



MAINTAINING VOTER CONFIDENCE.
ENHANCING THE VOTING EXPERIENCE.

Model 650

Best Practices Manual

Version 1.0

Election Systems and Software, Inc.

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MAINTAINING VOTER CONFIDENCE.
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Our Mission

Our Mission is to support democracy worldwide by providing proven, accurate, and innovative election systems and services to voters and election officials.

Our Vision

Our Vision is to continuously improve and grow our integrated total election solutions that provide "Better Elections Everyday." We will accomplish this vision with an uncompromising commitment to customer satisfaction and integrity within the election process.

Who We Are

ES&S is a company of dedicated people building integrated systems and developing solutions for the election official's total management needs:

- Election and voter registration management software
- Ballot counting and tabulation hardware
- Election information management software

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Chapter 1: Introduction

This manual has been designed as a set of Best Practices with the ES&S Model 650 central count scanner. It is comprised of guidelines and suggestions that have been proven effective in improving performance and through put of the machine. Use these guidelines and suggestions when you plan your election, perform maintenance, prepare for an election, and as you utilize the Model 650 for absentee and Election Day tabulation.

This manual is comprised of the following sections:

- **Proactive Decisions Impacting Performance**
- **Setting Unit Appropriately**
- **Selection and Training of Skilled Operator(s)**
- **Optimal Ballot Use**
- **When and How to Use Folded Ballots**
- **Ballot Preparation**

The ES&S central count system combines decentralized pencil-and-paper voting with centralized automated ballot counting. The centerpiece of this system is the ES&S Central Ballot Scanner: a high-speed, computerized, optical mark reader.

Voting takes place at various locations within a precinct. After the polls close, poll workers put ballots into a locked ballot box. They take the boxes to the central vote-counting location and count them using ES&S Central Ballot Scanners.

Note: Jurisdictions can also use central count scanners in a system with precinct counters, to count early vote and absentee ballots.

In addition, ES&S is seeing a shift from central count to precinct count on Election Day for many of our clients. Model 650s are being used almost exclusively for processing of early or absentee voting. Absentee ballots traditional have folds and are slower in processing than an Election Day ballot and thus magnifying the perception that the Model 650 is no longer performing like it did historically when it simply counted clean, unfolded Election Day ballots.

Election laws and procedures vary from state to state. Use the information in this guide to develop election administration procedures for your jurisdiction.

Contacting ES&S for Technical Support

This operator's manual should aid you in accomplishing most central scanner-related tasks. However, if you need additional assistance, or if you encounter a processing problem or system error, ES&S's technical support staff can provide advice and help you resolve the situation.

When you contact ES&S for technical support, please be near your scanner. In addition, be prepared to provide the following information to the support representative:

The model number of the product you are using.

The exact wording of any messages that appeared on your scanner.

A description of what happened, what you were doing when the problem occurred, and how you tried to solve the problem.

Support representatives are available between 8:00 a.m. and 5:00 p.m. Central Standard Time, however, support hours are extended during election periods.

You can contact an ES&S support representative in several ways:

Telephone: 800-247-8683 (USA & Canada) or 877-377-8683 (hardware related questions)
402-593-0101 (International)

Fax: 402-593-8107

Mail: Election Systems & Software
11208 John Galt Blvd.
Omaha, NE 68137 USA

E-Mail hardware@essvote.com

Chapter 2: Proactive Decisions Impacting Performance

Ordering Supplies Prior to an Election

This section describes the supplies needed to prepare the scanner for Election Day.

ES&S recommends keeping the following supplies on hand for each ballot scanner. **To order new or additional supplies, contact a representative at 1.800.247.8683.** Allow four weeks for delivery.

Item	Description	Quantity Recommended
Pick Belt	These are about four inches in diameter and look like very thick rubber bands. If ES&S is programming your election, these belts will be sent with the election definition. Only order from ES&S.	Two
Retard Pad	These thin, oval, rubbery pads are about one inch wide. Only order from ES&S.	Two
8.5" x 11" Continuous Feed, Three-part Paper	ES&S recommends that the printer paper be carbonless to avoid smearing. If you will be using the Election Reporting Manager, one part paper may be used.	Two Boxes
Pressurized Air Cans	Used to clean the sensors.	Two
Cloth and Isopropyl Rubbing Alcohol	Used to clean the rollers	One Bottle
Small White Adhesive Labels – ½ inch Wide	Use these labels to cover stray marks on the ballots. Only use labels from ES&S.	12 Sheets
Zip Disk	These should be FAT or FAT16 formatted disks. Warning: New Zip Disks come FAT 32 formatted. If you buy FAT 32 zip disks you must reformat them to FAT or FAT 16 before you use them in the Model 650.	Three
Marking Devices	The Model 650 is designed to handle many marking devices, however, ES&S recommends using either an ebony pencil or the Optech Ballot Marking Pen for best results.	Varies
Spare Printer Ribbon	Use this for a backup ribbon on your PC printer. Refer to the printer manual for the type of ribbon, or call ES&S.	One per Printer

Replacing the Pick Belt

For the best results, replace the pick belt before each election. The pick belt grabs, or “picks,” the top ballot and moves it into the read area. As the belt becomes old and worn, multiple ballots may pass through the scanner at once, causing the scanner to jam and stop processing ballots.

To replace the pick belt

1. Pull the worn belt off the right-hand roller, and then remove it from the left-hand roller.
2. Stretch out the new pick belt as you might stretch a balloon before inflating it.
3. Loop the belt around the left roller and then around the right roller until it fits into place.

Setting Up a Conducive Operating Environment

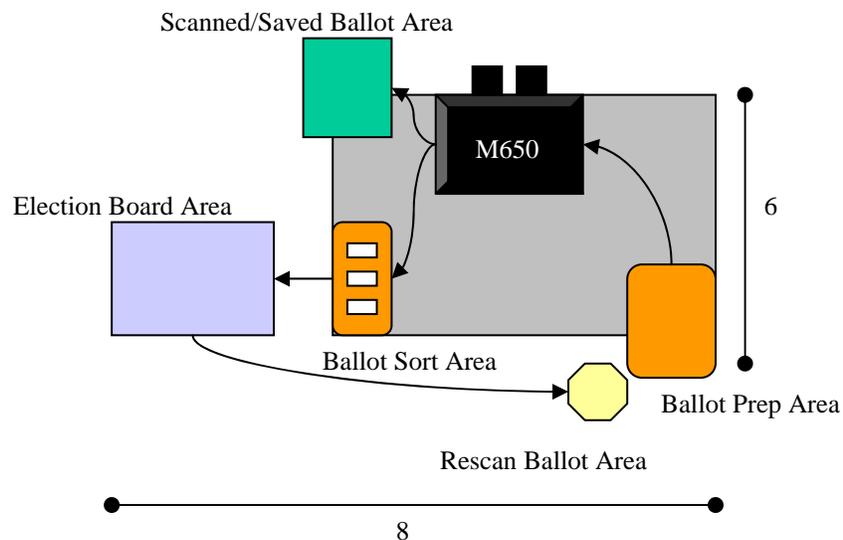
Ballots can be read on the Model 650 most efficiently when taking the environment and setup of the work process into factor.

