AeroJudge Electronic Scoring System

Detailed Judge's Guide

Introduction

AeroJudge is an electronic scoring system developed by a dedicated team of IMAC members to modernize competition judging. The system integrates seamlessly with the existing IMAC scoring program while eliminating paper scoring sheets and manual data entry. This detailed guide covers all practical aspects of using the device as a judge at IMAC contests.

System Benefits

The system has been successfully deployed at major events including the IMAC U.S. Nationals and the Tucson Aerobatic Shootout. In competitions with 60+ pilots, judges using AeroJudge have recorded over 12,000 individual scores without requiring manual data entry or cross-checking. This represents a significant reduction in scoring workload while maintaining accuracy and reliability.

The device operates on a local Wi-Fi network that does not require internet connectivity, making it suitable for remote field locations. Scores are locked in the device after saving and transfer to the scoring computer, ensuring data security throughout the process.

Hardware Overview

Physical Components

The AeroJudge device features a 3D-printed case designed to resemble an RC transmitter case for familiarity. The touch screen display serves as the primary graphical interface, with physical button controls located on the front and top edge.

Top Panel Controls:

- Power button (and LED indicator)
- Volume control knob
- Headphone output jack (3.5mm)
- Next button (forward navigation)
- Back button (reverse navigation)

Audio Features: Headphones are practially essential, as the judging device provides audio outputs and prompts on every action from score adjustments to detailed figure calling.

Power Connection: Located inside the battery compartment, an XT60 connector accepts standard RC battery types. EC3 connectors are also compatible without modification.

Power Management

The device is typically operated with 2S through 4S LiPo batteries. Battery selection should be based on your expected usage duration:

3S 3300mAh Battery:

- Voltage: 11.1V nominal
- Runtime: 6-7 hours of continuous use
- Weight: Lighter option

4S 3300mAh Battery:

- Voltage: 14.8V nominal
- Runtime: 12-13 hours of continuous use
- Weight: Slightly heavier
- Suitable for long all-day events with constant usuage.

You do not need to bring specific batteries if you already own compatible LiPo batteries for your RC aircraft. Pay attention to battery voltage level throughout the day to avoid mid-round power loss. The device will provide voltage status if checked in the menu system.

Powering Off the Device

To power off, the system must be fully powered on and initialized. Press and hold the power button for 5-6 seconds until the screen goes dark. The system is actually doing a shutdown cycle, teh screen goes dim, and then dark - At that point releasing the power button shuts off everything ready to start again.

This is an intentionally long step so that accidentally bumping the power button while in use cannot shut down the device.

With LiPo batteries, its adviseable to disconnect or remove them when not in use.

Sun Shade Accessory

The magnetic sun shade attaches to embedded magnets in the case and aligns with grooves on the display bezel. This attachment helps reduce glare in bright outdoor conditions. The sun shade can be easily removed when not needed and folds to store compactly.

To attach: Align the sun shade with the grooves on the front of the case and let the magnets pull it into position. To remove: Gently pull the sun shade away from the case.

Network and Connectivity

Wi-Fi Configuration

AeroJudge operates on a local wireless network created by a small travel type router. In the kits these have been completely pre-configured. This router can be directly or wirelessly connected to the scorekeeper's computer and establishes a private network for all judging devices and the scoring computer.

Important Network Details:

- The network is entirely local to the contest site
- No internet connection is required
- All scoring related communication occurs between devices and the scoring computer only
- The system is pre-configured before reaching the contest
- An external internet connection CAN be established fo rthe purposes of technical support or publishing live scores to aero-judge.com. This is NOT required and has no affect on the device functionality.

As a judge, you do not need to configure network settings. The devices will already be connected to the scoring network when you receive them. If you experience connectivity issues, notify the scorekeeper.

Starting Your Judging Session

Initial Setup

When you receive your AeroJudge device at the beginning of the day:

1. Connect your charged LiPo battery to the XT60/EC3 connector
2. Power on the device (a light touch of the power button is all it takes)
3. Connect your headphones or earbuds to the headphone jack
4. Adjust volume to a comfortable level using the top-panel control
5. Verify the device shows the pilot list for your contest / assigned class

If the device shows all pilots from all classes, don't worry—this is normal for some contest configurations. The scorekeeper can filter the display to show only your assigned class, typically reducing a 60+ pilot list to just the 10-15 pilots you'll be judging.

