Chapter 4

Election Readiness and Logic & Accuracy Testing

This chapter describes the procedures used to verify proper functioning of the equipment and Democracy Suite system as a whole. Prior to running any system level tests, a trained service technician performs a series of diagnostic tests in order to identify any existing or potential issues with the ImageCast® Evolution and ImageCast® Central tabulators. After, the Readiness Testing is executed to determine that the system has been configured properly and that the equipment functions correctly. Finally, Logic and Accuracy test is run prior to election to ensure that the election project has been programmed and configured correctly.

The election project database will be provided by Dominion Voting's Service Bureau. The Administrator must restore the Election Project on the EMS server by following the procedures outlined in Section 14.2.2.

Once the project is restored and the tabulator files have been copied to the ICC workstation, return here and proceed to Section 4.1 to test the ImageCast® tabulators. Once testing is completed, proceed to Section 4.2.

4.1   System Diagnostics Procedures

This section defines the System Diagnostic Testing Procedures, which are performed by a trained service technician in order to identify any existing or potential issues with the ImageCast® series of tabulators.

If any device fails diagnostic testing or a component of diagnostics testing, please refer to Troubleshooting and Problem Resolution in Appendix D.

4.1.1   ImageCast® Evolution System Diagnostic Testing Procedures

Prior to running pre-election diagnostics tests on the ImageCast® Evolution , a trained service technician must first login as Technician in order to access the Diagnostics options on the Technician Menu. The trained service technician must have an iButton Technician Security Key, username, and password before performing the following:

From here, two sets of Diagnostics tests can be performed - Automated Tests and Functional Tests - as listed in Table 4.1.
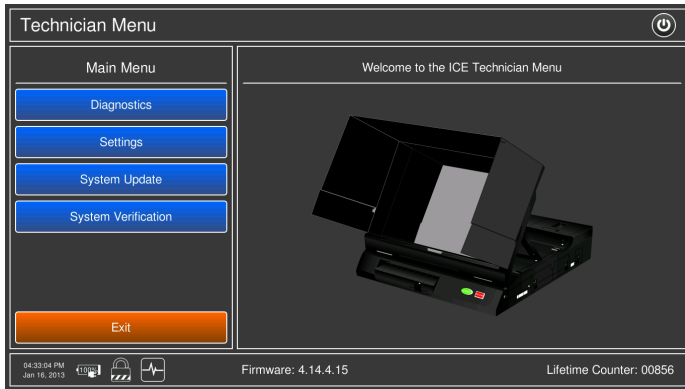
Figure 4.1: ImageCast® Evolution Technician Menu

1. Power up the ImageCast® Evolution by pressing the main power switch located on the side of the unit.

2. When prompted by the touchscreen, insert the Technician iButton Security Key into the Security Key receptacle, and enter the Technician Username and Password. If you are unsure of the password, contact your elections supervisor for assistance.

3. The Technician Menu, as seen in Figure 4.1, will appear. Under the Technician Main Menu, press the 'Diagnostics' menu button.

4. Ensure the paper roll is installed.

5. Ensure the printer inkjet cartridge is installed. Refer to Section 5.3.1.3

6. Ensure the ATI and headphones are connected. Refer to Section 5.3.1.4.

7. Clean ImageCast® Evolution . Refer to Section 5.3.1.2.

A Diagnostics Report can be printed via the ImageCast® Evolution thermal printer and retained for auditing purposes.

Automated Tests	Functional Tests
Memory	Audio
Compact Flash	Video
EEPROM	Scanner
Thermal Printer	Printer
Ballot Marking Printer	ATI
Video	Sip and Puff or Paddle
ATI	Virtual Keyboard
Audio	Voting Buttons
Internal Clock	System Test
Power	Communication Test
Scanner	
Power On Self Tests (POST)	

Table 4.1: ImageCast® Evolution Diagnostics

4.1.2 ImageCast® Central System Diagnostics Testing Procedures

The ImageCast® Central scanning devices automatically perform a set of diagnostic tests after every power cycle. The system generates a report at the end of the diagnostics testing procedure that outlines the status of the system. To display this report as a text file (.txt), navigate to the Administrator's 'STATUS' menu and press the 'SHOW LOG' button in the ImageCast® Central application.

4.2 System Readiness Testing Procedures

System Readiness Testing consists of end to end system test that helps to ensure that the system has been configured properly and that all parts of it function correctly. The test consists of pre-voting, voting and post-voting phases. Pre-voting phase consists of restoring and, if necessary, modifying the election project to be used for Readiness Testing as well as preparing all other necessary material for testing such as iButtons, Security Keys, test decks etc. Voting phase consists of scanning the test decks on all physical tabulators and post-voting involves loading results and analyzing the reports. Each of the following subsections addresses one of these phases.

4.2.1 Performing the Pre-Voting Phase Readiness Test

Tabulator pre-voting readiness tests can be performed with any suitable Democracy Suite election project and ballots. Dominion Voting Systems will provide state-specific Demonstration and/or Acceptance Test election projects for this purpose, or the jurisdiction can develop their own. Jurisdictions that have their elections programmed by Dominion Voting Systems' Service Bureau should proceed to Section 14.2.2 to restore the test election database and then continue with Section 4.2.2.

Jurisdictions that program their own elections will create their projects according to the custom use procedure document crated for them by Dominion Voting Systems, which they will receive after purchasing the system. In addition, specific procedures and tips for creating election projects in EMS EED are contained in the Section C.2.1.

In addition, even though ballot adjudication will not be performed in the Election Readiness Testing phase, the correct configuration and setup of the Adjudication system should be performed at this time. Depending on the expiration date set on the Adjudication Certificate, your Administrator might need to create a new certificate and install it on the EMS Server as well as the remote adjudication client workstations. The instructions on how to create and install Adjudication Certificate are described in the *California Installation Procedures* document, Sections 1.9.3.4 Creating Adjudication Certificates with XCA, 1.9.3.5 Adjudication Server Certificate Installation and 2.1.6.1 Adjudication Client Certificate Installation. Once this step is complete, the voting phase readiness test can begin.

4.2.2 Performing the Voting Phase Readiness Test

Voting phase readiness test is performed on all ImageCast® Evolution and ImageCast® Central tabulators. The following testing procedures require election-specific CF cards and iButton Security Keys to program the ImageCast® Evolution and ImageCast® Central using the EMS workstation. Refer to Appendix C, Section C.2.6 for details on how to program the CF cards and iButton Security Key. A pre-marked test deck of ballots (with a known set of results) for the specific election is also required for use in the readiness test.

