

SELF AUDITING VERIFIED ELECTION SYSTEM

The Basics of Double-Entry Votekeeping

Presently, there is no vote counting system in use in the United States which has any built in error detection. Mistakes, which are very common, often slip by and when occasionally caught, it is by chance rather than design. Additionally, even when known, errors are seldom fixed since the entire system tends stifle recounts, corrections, and audits. Flawed elections are frequently certified and the will of the people is not known.

This can be easily rectified by adopting the tried and true daily practice of the business world - Double-entry bookkeeping. It is an essential premise of accounting and is the main method by which accounting errors are detected and can be easily adapted and quickly implemented for vote counting.

This paper presents a possible implementation that is fast, transparent, uses existing technology, is less costly than the present systems, non-proprietary, and certainly more accurate as there are always two different vote tallies that are compared. Errors are known and corrected immediately before results are reported and well before certification.

Rather than correcting errors, **this system prevent errors.**

PRESIDENT	Theodore Roosevelt
SENATE	Thomas Jefferson
CONGRESS	Ayn Rand
GOVERNOR	Rachel Carson
SECRETARY OF STATE	Alexis De Tocqueville
STATE TREASURER	NONE
STATE SENATE	John Muir
STATE REPRESENTATIVE	Abraham Lincoln
Amendment A	NO
JUDGE ROY BEAN	Retain
JUDGE JUDY	ABSTAIN

STANDARDIZED BALLOTS

The key is that everything is based around a universal standardized ballot size and design. The ballot can be read universally - by hand, optical scanner, mechanical counter, hand scanner, and by any other non-proprietary system.

Parties and their respective candidates are color coded enabling easy sorting and immediate recognition of choices:

Constitution
 Democratic
 Green
 Libertarian
 Republican
 Independent

Yes/No items and other binary choices are green for affirmative and red for negative:

Yes
 No
 Retain
 Do Not Retain

Items where the voter abstains or does not want any of the choices is marked in black crossed-out text:

~~NONE~~
~~ABSTAIN~~

The ballot only shows the title of each race/issue and the particular color-coded choice of the voter. It can be adapted for voting methods such as range voting, approval, and instant runoff voting.



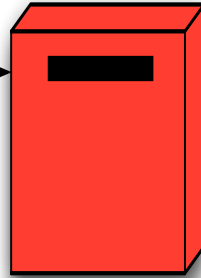
CASTING VOTES

Votes are entered on computer to allow for different ballot styles and enable people with disabilities. Computer keeps *backup auditing* tally of votes, but paper ballot is the official record. Never connects with any hardware involved with counting.

Standardized color-coded ballots are printed by computer.

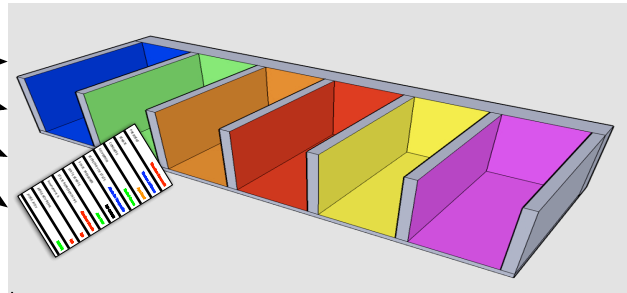
PRESIDENT	Theodore Roosevelt
SENATE	Thomas Jefferson
CONGRESS	Ayn Rand
GOVERNOR	Rachel Carson
SECRETARY OF STATE	Alexis De Tocqueville
STATE TREASURER	NO CHOICE
STATE SENATE	John Muir
STATE REPRESENTATIVE	Abraham Lincoln
Amendment A	NO
JUDGE ROY BEAN	NO
JUDGE JUDY	RETAIN

Ballot is placed in ballot box.
Box has secure slot that accepts ballots only during polling hours.
Other security features aid in tracking of box, etc.



SORTING VOTES

SMALL batch counting is done quickly at **precinct**.
Ballots are sorted for each race.
Ballots are put into bins that match color of choice.



COUNTING VOTES

Given that ballots are standardized,
ballots may be counted by many methods
Multiple counts are important due to every method
having some errors

Money Counting Machine

As used daily by banks and businesses. VERY inexpensive, VERY fast, and accurate. Over 1000 ballots/minute allows for multiple counts. Color makes improper sorting stand out during count.



Optical Scanning

Rated at 50-300+ ballots/min
In recent elections slowed due to paper jams, computer problems, and recognition errors. Process can be sped up by scanning before placing ballot in box.



Hand Counting

Still preferred in technologically advanced countries
Counted in small batches of several hundred ballots
by groups of 4-8 citizen poll workers
Speed allows for multiple counts



Other Methods

Measuring the thickness of ballots stacks with micrometer can be accurate and fast. Given that the standardized ballot is non-proprietary, citizens are encouraged to design new open-source counting methods.

AUDIT AND FINAL TALLY

Just as is done in standard accounting practices, the multiple data streams are compared to see if there is error. In the above scenario the backup auditing tally from the vote casting computer is compared to the count of the actual paper ballot. And, if more than one counting method is used the totals are compared. Any difference automatically results in recount of the paper ballots which are always the official record of the election.

RESULT POSTING AND CITIZEN AUDITS

Every single step of the voting process must be open. Auditing the central tabulator, which is prone to error and fraud, is generally overlooked. To continue the double-entry system, it is imperative that there be a second data stream to compare the cumulative polling place totals to the central tabulator totals reported by election officials. To that end, the raw results of each polling place must be posted for public viewing at the polling station, and the central election district cumulative totals must be posted on the Internet, in standardized raw form with individual polling station results, for direct download into a spreadsheet.