ACE COMBAT ROBOTICS

1 LB HYBRID ANTWEIGHT RULES & FIGHT NIGHT PROCEDURES

Plastic + Metal Hybrid Class • 3 Qualification Matches • Expanded Materials & Safety Standard

WEIGHT	QUALIFIERS	MATCH	ADVANCEMENT
1 lb / 454 g	3 matches	2:00 max	Top 8 default

QUICK REFERENCE

2026 ACE INTERNAL COMPETITION STANDARD • Safety-expanded revision

Class	ACE 1 lb Hybrid Antweight - a student-built combat robot class using a meaningful 3D-printed plastic structure with permitted metal components.
Weight	454 g maximum, ready to fight, including battery, weapon, fasteners, armor, and all installed parts. No scale tolerance.
Hybrid Build Rule	Plastic must be a real load-bearing part of the primary chassis/body. Metal is allowed for weapons, shafts, fasteners, brackets, wedges/forks, localized armor, and reinforcement. A fully metal chassis with decorative plastic does not qualify.
Power	Maximum 3S LiPo/LiHV. Battery must be secured and protected from direct impact.
Radio / Failsafe	2.4 GHz control system required. Loss of signal must stop drive motion and disable powered weapons.
Weapon Lock	Required for any powered weapon. The lock stays installed whenever the robot is outside the closed arena or approved test box.
Match Length	2 minutes. A match can end early by knockout, tap-out, disqualification, or referee stoppage.
Event Format	Each robot receives 3 qualification matches. Rankings determine entry into the elimination bracket.
Judging	If there is no knockout, judges score Damage (5), Control (3), and Aggression (3): 11 total points per judge.

Final Authority	ACE Event Directors, Safety Inspectors, and Referees may reject or stop any design or action they consider unsafe or clearly outside the intent of the class.

ACE EVENT-SPECIFIC RULES SUPERSEDE ANY OUTSIDE RULESET FOR THIS COMPETITION.

1. ROBOT CONSTRUCTION RULES

1.1 Weight & Class Identity

- Robots must weigh 454 g (1.00 lb) or less in their ready-to-fight configuration.
- The official event scale is final. Teams should leave a small weight margin for repairs, tape, or replacement hardware.
- This is a hybrid class: the robot must intentionally combine 3D-printed plastic construction with metal where it improves performance, durability, or function.

1.2 Hybrid Plastic + Metal Construction

ACE is intentionally using a middle ground between a traditional plastic antweight and a full-metal antweight. The printed polymer structure must be a real part of the robot's load path and must carry major components such as drive motors, weapon supports, battery/electronics, or armor. Metal may reinforce the design, but it may not form a complete stand-alone chassis that would remain functional if the printed structure were removed.

MATERIAL / COMPONENT	STATUS	ACE REQUIREMENT / LIMIT
3D-printed thermoplastics	**ALLOWED**	PLA/PLA+, PET/PETG, ABS, ASA, nylon and similar common engineering thermoplastics are allowed for chassis, armor and mounts.
Flexible printed polymers	**ALLOWED**	TPU/TPE may be used for wheels, bumpers, belts, guards, wire protection and compliant parts. They may not be used as loose entanglement material.
Fiber-filled filament	**INSPECTION REQUIRED**	Short-fiber carbon/glass-filled nylon, PETG or similar filament is allowed only if the printed part is solid, stable and does not shed sharp fibers. Continuous-fiber reinforcement requires Event Director approval.
Sheet / machined plastic	ALLOWED	UHMW/HDPE, polycarbonate, acetal/Delrin, nylon, ABS, PETG and acrylic sheet may be used. Polycarbonate is recommended where maximum impact resistance is desired.
Acrylic (PMMA)	**ALLOWED**	Acrylic is allowed for armor panels, covers, guards, mounts, cosmetic panels and other robot components. It must be securely mounted. Cracked, chipped, loose, or sharp-edged acrylic must be repaired or replaced before the robot may pass inspection or re-enter the arena.

