

ROBOFORGE 3

OVERVIEW	3
INTENTIONS	3

PRINTING INSTRUCTIONS 4

SOFTWARE REQUIRED	4
PRINTING SETTINGS	4
PRINTING QUALITY	4
SINGLE VS. DOUBLE-SIDED	4
COLOUR VS. BLACK AND WHITE ..	4

OPTIONS MENU 5

OVERVIEW	5
3D GRAPHICS	5
SOUND	6
GENERAL	6
CONCLUSION	6

ROBOT AI 7

IMPORTANCE OF AI	7
TYPES OF AI	7
OUTLINE OF EACH SECTION	7

CREATING AI 8

RULES THAT CONTROL AI	8
-----------------------------	---

ADVANCED AI 9

OVERVIEW	9
MODULE BASED AI	9
GATHERING INFORMATION	11
CONCLUSION	11
AI: CONCLUSION	12

PART CHARTS 13

COMPONENTS	13
COMPONENTS	14
CONTROLLERS	15
ENERGY	15
ROTATOR	15
JOINTS	16
JOINTS	17
SENSORS	17
SHIELDING	17
SHIELDING	18
WEAPONS	18



TESTING BOTS 19

IMPORTANCE OF TESTING	19
OVERVIEW	19
VIDEO PLAYBACK CONTROLS	19
COMMAND OPTIONS	20
BOT INFORMATION	21
CONCLUSION	22

TOURNAMENTS 23

OVERVIEW	23
LOGGING IN	23
TOURNAMENT MAIN MENU	24
ENTER	24
RESULTS	25
CHALLENGE	26
CHALLENGE ROOMS	27
ACCOUNT	29

TIPS AND LINKS 30

WORKSHOP	30
CUSTOMIZED IMAGE MAPS	30
OTHER PEOPLE'S STUFF	30
ROBOFORGE WEBSITE:	30
ROBOFORGE TUTORIALS:	30
ROBOFORGE FAQ:	30

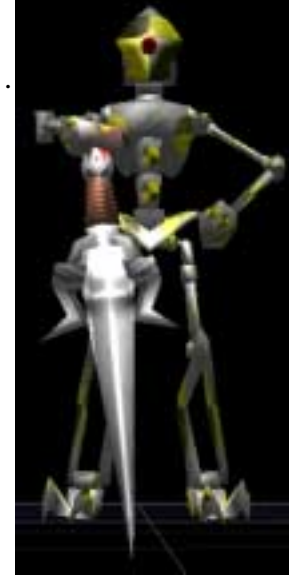
NOTES 31

.....	31
-------	----



ROBOFORGE

Welcome to Nednil's Roboforge Players Guide. This manual builds on the in-game help, it does not replace it. That is still your best bet if you are looking for an answer and can see the help button. If you are looking for futher information, you've come to the right place.



Overview

This manual is designed to complement the in-game help, and does not cover everything that the help does. However, you should find this manual an invaluable reference when playing RoboForge. There are charts which allow you to quickly run through all the component stats, helpful AI tutorials, and an explanation of how to do on-line gaming.

Intentions

Since RoboForge is distributed online, the manual is as well. Since it is an Adobe Acrobat file, you must have Adobe Acrobat to view and / or print it. Since you are reading this, you must have Adobe Acrobat. If you are not reading this, find Adobe Acrobat and download it!

Because this is an Acrobat file, you can choose which pages you want to print. It is important to **read the printing instructions**. This really is a manual whose content you can customize to your tastes. It is intended to provide you with the information that will be of use to you, and we hope that it does. Please feel free to contact the author at swkhour@learn.senecac.on.ca with any of your thoughts with regard to this manual.



Stephen Khouri - Last Revised: 02/06/2002

PRINTING INSTRUCTIONS

Software Required

You will need a recent copy of Adobe Acrobat in order to print this manual, or the Adobe Acrobat plugin for your browser software. Without it, you will not be able to view or print this manual. Since you are reading this, you must have such software, or a printed version, and so we will continue.

Printing Settings

Because this manual has graphics and text that occur beyond the regular printing area for most printers, it will be necessary to shrink the manual prior to printing. Fortunately, Adobe makes this very easy to do.

1. **Once the manual is open on-screen, click on the “Print” icon, or select File > Print to initiate the printing of the manual**
2. **Ensure that the “Fit to Page” checkbox has been checked. If it has not, then place a checkmark in it by clicking on the checkbox**
3. **Click on the “OK” button to begin the printing (Note: ensure that your printer is on and functioning properly)**

Printing Quality

The Printing quality of this manual will vary depending on the quality of the printer that prints it. If you have an older printer that does not produce a satisfactory quality copy of this manual, then copy the file onto a disk and bring it to a local print shop to be printed.

Single vs. Double-Sided

There are two copies of this manual in its PDF. The first is for double-sided printing, and the second is for single-sided printing. If your printer cannot do double-sided printing, then simply print the second half of this file only where the manual has a single-sided design.

Colour vs. Black and White

This manual can be printed in either colour or black and white. Some of the graphics and special text will lose some of their charm, but will still maintain their clarity and usefulness.

OPTIONS MENU

Overview

In general it should not be necessary to alter any of the settings within the options menu in Roboforge. If you are experiencing any sort of system difficulties or graphics anomalies, however, changing some of the settings may improve your gaming experience.

There are three main categories in the options menu: 3D Graphics, Sound, and General.



3D Graphics

Computer Speed - If you are experiencing excessive slowness while making and using your robots, make sure that you have selected an appropriate computer speed. There are three main choices for computer speed, with an explanation of each beside. These settings will automatically select different graphics options for you once one is selected.

If you want to customize your graphic options, then click on the “Advanced” button, and the 3D Graphics menu will change to a new menu with more options. If you want to return to the previous menu then click the “Back” button.

When selected, these advanced options have the following effects:

- **Smooth textures for distant objects** will increase the quality of the textures for objects that are far away from the camera when you are watching a battle; this option will reduce video speed.
- **Use fog in the battle player** will make robots that are far away from the camera (while watching a battle) appear hazier, simulating the impression of distance; this option will reduce video speed.
- **Use low texture detail** will decrease texture detail, and increase video speed.
- **Smooth animation in battle player** will make the battle animations smoother, but will reduce video speed.
- **Disable flashing objects** will identify the selected connectors within the Design area within Roboforge by making them flashing, but will reduce video speed.
- **Display zones as solid objects** will make the zones filled and translucent white in the Move making area within Roboforge, which is very useful for detailed work, but will reduce video speed.
- **Display Transparencies** will allow some objects to appear transparent when you are working in the Move making area within Roboforge, but will reduce video speed.
- **Special effects quality** will alter the quality of special effects like smoke, explosions, and fireworks. You can select which level of quality you want by clicking on the arrow and selecting one. Higher quality means reduced video speed.

