

## 5. Election Hand Tally, Step by Step

Here is a set of detailed instructions for conducting an STV hand tally.

The fabled complexity of this procedure, you may rest assured, is not difficult to grasp, once you've walked through a mock election or even a real election. Once past the initial hurdle of actually *wanting* to learn, and with a little middle school math, the basics should become clear. To help you test your skills we have included a practice election in Section 6.

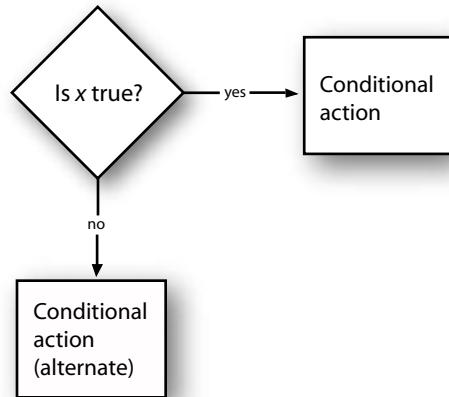
Any STV tally can be broken down into three main steps. Of these three steps, the first two are for the most part entirely straightforward. It is Step Three, with its slightly elaborate series of vote transfers, which contributes to STV its reputation for complex tallies.

Step Three itself can best be viewed as a self contained looping structure, because in Step Three you will repeatedly return to the same condition or unresolved state of tally until the election is complete. These redundant actions are typically referred to as *rounds*. Loops, rounds, cycles, whatever you call them, Step Three is a process that must be repeated until either all seats have been filled, or until there are only as many candidates remaining as there are open seats left.

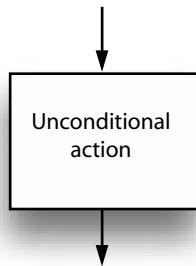
Suffice it to say, that if you follow the three steps, looping repeatedly through Step Three as necessary, you should be able to perform a hand tally with relative ease.

For the sake of understanding the flow charts in this chapter, it is probably a good idea to break each of the three steps down conceptually into one or other of two kinds of "Actions". These actions make up the atoms and molecules of the tally. They can be categorized as either *conditional* or *unconditional*.

If an action is conditional, it will only be carried out after evaluating the result of a prior action. For example, if the presence of a certain possible condition is evaluated as true, one conditional action should occur. But if the presence of the same possible condition evaluates as false, a different conditional action would be called for. In a flow chart such an evaluation is depicted by a diamond shaped box, with a question posed inside it, while rectangular boxes typically contain instructions (although in these two examples they simply indicate unspecified actions to be taken :



If an action is unconditional, then it will automatically be carried out as a necessary phase of the tally —no prior decision required (the first step of any tally will be an unconditional action .

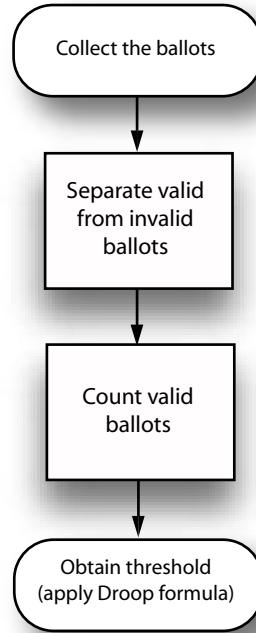


The following series of flow charts represent the three steps in simplified form. The obround boxes here represent the beginning or end of a process.

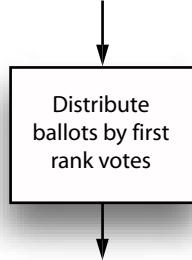
In Steps One and Two all actions are unconditional. With Step Three we encounter both unconditional and conditional actions. The looping structure of Step Three should be clear from the flow chart, as arrows lead from various actions back to the initial obround box, at which point a round will have been completed.

It may take several rounds before an election is complete. Step Three itself can be thought of as a series of rounds, initiated at Step Two.

