

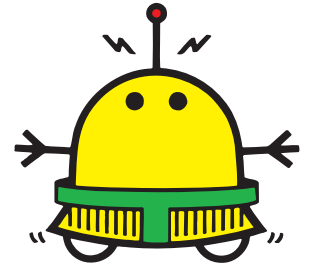
## Robot-Sumo Overview

The official name is the "All Japan Robot-Sumo Tournament."

Robot-Sumo has been held since 1989, and participants are competing with their own robot sumo wrestlers using technology and their imaginations.

There are two categories, the high school tournament and the all-Japan tournament, and the latter is held at the Ryougoku Kokugikan in Tokyo.

Two robots are placed in a sumo ring, and the winner is determined when one of them is pushed out of the ring.



Tournament official character  
"Robo-chan"

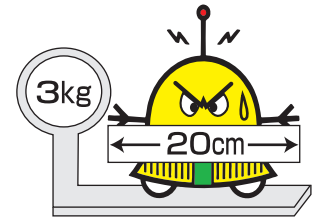
## Robot Size

The robot size must be 20 cm in depth x 20 cm in width, and the weight must be 3000 grams or less. There are no restrictions on the height.

Robot sumo is divided into two sections: "self-operating bouts," in which robot wrestlers fight based on computer programs, and "radio-control bouts," where wrestlers are controlled by a proportional radio control system.

Each section has its own Yokozuna grand champion.

\*There are no bouts between self-operating robots and radio-control robots.



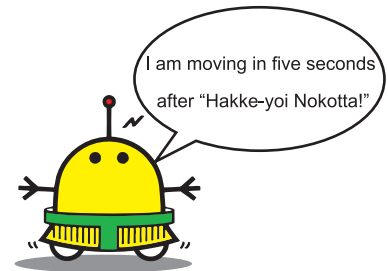
## Self-operating robots

A computer program is preset for a robot wrestler to store various tactics, and an operator will select suitable tactics at the fighting site.

Following the starting call of "Hakke-yoi Nokotta!," a switch has to be turned on, and a robot has to begin moving in five seconds.

A robot must be equipped with a "white-line detecting sensor" to recognize the edge of the sumo ring that is a white line.

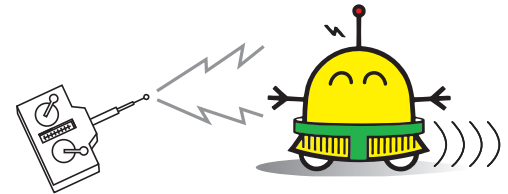
With the sensor, a robot wrestler may be able to make a last-ditch effort at the edge.



## Radio-controlled robots

An operator will move a robot freely using a proportional radio control system.

The essential techniques are not only controlling skills but also intuition and instant decision-making.



## Robot-Sumo Rules

A wrestler loses when a part of one robot's body touches the area outside the sumo ring. Falling down in the sumo ring does not determine a bout.

The match is three minutes.

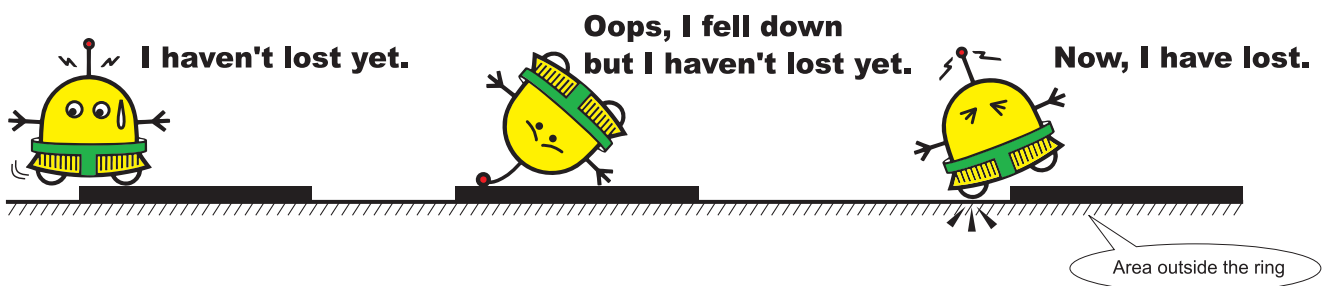
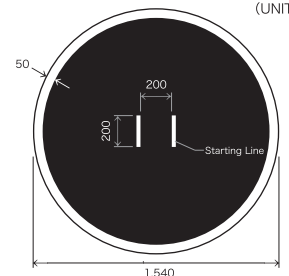
A robot who pushes the opponent out of the ring twice (or the one who wins two points) within the time is the clear winner.

