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Pendulous

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1.0 Introduction
1.1 Introduction

Every aspect of Pendulous has been designed with simplicity and strategy in mind. You now have a game that is easy to learn, fast to play and allows great strategic freedom.

1.2 Game Overview

This is a game of territorial conquests. Players are awarded victory points each turn. The player with the greatest number of victory points after the last turn is the winner. Victory points are awarded for sectors/territory squares and base squares that are owned and supplied. The game starts with a setup turn. Resource points are not used and attacks are not allowed. Each player will be given an opportunity to arrange units on the board during this setup turn. When the setup is completed, players alternate taking turns in which they can pickup or place units on the board. Placing units on opposing/opponent squares constitutes an offense. Placing units on owned squares are used for defense and/or supporting up coming attacks on opposing/opponent squares. Bases are very important in Pendulous. They are a source of supplies and generally have a higher point value then sectors/territory squares.   At the completion of a players' turn any squares that can not trace a supplies line to a home base become unsupplied. Unsupplied squares are not brought back into supplied. Any units on these squares will be disbanded and ownership of the squares will start to revert to adjacent players. The number of units, number of resources, sectors/territory ownerships (at the beginning of the game) and numerous other parameters are controlled by the scenario selected for play.

At this point it may be helpful to watch Pendulous being played by two computer players. Start up Pendulous and select the menu FILE|NEW. You will now see a list of scenarios supplied with Pendulous. Select a scenario. A dialog box will appear asking for the Player Assignments. Select "COMPUTER" for all players shown (not grayed). Dialog boxes appear asking for the computer players' that will command each player. Select any player from the list. Now press the "OK" button. For all other dialog boxes that appear just press the "OK" button. At the end of each turn a dialog box will appear which shows the current score. You can press the "OK" button to clear this display. While the computer players are executing their moves, feel free to scroll the board around and access any of the game menus.

2.0 Rules of Play
2.1 Board

The board in Pendulous is divided into squares (sometimes refereed to as sectors) which represent the battlefield. The squares can be either sectors/territories or base

squares. They are colored to that of their owning player. Sectors/territory squares can contain a unit and may or may not be in supplies. Base squares are their own source or own supplies and may not contain units. Every square is owned by one of the players in the game. All squares have a defense value. Sectors/territory squares have a value of 2. Base squares have a value of 25. In addition to this, base squares support the eight surrounding squares with a defensive value of 5 per square.

A unit on a square also adds to the defense value of that square and the surrounding eight squares. Defense values as well as offense values will be covered in more detail in the section on combat. Sectors/territory squares that are out of supplies are colored black. They are outlined in the owning players color. When ownership of sectors/territories or a base changes, the color of that square also changes to that of the new owner.

All blue portions of the board represent barriers such as lakes, rivers and oceans. No action can take place on the barrier areas. These areas play an important part in the strategies of Pendulous. They block supplied paths.

Bases that have water as any of the surrounding squares are port bases. Port bases allow barrier crossings to take place to any coastal square on the same body of water as long as barrier crossings are enabled for the scenario being played.

Diagonal squares are always valid paths. These squares are used for figuring supplies and naval invasion paths as well as determining adjacent squares.

2.2 Players

Up to four players can play Pendulous depending on the scenario selected. Any mix of human and computer players are allowed. The colors red, gray, green and blue represents the players. Turns proceed in the following order: Red, Gray, Green, Blue.

2.3 Victory Points

Before the next player takes a turn (and at the end of the game), victory points are accumulated for squares that are owned and have supplies. The number of points accumulated for each square depends on the scenario being played.
Sectors/territory squares generally have a lower point value than base squares.

2.4 The Game Turn

Each turn in Pendulous consists of each player given a chance to pickup and place units on the board, provided they have the necessary reserves and resources. The first turn in a game is the setup turn. Here each player is given the chance to arrange all start units on owned squares. Units can be freely pickup and placed on owned board squares during the setup turn without expending any resources.