## STEP ONE



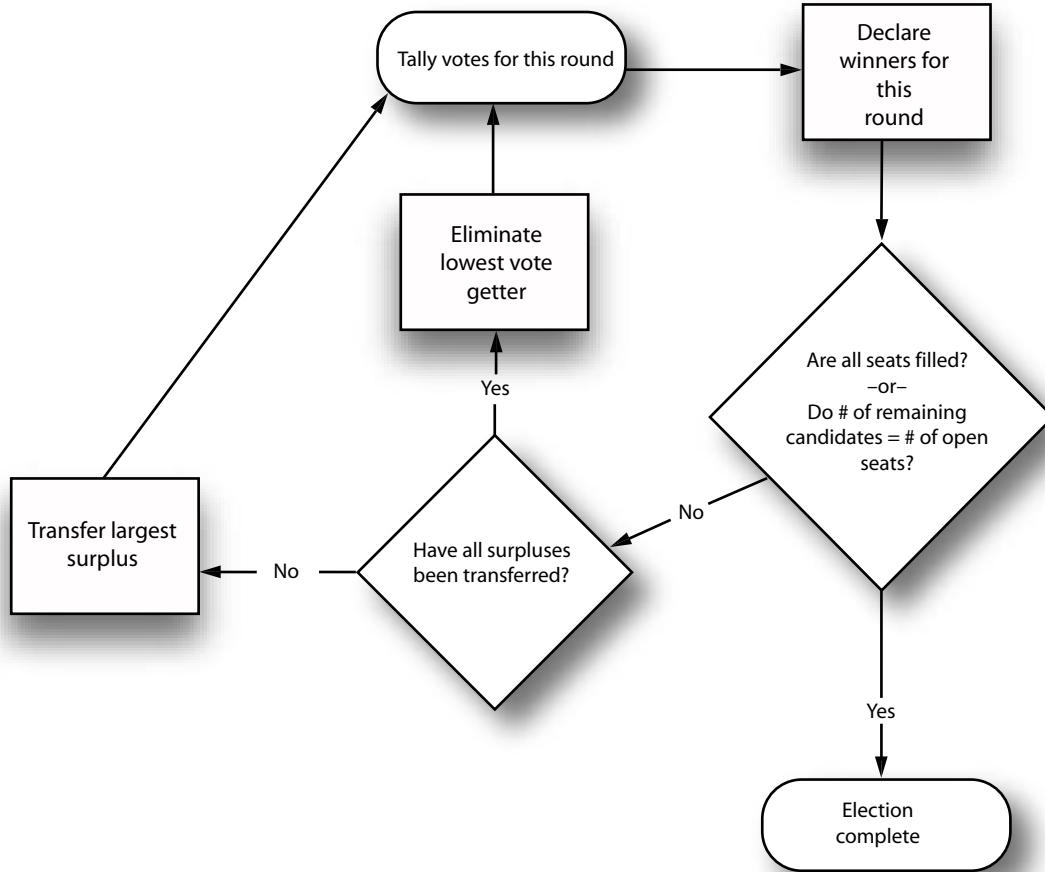
## STEP TWO



Before starting a hand tally you should have assembled ballot trays, markers, labels, tally sheets etc. as described in Chapter 3.

The description of a tally that follows can be used in conjunction with the tally flow chart immediately above and on the page following.

### STEP THREE



### Step One

#### **Action 1a:** *Collect the ballots.*

While mere collecting of ballots would seem to be simple enough, in actual practice, at Local Station Board meetings, collecting ballots might typically involve a protracted struggle on the part of election operators to draw the attention of easily distracted LSB Delegates.

To collect all of the ballots under such circumstances can prove to be challenging indeed. Consequently it is a very good idea to count exactly how many ballots will be distributed in advance, and to be sure upon collection that each and every ballot is accounted for. This is vital, not only because it is part of a good, orderly practice, but also because the total number of returned ballots will play a part in determining the threshold needed for election.

**Action 1b:** *Separate valid ballots from invalid ballots.*

Determining the number of valid ballots is another deceptively simple matter, which in fact it can involve some finer points. On the one hand, if you have prepared your ballots in a way that is easy to understand and fill out – never a sure thing where Pacifica and STV are involved – the vast majority of ballots should return filled out as instructed and with the voter’s intent clearly indicated. But some ballots inevitably will not be so easy to figure out. These are called *problem ballots*, and must be treated carefully.

Blank ballots constitute the simplest possible problem ballot scenario, and, believe it or not, they have turned up in LSB elections, and elections by the LSB. Because there is no ambiguity about blank ballots, they can be eliminated from the tally without much rigamarole. Illegible ballots present a more challenging scenario. As a principle, every effort should be made to determine the voter’s intent. This may involve scratching of heads, holding up to the light, etc. Problem ballots do serve to illustrate the advisability of having an election team of three or more, and hopefully observers present, who may provide creative suggestions for the resolving issues which problem ballots introduce.

