

Lagoon User Manual

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Abbreviations

CAT	-	Controller Authoring Tool
GUI	-	Graphical User Interface
SP	-	Strategic Planner

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1 Introduction

1.1 Overview

Lagoon is a 3D environment for naval surface simulation and training. Its main purpose is to help navy officers and trainees better prepare against potential attacks by swarms of small boats. To achieve this, two major modes of operations are supported in Lagoon:

- *Authoring*, during which scenarios involving a variety of *entities* (ships) are created and saved as learned *behaviors* (internally, these are represented as *behavior networks*), and
- *Execution*, during which recorded behaviors (scenarios) are played back under the user's control.

In both authoring and execution modes of operation the users can select individual entities or groups of entities in Lagoon and maneuver them using a set of commands available via Lagoon's GUI. Details of these commands as well as of the other features provided by the environment are given throughout this manual.

As shown in Fig. 1, the main parts of Lagoon's GUI are: (i) Lagoon 3D world, (ii) CAT controller, and (iii) SP. In addition, some Lagoon functions are available through the environment's menu bar.

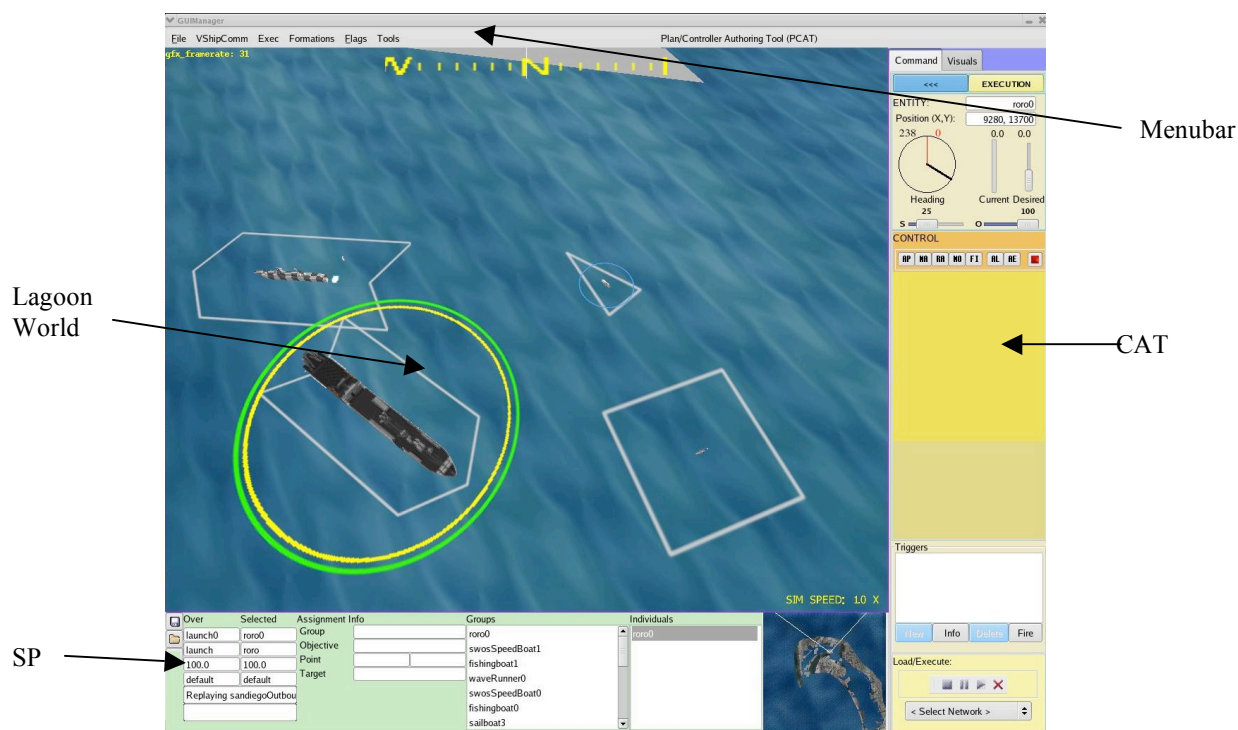


Fig. 1 Lagoon World

Specific details of operations for the first three (Lagoon World, CAT, and SP) are further given in their dedicated sections.

1.2 Menu Bar

Lagoon's menu bar (Fig. 2) allows access to a number of operations, as follows:

- The File menu (Fig. 3) allows saving and loading files as well as exiting the system;
- The VShipComm menu (Fig. 4) is used in connection with COVE, specifically for getting harbor information from the COVE world as well as for connecting with and disconnecting from this external environment (COVE);
- The Exec menu (Fig. 5) has only one menu item, *Execute*, which is used for executing a plan (further details are given in Section 4);
- The Formations menu (Fig. 6) is used as an alternative for grouping entities (units) into three types of formation: column formation, V-formation, and row formation (grouping entities can be performed directly using Lagoon World's petal menu detailed in Section 2 of this manual);
- The Flags menu (Fig. 7) provides access to two types of umpire cues: start scenario and target query.
- The Tools menu (Fig. 8) gives access to advanced explorer features of the environment. These are used mostly for debugging purposes but could also

provide good insight to users into the status of the Lagoon environment, as follows:

- Option Explorer submenu (Fig. 9), with the following subcategories:
 - Boolean Options submenu (Fig. 10), allowing various binary settings such as enabling/disabling fire, enabling/disabling weapons doing damage, enabling/disabling “sticky select” option, and so forth;
 - Tools submenu (Fig. 11), containing facilities for exploration such as logexplorer, evaexplorer, and soundexplorer;
 - Cove submenu (Fig. 12), with details on connecting to Cove such as the IP of the Cove server;
 - Game submenu (Fig. 13), with settings such as plan loaded, side selected, and skybox used;
 - Networking Options submenu (Fig. 14), with information on current machine and its networking characteristics(e.g., is it working as a server or as client);
- Eva Explorer submenu (Fig. 15)
- Sound Explorer submenu (Fig. 16)
- IM Explorer (Fig.17)

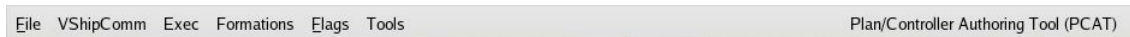


Fig. 2 Lagoon Menu Bar

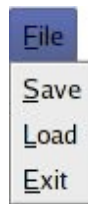


Fig. 3 Lagoon File Menu

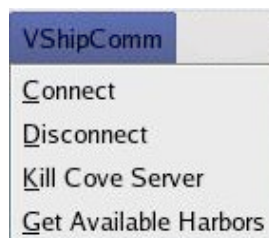


Fig. 4 Lagoon VShipComm Menu

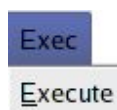


Fig. 5 Lagoon Exec Menu

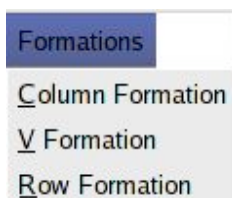


Fig. 6 Lagoon Formations Menu

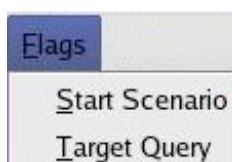


Fig. 7 Lagoon Flags Menu

As previously mentioned, the Tools set of snapshots that follow (Figures 8 to 17) are primarily useful for debugging purposes, but could provide the interested user some insight into the “internals” of the Lagoon software. As these tool options are being currently in the process of refinement and thus subject to modifications, details on each of them will be provided in future versions of this manual.

