

Hand Count Paper Ballots Using the Rocky Mountain Method

Version 2.0

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1 Overview

1.1 The Method

The Rocky Mountain Method is a fast, fun and accurate way to hand count paper ballots. A precinct's worth of ballots can be counted Election Night. The method specializes in simplicity and transparency; ballots never leave public view between being cast and counted. No part of the count is ever done alone. Every step of the count is double-checked (at least) in-process, in full view of a team of people. The fully auditable results are available as soon as the count is finished, which can be within hours, or even minutes, after the close of polls.

The method is made for precinct-level elections but can be scaled up or down for other situations by using more or fewer tally teams. Informal elections can use a simplified version of the process, while formal elections add chain-of-custody and reconciliation steps to construct a cast vote record.

1.2 History

The Rocky Mountain Method started with a meld of good ideas from other hand count methods; then the process was improved and adapted through elections large and small, informal and formal. One of the biggest tests was a 2024 state party assembly, where, although the organizers had only three weeks to plan, 144 volunteers took about 45 minutes to count approximately 2000 3-choice ballots, at a processing speed of better than 1 ballot every 2 seconds! This speed was possible because the ballots were divided among 24 tally teams, illustrating the method's scalability.

In 2026, a hand recount of 4248 more complex ballots took approximately 70 volunteers five hours; processing speeds reached 1100 ballots per hour, or a ballot tabulated every 3 seconds, or 4 choices tabulated every second.

The method can adapt to large precincts or small teams, depending on whether it is more important to finish counting fast or to fit a few hand counters into a small space.

1.3 Benefits

The Rocky Mountain Method has many benefits:

- Costs very little: it “relies on office supplies and lots of eyes”
- Double-checks results, in process
- Creates an auditable, physical record of the count, in process
- Finds and fixes mistakes immediately
- Discourages mistakes: the disrupted process draws attention to the problem
- Reinforces correct counting by a smooth process
- Minimizes fraud: ballots stay where they are cast until counted
- Eliminates controversy by inviting all citizens to watch and even participate

- Promotes teamwork and unity as opposing parties work together to achieve a fair result
- Easy to learn, even on-the-job
- Fun to compete for fastest team!

1.4 Process and requirements (space, time, people)

The Rocky Mountain Method divides hand counting into three processes:

- Batching (dividing up the ballots into small groups)
- Tallying (recording votes and doing an initial total)
- Aggregating (totaling the totals)

The tally process uses most of the time and people. A rough guideline relating complexity of ballots to the number of talliers and hours needed is:

ballots x choices = talliers x 500 x hours

If batchers and aggregators are not the same people tallying, the three process can mostly overlap; add a few minutes on either side of the tallying process to handle the first batches and the final aggregation. If the talliers are also the batchers, add batching time according to this formula:

ballots x 3 = minutes x 25 x batching teams

If the talliers are also the aggregators, allow about 15 minutes to aggregate every 600 ballots.

Space required: For a large election the three processes may be divided into three different areas, but for a small number of ballots, the whole process could be done at the same table.

Time required: The average time needed for a team of four to process a ballot will vary with the complexity and density of the ballot (a race where voters pick 1 of 18 candidates is faster to count than 9 yes-no questions, or a race where voters pick 12 of 18 candidates). Generally, a team should be able to process any reasonably-sized ballot faster than one ballot per minute. (Extremely long ballots are a bad practice because of voter fatigue, where voters get tired and don't vote the end of the ballot.)

People required: A team of four is the minimum requirement. The process can be speeded up by more teams counting in parallel, but only up to the point where tracking the batches takes longer than counting them, so hundreds of teams in the same place is probably not practical. A team of 10 (two teams of four to count, plus two for spares/runners/overhead) is a good starting point for planning Election Night counting in an average precinct.

2 Quick Start (simplified process for informal elections)

Skip to the next section if counting a formal election, such as a primary or general election for governmental office, which needs a process that constructs a cast vote record.

But for an informal election, such as a club of 150 members meeting to elect and count the vote for club officers, the process can be quick and simple, and is fully explained in this section. The [tally](#) and [aggregation](#) sheets are also simpler for an informal election.

A team of four may be enough to hand count the election. A team of four would start as two batch teams of Batchers 1 and 2, then form one tally team of Caller, Watcher, Tally 1, and Tally 2, then one aggregation team of Caller, Watcher, Agg 1, and Agg 2.

2.1 Batch the ballots

Step	This person...	Does this...	Notes
1	Batcher 1	Count 25 ballots (or fewer for the last batch) from the ballot box.	
2	Batcher 2	Recount the ballots.	
3	Batchers 1 and 2	IF the counts agree, THEN clip the ballots to 2 tally sheets. ELSE recount until both batchers agree.	This is a batch, which will stay together from now on. Batches each get their own consecutive number.
4	Batchers 1 and 2	Record the batch number on both tally sheets.	
5	Batchers 1 and 2	Put the batch in a pile for tallying.	

2.2 Tally the batches

Step	This person...	Does this...	Notes
1	Caller	Read the voted numbers on each ballot from a batch, handing each ballot to the Watcher.	Speed of reading should be comfortable for Tally 1 and 2.
2	Watcher	Observe the ballot and immediately correct the caller if there are any mistakes.	Watcher keeps the ballots in order, possibly stacking them in groups of 5.

3	Tally 1 and 2	Mark in green each column the Caller reads, in the row for that ballot.	A ruler or other straightedge helps talliers stay on the correct row.
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2.3 Fix mistakes

IF this happens...	THEN do this...
Tally 1 or 2 marks a box that should not have been marked	Cross out the mark in red, so it is clear not to count that mark.
Tally 1 or 2 misses marking a box that should have been marked	Mark the box.
Tally 1 or 2 skips a line and marks a ballot on the wrong row	Go back to the correct row and mark it correctly. Later, on the incorrectly marked row, mark all boxes in green that the Caller reads, and mark out in red any marks the Caller did not read.
Too many mistakes so it is hard to tell marked from unmarked boxes	Start the batch again with a new sheet.

2.4 Total the batch

Step	This person...	Does this...	Notes
1	Tally 1 and 2	Count the dots in each column.	
2	Tally 1 and 2	Write the total at the bottom of each column.	
3	Tally 1	Read the column totals out loud while Tally 2 checks.	
4	Tally 1 and 2	IF a number doesn't match, THEN do the following until the problem is resolved: - Count the marks again. - Compare marks in the column and circle any discrepancies. - Have the Caller re-read any ballot where there is a discrepancy.	

		• Have the Caller re-read the whole batch if necessary.	
5	Caller	Clip the ballots to the tally sheets and put the batch in a pile for aggregating.	

2.5 Aggregate the Batches

Step	This person...	Does this...	Notes
1	Caller, Watcher, Agg 1 and 2	Pick a batch and write the batch number on the next available row of the aggregation sheet.	
2	Caller	Read the column totals from one tally sheet, while Watcher follows along on the other tally sheet, immediately correcting Caller if there are any mistakes.	Speed of reading should be comfortable for Tally 1 and 2.
3	Agg 1 and 2	Write the number the Caller reads for each column, in the row for that batch.	Use pens, not markers, for aggregation.

2.6 Fix mistakes

IF this happens...	THEN do this...
Agg 1 or 2 writes in a box that should have been blank.	Cross out the number, so it is clear not to use that number.
Agg 1 or 2 writes the wrong number in a box.	As neatly as possible, cross out the wrong number and write the right number. If numbers become unreadable, start over with a new sheet.
Agg 1 or 2 skips a line and writes on the wrong row.	Agg 1 and 2 both skip the row and draw a line through all boxes on that row so it is clear not to count those numbers. Both start on the new row.
Too many mistakes so it is hard to read numbers.	Start again with a new sheet.

2.7 Total the totals

Step	This person...	Does this...	Notes
1	Agg 1 and 2	Total the numbers in each column and write the total at the bottom of each column.	Calculators are acceptable but not required.
2	Agg 1	Read the column totals out loud while Agg 2 checks.	
3	Agg 1 and 2	IF a number doesn't match, THEN do the following until the problem is resolved: • Total the column again. • Compare numbers in the column and circle any discrepancies. • Have the Caller re-read any batch where there is a discrepancy. • Have the Caller re-read all the batches if necessary.	
4	Caller, Watcher	Compare the totals with the candidate's numbers to see who won, and announce the winners	
5	Caller	Make a package of all the batches, with the aggregation sheets on top.	This is the official record of the election, to be kept as necessary.

3 Terms and Definitions

Adjudication

When the voter's intent is unclear, hand counters may need to decide whether and how to count the vote. Depending on what is unclear about the ballot, the formality of the election, and the laws governing the election, adjudication could be decided by the tally team or may need to be handled separately from the main count. Adjudication should never be done in private, by one person, or by people from only one party. If adjudicated ballots make up more than a tiny percentage of the total, something is wrong.

Agg 1 and 2

The job of Agg 1 and 2 is similar to Tally 1 and 2, but on the aggregation team. Instead of making marks on their sheets, they write the numbers from the tally totals, and total and cross-check those totals.

Aggregating

Totaling the totals; adding up vote totals from multiple batches to get an overall total. If an election is small enough for all the ballots to fit on one tally sheet, aggregation is unnecessary. An aggregation sheet can handle about 625 ballots; beyond that, there is a second level of aggregation (totaling the totals of totals). No precinct should have more ballots than two levels of aggregation can hold.

Aggregation Sheet

The sheet on which batch totals are totaled; second-level aggregation sheets total the aggregation totals.

Ballot

A ballot allows a voter to communicate election choices in secrecy. In the Rocky Mountain Method of hand counting, ballot size, shape, or paper is not critical as long as each choice is associated with a number. (If a ballot has no numbers, the Caller can even read numbers from a transparency over or template beside the ballot.) Ballot style is unimportant because the method minimizes time and space between ballot casting and counting, which also minimizes the opportunity to insert fake ballots. Numbering ballot choices means the hand count team does not have to pronounce names. Numbers also reduce emotion, as it is harder to notice which candidate is winning.

Batcher 1 and 2

Batchers divide the ballots into batches of 25 or fewer. Both batchers must agree on the count before the batch is complete.

Batching

Taking ballots from the ballot box, separating them into batches of 25 or fewer, and attaching the paperwork and secure ballot bag that tracks the batch through the counting process.

Caller

One of the positions on the tally or aggregation team. The caller reads the ballots or the tally sheets out loud.

Cast Vote Record

The complete record of a precinct's ballots and votes cast by race and candidate, or the complete record from all the precincts within a larger district.

Choice

One of the ovals on the ballot beside a name or an answer (answers are usually "Yes" or "No"). A voter marks, or doesn't mark, each choice. Most races have several choices: multiple candidates or answers. Each box in a row and column on a tally sheet reflects one choice.

Overvote

A race with too many choices marked. For instance, both "Yes" and "No" are marked, or multiple candidates marked where only one was allowed. None of the votes in the overvoted race count, because it is impossible to know which the voter actually intended, but other races on the ballot should still be counted.