4.2.2.1 Voting Phase Readiness Testing: ImageCast® Evolution

This section describes the Readiness testing procedure for the ImageCast® Evolution tabulators. The procedure consists of loading of CF cards containing election files on each ImageCast® Evolution tabulator and testing it by scanning test decks and verifying the results reports.

NOTE: Make sure to test every physical ImageCast® Evolution tabulator that might be used for Early Voting or Election Day.

1. Burn the CF cards and corresponding iButton for ICE to be tested.
   For instructions on how to burn the CF cards and iButton please see Sections C.2.6.1 and C.2.6.2.

2. Insert the memory card containing the Election Project into the CF1 card slot of the ICE tabulator, and the Initialized backup memory card into the CF2 card slot on the tabulator.
   For more details on how to do this, please see step 2 in Section 3.1.1.

3. Power up the ICE tabulator by lifting the LCD monitor into the operating position.
   For instructions on the power on procedure, see steps 3 through to 7 in Section 3.1.1.

4. When prompted by the LCD screen, insert the iButton Security Key and enter the appropriate password.
   For more details, see step 8 and 9 in Section 3.1.1.

5. Visually confirm that the date and time are correct by looking at the lower left section of the ImageCast® Evolution LCD screen.

6. Open the polls.
   For instructions on how to open polls, see steps 12 through to 21 in Section 8.3.1.

7. Prepare the ICE for scanning by activating the 'Standard Voting' session.
   For instructions on how to activate the 'Standard Voting' session on the ICE, follow the steps in Section 8.4.2.1.

8. Tabulate the pre-marked test deck of Readiness Testing ballots into the ImageCast® Evolution tabulator by feeding the test deck and then return here to continue with next steps below.

9. Start an Accessible Voting Session and vote a predefined voting pattern.
   Please refer to Section 8.4.2.2 for instructions on how to run an AVS session on the ImageCast® Evolution . Return here to continue with the next step below.

10. After all ballots have been tabulated and an Accessible Voting Sessions have been completed, insert the iButton Security Key and close the polls.
    For instructions on how to close the poll, see steps 2 through 6 in Section 8.7.1.

11. Allow at least one result tape to print and confirm that you do not need another copy.
    For more details see steps 7, 8 and 9 in Section 8.7.1, and then return here to continue with the next step below.

12. Power down the unit by pressing the 'Shut Down' icon at the top right corner of the screen.
    For more details, see step 11 in Section 8.7.1.

13. On the right side of the ImageCast® Evolution , open the CF1 and the CF2 card slot doors and remove both cards from the tabulator. Place both cards in the envelope provided. These cards will be used for tally in the Results Tally & Reporting application.

14. For each tabulator tested, confirm that the tabulator-level result reports match the expected results from the pre-marked test deck.

15. Repeat this test procedure for each physical ImageCast® Evolution tabulator.

4.2.2.2 Voting Phase Readiness Testing: ImageCast® Central

This section describes the Readiness testing procedure for the ImageCast® Central tabulators. The procedure consists of loading of ICC election files to the ICC workstation and testing each of the ImageCast® Central tabulators by scanning test decks and verifying the results reports.

Before you begin, ensure that the C:\DVS folder contains only the 'bin' folder and that the C:\DVS\bin contains only the ImageCast Central.exe executable file. If there are any other files or folders present in C:\DVS, delete them before proceeding.

NOTE: Test every physical ImageCast® Central tabulator to ensure it is functioning correctly.

1. Before you begin, ensure that the ImageCast® Central workstation and scanner are powered on and ready to load election files.
   Refer to Section 6.2 for more instructions. If the ICC workstation is already set up, continue with the next step.

2. Attach the CF card reader into the ImageCast® Central workstation.

3. Navigate to C:\DVS, and create the folder named 'config' inside it.

4. Load an election to the ImageCast® Central system, by inserting the programmed CF card into the CF card reader attached to the ImageCast® Central workstation.

5. Using Windows Explorer, browse to the CF card root directory.

6. Copy all the files and folders on the CF card, and paste them into the "C:\DVS\config" folder on the ImageCast® Central workstation.

7. Open ImageCast® Central application.
   See Section 6.4 for instructions on how to open the ICC application.

8. Print the Zero report by selecting the 'STATUS' icon.
   For instructions on how to print the Zero report see steps 7 and 8 in Section 6.10.

9. Configure the server path.
   For more details on configuring the server path, see Section 6.5.

10. Access Supervisor mode in the ICC application.
    See Section 6.6 on how to access Supervisor mode.

11. Set Scanner Properties and ICC Scan Options.
    For instructions on setting Scanner Properties and Scan Options, see Section 6.6.1) and Section 6.6.2), respectively.

12. If this is the first tabulator tested, the multi-feed settings need to be verified as explained in Section 6.2.1. However, this verification can be skipped for every next tabulator under test.

13. Tabulate and process the pre-marked test deck of ballots into the ImageCast® Central for that precinct.
    See Sections 6.8.1 and Section 6.8.2 on scanning ballots and accepting and discarding batches.

14. Close the poll.
    See Section 6.9 on instructions for how to close the poll.

15. Print results report.
    See step 2, 7 and step 8 in Section 6.10.

16. Exit the ImageCast® Central application by clicking on the **EXIT** button. The confirmation dialog will appear. Click **Yes** to exit the application.

17. Repeat steps 4 through to 13 for each ImageCast® Central physical tabulator. When all tabulators have been tested, proceed to the next section.

18. For each tabulator tested, confirm that the tabulator-level result reports match the expected results from the pre-marked test deck.

4.2.3   Performing the Post-Voting Election Day Phase Readiness Test

This section provides instructions on how to tally and report results from the ImageCast® Evolution and ImageCast® Central tabulators. Additional instructions can be found in the 'Help' menu within the EMS Results Tally & Reporting application (referred to as RTR).

1. Open the RTR application.
   See Section 9.4.1 for instructions on how to open the RTR application. If the project was created by the Dominion Voting's Service Bureau, the RTR user name and password will be provided to the jurisdiction. Jurisdictions programming their own elections will have to have their Administrator create an RTR user account and activate it in EED as described in Section 14.2.4.

2. Open the appropriate Election Project and enter your login credentials.
   See Section 9.4.2 for more details.

3. Load the results files, audit log files and result images (if enabled and required) from the ImageCast® Evolution , and the ImageCast® Central into the RTR application.
   See Sections 9.4.4 and 9.4.5 on how to load results from memory cards and directory. Once all result files are uploaded, return here and continue with the next step.

4. Validate and publish results files in the RTR application. See Section 9.4.6 on how to validate and publish results in RTR.