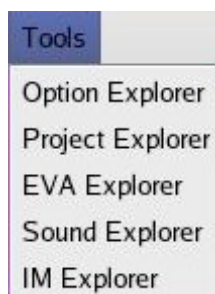


Fig. 8 Lagoon Tools Menu



Fig. 9 Option Explorer

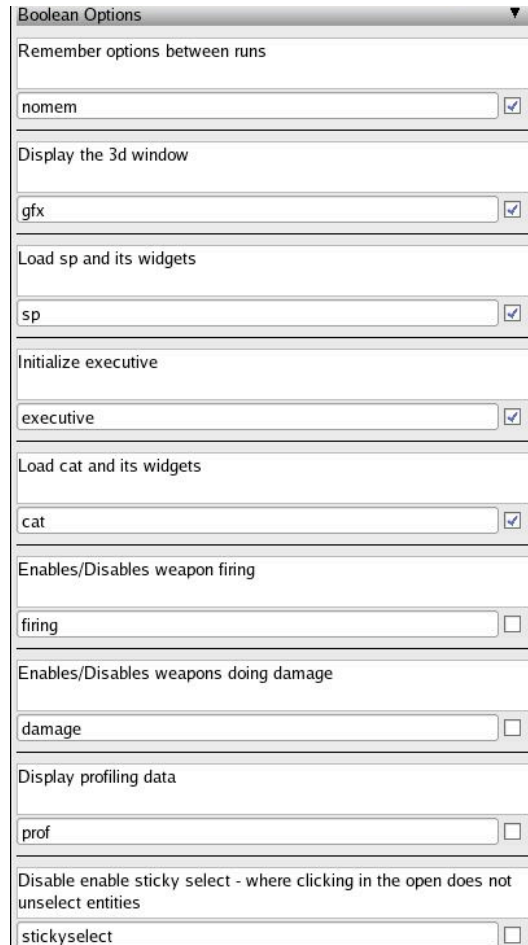


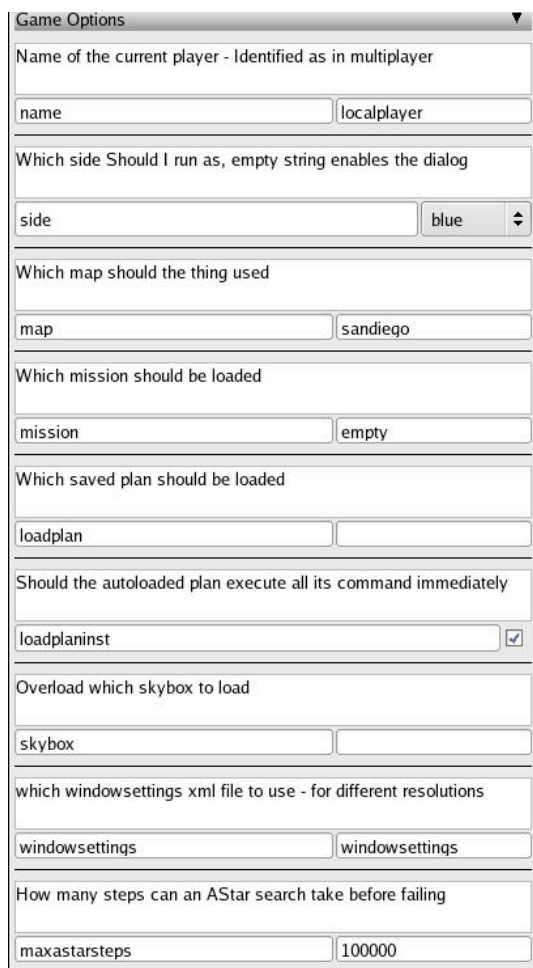
Fig. 10 Option Explorer: Boolean Options Submenu

Tools	
Load a Gui which allows you to see which project files have been loaded - Old	projectexplorer <input type="checkbox"/>
Load a Gui which shows all the data saved to logs	logexplorer <input checked="" type="checkbox"/>
Load a Gui which allows you to go through the eva tree	evaexplorer <input type="checkbox"/>
Load a Gui which lists all the sounds, and allows you to play them	soundexplorer <input type="checkbox"/>
Load a Gui allowing the user to see / edit all runtime options	optionexplorer <input type="checkbox"/>

Fig. 11 Option Explorer: Tools Submenu

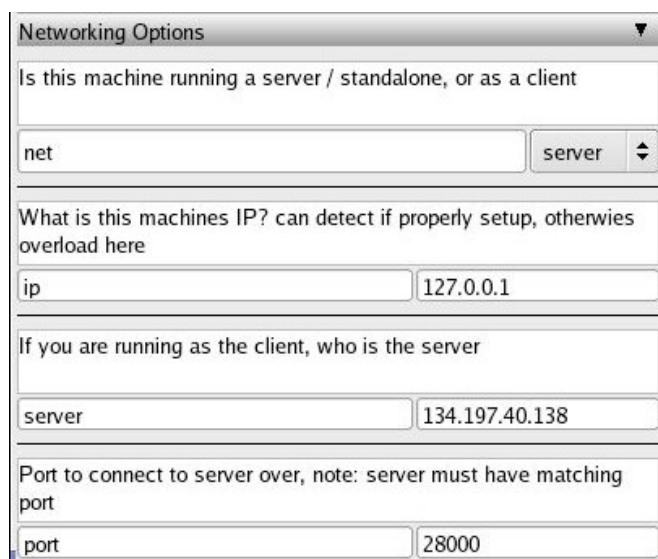
Cove	
Load cove data, or lagoon data	cove <input checked="" type="checkbox"/>
IP to the cove server	coveserver 192.168.1.4
Port on the cove-server to connect to	coveport 4000
Enable / disable transferring of harbors from cove	harborclient <input type="checkbox"/>

Fig. 12 Option Explorer: Cove Submenu



The screenshot shows the 'Game Options' window with the following settings:

- Name of the current player - Identified as in multiplayer: name (localplayer)
- Which side Should I run as, empty string enables the dialog: side (blue)
- Which map should the thing used: map (sandiego)
- Which mission should be loaded: mission (empty)
- Which saved plan should be loaded: loadplan (empty)
- Should the autoloading plan execute all its command immediately: loadplaninst (checked)
- Overload which skybox to load: skybox (empty)
- which windowsettings xml file to use - for different resolutions: windowsettings (windowsettings)
- How many steps can an AStar search take before failing: maxastarsteps (100000)

Fig. 13 Option Explorer: Game Options Submenu

The screenshot shows the 'Networking Options' window with the following settings:

- Is this machine running a server / standalone, or as a client: net (server)
- What is this machines IP? can detect if properly setup, otherwies overload here: ip (127.0.0.1)
- If you are running as the client, who is the server: server (134.197.40.138)
- Port to connect to server over, note: server must have matching port: port (28000)

Fig. 14 Option Explorer: Networking Options

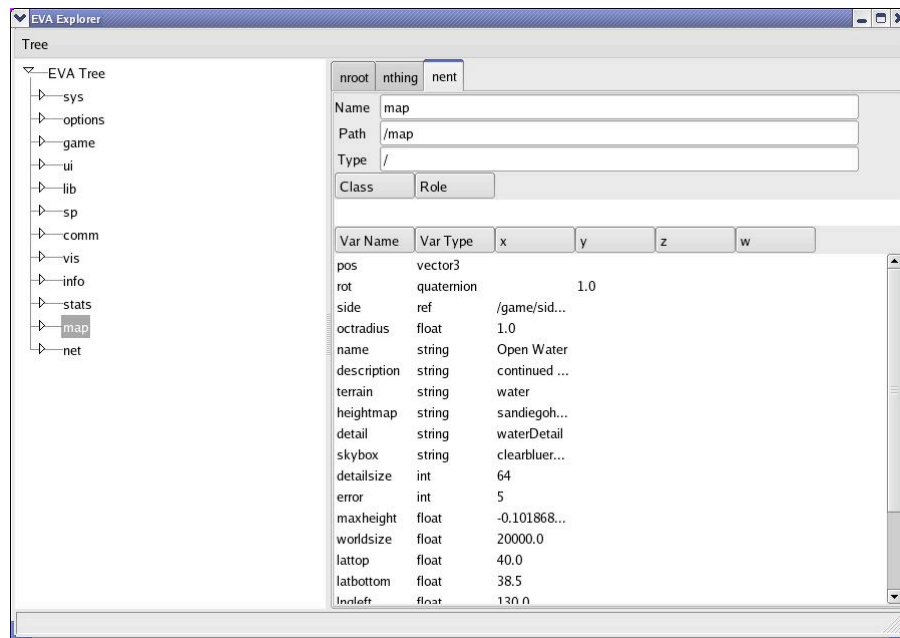


Fig. 15 Eva Explorer



Fig. 16 Sound Explorer

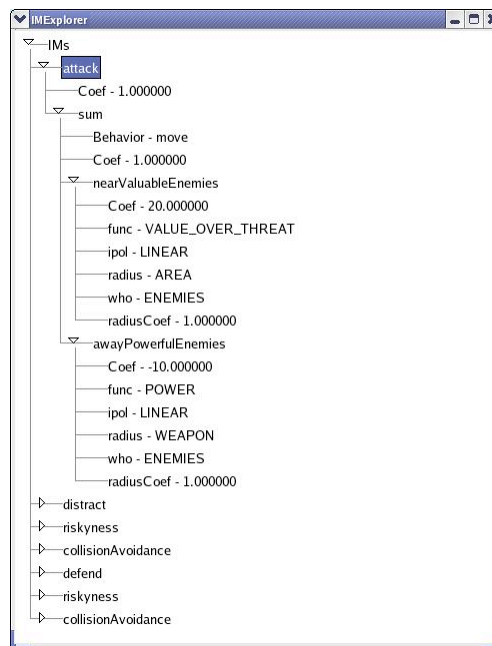


Fig. 17 IM Explorer

1.3 Lagoon 3D World

The Lagoon World is the actual graphical 3D domain in which ships are created and maneuvered by users. Detail of its characteristics and operational capabilities are given in Section 2 of this manual.

1.4 CAT Interface

CAT allows authoring and execution via direct control of individual entities (users control are given via CAT's Command panel). In addition, visualization of the current state of a behavior's execution is also possible via CAT's Visuals panel. Details of CAT's capabilities are available in Section 3 of this manual.

1.5 SP Interface

SP is responsible for organizing entities into groups and assigning tasks to groups. In addition, it displays various pieces of information about the Lagoon world. Details on SP are provided in Section 4 of this manual.

2 Lagoon World

2.1 Overview

The main elements present in Lagoon World's GUI are a compass and an indicator of simulation speed (Fig. 18). An essential interface device for operating within Lagoon is the *Petal menu*, which gives access to a variety of user operations. This menu is detailed next.

