TOMB RAIDER

LEVEL EDITOR

MANUAL & TUTORIAL

EIDOS INTERACTIVE   CORE

Tomb Raider marked a sensational new approach to 3$^{\mathrm{rd}}$ person gaming. Fans not only fell in love with Lara and her moves, but with the imaginative and intriguing worlds of her adventures. It all started with Lara's visit to some Egyptian ruins back in 1996, and has come full circle with the release of the Tomb Raider Level Editor which offers a different sort of adventure in another Egyptian setting. *Tomb Raider Chronicles* marks the end of the line of Tomb Raider games made with these development tools; but rather than viewing this as an end, the release of the editor makes it seem more like a beginning…

The Tomb Raider Level Editor includes a tutorial that will walk you through the basics needed to create your own stand alone Tomb Raider levels. (Please read about commercial use of this product.) Even though you will not be able to edit objects or animations (that means Lara's outfits), you have a wonderful variety of object sets from which to choose. You can sculpt and design on many different "levels", trigger events, create awe-inspiring spaces - simple to complex, and as you experiment you will learn more about what can be done, and quite possibly discover new methods of applying the knowledge you will have acquired.

Although we are not offering direct customer support with this product, we hope you will build a community of support via chat rooms and forums on our Eidos Interactive web site. Check Tombraider.com for news, links and updates about the Tomb Raider Level Editor ...we plan to release more object sets, project files and texture maps, and eventually hold a competition for the best "fan" Tomb Raider level(s).
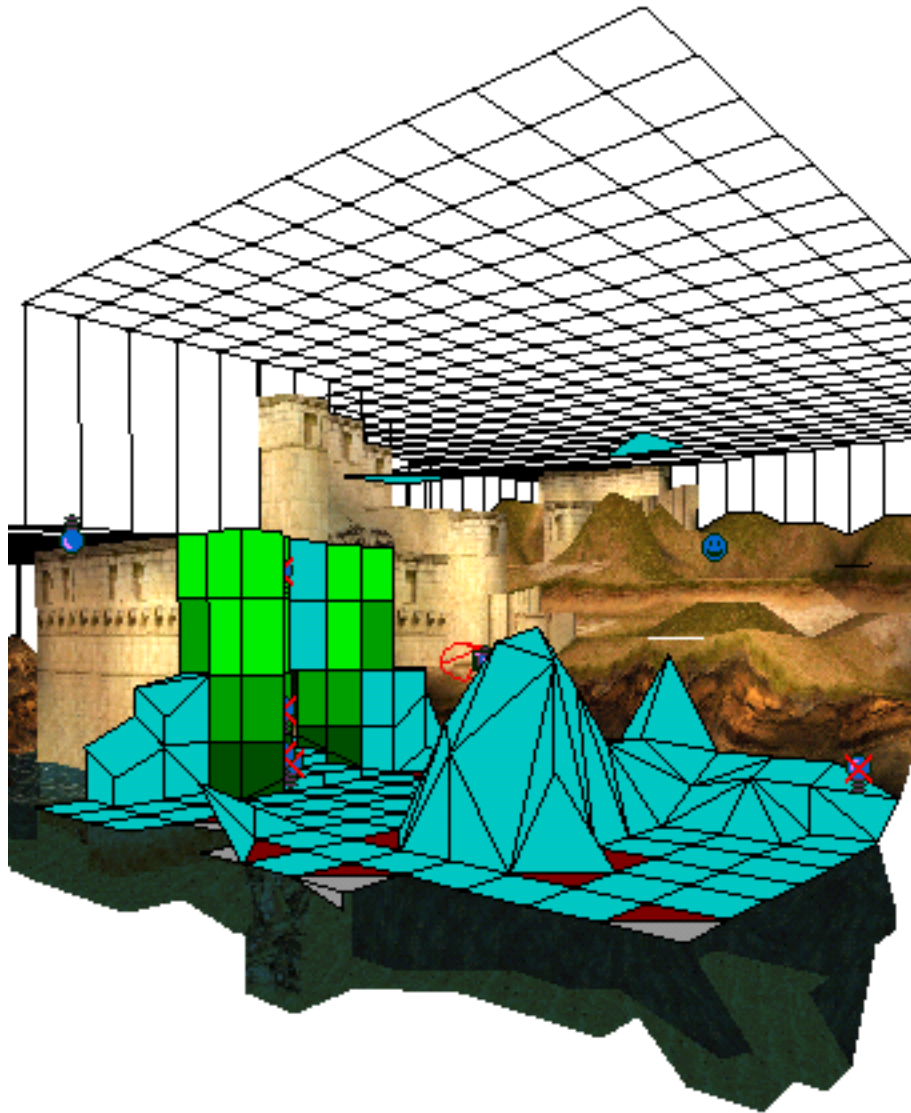
The *Tomb Raider Last Revelation* example levels provided with the tutorial are not finished levels and not intended to be played as such. They have been included with the editor to provide examples of the various skills you will learn and also to be used as a springboard for those who do not wish to build their own "worlds", but would rather spend time designing game-play.

