HOLLOW GROUND LEVEL EDITOR

< USER MANUAL >

Revision 2
(2004-05-10)

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PREFACE

This is the second revision of the HollowED User Manual. We have only made minor corrections in this edition. Most users do not bother to read manuals so we have decided to not further maintain the user manual. This means that the manual is more of an introduction than a complete reference to the editor. We also removed the manual from the standard distribution package of the final version of HollowED. This made the download archive seven times smaller. We will publish more material in the form of articles and guides on the web site instead of extending the scope of the manual any further.

1. INTRODUCTION

HollowED is the official level editor for Hollow Ground. The Hollow Ground game is built to use a scalable map set, meaning that the standard map set can be extended with custom maps. Custom maps are maps that you yourself or other users have created. The editor is not a stand-alone application, so you need a registered copy of the game Hollow Ground to use the editor. The Hollow Ground game software is distributed as shareware and is available for download from our web site (**www.aescapia.com/hollow_ground/**).

The purpose of the editor is to provide extended play value for users of Hollow Ground. Users can use the editor to contribute new game content to the community or just fool around with their own copy of the game. AESCAPIA AB provides a special download section for user contributed custom maps. Instructions for uploading map files are available on the web site.

Section 2 of this manual describes how you install the editor application. Section 3 is a hands-on **getting started** tutorial. Section 4 describes how to open and work with **map files**. Maps consist of two main building blocks: tiles and objects. Tiles make up the background and implement some features. Objects are mainly items, generators or monsters. Maps also have properties like color schemes and time-out events. Section 5 describes how you **edit tiles**. Section 6 describes how you **add and move objects**. Section 7 and 8 describes how to **adjust the map's colorization** and **edit properties** respectively. How you get **technical support** and what you can and cannot do with **copyrighted game assets** is described in section 9 and 10.

2. INSTALLATION

Installing the HollowED application is a simple one-step process. The download package only contains the HollowED application and a Read Me file. Decompress the StuffIt archive (if you have not already done so). Move the HollowED application to the Hollow Ground application folder on your Macintosh HD. The application must be placed in the same folder as your **registered** copy of Hollow Ground version 1.1 or later to run. For technical reasons the editor cannot run on an unregistered copy of the game, since it can only work with unlocked game assets. If you should have any problems with installing the HollowED software, please read the **Technical Support** section of this user manual.

3. GETTING STARTED

In the following we will create a custom map step-by-step. This is a good exercise and we will go through most of the editor's core functions.

3.1 CREATING YOUR FIRST MAP

Launch the HollowED application by double clicking the HollowED icon in the Finder. The application needs to do some initialization, so launching it might take anything from a few seconds to a minute or so, depending on how fast your computer is. After having launched the editor creates a new map with the name "Untitled". The template map is an empty hall framed by walls on all four sides. We will use this template map to create our very first simple custom map by doing the following steps.

a) Tile Bucket Tool. How you go about creating your map is a matter of taste, but one way is to use the carve out method, meaning that you begin with solid walls and carve out corridors and rooms. Since the template map does not consist of solid walls, we first need to fill the map with solid walls using the Tile Bucket Tool. Select the Tile Bucket Tool and then select the Wall Tile from the Tile List. Click once in the middle of the map. Make sure you click inside a floor tile.

NOTICE: Filling the entire map can take some time, since the editor needs to do some heavy computation for pre-calculated shadows etc.

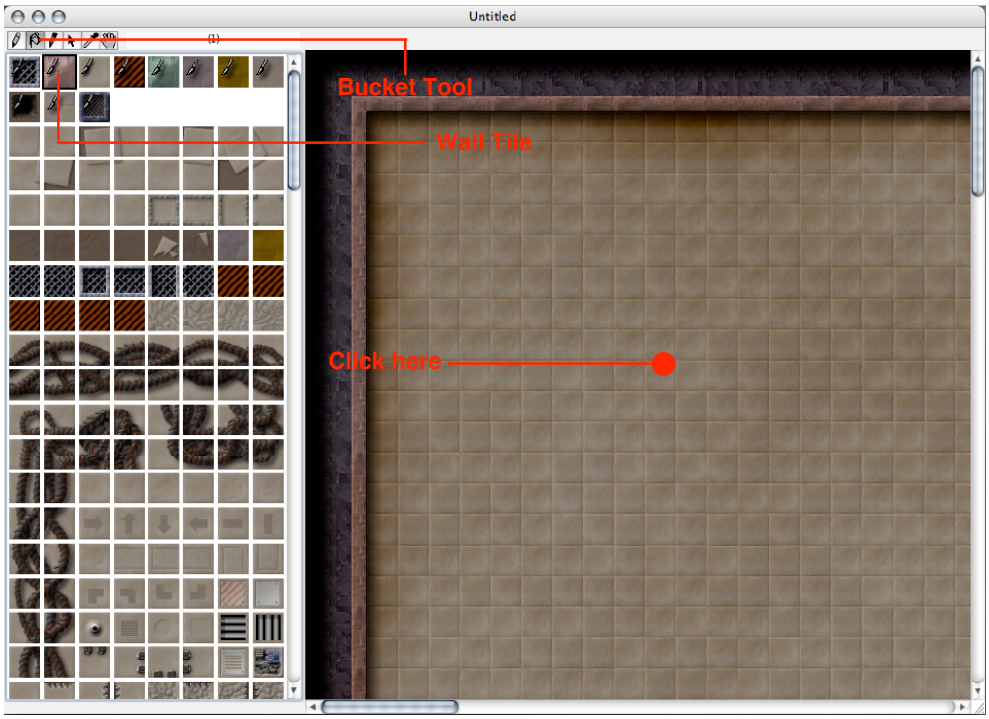


Figure 1

b) Zooming the map view. To get a better view of the structure of the map we should now use a larger zoom on the map. Select **Map ➡ Zoom ➡ 75 %** from the menu. You will now be able to see more of the map in the map window.

