

**Parallel Testing:
A menu of options**
Douglas Jones, August 12, 2004

Election-day testing may be conducted

- in the precinct.

This offers the greatest realism for testing the greatest opportunity for public education. Unfortunately, it also poses the greatest potential election security problems and the greatest risk of disrupting precinct activities.

- in a location very close to the precinct

The presence of a wall and a doorway between the precinct and the test site greatly simplifies security and greatly reduces the potential for disruption, while allowing great realism and public participation. Unfortunately, because convenient adjacent locations are not always available, this limits the precincts that can be used.

- in yet another location

This offers the greatest flexibility, the greatest security, and it is the least disruptive, but it greatly reduces public participation and realism.

Test ballots may be entered

- by the public

This maximizes the opportunity for public education, but poses a moderate security threat, because without training in test procedures, non-cooperative participants could threaten the utility of the tests.

- by trained volunteers

This allows broad participation, but it is not as open as wide-open public testing. The potential for tests being disrupted is reduced by the training requirement.

- by staff testers

This reduces the public to observers and may also reduce public confidence in the results.

Test ballots may be

- non-scripted

This maximizes realism. The only cooperation required is a willingness to allow scribes to record the test votes.

- scripted

Purely scripted tests are less realistic and require more cooperation from the test voters. Scripted tests are best done by trained volunteers. Scripted tests largely duplicate what could be learned from pre-election tests.

Test sites may be open

- from the normal poll-opening time to the normal poll-closing time
This maximizes realism but requires test participants (trained volunteer or staff) to commit to spending the entire day, and it may limit the locations that are available for testing.
- for reduced hours
This seriously limits realism and test coverage, since a widely proposed way that corrupt voting systems could detect testing is by seeing how long the polls have been open. It may make more locations willing to host the tests.

Voting machines may be selected at random

- at the last moment before the polls open
This minimizes the possibility that the selected machine could somehow be specially prepared for the test, but it requires that the testing be conducted near the precinct where the machine was to be used. This also requires that each precinct have enough spare machines that one can be pulled without causing problems.
- in advance
This maximizes the flexibility to conduct tests anywhere, but it introduces the possibility that the machine might be rigged for the test between the time of selection and testing.

Test ballots, as collected by the scribes, may be tabulated

- by hand at the test site
This is labor intensive clerical work, but note that each voting machine rarely collects more than 100 ballots, so this is an appropriate number of test ballots for a realistic parallel test.
- by machine in advance of testing
This is only possible for scripted tests.
- by machine after the close of testing.
This conflicts with use of the tabulating center for normal vote counting, and it is likely to delay the result of the test for several hours.

Of the outputs produced by the voting machine under test

- only the paper tape from the printer pack is compared with the tabulation
This is easy to do at the test site with pre-tabulated or hand counted test ballots, but it minimizes the number of data paths tested. The paper record is, however, the critical last thing checked done during normal canvassing, so testing it achieves quite a bit.
- all records are read immediately using a laptop
This allows a complete test at the test site relatively quickly after the polls close, so long as a laptop with serial port and CF reader is available.

Notes:

- a) Script design for parallel testing should mimic realistic voting patterns – the best scripts would be based on polling data that predicts (with no great accuracy) the vote in the precinct for which the tested machine was pulled. There is no value in using a script that simply guarantees complete coverage of all ballot positions, as in the pre-election test, because such a script actually signals, to the voting machine, that it is under test – in real general elections, it is rare for all candidates to receive votes in all precincts where they are on the ballot because many minor candidates and candidates for minor offices are literally unknown.
- b) The most important security problem involves the potential for data from the machine under test being accidentally mixed with data from the real election. The PEB and CF cards are the major vehicles that could cause such problems, so these should be marked in order to prevent their accidental confusion with real election results. The fact that this marking is being done must not be detectable to the voting system, only to the people involved. Since the iVotronic and PEB are literally turned off when the screen is blank, awaiting PEB insertion to enable voting, this is the time to physically mark the PEB and CF card – pulling the CF card and re-inserting it will not be detected by the machine. Among the marking measures that make good sense are the use of adhesive labels, paint, brightly colored tape, or something similar.

It is imperative that pollworkers, vote collection center workers and tabulation room workers all know how to recognize and exclude PEBs and CF cards with this marking.

- c) If testing is done in the precinct, confusion between the machine under test and the regular voting machines at that precinct must be addressed. Physically moving the machine out of line, for example, to the opposite wall of the room from the voting machines, and adding a rope barrier and prominent signs saying “machine under test” are all appropriate measures. The staff involved in conducting the test must be trained to serve as ambassadors, answering voter questions and explaining what they are doing. Educational handouts are essential!
- d) If members of the public are invited to cast test ballots, they should work with a scribe (trained volunteer or staff) under rules comparable to those for pre-election testing. Added security procedures may be needed to prevent a test ballot from being cast until the scribe has recorded it. This could involve, for example, two scribes per test voter, or even physical measures such as holding a plastic cup over the red VOTE button to prevent its being pressed until the scribes have verified that the vote is correctly recorded on paper.