MATERIAL / COMPONENT	STATUS	ACE REQUIREMENT / LIMIT
Aluminum	**ALLOWED**	May be used for brackets, motor mounts, top/bottom plates, hubs, localized armor, forks, wedgelets and other hybrid components. It may not become a complete independent metal chassis.
Steel / stainless steel	**ALLOWED**	May be used for weapons, shafts, fasteners, forks/wedges, wear surfaces, bearings and localized reinforcement. All edges and weapon parts must pass inspection.
Titanium	**ALLOWED**	Permitted for weapons, fasteners, forks/wedges, localized armor or reinforcement. Parts must be free of cracks, dangerous burrs and insecure mounting.
Brass / bronze / copper	**ALLOWED**	Permitted for bushings, electrical conductors, ballast-sized hardware and small functional parts. Loose metal ballast is not allowed.
Fasteners / bearings / shafts	**ALLOWED**	Common screws, nuts, washers, threaded inserts, bearings, bushings, axles, shafts, standoffs and retainers are allowed and do not count against the hybrid intent.
Rubber / silicone / foam	**ALLOWED WITH LIMITS**	Allowed for tires, vibration isolation, bumpers and wire protection. Foam may not be intentionally released or used as an entanglement device.
Adhesives / tapes / threadlocker	**ALLOWED WITH LIMITS**	Epoxy, CA glue, threadlocker, double-sided tape, electrical tape and similar products are allowed when fully cured/secured. Nothing may be designed to transfer adhesive to an opponent or arena.
Springs / elastic stored energy	**INSPECTION REQUIRED**	Allowed only when the mechanism can be positively restrained in a safe state outside the closed arena. The inspector may require a mechanical lock.
Magnets	**ALLOWED WITH LIMITS**	Small magnets may be used internally for sensors, retention or mechanisms. Magnets intended to anchor to, damage or interfere with the arena are prohibited.
Carbon-fiber / fiberglass / G10 sheet	**PROHIBITED UNLESS APPROVED**	Fiber laminate panels are not part of the default class because damaged edges can splinter. They require written Event Director approval before inspection.

MATERIAL / COMPONENT	STATUS	ACE REQUIREMENT / LIMIT
Magnesium / beryllium / mercury / exposed lead	**PROHIBITED**	Reactive, highly toxic or otherwise hazardous metals/materials are not permitted. Lead may not be used as exposed or loose ballast.
Ceramic / stone / concrete / glass	**PROHIBITED**	Brittle materials that can fragment, chip or create hard debris are not permitted as weapons, armor or ballast.
Loose ballast / shot / sand / powders	**PROHIBITED**	All mass must be a secured component. No loose pellets, shot, sand, powder or material intended to spill into the arena.
Wood / paper / cardboard	**NON-STRUCTURAL ONLY**	May be used for temporary templates, labels or cosmetic items if securely retained; not as the primary competition chassis or weapon material.

Hybrid construction examples

✓ LEGAL EXAMPLES	✕ NOT LEGAL FOR THIS CLASS
• PETG tub chassis + aluminum top plate + steel vertical spinner + metal shaft/fasteners. • Printed PLA+ frame + steel forks/wedgelets + aluminum weapon motor mount. • Printed chassis with a thin metal front armor strip protecting a high-impact area.	• Aluminum box chassis with a small printed decorative lid. • Steel frame and metal armor on all sides with only plastic spacers. • A robot whose plastic pieces could be removed without meaningfully changing the primary structure.

1.3 Approved Materials

Material approval is based on the actual part and its use, not only the material name. ACE inspectors may reject a normally allowed material if it is cracked, brittle, poorly retained, dangerously sharp, or likely to produce unsafe debris.

HYBRID INTENT TEST: metal parts are permitted, but they may not collectively form a complete independent chassis. If removing the printed polymer structure would leave a substantially complete driveable metal frame, the robot is out of class.

All unusual or unlisted materials must be disclosed before the event when practical. The Event Director may approve, conditionally approve, or prohibit a material based on arena containment and participant safety.

Cosmetic parts, labels and decorations must also be mechanically secure. Anything that can become loose debris during normal operation may be removed at inspection.

1.4 Power, Radio & Electrical

- Maximum battery voltage is 3S LiPo/LiHV. Batteries must be secured so they cannot move freely during impact.
- Battery cells must be protected from direct weapon contact and sharp internal edges.
- A manual method of fully removing power is required. Teams must be able to make the robot safe quickly when instructed.
- The radio system must fail safe: on signal loss, drive motion stops and any powered weapon stops or commands zero power.
- Power wiring, connectors, and electronics must be insulated and mounted so normal impacts will not immediately short the system.
- A clearly visible power-on indicator is strongly recommended and may be required by the inspector for designs where power state is not obvious.

1.5 Weapons & Prohibited Systems

Examples of conventional concepts include spinners, drums, lifters, flippers, hammers, control wedges and forks. A mechanism being listed here does not make it automatically legal; every robot must still satisfy the material, containment, power, failsafe, retention and handling rules below.