TIP: It is possible to see the entire map with a higher zoom, but that is not necessary at the moment.

c) Draw some corridors. The next step is to draw some corridors. Select the Pen Tool and then select the Floor Tile. Draw a structure that looks just like the one

in Figure 2. The easiest way to do it is by using different sizes of the Pen Tile Tool.

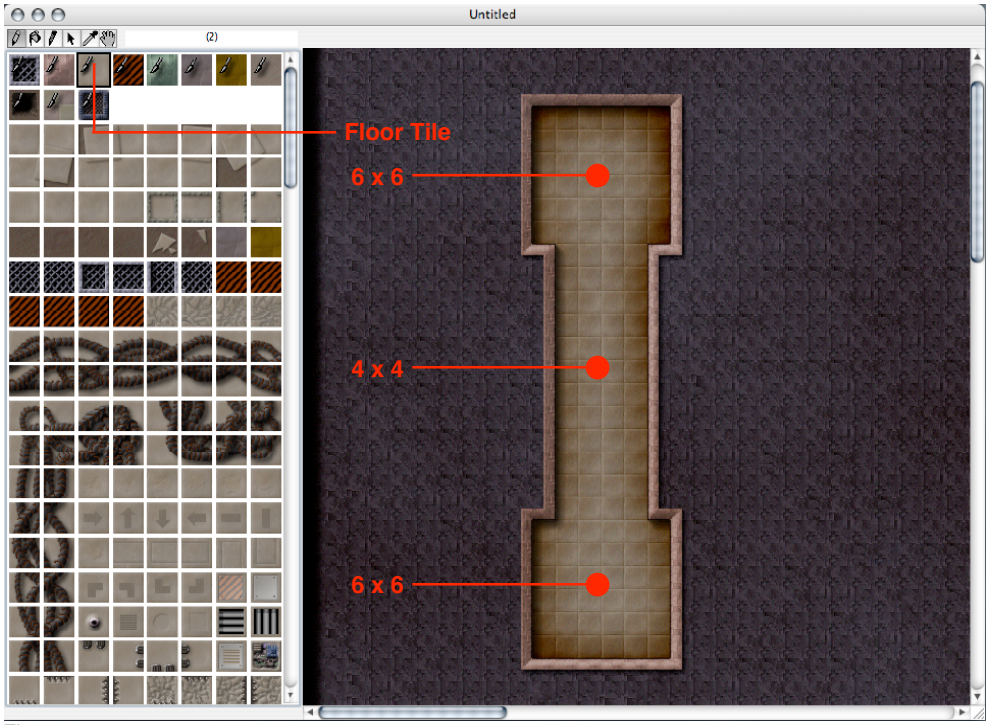


Figure 2

Select **Map ➡ Pen Size ➡ 6** from the menu. Then click once to create the upper and lower rooms. The change the **Pen Size to 4** and connect the two rooms by drawing a line between the two 6 x 6 squares. The easiest way to draw a straight line is to hold down the SHIFT-key while drawing.

NOTICE: The editor automatically adjusts and shades the wall tiles as you draw the rooms and corridors. You will notice that there are many such automated Tile Brushes in the editor. You need to experiment with them and learn how they work and how they do not work!

TIP: Remember that you can **Edit ➡ Undo** any of your mistakes. The editor has multiple Undo and Redo.

d) Entrance and Exit. The most important feature of a map is the Exit and Entrance Elevators. The map can have more than one of each, but must have at least one of each.

WARNING: The game will automatically discard your map from the list of loadable maps if it does not contain at least one entrance and one exit. The game warns you about this and refuses to run the map.

Select **Map ➡ Pen Size ➡ 1** from the menu. Select the Entrance Elevator Tile Set. Select the tile in the upper left corner.

NOTICE: The name “Entrance Elevator (212)” appears in the Info Field. This means that you have selected a Tile Set, tiles grouped into a set of tiles. The parenthesized number is the Tile ID, you can ignore it unless you are a mod programmer.

Start drawing one tile into the upper left corner of the upper 6 x 6 room. Notice how the Pen Tool tiles the Elevator Tile Set and keeps track of the bounds of the elevator. When you have finished drawing the Entrance, do the Exit Elevator in the same fashion. Congratulations, you have now created a fully functioning Hollow Ground custom map! It should look like Figure 3.

