AutoMARK Accuracy Verification Procedure
Version 1.1

This procedure will verify that the ballots under test are printed to proper specifications, and that the AutoMARK is accurately printing marks within the mark detection tolerances of the ES&S paper ballot tabulators. You will need blank ballots with a matching AutoMARK election definition memory card, and an AutoMARK Print Accuracy Verification overlay of the proper length.

Aligning Ballot with Accuracy Overlay

1. Print a ballot on the AutoMARK by using the Test Print feature in diagnostics, or individually voting each contest using the normal contest screens in vote mode.
2. Place the ballot under the overlay. The right edge of the ballot should be aligned with the dashed lines and trim marks that represent the right edge of the ballot. There is a comment "Hold Ballot on this Edge" on the overlay with an arrow pointing to the appropriate dashed line.
3. Align the top edge of the ballot with the top trim marks or dashed line on the overlay that represents the top edge of the ballot.

Horizontal Alignment Verification

Since the horizontal position of the tabulator's mark sensors are relative to the right side of the ballot, it is important to ensure that the ballot remains in alignment with the overlay throughout the verification procedure.

4. You should first verify the proper position of the ovals themselves. In each column of the ballot, verify that the ovals are within the clear space inside of the gray boxes. If the ovals extend left or right into the side of the gray box, the ballot was not printed within proper tolerances. If this is the case, verify that the ballot is still aligned with the right edge of the overlay. The figure 1 shows examples of good and bad horizontal oval alignment.

The first oval is within the clear area of the gray box. The second oval fails because it extends horizontally into right side of the gray box.

Figure 1

5. Once you verify that the ovals are within tolerances, you can then check the position of the marks printed by the AutoMARK. This is accomplished by comparing the position of the marks to their respective Valid Mark Zones. The Valid Mark Zones are the vertically oriented ellipses that are located within the gray oval verification box. To verify the horizontal placement of the mark, the mark should span the entire width of the Valid Mark Zone. Figure 2 shows examples of good and bad mark alignment.

The first mark spans the width of the Valid mark zone. The second mark fails because the left edge of the mark is within the left edge of the mark zone.

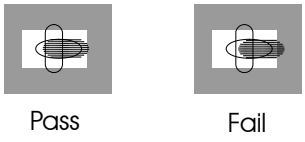

Figure 2

Vertical Alignment Verification

Vertical alignment must be checked on a row-by-row basis because the row spacing on the ballot can vary slightly from the spacing on the overlay. The ballot image may be stretched or shrunk slightly when it is printed, and the paper itself can expand or shrink if the humidity conditions are different than when the ballot was actually printed.

6. Since the tabulators relate the position of the mark to the timing tracks running down side of the ballot, you must ensure that the ballot is set vertically in the overlay so that the timing mark in the row you are checking is centered in its respective alignment box. If you align the top edge of the ballot with the top of the image on the overlay, it should be pretty close, but you may have to make slight adjustments when checking each row, particularly if the ballot and mark printing are questionable. This is shown in figure 3. In the first row the mark in channel C appears to be out of tolerance, but the timing mark on the left is not centered. When the timing mark is properly centered as shown in the next row, the mark in channel C is now within tolerances.

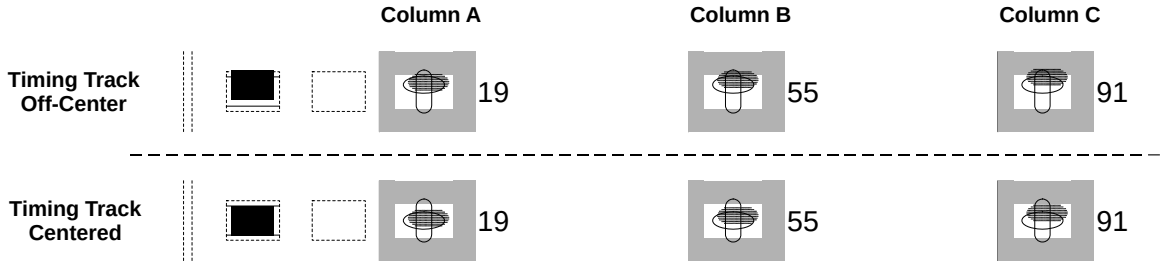

Figure 3

7. Once the timing mark is properly centered, check the vertical alignment of the ovals in each column to make sure the oval is not touching the top or bottom of the gray box. On most ballots, the ovals and timing tracks are printed at the same time, so the vertical alignment of the ovals is almost guaranteed. Small image skewing can make the oval a little off center, but never enough to take it out of alignment. Figure 4 shows examples of both good and bad vertical oval alignment.

The first oval is within the clear area of the gray box. The second oval fails because it extends into the lower section of the gray box.

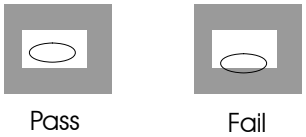

Figure 4

8. Now check the vertical alignment of the marks. As long as the mark is within the vertical confines of the Valid Mark Zone, the mark is within tabulation tolerances. Figure 5 shows examples of both good and bad mark alignment.

The first mark is OK because the bottom edge of the mark is above the bottom edge of the zone. The second mark drops below the lower edge of the mark zone and fails accuracy verification..

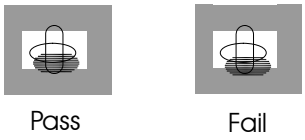

Figure 5

9. The procedure is now complete. If any ovals extend beyond the inside borders of the gray box, you ballot printing process must be evaluated for problems. If an AutoMARK ever prints a mark outside of the Valid Mark Zone, the ballot must again be checked to ensure they are within proper tolerances. If the ballots appear OK, then the AutoMARK requires servicing.