1.6 Mechanical Weapon & Stored-Energy Safety

• Every powered weapon must have a positive physical weapon lock or restraint that prevents dangerous motion while the robot is outside the closed arena/test box. A radio switch alone is not a weapon lock.

• Weapon locks must be obvious, durable, easy to install/remove without placing hands in the weapon path, and remain installed while carrying, staging, repairing, or powering the robot for non-weapon checks.

• Rotating or reciprocating weapon assemblies must use secure mechanical retention. Cracked, visibly bent, loosely retained, or damaged weapon components will not pass inspection.

• Any spring, elastic, flywheel, pneumatic-like accumulator, or other stored-energy mechanism must be discharged or positively restrained whenever the robot is handled outside the arena.

• Exposed sharp points and edges must be covered, guarded, or otherwise made safe while outside the arena. Covers must stay on until the arena is closed and staff authorize removal.

• No team may intentionally operate a powered weapon in the open pit, hallway, parking area, classroom, or lab floor. Weapon testing is limited to the closed competition arena or an ACE-approved enclosed test box.

SYSTEM / HAZARD	RULE	DETAIL
Open flame / flamethrowers	**PROHIBITED**	No torches, burners, flame jets, heated ignition sources or devices intended to ignite an opponent, arena or material.
Explosives / pyrotechnics	**PROHIBITED**	No explosive charges, fireworks, squibs, primers, ammunition, explosive bolts, combustion charges or pyrotechnic effects.
Fuel / combustion	**PROHIBITED**	No gasoline, alcohol fuel, propane, butane, hydrogen or other combustible fuel systems. Internal-combustion engines are not permitted.
Smoke / incendiary effects	**PROHIBITED**	No smoke generators, sparking effects, thermite, incendiary mixtures or intentionally self-heating chemical reactions.
Compressed gas / pneumatics	**PROHIBITED**	No CO2 cartridges, compressed-air tanks, gas accumulators or other pressurized-gas weapon/actuation systems in this 1 lb class.
Hydraulics / pressurized liquid	**PROHIBITED**	No hydraulic accumulators or pressurized liquid systems. Small sealed lubricants inside normal bearings/gearboxes are allowed.
Projectiles / detachable weapons	**PROHIBITED**	No weapon or component designed to intentionally leave the robot, launch across the arena, or create free-flying projectiles.
Entanglement	**PROHIBITED**	No nets, fishing line, loose wire, chain, string, fabric strips, expanding mesh, adhesive traps or devices intended to foul an opponent.
Liquids / powders / chemicals	**PROHIBITED**	No intentionally released water, oil, solvents, acids, bases, corrosives, irritants, powders, dust, foam, paint or other arena-contaminating substances.
Electronic / radio / optical interference	**PROHIBITED**	No shock electrodes, stun devices, intentionally destructive high voltage, EMP effects, RF jamming, deliberate control-system interference, or laser/optical devices intended to injure, blind, damage cameras/sensors, or create a viewing hazard.
Arena-damaging anchoring	**PROHIBITED**	No magnets, suction, spikes, adhesives or mechanisms intended to damage, permanently mark, penetrate or lock onto the arena.
Spring / elastic mechanisms	**INSPECTION REQUIRED**	Allowed only if stored energy can be restrained outside the arena and the mechanism cannot release unexpectedly during handling.

2. SAFETY, INSPECTION & PIT RULES

2.1 Required Pre-Match Inspection

	INSPECTION CHECK
☐	Weight at or below 454 g on the official scale
☐	Hybrid construction rule compliance
☐	Battery secure and protected
☐	Radio bind and failsafe verification
☐	Drive function and weapon function verified in a controlled area
☐	Weapon lock fits securely and can be installed/removed safely
☐	No loose hardware, exposed conductors, or hazardous sharp edges
☐	Robot name / team identification visible or clearly associated with the entry
☐	Any unusual mechanism reviewed by the Safety Inspector
	Materials comply with the Approved Materials matrix; unusual materials disclosed
	No prohibited fire, explosive, projectile, chemical, gas, hydraulic, entanglement or interference systems
	Weapon / rotating assembly has secure mechanical retention and no visible cracks or damage
	Power-off / disconnect method is accessible and understood by the team
	Sharp edges / points are covered or safely restrained outside the arena
	Any stored-energy mechanism has an effective safety restraint
	Battery chemistry, cell count and voltage comply with the 3S maximum
	Robot can be carried and staged without placing hands in a hazard zone

A robot may be re-inspected after major repairs, weapon changes, battery changes that affect fit/protection, or at any time requested by event staff.

