AccuVote-TS R6 System Hardware Specification, Document Revision 1.0, Diebold Election Systems, April 30, 2001

AccuVote-TS Hardware Guide, Document Revision 1.0, Diebold Election Systems, April 30, 2001

AccuVote-TS Ballot Station 4.5 User's Guide, Revision 2.0, Diebold Election Systems, June 17, 2004

GEMS 1.18 Product Overview Guide, Revision 2.0, Diebold Election Systems, February 13, 2004

GEMS 1.18 Reference Guide, Revision 6.0, Diebold Election Systems, June 15, 2004

GEMS 1.18 Election Administrator's Guide, Revision 6.0, Diebold Election Systems, June 15, 2004

GEMS 1.18 User Guide, GEMS, Revision 4.0, Diebold Election Systems, November 1, 2002

Voter Card Encoder 1.3 User's Guide, Revision 1.0, Diebold Election Systems, February 10, 2004

Key Card Tool 1.0 User's Guide, Revision 2.0, Diebold Election Systems, April 20, 2004

AccuVote OS Precinct Count 1.96 User's Guide, Revision 1.0, Diebold Election Systems, August 27, 2002

AccuVote OS AccuFeed User's Guide, Revision 1.0, Diebold Election Systems, July 18, 2002

VCProgrammer 4.1 User's Guide, Revision 2.0, Diebold Election Systems, September 24, 2002

Source Code, GEMS Version 1-18-22G, Diebold Election Systems, July 2004

Source Code, ATVS Version 4.5.2, Diebold Election Systems, August 2004

Diebold Election Systems, Inc. Software Functional Test Report GEMS 1-18-22, Ciber Independent Test Authority, September 29, 2004

Change Release Report of the AccuVote TS R6 DRE Voting Machine, Wyle Laboratories, August 3, 2004

3.4 Overview of System Operation

Election Definition: The following functions are performed by the Global Election Management System (GEMS).

Create the election database.

Enter races and candidates, issues and options that are to appear in the election

Select the races and issues that are to appear on each ballot style.

Enter headings and instructions as they are to appear on the ballots.

Format the ballots.

Establish passwords for the voter cards and poll manager's cards.

Hardware Programming: Once the election definition is complete, the PCMCIA cards can be prepared to control the AccuVote TS voting stations and the AccuVote OS optical scan ballot scanners. A PCMCIA card must be prepared for each voting station and each ballot scanner.

Precinct Setup: The voting stations and ballot scanners are prepared for the election by inserting the PCMCIA cards and powering up the device. The device performs a self test and is then ready for pre-election testing.

Election Day (Precinct) Activities: As the polls are opened and each device is powered up, the device performs a self test and presents a menu with the various options allowed at the polling place. If the 'open polls' option is selected, the registers are set to zero and a 'zero totals' tape is printed.

When the polls are closed, the vote totals from each device are recorded to the PCMCIA cards. These cards are then transported to a central counting location for entry into the GEMS system for tallying and reporting. If desired, unofficial results from the precincts can be transmitted to the central location via modem.

Vote Tallying/Report Printing: The PCMCIA cards from each precinct are returned to the central facility where they are loaded into the GEMS. During this step, any known errors can be manually corrected and absentee votes can be entered.

At any time during the tally of the votes or at the completion of vote tallying, election result can be printed by precinct or overall. These reports can also be exported to other systems or posted on the Internet.

The system administrator can use the GEMS to print the various audit logs.

4. Compliance With Applicable Statues and Standards

4.1 Election Assistance Commission Voting System Standards

Hardware/Firmware: The AccuVote TS R6 Voting System hardware and firmware was examined by Wyle Laboratories, Huntsville, Alabama and found to be in compliance with the hardware specifications contained in the EAC Voting System Standards. Wyle is an Independent Test Agency approved by the National Association of State Election Directors (NASED).

Software: The GEMS election management software was examined by Ciber, Inc., Huntsville, Alabama and found to be in compliance with the software specifications contained in the EAC Voting System Standards. Ciber, Inc. is an Independent Test Agency approved by the National Association of State Election Directors.

NASED Qualification: Based on the reports from the ITAs, NASED assigned the system Qualification Number N-1-06-12-12-003.

4.2 Help America Vote Act of 2002

The AccuVote TS R6 Voting System is classified as an electronic voting system and, as such, falls under the following Sections of the **Help America Vote Act of 2002**

TITLE III--UNIFORM AND NONDISCRIMINATORY ELECTION TECHNOLOGY AND ADMINISTRATION REQUIREMENTS; SEC. 302. PROVISIONAL VOTING AND VOTING INFORMATION REQUIREMENTS.

(a) Provisional Voting Requirements.--If an individual declares that such individual is a registered voter in the jurisdiction in which the individual desires to vote and that the individual is eligible to vote in an election for Federal office, but the name of the individual does not appear on the official list of eligible voters for the polling place or an election official asserts that the individual is not eligible to vote, such individual shall be permitted to cast a provisional ballot ...

The AccuVote R6 voting station has the facility to allow a voter to vote a provisional ballot. This ballot is stored in a separate location and is not included in the tally until the voter's credentials have been established by the county registrar.

The paper ballot used for absentee voting can also be used to satisfy this requirement.

(2) Audit capacity (B) Manual audit capacity.—
(i) The voting system shall produce a permanent paper record with a manual audit capacity for such system.

The AccuVote TS R6 Voting System can satisfy this requirement.

(ii) The voting system shall provide the voter with an opportunity to change the ballot or correct any error before the permanent paper record is produced.

The AccuVote TS R6 Voting System satisfies this requirement. The AccuVote TS R6 Voting System presents a summary screen at the end of the ballot that gives the voter the opportunity to change any selection.

(3) Accessibility for individuals with disabilities.—The voting system shall--(A) be accessible for individuals with disabilities, including non-visual accessibility for the blind and visually impaired, in a manner that provides the same opportunity for access and participation (including privacy and independence) as for other voters;

The voter using the AccuVote TS R6 voting station can choose to view the ballot in large print or in high contrast or both. In addition, The AccuVote TS R6 voting station can be equipped with a telephone keypad and earphones for vision impaired voters.

4.3 Georgia Election Code

The AccuVote TS R6 Voting System is classified as a direct recording electronic voting system. The Georgia Election Code, Section 21-3-379 regulates systems of this type.

21-2-379.1 Requirements for use of electronic recording voting systems

No direct electronic recording voting system shall be adopted or used unless it shall, at the time, satisfy the following requirements:

(i) It shall provide facilities for voting for such candidates as may be nominated and upon such questions as may be submitted;

The AccuVote TS R6 Voting System satisfies this requirement.

(ii) It shall permit each elector, in one operation, to vote for all candidates of one party of body for presidential electors;

The AccuVote TS R6 Voting System satisfies this requirement.

(1) Except as provided in paragraph (2) of this Code section for presidential electors, it shall permit each elector, at other than primaries, to vote a ticket selected from nominees of any and all parties or bodies, from independent nominations, and from persons not in nomination;

The AccuVote TS R6 Voting System satisfies this requirement.

(2) It shall permit each elector to vote, at any election, for any person and for any office for whom and for which he or she is lawfully entitled to vote, whether or not the name of such person or persons appears as a candidate for election, to vote for as many persons for an office as he or she is entitled to vote for; and to vote for or against any question upon which he or she is entitled to vote;

The AccuVote TS R6 Voting System satisfies this requirement. Tests included multiple candidates for a single office and write-in candidates.

(3) It shall preclude the counting of votes for any candidate or upon any question for whom or upon which an elector is not entitled to vote; shall preclude the counting of votes for more persons for any office than he or she is entitled to vote for; and shall preclude the

counting of votes for any candidate for the same office or upon any question more than once;

The AccuVote TS R6 Voting System satisfies this requirement. Tests indicated that the voter was only able to see and vote on the assigned ballot style. The system does not allow over-votes. Once the allowed number of candidates has been selected, the voter cannot select another candidate without first releasing one of the previously selected candidates. Tests were conducted to ensure that a voter could not write in the same name multiple times in a multi-candidate contest.

(4) It shall permit voting in absolute secrecy so that no person can see or know for whom any other elector has voted or is voting save an elector whom he or she has assisted or is assisting in voting, as prescribed by law.

The AccuVote TS R6 Voting System satisfies this requirement.

(5) It shall be constructed of material of good quality in a neat and workmanship like manner;

The AccuVote TS R6 Voting System satisfies this requirement. The quality of the materials and workmanship was reviewed by the hardware/firmware ITA, Wyle Laboratories.

(6) It shall, when properly operated, record correctly and accurately every vote cast;

The AccuVote TS R6 Voting System satisfies this requirement. The hardware ITA, Wyle Laboratories, and the software ITA, Ciber, Inc., extensively tested this requirement. The State certification tests included logic and accuracy tests, but with a smaller number of ballots than the tests conducted by the ITAs.

(7) It shall be so constructed that an elector may readily learn the method of operating it;

In order to vote, the voter must press a pressure sensitive spot containing the name of the candidate. When the spot is pressed, a lighted square containing a large X appears beside the candidate's name. The persons participating in these tests did not have undue difficulty voting on the AccuVote TS R6 Voting System.

(8) It shall be safely transported.

The portion of the system that is installed in the precinct, the AccuVote TS R6 voting stations Precinct Card Manager are small and easily transported. See Section 3.2, System Hardware/Firmware.

21-2-379.4 Ballot appearance; write in votes on DRE systems

(a) *The ballots for direct recording electronic (DRE) voting systems shall be of such size and arrangement as will suit the construction of the DRE screen and shall be in plain, clear type that is easily readable by persons with normal vision. If the equipment has the capacity for color display, the names of all candidates in a particular race shall be displayed in the same color, font, and size and the political party or body affiliation of candidates may be displayed in a color different from that used to display the names of the candidates, but all political party or body affiliations shall be printed in the same size and font. All ballot questions and constitutional amendments shall be displayed in the same color.*

The AccuVote TS R6 Voting System satisfies this requirement.

(b) *The arrangement of offices, names of candidates, and questions upon the ballots shall conform as nearly as practicable to this chapter for the arrangement of such offices, names of candidates, and questions on paper ballots.*

The AccuVote TS R6 Voting System satisfies this requirement.

(c) *Electors shall be permitted to cast write-in votes on DRE voting systems as provided in Code Section 21-2-133. The design of the ballot shall permit the election superintendent and poll workers when obtaining the vote count from such systems to determine readily whether an elector has cast any write-in vote not authorized by law.*

The AccuVote TS R6 Voting System satisfies this requirement.

21-2-379.5 Ballot information

(b) *The ballot for each candidate or group of candidates nominated by a political party or body shall display the name or designation of the political party or body.*

The AccuVote TS R6 Voting System satisfies this requirement.

(c) *The incumbency of a candidate seeking election for the public office he or she then holds shall be indicated on the ballot.*

The AccuVote TS R6 Voting System satisfies this requirement.

Appendix A

Certification Test Plan
Of the
Georgia DRE Voting System
September 2004

Hardware Definition

GEMS Computer

Voter Card Encoders
- 101532
- 115663
- 119134
- 119136

Voting Stations
- 110002
- 113438
- 114187
- 114995
- 115673
- 116217
- 116372
- 116669
- 119520
- 121216
- 121606
- 123461
- 128124

Key Card Tool
- Dell Notebook Computer

Absentee Ballot Scanner
- 86634

Software Definition

AVTS-R6	4.5.2
AVOS	1.94w
GEMS	1.18.22G

Encoder	1.3.2
Key Card Tool	1.0.1

Phase I: Initial Setup:

1. Install the new system on Center devices and identify the differences between the current and the new system.
2. Identify the portions of the system that will require changes to the current training for election officials and poll workers.
3. Develop the ballot styles that will be used in the following Phases II and III. The ballot style for Phase II should be long enough that the summary page does not show on a single screen.
4. Develop voting scripts and voter instructions for use in Phase II.
5. Identify the devices that will be available for use during Certification Testing and set up the test environment.
6. Schedule a meeting to brief the KSU and SOS staff on the above items. This briefing should contain sufficient detail to enable this staff to make decisions about the implementation of the new system.

Phase II: Usability Testing

This test will test the end-to-end operation of the system by setting up and executing an election that is typical of an election in the State. Voting scripts will be prepared with a known outcome. All voting stations will record a number of votes that exceeds the number of votes normally cast on a voting station in a State election.

Setup: The configuration for this test will consist of two precincts from each of two counties, for a total of four precincts, as follows:

Clayton County: Forest Park 2 and Forest Park 6 Precincts.

Pierce County: Blackshear and Hackelbarney Precincts

Each county will have one early-voting terminal and each precinct will have two voting stations. The overall system employed will consist of a computer operating under GEMS 1.18.22G, a lap-top computer with Key Card Tool 1.0.1, thirteen AccuVote TS voting stations with firmware version 4.5.2 , two AccuVote OS ballot scanners with firmware version 1.94w, four voter card encoders with firmware version 1.3.2. (Diagram A, below)

Phase III: Stress Testing

1. High volume tests. Conduct tests to determine the ability of the TS units to accommodate a high volume of ballots. The number of ballots cast in this test will exceed the number of ballots that may be cast in an early voting setup.

2. Precinct worker errors. Identify and test the system's ability to recovery from various types of errors that are typically committed by poll workers.
3. Voter errors. Identify and test the system's ability to recovery from various types of errors that are typically committed by voters.
4. Acts of Nature/Vandalism. Identify and test the system's ability to recovery from various acts of nature or vandalism.

Phase IV: Security Tests

Tests to be defined by the CSIS Security Center will include

(The following are some suggestions)

- Attempts to fabricate voter cards.
- Attempts to fabricate poll manager cards.
- Attempts to fabricate memory cards.
- Tests to detect extraneous/fraudulent code.

Ballot Script
Georgia Certification Test

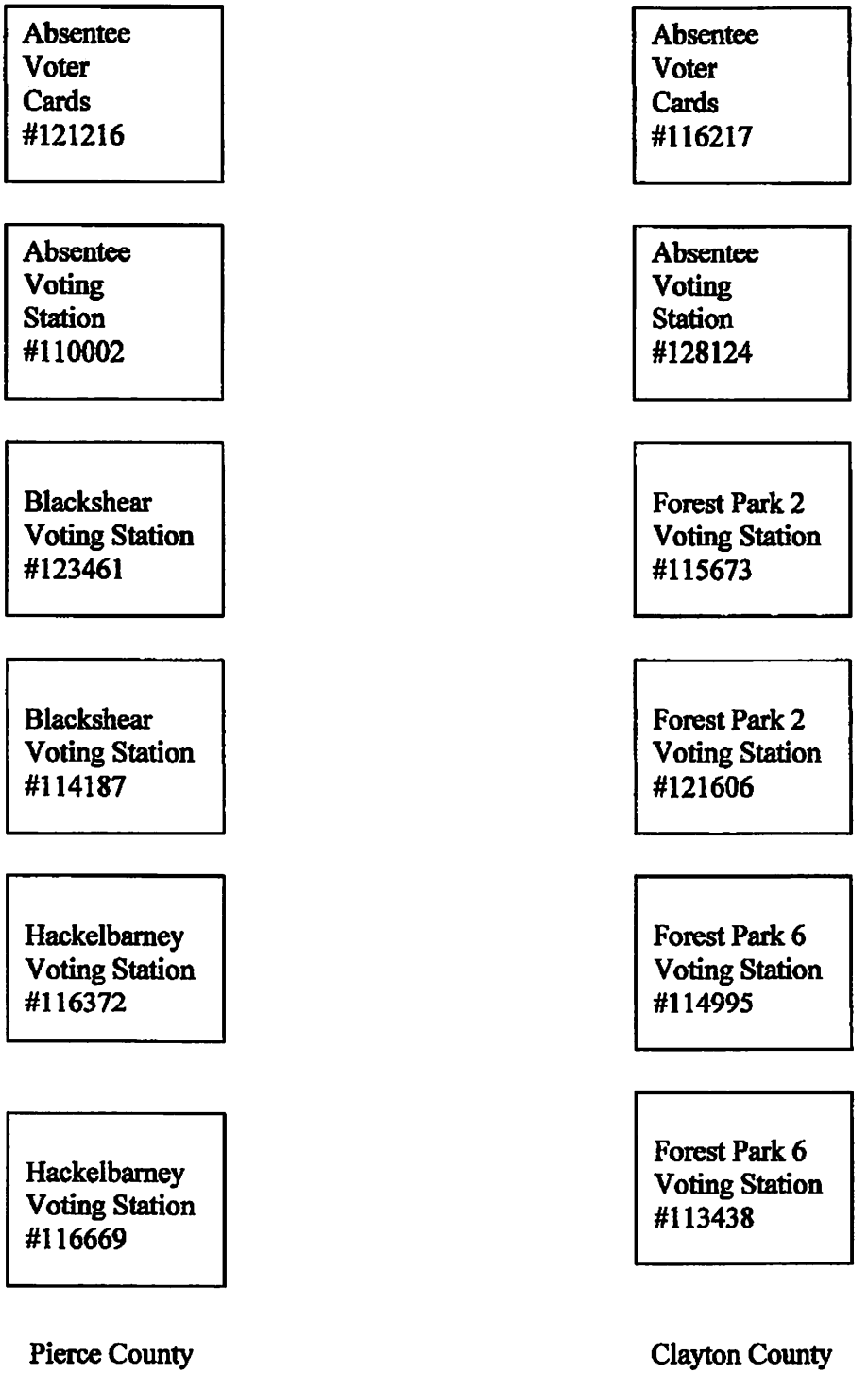
County: Clayton
Precinct/Split: Forest Park 2, Split A
Voting Station: _____
Script: 1

Voter: _____ **Date:** _____

US Senate:	**MAX CLELAND**
Governor:	**ROY E BARNES**
Lt. Governor:	**MARK TAYLOR**
Secretary of State:	**CATHY COX**
Attorney General:	**THURBERT BAKER**
Comm. Of Agriculture:	**TOMMY IRVIN**
Comm. Of Insurance:	**LOIS COHEN**
State School Super:	**BARBARA CHRISTMAS**
Comm. Of Labor	**MICHAEL THURMOND**
Public Service Comm. 1	**EARLEEN W SIZEMORE**
Public Service Comm. 2	**LAUREN MCDONALD, JR**
US Rep 13th District	**DAVID SCOTT**
State Senate 44th District:	**TERRELL A STARR**
State Rep. 50th District:	**GEORGANA SINKFIELD**
County Comm. Dist. 1	**CARL RHODENIZER**
Board of Education:	**ERICA DAVIS or SUE RYAN**

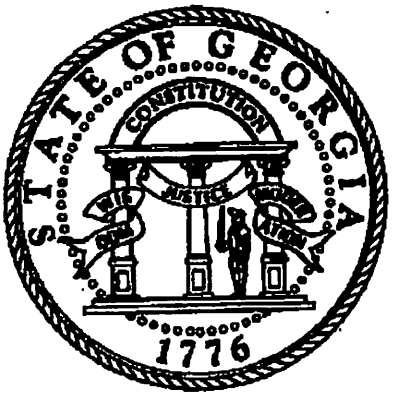
(CONTINUED)

Const. Ammend. 1	**YES**
Const. Ammend. 2	**YES**
Const. Ammend. 3	**YES**
Const. Ammend. 4	**YES**
Const. Ammend. 5	**YES**
Const. Ammend. 6	**YES**
Statewide Ref. A	**YES**
Statewide Ref. B	**YES**
Statewide Ref. C	**YES**
Statewide Ref. D	**YES**
Statewide Ref. E	**YES**



Usability Test Configuration
Diagram A

Certification Test of the



Diebold Election Systems Voting System

Prepared for:

Elections Division
Office of the Secretary of State
State of Georgia

Prepared by:

Center for Election Systems
Kennesaw State University
Kennesaw, Georgia, 30144

September 16, 2005

Contents

1.	Introduction		3
2.	Summary of Findings		3
3.	System Description		3
	3.1	System Hardware	4
	3.2	System Software/Firmware	4
	3.3	System and Test Documentation	5
	3.4	Overview of System Operation	6
4.	Compliance With Applicable Statues and Standards		7
	4.1	Election Assistance Administration Voting System Standards	7
	4.2	Help America Vote Act of 2002	7
	4.3	Georgia Election Code	9
Appendix A: Certification Test Plan			13

1. Introduction

Certification Tests of the Diebold AccuVote TS R6 Voting System were conducted at Kennesaw State University during the months of September, November, and December 2004. The Test Plan that was followed is contained in Appendix A.

The staff of the Kennesaw State University Center conducted these tests for Election Systems under the direction of Dr. Brit Williams.

Certification tests of the ExpressPoll 4000 were conducted in August and September 2005.

2. Summary of Findings

The Diebold AccuVote TS Voting System was found to be in compliance with the applicable provisions of the Help America Vote Act of 2002, the Georgia Election Code, the Rules of the Georgia Election Board, and the Rules of the Secretary of State.

The following features are enhancements of the tested system over the previous system.

Encryption of the data files transmitted via modem: When the polls close on election night the poll manager has the ability to transmit unofficial results to the county elections office. The previous version of the voting system did not encrypt this file prior to transmission. The tested version of the voting system encrypts this file prior to transmission.

Randomization of all internal ballot image files: The previous version of the voting system contained one ballot image file that was not randomized. The tested version of the voting system randomizes all internal ballot image files.

Dynamic password on Poll Manager Card: In previous version of the voting system the password on the Poll Manager Card was a static four-digit number. The tested version of the system has a six-digit password and allows this password to be changed as often as desired.

Dynamic password on Voter Cards: In the previous version of the voting system the password contained in the hand-shaking routine between the voter card and the voting station was static. The tested version of the system allows this password to be changed as often as desired.

ExpressPoll 4000: ExpressPoll 4000 functions as an encoder that is connected to the precinct's electors list. By reading and displaying the precinct's electors list, ExpressPoll 4000 creates a voter access card which will access the voter's

assigned ballot style by associating the voter's ballot combination, as outlined in the voter registration record, with the ballot styles maintained on the voting units within the precinct.

3. System Description

The system tested was the **AccuVote TS Voting System**, presented by Diebold Election Systems, Inc., 1611 Wilmeth Road, McKinney, Texas, 75069-8250. This system is composed of the **AccuVote TS R6 Voting Station**, the **AccuVote OS Ballot Scanner**, the **Voting Card Encoder**, the **ExpressPoll 4000** and a commercial computer running the **Global Election Management System (GEMS)**. A complete list of the system tested is contained in Appendix A.

3.1 System Hardware

The hardware tested consisted of:

- A **"Large County" GEMS computer** provided by Diebold under the State contract.

  Thirteen **AccuVote TS R6 Voting Stations** provided the voter interface.

  Four **Voter Card Encoders** were used to program the voter cards.

  One **AccuVote OS Ballot Scanner** was used to process absentee and provisional/challenged ballots.

  Smart Cards were used for voter cards and supervisor cards.

  Twenty-five **ExpressPoll 4000s** were used to display voter information from the state voter registration database for precincts and program the corresponding voter card.

The specific devices used during the certification tests are listed in the Test Plan, Appendix A.

3.2 System Software/Firmware

The operating system used by the personal computers that support the Global Election Management System and the Poll Book systems is **Windows CE**. Windows CE is also the operating system that controls the functions of the Voting Stations.

The **Global Election Management System (GEMS), Version 1.18.22G**, is a Diebold proprietary system which runs on a standard personal

computer and performs the following pre-election functions: setup the election data base, create a new election, enter contests and issues, define ballot styles, and produce the PCMCIA cards that are used to program the voting stations in the precincts and the absentee ballot scanners. After the polls close, this system reads the PCMCIA cards from the precincts, tallies the votes, and prints the various reports and audit data.

BS, Version 4.5.2 is a Diebold proprietary system that controls the voting stations.

OS, Version 194w is a Diebold proprietary system that controls the OS Ballot Scanner.

Encoder Firmware 1.32 is a Diebold proprietary system that controls the voter card encoder.

Key Card Tool 1.01 is a Diebold Proprietary system that enables the election official to change the passwords on the Voter Cards and the Poll Manager's Card.

ExpressPoll Firmware 1.2.53 is a Diebold Proprietary system that enables an election official to read a voter record from the voter registration database and create a Voter Card for the ballot style that corresponds to the voter's registration information.