After the setup turn, normal game turns begin. They proceed in the same manner as the setup turn. Exception: Attacks are allowed and one resource point is expended for each unit picked up or placed on the board.

At the start of each players' turn, the reinforcement rate value is added to that players' reserves. Now the resource rate value is added to that players' resources.

The player will now receive these units and resources on every turn during the game with the exception of the setup turn.

When the player has finished his turn select TURN|END menu.

At the end of any turn, if the player controls no bases, he is out of the game and all owned sectors/territory squares become unsupplied.

2.5 Units

Units are a players' only direct tool available to win at Pendulous.

Two basic operations can be performed in Pendulous. You can place units on the board (from the reserves) and you can pick up units off the board. They will be placed in the reserves. The reserve is the holding area for all units that are not on the board. Units are never moved directly on the board. They must first be placed in the reserves.

To place a unit on the board you must have at least one unit in your reserves and have at least one resource point. Both of these values are always visible on the left side of the game window. Use the mouse cursor to select the board square you desire and press the left mouse button. If the square you selected is a legal square the unit will move from your reserves on to that board square. One resource point will be used. What constitutes a legal board square will be covered later.

After you have placed a unit on a board square owned by an opposing/opponent, this will cause an offense to take place on that square. This offense may or may not succeed.

To pickup a unit off the board you must have at least one resource point. Use the mouse cursor to select the board square that contains a unit that you wish to pickup and press the left mouse button. As long as the unit you selected is in supplies it will be picked up and placed in the reserves.

A unit being placed on an opposing/opponent square has an offense value of 10. Units on the board next to an opposing/opponent square being attacked support the offense with a value of 5. Units on a square being attacked give that square a defense value of 15. Units next to a home square being attacked add 5 points to the defense of that square.

Each player receives a fixed number of units during the setup turn. Each turn there after a fixed number may be received as reinforcements. These numbers are set per scenario.

Units can be reused any number of times in a game turn as long as resource points are available.

2.6 Resources

Resources can represent a variety of things in Pendulous. It will start from a players technological advantage to a players fuel and ammunition state. Then continues to the actual makeup of forces within ones unit with higher resource numbers representing more mobile forces.

Resources in Pendulous determine how mobile a players' force can be. For each unit placed on the board one resource point is expended. For each unit picked up off the board one resource point is expended.

As with reinforcements a player receives a fixed number of resources on the first turn of the game and then receives a fixed number of resources at the start of each turn.

2.7 Combat

Combat occurs in Pendulous when a player attempts to place a unit on a square (sectors/territories or base) owned by another player. The loser of the battle will lose a unit. If the attacker wins, the square attacked will change ownership (color) to the attacker. If the attacker loses one unit, it will be subtracted from the reserves. The attacker will expend one resource point regardless of who wins the combat.

In order for a square to be a valid offense square, the player must have a home square adjacent to the target square.

To reflect the uncertainty in combat, randomness plays a part in the resolution of combat. To resolve combat, defender and attacker accumulate points as follows:

> Attacker Points
> > - 10 points for attacking unit
> > - 5 points for each attackers unit next to target square
> - 2 points for naval invading unit
> > - 3 points for each attackers base next to target square
>
> Defender Points
> > - 2 Points for sectors/territories
> > - 15 Points for unit in defending square
> > - 5 Points for each defenders unit next to target square
> > - 25 Points for base square
> > - 5 Points if target square is next to defender base
> > - 0 Unsupplied square (no support is given)

In addition to the above points, some percentage modifiers may be applied to the attacker and defender totals. Each time a player attacks the same square successively, the attackers point value increases by 25%. On the second offense to a square, the attacker will get a 25% bonus. On the third offense, the attacker will get a 50 % bonus, etc.. Each player for every scenario is given a unit effectiveness percentage. This represents a direct percentage of point bonus' or detriment. A player with a unit effectiveness of 80% would receive just 80% of his offense or defense points for every combat. A player with 120% would receive a 20% bonus for his offense or defense points for every combat.

