



Wisconsin Election Integrity

to make sure elections reflect the will of the people

Ballot-Projection Method for Manual Vote-counting

For use in voting-machine audits and election audits

Since 2014, consensus among American election-administration authorities has been clear: computer-tabulated election outcomes should be verified with routine audits before they are certified.

Manually counted audits provide:

- **Voter confidence.** In this age of broad awareness of computer systems' vulnerability, manually counted audits are the only way for officials to refute suspicions and establish trust.
- **Election security.** They ensure serious miscounts from any cause are detected and corrected during the canvass. When performed routinely, they deter electronic tampering.

Paper ballots can be manually counted in different ways. As manually counted audits are incorporated into the routine canvass, the following four requirements will be of critical value in selecting a manual counting method:

1. Ballot security.

Ballots must be protected from damage, alteration, and loss during the manual count. The best methods are those that limit the number of people handling the ballots and the number of times they must handle them.

2. Accuracy.

In a manual count, accuracy is established with redundant counts—two or more people must agree on each vote, reconciling each disagreement. The best hand-counting methods are those that produce fewer differing counts to be reconciled before the hand count is complete.

3. Speed.

Faster methods of manual counting help to restrain costs, because labor is the biggest cost. Quicker counting also makes the task more pleasant for both counters and observers.

4. Transparency.

The value of a manual count depends upon how much trust it produces in candidates and voters. The best methods are those that allow observers to see that the votes are being counted accurately and honestly.

The most appropriate method depends, among other things, on the ballot design and how many races are reviewed.

This paper explains a manual counting method that takes advantage of digital camera technology to fulfill each of those four requirements better than traditional stack-and-sort methods or methods that rely on individual counters filling out tally sheets.



The ballot-projection method ensures:

- Ballot security - Only one person handles the ballots, and only once.
- Accuracy - Many people see the same ballot at the same time and can resolve disagreements quickly as they arise.
- Speed - Redundant counts are performed concurrently rather than consecutively.
- Transparency - Observers see exactly what the counters are seeing.

Equipment

A projector and a document camera or video camera with a tripod are all the electronic equipment needed to conduct a projected-ballot manual count. The only other necessary equipment is about two dozen inexpensive hand-held click counters.

General Procedures

1. The official counters and observers gather in a room in which the ballot display has been set up, with the camera connected to the projector and aimed down at a stack of ballots on the table.
2. All the official counters and any interested observers are given handheld tabulating clickers.
3. Two counters are assigned to count votes for each candidate or aggregated vote total (e.g., minor write-in candidates) that needs to be tabulated.
4. The camera is turned on and the ballots underneath it are then displayed at a rate of approximately one per second by the ballot handler moving one ballot at a time from the original stack to another pile while all those with click-counters count their assigned candidates' votes.



When ambiguous votes are encountered, any of the official counters can say “Stop.” Counting resumes when the group reaches agreement on how the vote should be counted.

If necessary, at intervals that the clerk or counters feel appropriate, the ballot display can be paused to allow each pair of counters to compare their subtotals and resolve any differences. The agreed-upon subtotals are recorded.

5. When all the ballots that are to be included in the manual count have been displayed, the subtotals are tabulated and the manual count is complete.

Detailed Procedures

Determine the specific purpose of the manual count and which vote totals you want to verify.

Depending upon the purpose of the manual count, you will be able to aggregate some vote totals as you count them. It is only in recounts under s.9.01, Wis. Stats., that separate vote totals for each candidate must be tabulated (with the exception of unregistered write-in votes, which can be aggregated into a single total.)

Manual counts for voting machine audits - To assess whether an individual voting machine was counting the votes reliably (that is, a voting-machine audit under s.7.08(6), Wis. Stats.), the manual count will need to produce separate vote totals for:

- Each candidate whose name appears on the ballot, regardless of whether that candidate received a significant number of votes;
- The aggregate number of write-in votes for which the write-in oval was filled in, regardless of whether the person named as a write-in was registered as a write-in candidate; and
- The aggregate number of ballots on which no machine-countable vote was marked. This category includes write-in votes without a marked oval; ballots on which too many ovals were marked; blank ballots; and votes that were marked in a way such that the voting machine could not have detected them.

Manual counts for election audits - If the purpose of the manual count is to increase confidence that the preliminary election results identified the correct winner—that is, an election audit—vote totals can be aggregated even further. To fulfill the purpose of an election audit, the manual count needs to produce separate vote totals only for each competitive candidate. All other votes can be counted as one combined aggregate, although accuracy will be more reliable if at least two separate totals are produced for:

- The aggregate number of votes cast for minor candidates, regardless of whether they were on the ballot or write-ins; and
- The aggregate number of ballots containing no vote or marks for which the voter's intent was unclear.

