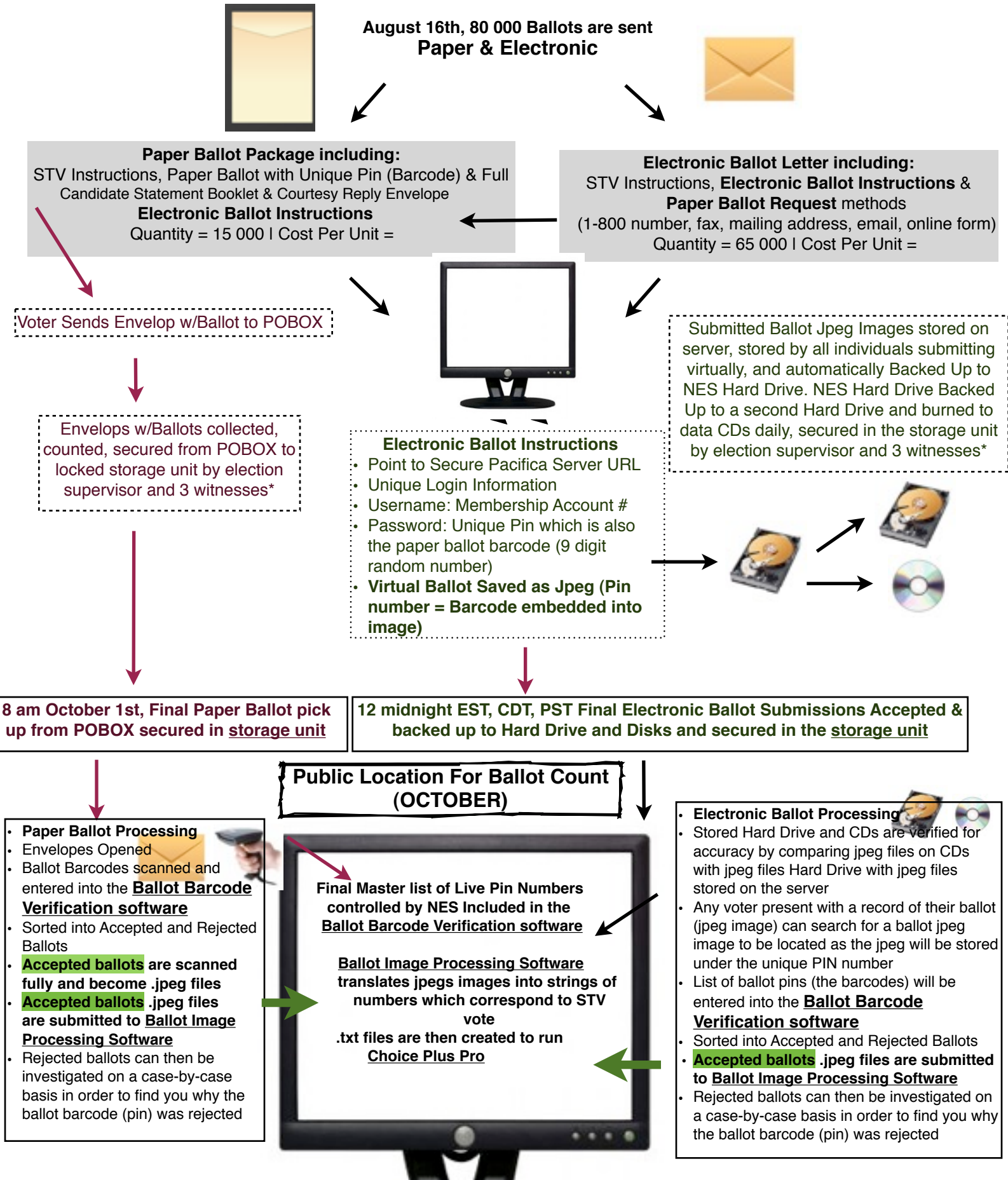


Introduction:

- We have been developing an integrated Paper-ballot & Electronic Ballot System for Pacifica's 2010 Election.
- This model is presented visually. See Paper Ballot & Electronic Ballot System Model (page 2)
- For a step by step description see Paper Ballot & Electronic System - Step by Step (page 3)
- Both paper and electronic ballot system have problems. The integrated system would minimize the problems associated with either method. See page 3 for a discussion of problems and solutions
- Before this model is implemented, we would have you test a pilot.
- Compared to last year's budget (82 000\$ spent on printing and mailing not including WBAI's reissue), we will save about 45 to 50 000\$ on printing, mailing and manual labor costs by using this method.

Image 1: Integrated Paper Ballot & Electronic Ballot System Model



Paper Ballot & Electronic System - Step by Step

0. Approximately 15 000 paper ballots (ballot and candidate package) and 65 000 electronic ballots (a letter with instructions, unique pin etc) would be mailed out. The 15 000 who would get the paper ballot default would be based on the list of people who voted last year who voted in last year's election are who are more likely to need the traditional ballot. Note anyone who received an e-ballot and would need a paper ballot would just need to request one.

