MAKERFIGHT's Ruleset

1 General rules

Makerfight's ruleset is voluntarily simple and is subject to updates if needed.

1.1 Introduction

1. **Safety first**. People's safety must be the first focus during any activity related to Makerfight.
2. **Be excellent to each other.** Mutual respect is necessary to the good running of the community, and we take it to heart. In case of doubt when it comes to solving a conflict, keep in mind why we are all members of this community, and try to solve the problems with a positive attitude.
3. **Don't make us create new rules.** No one enjoys booksize rulesets. Most rules exist because somebody once had a risky or inappropriate behavior, making the said rules unfortunately necessary. Don't be that somebody !

1.1 Participating to Makerfight

1. All participants build and use their robots at their own risks. All participants are responsible for their own safety and other's safety while designing, building and using their robots. The event organizer maintains a liability insurance for the event and encourages the participants to do the same.
2. It is expected from the participants that they follow Makerfight's ruleset on their own without constantly requiring reminders.
3. In case of doubt regarding a robot or a weapon not taken into account in the present ruleset, it is recommended to contact the event organizer prior to the event, in order to avoid a potentially disappointing non admission to participate from the organizer during the technical check.
4. Exploiting a loophole that may exist in this ruleset may put at risk the participants, the staff, or the audience, thus the organizer may disqualify a robot even before the beginning of the fights without necessarily having to justify their decision.

2 Safety

2.1 Locking bars (mandatory for all active weapons)

The active weapons locking bars must ensure the moving parts of an active weapon cannot move even if activated. The locking bar must be a mechanical device. The capacity of the locking bars will be evaluated and tested in the arena if necessary. In case of doubt, the organizer may require the participant to increase the locking bar's capacity prior to the final technical check of the robot.

2.2 Electrical supply disconnection device (mandatory)

The electrical supply disconnection device must be easily accessible from the outside of the robot, without having to dismount any part. It must be located in a location which makes the switching of the electrical supply safe for the operator regarding the weapons.

When the electrical supply is connected, the robot can operate (the robot can move and the weapon can be activated). When the electrical supply is not connected, the robot must not be able to operate. The device must be wired as close as possible to the battery, in order to fully disconnect the robot's power circuit. If several batteries are used in the robot, the device must either disconnect each battery, or several devices must be present (to announce during the tech check). The device can be a link or a switch. The device will be tested during the technical check.

2.3 Carrying and storage cradles (mandatory)

The cradle must avoid contact between the locomotion means (wheels for example) and the surface the cradle is put on (floor, workbench, table …). It must ensure stability at any stage of its use including the drive system testing. The cradle will be tested during the technical check.

2.4 Failsafe (mandatory)

The robot must have a failsafe feature : in case of loss of the radio signal (for example if the remitter shuts down), the robot must stop all movements within 5 seconds. This feature can easily be implemented with modern radio RC systems, or it can be developed specifically. The failsafe will be tested during the technical check.

2.5 Inappropriate behavior

A team may be disqualified in case of inappropriate behavior of one or several of its members, especially if repeated.

2.6 Application of the safety rules

2.6.1 Everytime

It is expected from the participants that they follow common sense safety rules, such as wearing PPE when using power tools. The use of welders, grinders and any other equipment that may cause sparks, fumes, arcs, debris or any other substances is only allowed in specialized and dedicated areas. In case of doubt, don't decide, ask the event organizer.

2.6.2 When the robot does not fight

When the robot is not inside of the arena, then, by default, the locking bars must be in place, the electrical supply disconnection device must be disconnecting the electrical supply , and the robot must be put on its cradle.

In the pits, it is possible to :

- Remove the locking bars, provided that the source(s) of energy has been fully disconnected, and if possible removed from the robot.
- Powering on the robot, provided that the robot is on its cradle and :
    - either the locking bar is in place
    - or the moving parts of the weapon are mechanically disconnected from their source of mechanical power (for example by removing the chain or belt between a spinner and its motor). This case is not automatically allowed if the source of mechanical power is not an electrical rotating motor. In case of doubt, ask the organizer before powering on.