Understanding the Pilot List Screen

The main screen displays pilots in your assigned class or classes. Each pilot entry shows:

- Flight Line and Judge Number
- Info Button
- Pilot name
- Class designation
- Next round and sequence number
- A "Judge" button to begin scoring that pilot

Info Button: The small round info button in the top right corner home screen can be pressed to display additional device and system information. This includes:

- AeroJudge app version number
- IP sddress
- Wifi connection strength
- Battery status (Voltage and %)
- Score system connected status

Use the Next and Back buttons at the top to scroll through the pilot list. At a typical regional contest with 20-25 pilots total, you might see all pilots. At larger events, filtering keeps the list manageable.

Judging a Flight

Selecting Pilot and Sequence

To begin judging a specific pilot:

1. Navigate to the pilot using Next/Back buttons
2. Press the "Judge" button in the center of their entry

The sequence selection screen appears with several options:

Sequence Direction:

- B Sequence: Left to right
- C Sequence: Right to left

Sequence Type:

- Known: The pilot is flying a known sequence
- Unknown: The pilot is flying an unknown sequence
- Freestyle: The pilot is flying a freestyle routine

Select the appropriate options for the flight you're judging and proceed.

The Figure Judging Screen

After selecting the sequence, the first figure appears. The screen displays:

Top of Screen:

- Pilot Name (Class, Round Type) *This is a great checkpoint to make sure the correct pilot was selected*

Center of Screen:

- Current score (starts at 10)
- Image of the Aresti Figure

Bottom of Screen:

- Round number, Sequence Number, Flight Direction
- Figure Number, Figure Name
- Menu button * Caution: this can be used to exit from the judging screens without saving scores!

Special function buttons (Zero, Break, Not Observed)

- Collar button for element-by-element audio

Audio Caller System

One of AeroJudge's most powerful features is the integrated audio callout system. This functions like having a personal caller working at your own pace.

Automatic Announcement: When each figure appears, the device automatically announces the figure number and name through your headphones. For example: "Figure one, down loop."

Caller Button - Element-by-Element Guidance: Press the "Caller" button to hear detailed breakdown of the maneuver elements. The system will announce each component of the figure in sequence:

For example, on a down loop figure:

ADD CALLER EXAMPLE

You control the pace! Press to start, press to pause, press to continue. This allows you to keep your eyes on the aircraft while understanding exactly what should be happening at each moment.

The audio callouts include all maneuver instructions such as "pull 45 degrees," "push to vertical down line," and other orientation cues. This eliminates the need to reference an Aresti sheet during judging.

Scoring Process

All figures begin at 10 points. As you observe errors or imperfections, you deduct points using the buttons provided.

Deduction Buttons (Right Side):

- **"-1"** button: Deducts one full point
- **"-0.5"** button: Deducts one-half point

After each button press, the device announces your current score audibly. For example, after pressing "-1" once, you'll hear "nine." After pressing "-0.5" again, you'll hear "eight point five."

Add-Back Buttons (Left Side):

- **"+1"** button: Adds one full point back
- **"+0.5"** button: Adds one-half point back

Why Add-Back Buttons? Mistakes happen during judging. You might accidentally press a deduction button, or you might change your assessment of the maneuver after completing it. The add-back buttons allow you to correct your score without restarting the figure. Simply use the +1 or +0.5 buttons to restore points as needed.

Example Scoring Scenario:

- Figure starts at 10
- You observe a slight wing rock: Press "-0.5" → Score is now 9.5
- You see a heading deviation: Press "-1" → Score is now 8.5
- You hear "eight point five" in your headphones

- You reconsider the heading deviation wasn't that severe: Press "+0.5" → Score is now 9.0
- Final score recorded: 9.0

The current score is always visible on screen and can be shown to a scribe if one is present, though scribes are no longer necessary with AeroJudge.

Special Scoring Situations

Not Observed (NO Button): Situations arise where you cannot properly observe a figure. The aircraft might silhouette against bright sky, pass behind a cloud, or simply move beyond your field of view. Rather than guessing at a score, press the "Not Observed" button.

The device marks this figure as "NO" and displays "Not Observed" in your headset. In the final scoring:

- If you have multiple judges (3 or 5 is standard for large events), the system averages the other judges' scores for this figure
- The scorekeeper can see which figures were marked as not observed
- This maintains judging integrity while acknowledging practical limitations

This feature is particularly valuable at contests with multiple judges, where one judge missing a figure doesn't compromise the overall scoring accuracy.

Zero Button: Press this button when a figure deserves an automatic zero. The zero button immediately sets the score to zero for that figure.