Most of these options will not noticeably impact on the speed of the game. However, one option that is commonly selected is the “Disable flashing objects” option. If this is selected then when

you select a component in the Design area within Roboforge the selected connectors will not be flashing, they will be blue (the connectors are the small squares that indicate where a component can be connected to other components).

Sound

There are three sliders in the sound options menu. The three sliders control Foreground sound volume, Background sound volume, and Interface sound volume. If the slider is moved to the left the volume will decrease, and if the slider is moved to the right then the volume increased. The sliders control the following:

- **Foreground sound volume** controls the volume of the announcer-bot in the battle player, and the volume of the battle sounds as the robots clash with one another.
- **Background sound volume** controls the volume of the cheering fans and any other background sound (different arenas have different sounds).
- **Interface sound volume** controls the volume of the sounds generated when you attach components together, rotate a component, or work with AI nodes.

General

- **Invert mouse Y axis in battle player** will reverse the direction of the camera with respect to vertical movement; if you move the mouse down the camera will move up, and if you move the mouse up, the camera will move down.
- **Autosave in workshop** will ensure that any changes you make to your robot are saved even if you forget to do so yourself.

Conclusion

When you have finished making your changes, click on the **Save Preferences and Exit** button and your changes will be saved.

If you want to exit without saving any of your changes, click on the X button in the upper right corner of the screen and you will be returned to the main menu.

ROBOT AI

Importance of AI

The difference between a robot that wins battles and a robot that loses them usually comes down to AI. The robot with strong AI has a natural advantage over its competition. Strong AI means that a robot can adapt better to the changes that occur in battle. Strong AI means your robot can outmaneuver the enemy, and hit the enemy more effectively. Strong AI means your robot doesn't spend the battle trying to make a new door in the arena wall.



Does strong AI mean your robot will always win? No, there are no guarantees, but it will have a much better chance of achieving victory.

Types of AI

There are a near infinite number of ways to program your robot, but you want the programming that will work. Different robots require different types of AI, which maximize the advantages of that robot's design. A **Bully-bot** will not have the same AI as a **Hammer-bot**, because each design means different types of offense and defense are required to be successful.

In this chapter the different forms your AI may take are outlined, and divided into three categories that correspond roughly to the expected difficulty of programming that particular AI. Although it is not necessary to read through the categories in order, you may find it gives you new insight into bot-building AI, new ways to make the most of your robots design, or new ways to avoid the AI blunders that send robots into the fray backwards.

Outline of each section

- **CREATING AI**
This section covers important rules about how the robots interpret and execute AI commands.
- **ADVANCED AI**
This section covers module-based systems to control your robots functions, and making a robot that reacts effectively to its environment.



CREATING AI

Rules that control AI

There are three important rules that govern node processing:

1. Robot movements follow a priority sequence
2. Bot move actions must refer to a legal move
3. Any part or parts of a robot can only be affected by one move at a time, unless they have been programmed to move that way in a user-defined move



When a robot begins processing its AI sequence, it will attempt to execute every decision that it is in the **AI Decision Tree**. If a decision leads to a move action, the robot will attempt to complete that move action. There are three factors that control whether a move can be completed, and they are priority, energy, and ability.

Priority - The priority of the moves is as follows:

- *Chassis Movement*
A chassis move (whether simple or complex) is the weakest movement type.
- *Bot Move Action*
A Bot Move Action will take priority over any Chassis movement. If a chassis move is processed that moves the robot backwards, and then a Bot move action is processed that moves the robot forwards, the chassis move will be ignored and the robot will move forwards. Once a bot move action is active, the move continues until it is finished, ignoring any other bot move actions, unless ...
- *Overriding moves*
Bot Move actions in which the “Override conflicting moves” checkbox has been selected. This move will now override any move that would require movement different than this overriding move. This means that any other currently active chassis movement or bot move action that interferes will be overridden. Once an overriding move is active, no other overriding move can interfere. The move continues until it is finished without interruption.

Energy - If a robot has lost its energy then it will be unable to complete moves at their normal speed. This is bad. It may not seem like a big deal if your spinner stops spinning so fast, but if that enemy ground decides to introduce you to the pavement and your bot just sits there you may change your mind.

Ensure that your robot has enough energy to complete all of the moves it might make. You might find it better to invest a little more money in a good energy source, rather than spend time programming the AI to deal with energy shortages.

Ability - If a robot is against a wall, or is blocked by the opponent, it may not be able to complete a move that it is trying to make. If this occurs, the robot will attempt the movement and will complete any part of the movement that it is able to. It will continue to attempt its movements until a deadlock is declared, or the time limit of the battle has been reached.

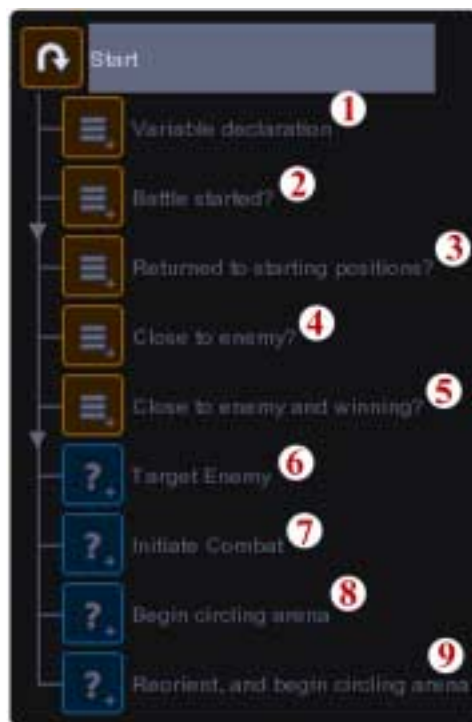
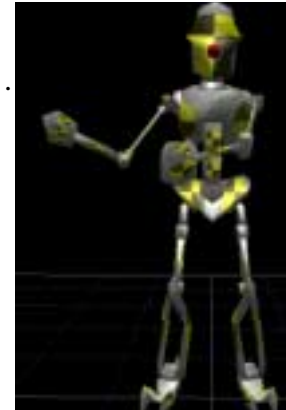
ADVANCED AI

OVERVIEW

This section outlines the value of module-based AI programming, and the best ways to make your robot aware of its environment.

Module Based AI

Module based AI keeps every main behaviour separated from the rest. This makes it much easier to understand, alter, and troubleshoot your AI. In a module system, there are three main elements: variables, checkers, and behaviours.



Variables are pieces of data which are boolean (true/false) in nature. In RoboForge, variables store a yes or no value. In the figure on the left, variables are declared (they are created and told what value to store) in **number one**. There is more on variables below.

Checkers determine what the robots immediate environment is like. In the figure on the left, **numbers two - five** are checkers. They have a question about the environment, which is used to describe each one, which they attempt to answer.