Once the point values are determined for attacker and defender, they are compared to give a percentile chance that the attacker will succeed. If the attacker has 25 points and the defender has 25 points it is a 50% chance of success. If the attacker has 10 points and the defender has 30 points it is a 25% chance that the attacker will win.

Of course all of the above combat resolution procedures are performed automatically. The values are always visible on the left side of the game window.

Barrier crossings are resolved in the same manor as sectors/territories attacks. The only difference is what constitutes a valid square. To perform a naval offense, the target square must have barrier in one square around it. The attacking player must have a port base on that body of barrier. Barrier crossings should only be used when no other choice exists. They are very risky because invading units need to battle for a source of supplies before the invading players' turn is over.

2.8 Supplies

Supplies plays a big role in Pendulous. An entire game can be lost if all of ones units are destroyed when their lines of supplies are cut.

Every home base is a source of supplies for that player. Every sectors/territories square must be able to trace a line of supplies to a home base. To trace a line of supplies, a square must be adjacent to another home square that is in supplies and so on. You can picture supplies as spreading out from each home base. Spreading first to each home square adjacent to the base, then each square that is adjacent to the squares next to the base. This continues until all squares have been checked.

At the end of each players' turn, supplies checks are performed. Any squares that are found to be out of supplies are colored black and outlined in the owning players' color. If home squares are found to be out of supplies at the end of the players' turn, any units on those squares are disbanded. This effect gives a player one turn to bring home squares (which were forced out of supplies by another player) back into supplies.

At the start of each players' turn, any opposing/opponents' unsupplied square (adjacent to any square owned by this player and in supplies) reverts ownership to this player. This allows a player to capture many squares without ever needing to offense each square.

3.0 Special Functions
3.1 Reports

During a game various status reports can be viewed.

3.1.1 Player Settings Report: REPORTS|PLAYER SETTINGS

This report gives information about each players' current status in the game. The following values are shown in the report:

Reinforcement Rate: The number of units each player will receive at the start of the players' turn.

Resource Rate: The number of resource points each player will receive at the start of the players' turn.

Maximum Forces: The total number of units each player can have on the board and reserves at any time during the game. Reinforcements will not be given to the player that would cause the unit count to exceed this maximum force count.

Reserves: This is the current number of units in each players' reserves.

Resources: This is the current number of resources accumulated by each player.

Victory Points: This is the current number of victory points accumulated by each player.

Unit Effectiveness: This is the percentage of unit effectiveness applied to combat resolutions for each player.

3.1.2 Game Settings: REPORTS|GAME SETTINGS

This report gives information about the scenario being played.

Number of Turns: The number of turns in the current scenario.

Victory Points: Sectors/territories: The number of victory points accumulated by each turn for each sectors/territories square owned.

Victory Points: Base: The number of victory points accumulated by each turn for each base square owned.

Barrier Crossing Allowed/Not Allowed: This indicates whether barrier crossings are allowed for this scenario.

3.1.3 Status Report: REPORTS|STATUS REPORT

This report gives information on the combat resolutions that have occurred.

Total Attacks: This shows a count of the number of attacks each player has made.

Total Defenses: This shows a count of the number of defenses each player has made.

Offense Success %: This shows the percentage of successful attacks performed by each player.

Defense Success %: This shows the percentage of successful defenses performed by each player.

Average Offense %: This shows the average offense success percentage for each player.

Average Defense %: This shows the average defense success percentage for each player.

3.2 Saving Games

Once a game has been started it can be saved at any point for later continuation. To save a game in progress, select the menu FILE|SAVE GAME. A dialog box will appear. Enter an eight character description of the game being saved. These eight characters plus ".SAV" will be the actual file name used to save the game.

3.3 Playing Saved Games

To play a saved game, select the FILE|RELOAD SAVED GAME menu. A dialog box will appear. Select or enter the name of the saved game you wish to play.

3.4 Full View

Full view is an optional (display only) window that can be activated. This will allow players to see the entire board at a smaller scale. This of course is only necessary for scenarios with maps too large to be seen on the screen all at once. To activate the full view, select the OPTIONS|WORLD VIEW menu. To deactivate, select the menu again.

