

# RoboCup 2002 Rescue Simulation Leagues

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2002.2.13 draft(version.1)

2002.2.18 draft(version.2)

2002.3.11 draft(version.3)

2002.3.25 draft(version.4)

- Caution 4 and 5 were changed according to the tests at Japan Open(March.23-24).
- Term 3.1 and 3.3 are made more clearly for cases with the number of **\*\***-center = 0.

2002.4.9 draft(version.5)

- Kernel vesion 0.38 becomes available.  
The new kernel is changed to support the original config.txt. The following parameter is returned to TRUE.

```
notify_only_fire_for_far_buildings      : true -> flse 2002.3.25
```

2002.4.27 draft(version.6)

- B) Games rules 3.4 [messages that rescue agents communucare within a team] is newly added and the content of 4.2.5 [number of communication] that was deleted is included into 3.4

2002.4.30 draft(version.7)

- Definition of **\*simple\*** sentence is modified.
- Caution: There may be some modification after test computer conditions on the venue.

2002.6.7 draft(version.8)

- errata: in 2002's evaluation formul.  
*P: number of living civilian agent*, is modified to the right one

```
P: number of living agents,
```

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## Index

### A) [Schedules](#)

1. Team meeting: tentative(Jun. 18; from 13:00)
2. Requirements;
3. Preliminary games: (Jun. 19-21)
4. Final games: (Jun. 22 - 23)

### B) [Game Rules](#)

1. Software Environments
2. GIS Maps
3. Agents
4. Parameters used in games
5. Evaluation rule (Which team will win ?)
6. Valid games.

## 7. Others

**Schedules**

1. Team meeting: tentative(Jun. 18; from 13:00)

2. Requirements;

Each team is required to prepare following files:

1. two gis\_init data files,  
one for Kobe City map and the other for Virtual City map,
2. galpolydata file and shindopolydata file.

**caution 1:** Tools for these files can be download from [Hatayama's tool](#) and [Takahashi's tool](#). The team can only change the number of ignition points, and the position of the ignition points agents.(cf. Game Rules [3].Agents)

**caution 2:** The files that every team prepares are key for rescue operations. We hope that every team checks your own files by your agents.

Thanks in advances for preparing good files.

3. Preliminary games: (Jun. 19-21) The number of registered teams are fourteen teams at March.6,2002.

1. They are divided in three groups A, B and C. Fourteen teams are labeled as {a1, a2, a3, a4, a5}, {b1, b2, b3, b4, b5} and {c1, c2, c3, c4}.
2. At each league, all teams do games for Kobe City maps and Virtual City maps.

**caution 3:** In this year, two kinds of map - Kobe City and Virtual City - are used. Each team will rescue at Kobe City map and Virtual City map with different situations.

League P	Kobe City map					Virtual City map					total
gis_init data from	p1	p2	p3	p4	p5	p1	p2	p3	p4	p5	points
p1											
p2	5*5 games					5*5 games					
p3	for A, B					for A, B					
p4	4*4 games					4*4 games					
p5	for C					for C					

comments:

1. P is one of {A, B,C}, and x is the corresponding lower character.
  2. For games in league A (B, C), galpolydata and shindopolydata files are selected from files that a team of league B (C, A) designed.
  3. For example, the teams in the league A will do rescue operations at five times at Kobe city using different gis\_int data files. The teams get points according to scores shown by LogViewers - the 1st team gets 4 points, the 2nd team gets 3 points, 3rd team gets 2 points, 4th team gets 1 points, and the 5th gets none. When the score of LogViewer are the same as other teams, then they get average points. And they do rescue operations at five time at Virtual City using different gis\_int data files. The teams get points from  $4*5*2=40$  to 0 and are ranked by the points.
  4. Top two teams of each leagues are qualified to final games. When there are teams with the same points, then their total scores of LogViewer determine their ranks.  
Total  $(5*5 + 5*5 + 4*4)*2 = 132$  games are done during 3days.
4. Final games: (Jun. 22 - 23)
- Jun. 22
1. Top 3 teams are selected in tournament style.