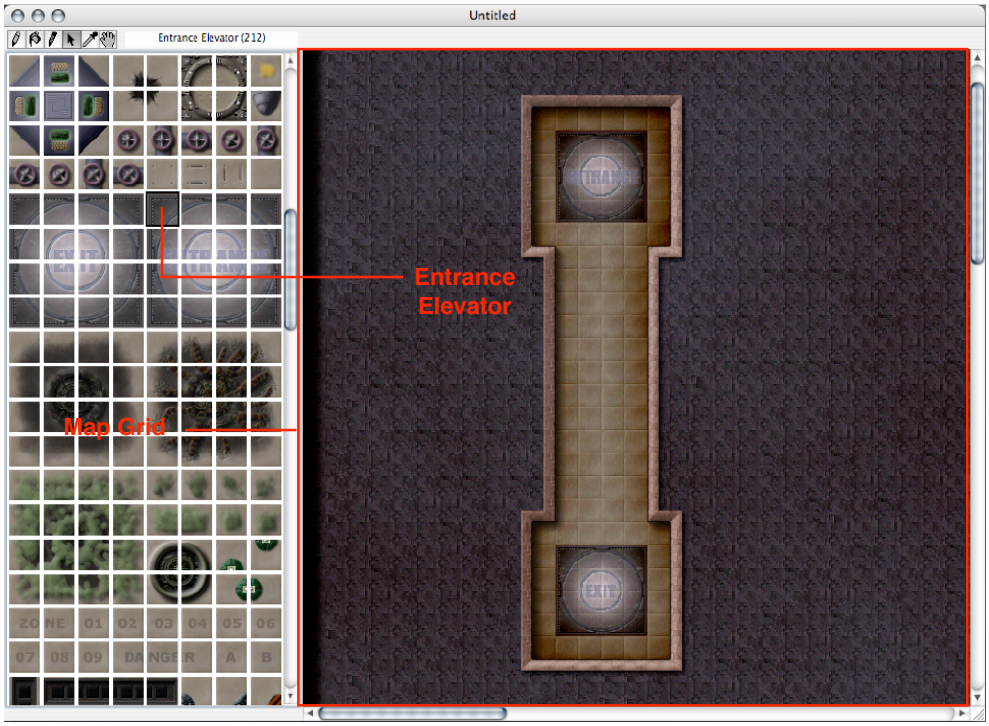


Figure 3

3.2 ADDING SOME OBJECTS

The map that we have just created is fully functional, but not very exciting. In the following section we will learn how to add some monsters and items (objects).

a) Adding a key card. Select the Object Placement Tool. You will notice how the Tile List is replaced by the Object List. Select the Key Card object from the list and then just click anywhere on any floor tile in the map grid. You will notice how a Key Card object is placed at the spot where you clicked.

b) Adjusting the placement. Since we just clicked randomly the Key Card is probably not where we want it to be. Objects can be precision placed by using the Object Selection Tool. The Selection Tool is versatile so we will take some time to get to know all of its features better.

Select the Object Selection Tool from the Toolbar. Select **Map ➡ Zoom ➡ 100 %** from the menu. Zoom to 100%, since it is easier to do precision placement in full zoom. There is also a 150% zoom if you really need pixel perfect placement. Click on the Key Card item on the map. Notice how it is hilited. You can now drag the object to where you want it.

TIP: Try dragging it over the walls and notice how the editor automatically uses the in-game sprite engine's collision detection to find a valid object position. This prevents you for incorrectly placing objects inside walls and other invalid areas. Also, notice that some objects (i.e. secret doors, fans etc.) can be placed above and inside walls.

Now let us experiment with moving objects. Try holding down the left mouse button on a tile that does not contain an object (that is any tile except the one occupied with the Key Card) and drag. You will notice that the Selection Tool will display a rubber band selection. You can use it to select multiple objects. You can also select multiple objects by SHIFT-clicking them (just like you would do select multiple icons in the Finder). Finally, you can precision adjust selected objects by hitting any of the ARROW-keys. Deselect by clicking any vacant tile.

c) **Adding a door.** Before we actually add a door object, we will draw a doorframe so that there is something telling us it is a doorway even after the door has been unlocked and opened (disappeared). Select the Pen Tile Tool from the Toolbar. Select the "Doorway Horizontal #1 (325)" Tile Set from the Tile List.

Draw the doorframe in the middle of the corridor, like is shown in Figure 4. Notice how the Pen Tool is automatically constraining the doorframe so that it is 4 x 3 tiles in size. Here it is appropriate, but sometimes you need to account for this to create doorframes of a different width.

Select Object Placement Tool from the Toolbar. Select **Map ➡ Snap To Grid** from the menu. Select the "4 Tile Horizontal Door" from the Object List. Place the door by clicking approximately in the middle of the doorframe. You do not have to be exact, since you turned Snap to Grid on the editor will help you to align the door perfectly within the doorframe. Should you for some reason get the door wrong just hold down the CTRL-key and the current tool will temporarily change to the Object Selection Tool. Move the door to where you wanted it and release the CTRL-key. The current tool will change back to the Object Placement Tool.

d) **Adding some monsters.** Select the Cyborg Zombie object from the Object List. Add one or two Cyborg Zombies as shown in Figure 4. You add the monsters just like you added the Key Card and the Door objects. You might want to turn the Snap To Grid function off when you place monsters. Also, placing some items out of grid makes the visual appearance more vivid. Then again, some things should of course always be aligned to the grid (i.e. force fields, doors etc.).