At the end of the day, if, in the carefully considered opinion of the election team, a ballot is entirely illegible, or the voter’s intent is somehow indiscernible such a ballot is simply not valid, and may be disregarded entirely, according to Robert’s Rules *so long as it cannot affect the result*. Unfortunately with STV, with its complicated tally involving often several rounds, it is not a simple matter at the outset knowing whether or not a given ballot could affect the outcome. As a consequence, virtually all ballots need to be treated as though they could affect the outcome. In such an instance *Robert’s Rules of Order* dictates that the “tellers” which is how parliamentarians derisively allude to the election team shall present the problem ballot to the chair of the LSB, who will in turn present the matter to the body. The chair will invite the election team to explain the nature of the problem ballot to the assembled group, who hold the ultimate responsibility for handling problem ballots.

To summarize: On problem ballots every effort should be made to interpret voter intent. Before disqualifying any ballots, where the outcome may be affected, be sure to notify the chair, who will inform the body of the matter, presenting the ballots and seeking their consent (or disapproval) for the disqualification.

At the end of this action you should have only valid ballots left to deal with.

**Action 1c:** *Count the valid ballots.*

Here is the first really easy action. Mark the number of valid ballots on your tally form. You need this number in order to calculate the threshold. Should you also make a record of any dis qualified ballots? It probably won't do any harm. One good idea would be to number each ballot in pen or pencil for future reference.

**Action 1d:** *Apply the Droop formula to obtain the threshold.*

The Droop formula reads as follows:

threshold =  $1 + (\text{valid ballots}/(\text{seats}+1))$  rounded down to the nearest integer

Be sure to always round *down* and never *up*.

If you refer to the Bylaws you may notice there is no reference to rounding down. In all probability this is an error, so please avoid if possible arguing about it at tally time and just round the number down. Someday the Bylaws will get fixed, and this error will be corrected, but for the time being we are stuck with the Bylaws as written.

So, when you have calculated the threshold you should find yourself looking at an integer, not a number that includes a fraction such as *seven and one half*. If you somehow come up with a number plus a fraction, simply drop the fraction.

Once the threshold has been determined, it should be announced to the election team, and to any observers present. Also, make a note of the threshold on your tally form.

Note: Some systems of STV tally allow for an adjustable threshold. Because Pacifica has become accustomed to a fixed threshold, that is the method we recommend here.

## **Step Two**

**Action 2a:** *Distribute ballots according to first rank votes.*

You should now have prepared ballot trays, or bowls, any set of shallow receptacles should do aluminum pie tins, for example . Each ballot tray should be marked with a candidate's name, and one tray marked "exhausted".

If you absolutely have nothing to serve as a ballot tray on hand, you may stack the ballots in piles, provided there is some label to identify each pile by candidate, with one pile for the exhausted tally. Each ballot should probably have a first rank vote indicated, although there is a possibility that some problem type ballots may not. In the situation where there is not a first rank vote indicated, but some lower rank is indicated instead, you may best be advised to “collapse” the ballot, thus elevating whatever highest rank is indicated to be essentially the first rank vote. *See the section on “Gaps”.*

Now you can distribute the ballots into the trays according to their first rank votes. For instance, any ballots indicated with “Candidate A” as the first choice should be placed in the tray marked “Candidate A”. When you are finished every valid ballot should be in a tray.

You might also perform your first *checksum* here. A checksum occurs when you total up all of the votes in every pile and compare that result to the initial number of valid ballots. They should always be the same. As the tally progresses through the rounds, the checksum will help keep you on track and may even catch a few errors. With checksums, and careful tallying, you can be reasonably confident, at every round, that you haven’t committed a significant error.

## **Step Three**

### **Action 3a:** *Tally the votes for this round.*

This action is simply a matter of counting the votes each candidate has received so far, which is the same as counting how many votes are in each pile.

The first time you perform this action, every ballot is worth exactly one vote. But as you perform this action a second, third, fourth time, and so on, some ballots will need to be counted which have been marked down in value to a fraction of a vote, as indicated by a marking on the ballot. If ballots have fractional values marked on them, count each of those ballots according to that indicated fractional value, e.g. if a ballot has “1/4” marked on it, count that ballot as one fourth of a vote.