Behaviours determine what the robot will do. In the figure on the left, **numbers six - nine** are behaviours. These are the actions that you program your robot to do. As you can see, action six tells your robot to target the enemy, action seven tells your robot to initiate combat, and so on.

All of the variables are set to begin with the value “no”. You decide whether they begin yes or no, but it is best to begin with them all on “no” to indicate that nothing is yet known about the environment the robot is in.

It is always best to label a variable with words that ensure you immediately recognize what the variable is for.

Numbers one-five in the figure on the right each have a name that clearly communicates what that variable will be responsible for recording.



To determine how we should name our variables, we will now look at the important part they play in the AI decision tree.



The figure on the left is an example of how a checker operates. In **number one** it uses a timing node to determine whether or not the time elapsed in the battle is greater than 1.0 seconds (as discussed already, the computer knows that the number is measured in seconds because it is a timing node).

In **number two** the Target_enemy variable is changed from =no (from when it was first declared) to =yes.

So now that the variable has been changed, what next? Now we look at the behaviour that was programmed to target the enemy. This behaviour begins with a complex decision node, which checks whether the Target_enemy variable is =yes. You can see both the node, and its expression in the figures on the right in **numbers one and two**.



If Target_enemy is =yes, then the Y branch of the decision is activated. If it is not, then the N branch of the decision is activated. In this case it is =yes and so the Find Enemy routine is activated which contains all the instructions to the robot for how to locate and approach the enemy.

When battle begins, and the computer starts to process the AI Decision Tree, let's recap what will happen. First, the checkers will check for certain conditions. If those conditions are present then the checkers will activate specific variables that clearly identify those conditions. As a result, the variables will activate specific robot behaviours, and now your robot is off and running, or floating, or driving, or whatever.

Conclusion

Module-based AI is not intended to make your robot more lethal in combat, it is designed to make your life easier. It is filled with unnecessary nodes, and will take time to process. However, if it is used as a starting point, and you always have a shop-bot saved in a separate file, you will save yourself hours of frustration. The more complex your AI is, the more useful it becomes to have a blueprint that reminds you how it is all laid out.

Gathering Information

There are so many possibilities for designs in Roboforge that you have a lots of room for creativity. However, this also means that no two robots are exactly alike, and that when you enter your robot into a tournament you never know what your robot will be up against. The Scouts have said it for years, take their advice and **BE PREPARED**. There are many ways to help your robot figure out what it's fighting, and how well it's performing, and a few of them are listed here.

CHASSIS TYPE can be determined by using the three chassis world items:

- Hovers (yes/no)
- Is legged (yes/no)
- Is wheeled (yes/no)

This is useful to know if your robot attacks at a certain height. If you have a robot that attacks low fighting against a floater, you may end up fighting dirt while the floater knocks some sense into you.



ATTACK TYPE can be determined by using the Width and Depth world items. If the enemy robot is a spinner then their depth and width will change as their weapon spins. You can also use the Height world item to determine whether or not the enemy robot is going to drop something ominous and heavy on your robot. Any robot with lots of height may be attacking from above.



Remember! You might find it better to use high weapon-detecting zones rather than the height world item, to detect attacks from above. After all, the enemy bot might have any component up there, while the true weaponry is all in the front.

SPEED can be determined by using Speed and Velocity world items. If you have a simple run code that makes your robot run away from your enemy, you need to ensure that the enemy is not much faster than you are, otherwise your run code will become hit-the-robot-from-behind-where-it-has-the-least-shielding code.

HEALTH can be determined by using the Health world items, and if you want your robot to run for it, in the bravest way possible, after you have damaged the enemy bot, this is the best choice for a checker. Compare your health with the enemy robot's health, and if you have a higher number than get running, or floating, or whatever.

Unless of course you have one of those bots that is in it simply to lay on a beat-fest, in which case any information that does not allow you to slap on another grond is drivell.

Conclusion

Make sure your robot is prepared for anything, and is able to determine what it is fighting and what is happening all around it. The more your robot knows, the more effective its attacks and defenses will become.

AI: Conclusion

Introduce yourself to AI slowly. Trying to do too much too fast may lead to problems, and make it difficult to determine where those problems are. Master the commands step by step, always maintaining clear focus on what each node is doing. Nodes are sneaky, keep an eye on them.

When you are constructing your own AI, use group nodes to clump nodes together, and label everything that you can so that you can easily navigate your AI decision tree. Once you are in control, then you can begin the process of trimming and streamlining your AI, to make the robots calculations faster and more effective in combat.

When you are ready to streamline your AI tree, save your work as a “shop bot”, streamline the AI decision tree, and then save with your regular robots name. Saving your robot as a shop bot, for instance “Shop bot Nednil”, reminds you that this is your template, your blueprints for how your robot should think. If anything goes wrong with your robot you will always have the shop bot with its clearly written AI structure to refer to, and help clear up any confusion. It is an invaluable reference when you return to your robot after several days, or have multiple robots on the go, and need to re-familiarize yourself with the mad genius of how you put it together in the first place.

PART CHARTS

COMPONENTS

Race	Item	Cost	Weight	D.p.		
Cytol	Totek Reach	100	11	150		
Cytol	Cyn Stretch	120	5	132		
Cytol	Totek Column	180	56	346		
Cytol	Totek Sternum	200	14	305		
Cytol	Totek Toel	210	43	370		
Cytol	Cyn Spine	210	25	261		
Cytol	Cyn Claw	210	21	232		
Cytol	Totek Clamp	240	66	390		
Cytol	Totek Ankle	270	57	454		
Cytol	Totek Tube	330	26	216		
Cytol	Cyn Retractor	350	58	462		
Cytol	Totek Ulna	400	97	704		
Cytol	Cyn Ribcage	430	116	823		
Cytol	Totek Scapula	590	255	1222		
Cytol	Cyn Tibialis	590	143	986		
Cytol	Totek Tomb	1570	818	3700		
Oratha	Abhasa Stem	80	2	111		
Oratha	Abhasa End	80	1	105		
Oratha	Abhasa Bend	150	6	133		
Oratha	Abhasa Tail	180	72	352		
Oratha	Abhasa Segment	240	120	521		
Oratha	Rahshana Tract	260	156	648		
Oratha	Rahshana Unit	300	190	768		
Oratha	Rahshana Tentacle	300	73	468		
Oratha	Abhasa Wedge	350	120	703		
Oratha	Rahshana Beak	350	67	605		
Oratha	Rahshana Wishbone	370	69	614		
Oratha	Rahshana Jihad	500	279	1076		
Oratha	Rahshana Oar	600	441	1643		
Oratha	Abhasa Chin	700	525	1938		
Oratha	Rahshana Shell	820	621	2273		
Oratha	Abhasa Motile Flux	1040	809	2934		
Oratha	Abhasa Carapace	1470	1170	4195		
Raiken	Ginsai Haft	90	3	118		
Raiken	Ginsai Fist	120	18	191		
Raiken	Ginsai Fu Bi	150	31	226		
Raiken	Guandi Upper Gao	200	53	367		
Raiken	Guandi Interlimb	210	64	359		
Raiken	Ginsai Fu Qua	240	85	440		
Raiken	Guandi Delt	270	76	482		
Raiken	Ginsai Fu Shu	270	62	414		
Raiken	Ginsai Amgan	350	137	650		
Raiken	Ginsai Pectoral Array	850	501	2105		
Raiken	Guandi Din Ghi Torso	1360	827	3408		