3.3 System and Test Documentation

AccuVote-TS R6 System Hardware Specification, Document Revision 1.0, Diebold Election Systems, April 30, 2001

AccuVote-TS Hardware Guide, Document Revision 1.0, Diebold Election Systems, April 30, 2001

AccuVote-TS Ballot Station 4.5 User's Guide, Revision 2.0, Diebold Election Systems, June 17, 2004

GEMS 1.18 Product Overview Guide, Revision 2.0, Diebold Election Systems, February 13, 2004

GEMS 1.18 Reference Guide, Revision 6.0, Diebold Election Systems, June 15, 2004

GEMS 1.18 Election Administrator's Guide, Revision 6.0, Diebold Election Systems, June 15, 2004

GEMS 1.18 User Guide, GEMS, Revision 4.0, Diebold Election Systems, November 1, 2002

Voter Card Encoder 1.3 User's Guide, Revision 1.0, Diebold Election Systems, February 10, 2004

Key Card Tool 1.0 User's Guide, Revision 2.0, Diebold Election Systems, April 20, 2004

AccuVote OS Precinct Count 1.96 User's Guide, Revision 1.0, Diebold Election Systems, August 27, 2002

AccuVote OS AccuFeed User's Guide, Revision 1.0, Diebold Election Systems, July 18, 2002

VCProgrammer 4.1 User's Guide, Revision 2.0, Diebold Election Systems, September 24, 2002

Source Code, GEMS Version 1-18-22G, Diebold Election Systems, July 2004

Source Code, ATVS Version 4.5.2, Diebold Election Systems, August 2004

Diebold Election Systems, Inc. Software Functional Test Report GEMS 1-18-22, Ciber Independent Test Authority, September 29, 2004

Change Release Report of the AccuVote TS R6 DRE Voting Machine, Wyle Laboratories, August 3, 2004

Source Code, ExpressPoll 4000 version 1.2.53, August 2005

Source Code, ExpressPoll 4000 Card Writer version 1.1.4.0, August 2005

ExpressPoll 4000 User's Guide v2.01, February 2005

ExpressPoll CardWriter TDP 2.02 System Overview, August 2005

ExpressPoll CardWriter TDP 2.08 System Operations Procedures, August 2005

3.4 Overview of System Operation

Election Definition: The following functions are performed by the Global Election Management System (GEMS).

Create the election database.

Enter races and candidates, issues and options that are to appear in the election

Select the races and issues that are to appear on each ballot style.

Enter headings and instructions as they are to appear on the ballots.

Format the ballots.

Establish passwords for the voter cards and poll manager's cards.

Hardware Programming: Once the election definition is complete, the PCMCIA cards can be prepared to control the AccuVote TS voting stations and the AccuVote OS optical scan ballot scanners. A PCMCIA card must be prepared for each voting station and each ballot scanner.

Precinct Setup: The voting stations and ballot scanners are prepared for the election by inserting the PCMCIA cards and powering up the device. The device performs a self-test and is then ready for pre-election testing. ExpressPolls are prepared for each precinct by inserting a Compact Flash Card containing voter information for all precincts within the state. ExpressPolls are then assigned to individual precinct allowing the device to display the electors list for that precinct and encode voter access cards that are to be used with the AccuVote TS units assigned to that location.

Election Day (Precinct) Activities: As the polls are opened and each device is powered up, the device performs a self-test and presents a menu with the various options allowed at the polling place. If the 'open polls' option is selected, the registers are set to zero and a 'zero totals' tape is printed.

A poll worker uses the ExpressPoll 4000 to isolate a voter's name on an electronically displayed elector's list within the precinct. It then encodes a voter access card while at the same time marking the precinct's electors list. The combined operation is designed to provide an accurate listing of voter participation at the precinct while ensuring that each participating elector receives the proper ballot style which is based directly on the voter's ballot combination outlined in the state's voter registration system.

When the polls are closed, the vote totals from each device are recorded to the PCMCIA cards. These cards are then transported to a central counting location for entry into the GEMS system for tallying and reporting. If desired, unofficial results from the precincts can be transmitted to the central location via modem.

During the precinct's closing procedures, the number of voters marked on the ExpressPolls is recorded and used to reconcile the precinct's activities for the day. ExpressPoll 4000 maintains a numbered list of voters that is updated as every voter access card is created. This numbered list is also used during the evening closing process.

Vote Tallying/Report Printing: The PCMCIA cards from each precinct are returned to the central facility where they are loaded into the GEMS. During this step, any known errors can be manually corrected and absentee votes can be entered.

At any time during the tally of the votes or at the completion of vote tallying, election result can be printed by precinct or overall. These reports can also be exported to other systems or posted on the Internet.

The system administrator can use the GEMS to print the various audit logs.

All actions on ExpressPoll 4000 are written to a log file stored on the unit's Compact Flash Card and also to an internal memory location. Following the election, these log files are retrieved in order to print marked electors lists and numbered lists of voters for records retention purposes.

4. Compliance With Applicable Statues and Standards

4.1 Election Assistance Commission Voting System Standards

Hardware/Firmware: The AccuVote TS R6 Voting System hardware and firmware was examined by Wyle Laboratories, Huntsville, Alabama and found to be in compliance with the hardware specifications contained in the EAC Voting System Standards. Wyle is an Independent Test Agency approved by the National Association of State Election Directors (NASED).

Software: The GEMS election management software was examined by Ciber, Inc., Huntsville, Alabama and found to be in compliance with the software specifications contained in the EAC Voting System Standards.

Ciber, Inc. is an Independent Test Agency approved by the National Association of State Election Directors.

NASED Qualification: Based on the reports from the ITAs, NASED assigned the system Qualification Number N-1-06-12-12-003.

4.2 Help America Vote Act of 2002

The AccuVote TS R6 Voting System is classified as an electronic voting system and, as such, falls under the following Sections of the **Help America Vote Act of 2002**

TITLE III--UNIFORM AND NONDISCRIMINATORY ELECTION TECHNOLOGY AND ADMINISTRATION REQUIREMENTS; SEC. 302. PROVISIONAL VOTING AND VOTING INFORMATION REQUIREMENTS.

(a) Provisional Voting Requirements.--If an individual declares that such individual is a registered voter in the jurisdiction in which the individual desires to vote and that the individual is eligible to vote in an election for Federal office, but the name of the individual does not appear on the official list of eligible voters for the polling place or an election official asserts that the individual is not eligible to vote, such individual shall be permitted to cast a provisional ballot ...

The AccuVote R6 voting station has the facility to allow a voter to vote a provisional ballot. This ballot is stored in a separate location and is not included in the tally until the county registrar has established the voter's credentials.

The paper ballot used for absentee voting can also be used to satisfy this requirement.

(2) Audit capacity (B) Manual audit capacity.—
(i) The voting system shall produce a permanent paper record with a manual audit capacity for such system.

The AccuVote TS R6 Voting System can satisfy this requirement.

(ii) The voting system shall provide the voter with an opportunity to change the ballot or correct any error before the permanent paper record is produced.

The AccuVote TS R6 Voting System satisfies this requirement. The AccuVote TS R6 Voting System presents a summary screen at the end of the ballot that gives the voter the opportunity to change any selection.

(3) Accessibility for individuals with disabilities.—The voting system shall--(A) be accessible for individuals with disabilities, including non-visual accessibility for the blind and visually impaired, in a manner that provides the same opportunity for access and participation (including privacy and independence) as for other voters;

The voter using the AccuVote TS R6 voting station can choose to view the ballot in large print or in high contrast or both. In addition, The AccuVote TS R6 voting station can be equipped with a telephone keypad and earphones for vision impaired voters.

4.3 Georgia Election Code

The AccuVote TS R6 Voting System is classified as a direct recording electronic voting system. The Georgia Election Code, Section 21-3-379 regulates systems of this type.

21-2-379.1 Requirements for use of electronic recording voting systems

No direct electronic recording voting system shall be adopted or used unless it shall, at the time, satisfy the following requirements:

(i) It shall provide facilities for voting for such candidates as may be nominated and upon such questions as may be submitted;

The AccuVote TS R6 Voting System satisfies this requirement.

(ii) It shall permit each elector, in one operation, to vote for all candidates of one party of body for presidential electors;

The AccuVote TS R6 Voting System satisfies this requirement.

(I) Except as provided in paragraph (2) of this Code section for presidential electors, it shall permit each elector, at other than primaries, to vote a ticket selected from nominees of any and all parties or bodies, from independent nominations, and from persons not in nomination;

The AccuVote TS R6 Voting System satisfies this requirement.

(2) *It shall permit each elector to vote, at any election, for any person and for any office for whom and for which he or she is lawfully entitled to vote, whether or not the name of such person or persons appears as a candidate for election, to vote for as many persons for an office as he or she is entitled to vote for; and to vote for or against any question upon which he or she is entitled to vote;*

The AccuVote TS R6 Voting System satisfies this requirement. Tests included multiple candidates for a single office and write-in candidates.

(3) *It shall preclude the counting of votes for any candidate or upon any question for whom or upon which an elector is not entitled to vote; shall preclude the counting of votes for more persons for any office than he or she is entitled to vote for; and shall preclude the counting of votes for any candidate for the same office or upon any question more than once;*

The AccuVote TS R6 Voting System satisfies this requirement. Tests indicated that the voter was only able to see and vote on the assigned ballot style. The system does not allow over-votes. Once the allowed number of candidates has been selected, the voter cannot select another candidate without first releasing one of the previously selected candidates. Tests were conducted to ensure that a voter could not write in the same name multiple times in a multi-candidate contest.

(4) *It shall permit voting in absolute secrecy so that no person can see or know for whom any other elector has voted or is voting save an elector whom he or she has assisted or is assisting in voting, as prescribed by law.*

The AccuVote TS R6 Voting System satisfies this requirement.

(5) *It shall be constructed of material of good quality in a neat and workmanship like manner;*

The AccuVote TS R6 Voting System satisfies this requirement. The quality of the materials and workmanship was reviewed by the hardware/firmware ITA, Wyle Laboratories.

(6) *It shall, when properly operated, record correctly and accurately every vote cast;*

The AccuVote TS R6 Voting System satisfies this requirement. The hardware ITA, Wyle Laboratories, and the software ITA,

Ciber, Inc., extensively tested this requirement. The State certification tests included logic and accuracy tests, but with a smaller number of ballots than the tests conducted by the ITAs.

(7) It shall be so constructed that an elector may readily learn the method of operating it;

In order to vote, the voter must press a pressure sensitive spot containing the name of the candidate. When the spot is pressed, a lighted square containing a large X appears beside the candidate's name. The persons participating in these tests did not have undue difficulty voting on the AccuVote TS R6 Voting System.

(8) It shall be safely transported.

The portion of the system that is installed in the precinct, the AccuVote TS R6 voting stations Precinct Card Manager are small and easily transported. See Section 3.2, System Hardware/Firmware.

21-2-379.4 Ballot appearance; write in votes on DRE systems

(a) The ballots for direct recording electronic (DRE) voting systems shall be of such size and arrangement as will suit the construction of the DRE screen and shall be in plain, clear type that is easily readable by persons with normal vision. If the equipment has the capacity for color display, the names of all candidates in a particular race shall be displayed in the same color, font, and size and the political party or body affiliation of candidates may be displayed in a color different from that used to display the names of the candidates, but all political party or body affiliations shall be printed in the same size and font. All ballot questions and constitutional amendments shall be displayed in the same color.

The AccuVote TS R6 Voting System satisfies this requirement.

(b) The arrangement of offices, names of candidates, and questions upon the ballots shall conform as nearly as practicable to this chapter for the arrangement of such offices, names of candidates, and questions on paper ballots.

The AccuVote TS R6 Voting System satisfies this requirement.

(c) Electors shall be permitted to cast write-in votes on DRE voting systems as provided in Code Section 21-2-133. The design of the ballot shall permit the election superintendent and poll workers

when obtaining the vote count from such systems to determine readily whether an elector has cast any write-in vote not authorized by law.

The AccuVote TS R6 Voting System satisfies this requirement.

21-2-379.5 Ballot information

(b) The ballot for each candidate or group of candidates nominated by a political party or body shall display the name or designation of the political party or body.

The AccuVote TS R6 Voting System satisfies this requirement.

(c) *The incumbency of a candidate seeking election for the public office he or she then holds shall be indicated on the ballot.*

The AccuVote TS R6 Voting System satisfies this requirement.

21-2-224 Official List of Electors Content (Active and Inactive)

(g) The official list of electors and the official list of inactive electors prepared and distributed to the poll officers of each precinct shall include only the elector's name, address, ZIP Code, date of birth, voter identification number, a designation of whether the elector registered for the first time in this state by mail and is required to comply with Code Sections 21-2-220 and 21-2-417, congressional district, state Senate district, state House district, county commission district, if any, county or independent board of education district, if any, and municipal governing authority district designations, if any, and such other voting districts, if any. The official list of electors and the official list of inactive electors prepared and distributed to the poll officers of each precinct may also include codes designating that an elector has voted by absentee ballot, has been challenged, or has been sent mail by the registrars which has been returned marked undeliverable. No person whose name does not appear on the official list of electors shall vote or be allowed to vote at any election, except as otherwise provided in this article.

The ExpressPoll 4000 satisfies this requirement.

21-2-401 Official List of Electors Content (Active and Inactive)

(b) *... The list shall indicate the name of any elector who has been mailed or delivered an absentee ballot. The list for a given precinct may be divided into as many alphabetical sections as is deemed necessary. ...In addition, the registrars shall at the same time place in the possession of the managers in each precinct one copy of the list of inactive electors for such precinct. ...*

The ExpressPoll 4000 satisfies this requirement.

(c) *The registrars may, in their discretion, place a master list containing the names and proper voting precincts of all electors and all inactive electors of the county or municipality at some or all of the polling places located in the county or municipality on the day of each election for use by the poll workers to assist electors in locating their proper precinct.*

The ExpressPoll 4000 satisfies this requirement.

Appendix A

Certification Test Plan
Of the
Georgia DRE Voting System
September 2004

Hardware Definition

GEMS Computer

Voter Card Encoders
- 101532
- 115663
- 119134
- 119136

Voting Stations
- 110002
- 113438
- 114187
- 114995
- 115673
- 116217
- 116372
- 116669
- 119520
- 121216
- 121606
- 123461
- 128124

Key Card Tool
- Dell Notebook Computer

Absentee Ballot Scanner
- 86634

Software Definition

AVTS-R6	4.5.2
AVOS	1.94w
GEMS	1.18.22G

Encoder	1.3.2
Key Card Tool	1.0.1

Faze I: Initial Setup:

1. Install the new system on Center devices and identify the differences between the current and the new system.
2. Identify the portions of the system that will require changes to the current training for election officials and poll workers.
3. Develop the ballot styles that will be used in the following Phases II and III. The ballot style for Phase II should be long enough that the summary page does not show on a single screen.
4. Develop voting scripts and voter instructions for use in Phase II.
5. Identify the devices that will be available for use during Certification Testing and set up the test environment.
6. Schedule a meeting to brief the KSU and SOS staff on the above items. This briefing should contain sufficient detail to enable this staff to make decisions about the implementation of the new system.

Phase II: Usability Testing

This test will test the end-to-end operation of the system by setting up and executing an election that is typical of an election in the State. Voting scripts will be prepared with a known outcome. All voting stations will record a number of votes that exceeds the number of votes normally cast on a voting station in a State election.

Setup: The configuration for this test will consist of two precincts from each of two counties, for a total of four precincts, as follows:

Clayton County: Forest Park 2 and Forest Park 6 Precincts.

Pierce County: Blackshear and Hackelbarney Precincts

Each county will have one early-voting terminal and each precinct will have two voting stations. The overall system employed will consist of a computer operating under GEMS 1.18.22G, a lap-top computer with Key Card Tool 1.0.1, thirteen AccuVote TS voting stations with firmware version 4.5.2, two AccuVote OS ballot scanners with firmware version 1.94w, four voter card encoders with firmware version 1.3.2. (Diagram A, below)

Phase III: Stress Testing

1. High volume tests. Conduct tests to determine the ability of the TS units to accommodate a high volume of ballots. The number of ballots cast in this test will exceed the number of ballots that may be cast in an early voting setup.

2. Precinct worker errors. Identify and test the system's ability to recovery from various types of errors that are typically committed by poll workers.
3. Voter errors. Identify and test the system's ability to recovery from various types of errors that are typically committed by voters.
4. Acts of Nature/Vandalism. Identify and test the system's ability to recovery from various acts of nature or vandalism.

Phase IV: Security Tests

- Conduct vulnerability assessment of the Diebold DRE to determine open ports and known vulnerabilities.
- Perform vulnerability assessment of the standard installation of GEMS Election Management Systems (EMS) to determine open ports and known vulnerabilities.
- Develop implementation recommendations for GEMS EMS, focusing on physical and procedural security.
- Hash and document GEMS standard installation for use in implementation validation and verification.
- Create hashing scripts to validate county implementations of GEMS against certified CES implementation of GEMS software.

Sample Ballot Script

Ballot Script
Georgia Certification Test

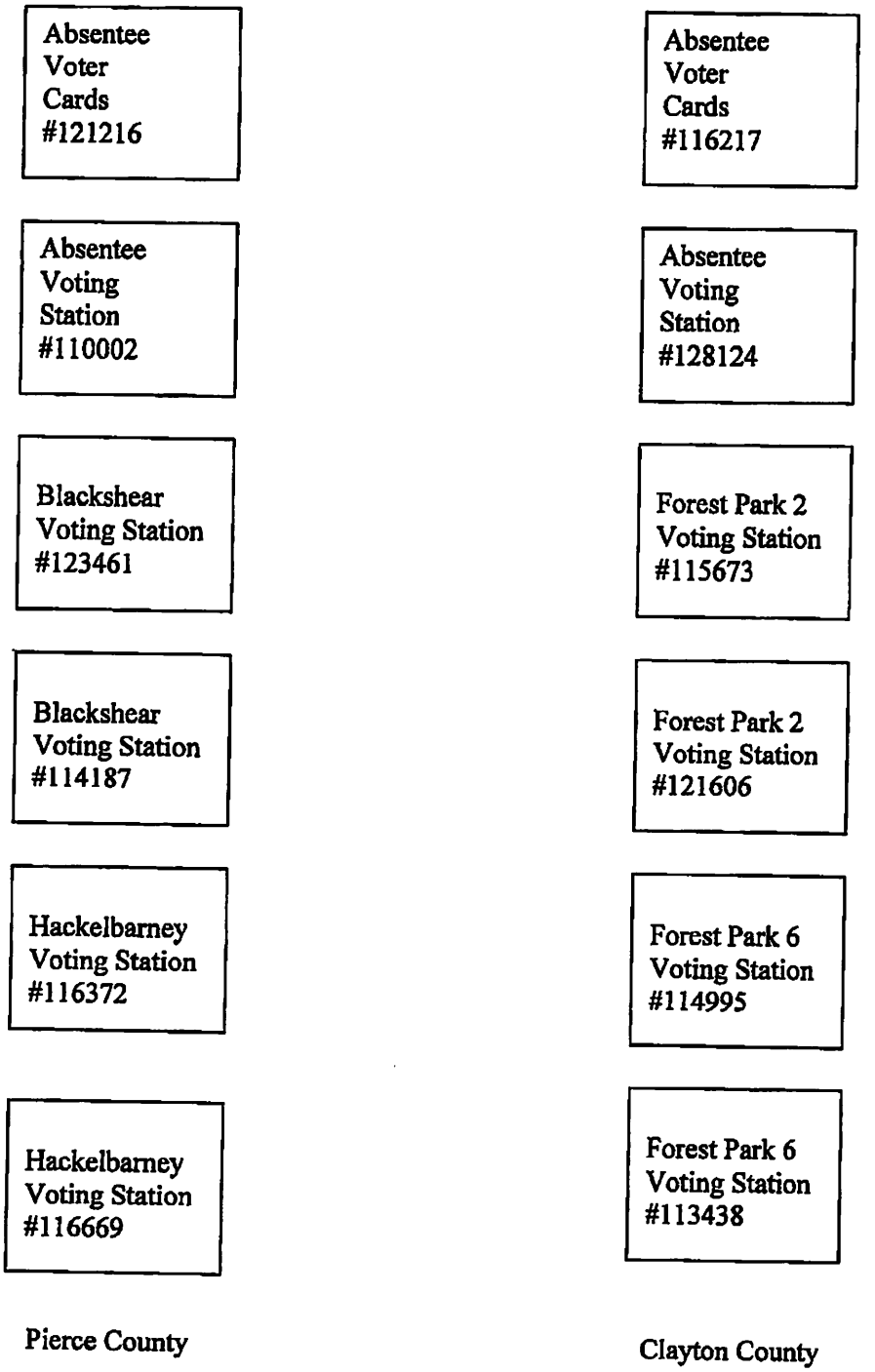
County:	**Clayton**
Precinct/Split:	**Forest Park 2, Split A**
Voting Station:	_____
Script:	1

Voter: _____ **Date:** _____

US Senate:	**MAX CLELAND**
Governor:	**ROY E BARNES**
Lt. Governor:	**MARK TAYLOR**
Secretary of State:	**CATHY COX**
Attorney General:	**THURBERT BAKER**
Comm. Of Agriculture:	**TOMMY IRVIN**
Comm. Of Insurance:	**LOIS COHEN**
State School Super:	**BARBARA CHRISTMAS**
Comm. Of Labor	**MICHAEL THURMOND**
Public Service Comm. 1	**EARLEEN W SIZEMORE**
Public Service Comm. 2	**LAUREN MCDONALD, JR**
US Rep 13th District	**DAVID SCOTT**
State Senate 44th District:	**TERRELL A STARR**
State Rep. 50th District:	**GEORGANA SINKFIELD**
County Comm. Dist. 1	**CARL RHODENIZER**
Board of Education:	**ERICA DAVIS or SUE RYAN**

(CONTINUED)

Const. Ammend. 1	**YES**
Const. Ammend. 2	**YES**
Const. Ammend. 3	**YES**
Const. Ammend. 4	**YES**
Const. Ammend. 5	**YES**
Const. Ammend. 6	**YES**
Statewide Ref. A	**YES**
Statewide Ref. B	**YES**
Statewide Ref. C	**YES**
Statewide Ref. D	**YES**
Statewide Ref. E	**YES**



Usability Test Configuration
Diagram A

ExpressPoll Testing Setup
August – September 2005

Thirty-four GEMS databases were built using data associated with the July 2004 Georgia General Primary. These databases were combined with voter registration data for all registered voters in Georgia as of August 1, 2005. The combined data was used to power ExpressPoll during testing.

Phase I: Usability Tests

Testing is conducted to witness the end-to-end operation of the system by setting up and executing an election that is typical of an election in the State. Testing scripts will be prepared requiring the user to perform detailed operations on each ExperssPoll unit with a known outcome.

Setup: Two ExpressPoll 4000 units are connected via crossover cable and are assigned to a single polling location (normal precinct configuration). Users are to assign their devices to one of four locations from a list of known polling locations contained in the test data. Once assigned, users performed specific functions required of a precinct's electors list and voter access card encoder.

Four Required Locations:

Name (County)	Polling Precinct ID
Quitman (Brooks County, GA)	014008
Trenton (Dade County, GA)	041007
Leesburg (Lee County, GA)	088005
Lewis Frasier (Liberty County, GA)	089002

Phase II: Stress Testing

1. High volume tests. Tests conducted to determine the ability of ExpressPoll 4000 to function in an expected and anticipated manner over an extended period of within pre-designated precincts using ExpressPoll 4000's normal precinct configuration.
2. Precinct worker errors. Identify and test the system's ability to recovery from various types of errors that are typically committed by poll workers.

Phase III: Security Testing

1. Penetration tests conducted by the Center for Information Security Education and Awareness at Kennesaw State University. These tests are used to determine the vulnerability to outside attack of ExpressPoll 4000 in its precinct configuration.

[redacted]

Interim Certification Test of the

Diebold Election Systems TS Voting System With AccuView Printer

Prepared for:

Elections Division
Office of the Secretary of State
State of Georgia

Prepared by:

Center for Election Systems
Kennesaw State University
Kennesaw, Georgia, 30144

August 8, 2006

Certification Test Plan
For the
Diebold TS Voting System
With the
AccuView Printer Module

Introduction: The purpose of this certification test is to evaluate the Diebold TS voting system with AccuView Printer Module for use in the State of Georgia in a pilot test during the 2006 Primary Election. This certification is an interim certification that will expire on December 31, 2006. The pilot test is to be conducted in three precincts, one in each county that is selected to participate in the pilot. The Test Plan for this certification is contained in the Appendix.

Conclusion: The Diebold TS voting station with the AccuView Printer Module successfully completed the Certification Test Plan contained in the Appendix. The system described in the Test Plan is recommended for use in the pilot project scheduled for the November 2006 Election and any subsequent run off. It should be noted that this certification evaluation is for use of the system in this one election only. Tests that were not relevant to restricted use in a single election were not conducted. Thus, prior to awarding this system an unrestricted certification, the system should undergo a more extensive certification review.

Overview of the Certification Tests:

The purpose of these certification tests was to establish that the GEMS 1.18.24 and the TSX voting station with firmware AVTS 4.6.4, equipped with the AccuView Printer Module will function seamlessly with the current Georgia voting system.

During these tests it was established that:

- GEMS 1.18.24 and GEMS 1.18.22G can be installed simultaneously on a single server and share a single election database.
- Memory cards from the TSX voting station with firmware AVTS 4.6.4 will load correctly into this shared database.
- Memory cards from the TS-R6 and TSX voting stations with firmware AVTS 4.5.2 will load correctly into this shared database.
- Reports printed from this shared database correctly reflect the combined data from all voting stations.
- Voter cards produced by the ExpressPoll 4000 will operate correctly in the TSX voting station with firmware AVTS 4.6.4.