Equipment and Workflow Set-Up:

The M650 needs to be set up in a restricted area with minimal traffic.

Appropriate room behind the scanner is necessary for the printer paper boxes and output.

Many equipment configurations are possible, below is one layout that proves to be effective in processing ballots.



Ballot Prep Area: Ballots are being removed from ballot boxes or envelopes and prepared for scanning.

M650 Operation: Scanning of ballots.

Ballot Sort Area: Sorted ballots are being placed here in labeled trays for Election Board review.

Scanned/Saved Ballot Area: Finished ballots are being stored.

Election Board Area: Board is retrieving sorted ballots from the trays and determining the next action according to state and local regulations.

Rescan Ballot Area: Election Board is placing the ballots to be rescanned after correcting the problem.

Utilizing Appropriate Marking Devices

The selection of the appropriate marking device improves the efficiency of ballot tabulation and decreases the impact of marginal marks. This is especially true for those using visible red light machines.

Making the appropriate device available or communicating it to those who will be participating in early or absentee voting is as important as the selection. **Appendix A** is a full matrix outlining recommended marking devices. Specific recommendations for the Model 650 are:

Recommended Precinct Device - VL Ballot Pen: BIC Grip, Roller ball, Black .7mm tip, Part # 6100

Alternate Precinct Device – Felt Tip Pen, Eberhard, Raber, Felt Tip Pen, Part #00505

2nd Alternate Precinct Device – Precinct Pencil, Sanford Design, Ebony Jet Black, Extra Smooth, Part # PS-PP

Absentee Marking Device – Absentee Pen/Pencil, Spearhead Pen, Part #00500 or pencil, Part #00540

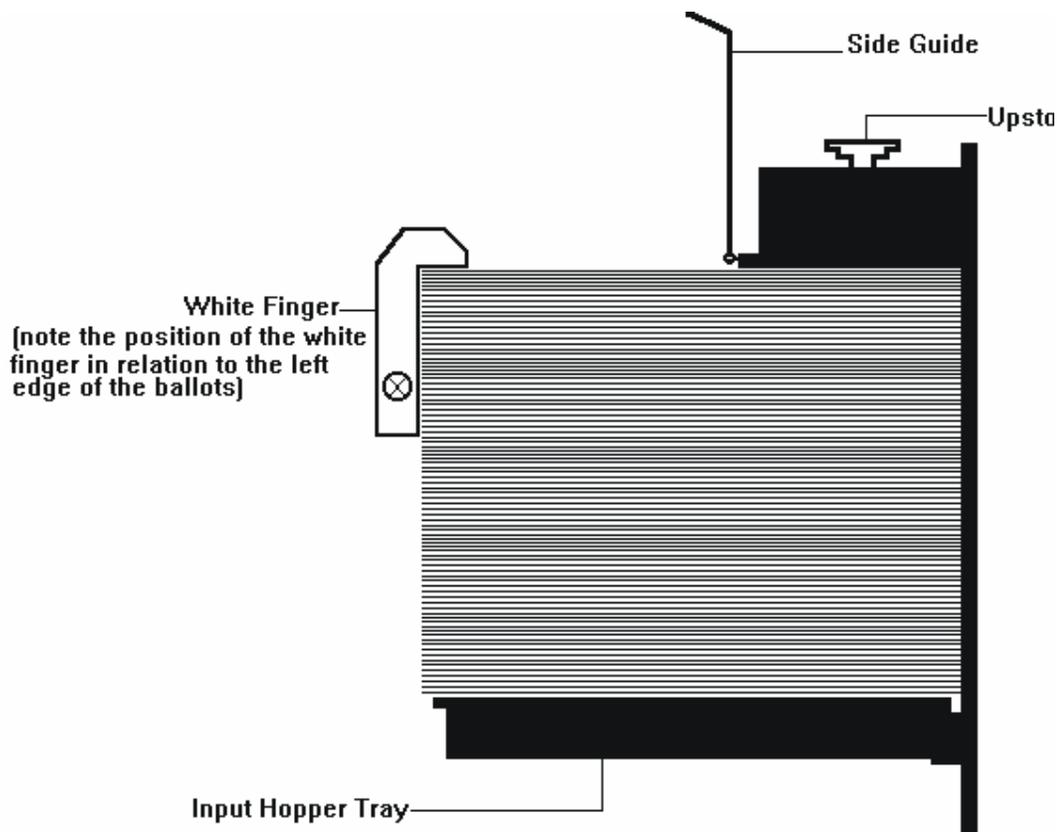
Chapter 3: Setting Unit Appropriately

Making sure that your unit is set up appropriately increases the likelihood of maximum efficiency and throughput.

Adjusting the Input Hopper Tension

Make sure you keep tension on the input hopper tray as consistent as possible. The tray should have the same amount of spring tension whether it is holding three ballots or three hundred. It is impossible to achieve truly consistent tension but you should try to come as close as possible.