It is possible that this action will be performed only one time. If so, then all seats will be filled, and the election is over. But it is more likely that you will return to this action at least once, after subsequent actions have been performed.

Mark the results on your tally form. Go to Action 3b.

### **Action 3b:** *Declare winners for this round if any .*

At this point any candidates who have received a total number of votes equal to or greater than the threshold are declared elected if they have not been so declared already. This does *not* mean these results should be announced to the body. Just mark them “elected” on your tally sheet. The ballot trays of the elected candidates should be marked or somehow covered so that they do not receive any additional transferred votes.

This Action concludes a round, so that means it is time to perform another checksum. Add up the tally of votes attributed to each of the candidates, including the exhausted tally. This total number should equal the original number of valid ballots. If not, then go back a step and figure

out where you went wrong. The error should be somewhere between this checksum and the prior checksum.

Once the checksum is clear, you may go on to Action 3c.

**Action 3c:** *Are all seats filled?*

Count the number of candidates if any who have been elected. If the number of candidates elected is equal to the number of seats to be filled, the election is over.

—But if all seats are not filled—

Count the number of unfilled seats.

Count the number of remaining candidates remaining candidates have neither been elected nor eliminated .

If the number of unfilled seats is equal to the number of remaining candidates, then those remaining candidates should be declared elected, even if they have not reached the threshold.

Candidates *can* be elected if they have not achieved the threshold! But only in Action 3c. If all seats are now filled, the election is over. Mark the final results on your tally form. You won't need to perform a final checksum, because no transfer has taken place since the last such check.

—But if the number of unfilled seats is *not* equal to the number of remaining candidates

Proceed to Action 3d.

**Action 3d:** *Have all surpluses been transferred?*

At this point, if there are candidates who have been elected, one or more may well have received a total number of votes in excess of the threshold. Such candidates are said to have a surplus.

A candidate's surplus is calculated according to this formula:

$$\text{surplus} = (\text{total votes received}) - \text{threshold}$$

If more than one candidate has a surplus, determine which candidate has the largest surplus. In the case of a tie for largest surplus, refer to the “Ties” section at the end of these directions before proceeding further.

If one or more candidates has a surplus, go to Action 3e.

If there are no elected candidates with surpluses, then determine which candidate has received the least number of votes. Again, if there is a tie, refer to the section “Ties” at the end of these directions before proceeding further.

Go to Action 3f.

**Action 3e:** *Transfer votes from the largest surplus.*

In this action you will effectively distribute the surplus votes of the candidate with the largest surplus (which you have identified in Action 3d.)

Surplus votes must be transferred at a *fractional value* of their prior value.

At the onset of tallying, one ballot equals one vote in every case. When ballots transfer from a surplus they never transfer with a value of 1, but always with a value of some fraction of their prior value. If a ballot has already been transferred from a candidate’s surplus, then it will have a fractional value already. Whatever value a ballot had on the last round (if this is the first round, it will automatically have a value of 1), that *prior value* will be multiplied by a fraction in order to get the *new value*. Here is how you calculate the new value for ballots being transferred from a surplus:

$$\text{fractional value} = \text{surplus}/\text{total votes received}$$

Then calculate the ballots’ new value as follows:

$$\text{new value} = \text{fractional value} \times \text{prior value}$$

The new value will *always* be a fraction of the prior value.

Write the new value on each of the ballots in the tray of the candidate whose surplus you are to distribute. For some ballots there may be more than one fractional value marking on the ballot. The fraction with the smallest value will always be the current fractional value.

Place each ballot into the ballot tray of the remaining candidate ranked highest on the ballot, being sure *never* to transfer votes to a candidate who has been either elected or eliminated.

If there are no remaining candidates indicated on a ballot, then that ballot gets transferred to the exhausted tray.

For purposes of calculating the checksum, it is important to remember that once a candidate’s surplus has been transferred, that candidate needs to retain a value of votes equal to the threshold. This only exists on your tally sheet, not in the actual ballot bowl or pile. As always, the checksum itself should tell you whether you have performed this correctly or not.

Go back to Action 3a.