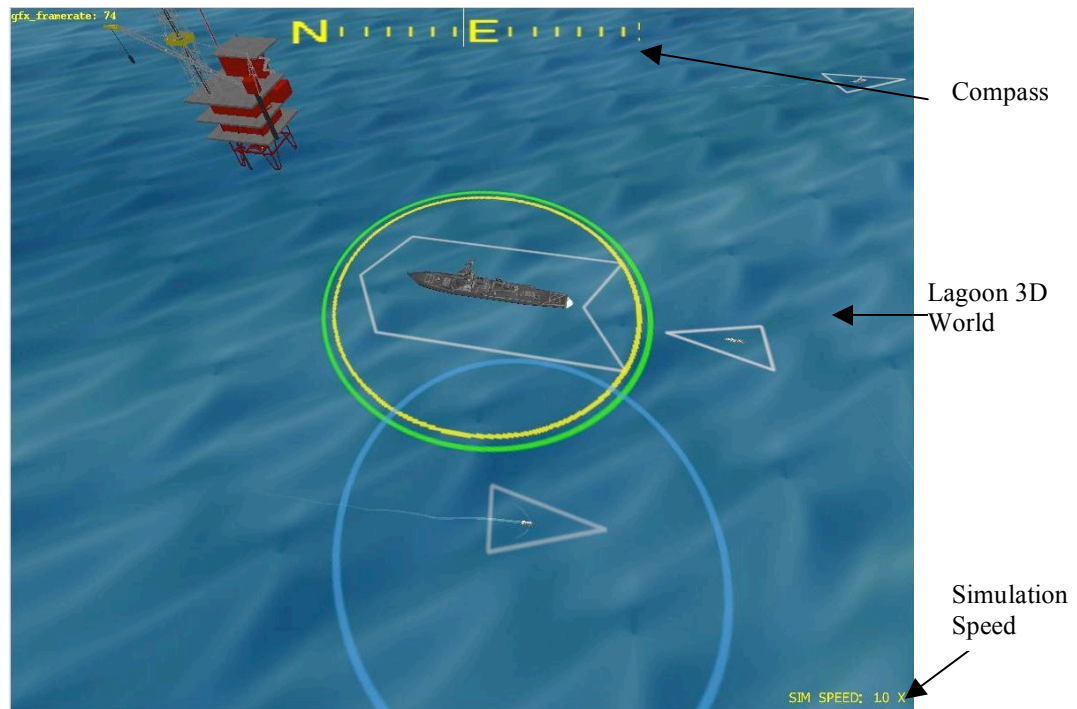


Fig. 18 Lagoon World

2.2 The Petal Menu

The Petal Menu, whose name comes from its resemblance with a round-shaped flower with symmetrical petals, is an innovative interface device that uses a compact form to give access to a variety of user operations.

These operations are illustrated next, starting with the Petal Menu's main *layer* (or *main menu*) (Fig. 19) and then continuing “top-down” inside the hierarchy of layers (or *submenus*) that make up the Petal Menu's structure: Camera Controls (Fig. 20), Time Controls (Fig. 21), Battle Master (Fig. 22), Create Entity (Fig. 23), Create Large Entity (Fig. 24), Create Medium Entity (Fig. 25), Create Small Entity (Fig. 26), Move Entity (Fig. 27), Entity

(Fig. 28), Groups (Fig. 29), Assign to Group (Fig. 30), Entity Battle Master (Fig. 31), Entity Set Side (Fig. 32), Entity Behavior (Fig. 33), and Target Group (Fig. 34).

As shown in Fig. 19, the main petal menu consists of three submenus: Battle Master, which includes options (functions) related to creating and control entities in the Lagoon 3D world, Camera Controls, which provides options for moving the camera view within the Lagoon world, and Time Controls, which has options for changing the speed of the simulation.

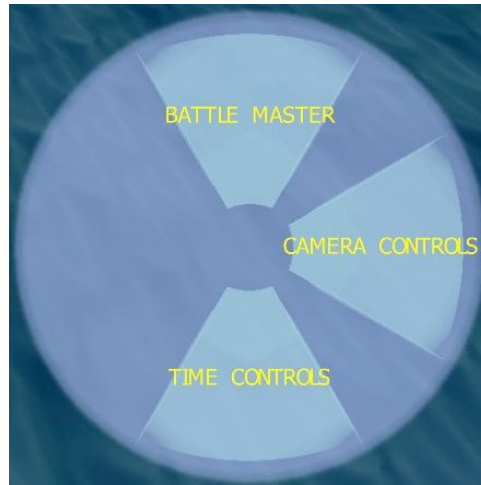


Fig. 19 Lagoon World: Main Petal Menu

In Fig. 20, the Camera Controls submenu consists of three options for moving the camera view within the Lagoon world: **Faster**, which increases the camera speed (action that can be also performed by pressing the T key on the keyboard), **Slower**, which decreases the camera speed (can be also performed by pressing the G key), and **Unattach/Attach**, which toggles the camera lock on the ship (can also be performed by pressing the L key). In Fig. 20 the camera is attached to the ship and thus the left-hand side petal indicates the **Unattach** as possible action. When camera is unattached, this petal will indicate **Attach** as possible action.

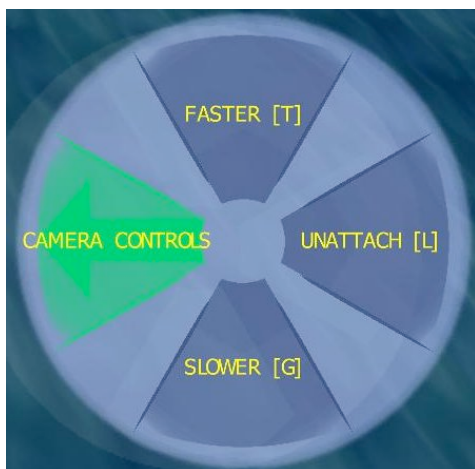


Fig. 20 Lagoon World: Petal Menu Camera Controls Submenu

Fig. 21 shows the Time Controls submenu, with three options: Faster, which increases (doubles) the speed of simulation (can also be performed by pressing the R key), Slower, which decreases by half the speed of simulation (can also be performed by pressing the F key), and P, which pauses/resumes the simulation (can also be performed by pressing the P key).

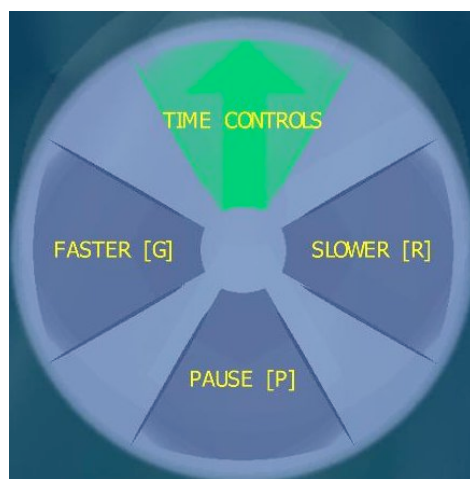


Fig. 21 Lagoon World: Petal Menu Time Controls Submenu

The Battle Master submenu of the petal menu is shown in Fig. 22. It allows access to the Create Entity submenu detailed in Fig. 23.

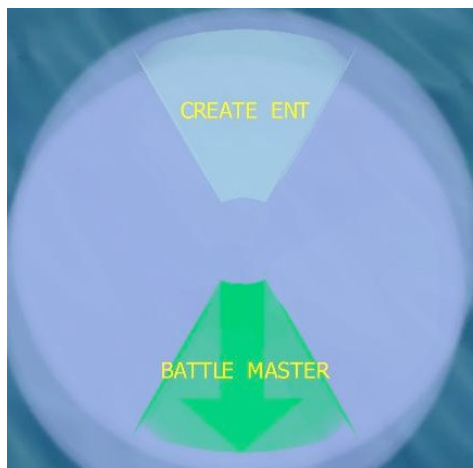


Fig. 22 Lagoon World: Petal Menu *Battle Master* Submenu

The Create Entity submenu shown in Fig. 23 allows the user to create entities of three types: Large, Medium, and Small (these submenus are further detailed next).

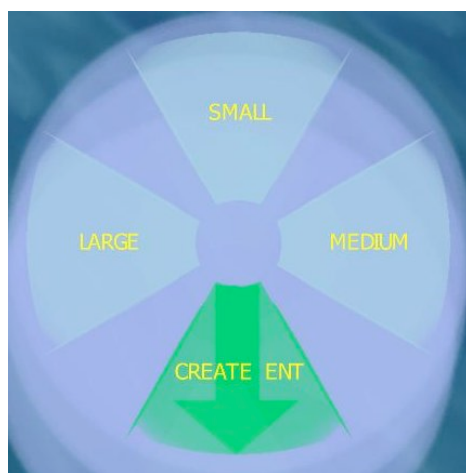


Fig. 23 Lagoon World: Petal Menu *Create Entity* Submenu

In Fig. 24 the Create Large Entity submenu is shown. Via this submenu, the user can create at the place of the cursor in the Lagoon 3D world a large entity that can be of any of the 9 types listed on the petals (e.g., FFG7, DDG51, etc).



Fig. 24 Lagoon World: Petal Menu *Create Large Entity* Submenu

In Fig. 25 the Create Medium Entity submenu is shown. Via this submenu, the user can create at the place of the cursor in the Lagoon 3D world a medium entity that can be of any of the 3 types listed on the petals (Fishing boat, Sail boat, Tractor tug).