2.2 Pit & Lab Safety

- Powered weapons may only be operated inside the closed competition arena or an ACE-approved test box.
- Weapon locks remain installed in the pits, while carrying the robot, and while waiting in the staging line.
- Robots should be carried with the weapon pointed away from the body and other people.
- LiPo/LiHV batteries showing swelling, puncture damage, heat damage, or exposed conductors must be removed from service immediately.
- Closed-toe shoes and long pants are required in the ACE Lab. Safety glasses are required when using tools or when directed by lab staff. Long hair must be tied back and loose clothing/jewelry secured.
- Only team members actively repairing or preparing a robot should occupy the immediate pit/work area during busy periods.

2.3 Battery & Electrical Safety

• Only commercially manufactured rechargeable battery cells/packs suitable for hobby robotics may be used. Maximum battery is 3S LiPo/LiHV (12.6 V fully charged for standard LiPo). No homemade lithium cells or damaged/recovered cells.

• Batteries must be firmly restrained inside the robot and protected from direct weapon contact, crushing, abrasion, puncture hazards, and sharp fasteners. Soft-pack batteries should have rigid or semi-rigid protection around likely impact areas.

• Charging must use a compatible balance charger on a nonflammable surface and in the designated charging area. LiPo/LiHV packs must be balance charged; unattended charging is not permitted.

• Swollen, punctured, crushed, overheated, leaking, or physically damaged batteries are immediately out of service. Event staff may quarantine any pack that appears unsafe.

• Battery connectors must be insulated against accidental short circuits. Exposed conductor, damaged insulation, or loose high-current wiring must be repaired before the robot can return to the arena.

• Teams must know how to fully de-energize the robot without reaching through a moving weapon path. A removable link, accessible switch, removable battery connection, or equivalent approved method may be used.

• When a robot is declared safe after a match, drive and weapon power must be disabled before anyone reaches into the arena.

2.4 Fire, Smoke & Thermal-Event Rules

ACE ZERO-FLAME RULE: A robot may not intentionally create flame, combustion, smoke, sparks as an effect, explosive pressure, or an incendiary/thermal attack. Any system whose intended function is to burn, ignite, explode, heat-damage, or chemically attack another robot is prohibited.

• If a robot emits smoke, flame, venting gas, intense heat, or signs of a battery failure, the match stops immediately. Drivers step back and follow staff instructions.

• Participants must not open the arena, grab the robot, disconnect a smoking battery, or attempt an improvised fire response until designated event/lab staff declare it safe to do so.

• A robot involved in a thermal event must be re-inspected before it can compete again. The affected battery may not be reused at the event.

• Deliberately causing another robot's battery to ignite through a prohibited system results in disqualification. Normal legal combat contact that happens to cause battery damage is handled as a safety stoppage and match result under referee authority.

2.5 Pit, Tool & Fabrication Safety

• Required ACE Lab attire: long pants, closed-toe shoes, appropriate shop clothing, long hair tied back, and loose jewelry/clothing secured. Safety glasses are required when using tools and whenever directed by lab staff.

• Machine tools, soldering equipment, grinders, saws, drills and other fabrication equipment may only be used by members who are authorized/trained for that equipment and in accordance with ACE Lab rules.

• Grinding, cutting, drilling, soldering and similar repair work must stay in designated work areas. Teams are responsible for chips, sharp offcuts, hot tools and debris created during repairs.

• Powered robots may not be left unattended. The robot should remain powered off whenever active testing is not immediately occurring.

• Keep pit aisles, exits and the arena perimeter clear. Batteries, extension cords, chargers and tools may not create trip hazards or block access.

2.6 Arena Loading, Unloading & Match Safety

• Robots enter the arena powered off with the weapon lock installed unless the referee directs otherwise. Teams remove the weapon lock only after the arena is closed and the referee authorizes it.

• After the match, drivers stop all motion and wait for referee permission before approaching the arena. Weapon motion must fully stop before the arena is opened.

• If a weapon cannot stop normally, a robot is on fire, or a battery is venting, nobody enters the arena until the Event Director/Safety Inspector establishes a safe recovery plan.

• Spectators and nonessential team members must remain behind the designated safety boundary. No person may lean over, reach through, or bypass arena guarding during an active or armed match.

• Deliberate attacks after the referee calls STOP, after an opponent taps out, or while arena personnel are entering are grounds for immediate disqualification and possible removal from the event.