Precinct Coordinator

Two people of different parties coordinating the precinct effort. Precinct coordinators make sure the hand count team is trained and present. On Election Night, precinct coordinators sign for the ballot boxes from polling station personnel, reconcile the number of ballots after batching and aggregation, post and transmit results at the end of counting, and sign the ballots over to the ballot transporters. Precinct coordinators answer or elevate questions, make sure counters follow procedures, and handle precinct paperwork.

Race

A race is one position or question for which there may be one or many choices of candidates or answers.

Reconciliation of Ballots

For a formal election, the process must prove that the number of ballots at the beginning of hand counting matches the number at the end; the number of ballots counted in batching must equal the final total of ballots in each of the batches after tabulation, plus any ballots removed because they were spoiled.

Reconciliation of Votes

For a formal election, the process must prove with each batch that the total number of votes allowed on that many ballots matches the number of tallied votes, plus the total of undervotes, plus the total of votes the overvoted races should have had. This cross-check shows that votes in overvoted races were not counted, and prevents votes from being fraudulently added to

undervoted ballots after this step. Reconciliation also records all the undervotes on a completely blank ballot, which would otherwise look like the tally team accidentally skipped a line.

Runner

Runners move batches from the batching area to the tally area, or from the tally area to the aggregation area. Runners are important for moving batches when there are many tally teams, but in a small setup, the batchers or members of the tally team will also be the runners.

Spare

Hand count teams should have one or two spare hand counters available to step in for anyone on a tally team needing a break. Spares may work as extra batchers or runners when not otherwise needed.

Spoiled Ballot

A ballot gets spoiled when a voter does something wrong (for instance, marks both yes and no) and realizes it before casting the ballot. The voter can trade the spoiled ballot for a new ballot, and the election judges mark or cut the spoiled ballot to make it clear it must not be counted. A spoiled ballot can also be a ballot so mangled or dirty the voter's intent can't be known, or a misprinted ballot. Ballots are usually spoiled while the polls are open and are handled by the election judges, so it should be rare to find a spoiled ballot in the ballot box. But if there is one, it is part of the total number of ballots the Precinct Coordinators signed for, so it must be tracked separately from the counting process so the number of ballots can be reconciled.

Tabulation

Counting the contents of ballots (vote count), as compared to the number of ballots (ballot count).

Tally 1 and 2

The talliers make up half the tally team and do identical jobs of marking each vote on identical tally sheets. At the end of a batch they total the marks and cross-check the totals with each other.

Tally Sheet

The sheet on which a batch of votes is tabulated and totaled.

Tallying

The actual counting of votes – recording all the votes from a ballot and totaling them with votes from other ballots.

Undervote

An undervote is a race where the voter marked fewer choices than allowed, or none at all. There is nothing wrong with an undervote, but it can be an easy target for fraudulent marks on the ballot before the vote is counted.

Watcher

One of the positions on the tally or aggregation team. The Watcher observes the ballot, or the alternate tally sheet, as a check on what the Caller says, and may also stack ballots and keep an eye on the talliers or aggregators to alert them to any mistakes.

Write-In

In Colorado, write-in votes are not always allowed, and where allowed they are usually limited to officially announced write-in campaigns. So there should be no need to count votes for Mickey Mouse and Donald Duck. If a race allows write-ins, leave space for write-ins at the end of the tally and aggregation sheet, or attach a [separate page for write-ins](#) to the tally and aggregation sheets.

4 Principles of Transparency

Elections must be transparent because the Constitution guarantees citizens of the United States in Article IV, Section 4 the right to elect their representative government. If citizens don't know whether their votes were counted correctly, they can't know the government was elected by the citizens.

4.1 Minimize time and space between casting and counting of votes

Secret ballots create a period of deep vulnerability to fraud. Ballots are kept secret by collecting them with other ballots so a vote cannot be traced to an individual. But collecting the ballots creates time and space between the casting and counting of the vote, during which the ballots are most vulnerable to election fraud. To minimize that vulnerability, we must minimize time and space between casting and counting. Counting at the polling station should begin as soon as polls are closed and continue until all votes are tabulated and totaled. Voting at the precinct level decentralizes elections and keeps the counting process small enough to finish within hours.

4.2 Maximize eyes on the process between casting and counting of votes

Since the value of an election is shared equally among all registered voters of the precinct, all registered voters of the precinct should be able to watch the counting process closely enough to agree that it was done correctly. Where it is not physically possible for all interested citizens to watch, livestream cameras can improve the transparency of counting. Voting and counting at the precinct level keeps the process small enough for average citizens to oversee.

4.3 Never move or store untabulated ballots

In the same way nobody would accept custody of hundreds of dollars without counting it and agreeing on the total, ballots should never be moved or stored without knowing their vote contents. There are two kinds of numbers associated with ballots: the number of ballots and the number of votes. Knowing the number of ballots but not the number of votes is as pointless as knowing the number of cash bills without knowing whether the bills are worth \$1 or \$100.

4.4 Quiet is important for counting; transparency is essential

Since it is difficult to count ballots with distracting background noise, counting areas should be kept as quiet as possible, but quiet should not be used as an excuse to exclude the public. An ideal counting area would be like the Colorado legislature, where business on the main floor is not easily distracted by coming and going in the galleries, but the public can literally oversee everything that happens.

4.5 Chain of custody

After counting a formal election, there should be a record of every person who had contact with the ballots at all times – the chain of custody records. Meta-information on [tally](#) and [aggregation](#) sheets creates a full record of who batched, tallied, and aggregated which ballots. [Reconciliation sheets](#) track how many ballots there were at the beginning and end of counting. Because the count is the definitive process in which each ballot and its contents are recorded, the totals at the

end of the process should be the most trustworthy. Minor discrepancies could happen because of ballots sticking together or a voter walking out with a ballot. Voting at the precinct level minimizes these discrepancies as there are more people per ballot to pay attention to the chain of custody of every ballot.

4.6 Election processes incompatible with transparency

Ballots should never leave public view between casting and counting and thus should never be placed in an opaque container or machine, including an opaque ballot box. The following processes violate transparency:

- Mail-in ballots violate transparency because the postal process does not preserve chain of custody, much less public view.
- Mail-in ballots also violate transparency because the public can't see who filled out the ballot (not necessarily the same person who signed the envelope.) A ballot is only valid if the voter is eligible, so the public can't know whether mail-in ballots are valid.
- Centralized counting (for instance, at the county level) violates transparency because ballots leave public view to be moved to a central area. If ballots are also cast centrally so they don't have to be moved, transparency is still violated because the counting process is too massive for the public to fully view.
- Multi-day elections violate transparency because ballots have to be stored overnight away from public view.
- Voting outside of one's own precinct violates transparency because the ballot has to be moved to the correct precinct, away from public view.
- Absentee ballots (as for military voters) violate transparency because ballots are moved without public view. However, the American public has historically allowed this small amount of vulnerability in order to allow deployed military to vote. The vulnerability can be reduced by sending ballots only to those who specifically request them and requiring notarization to affirm that the ballot was filled out by the actual voter. (Any military officer qualifies as a notary for this purpose.)

5 Planning the Paperwork

5.1 Tally Sheets

Tally sheets can be generic or custom-made for the election. A well-planned tally sheet is an important factor in counting speed, but because elections come in many shapes and sizes, setting up a tally sheet may be more of an art than a science. See examples of tally sheets in the Appendix. It is helpful to keep everything on one page when possible, but a page crammed full of tiny boxes is intimidating to counting teams. Some best practices and other considerations are:

- Tally sheets should have 25 rows unless there is a reason for a non-standard batch size.
- For a formal election the sheet includes chain-of-custody information to show who handled each batch of ballots, such as:
 - Ballot box number
 - Batching station number
 - Batch number
 - Each person on the tally team
 - Runners
 - Aggregation station
- A formal election may also include vote reconciliation forms at the bottom of each race on the tally sheet, with:
 - Number of ballots in the batch
 - Number of allowable votes in the race
 - Total overvotes in the race
 - Total undervotes in the race
 - Sum of totals of the choices in the race
- An informal tally sheet may only need the batch number.
- Chain-of-custody information is easy to forget to fill out in the rush of tallying, and in a large event, finding which tally team forgot can delay counting. Consider:
 - Put the spaces to record the batch station and tally station at the very top of the tally sheet.
 - Create checklists for tally teams to remind them what has to be done before the batch moves on.
 - Have runners check that all chain-of-custody information to that point is filled out before they pick up a batch.
 - Appoint the most experienced hand counters, who understand the process, as runners.
 - Have Callers and Watchers work on the chain-of-custody information and any other paperwork while talliers are adding up columns and cross-checking.
- Boxes need to be big enough to allow a correction to fit clearly.

- Consider the balance between putting as many choices as possible on a single page so talliers don't have to flip pages, and having fewer columns so the talliers don't lose their place in the middle of the page. Using legal or ledger size paper may help.
- If using multiple attached pages, consider that marks on one page could bleed through to the next page.
- If using multiple separate pages, consider the danger of a page getting separated from its batch.
- Since write-in columns are wider and in most cases there are few votes for write-ins, a separate page for write-ins will save space on the main page without sacrificing much time.
- Vote reconciliation forms at the bottom of each race on a tally sheet keep the relevant numbers right where they are needed, but undervote/overvote columns can double the horizontal space needed on the page.
- Printing faint column numbers in all the boxes or alternately-shaded lines can help talliers keep their place.

5.2 Aggregation Sheets

Aggregation sheets are in many ways just the next level of the tally sheet. Their format tends to follow the tally sheet and many of the same considerations apply. Aggregation sheets can be generic or custom-made for the election; see examples in the Appendix.

An aggregation sheet may have as many rows as fit on the page. 25 rows will handle up to 625 ballots, which is enough for most purposes. Beyond that level, use a second-level aggregation sheet to handle thousands of ballots by totaling the first-level aggregation totals.

Boxes need to be big enough to write numbers, not just dots, along with possible corrections.

Printing alternately-shaded lines can help the aggregation team keep their place, but do not print faint column numbers in aggregation sheet boxes because column numbers could get confused with vote totals.

For a formal election the aggregation sheet includes chain-of-custody information to show who handled each batch of ballots, such as:

- Batch number
- Batch station
- Tally station
- Each person on the aggregation team

Aggregation sheets do not need vote reconciliation forms as that step is completely handled in the tallying process.

An informal aggregation sheet just needs to record each batch number.

5.3 Other forms

The tally sheet and aggregation sheet are the essentials for the Rocky Mountain Method, but formal elections will also have other forms for various purposes, some of which may need input from the hand count team. Some of these forms may be governed by laws, bylaws, or rules. They might be combined on a sheet or they may be set up as a whole packet of paperwork. Check on possible requirements for the following, and see the Appendix for some examples.