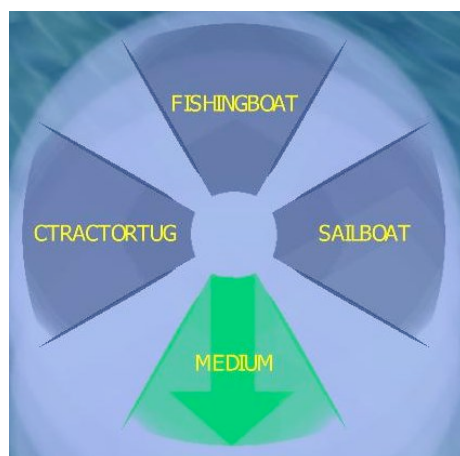


Fig. 25 Lagoon World: Petal Menu *Create Medium Entity* Submenu

In Fig. 26 the Create Small Entity submenu is shown. Via this submenu, the user can create at the place of the cursor in the Lagoon 3D world a small entity that can be of any of the 5 types listed on the petals (e.g., Cigarette, Launch, etc).

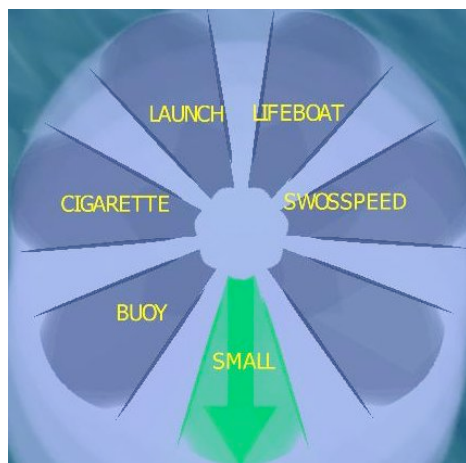


Fig. 26 Lagoon World: Petal Menu *Create Small Entity* Submenu

When an entity is selected in the Lagoon 3D world, the petal menu invoked by right-clicking the mouse in the Lagoon world opens the Move Entity submenu, with six options, as shown in Fig. 27: Move, Move To, Move Pos, Route, Add Waypt, and Follow Track.

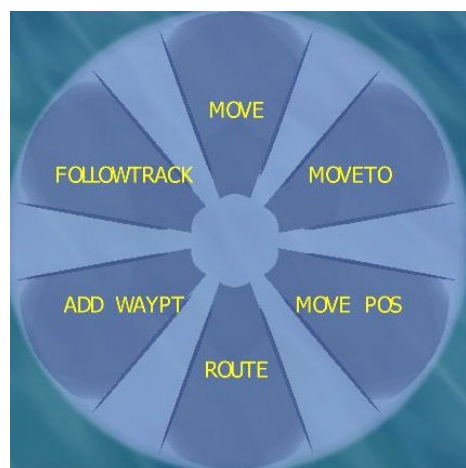


Fig. 27 Lagoon World: Petal Menu *Move Entity* Submenu

Also, when an entity is selected in the Lagoon 3D world, the petal menu that opens for that entity has two submenus (Battle Master and Groups) and four submenus (Debug, Watch, Reset Track, Attach Camera, and Watch). Entity's Groups and Battle Master submenus are described next.



Fig. 28 Lagoon World: R-Petal Menu *Entity* Submenu

As shown in Fig. 29 the petal menu's Groups submenu that opens for a selected entity allows the user to remove the entity from a group (option Remove From Group) or assign the entity to a group (via the submenu Assign to Group, further detailed in Fig. 30).

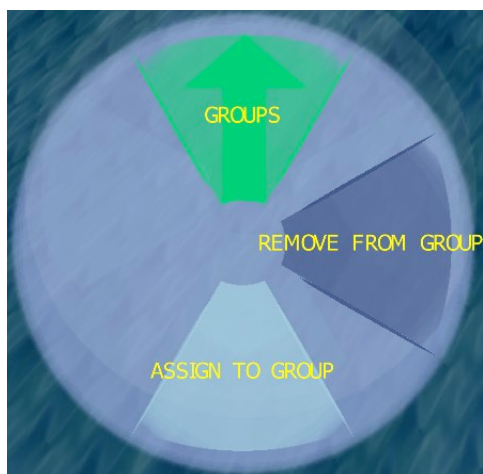


Fig. 29 Lagoon World: Petal Menu *Groups* Submenu

Fig. 30, which contains the Assign to Group submenu indicates that an entity can be assigned to any of the 10 possible groups, numbered from 0 to 9.

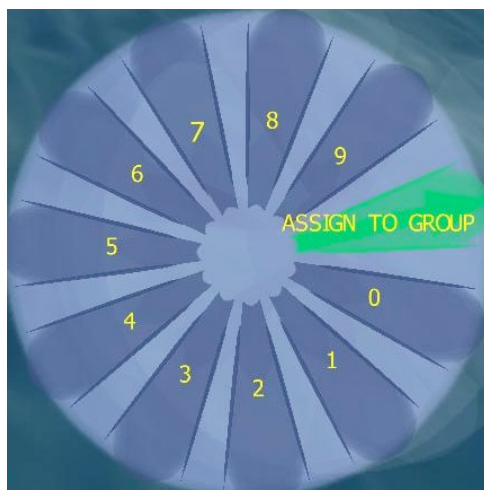


Fig. 30 Lagoon World: Petal Menu *Assign to Group* Submenu

The Entity Battle Master submenu shown in Fig. 31 applies for a selected entity and contains 2 options, Place and Delete, and a submenu, Set Side. Place allows quick placement of the entity at a desired position and with desired orientation by dragging the entity in the Lagoon 3D world while Delete serves for removing an entity from the Lagoon world. The Set Side submenu is detailed in Fig. 32.



Fig. 31 Lagoon World: Petal Menu *Entity Battle Master* Submenu

As shown in Fig. 32, the Entity Set Side submenu contains 5 sides to which an entity can be assigned to (Blue, Yellow, Neutral, Green, and Red).

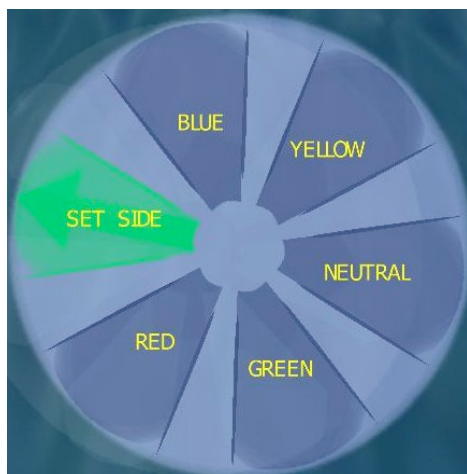


Fig. 32 Lagoon World: Petal Menu *Entity Set Side* Submenu

The petal menu's Entity Behavior submenu has one submenu (Target Group, further detailed in Fig. 34) and 5 possible behaviors that can be assigned to the selected entity: Fire, Move To, Ramship, Maintain Station, and Select Target.



Fig. 33 Lagoon World: Petal Menu *Entity Behavior* Submenu

As shown in Fig. 34 the Target Group submenu has two options: Ram and Attack.



Fig. 34 Lagoon World: Petal Menu *Target Group* Submenu

2.3 Entity and Group Markers

The following visual circular markers, each with a specific contour color (as specified next) are used in Lagoon (Fig. 35):

BLUE	-	Cursor over entity
YELLOW	-	CAT selected
GREEN	-	SP selected
RED	-	Target selected

In addition, for easier “at sea” identification from a distance, additional markers are attached to entities (these are visible only at a higher level of zooming out) (Fig. 35):

TRIANGLE	-	Small size entity
SQUARE	-	Medium size entity
POLYGON	-	Large size entity

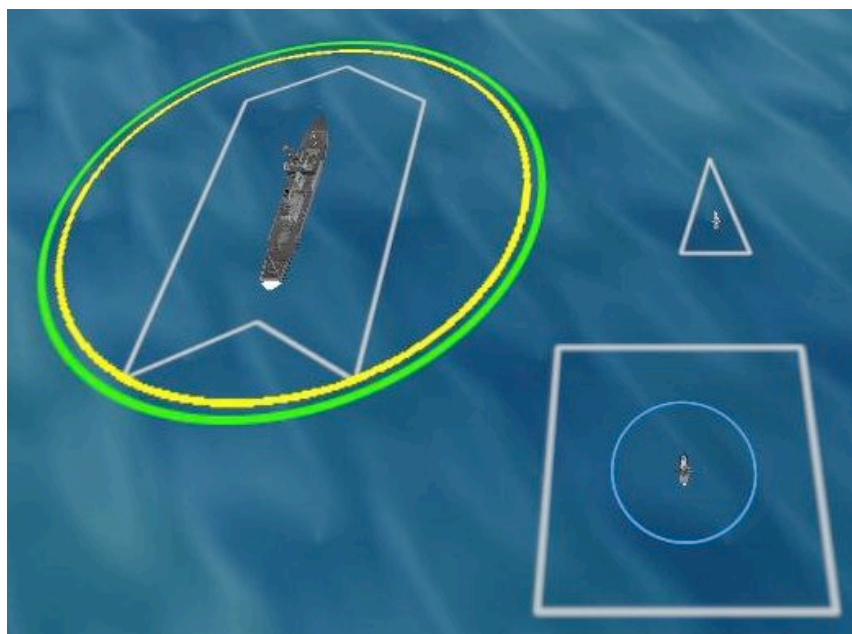


Fig. 35 Lagoon World: Entity Selection Markers

Other visual markers in Lagoon World are:

- | | | |
|-----------------------|---|---|
| Target line | - | ORANGE line from an entity to its selected target (Fig. 36) |
| Distance trigger line | - | YELLOW line between two entities (Fig. 37) |
| Current heading | - | BLUE line from the entity (Fig. 38) |
| Move-to point | - | LIGHT GREEN glowing point the entity is moving to (Fig. 38) |

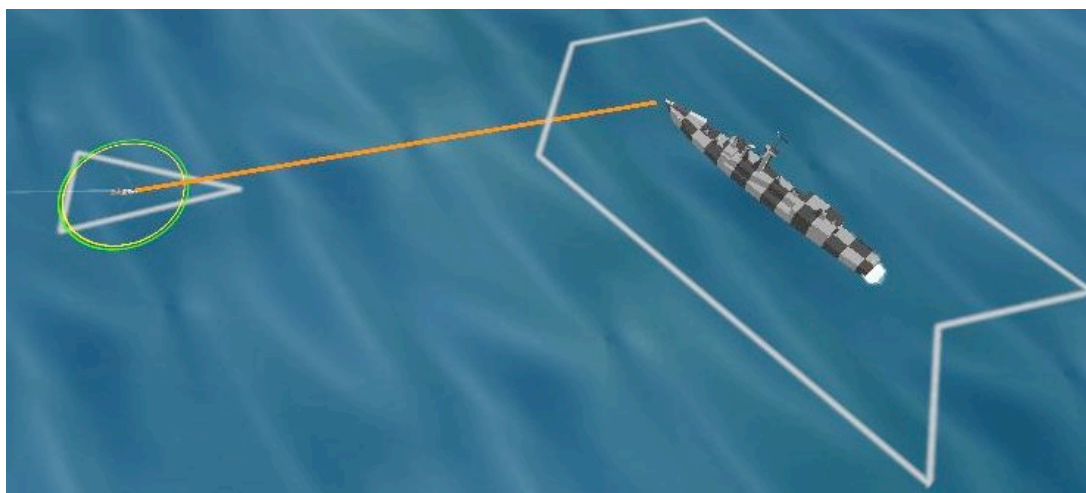


Fig. 36 Lagoon World: Target line from entity to selected target

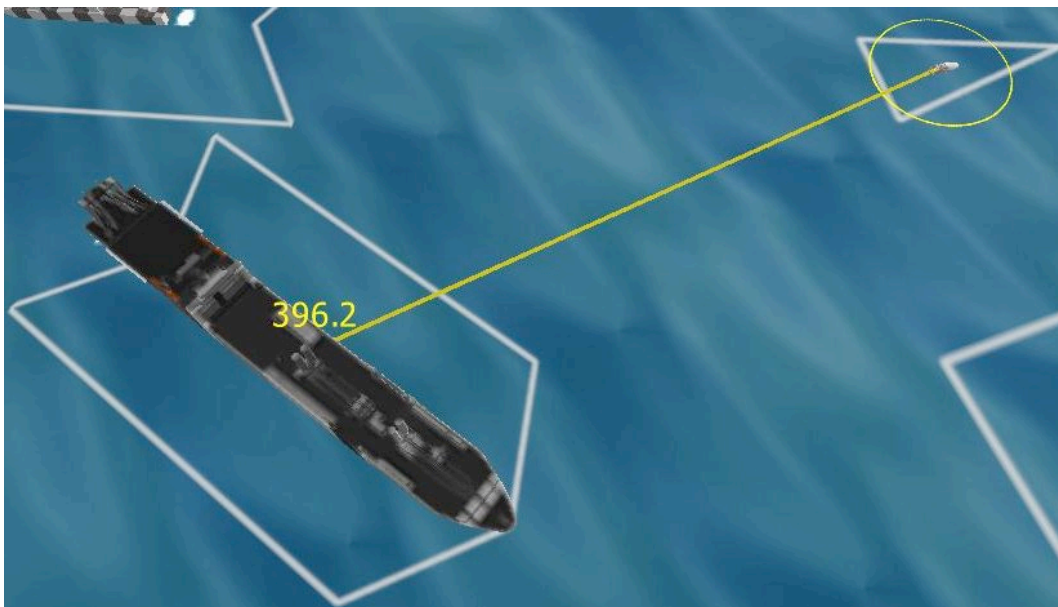


Fig. 37 Lagoon World: Distance trigger line with actual distance value

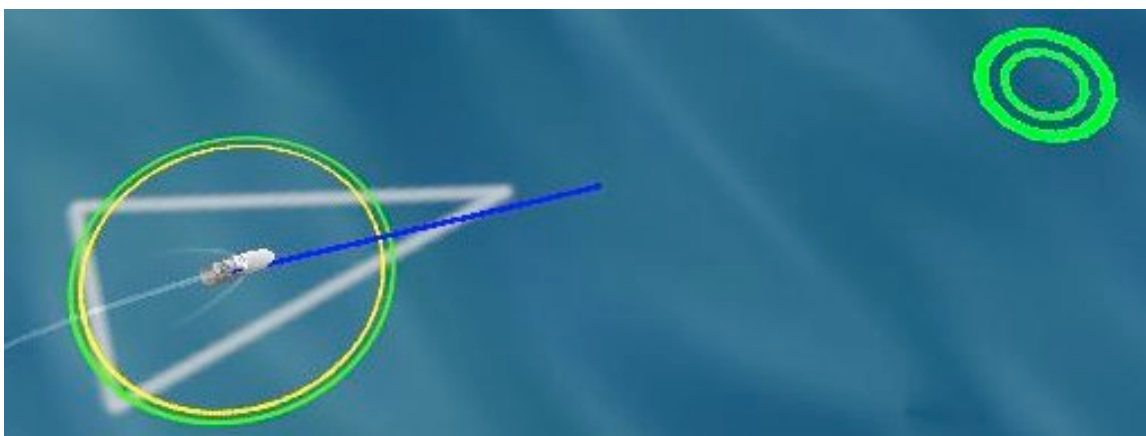


Fig. 38 Lagoon World: Move to glowing point and current heading line

3 CAT

3.1 Overview

CAT allows authoring and execution via direct control of individual entities. As shown in Fig. 39, CAT's GUI consists of two panels, accessible via the tabs Command and, respectively, Visuals. Specifically, user control and entity information are available via CAT's Command panel (Fig. 40 – Authoring mode and Fig. 41 – Execution mode) while visualization of the current state of a behavior's execution is available via CAT's Visuals panel (to be included in future versions of the Lagoon environment).

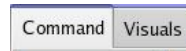


Fig. 39 CAT Command, Triggers, and Visuals Tabs

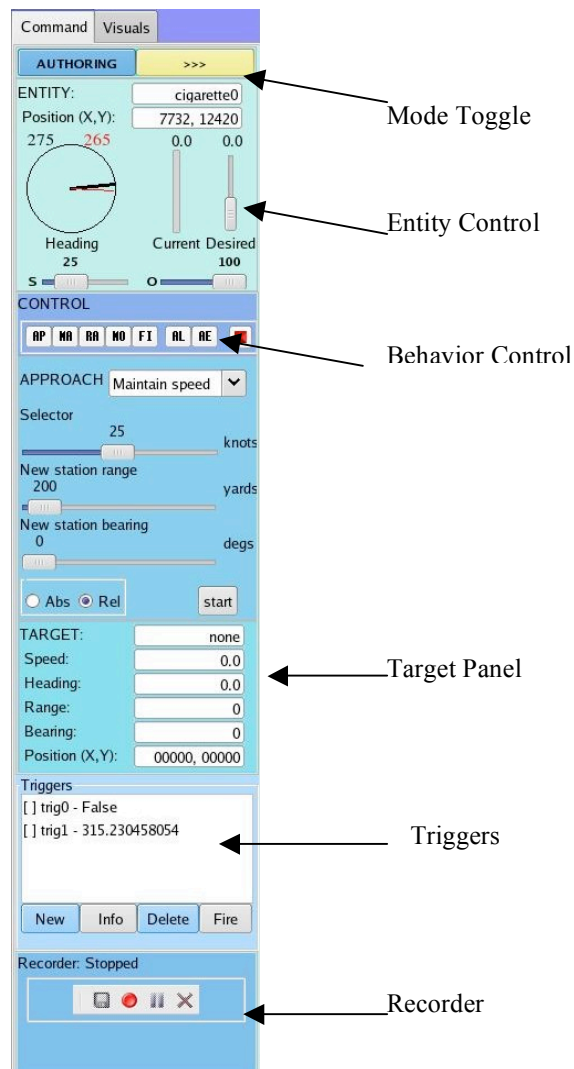


Fig. 40 CAT Command Tab in *Authoring* mode



Fig. 41 Command Tab in *Execution* mode

The structure of the Command panel varies in time depending on the chosen mode of operation – the Mode Toggle buttons of the Mode (sub)panel (top of Command panel, as pointed out in Fig. 40) can be used to switch between *Authoring* and *Execution*.

3.1 Mode Panel

The Mode panel serves for switching between Authoring and Execution. The mode shown (*Authoring* in Fig. 40, *Execution* in Fig. 41) is the current mode of operation for the selected entity.

3.2 Entity Panel

The Entity panel (Fig. 40, second from top) displays information about the selected entity and allows setting the desired heading (by using the knob's red needle), the desired speed

(by using the vertical slider on the left-hand side of the panel), the desired “safety factor”, i.e. the weight of avoiding collision (by using the horizontal slider on the left-hand side of the panel), and the desired “objective factor”, i.e. the weight of achieving the entity’s objective (by using the horizontal slider on the right-hand side of the panel).