Break Button: Use this when the pilot breaks from his sequence. The break button records this situation appropriately in the scoring system.

There is a distinction between a "break" penalty and a "break in sequence". For a simple break, the figure where that occured should be marked with this button. When a break in sequence applies, the figure should be marked with the break button AND then the follwong figure should be zeroed.

Deadline Button: The Deadline button is coming in 2026 and can be used to mark flight boundary infractions. It will automatically zero that figure and is clearly identified in Score for the contest director to make safety evaluations.

Navigating Between Figures

Use the Next and Back buttons at the top of the screen to move through the sequence:

Next Button: Advances you to the next figure in the sequence. Use this after you've completed scoring the current figure.

Back Button: Returns you to the previous figure if you need to review or modify a score. You can navigate backward through multiple figures if needed before the final save.

Continue this process through all figures in the sequence. A typical IMAC sequence includes 10 maneuver figures.

Scoring for Sound and Airspace Control

After completing all 10 figures, you'll score two additional components:

Sound: This scores the Use whole numbers only (no half points). Typical scores range from 1 to 10, with most flights scoring between 6 and 8.

Airspace: This scores how well the pilot maintained proper positioning in front of the judges and within the flight area. Use whole numbers only. Good airspace management typically scores 7-10, while poor positioning might score 4-6.

These scores function identically to traditional paper scoring and integrate into the final results using the standard IMAC scoring formulas.

Review and Submission

Summary Screen

After scoring all figures, sound, and airspace, press Next one final time. The summary screen appears showing all 12 scores (10 figures plus sound and airspace).

The summary displays:

- Figure numbers (1-10)
- Figure names
- Your score for each figure
- Sound score
- Airspace score

Review Features:

- The text may appear small initially on the summary screen
- Use pinch-to-zoom gestures (like on a smartphone) to enlarge specific areas
- Scroll horizontally to see all information
- Look for any figures marked "NO" (Not Observed)
- Verify all scores appear as you intended

Making Corrections

If you notice an error on the summary screen, you can return to any figure to correct it:

1. Use the Back button to navigate to the specific figure
2. Adjust the score using deduction or add-back buttons
3. Navigate forward again through subsequent figures
4. Return to the summary screen
5. Verify the correction

Take your time reviewing. Once you press Save, the scores lock in the device and cannot be modified.

Saving Your Scores

When satisfied with all scores on the summary screen:

1. Press the "Save" button
2. The device locks your scores permanently
3. The screen automatically returns to the pilot list
4. You're ready to judge the next pilot

What Happens After Saving: Your scores are now stored securely in the device. Depending on contest configuration, one of two things will happen:

Automatic Upload: The device may be configured to automatically transmit your scores to the scoring computer via Wi-Fi immediately after saving. You don't need to do anything else.

Manual Upload: The device may be set for manual upload, meaning the scorekeeper will trigger the upload when ready (typically after judging several pilots or at natural breaks in competition).

Data Transfer and Upload

Understanding the Upload Process

Once you save scores, they're locked in your device. The data must transfer to the scorekeeper's computer to generate results. This transfer happens via the Wi-Fi network.

Manual Upload Method

If your contest uses manual upload and you are asked to do that:

1. Press the red hamburger "Menu" button on your device
2. Select the blue "Upload" button from the menu
3. The device displays "Score Sync Success" when upload completes
4. All saved scores from your device are now in the scoring computer

The scorekeeper will tell you when to perform manual uploads. Typical times include:

- After completing a round of judging
- Before lunch breaks
- At the end of each class
- When specifically requested by the scorekeeper

Automatic Upload

If automatic upload is enabled, your scores transmit to the scoring computer. You don't need to access the Menu or Upload buttons—the system handles everything.

Scorekeeper Integration

From the scorekeeper's perspective, once judges upload their scores:

1. The scorekeeper clicks one button to import all judge data
2. The scorekeeper clicks one button to generate results
3. Results print or publish immediately!

This eliminates thousands of manual keystrokes that would be required with paper scoring sheets.

Operating Tips and Best Practices

Battery Management

Start each day with a fully charged battery. Monitor battery level throughout the day, particularly during extended contest days. If your battery level drops below 30%, consider swapping to a fresh battery during a natural break in competition.

Many pilots bring multiple charged batteries to the field for their aircraft. The same batteries work in AeroJudge devices, so you can share resources across your equipment.

