2027 Technical Judges Tip Sheet

As a Technical Judge and/or Match Observer you will work with other judges to identify and vet candidates for the Machine Awards. Early in the event, match observers should look for candidates that may match the award guidelines to ensure judges can follow-up with specific questions for the team. Later in the event, the match observers help verify the on-field performance of candidates they have identified through team interviews. Use this document in conjunction with the Award Workbook.

Autonomous Award

Although there is a strict Autonomous period, you should still pay close attention to spot autonomous actions throughout the entire match. Teams use autonomous actions throughout the entire match to score more reliably and/or quickly.

Identifying Candidates

- **Robots that excel in the autonomous period.** Robots that complete multiple game actions,
- above and beyond most other teams, or exhibit exceptional reliability of their game actions that are comparable to other teams.
- **Robots that "snap" to an angle pointed directly at a scoring element or retrieval station or jitter rapidly back and forth while moving towards one.** If a robot appears to quickly turn towards a desired location and abruptly stop aimed right at it, or jitters back and forth very quickly while moving towards it, it is likely using sensors to track it autonomously.

Vetting Contenders

- **Verify the stated functions appear to be autonomous and work effectively.** Make sure that the described features appear to be sensing/reacting to the specific location of the field object and that they effectively achieve the desired objective.

Creativity Award *sponsored by Rockwell Automation*

Identifying Candidates

- **Robots that appear to solve one or more game challenges in a unique way**. If one team is approaching one of the game challenges (acquiring game pieces, aligning/scoring game pieces, end game, etc.) in a different way than the other robots you are seeing, they may make a good candidate.

Vetting Contenders

- **Verify the candidate mechanism appears to address the game objective.** The candidate mechanism/feature does not need to be the best at completing the game challenge, but it should complete the desired objective.

Excellence in Engineering Award *sponsored by Littelfuse*

Identifying Candidates

- **N/A.** This award is based primarily on process and thus cannot be identified well by observing robots.

Vetting Contenders

- **Verify that the robot is effective.** The candidate's robot does not need to be the best at completing the game challenge, but it's design should be "functional and practical" as well as "contributes to the team's success on the field".

Industrial Design Award *sponsored by GE Aerospace*

Identifying Candidates

- **Robots that have an overall polished/elegant look**. This award celebrates an efficiently designed overall machine where the components are designed to work seamlessly together.

Vetting Contenders

- **Verify the machine is robust** – This doesn't mean that the robot never breaks, but a machine that is "capable of withstanding the rigors of the contest" should have minimal failures on the field.

Innovation in Control Award

As opposed to the Autonomous award which rewards teams which have very effective autonomous actions, this award rewards teams which have innovative controls solutions (while remaining effective/advantageous).

Identifying Candidates

- **Look for robot mechanisms that look well controlled –** Mechanisms that move quickly can be difficult to control accurately, teams that can do both are likely using strategies/sensors that may make them a candidate for this award.
- **Innovative controllers** – They may be tough to spot, but any team using an innovative device to control their robot (e.g., a custom-made replica of the robot's arm) may also make a good candidate for this award.

Vetting Contenders

- **Verify the candidate feature appears to address the game objective** – The candidate's mechanism/feature does not need to be the best at completing the game challenge, but it should be "reliable under the stress of competition"
- **If possible, verify that the mechanism works as described** – Where possible, assess whether the actual behavior of the mechanism on the field describes the team's description provided to the Machine judges.

Quality Award

Identifying Candidates

- **Quality Robots -** This award is difficult to identify on the field; however your best bet is to trust your eyes/gut on machines that look like they are built with a high level of quality.

Vetting Contenders

- **Verify the machine is robust** – This doesn't mean that the robot never breaks, but a machine that "can withstand the rigors of competition" should have little to no failures on the field.