2.7 Re-Inspection Triggers

A robot must return to inspection after: a weapon or major armor replacement; a material change; major chassis repair; battery chemistry/cell-count change; power-system change; damage affecting containment or electrical safety; a fire/thermal event; or whenever requested by an ACE referee, inspector or Event Director.

2.8 Unsafe Robot / Match Stoppage

The referee may stop a match immediately for battery fire/venting, uncontrolled weapon behavior, detached hazardous components, arena damage, containment concerns, exposed energized conductors, prohibited material release, or any condition that creates an unreasonable risk. Safety stoppages are not protestable during the match. After the hazard is controlled, the Event Director determines whether the result is a knockout/loss, judges' decision, restart, no-contest, or disqualification based on the cause and the fight up to the stoppage.

SAFETY AT A GLANCE

ALWAYS	NEVER	STOP & NOTIFY STAFF
• Weapon lock on outside arena • Battery secured and undamaged • Failsafe working • PPE and lab attire followed	• Test weapons in open lab areas • Use fire, explosives, gas or projectiles • Reach into an armed arena • Ignore referee or inspector commands	• Smoke, flame or battery venting • Uncontrolled weapon motion • Exposed live wiring after damage • Loose hazardous parts or containment concern

When in doubt, keep the robot powered off and ask an ACE Safety Inspector before continuing.

3. FIGHT NIGHT EVENT FORMAT

3.1 Qualification Stage - 3 Matches Per Robot

ROUND	PAIRING	GOAL	NOTES
Qual 1	Random	Give every robot an initial match.	Avoid same-team pairings where practical.
Qual 2	Record-based	Pair robots with similar qualification records.	Avoid rematches whenever possible.
Qual 3	Record-based	Final chance to improve ranking before bracket selection.	Strength of schedule is considered in ties.

Qualification records are W-L. Each match must produce a winner unless the Event Director declares a no-contest because the arena or event system prevented a fair match.

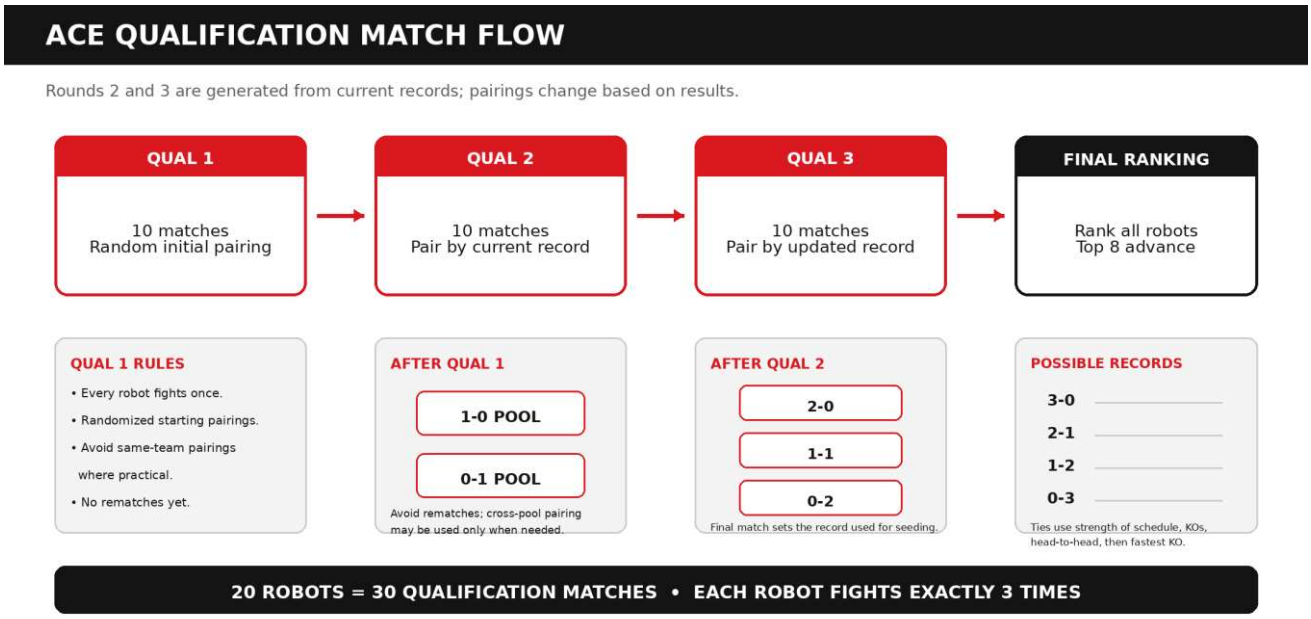


Figure 1. Qualification pairing flow for the default three-match ACE format.