System Tested: The system tested consisted of the following components of the Diebold TS voting system:

GEMS 1.18.24,

AccuVote TS firmware AVTS 4.6.4, and

AccuVote TS voting stations with the attached AccuView Printer Module.

The following components of the Georgia voting system were included in the test to verify compatibility:

GEMS 1.18.22G,

AccuVote TS – R6 voting stations with firmware AVTS 4.5.2,

AccuVote TSX voting stations with AccuVote firmware AVTS 4.5.2, and

ExpressPoll 4000 1.2.0

Applicable Documents:

Software Functional Test Report Diebold Election Systems GEMS 1-18, Addendum 12 for GEMS 1-18-22G, Ciber Independent Test Authority, June 2006.

Hardware Qualification Testing of the Diebold Election Systems AccuVote TSX Model D DRE Voting Machine, Wyle Report 52501-07 on the AccuVote TSX Model D Tablet, Wyle Laboratories, Inc., April 2006.

AccuView Printer Module Hardware Guide, Diebold Election Systems, Revision 2.0, May 2005.

AccuView Printer Module Single Roll Opening and Closing Procedures, Diebold Election Systems, Revision 1.0, May 2005.

AccuVote TSX Hardware Guide, Diebold Election Systems, Revision 8.0, February 2004.

AccuVote TSX Poll worker's Guide, Diebold Election Systems, Revision 5.0, March 2005.

GEMS 1-18 Election Administrator's Guide, Diebold Election Systems, Revision 10.0, May 2005.

GEMS 1.18 Product Overview Guide, Revision 3.0, Diebold Election Systems, December 2005.

GEMS 1.18 Reference Guide, Revision 8.0, Diebold Election Systems, April 2005.

GEMS 1.18 System Administrator's Guide, Revision 7.0, Diebold Election Systems, January 2006.

GEMS 1.18 User Guide, GEMS, Revision 12.0, Diebold Election Systems, April 2005.

APPENDIX

Certification Test Plan
Of the
AccuVote TSX Voting Station
Georgia DRE Voting System
September 2004

Overall Objective: The purpose of these tests is to verify that the AccuVote TSX voting station with AccuView Printer Module using firmware version TSX 4.6.4, will operate seamlessly in the Georgia Voting System.

Phase I: Interoperability:

The purpose of these tests is to verify the interoperability of the AccuVote TSX with AccuView Printer voting station with existing components of the Georgia Voting System.

1. Verify that memory cards produced by GEMS 1.18.24 will load successfully into the TSX voting station with firmware AVTS 4.6.4.
2. Verify that memory cards created by closing the polls on a TSX voting station with firmware TS 4.6.4 will upload successfully into GEMS 1.18.24.
3. Verify that voter cards produced by PollBook 4000, version 1.2.53, will operate successfully in the TSX voting station with firmware TS 4.6.4.
4. Verify that GEMS 1.18.24 and GEMS 1.18.22G will operate on a single server with a shared database.
5. Verify that a mix of memory cards produced by closing the polls on AccuVote TS-R6 voting stations and AccuVote TSX voting stations using firmware TS 4.5.2, and TS voting station using firmware TS 4.6.4 will upload correctly into a shared database on a single server running both GEMS 1.18.24 and GEMS 1.18.22G.

Phase II: Usability Testing

This test will test the end-to-end operation of the system by setting up and executing an election that is typical of an election in the State. Voting scripts will be prepared with a known outcome.

Setup: The configuration for this test will consist of two precincts from each of two counties, for a total of four precincts, as follows:

Clayton County: Forest Park 2 and Forest Park 6 Precincts.

Pierce County: Blackshear and Hackelbarney Precincts

Each precinct will have one TSX voting station with AccuView Printer Module. The overall system employed will consist of a computer operating under GEMS 1.18.24, a

lap-top computer with Key Card Tool 1.0.1, four AccuVote TSX voting stations with firmware version TSX 4.6.4., and one Express Poll 4000 with firmware version 1.2.53.

Hardware Definition

GEMS Computer

ExpressPoll 4000
SOGS009A

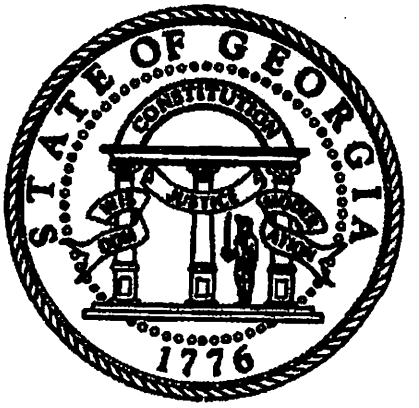
AccuVote TS-R6 Voting Stations
159543

AccuVote TSX Voting Stations with AccuView Printer Modules
261577
262530
275943
281335

Key Card Tool
Dell Notebook Computer

Software Definition

AVTS-R6	4.5.2
AVTS-TSX	4.5.2
AVTS-TSX	4.6.4
GEMS	1.18.22G
GEMS	1.18.24
Encoder	1.3.2
Key Card Tool	1.0.1
PollBook 4000	1.2.0



Certification Test of the

Diebold Election Systems TS Voting System

Prepared for:

Elections Division
Office of the Secretary of State
State of Georgia

Prepared by:

Center for Election Systems
Kennesaw State University
Kennesaw, Georgia, 30144

Revised
July 10, 2006

Contents

1.	Introduction		3
2.	Summary of Findings		3
3.	System Description		3
	3.1	System Hardware	4
	3.2	System Software/Firmware	4
	3.3	System and Test Documentation	5
	3.4	Overview of System Operation	6
4.	Compliance With Applicable Statues and Standards		7
	4.1	Election Assistance Administration Voting System Standards	7
	4.2	Help America Vote Act of 2002	7
	4.3	Georgia Election Code	9
Appendix A:	Certification Test Plan		13
Appendix B:	Certification Test Plan; TSX – Model C		19
Appendix C:	Certification Test Plan; TSX – Model D		23

1. Introduction

Certification Tests of the Diebold Election Systems TS Voting System were conducted at Kennesaw State University during the months of September, November, and December, 2004. The Test Plan that was followed is contained in Appendix A.

Certification tests to include the ExpressPoll 4000 in this system were conducted in August and September, 2005.

Certification tests to include the AccuVote TSX – Model C Voting Station in this system were conducted in March 2006.

Certification tests to include the AccuVote TSX – Model D Voting Station in this system were conducted in July 2006.

These tests were conducted by the staff of the Kennesaw State University Center for Election Systems under the direction of Dr. Brit Williams.

2. Summary of Findings

The Diebold Election System TS Voting System as tested in 2004 was found to be in compliance with the applicable provisions of the Help America Vote Act of 2002, the Georgia Election Code, the Rules of the Georgia Election Board, and the Rules of the Secretary of State.

The following features are enhancements that were tested for inclusion in the original system.

Encryption of the data files transmitted via modem: When the polls close on election night the poll manager has the ability to transmit unofficial results to the county elections office. The previous version of the voting system did not encrypt this file prior to transmission. The tested version of the voting system encrypts this file prior to transmission.

Randomization of all internal ballot image files: The previous version of the voting system contained one ballot image file that was not randomized. The tested version of the voting system randomizes all internal ballot image files.

Dynamic password on Poll Manager Card: In previous version of the voting system the password on the Poll Manager Card was a static four digit number. The tested version of the system has a six digit password and allows this password to be changed as often as desired.

Dynamic password on Voter Cards: In the previous version of the voting system the password contained in the hand-shaking routine between the voter card

and the voting station was static. The tested version of the system allows this password to be changed as often as desired.

ExpressPoll 4000: ExpressPoll 4000 functions as an encoder that is connected to the precinct's electors list. By reading and displaying the precinct's electors list, ExpressPoll 4000 creates a voter access card which will access the voter's assigned ballot style by associating the voter's ballot combination, as outlined in the voter registration record, with the ballot styles maintained on the voting units within the precinct.

AccuVote TSX – Model C Voting Station: The TSX – Model C is a revised version of the AccuVote TS R6 voting station. The TSX is functionally identical to the TS R6. Enhancements include an integrated carrying/storage case, lighter weight, and a light-weight, battery powered voting tablet that can be removed from the case and placed in a handicapped voters lap or carried to curb-side. The certification Test Plan for the TSX – Model C is contained in Appendix B.

AccuVote TSX – Model D Voting Station: The TSX – Model D is a slightly modified version of the TSX Model C Voting Station. The Model D is both functionally and electronically identical to the Model C. Thus, the Model D does not require any additional training for election officials or voters who are familiar with the Model C. The Model D was developed in response to the unavailability of some of the components of the Model C. The certification Test Plan for the TSX – Model D is contained in Appendix B.

3. System Description

The system tested was the **AccuVote TS Voting System**, presented by Diebold Election Systems, Inc., 1611 Wilmeth Road, McKinney, Texas, 75069-8250. This system is composed of the **AccuVote TS R6 Voting Station**, the **AccuVote TSX Voting Station**, the **AccuVote OS Ballot Scanner**, the **Voting Card Encoder**, the **Express Poll 4000**, and a commercial computer running the **Global Election Management System (GEMS)**. A complete list of the system tested is contained in Appendix A.

3.1 System Hardware

The hardware tested consisted of:

- A **"Large County" GEMS computer** provided by Diebold under the State contract.

  Thirteen **AccuVote TS R6 Voting Stations** provided the voter interface.

  Four **Voter Card Encoders** were used to program the voter cards.

One **AccuVote OS Ballot Scanner** was used to process absentee and provisional/challenged ballots.

Smart Cards were used for voter cards and supervisor cards.

Twenty-five **ExpressPoll 4000s** were used to read voter's records from the precinct voter registration database and create the corresponding voter card.

Four **AccuVote TSX Voting Stations** were tested to verify that the voting stations will integrate seamlessly into the existing Georgia voting system.

The specific devices used during the certification tests of the Diebold Election System TS Voting System are listed in Appendix A.

The specific devices used during the certification tests of the AccuVote TSX voting stations are listed in Appendix B.

3.2 System Software/Firmware

The operating system used by the personal computers that support the Global Election Management System and the Poll Book systems is **Windows CE**. Windows CE is also the operating system that controls the functions of the Voting Stations.

The **Global Election Management System (GEMS), Version 1.18.22G,** is a Diebold proprietary system which runs on a standard personal computer and performs the following pre-election functions: setup the election data base, create a new election, enter contests and issues, define ballot styles, and produce the PCMCIA cards that are used to program the voting stations in the precincts and the absentee ballot scanners. After the polls close, this system reads the PCMCIA cards from the precincts, tallies the votes, and prints the various reports and audit data.

BS, Version 4.5.2 is a Diebold proprietary system that controls the TS-R6 and TSX voting stations.

OS, Version 194w is a Diebold proprietary system that controls the OS Ballot Scanner.

Encoder Firmware 1.32 is a Diebold proprietary system that controls the voter card encoder.

Key Card Tool 1.01 is a Diebold Proprietary system that enables the election official to change the passwords on the Voter Cards and the Poll Manager's Card.

ExpressPoll Firmware 1.2.0 is a Diebold Proprietary system that enables an election official to read a voter record from the voter registration database and create a Voter Card for the ballot style that corresponds to the voter's registration information.

3.3 System and Test Documentation

AccuVote-TS R6 System Hardware Specification, Document Revision 1.0, Diebold Election Systems, April 30, 2001

AccuVote-TS Hardware Guide, Document Revision 1.0, Diebold Election Systems, April 30, 2001

AccuVote-TS Ballot Station 4.5 User's Guide, Revision 2.0, Diebold Election Systems, June 17, 2004

GEMS 1.18 Product Overview Guide, Revision 2.0, Diebold Election Systems, February 13, 2004

GEMS 1.18 Reference Guide, Revision 6.0, Diebold Election Systems, June 15, 2004

GEMS 1.18 Election Administrator's Guide, Revision 6.0, Diebold Election Systems, June 15, 2004

GEMS 1.18 User Guide, GEMS, Revision 4.0, Diebold Election Systems, November 1, 2002

Voter Card Encoder 1.3 User's Guide, Revision 1.0, Diebold Election Systems, February 10, 2004

Key Card Tool 1.0 User's Guide, Revision 2.0, Diebold Election Systems, April 20, 2004

AccuVote OS Precinct Count 1.96 User's Guide, Revision 1.0, Diebold Election Systems, August 27, 2002

AccuVote OS AccuFeed User's Guide, Revision 1.0, Diebold Election Systems, July 18, 2002

VCProgrammer 4.1 User's Guide, Revision 2.0, Diebold Election Systems, September 24, 2002

Source Code, GEMS Version 1-18-22G, Diebold Election Systems, July 2004

Diebold Election Systems, Inc. Software Functional Test Report GEMS 1-18-22, Ciber Independent Test Authority, September 29, 2004

Change Release Report of the AccuVote TS R6 DRE Voting Machine, Wyle Laboratories, August 3, 2004

Software Functional Test Report Diebold Election Systems GEMS 1-18, Addendum 12 for GEMS 1-18-22G, Ciber Independent Test Authority, June 2006

Hardware Qualification Testing of the Diebold Election Systems AccuVote TSX Model D DRE Voting Machine, Wyle Report 52501-07 on the AccuVote TSX Model D Tablet, Wyle Laboratories, Inc., April 2006

AccuVote TSX Hardware Guide, Diebold Election Systems, Revision 8.0, February 2004

AccuVote TSX Pollworker's Guide, Diebold Election Systems, Revision 5.0, March 2005

GEMS 1-18 Election Administrator's Guide, Diebold Election Systems, Revision 10.0, May 2005

GEMS 1.18 Product Overview Guide, Revision 3.0, Diebold Election Systems, December 2005

GEMS 1.18 Reference Guide, Revision 8.0, Diebold Election Systems, April 2005

GEMS 1.18 System Administrator's Guide, Revision 7.0, Diebold Election Systems, January 2006

GEMS 1.18 User Guide, GEMS, Revision 12.0, Diebold Election Systems, April 2005

3.4 Overview of System Operation

Election Definition: The following functions are performed by the Global Election Management System (GEMS).

Create the election database.

Enter races and candidates, issues and options that are to appear in the

election

Select the races and issues that are to appear on each ballot style.

Enter headings and instructions as they are to appear on the ballots.

Format the ballots.

Establish passwords for the voter cards and poll manager's cards.

Hardware Programming: Once the election definition is complete, the PCMCIA cards can be prepared to control the AccuVote TS voting stations and the AccuVote OS optical scan ballot scanners. A PCMCIA card must be prepared for each voting station and each ballot scanner.

Precinct Setup: The voting stations and ballot scanners are prepared for the election by inserting the PCMCIA cards and powering up the device. The device performs a self test and is then ready for pre-election testing.

Election Day (Precinct) Activities: As the polls are opened and each device is powered up, the device performs a self test and presents a menu with the various options allowed at the polling place. If the 'open polls' option is selected, the registers are set to zero and a 'zero totals' tape is printed.

The ExpressPoll 4000 is used by a poll worker to isolate a voter's name on an electronically displayed elector's list within the precinct and then create a voter access card while at the same time marking the precinct's electors list. The combined operation is designed to provide an accurate listing of voter participation at the precinct while ensuring that each participating elector receives the proper ballot style which is based on the voter's ballot combination outlined in the state's voter registration system.

When the polls are closed, the vote totals from each device are recorded to the PCMCIA cards. These cards are then transported to a central counting location for entry into the GEMS system for tallying and reporting. If desired, unofficial results from the precincts can be transmitted to the central location via modem.

Vote Tallying/Report Printing: The PCMCIA cards from each precinct are returned to the central facility where they are loaded into the GEMS. During this step, any known errors can be manually corrected and absentee votes can be entered.

At any time during the tally of the votes or at the completion of vote tallying, election result can be printed by precinct or overall. These

reports can also be exported to other systems or posted on the Internet.

The system administrator can use the GEMS to print the various audit logs.

4. Compliance With Applicable Statues and Standards

4.1 Election Assistance Commission Voting System Standards

Hardware/Firmware: The Diebold Election Systems TS Voting System hardware and firmware was examined by Wyle Laboratories, Huntsville, Alabama and found to be in compliance with the hardware specifications contained in the EAC Voting System Standards. Wyle is an Independent Test Agency approved by the National Association of State Election Directors (NASED).

Software: The GEMS election management software was examined by Ciber, Inc., Huntsville, Alabama and found to be in compliance with the software specifications contained in the EAC Voting System Standards. Ciber, Inc. is an Independent Test Agency approved by the National Association of State Election Directors.

NASED Qualification: Based on the reports from the ITAs, NASED assigned the system Qualification Number N-1-06-12-12-003.

4.2 Help America Vote Act of 2002

The Diebold Election Systems TS Voting System is classified as an electronic voting system and, as such, falls under the following Sections of the **Help America Vote Act of 2002**

TITLE III--UNIFORM AND NONDISCRIMINATORY ELECTION TECHNOLOGY AND ADMINISTRATION REQUIREMENTS; SEC. 302. PROVISIONAL VOTING AND VOTING INFORMATION REQUIREMENTS.

(a) Provisional Voting Requirements.--If an individual declares that such individual is a registered voter in the jurisdiction in which the individual desires to vote and that the individual is eligible to vote in an election for Federal office, but the name of the individual does not appear on the official list of eligible voters for the polling place or an election official asserts that the individual is not eligible to vote, such individual shall be permitted to cast a provisional ballot ...

The Diebold Election Systems TS Voting System has the facility to allow a voter to vote a provisional ballot. This ballot is stored in a separate location and is not included in the tally until the voter's credentials have been established by the county registrar.

The paper ballot used for absentee voting can also be used to satisfy this requirement.

(2) Audit capacity (B) Manual audit capacity.—
(i) The voting system shall produce a permanent paper record with a manual audit capacity for such system.

The Diebold Election Systems TS Voting System can satisfy this requirement.

(ii) The voting system shall provide the voter with an opportunity to change the ballot or correct any error before the permanent paper record is produced.

The Diebold Election Systems TS Voting System satisfies this requirement. The AccuVote TS R6 and TSX Voting Stations present a summary screen at the end of the ballot that gives the voter the opportunity to change any selection.

(3) Accessibility for individuals with disabilities.—The voting system shall--(A) be accessible for individuals with disabilities, including non-visual accessibility for the blind and visually impaired, in a manner that provides the same opportunity for access and participation (including privacy and independence) as for other voters;

The voter using the AccuVote TS R6 and TSX voting stations can choose to view the ballot in large print or in high contrast or both. In addition, The AccuVote TS R6 and TSX voting stations can be equipped with a telephone keypad and earphones for vision impaired voters.

4.3 Georgia Election Code

The Diebold Election Systems TS Voting System is classified as direct recording electronic voting systems. The Georgia Election Code, Section 21-3-379 regulates systems of this type.

21-2-379.1 Requirements for use of electronic recording voting systems

No direct electronic recording voting system shall be adopted or used unless it shall, at the time, satisfy the following requirements:

(i) It shall provide facilities for voting for such candidates as may be nominated and upon such questions as may be submitted;

The Diebold Election Systems TS Voting System satisfies this requirement.

(ii) It shall permit each elector, in one operation, to vote for all candidates of one party of body for presidential electors;

The Diebold Election System TS Voting System satisfies this requirement.

(1) Except as provided in paragraph (2) of this Code section for presidential electors, it shall permit each elector, at other than primaries, to vote a ticket selected from nominees of any and all parties or bodies, from independent nominations, and from persons not in nomination;

The Diebold Election Systems TS Voting System satisfies this requirement.

(2) It shall permit each elector to vote, at any election, for any person and for any office for whom and for which he or she is lawfully entitled to vote, whether or not the name of such person or persons appears as a candidate for election, to vote for as many persons for an office as he or she is entitled to vote for; and to vote for or against any question upon which he or she is entitled to vote;

The Diebold Election Systems TS Voting System satisfies this requirement. Tests included multiple candidates for a single office and write-in candidates.

(3) It shall preclude the counting of votes for any candidate or upon any question for whom or upon which an elector is not entitled to vote; shall preclude the counting of votes for more persons for any office than he or she is entitled to vote for; and shall preclude the counting of votes for any candidate for the same office or upon any question more than once;

The Diebold Election Systems TS Voting System satisfies this requirement. Tests indicated that the voter was only able to see and vote on the assigned ballot style. The system does not allow over-votes. Once the allowed number of candidates has been

selected, the voter cannot select another candidate without first releasing one of the previously selected candidates. Tests were conducted to ensure that a voter could not write in the same name multiple times in a multi-candidate contest.

(4) *It shall permit voting in absolute secrecy so that no person can see or know for whom any other elector has voted or is voting save an elector whom he or she has assisted or is assisting in voting, as prescribed by law.*

The Diebold Election Systems TS Voting System satisfies this requirement.

(5) *It shall be constructed of material of good quality in a neat and workmanship like manner;*

The Diebold Election Systems TS Voting System satisfies this requirement. The quality of the materials and workmanship was reviewed by the hardware/firmware ITA, Wyle Laboratories.

(6) *It shall, when properly operated, record correctly and accurately every vote cast;*

The Diebold Election Systems TS Voting System satisfies this requirement. The hardware ITA, Wyle Laboratories, and the software ITA, Ciber, Inc., extensively tested this requirement. The State certification tests included logic and accuracy tests, but with a smaller number of ballots than the tests conducted by the ITAs.

(7) *It shall be so constructed that an elector may readily learn the method of operating it;*

In order to vote on the AccuVote TS R6 or TSX voting station, the voter must press a pressure sensitive spot containing the name of the candidate. When the spot is pressed, a lighted square containing a large X appears beside the candidate's name. The persons participating in these tests did not have undue difficulty voting on the AccuVote TS R6 and TSX Voting Stations.

(8) *It shall be safely transported.*

The portion of the system that is installed in the precinct, the AccuVote TS R6 and TSX voting stations and the Express Poll 4000, are small and easily transported. See Section 3.2, System Hardware/Firmware.

21-2-379.4 Ballot appearance; write in votes on DRE systems

(a) *The ballots for direct recording electronic (DRE) voting systems shall be of such size and arrangement as will suit the construction of the DRE screen and shall be in plain, clear type that is easily readable by persons with normal vision. If the equipment has the capacity for color display, the names of all candidates in a particular race shall be displayed in the same color, font, and size and the political party or body affiliation of candidates may be displayed in a color different from that used to display the names of the candidates, but all political party or body affiliations shall be printed in the same size and font. All ballot questions and constitutional amendments shall be displayed in the same color.*

The Diebold Election Systems TS Voting System satisfies this requirement.

(b) *The arrangement of offices, names of candidates, and questions upon the ballots shall conform as nearly as practicable to this chapter for the arrangement of such offices, names of candidates, and questions on paper ballots.*

The Diebold Election Systems TS Voting System satisfies this requirement.

(c) *Electors shall be permitted to cast write-in votes on DRE voting systems as provided in Code Section 21-2-133. The design of the ballot shall permit the election superintendent and poll workers when obtaining the vote count from such systems to determine readily whether an elector has cast any write-in vote not authorized by law.*

The Diebold Election Systems TS Voting System satisfies this requirement.

21-2-379.5 Ballot information

(b) *The ballot for each candidate or group of candidates nominated by a political party or body shall display the name or designation of the political party or body.*

The Diebold Election Systems TS Voting System satisfies this requirement.

(c) *The incumbency of a candidate seeking election for the public office he or she then holds shall be indicated on the ballot.*

The Diebold Election Systems TS Voting System satisfies this requirement.

Appendix A

Certification Test Plan
Of the
Georgia DRE Voting System
September 2004

Hardware Definition

GEMS Computer

Voter Card Encoders
- 101532
- 115663
- 119134
- 119136

Voting Stations
- 110002
- 113438
- 114187
- 114995
- 115673
- 116217
- 116372
- 116669
- 119520
- 121216
- 121606
- 123461
- 128124

Key Card Tool
- Dell Notebook Computer

Absentee Ballot Scanner
- 86634

Software Definition

AVTS-R6	4.5.2
AVOS	1.94w
GEMS	1.18.22G

Encoder	1.3.2
Key Card Tool	1.0.1

Phase I: Initial Setup:

1. Install the new system on Center devices and identify the differences between the current and the new system.
2. Identify the portions of the system that will require changes to the current training for election officials and poll workers.
3. Develop the ballot styles that will be used in the following Phases II and III. The ballot style for Phase II should be long enough that the summary page does not show on a single screen.
4. Develop voting scripts and voter instructions for use in Phase II.
5. Identify the devices that will be available for use during Certification Testing and set up the test environment.
6. Schedule a meeting to brief the KSU and SOS staff on the above items. This briefing should contain sufficient detail to enable this staff to make decisions about the implementation of the new system.

Phase II: Usability Testing

This test will test the end-to-end operation of the system by setting up and executing an election that is typical of an election in the State. Voting scripts will be prepared with a known outcome. All voting stations will record a number of votes that exceeds the number of votes normally cast on a voting station in a State election.

Setup: The configuration for this test will consist of two precincts from each of two counties, for a total of four precincts, as follows:

Clayton County: Forest Park 2 and Forest Park 6 Precincts.