**Action 3f:** *Eliminate lowest vote getter.*

In this action you will distribute all of the votes of a candidate who has just been eliminated. This will be a candidate who, on the last round, had received the least number of votes which you have identified in Action 3d).

Each ballot from an eliminated candidate will be transferred at the full value it held on the last round. This may be either one whole vote, or a fractional value, if the ballot has been transferred from a surplus already. It may also be a fraction of a fraction of a vote, if the ballot has been transferred as a surplus more than once.

Take all of the ballots from the eliminated candidate's pile, and place each ballot into the ballot tray of the highest ranked surviving candidate on the ballot. If there are no remaining candidates indicated on a ballot, then that ballot gets transferred to the exhausted tray.

For purposes of performing the checksum, in contrast to the situation described in Action 3e above, an eliminated candidate retains *no* votes whatsoever after his/her ballots have been transferred.

Go back to Action 3a.

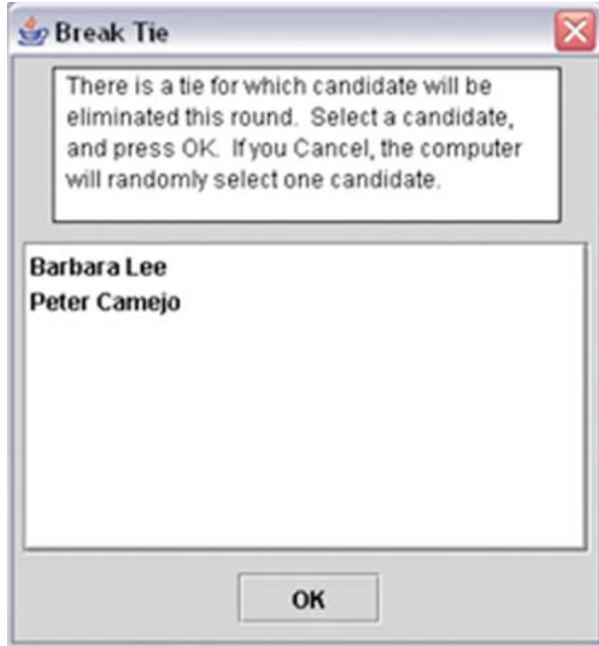
## **Ties**

There are two situations in an STV hand tally where you may be confronted with a tie. By far the kind of tie most likely to be significant to the outcome of an election is a lowest vote-getter tie.

The other kind of tie occurs when two or more candidates have the identical number of surplus votes. The Pacifica Bylaws are silent on the matter of how to resolve ties between surplus vote values, quite possibly based on the assumption that the sequence must be irrelevant. EWG has determined that the sequence in which surpluses are transferred can, in some instances, affect the outcome of an election. Consequently, we feel there must be a procedure set in advance for dealing with this situation as it arises. For tied surpluses our recommendation is that you use the previous round method. Look on your tally sheet to see which of the tied candidates had the most votes on the previous round and transfer that candidate's surplus first. If there is a tie as well in the previous round, go to the round prior to that to resolve the tie. If the tie occurs on the first round, use a random method such as coin toss, drawing straws, or picking names from a hat.

The Pacifica Bylaws are clear on how to break a tie for last place. Article Fifteen, Section One A5 d states: "If there is a tie as to the candidate with the least number of votes, the candidate to be first eliminated shall be decided by drawing straws."

This generally rules out using the previous round method for low vote getters in hand tallies. In the event that a computer cross check is being performed, CP Pro will use the previous round method where applicable. When CP Pro is unable to resolve the tie using previous round, it will present you with a choice for resolving the tie with a message such as this:



If you are performing a computer cross check, likely with CP Pro, you would optimally want all ties resolved in perfect conformity between the hand and electronic tallies. Because changing the way CP Pro works is not a ready option, and because the Pacifica Bylaws must legally determine how election procedures are carried out, simply ensure that the hand tally serves as the tally of record, and make clear via written and oral announcement that the software tally may not resolve some ties according to tally methods prescribed in the Bylaws. The EWG sees no alternative to this solution until either the software is updated, or the Pacifica Bylaws are amended.

#### Footnote

1. Computer programmers may recognize Step Three in its entirety as a loop algorithm. Action 3b essentially asks the question “Is the election complete?” If the answer is yes, then you exit the loop. If the answer is no, then you go through the loop again. Fortunately, you don’t need to be a computer programmer to perform a hand tally.