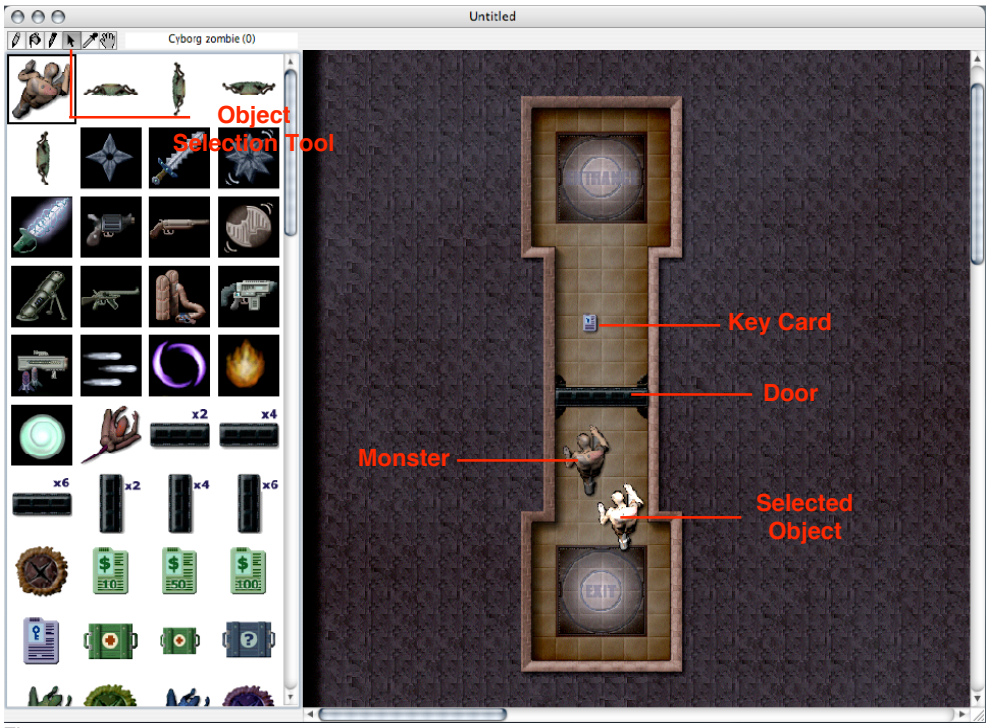


Figure 4

3.3 Saving and Testing the Map

The final stage of designing a custom map is to save and test it in the Hollow Ground game application. Custom maps require Hollow Ground version 1.1 or later to run. Before we test the map, we shall do one last thing. We shall edit the map's title. We will leave the other map properties unchanged for now. See sections 7 and 8 for a full description of how to edit all of a map's properties.

Select **Map ➡ Properties** command from the menubar. The Map Properties Dialog Box appears. Click the Map Title editable text field and delete the preset title “Untitled”. Type “My First Map” as is shown in Figure 5. Click the OK button to apply the changes. Notice that the map window’s titlebar changes to “My First Map” to reflect the change.

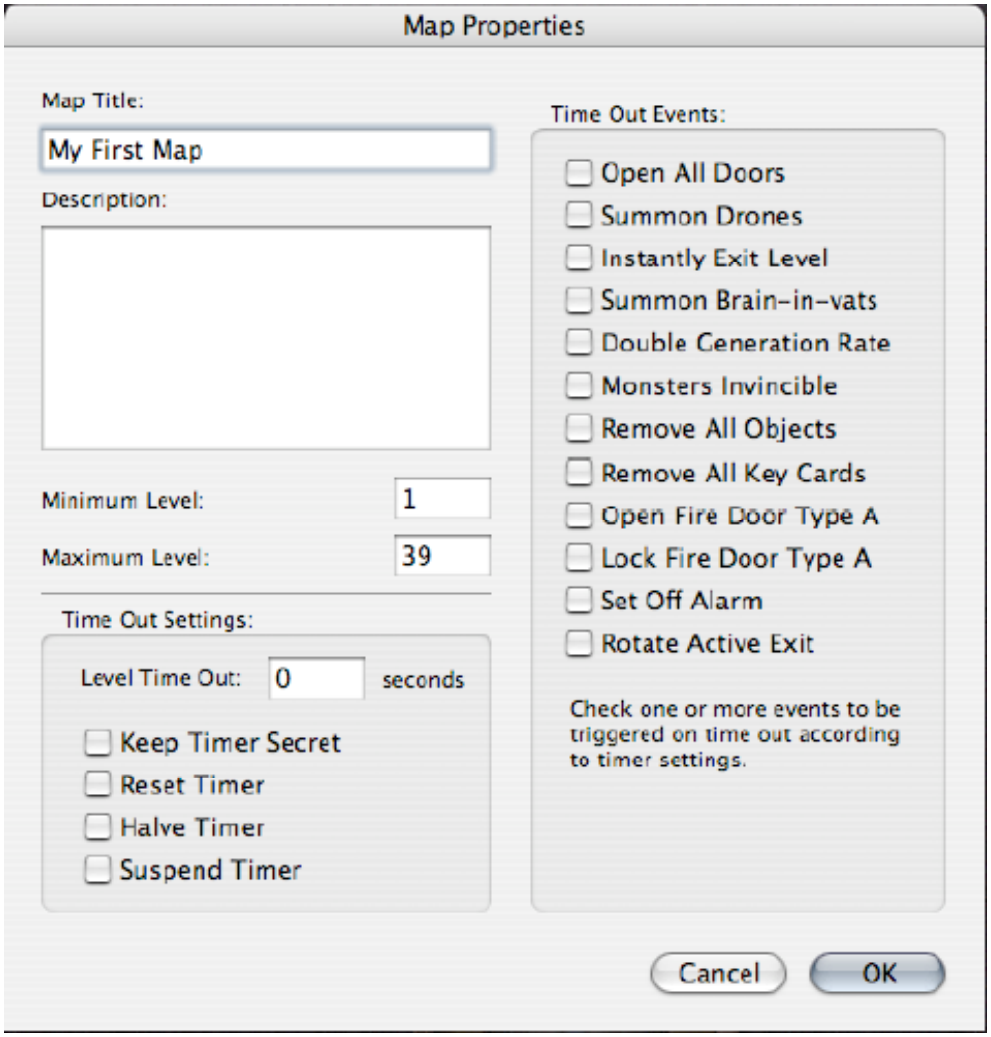


Figure 5

Select **File ➡ Save As** command from the menubar. A standard MacOS save dialog box appears. The dialog box looks somewhat differently depending on what version of the system software you are currently running. Notice that the map file name default to the map’s Title field. Your default file name should read “My First Map”. You can give you custom map file any name, but it is a good idea to make it descriptive. Do not use generic file names like “Map68” since they are reserved for the standard map set. For now lets stick with the default file name!