For manual counts of any purpose, the clerk can count votes at a finer level of detail—such as counting separately for each non-competitive write-in candidate—at his or her discretion.

Determine criteria and standards for responding to unexpected results.

There is a possibility that the results of any manual count might not match the expected result. To avoid confusion and the appearance of bias or dishonesty, it is important to decide beforehand which discrepancies are small enough to be dismissed as immaterial and which will result in further action to resolve them. In addition, the steps that will be taken to resolve significant discrepancies should be identified before the manual count begins.

For voting-machine audits under s.7.08(6), the Wisconsin Elections Commission has prescribed criteria for discrepancies and the actions needed to resolve them. For a specific type of election audit (risk-limiting audits), criteria are built into the prescribed statistical formulas, and the prescribed action is to expand the sample until the correct winner is confirmed. For other election audits, though, local election officials will need to develop their own criteria and standards for responding to unexpected results.

Determine how many counters and how large a room will be needed.

To provide the redundancy that ensures accuracy, a projected-ballot manual count needs at least two counters for each total to be tabulated, and at least one to count total ballots. This is more counters than are typically employed for a typical manual count, but the counting goes rapidly, so the number of paid work hours is similar or less. In addition, because the counters never touch the ballots and full transparency prevents bias, counters can be recruited from sources that may not be appropriate for traditional methods of manual counting.

As an example, consider a manual count of a race with two major candidates on the ballot and a competitive registered write-in candidate.

A voting-machine audit will need a minimum of:

- Four counters for the two candidates whose names appear on the ballot (two counters apiece);
- Two counters for all the write-in votes that were marked with ovals (regardless of which write-in candidate received the vote);
- Two counters for all the ballots on which no machine-readable vote appeared (including votes for the registered write-in candidate that were not marked with a filled-in oval).

For the same race, an election audit will need a minimum of:

- Six counters for the three candidates who received a significant number of votes (two for each of the three);
- Two counters for the ballots that contained votes for unregistered write-ins or no valid vote.

NOTE: *It is important to count either a vote or an undervote for every ballot.* Accuracy of the manually count is checked, in part, by comparing total votes to total ballots. For example, do not plan to ignore votes for unregistered write-in candidates. Without either a vote or undervote counted for every ballot, the number of total votes will not match the number of ballots.

The room used for the manual count needs to have:

- A plain wall or space for a screen large enough to project an image large enough for all counters and observers to view clearly;
- A table on which to set the ballots and the projection equipment; and
- Seating room to accommodate all the counters and a sufficient number of observers to provide the manual count with credibility.

Obtain the equipment

Hand held click-counters can be purchased in bulk online or in office-supply stores. Avoid electronic beeping counters; experience has shown these to be distracting and more difficult to use.

To project the ballots, you will need (1) a projector and (2) either a document camera or a video camera and tripod. If you want to record the ballot display as it occurs, which is a good idea, you'll need the video camera and a tripod. The video can be kept as documentation and/or posted on the internet. Otherwise, a document camera, which typically comes with its own stand, will do.

Supplies might include rubber finger tips or finger moisturizer, to assist in smoothly moving the ballots during the display.

Public notice

Follow standard procedures for appropriate public notice.

To ensure the manual count serves the intended purpose of increasing voter confidence, it's advisable specifically to invite observers. Consider, for example, extending invitations not just

political party representatives, but also a high school social studies class, scout organization, local civic groups, or local news media.

Review the election records and retrieve all the ballot bags.

For a voting-machine audit, you will need to manually count only those ballots that were tabulated on Election Day by the machine.

For an election audit, you will want to include all valid ballots. You also need to be prepared to identify any sets of remade ballots and ensure that only one of each set is included in the manual count.

Do not open the ballot bags until observers are present.

Prepare the forms

Only the smallest precincts or samples can be manually counted in just one batch, so the manual count will need tally sheets on which the counters' subtotals can be recorded, and then tabulated. The tally sheets will also be signed by those present at the manual count to serve as an official record of the results. An example of a tally sheet is attached.

The individual counters won't need tally sheets. Experience found that looking back and forth between the screen and a tally sheet increased mistakes. Counters should be instructed to keep their eyes on the screen as the count is underway.

For use in training counters, prepare a few voided *training ballots* with a variety of regular, idiosyncratic, and ambiguously marked votes.