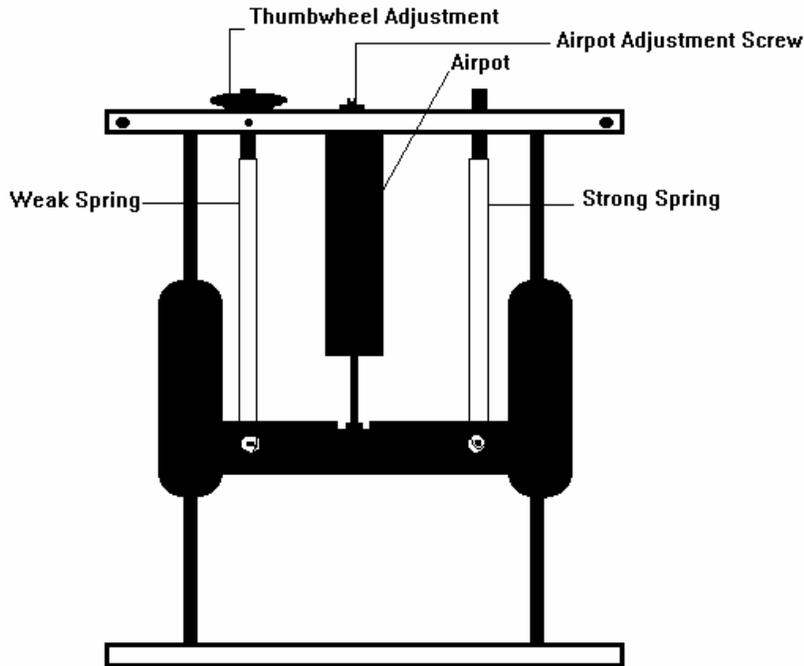
Note: Make sure that spring tension is not set too strong when there are a small number of ballots on the tray. If the spring is set too strong, ballots will feed poorly or not at all.



Spring tension on the input hopper has a dramatic effect on the way the 650 functions. If tension is not set correctly, the scanner will function poorly or not at all.

To adjust spring tension for the input hopper tray:

1. Adjust input hopper tension by adjusting the two springs that support the tray. Open the rear of the scanner and locate the spring assembly behind the input hopper. The weak spring is on the left and the strong spring is on the right. Use the small wheel at the top of the bolt attaching the weak spring to the hopper tray to make most of your adjustments.



Input Hopper Assembly (Rear View)

2. ES&S adjusts the input hopper tension when the scanner is manufactured, but the springs will lose some of their elasticity over time. Use the thumb-wheel to adjust the weak spring and reset the hopper tray to the correct tension.

Note: Never store the 650 with the input hopper locked in the down position. Locking the hopper tray down stretches and weakens the springs. Always store scanners with the hopper tray up.

3. Make sure that you turn at least 5/8-inch of spring into the grooves on the bolt for the weak spring. If you connect too little spring to the bolt, the spring may detach from the bolt when the hopper tray is lowered.

Note: 14", 17" and 19" inch ballots require different input hopper tensions. You must adjust the hopper tension if you change ballot size.

Checking the Paper Path

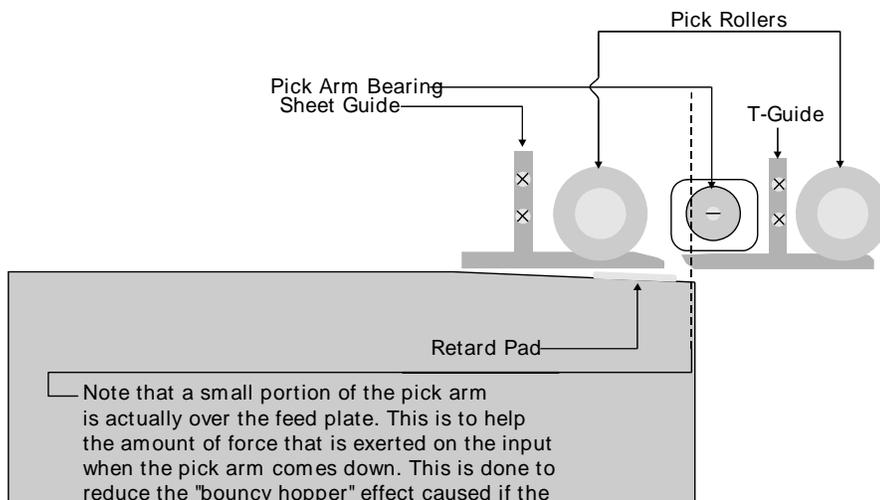
Clear the paper path of debris and dust paying careful attention to the following areas:

1. **Optic Sensors:** Paper dust builds on these sensors over time. Use compressed air or alcohol and a clean cloth to clear paper and dust. ES&S does not recommend using other liquids or solvents on the optic sensors.
2. **Main Paper Path:** This is the path that the ballot takes along the main plate as the drive and pinch rollers transport it through the scanner. Paper debris can build up in the crease created where the main plate meets the feed plate. Keep this area clean and free of build up.

Adjusting Paper Guides

Adjust the following three paper guides:

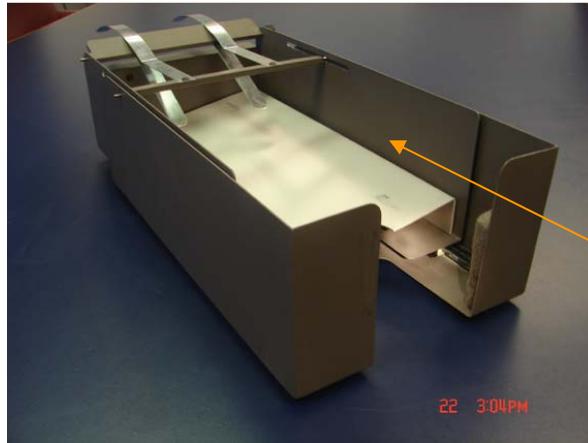
- **The white finger guide:** Place the finger guide as close to the left edge of the ballot stack as possible without physically touching it. If you place this guide too close, it will pinch the ballots and cause feed errors. If you place it too far from the ballots, the guide will cause code, row or black-check errors.
- **The T-guide:** This guide is located behind the pick belt between the pick rollers. Adjust this guide vertically so it holds ballots slightly below the bottom edge of the pick belt. If you set this guide too high, the scanner will “stream” feed causing uncontrolled feed errors. If you set this guide too low the scanner will have difficulty picking ballots and pick errors will occur.
- **The sheet guide:** The sheet guide is located immediately in front of the first drive roller. Adjust the sheet guide vertically so that it smoothes ballots as they pass through the drive and pinch rollers. Set this guide to a gap of three or four ballots. If the guide is set too low, ballots will jam and the scanner will not feed properly.



Installing and Adjusting the Output Hopper

Line up the output hopper slide with its corresponding slot located on the left side of the scanner. Slide the hopper down making sure that the top edge of the hopper is below the feed path.