If time runs out the wrestler who has gained one point wins the bout.

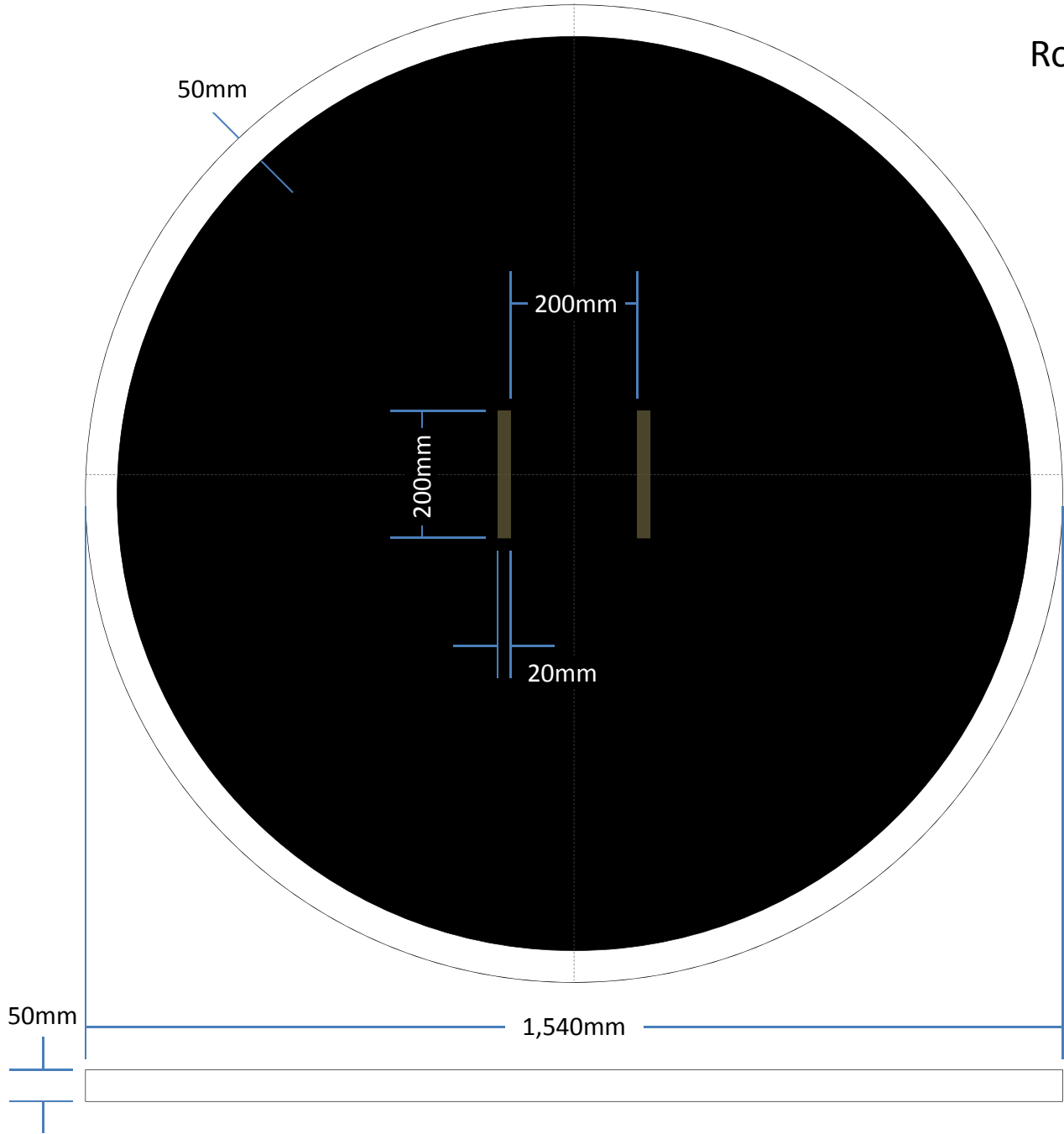
When a match ends in a draw, the winner is determined either by the judge's decision, or by adding an extra time.