We sincerely hope you will enjoy inventing, designing, and building with and for Lara as much as we have over the past 4 years. We thank all of you who have held the enthusiasm for the Tomb Raider series, thereby contributing to its success. We wish you happy adventuring with Lara and the tools used to create her worlds.

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EDITOR OVERVIEW

How it Works

Blocks, squares and clicks. Get used to these terms because you'll be hearing them frequently. The Tomb Editor is designed to work with a basic "building block" proportioned to Lara and her movements. Texture "tiles", equal in scale to these basic "building blocks", are applied to the modeled rooms comprising each level. Lights, objects, enemies and sounds are placed within the model to create the worlds for Lara's adventures!

Building Rooms   Levels are built by connecting a series of rooms comprised of walls and "building blocks." The floors and ceilings of these rooms are sectioned into squares. The "building blocks" are created when you raise a square up from the floor or lower one down from the ceiling. Four mouse clicks up or down equals the width of these square sections and creates a perfect cube. (Remember all those "blocks" Lara pushed and pulled around?!) Building blocks can range in height from one click all the way up (or down) to however far you are willing to push the limits! But bear in mind Lara is only 3 clicks tall and certain texture limitations must be considered in order to create a believable world.

The building blocks are not limited to cubes or columns with flat tops. Corners of the surfaces can be pulled up or down to create angled slopes and "organic" surfaces - great for creating rocky caves or sand dunes.

Applying Textures   Textures are applied to the surfaces of the blocks to further define the block shapes and ultimately define Lara's environments. Each level has a specific texture file that must be loaded in order to apply the textures. A texture file is comprised of many 64x64 pixel "texture tiles".

Ideally, textures are placed on square block surfaces since textures will stretch or compress to fit the space defined by the size of the building blocks. Overly stretched or compressed textures don't look their best so to allow for this, all the vertical surfaces can be broken into smaller segments.

Applying Lighting Effects   Every room has an RGB ambient light capability ranging from zero to 100% white light, with every color in between. Lights, spotlights, effect lights, sunlight and shadows add drama and help to create a real world ambience.

Placing Objects   What would Lara's world be without objects to pick up or enemies to fight? Each project has a specific file, or WAD (object set), that must be loaded before the placement of objects or baddies is possible. WAD files include the specific objects, from ammo to animated water fountains, and at least three or four baddies per level. Animations take up a lot of memory, so forget about that room with 1000 scorpions! This is the time to employ your design skills and discover new meaning to the term "game balance"!