Pierce County: Blackshear and Hackelbarney Precincts

Each county will have one early-voting terminal and each precinct will have two voting stations. The overall system employed will consist of a computer operating under GEMS 1.18.22G, a lap-top computer with Key Card Tool 1.0.1, thirteen AccuVote TS voting stations with firmware version 4.5.2 , two AccuVote OS ballot scanners with firmware version 1.94w, four voter card encoders with firmware version 1.3.2. (Diagram A, below)

Phase III: Stress Testing

1. High volume tests. Conduct tests to determine the ability of the TS units to accommodate a high volume of ballots. The number of ballots cast in this test will exceed the number of ballots that may be cast in an early voting setup.

2. Precinct worker errors. Identify and test the system's ability to recovery from various types of errors that are typically committed by poll workers.
3. Voter errors. Identify and test the system's ability to recovery from various types of errors that are typically committed by voters.
4. Acts of Nature/Vandalism. Identify and test the system's ability to recovery from various acts of nature or vandalism.

Phase IV: Security Tests

- Conduct vulnerability assessment of the Diebold DRE to determine open ports and known vulnerabilities.
- Perform vulnerability assessment of the standard installation of GEMS Election Management Systems (EMS) to determine open ports and known vulnerabilities.
- Develop implementation recommendations for GEMS EMS, focusing on physical and procedural security.
- Hash and document GEMS standard installation for use in implementation validation and verification.
- Create hashing scripts to validate county implementations of GEMS against certified CES implementation of GEMS software.

Sample Ballot Script

Ballot Script
Georgia Certification Test

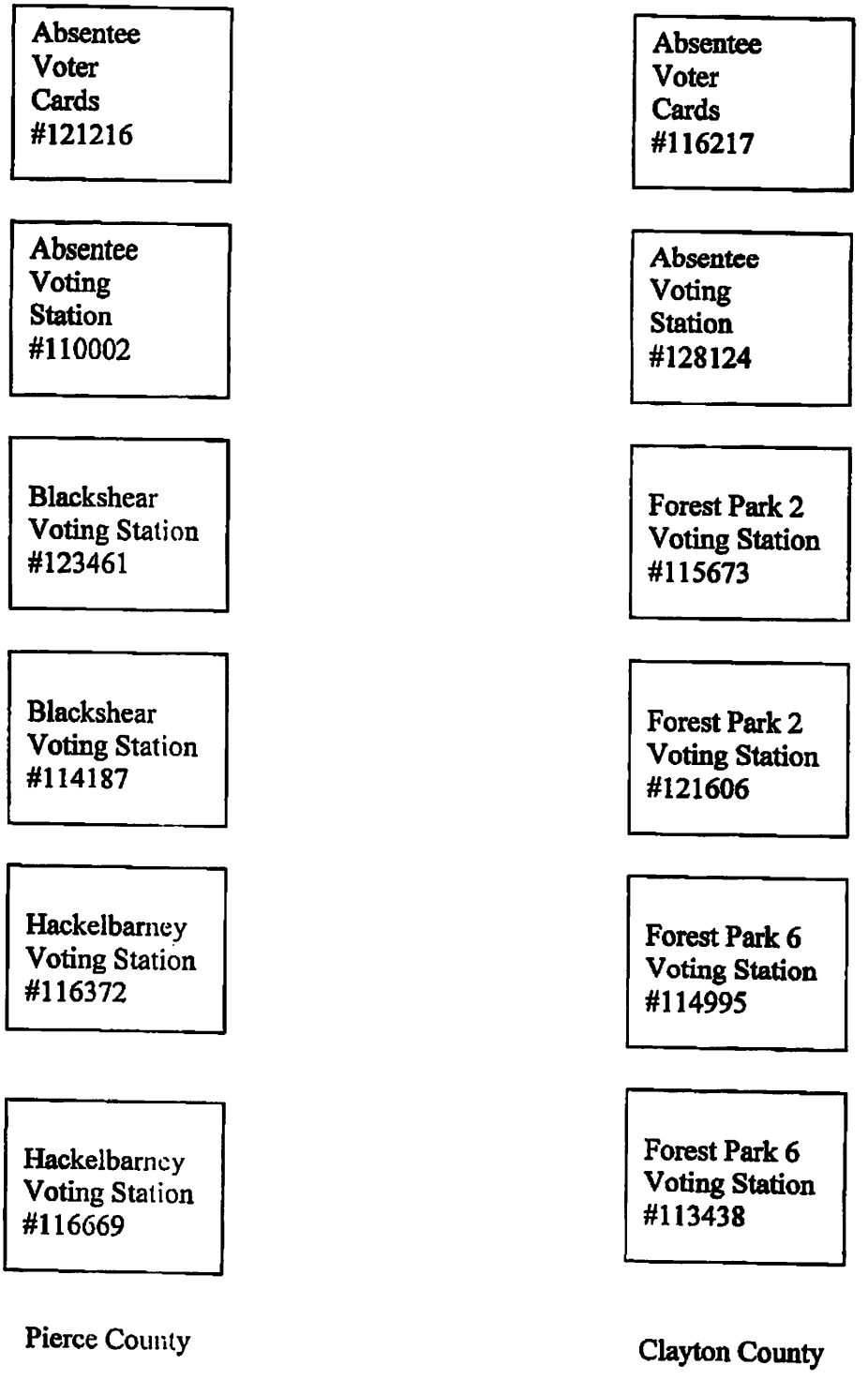
County: Clayton
Precinct/Split: Forest Park 2, Split A
Voting Station: _____
Script: 1

Voter: _____ **Date:** _____

US Senate:	**MAX CLELAND**
Governor:	**ROY E BARNES**
Lt. Governor:	**MARK TAYLOR**
Secretary of State:	**CATHY COX**
Attorney General:	**THURBERT BAKER**
Comm. Of Agriculture:	**TOMMY IRVIN**
Comm. Of Insurance:	**LOIS COHEN**
State School Super:	**BARBARA CHRISTMAS**
Comm. Of Labor	**MICHAEL THURMOND**
Public Service Comm. 1	**EARLEEN W SIZEMORE**
Public Service Comm. 2	**LAUREN MCDONALD, JR**
US Rep 13th District	**DAVID SCOTT**
State Senate 44th District:	**TERRELL A STARR**
State Rep. 50th District:	**GEORGANA SINKFIELD**
County Comm. Dist. 1	**CARL RHODENIZER**
Board of Education:	**ERICA DAVIS or SUE RYAN**

(CONTINUED)

Const. Ammend. 1	**YES**
Const. Ammend. 2	**YES**
Const. Ammend. 3	**YES**
Const. Ammend. 4	**YES**
Const. Ammend. 5	**YES**
Const. Ammend. 6	**YES**
Statewide Ref. A	**YES**
Statewide Ref. B	**YES**
Statewide Ref. C	**YES**
Statewide Ref. D	**YES**
Statewide Ref. E	**YES**



Usability Test Configuration
Diagram A

Appendix B

Certification Test Plan
Of the
AccuVote TSX Voting Station
Georgia DRE Voting System
September 2004

Overall Objective: The purpose of these tests is to verify that the AccuVote TSX voting station, firmware version 4.5.2, will operate seamlessly in the Georgia Voting System. The precinct layout for these tests will be the same as the precinct layout presented in Appendix A, above.

Phase I: Interoperability:

The purpose of these tests is to verify that the AccuVote TSX voting station will operate seamlessly in the Georgia Voting System.

1. Verify that memory cards produced by GEMS 1.18.22G will load successfully into either the TS-R6 or the TSX voting stations.
2. Verify that memory cards created by closing the polls on either a TS-R6 or a TSX voting station will upload successfully into GEMS 1.18.22G.
3. Verify that voter cards produced by PollBook 4000, version 1.2.0, will operate successfully in either the TS-R6 or the TSX voting station.
4. Verify that a mix of memory cards produced by closing the polls on AccuVote TS-R6 voting stations, AccuVote TSX voting stations, and AccuVote OS optical scan ballot scanners will upload correctly into GEMS 1.18.22G.

Phase II: Usability Testing

This test will test the end-to-end operation of the system by setting up and executing an election that is typical of an election in the State. Voting scripts will be prepared with a known outcome. All AccuVote TSX voting stations will record a number of votes that exceeds the number of votes normally cast on a voting station in a State election.

Setup: The configuration for this test will consist of two precincts from each of two counties, for a total of four precincts, as follows:

Clayton County: Forest Park 2 and Forest Park 6 Precincts.

Pierce County: Blackshear and Hackelbarney Precincts

Each precinct will have one TSX voting stations. The overall system employed will consist of a computer operating under GEMS 1.18.22G, a lap-top computer with Key Card Tool 1.0.1, four AccuVote TSX voting stations with firmware version 4.5.2 ,

one AccuVote OS ballot scanners with firmware version 1.94w, one Express Poll 4000 with firmware version 1.2.0

Phase III: Stress Testing

The purpose of this test it to verify that the AccuVote TSX voting station can accommodate the number of ballots cast during early voting. The number of ballots voted in this test will exceed 50,000 on a single voting station.

Phase IV: Security Tests

- Conduct vulnerability assessment of the AccuVote TSX voting station to determine open ports and known vulnerabilities.
- Develop recommendations for the storage and handling of TSX voting stations.

Hardware Definition

GEMS Computer

ExpressPoll 4000
506?012A

AccuVote TS-R6 Voting Stations
159?43

AccuVote TSX Voting Stations
204?15
208152
223?94
258?38

Key Card Tool
Dell Notebook Computer

Absentee Ballot Scanner
408?5

Software Definition

AVTS-R6	4.5.2
AVOS	1.94w
GEMS	1.18.22G
Encoder	1.3.2

Key Card Tool	1.0.1
PollBook 4000	1.2.0

Appendix C

Certification Test Plan
Of the
AccuVote TSX Model D Voting Station
Georgia DRE Voting System
September 2004

Overall Objective: The purpose of these tests is to verify that the AccuVote TSX, Model D, voting station using firmware version TSX 4.5.2, will operate seamlessly in the Georgia Voting System.

Phase I: Interoperability:

The purpose of these tests is to verify the interoperability of the AccuVote TSX Model D voting station with existing components of the Georgia Voting System.

5. Verify that memory cards produced by GEMS 1.18.22G will load successfully into either the TS-R6 or the TSX Model D voting stations.
6. Verify that memory cards created by closing the polls on either a TS-R6 or a TSX Model D voting station will upload successfully into GEMS 1.18.22G.
7. Verify that voter cards produced by PollBook 4000, version 1.2.0, will operate successfully in either the TS-R6 or the TSX Model D voting station.
8. Verify that a mix of memory cards produced by closing the polls on AccuVote TS-R6 voting stations and AccuVote TSX Model D voting stations will upload correctly into GEMS 1.18.22G.

Phase II: Usability Testing

This test will test the end-to-end operation of the system by setting up and executing an election that is typical of an election in the State. Voting scripts will be prepared with a known outcome.

Setup: The configuration for this test will consist of two precincts from each of two counties, for a total of four precincts, as follows:

Clayton County: Forest Park 2 and Forest Park 6 Precincts.

Pierce County: Blackshear and Hackelbarney Precincts

Each precinct will have one TSX – Model D voting station. The overall system employed will consist of a computer operating under GEMS 1.18.22G, a lap-top computer with Key Card Tool 1.0.1, four AccuVote TSX Model D voting stations with firmware version TSX 4.5.2, and one Express Poll 4000 with firmware version 1.2.0

Phase III: Stress Testing

The purpose of this test it to verify that the AccuVote TSX – Model D voting station can accommodate the number of ballots cast during early voting. The number of ballots voted in this test will exceed 50,000 on a single voting station.

Hardware Definition

GEMS Computer

ExpressPoll 4000
SOGS009A

AccuVote TS-R6 Voting Stations
159543

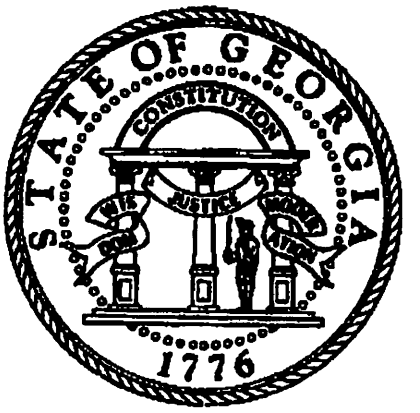
AccuVote TSX Model D Voting Stations
262247
263480
263513
263515
276094
276137

Key Card Tool
Dell Notebook Computer

Software Definition

AVTS-R6	4.5.2
AVTS-TSX	4.5.2
GEMS	1.18.22G
Encoder	1.3.2
Key Card Tool	1.0.1
PollBook 4000	1.2.0

Certification Test of the



Diebold Election Systems Voting System

Prepared for:

Elections Division
Office of the Secretary of State
State of Georgia

Prepared by:

Center for Election Systems
Kennesaw State University
Kennesaw, Georgia, 30144

June 12, 2007

Contents

1.	Introduction		3
2.	Summary of Findings		3
3.	System Description		4
	3.1	System Hardware	4
	3.2	System Software/Firmware	4
	3.3	System and Test Documentation	5
	3.4	Overview of System Operation	7
4.	Compliance With Applicable Statues and Standards		8
	4.1	Election Assistance Administration Voting System Standards	8
	4.2	Help America Vote Act of 2002	9
	4.3	Georgia Election Code	10
Appendix A: Certification Test Plan			15

1. Introduction

Certification Tests of the Diebold AccuVote TS R6 Voting System were conducted at Kennesaw State University during the months of September, November, and December 2004. The Test Plan that was followed is contained in Appendix A.

The staff of the Kennesaw State University Center conducted these tests for Election Systems under the direction of Dr. Brit Williams.

Certification tests of the ExpressPoll 4000 were conducted in August and September 2005.

Certification tests of the ExpressPoll software upgrade 2.1.2 were conducted in May and June 2007

2. Summary of Findings

The Diebold AccuVote TS Voting System was found to be in compliance with the applicable provisions of the Help America Vote Act of 2002, the Georgia Election Code, the Rules of the Georgia Election Board, and the Rules of the Secretary of State.

The following features are enhancements of the tested system over the previous system.

Encryption of the data files transmitted via modem: When the polls close on election night the poll manager has the ability to transmit unofficial results to the county elections office. The previous version of the voting system did not encrypt this file prior to transmission. The tested version of the voting system encrypts this file prior to transmission.

Randomization of all internal ballot image files: The previous version of the voting system contained one ballot image file that was not randomized. The tested version of the voting system randomizes all internal ballot image files.

Dynamic password on Poll Manager Card: In previous version of the voting system the password on the Poll Manager Card was a static four-digit number. The tested version of the system has a six-digit password and allows this password to be changed as often as desired.

Dynamic password on Voter Cards: In the previous version of the voting system the password contained in the hand-shaking routine between the voter card and the voting station was static. The tested version of the system allows this password to be changed as often as desired.

ExpressPoll 4000: ExpressPoll 4000 functions as an encoder that is connected to the precinct's electors list. By reading and displaying the precinct's electors list, ExpressPoll 4000 creates a voter access card which will access the voter's assigned ballot style by associating the voter's ballot combination, as outlined in the voter registration record, with the ballot styles maintained on the voting units within the precinct.

3. System Description

The system tested was the **AccuVote TS Voting System**, presented by Diebold Election Systems, Inc., 1611 Wilmeth Road, McKinney, Texas, 75069-8250. This system is composed of the **AccuVote TS R6 Voting Station**, the **AccuVote OS Ballot Scanner**, the **Voting Card Encoder**, the **ExpressPoll 4000** and a commercial computer running the **Global Election Management System (GEMS)**. A complete list of the system tested is contained in Appendix A.

3.1 System Hardware

The hardware tested consisted of:

- A **"Large County" GEMS computer** provided by Diebold under the State contract.

  Thirteen **AccuVote TS R6 Voting Stations** provided the voter interface.

  Four **Voter Card Encoders** were used to program the voter cards.

  One **AccuVote OS Ballot Scanner** was used to process absentee and provisional/challenged ballots.

  Smart Cards were used for voter cards and supervisor cards.

  Twenty-five **ExpressPoll 4000s** were used to display voter information from the state voter registration database for precincts and program the corresponding voter card.

The specific devices used during the certification tests are listed in the Test Plan, Appendix A.

3.2 System Software/Firmware

The operating system used by the personal computers that support the Global Election Management System and the Poll Book systems is **Windows CE**. Windows CE is also the operating system that controls the functions of the Voting Stations.

The **Global Election Management System (GEMS), Version 1.18.22G,** is a Diebold proprietary system which runs on a standard personal computer and performs the following pre-election functions: setup the election data base, create a new election, enter contests and issues, define ballot styles, and produce the PCMCIA cards that are used to program the voting stations in the precincts and the absentee ballot scanners. After the polls close, this system reads the PCMCIA cards from the precincts, tallies the votes, and prints the various reports and audit data.

BS, Version 4.5.2 is a Diebold proprietary system that controls the voting stations.

OS, Version 194w is a Diebold proprietary system that controls the OS Ballot Scanner.

Encoder Firmware 1.32 is a Diebold proprietary system that controls the voter card encoder.

Key Card Tool 1.01 is a Diebold Proprietary system that enables the election official to change the passwords on the Voter Cards and the Poll Manager's Card.

ExpressPoll Firmware 2.1.2 is a Diebold Proprietary system that enables an election official to read a voter record from the voter registration database and create a Voter Card for the ballot style that corresponds to the voter's registration information.

3.3 System and Test Documentation

AccuVote-TS R6 System Hardware Specification, Document Revision 1.0, Diebold Election Systems, April 30, 2001

AccuVote-TS Hardware Guide, Document Revision 1.0, Diebold Election Systems, April 30, 2001

AccuVote-TS Ballot Station 4.5 User's Guide, Revision 2.0, Diebold Election Systems, June 17, 2004

GEMS 1.18 Product Overview Guide, Revision 2.0, Diebold Election Systems, February 13, 2004

GEMS 1.18 Reference Guide, Revision 6.0, Diebold Election Systems, June 15, 2004

GEMS 1.18 Election Administrator's Guide, Revision 6.0, Diebold Election Systems, June 15, 2004

GEMS 1.18 User Guide, GEMS, Revision 4.0, Diebold Election Systems, November 1, 2002

Voter Card Encoder 1.3 User's Guide, Revision 1.0, Diebold Election Systems, February 10, 2004

Key Card Tool 1.0 User's Guide, Revision 2.0, Diebold Election Systems, April 20, 2004

AccuVote OS Precinct Count 1.96 User's Guide, Revision 1.0, Diebold Election Systems, August 27, 2002

AccuVote OS AccuFeed User's Guide, Revision 1.0, Diebold Election Systems, July 18, 2002

VCProgrammer 4.1 User's Guide, Revision 2.0, Diebold Election Systems, September 24, 2002

Source Code, GEMS Version 1-18-22G, Diebold Election Systems, July 2004

Source Code, ATVS Version 4.5.2, Diebold Election Systems, August 2004

Diebold Election Systems, Inc. Software Functional Test Report GEMS 1-18-22, Ciber Independent Test Authority, September 29, 2004

Change Release Report of the AccuVote TS R6 DRE Voting Machine, Wyle Laboratories, August 3, 2004

Source Code, ExpressPoll 4000 version 2.1.2, May 2007

Source Code, ExpressPoll 4000 Card Writer version 1.1.4.0, August 2005

ExpressPoll 4000 User's Guide v2.01, February 2005

ExpressPoll CardWriter TDP 2.02 System Overview, August 2005

ExpressPoll CardWriter TDP 2.08 System Operations Procedures, August 2005

3.4 Overview of System Operation

Election Definition: The following functions are performed by the Global Election Management System (GEMS).

Create the election database.

Enter races and candidates, issues and options that are to appear in the election

Select the races and issues that are to appear on each ballot style.

Enter headings and instructions as they are to appear on the ballots.

Format the ballots.

Establish passwords for the voter cards and poll manager's cards.

Hardware Programming: Once the election definition is complete, the PCMCIA cards can be prepared to control the AccuVote TS voting stations and the AccuVote OS optical scan ballot scanners. A PCMCIA card must be prepared for each voting station and each ballot scanner.

Precinct Setup: The voting stations and ballot scanners are prepared for the election by inserting the PCMCIA cards and powering up the device. The device performs a self-test and is then ready for pre-election testing. ExpressPolls are prepared for each precinct by inserting a Compact Flash Card containing voter information for all precincts within the state. ExpressPolls are then assigned to individual precinct allowing the device to display the electors list for that precinct and encode voter access cards that are to be used with the AccuVote TS units assigned to that location.

Election Day (Precinct) Activities: As the polls are opened and each device is powered up, the device performs a self-test and presents a menu with the various options allowed at the polling place. If the 'open polls' option is selected, the registers are set to zero and a 'zero totals' tape is printed.

A poll worker uses the ExpressPoll 4000 to isolate a voter's name on an electronically displayed elector's list within the precinct. It then encodes a voter access card while at the same time marking the precinct's electors list. The combined operation is designed to provide an accurate listing of voter participation at the precinct while ensuring that each participating elector receives the proper ballot style which is based directly on the voter's ballot combination outlined in the state's voter registration system.

When the polls are closed, the vote totals from each device are recorded to the PCMCIA cards. These cards are then transported to a central counting location for entry into the GEMS system for tallying and reporting. If desired, unofficial results from the precincts can be transmitted to the central location via modem.

During the precinct's closing procedures, the number of voters marked on the ExpressPolls is recorded and used to reconcile the precinct's activities for the day. ExpressPoll 4000 maintains a numbered list of voters that is updated as every voter access card is created. This numbered list is also used during the evening closing process.

Vote Tallying/Report Printing: The PCMCIA cards from each precinct are returned to the central facility where they are loaded into the GEMS. During this step, any known errors can be manually corrected and absentee votes can be entered.

At any time during the tally of the votes or at the completion of vote tallying, election result can be printed by precinct or overall. These reports can also be exported to other systems or posted on the Internet.

The system administrator can use the GEMS to print the various audit logs.

All actions on ExpressPoll 4000 are written to a log file stored on the unit's Compact Flash Card and also to an internal memory location. Following the election, these log files are retrieved in order to print marked electors lists and numbered lists of voters for records retention purposes.

4. Compliance With Applicable Statues and Standards

4.1 Election Assistance Commission Voting System Standards

Hardware/Firmware: The AccuVote TS R6 Voting System hardware and firmware was examined by Wyle Laboratories, Huntsville, Alabama and found to be in compliance with the hardware specifications contained in the EAC Voting System Standards. Wyle is an Independent Test Agency approved by the National Association of State Election Directors (NASED).

Software: The GEMS election management software was examined by Ciber, Inc., Huntsville, Alabama and found to be in compliance with the software specifications contained in the EAC Voting System Standards.

Ciber, Inc. is an Independent Test Agency approved by the National Association of State Election Directors.

NASED Qualification: Based on the reports from the ITAs, NASED assigned the system Qualification Number N-1-06-12-12-003.

4.2 Help America Vote Act of 2002

The AccuVote TS R6 Voting System is classified as an electronic voting system and, as such, falls under the following Sections of the **Help America Vote Act of 2002**

TITLE III--UNIFORM AND NONDISCRIMINATORY ELECTION TECHNOLOGY AND ADMINISTRATION REQUIREMENTS; SEC. 302. PROVISIONAL VOTING AND VOTING INFORMATION REQUIREMENTS.

(a) Provisional Voting Requirements.--If an individual declares that such individual is a registered voter in the jurisdiction in which the individual desires to vote and that the individual is eligible to vote in an election for Federal office, but the name of the individual does not appear on the official list of eligible voters for the polling place or an election official asserts that the individual is not eligible to vote, such individual shall be permitted to cast a provisional ballot ...

The AccuVote R6 voting station has the facility to allow a voter to vote a provisional ballot. This ballot is stored in a separate location and is not included in the tally until the county registrar has established the voter's credentials.

The paper ballot used for absentee voting can also be used to satisfy this requirement.

(2) Audit capacity (B) Manual audit capacity.—
(i) The voting system shall produce a permanent paper record with a manual audit capacity for such system.

The AccuVote TS R6 Voting System can satisfy this requirement.

(ii) The voting system shall provide the voter with an opportunity to change the ballot or correct any error before the permanent paper record is produced.

The AccuVote TS R6 Voting System satisfies this requirement. The AccuVote TS R6 Voting System presents a summary screen at the end of the ballot that gives the voter the opportunity to change any selection.

(3) Accessibility for individuals with disabilities.—The voting system shall--(A) be accessible for individuals with disabilities, including non-visual accessibility for the blind and visually impaired, in a manner that provides the same opportunity for access and participation (including privacy and independence) as for other voters;

The voter using the AccuVote TS R6 voting station can choose to view the ballot in large print or in high contrast or both. In addition, The AccuVote TS R6 voting station can be equipped with a telephone keypad and earphones for vision impaired voters.

4.3 Georgia Election Code

The AccuVote TS R6 Voting System is classified as a direct recording electronic voting system. The Georgia Election Code, Section 21-3-379 regulates systems of this type.