2.6.3 Before a fight

A robot can only be put inside the arena after being invited to do so by the designated arena marshall. Only one operation of putting a robot inside the arena can be performed at the same time. Once inside the arena, the first roboteer can power on its robot, then makes sure nothing moves, then removes the locking bar. He can then turn its radio emitter on, then places its robot in a corner (the furthest from the door for the first robot). Then the second roboteer follows the same procedure, but places its robot in the opposite corner. Then the arena marshall closes and locks the door. Only then the weapons can be tested.

Radio emitters can never be put inside the arena.

2.6.4 During a fight

If, despite the failsafe, a robot gets out of control, then we first wait for the battery to empty. If it takes more than 6 minutes, then the organizer will use an entanglement net to stop the robot. The organizer is not responsible of any damage caused to the robot during these procedures.

2.6.5 After a fight

If they are still capable of doing so, the roboteers will drive their robots close to the arena door, then turn their radio emitters off.

The arena marshall unlocks and opens the door. He invites a first roboteer to turn its robots power off, put the locking bar, then get its robot out of the arena. The arena marshall then invites the second roboteers to follow the same procedure.

Roboteers are not allowed to get inside the arena without being invited by the arena marshall. If a robot has not been able to get close enough to the door to be deactivated from outside of the arena, the roboteer must turn its radio emitter off, then it will be the arena marshall who will get inside of the arena, power the robot off, put the locking bar and bring the robot to the roboteer.

Radio emitters can never be put inside the arena.

3 Robots

3.1 Weight

The robot's weight must be 13.6Kg or under *(30 Lbs* featherweight weight class*)*.

The scale used at event time will be the only reference used. If possible, the event organizer will have the scale certified prior to the event, or will have a weight reference item to check it the day of the event.

It is recommended to be able to easily remove weight in case there are differences between the scale used at the event and the one used to check the robot prior to the event.

The maximum weight must include all the components such as batteries, consumables, etc, as well as the link. The locking bars are not part of the weight of the robot.

If the robot has interchangeable parts (different setups), it will be weighted in its heavier setup.

In case of a multibot configuration, the weight considered will be the addition of the weights of all the robots. For example it is possible to have a 10Kg main robot and a 3.6Kg minibot.

3.2 Technical constraints

Every robots must be controlled by the driver(s) and must fulfill the following constraints :

- Wireless communication. The communication protocol is not imposed.
- No explosive, no flamme.
- Pneumatics : One tank of CO2 with maximum pressure of 68 bars is allowed, see specific appendix.
- No liquid projections.
- Nothing alive.
- No projectiles.
- No entanglement devices. For example, nets, cables, or fabrics designed to entangle the weapon of the opponent are prohibited. The authorization of a specific or border line device will be decided during the technical check.
- No electrical discharge, EMP device, or system designed to disturb electronics or communications.

3.3 Multibot / Clusterbots / Minibots / Secondary Bot

It is possible to have more than one bot at the same time. Robots can be driven separately.

All the robots including the non main bot must comply with all the constraints written in the ruleset.

The weight will be checked in the heaviest configuration.

multibot configuration must be declared as a multibot configuration at the beginning of the event (during the technical check).

Each robot must be able to show control independently.

3.4 Approval of the robot & technical check

Each robot engaged in Makerfight must pass a technical check before it can compete.

The technical check is based on a checklist (see appendix). All the boxes must be checked in order for the robot to pass the check.

If a robot does not pass the technical check, the team can modify it in order to comply, and go through the technical check again.

All the safety features written in the ruleset will be checked.

As designers and builders, teams must inform the technical check staff about any potential risk associated with the robot, as well as explaining how the robot works.

In some cases, the technical check staff may decide it is necessary to limit the use of a robot (for example reduce the maximal speed of a weapon motor). It is the team's responsibility to ensure the restriction is applied at any given time, or the team will be disqualified.