- Record of ballots cast – records the total number of ballots handed out at the precinct.
- Batching station form – records batch numbers and number of ballots in each batch.
- Spoiled ballot form – records the number of spoiled ballots received by the hand count team and the number found during counting.
- Ballot reconciliation form – compares the total of valid and spoiled ballots received from the polling station, the total counted during batching, and the total of batched ballots after aggregation.
- Results and percentages – records the totals from aggregation, calculates the percentage of the vote that went to each candidate/question, and lists the winner(s).
- Results form to post – form for posting the results at the precinct location for public view.
- Transmission form – creates record of results before transmission to next level (for instance district or city), current totals from next level, and new total to confirm with next level.

6 Planning for Personnel

6.1 Basic team

Ten people is a good starting estimate for a precinct. A team of ten allows for two tally teams (some will double as batchers and aggregators) plus a couple of people for overhead and spares. As a starting estimate, expect a team of ten to count 600 ballots in 5 hours.

The hand count team is led by two Precinct Coordinators, who should not have the same party affiliation. For a large team, Precinct Coordinator may be a full-time job, but for smaller teams Precinct Coordinators would also be regular team members in batching, tallying, and aggregating.

The minimum number needed at any stage is four people.

For batching	For tallying	For aggregating
Batcher 1	Caller	Caller
Batcher 2	Watcher	Watcher
	Tally 1	Agg 1
	Tally 2	Agg 2

6.2 Personnel needs depend on ballot processing speed

Estimates are that a team of four could batch, tally, and aggregate 100 ballots in 100 minutes, or 300 ballots in the five hours between close of polls and midnight on Election Night. Add more tally teams of four for slower workers or longer ballots. To be sure of having plenty of people, plan to recruit several weeks ahead of time, recruit half again as many people as needed, and confirm with them the week before.

6.3 Scaling up for faster processing

The slowest part of the process is the tallying, so to handle more ballots or to go faster, add more tally teams. As the number of teams increase, add a few extra people to use as runners and spares to trade out with tired talliers.

6.4 Planning for breaks

Many teams can handle a couple hours or more without a break, but if ballots have 15 or more choices, a short break after each 100 ballots tallied may help to reduce eyestrain. Snacks and drinks are recommended, if there is space to keep it far away from the ballots. Make sure that hand counters on break stay quiet so as not to distract teams that are still counting. The hardest, and most important, time to keep everyone quiet is when tallying is over. Most of the team is done working and wants to know the results, but those who are still working are adding up large columns of numbers, which is hard to do around excited, loud people.

6.5 Recruit younger people

Retirees are often the most available, but younger people tend to catch on to hand counting quickly and do it faster (often doubling or tripling the speed) and more accurately. Teenagers may consider hand counting as a competition, which encourages accuracy as well as speed since the method works fastest when there are no mistakes. Hand counting is a civic duty which fits well into the community service hours many schools and student activities require.

6.6 Specialties

Accountants are good people for the aggregation team, and people with loud voices could be callers. In a larger event, expedite the process by having one or more people as floor managers to

watch for questions and head off problems. Consider assigning one person to the sole job of making sure ballots are never left unattended.

6.7 Training

Hand counting is, like a game, best learned by doing rather than reading the rules. Train hand counters with a mock election or have them arrive early enough to go through a sample batch. Train new people on-the-job by putting them on a team with experienced hand counters.

7 Planning for Equipment and Space

7.1 Equipment needed

- Writing utensils
 - Green markers (at least 4 per tally team in case a marker goes dry)
 - Red markers (at least 2 per tally team)
 - Black or blue ballpoint pens (at least 1 per hand counter)
- Paperwork (recommendation; specific forms will depend on election rules)
 - Tally sheets with enough columns to accommodate all choices on ballot (8 per 100 expected ballots, plus extras)
 - Aggregation sheets with enough columns to accommodate all choices on ballot (2 per 600 expected ballots, plus extras)
 - Batch list (at least 1 per ballot box; enough to accommodate the maximum ballots expected in the box)
 - (If more than 600 expected ballots) second-level aggregation sheets (2 for every 600 expected ballots, plus extras)
 - Spoiled ballot tally sheet (2)
 - Reconciliation sheet (1)
 - Results sheet/poster (1)
 - Transmission sheet (1)
- Office supplies
 - Black binder paper clips (at least 4 per 100 expected ballots)
 - Clear tamper-indicating plastic bags (also known as bank bags), 12" x 16" or big enough to hold 25 ballots
 - (Optional for larger elections) Clear boxes to hold the batches corresponding to each set of aggregation sheets
 - Clear tamper-indicating bags or boxes big enough to hold the entire package of ballots
- Tables and chairs
 - Tally tables (1 per tally team, accommodates 4 people)
 - Batching tables (optional but recommended, 1 per ballot box, accommodates 2 people)
 - Aggregation table (optional, 1 per 600 ballots, accommodates 4 people)
- Optional but recommended
 - Straightedges or t-squares for following across a row (at least 2 per tally team)
 - Simple arithmetic calculators (2 per aggregation team)
 - Cameras and mounts to livestream the counting
 - Checklists or sample sheets to remind teams what must be filled out at which step
 - Directions to remind teams what to do for infrequent situations such as spoiled ballots

- Optional
 - Index cards (and some way to hold them vertically) for signs to identify each batching and tally station (“Batch 1”, “Tally C”, etc.)
 - Name tags/ID tags for hand counters
 - Safety vests or other clothing to easily identify hand counters; in a large area different colors for different roles may be useful
 - (For larger elections) Desk flags to raise to signal a runner that a batch is ready to move
 - Rubber/gel fingertips, fingertip moistener, etc.
 - Note pads in case teams need to make a note of some special situation (the piece of paper will need to go with the batch as part of the election records.)
 - General office supplies such as paper, scissors, tape, duct tape, zip ties, poster board, wide-tip markers, string, wipes, etc.
 - Printer for extra copies of sheets and forms, etc.
 - Timers, such as those used for chess matches, for each team to time how long it takes them to tally one batch.

Consider possible needs for trash cans and signage. Sort supplies ahead of time by station into boxes or bags labeled as “Batch Station A” “Tally Station 2” etc.

7.2 Space needed

See examples in the Appendix of possible setups for different sized teams. Space needed includes space for:

- Tables and chairs for each tally team (suggested table space of 4’ x 2.5’)
 - Plenty of space between tables allows runners to move around easily and, more importantly, gives tables sound space so that one table’s count doesn’t confuse another table.
- Public to watch the counting (and/or livestream cameras)
- Personal belongings
- Optional
 - Batching table(s)
 - Aggregation table(s)
 - Extra supplies
 - Break tables

Walk through the venue and hand count area as early as possible in the planning process. Pay attention to traffic flow, electrical needs, sound characteristics, and security of the area, always keeping in mind how the chain of custody of ballots will look throughout the process.

8 Costs

8.1 Note on costs

Estimated cost of mail-in ballots: at least \$10/ballot considering printing, mailing, and returns. Cancelling universal mail-in ballots frees up at least \$10,000 per average precinct of 1000 voters, money which could be used for precinct-level polling stations and hand counting.

8.2 Cost of space

Space for precinct polling stations should be handled by the city/county/local government. Since the ballots must be counted before they are moved, costs for space should at most add a few more hours on to an existing day-long contract handled by the local government.

8.3 Personnel costs

It is reasonable to pay hand counters to do the work the county currently pays election machine vendors to do. A team of 10 working 5 hours at \$20/hour would only cost \$1000/precinct.

However, keep in mind the effort may be much simpler with volunteers. Citizens aren't paid for a few hours of jury duty, and helping count ballots for a few hours Election Night is an easy, local, off-hours civic duty. Consider that an all-volunteer force of hand counters will not need to:

- keep exact records of time spent
- send SSN information to the county
- wait weeks to be paid
- be approved by the county

8.4 Cost of equipment/supplies

Most of the supplies are paper, pens, tables, and chairs for about 10 people per precinct. It would be difficult to spend more than a couple hundred dollars on supplies other than cameras.

8.5 Cost of cameras

Livestreaming the hand counting is optional but desirable for maximum transparency, and could cost anything from \$50 to several thousand dollars for a professional videographer.

8.6 Conclusion

The cost per precinct for hand counting could be under \$100, but even renting a gymnasium for each precinct, paying all the hand counters, and hiring a videographer is cheaper than mail-in ballots for the same precinct.

9 How to Sign for Ballots

9.1 Blank ballots are not part of the hand count

Election Judges should account for and return blank ballots to the county; the hand count team should not normally have to count blank ballots.

Specific forms will depend on local election rules, but should generally capture the following information.

Step	This person...	Does this...	Notes
1	Election Judges	Record: • Number of ballots given to voters • Number of spoiled ballots • Number of other ballots and description • Total number of ballots left for hand counting	If ballots other than in ballot box(es) and spoiled ballots are left for the hand count team, there should be a written explanation.
2	Election judges	Sign and date the reconciliation sheet.	
3	Precinct Coordinators	Sign and date the reconciliation sheet acknowledging receipt of ballot box(es) and spoiled ballots.	

9.2 Why there could be discrepancies

The number of ballots given to voters minus the number of spoiled ballots ought to equal the number of ballots in the ballot box(es). There could be minor discrepancies if for instance a voter decided not to vote and left with a ballot. Election Judges should be able to account for any discrepancies; the Precinct Coordinator is only accepting responsibility for the ballots listed as available for hand counting, plus the responsibility to deliver the listed spoiled ballots.

10 How to Batch Ballots

10.1 Create batch teams

A batch team is two people, Batchers 1 and 2, who have a batch team number. Because tallying takes longer than batching, it may be fastest to have only one or two batch teams, while the other hand counters form tally teams as soon as batches are assembled.

10.2 (Optional) Check for spoiled ballots and improper write-ins

Step	This person...	Does this...	Notes
1	Batchers 1 and 2	Sort through ballots in the ballot box, checking for spoiled ballots and setting them aside with any spoiled ballots from the election judges.	Spoiled ballots should be rare at this stage.
2	Batchers 1 and 2	Check for improper write-ins.	A ballot with a write-in not on the list of approved write-in candidates should be treated as an undervote for that race.
3	Batchers 1 and 2	Put checked ballots in batching area.	

10.3 Count out a batch

Step	This person...	Does this...	Notes
1	Batcher 1	Count 25 ballots (or fewer for the last batch) from the ballot box.	Each batch team should work with one ballot box at a time.
2	Batcher 2	Recount the ballots.	
3	Batchers 1 and 2	IF the counts agree, THEN clip the 25 ballots to 2 tally sheets and a clear tamper-indicating bag. ELSE recount until both batchers agree.	This is a batch, which will stay together from now on.
4	Batchers 1 and 2	Fill out this information on both tally sheets:	Each batch team should number their batches

		• Date • Batch station • Ballot box • Batch number • Number of ballots in batch	consecutively. A batch is uniquely identified by its ballot box, batch team, and batch number. For a small election, “batch station” and “ballot box” may both be “1”. “Number of ballots in batch” will usually be “25”.
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10.4 (Optional) Number the ballots

In elections where ballots can be numbered without the mark being considered an alteration of the ballot, numbering them is useful to keep them in order so it is easy to go back to a particular ballot to check on a discrepancy. Numbered ballots also make the record more auditable because it is immediately clear which line on the tally sheet matches which ballot.