■ Size of the sumo ring

(UNIT: mm)



# Robot Sumo Dohyo Data Sheets



### Dohyo DataSheets:

Diameter 1,540mm

Material(Surface)  
Cold-rolled steel plate  
(Sheet Plate)  
1.6mm thickness

Material(Frame)  
All Alumium  
50mm thickness  
\*Material which is not affected by the magnet. Another possibility in the wood.

Color  
Dohyo face Matte Black  
StartLine Dark brown matte  
Edg of the ring White

Paint  
Acrylic resin paint baking finish type  
Baking temperature is 130°C

# **【Match Regulation for All Japan Robot-Sumo Tournament】 Ver4.0**

## Chapter I General Provisions

(Objective)

Article 1.

This Regulation defines match rules and regulations for the All Japan Robot-Sumo Tournament.

## Chapter II Definition of a Match

(Definition)

Article 2.

In a match, both contestants (for every unit of robot, a single operator shall be registered and a single assistant can be attached; provided, however, that the assistant cannot concurrently serve as an operator) will play the game and compete for an effective point (hereinafter referred to as “Yuko Point”) using each own made radio-controlled type or autonomous type robot each other in a Dohyo (match ring) area as pre-allocated in accordance with this Match Regulation (hereinafter referred to as “this Regulation”), and a judge will determines the winner.

## Chapter III Specifications of Dohyo Jonai (Match Ring Area)

(Specifications of Dohyo, etc.)

Article 3.

Specifications of Dohyo, etc. shall be as follows:

### 1. Definition of Dohyo Jonai (match ring area)

(1) A Dohyo Jonai (match ring area) consists of a Dohyo (match ring) and a Yochi (outer layer area of the Dohyo). The rest of the space is referred to as a Dohyo Jogai (outside Dohyo area).

### 2. Specifications of Dohyo

(1) Dohyo (match ring) shall be a circle which is covered by a black SPCC (cold-reduced carbon steel) board on top of the 5-cm height, 154-cm diameter (including Tawara (dividing line)) aluminium board.

### 3. Shikiri-Sen (starting line)

Shikiri-Sen (starting line) shall be indicated as two brown lines with a width of 2 cm and a length of 20 cm. Each line shall be located at 10 cm right and left from the center of Dohyo (match ring).

### 4. Tawara (dividing line)

(1) Tawara (dividing line) shall be indicated by a white circle line with a width of 5 cm to the inside from the outer line of Dohyo (match ring) (The white area shall be deemed as within

Dohyo).

#### 5. Yochi

(1) Yochi shall be the 100 cm area to outside from the outer line of Dohyo (match ring); provided, however, that the color of Yochi shall be other than in white, and configuration and materials of Yochi may be chosen freely to the extent that it does not detract the mind of this Regulation.

### Chapter IV Specifications of a Robot

(Specifications of a Robot, etc.)

#### Article 4.

Specifications of a robot, etc. shall be as follows:

##### 1. Specifications of a robot

(1) A robot shall be 20 cm width and 20 cm depth (no restriction on height), able to be stored in a cubicle box frame for standard inspection.

##### 2. Weight of a robot

(1) 3,000g or less (including accessories); provided, however, that in the case of the radio-controlled model, the weight of the proportional control system (hereinafter referred to as "PCS") shall be excluded from the 3,000g limit.

##### 3. Radio waves usable for radio controlled models

Radio waves usable for radio controlled models shall be narrow band waves of 2.4 GHz, 27 MHz (01-12) and 40 MHz (61, 63, 65, 67, 69, 71, 73, 75 band)

##### 4. Requirement of PCS

(1) Only one PCS shall be allowed for each robot.

(2) For PCSs, only the Fujisoft Shin Rajikon System or those made by Futaba, JR, Sanwa or Kondo Kagaku can be used.

##### 5. Crystal

(1) Contestants shall bring and use such crystal reception parts for the radio control system as with the wave range usable in the tournament, with a prior approval of the administration office. If the crystal brought by him contains any deficiencies, contestants shall use those provided by the administration office.

(2) Contestants shall preliminarily take measures so that crystal reception parts can be easily fixed to and removed from the robot.

(3) This shall not apply to the cases where the contestant use the Fujisoft Shin Rajikon System.