1. Voting members will be sent a letter which includes e-voting instructions & paper ballot request instructions (contact information 1800 number, address and fax to get a paper ballot & candidate packages)

2. The instructions will include a URL where the member will login to a secure site using their membership number (aka "username") and their unique pin (aka "ballot barcode")

3. Once they login they will be presented with a tutorial on how to fill out their ballot (either simple instructions or an actual animation)

4. They have the option to skip these instructions and jump to casting their vote

5. The virtual ballot interface will look exactly like the paper ballot

6. It will include the pin number in the lower right hand corner of the ballot and be associated to a barcode image (only symbolic in purpose).

6*. The pin will state with 2 letters which define the station and if the ballot is listener or staff (eg. KPFA Listener pin would be AL092837569 - KPFA Staff pin AS908475637)

7. They can rank the candidates by simply by using the mouse to click the box associated to the position desired

8* The candidate names will be hyperlinks which lead to their candidate questionnaires, statements and bios

8. They will be able to create any pattern of choices EXCEPT they will only be able to rank any individual candidate once (can't check position 2 and position 7 for candidate X - as this makes no sense)

9. They will be able to save their vote prior to submitting (a little button at the bottom for "save")

10. They will be able to logout and come back to continue their vote.

11. There will be an option to receive an email notification if they have not submitted their vote and would like to be reminded (optional)

12. Once they submit (little button "Cast your Vote") they will no longer be able to make changes

13. When they submit they have the option to print out and save as a jpeg

14. Once the ballot is submitted it will be saved on the server as a jpeg

15. The name of the jpeg will be the ballot pin (or ballot barcode)

16. If they have made any errors and they would like the opportunity to resubmit they can simply contact the national election supervisor who will control the list of live barcodes

17. Come the count day the paper ballots will be scanned and saved as jpegs

18. The virtual ballot jpegs and the scanned paper ballots will be processed by Bing's software which translated images into strings of numbers corresponding to a given voter's ballot choices

19. The strings of numbers together with the other files needed to run prochoice plus will be created

20. Prochoice plus will run the STV calculation

21. Results, raw ballot files (jpegs) will be made publicly available

22. Individuals will be able to verify their virtual vote by searching for their virtual ballot (their pin number is the jpeg name, pin number embedded into the jpeg image, symbolically associated to the barcode)

Potential problems with mail-in and electronic voting:

Both forms of voting have potential problems, but we can take steps to minimize them. Real problems arise when (as with some electronic voting systems used in national, state, and municipal elections) no real steps are taken to deal with these matters such as fraud, secret/proprietary software, unverifiability of votes, etc. Paper ballot boxes also have a very long and unfortunate history of fraudulent ballots getting counted.

Paper ballot voting has some disadvantages that electronic voting does not have, and that's why we want to give Pacifica members a choice in how they vote.

Paper ballots can be lost (either in the mail going to or from a member, or at the home of a member) and might not be replaced in time if only discovered at the last minute.

Paper ballots can be fraudulently padded with improper ballots if steps are not taken to ensure that duplicates are not allowed, if only a single person collects ballots from the PO box with no oversight, etc.

Some paper ballots in every Pacifica election have also been unclear as to a voter's choice, when for example a voter mistakenly marks a choice he/she does not want and does not make it clear what his/her real choice is. (An example might be to rank a particular candidate both 1st and 10th, with no notes written on the ballot how with the election supervisor know which ranking the voter wants?)

Here are some ways we'll be able to verify ballots and prevent problems at least as well as with all-paper voting, and in a much more thorough manner than with national electronic voting systems:

- * We'll validate that the voter is a member.
- * We'll validate that each voter can vote only once (paper or electronic).
- * We'll use a secure connection (SSL) to the web server used for voting, and voting will NOT be by e-mail (which is inherently insecure).
- * Immediately after a member votes online, he/she will get a confirmation number/ballot code and instructions to save that number so the ballot can be verified later if desired.
- * We'll publicly post all ballot images on a web site, with the ballot identifier/ID/bar code number as part of file name to make it easy for any voter to verify that his/her ballot was received.
- * We'll publicly post all output files of the ballot scanning/processing software, in a text file with each record associated with ballot number/ID/bar code (input to Choice Plus Pro). This allows anyone to verify that the ballot image (from the previous step) was properly processed and the voter's choices were identified correctly by the software (or manually in case of ambiguity).
- * We'll publicly post all output files from Choice Plus Pro (the software which takes the text files above with ballot information, and performs the STV counting of them) - round by round election results will be posted.
- * We'll use open source software, and publicly post it, for both the ballot image processing software, and for the vote counting software (Choice Plus Pro) so that anyone with a computer programming background can verify that software is correct, and in fact can even duplicate the vote counting using the publicly posted ballot images.
- * We'll make frequent backups of files, and with each ballot also stored on two different disk drives as soon as a member votes.
- * Although highly unlikely that we will need this we will have a plan B if we are hacked by setting up the online voting system on a second secured server in case we are victim to a *distributed denial-of-service* (DDoS) attack.