One way to quickly number ballots is to print each ballot with the numbers 1-25 in a column on the side of the ballot. Then batchers can quickly go through a batch of 25 marking “1” on the first ballot in the stack, “2” on the next ballot, etc. See ballot examples in Appendix.

10.5 Separate spoiled ballots and record total ballot numbers

Specific forms will depend on local election rules, but should generally capture the following information.

Step	This person...	Does this...	Notes
1	Batchers 1 and 2	Count spoiled ballots.	
2	Precinct Coordinators	Fill out this information on the spoiled ballot tally sheets: • Date • Total ballots from polling and batching	
3	Batchers 1 and 2	Clip the spoiled ballots and the spoiled ballot tally sheets with a clear tamper-indicating bag but do not seal the ballots in the bag.	
4	Runner	Fill out this information on both	

		spoiled ballot tally sheets: • Batch to aggregation runner	
5	Runner	Take spoiled ballots to the aggregation area.	
6	Precinct Coordinators	Record the following numbers on the Batching Station part of the reconciliation sheet: • Number of full batches • Total number of ballots in full batches • Number in partial batches • Total number of ballots in partial batches • Total number of ballots from ballot boxes • Number of spoiled ballots • Number of other ballots • Total number of ballots left for hand counting	
7	Precinct Coordinators	Sign and date the reconciliation sheet for the number of ballots counted in batching.	

10.6 If there are discrepancies

If the total number of ballots left for hand counting in the Polling Station section does not equal the total number of ballots left for hand counting in the Batching Station section, try to find the reason for any discrepancy. If the discrepancy cannot be resolved, refer to election law to decide whether the discrepancy is small enough the team can move on to the next step.

11 How to Tally Ballots

11.1 (Optional) Check for overvotes/undervotes/spoiled ballots

Undervotes and overvotes will probably be uncommon in a normal election, so it could be easy to miss them without reconciling the number of votes in each batch. Vote reconciliation is a quick extra step that improves accounting and greatly narrows the window in which an undervote could be fraudulently filled in.

When overvotes and undervotes are more likely (for instance a race choosing 6 candidates out of 10) the Caller and Watcher may save time overall by a quick pre-check of ballots before tallying. Placing ballots with overvotes or undervotes at the beginning or the end of the batch focuses attention on marking them correctly.

Spoiled ballots at this point are rare and will probably be obvious. Put any spoiled ballots with the other spoiled ballots and change (and initial) the number of ballots listed on the tally sheet for the batch.

11.2 Write-in votes

For a ballot with a write-in vote, Tally 1 and 2 should write the candidate's name in the write-in column on the tally sheet or attached write-in sheet. The column can be numbered or treated as an additional column that happens to have a name rather than a number.

11.3 Tally a batch

Step	This person...	Does this...	Notes
1	Caller	Signal a runner to bring a batch.	
2	Runner	Bring a batch from the batching area and fill out this information on both tally sheets: • Batch to tally runner • Tally station	After the first batch, there will also be a batch ready for the runner to pick up.
3	Caller	Read the voted numbers on each ballot and hand the ballot to the Watcher.	Caller should adjust the speed to whatever is comfortable for Tally 1 and 2.
4	Watcher	Observe the ballot and immediately correct the caller if there are any mistakes.	Watcher may stack ballots in crosswise groups of five in case the team needs to refer back to a ballot.

5	Tally 1 and 2	Mark in green each column the Caller reads, in the row for that ballot.	A ruler or other straightedge helps talliers stay on the correct row.
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11.4 Mark undervotes in an undervoted race

Step	This person...	Does this...	Notes
1	Caller	Read any numbers that are voted in the undervoted race, then how many undervotes there are.	Announcing ahead of time that the race is undervoted may help.
2	Watcher	Observe the ballot and immediately correct the caller if there are any mistakes.	
3	Tally 1 and 2	Mark normal votes as usual, and make one mark in the race's undervote column for each undervote.	Undervote columns are the only columns that can have multiple marks. The total number of undervotes could also be written in as a number in pen.

11.5 Mark overvotes in an overvoted race

Step	This person...	Does this...	Notes
1	Caller	Read all the voted numbers, then announce the race is overvoted.	Announcing ahead of time that the race is overvoted may help.
2	Watcher	Observe the ballot and immediately correct the caller if there are any mistakes.	
3	Tally 1 and 2	Mark votes as usual, then draw a red line through all the votes in that race and mark the race's overvote column.	The marks create a complete record of voter choices, while the red line shows the choices aren't counted. The overvote column gets only one mark even if there were many extra votes.

11.6 How to fix a mistake

IF this happens...	THEN do this...
Tally 1 or 2 marks a box that should not have been marked	Cross out the mark in red, so it is clear not to count that mark.
Tally 1 or 2 misses marking a box that should have been marked	Mark the box.
Tally 1 or 2 skips a line and marks a ballot on the wrong row	Go back to the correct row and mark it correctly. Later, on the incorrectly marked row, mark in green all boxes the Caller reads, and mark out in red any marked boxes the Caller does not read.
Too many mistakes so it is hard to tell marked from unmarked boxes	Write “SPOILED” across the tally sheet but keep it with the batch. Start the batch again with a new sheet.

11.7 Total the batch

Step	This person...	Does this...	Notes
1	Tally 1 and 2	Count the dots in each column, writing the total at the bottom of each column.	Use pen, not marker. Undervote and overvote columns are totaled the same as others except that the undervote column could have more than one mark per box.
2	Tally 1	Read the column totals out loud while Tally 2 checks.	
3	Tally 1 and 2	IF a number doesn’t match, THEN do the following until the problem is resolved: • Count the marks again. • Compare marks in the column and circle any discrepancies. • Have the Caller re-read any ballot where there is a discrepancy. • Have the Caller re-read the	Re-reading the whole batch is rarely necessary.

		whole batch if necessary.	
4	Tally 1 and 2	Initial any corrections.	

11.8 Reconcile the votes for each race

Reconciliation is a check that the maximum number of possible votes in the batch equals the total of votes for each choice, plus the total of undervotes, plus the maximum number of votes an overvoted race should have had.

Details of the reconciliation form vary depending on the kind of races and how space is used on the tally sheet. The form may or may not be on the tally sheet, but must stay with the batch as part of the permanent record.

Step	This person...	Does this...	Notes
1	Tally 1 and 2	Multiply the number of ballots in the batch by the number of votes allowed in the race.	
2	Tally 1 and 2	Add the column totals of the race's numbered columns.	
3	Tally 1 and 2	Multiply the race's overvote column total by the number of votes allowed in the race.	
4	Tally 1 and 2	Add the numbers from Steps 2 and 3 to the undervote column total.	
5	Tally 1 and 2	Compare the number from Step 4 to the number from Step 1, and compare with the other tallier.	The number from Step 1 should equal the number from Step 4. Calculators are acceptable but not required.
6	Tally 1 and 2	IF the numbers don't match, THEN check all previous steps and procedures until the problem is resolved. Initial any corrections.	This is a final cross-check of all numbers from the batch. Discrepancies should be quick to resolve unless the whole team missed a case of over- or undervoting.

11.9 Document the batch for aggregation

Step	This person...	Does this...	Notes
1	Caller	Put the ballots in a clear tamper-indicating bag, clipping the tally sheets to the bag.	Wait until the batch is aggregated to seal the bag, in case of corrections.
2	Caller, Watcher, Tally 1 and 2	Fill out this information on both tally sheets: • Tally caller • Tally watcher • Tally one • Tally two	
3	Caller	Signal a runner to take the batch to the aggregation area.	
4	Runner	Fill out this information on both tally sheets: • Tally to aggregation runner	Usually it will make sense for the runner to bring the next batch at the same time.
5	Runner	Take the batch to the aggregation area.	For easier reconciliation, make separate piles of partial batches (fewer than 25) and full batches, at the aggregation station.

12 How to Aggregate Batches

12.1 Write-in votes

For a batch with write-in votes, Agg 1 and 2 should write a candidate's name in the write-in column on the aggregation sheet or attached write-in sheet. The column can be numbered or treated as an additional column that happens to have a name rather than a number.

12.2 Aggregate a batch

Step	This person...	Does this...	Notes
1	Agg 1 and 2	Enter for each batch the following numbers (listed on the tally sheets) in each row of the aggregation sheets: • Tally station • Batch station • Batch #	
2	Caller	Read the column totals from one tally sheet.	Caller adjusts the speed to whatever is comfortable for Total 1 and 2.
3	Watcher	Follow along on the other tally sheet and immediately correct the Caller if there are any mistakes.	The tally sheets have already been double-checked against each other; this step quadruple-checks them.
4	Agg 1 and 2	Write in each column the number the Caller reads.	Use pens, not markers, for aggregation.

12.3 How to fix a mistake

IF this happens...	THEN do this...
Agg 1 or 2 writes in a box that should have been blank.	Cross out the mark, so it is clear not to count that mark.
Agg 1 or 2 writes the wrong number in a box.	As neatly as possible, cross out the wrong number and write the right number. If numbers become unreadable, starting over with a new sheet may be necessary. (Write "SPOILED" across the old sheet and bag it with the batches after aggregating.)

Agg 1 or 2 skips a line and writes on the wrong row.	Agg 1 and 2 both skip the row (draw a line through all boxes on that row so it is clear not to count those numbers) and start on the new row. For aggregation, it is not important to use all the rows on the sheet, but it is important that Agg 1 and 2 use the same rows.
Too many mistakes so it is hard to read numbers.	Write “SPOILED” across the sheet but bag it with the batches after aggregating. Start again with a new sheet.

12.4 Total the totals

Step	This person...	Does this...	Notes
1	Agg 1 and 2	Total the numbers in each column and write the total at the bottom of each column.	Calculators are acceptable but not required. Calculators don't violate transparency because the numbers are on the paper for anyone to see; anyone watching could check the totals by adding the same numbers with a calculator, abacus, pencil, or mental math.
2	Agg 1	Read the column totals out loud while Agg 2 checks.	
3	Agg 1 and 2	IF a number doesn't match, THEN do the following until the problem is resolved: • Total the column again. • Compare numbers in the column and circle any discrepancies. • Have the Caller re-read any batch where there is a discrepancy. • Have the Caller re-read all the batches if necessary.	Re-reading all the batches shouldn't be necessary. Since the batches are numbered it is easy to identify which batch will resolve the discrepancy.

12.5 Document the batches for reporting

Step	This person...	Does this...	Notes
1	Caller	Fill out this information on both tally sheets: • Aggregation station	
2	Caller, Watcher, Agg 1 and 2	Fill out this information on both aggregation sheets: • Date • Agg station • Agg sheet # • Agg caller • Agg watcher • Agg 1 • Agg 2	
3	Caller	Check that all tally sheets are sealed in or clipped to the correct ballot bags.	
4	Precinct Coordinators	Record these numbers on the Aggregation Station part of the reconciliation sheet: • Number of full batches • Total number of ballots in full batches • Number in partial batches • Total number of ballots in partial batches	
5	Caller	Seal the ballot bags and tally sheets, and one aggregation sheet, in a large clear tamper-indicating bag with the aggregation sheet facing out, and clip the other aggregation sheet to the bag.	If second-level aggregation is needed, wait to seal the bag until the second-level aggregation is done.