COMPONENTS

Race	Item	Cost	Weight	D.p.		
Srikar	Kritect Sectlimb	120	25	215		
Srikar	Kritect Collar	130	28	227		
Srikar	Kritect Extremity	150	8	149		
Srikar	Kritect Telson	200	68	407		
Srikar	Kritect Rotark	220	76	446		
Srikar	Rechtext Tri	240	41	350		
Srikar	Rechtext UpperArc	270	102	560		
Srikar	Kritect Limb	270	75	440		
Srikar	Kritect Grasp	350	92	657		
Srikar	Kritect Operculum	450	196	983		
Srikar	Rechtext LowerArc	470	205	1023		
Srikar	Rechtext Intimidator	500	142	955		
Srikar	Kritect Exopoint	770	235	1512		
Srikar	Kritect Kranium	1070	525	2462		
Srikar	Rechtext Thorax	1500	750	3475		
Standard	Standard Panel	90	3	113		
Standard	Standard 45 Angle	110	17	171		
Standard	Standard Extension	110	15	163		
Standard	Standard Large Panel	110	14	157		
Standard	Standard Tetrahedron	110	13	154		
Standard	Standard Box	110	9	145		
Standard	Standard 30 Angle	120	22	189		
Standard	S. Long Connector	220	81	426		
Standard	Standard Large Box	590	291	1266		
Standard	Standard Disc	720	368	1574		
Ultair	Terangelus Prolato	120	13	175		
Ultair	Terangelus Calamus	180	4	234		
Ultair	Provectus Humerus	270	34	372		
Ultair	Provectus Hoverlink	310	34	495		
Ultair	Terangelus Icarus	330	47	482		
Ultair	Ultair Hyper Arc	400	41	551		
Ultair	Provectus Hovertractor	510	18	353		
Ultair	Terangelus Heliandum	540	97	882		
Ultair	Terangelus Medius	590	78	863		
Ultair	Ultair Core Arc	1540	560	3180		
Volker	Bladsk Saw Arm	100	20	173		
Volker	Bladsk Shock End	140	55	295		
Volker	Bladsk Brace	150	63	323		
Volker	Vraska Upper Strut	160	98	395		
Volker	Bladsk Shock	270	33	386		
Volker	Bladsk Hub	350	228	899		
Volker	V. Load Hydraulics	410	352	1158		
Volker	V. Heavy Hydraulics	420	372	1217		
Volker	Vraska Lower Strut	520	527	1682		
Volker	Bladsk Hq Axle	750	725	2275		
Volker	Bladsk Rig	830	901	2805		
Volker	V. Command Helm	1150	1274	3922		

CONTROLLERS

Race	Item	Cost	Weight	D.p.	Decisions	
Cytol	Cyn Torturer	1280	66	513	150	
Cytol	T. Reaper Skull	1490	132	680	150	
Oratha	R. Ahura Cord	1040	62	573	100	
Oratha	A. Cephalomind	1180	39	437	150	
Raiken	Guandi Assessor	1370	20	331	200	
Raiken	Ginsai Coniver	1460	28	386	200	
Srikar	R. Symbiote	640	27	420	75	
Srikar	K.Cerebroparasite	1240	60	680	100	
Standard	S. Controller	1200	41	447	150	
Ultair	P. F. Cortex	2000	35	498	250	
Ultair	Terangelus Halo	2150	55	404	300	
Volker	V. Neuroblock	740	32	380	100	
Volker	Bladsk Thinktank	950	167	602	100	

ENERGY

Race	Item	Cost	Weight	D.p.	Capacity	Output	
Cytol	Cyn Heart	1820	22	334	730	4200	
Cytol	T. B. Chamber	2230	197	967	645	6350	
Oratha	A. D. Ventricle	2180	250	977	685	6680	
Oratha	R. Arthrocell	2620	311	1191	980	6910	
Raiken	G. Nuclear Disc	3200	87	765	1050	8900	
Raiken	G. P. M. Pack	3200	78	710	1050	6900	
Srikar	Kritect Digestivac	2000	42	291	605	7100	
Srikar	Rechtext Biodrive	2880	235	1161	865	8260	
Standard	Standard Energy	1290	184	836	370	3000	
Ultair	P. Cardio Orb	2740	145	898	885	7340	
Ultair	T. Fusion Pile	2860	35	501	1000	8000	
Volker	B. Radern Engine	3120	919	3316	815	7850	
Volker	V. P. Engine	3560	286	1776	840	9400	

ROTATOR

Race	Item	Cost	Weight	D.p.	Power	Range	M.V.	M.A.	
Standard	Small Rotator	360	9	254	40	Infinity	178	97	
Standard	Medium Rotator	520	12	277	50	Infinity	172	103	
Standard	Large Rotator	870	20	325	65	Infinity	201	115	