Placing Audio Tracks   Audio tracks *play* an important role in setting the various moods within a level and are as easy as objects to trigger. After you have listened to the audio tracks, try to imagine how and where they will add to the overall ambience, the "drama" and game play of your level.
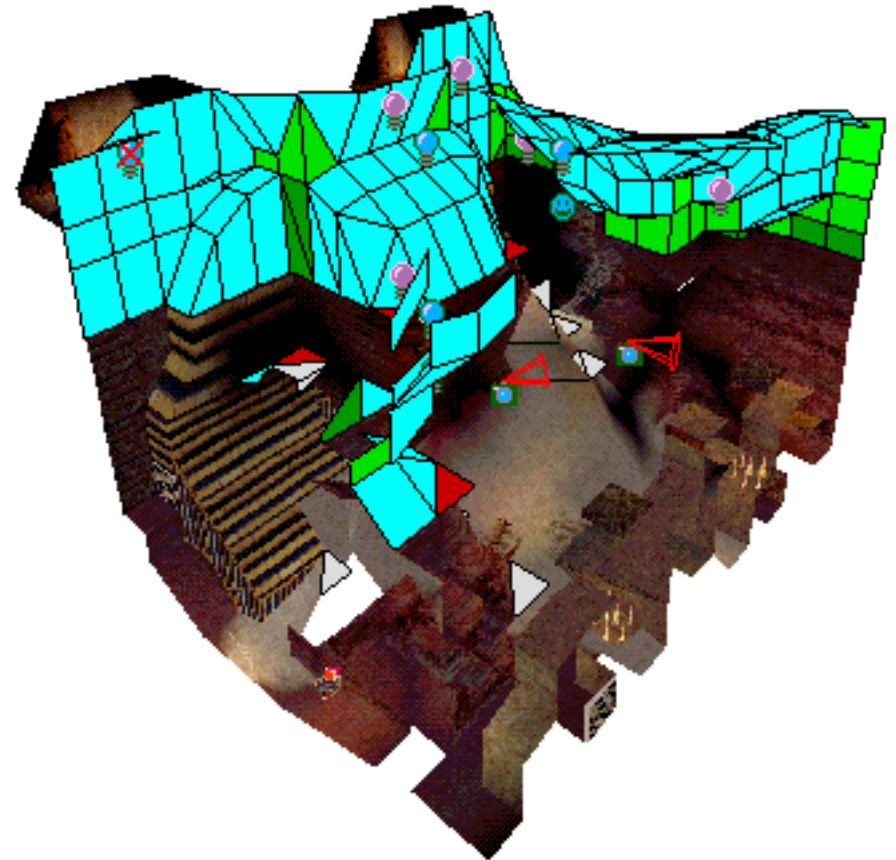
The Interactive Interface

The interface has been divided into six sections for easier reference: Drop Down Menu Bar, Plan View Panel, Object Panel, Lighting Panel, Editor Window Panel and the Texture Panel. Click on a Panel Name and below for a detailed description of the windows and buttons within each section.

If you have access to a printer, it would be a good idea to print out the file "Interface.PDF" to use as reference while working in the tutorial, until you become familiar with the interface terminology. You can also print out the individual panel sections if you prefer a hard copy.

Drop Down Menu Bar

Plan View Panel
Top down view of the selected room; secondary working window

Plan View Grid

Room Edit Buttons
Create rooms; add/edit features in rooms

Object Panel
Preview, select, light and place objects

Lighting Panel
Select, place and adjust lights

Editor Window Panel
Main working window for modeling, texturing and viewing in 2D, 3D and Preview modes.