12.6 Second-level aggregating

A 25x25 aggregation sheet can handle up to 625 ballots. For a larger election, the aggregation sheet could be expanded to 30 or 40 rows, but rather than sacrifice readability, some of the

batches can be recorded on a second set of aggregation sheets. The aggregation team then does a second level of aggregation to get the final totals. See the [sample sheet](#) in the Appendix.

When there are enough ballots to need second-level aggregation, use a box or other large container for each aggregated set of ballots, which will be slippery in their plastic bags.

Step	This person...	Does this...	Notes
1	Agg 1 and 2	Enter for each first-level aggregation sheet the following number in each row of the second-level aggregation sheets: • Agg sheet #	
2	Caller	Read out the column totals from one first-level aggregation sheet.	Caller should adjust the speed to whatever is comfortable for Total 1 and 2.
3	Watcher	Follow along on the other first-level aggregation sheet and immediately correct the Caller if there are any mistakes.	
4	Agg 1 and 2	Write the number the Caller reads for each column.	
5	Agg 1 and 2	Total the numbers in each column and write the total at the bottom of each column.	Calculators are acceptable but not required.
6	Agg 1	Read the column totals out loud while Total 2 checks.	
7	Agg 1 and 2	Resolve any discrepancies.	
8	Caller, Watcher, Agg 1 and 2	Fill out this information on both second-level aggregation sheets: • Date • Agg station • Agg caller • Agg watcher	

		• Agg 1 • Agg 2	
9	Caller	Seal the first-level aggregation bags, and seal the first-level bags in a second-level bag along with one second-level aggregation sheet facing out, and clip the other second-level aggregation sheet to the bag.	

12.7 Reconcile total ballot numbers

Specific forms will depend on local election rules, but should generally capture the following information.

Step	This person...	Does this...	Notes
1	Agg Caller and Watcher	Count, and confirm the count of, all spoiled ballots.	
2	Agg Caller and Watcher	Fill out this information on the spoiled ballot tally sheets: • Aggregation station • Additional spoiled ballots from tallying • Total spoiled ballots	
3	Agg Caller and Watcher	Seal the spoiled ballots and one spoiled ballot tally sheet in a clear tamper-indicating bag, with the spoiled ballot tally sheet facing out so it is completely readable, and clip the other spoiled ballot tally sheet to the bag.	
4	Precinct Coordinators	Record these numbers on the Aggregation Station part of the reconciliation sheet: • Total number of ballots from ballot boxes • Number of spoiled ballots	

		• Number of other ballots • Total number of ballots left for hand counting	
5	Precinct Coordinators	Sign and date the reconciliation sheet for the number of ballots counted in batching.	

12.8 If there are discrepancies

If the total number of ballots left for hand counting in the Polling Station and Batching Station sections do not equal the total number of ballots left for hand counting in the Aggregation Station section, try to find the reason for any discrepancy. Refer to election law to decide whether the discrepancy is small enough the team can move on to the next step.

12.9 Post and Transmit Results

Specific forms will depend on local election rules, but should generally capture the following information.

Step	This person...	Does this...	Notes
1	Precinct Coordinators	Fill out this information on the results sheet: • 10-digit precinct number • Number of ballots cast • Number of votes cast for each candidate/question choice • Total number of votes cast for each race	
2	Precinct Coordinators	Post the results sheet at the precinct site in a secure place that is in full view of the public.	For instance, post the results sheet facing out, on the inside of the window of a locked door.
3	Precinct Coordinators	Fill out this information on the precinct section of the transmission sheet: • Number of ballots cast • Number of votes cast for each candidate/question choice • Total number of votes cast for each race	
4	Precinct Coordinators	Call in the results to the next level (district/city/county/etc.) Report the total number of ballots cast for the precinct. For each candidate/question choice, 1. Ask for the current total for the district/city/county/etc. and enter it on the transmission sheet. 2. Add the precinct's total to the	This process creates a record to show that precinct totals were correctly transmitted to the next level and correctly totaled at that level.

		current total. 3. Report the precinct total for that choice and confirm the new current total.	
5	Precinct Coordinators	Sign over package of ballots and forms to ballot transporters.	

13 Extreme Situations

13.1 Formal and informal elections

Hand counting should be kept as simple as possible; fraud is best hidden in complexity. An informal election where numbers are small and everyone is present for the whole process won't need detailed chain-of-custody documentation and ballot reconciliation. On the other hand, formal elections for governmental positions may require extra procedures not in this manual; refer to local laws as long as they support, rather than threaten, transparency.

13.2 Ballots without numbers

When, for whatever reason, the ballots do not have a number associated with each choice, a simple solution is to create a transparent numbered overlay for the Caller on each team, where the overlay can be lined up with the choices on the ballot to show a number by each choice. Then the Caller reads the numbers as usual.

Putting the overlay on top of the whole stack of ballots and removing each ballot after it is read goes faster than shuffling each ballot in and out of the overlay.

13.3 Scaling up (many ballots)

The average number of registered voters in a precinct is around 1000. However, some precincts in Colorado are several times that size. A precinct of 3000 may be more than three times as complex as an average precinct, but the hand count method is scalable (see comparison chart below). A good estimate for recruiting enough hand counters is to get 1% of the registered voters. Remember to prepare a larger space for a scaled-up counting effort.

Precinct of 1000 voters with 600 ballots	Precinct of 4000 with 3000 ballots
10 hand counters	50 hand counters
2 tally teams	10 tally teams
2 batching stations each handling 12 batches	5 batching stations each handling 24 batches
1 aggregation station	5 aggregation stations
Can count 120 ballots per hour	Can count 600 ballots per hour
Start at 7pm, finish by midnight	Start at 7pm, finish by midnight

13.4 Scaling down (few ballots)

The smallest precincts in the county may have so few ballots they fit on one tally sheet. In this case, many procedures in this manual may seem like overkill, but can still be important for keeping precinct results consistent.

In a small precinct, ballot secrecy becomes a concern, and redaction of detailed results is often suggested as the solution, but citizens will see the ballots before any redaction. Even if this situation threatens ballot secrecy, [there is court precedent](#) that transparency, and in particular auditability, is more important than ballot secrecy, so a small precinct is not a reason to avoid hand counting.

Another consideration is that with mail-in ballots, the election judges who take ballots out of the ballot envelopes know exactly who the ballot belonged to, although nobody can know for sure if that person voted their own ballot. Citizens counting neighbors' ballots might make educated guesses about whose ballot is whose, but since the ballots are nameless, citizens can never threaten ballot secrecy as much as election judges under the current system.

13.5 Many choices

A ballot with 30 choices (for instance, three races with four candidates each, plus five judge retention questions, plus four ballot questions) is a reasonable size of ballot for a county, state, or federal election. Recent Colorado ballots have been several times that size, but could be reduced by holding separate elections, with separate ballots, for each level. Besides making ballots easier to count, smaller ballots are better for voters. When voters get tired of trying to keep track of every race on the ballot, the most local races get neglected. Unfortunately, those local races are the ones that affect the voter most directly.

A tally sheet with 75 or 100 choices should rarely be necessary, but if it does become necessary, one way to handle it is to print the pages on a legal (8.5x17) or tabloid (11x17) page, and use straightedges carefully to keep track of which row is which. Another possibility is to print the choices over several pages, and after marking the first 25 or so choices, talliers flip to the second page and continue until 50 or so, then flip again. The page flipping takes extra time, but the boxes on the chart don't have to be compressed.

The aggregation sheet can be handled similarly to the tally sheet, but since the aggregation stage doesn't take as long as tallying but does need enough space in the boxes to write numbers, the page-flipping option may be best.

13.6 Little time

Adding more tally teams multiplies the overall speed of processing ballots, but only up to a point. As the number of tally teams increases, the complexity of keeping track of the batches (not to mention the complexity of dealing with more people) also increases. Ideal team size is in the sweet spot between the simplicity of a single team and the speed of multiple teams.

13.7 Little space

If there is not much space for counting the ballots, allow more time for counting. Four people could work just in the space that four chairs occupy, without a table, by using clipboards on their

laps. But it won't be easy to organize the paperwork and it won't be very comfortable, which is a problem if the team is going to be there for several hours.

13.8 Few workers

If volunteers get sick, or don't show up, or work much slower than expected, or other factors slow the effort, as soon as the problem becomes evident, Precinct Coordinators should contact the next level of election reporting to resolve the problem. Possible solutions include reassigning extra people from nearby precincts or precincts that finish early.

13.9 Many workers

A large precinct may need to identify workers with badges or clothing (for instance, different-colored vests) to keep track of who should be handling ballots and who should be doing which job. Visual signaling for runners (for instance, raising a small flag) will help keep background noise down, and for the same reason citizens observing the process may need to be in a separate room watching livestreamed cameras.

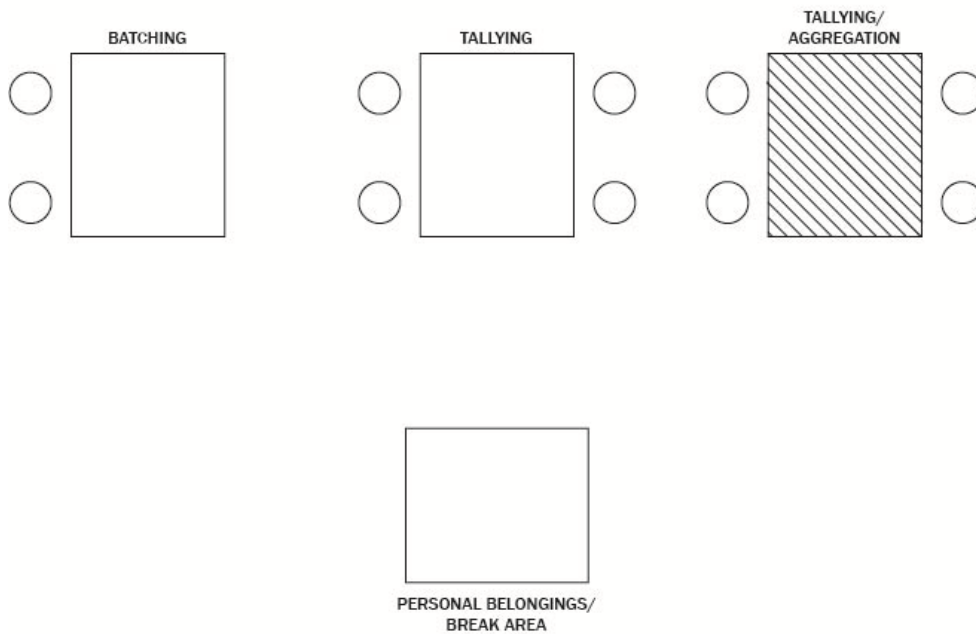
13.10 Military/overseas ballots

Although precinct-level hand counting does not mix well with overseas ballots under the UOCAVA law, a team of hand counters would count these ballots at the place the county receives them. The first step would probably be sorting them by precinct number/ballot type. The results could be added to precinct results as a separate notation after the precinct results are received. Local Precinct Coordinators could note military/overseas results as an addendum to the results posted at the precinct.