Before we actually save the map, we need to tell the editor application where to put the new file. Custom maps need to be placed inside the Hollow Ground Maps folder to be activated. Locate that folder and select it in the save dialog’s file browser. Click the Save button. You have now completed the creation of the custom map.

Hide the editor application by pressing the COMMAND-H shortcut. Launch the Hollow Ground game application. Select One Player while holding down the ALT-key. A list of all active maps appear. Select your map (titled “My First Map”) and do a test run.

4. MAP FILES

Hollow Ground is built to use a scalable map set, meaning that the standard map set can be extended with **bonus** and **custom maps**. Bonus maps are official add-on maps from Aescapia AB that are available for both separate download and as part of new updates (http://www.aescapia.com/downloads/). Custom maps are maps that you yourself or other users have created. The only difference between bonus and custom maps is that bonus maps are official maps, just like maps from the standard set. Official maps have been tested so that they do not upset the careful game balance, while custom maps could very well make the game unplayable.

4.1 INSTALLING BONUS OR CUSTOM MAPS

Installing bonus or custom maps is an easy process. Maps are stored in separate Map Files. Installing a new map is as easy as dragging and dropping the Map File into the Hollow Ground Maps Folder. You find the Maps Folder inside the Hollow Ground application folder (the folder where your Hollow Ground game application is stored). The Maps Folder contains all of your active maps, including the standard map set. Standard maps are easy to identify since they have generic names like “Map08”. Once the Map File is put into the Maps Folder all you have to do is launch the Hollow Ground game application.

WARNING: It is not recommended to delete or replace standard maps. Deleting or replacing maps from the standard map set can potentially make the game crash. The game simply needs a minimum number of maps in each difficulty layer. It ships with a sufficient number of maps in each such difficulty layer. Bonus and custom maps on the other hand can always be replaced or removed. The game performs a check on startup to make sure that the Maps folder contains enough maps on each level difficulty layer.

4.2 REMOVING BONUS OR CUSTOM MAPS

Removing bonus or custom maps is as easy as installing them. Maps are stored in separate Map Files. Removing a map is just a matter of dragging the Map File out of the Hollow Ground Maps Folder. You find the Maps Folder inside the Hollow Ground application folder (the folder where your Hollow Ground game application is stored). Please, see the above warning about removing map files from the standard map set.

4.3 ENCRYPTED MAP FILES

Most of the Map Files belonging to the standard map set are encrypted; in fact all standard maps that are not used for demo purposes are encrypted. The editor cannot open and edit encrypted map files. If you try to open an encrypted map file you will get an error message. There are several reasons for preventing these map files from being readable in the editor. One reason is that it would be too easy to cheat, making the game less fun to play. For technical reasons the editor cannot unlock and decrypt game assets, so it can only be used with a registered version of the Hollow Ground game application. If you try to launch the editor without having a registered Hollow Ground game application residing in the same folder as the editor you will get an error message and the editor will refuse to launch. The editor needs to access unlocked game assets found in the game’s application folder.

WARNING: Encrypted map files from the standard map set are personalized to your computer and your copy of the game, once they are unlocked. Copying such map files from another computer causes your game to crash. If this happens all you can do is download the full game and re-install and register the game using your personal registration code. Unlocked assets, which is required to run the editor, is not the same thing as decrypted assets. Only your registered copy of the game can decrypt your own unlocked assets. Unfortunately such a copy protection is necessary, since we are generous enough to publish all of our source code as open source. Our customer service will gladly help you if you should have any problems with your game (http://www.aescapia.com/support/).

4.4 Opening and editing map files

Bonus, custom and demo maps are fully editable. HollowEd is used to edit such Map Files. In fact that is all it does! You can double click Map Files to open them, but this will most likely launch them in Hollow Ground, which is defined as the file's viewer application. This can be changed in the Finder, but for now we assume that you have not. The best way to open a map is to select **File ➡ Open…** from the menubar. This will present you with a standard open dialog. Select a Map File and click Open. For further information see the Open menu command description.

4.5 Creating a new map file

Useful as it might be to open and edit existing Map Files, the purpose of the editor is to allow users to create their very own maps. The editor application automatically opens a new template map as you launch it. You can also create a new map by selecting **File ➡ New** form the menubar. The new map is a copy of the template map, so you need to use Save As to actually create a new Map File. The editor will automatically ask you to do so if you close the map window or quit the application without having saved the new map. Once the map has been saved as a file it will only ask you to save any changes made to it.

WARNING: The newly created and saved map cannot be launched in Hollow Ground before you have added at least one Entrance and one Exit Elevator feature to it (see Editing Tiles).

5. EDITING TILES

The map consists of tiles and objects. Tiles are generally used to create walls, corridors, rooms and other non-dynamic features. Objects on the other hand are generally used for dynamic features like monsters and items. We say "generally" because features have been implemented as tiles or objects depending on what is technically the best method of implementation for that specific feature. Most of the time this should not lead to any confusion.

5.1 Tile pen tool

Select the Tile Pen Tool from the toolbar. The Tile Pen Tool is one out of three tools (the other two are the Tile Bucket Tool and the Eye Dropper Tool) that are specifically used for editing map tiles. Selecting the Tile Pen Tool makes the Tile List visible. You select a specific tile from the Tile List and use the Tile Pen Tool to draw that tile feature onto the map.