JOINTS

Race	Item	Cost	Weight	D.p.	Power	Range	M.V.	M.A.	
Cytol	Cyn Motion	160	1	208	50	180	573	859	
Cytol	Totek Twist	180	3	226	50	195	573	859	
Cytol	Cyn Iliofemoral	300	3	221	50	138	573	859	
Cytol	Totek Alterspin	300	6	247	50	229	573	859	
Cytol	Totek Half	310	8	256	100	180	573	859	
Cytol	Totek Walker	330	23	343	100	229	573	859	
Cytol	Cyn Socket	330	5	236	50	180	573	859	
Cytol	Cyn Femur	400	11	278	100	138	573	859	
Cytol	Totek Flayed One	1390	119	1037	100	2.4	2	2	
Oratha	Abhasa Tarsal	310	11	267	100	720	573	859	
Oratha	Abhasa Phalange	320	13	281	100	229	573	859	
Raiken	Ginsai Shaft Joint	120	5	236	50	90	573	859	
Raiken	Guandi LowTurn	120	3	225	50	155	573	859	
Raiken	Guandi Upper	210	3	224	50	229	573	859	
Raiken	G. Omnirotate Disc	240	4	231	50	229	573	859	
Raiken	Guandi Lower	300	3	225	100	155	573	859	
Raiken	Ginsai Gs180	310	6	240	100	180	573	859	
Raiken	Ginsai Gsb180	310	6	240	100	180	573	859	
Raiken	G. Power Shock	310	8	255	100	229	573	859	
Raiken	Guandi Semi	390	17	313	150	229	401	573	
Srikar	R. D. Interchange	180	4	236	50	229	573	859	
Srikar	R. Strike Joint	240	5	243	50	229	573	859	
Srikar	Kritect Maneuver	370	15	322	150	229	401	573	
Srikar	Kritect Crawler	460	40	522	150	360	401	573	
Srikar	Kritect Sectslider	1580	116	1130	100	2.8	2	2	
Standard	Small 180	150	7	246	50	180	573	859	
Standard	Small 45	150	7	246	50	45	573	859	
Standard	Small 90	150	7	246	50	90	573	859	
Standard	Medium Omni	310	9	254	100	720	573	859	
Standard	Medium Omni 180	310	9	254	100	180	573	859	
Standard	Medium Omni 90	310	9	254	100	90	573	859	
Standard	Medium 180	310	9	256	100	180	573	859	
Standard	Medium 45	310	9	256	100	45	573	859	
Standard	Medium 90	310	9	256	100	90	573	859	
Standard	Large Omni	330	10	262	150	720	401	573	
Standard	Large Omni 180	330	10	262	150	180	401	573	
Standard	Large Omni 90	330	10	262	150	90	401	573	
Standard	Telescopic	860	3	218	100	1.1	3	2	
Standard	Telescopic Medium	860	3	218	100	0.8	3	2	
Standard	Telescopic Small	860	3	218	100	0.5	3	2	
Ultair	Provectus Hoverjoint	450	11	296	100	138	573	859	
Ultair	Terangulus Prolabor	870	3	227	100	0.5	3	2	

JOINTS

Race	Item	Cost	Weight	D.p.	Power	Range	M.V.	M.A.	
Volker	B. Lesser Roller	150	4	227	50	229	573	859	
Volker	Vraska Caterpillar	330	15	283	150	138	401	573	
Volker	Vraska Steer	350	27	350	150	90	401	573	
Volker	Vraska Brake Turn	390	65	559	150	172	401	573	
Volker	Bladsk Uber Roller	560	175	1164	200	229	286	286	
Volker	Bladsk Ram Slide	1480	155	1053	100	2	3	2	

SENSORS

Race	Item	Cost	Weight	D.p.	Range	F.O.V	
Cytol	Cyn Short Wave	860	2	219	16	130	
Cytol	Totek Radar	1010	3	225	25	100	
Oratha	R. Retinal Spike	1010	6	237	25	100	
Oratha	A. Rhabdom	2150	4	225	8	360	
Raiken	G. Perceptor	930	1	209	25	90	
Raiken	G. P. Sonar Unit	2320	9	258	12	360	
Srikar	R. Seeker	740	1	214	20	90	
Srikar	K. Antenna	1120	24	373	35	50	
Standard	Standard Sensor	910	2	214	17	140	
Ultair	P. Optic Lens	1000	0	208	25	100	
Ultair	T. Spectogav	1250	1	210	40	50	
Volker	V. Judge	1190	10	255	40	40	
Volker	B. Balor Eye	2220	2	213	10	360	

SHIELDING

Race	Item	Cost	Weight	D.p.	Resistance	
Cytol	Cyn Coyol Hex	700	19	220	90	
Cytol	Totek Skin	870	39	342	90	
Cytol	Totek Windscreen	1100	65	503	90	
Oratha	Abhasa Rayfin	610	20	200	90	
Oratha	Abhasa Fin	810	67	435	90	
Oratha	R. C. Shell	900	83	518	90	
Raiken	G. S. Modular2	530	11	147	90	
Raiken	G. Subprotech	530	1	107	90	
Raiken	G. C. Ki Stabber	540	1	109	90	
Raiken	G. S. Modular1	590	13	168	90	
Raiken	G. Kung Ni	680	35	276	90	
Raiken	G. Horn Shield	690	35	279	90	
Raiken	Ginsai Protech	790	59	399	90	
Raiken	G. Dome Shield	1490	220	1200	90	

SHIELDING

Race	Item	Cost	Weight	D.p.	Resistance	
Srikar	R. C. S. Growth	550	4	124	90	
Srikar	Kritect Scale	650	15	192	90	
Standard	S. Shield	570	10	152	86	
Standard	S. Square Shield	580	12	162	86	
Ultair	P. Maltese	700	11	190	90	
Ultair	T. Tectum	780	15	226	90	
Volker	Bladsk Ridge	490	32	215	90	
Volker	V. Dread Shield	510	9	134	90	
Volker	Bladsk Cruciflect	520	8	131	90	

WEAPONS

Race	Item	Cost	Weight	D.p.	Mass	Bonus	Resistance	
Cytol	Cyn Scythe	1530	31	297	31	50	93	
Cytol	T. M. Tongue	2190	45	382	45	55	93	
Cytol	C. S. Talon	2340	52	423	52	55	93	
Cytol	Totek Cymil	2640	78	583	78	50	93	
Oratha	R. Taiaha	2050	79	496	79	51	93	
Oratha	A. Cephaloprong	2100	87	535	87	50	93	
Oratha	Rahshana Koru	2110	77	489	77	52	93	
Oratha	Abhasa Trident	2390	103	619	103	50	93	
Raiken	Guandi Puncturer	1430	44	320	44	50	93	
Raiken	G. Combat Axe	1770	121	586	121	50	93	
Raiken	Ginsai Mace	1980	146	685	146	50	93	
Raiken	G. Diu Ne Ram	2040	81	509	81	50	93	
Raiken	G. War Sword	2540	113	669	113	50	93	
Raiken	G. Tira No Saw	2610	118	692	118	50	93	
Srikar	K. Venom Sting	2640	82	595	82	50	93	
Srikar	Rechtext Raker	3110	102	715	102	50	93	
Srikar	Kritect Pincer	3980	140	943	140	50	93	
Standard	S. Weapon	1390	42	310	42	50	93	
Standard	S. Hammer	1490	48	340	48	50	93	
Ultair	T. Ictus	1820	29	332	29	50	93	
Ultair	P. C. Gladius	1880	29	340	29	50	93	
Ultair	Provectus Bolla	3010	59	580	59	50	93	
Volker	V. Jackhammer	1040	59	309	59	50	93	
Volker	Vraska Drill	1140	85	397	85	50	93	
Volker	Bladsk Saw	2550	56	508	56	50	93	
Volker	Bladsk Grond	4920	177	1177	177	50	93	

TESTING BOTS



Importance of testing

One of the most frustrating things is when your robot does something unexpected in an online battle, something that might lead to its defeat. It is very important to test your bot thoroughly prior to entering it into online tournaments.

There is a lot of useful information you have access to during test battles, some of which may show you AI flaws, unexpected moves, and just how much damage the ground attached to those 10 spinning joints really does. Be prepared for surprises.

