Ballot Photography for Vote Count Audits
Michigan Election Reform Alliance.Org
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The original vote counts in an election may be audited for accuracy by first photographing the voted ballots, along with the poll book, ballot containers and their tags and seals. This document provides guidance on photographing ballots to help ensure an accurate and efficient vote count audit. The central aim of the photography is to create a clear digital record that matches photos to the voted ballots one to one. A second aim is to allow multiple observers to participate in the audit count without being in the physical presence of the ballots, and thus to facilitate highly accurate vote count results.

Equipment

Essential equipment includes:
1. A high-definition digital camera with photo counter,
2. A tripod that can be set to three feet high or less for table top use, and
3. A bright desk lamp in case the area designated for photography lacks adequate indoor lighting.

Use a camera that can take shots and recover for the next shot quickly. Use of an indoor flash is not advisable since it will take longer and rapidly use up batteries. Bring a backup battery and second memory card in case the first is exhausted. Both can be reused. Batteries should be fully charged before each session (ballot sets are usually large – up to around 3000 is possible). Memory cards can be erased and used again after the data have been downloaded to a computer file.

The digital camera enables computer management of large amounts of photographic data and enlargement of computer views (zoom in) if needed. Most digital cameras will be adequate. A rated resolution of at least 12 mega pixels is recommended with a good lens and the ability to focus sharply at three feet from target or less. It may be desirable to use a camera that can focus at one foot or less, so the photographer can view the

monitor while seated and thus avoid standing for long periods. The photo counter provides a way to uniquely identify each photo and facilitates the audit's accounting of a one-to-one match between the photos used by the audit and the voted paper ballots. The tripod helps to prevent blurring and create uniform ballot photos.

Ballot Container Seals and Tags

If possible, take photos of the ballot containers, and their seals and tags, before starting on ballots. Take close-up photos of seals and the certificates in the tag holders.* The type of seal should be easy to discern from the photo and the signatures on the tagged certificates should be clearly visible. These measures will create photo identifiers for each set of ballot photos (usually, for each precinct or group of absentee ballots) and assist review of chain of custody of the ballots. Poll books may be photographed separately.

Set Up

Mount the camera on the tripod and set them on the edge of a table. There should be sufficient space to place a ballot in the target area for photographing and manage two piles of ballots (incoming and outgoing) next to it. Set the tripod at a height that allows the photographer to easily view the camera's monitor and controls.

Prepare a small file card or piece of paper by writing "duplicate" on it in bold marker. Set the "dup" marker next to the tripod in easy reach but outside of the target area. (See "Duplicates" below.)

For ballots that are on longer paper (approx. legal size) some cameras can be set to use landscape mode, some can simply be rotated 90 degrees.

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*Ballots do not have to be stored under seal after they have been legally released (30 days after certification). They might not be sealed when the photographic team arrives, as the Clerk might have needed the containers for another election and put the older ballots in boxes for the remainder of the retention period. If there are no tagged

certificates, write the identity of the ballot batch on a piece of paper and take a photo of it before starting on the ballots.

Be sure the target area is completely inside the camera's scope and clearly focused. Tape can be placed on the table top to mark the target area. Using a fixed focus may help to speed up the work, even if the camera takes only a second to auto focus. A fixed focus will also help to avoid blurred shots, which can result from pressing the snap button a fraction of a second too soon while the camera is still focusing.

Ballot Photography

Plan to photograph a complete set of ballots (precinct, absentee batch, etc.) during each session. If you have to come back again to finish a set, the opportunity for error will increase. You will then have to improvise with the clerk's office a way of reliably marking the audit's place in the set to start from next time. The ballots should be securely stored between photo sessions, such as in a locked cabinet.

The photographer should bring an assistant in case the jurisdiction's Clerk allows handling of the ballots other than by staff. If the photographer's assistant is not allowed to handle ballots, there are other ways to assist (see below).

The ballot handler will place each ballot in the designated area. The photographer should check each time to be sure the ballot is fully in the picture and in focus, before snapping the shot. After the shot, recheck it to be sure there is no blurring and nothing on the ballot is left out.

> *Duplicates*
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> It is almost inevitable that some shots will need to be retaken for clarity or completeness. When the need arises, place the "dup" card or paper next to any subsequent shots of the same ballot so the duplicate label is clearly visible in the shot but does not obscure any portion of the ballot. When a clear shot has been achieved, proceed to the next ballot.

Ask the ballot handler not to move a ballot out of the target area until the photographer has given the OK.