TIP: There is a modifier key for drawing straight lines. Hold down the SHIFT-key while drawing to constrain the pen tool to either the vertical or the horizontal axis only.

5.2 Pen Size

Select **File ➡ New** form the menubar. The Pen Size property affects the size of the Tile Pen Tool and is mainly useful for drawing corridors of a specific width.

5.3 Tile Bucket Tool

Select the Tile Bucket Tool from the toolbar. The Tile Bucket Tool is one out of three tools that are specifically used for editing map tiles. Selecting the Tile Pen Tool makes the Tile List visible. You select a specific tile from the Tile List and use the Tile Bucket Tool to fill areas of the map with the selected type of tile. The Tile Bucket Tool performs what is known as a flood fill on the map tiles. It fills all tiles of the same type as the one you clicked in. The tiles need to be continuous, meaning that the bucket tool only fills tiles that are adjacent to a tile of the same type. If you create a room without any exit and fill it with a certain tile, the room is filled, but the not the rest of the map. The bucket tool is not that useful, but can sometimes save you some work.

5.4 Eye dropper Tool

Select the Eye Dropper Tool from the toolbar. The Eye Dropper Tool is one out of three tools that are specifically used for editing map tiles. The Eye Dropper Tool is used to pick up a specific tile from the map grid. Place the Eye Dropper cursor above the tile and click to select it in the Tile List. You can now select the Pen or Bucket Tool to draw or fill with that tile.

TIP: There is a hot key for quickly selecting the Eye Dropper Tool while you are working with another tool. Hold down the ALT-key to temporarily select the Eye Dropper Tool and release it to re-select the previous tool.

5.5 Tile Brushes and Tile Sets

Some tiles are grouped into sets of tiles. There are conceptually two different types of tile sets, but most of the time, as a user, you will not notice the difference. The top of the Tile List consist of 11 specific tile sets that are a.k.a. Tile Brushes. Wall and floor tiles are two examples of such Tile Brushes. Tile Brush sets are more complex than ordinary Tile Sets, so they need to be handled specifically by the editor, but pretty much work like any other tile set from the user's perspective. Tile sets are named in the Tile Information Field.

The difference between drawing with individual tiles compared to Tile Brushes and other Tile Sets is that the editor automatically handles tile adjustment, shading, repetition etc., if the tile is part of a Tile Set. The editor also constrains or repeats the pattern of tiles as is appropriate. The best way to understand how this actually works is to just experiment with using the different Tile Sets and learn how they behave. Also, while they behave, as you would expect them to most of the time, they are not smart enough to always figure out what you want to accomplish. Part of learning how to use the Tile Sets is to learn how you "fool" the editor into doing things that is out of the ordinary. The best way to disable the automation is to single-click tiles onto the map instead of holding down the mouse button. You will quickly notice that doing cool maps is all about pushing beyond how tiles and objects where intended to be used.

5.6 Passable and unpassable tiles

Tiles have a propery that tells the game if they are passable or unpassable. Wall tiles are unpassable while floor tiles are passable. Most of the time unpassable means that neither monsters, nor player characters can walk through the tile and most of the time projectiles can not pass through them either. The property of being passable or not is a bit special cased so there is really no point in just telling which tiles are passable. The best way to tell if a tile behaves as you would like it to is to simply test it in the game application. Some tiles are passable, but slows down monsters or player characters (i.e. pipes, hoses).

5.7 Special feature tiles

Most tiles do not interact with the player characters, besides hindering or slowing down his/her movement. There are however also some tiles that implement a special function/feature in the game. Most of the time this property is reserved for objects, but as mentioned above, sometimes it makes more sense to put that functionality inside the tile. The Entrance and Exit tile sets are typical examples of this.

6. EDITING OBJECTS

The map consists of tiles and objects. The general difference between the two has been described in the Editing Tiles section. Objects can generally be grouped into monsters and items, the difference should be rather obvious and not require any explanation.

6.1 OBJECT PLACEMENT TOOL

Select the Object Placement Tool from the toolbar. The Object Placement Tool is one out of two tools (the other one is the Object Selection Tool) that are specifically used for editing map objects. Selecting any of the two object tools makes the Object List visible. You select a specific object from the Object List and use the Object Placement Tool to add that object to the map. Clicking on the map grid adds an object to the map at the nearest free space to coordinates where the click occurred. Free space is defined depending on the type of object and the passable property of the tile clicked.

6.2 OBJECT SELECTION TOOL

Select the Object Selection Tool from the toolbar. The Object Selection Tool is one out of two tools (the other one is the Object Placement Tool) that are specifically used for editing map objects. Clicking on an object in the map grid hilites it and makes it selected. You can select more than one object by holding down the SHIFT-key or dragging the mouse to use rubber band selection (just like you would select icons in the Finder). You can deselect all objects by clicking on a spot in the map grid that does not contain an object. Holding down the mouse button and dragging them can move selected objects. Notice that the editor uses the game's collision detection to make sure that objects are placed in a "free spot" just like when they are added using the Object Placement Tool. You can also nudge selected objects by using the arrow keys. Selected objects can be deleted using the **Edit ➡ Delete** command from the menubar or the BACKSPACE key.

TIP: There is a hot key for quickly selecting the Object Selection Tool while you are working with another tool. Hold down the CTRL-key to temporarily select the Object Selection Tool and release it to re-select the previous tool.