The tournament games will be done between the 1st teams of a league (A1, B1, C1) and the 2nd teams of the other league (A2, B2, C2) - A1 vs. B2 , B1 vs. C2 and C1 vs. A2.

```
A1 --+
    +-->X: using data files of (KC_C1, VC_C1, CC_C2)
B2 --+
B1 --+
    +-->Y: using data files of (KC_A1, VC_A1, CC_A2)
C2 --+
C1 --+
    +-->Z: using data files of (KC_B1, VC_B1, CC_B2)
A2 --+
```

Each team will do two rescue operations, at Kobe city and Virtual City. The gis\_init data, galpolydata and shindopolydata files are used from other league. For example, files of C1 are used at the game of A1 vs. B2. In a case of tie score, third game will do in the following steps:

- select map by coin toss, head -> Kobe city map, tail -> Virtual city map,
  - use data files of C2.
2. exhibition of Fukuoka map by three teams (X\_loser, Y\_loser, Z\_loser).
  3. semi-final matches among (X\_winner, Y\_winner, Z\_winner).
- Top two teams are finalist (F1, F2). The third team is the third-place winner (F3). Each team will do three rescue operations, using gis\_init data, galpolydata and shindopolydata files of X\_loser, Y\_loser, Z\_loser. A coin toss determines which map, Kobe city or Virtual city is used. (head -> Kobe city map, tail -> Virtual city map).

```
map: coin toss by |X_winner|Y_winner|Z_winner|
-----+-----+-----+-----+total
      data files of |X_loser |Y_loser |Z_loser |points
=====+=====+=====+=====+=====
                X_winner|      |      |      |
                Y_winner|      |      |      |
                Z_winner|      |      |      |
```

The teams get points according to scores shown by LogViewers - the 1st team gets 2 points, the 2nd team gets 1 point, 3rd team gets none. When the score of LogViewer are the same as other teams, then they get average points. The teams are ranked as F1, F2, F3 by the total points of three rescue operations. When there are teams with tie scores, the teams do rescue operations.

```
(extra 1)    map : the other map of X_winner's coin toss
             data file: X_loser
             If the ties are resolved, then finish,
             else do extra 2.
(extra 2)    map : the other map of Y_winner's coin toss
             data file: Y_loser
             If the ties are resolved, then finish,
             else do extra 2.
(extra 3)    map : the other map of Z_winner's coin toss
             data file: Z_loser
```

#### 4. Jun. 23

Final games between F1(1st team in the semi-final) and F2(2nd team).

```
(1st game) using    map: coin toss by referee.
                  data file: committee provides.
                  If the winner of the 1st game is F1,
                  then F1 is the champion of 2002,
                  else do 2nd game.
(2nd game) using    map: the other map used in the 1st game.
                  data file: committee provides.
```

The winner of the 2nd game is the champion of 2002.

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## Game Rules

### 1. Software environments:

A Linux package will be used in Fukuoka. The package will be down loaded [here](#). On Feb. 13, 2002, a package (version number 0.37) including newly proposed softwares can be downloaded. At competition, a package of the latest version will be used.

According voting to proposals, this year we will use newly

1. traffic simulator proposed by Morimoto,
2. civilian agent with behavior rule sets proposed by Shinoda and Noda.

### 2. GIS Maps:

This year, two kinds of GIS map are used for games,

1. 1/10 model of Kobe map,
2. 1/1 model of virtual city map.

Each team must prepare gisinit.txt (that determines initial conditiions of agents) for both maps. The files are submitted at Team meeting at Jun.

The files can be edited by using [Hatayama's tool](#).

### 3. Agents:

1. The numbers of agents and ignition points specified in gisinit.txt are in the following range. The numbers are open before games.

	min.	max.	
-----+-----+-----			
Fire Brigade	: 10	15	
Police Force	: 10	15	
Ambulance	: 5	8	
Civilian	: 70	90	
Fire Brigade Center:	0	1	[*]
Police Force Center:	0	1	[*]
Ambulance Center	: 0	1	[*]
Refuges	: 1	5	
-----+-----+-----			
ignition points	: 2	8	

[\*]: Even a team with the number of \*\*-center = 0, the team must prepare dummy \*\*-center agent. (cf. 3.3)

2. agents prepared by committee is only Civilian:

Several candidates of civilian agent have been proposed by Shinoda and Noda. After tests at at RoboCup Japan Open (March, 23-24, 2002), [Shinoda](#) and Noda's civilian with behavior rule sets is used.

3. agents that a team prepares:

A team is recommended to make folloing all kind of agents.

- Fire Brigade:
- Police Force, Ambulance:
- Fire Brigade Center, Police Force Center, Ambulance Center:

However, a team can participate as long as

1. the team must make original Fire Brigade agent by itself.
2. the team uses Police Force, Ambulance agents that are open in the net, and express acknowledgements to their usage.
3. the team can Not use other team's Fire Brigade Center, Police Force Center, and Ambulance Center. Because, communication between \*\*-Center agent and corresponding agents is one of key reseach themes in multi-agent system. At least, they make dummy \*\*-Center agent for a case that other

teams make gisint.txt with **\*\***-Center agent.