5. Create the Election Summary Report.
   For instruction on creating Election Summary Report, see Section 9.5.

6. Confirm that the results from the Election Summary Report from RTR matches the tabulator summary reports and the expected test deck results.

7. Review a subset of Audit Marked images in order to confirm that ballot image files are clear and readable and to verify that the system is interpreting the individual ballots correctly. The images can be found in each batch folder on the EMS server - D:\Adjudication\Project_Name\ Results\Tabulator_x_x_x_x_x\Batch_x_x_x\Images.

4.3   Logic and Accuracy Testing of System and Components

Formal Logic and Accuracy Testing is required to be conducted in accordance with the Elections Code to ensure that the system has been configured correctly for an election.

This testing is performed using a set of ballots for which the correct results are known ahead of time. Such a test set, also called a test deck, is run through the system to ensure that the results shown by the tabulator are aligned with those expected.

After Logic and Accuracy Testing has been completed, the system must be reset in order to remove the test results. The system can then be locked away in a secure location until actual election ballots are ready to be scanned.

Notify the election supervisor immediately if there are any problems or irregularities during Logic & Accuracy testing. If at any time during the testing the system fails or produces incorrect results that cannot be attributed to human error, notify the election supervisor immediately.

4.3.1 Pre-Conditions for Performance of Tests

4.3.1.1 Restore Election Project

Prior to begging an L & A testing, the Administrator needs to restore the election project. For instructions on how to restore the election project please see Section 14.2.2.

4.3.1.2 Pre-Testing of the Scanning setting with Official election ballots from the certified ballot printer

As mentioned in Section 4.3.2.2, pretesting the Scanning setting with the actual election ballots, as delivered by the certified ballot printer, must be performed.

When the first printed Official ballots and/or test decks are received by the jurisdiction (prior to Logic and Accuracy testing), they should be tested on the ImageCast® Central system with the election project to confirm that the tabulator scanning parameter settings and the VRS settings will work with the ballots as printed. With the variety of print methods used to print ballots, and the substantial variation in the types of printing presses, a small batch of ballots, numbering between 50 and 100 ballots (sampled throughout the ballot types and styles) should be tabulated with one of the ImageCast® Central tabulators that have been defined in the elections project (usually the Absentee tabulation unit). These ballots will not be marked (although they can be if they are test deck ballots) to confirm that they will not misread and that un-voted voting positions do not read as ambiguous marks.

To run this test, perform the following steps:

1. Setup, load, and prepare your ImageCast® Central tabulator for use as per the procedures outlined below.

2. On the Configuration menu, click the "Scan Options" button.

3. The "Scan Option" dialog box will appear.

4. Click the options to "Stop Scan on" on Ambiguous marks.

5. Return to the Scanning menu and start scanning the batch of ballots.

6. In order for the test to pass, there should not be stoppages due to ambiguous marks.

7. If the scanner is stopping due to the ambiguous marks, troubleshoot the scanner by following procedure in Section D.2.1.1.

4.3.1.3 Test Decks Required for Logic and Accuracy Testing

Test decks are generated either manually from unmarked ballots, automatically using the Democracy Suite Test Deck Generator utility, or by a combination of the two methods.

Ensure you test for the handling and reporting of exception ballots (blank, over-voted, write-in, error, etc.) as required by Elections Code. While test decks can be created at the jurisdiction on the EMS ballot printer, actual "Official Ballots" produced by the CA-certified ballot printer should also be included in the test. A control sheet should be created that summarizes the total results for the test decks prior to

beginning the Logic and Accuracy Testing. Pre-marked test decks should be supplied by the jurisdiction's selected certified ballot printer. This ensures that the exact paper, ink, and print process for use on Election Day are being tested.

There are two distinct levels of test decks: *"Ballot Level"* and *"Tabulator Level"*. The meanings of the different levels of test decks will become clear when executing the procedures below.

1. **Establish "Ballot-Level" test decks for each ballot style**: Each ballot style will have its own test deck, called a "Ballot Level" test deck. For a given ballot style, each and every voting space on that ballot style must be tested. Therefore, the number of ballots in the "Ballot Level" test deck will depend on the number of candidates that appear on that particular ballot style.

   Once the "Ballot Level" test decks have been created for each of the ballot styles, conduct tabulator and manual counts in order to determine the results for each "Ballot Level" test deck.

2. **Establish "Tabulator Level" test decks for each tabulator**: Each tabulator will also have its own test deck called a "Tabulator Level" test deck. The test deck for a given tabulator will simply be the combination of the "Ballot Level" test decks for each of the ballot faces that the tabulator is programmed to accept.

   If applicable, the "Tabulator Level" test deck for a given tabulator should include ballot styles that the tabulator is programmed to reject in order to ensure that it has been correctly programmed to do so. For example, if the tabulator is programmed to read Ballot Style 1 of 80, another style (of the 80) should be scanned to verify that the machine is programmed to reject them.

   The results for each of the "Tabulator Level" test decks can be determined by manually adding together the results from each of the "Ballot Level" test decks that comprise the particular "Tabulator Level" test deck.

4.3.1.4   Backup of Election Project

Ensure that the EMS Administrator has backed up Election Project (see Section 14.2.1) prior to staring the Logic and Accuracy Test.

The project package created during this back up procedure must be manually copied and saved to a dedicated and safe location. The folder where the project is saved should be named distinctly in order to differentiate it in the future.

4.3.2   Logic and Accuracy Test Procedures

Once the system has been fully configured, and as soon as possible after receipt of the first set of official election ballots from the printer, the jurisdiction must conduct formal "Logic & Accuracy" testing in order to confirm that the system has been correctly configured, and that all components are functioning properly. The process of Logic & Accuracy testing is described generally, and then more specifically in the sections to follow.
Note that the detailed Logic & Accuracy testing procedures may vary from one jurisdiction to the next. The procedures presented in this document are suggestions only, and the applicable laws and regulations of the jurisdiction must ultimately determine the specific testing process to be followed. This testing should be performed prior to every election.

On a high level, Logic & Accuracy testing consists of the following basic steps:

- Restoring or programming of an Election Project in the Election Management System.

- Generate test ballots (test decks), either manually from unmarked ballots, or automatically using the EMS Test Deck application with a predetermined voting pattern and expected result totals.

- Running of the appropriate test decks through each of the tabulators in the system.

- Closing of the polls and inspecting the results tapes to ensure that the results are correct for each tabulator.

- Uploading of results files from all ICE and ICC tabulators into the RTR application.

- Running Election Summary Report.