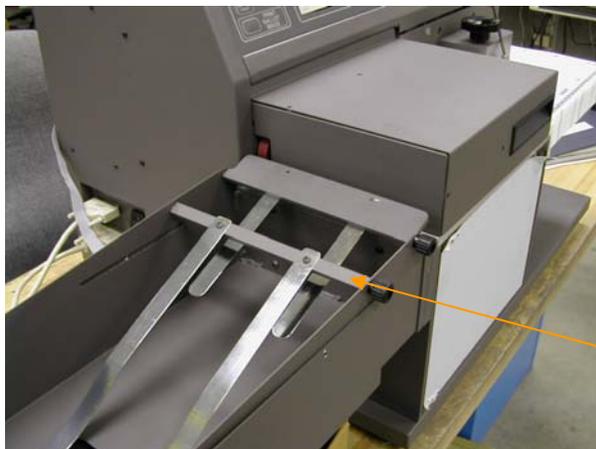
Using the slant tray when processing folded ballots, improves the throughput. Assure the slant tray is properly installed in the output hopper.



SLANT TRAY

Adjust the length of the output hopper to match the length of the ballots being used for the election. The hopper is adjustable to accommodate all ballot lengths.

Adjust the ballot guides to approximately 45°, making sure the two guides do not touch.



BALLOT GUIDES

Chapter 4: Performing Pre-Election Day Tasks

This section provides instructions for performing the following preparatory tasks:

- Pre-election maintenance on the pick belt, retard pad, rollers and fiber optic sensors.
- Loading the election definition.
- Testing the election definition.

Pre-Election Maintenance

In order to keep the scanner in working order, perform routine maintenance before each election. It is important that you unplug the scanner before performing these tasks and that you raise the read head to avoid damaging the control panel.



Warning: The power supply cord for this product should be routed or installed in such a manner to protect it from being walked on or pinched. Make sure you power the unit down completely before connecting or disconnecting the power cable. Remove the power cord before moving the unit. Place the power cord near an easily accessible unobstructed socket outlet.

Replacing the Pick Belt

The pick belt grabs, or “picks,” the top ballot and moves it into the read area. As the belt becomes old and worn, multiple ballots may pass through the scanner at once, causing the scanner to jam and stop processing ballots. For the best results, replace the pick belt before each election. (There is an effective use date stamped on the inside of each pick belt. Pick belts have a 6-month life span.)

To replace the pick belt

1. Pull the worn belt off the right-hand roller, and then remove it from the left-hand roller.
2. Stretch out the new pick belt as you might stretch a balloon before inflating it.
3. Loop the belt around the left roller and then around the right roller until it fits into place.

Cleaning and Replacing the Retard Pads

The retard pads should be light-colored and clean. The first retard pad is an oval pad found below the pick belt. The second pad is a square pad located on the input hopper tray. You should clean these pads regularly. If either pad is dirty or discolored, cleaning them may improve the performance of the scanner. Replace the retard pad below the pick belt if it appears worn or is not performing well.

To clean the retard pads

To clean either retard pad, wipe the area with a dry, cotton cloth to absorb any ink without smearing it.

To replace the retard pad

1. Use the small tuning screwdriver stored in the back of the scanner to lift the edge of the pad until it is above the metal surface.
2. Place the new pad into position beneath the pick belt with the flat surface down, and then pop it into place with the screwdriver.

Note: Make sure there are no exposed pad edges and that the pad is inserted flat surface down. Failure to properly insert the pad can cause ballots to jam and/or rip as the scanner feeds them through the transport.

Cleaning the Rollers

The rollers move the ballots through the read area and into the output hopper. If the surfaces of the rollers are dirty or discolored, clean them.

To clean the rollers, apply isopropyl-rubbing alcohol to a cotton cloth and clean the visible surfaces of the rollers, turning them as you clean to expose most of the surface area of the rollers.

Cleaning the Fiber Optic Sensors

The sensors are small devices (approximately 1/8 inch in diameter) that read ballots and detect paper jams. The sensors are embedded in metal plates in the read area.

To clean the fiber optic sensors, wipe them with a dry, cotton cloth or use a pressurized air can to clean out any debris or paper dust collected during scanner operation. It is important to hold the can upright so that you do not expel propellant onto the sensors.

Cleaning the Scanner



Caution: If it should become necessary to clean the scanner, disconnect the unit from its power source. Do not use liquid cleaners, aerosols, abrasive pads, scouring powders or solvents, such as benzene or alcohol. Use a soft cloth lightly moistened with a mild detergent solution. Ensure that the surface cleaned is fully dry before reconnecting the power.

Connecting the External Printers

Connect your printer(s) to the Model 650 to print reports on 8.5 x 11 sized paper. Refer to the printer manual for specific instructions on operating the printer.

To connect an external printer

1. Plug the printer cable into the external parallel printer port located next to the on/off switch on the side of the scanner
2. Plug the other end of the printer cable into the parallel printer port on the back of the printer.
3. Connect the printer's electric cord to a wall outlet.

Loading the Election Definition

Election coders create a new zip disk containing the current election information for every new election. If ES&S is coding your election, they will send the disk to you.

Note: Make sure you plug the scanner into a grounded, three-prong electrical outlet and that you only plug one scanner into a single wall or floor outlet at a time. Do not use an extension cord with the scanner. Use the power strip (with 6' cord) that ES&S sent with your scanner.

Warning: The power supply cord for this product should be routed or installed in such a manner to protect it from being walked on or pinched. Power the unit down completely before connecting or disconnecting the power cable. Remove the power cord before moving the unit. The power cord must be placed near an easily accessible unobstructed socket outlet.

To load a new election definition

1. Turn on the printers. Verify that the printer paper is loaded properly, and that the print head is at the top of the page. Refer to your printer instructions for guidance (the printer manufacturer's manual should always be kept in the drawer of the scanner stand).
2. Insert the zip disk with your election definition into the zip drive on the scanner. You must insert the disk *before* you turn the scanner on for the scanner to recognize that you are loading a new election definition.
3. Turn the scanner on. The message "Booting M650" appears.

The message, "Press Stop to Keep (Election Name 1) Press Start to Initialize (Election Name 2)" appears after the machine boots.

4. Press **START** to transfer the election definition files from the zip disk to the scanner's internal drive. The message "Confirm: Initialize Election? Press Stop to Cancel, Start to Continue" appears.

5. Press **START** to transfer the election definition file from the zip disk to the internal drive. The message “Initializing Election Files” appears. The next message reads, “Printing System Ready Report,” followed by a message which reads “Ready for Regular Counting.”

After you load the election definition, the ‘Ready’ light illuminates, and the scanner is in on-line mode. The report format is automatically set to short when the scanner starts.

6. Make sure the information on the Machine Readiness Report is correct. Contact an ES&S support technician immediately if the printed information is not correct for the current election.
7. Remove the zip disk with the election definition and store it in a safe place.