If the robot has several interchangeable components, all the setups will need to be tested during the technical check. Only the setups shown at the time of the technical check will be allowed. It is not allowed to mix robots which were separately registered.

Repairs and minor modifications are allowed between fights. In case of heavier modification, the robot must pass the technical check again before the next fight.

The robot must overall be safe enough to be operated. The organizer may disqualify any robot if they think the robot is not safe enough.

Only the event organizer can allow a robot to compete.

4 Transmission and communications

The robot must be controlled via a wireless system. The choice of the technology is free, however some rules must be followed :

1. The transmission can only be activated when the robot is inside the arena, in a test area decided by the organizer, or in the pits provided all the safety rules are followed (see § 2.6.2).
2. Radio communication systems must comply with applicable laws and restrictions, if a specific license is required for a given system, the team must inform the organizer, and provide the license if asked for.
3. It is not allowed to purposely cause interference with the opponent's transmission system.
4. It is recommended to use a system with emitter / receiver binding feature. If not, the frequency of the communication system must be changeable in order to avoid interferences.

5 The pits

A pit area is provided to each team, equipped with :

- 1 table
- 1 bench or chairs
- 1 electrical supply 230V (bring an extension cord, and an adapter for French plugs if necessary)

The pit area is where the robots may be repaired, set up and tested by the teams, while following the safety rules written in the ruleset.

Every team can store their spare parts, tools and other materials necessary to fix their robots during the event.

Charging the batteries can only be done in the pits, with an appropriate charger. It is also recommended to have a safety battery bag for charging and storing the batteries.

Only the participant team members and the organizer staff can access the pit area. For safety reasons the access will be checked by authorized staff members.

6 The arena

The arena is approximately 4 meters by 4 meters. It is flat and horizontal. Its floor is made out of 8 tables with 2mm thick steel on top and wood underneath attached together. Arena hazards may exist, and may be activated by the audience.

During the fights the arena is closed and no one can enter. When no fight is occurring, entering the arena is subject to authorisation of the current staff member responsible for the arena.

The arena is surrounded by an area delimited by barriers. This area is not allowed to the audience, only to participants and staff members.

The following items will be available close to the arena :

- A bucket filled with sand, a broom and a dustpan,
- Fireproof and cutproof gloves,
- A CO2 fire extinguisher,
- A fire blanket,
- An entanglement net or blanket.

7 The fight

The compatibility of transmission frequencies must be checked before the fight starts.

7.1 Number of rounds and duration of the fight

The fights are played by 2 winning rounds. Each round lasts 90 seconds. This duration may be modified by the event organizer in order to fit the all tournament into one weekend. It will be minimum 60 seconds

and maximum 120 seconds. The duration will be decided at the beginning of the event and will not be modified afterwards.

7.2 Beginning of the fight

The robots will start the fight at opposite sides or corners of the arena. Normally the starting areas will be visually delimited, and will be away from the arena hazards.

Roboteers can quickly test their machines before the fight. The referee must confirm with the roboteers that they are ready before the countdown starts.

The fight starts after the end of the start countdown. During the countdown the robots must stay still, and the weapons can not be started. Failing to follow this rule will result in a false start, and if repeated to an elimination.

7.3 Judging criterias of a round

A robot losses a round in one or another of the following cases :

- ***It is unable to move.*** At any time the driver must be able to move the robot (or at least part of a clusterbot) in a controlled manner if the referee ask them to. In this case it must be able to move on a significant distance (out of its own perimeter). After a first warning, if the robot (or last part of a clusterbot) does not move, the referee starts a 10 seconds countdown, after which the robot loses the round.
- ***The driver taps out.*** To tap out, alert verbally the judges and the opponent, and or tap the arena 3 times. The opponent must immediately cease to attack.
- ***The robot isn't safe anymore.*** : loss of control, fire, etc. The organizer (safety staff, judges, referees) may impose to cease the fight for safety reasons. This decision is not revocable and not arguable.
- The robot is ***disqualified*** for unfair or dangerous behavior.