6. Autonomous type robot - Starting movement

(1) A robot shall be designed so that it will start its movement five seconds after the operating switch is turned on by means of the "remote controller for starting/stopping movement" (hereinafter referred to as "Remote Controller").

7. Autonomous type robot - Method for stopping movement

(1) For safety reasons, the robot may be stopped by the "Remote Controller."

(2) If the "Remote Controller" is based on radio waves, the wave range for the radio controlled models used in the tournament may not be used. **But 2.4GHz is excluded.**

8. Conditions for usage of blades

(1) Such components as may be dispersed from the robot body when in contact with other robots or during movement shall be prohibited.

9. Measures of fire prevention

(1) Such measures as prevent over-current to the battery, such as equipping safety fuse or poly-switch and blocking by the circuit, shall be taken.

(Movement conditions for autonomous type robot)

Article 5.

A robot shall be designed to detect, turn and face by itself, and take action showing its fight against, the opponent. In the event of doubt in its movement, any operation check may be made under the instructions of the judges. (The operation check shall be carried out under the conditions the match has terminated, without any program change.)

(Conditions for usage of "Remote Controller" for autonomous type robot)

Article 6.

1. Contestants shall put at the designated place and shall not touch, the "Remote Controllers" until receiving instructions from judges.

2. Operation of the "Remote Controller" to stop the movement of the robot shall be performed outside the Dohyo Jogai (outside Dohyo area).

(Prohibited matters in designing and making robots)

Article 7.

1. Robots may not contain any disturbing wave generators or any components which may disturb the control by opponents of robots, such as flash.

2. Any components which may scratch, or cause any damage on, the surface of Dohyo (match

ring) shall be prohibited.

3. Robots may not contain any devices which spray any charged liquid, powder or gas to the opponent.
4. Robots may not contain any ignition devices.
5. Robots may not contain any shooting or throwing devices.
6. Robots may not contain any parts which fix the robot to Dohyo (match ring) surface and prevent it from moving, such as suckers, glue and so on.

## Chapter V Rules of the Match

(Rules of the Match)

Article 8.

1. As a basic rule, competition time shall be based on three matches in three minutes, and the team which gets two Yuko (effective) points within the competition time will be deemed the winner.
2. If only one single Yuko Point (effective point) has been got by the end of the competition time, the team which has got the Yuko Point will be deemed the winner.
3. If neither of the teams wins the match within the competition time, the winner will be decided according to Article 15 [Yusei].  
If Yusei cannot be decided or if the number of Yuko (effective) points each team has got in the match is the same each other, the competition time will be extended by three minutes. In the extension time, the team which gets one Yuko Point (effective point) will be deemed the winner of the competition.
4. No maintenance is allowed until the competition is over; provided, however, that this shall not apply to any maintenance carried out during waiting time for the next match or any program change for autonomous type robot carried out during the match.

## Chapter VI Execution of the Match

(Safety Measures)

Article 9.

1. For securing safety, contestants and judges shall wear goggles, gloves and sports shoes during the match.
2. For radio-controlled type robots, PCS shall be operated as per stop signals indicated by judges and be placed at pre-allocated place, and may not be operated outside the match time.  
Therefore, for placing a robot into Shikiri-Sen (starting line), operating by PCS shall be prohibited. Contestants shall promptly have the robot positioned at the Shikiri-Sen (starting line) manually and have it ready for the match.

(Beginning of the Match)

Article 10.

1. A match will begin following the instruction of the judges. Contestants will bow to each other at the Dohyo Jogai (outside Dohyo area) and then enter the Dohyo Jonai (match ring area). Then, contestants shall put their robots, on Shikiri-Sen (starting line) (no part of the robot may go over

the line toward the opponent) or within the lines extended vertically from the both edges of the Shikiri-Sen (starting line) to the white line, or so that any of the part of the robot will touch said extended lines.

2. Both of the contestants shall concurrently place the robots on the Dohyo (match ring) as described in the preceding paragraph according to the sign of the judge. Once having the robot placed, contestants may not move it.

**\*After you put your robot at the Dohyo you must leave the area immediately.**

3. For radio-controlled type robots, a match will begin upon the starting sign of the main judge.

4. For autonomous type robots, a match will begin five seconds after the starting sign of the main judge. In response to the starting sign of the main judge, operators shall give orders to the robot to start by means of the "Remote Controller", and then put said controller at the designated place.