When

team A := makes only Fire Brigades,

team B := makes Fire Brigades, Police Force.

team C := makes Fire Brigades, Police Force, Ambulance.

team D := makes Fire Brigades, Police Force, PF(Police Force) Center.

, then their rescue teams are compose of the followings.

	own agents	agents from OPEN source
Team A	Fire Brigades	Police Force, Ambulance
Team B	Fire Brigades, Police Force	Ambulance
Team C	Fire Brigades, Police Force, Ambulance	
Team D	Fire Brigades, Police Force, PF Center	Ambulance

#### 4. messages that rescue agents communicate within a team

- All rescue agents can tell (or say ) Max 4 simple sentences per 1 turn.
- Agents in the same rescue team can hear other team mates saying, however, are not permitted to read all messages.
- definitions of *\*simple\** sentence:  
Takeuchi and Morimoto proposed one [definition](#) to clear what simple sentences are at last November. We have not adequately discussed to agree it, so there are two ways for 2002's definition,
  1. each team is suggested to use Takeuchi and Morimoto's proposal,
  2. if a team does not use Takeuchi and Morimoto's proposal, the team is required to explain their communication and messages at team meeting, June 18, using documents. In this case, conditions are

1. Rescue agents (including center agents) can see sender ID of all messages, but can read MAX 4 messages.
2. There is no restriction on the length of messages, however, the length under 256 bytes is recommended from network traffic.

**important caution 6** : Kernel by ver.039 does not support checking - rescue agents hear a limited number (M) sentences in a cycle, completely discard other messages it decides not to hear. And the number of M varies which definition your team takes. So they are treated as fair play rules and are subject to check mechanisms similar to [ones](#) at 2001 competition. The explanatory documentations delivered by teams at June 18 are used both in the check process and in discussion of rules for 2003 at the venue.

#### 5. Parameters uses in games:

##### 1. new parameters in config.txt[kernel]:

Many of these are refered to "Fir Play rules" last year, and they have been implemented since kernel from 0-34 version.

Committee members decide to run run Kernel with default config.txt. The default parameters are

```
$ pwd
../rescue-0_38-unix/RUN
$ more config.txt
```

```
##### new options for the 2002 competi\on.
```

```
area_per_repair_cost      : 20000000
round_down_quantity      : false
accept_multiple_nozzles   : true
near_agents_rescuable    : true
steps_far_fire_invisible  : 5
```

```

steps_agents_freezed           : 3
notify_initial_position        : false
notify_position_history        : false
miscsimulator_supports_load    : false
notify_only_fire_for_far_buildings : true

notify_unchangeable_informaion : true
#                               true for compatibility
##### traditional options
:
```

For more information, please refer to [Koto\\_san's mail](#) with Subject: package ver. 0.34 available.

2. parameters: [tentative]

1. simulation time: 300 steps,
2. range of eyesight is 10m,
3. range of voice is 30m,
4. power of earthquake.

**caution 7:** Committe will prepare several files - shindopolydata.dat, galpolydata.dat - that determines how much roads and building are collapsed. Any pair of the files will be used for games. So it is no use to program the information of these files, BUT, it is PROHIBITED to program the information of these files - gisinit.txt, shindopolydata.dat, galpolydata.dat - directly.

6. Evaluation Rule(Which team will win?):

**very important caution 8:** (this term is differnt from last year.) 2002's evaluation formulra is designed to reflect activities of all kinds of agents.

$$V=(P + S/Sint) * \text{sqrt}(B/Bint)$$

P: number of living agents,  
 S: remaing HP of all agents,  
 Sint: total HP of all agents at initial,  
 B: area of houses that are not burnt,  
 Bint: total area at initial.

The more V value for a map, the better rescue operation.

7. Valid games:

Are games valid when some simulators fail?:

Some simulators may fail during a game, although they are debugged. In that case, only ONE more simulation is permitted. When the same problem occurs at the simulation, the simulation continues to the end.

The point at the game is treated on the principle that the continuation should not be the team's favor. Namely,

1. in a case of the traffic simulator fails, the continuation is against the team's point. So, the game is valid and the point is treated as effective one.
2. in cases of the other simulators (including kernel) fail, the continuation is for the team's point. For example, the fire simulator stops then there are not more fire. In that case, the team gets 0 point for that simulation in the preliminary games, and loses the game in the final games.

8. Others

1. We have to ensure that the competition field for two competing teams is identical not only parameters but also the seeds of random numbers used in simulators, -- the miscsimulator, collapse simulator, fire simulator.

**caution 9:** This does NOT say that the same seeds and parameters are used for all games. The committe will change them in codes, files -

- galpolydata.dat, shindopolydata.dat - properly.
- 2. remote entry is OK,
- 3. source code must be open after competition,
- 4. Log files will be open.