3.3 Control Panel

The Behavior Control panel (Fig. 40, center) serves for controlling the behavior of the selected entity. The small, 2-letter marked buttons on top of this panel provide the interface for accessing one of 7 possible primitive behaviors. When the cursor is over such a button a tool-tip indicates the full name of the primitive behavior the button is associated with. For easier identification, 2 letters are assigned to these behavior buttons as follows:

- | | | | |
|-----|----|---|---|
| (1) | AP | - | Approach (Fig. 42 and Fig. 43) |
| (2) | MA | - | Maintain [Station] (Fig. 44 and Fig.45) |
| (3) | RA | - | Ram (Fig. 46 and Fig. 47) |
| (4) | MO | - | MoveTo (Fig. 48 and Fig.49) |
| (5) | FI | - | Fire (Fig. 52) |
| (6) | AL | - | Avoid Land (Fig. 50) |
| (7) | AE | - | Avoid Entity (Fig. 51) |

In addition, a small red button is used to clear (stop) all entity’s primitive behaviors. The Behavior Control panel has a sub-panel, the Target panel (Fig. 53), which provides information about the selected target, if any, of the selected entity. Also, when a specific behavior is selected, the sub-panel corresponding to that behavior (e.g., Approach, as shown in Figs. 40 and 41) opens in the Behavior Control panel just below the set of 2-letter marked buttons.

Fig. 42 shows the Approach behavior control sub-panel, with option Maintain speed selected. In this case, the Selector slider allows setting the desired speed, while the New station range and New station bearing sliders allow setting of desired range and bearing, respectively. Note that, in general (for all behaviors), the values of sliders can be fine-tuned by using the regular left and right arrow keys found on the keyboard.



Fig. 42 CAT Approach Behavior Panel with Maintain Speed

Fig. 43 shows the Approach behavior control sub-panel, with option Maintain time selected. In this case, the Selector slider allows setting the desired time, while the New station range and New station bearing sliders allow setting of desired range and bearing, respectively.



Fig. 43 CAT Approach Behavior Panel with Maintain Time

Fig. 44 shows the Maintain behavior control sub-panel, with option Maintain speed selected. In this case, the Selector slider allows setting the desired speed, while the New station range and New station bearing sliders allow setting of desired range and bearing, respectively. Radio buttons Rel and Abs are used to choose between relative and absolute types of maintain station.



Fig. 44 CAT Maintain Station Behavior Panel with Maintain Speed

Fig. 45 shows the Maintain behavior control sub-panel, with option Maintain time selected. In this case, the Selector slider allows setting the desired time, while the New station range and New station bearing sliders allow setting of desired range and bearing, respectively. Radio buttons Rel and Abs are used to choose between relative and absolute types of maintain station.

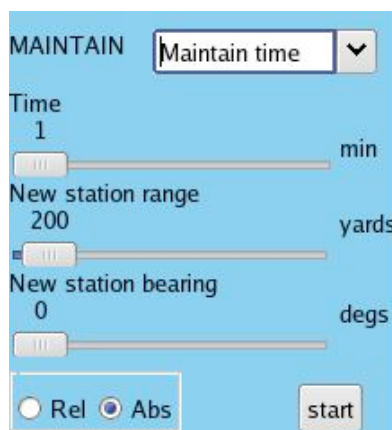


Fig. 45 CAT Maintain Station Behavior Panel with Maintain Time

Fig. 46 shows the Ramship behavior control sub-panel, with option Maintain speed selected. In this case, the Selector slider allows setting the desired speed for ramming.

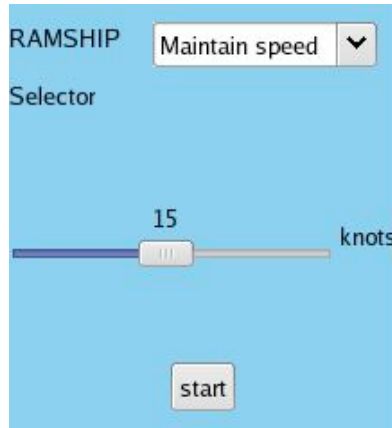


Fig. 46 CAT Ram Ship Behavior Panel with Maintain Speed

Fig. 47 shows the Ramship behavior control sub-panel, with option Maintain time selected. In this case, the Selector slider allows setting the desired time for ramming.



Fig. 47 CAT Ram Ship Behavior Panel with Maintain Time

Fig. 48 shows the Move To behavior control sub-panel, with option Maintain speed selected. In this case, the Selector slider allows setting the desired speed for moving to the selected point (the coordinates of which being displayed in XY format).

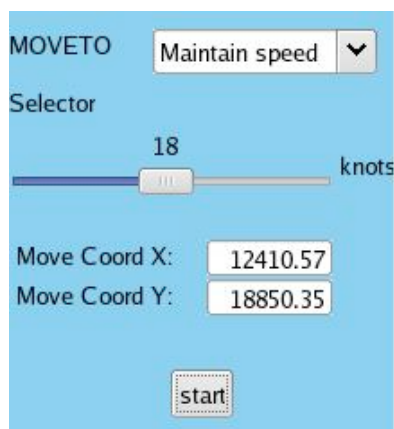


Fig. 48 CAT Move To Behavior Panel with Maintain Speed

Fig. 49 shows the Move To behavior control sub-panel, with option Maintain time selected. In this case, the Selector slider allows setting the desired time for moving to the selected point (the coordinates of which being displayed in XY format).

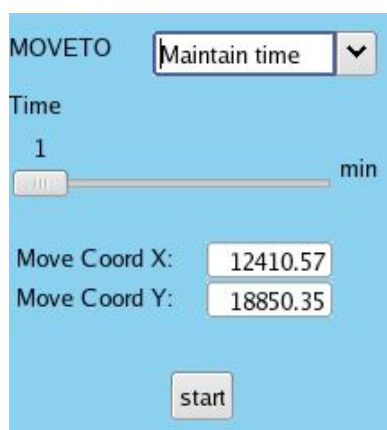


Fig. 49 CAT Move To Behavior Panel with Maintain Time

Fig. 50 shows the simple interface of the Avoid Land behavior control sub-panel, which can only be started (using the Start button) or stopped (using the Stop button, as the Start button changes into a Stop button when the behavior is started).

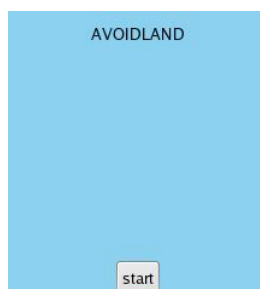


Fig. 50 CAT Avoid Land Behavior

Fig. 51 shows the Avoid Entity behavior control sub-panel while Fig. 52 shows the Fire behavior control sub-panel, both similar to the Avoid Land control sub-panel.

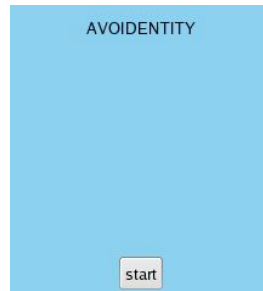


Fig. 51 CAT Avoid Entity Behavior

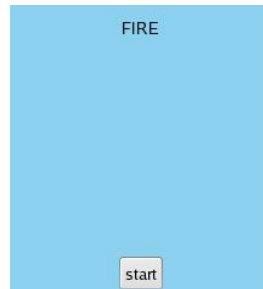


Fig. 52 CAT Fire Behavior

Fig. 53 shows the Target sub-panel of an entity's behavior Control panel. If a target was selected, the information displayed about it consists of name, speed, heading, range, range, and position XY.

TARGET:	ddq510
Speed:	7.4
Heading:	2.8
Range:	1925.4
Bearing:	28.7 R
Position (X,Y):	11623, 19231

Fig. 53 CAT Target Pane

3.3 Triggers Panel

This panel (Fig. 54 and Fig. 55) allows creating and firing various types of triggers. In *Authoring* mode a new trigger can be created, deleted, fired, and queried for its detailed information (Fig. 54) while in *Execution* mode an existing trigger can only be fired and its detailed information displayed (Fig. 55).

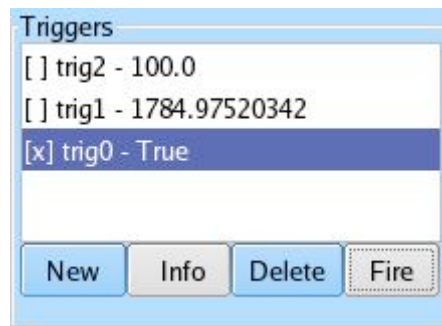


Fig. 54 CAT Triggers panel in authoring mode

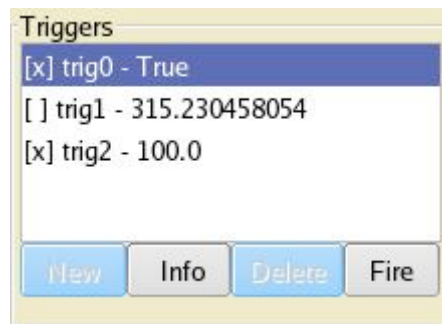


Fig. 55 CAT Triggers panel in execution mode

Currently, three types of triggers can be created: Alert, Distance, and Damage (Fig. 56). While **Alert** is a boolean flag, **Distance** and **Damage** need be further defined as either “less than”, “greaterThan”, or “approx” (Fig. 57). Additional details are needed to create specific triggers, as shown in Figs. 58, 59, and 60. Information on a trigger can be obtained by clicking on the Info button (Fig. 61) and, in *Authoring* mode only, a trigger can also be deleted (Fig. 62).