5. In the event of any scratches/dirt on the Dohyo (match ring) area, if judges decide that the match can continue on the same Dohyo (match ring), the Dohyo (match ring) shall continue to be used without change.

(Ending of the match)

Article 11.

1. Competition shall be officially end upon the announcement by the main judge of the winner. Contestants shall be carry the robot from the Dohyo (match ring) area to the Dohyo Jogai (outside Dohyo area) and then bow to each other.

2. Upon the suspension or ending of the match, contestants shall immediately stop the robot, according to the sign of the main judge; provided, however, that for autonomous type robots, contestants shall stop the robot by means of the "Remote Controller".

(Torinaoshi (rematch))

Article 12.

If any of the following items arises, the match shall be suspended and rematch shall be carried out:

1. Both robots are in a state in contact with each other, and either become unable to move or are running on the same orbit;

2. Both robots concurrently touch any part of Yochi of the Dohyo Jogai (outside Dohyo area); or



3. Otherwise, the judges decide that it is impossible to determine the winner.
  
4. If winner cannot be determined after the Torinaoshi (rematch), the main judge may place the robots in the allocated position and resume the match,  
and thereafter, the same procedure shall be repeated until winner is determined, within the allocated time.

## Chapter VII Yuko Point (effective point), Shinitai and Yusei (predominant)

(Yuko Point (effective point))

Article 13.

If any of the following situations arises, the contestant shall get a Yuko Point (effective point):

1. its robot makes the opponent's robot touch any part of the Yochi of Dohyo Jogai (outside Dohyo area) by lawful means;
2. the opponent's robot touches any part of the Yochi of Dohyo Jogai (outside Dohyo area) for any reason;
3. the opponent's robot is judged as the "Shinitai" pursuant to Article 14;
4. its robot is judged as the "Yusei (predominant)" pursuant to Article 15;
5. "Keikoku (warning)" as defined in Article 16 is given twice to the opponent;
6. the opponent is judged as having committed "Hansoku (violation)" as defined in Article 17;
7. A winner who has been granted Fusensho (a win without a match) as defined in Article 20 paragraph 3, shall be granted two Yuko (effective) points; provided that if he/she has already had one Yuko Point then one Yuko Point shall be granted. The number of Yuko Points having been acquired by the opponent who lost the match shall remain effective.

(Shinitai)

Article 14.

One Yuko Point (effective point) shall be granted to the contestant in the name of Shinitai if:

1. one or more wheels of the opponent's robot run off the edge of Dohyo (match ring), and the judges decide that it cannot return into the Dohyo (match ring).

(Yusei (predominant))

Article 15.

One Yuko Point (effective point) shall be granted to the contestant in the name of Yusei (predominant) if:

1. the judges decide that the contestant's robot is more predominant than the opponent's one, comprehensively taking into consideration strategy, movements and skills of both robots.
2. The decision under Article 8 paragraph 3 shall be made based on the decision made under the preceding paragraph.

## Chapter VIII Hansoku (violation) and Penalty

(Keikoku (Penalty))

Article 16.

Any of the following events arises on the part of a contestant, he/she shall receive a Keikoku (warning). If a contestant receives a Keikoku (warning) twice, one Yuko Point (effective point) shall be granted to the opponent.

1. An operator or assistant or any portion thereof (PCS, etc.) enters the Dohyo Jonai (match ring area) during the match; provided, however, that this shall not apply after the main judge calls match end.
2. There is a movement of the robot (physical extension or movement) before the match begins;
3. The contestant violates Article 6 (Conditions for usage of "Remote Controller" for autonomous type robot);
4. The robot is repositioned after it has been placed in the Dohyo (match ring);
5. The contestant violates Article 9 paragraph 2 (Safety Measures);
6. When the player use a lot of time making some corrections or any delayed act.
7. Any other actions that may harm fairness of the match.

(Hansoku (violation))

Article 17.

Any of the following events arises on the part of a contestant, one Yuko Point (effective point) shall be granted to the opponent or both parties:

1. Any of the components is dropped from the robot, and the dropped component is in moving condition;
2. The robot stopped moving and become unmovable on the Dohyo (match ring);
3. Both of the robots are moving but no contacts are made;
4. There is application from the contestant to terminate the match;
5. The contestant has caused its robot to start to move, and the judges judged it dangerous; or
6. Any of the components has flown, and the judges judged it dangerous.