6.3 SNAP TO GRID

Select the **Map ➡ Snap to Grid** command from the menubar. This forces all objects to be placed according to the tile grid. Notice that tiles are actually only 16 x 16 pixels in size although they can only be edited as 32 x 32 pixel tiles. Objects snap to half a tile for this reason, since it offers more precision. You can always turn the Snap to Grid function off and place objects anywhere you like with pixel precision. The Snap to Grid placement is very well suited for placement of certain objects like doors, force fields etc. Both objects added with the Object Placement Tool and objects that are moved with the Object Selection Tool are affected by the Snap to Grid function.

6.4 SPECIAL FEATURE OBJECTS

Just like special feature tiles, some objects implement special features other than being items or monsters. The most common special feature objects are the different monster generators. Below is a list describing all special feature objects in Hollow Ground version 1.1.

7. EDITING THE MAP'S COLOR PALETTE

The game uses 16-bit color graphics (thousands of colors), so there is actually not a color look-up table that can be edited. Instead Hollow Ground uses an advanced color adjustment algorithm. Wall and floor tiles can be color adjusted using the HSV model. You can adjust the hue, saturation and value of each pixel within the tile set. In addition the game also uses a fractal algorithm to apply a layer of dirt over the actual map. The combination of those two methods (as well as persistent effects) creates a much more vivid environment than in most tile based engines. Hollow Ground contains literally hundreds of such small details that help create the special look-and-feel. Most of them are actually so carefully implemented that most of the time users do not consciously notice them, but if we removed them you would instantly know that something was missing. One such detail is that we automatically color correct all objects according to the map's color palette. You need to be aware of this when you create your custom maps.

7.1 ADJUSTING THE COLOR OF TILES

The whole tile set is divided into two types of tiles: walls and floors. Select the **Map ➡ Color Palette** command from the menubar to open the Color Palette dialog box. You adjust the color of wall and floor tiles separately using the Wall Color and Floor Color sliders.

How the change affects the map's tiles is immediately previewed in the lower right corner of the dialog box. If you have trouble understanding the HSV color model, try picturing Hue as the color, Saturation as how much color and Value as how light or dark the color is.

7.2 ADJUSTING THE COLOR OF DIRT

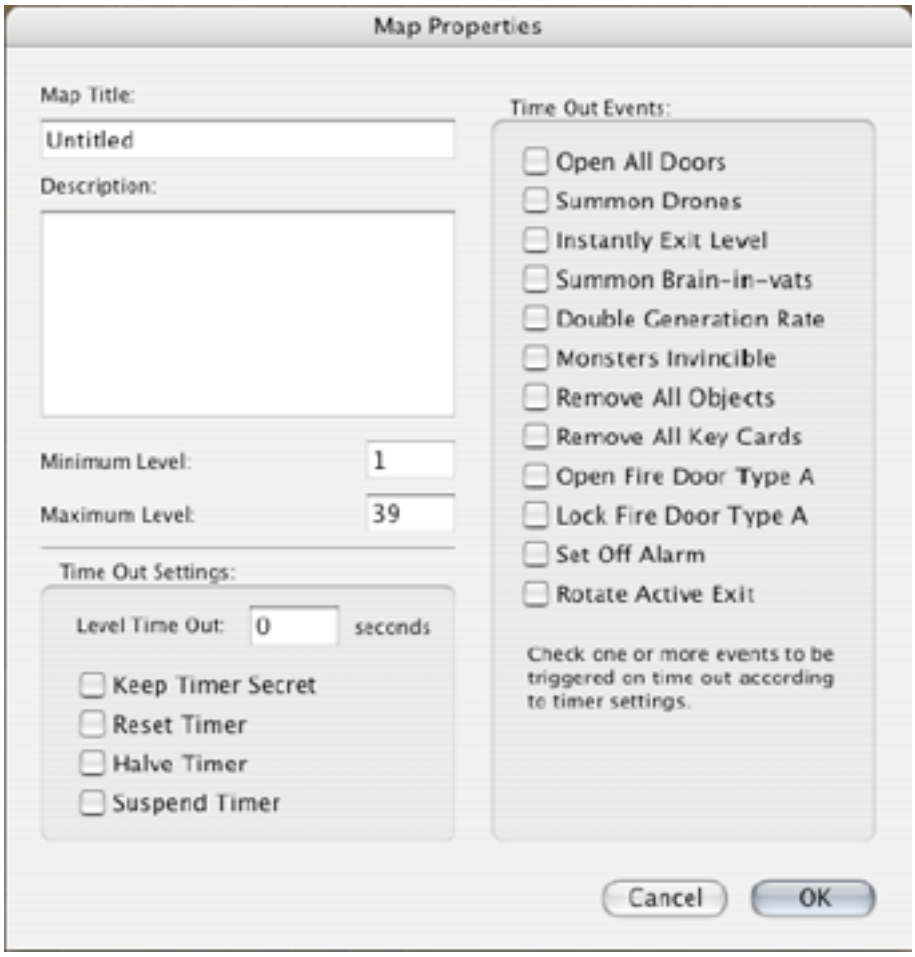
The game uses an algorithm to put a layer of dirt on the map. You can control the color and incidentally also the amount of dirt. Select the **Map ➡ Color Palette** command from the menubar to open the Color Palette dialog box. You adjust the color of dirt by using the Dirt Color sliders. The dirt algorithm works a bit different from the algorithm that adjusts tile color. It uses an RGB (Red, Green, Blue) color model. The sliders control the amount of red, green or blue color that is applied to the map by the algorithm. The dirt color is not previewed (although we might implement that later), but you can apply the changes to the map by hitting the Ok button. It will take some time to apply the dirt and color adjust the entire tile set, color correct objects etc. The reason you almost never notice this or loading times in the game itself is because we load maps and color adjust in the background, while the user is selecting characters, shopping etc. Most of the time this should result in zero loading time, even if the game application actually need to do some heavy calculations to prepare each map.