- Additionally processing ballots from Early Vote ICE's and Election Day ICE (single precinct ICE's with unqualified write-ins and multiple precinct ICE's with any write-in votes) as described in Official Canvass and Post-Election Procedures chapter. This includes re-scanning those ballots on appropriate ICC tabulators, adjudicating ballots with outstack conditions (this will be mainly write-ins) and then submitting adjudicated bathes for import to RTR.

- Managing Election Day and Early Vote ICE results in RTR

  1. Rejecting results in RTR for single precinct Election Day ICE tabulators that contain certified write-in votes, resolving write-in votes and then publishing the results again.
  2. Rejecting and then deleting results from ICE tabulators that were rescanned on ICC and adjudicated in simulated post-election period.

- Importing all results into RTR, validating and publishing results and then generating reports and comparing the results from these reports with the expected result totals for the test decks.

- If any vote discrepancies or errors are encountered during this process, the ballots and the procedure must be reviewed as human error is the most likely the cause. Otherwise, the Administrator is informed immediately. Once the problem has been corrected, repeat the entire Logic & Accuracy testing procedure for the affected tabulator(s).

- If there are no errors or discrepancies, sign and date the forms certifying that the Logic & Accuracy testing has been conducted successfully. These forms should be retained, along with the test decks, as part of the test documentation records for the election.

- Finally, each of the tabulators are re-zeroed and the results database is purged in order to delete the Logic & Accuracy results from the system prior to the actual election.

These steps are also summarized in the Figure 4.2.

Once the Logic & Accuracy testing is complete and the system has been re-zeroed, all components of the system must be stored in a secure location until the election (or until the first early voting opportunity) in order to ensure that they cannot be accessed or tampered with.

The Logic & Accuracy testing is described in the four subsections below. The process starts with detailed procedure for ImageCast® Evolution , then ImageCast® Central tabulators, Post-Election Processing and Adjudication and it ends with detailed procedure for results processing in the EMS RTR application.

		VBM	Early	Election Day
E-7 to E Day	1.	Scan all ballots on the ICC connected to all precincts	Scan ballots on one or more ICE tabulators connected to many or all precincts	Scan ballots on ICE tabulators belonging to one or more precincts
E Night	2.	Stop scanning at cutoff time and import results to RTR	Import results to RTR from CF cards after polls closed	Import results to RTR from CF cards after polls closed
	3.	Validate and Publish results and run Election Night Summary Report		
E+1 to E+30	4.	Continue with scanning ballots on the ICC connected to all precincts	Delete results from RTR	Reject results for ICE in RTR
	5.	Adjudicate ballots in batches, resolving write-ins and other exceptions.	Rescan all ballots on the ICC connected to all precincts and Early Voting counting group	Resolve write-in names in RTR
	6.	Import adjudicated results to RTR	Adjudicate ballots in batches, resolving write-ins and other exceptions.	OR
	7.		Import adjudicated results to RTR	Delete results from RTR
	8.			Re-scan all ballots on the ICC connected to all precincts and Early Voting counting group
	9.			Adjudicate ballots in batches, resolving write-ins and other exceptions.
	10.			Import adjudicated results to RTR
	11.	Validate and Publish results and run Canvass SOV Report		

Figure 4.2: Use Procedure Workflow

4.3.2.1 ImageCast® Evolution Logic and Accuracy Test Procedures

This section describes the Logic & Accuracy testing procedure for the ImageCast® Evolution (referred to as ICE) tabulators. The procedure consists of loading election files to an ICE tabulator and testing of these election files by scanning ballots and verifying the reports in RTR. This procedure is repeated for each ICE tabulator programmed in the Election Project.

NOTE: The ballots from **ICE tabulators handling multiple precincts** and **single precinct ICE tabulators containing unqualified write-ins**, if such tabulators exist, will then be re-scanned on the appropriate ICC tabulators. The originally imported results for such tabulators will be deleted in RTR. The ballots will then be adjudicated and imported into RTR, as described in Section 4.3.2.3. After testing is complete, the CF cards used will be re-zeroed and stored for later use in official ballot processing.

NOTE: Make sure to test every tabulator that is defined in the Election Project (including any spare tabulators defined, that might be used for election day replacement).

1. Burn the CF cards and corresponding iButton for ICE to be tested.
   For instructions on how to burn the CF cards and iButton please see Sections C.2.6.1 and C.2.6.2.

2. Insert the memory card containing the Election Project into the CF1 card slot of the ICE tabulator, and the Initialized backup memory card into the CF2 card slot on the tabulator.
   For more details on how to do this, please see step 2 in Section 3.1.1.

3. Power up the ICE tabulator by lifting the LCD monitor into the operating position.
   For instructions on the power on procedure, see steps 3 through to 7 in Section 3.1.1.

4. When prompted by the LCD screen, insert the iButton Security Key and enter the appropriate password.
   For more details, see step 8 and 9 in Section 3.1.1.

5. Visually confirm that the date and time are correct by looking at the lower left section of the ICE LCD screen.

6. Open the polls.
   For instructions on how to open polls, see steps 12 through to 21 in Section 8.3.1.

7. Prepare the ICE for scanning by activating the 'Standard Voting' session.
   For instructions on how to activate the 'Standard Voting' session on the ICE, follow the steps in Section 8.4.2.1.

8. Tabulate the pre-marked test deck of Logic & Accuracy Testing ballots into the ICE tabulator by feeding the test deck and then return here to continue with next steps below. **NOTE**: Please note and confirm the tabulators' handling of any exception ballots per DCF/MBS that were set according to jurisdictional procedures.

9. Start an 'Accessible Voting Session' and vote a predefined voting pattern for every language defined in the Election Project. Test every candidate position at least once, and verify that the audio message matches the visual ballot display.
   Please refer to Section 8.4.2.2 for instructions on how to run an AVS session on the ICE.

10. After all ballots have been tabulated and an Accessible Voting Sessions have been completed, insert the iButton Security Key and close the polls.
    For instructions on how to close the poll, see steps 2 through 6 in Section 8.7.1.

11. Allow the two result tapes to print and confirm that you do not need another copy.
    For more details on printing results tape, see steps 7, 8 and 9 in Section 8.7.1.

12. Power down the unit by pressing the 'Shut Down' icon at the top right corner of the screen. For more details, see step 11 in Section 8.7.1.

13. On the right side of the ICE, open the CF1 and the CF2 card slot doors, and remove both cards from the tabulator. Place both cards in the envelope provided. These cards will be used for tally in the Results Tally & Reporting application.

14. For each tabulator tested, confirm that the tabulator-level result reports match the expected results from the pre-marked test deck.