21-2-379.1 Requirements for use of electronic recording voting systems

No direct electronic recording voting system shall be adopted or used unless it shall, at the time, satisfy the following requirements:

(i) It shall provide facilities for voting for such candidates as may be nominated and upon such questions as may be submitted;

The AccuVote TS R6 Voting System satisfies this requirement.

(ii) It shall permit each elector, in one operation, to vote for all candidates of one party of body for presidential electors;

The AccuVote TS R6 Voting System satisfies this requirement.

(1) Except as provided in paragraph (2) of this Code section for presidential electors, it shall permit each elector, at other than primaries, to vote a ticket selected from nominees of any and all parties or bodies, from independent nominations, and from persons not in nomination;

The AccuVote TS R6 Voting System satisfies this requirement.

(2) *It shall permit each elector to vote, at any election, for any person and for any office for whom and for which he or she is lawfully entitled to vote, whether or not the name of such person or persons appears as a candidate for election, to vote for as many persons for an office as he or she is entitled to vote for; and to vote for or against any question upon which he or she is entitled to vote;*

The AccuVote TS R6 Voting System satisfies this requirement. Tests included multiple candidates for a single office and write-in candidates.

(3) *It shall preclude the counting of votes for any candidate or upon any question for whom or upon which an elector is not entitled to vote; shall preclude the counting of votes for more persons for any office than he or she is entitled to vote for; and shall preclude the counting of votes for any candidate for the same office or upon any question more than once;*

The AccuVote TS R6 Voting System satisfies this requirement. Tests indicated that the voter was only able to see and vote on the assigned ballot style. The system does not allow over-votes. Once the allowed number of candidates has been selected, the voter cannot select another candidate without first releasing one of the previously selected candidates. Tests were conducted to ensure that a voter could not write in the same name multiple times in a multi-candidate contest.

(4) *It shall permit voting in absolute secrecy so that no person can see or know for whom any other elector has voted or is voting save an elector whom he or she has assisted or is assisting in voting, as prescribed by law.*

The AccuVote TS R6 Voting System satisfies this requirement.

(5) *It shall be constructed of material of good quality in a neat and workmanship like manner;*

The AccuVote TS R6 Voting System satisfies this requirement. The quality of the materials and workmanship was reviewed by the hardware/firmware ITA, Wyle Laboratories.

(6) *It shall, when properly operated, record correctly and accurately every vote cast;*

The AccuVote TS R6 Voting System satisfies this requirement. The hardware ITA, Wyle Laboratories, and the software ITA,

Ciber, Inc., extensively tested this requirement. The State certification tests included logic and accuracy tests, but with a smaller number of ballots than the tests conducted by the ITAs.

(7) *It shall be so constructed that an elector may readily learn the method of operating it;*

In order to vote, the voter must press a pressure sensitive spot containing the name of the candidate. When the spot is pressed, a lighted square containing a large X appears beside the candidate's name. The persons participating in these tests did not have undue difficulty voting on the AccuVote TS R6 Voting System.

(8) *It shall be safely transported.*

The portion of the system that is installed in the precinct, the AccuVote TS R6 voting stations Precinct Card Manager are small and easily transported. See Section 3.2, System Hardware/Firmware.

21-2-379.4 Ballot appearance; write in votes on DRE systems

(a) *The ballots for direct recording electronic (DRE) voting systems shall be of such size and arrangement as will suit the construction of the DRE screen and shall be in plain, clear type that is easily readable by persons with normal vision. If the equipment has the capacity for color display, the names of all candidates in a particular race shall be displayed in the same color, font, and size and the political party or body affiliation of candidates may be displayed in a color different from that used to display the names of the candidates, but all political party or body affiliations shall be printed in the same size and font. All ballot questions and constitutional amendments shall be displayed in the same color.*

The AccuVote TS R6 Voting System satisfies this requirement.

(b) *The arrangement of offices, names of candidates, and questions upon the ballots shall conform as nearly as practicable to this chapter for the arrangement of such offices, names of candidates, and questions on paper ballots.*

The AccuVote TS R6 Voting System satisfies this requirement.

(c) *Electors shall be permitted to cast write-in votes on DRE voting systems as provided in Code Section 21-2-133. The design of the ballot shall permit the election superintendent and poll workers*

when obtaining the vote count from such systems to determine readily whether an elector has cast any write-in vote not authorized by law.

The AccuVote TS R6 Voting System satisfies this requirement.

21-2-379.5 Ballot information

(b) The ballot for each candidate or group of candidates nominated by a political party or body shall display the name or designation of the political party or body.

The AccuVote TS R6 Voting System satisfies this requirement.

(c) *The incumbency of a candidate seeking election for the public office he or she then holds shall be indicated on the ballot.*

The AccuVote TS R6 Voting System satisfies this requirement.

21-2-224 Official List of Electors Content (Active and Inactive)

(g) The official list of electors and the official list of inactive electors prepared and distributed to the poll officers of each precinct shall include only the elector's name, address, ZIP Code, date of birth, voter identification number, a designation of whether the elector registered for the first time in this state by mail and is required to comply with Code Sections 21-2-220 and 21-2-417, congressional district, state Senate district, state House district, county commission district, if any, county or independent board of education district, if any, and municipal governing authority district designations, if any, and such other voting districts, if any. The official list of electors and the official list of inactive electors prepared and distributed to the poll officers of each precinct may also include codes designating that an elector has voted by absentee ballot, has been challenged, or has been sent mail by the registrars which has been returned marked undeliverable. No person whose name does not appear on the official list of electors shall vote or be allowed to vote at any election, except as otherwise provided in this article.

The ExpressPoll 4000 with software version 2.1.2 satisfies this requirement.

21-2-401 Official List of Electors Content (Active and Inactive)

(b) *... The list shall indicate the name of any elector who has been mailed or delivered an absentee ballot. The list for a given precinct may be divided into as many alphabetical sections as is deemed necessary. ...In addition, the registrars shall at the same time place in the possession of the managers in each precinct one copy of the list of inactive electors for such precinct. ...*

The ExpressPoll 4000 with software version 2.1.2 satisfies this requirement.

(c) *The registrars may, in their discretion, place a master list containing the names and proper voting precincts of all electors and all inactive electors of the county or municipality at some or all of the polling places located in the county or municipality on the day of each election for use by the poll workers to assist electors in locating their proper precinct.*

The ExpressPoll 4000 with software version 2.1.2 satisfies this requirement.

Appendix A

Certification Test Plan
Of the
Georgia DRE Voting System
September 2004

Hardware Definition

GEMS Computer

Voter Card Encoders
- 101532
- 115663
- 119134
- 119136

Voting Stations
- 110002
- 113438
- 114187
- 114995
- 115673
- 116217
- 116372
- 116669
- 119520
- 121216
- 121606
- 123461
- 128124

Key Card Tool
- Dell Notebook Computer

Absentee Ballot Scanner
- 86634

Software Definition

AVTS-R6	4.5.2
AVOS	1.94w
GEMS	1.18.22G

Encoder	1.3.2
Key Card Tool	1.0.1

Faze I: Initial Setup:

1. Install the new system on Center devices and identify the differences between the current and the new system.
2. Identify the portions of the system that will require changes to the current training for election officials and poll workers.
3. Develop the ballot styles that will be used in the following Phases II and III. The ballot style for Phase II should be long enough that the summary page does not show on a single screen.
4. Develop voting scripts and voter instructions for use in Phase II.
5. Identify the devices that will be available for use during Certification Testing and set up the test environment.
6. Schedule a meeting to brief the KSU and SOS staff on the above items. This briefing should contain sufficient detail to enable this staff to make decisions about the implementation of the new system.

Phase II: Usability Testing

This test will test the end-to-end operation of the system by setting up and executing an election that is typical of an election in the State. Voting scripts will be prepared with a known outcome. All voting stations will record a number of votes that exceeds the number of votes normally cast on a voting station in a State election.

Setup: The configuration for this test will consist of two precincts from each of two counties, for a total of four precincts, as follows:

Clayton County: Forest Park 2 and Forest Park 6 Precincts.

Pierce County: Blackshear and Hackelbarney Precincts

Each county will have one early-voting terminal and each precinct will have two voting stations. The overall system employed will consist of a computer operating under GEMS 1.18.22G, a lap-top computer with Key Card Tool 1.0.1, thirteen AccuVote TS voting stations with firmware version 4.5.2, two AccuVote OS ballot scanners with firmware version 1.94w, four voter card encoders with firmware version 1.3.2. (Diagram A, below)

Phase III: Stress Testing

1. High volume tests. Conduct tests to determine the ability of the TS units to accommodate a high volume of ballots. The number of ballots cast in this test will exceed the number of ballots that may be cast in an early voting setup.

2. Precinct worker errors. Identify and test the system's ability to recovery from various types of errors that are typically committed by poll workers.
3. Voter errors. Identify and test the system's ability to recovery from various types of errors that are typically committed by voters.
4. Acts of Nature/Vandalism. Identify and test the system's ability to recovery from various acts of nature or vandalism.

Phase IV: Security Tests

- Conduct vulnerability assessment of the Diebold DRE to determine open ports and known vulnerabilities.
- Perform vulnerability assessment of the standard installation of GEMS Election Management Systems (EMS) to determine open ports and known vulnerabilities.
- Develop implementation recommendations for GEMS EMS, focusing on physical and procedural security.
- Hash and document GEMS standard installation for use in implementation validation and verification.
- Create hashing scripts to validate county implementations of GEMS against certified CES implementation of GEMS software.

Sample Ballot Script

Ballot Script
Georgia Certification Test

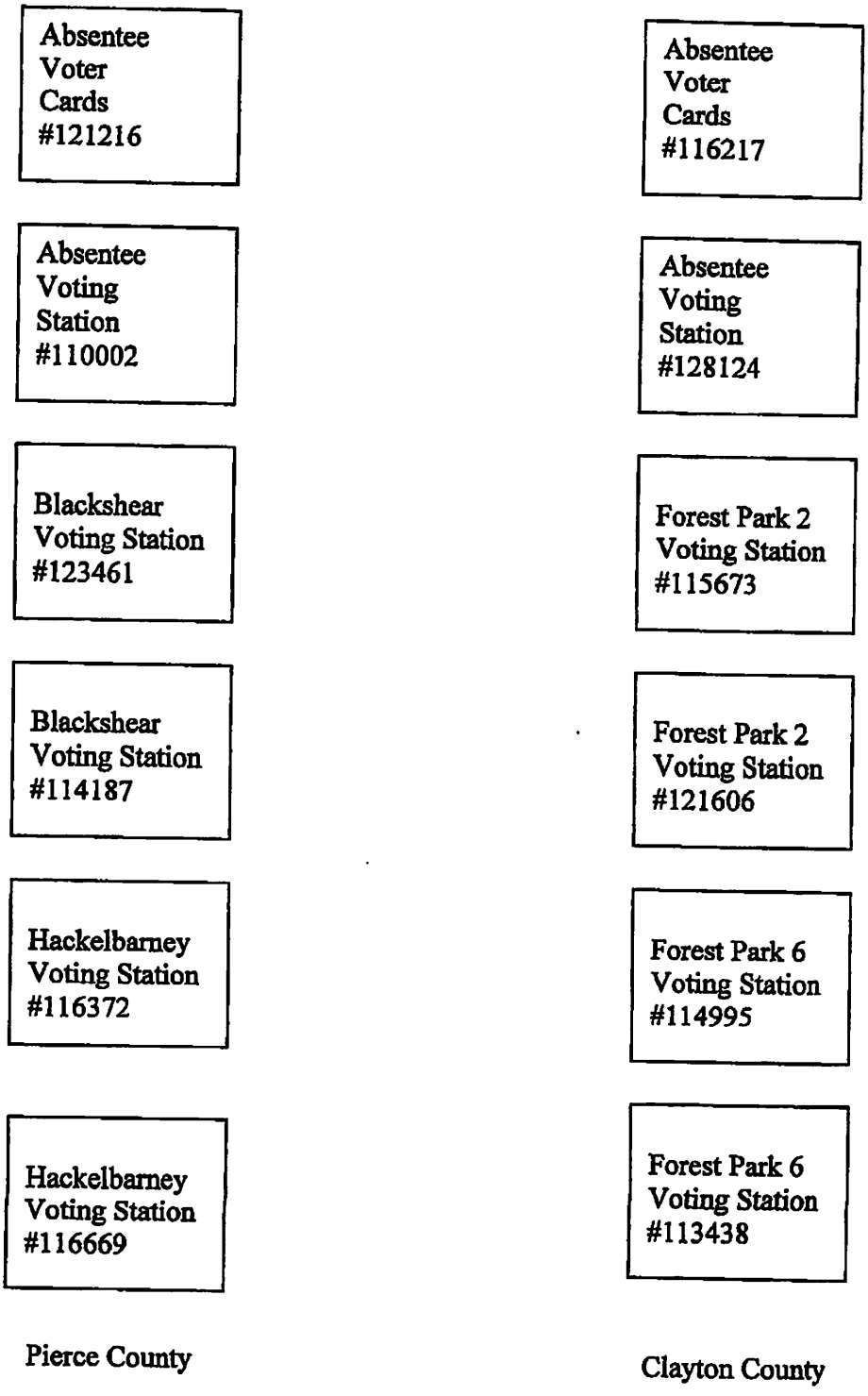
County:	**Clayton**
Precinct/Split:	**Forest Park 2, Split A**
Voting Station:	_____
Script:	1

Voter: _____ **Date:** _____

US Senate:	**MAX CLELAND**
Governor:	**ROY E BARNES**
Lt. Governor:	**MARK TAYLOR**
Secretary of State:	**CATHY COX**
Attorney General:	**THURBERT BAKER**
Comm. Of Agriculture:	**TOMMY IRVIN**
Comm. Of Insurance:	**LOIS COHEN**
State School Super:	**BARBARA CHRISTMAS**
Comm. Of Labor	**MICHAEL THURMOND**
Public Service Comm. 1	**EARLEEN W SIZEMORE**
Public Service Comm. 2	**LAUREN MCDONALD, JR**
US Rep 13th District	**DAVID SCOTT**
State Senate 44th District:	**TERRELL A STARR**
State Rep. 50th District:	**GEORGANA SINKFIELD**
County Comm. Dist. 1	**CARL RHODENIZER**
Board of Education:	**ERICA DAVIS or SUE RYAN**

(CONTINUED)

Const. Ammend. 1	**YES**
Const. Ammend. 2	**YES**
Const. Ammend. 3	**YES**
Const. Ammend. 4	**YES**
Const. Ammend. 5	**YES**
Const. Ammend. 6	**YES**
Statewide Ref. A	**YES**
Statewide Ref. B	**YES**
Statewide Ref. C	**YES**
Statewide Ref. D	**YES**
Statewide Ref. E	**YES**



Usability Test Configuration
Diagram A

ExpressPoll 4000 with Software Version 2.1.2 Testing Setup
May – June 2007

One Hundred fifty-nine GEMS databases were built using data associated with the July 2006 Georgia General Primary. These databases were combined with voter registration data for all registered voters in Georgia as of May 1, 2007. The combined data was used to power ExpressPoll during testing.

Phase I: Usability Tests

Testing is conducted to witness the end-to-end operation of the system by setting up and executing an election that is typical of an election in the State. Testing scripts were prepared requiring the user to perform detailed operations on each ExpressPoll unit with a known outcome.

Setup: Two ExpressPoll 4000 units are connected via crossover cable and are assigned to a single polling location (normal precinct configuration). Users are to assign their devices to one of four locations from a list of known polling locations contained in the test data. Once assigned, users performed specific functions required of a precinct's electors list and voter access card encoder.

Four Required Locations:

Name (County)	Polling Precinct ID
Vineville 6 (Bibb County, GA)	011036
Brooklet (Bulloch County, GA)	016004
Jenkinsburg (Butts County, GA)	018004
Canton (Cherokee County, GA)	028062

Phase II: Stress Testing

1. High volume tests. Tests conducted to determine the ability of ExpressPoll 4000 to function in an expected and anticipated manner over an extended period of within pre-designated precincts using ExpressPoll 4000's normal precinct configuration.
2. Precinct worker errors. Identify and test the system's ability to recovery from various types of errors that are typically committed by poll workers.

Phase III: Security Testing

Penetration tests on the ExpressPoll 4000 were previously conducted by the Center for Information Security Education and Awareness at Kennesaw State University. These tests were used to determine the vulnerability to outside attack of ExpressPoll 4000 in its precinct configuration.

Certification Test of the

Premier Election Solutions, Inc. TS Voting System

Prepared for:

Elections Division
Office of the Secretary of State
State of Georgia

Prepared by:

Center for Election Systems
Kennesaw State University
Kennesaw, Georgia, 30144

Revised
March 28, 2008

Contents

1.	Introduction		3
2.	Summary of Findings		3
3.	System Description		5
	3.1	System Hardware	5
	3.2	System Software/Firmware	6
	3.3	System and Test Documentation	6
	3.4	Overview of System Operation	9
4.	Compliance With Applicable Statues and Standards		10
	4.1	Election Assistance Administration Voting System Standards	10
	4.2	Help America Vote Act of 2002	10
	4.3	Georgia Election Code	12
Appendix A:	Certification Test Plan		16
Appendix B:	Certification Test Plan: TSX – Model C		22
Appendix C:	Certification Test Plan: TSX – Model D		24
Appendix D:	Validation Test Plan of the Dell Power Edge Server		26

1. Introduction

Certification Tests of the Georgia Voting System were conducted at Kennesaw State University during the month of March 2008. The purpose of these tests was to verify that the Dell Power Edge Server with service pack 4 would function seamlessly in the Georgia voting system. These components passed these tests. A recommendation was sent to the Secretary of State that these components be certified for use in Georgia voting system. The Test Plans for these tests are contained in Appendix D.

Certification Chronology

Certification tests of the Georgia Voting System including security upgrades were conducted in December 2004. (See Appendix A)

Certification tests to include the ExpressPoll 4000 in this system were conducted in August and September, 2005.

Certification tests to include the AccuVote TSX – Model C Voting Station in this system were conducted in March 2006. (See Appendix B)

Certification tests to include the AccuVote TSX – Model D Voting Station in this system were conducted in July 2006. (See Appendix C)

Tests to validate that the Dell Power Edge Server, service pack 4, with all security and time zone updates as of 3/11/2008 will function correctly in this system were conducted in March 2008. (See Appendix D)

These tests were conducted by the staff of the Kennesaw State University Center for Election Systems under the direction of Dr. Brit Williams.

2. Summary of Findings

The Premier Election System TS Voting System as tested in 2004 was found to be in compliance with the applicable provisions of the Help America Vote Act of 2002, the Georgia Election Code, the Rules of the Georgia Election Board, and the Rules of the Secretary of State. This system consists of the following components:

Dell Power Edge with GEMS	1.18.22G
AccuVote R6 voting station with	AVTS 4.5.2
AccuVote OS ballot scanner with	AVOS 1.94w
Voter Card Encoder with	Firmware 1.32
Key Card Tool with	Firmware 1.01

The following features are enhancements that were tested in December 2004 for inclusion in the Georgia voting system.

Encryption of the data files transmitted via modem: When the polls close on election night the poll manager has the ability to transmit unofficial results to the county elections office. The previous version of the voting system did not encrypt this file prior to transmission. The tested version of the voting system encrypts this file prior to transmission.

Randomization of all internal ballot image files: The previous version of the voting system contained one ballot image file that was not randomized. The tested version of the voting system randomizes all internal ballot image files.

Dynamic password on Poll Manager Card: In previous version of the voting system the password on the Poll Manager Card was a static four digit number. The tested version of the system has a six digit password and allows this password to be changed as often as desired.

Dynamic password on Voter Cards: In the previous version of the voting system the password contained in the hand-shaking routine between the voter card and the voting station was static. The tested version of the system allows this password to be changed as often as desired.

The ExpressPoll 4000 with firmware 2.1.2 with card writer 1.1.4.0 was tested in September 2005 for inclusion in the Georgia voting system.

ExpressPoll 4000: ExpressPolls function as an encoder that is connected to the precinct's electors list. By reading and displaying the precinct's electors list, The ExpressPoll creates a voter access card which will access the voter's assigned ballot style by associating the voter's ballot combination, as outlined in the voter registration record, with the ballot styles maintained on the voting units within the precinct.

The AccuVote TSX, Models C and D with firmware 4.5.2 were tested in July 2006 for inclusion in the Georgia voting system.

AccuVote TSX – Model C Voting Station: The TSX – Model C is a revised version of the AccuVote TS R6 voting station. The TSX is functionally identical to the TS R6. Enhancements include an integrated carrying/storage case, lighter weight, and a light-weight, battery powered voting tablet that can be removed from the case and placed in a handicapped voters lap or carried to curb-side. The certification Test Plan for the TSX – Model C is contained in Appendix B.

AccuVote TSX – Model D Voting Station: The TSX – Model D is a slightly modified version of the TSX Model C Voting Station. The Model D is both

functionally and electronically identical to the Model C. Thus, the Model D does not require any additional training for election officials or voters who are familiar with the Model C. The Model D was developed in response to the unavailability of some of the components of the Model C. The certification Test Plan for the TSX – Model D is contained in Appendix C.

The Dell Power Edge Server, service pack 4, with all security and time zone updates as of 3/11/2008 was tested in March 2008 for inclusion in the Georgia Voting System.

The original Dell servers used in the Georgia Voting System were acquired in 2002. These servers are nearing the end of their expected life. The Dell Power Edge tested will be used as a replacement for the original Dell computers. The certification test plan for the Dell Power Edge Server is contained in Appendix D.

3. System Description

The system tested in December 2004 was the **AccuVote TS Voting System**, presented by Premier Election Systems, Inc., 1611 Wilmeth Road, McKinney, Texas, 75069-8250. This system is composed of the **AccuVote TS R6 Voting Station**, the **AccuVote TSX Voting** Station, the **AccuVote OS Ballot Scanner**, the **Voting Card Encoder**, the **Express Poll 4000**, and a commercial computer running the **Global Election Management System (GEMS)**. A complete list of the system tested is contained in Appendix A.

3.1 System Hardware

At the conclusion of tests performed in March 2008, the hardware of the Georgia voting system consists of:

- **Dell Power Edge computers** provided by Premier under the State contract support the election management system (GEMS).

  Dell Power Edge Servers with service pack 4 support the election management system.

  AccuVote TS R6 Voting Stations provide a voter interface.

  AccuVote TSX Models C and D Voting Stations provide a voter interface.

  AccuVote OS Ballot Scanners are used to process absentee and provisional/challenged ballots.

Voter Card Encoders are used to program the voter cards.

Smart Cards are used for voter cards and supervisor cards.

ExpressPoll 4000s are used to read voter's records from the precinct voter registration database and create the corresponding voter card.

3.2 System Software/Firmware

At the conclusion of tests performed in March 2008, the software/firmware of the Georgia voting system consists of:

The operating system used by the personal computers that support the Global Election Management System and the Poll Book systems is **Windows CE with power pack 4.** Windows CE is also the operating system that controls the functions of the Voting Stations.

The **Global Election Management System (GEMS), Version 1.18.22G,** is a Premier proprietary system which runs on a the Dell servers and performs the following pre-election functions: setup the election data base, create a new election, enter contests and issues, define ballot styles, and produce the PCMCIA cards that are used to program the voting stations in the precincts and the absentee ballot scanners. After the polls close, this system reads the PCMCIA cards from the precincts, tallies the votes, and prints the various reports and audit data.

BS, Version 4.5.2 is a Premier proprietary system that controls the TS-R6 and TSX voting stations.

OS, Version 194w is a Premier proprietary system that controls the OS Ballot Scanner.

Encoder Firmware 1.32 is a Premier proprietary system that controls the voter card encoder.

Key Card Tool 1.01 is a Premier Proprietary system that enables the election official to change the passwords on the Voter Cards and the Poll Manager's Card.

ExpressPoll Firmware 1.2.0 with card writer 1.1.4.0 is a Premier Proprietary system that enables an election official to read a voter record

from the voter registration database and create a Voter Card for the ballot style that corresponds to the voter's registration information.