After a round, if none of the previously listed losses occurred, the winner is decided by the judges.

The judges are part of the organizing staff. The judging team is made out of 3 persons. They must not be participants nor be affiliated to participants.

The commentator is also the referee. He is in charge of enforcing the rules during the fights (KO, countdowns, etc…). He will also check the active arena hazards are used in a non abusive way.

The winner is decided following the majority of judges decisions. The criterias used to decide the winner are :

- Damages inflicted to the opponent,
- The combative attitude of the robot,
- The control of the driver on its robot.

7.4 Blockage / pinning of the opponent

It is not allowed to block / pin an opponent for more than 10 seconds, for example if a robot pins its opponent against the arena wall or if it make the opponent impossible to self right, it must cease to block after maximum 10 seconds. The referee will ask to “Release” after 10 seconds. The blocking robot must back up and give a fair chance to its opponent to get back in the fight. Purposely and repetitively pinning an opponent will not give a win but may only get you points.

A robot which grabs or moves the opponent around must release after a maximum of 30 seconds.

If 2 robots are locked together and are unable to separate, the referee may pause the fight to separate the robots. When separating the robots, the roboteers must follow the instructions from the arena marshall for everyone’s safety.

7.5 End of a round

At the end of a round, when the time is out, a specific sound will occur, marking the end of the round. Robots must cease to move or attack. Damages inflicted after the end of the round will not count and may be considered unfair play.

7.6 Pauses

For technical reasons (robots locked together, etc …), or for safety reasons, judges and referees can pause the round. The timer will be stopped but not reset.

If there is less than 30 seconds left on the timer or if the round has been paused for more than 5 minutes, the round may be judged without resuming the round.

7.7 Behaviour and fair play

The judges, referees and organizers can eliminate (for a round or for a fight), or even disqualify a robot for unfair play, bad behavior noticed inside or outside the arena, or for not following the safety rules.

7.8 Decision

Normally the judges decision is final. In case of a dispute, a team who disagrees with the judges decision can ask for clarification or explanation, but at the end of the exchange, the final decision is non-revocable.

Repeatedly and abusively contesting the judges decision may result in the disqualification of the team for the rest of the event.

To avoid any mistake, it is recommended that the winning team checks the result records matches the judges decision.

In case a team needs to repair a robot between 2 rounds, a 5 minutes time is allowed. If the robot can not restart, it loses the round and potentially the fight. The team will be allowed to repair the robot in the pits for its next fight.

A team can request to postpone a fight once if it needs more time to repair after a previous fight. If, when called for the second time, the robot can not compete, he loses the fight (but is not disqualified). If the team manages to repair for the following fight, the robot gets back in the competition.

8 The two phases of the competition

8.1 Qualification phase (groups)

The number of groups will be decided by the organizer depending on the number of registered and showing up robots. The teams will be put into groups which will have, as much as possible, the same number of robots. The group that a team will be assigned to is taken randomly.

If one team has several robots in the competition, the team will be able to ask the group assignment to be redone if more than one of their robots ends up in the same group.

8.1.1 Scores calculation

Points given during the qualifications phases are calculated as follow.

A registered robot that does not participate to any fight is considered as not present (this impacts the 3rd and 4rth place calculation).

For each scheduled fight :

- The winner gets 3 points,
- If the losers has won 1 round he gets 1 point, otherwise 0,
- If 1 robot forfeits, the one that shows up gets 3 points.

Ranking within a group :

To decide robots ranking within a group, in case of equality of points, we do as follow, then calculate a score :

We count the points, then, in case of equality :

1. We count the fights won in a single round (KO during the first round with no return of the KOed robot),
2. We count the biggest amount of wins on the won rounds (we do not count wins by forfeit),
3. We count the smallest amount of rounds done (this counting aims at giving advantage to attacking robots, who really fought and easily beat their opponents).

8.2 Direct elimination phase

After the end of the qualification phase, the 2 best robots of each group are automatically qualified.