3.2 Ranking & Advancement

- Primary ranking: qualification win-loss record.
- Tiebreaker 1: opponent match-win percentage / strength of schedule.
- Tiebreaker 2: number of knockouts earned.
- Tiebreaker 3: head-to-head result, if the tied robots fought each other.
- Tiebreaker 4: fastest knockout time.
- Final unresolved tie: Event Director random draw or one additional tiebreak match if schedule allows.

DEFAULT BRACKET SIZE: Top 8 advance when 12 or more robots compete. Top 4 advance for fields of 6-11 robots. The Event Director may adjust the bracket before qualification matches begin based on final attendance.

3.3 Finals / Elimination Bracket

- Single-elimination bracket seeded by qualification ranking (1 vs 8, 4 vs 5, 2 vs 7, 3 vs 6 in an 8-robot bracket).

- Bracket matches use the same knockout and judging rules as qualification matches.
- If a robot cannot safely compete when called, the Event Director may allow a short repair window when the schedule permits. Otherwise, the match may be forfeited.
- The final determines the Fight Night Champion. A third-place match may be run if time allows.

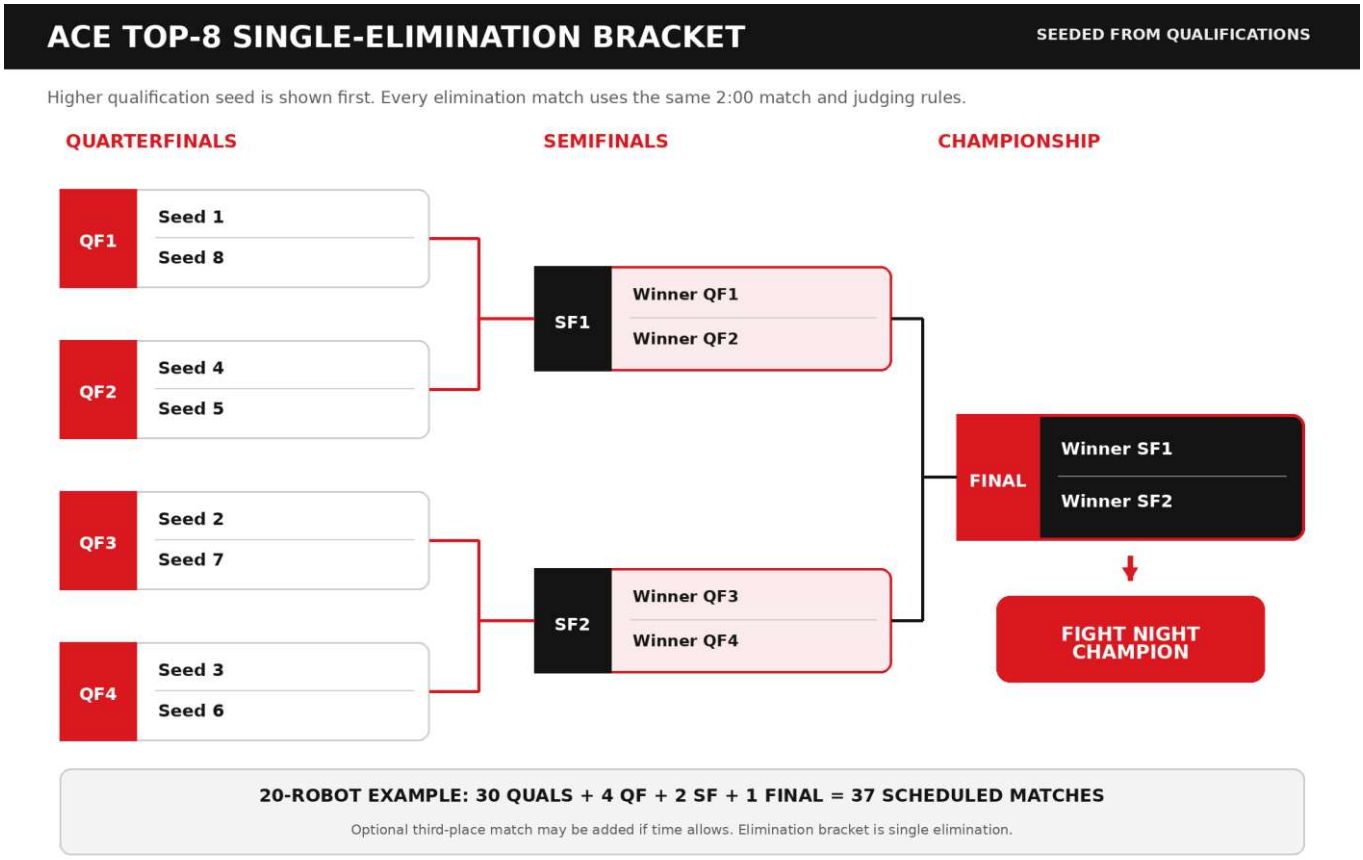


Figure 2. Default Top-8 finals bracket seeded directly from qualification ranking.

FINALS MATCH KEY

MATCH	PAIRING	ADVANCES TO
QF1	Seed 1 vs Seed 8	SF1
QF2	Seed 4 vs Seed 5	SF1
QF3	Seed 2 vs Seed 7	SF2
QF4	Seed 3 vs Seed 6	SF2
SF1	Winner QF1 vs Winner QF2	Final
SF2	Winner QF3 vs Winner QF4	Final
FINAL	Winner SF1 vs Winner SF2	Champion

3.4 Example 20-Robot Event Flow

PAIRING NOTE: Round 1 can be posted before the event. Round 2 and Round 3 should be generated only after the previous round is complete so teams can be paired by current record and rematches can be avoided.

STAGE	MATCH COUNT	WHAT HAPPENS
Qualification Round 1	10 matches	All 20 robots receive Match 1.
Qualification Round 2	10 matches	Robots paired by current record where possible.
Qualification Round 3	10 matches	Final qualification match for each robot.
Quarterfinals	4 matches	Top 8 begin the single-elimination bracket.
Semifinals	2 matches	Four robots remain.
Final	1 match	Fight Night Champion is crowned.
TOTAL (default 20-robot event)	**37 matches**	**30 qualification matches + 7 single-elimination matches. Optional third-place match makes 38.**

4. MATCH PROCEDURES & WIN CONDITIONS

4.1 Before the Match

1. Both teams report to staging when called with the robot powered off and weapon lock installed.
2. Referee confirms both robots have passed inspection and are safe to enter the arena.
3. Robots are placed in assigned starting areas. Weapon locks are removed only after the arena is closed and the referee gives permission.