Prepare to count

1. Arrange the room so that all the counters and observers will have a comfortable, unobstructed view of the projected ballots. Counters do not need tables or writing surfaces.
2. Set up the camera and projector on a table with enough room for two side-by-side stacks of ballots—one right under the camera and the other for the ballots that have been displayed.
3. When the counters and observers are in place:
 - Using the training ballots, check the focus of the projector.
 - Using the training ballots, instruct counters and observers how to count the various types of ballot marks they will see.
 - Instruct the counters that they are to say "Stop" whenever they need more time to view a ballot during the display.
 - Hand out click-counters to the official counters and any observers who want to participate.
 - Open the ballot bags, following standard chain-of-custody procedures.
 - Remove the ballots and place in a single stack, with every ballot face up and oriented in the same direction. Make sure you have included all the ballots you want to count and excluded any ballots you do not want to count. For example, provisional ballots accepted after Election Day would not be included in a voting-machine audit, but would be included in an election audit.
 - It is optional whether to count the total number of ballots before you start, and whether to divide a large stack into smaller stacks of equal numbers. You will probably want to

count in batches, but the batches do not need to be of precisely consistent size, and you can count ballots as they are displayed.

- Assign two counters for each candidate or aggregated total (including total ballots) you want to tabulate, and at least one to count total ballots. It is best to have the two members of each pair seated as far apart as possible, so they will not be distracted or influenced by the other's clicking.

Display the ballots

1. Place a stack of ballots beneath the camera. Adjust the stack so the race(s) that will be counted takes up the largest part of the screen.
2. Placing strips of masking tape on the table to mark the correct position of the stack will assist in preventing the stack from 'drifting' as the ballots are displayed.
3. Place a cover sheet over the top ballot. If you are recording the display, this should say the Municipality, Ward, and batch number (if you are counting an entire ward), or the sample number (if you are counting a sample drawn from across the jurisdiction).
4. Tell counters to make sure their clickers are set to zero.
5. Start the video recording, if you are recording the ballot display.
6. Immediately before removing the cover sheet to start the count, alert the counters to have their eyes forward on the screen.
7. Remove the cover sheet and display the ballots by sliding them, one by one, off to the side to form a stack of counted ballots. Counters experience a cleaner view of the ballots if the ballots are slid off, rather than picked up or flipped as they are removed.
A slow but steady pace helps the counters. Start with a pace of about 1.5 seconds per ballot, until counters express confidence in going faster.

Counting the votes

- As the ballots are displayed, each counter will click once each time they see a vote for their assigned candidate.
- Counters should say "Stop" if they need extra time to discern or interpret a vote. Ambiguous votes can be discussed and resolved as they appear, and the display can continue.
- It is important that either a vote or an undervote is counted for each and every ballot. At the end of the manual count, the total number of votes plus the total number of undervotes must equal the number of ballots, as an accuracy check.

Comparing and recording subtotals

1. At intervals (which do not need to be regular), the display should pause to compare and record the vote totals that have been counted by each pair of counters. Each group of counters can decide for itself how often to pause to record subtotals. Experience indicates at the start, a pause every 25th ballot or so is useful, but counters quickly find this too frequent. Counters will likely develop enough skill and confidence to accurately count more than 100 ballots without pausing to compare and record subtotals.
2. At each pause, the ballot-handler should set the stack of counted ballots aside or turn it one-quarter turn so that each batch is stacked perpendicular to the batch before and after. If the counters make an error that cannot be resolved except by recounting the last batch, the ballot-handler will then be able to re-display just that one batch.

3. At each pause, the person handling the ballots should place the tally sheet under the camera, so that all who are present can watch as the totals are recorded.
4. The ballot-handler should ask each counter, individually, to call out the total on his/her clicker. If both counters in a pair agree, that total should be recorded on the tally sheet.
5. The election official in charge of the manual count can decide what actions will be taken to resolve any differences. Most frequently, discrepancies are usually only one vote and can be resolved by tabulating the all the votes counted during that batch and comparing them to the total ballots, to reveal whether a counter missed or double-counted a vote.
6. Add all the votes/undervotes recorded in the batch and compare to the total number of ballots in the batch. If the two numbers are not equal, verify the number of ballots in the batch by hand-counting, and reconcile the numbers before resuming the display.
7. When all the subtotals are recorded and reconciled, the counters should be instructed to reset their clickers to zero.
8. A cover sheet should be placed on top of the next batch of ballots, and the display resumed after telling all counters to turn their eyes to the screen and get ready to count.

Calculating the final totals and concluding the count

1. After the entire group of ballots to be included in the manual count has been recorded on the tally sheet, add up the total number of ballots and the number of votes counted for each candidate or category of votes.
2. Compare the vote totals to the expected results. If the results of the manual count do not match the expected vote totals, the election official in charge of the manual count should refer to criteria adopted beforehand to determine which discrepancies are small enough to be dismissed as insignificant and which indicate a need for further action.
3. Ballots should be sealed, with the used bags, in new ballot bags, following standard procedures for documenting the chain of custody.

Election Audit, November 3, 2020 – Tally sheet

County	Municipality/Ward - or – Sample number
Office	Date

Batch 1								
Batch 2								
Batch 3								
Batch 4								
Total								

Counting officials' signatures

Observers' signatures