Headphone Use

Headphones provide several advantages:

- Better audio clarity in windy conditions
- No distraction to adjacent judges
- Easier to hear element callouts during noisy aircraft operations
- Privacy for your judging process

Keep the volume at a comfortable level where you can clearly hear callouts.

Sun Shade Deployment

Attach the sun shade when judging in direct sunlight or when the sun angle creates glare on the screen. Remove it when judging in shade or overcast conditions for maximum screen brightness.

The magnetic attachment makes it easy to add or remove the shade between flights as conditions change throughout the day.

Learning Curve and Comfort

Most judges report feeling comfortable with AeroJudge after judging just one complete round (one pilot through all figures). The interface is intuitive, and the audio assistance significantly reduces the cognitive load compared to traditional paper scoring.

Don't worry about making mistakes in your first round. The add-back buttons, ability to navigate backward, and pre-save review screen all provide opportunities to correct any errors before final submission.

Scribe Considerations

AeroJudge eliminates the need for scribes. Your scores save directly in the device, transfer electronically to the computer, and appear automatically in the results. This frees up volunteers for other contest tasks.

However, some judges prefer having a scribe as a backup or for comfort during the transition period. If you choose to use a scribe, you can show them the score display after each figure. The scribe can write these on traditional paper sheets as a backup record, though this defeats some of the efficiency gains of electronic scoring.

In the Southeast US region, where AeroJudge has been in regular use throughout the past three competition seasons, we simply dont use scribes!

Multi-Judge Coordination

AeroJudge works identically whether you're the only judge or one of five judges on a panel. Each judge operates their device independently. The scoring program automatically handles that calculations.

You don't need to coordinate with other judges during the flight or compare scores. Simply judge independently and let the system handle the mathematics.

Troubleshooting and Support

Common Issues

"I can't hear the audio callouts"

- Check that your headphones are fully inserted in the jack
- Verify the volume control is turned up
- Confirm the device is powered on
- Try the built-in speaker to verify audio system is working

"The screen won't respond to my touch"

- Wipe the screen clean with a soft cloth—dust or oil can affect touchscreen sensitivity
- Remove gloves if wearing them—most touchscreens require skin contact
- Verify the device has power and the battery isn't depleted

"I don't see my pilot in the list"

- Use Next/Back buttons to scroll through all pilots
- Check if filtering is enabled and you're looking at the correct class
- Notify the scorekeeper—the pilot may need to be added to the system

"The Wi-Fi isn't working / uploads fail"

- Verify you're within range of the router
- Check that the router is powered on
- Notify the scorekeeper—network configuration issues require their attention
- Your scores are still safe in your device even if upload temporarily fails

"I need to change a score after saving"

- Once saved, scores lock in the device for integrity
- Contact the scorekeeper immediately if a legitimate error occurred
- The scorekeeper has administrative tools to modify scores with proper documentation
- Don't wait until end of day—report issues promptly

Getting Help at the Contest

Your primary support contact is the scorekeeper or contest director. They have experience with the system and can address most issues quickly. Don't hesitate to ask questions or report problems.

Remember that the AeroJudge team has processed thousands of scores at major events. The system is proven and reliable. Most "problems" are actually minor user interface questions that resolve quickly with brief guidance.

Advanced Features and Future Development

Upcoming Capabilities

The AeroJudge development team continues to refine and expand the system based on user feedback from judges, scorekeepers, and contest directors.

Freestyle Judging: Future versions will include full support for freestyle sequences, expanding AeroJudge capability beyond known and unknown sequences.

Additional Analysis: Development is underway on features that provide statistical analysis of judging patterns, help identify scoring inconsistencies, and offer training tools for developing judges.

System Evolution

AeroJudge is an open-source community project involving contributors from multiple countries. The development team actively solicits feedback from judges using the system. Your observations, suggestions, and experience reports help shape future improvements.

If you have ideas for enhancements or notice areas where the user interface could be clearer, share that feedback with your regional director or contest director. They can forward suggestions to the development team.

Conclusion

AeroJudge represents a significant advancement in IMAC competition scoring. The system maintains the established judging criteria and scoring formulas you're familiar with while eliminating manual paperwork and data entry. The audio assistance features help you judge more confidently, and the electronic data transfer ensures accuracy while reducing scorer workload.

After one or two rounds of use, most judges find AeroJudge more efficient and easier than traditional paper scoring. The system has proven itself at major national events and is ready for widespread deployment.

Your role as a judge remains unchanged: observe each figure carefully, assess it against the standards, and provide fair scores. AeroJudge simply makes that process smoother and more efficient for everyone involved.

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