4. Both drivers confirm readiness. The match starts on the referee countdown.

4.2 How a Match Is Won

ESULT	DEFINITION
ockout (KO)	A robot is unable to show controlled translational movement and does not recover during a referee count.
p-Out	A driver may surrender at any time. The opponent receives the win.
dges' Decision	If both robots are still competing when time expires, the judges determine the winner using the 11-po system.
squalification	Serious safety violations, intentional prohibited actions, refusal to follow referee commands, or oth major rule violations may result in a loss.
feree Stoppage	The referee may stop the fight for safety. The Event Director determines whether the result is a w judges' decision, restart, or no-contest.

4.3 Controlled Movement, Pins & Stuck Robots

- Controlled translational movement means the robot can move from one location in the arena to another under driver control. Merely spinning in place is not sufficient.
- A robot that appears immobilized may be given a 10-count by the referee. If it demonstrates controlled movement before the count ends, the fight continues.
- Pins are limited to approximately 10 seconds. A robot must release when the referee instructs it to do so and must allow a reasonable opportunity for separation.
- Robots that become stuck because of their own design, opponent action, or normal arena geometry are generally not unstuck. The referee may intervene if an arena defect or unsafe condition caused the problem.
- If both robots become immobilized at nearly the same time, the match may go directly to a judges' decision based on the fight up to that point.

5. JUDGING SYSTEM

ACE uses a simple 11-point system so drivers can understand exactly how a decision is reached. Three judges are preferred. Each judge splits all points between the two robots and selects a winner; the majority of judges decides the match.

CATEGORY	POINTS	WHAT JUDGES LOOK FOR	EXAMPLES
Damage	5	Functional damage caused to the opponent. Loss of drive, weapon function, armor, or structural integrity matters more than cosmetic scratches.	Disabled weapon, lost wheel, bent frame, major armor removal.
Control	3	Which robot better dictates position, engagement, and pace of the fight while maintaining effective driving and weapon use.	Pinning, flipping, forcing poor angles, keeping a spinner from reaching speed.
Aggression	3	Which robot makes purposeful attempts to engage and attack. Simply waiting for the opponent does not earn strong aggression.	Chasing, initiating contact, repeated attack attempts, re-engaging after separation.