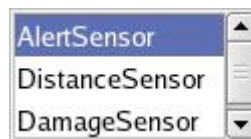


Fig. 56 CAT Types of Triggers Dropdown Menu

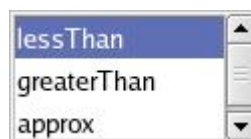
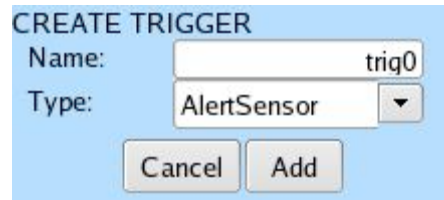


Fig. 57 CAT Types of Trigger Subtypes Dropdown Menu

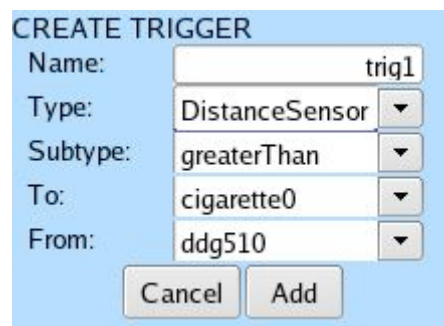
As shown in Fig. 58, a name of type “trigX” is automatically (and sequentially) generated when a new trigger is created. This name can be overwritten by the user.



A screenshot of the 'CREATE TRIGGER' panel. It has a light blue background. At the top, the title 'CREATE TRIGGER' is in bold. Below it, there are two labels: 'Name:' and 'Type:'. The 'Name:' label is followed by a text input field containing 'trig0'. The 'Type:' label is followed by a dropdown menu showing 'AlertSensor'. At the bottom, there are two buttons: 'Cancel' and 'Add'.

Fig. 58 CAT Create Alert Sensor Trigger Panel

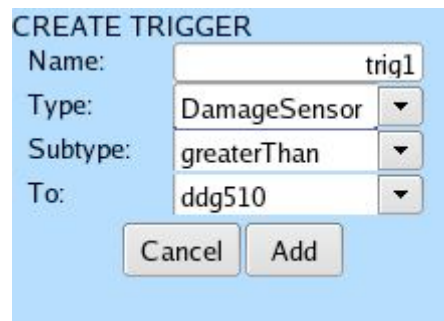
As shown in Fig. 59, the additional details needed to create a Distance trigger consist of a Subtype (as previously described in Fig. 57), a To ship selected from the drop-down list of existing entities in Lagoon 3D world, and a From ship, also selected from the drop-down list of existing entities in Lagoon 3D world.



A screenshot of the 'CREATE TRIGGER' panel. It has a light blue background. At the top, the title 'CREATE TRIGGER' is in bold. Below it, there are five labels: 'Name:', 'Type:', 'Subtype:', 'To:', and 'From:'. The 'Name:' label is followed by a text input field containing 'trig1'. The 'Type:' label is followed by a dropdown menu showing 'DistanceSensor'. The 'Subtype:' label is followed by a dropdown menu showing 'greaterThan'. The 'To:' label is followed by a dropdown menu showing 'cigarette0'. The 'From:' label is followed by a dropdown menu showing 'ddg510'. At the bottom, there are two buttons: 'Cancel' and 'Add'.

Fig. 59 CAT Create Distance Sensor Trigger Panel

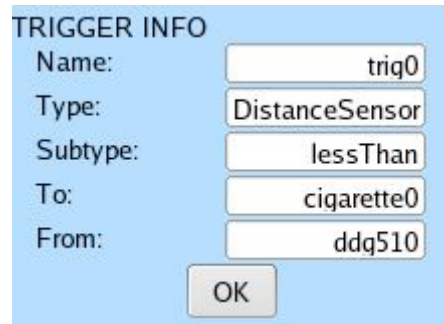
As shown in Fig. 60, the additional details needed to create a Damage trigger consist of a Subtype (as previously described in Fig. 57) and a To ship selected from the drop-down list of existing entities in Lagoon 3D world.



A screenshot of the 'CREATE TRIGGER' panel. It has a light blue background. At the top, the title 'CREATE TRIGGER' is in bold. Below it, there are four labels: 'Name:', 'Type:', 'Subtype:', and 'To:'. The 'Name:' label is followed by a text input field containing 'trig1'. The 'Type:' label is followed by a dropdown menu showing 'DamageSensor'. The 'Subtype:' label is followed by a dropdown menu showing 'greaterThan'. The 'To:' label is followed by a dropdown menu showing 'ddg510'. At the bottom, there are two buttons: 'Cancel' and 'Add'.

Fig. 60 CAT Create Damage Sensor Trigger Panel

Fig. 61 shows that information displayed about a trigger consists of name, type, and specific trigger-dependent details such as subtype, to and from in the case of a distance trigger. This information can be obtained by clicking on the Info button of the Triggers panel (Figs. 54 and 55).



TRIGGER INFO

Name:

Type:

Subtype:

To:

From:

Fig. 61 CAT Trigger Information Panel

In *Authoring* mode, if the Delete button is clicked on for a selected trigger, the warning message shown in Fig. 62 is displayed to prevent accidental deletion of the trigger by the user.



DELETING TRIGGER!

trig0

Are you sure you want to delete?

Fig. 62 CAT Delete Trigger Panel

3.4 Visuals Panel

The Visuals panel will be incorporated in the near future into CAT's GUI.

4 SP

4.1 Overview

SP is responsible for organizing entities into groups, and assigning CAT tasks to those groups. In addition, it displays a variety of information about the state of the Lagoon world. This section details information on the usage of SP, describing the interface and all of its components. The main component of SP's GUI are shown in Fig. 63.

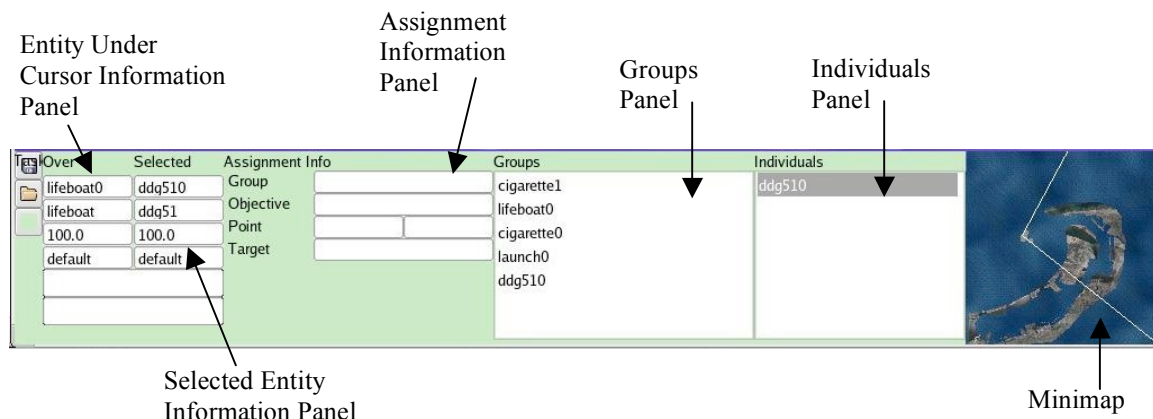


Fig. 63 SP Interface

4.2 Information Panel

The Information panel (Fig. 63, left hand-side) shows information on what is currently selected. This can be helpful in selecting a particular entity or in getting information about an entity. Furthermore, it has two buttons that allows loading (Fig. 64) and, respectively, saving a plan (Fig. 65). In Fig. 64, notice that if the Run Immediately checkbox is checked then all entities of the plan are loaded as quickly as possible. Otherwise, the entities are loaded at the same speed they were created when constructing the plan.

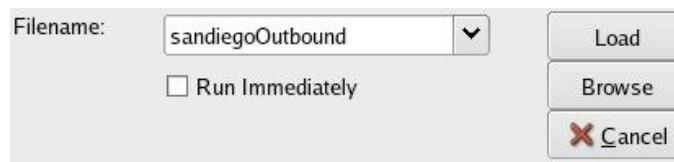


Fig. 64 SP Load Saved Plan



Fig. 65 SP Save Plan

4.3 Assignment Info Panel

The Assignment Info panel (Fig. 66) displays information on the currently selected group. It shows the name of the group and what it has been assigned to do, including its target.

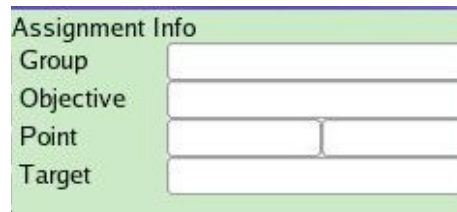


Fig. 66 SP Assignment Info Panel

As shown in Fig. 48, the colors attached to the entities in groups can be either GRAY (neutral entities), BLUE (own entities, or friendly), or RED (enemy entities).