15. Open the EMS Results Tally & Reporting application (referred to as RTR). See Section 9.4.1 for instructions on how to open the RTR application. If the project was created by the Dominion Voting's Service Bureau, the RTR user name and password will be provided to the jurisdiction. Jurisdictions programming their own elections will have to have their Administrator create an RTR user account and activate it in EED as described in Section 14.2.4.

16. Open the appropriate Election Project and enter your login credentials. See Section 9.4.2 for more details.

17. Load the results files, audit log files and result images (if enabled and required) from ICE tabulators. See Sections 9.4.4 on how to load results from memory cards. Once all result files are uploaded, return here and continue with the next step.

18. Validate and publish results files in the RTR application. See Section 9.4.6 on how to validate and publish results in RTR.

19. Create the Election Summary Report. For instruction on creating Election Summary Report, see Section 9.5.

20. Confirm that the results from the Election Summary Report from RTR matches the tabulator summary reports and the expected test deck results.

21. Review a subset of Audit Marked images in order to confirm that ballot image files are clear and readable and to verify that the system is interpreting the individual ballots correctly. The images can be found in each batch folder on the EMS server - D:\Adjudication\ Project_Name\Results\Tabulator_x_x_x_x_x\Batch_x_x_x\Images.

4.3.2.2   ImageCast® Central Logic and Accuracy Test Procedures

This section describes the Logic & Accuracy testing procedure for the ImageCast® Central (referred to as ICC) tabulators. The procedure consists of loading each set of ICC election files and testing these election files by scanning test decks and verifying the results reports. The election files for each ICC tabulator are loaded, test decks scanned, adjudicated and the results uploaded to EMS RTR. The testing procedure is repeated for each of the ICC tabulators defined in the project. After testing is complete, the test results are archived.

NOTE: Make sure to test every tabulator that is defined in the Election Project (including any spare tabulators defined, that might be used for election day replacement).

1. Before you begin, ensure that the ICC workstation and scanner are powered on and ready to load election files. Refer to Section 6.2 for more instructions. If the ICC workstation is already set up, continue with the next step.

2. The election administrator will need to copy sets of ICC election files from the EMS Server to the ICC workstations (if there is more than a single ICC scanner used by a jurisdiction) and prepare each set of election files to be loaded on ICC workstations.
Please refer to Section 14.3 for instructions on transferring and preparing the ICC election files.

    NOTE: If the election project has been prepared by the Dominion Voting Systems Service Bureau, the prepared ICC election files will be provided along with the election project. The only step that must be performed is copying the files to the ICC workstation.
    After the ICC election files have been copied over, continue to the next step.

3. Ensure that the administrator is in possession of a labelled iButton that corresponds to each set of ICC election files.
    For instructions on creating iButtons see Section C.2.6.2.

4. The election administrator will need to deploy each set of election files to be tested, by moving the appropriate 'DVS' folder to the root of the C: drive.
    Follow the steps in Section 14.4.2.

5. Open ICC application.
    See Section 6.4 for instructions on how to open the ICC application.

6. Print the Zero report by selecting the 'STATUS' icon.
    For instructions on how to print the Zero report see steps 7 and 8 in Section 6.10.

7. Configure the server path.
    For more details on configuring the server path, see Section 6.5.

8. Access Supervisor mode in the ICC application.
    See Section 6.6 on how to access Supervisor mode.

9. Set Scanner Properties and ICC Scan Options.
    For instructions on setting Scanner Properties and Scan Options, see Section 6.6.1) and Section 6.6.2), respectively.

10. If this is the first tabulator tested, the multi-feed settings need to be verified. However, this verification can be skipped for every next tabulator under test.
    For instructions on how to verify multi-feed settings, see Section 6.2.1.

11. Tabulate and process the pre-marked test deck of ballots into the ICC for that precinct.
    See Sections 6.8.1 and Section 6.8.2 on scanning ballots and accepting and discarding batches.

12. Close the poll.
    See Section 6.9 on instructions for how to close the poll.

13. Print results report.
    See step 2, 7 and step 8 in Section 6.10.

14. Exit the ICC application by clicking on the **EXIT** button. The confirmation dialog will appear. Click **Yes** to exit the application.

15. Have the Administrator back up the entire DVS directory.
    See Section 14.4.1 for further instructions.

16. Repeat steps 5 through to 13 for each ICC tabulator.

17. For each tabulator tested confirm that the tabulator-level result reports match the expected results from the pre-marked test deck.

18. Open the EMS Results Tally & Reporting application (referred to here as RTR).
    See Section 9.4.1 for instructions on how to open the RTR application. If the project was created by the Dominion Voting's Service Bureau, the RTR user name and password will be provided to the jurisdiction. Jurisdictions programming their own elections will have to have their Administrator create an RTR user account and activate it in EED as described in Section 14.2.4.

19. Open the appropriate Election Project and enter your login credentials.
    See Section 9.4.2 for more details.

20. Load the results files, audit log files and result images (if enabled and required) from the ICC tabulators into the RTR application.
    See Section 9.4.5 on how to load results from directory. Once all result files are uploaded, return here and continue with the next step.

21. Validate and publish results files in the RTR application.
    See Section 9.4.6 on how to validate and publish results in RTR.

22. Create the Election Summary Report.
    For instruction on creating Election Summary Report, see Section 9.5.

23. Confirm that the results from the Election Summary Report from RTR matches the tabulator summary reports and the expected test deck results.

24. Review a subset of Audit Marked images in order to confirm that ballot image files are clear and readable and to verify that the system is interpreting the individual ballots correctly. The images can be found in each batch folder on the EMS server - D:\Adjudication\Project_Name\ Results\Tabulator_x_x_x_x_x\Batch_x_x_x\Images.

4.3.2.3   Adjudication and Post-Election Processing Logic and Accuracy Test Procedures

Up to this point, the L & A procedure covered testing of Pre-election and Election Day period activities. This section describes the procedure for testing the Post-Election Day period activities. In this period the adjudication of Absentee/All Mail ballots takes place and additional processing of ballots from ICE tabulators might be required.

1. **NOTE: This step only applies in case you have Early Vote ICE tabulator(s) in your L& A test handling more than one precinct that contain ballot(s) with certified or uncertified write-in in votes**.
   Reject and then delete result files for those ICE tabulators from the RTR. Then, rescan ballots from such tabulator(s) on the appropriate ICC tabulator.
   For detailed instructions on how to do this, see Section 11.5.

2. **NOTE: This step only applies in case you have Election Day ICE tabulator(s) handling more than one precinct that contain ballot(s) with write-in votes AND/OR Election Day ICE tabulator(s) handling one precinct that contain ballot(s) with unqualified write-in votes**.
   Reject and then delete result files for those ICE tabulators from the RTR. Then, rescan ballots from such tabulator(s) on the appropriate ICC tabulator.
   For detailed instructions on how to do this, see Section 11.6.