Caution: Do not reuse the election definition disk to store election data. Use blank zip disks instead so that your election definition can be archived. The election definition will remain on the machine until a new election definition is loaded.

Note: When you save results to a zip disk, you can use that results disk to load the election definition onto additional scanners. Initialization of these machines will be faster than it was when the election definition was loaded onto the first scanner. Make sure that you zero totals on any scanners for which you load the election definition with a results disk.

Testing the Election Definition

ES&S will provide a hand counted test deck for each election. A test deck is a stack of sample ballots that are marked and scanned at ES&S. The reports included with the test deck contain accurate results for the election definition sent to your jurisdiction.

Use the test deck to verify your election definition and to test scanner operation. Be sure to follow your local election laws regarding election testing. To test the election you will zero totals on the scanner and turn off the sort options, then run your test deck and check the result reports.

Zero Totals and Turn off Sort Options

Prepare the scanner before you run the test deck.

To zero totals and turn off sort options

1. Turn on the printer. Make sure the paper is loaded properly and that the print head is at the top of the page.

2. Turn on the scanner. An underscore character will appear followed by the message “Booting M650.” If you have not loaded the election definition, follow the instructions in the previous section titled “Loading the Election Definition.” A Machine Readiness Report will print if an election definition is already loaded and the zip drive is empty. The message, “Ready for Regular Counting,” will appear.
3. Check the Machine Readiness Report for accuracy. Contact ES&S if any of the printed information is not correct.
4. Hold down the **ENABLE** button and press **ZERO TOTALS** to clear the scanner. The message, "Confirm: Zero Totals? Press Stop to Cancel, Start to Continue" appears.
5. Press **START** then press **STOP**. The message “Ready for regular counting” appears.
6. Turn off any active SORT options by pressing the buttons in the SORT area until all the lights are off.
7. Press **SELECT** until the “ON-LINE” lamp lights up in the Mode area. (Default on power up.)

Scan the Test Deck and Check Reports

Use the test deck sent by ES&S, or create your own test deck by marking ballots and hand-counting the results. Test at least one ballot from each ballot style.

To scan the test deck and check reports

1. Load the test deck in the input hopper. For instructions on loading ballots, see “Chapter 5: Operating the Scanner” in the *ES&S Model 650 Central Ballot Scanner Operator’s Manual*.
2. Press **START** to scan the test deck.
3. Press **SAVE** to save your test results to the internal drive. A confirmation message indicating the number of ballots saved appears.
4. Print a Grand Totals Report (long format) and a Precincts Processed Report (long format). For instructions on printing reports from the scanner, see the “Printing Results Reports” section in the *ES&S Model 650 Central Ballot Scanner Operator’s Manual*.
5. Compare your reports to those sent from ES&S or to your hand count. If totals do not match, zero totals and scan the ballots again. Contact ES&S immediately if totals still do not match.
6. If you are using Election Reporting Manager, insert a blank zip disk. Press **SAVE** to save the results to the internal drive. Press **SAVE** again while holding down the **ENABLE** button to transfer results to the zip disk. Press **START** to confirm that you want to save totals to the transfer disk. Follow the procedures described in the “Election Reporting Manager User’s Guide” to load results from the zip disk and test reporting procedures.
7. Call ES&S after completing the test, even if the reports match.

Setting the Date/Time

Note: This option is available in software version 2.0 and above.

Hold the ENABLE button and press FORMAT to access the internal configuration screen options

Note: Use the START and STOP button to maneuver through the choices.

Hold down the ENABLE button and press START to choose an option.

Hold down the ENABLE button and press STOP to exit the menu.

Select the option group by pressing the STOP button until you reach ZONE & DATE/TIME.

Select the options within the group by using the STOP and START buttons.

Configuration Name	Options	Description
Zone & Date/Time		
Time Zone	Central + Daylight Mountain + Daylight Pacific + Daylight UTC (GMT) Indiana (Eastern) Arizona (Mountain) Hawaii Eastern + Daylight	Use this option to set the local time zone.
Set Year		Select the current year.
Set Month		Select the current month.
Set Day of Month		Select the current day of the month.
Set Hour Field		Select the current hour.
Set Minute Field		Select the current minute.

Chapter 5: Selection and Training of a Skilled Operator

The individual running the unit also impacts the performance of the Model 650. There are certain skill sets and abilities that you should think about when selecting the individuals who will prepare ballots and operate the unit for tabulation.

Selecting the Scanner Operator

The individual(s) you utilize to run the machine should possess:

- **Stamina:** There is a physical element to running the ballots through the Model 650. It requires being on your feet for long periods of time. It also requires the ability to continually lift stacks of ballots.
- **Detail Orientation:** The individual will need to stay focused, monitoring ballots and the messages of the unit.
- **Positive Attitude:** Counting a large number of ballots can be frustrating to some individuals. Depending on sort options and the condition of the ballots, there will be stops and jams. The task requires someone who is patient and not easily frustrated with interruptions.

Election Systems & Software recommends that two individuals be assigned per unit for processing purposes. Not only does a second individual assist with the process but it also provides an experienced back up in future elections should something happen to the primary.

The primary individual is responsible for running the ballots through the unit. The secondary individual assists with staging the ballots prior to being run and returning the ballots to storage once they have been run. They are loading and emptying the trays. The secondary individual also serves as a resource for questions and issues.

Training a Scanner Operator

Take the opportunity to learn some basic scanner functions while performing preventative maintenance is being performed. Ongoing training keeps questions and procedures fresh in the operator's mind and cuts down on unnecessary maintenance calls. Previous test decks and/or election ballots can be used or even the blank ballots left behind by the technician for operator use.

Train the operator in following areas. Make sure to cover all of these topics during initial training and be prepared to answer questions about any of these topics during follow-up visits.

Installing the Election Definition

1. Show the operator how to load the election definition using a zip disk.
2. Point out the location of the reset switch and the back door interlock. Make sure to inform the operator that the scanner will not operate when the back door or the front door is open.
3. Show the operator how to plug the scanner in and turn the power on.

Understanding the Front Panel

1. Explain the functions of all of the switches on the front panel, taking extra time to explain the following switches:
 - Zero Totals switch
 - Absentee switch
 - Format switch

Note: Stress the fact that the Zero Totals and Add switches must be pressed at the same time as the Zero/Add Enable button.