Overview

When you complete a battle it will automatically load as a video sequence. The Battle Replay display has a number of important features which will be discussed here, such as the video playback controls, and the command options. Any active button will be brighter around its border.

Video Playback Controls

There are six video controls: Play, Stop, Skip backward, Skip forward, Playback Slider, Viewing Mode Toggle, and Slow Motion Toggle.



Play button: Click on this button to watch the battle replay.



Stop button: Click on this button to stop the battle replay.



Skip Backward, and Skip Forward



Video Playback Slider



Viewing Mode toggle: Click on this button to cycle between viewing modes.



Slow motion toggle: Click on this button to watch the battle replay in slow motion.

The **Skip Backward** and **Skip Forward** buttons move the battle backward or forward by increments, so that you can keep track of what is happening .

The **Video Playback Slider** allows you to scroll to any point in the battle from beginning to end. However, the screen will only update once you have pressed the Play button.

The **Viewing Mode** toggle, when clicked, cycles between five types of viewing modes: Robot 1 cam, Robot 2 cam, Study cam, TV cam, and Walking cam.

- **Robot 1 cam, and Robot 2 cam:** These two camera modes are each always centered on one and only one of the two robots in the arena. You can move the camera anywhere by moving the mouse, and holding down the <SHIFT> key allows you to zoom in and out by moving the mouse up and down.
- **Study cam:** This camera mode is always centered on the middle point between the two robots. You can move anywhere along the edge of the arena (and up the walls) but you can not move into the centre of the arena. You can zoom by holding down the <SHIFT> key and moving the mouse up and down.
- **TV cam:** For those whose basic needs are food, clothing, shelter, and a remote control, you can choose the TV viewing mode. This is similar to the Study cam, but there is no zoom, and you cannot view the battle from ground level. The TV cam has an automatic zoom, and is the best choice for general viewing.
- **Walking cam:** This camera mode is not centered on anything. You can look anywhere you want, and move the camera around by holding the <SHIFT> key and moving the mouse. However, the camera cannot leave the ground level.

Command Options

There are four command options: Save, Exit, Capture Screenshot, and Bot Information.



Save



Exit



Capture Screenshot



Bot Information



Remember! You will not have access to Bot Information when you are viewing battles that involve any bots not found in your computer.

The **Save** button allows you to save the battle in your Archives with a name of your choosing.

The **Exit** button exits the battle replay and returns you to wherever you were prior to viewing the battle.

The **Capture Screenshot** button allows you to take a snapshot of whatever is on the screen. You must type in a name for the screenshot or else it will not be saved. After saving, a pop-up window tells you if it was successfully saved. All screenshots are saved into the /image directory within Roboforge.

The **Bot information** button provides a massive amount of useful information, and is the best tool available for helping to troubleshoot unexpected robot behaviour.

Bot Information

There are four tabs in the Bot Information window: AI, World, Action, and Comment. There are also three buttons to the left of the window: Show labels, Show Zones, and Show Sensor Coverage.



Show text: Click on this button to make the AI Decision tree text appear or disappear.



Show zones: Click on this button to make your robot's zones appear or disappear.



Show sensor coverage: Click on this button to make your robot's sensor coverage appear or disappear.

When examining the information available in the Bot Information window, it would be a good idea to click the Slow Motion button. Unless you want to challenge your computer to a speed-reading competition (you will lose) you will need to slow things down. This is when the Skip Forward and Skip Backward buttons really come in handy, so that you can move things along slowly enough to keep track of all the data you need.

The four tabs each provide you with valuable information:



The **AI** tab tracks the processing of your AI Decision Tree by the computer. All nodes that are active or have just been processed, as in the picture on the left at **numbers one - two**, are highlighted with white.

As you can see in the figure on the left, there are two decisions in the AI Decision Tree that have been processed, and there is a node inbetween them that was not. The reason the middle node is not white is because after the node at number one was processed, the decision was answered with a logical “no” and thus the computer moved on the node at number two. If the decision was answered “yes” the middle node would have been processed instead.

The **Action** tab tracks the movements that your robot is making. It keeps track of two types of movements; Chassis Moves and Current Moves. Chassis moves occur when the robot is moving forward, backward, turning left, turning right, or standing, like in the figure to the right at **number one**.

Current moves occur whenever the AI Decision Tree tells the robot to move. You can see that at **number two** the name of the moves that you have defined for your robot will appear as it attempts to complete them.

You can also see that there are many moves operating at the same time, because they don't interfere with one another.





The **Comment** tab tracks the results of major contact between the robots and their environments. As you can see in **number one** the details listed in the comment tab are all separated by a title line. In this case the title is “collision”.

The structure of each collision, as seen in **number two** in the figure on the left, is as follows:

Robot Name (component name) takes X damage

In this case X is the number of damage points the component takes as a result of the collision.

The **World** tab tracks all of the data that you have access to when programming AI. The more complex the robot, the more data there will be in the World tab. This data includes:

- the velocity, health, and energy of your robot, seen in the figure on the right in **numbers one - three**
- whether any moves are active
- the health of all the robots components
- the health, energy, and speed of your enemy
- the status of any variables
- the angle of your robot to the centre of the arena, and the angle of your enemy to the centre

History Item	Value
timeSinceDeadlock	150
timeRemaining	60.00
timeElapsed	6.98
deadlockPercent	44.44
me.turned	no
me.weight	5004
me.timeSinceCollision	0.12
me.velocity	0.02
me.health	49%
me.health	60.00
me.energy	98.83

The World tab is vitally important when testing your robot because it shows you the numbers that you need to know. For instance, if you programmed your robot to side-step when the enemy is within 15m, yet your robot quietly sits and contemplates its role in the universe, you can use the World tab to find an exact moment when the enemy was within 15m. Then you can see what was happening at that point that prevented your robot from doing what it was supposed to.

Conclusion

Testing your robots is fun, but also a necessity. There are many tools available to help you when you begin your own testing, and knowing the value of each tool will increase your enjoyment, and your skill, in using RoboForge.

TOURNAMENTS

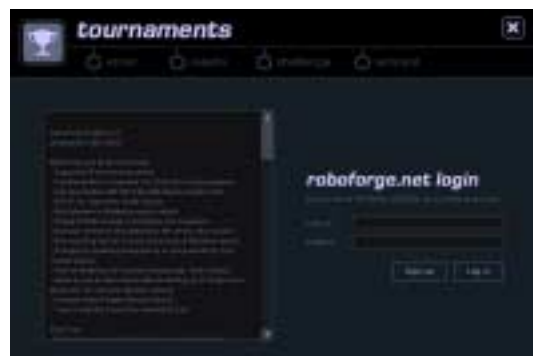
Overview

This section discusses how to experience tournaments online. This section describes the process of getting logged in, entering your robots into online battles, and checking your results to see how your robots performed, and how you compare in rank to everyone else who is playing.