3. The Adjudication Administrator should log into the EMS Server, open and configure the Election Project and then start adjudication.
For introductory information on adjudication and a description of user roles such as the Adjudication Administrator, read the start of Chapter 10 and Section 10.1.1, and then return here. For instructions on how to open and configure an Election Project and start adjudication, see Section 10.2 and then return here.

4. The General Adjudication User(s) should log into the remote client workstation(s) and adjudicate ballots. This step in the procedure can be done in parallel with the next step or they can be executed sequentially as listed.
For instructions on how to adjudicate ballots, see Section 10.3, and then return here.

5. The Adjudication Administrator performs administrative tasks, such as managing batches, running reports and submitting batches to RTR for tallying.
For instructions on how to execute administrative activities, see Section 10.4 and then return here.

6. **NOTE: This step only applies in case you have an Election Day ICE handling only one precinct, that contain ballots with certified write-in(s)**.
Resolve write-in votes for such tabulators in RTR.
For instructions on how to resolve certified write-ins in RTR, see Section 11.8.1.

7. Import all adjudicated results into RTR.
For instructions on how to import adjudicated results into RTR, see Section 11.10.

8. Run the Statement of Votes Cast report in RTR.
For instructions on how to run this report, see Section 11.11.

9. Compare and verify that the Statement of Votes Cast report matches the expected results.

4.3.3 Logic and Accuracy System Test Acceptance Criteria and Completeness

Logic and Accuracy testing is only complete when all results are accurate. Any errors found should be corrected, and the appropriate tests should be repeated until accurate results are achieved.

To verify the completeness of the System Logic & Accuracy Test, confirm the following:

- That the tabulator-level result reports match the expected results from the pre-marked test decks.

- That exception ballots are properly handled by the tabulator per the DCF/MBS settings.

- That the individual tabulator reports from RTR match the tabulator level result reports.

- That the summary report for each counting group defined in the Election Project matches the sum of all individual tabulator level reports for that group.

- That the Statement of Votes Cast report after adjudication of ballots matches the expected results.

- That the ballot image files are clear and readable from both ImageCast® Central and ImageCast® Evolution .

- That the tabulator "Counting Groups" are configured correctly, and according to jurisdiction preference, with regards to separating the ImageCast® Central count results from Precinct results. This is imperative for obtaining the correct X of Y values in percentage of precincts reported.

4.4 Backing up the Logic and Accuracy Test Results

Before resetting the system for election day, make sure that the EMS Administrator has backed up the results from the entire system. This includes the following:

1. A backup of the Election Project containing the results from the executed L&A System Test.
   See Section 14.2.1 on how to back up a project. The project package created during this back up procedure must be manually copied and saved to a dedicated folder on the EMS Server. Name this folder distinctly so it can be identified in the future.
   NOTE: Do not rename the project package.

2. A backup of the ImageCast® Evolution by storing the labeled CF cards in a safe place. ICE results that were imported into the EMS RTR during the L&A test will be preserved within the backed up Election Project package. The CF cards need to be clearly labeled so that they can be safely returned into their respective ICE units during the preparation for Election Day.

3. A backup of the entire Adjudication folder from the D:\drive and databases on the EMS server.
   See the start of Section 14.5 for general information on backing up Adjudication.
   For instructions on how to back up the Adjudication databases, see Section 14.5.1.
   For instructions on how to back up the Adjudication folder, see Section 14.5.2.

4. A backup of all ICC election files containing results form the L & A test by **moving** the entire **C:\ICC Election Files** folder to a safe place.
   NOTE: After backing up, make sure that the Administrator deploys the master copy of ICC Election Files to the C: drive of ICC workstations so that the system is ready for Election Day.

4.4.1 Stopping Adjudication After Logic and Accuracy Testing

Once L & A is complete, the Adjudication Administrator should log into the EMS server and stop adjudication.
For instructions on how to do this, see Section 10.4.7, and then return here.

4.4.2 Retention and Documentation of Test Materials

Reports generated by products within the Democracy Suite® product line during logic and accuracy testing should be retained along with test decks, and any supplementary testing materials, for the retention period required by California law. Place all documentation in envelopes and/or boxes. Seal, initial, and date the envelopes and/or boxes, as required by California law. This retention period should take place in a secured location with restricted access to those designated by the jurisdiction. If the Democracy Suite® system is used in a federal election, testing materials must be retained for a period of 22 months as required by federal regulation.

A listing of the available reports on ImageCast® Evolution can be found in Appendix G. A description of available reports on ImageCast® Central is available in Section 6.10.

Chapter 5

Post-L & A Preparation for Election Day

After successful completion of L & A System Test, election equipment must be prepared for election day.

5.1 Election Project Backup

The jurisdiction should send the initial backup of Election Project to the Secretary of State pursuant with the California election code.

5.2 Purge the System of Test Results

Once testing is complete, the entire system must be purged prior to using it for the election. The Election Administrator should ensure that the L & A test results are purged from the following locations:

1. Purging the ImageCast® Evolution tabulator level results from each individual memory card. Refer to Section F.1. Leave the CF cards inside the ImageCast® Evolution , so that the unit can be physically secured for the Election Day as described in Section 5.4.

2. Purging the Results Tally & Reporting database. Refer to Section 9.4.2 for instructions on how to open an election project in RTR and 14.6.1 to purge the results.

3. Purging of all Adjudication files from the EMS Server by deleting the contents of the D:\Adjudication folder. Refer to Section 14.6.2.

4. ImageCast® Central files were backed up and cleared in Section 4.4 and a new copy of the master set of election files (created in Section 14.3), were deployed at that time.