If a qualified robot forfeit, the 3rd one of its group takes its place.

If it is necessary to qualify more than 2 robots per group (due to a number of groups different than 4 or 8 for example), the best 3rds, then the best 4rths will complete the final list.

The calculation of the best 3rds and best 4rths is done by dividing the score of a robot by how many fights it was supposed to have. We get a ranking of all the 3rds and a ranking of all the 4rths.

After the qualifications phase, qualified robots go on a direct elimination phase. At each step, the loser is eliminated and the winner goes on.

After the semi-finales, the 2 losers have a “small finale” to decide the overall 3rd place, and the 2 winners go to the finale.

9 The team

Each team can be composed of up to 5 persons. It is possible to change drivers between 2 rounds but not during a round.

If there are several robots, there can be several drivers.

There can also be several drivers for the same robot, for example one for the driving itself and one for the weapon.

10 Ruleset

This ruleset can also be found on the Makeright dedicated website :
https://www.makerfight.fr/reglement-makerfight/

11 Contact informations

MAKERFIGHT is organized by the association TECHNISTUB which manages a Fablab & Makerspace in Mulhouse, France.

Generally, informations about the event and its organization will be regularly posted on Technistub’s and / or Makerfight’s channels :

- Website : http://www.technistub.org or http://www.makerfight.fr/
- Facebook : https://www.facebook.com/technistub/ and https://www.facebook.com/makerfight.mulhouse/
- Twitter : https://twitter.com/Technistub et https://twitter.com/makerfight68
- Instagram : https://www.instagram.com/technistub/ et https://www.instagram.com/makerfight/

The address of the association is :

Association Technistub
2 rue des Flandres

Bât. 5.06
68100 Mulhouse
FRANCE

An access map is available here.

N.B. : the MAKERFIGHT event does not take place at the Technistub location but in a location rented for the occasion.

Any question related to the ruleset can be sent to the organizer via the website contact form or by email to contact@makerfight.fr.

12 Appendix

12.1 Penumatics

12.2

12.3 Tech check sheet (example)

This appendix shows an example of a tech check sheet. This one is given for informations. The one used on tournament's day may vary.

Date		**Revision**	
Robot and team name			
Team captain			

Every following verifications must be performed :

Subject	**Additional informations**	**Decision**	
		Success	**Fail**
Weight	Featherweight class : weight equal or less than 13.6 Kg. In case of a clusterbot, all parts must be weighted together. If several configurations for a same robot, the heavier must be weighted.		
Communication system	Radio communication systems must comply with applicable laws and restrictions, if a specific license is required for a given system, the team must inform the organizer, and provide the license if asked for.		
Batteries	Batteries must be sufficiently protected. Use of a protective bag is advised.		
Chargers	Chargers must be appropriated to the batteries used.		
Wirring	No insulated wires. Wires size must be appropriated for the current they carry.		
Locking bar	The active weapons locking bars must ensure the moving parts of an active weapon cannot move even if activated. The locking bar must be a mechanical device.		
Electrical supply disconnection device	The electrical supply disconnection device must be easily accessible from the outside of the robot, without having to dismount any part. It must be located in a location which		

	makes the switching of the electrical supply safe for the operator regarding the weapons. Check how many devices per robot.		
Failsafe	Check the failsafe is implemented and it works. Robot on the cradle, drive train full on, it must stop if the radio emitter gets turned off, while keeping the drive train setpoint full on.		
- Carrying and storage cradles	The cradle must avoid contact between the locomotion means (wheels for example) and the surface the cradle is put on (floor, workbench, table …). It must ensure stability at any stage of its use including the drive system testing.		
General safety	The sobot does not show any unprotected sharp edge or corners while carrying, storing, or in the pit. All part of the robot must be sufficiently mounted to avoid projectiles.		
Pneumatics	Only allowed gas is CO_2. The gas cylinder must be sufficiently protected. Pressure is limited to 68 bars Appropriated burst discs must be installed.		