Either the photographer or the assistant should keep a count of the number of duplicates taken for each session or ballot batch.

The "dup" label helps to ensure accurate ballot accounting when the audit reviews the photos (see below).

If he or she is not handling ballots, the photographer's assistant can a) spell the photographer occasionally (many of us can't stand comfortably for hours at a time), b) keep track of the number of duplicate shots taken, or even c) keep count of the number of ballots photographed. If the photographer's assistant does handle the ballots, the pair may still want to switch roles from time to time to avoid fatigue and the errors it can lead to.

Volunteer photographers and their assistants should take some time to practice the basic routine of shooting ballots so that it is familiar and comfortable and they are ready to go at the beginning of their appointment for ballot photography. Both should be familiar with how to use the camera selected for the purpose.

Photographing Ballots from a Michigan Primary

In Michigan one may vote for only one party in a partisan primary election. If even a single vote is marked for a second party ("cross over" vote), all votes on the partisan portions of that ballot must be discounted. Hence, in photographing partisan primary ballots the record must be sufficient to identify cross over votes so they can be discounted.

If the partisan sections of a primary ballot spill over to the back of the ballot, then the back should be photographed immediately after the front (or any duplicates of the front). Then it will be possible to discern when cross over voting has occurred.

Ballots with cross over votes should not be counted for either party. However, It is still necessary to photograph the ballots. While those

partisan votes are not valid, the ballots are still, technically, "voted" ballots, even if there are no other votes marked.

Shooting ballot backs all together will not reliably lead to an accurate way of identifying cross over ballots. It's too easy for the ballot order to get shuffled between shooting fronts and back.

If the entire partisan ballot is on one side and only non-partisan contests are on the other, and the audit is not concerned with the non-partisan ballot, then photographing the non-partisan side can be skipped.

Ballot Accounting

When a complete set of photos has been taken for a precinct, ward, or other ballot batch, the number of the final photo as set by the camera's counter can be reconciled with the clerk's data on the number of voted ballots in the set.

Method 1: For a) any election with ballots that use only one side, or b) a general election with two-sided ballots if the audit is only concerned with races on one side, or c) a primary election with two-sided ballots if the partisan portions of the ballot are entirely on one side the audit is only concerned with that side.

> Where C_F is the counter number of the *final* ballot photo, C_1 the counter number of the first ballot photo, D the number of duplicates taken, and N the number of voted ballots according to the clerk's record, the following should hold:

$$N = C_F - C_1 + 1 - D$$

Method 2: For a primary election with two-sided ballots, if partisan portions of the ballot appear on both sides or partisan portions are on one side only but the audit is concerned with the other side as well.

> With variables defined as in Method 1:

$$N = (C_F - C_1 + 1 - D) / 2$$

If the formula doesn't balance, then recheck D (the number of duplicates). If it still doesn't hold, it may be desirable to count the number of voted ballots by hand, if the Clerk will permit this. Whether a separate hand count of the number of voted ballots is needed depends on the purpose of the audit.* In any case, don't throw out the photographic data. Discrepancies between ballot totals are not uncommon in audits. When chain of custody has been breached, even large discrepancies in ballot totals can arise. (See [Are Michigan's Elections Trustworthy?](http://michiganelectionreformalliance.org/AlleganAudit.pdf)
http://michiganelectionreformalliance.org/AlleganAudit.pdf)

Report to the Audit Administrator

After a session, download all the photos taken to a computer file. Label the file with the name of the jurisdiction, precinct and ward numbers, or absentee count board number, and election date. If there are smaller batches within a precinct, ward, or board, include the batch number as well. Make a separate backup of the file. Then transmit the photo file to the audit administrator (e.g. via Dropbox or other cloud service, or by data disk, external thumb drive, or external hard drive). Do not in any case try to email the photo file, as it will be far too large to arrive intact or even be sent by most email servers.

Along with the photo file, transmit a report to the audit administrator. Include your ballot accounting in your report and any comments that may be in order, e.g. about anomalies encountered, problems, whether fixed and how, advice for subsequent sessions, etc.

Memory cards should be erased before any subsequent session and batteries recharged.

The audit administrator will need to use a computer with adequate speed and memory for the task (e.g., a reasonably good desk top) and with a photo manager installed, such as Windows 7 Photo Manager. The zoom function is crucial.

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*For a full recount of a particular election race or ballot initiative, discrepancies in voted ballot totals can invalidate the entire recount. For an audit that uses sampling procedures, such discrepancies may or may not vitiate the audit.