Editor Window

Editor Window Buttons

Room Info Box

Color Palette
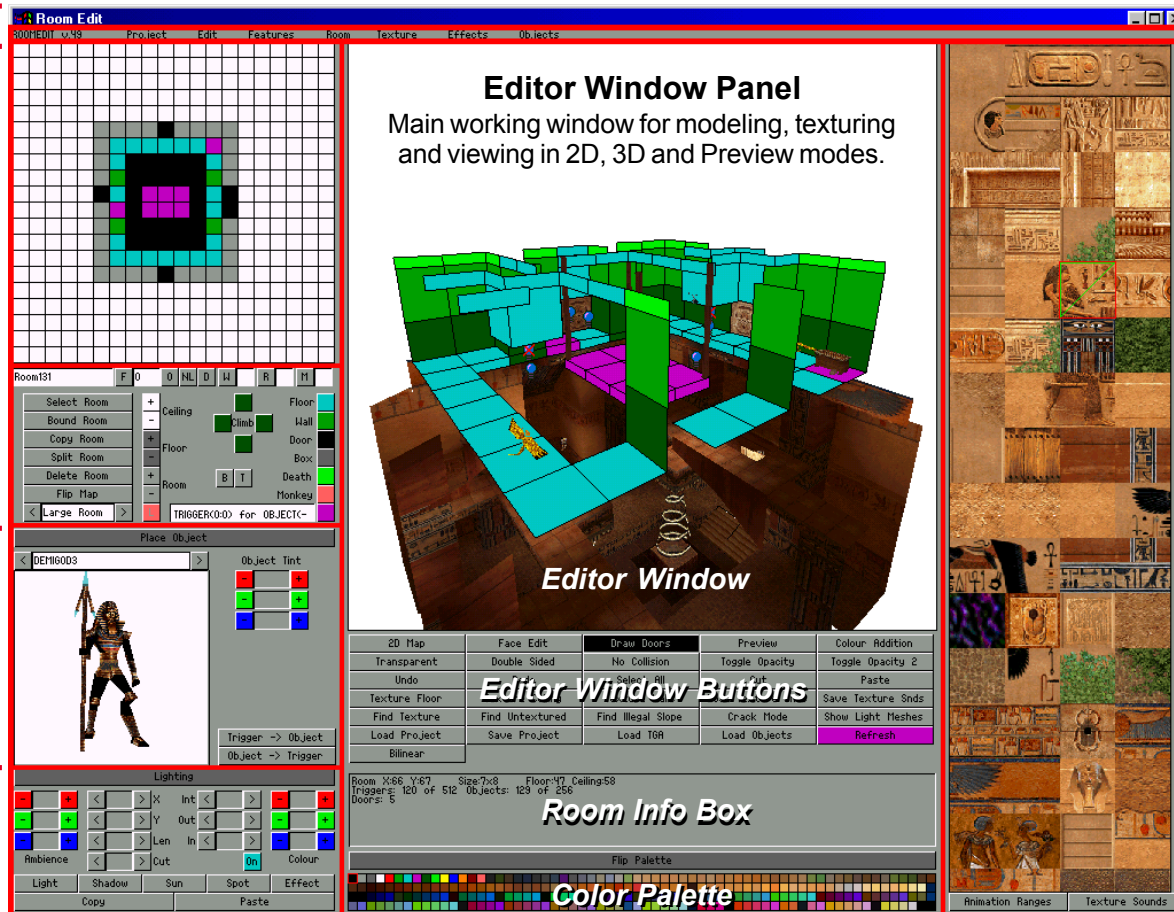
Texture Panel
Select tiles for texturing model; set animation ranges and texture sounds.

IMPORTANT NOTE:
Pressing ALT with ENTER will remove the top blue Windows Bar and also make the bottom row of buttons visible.

Editor Window Buttons
Different modes of viewing; misc. functions and shortcuts mainly for texturing and modeling

Room Info Box
Room location and statistics; total number of triggers and objects in project.

Color Palette
Provides colors used for transparency; quick way to assign color to lights and objects.

Launching the Tutorial (tut1.prj)

When you installed the editor software, all your folders were set up properly for you on your C drive. However, if you weren't able to install to the default directory on your C Drive, you will get an error message when loading up the tutorial project, or any of the example projects. If this is the case, please refer to the *Level Editor Messages* section in the Trouble Shooting guide at the end of the manual. It will tell you what to do. Also, before going any farther, check this **FILE FLOW CHART** to gain a better concept of how everything works together and where to find files when you need them.

Make sure your desktop resolution is set to 1024x768 and your color depth at 16-bit. **Room Editor WILL NOT RUN if you are in 24-bit color.** Using the start menu on your tool bar, go to Core Design\Tomb Raider Level Editor\Tools\Room Editor to open the program. (You may want a shortcut on your desk top for quick access!) In order to view the bottom row of buttons on the interface, press ALT + ENTER to get rid of the Windows Bar at the top. This will fit the entire interface to your screen.

Using the Drop Down Menu at the top of the editor interface, look under "Project" and load the file **tut1.prj** located in the TUT1 folder in the maps directory. A 3D representation of the first room in the tutorial, or demo model, will appear in the EDITOR WINDOW. (If your EDITOR WINDOW or any portion of it appears black, minimize the window, then maximize it. You'll have to hit ALT + ENTER again to regain your Windows bar.)

Quick Tour / Getting Familiar with the Interface

This is a good time to check out the demo model so you can see what it is you are about to learn. You also need to get familiar with some "key" buttons on the interface in order to find your away around the model and the rooms that you will soon build.