3.5 Watching a Replay

REPLAY|START REPLAY: This menu will allow you to watch the current game from the first turn to the last turn played. Once this has been started you can not return back to the game and take turns. If the game is still in progress when this option is selected, you will be prompted to save the current game. During the replay process, you can stop the replay by selecting REPLAY|STOP REPLAY from the menu.

3.6 Tile Sets

Pendulous supports different tile sets for your units and map board. It is similar to the game of Chess having different piece sets. Select one of the tile sets under the "TILE SET" menu. A tile set can be changed at any time during play. The tile set selected (after you have saved an edited scenario) will be the default tile set for that scenario.

3.7 Other Menus and Dialogs

OPTIONS|END TURN DIALOG: This allows turning off the end turn dialog box that appears at the end of each turn. Select this menu to turn this option off and on. This is useful when you have the computer play all players in the background.

OPTIONS|ANIMATION: This menu item can be toggled on and off. To speed up a game, you can turn this option off.

OPTIONS|SOUND: This menu item can be toggled on and off. If you want to hear sound effects, turn this option on.

HELP: The on-line help has not yet been implemented.

HELP|ABOUT: This menu shows the game credits.

4.0 Scenario Editor

Pendulous includes a complete scenario editor. The editor scenarios can be created and edited. All scenarios included in Pendulous were developed in this editor. To enter the scenario editor, select the FILE|SCENARIO EDITOR menu.

4.1 Scenario Editor Board

On the left side of the game window exist two sets of radio buttons. The top group is the player select group. The bottom group is the board type select group. By selecting the player and the board type, you determine the type of square that will be placed on the board. Once the player and board type have been selected, bring the mouse cursor over the board area. To place or overwrite a square, press the left mouse button. The new square will appear. To draw multiple squares, hold down the left mouse button and move the mouse over the board.

4.2 Scenario Settings

The scenario editor gives access to a variety of dialog boxes that allow setting all adjustable portions of a scenario.

4.2.1 Player Settings: SETTINGS|PLAYER SETTINGS

The values specific to each player are set here.

Units Per Turn: The number of units this player will receive at the start of his turn.

Units Per Base: The number of units this player will receive at the start of his turn for each base owned.

Resources Per Turn: The number of resource points this player will receive at the start of his turn.

Resources Per Base: The number of resources this player will receive at the start of his turn for each base owned.

Maximum Forces: The total number of units each player can have on the board and reserves at any time during the game. Reinforcements will not be given to the player that would cause the unit count to exceed this maximum force count.

Initial Forces: This is the number of units each player will have added to the reserves at the start of the setup turn.

Start Resources: This is the number of resource points each player will have on the first turn (plus the resource rate).

Start Victory Points: Victory points can be given to each player at the start of the game for balance or handicap purposes.

Unit Effectiveness: This is the percentage of unit effectiveness applied to combat resolutions for each player.

4.2.2 Scenario Settings: SETTINGS|SCENARIO SETTINGS

The setting specific to the scenario can be adjusted here.

Number of Turns: The number of turns in the scenario.

Victory Points: Sectors/territories: The number of victory points accumulated by each turn for each sectors/territories squares owned.

Victory Points: Base: The number of victory points accumulated by each turn for each base square owned.

Allow Barrier Crossing: Check this box to allow barrier crossings for the scenario.

Hidden Units: Check this box to enable the hidden unit feature. Playing a scenario with this feature enabled will hide opposing units from sight unless they are adjacent to an opposing players' square. Once spotted, if ownership of squares should change (which will cause a players' unit to become unadjacent to an opposing owned square), it would again become hidden.

Hidden Sectors: Check this box to enable the hidden sector feature for the scenario being edited or created. When using this feature in a scenario all sectors (sectors/territories, squares, etc.) are hidden until you move adjacent to them. This has the effect of creating a scenario requiring exploration.