5.3 Hardware Maintenance and Preparation For Use

5.3.1 ImageCast® Evolution Maintenance and Preparation

The ImageCast® Evolution does not require any software or preventative periodic maintenance tasks such as database performance analysis, software backup, or database tuning. However, it is recommended to periodically execute each of the following:

- Paper transport cleaning

- Internal printer cartridge removal/replacement/storage

- Internal battery recharging

5.3.1.1 Maintenance Equipment

Special purpose test and maintenance equipment for Technicians, as well as parts and materials required for fault isolation, diagnostic and maintenance purposes, are listed below:

Basic Tool Kit

- T7, T10 and T20 Security Torx screw drivers

- 9/32" Socket wrench

- Size #1 and Size #2 Phillips Screwdrivers

- T10 and T20 Torx Screwdrivers

- Extra hardware (T7, T10 and T20 screws)

- Pair of Pliers

- Two (2) extra iButton security keys

- DB9 Serial Cable

- PC with Windows 2000/NT/XP/Vista/7 OS and a Serial Port for Diagnostics debugging

Parts and Materials

- Dust cloth and Alcohol(>70% Ethanol)

- Diagnostics Test ballot

- Two (2) Thermal Printer Paper rolls (3" 75ft)

- Two (2) power supplies (19VDC Adaptor)

- Two (2) 14.8VDC Battery Packs

- Two (2) Audio Tactile Interface (ATI) units

- Two (2) Contact Image Sensors (CIS)

- One (1) Main Processor/Controller Board

- One (1) Scanner Controller Board

- Cotton swabs or Soft, Lint-free piece of material

- Distilled/bottled water

- Calibration Test Ballot

- Two (2) inkjet printer cartridges

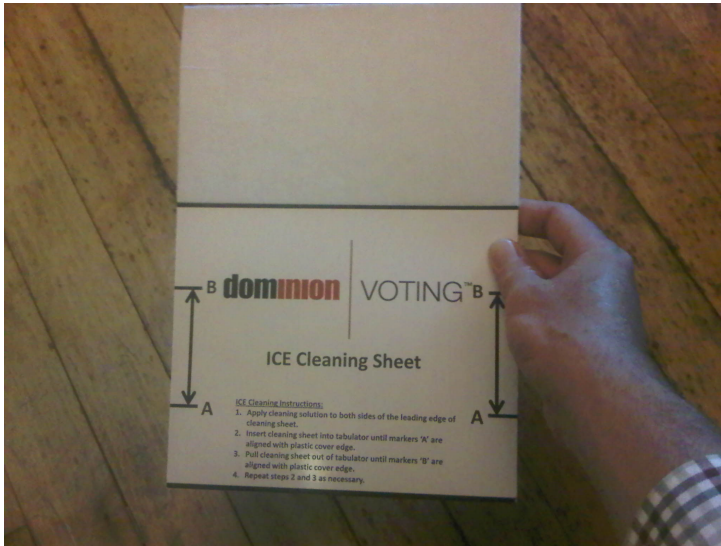### 5.3.1.2 ImageCast® Evolution Cleaning Procedures

Figure 5.1: The ImageCast® Evolution Cleaning Sheet

This section describes the procedure for cleaning the paper path of Dominion Voting Systems ImageCast® Evolution using the specified Cleaning Sheet. To perform the cleaning procedures, be sure to obtain a DVS Specified Cleaning Sheet and a sealable eye-dropper or squirt bottle with cleaning solution: >70% Ethanol (Ethyl-alcohol).
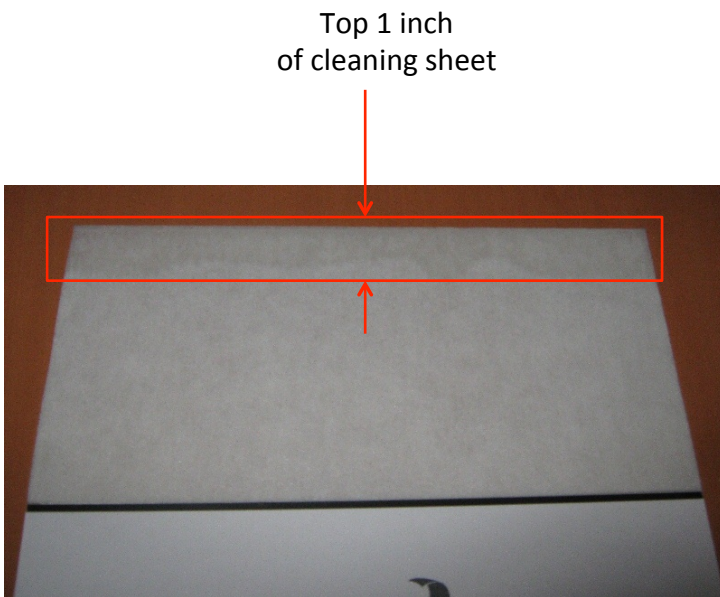

Figure 5.2: The Leading Fabric Edge

Step 1: Power down the unit, collapse the Touchscreen Monitor into its storage position and turn OFF the Service ON/OFF switch. Ensure that all LED lights on the unit are *off*.

Step 2: Fill the eye-dropper with cleaning solution and use it to place one horizontal line of solution along the top 1" of the leading fabric edge of the sheet as seen in Figure 5.2.

Step 3: Insert this end of the DVS Specified Cleaning Sheet into the tabulator.

Figure 5.3: Inserting ICE Cleaning Sheet

Step 4: Continue to feed the sheet into the tabulator until the "A" line on the cleaning sheet is aligned with the bottom surface of tabulator's entry slot cover.

Step 5: Pull the cleaning sheet until "B" line on the cleaning sheet is aligned with this plastic cover edge.
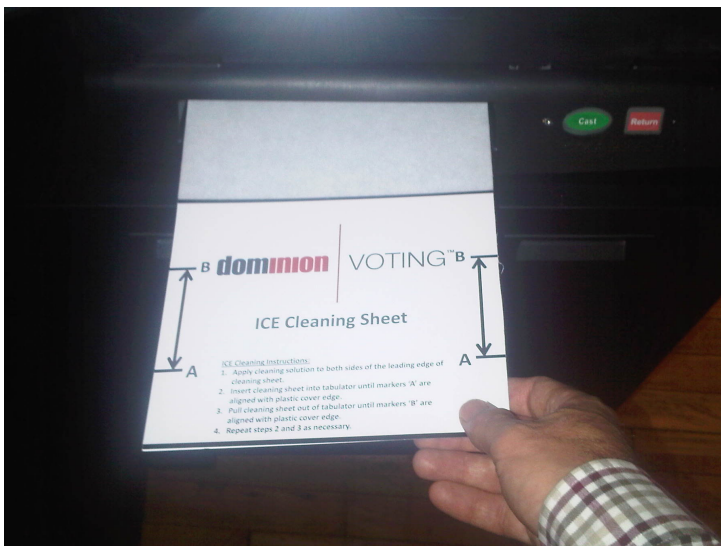

Figure 5.4: Feeding the ICE Cleaning Sheet Back and Forth

Step 6: Repeat steps 4 and 5 as required in a back and forth motion. Note that the leading edge of the cleaning sheet passes over the upper and lower scanners as the sheet is moved between the "A" and "B" marks.

Step 7: Lift the Touchscreen Monitor into its operating position and power up the unit by turning ON the Service switch.

Step 8: Run several (10) blank sheets or ballots through the main path to remove any residual cleaning solution.