Logging in

Logging in to the Roboforge online Tournaments requires three main steps:

1. When you click on the Tournament button from the Roboforge main menu, you are first brought to a screen that asks you to accept the Roboforge licence agreement. You will not be allowed to battle online if you do not choose to accept the terms of the agreement.
2. The next screen that appears will be the Roboforge update screen, where the program checks for any new updates that it needs to download. If any are found, the updates will occur automatically.
3. The next screen that appears is the tournament login screen. If you do not have an account yet you will need to click on the “Sign up” button to create one. If you have already created an account then enter your Login ID and your password and click the “Log In” button.



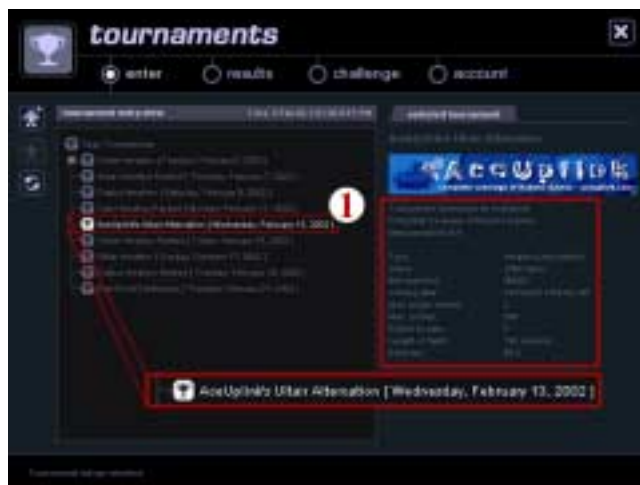
Tournament Main Menu

From the tournaments main menu there are four areas you can explore; **enter**, **results**, **challenge**, and **account**. The four areas are described below:

Enter

This is where you begin. On the left is the **tournament entry view** menu that shows you which battles you can sign up for, and on the right is the **selected tournament** menu that shows you the details of any battle that you select by clicking on it with the mouse.

As you can see in the picture on the right, the AceUplink's Ultair Altercation battle, found at **number one**, has been selected, and the battle details have been displayed.



The selected tournament menu tells you important information about the battle such as what type of battle it is, what the robot cost limit is, how many robots you can sign up, and whether there is any cost to join the battle.

TYPES OF BATTLE can be either Amateur or Professional, and either ranked or unranked.

- If you join a Professional battle then you will have to pay to enter. You will also be able to win lots of money if your robot does well.
- If you join an Amateur battle then there is no charge.
- If you join a ranked battle then your wins or losses will count for or against you, and you will earn points and be listed in the amateur or pro rank in the ranking menus in the **results** area; you will be ranked against all the other players.

TO ENTER A ROBOT INTO BATTLE you must first select a battle from the tournament entry view menu. When you have selected a battle you may enter your robot into it.



Enter tournament: Click on this button to enter a robot into a battle.



Remove from Tournament: Click on this button to remove a robot from a battle.



Refresh display: Click on this button to refresh the tournament entry view display.

When you enter a robot you will be prompted to select which robot (from all the robots that are on your computer) you would like to submit to the battle. After you have made your selection the robot will be uploaded to the RoboForge server and a small plus sign “+” will appear next to the battle you just joined. Clicking on this sign will open a directory tree and show you which robots you have entered into that battle.

To Remove a robot from a tournament simply select the robot from the **selected tournament menu** and click the “Remove from Tournament” button.

Results





This is where you can view the results of battles that have taken place. On the left is the **tournament results view** menu that shows you which battles you can explore. On the right are the **results**, **pro rank**, and **amateur rank** tabs that show you what happened in the battles you select, and how you rank against the other Roboforge players.



For the battle selected at **number one** in the picture on the right, the results tab tells you which robots fought, who won the battle, what round the battle was in, and how the battle was won. It also allows you to view information on the creators of each of the participating robots.

Click on the “**Creator Stats**” button and you will be able to view information about who created the bots, and how high their rankings are.

TO VIEW COMPLETED BATTLES you must first select one of the battles from the tournament results view menu. You will only be able to view the finals, featured fights, and battles that your robots fought in. When you have selected a battle you may do the following:

-  **Play battle:** Click on this button to watch the video of the battle replayed.
-  **Save battle to disk:** Click on this button to save the battle in your video archives.
-  **Nominate battle:** Click on this button to nominate the battle as a must-see
-  **Refresh display:** Click on this button to refresh the tournament results view display.

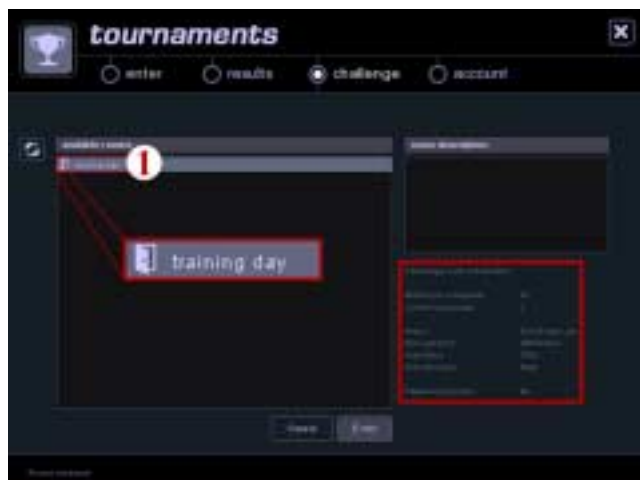
TO CHECK YOUR RANKING you must select the Pro rank tab and/or the Amateur rank tab. You will only have a ranking if you have gotten at least one point from a battle. You will only be included on a rank tab if your robot has fought within that type of battle; so amateur players will not have a ranking in the professional tab unless they join the professional league and participate in one or more battles.

FEATURED FIGHTS are fights that have been nominated as being interesting, exciting, and worthwhile to watch. You can nominate any battle to be included as a Featured fight by selecting the Nominate battle button.

Challenge

This is where you can go to fight battles with other players online, just for the fun of it. On the left is the **Available rooms** menu that shows you if there are any active rooms. On the right is the **Room description area** that describes a room once you have selected it from the available rooms menu by clicking on it.

In the picture on the right, the information of the selected room, found at **number one**, is displayed in the room description area.



The room description area has a window where the creator of the room may have written his/her own description of the room and what purpose it serves.