7.3 DEFAULT COLOR

You can always go back to the default color settings by pressing the Default button in the Color Palette dialog. If you should get lost while editing the colors, it is a good idea to go back to the default settings and start all over again. If you do not want to apply the color adjustments to you map you can always press the Cancel button. Notice that you can also Undo and Redo color adjustment, so it is safe to press Ok to preview what the adjustments actually will look like on the map. This is a good idea since Dirt Color adjustment is not currently previewable in the Color Palette dialog.

8. EDITING THE MAP'S PROPERTIES

Maps have properties like a title, a description, level depth span and time out events. These properties can be edited by selecting the **Map ➡ Properties** command from the menubar. Map properties can be very powerful once you understand how to fully use them. Notice that Time Out Events can be combined to create a variety of effects.



8.1 MAP TITLE

Maps need not have a title to work, but you should create a unique title for your map so that players can easily recognize it. Make sure the title is not too long, since it needs to be displayed in the lower part of the interface. If you use a title that is too long it will simply be truncated.

8.2 DESCRIPTION

The need not have a description either to work, but you should always provide one that gives the player some sort of hint as what lies ahead. If you fail to provide a proper title and description players will not be able to know how to prepare for the map. That could of course be part of a sinister puzzle, but do not overuse it, it is generally not that much fun.

8.3 LEVEL DEPTH SPAN

The map's level depth is expressed as a minimum and a maximum level depth at which the map can appear. This is known as the level depth span. The standard map set is divided into layers, but that is only a matter of game balance and there is no technical reason that a map cannot appear on any level depth. However, the difficulty of the game increases each five levels, so it is a good idea to conform to

the concept of difficulty layers. Finding the proper level depth span takes a lot of time and effort. The game is actually so complex that there is no rule of thumb, so you need to test your map carefully before releasing it. You also need to listen to other users' feedback. We have adjusted some level depth spans in the bonus and standard maps after such feedback. The bonus map Proving Grounds originally had a too low Minimum Level. Your maps should at least be playable in Normal Difficulty mode.

8.4 TIME OUT SETTINGS

Maps can have a timer. The timer is expressed in seconds and can be edited in the Level Time Out field. If the timer is set to zero the map has no timer. If the timer is set to something above zero a timer will count down as the players enter the map or if the Suspend Timer property is set if the timer is manually triggered. When the timer reaches zero it triggers the time out events that have been set and either stops or rests depending on the settings.

Keep Timer Secret	The timer is hidden from the users view and not displayed on the screen. The time out event comes as a surprise to the player.
Reset Timer	The timer does not stop after time out, instead it is reset and start counting down again, triggering a new time out event each time it reaches zero.
Halve Timer	The timer does not just reset as it reaches zero, it also halves the time out limit each time, resulting in faster and faster time out limits.
Suspend Timer	The timer does not automatically start as the player enters the level; instead it has to be triggered manually by shooting the Invoke Time Out blow-up switch. This can create very complex puzzles, since the whole range of time out events become available for creating level goals.

8.5 TIME OUT EVENTS

The map's timer triggers the time out events. Time out events can be combined, so you can apply more than one. The combination of different time out events and time out settings can create a large variety of different effects. It is impossible to describe every combination so we encourage you to experiment.

Open All Doors	Unlocks and opens all ordinary doors on the level. Fire doors are not affected. This removes the need to use key cards.
Summon Drones	1-2 drones are summoned at each time out. The drones appear in the closest free spot available next to the player characters.
Instantly Exit Level	Instantly exits the level. This is an alternative to exiting the level by stepping on the Exit Elevator, but it does not remove the need for an Exit Elevator.
Summon Brain-in-vats	1-2 brains-in-vat are summoned at each time out. The brains appear in the closest free spot available next to the player characters. This can be very deadly!
Double Generation Rate	Doubles the rate at which monsters are generated. Notice that any level can become a veritable slaughterhouse if you use this event in conjunction with Reset Timer (and Halve Timer for that matter).
Monsters Invincible	Makes all monsters on the level very hard (but not impossible) to kill. Notice that only monsters that have been currently spawned are affected.

Remove All Objects	Remove all items from the level. This is great for making maps where the goal is to race for a special item or a stash of items.
Remove All Key Cards	Remove all Key Cards from the level. This is a special version of the Remove All Objects event.
Open Fire Door Type A	Opens all fire doors of type A. This is equivalent to pressing a switch of type A and can work as a substitute for such a switch.
Lock Fire Door Type A	Closes and locks all fire doors of type A. Notice that this event is not equal to pressing a switch of type A, since a switch only closes the fire door, while the event actually permanently locks the door by disabling all switches of type A.
Set Off Alarm	This causes squatters to panic, running around aimlessly and away from monsters and player characters. It is used in the Prison Block maps, where it is used in conjunction with an Open All Doors event.
Rotate Active Exit	Rotates the active Exit Elevator among the available Exit Elevators. Notice that you need at least two Exits for this event to make any sense.

9. TECHNICAL SUPPORT

HollowED is unsupported freeware. Kindly read the HollowED License Agreement for further details. However, AESCAPIA AB supplies a lot of troubleshoot information on our web site (**www.aescapia.com/hollowed/**) and maintains a discussion forum where you can ask support questions and get help from other dedicated users (**www.aescapia.com/forums/**). AESCAPIA AB will also publish more tutorials and how-to articles on the web site in the future.

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11. CREDITS

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