Viewing Rooms in 2D

Click on the 2D MAP button – the top left button directly below the EDITOR WINDOW. (Buttons change from gray to black in the "on" position.)

You now have a top down view of the entire demo model. Notice that the first room is red while the others are blue and gray. The colors represent different elevations:

RED: The room in which you are working.

LIGHT BLUE: Rooms at the *same* elevation as the room in which you are working.

LIGHT GRAY: Rooms *above* the room in which you are working.

DARK GRAY: Rooms *below* the room in which you are working.

Find the PLAN VIEW grid in the upper left corner of the interface. The PLAN VIEW grid displays a top down view of the selected room in light blue squares. The surrounding gray squares represent the walls of the room, and are not counted as part of the actual room dimensions. The black squares represent doors or "portals" into adjoining rooms.

> *NOTE: One grid square = one "building block"*

Viewing rooms in 3D

Click off the 2D MAP button to view a 3D representation of the selected room in the EDITOR WINDOW.

1. Use arrow keys to rotate the model

2. Use "page up" and "page down" to zoom in and out

Face Edit Button: Click on the FACE EDIT button to view the rooms with textures. (If you accidentally change a texture during your exploration, you can press "Control U" to change it back again.)

Draw Doors Button: Click the DRAW DOORS button to view the rooms that are attached to the selected rooms. As you rotate the model, notice how the edges and "walls" disappear to allow you a better working view.

Lighting Button: If you want to view the rooms with lighting effects, click the LIGHTING button in the LIGHTING PANEL located in the lower left corner of the interface screen.

Selecting Rooms

Click on the 2DMAP button. Find the text window directly below the PLAN VIEW grid. Click on SELECT ROOM button and choose "Cropped Room" from the pop-up window, then click "Okay". Notice that the name of the room appears in the ROOM TEXT WINDOW and the

new room you selected appears on the PLAN VIEW grid - it is now the "red" or the "selected" room in the EDITOR WINDOW.

Now click on other rooms in the EDITOR WINDOW and watch as they appear successively on the PLAN VIEW grid and in the ROOM TEXT WINDOW below the grid.

Also, as you click on different rooms notice that sometimes the other rooms change color as a new room becomes selected. If the room you selected rests at a different elevation than the previously selected room, the editor will adjust all the colors so that you can see which rooms are now at the same elevation (blue) as the selected room and which rooms are above (light gray) or below (dark gray).

> **TIP:** *Here is a trick to help illustrate these elevation differences. Select the "One Square" room using the SELECT ROOM button. Press the ROOM + or - buttons (from the ROOM EDIT BUT-TONS) and watch as the elevation read-out changes in the INFO BOX below the EDITOR WINDOW. After several clicks, notice how the other rooms change color as the small room moves above and/or below them.*

Navigating through the Model

The Flip Palette Button - At first glance you may have thought this button had to do with the color palette below it, but it does not. Some-times you can't select a room using the mouse because it is hidden by the rooms on top…the FLIP PALETTE button will help you find these "hidden" rooms. Select a room then hit the FLIP PALETTE button. All of the rooms above your selected room will disappear from view - only the rooms on the same elevation (blue) as your selected room and below it (dark gray) will remain. If you click again, it will replace the rooms above. This is a highly useful button for aiding in vertical navigation and selecting hidden rooms and will be important once you begin building multilayered models.

ALT + Z CRITICAL TO LEARN! "Alt Z" brings up the "place target" cursor. You can move from one room to another by clicking on adjoining rooms while in the 3D view (with the DRAW DOORS button clicked on).

You can also click on the PLAN VIEW grid with the "place target" cursor to move within that room. "Alt Z" allows you to change the rotational axis of the room – the square you click with the "place target" cursor be-comes the new rotational axis of the room. Get back to the default view and axis by using the ROOM drop-down menu and clicking CENTRE (English spelling).