4.2.3 Scenario Description: SETTINGS|SCENARIO DESCRIPTION

This allows editing the description for a scenario. Up to 256 characters can be used to describe the scenario. This is a free form description area. To force a carriage return, type CTLR|ENTER. To force a tab, type CTLE|TAB.

4.2.4 Players Names: SETTINGS|PLAYERS NAMES

The default names for each player can be edited here. These names can be overridden when the scenario is played.

4.2.5 Board Size: SETTINGS|BOARD SIZE

The size of the board can be changed here. The maximum board size is 50 squares by 50 squares.

4.2.6. Board Generations: SETTINGS|BOARD GENERATION SETTINGS

Selecting this menu option will display a dialog box. This dialog box allows you to enter parameters that affect the random generations of boards. To use, enter in the number of bases per player. A zero would mean this player would not be in the game. The barrier level value is used to determine the amount of barrier squares on the board. The production of barrier squares will increase if the number of barrier squares is a higher number.
The "Generate Board at Game Start" allows you to specify that this scenario will have a new board each time it is played. If this option is not checked, then the board generation will only be in effect during the scenario editing process. Once all of the settings are complete, press "OK". This previous board will be erased and a new random board will be generated. To regenerate the board based on the same settings, you can select the menu BOARD|GENERATE BOARD. You can do this any number of times.

4.3 Other Scenario Editor Menus

The following are the additional menu selections available in the scenario editor.

FILE|NEW SCENARIO: Reset the scenario editor. This is the state when the scenario editor is started.

FILE|LOAD SCENARIO: Load an existing scenario for editing. A dialog box will appear with a list of all scenarios. Enter or select the scenario desired.

FILE|SAVE SCENARIO: Save the current scenario to a file. A dialog box will appear. Enter an eight character description of the scenario being saved. These eight characters plus ".SCN" will be the actual file name used to save the scenario.

FILE|PLAY SCENARIO: Play the scenario as it currently exists in the editor. This is useful for trying out changes to a scenario or bringing a scenario into the editor to give a player a handicap.

FILE|EXIT EDITOR: Selecting this will re-exit the editor.

BOARD|WORLD VIEW: This operates the same as during a game.

HELP: The on-line help has not yet been implemented.

HELP|ABOUT: This menu shows the game credits.

5.0 General Strategy and Tactics

A wide variety of strategies exist in Pendulous. You will find some that you like and employ successfully. Others not so successfully. The effectiveness of a strategy largely depends on the scenario being played and the strategies employed by your opponents. My only intention here was to describe some general ideas.

5.1 Defending

As defender generally you will start with a larger number of squares and/or bases. You must attempt to put off the offense(s) long enough to give you victory. Experiment with these ideas as a defender:

Strongly defend only your bases allowing the larger sectors/territories masses to be taken.

Constantly hassle the attacker by performing attacks against his bases.

Hold units and resources for a number of turns. To keep from being cut from his supplies, the attacker will become cautious.

Manage to always get sectors/territories and units that are unsupplied back into supplies. If done properly, the game will be over before the attacker has really accomplished much.

Make only high percentage attacks thus building large numbers of units on the board.

5.2 Attacking

As attacker you will generally start with fewer lands and/or base squares. You must gain sectors/territories and bases to win. As attacker, time is against you. Here are some general attacking strategies:

Drive and attempt to capture every opposing/opponent base not worrying about the sectors/territories squares. If all bases are captured, the opponent is out of the game. He may still win if enough victory points were accumulated.

With each turn you take, carefully get as much of the opposing/opponents supplies.

With each turn, continuously drive deeper into opposing/opponents territory.

Make use of large number of resources by attacking the defenders weaker areas leaving the defenders' units useless.

Make high percentage attacks building up a large number of on board units.

6.0 The Computer Player Maker: FILE|COMPUTER PLAYER MAKER

Pendulous offers a unique feature that I have yet to see in any other game. Using the Computer Player Maker feature, can greatly affect the way the computer will play. One dialog box exists which gives you access to this feature. The Computer Player Maker dialogs can be divided into three main sections. Along the top of the dialog are four radio buttons. The middle section allows for value editing. The bottom of the dialog is command buttons.