Appendix A Sample Table Setups

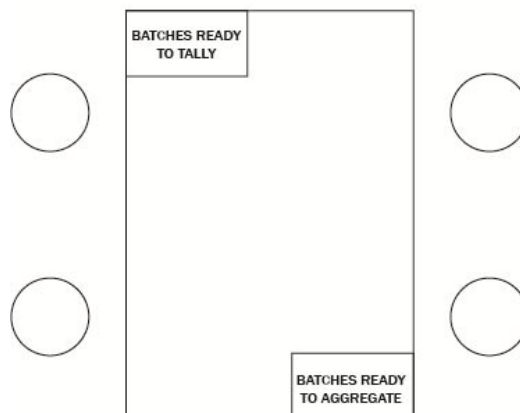
A team of 10 can handle an average precinct. After batching is done, the batch team becomes spares for other roles as needed. The second tally team becomes the aggregation team when the tallying is done.

PRECINCT TEAM OF 10



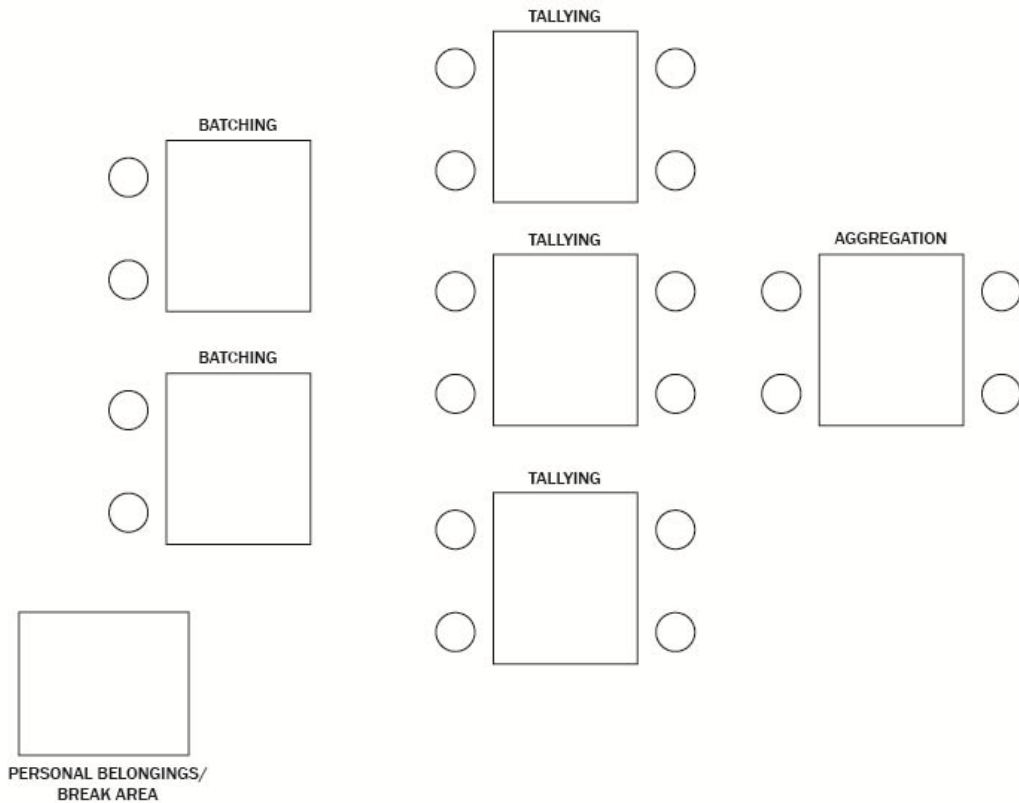
For a small precinct, a team of 4 can batch, then tally, then aggregate at the same table.

PRECINCT TEAM OF 4

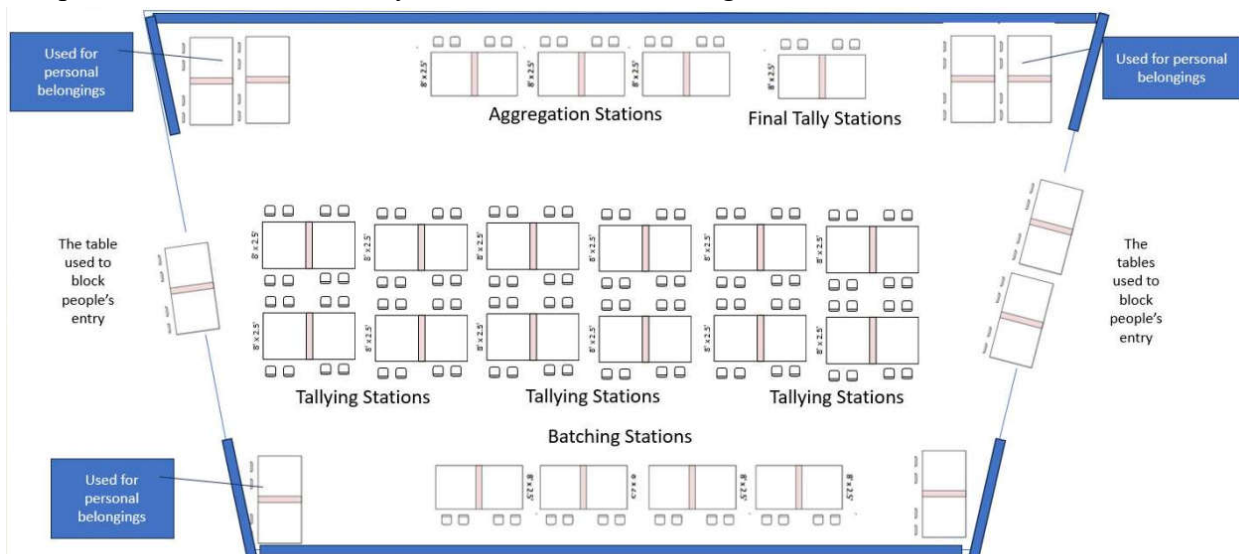


For a large precinct, a team of 20 can divide the tallying among 3 teams (or 4 if the aggregation team helps tally for a while). After batching, the batchers become spares for other positions as needed.

PRECINCT TEAM OF 20



Setup from 2024 state assembly for team of 144 counting 2000 ballots:



Appendix B Sample Ballots

Mock ballot for city election, 30 choices:

Definitely Not Official Ballot
Arapahoe County, Colorado
Tuesday, November 3, 2026

Precinct 6163803153 - 1
Ballot Type: 1

WARNING: Any person who, by use of force or other means, unduly influences an eligible elector to vote in any particular manner or to refrain from voting, or who falsely makes, alters, forges, or counterfeits any mail ballot before or after it has been cast, or who destroys, defaces, mutilates, or tampers with a ballot is subject, upon conviction, to imprisonment, or to a fine, or both. Section 1-7.5-107(3)(b), C.R.S

County Clerk and Recorder (Vote for One)

1. ☐ Shirley U. Jest
Democratic
2. ☐ Reid Enright
Republican

County Treasurer (Vote for One)

3. ☐ Winsome Cash
Republican
4. ☐ Penny Wise
Democratic
5. ☐ Meg A. Moola
Libertarian

County Assessor (Vote for One)

6. ☐ Iona Lott
Republican
7. ☐ U. O. Money
Democratic
8. ☐ Rich Mann
Libertarian

County Sheriff (Vote for One)

9. ☐ Marshall Law
Republican
10. ☐ Lauren Order
Democratic
11. ☐ Jay Walker
Libertarian

County Coroner (Vote for One)

12. ☐ M. Balmer
Republican
13. ☐ Phil Graves
Democratic
14. ☐ Liv Long
Libertarian

Judicial Retention Questions (Vote YES or NO)

County Court Judge

Shall Judge Eileen Dover of the Arapahoe County Court be retained in office?

15. ☐ Yes
16. ☐ No

Shall Judge Olive Branch of the Arapahoe County Court be retained in office?

17. ☐ Yes
18. ☐ No

Shall Judge Kerry Okey of the Arapahoe County Court be retained in office?

19. ☐ Yes
20. ☐ No

Shall Judge Woody Forrest of the Arapahoe County Court be retained in office?

21. ☐ Yes
22. ☐ No

Ballot measures (Vote YES or NO)

City of Littleton Ballot Issue 3A

Shall the City of Littleton forbid the forbidding of protests that protest protesters of protests

23. ☐ YES/FOR
24. ☐ NO/AGAINST

City of Littleton Ballot Question 301

Shall cereal be defined as soup in Littleton restaurants?

25. ☐ YES/FOR
26. ☐ NO/AGAINST

City of Littleton Ballot Question 3B

Shall it be illegal to call pets silly names within the borders of the City of Littleton?

27. ☐ YES/FOR
28. ☐ NO/AGAINST

City of Littleton Ballot Question 3C

Shall snow be forbidden in summer, defined as from May 1st to September 15th, within the City of Littleton?

29. ☐ YES/FOR
30. ☐ NO/AGAINST

Mock ballot for town election, 12 choices, ballot stubs for voter on top, ballot numbers for batching on right side:

BALLOT NO: _____							
BALLOT NO: _____							
Town Of Hand Count, Colorado Municipal Election Tuesday, November 3, 2026		 Clerk McClerk, Town Clerk					
 To vote for a named candidate, or for or against a ballot measure, put a check, an X, or completely fill the oval to the left of your choice. Use black or blue ink.	 If a race includes a write-in line, you may vote for a write-in candidate by completely filling in the oval to the right of the line and printing at least the last name of an eligible write-in candidate on the line.	 To make a correction, draw a bold line through the oval and candidate name or ballot measure selection marked by mistake, then fill in the oval next to the correct name. If you voted for the only candidate in a race and want to withdraw that vote, you must request a replacement ballot.	Numbers following the bubbles are for hand counting purposes only.				
Municipal Offices		Ballot Questions					
Town of Hand Count Trustee (Vote for Three) ☐ 1. Candidate 1 ☐ 2. Candidate 2 ☐ 3. Candidate 3 ☐ 4. Candidate 4 ☐ 5. Candidate 5 ☐ 6. Candidate 6		TOWN OF HAND COUNT BALLOT QUESTION 2 Shall the Town of Hand Count adopt the following: • At vero eos et accusamus et iusto odio dignissimos ducimus qui blanditiis praesentium voluptatum deleniti atque corrupti quos dolores et quas molestias excepturi sint occaecati cupiditate non provident, similique sunt in culpa qui officia deserunt mollitia animi, id est laborum et dolorum fuga. Et harum quidem rerum facilis est et expedita distinctio. Nam libero tempore, cum soluta nobis est eligendi optio cumque nihil impedit quo minus id quod maxime placeat facere possimus, omnis voluptas assumenda est, omnis dolor repellendus. Temporibus autem quibusdam et aut officiis debitis aut rerum necessitatibus saepe eveniet ut et voluptates repudiandae sint et molestiae non recusandae. Itaque earum rerum hic tenetur a sapiente delectus, ut aut reiciendis voluptatibus maiores alias consequatur aut perferendis doloribus asperiores repellat. ☐ 9. YES/FOR ☐ 10. NO/AGAINST					
Ballot Questions		TOWN OF HAND COUNT BALLOT QUESTION 3					
TOWN OF HAND COUNT BALLOT QUESTION 1 Shall the Town of Hand Count adopt the following: • Sed ut perspiciatis unde omnis iste natus error sit voluptatem accusantium doloremque laudantium, totam rem aperiam, eaque ipsa quae ab illo inventore veritatis et quasi architecto beatae vitae dicta sunt explicabo. Nemo enim ipsam voluptatem quia voluptas sit aspernatur aut odit aut fugit, sed quia consequuntur magni dolores eos qui ratione voluptatem sequi nesciunt. Neque porro quisquam est, qui dolorem ipsum quia dolor sit amet, consectetur, adipisci velit, sed quia non numquam eius modi tempora incidunt ut labore et dolore magnam aliquam quaerat voluptatem. ut enim ad minima veniam, quis nostrum exercitationem ullam corporis suscipit laboriosam, nisi ut aliquid ex ea commodi consequatur? Quis autem vel eum iure reprehenderit qui in ea voluptate velit esse quam nihil molestiae consequatur, vel illum qui dolorem eum fugiat quo voluptas nulla pariatur? ☐ 7. YES/FOR ☐ 8. NO/AGAINST		Shall the Town of Hand Count adopt the following: Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. ☐ 11. YES/FOR ☐ 12. NO/AGAINST					
		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">Batch Number</td> <td style="width: 50%;"></td> </tr> <tr> <td style="text-align: center;">Ballots in Batch</td> <td></td> </tr> </table>		Batch Number		Ballots in Batch	
Batch Number							
Ballots in Batch							

Appendix C Sample Polling Station Ballot Record

Title of Event -- 2026 TOWN OF HAND COUNT ELECTION 11-3-2026												
BALLOTS CAST RECORD												
ELECTION JUDGES - KEEP THIS FORM BY THE BALLOT BOX AND RECORD EACH BALLOT CAST.												
EJ 1. Take Sig. Card, Find Name, Write Ballot # in Poll Book & in upper right corner of Sig. Card. Place Sig Card face down.												
EJ 2. Write Ballot # on both Ballot Stubs, cut top stub, put face down. Fold w/writing in, instruct to vote and refold.												
EJ 3. Cut 2nd Ballot Stub off folded ballot, put Stub face down (keep in order), instruct to cast. Mark tick below.												
EXAMPLE: Make consecutive tick marks for each ballot cast. The fifth mark is horizontal.												
III- III-	III- III-	III- III-	III- III-	III- III-	III- III-	III- III-	III- III-	III- III-	III- III-	III- III-	III- III-	III- III-
										EXAMPLE ABOVE - Total number tick		
Write directly on the tick marks. Use the printed numbers to help figure the totals.												
10	20	30	40	50	60	70	80	90	100			
III- III-	III- III-	III- III-	III- III-	III- III-	III- III-	III- III-	III- III-	III- III-	III- III-			
110	120	130	140	150	160	170	180	190	200			
III- III-	III- III-	III- III-	III- III-	III- III-	III- III-	III- III-	III- III-	III- III-	III- III-			
210	220	230	240	250	260	270	280	290	300			
III- III-	III- III-	III- III-	III- III-	III- III-	III- III-	III- III-	III- III-	III- III-	III- III-			
310	320	330	340	350	360	370	380	390	400			
III- III-	III- III-	III- III-	III- III-	III- III-	III- III-	III- III-	III- III-	III- III-	III- III-			
410	420	430	440	450	460	470	480	490	500			
III- III-	III- III-	III- III-	III- III-	III- III-	III- III-	III- III-	III- III-	III- III-	III- III-			
510	520	530	540	550	560	570	580	590	600			
III- III-	III- III-	III- III-	III- III-	III- III-	III- III-	III- III-	III- III-	III- III-	III- III-			
Number of Ballots Cast. CIRCLE LAST BOX OF TICK MARKS. Total # of tick marks (BALLOTS):										87		
SPOILED BALLOTS:												

Appendix D Sample Batch Station Record

Name of Election

Batch Station _____

Number in Batch

Batch 1 _____

Batch 2 _____

Batch 3 _____

Batch 4 _____

Batch 5 _____

Batch 6 _____

Batch 7 _____

Batch 8 _____

Batch 9 _____

Batch 10 _____

Appendix E Informal Tally Sheet

Tally sheet for training or informal elections, 20 choices:

Tally Sheet for 20 Choices																								
Choice #	Caller:					Watcher:					Tally One:					Tally Two:								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Write-in 1	Write-in 2	Write-in 3	
Ballot																								
1																								
2																								
3																								
4																								
5																								
6																								
7																								
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22																								
23																								
24																								
25																								
Choice #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Write-in 1	Write-in 2	Write-in 3	
Total for choice																								

Appendix F Informal Aggregation Sheet

Aggregation sheet for training or informal elections, 20 choices:

Aggregation Sheet for 625 Ballots										Agg Caller:										Agg Watcher:										Agg One:										Agg Two:		
Choice #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Write-in 1	Write-in 2	Write-in 3																			
Batch #																																										
1																																										
2																																										
3																																										
4																																										
5																																										
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Choice #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Write-in 1	Write-in 2	Write-in 3																			
Agg total for choice																																										

Appendix G Sample Tally Sheets

Tally sheet, 30 choices:

Election for:		Date:		BATCHING		Batch Station:		Batch #:		Ballot Box:		Batch to Tally Runner:																		
Tally Sheet for 30 Choices				TALLYING		Tally Station:				Tally Watcher:																				
Notes:				Tally Clerk:				Tally One:		Tally Two:																				
				AGGREGATION																										
				Aggregation Station:																										
Choice	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
5	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
6	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
7	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
8	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
9	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
10	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
11	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
12	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
13	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
14	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
15	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
16	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
17	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
18	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
19	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
20	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
21	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
22	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
23	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
25	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Total for choice	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

Cast vote record tally sheet, 12 choices, record of undervote/overvote and ballot reconciliation:

TOWN OF HAND COUNT ELECTION NOV 3, 2026												CAST VOTE RECORD TALLY SHEET												Reader:												BATCH NUMBER:																																																																																																																																															
BATCHERS:												and												WATCHER:												# BALLOTS IN BATCH (25):																																																																																																																																															
Instructions: Reader reads aloud the ballot number, then the number directly to the right of each bubble marked on that ballot. Tallys place a Sharpie DOT in each corresponding ballot line and vote column.																								Tallys make identical CVs per BATCH. Circle who made this CVR.												NUMBER BALLOTS IN BATCH IF NOT 25 =																																																																																																																																															
CANDIDATES THREE CHOICES IF LESS THAN 13 ARE VOTED PUT ONE MARK PER UNDERVOTE IN THE UNDER VOTE COLUMN. IF VOTED FOR MORE THAN 3 MAKE A RED BALL LINE THROUGH 1-6 AND PUT ONE SHARPER DOT IN 0. DO NOT																								Tally #1:												Tally #2:												RUNNER:																																																																																																																																			
BALLOT #												BALLOT #												BALLOT #												BALLOT #																																																																																																																																															
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3												4												5												6												7												8												9												10												11												12												Under Vote												Over Votes												BALLOT #																																			
4												5												6												7												8												9												10												11												12												Under Vote												Over Votes												BALLOT #																																															
5												6												7												8												9												10												11												12												Under Vote												Over Votes												BALLOT #																																																											
6												7												8												9												10												11												12												Under Vote												Over Votes												BALLOT #																																																																							
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Choice Total												Choice Total												Choice Total												Choice Total																																																																																																																																															
Per and Watcher watch as Tallys add the DOTs in each column and record in "Choice Total" box. BEFORE GOING ON, COMPARE THE "CHOICE TOTAL" LINE ABOVE WITH THE "CHOICE TOTAL" LINE FROM THE TEAMS OTHER CVR SHEET.																																																																																																																																																																																			
Ballots/Batch if not 25												X Maximum Candidate VOTES/BALLOT (3) =												TOTAL (75)												SPOILED BALLOTS =												Ballots/Batch if not 25												X Maximum Question VOTES/BALLOT (3) =												TOTAL (75)																																																																																																											
(Add Choice Totals for column 1-6) Number of Candidate Votes Recorded This Batch =												Number of Candidate Under Votes This Batch =												TOTAL = (75) OR												Total Number of Votes for Question #1 (SB 25)												TOTAL																																																																																																																																			
Number of Candidate Over Votes This Batch =												X3 Ideal Votes =												TOTAL = (75) OR												Total Number of Votes for Question #2 (SB 25)												TOTAL																																																																																																																																			
TOTAL = (75) OR												TOTAL = (75) OR												TOTAL = (75) OR												TOTAL = (75) OR												TOTAL = (75) OR												TOTAL = (75) OR																																																																																																																							

Aggregation sheet, 30 choices:

[illegible]

Aggregation sheet with undervote/overvote record, 12 choices:

TOWN OF HAND COUNT ELECTION NOVEMBER 3, 2026										Reader:		1ST AGGREGATION STEP									
TEAM NAME:										Watcher:											
Instructions: PUT BATCHES IN NUMERICAL ORDER PRIOR TO RECORDING. Reader reads aloud the BATCH NUMBER, then the CHOICE TOTAL numbers recorded in each corresponding Batch Number line and Vote column. Tally's Record Batch # and TOTALS with black pen.										Tally's make identical Aggregation Sheets. Circle who filled this form.											
MAKE A RED PEN LINE THROUGH MISTAKES, RED CIRCLE CORRECT NUMBER, INITIAL CORRECTIONS.																					
CANDIDATES										QUESTION 1		QUESTION 2		QUESTION 3							
BATCH # ↑↓	1	2	3	4	5	6	Under Vote	Over Votes	7	8	Under Vote	Over Votes	9	10	Under Vote	Over Votes	11	12	Under Vote	Over Votes	BATCH # ↑↓
	1	2	3	4	5	6	U	0	7	8	Under Vote	Over Votes	9	10	Under Vote	Over Votes	11	12	Under Vote	Over Votes	
	X	2	3	4	5	6	U	0	7	8	Under Vote	OVER VOTE	9	10	Under Vote	OVER VOTE	11	12	Under Vote	OVER VOTE	
	1	2	3	4	5	6	U	0	7	8	Under Vote	Over Votes	9	10	Under Vote	Over Votes	11	12	Under Vote	Over Votes	
	1	2	3	4	5	6	U	0	7	8	Under Vote	OVER VOTE	9	10	Under Vote	OVER VOTE	11	12	Under Vote	OVER VOTE	
CHOICE TOTAL																					CHOICE TOTAL
CANDIDATES										QUESTION 1		QUESTION 2		QUESTION 3							
ADD EACH COLUMN ABOVE AND RECORD TOTALS IN CORRESPONDING "CHOICE TOTAL" BOX. DRAW A RED PEN LINE THROUGH ANY UNUSED BATCH ROWS.																					
CLIP AGGREGATION SHEETS ON TOP OF CORRESPONDING BATCH SHEETS. PASS PACKET TO FINAL AGGREGATION TABLE.										SPOILED BALLOTS =		-###-###-									