2. Explain the functions of all of the LEDs especially the Rescan Ballot light. Explain to the operator when this light illuminates and what to do when it flashes.

Cleaning the Read Head

1. Explain how to raise the read head.
2. Point out the optics and give instructions on how to clean them with compressed air making sure to warn the operator that they should always hold the compressed air can upright in order to avoid spraying propellant on the optics.
3. Point out the multi-sheet sensor and explain the importance of keeping it clean and free of debris.

Using the Input Hopper

1. Explain how to load ballots into the input hopper making sure to explain the importance of “jogging” the ballots.
2. Show the operator how to jog ballots by hand.
3. Show the operator how to set the up-stop knob and the paper guides.
4. Show the operator how to change the pick belt and clean the retard pad.
5. Show the operator how to adjust the weak spring that controls the tension of the input hopper tray.
6. Explain what the pick strength knob is and show the operator how to adjust it.

Explaining Feed Errors

1. List all possible ballot feeding errors and tell the operator what to do in each situation.
2. Explain the importance of bringing both ballots back to the input hopper in the event of a multi-sheet error.
3. Demonstrate how to resolve errors without damaging or causing further damage to the ballots involved.

Note: You can see a full list of error messages in the Operator’s Manual.

Sorting Ballots

1. Show the operator all of the sort switches and explain what each one does.
2. Explain that the scanner will not count sorted blanks and over-votes, and that it will only count sorted write-ins if the election was programmed to count them.
3. Explain what to do with over-voted ballots and blank ballots after the scanner sorts them.

Note: See **Appendix B**, Understanding Sort Option and Impact to Processing Ballots, for greater detail and recommendations.

Backing up Data

1. Explain the purpose of the Zip drive and show the operator how it is used.
2. Show the operator how to save totals to the Model 650 hard disk and to the Zip drive.
3. Tell the operator to save often, use multiple disks and label the disks clearly.
4. Show the operator how to recover data in case of a power failure or if they need to print additional reports.

Using the Printer

1. Show the operator how to load paper into the printer and set the top of the form.
2. Explain how to set up the print head gap (if applicable) and change the printer ribbon.
3. Show the operator how to clear a jammed printer and explain how the printer is connected to the ballot scanner.

Basic Scanner Maintenance

1. Explain why it is important to keep the scanner clean.
2. Show the operator how to clean the read head area and the rollers.
3. Tell the operator to store the scanner in a climate controlled room with the dust cover on and the input hopper tray unlocked at its highest position.

Explaining the Election Flow

Talk with the operator about how ballots flow to and from the scanner. Cover areas such as ballot preparation, resolution procedures and prompt removal of counted ballots to avoid having the same ballots run twice.

Running Reports

1. Show the operator the different types of reports available and the different report formats.
2. Explain what everything on the report means including, under-votes, over-votes, etc.

Tuning the Scanner

1. Demonstrate how to get the direct digital dump on the flip display and explain how the different channels read the ballot.
2. Show the operator what happens to the values when a ballot is hand turned through the scanner.
3. Show the location of the amplifier card and tuning screwdriver. Explain the theory of tuning channels in case it is necessary to have the operator perform some simple corrections in an emergency only under supervision of a technician AND at the request of the technician.
4. Show the operator how to print the M650 Ballot Image report by pressing the Print Ballot Image button in case it is necessary for the operator to perform ballot diagnostics.

Explaining Ballot Layout

1. Show the operator the timing track, code channel, black check marks, and explain their purpose.
2. Correlate their position on the ballot with the location of the optics.
3. Explain that the accuracy of the scanner is dependent on how the voters fill in the ovals.

Final Note

Thorough training is extremely important because a knowledgeable and prepared scanner operator can resolve almost any problem over the phone. The more prepared an operator is, the more likely it is a problem can be solved without sending a technician.

Chapter 6: Optimal Ballot Use

The performance of the Model 650 is also impacted by the type and layout of a ballot. This section shares information perforations, paper specifications, printing specifications and scoring.

Perforations

A ballot Stub is a non-readable portion of the ballot that election workers remove at the polling place for auditing purposes. Ballots should be perforated for easy separation. A micro-perfing wheel should be used with no fewer than 15 teeth and no more than 25 teeth.

Paper Specifications

80 lbs Paper Specs

Use only ES&S ballot code or digital stock. This paper is specially manufactured for ES&S and is not available through normal paper distribution. ES&S is not responsible for the performance of the ballot if a substitute paper is used without specific approval from ES&S. ES&S code or digital stock meets all the specifications for the ES&S Model 650 scanner. ES&S code stock is already printed with timing and code tracks. Inspect all paper stock before printing on it.

The use of non-ES&S paper stock may cause sensor difficulties with paper brightness, bleed through, smearing, paper transport or sheet sensor calibration. ES&S scanners do not function properly with other types of ballot stock. Order ballot stock through ES&S to make sure your paper meets scanning requirements. Code boxes should be dark with all lines clear and edges clean. There should be no smearing of ink or any offset. Cut lines should be visible on all four sides of the ballot. The code stock may not be in exact registration from one style to another. As a result there may be as much as 1/16 inch difference from one style to another. If bleed cut lines are not visible on all four sides of the ballot, the stock is not cut to tolerances.

Printing Specifications

80lbs

- Ballots can be printed on ES&S generic stock, codestock, or multiple up sheets
- Colored ink can be used in non-read areas of ballot, black commercial ink is most common
- Ink density 1.15-1.25
- No Powder or Varnish
- Verify Sequence/Style number on front and back of ballot
- Use registration overly to verify alignment
- Registration align cross hairs and bullets in all four corners
- If needed stub and number should be at bottom of the ballot
- Shrink wrap with a backer to strengthen the package.

Scoring

80 lbs Ballots

It is not recommended that you score these ballots before folding them. A folding machine should be used to expedite the process. In addition, roller pressures should be reduced to about 2 – 3 thickness of code stock. **DO NOT** fold across ovals or arrows. Scoring followed by folding may result in the ballot separating at the score/fold line.

Chapter 7: When and How to Use Folded Ballots

The Case for Not Folding Ballots

There are numerous issues associated with the high speed processing of folded ballots. A lot of study has been done to determine the best methods of folding and preparing ballots for feeding to the M650. Essentially folding a ballot is known to damage the paper to some degree, and is therefore not conducive to high speed processing. The most effective solution to this issue seems to be elimination of the folding requirement entirely.