3.3 System and Test Documentation

AccuVote-TS R6 System Hardware Specification, Document Revision 1.0, Premier Election Solutions, Inc., April 30, 2001

AccuVote-TS Hardware Guide, Document Revision 1.0, Premier Election Solutions, Inc., April 30, 2001

GEMS 1.18 User Guide, GEMS, Revision 4.0, Premier Election Solutions, Inc., November 1, 2002

AccuVote OS AccuFeed User's Guide, Revision 1.0, Premier Election Solutions, Inc., July 18, 2002

VCProgrammer 4.1 User's Guide, Revision 2.0, Premier Election Solutions, Inc., September 24, 2002

AccuVote OS Precinct Count 1.96 User's Guide, Revision 1.0, Premier Election Solutions, Inc., August 27, 2002

AccuVote-TS Ballot Station 4.5 User's Guide, Revision 2.0, Premier Election Solutions, Inc., June 17, 2004

GEMS 1.18 Product Overview Guide, Revision 2.0, Premier Election Solutions, Inc., February 13, 2004

GEMS 1.18 Reference Guide, Revision 6.0, Premier Election Solutions, Inc., June 15, 2004

GEMS 1.18 Election Administrator's Guide, Revision 6.0, Premier Election Solutions, Inc., June 15, 2004

Voter Card Encoder 1.3 User's Guide, Revision 1.0, Premier Election Solutions, Inc., February 10, 2004

Key Card Tool 1.0 User's Guide, Revision 2.0, Premier Election Solutions, Inc., April 20, 2004

Source Code, GEMS Version 1-18-22G, Premier Election Solutions, Inc., July 2004

Premier Election Solutions, Inc., Inc. Software Functional Test Report GEMS 1-18-22, Ciber Independent Test Authority, September 29, 2004

Change Release Report of the AccuVote TS R6 DRE Voting Machine, Wyle Laboratories, August 3, 2004

AccuVote TSX Hardware Guide, Premier Election Solutions, Inc., Revision 8.0, February 2004

AccuVote TSX Poll worker's Guide, Premier Election Solutions, Inc., Revision 5.0, March 2005

GEMS 1-18 Election Administrator's Guide, Premier Election Solutions, Inc., Revision 10.0, May 2005

GEMS 1.18 Product Overview Guide, Revision 3.0, Premier Election Solutions, Inc., December 2005

GEMS 1.18 Reference Guide, Revision 8.0, Premier Election Solutions, Inc., April 2005

GEMS 1.18 User Guide, GEMS, Revision 12.0, Premier Election Solutions, Inc., April 2005

ExpressPoll Administrator's Guide for Version 2.0 and 2.1, Revision 3.0, Premier Election Solutions, 2005

ExpressPoll Emulator and Resource Guide for Versions 1.2 and 2.1, Revision 3.0, Premiere Election Solutions, 2005

ExpressPoll User's Guide for Versions 2.0 and 2.1, Revision 3.0, Premier Election Solutions, 2005

ExpressPoll CardWriter 1.0 Technical Data Package Appendix A: Software Specification, Premier Election Solutions, Inc., 2005

ExpressPoll CardWriter 1.0 Technical Data Package Appendix B: Program Data Structure and Flow, Premier Election Solutions, Inc., 2005

Software Functional Test Report Premier Election Solutions, Inc. GEMS 1-18, Addendum 12 for GEMS 1-18-22G, Ciber Independent Test Authority, June 2006

Hardware Qualification Testing of the Premier Election Solutions, Inc. AccuVote TSX Model D DRE Voting Machine, Wyle Report 52501-07 on the AccuVote TSX Model D Tablet, Wyle Laboratories, Inc., April 2006

GEMS 1.18 System Administrator's Guide, Revision 7.0, Premier Election Solutions, Inc., January 2006

Georgia Election Code, Annotated, 2007 Edition

3.4 Overview of System Operation

Election Definition: The following functions are performed by the Global Election Management System (GEMS).

Create the election database.

Enter races and candidates, issues and options that are to appear in the election

Select the races and issues that are to appear on each ballot style.

Enter headings and instructions as they are to appear on the ballots.

Format the ballots.

Establish passwords for the voter cards and poll manager's cards.

Hardware Programming: Once the election definition is complete, the PCMCIA cards can be prepared to control the AccuVote TS voting stations and the AccuVote OS optical scan ballot scanners. A PCMCIA card must be prepared for each voting station and each ballot scanner.

Precinct Setup: The voting stations and ballot scanners are prepared for the election by inserting the PCMCIA cards and powering up the device. The device performs a self test and is then ready for pre-election testing.

Election Day (Precinct) Activities: As the polls are opened and each device is powered up, the device performs a self test and presents a menu with the various options allowed at the polling place. If the 'open polls' option is selected, the registers are set to zero and a 'zero totals' tape is printed.

The ExpressPoll is used by a poll worker to isolate a voter's name on an electronically displayed elector's list within the precinct and then create a voter access card while at the same time marking the precinct's electors list. The combined operation is designed to provide an accurate listing of voter participation at the precinct while ensuring that each participating

elector receives the proper ballot style which is based on the voter's ballot combination outlined in the state's voter registration system.

When the polls are closed, the vote totals from each device are recorded to the PCMCIA cards. These cards are then transported to a central counting location for entry into the GEMS system for tallying and reporting. If desired, unofficial results from the precincts can be transmitted to the central location via modem.

Vote Tallying/Report Printing: The PCMCIA cards from each precinct are returned to the central facility where they are loaded into the GEMS. During this step, any known errors can be manually corrected and absentee votes can be entered.

At any time during the tally of the votes or at the completion of vote tallying, election result can be printed by precinct or overall. These reports can also be exported to other systems or posted on the Internet.

The system administrator can use the GEMS to print the various audit logs.

4. Compliance With Applicable Statues and Standards

4.1 Election Assistance Commission Voting System Standards

Hardware/Firmware: The Premier Election Solutions, Inc. TS Voting System hardware and firmware was examined by Wyle Laboratories, Huntsville, Alabama and found to be in compliance with the hardware specifications contained in the EAC Voting System Standards. Wyle is an Independent Test Agency approved by the National Association of State Election Directors (NASED).

Software: The GEMS election management software was examined by Ciber, Inc., Huntsville, Alabama and found to be in compliance with the software specifications contained in the EAC Voting System Standards. Ciber, Inc. is an Independent Test Agency approved by the National Association of State Election Directors.

NASED Qualification: The components that comprise the Georgia voting system are qualified under NASED voting system Qualification Numbers N-1-06-12-12-003 through N-1-06-12-12-010.

4.2 Help America Vote Act of 2002

The Premier Election Solutions, Inc. TS Voting System is classified as an electronic voting system and, as such, falls under the following Sections of the **Help America Vote Act of 2002**

TITLE III--UNIFORM AND NONDISCRIMINATORY ELECTION TECHNOLOGY AND ADMINISTRATION REQUIREMENTS; SEC. 302. PROVISIONAL VOTING AND VOTING INFORMATION REQUIREMENTS.

(a) Provisional Voting Requirements.--If an individual declares that such individual is a registered voter in the jurisdiction in which the individual desires to vote and that the individual is eligible to vote in an election for Federal office, but the name of the individual does not appear on the official list of eligible voters for the polling place or an election official asserts that the individual is not eligible to vote, such individual shall be permitted to cast a provisional ballot ...

The Premier Election Solutions, Inc. TS Voting System has the facility to allow a voter to vote a provisional ballot. This ballot is stored in a separate location and is not included in the tally until the voter's credentials have been established by the county registrar.

The paper ballot used for absentee voting can also be used to satisfy this requirement.

(2) Audit capacity (B) Manual audit capacity.—
(i) The voting system shall produce a permanent paper record with a manual audit capacity for such system.

The Premier Election Solutions, Inc. TS Voting System can satisfy this requirement.

(ii) The voting system shall provide the voter with an opportunity to change the ballot or correct any error before the permanent paper record is produced.

The Premier Election Solutions, Inc. TS Voting System satisfies this requirement. The AccuVote TS R6 and TSX Voting Stations present a summary screen at the end of the ballot that gives the voter the opportunity to change any selection.

(3) Accessibility for individuals with disabilities.—The voting system shall--(A) be accessible for individuals with disabilities, including non-visual accessibility for the blind and visually impaired, in a manner that provides the same opportunity for access and participation (including privacy and independence) as for other voters;

The voter using the AccuVote TS R6 and TSX voting stations can choose to view the ballot in large print or in high contrast or both. In addition, The AccuVote TS R6 and TSX voting stations can be equipped with a keypad and earphones for vision impaired voters.

4.3 Georgia Election Code, Annotated, 2007 Edition

The Premier Election Solutions, Inc. TS Voting System is classified as direct recording electronic voting systems. The Georgia Election Code, Section 21-3-379 regulates systems of this type.

21-2-379.1 Requirements for use of electronic recording voting systems

No direct electronic recording voting system shall be adopted or used unless it shall, at the time, satisfy the following requirements:

(1) *It shall provide facilities for voting for such candidates as may be nominated and upon such questions as may be submitted;*

The Premier Election Solutions, Inc. TS Voting System satisfies this requirement.

(2) *It shall permit each elector, in one operation, to vote for all candidates of one party of body for presidential electors;*

The Premier Election System TS Voting System satisfies this requirement.

(3) *Except as provided in paragraph (2) of this Code section for presidential electors, it shall permit each elector, at other than primaries, to vote a ticket selected from nominees of any and all parties or bodies, from independent nominations, and from persons not in nomination;*

The Premier Election Solutions, Inc. TS Voting System satisfies this requirement.

(4) *It shall permit each elector to vote, at any election, for any person and for any office for whom and for which he or she is lawfully entitled to vote, whether or not the name of such person or persons appears as a candidate for election, to vote for as many persons for an office as he or she is entitled to vote for; and to vote for or against any question upon which he or she is entitled to vote;*

The Premier Election Solutions, Inc. TS Voting System satisfies this requirement. Tests included multiple candidates for a single office and write-in candidates.

(5) *It shall preclude the counting of votes for any candidate or upon any question for whom or upon which an elector is not entitled to vote; shall preclude the counting of votes for more persons for any office than he or she is entitled to vote for; and shall preclude the counting of votes for any candidate for the same office or upon any question more than once;*

The Premier Election Solutions, Inc. TS Voting System satisfies this requirement. Tests indicated that the voter was only able to see and vote on the assigned ballot style. The system does not allow over-votes. Once the allowed number of candidates has been selected, the voter cannot select another candidate without first releasing one of the previously selected candidates. Tests were conducted to ensure that a voter could not write in the same name multiple times in a multi-candidate contest.

(6) *It shall permit voting in absolute secrecy so that no person can see or know for whom any other elector has voted or is voting save an elector whom he or she has assisted or is assisting in voting, as prescribed by law.*

The Premier Election Solutions, Inc. TS Voting System satisfies this requirement.

(7) *It shall be constructed of material of good quality in a neat and workmanship like manner;*

The Premier Election Solutions, Inc. TS Voting System satisfies this requirement. The quality of the materials and workmanship was reviewed by the hardware/firmware ITA, Wyle Laboratories.

(8) *It shall, when properly operated, record correctly and accurately every vote cast;*

The Premier Election Solutions, Inc. TS Voting System satisfies this requirement. The hardware ITA, Wyle Laboratories, and the software ITA, Ciber, Inc., extensively tested this requirement. The State certification tests included logic and accuracy tests, but with a smaller number of ballots than the tests conducted by the ITAs.

(9) *It shall be so constructed that an elector may readily learn the*

method of operating it;

In order to vote on the AccuVote TS R6 or TSX voting station, the voter must press a pressure sensitive spot containing the name of the candidate. When the spot is pressed, a lighted square containing a large X appears beside the candidate's name. The persons participating in these tests did not have undue difficulty voting on the AccuVote TS R6 and TSX Voting Stations.

(10) *It shall be safely transported.*

The portion of the system that is installed in the precinct, the AccuVote TS R6 and TSX voting stations and the Express Poll 4000, are small and easily transported. See Section 3.2, System Hardware/Firmware.

21-2-379.4 Ballot appearance; write in votes on DRE systems

(a) The ballots for direct recording electronic (DRE) voting systems shall be of such size and arrangement as will suit the construction of the DRE screen and shall be in plain, clear type that is easily readable by persons with normal vision. If the equipment has the capacity for color display, the names of all candidates in a particular race shall be displayed in the same color, font, and size and the political party or body affiliation of candidates may be displayed in a color different from that used to display the names of the candidates, but all political party or body affiliations shall be printed in the same size and font. All ballot questions and constitutional amendments shall be displayed in the same color.

The Premier Election Solutions, Inc. TS Voting System satisfies this requirement.

(b) The arrangement of offices, names of candidates, and questions upon the ballots shall conform as nearly as practicable to this chapter for the arrangement of such offices, names of candidates, and questions on paper ballots.

The Premier Election Solutions, Inc. TS Voting System satisfies this requirement.

(c) Electors shall be permitted to cast write-in votes on DRE voting systems as provided in Code Section 21-2-133. The design of the ballot shall permit the election superintendent and poll workers when obtaining the vote count from such systems to determine

readily whether an elector has cast any write-in vote not authorized by law.

The Premier Election Solutions, Inc. TS Voting System satisfies this requirement.

21-2-379.5 Ballot information

(b) *The ballot for each candidate or group of candidates nominated by a political party or body shall display the name or designation of the political party or body.*

The Premier Election Solutions, Inc. TS Voting System satisfies this requirement.

(c) *The incumbency of a candidate seeking election for the public office he or she then holds shall be indicated on the ballot.*

The Premier Election Solutions, Inc. TS Voting System satisfies this requirement.

Appendix A

Certification Test Plan
Of the
Georgia DRE Voting System
September 2004

Hardware Definition

GEMS Computer

Voter Card Encoders
- 101532
- 115663
- 119134
- 119136

Voting Stations
- 110002
- 113438
- 114187
- 114995
- 115673
- 116217
- 116372
- 116669
- 119520
- 121216
- 121606
- 123461
- 128124

Key Card Tool
- Dell Notebook Computer

Absentee Ballot Scanner
- 86634

Software Definition

AVTS-R6	4.5.2
AVOS	1.94w
GEMS	1.18.22G

Encoder	1.3.2
Key Card Tool	1.0.1

Phase I: Initial Setup:

1. Install the new system on Center devices and identify the differences between the current and the new system.
2. Identify the portions of the system that will require changes to the current training for election officials and poll workers.
3. Develop the ballot styles that will be used in the following Phases II and III. The ballot style for Phase II should be long enough that the summary page does not show on a single screen.
4. Develop voting scripts and voter instructions for use in Phase II.
5. Identify the devices that will be available for use during Certification Testing and set up the test environment.
6. Schedule a meeting to brief the KSU and SOS staff on the above items. This briefing should contain sufficient detail to enable this staff to make decisions about the implementation of the new system.

Phase II: Usability Testing

This test will test the end-to-end operation of the system by setting up and executing an election that is typical of an election in the State. Voting scripts will be prepared with a known outcome. All voting stations will record a number of votes that exceeds the number of votes normally cast on a voting station in a State election.

Setup: The configuration for this test will consist of two precincts from each of two counties, for a total of four precincts, as follows:

Clayton County: Forest Park 2 and Forest Park 6 Precincts.

Pierce County: Blackshear and Hackelbarney Precincts

Each county will have one early-voting terminal and each precinct will have two voting stations. The overall system employed will consist of a computer operating under GEMS 1.18.22G, a lap-top computer with Key Card Tool 1.0.1, thirteen AccuVote TS voting stations with firmware version 4.5.2 , two AccuVote OS ballot scanners with firmware version 1.94w, four voter card encoders with firmware version 1.3.2. (Diagram A, below)

Phase III: Stress Testing

1. High volume tests. Conduct tests to determine the ability of the TS units to accommodate a high volume of ballots. The number of ballots cast in this test will exceed the number of ballots that may be cast in an early voting setup.

2. Precinct worker errors. Identify and test the system's ability to recovery from various types of errors that are typically committed by poll workers.
3. Voter errors. Identify and test the system's ability to recovery from various types of errors that are typically committed by voters.
4. Acts of Nature/Vandalism. Identify and test the system's ability to recovery from various acts of nature or vandalism.

Phase IV: Security Tests

- Conduct vulnerability assessment of the Premier DRE to determine open ports and known vulnerabilities.
- Perform vulnerability assessment of the standard installation of GEMS Election Management Systems (EMS) to determine open ports and known vulnerabilities.
- Develop implementation recommendations for GEMS EMS, focusing on physical and procedural security.
- Hash and document GEMS standard installation for use in implementation validation and verification.
- Create hashing scripts to validate county implementations of GEMS against certified CES implementation of GEMS software.

Ballot Script
Georgia Certification Test

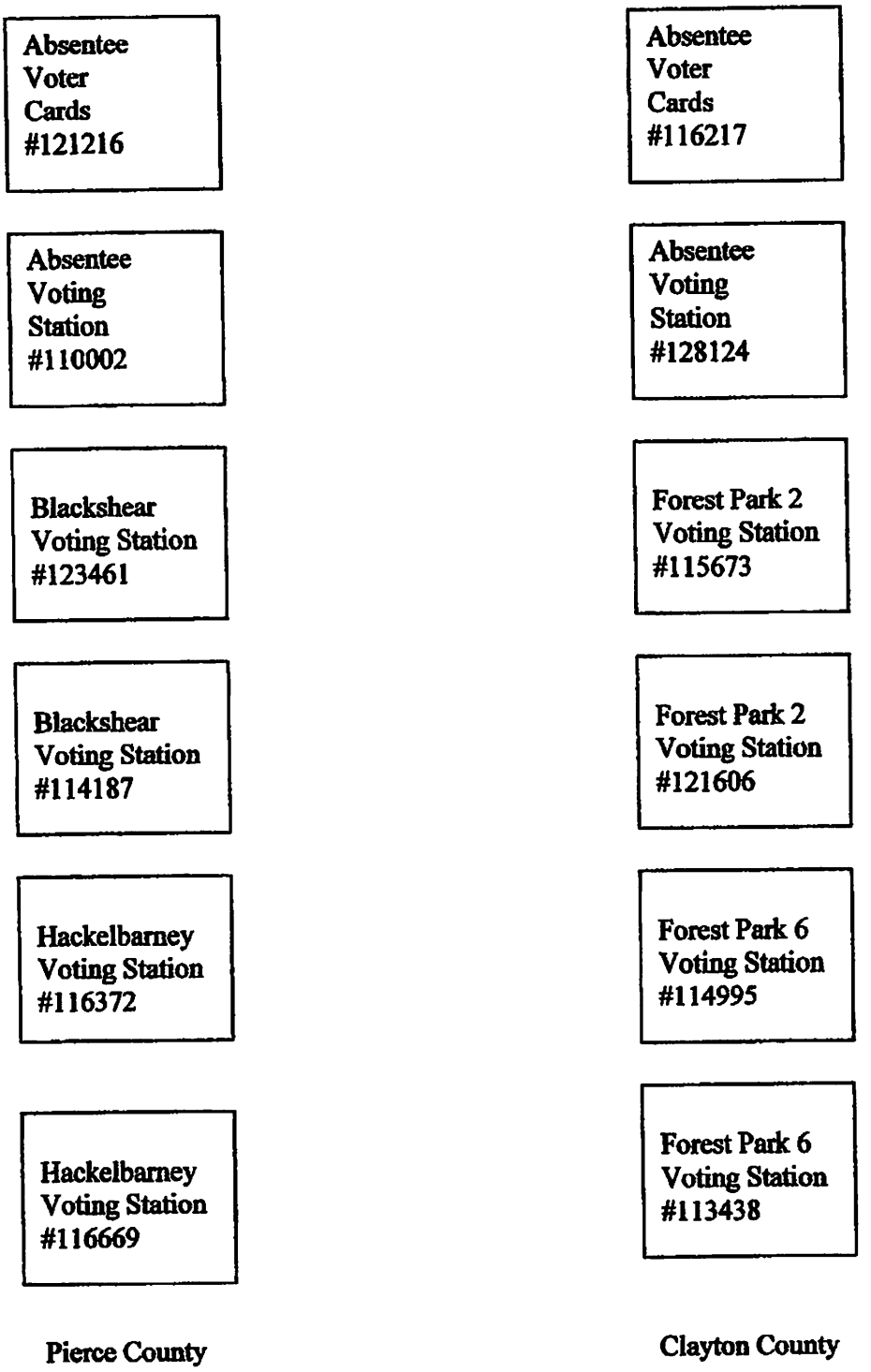
County: Clayton
Precinct/Split: Forest Park 2, Split A
Voting Station: _____
Script: 1

Voter: _____ **Date:** _____

US Senate:	**MAX CLELAND**
Governor:	**ROY E BARNES**
Lt. Governor:	**MARK TAYLOR**
Secretary of State:	**CATHY COX**
Attorney General:	**THURBERT BAKER**
Comm. Of Agriculture:	**TOMMY IRVIN**
Comm. Of Insurance:	**LOIS COHEN**
State School Super:	**BARBARA CHRISTMAS**
Comm. Of Labor	**MICHAEL THURMOND**
Public Service Comm. 1	**EARLEEN W SIZEMORE**
Public Service Comm. 2	**LAUREN MCDONALD, JR**
US Rep 13th District	**DAVID SCOTT**
State Senate 44th District:	**TERRELL A STARR**
State Rep. 50th District:	**GEORGANA SINKFIELD**
County Comm. Dist. 1	**CARL RHODENIZER**
Board of Education:	**ERICA DAVIS or SUE RYAN**

(CONTINUED)

Const. Ammend. 1	**YES**
Const. Ammend. 2	**YES**
Const. Ammend. 3	**YES**
Const. Ammend. 4	**YES**
Const. Ammend. 5	**YES**
Const. Ammend. 6	**YES**
Statewide Ref. A	**YES**
Statewide Ref. B	**YES**
Statewide Ref. C	**YES**
Statewide Ref. D	**YES**
Statewide Ref. E	**YES**



Usability Test Configuration
Diagram A

Appendix B

Certification Test Plan
Of the
AccuVote TSX Voting Station
Georgia DRE Voting System
September 2004

Overall Objective: The purpose of these tests is to verify that the AccuVote TSX voting station, firmware version 4.5.2, will operate seamlessly in the Georgia Voting System. The precinct layout for these tests will be the same as the precinct layout presented in Appendix A, above.

Phase I: Interoperability:

The purpose of these tests is to verify that the AccuVote TSX voting station will operate seamlessly in the Georgia Voting System.

1. Verify that memory cards produced by GEMS 1.18.22G will load successfully into either the TS-R6 or the TSX voting stations.
2. Verify that memory cards created by closing the polls on either a TS-R6 or a TSX voting station will upload successfully into GEMS 1.18.22G.
3. Verify that voter cards produced by PollBook 4000, version 1.2.0, will operate successfully in either the TS-R6 or the TSX voting station.
4. Verify that a mix of memory cards produced by closing the polls on AccuVote TS-R6 voting stations, AccuVote TSX voting stations, and AccuVote OS optical scan ballot scanners will upload correctly into GEMS 1.18.22G.

Phase II: Usability Testing

This test will test the end-to-end operation of the system by setting up and executing an election that is typical of an election in the State. Voting scripts will be prepared with a known outcome. All AccuVote TSX voting stations will record a number of votes that exceeds the number of votes normally cast on a voting station in a State election.

Setup: The configuration for this test will consist of two precincts from each of two counties, for a total of four precincts, as follows:

Clayton County: Forest Park 2 and Forest Park 6 Precincts.

Pierce County: Blackshear and Hackelbarney Precincts

Each precinct will have one TSX voting stations. The overall system employed will consist of a computer operating under GEMS 1.18.22G, a lap-top computer with Key Card Tool 1.0.1, four AccuVote TSX voting stations with firmware version 4.5.2 ,

one AccuVote OS ballot scanners with firmware version 1.94w, one Express Poll 4000 with firmware version 1.2.0

Phase III: Stress Testing

The purpose of this test it to verify that the AccuVote TSX voting station can accommodate the number of ballots cast during early voting. The number of ballots voted in this test will exceed 50,000 on a single voting station.

Phase IV: Security Tests

- Conduct vulnerability assessment of the AccuVote TSX voting station to determine open ports and known vulnerabilities.
- Develop recommendations for the storage and handling of TSX voting stations.

Hardware Definition

GEMS Computer

ExpressPoll 4000
5065012A

AccuVote TS-R6 Voting Stations
159543

AccuVote TSX Voting Stations
204315
208152
223494
258838

Key Card Tool
Dell Notebook Computer

Absentee Ballot Scanner
40805

Software Definition

AVTS-R6	4.5.2
AVOS	1.94w
GEMS	1.18.22G
Encoder	1.3.2
Key Card Tool	1.0.1
PollBook 4000	1.2.0

Appendix C

Certification Test Plan
Of the
AccuVote TSX Model D Voting Station
Georgia DRE Voting System
September 2004

Overall Objective: The purpose of these tests is to verify that the AccuVote TSX, Model D, voting station using firmware version TSX 4.5.2, will operate seamlessly in the Georgia Voting System.

Phase I: Interoperability:

The purpose of these tests is to verify the interoperability of the AccuVote TSX Model D voting station with existing components of the Georgia Voting System.

5. Verify that memory cards produced by GEMS 1.18.22G will load successfully into either the TS-R6 or the TSX Model D voting stations.
6. Verify that memory cards created by closing the polls on either a TS-R6 or a TSX Model D voting station will upload successfully into GEMS 1.18.22G.
7. Verify that voter cards produced by PollBook 4000, version 1.2.0, will operate successfully in either the TS-R6 or the TSX Model D voting station.
8. Verify that a mix of memory cards produced by closing the polls on AccuVote TS-R6 voting stations and AccuVote TSX Model D voting stations will upload correctly into GEMS 1.18.22G.