The top row of radio buttons represents four different minds sets the computer will play under. The computer will determine if it needs to be on the offense in order to win the game. In addition the setup turn can handle things a little differently. For each of the possible mind sets, the computer can play under a set of 23 weighting values. These values exist for a total of 96 programmable values that affect the play of the computer.

I will briefly describe each of the play values, but first a word of warning. Valid ranges have not been tested. It would be very likely that you could make a computer player totally useless. I would recommend loading an existing computer player and tweaking the values, then play against these new values. I am very confident that by adjusting these values you can make better computer players then those supplied.

For each move, the computer can evaluate each square on the board. The computer can do this by looking at the square and adjacent squares, then tallying up the values (when they apply). The square with the high values is the square where the next action will take place. Below you will find the meanings of the values:

Opposing Base Own Sector: The value of a owned square next to an opposing base.

Opposing Base Opposing Sector: The value of an opposing square that is next to an opposing base.

Max. Distance to Opposing Base: How many squares away on the board to look for opposing bases.

Own Base Own Sector: The value of a owned square next to an owned base.

Owned Base Opposing Sector: The value of an opposing square next to an owned base.

Max. Distance to Own Base: How many squares away on the board to look for own bases.

Sector Cut From Supplies: The value of each opposing sector cut from supplies based on a move into this square.

Unit Cut From Supplies: The value of each opposing unit cut from supplies based on a move into this square.

Sector Saved From Unsupplied: The value of each owned sector brought back into supplies based on a move into this square.

Unit Saved from Unsupplied: The value of each owned unit brought back into supplies based on a move into this square.

Min. Offense Percentage Rate: This is the lowest offense rate
offense that will be made. (Risky)

Per Square Explored: The value of each square explored based on a move into this square.

Own Unit Own Sector: The value of each owned unit surrounding this owned square. (This has to do with pickups off the board.)

Opposing Unit Own Sector: The value of each opposing unit surrounding this square.

Own Unit Opposing Sector: The value of each owned unit surrounding this opposing owned square.

Opposing Unit Opposing Sector: The value of each opposing unit surrounding this opposing owned square.

Min. Value for Placement: The value a square must have before placement will take place. (This prevents the computer from wasting units and resources by just placing them on his own squares when not needed.)

Max. Value for Pickup: The maximum value a square can have and still allow unit pickups. (This prevents the computer from wasting resources picking up units when it is not needed.)

Border Square: The value added if the square being evaluated has an opposing adjacent square.

Offense Tendency Per Percentage: The value given to an offense on a square per

percentage points of success. (This will insure that the computer player will prefer higher percentage attacks over lower percentage attacks.)

<u>Defense Tendency Per Percentage</u>: The value given to a defense square per percentage point chance of a success defense.

<u>Sector Offense</u>: The value added if this square would be a sector offense.

<u>Barrier Offense</u>: The value added if this square would be an offense across a barrier.

The command buttons along the bottom allow you to "LOAD" existing computer player or select "NEW" to enter all original values. Once you have entered or modified all values you can "SAVE" to a new file. By doing this, you have created a new computer player that will appear in the list of computer players when you start a game. Pressing "EXIT" will bring you back to the main game screen.

7.0 Designer Notes

Pendulous may look and feel like a new and unique strategy experience. Its roots indirectly extend deep in history. Most new ideas are really combinations of older concepts and ideas. Pendulous is no different. I can point to some specific experiences in my game playing history that influenced this game. As a teenager, I enjoyed playing complex war simulated board games. In 1985, I was in Japan for business. There I was introduced to the board game GO. Now that Pendulous is complete, I see its roots in these two game experiences.

8.0 Credits

Designed and Programmed: Ken Carlino

Play Testing: Ken Carlino, Jeff Siebold, and Mark Janovics

Documentation: Ken and Marcy Carlino