There are incentives that exist discouraging the use of folded ballots related to cost savings and resulting in more efficient ballot processing. One case study revealed that replacing the old method of mailing a four fold ballot and a standard No. 10 return envelope to the voter, with an unfolded 14 inch ballot and return envelope essentially doubled the cost. However, this increase was offset by reduced operator training cost, less ballot preparation time, and a more than 100% increase in machine throughput.

Standard Case Study and Costs:

Folded Ballot Costs

.03 per ballot for machine folding
.10 No. 10 outgoing envelope
.10 No. 10 return envelope
.39 first class postage for single fold ballot (2006 US postal rate)
.62 per ballot **PLUS** Additional \$xxx/labor for ballot preparation and operator time (estimate 100% increase)

Unfolded Ballot Costs

.22 large outgoing envelope
.19 large return envelop
.63 first class postage for single 14" unfolded ballot (2006 US postal rate)
1.04

Other more creative methods to even further reduce the added cost of unfolded ballots are being explored by ES&S. It is believed that following certain handling guidelines of unfolded ballots could result in a net zero increase over the cost of handling folded ballots.

How to Properly Fold a Ballot

If you prefer to use folded ballots, we recommend the following guidelines for properly folding a ballot. Machine folded ballots can cause ballot jams and out stacking problems when they are not folded correctly. Machine folding puts very tight folds on the paper. This tight fold stretches and tears the paper fibers on the outside of the fold. When the paper is unfolded, the fibers stand up, creating a “speed bump” across the width of the paper. Because the paper fibers are stretched and torn, the paper loses a great deal of rigidity. A ballot weakened this way tends to fold up when its leading edge hits the speed bump on the previous ballot resulting in multiple ballot jams.

Close up view of ‘Speed Bump’

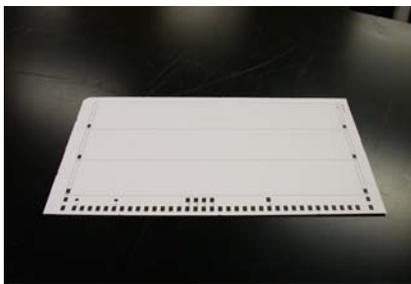


While all ballot folds will stretch and tear the paper fibers, it is possible to control where the folds occur and on which side of the paper. Use the following ballot folding process for 14-inch ballots for the Model 650.

To fold 14-inch ballots

Fold the ballot in half with the front side of the ballot on the inside of the fold. This will make the back of the ballot visible, and the timing track will be on the inside of the fold.

Face up ballot

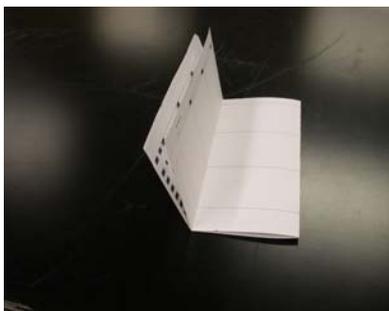


First fold

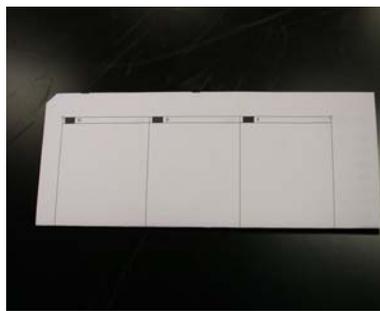


Fold the ballot in half again. When the ballot is finished, all that should be visible are the D-E-F Start Marks (top Black Checks).

Second fold



Folded ballot



Top 12 Tip List

Election Systems & Software shares the Top 12 Tips for folded ballot scanning:

1. Have your ballots machine folded by a commercial printer.
2. Fold your ballots using the ES&S folded ballot specification.
3. If your jurisdiction uses stubs, make sure the printer perforates using microperf. See the ES&S ballot production manual for complete ballot details.
4. Have Preventative Maintenance performed on your scanner annually.
5. Make sure you have enough room to handle ballots without further damaging them. Preparing folded ballots for processing takes more space than flat ballots. The space should be clear of every thing from soda cans to paperclips.
6. Back bend ballots at each fold. Gently fold the paper the opposite direction of its fold. Do not crease it, but rather fold it just enough that the paper will want to lay as flat as possible. Rolling the stack of ballots in the opposite direction of the folds can also be helpful.
7. Work with small stacks. The ES&S high-speed scanners are all designed to hold around 300 flat ballots. When processing folded ballots, stacks may have to be reduced to 25~50, or less depending on the condition of the paper.
8. Place the stack in a jogger, after back bending small stacks.
9. Clean your scanner often. Folded (absentee) ballots tend to have a lot of foreign material present when they are returned. Some of this will be liberated during jogging - some will get caught in the read head during processing. Wipe down the read head every couple hundred ballots.
10. Make machine adjustments in small increments, and adjust one thing at a time.
11. Pinch the stack of ballots at the bottom right corner using your index finger and thumb. This will help with some multiple ballot issue.
12. If ballots are stream feeding, use the manual crank on weak spring to lower the hopper. Do this in small increments.

Chapter 8: Ballot Preparation

Ballot preparation can greatly improve the effectiveness of the M650 scanning process. Ballots that arrive at Election Central in the ballot boxes cannot just be placed on the M650 without generating ballot feed errors. Below are areas of preparation that should be done prior to scanning ballots.

Absentee Ballot Preparation

Typically absentee ballots are folded to fit into the appropriate envelope. Because folded ballots can cause problems when scanning, taking time to prepare the ballots can improve the processing on Election Day.

Follow these steps to prepare folded ballots for scanning:

- 1) Keep in a cool, humidity controlled area.
- 2) As soon as state and local regulations allow, remove from the envelope, gently back bend and lay them flat.
- 3) If possible, weigh them down with something flat and heavy, such as a telephone book.
- 4) Quickly review ballots for damage to the timing or channel code information. Follow the procedure for spoiling and remarking the ballot in your jurisdiction, as damaged ballots will cause an error on the M650.
- 5) Scan folded ballots in smaller stacks – 50 or less.