4.4 Groups Panel

The Groups panel (Fig. 63, center) is used for creating new empty groups, as well as for splitting and merging existing groups. Dragging a box in the 3D world over units designates them to be added to this new group. The user can control-click on the entity list to select or deselect individual entities. He or she needs to choose a side for this group to belong to as well as a name, and then hit a group number button (digits between 0 and 9). Entities will be removed from any groups they currently belong too, and added to the new group.

4.5 Individuals Panel

The Individuals panel (Fig. 63, center-right) shows the list of individuals in the world - entities that have not been assigned to a group.

4.7 Minimap

The minimap (Fig. 67) shows the positions of units in the world from a top down view. It is useful to survey the situation in Lagoon. In the future support will be included for right clicking in it to command units.



Fig. 67 San Diego Mini Map

5 Scenarios

5.1 Authoring Scenarios

In *Authoring* mode scenarios (internally called “behavior networks”) can be recorded and saved using the recorder device available in the CAT’s Command panel (Fig. 68). From left to right the buttons available on the Recorder panel are:

- SAVE
- START RECORDING
- PAUSE
- STOP



Fig. 68 CAT Behavior Recorder

When saving a scenario the dialog that opens prompts the user for a name of the behavior network (Fig. 69).

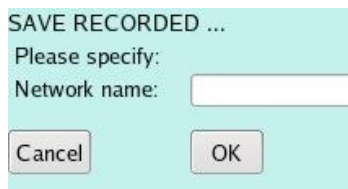


Fig. 69 CAT Save Recorded Behavior Panel

5.2 Executing Scenarios

In *Execution* mode scenarios (“behavior networks”) can be loaded and executed using the playback device available in the CAT’s Command panel (Fig. 70). From left to right the buttons available on the Recorder panel are:

- STOP
- PAUSE
- RUN
- DELETE



Fig. 70 CAT Behavior Playback Panel

To load a scenario the user has to select the behavior network to be executed from a drop-down list (Fig. 71).

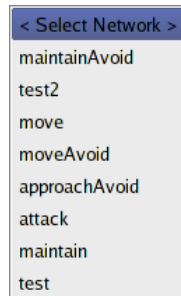


Fig. 71 CAT Select Network to Load Dropdown Menu

6 Ship Models

Following are the ship models that can populate the Lagoon system (Figures 72 to 84). These ships can be created through the **Petal Menu** under the **Battle Master—Create Entity** submenu option (details are given in Section 2). Ships can be controlled independently or in groups. Once a ship is created, its velocity and heading can be specified through the CAT interface (described in Section 3).



Fig. 72 Aircraft Carrier



Fig. 73 CG47



Fig. 74 Cigarette Boat



Fig. 75 Tractor Tug



Fig. 76 Launch



Fig. 77 Lifeboat



Fig. 78 Sailboat

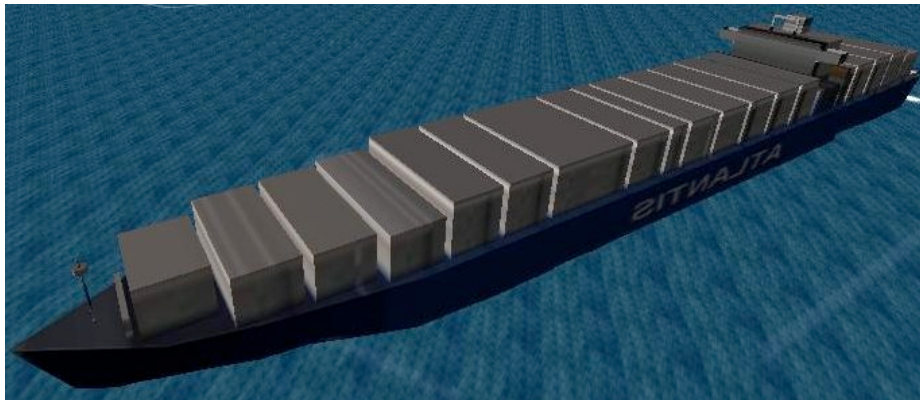


Fig. 79 Container Ship

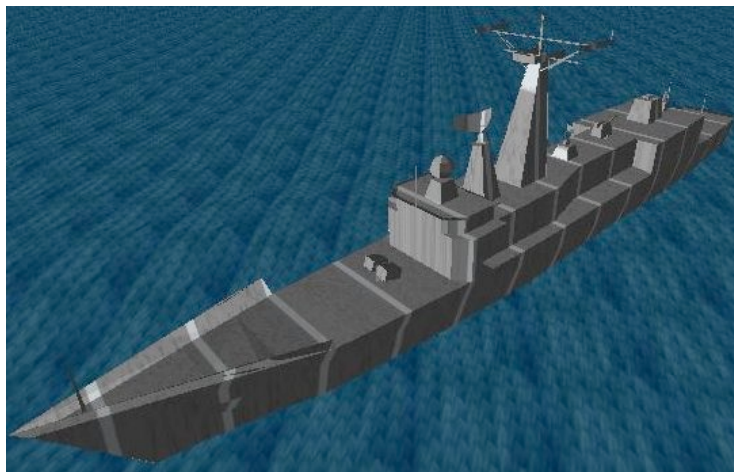


Fig. 80 FFG7



Fig. 81 WHEC



Fig. 82 DDG51 Destroyer



Fig. 83 Fishing Boat

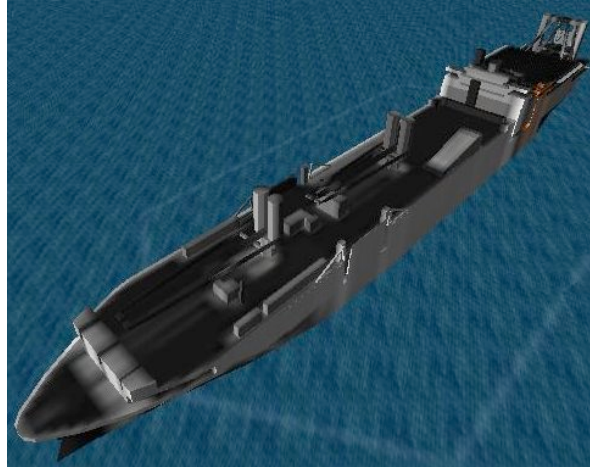


Fig. 84 Roro

7 Execution Options

The options most commonly used on invoking the execution of Lagoon are the following:

nomem	Description: Remember options between runs Values: [0, 1] Default: 1
firing	Description: Enables/disables weapon firing Values: [0, 1] Default: 0
damage	Description: Enables/disables weapons doing damage Values: [0, 1] Default: 0
stickyselect	Description: Enables/disables sticky select (where clicking in the open doesn't unselect entities) Values: [0, 1] Default: 0
cove	Description: Load Cove data or Lagoon data Values: [0, 1] Default: 1
coveserver	Description: IP of the cove server Values: * Default: 192.168.1.4
side	Description: Which side the user runs as, empty string enables the dialog Values: ['blue', 'red', 'green', 'yellow', 'bm', 'observer', ''] Default: 'bm'
map	Description: Which map to be loaded Values: * Default: 'openwater'
loadplan	Description: Which saved plan to be loaded Values: * Default: none
skybox	Description: Which skybox to be loaded Values: * Default: none
net	Description: Is this machine running as a server or a client Values: ['server', 'client'] Default: 'server'
ip	Description: This machine's IP Values: * Default: myip
server	Description: If this machine is a client, which IP has the server Values: * Default: 134.197.40.138

8 Connecting Lagoon with COVE

The following is a series of steps to connect Lagoon with COVE. You will need to know the IP address of the Windows machine where COVE is installed, or where COVE is planned to run.

1. Start COVE.
2. Open the “ConnectToLagoon.py” script on the script editor in COVE.
3. Load and start the desired scenario and or exercise in COVE.
4. Run the script loaded in the script editor in COVE.
5. Start Lagoon with the “covehost” command line option, along with the IP address of the machine where COVE is running. The IP address given in the following example is a dummy IP address. You would replace the IP address shown with your corresponding address. Example: `go covehost=192.134.0.1`
6. In Lagoon, go to the VShipComm menu option on the menubar and select the “Connect” option.
7. This will connect Lagoon with COVE. The ship entities are controlled in Lagoon. If the speed of a ship is set in Lagoon, the corresponding entity in COVE will have its speed set to the same speed. Similarly, the heading of any entity is controlled in Lagoon.
8. When done, in Lagoon, go to the VShipConn menu option on the menubar and select the “Disconnect” option.
9. End the simulation by pressing F12. This will terminate Lagoon.
10. End the COVE exercise by stopping the scenario, closing the script editor window, and exiting COVE.

9 Key Mappings

The following is the list of controls accessible via the keyboard.

Key	Action
A	Move camera to the left
D	Move camera to the right
E	Rotate camera to the right
ESC	Toggle scripting console
F	Decrease simulation speed by half
F5	Output entity information on the console and terminal
F11	Take screenshot of world
F12	Stop game
G	Decrease camera speed
L	Toggle camera lock on ship
O	Toggle sky active
P	Toggle water active
Q	Rotate camera to the left
R	Double simulation speed
S	Move camera up
T	Increase camera speed
U	Toggle display of axis
V	Toggle display of octree
W	Move camera down
X	Camera zoom out
Y	Toggle screen grid
Z	Camera zoom in

10 Known Issues

The following is a list of known issues.

[Suggested format]

DESCRIPTION – Brief description, with context and relevant details

POSSIBLE CAUSE – Brief description