Appendix I Sample Ranking and Percentage Form

TOWN OF HAND COUNT ELECTION NOVEMBER 3, 2026										FINAL AGGREGATION TALLY SHEET AND PERCENTAGE CALCULATION											
TEAM NAME:										READER:											
TRANSFER TOTALS FROM EACH COLUMN IN "CHOICE TOTAL" BOX ON TEAM'S FIRST AGGREGATION SHEET TO THE "CHOICE TOTAL" ROW BELOW. WRITE DIRECTLY ON THE GREY NUMBERS.										WATCHER:											
(MAKE A RED PEN LINE THROUGH MISTAKES, RED CIRCLE CORRECTION, INITIAL CORRECTIONS.)										TALLY #1 & #2 MAKE IDENTICAL AGGREGATION SHEETS. CIRCLE WHO FILLED THIS FORM											
										TALLY #1:											
										TALLY #2:											
CANDIDATES										QUESTION 1		QUESTION 2		QUESTION 3							
	1	2	3	4	5	6	Under Vote	Over Votes	7	8	Under Vote	Over Votes	9	10	Under Vote	Over Votes	11	12	Under Vote	Over Votes	Choice Total
Choice Total	1	2	3	4	5	6	Under Vote	Over Votes	7	8	Under Vote	Over Votes	9	10	Under Vote	Over Votes	11	12	Under Vote	Over Votes	A.
A.	1	2	3	4	5	6			7	8			9	10			11	12			A.
B.	1	2	3	4	5	6			7	8	Under Vote	Over Votes	9	10	Under Vote	Over Votes	11	12	Under Vote	Over Votes	B.
C.	1	2	3	4	5	6	Under Vote	Over Votes													C.
ROW A. RECORD THE RESULT OF DIVIDING THE CHOICE TOTALS BY THE TOTAL NUMBER OF VOTES IN CANDIDATES SECTION. (100 BALLOTS SHOULD BE 300 TOTAL VOTES IN 1-6. 100 BALLOTS ARE 100 TOTAL VOTES PER EACH																					
ROW B. MULTIPLY THE NUMBER IN ROW A. BY 100 AND RECORD THE RESULTING PERCENTAGE IN ROW B. CIRCLE HIGHEST PERCENT FOR QUESTIONS 1, 2, AND 3.																					
ROW C. RANK CANDIDATES BY WINNING PERCENTAGE. HIGHEST IS #1, LOWEST IS #6. (BREAK TIES BY LOOKING AT THE TOTALS, INCLUDING DECIMALS, IN ROW B.)																= TOTAL NUMBER OF BALLOTS CAST					
USE ONE FINAL AGGREGATION TALLY SHEET FOR HAND WRITTEN OFFICIAL ELECTION REPORT, ONE FOR COMPUTER REPORT.																					

Second-level aggregation sheet, aggregating multiple aggregation sheets, 30 choices:

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Second-level aggregation sheet, aggregating multiple teams' results, with undervote/overvote record, 12 choices:

TOWN OF HAND COUNT ELECTION NOVEMBER 3, 2026										ALL TEAMS RESULTS AGGREGATION											
Instructions: Reader reads aloud the TEAM NAME, then the CHOICE TOTAL numbers recorded in each corresponding FINAL AGGREGATION line and Vote column. Tallys Record Batch # and TOTALS with black pen.										Reader:											
MAKE A RED PEN LINE THROUGH MISTAKES, RED CIRCLE CORRECT NUMBER, INITIAL CORRECTIONS.										Tally #1:											
Tally #2:										Tally #2:											
PUT BATCHES IN ALPHABETICAL ORDER PRIOR TO RECORDING																					
CANDIDATES										QUESTION 1											
TEAM #	1	2	3	4	5	6	Under Vote	Over Votes	7	8	Under Vote	Over Votes	9	10	Under Vote	Over Votes	11	12	Under Vote	Over Votes	TEAM #
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	X	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	12	U	O	
	1	2	3	4	5	6	U	O	7	8	U	O	9	10	U	O	11	1			

Appendix K Sample Write-In Tally Sheet

Election for:		Date:	BATCHING	Batch Station:	Batch R:	Ballot Box:	Batch to Tally Runner:
Tally Sheet for Write-Ins			TALLYING	Tally Station:			
Notes:		Tally Caller:		Tally Watcher:		Tally to Aggregation Runner:	
		Tally One:		Tally Two:			
		AGGREGATION		Aggregation Station:			
Choice							
Ballot							
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
Choice							

[illegible]

Appendix M Sample Spoiled Ballot Tally Sheet

Spoiled Ballot Tally Sheet		Date:
Batch Station:	Aggregation Station:	Batch to Aggregation Runner:

Total spoiled ballots from polling and batching: _____

Additional spoiled ballots from tallying: _____

Total spoiled ballots: _____

Appendix N Sample Reconciliation Sheet

Sample reconciliation sheet in three parts:

Reconciliation Sheet

Polling Station			
1	Number of ballots given to voters:		_____
2	Number of spoiled ballots:		_____
3	Number of other ballots:		_____
	Description:		_____
4	Total number of ballots left for hand counting:		_____
I certify that the numbers above are true to the best of my knowledge:			
Election Judges:			
Printed name:	Signature:	Date:	Party:
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
I acknowledge the above totals:			
Precinct Coordinators:			
Printed name:	Signature:	Date:	Party:
_____	_____	_____	_____
_____	_____	_____	_____

Batching Station			
5	Number of full batches (25 ballots):		_____
6	Total number of ballots in full batches (line 5 x 25):		_____
7	Number in partial batches:		_____

8	Total number of ballots in partial batches:		_____
9	Total number of ballots from ballot boxes (line 6 + line 8):		_____
10	Number of spoiled ballots:		_____
11	Number of other ballots:		_____
	Description		_____

12	Total number of ballots left for hand counting (line 9 + line 10 + line 11):		_____
I certify that the numbers above are true to the best of my knowledge:			
Precinct Coordinators:			
Printed name:	Signature:	Date:	Party:
_____	_____	_____	_____
_____	_____	_____	_____

Aggregation Station			
13	Number of full batches (25 ballots):		_____
14	Total number of ballots in full batches (line 13 x 25)		_____
15	Number in partial batches:		

16	Total number of ballots in partial batches:		_____
17	Total number of ballots from ballot boxes (line 14 + line 16):		_____
18	Number of spoiled ballots:		_____
19	Number of other ballots:		_____
	Description		
20	Total number of ballots left for hand counting (line 17+ line 18 + line 19):		_____
I certify that the numbers above are true to the best of my knowledge:			
Precinct Coordinators:			
Printed name	Signature:	Date:	Party:
_____	_____	_____	_____
_____	_____	_____	_____

Sample reconciliation and chain-of-custody form:

1	TOWN OF HAND COUNT ELECTION 2026			# OF	3-Nov-26	
2	BALLOTS CHAIN OF CUSTODY			BALLOT		
3	NAME/INITIALS	✓	PROCESS TITLE	S/STEP	RECONCILE	
4	CLERK		DESIGN AND PRINT		TOTAL #OF BALLOTS	
5	JUDGE		# BALLOTS CAST POLL BOOK		ALL NUMBERS IN	
6	JUDGE		BALLOTS / BALLOT CAST SHEET		YELLOW BOXES	-
7	JUDGE		BALLOTS CAST NUMBER STUB		MUST MATCH	=
8	JUDGE		SPOILED BALLOTS FROM VOTING AND POLLING			-
9	JUDGE		TOTAL NUMBER OF NOT-VOTED BALLOTS			=
10	TALLY		# OF BALLOTS IN BATCH 1		Confirm by Counting	=
11	TALLY		# OF BALLOTS IN BATCH 2			
12	TALLY		# OF BALLOTS IN BATCH 3			
13	TALLY		# OF BALLOTS IN BATCH 4		SPOILED BALLOTS FROM:	
14	TALLY		# OF BALLOTS IN BATCH 5		POLLING	### ---
15	TALLY		# OF BALLOTS IN BATCH 6		BATCHING	### --- +
16	TALLY		# OF BALLOTS IN BATCH 7		TALLYING	### --- +
17	TALLY		# OF BALLOTS IN BATCH 8		TOTAL SPOILED BALLOTS	=
18	TALLY		# OF BALLOTS IN BATCH 9			
19	TALLY		# OF BALLOTS IN BATCH 10			
20	TALLY		# OF BALLOTS IN BATCH 11			
21	TALLY		# OF BALLOTS IN BATCH 12			
22	TALLY		# OF BALLOTS IN BATCH 13		Final Aggregation	=
23	TALLY		# OF BALLOTS IN BATCH 14		(SHOULD MATCH PINK BOX	
24	TALLY		# OF BALLOTS IN BATCH 15		IN ROW 35, BELOW.	
25	TALLY		# OF BALLOTS IN BATCH 16		NUMBER OF BALLOTS CAST	
26	TALLY		# OF BALLOTS IN BATCH 17			
27	TALLY		# OF BALLOTS IN BATCH 18			
28	TALLY		# OF BALLOTS IN BATCH 19		COUNT FOR ALL BALLOT	
29	TALLY		# OF BALLOTS IN BATCH 20		Final Aggregation	
30	TALLY		# OF BALLOTS IN BATCH 21		SPOILED BALLOTS	+
31	TALLY		# OF BALLOTS IN BATCH 22		UNUSED BALLOTS	+
32	TALLY		# OF BALLOTS IN BATCH 23		TOTAL #OF BALLOTS	=
33	TALLY		# OF BALLOTS IN BATCH 24		MATCHES GREEN ABOVE	
34	TALLY		# OF BALLOTS IN BATCH 25			
35	JUDGE		ADD BATCHES 1 TO 25 =		NUMBER BALLOTS CAS	

Appendix O Resources:

[Colorado Counts Arapahoe](#)

Collection of hand counting information, focused on Arapahoe County, Colorado

[Colorado State Assembly Teller/Hand Count Report 2024](#)

White paper documenting a major test of what became the Rocky Mountain Method

[Colorado Union of Ballot Counters](#)

Videos of hand count demonstration events throughout Colorado

[Shasta County Mechanical Hand Count Voting System](#)

Example of county-required legal details for another method of hand counting

[Shasta County Manual Tally Plan](#)

Example of detailed plan for a hybrid system of scanning ballots, hand counting a percentage via another hand count method, and machine counting to fit state requirements

[Missouri Method](#)

One of the first hand count methods successfully replacing election machines in an actual election administered by an election authority