Step 9: Verify the scan quality by scanning in valid ballots, and repeat the procedure if required.

5.3.1.3   Internal Printer Cartridge Removal/Replacing and Storage

If time between the ImageCast® Evolution usage is expected to exceed two months, it is recommended that the Integrated Printer's inkjet cartridge be removed and stored appropriately to prevent it from drying out.

Removing/Replacing Printer Inkjet Cartridge

1. Navigate to the Diagnostics menu on the ImageCast® Evolution 's touchscreen.

2. Press **Replace** under the 'Cartridge Replacement' menu. This will initiate the Cartridge Carriage alignment procedure to allow easy accessibility of the ink cartridge for removal.

3. To access the Inkjet Printer from the rear of the tabulator, unscrew the two T20-type Torx Security screws on the rear access door.

4. On the printer baffle, press the two tabs along the center of the baffle inwards and pull outward to open the door.

5. Press the latch tabs on the cartridge release cover and lift it upward.

6. Using your thumb, slightly press down on the front top edge of the inkjet cartridge to tilt and slide it out of the carriage.

7. Remove the replacement print cartridge from its packaging.

8. Carefully remove the plastic tape covering the ink nozzles. **NOTE:** Do not touch the print cartridge ink nozzles or copper contacts. Touching these parts will result in clogs, ink failure, and bad electrical connections.

9. Hold the print cartridge so that the electrical contact points are facing toward the printer, and then slide the print cartridge into the carriage.

10. Push down on the cartridge release cover until it snaps closed.

11. Close the Printer Access door.

12. Secure the Rear access door back in place with the two T20-type Torx Security screws.

13. On the Touchscreen LCD, press the **I'm Done** button.

Storage Procedure

1. Place the cartridge in a standard 4 1/8" x 9" paper envelope such that its contact and nozzles do not touch the envelope. Squeeze out the air in the envelope before sealing it.

2. Place the paper envelope in an airtight container such as a rigid sealed plastic container, or a resealable plastic bag.

3. Place a water-soaked sponge in the plastic container/bag. (squeeze out air in the bag before sealing it).

4. Store the cartridge in a dark area at room temperature (15-35 degree Celsius).

It is recommended that a printing test is run prior to the machine's deployment. This test ensures that the print quality meets expected standards.

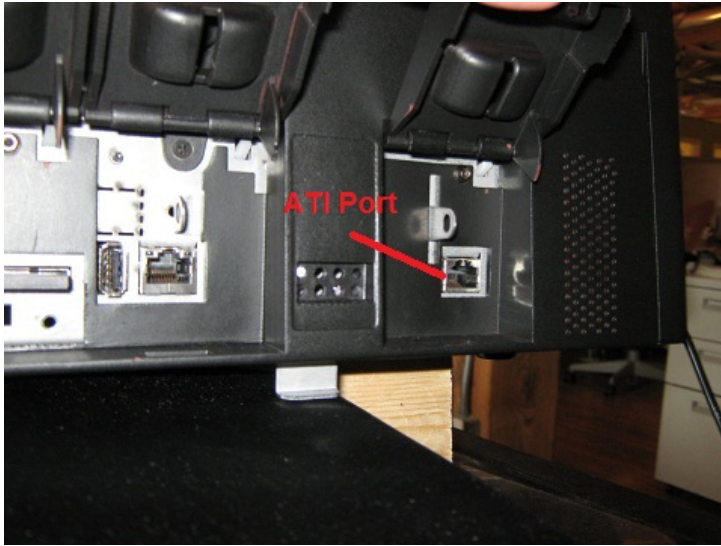### 5.3.1.4   Installing the Audio Tactile Interface or the A.T.I

Figure 5.5: A.T.I. Port on the ICE.

1. The A.T.I. device needs to be plugged in before powering up the unit. Open and lift up the fourth (4th) door on the right side of the ICE to expose the A.T.I. port.

Figure 5.6: A.T.I. Device Plugged into the ICE.

2. Plug in the A.T.I. cable into the A.T.I. port.

Figure 5.7: Connect the headphones to the headphone jack at the bottom of the ATI.

3. Connect the headphones to the headphone jack on the bottom right of the ATI.

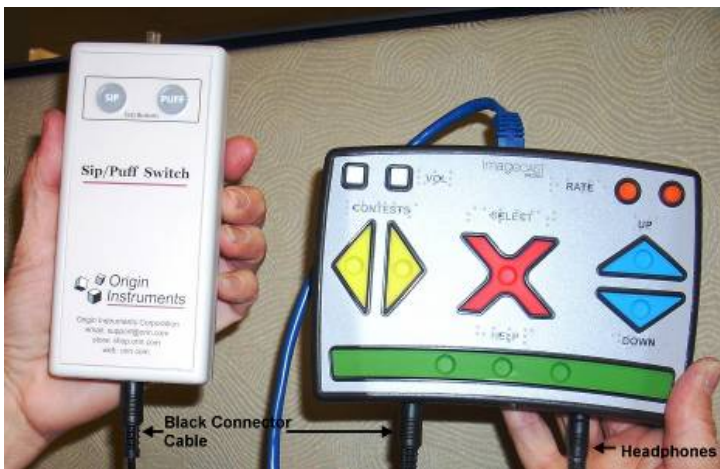### 5.3.1.5 Connecting the Paddles and Sip & Puff

Figure 5.8: Connecting the Paddles to the ImageCast® Evolution

1. Paddles can be connected to the ATI via the 3.5 mm Sip & Puff jack located on the unit.

Figure 5.9: Connecting the Sip/Puff to the ImageCast® Evolution

2. The Sip & Puff can be connected to the ATI via the 3.5 mm Sip & Puff jack located on the unit.

5.3.1.6 Internal Battery Recharging

In order to obtain maximum battery life, periodic maintenance of the internal back-up battery is important. It is therefore recommended that the internal back-up battery be charged for at least 12 hours every eight months when the unit is in power-off mode/storage.

It is equally important to ensure that the internal battery is fully charged before the unit is deployed on Election Day.

The Battery Status is indicated using visual indicators on the ICE side panel.

To charge the battery, connect the unit to a standard 120V, 60Hz AC Power Supply and ensure that the Touchscreen LCD is in its horizontal position and the Service Switch in the ON position.

5.3.2   ImageCast® Central Maintenance and Preparation

Maintenance procedures for the ImageCast® Central scanner configurations can be found in commercial off-the-shelf product documentation.

5.4   Physical Security

Once the system has been purged of L & A results and the ImageCast® Evolution maintenance and preparation has been completed, all equipment needs to be physically secured in final preparation for the Election Day. Please refer to Section F.2 for these procedures.