5.1 Point Splits

- Damage (5): typical splits are 5-0 for overwhelming damage, 4-1 for clear damage advantage, and 3-2 for a close category.
- Control (3): 3-0 for near-total control or 2-1 when one robot has a noticeable but not overwhelming edge.
- Aggression (3): 3-0 when one robot clearly refuses to engage while the other attacks; 2-1 for most competitive fights.
- Judges score the fight as a whole. A destructive weapon does not automatically win if it fails to connect or the opposing robot dominates the rest of the match.

5.2 Judging Examples

Example A - Spinner earns the decision
Bot A removes one of Bot B's wheels and disables Bot B's weapon. Bot B stays aggressive and pushes Bot A for portions of the match. A reasonable card could be Damage 5-0, Control 1-2, Aggression 1-2 = Bot A wins 7-4.

Example B - Control bot beats a dangerous spinner
Bot A (wedge/lifter) takes little damage, repeatedly keeps Bot B's spinner from reaching speed, pins and repositions Bot B, and initiates most engagements. A reasonable card could be Damage 2-3, Control 3-0, Aggression 2-1 = Bot A wins 7-4.

Example C - Very close fight
Both robots remain fully functional. Bot A lands slightly more meaningful hits while Bot B controls positioning for longer. A judge might score Damage 3-2, Control 1-2, Aggression 2-1 = Bot A wins 6-5.

6. ACE AWARDS & ENGINEERING REVIEW

Match results determine the competition champion. ACE may also recognize teams for engineering quality and conduct. These awards do not change qualification rankings or the elimination bracket.

AWARD / RUBRIC AREA	WEIGHT	WHAT IS CONSIDERED
Engineering Design	30%	Sound design choices, structural efficiency, weapon integration, drivetrain layout, and clear engineering reasoning.
Build Quality	25%	Manufacturing quality, assembly, wiring, fastener retention, robustness, and safe construction.
Reliability & Serviceability	20%	Robot survives multiple fights, can be repaired efficiently, and has accessible components.
Innovation	15%	Creative mechanisms, smart material use, novel geometry, or an original competitive approach.
Team Explanation	10%	Team can clearly explain design decisions, lessons learned, and what they would improve.

Suggested ACE awards: Fight Night Champion • Runner-Up • Best Engineered Robot • Most Innovative Design • Sportsmanship Award

7. TEAM CONDUCT & EVENT AUTHORITY

- Good sportsmanship is required. Drivers and pit crews must follow referee, inspector, and lab-staff instructions promptly.
- Teams may ask for a rule clarification before a match. Arguing with judges during or immediately after a match is not permitted.
- Judges' decisions on scored matches are final unless there is a clear scoring/identity error (for example, points recorded for the wrong robot).
- The Event Director has final authority on class eligibility, safety, schedule adjustments, and unusual situations not directly covered by this document.
- ACE may issue rule clarifications before the event. Immediate safety updates may be made at any time if needed to protect participants or the arena.

APPENDIX A - TEAM MATCH CHECKLIST

- ☐ Robot is under 454 g
- ☐ Battery is charged, secure, and undamaged
- ☐ All screws / nuts / weapon hardware are tight
- ☐ Radio is bound and failsafe works
- ☐ Weapon lock is installed before leaving the pit
- ☐ Spare batteries / tools are ready
- ☐ Team knows its next match and staging time
- ☐ After match: power off, weapon lock on, inspect battery and weapon before repair
- ☐ No fire / explosive / gas / projectile / liquid / entanglement system installed
- ☐ Weapon and shaft retention inspected for cracks, looseness or damage
- ☐ Sharp edges are covered before leaving the arena area
- ☐ Charging is in the designated area with an approved balance charger; major repairs/material changes are reported for re-inspection

APPENDIX B - JUDGE SCORECARD

Match #: _____ Robot A: _____ Robot B: _____

CATEGORY	ROBOT A	ROBOT B	TOTAL POINTS
Damage	_____	_____	5
Control	_____	_____	3
Aggression	_____	_____	3
TOTAL	_____	_____	11

Judge notes: _____

_____

Winner on this card: ☐ Robot A ☐ Robot B Judge: _____

BUILD SMART. INSPECT EVERYTHING. FIGHT HARD. RESPECT THE PEOPLE AND THE MACHINES.