Below this window the room description includes important information that puts limitations on the battles that will occur within it. Some of the information it provides is as follows:

- Maximum occupants and Current occupants. If the current occupants is equal to the maximum for that room, then no more players may enter into that room.
- The name of the arena in which the battle will take place.
- The **Bot cost limit**. No player will be able to battle with a robot that exceeds the bot cost limit of the room they are in.
- The maximum amount of time that any battles will take place within. All battles played within the room will run until the fight time has been reached, or there is a clear victory.
- The accuracy of the simulation.
- Whether there is a password to enter the room. If you do not know the password, you will not be able to enter the room.

When you have selected a room and are ready to enter it, click the “Enter” button.

CREATING ROOMS is done by first clicking the “Create” button, after which the **Create a new challenge room** window will appear. You can enter a name for the room, a description of the room, and a password to limit who can enter the room. You will also have the chance to change the properties of the room by selecting any of the options found in the drop-down lists.



Remember! If you choose a password, you may end up preventing friends from entering your room, and prevent some of the more famous Roboforge players from dropping by.



Challenge Rooms

Challenge rooms allow you to chat with other players, challenge them to combat, check out other player's stats, and watch the video replay of any battles that have occurred in the room.

The challenge rooms have five main areas: the **Messages** window, the **Battle view** window, the **Battles** menu, the **Players** menu, and the **Player information** window. Each of these areas are labelled.

There are also a number of buttons available in the challenge rooms:



Refresh display: Click on this button to refresh the challenge room display.



Whisper Mode Toggle: Use this button to switch between normal and whisper mode.



Block select: Click on this button to avoid seeing a selected player's messages.



Whisper select: Click on this button to whisper messages to a selected player.



Battle challenge: Click on this button to challenge a selected player to combat.



Play Selected Battle: Click on this button to watch a video replay of a selected battle.

CHATTING IN CHALLENGE ROOMS

is done by typing what you want to say into the text box, found at **number one**, and then clicking the “Send” button. The chatting will appear in the “Messages” window; though the speed at which your messages display is dependant upon your internet connection speed.

By selecting a player from the players menu (in the picture on the right LAB has been selected) you will be given the choice to either Block messages from that player, whisper messages to that player, or challenge that player to do combat.



PLAYER STATS can be viewed by selecting a player from the players menu and clicking on the “Stats” button above the player information window.

WHISPERING means that only those players that you select, with the whisper select button, will be able to see the messages you type and send. In order to send messages in whisper mode you must click on the whisper mode toggle. When the toggle changes appearance to the whisper select button you are ready to send whispered messages. To send normal messages click on the whisper mode toggle once again.

BLOCKING the messages from another player, by selecting that player and clicking on the block select button, does not prevent that player from sending messages, it only stops those messages from appearing in your messages window. Also, it does not prevent another player from seeing the messages that you send.

CHALLENGING other players to combat is done by selecting a player and then clicking on the battle challenge button. When you issue a challenge to any player they will be presented with the choice to either accept, or decline the invitation to do battle. If the other person accepts your challenge you will both be required to select a robot that will fight for you



Remember! It is the computer of the person who is challenged that calculates the battle, not the challenger. If you and another player decide to do battle, you should both determine who has the slowest computer. The person with the slowest computer should be the person who then issues the challenge to do battle.

WATCHING BATTLES in challenge rooms occurs automatically if you are the player who was challenged. While the battle is being fought, it will appear in the battle view window of the player whose computer is calculating the battle, and the name of the battle (*player 1 vs player 2*) will appear for everyone to see in the battles menu. As a battle progresses its completion is measured, and the percentage of the battle that is complete will be displayed in the battles menu.

When the battle has completed it will be uploaded to Roboforge, and anyone in the challenge room where it was fought will be able to view it. To view the video replay of the battle select it from the list in the battles menu and then click on the play selected battle button.

When you view a battle you will be taken to the battle player. When you exit the battle player you will be returned to the same challenge room you were just in.



Remember! Be certain to save the battle while you are in the battle player if you want to keep a record of it. The battles are not automatically saved, so make sure that you save the ones you want to keep.

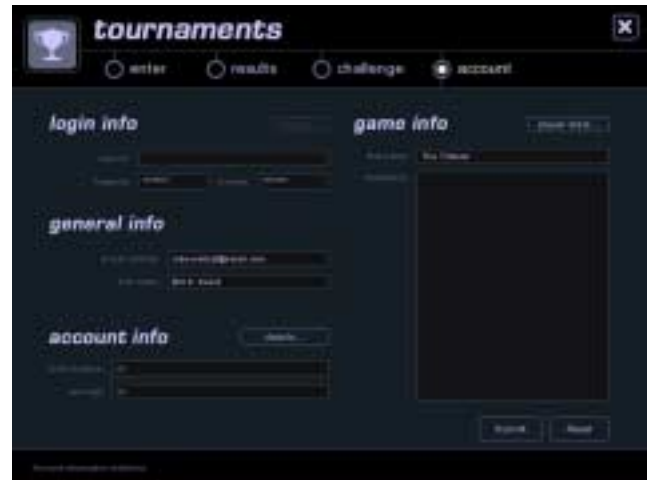
Account

This is where you go to change any of your personal details. From this screen you can change the following:

- Login password
- Nick name
- Description of yourself
- Your email address
- Your full name
- Your account status

After you have made your changes, be certain to click on the “Submit” button so that the changes are saved.

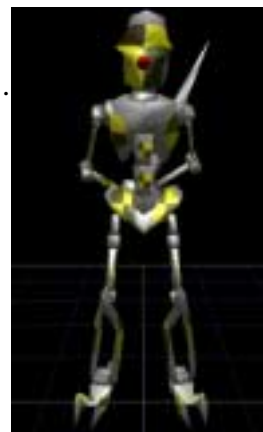
You can also check your stats by clicking on the “Player stats...” button.



TIPS AND LINKS

Workshop

Remember that there is no Undo button in Roboforge. If you remove any part of your robot or your robot's AI and it has not been saved as a limb or AI block then it will be gone. It is important to work carefully and slowly. Ensure that you save often.



Customized image maps

If you go into the **map** folder in the Roboforge main menu, and then go into one of the race folders such as **Srikar** or **Standard**, you will find all of the image maps for the different component textures. If you open one of these files in a paint program and change the picture, you can rename the file and copy it back into the directory. Now when you change the appearance of your robot, you will be able to use the image maps you created. You can have lots of fun doing this but remember, no one else will be able to see your robots the way you do unless they also have those special new image maps, with the same names, in the same directories. You can introduce Nednil to his cousin Woody, or his cousin from Canada:



Other people's stuff

There are many robot and AI examples that can be found and shared on the internet. Make use of them. Even if you don't end up using them, you can look at them, learn from them, and improve on them.

Roboforge is all about coming together and having fun as on online community; the more you participate, the more fun you will have.

Roboforge website:

<http://www.robforge.com>

Roboforge Tutorials:

<http://dewstation.tripod.com/index3.html>

Roboforge FAQ:

<http://www.aceuplink.com/robforge/info/faq/>

NOTES