Phase II: Usability Testing

This test will test the end-to-end operation of the system by setting up and executing an election that is typical of an election in the State. Voting scripts will be prepared with a known outcome.

Setup: The configuration for this test will consist of two precincts from each of two counties, for a total of four precincts, as follows:

Clayton County: Forest Park 2 and Forest Park 6 Precincts.

Pierce County: Blackshear and Hackelbarney Precincts

Each precinct will have one TSX – Model D voting station. The overall system employed will consist of a computer operating under GEMS 1.18.22G, a lap-top computer with Key Card Tool 1.0.1, four AccuVote TSX Model D voting stations with firmware version TSX 4.5.2, and one Express Poll 4000 with firmware version 1.2.0

Phase III: Stress Testing

The purpose of this test it to verify that the AccuVote TSX – Model D voting station can accommodate the number of ballots cast during early voting. The number of ballots voted in this test will exceed 50,000 on a single voting station.

Hardware Definition

GEMS Computer

ExpressPoll 4000
SOGS009A

AccuVote TS-R6 Voting Stations
159543

AccuVote TSX Model D Voting Stations
262247
263480
263513
263515
276094
276137

Key Card Tool
Dell Notebook Computer

Software Definition

AVTS-R6	4.5.2
AVTS-TSX	4.5.2
GEMS	1.18.22G
Encoder	1.3.2
Key Card Tool	1.0.1
PollBook 4000	1.2.0

Appendix D

Validation Test Plan
of the
Dell Power Edge Server
for use in the
Georgia Voting System

March 2008

Overall Objective: The purpose of these tests is to verify that the Dell Power Edge Server with Windows 2000, service pack 4 with all security and time zone updates as of 3/11/2008 will not affect the overall flow of program control or the manner in which ballots are recorded and the votes are processed in the Georgia voting system.

Phase I: Interoperability:

The purpose of these tests is to verify the interoperability of the Dell Power Edge Server with Windows 2000, service pack 4 with existing components of the Georgia Voting System.

1. Verify that memory cards produced by GEMS 1.18.22G will load successfully into the AccuVote TS-R6, the AccuVote TSX voting stations, and the AccuVote OS ballot scanner.
2. Verify that a mix of memory cards produced by closing the polls on AccuVote OS ballot scanners, AccuVote TS-R6 voting stations, and AccuVote TSX voting stations will upload correctly into GEMS 1.18.22G.
3. Verify modem transmissions between the AccuVote TS-R6, the AccuVote TSX, and the AccuVote OS and GEMS 1.18.22G.
4. Verify that GEMS 1.18.22G prepares all backup materials and all reports correctly using third-party software products.

Phase II: Usability Testing

This test will test the end-to-end operation of the system by setting up and executing an election that is typical of an election in the State. Voting scripts will be prepared with a known outcome.

Setup: The GEORGIA CERTIFICATION database will be use as the election setup for this test. This election setup consists of one federal office, two state offices, one county office, and two referendum questions.

The voting system tested will consist of one AccuVote TS – R6 voting station with firmware version 4.5.2, one AccuVote TSX – Model D voting station with firmware version 4.5.2, and one AccuVote OS ballot scanner with firmware 1.94w. ExpressPoll 4000s with firmware version 2.1.2 and card writer firmware version 1.1.4.0. will be used to produce voter cards.

The GEMS server employed will consist of a Dell Power Edge server with Windows 2000, service pack 4 running GEMS 1.18.22G.

Hardware Definition

GEMS Computer (1)
Dell Power Edge server
with Windows 2000, service pack 4
with all security and time zone updates
as of 3/11/2008

ExpressPoll 4000

AccuVote TS-R6 Voting Stations

AccuVote TSX Model D Voting Stations

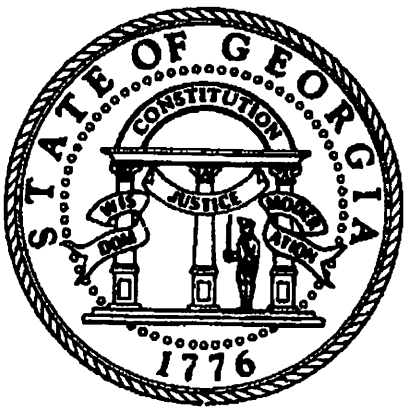
AccuVote OS ballot scanners

Software Definition

Windows 2000	Service pack 4
AVTS-R6	4.5.2
AVTS-TSX	4.5.2
AVOS	1.94w
GEMS	1.18.22G
Encoder	1.3.2
ExpressPoll 4000	2.1.2 with card writer 1.1.4.0

Test Participants – March 26, 2008

Brit Williams	Kennesaw State University
Michael Barnes	Kennesaw State University
Devin Pearson	Kennesaw State University



Certification Test of the

Premier Election Solutions, Inc. TS Voting System

Prepared for:

Elections Division
Office of the Secretary of State
State of Georgia

Prepared by:

Center for Election Systems
Kennesaw State University
Kennesaw, Georgia, 30144

Revised
April 11, 2008

Contents

1.	Introduction		3
2.	Summary of Findings		3
3.	System Description		5
	3.1	System Hardware	5
	3.2	System Software/Firmware	6
	3.3	System and Test Documentation	6
	3.4	Overview of System Operation	9
4.	Compliance With Applicable Statues and Standards		10
	4.1	Election Assistance Administration Voting System Standards	10
	4.2	Help America Vote Act of 2002	10
	4.3	Georgia Election Code	12

Appendix A: Certification Test Plan	16
Appendix B: Certification Test Plan: TSX – Model C	22
Appendix C: Certification Test Plan: TSX – Model D	24
Appendix D: Validation Test Plan of the Dell Power Edge Server	26
Appendix E: Certification Test Plan: ExpressPoll 5000 And interoperability of the ExpressPoll 4000 and 5000.	28

1. Introduction

Certification Tests of the Georgia Voting System were conducted at Kennesaw State University during the month of April 2008. The purpose of these tests was to verify that the ExpressPoll 5000 will function seamlessly in the Georgia voting system. This component passed these tests. A recommendation was sent to the Secretary of State that this component be certified for use in Georgia voting system. The Test Plans for these tests are contained in Appendix E.

Certification Chronology

Certification tests of the Georgia Voting System including security upgrades were conducted in December 2004. (See Appendix A)

Certification tests to include the ExpressPoll 4000 in this system were conducted in August and September, 2005 .

Certification tests to include the AccuVote TSX – Model C Voting Station in this system were conducted in March 2006. (See Appendix B)

Certification tests to include the AccuVote TSX – Model D Voting Station in this system were conducted in July 2006. (See Appendix C)

Tests to validate that the Dell Power Edge Server, service pack 4, with all security and time zone updates as of 3/11/2008 will function correctly in this system were conducted in March 2008. (See Appendix D)

Certification tests to include the ExpressPoll 5000 in this system were conducted in March 2008. (See Appendix E)

These tests were conducted by the staff of the Kennesaw State University Center for Election Systems under the direction of Dr. Brit Williams.

2. Summary of Findings

The Premier Election System TS Voting System as tested in 2004 was found to be in compliance with the applicable provisions of the Help America Vote Act of 2002, the Georgia Election Code, the Rules of the Georgia Election Board, and the Rules of the Secretary of State. This system consists of the following components:

Dell Power Edge with GEMS	1.18.22G
AccuVote R6 voting station with	AVTS 4.5.2
AccuVote OS ballot scanner with	AVOS 1.94w
Voter Card Encoder with	Firmware 1.32
Key Card Tool with	Firmware 1.01

The following features are enhancements that were tested in December 2004 for inclusion in the Georgia voting system.

Encryption of the data files transmitted via modem: When the polls close on election night the poll manager has the ability to transmit unofficial results to the county elections office. The previous version of the voting system did not encrypt this file prior to transmission. The tested version of the voting system encrypts this file prior to transmission.

Randomization of all internal ballot image files: The previous version of the voting system contained one ballot image file that was not randomized. The tested version of the voting system randomizes all internal ballot image files.

Dynamic password on Poll Manager Card: In previous version of the voting system the password on the Poll Manager Card was a static four digit number. The tested version of the system has a six digit password and allows this password to be changed as often as desired.

Dynamic password on Voter Cards: In the previous version of the voting system the password contained in the hand-shaking routine between the voter card and the voting station was static. The tested version of the system allows this password to be changed as often as desired.

The ExpressPoll 4000 with firmware 2.1.2 with card writer 1.1.4.0 was tested in September 2005 for inclusion in the Georgia voting system.

ExpressPoll 4000: ExpressPolls function as an encoder that is connected to the precinct's electors list. By reading and displaying the precinct's electors list, The ExpressPoll creates a voter access card which will access the voter's assigned ballot style by associating the voter's ballot combination, as outlined in the voter registration record, with the ballot styles maintained on the voting units within the precinct.

The AccuVote TSX, Models C and D with firmware 4.5.2 were tested in July 2006 for inclusion in the Georgia voting system.

AccuVote TSX – Model C Voting Station: The TSX – Model C is a revised version of the AccuVote TS R6 voting station. The TSX is functionally identical to the TS R6. Enhancements include an integrated carrying/storage case, lighter weight, and a light-weight, battery powered voting tablet that can be removed from the case and placed in a handicapped voters lap or carried to curb-side. The certification Test Plan for the TSX – Model C is contained in Appendix B.

AccuVote TSX – Model D Voting Station: The TSX – Model D is a slightly modified version of the TSX Model C Voting Station. The Model D is both functionally and electronically identical to the Model C. Thus, the Model D does not require any additional training for election officials or voters who are familiar with the Model C. The Model D was developed in response to the unavailability of some of the components of the Model C. The certification Test Plan for the TSX – Model D is contained in Appendix C.

The Dell Power Edge Server, service pack 4, with all security and time zone updates as of 3/11/2008 was tested in March 2008 for inclusion in the Georgia Voting System.

The original Dell servers used in the Georgia Voting System were acquired in 2002. These servers are nearing the end of their expected life. The Dell Power Edge tested will be used as a replacement for the original Dell computers. The certification test plan for the Dell Power Edge Server is contained in Appendix D.

The ExpressPoll 5000 with firmware 2.1.2 with card writer 1.1.4.0 was tested in April 2008 for inclusion in the Georgia voting system.

The ExpressPoll 5000 is a revised, newer model of the ExpressPoll 4000. Its function is identical to the function of the ExpressPoll 4000. The ExpressPoll 4000 is no longer available. The certification test plan for the ExpressPoll 5000 is contained in Appendix E.

3. System Description

The system tested in December 2004 was the **AccuVote TS Voting System**, presented by Premier Election Systems, Inc., 1611 Wilmeth Road, McKinney, Texas, 75069-8250. This system is composed of the **AccuVote TS R6 Voting Station**, the **AccuVote TSX Voting** Station, the **AccuVote OS Ballot Scanner**, the **Voting Card Encoder**, the **Express Poll 4000**, and a commercial computer running the **Global Election Management System (GEMS)**. A complete list of the system tested is contained in Appendix A.

3.1 System Hardware

At the conclusion of tests performed in March 2008, the hardware of the Georgia voting system consists of:

- **Dell Power Edge computers** provided by Premier under the State contract support the election management system (GEMS).

Dell Power Edge Servers with service pack 4 support the election management system.

AccuVote TS R6 Voting Stations provide a voter interface.

AccuVote TSX Models C and D Voting Stations provide a voter interface.

AccuVote OS Ballot Scanners are used to process absentee and provisional/challenged ballots.

Voter Card Encoders are used to program the voter cards.

Smart Cards are used for voter cards and supervisor cards.

ExpressPoll 4000s and ExpressPoll 5000s are used to read voter's records from the precinct voter registration database and create the corresponding voter card.

3.2 System Software/Firmware

At the conclusion of tests performed in March 2008, the software/firmware of the Georgia voting system consists of:

The operating system used by the personal computers that support the Global Election Management System and the Poll Book systems is **Windows CE with power pack 4.** Windows CE is also the operating system that controls the functions of the Voting Stations.

The **Global Election Management System (GEMS), Version 1.18.22G,** is a Premier proprietary system which runs on a the Dell servers and performs the following pre-election functions: setup the election data base, create a new election, enter contests and issues, define ballot styles, and produce the PCMCIA cards that are used to program the voting stations in the precincts and the absentee ballot scanners. After the polls close, this system reads the PCMCIA cards from the precincts, tallies the votes, and prints the various reports and audit data.

BS, Version 4.5.2 is a Premier proprietary system that controls the TS-R6 and TSX voting stations.

OS, Version 194w is a Premier proprietary system that controls the OS Ballot Scanner.

Encoder Firmware 1.32 is a Premier proprietary system that controls the voter card encoder.

Key Card Tool 1.01 is a Premier Proprietary system that enables the election official to change the passwords on the Voter Cards and the Poll Manager's Card.

ExpressPoll Firmware 1.2.0 with card writer 1.1.4.0 is a Premier Proprietary system that enables an election official to read a voter record from the voter registration database and create a Voter Card for the ballot style that corresponds to the voter's registration information.

3.3 System and Test Documentation

AccuVote-TS R6 System Hardware Specification, Document Revision 1.0, Premier Election Solutions, Inc., April 30, 2001

AccuVote-TS Hardware Guide, Document Revision 1.0, Premier Election Solutions, Inc., April 30, 2001

GEMS 1.18 User Guide, GEMS, Revision 4.0, Premier Election Solutions, Inc., November 1, 2002

AccuVote OS AccuFeed User's Guide, Revision 1.0, Premier Election Solutions, Inc., July 18, 2002

VCProgrammer 4.1 User's Guide, Revision 2.0, Premier Election Solutions, Inc., September 24, 2002

AccuVote OS Precinct Count 1.96 User's Guide, Revision 1.0, Premier Election Solutions, Inc., August 27, 2002

AccuVote-TS Ballot Station 4.5 User's Guide, Revision 2.0, Premier Election Solutions, Inc., June 17, 2004

GEMS 1.18 Product Overview Guide, Revision 2.0, Premier Election Solutions, Inc., February 13, 2004

GEMS 1.18 Reference Guide, Revision 6.0, Premier Election Solutions, Inc., June 15, 2004

GEMS 1.18 Election Administrator's Guide, Revision 6.0, Premier Election Solutions, Inc., June 15, 2004

Voter Card Encoder 1.3 User's Guide, Revision 1.0, Premier Election Solutions, Inc., February 10, 2004

Key Card Tool 1.0 User's Guide, Revision 2.0, Premier Election Solutions, Inc., April 20, 2004

Source Code, GEMS Version 1-18-22G, Premier Election Solutions, Inc., July 2004

Premier Election Solutions, Inc., Inc. Software Functional Test Report GEMS 1-18-22, Ciber Independent Test Authority, September 29, 2004

Change Release Report of the AccuVote TS R6 DRE Voting Machine, Wyle Laboratories, August 3, 2004

AccuVote TSX Hardware Guide, Premier Election Solutions, Inc., Revision 8.0, February 2004

AccuVote TSX Pollworker's Guide, Premier Election Solutions, Inc., Revision 5.0, March 2005

GEMS 1-18 Election Administrator's Guide, Premier Election Solutions, Inc., Revision 10.0, May 2005

GEMS 1.18 Product Overview Guide, Revision 3.0, Premier Election Solutions, Inc., December 2005

GEMS 1.18 Reference Guide, Revision 8.0, Premier Election Solutions, Inc., April 2005

GEMS 1.18 User Guide, GEMS, Revision 12.0, Premier Election Solutions, Inc., April 2005

ExpressPoll Administrator's Guide for Version 2.0 and 2.1, Revision 3.0, Premier Election Solutions, 2005

ExpressPoll Emjulator and Resource Guide for Versions 1.2 and 2.1, Revision 3.0, Premiere Election Solutions, 2005

ExpressPoll User's Guide for Versions 2.0 and 2.1, Revision 3.0, Premier Election Solutions, 2005

ExpressPoll CardWriter 1.0 Technical Data Package Appendix A: Software Specification, Premier Election Solutions, Inc., 2005

ExpressPoll CardWriter 1.0 Technical Data Package Appendix B: Program Data Structure and Flow, Premier Election Solutions, Inc., 2005

Software Functional Test Report Premier Election Solutions, Inc. GEMS 1-18, Addendum 12 for GEMS 1-18-22G, Ciber Independent Test Authority, June 2006

Hardware Qualification Testing of the Premier Election Solutions, Inc. AccuVote TSX Model D DRE Voting Machine, Wyle Report 52501-07 on the AccuVote TSX Model D Tablet, Wyle Laboratories, Inc., April 2006

GEMS 1.18 System Administrator's Guide, Revision 7.0, Premier Election Solutions, Inc., January 2006

Georgia Election Code, Annotated, 2007 Edition

3.4 Overview of System Operation

Election Definition: The following functions are performed by the Global Election Management System (GEMS).

Create the election database.

Enter races and candidates, issues and options that are to appear in the election

Select the races and issues that are to appear on each ballot style.

Enter headings and instructions as they are to appear on the ballots.

Format the ballots.

Establish passwords for the voter cards and poll manager's cards.

Hardware Programming: Once the election definition is complete, the PCMCIA cards can be prepared to control the AccuVote TS voting stations and the AccuVote OS optical scan ballot scanners. A PCMCIA card must be prepared for each voting station and each ballot scanner.

Precinct Setup: The voting stations and ballot scanners are prepared for the election by inserting the PCMCIA cards and powering up the device. The device performs a self test and is then ready for pre-election testing.

Election Day (Precinct) Activities: As the polls are opened and each device is powered up, the device performs a self test and presents a menu with the various options allowed at the polling place. If the 'open polls' option is selected, the registers are set to zero and a 'zero totals' tape is printed.

The ExpressPoll is used by a poll worker to isolate a voter's name on an electronically displayed elector's list within the precinct and then create a voter access card while at the same time marking the precinct's electors list. The combined operation is designed to provide an accurate listing of voter participation at the precinct while ensuring that each participating elector receives the proper ballot style which is based on the voter's ballot combination outlined in the state's voter registration system.

When the polls are closed, the vote totals from each device are recorded to the PCMCIA cards. These cards are then transported to a central counting location for entry into the GEMS system for tallying and reporting. If desired, unofficial results from the precincts can be transmitted to the central location via modem.

Vote Tallying/Report Printing: The PCMCIA cards from each precinct are returned to the central facility where they are loaded into the GEMS. During this step, any known errors can be manually corrected and absentee votes can be entered.

At any time during the tally of the votes or at the completion of vote tallying, election result can be printed by precinct or overall. These reports can also be exported to other systems or posted on the Internet.

The system administrator can use the GEMS to print the various audit logs.

4. Compliance With Applicable Statues and Standards

4.1 Election Assistance Commission Voting System Standards

Hardware/Firmware: The Premier Election Solutions, Inc. TS Voting System hardware and firmware was examined by Wyle Laboratories, Huntsville, Alabama and found to be in compliance with the hardware specifications contained in the EAC Voting System Standards. Wyle is an Independent Test Agency approved by the National Association of State Election Directors (NASED).

Software: The GEMS election management software was examined by Ciber, Inc., Huntsville, Alabama and found to be in compliance with the software specifications contained in the EAC Voting System Standards. Ciber, Inc. is an Independent Test Agency approved by the National Association of State Election Directors.

NASED Qualification: The components that comprise the Georgia voting system are qualified under NASED voting system Qualification Numbers N-1-06-12-12-003 through N-1-06-12-12-010.

4.2 Help America Vote Act of 2002

The Premier Election Solutions, Inc. TS Voting System is classified as an electronic voting system and, as such, falls under the following Sections of the **Help America Vote Act of 2002**

TITLE III–UNIFORM AND NONDISCRIMINATORY ELECTION TECHNOLOGY AND ADMINISTRATION REQUIREMENTS; SEC. 302. PROVISIONAL VOTING AND VOTING INFORMATION REQUIREMENTS.

(a) Provisional Voting Requirements.–If an individual declares that such individual is a registered voter in the jurisdiction in which the individual desires to vote and that the individual is eligible to vote in an election for Federal office, but the name of the individual does not appear on the official list of eligible voters for the polling place or an election official asserts that the individual is not eligible to vote, such individual shall be permitted to cast a provisional ballot ...

The Premier Election Solutions, Inc. TS Voting System has the facility to allow a voter to vote a provisional ballot. This ballot is stored in a separate location and is not included in the tally until the voter's credentials have been established by the county registrar.

The paper ballot used for absentee voting can also be used to satisfy this requirement.

(2) Audit capacity (B) Manual audit capacity.—
(i) The voting system shall produce a permanent paper record with a manual audit capacity for such system.

The Premier Election Solutions, Inc. TS Voting System can satisfy this requirement.

(ii) The voting system shall provide the voter with an opportunity to change the ballot or correct any error before the permanent paper record is produced.

The Premier Election Solutions, Inc. TS Voting System satisfies this requirement. The AccuVote TS R6 and TSX Voting Stations present a summary screen at the end of the ballot that gives the voter the opportunity to change any selection.

(3) Accessibility for individuals with disabilities.—The voting system shall--(A) be accessible for individuals with disabilities, including non-visual accessibility for the blind and visually impaired, in a manner that provides the same opportunity for access and participation (including privacy and independence) as for other voters;

The voter using the AccuVote TS R6 and TSX voting stations can choose to view the ballot in large print or in high contrast or both. In addition, The AccuVote TS R6 and TSX voting stations can be equipped with a keypad and earphones for vision impaired voters.

4.3 Georgia Election Code, Annotated, 2007 Edition

The Premier Election Solutions, Inc. TS Voting System is classified as direct recording electronic voting systems. The Georgia Election Code, Section 21-3-379 regulates systems of this type.

21-2-379.1 Requirements for use of electronic recording voting systems

No direct electronic recording voting system shall be adopted or used unless it shall, at the time, satisfy the following requirements:

(1) *It shall provide facilities for voting for such candidates as may be nominated and upon such questions as may be submitted;*

The Premier Election Solutions, Inc. TS Voting System satisfies this requirement.

(2) *It shall permit each elector, in one operation, to vote for all candidates of one party of body for presidential electors;*

The Premier Election System TS Voting System satisfies this requirement.

(3) *Except as provided in paragraph (2) of this Code section for*

presidential electors, it shall permit each elector, at other than primaries, to vote a ticket selected from nominees of any and all parties or bodies, from independent nominations, and from persons not in nomination;

The Premier Election Solutions, Inc. TS Voting System satisfies this requirement.

(4) *It shall permit each elector to vote, at any election, for any person and for any office for whom and for which he or she is lawfully entitled to vote, whether or not the name of such person or persons appears as a candidate for election, to vote for as many persons for an office as he or she is entitled to vote for; and to vote for or against any question upon which he or she is entitled to vote;*

The Premier Election Solutions, Inc. TS Voting System satisfies this requirement. Tests included multiple candidates for a single office and write-in candidates.

(5) *It shall preclude the counting of votes for any candidate or upon any question for whom or upon which an elector is not entitled to vote; shall preclude the counting of votes for more persons for any office than he or she is entitled to vote for; and shall preclude the counting of votes for any candidate for the same office or upon any question more than once;*

The Premier Election Solutions, Inc. TS Voting System satisfies this requirement. Tests indicated that the voter was only able to see and vote on the assigned ballot style. The system does not allow over-votes. Once the allowed number of candidates has been selected, the voter cannot select another candidate without first releasing one of the previously selected candidates. Tests were conducted to ensure that a voter could not write in the same name multiple times in a multi-candidate contest.

(6) *It shall permit voting in absolute secrecy so that no person can see or know for whom any other elector has voted or is voting save an elector whom he or she has assisted or is assisting in voting, as prescribed by law.*

The Premier Election Solutions, Inc. TS Voting System satisfies this requirement.

(7) *It shall be constructed of material of good quality in a neat and workmanship like manner;*

The Premier Election Solutions, Inc. TS Voting System satisfies this requirement. The quality of the materials and workmanship was reviewed by the hardware/firmware ITA, Wyle Laboratories.

(8) *It shall, when properly operated, record correctly and accurately every vote cast;*

The Premier Election Solutions, Inc. TS Voting System satisfies this requirement. The hardware ITA, Wyle Laboratories, and the software ITA, Ciber, Inc., extensively tested this requirement. The State certification tests included logic and accuracy tests, but with a smaller number of ballots than the tests conducted by the ITAs.

(9) *It shall be so constructed that an elector may readily learn the method of operating it;*

In order to vote on the AccuVote TS R6 or TSX voting station, the voter must press a pressure sensitive spot containing the name of the candidate. When the spot is pressed, a lighted square containing a large X appears beside the candidate's name. The persons participating in these tests did not have undue difficulty voting on the AccuVote TS R6 and TSX Voting Stations.

(10) *It shall be safely transported.*

The portion of the system that is installed in the precinct, the AccuVote TS R6 and TSX voting stations and the Express Poll 4000, are small and easily transported. See Section 3.2, System Hardware/Firmware.