(Hansoku-make (losing game by violation))

Article 18.

Any of the following events arises on the part of a contestant, he/she shall lose the game, in the name of Hansoku-make (losing game by violation):

1. The contestant does not show up at the designated Dohyo (match ring) when called at the beginning of the game;
2. The contestant commits any actions that may seriously harm fairness of the match, including but not limited to damaging, making dirty and distorting the Dohyo (match ring);
3. The contestant violates Article 4 "Specifications of a Robot, etc."; provided, however, that the term "disperse" as used in Article 4 paragraph 8 shall include any and all "dispersing," regardless of the scale of dispersing, which means that when any component is dispersed from the robot body, a Hansoku-make (losing game by violation) shall apply regardless of the scale of the dispersing;
4. The robot does not perform such movements as listed in Article 5 "Movement conditions for autonomous type robot";
5. The contestant attends the match without wearing protective guards as described in Article 9 "Safety Measures"; or
6. A fire comes out from the robot, or the judge decides that the same situations as a fire come out.

(Shikkaku (disqualification))

Article 19.

Any of the following events arises, the contestant shall be disqualified and shall not be on the ranking list:

1. The contestant has produced the robot by such methods as listed in Article 7 "Prohibited matters in designing and making robots";
2. The contestant displays unsportsmanlike behavior, including but not limited to abusing or defaming the opponent or judges, and intentional renunciation; or
3. The contestant intentionally injures the opponent.

## Chapter IX Injuries and Accidents During a Match

(Request for suspension)

Article 20.

1. If being injured due to any accidents caused by operation of robot during a match, and becoming unable to continue to perform the match, the contestant may request the judges to suspend the match.
2. In the case of the preceding paragraph, the judges shall promptly take appropriate measures.
3. If rematch does not realize despite of the measures under the preceding paragraph, the opponent shall be deemed the winner, without match.

## Chapter X Objections

(Objections)

Article 21.

No objection may be made against the judgment of the judges.

## Chapter XI Specifications of Marking, etc.

(East-West direction)

Article 22.

East-West direction of Dohyo (match ring) shall be determined based on the position to the judges. The right hand side of the judges marks the East, and the left hand side of the judges marks the West.

(Marking on robot)

Article 23.

A sticker of the following color shall be attached to each robot at such a position as can be easily recognized by the judges: The color of the sticker shall be red in the case of the East side contestant, or blue in the case of the West side contestant.

## Chapter XII Others

(Revision or abolition of regulations)

Article 24.

Revision or abolition of this regulation shall be adopted by the chairperson of the tournament committee, through deliberation of the committee pursuant to the tournament committee's regulation.

## Supplementary Provisions

1. This Regulation Ver2.0 shall be revised and come into effect from June 10, 1994;
2. This Regulation Ver2.1 shall be revised and come into effect from June 12, 1995;
3. This Regulation Ver2.2 shall be revised and come into effect from June 1, 1996;
4. This Regulation Ver2.3 shall be revised and come into effect from June 20, 1997;
5. This Regulation Ver2.4 shall be revised and come into effect from June 3, 1998;
6. This Regulation Ver2.5 shall be revised and come into effect from June 22, 1999;
7. This Regulation Ver2.7 shall be revised and come into effect from July 4, 2001;
8. This Regulation Ver2.8 shall be revised and come into effect from July 4, 2002;
9. This Regulation Ver2.9 shall be revised and come into effect from January 27, 2003;
10. This Regulation Ver3.0 shall be revised and come into effect from June 1, 2003;
11. This Regulation Ver3.1 shall be revised and come into effect from August 19, 2004;
12. This Regulation Ver3.2 shall be revised and come into effect from June 1, 2005;
13. This Regulation Ver3.3 shall be revised and come into effect from June 1, 2006;
14. This Regulation Ver3.4 shall be revised and come into effect from June 1, 2009;
15. This Regulation Ver3.5 shall be revised and come into effect from June 1, 2011;
16. This Regulation Ver3.6 shall be revised and come into effect from June 1, 2012;
17. This Regulation Ver3.7 shall be revised and come into effect from June 1, 2013;
18. This Regulation Ver3.8 shall be revised and come into effect from June 1, 2015.
19. This Regulation Ver3.9 shall be revised and come into effect from June 1, 2016.
20. This Regulation Ver4.0 shall be revised and come into effect from June 1, 2017.