See also, Chapter 7: When and How to Use Folded Ballots

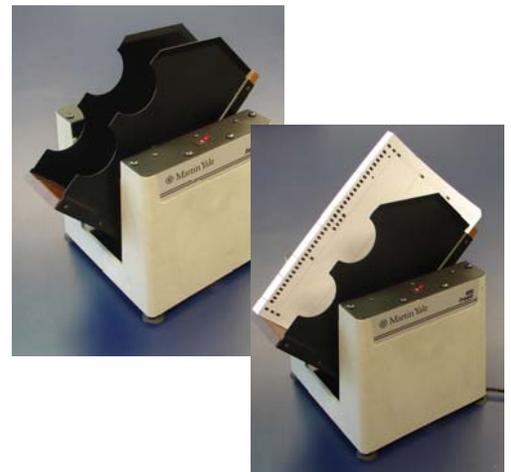
Jogging

Jogging lines up the edges of the ballots evenly, alleviates paper/dust particles and separates the ballots. ES&S offers for purchase jogging equipment to assist in preparing ballots.

Jogging the ballots is essential to eliminating ballots feed errors on the M650.

Fanning (for separation and removing paper particles) and tapping the edges on a table (for alignment) is a manual alternative to using ES&S Jogging equipment.

Ballots with the stubs removed can also cause errors if not prepared. Jogging these types of ballots upside down is the proper way to prepare these for M650 processing.

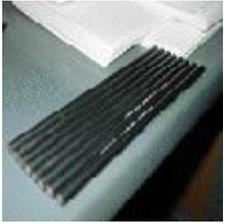


Environment

Humidity is the most influential factor when working with paper ballots. A temperature and humidity controlled room is essential to optimal M650 operations. Ballots should be stored, handled and prepared, prior to and on Election Day, in a controlled environment.

Appendix A

Recommended and Approved Marking Devices by Product 04/22/06

Pen						
Name	VL Ballot Pen	Precinct Pencil	Felt Tip Pen	Absentee Pen	Absentee Pencil	Precinct Pen
Part #	6100	PS-PP	00505	00500	00540	75409
Type	BIC Grip Roller Ball Black - .7mm tip	Sanford Design Ebony – Jet Black Extra Smooth	Eberhard Faber Felt Tip Pen	Spearhead Pen	Unknown	BIC Round Stic Black Medium Point

Tabulators (Sensor Type)	Recommended Precinct Device	Alternate Precinct Device	2nd Alternate Precinct Device	Absentee Marking Device	Comments
M-100 (Visible Light)	VL Ballot Pen	*Precinct Pen		Absentee Pen	* Strongly recommend VL Ballot Pen over Alternate
M-650 (Visible Light)	VL Ballot Pen	Felt Tip	Precinct Pencil	Absentee Pen/Pencil	
M-550/M-150 VL (Visible Light)	VL Ballot Pen	Felt Tip	Precinct Pencil	Absentee Pen/Pencil	
M-315/M-115 (Infrared Light)	Precinct Pencil	Felt Tip		Absentee Pencil	Infrared scanners must use pencils, or the Felt Tip Pen
M-550/M-550 IR (Infrared Light)	Precinct Pencil	Felt Tip		Absentee Pencil	Infrared scanners must use pencils, or the Felt Tip Pen
Optech Eagle (Infrared Light)	Felt Tip	Precinct Pencil		Absentee Pencil	Infrared scanners must use pencils, or the Felt Tip Pen
Optech IV-C (Visible Light)	Felt Tip	Precinct Pencil	VL Ballot Pen	Absentee Pen/Pencil	

Appendix B

Understanding Sort Options and Impact to Processing Ballots

	Definition	Why Necessary?	Result	Action Needed	Impact to Throughput
Blank	No marks detected on ballot	To assure ballots with marks that are NOT readable by the M650 are tallied. Typically counties will sort for blank ballots on the Absentee group where the type of marking device is not controlled.	M650 stops Ballot Not Counted Message received	Operator to confirm lack of marks on ballot. <ul style="list-style-type: none"> If no marks, place in Blank box for re-run without sort option functional. If marks are present, place ballot in box for review/remark by election board. 	Performance is decreased due to stops
Over vote	Too many marks detected in race or on ballot (straight party)	To assure ballots with too many marks are reviewed. Some counties will send to the election board to determine voter intent and mark appropriately.	M650 stops Ballot Not Counted Message received	Operator to place ballot in Over vote box for election board review. <ul style="list-style-type: none"> If Over vote is valid, ballot will need to be re-run without sort option functional so all other races will be tallied. 	Performance is decreased due to stops
Special	Client defined sort option – typically used for identifying cross-over ballots	During a closed primary, the voter is only allowed to vote in one party. If the voter has voted in multiple parties, this is considered a cross over ballot and makes their votes in that race void.	M650 stops Ballot Not Counted Message received	Operator to place ballot in Cross over or Special box for election board review.	Performance is decreased due to stops
Write-In	Mark detected in write-in oval/arrow	The M650 reads ovals or arrows, not names/words. If a race is decided by the write-in choice, the ballots will need to be reviewed so the candidate names are known.	M650 stops Message received depends upon coding of election. Ballot may or may not be counted.	Operator to confirm write-in oval/arrow mark and place ballot in Write-In box for names to be tallied individually. <ul style="list-style-type: none"> If ballot is not counted, write-in ballots will need to be re-run without sort option functional to tally votes on the ballot. 	Performance is decreased due to stops

Sorting Recommendations

Throughput can be minimally impacted if the operator is **NOT** spending time reviewing the ballot. Ideally, the operator will have specific, labeled boxes / trays to put the ballots which have been sorted. The operator can then focus on the M650 and keep the machine running which others interpret the issue with the ballot. Another person or persons (like an election board) would review each box of sorted ballots and determine the action needed.

Actions Possible:

- None – ballot is valid as is and will need to be re-run on the M650 with the sort functionality OFF.
- Remark of ballot – board would make corrections to the ballot so the M650 will read appropriately.
- Spoil and remark of ballot – board would create a new ballot with the voter's intent to be scanned.

Suggested Boxes/Trays:

- Blank
- Over vote
- Special (only if using the functionality)
- Write-In
- System Messages (like Indeterminate Marks in Channel xxx)
- Damaged Ballots

A process for returning and re-running the ballots on the M650 is also necessary. This may include return boxes or trays depending upon the county organization and staff available.

Suggested Boxes /Trays for Re-run:

- Re-run
- Re-run with Sort Functionality OFF

Reminder: All ballots that received a Ballot Not Counted message are not included with the totals; the ballot will need to be re-run on the M650. In some cases the sort options should be turned off.

Note: In the states/counties where determining voter intent is not allowed, sorting for Blanks (during Absentee ballot processing) and Write-In (to determine candidate name) are the sort recommendations.

If the sort option is OFF for Over vote or Special (Cross over) the race with the incorrect marks will **not** be counted and all other races will be included in the results.