21-2-379.4 Ballot appearance; write in votes on DRE systems

(a) The ballots for direct recording electronic (DRE) voting systems shall be of such size and arrangement as will suit the construction of the DRE screen and shall be in plain, clear type that is easily readable by persons with normal vision. If the equipment has the capacity for color display, the names of all candidates in a particular race shall be displayed in the same color, font, and size and the political party or body affiliation of candidates may be displayed in a color different from that used to display the names of the candidates, but all political party or body affiliations shall be printed in the same size and font. All ballot questions and constitutional amendments shall be displayed in the same color.

The Premier Election Solutions, Inc. TS Voting System satisfies this requirement.

(b) *The arrangement of offices, names of candidates, and questions upon the ballots shall conform as nearly as practicable to this chapter for the arrangement of such offices, names of candidates, and questions on paper ballots.*

The Premier Election Solutions, Inc. TS Voting System satisfies this requirement.

(c) *Electors shall be permitted to cast write-in votes on DRE voting systems as provided in Code Section 21-2-133. The design of the ballot shall permit the election superintendent and poll workers when obtaining the vote count from such systems to determine readily whether an elector has cast any write-in vote not authorized by law.*

The Premier Election Solutions, Inc. TS Voting System satisfies this requirement.

21-2-379.5 Ballot information

(b) *The ballot for each candidate or group of candidates nominated by a political party or body shall display the name or designation of the political party or body.*

The Premier Election Solutions, Inc. TS Voting System satisfies this requirement.

(c) *The incumbency of a candidate seeking election for the public office he or she then holds shall be indicated on the ballot.*

The Premier Election Solutions, Inc. TS Voting System satisfies this requirement.

Appendix A

Certification Test Plan
Of the
Georgia DRE Voting System
September 2004

Hardware Definition

GEMS Computer

Voter Card Encoders
- 101532
- 115663
- 119134
- 119136

Voting Stations
- 110002
- 113438
- 114187
- 114995
- 115673
- 116217
- 116372
- 116669
- 119520
- 121216
- 121606
- 123461
- 128124

Key Card Tool

Dell Notebook Computer

Absentee Ballot Scanner
- 86634

Software Definition

AVTS-R6	4.5.2
AVOS	1.94w
GEMS	1.18.22G

Encoder	1.3.2
Key Card Tool	1.0.1

Phase I: Initial Setup:

1. Install the new system on Center devices and identify the differences between the current and the new system.
2. Identify the portions of the system that will require changes to the current training for election officials and poll workers.
3. Develop the ballot styles that will be used in the following Phases II and III. The ballot style for Phase II should be long enough that the summary page does not show on a single screen.
4. Develop voting scripts and voter instructions for use in Phase II.
5. Identify the devices that will be available for use during Certification Testing and set up the test environment.
6. Schedule a meeting to brief the KSU and SOS staff on the above items. This briefing should contain sufficient detail to enable this staff to make decisions about the implementation of the new system.

Phase II: Usability Testing

This test will test the end-to-end operation of the system by setting up and executing an election that is typical of an election in the State. Voting scripts will be prepared with a known outcome. All voting stations will record a number of votes that exceeds the number of votes normally cast on a voting station in a State election.

Setup: The configuration for this test will consist of two precincts from each of two counties, for a total of four precincts, as follows:

Clayton County: Forest Park 2 and Forest Park 6 Precincts.

Pierce County: Blackshear and Hackelbarney Precincts

Each county will have one early-voting terminal and each precinct will have two voting stations. The overall system employed will consist of a computer operating under GEMS 1.18.22G, a lap-top computer with Key Card Tool 1.0.1, thirteen AccuVote TS voting stations with firmware version 4.5.2 , two AccuVote OS ballot scanners with firmware version 1.94w, four voter card encoders with firmware version 1.3.2. (Diagram A, below)

Phase III: Stress Testing

1. High volume tests. Conduct tests to determine the ability of the TS units to accommodate a high volume of ballots. The number of ballots cast in this test will exceed the number of ballots that may be cast in an early voting setup.

2. Precinct worker errors. Identify and test the system's ability to recovery from various types of errors that are typically committed by poll workers.
3. Voter errors. Identify and test the system's ability to recovery from various types of errors that are typically committed by voters.
4. Acts of Nature/Vandalism. Identify and test the system's ability to recovery from various acts of nature or vandalism.

Phase IV: Security Tests

- Conduct vulnerability assessment of the Premier DRE to determine open ports and known vulnerabilities.
- Perform vulnerability assessment of the standard installation of GEMS Election Management Systems (EMS) to determine open ports and known vulnerabilities.
- Develop implementation recommendations for GEMS EMS, focusing on physical and procedural security.
- Hash and document GEMS standard installation for use in implementation validation and verification.
- Create hashing scripts to validate county implementations of GEMS against certified CES implementation of GEMS software.

Ballot Script
Georgia Certification Test

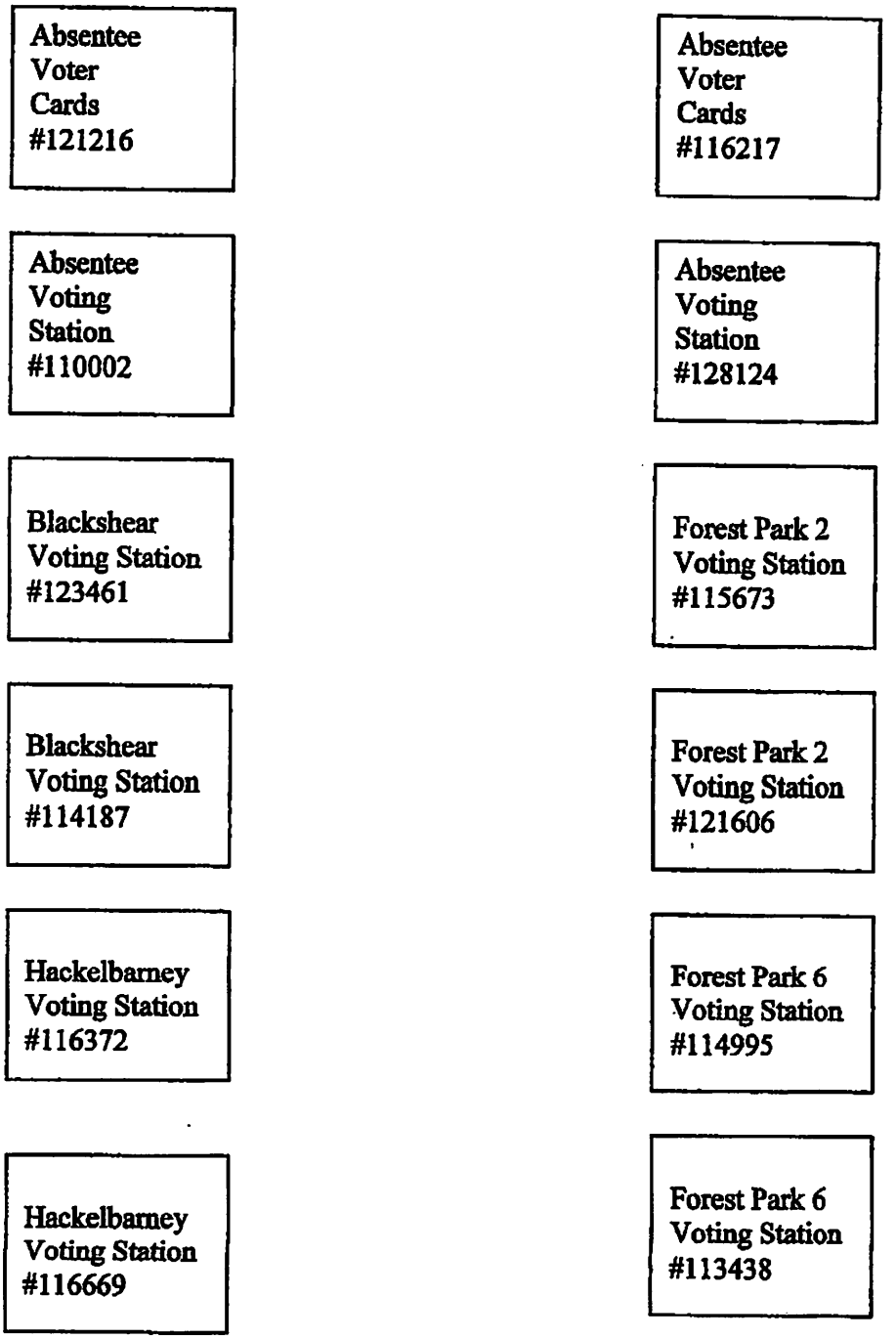
County:	**Clayton**
Precinct/Split:	**Forest Park 2, Split A**
Voting Station:	_____
Script:	**1**

Voter: _____ **Date:** _____

US Senate:	**MAX CLELAND**
Governor:	**ROY E BARNES**
Lt. Governor:	**MARK TAYLOR**
Secretary of State:	**CATHY COX**
Attorney General:	**THURBERT BAKER**
Comm. Of Agriculture:	**TOMMY IRVIN**
Comm. Of Insurance:	**LOIS COHEN**
State School Super:	**BARBARA CHRISTMAS**
Comm. Of Labor	**MICHAEL THURMOND**
Public Service Comm. 1	**EARLEEN W SIZEMORE**
Public Service Comm. 2	**LAUREN MCDONALD, JR**
US Rep 13th District	**DAVID SCOTT**
State Senate 44th District:	**TERRELL A STARR**
State Rep. 50th District:	**GEORGANA SINKFIELD**
County Comm. Dist. 1	**CARL RHODENIZER**
Board of Education:	**ERICA DAVIS or SUE RYAN**

(CONTINUED)

Const. Ammend. 1	**YES**
Const. Ammend. 2	**YES**
Const. Ammend. 3	**YES**
Const. Ammend. 4	**YES**
Const. Ammend. 5	**YES**
Const. Ammend. 6	**YES**
Statewide Ref. A	**YES**
Statewide Ref. B	**YES**
Statewide Ref. C	**YES**
Statewide Ref. D	**YES**
Statewide Ref. E	**YES**



Usability Test Configuration
Diagram A

Appendix B

Certification Test Plan
Of the
AccuVote TSX Voting Station
Georgia DRE Voting System
September 2004

Overall Objective: The purpose of these tests is to verify that the AccuVote TSX voting station, firmware version 4.5.2, will operate seamlessly in the Georgia Voting System. The precinct layout for these tests will be the same as the precinct layout presented in Appendix A, above.

Phase I: Interoperability:

The purpose of these tests is to verify that the AccuVote TSX voting station will operate seamlessly in the Georgia Voting System.

1. Verify that memory cards produced by GEMS 1.18.22G will load successfully into either the TS-R6 or the TSX voting stations.
2. Verify that memory cards created by closing the polls on either a TS-R6 or a TSX voting station will upload successfully into GEMS 1.18.22G.
3. Verify that voter cards produced by PollBook 4000, version 1.2.0, will operate successfully in either the TS-R6 or the TSX voting station.
4. Verify that a mix of memory cards produced by closing the polls on AccuVote TS-R6 voting stations, AccuVote TSX voting stations, and AccuVote OS optical scan ballot scanners will upload correctly into GEMS 1.18.22G.

Phase II: Usability Testing

This test will test the end-to-end operation of the system by setting up and executing an election that is typical of an election in the State. Voting scripts will be prepared with a known outcome. All AccuVote TSX voting stations will record a number of votes that exceeds the number of votes normally cast on a voting station in a State election.

Setup: The configuration for this test will consist of two precincts from each of two counties, for a total of four precincts, as follows:

Clayton County: Forest Park 2 and Forest Park 6 Precincts.

Pierce County: Blackshear and Hackelbarney Precincts

Each precinct will have one TSX voting stations. The overall system employed will consist of a computer operating under GEMS 1.18.22G, a lap-top computer with Key Card Tool 1.0.1, four AccuVote TSX voting stations with firmware version 4.5.2 ,

one AccuVote OS ballot scanners with firmware version 1.94w, one Express Poll 4000 with firmware version 1.2.0

Phase III: Stress Testing

The purpose of this test it to verify that the AccuVote TSX voting station can accommodate the number of ballots cast during early voting. The number of ballots voted in this test will exceed 50,000 on a single voting station.

Phase IV: Security Tests

- Conduct vulnerability assessment of the AccuVote TSX voting station to determine open ports and known vulnerabilities.
- Develop recommendations for the storage and handling of TSX voting stations.

Hardware Definition

GEMS Computer

ExpressPoll 4000
5065012A

AccuVote TS-R6 Voting Stations
159543

AccuVote TSX Voting Stations
204315
208152
223494
258838

Key Card Tool
Dell Notebook Computer

Absentee Ballot Scanner
40805

Software Definition

AVTS-R6	4.5.2
AVOS	1.94w
GEMS	1.18.22G
Encoder	1.3.2
Key Card Tool	1.0.1
PollBook 4000	1.2.0

Appendix C

Certification Test Plan
Of the
AccuVote TSX Model D Voting Station
Georgia DRE Voting System
September 2004

Overall Objective: The purpose of these tests is to verify that the AccuVote TSX, Model D, voting station using firmware version TSX 4.5.2, will operate seamlessly in the Georgia Voting System.

Phase I: Interoperability:

The purpose of these tests is to verify the interoperability of the AccuVote TSX Model D voting station with existing components of the Georgia Voting System.

5. Verify that memory cards produced by GEMS 1.18.22G will load successfully into either the TS-R6 or the TSX Model D voting stations.
6. Verify that memory cards created by closing the polls on either a TS-R6 or a TSX Model D voting station will upload successfully into GEMS 1.18.22G.
7. Verify that voter cards produced by PollBook 4000, version 1.2.0, will operate successfully in either the TS-R6 or the TSX Model D voting station.
8. Verify that a mix of memory cards produced by closing the polls on AccuVote TS-R6 voting stations and AccuVote TSX Model D voting stations will upload correctly into GEMS 1.18.22G.

Phase II: Usability Testing

This test will test the end-to-end operation of the system by setting up and executing an election that is typical of an election in the State. Voting scripts will be prepared with a known outcome.

Setup: The configuration for this test will consist of two precincts from each of two counties, for a total of four precincts, as follows:

Clayton County: Forest Park 2 and Forest Park 6 Precincts.

Pierce County: Blackshear and Hackelbarney Precincts

Each precinct will have one TSX – Model D voting station. The overall system employed will consist of a computer operating under GEMS 1.18.22G, a lap-top computer with Key Card Tool 1.0.1, four AccuVote TSX Model D voting stations with firmware version TSX 4.5.2, and one Express Poll 4000 with firmware version 1.2.0

Phase III: Stress Testing

The purpose of this test it to verify that the AccuVote TSX – Model D voting station can accommodate the number of ballots cast during early voting. The number of ballots voted in this test will exceed 50,000 on a single voting station.

Hardware Definition

GEMS Computer

ExpressPoll 4000
SOGS009A

AccuVote TS-R6 Voting Stations
159543

AccuVote TSX Model D Voting Stations
262247
263480
263513
263515
276094
276137

Key Card Tool
Dell Notebook Computer

Software Definition

AVTS-R6	4.5.2
AVTS-TSX	4.5.2
GEMS	1.18.22G
Encoder	1.3.2
Key Card Tool	1.0.1
PollBook 4000	1.2.0

Appendix D

Validation Test Plan
of the
Dell Power Edge Server
for use in the
Georgia Voting System

March 2008

Overall Objective: The purpose of these tests is to verify that the Dell Power Edge Server with Windows 2000, service pack 4 with all security and time zone updates as of 3/11/2008 will not affect the overall flow of program control or the manner in which ballots are recorded and the votes are processed in the Georgia voting system.

Phase I: Interoperability:

The purpose of these tests is to verify the interoperability of the Dell Power Edge Server with Windows 2000, service pack 4 with existing components of the Georgia Voting System.

1. Verify that memory cards produced by GEMS 1.18.22G will load successfully into the Accuvote TS-R6, the AccuVote TSX voting stations, and the AccuVote OS ballot scanner.
2. Verify that a mix of memory cards produced by closing the polls on AccuVote OS ballot scanners, AccuVote TS-R6 voting stations, and AccuVote TSX voting stations will upload correctly into GEMS 1.18.22G.
3. Verify modem transmissions between the AccuVote TS-R6, the AccuVote TSX, and the AccuVote OS and GEMS 1.18.22G.
4. Verify that GEMS 1.18.22G prepares all backup materials and all reports correctly using third-party software products.

Phase II: Usability Testing

This test will test the end-to-end operation of the system by setting up and executing an election that is typical of an election in the State. Voting scripts will be prepared with a known outcome.

Setup: The GEORGIA CERTIFICATION database will be use as the election setup for this test. This election setup consists of one federal office, two state offices, one county office, and two referendum questions.

The voting system tested will consist of one AccuVote TS – R6 voting station with firmware version 4.5.2, one AccuVote TSX – Model D voting station with firmware version 4.5.2, and one AccuVote OS ballot scanner with firmware 1.94w. ExpressPoll 4000s and ExpressPoll 5000s with firmware version 2.1.2 and card writer firmware version 1.1.4.0. will be used to produce voter cards.

The GEMS server employed will consist of a Dell Power Edge server with Windows 2000, service pack 4 running GEMS 1.18.22G.

Hardware Definition

GEMS Computer (1)
Dell Power Edge server
with Windows 2000, service pack 4
with all security and time zone updates
as of 3/11/2008

ExpressPoll 4000
Express Poll 5000

AccuVote TS-R6 Voting Stations

AccuVote TSX Model D Voting Stations

AccuVote OS ballot scanners

Software Definition

Windows 2000	Service pack 4
AVTS-R6	4.5.2
AVTS-TSX	4.5.2
AVOS	1.94w
GEMS	1.18.22G
Encoder	1.3.2
ExpressPoll 4000	2.1.2 with card writer 1.1.4.0
ExpressPoll 5000	2.1.2 with card writer 1.1.4.0

Test Participants – March 26, 2008

Brit Williams	Kennesaw State University
Michael Barnes	Kennesaw State University
Devin Pearson	Kennesaw State University

Appendix E

Certification Test of the ExpressPoll 5000
and
Interoperability Test
of the
ExpressPoll 4000 and ExpressPoll 5000

March 2008

Purpose of Test

The ExpressPoll 4000 has been previously certified for use in the Georgia voting system. The ExpressPoll 5000 is an enhanced version of the ExpressPoll 4000. The purpose of this test is to verify that the ExpressPoll 5000 will function correctly both independently and in combination with the ExpressPoll 4000.

Test Requirements

Database

One Hundred fifty-nine GEMS databases were built using data associated with the February 2008 Presidential Preference Primary. These databases were combined with voter registration data for all registered voters in Georgia as of January 7, 2008. The combined data will be used to power ExpressPolls during testing.

Hardware

ExpressPoll 4000
ExpressPoll 5000
AVTS R – 6 voting station
AVTS TSX voting station
Four-port Hub
Direct Cables
Crossover Cables

Software/Firmware

ExpressPoll 4000	2.1.2 with card writer 1.1.4.0
ExpressPoll 5000	2.1.2 with card writer 1.1.4.0
AVTS R – 6	firmware 4.5.2
AVTS TSX	firmware 4.5.2

Test Configurations

- Two EP 5000 via crossover cable
- One EP 4000 and one EP 5000 via crossover cable
- Two EP 5000 via Hub
- Three EP 5000 via Hub
- Three EP 4000 via Hub
- One EP 4000 and two EP 5000 via Hub
- Two EP 4000 and one EP 5000 via Hub
- Two EP 4000 and three EP 5000 via Hub

Configuration Test Outline

- Prepare the configuration to be tested.
- Load the database into the ExpressPolls
- Select the precinct
- Prepare voter cards
- Verify correctness of voter cards
- Verify ExpressPoll synchronization

Test Participants – March 25, 2008

Brit Williams	Kennesaw State University
Michael Barnes	Kennesaw State University
Mike McCarthy	Secretary of State
Joseph Kirk	Bartow County
Maxine Daniels	DeKalb County
Derrick Gilstrap	Fulton County
Brenda Williams	Fulton County
Janice Williams	Gwinnett County
Claudia Lashen	Gwinnett County
Regina Clark	Gwinnett County

Interim
Certification Test
of the

Integrated Solutions Area Imaging Bar Code Scanner: MK1690-38-12-ISI

Prepared for:

Elections Division
Office of the Secretary of State
State of Georgia

Prepared by:

Center for Election Systems
Kennesaw State University
Kennesaw, Georgia 30144

May 6, 2010

Certification Test Plan
For the
Integrated Solutions Area Imaging Bar Code Scanner

Introduction

The purpose of this certification test is to evaluate the Integrated Solutions Area Imaging Bar Code Scanner (Scanner) model MK 1690-38-12-ISI for use in the State of Georgia in a pilot test during the May 2010 Special Election in Bartow County, Georgia. This certification is an interim certification that will expire on December June 30, 2010. The pilot test is to be conducted in the Pine Log precinct. The Test Plan for this certification is contained in the Appendix.

Conclusion

The Scanner and its intended use are in conformance with Official Code of the State of Georgia statutes related to voting machines and election administration and the applicable Rules of the State Election Board and Rules of the Rules of the Secretary of State of Georgia. The product conforms to commonly accepted standards for information technology products and documentation.

The Scanner successfully passed all tests in the Test Plan.

Product Description

Model Number: MK1690-38-12-ISI
Description: Area Imaging Bar Code Scanner with native decryption algorithm and ExpressPoll compatibility.
Includes:

- Honeywell Focus MS1690-38 Area Imager
- USB Cable
- Flex Stand
- MS1690 User's Guide
- Integrated Solutions software configurations to scan, decode, decrypt and parse Georgia Drivers License and state identification cards currently in use; and to provide a direct Plug-and-Play interface compatible with ExpressPoll®-5000 and ExpressPoll®-4000 units.

The Integrated Solutions Area Imaging Bar Code Scanner (Scanner) MS 1690-38, is manufactured for Honeywell then customized by Integrated Solutions International with a native decryption algorithm that makes the scanner capable of scanning and decrypting the bar codes used on contemporary and legacy Georgia Drivers Licenses.

The Scanner uses a low speed USB connection to interface with the Diebold/Premier ExpressPoll 4000 and 5000 electronic pollbooks. The Scanner comes with a 5' cable, with USB and RJ45 connectors and a gooseneck stand for the Scanner. The Scanner is capable of decoding 1D and 2D bar code symbologies.

The Scanner is intended for use with existing and future versions of the state-certified ExpressPoll electronic pollbook.

Overview of the Certification Test

The Scanner has been tested with the following configurations:

- ExpressPoll 4000, running ExpressPoll software version 2.1.2
- ExpressPoll 5000, running ExpressPoll software version 2.1.2
- The current voters list for the state of Georgia, including existing Drivers License numbers and voter registration numbers.
- Contemporary and Legacy Georgia Drivers Licenses

A total of six scanners were received for the test. Each scanner was tested for its ability to accurately and consistently recognize the following barcodes:

- Bar code 128. This is an industry standard bar code that is unencrypted. It is contemplated that this bar code format will be used in future applications of storing the voter registration number on the state-issued voter ID card. This code contains only numeric data
- Contemporary, 2D (PDF 417) unencrypted Georgia Drivers License bar code (issued starting Fall 2009)
- Legacy, 2D (PDF 417) encrypted Georgia Drivers License bar code

All six scanners successfully scanned the test bar codes and performed successful lookups using the connected ExpressPoll unit.

The ExpressPoll units recognized the connected scanners and were able to gracefully recover from failed or invalid search attempts.

Documentation

- Scanner operations and maintenance manual
- ExpressPoll Manual, v 2.1.3 (2009, KSU Center for Election Systems)

APPENDIX

Certification Test Plan
of the
Integrated Solutions Area Imaging Bar Code Scanner

Overall Objective

The purpose of the test was to verify that the MK1690-38-12-ISI scanner will operate with the currently configured and certified ExpressPoll 4000 and ExpressPoll 5000 electronic pollbooks.

Phase I: Interoperability

The purpose of these tests is to verify the interoperability of the Scanner with the ExpressPoll electronic pollbooks

1. Verify the Scanner interfaces with both models of ExpressPoll electronic pollbooks.

2. Verify the Scanner will scan various bar codes (including all known versions of the Georgia Drivers License bar code) and import the scanned Drivers License number and/or bar code value into ExpressPoll's record search function.

3. Verify that error conditions fail gracefully and do not compromise system functionality or stability

Phase II: Usability Testing

1. Simulate election-day use of the Scanner at a precinct.

2. Verify the accuracy of the Scanner and limitations on its ability (orientation, malformed target bar codes, distance from target, etc.).

3. Verified the Scanner works properly in hand-held and cradled configuration.

Hardware Definition

Integrated Solutions MK 1690-38 Scanner

- 7410030148
- 7410041434
- 7410041467
- 7410030478
- 7410020573
- 7410041534

ExpressPoll 4000

- SOGS008A
- SOGS010A
- SOGS011B

ExpressPoll 5000

- SOGV013A
- SOGV017A
- SOGV018A

Software Definition

ExpressPoll 2.1.2
Security Key 4.5+

Data Files

Voter registration list from 2009 municipal election in Atkinson County, Georgia. This file was modified to include Drivers License numbers from the state Voter Registration System.