> **NOTE:** *If you use the CENTRE feature bear in mind that it places your eye level in the middle of the room. This can really tweak your sense of proportion in larger rooms. If the room is 20 clicks tall (the editor default), your eye level is 19 feet 2 inches above the floor!*

Preview Mode

Click the PREVIEW button to view your model as it will appear (well, almost) in the game. To explore around the model you:

1. Move the mouse to the left or right to look sideways

2. Left click to zoom in/move forward

3. Right click to zoom out/move backward

4. Press "ESC" or hit the SPACEBAR to exit

This is a low resolution view that allows you to quickly fly through and check your design and is very useful because the editor always ends up in whatever room you fly to. The controls feel a little clumsy at first, but you'll get used to them with a little practice.

Take some time to fly through all the rooms. Stop in different locations, exit the preview mode to observe the room on the PLAN VIEW grid and the EDITOR WINDOW. Practice using the ALT Z command to navigate in both 2D and 3D views.

Time to get your hands dirty…

Section I

IN THE BEGINNING

The tutorial project (tut1.prj) is designed specifically to teach you the basics as you explore and build a duplicate project. Upon completion of the tutorial, you will be able to create your own playable level, and/or move on to more advanced techniques.

When you launched the tutorial, you noticed the "demo" model situated in the upper portion of the EDITOR WINDOW panel. Placement of this model in the upper portion of the window gives you space to build a duplicate model just beneath the original. It also provides quick access to the demo model for visual reference. Once you have completed your model, if you like, you can connect it with the original to create one large level.

Once again Lara finds herself trapped in a tomb - she'll have to solve a few puzzles and fight a few baddies in order to find her way out. If you haven't checked it out already, take a few moments to play the Demo Level so you can better visualize what you are going to build.

Saving Your Project

It is highly recommend that you save your project and save often! An *autosave* function is activated when you enter the Preview mode or when you output a WAD file, but it is still a good idea to save periodically. The autosave.prj file can be found in the root directory. Once created, every time you load a project you will be ask if you wish to load in autosave. If not, hit cancel before using the Drop Down Menu to load your project or you'll crash the Editor.

The autosave.prj will automatically be removed when you quit out of the Room Editor, unless the program was not shut down properly (forced re-boot or crash). So remember to save your project before exiting the Room Editor - the autosave feature is only used for emergencies!

It's not a bad idea to adopt a method for saving your project files with a different iteration instead of copying over your current version. This will prevent having to redo an entire project should a bug develop (not very likely, but it can happen). A good system for renaming is to cycle through the alphabet (tut1a.PRJ, tut1b.PRJ, tut1c. PRJ, etc.).

Creating a Room

First, get back into the 2D view by clicking the 2D MAP button. Click the SELECT ROOM button and scroll down to the first empty room, select it and hit OKAY. This will make a new room the default size of 18x18 squares by 20 clicks high. It fills the entire grid (remember, the gray squares don't count as real estate!).

Naming your Room

Click in the ROOM TEXT WINDOW below the PLAN VIEW grid; and name your room something identifiable. (You don't HAVE to name the rooms, but it makes it easier to find specific rooms in more complex levels.) An easy way to name your rooms and one that will help prevent confusion later on in the tutorial is to use the same name as the rooms in the demo model but add a letter at the end. So your version of "First Room" would be "First RoomX", "Dome Room" would be "Dome RoomX" and so on. . Use the Backspace button to get rid of the existing text, then type your room name. **You must hit ENTER for the name to "stick."**

Moving your Room

You probably noticed the large red square that appeared in the upper left corner of the EDITOR WINDOW. All new rooms appear in this location. Right click and drag your room into the space below the demo model.

Sizing your Room

Back to the PLAN VIEW grid. You've got to reduce your new room to a more manageable size. Right click in the light blue area of the grid and drag a selection the size of 8 squares down by10 squares across (the selection will have a red outline). Now hit the BOUND ROOM button located in the ROOM EDIT buttons below the grid. Your room is now 8x10 squares.

TAKING A LOOK

Time to look at the room you just built. Make sure the room is selected (red) and click off the 2D MAP button. You should see a room with a light blue floor and ceiling and medium green walls.

Go to the PLAN VIEW grid and click one of the light blue squares. Notice that the corresponding square on the model (in the EDITOR WINDOW) is now highlighted in red, both on the floor and on the ceiling. When a square is red, it is ready for "action."

> *NOTE: You can select a square from the model, but if you accidentally click on it twice, a white arrow will appear in the middle of the square. Don't worry about these arrows now, you will learn more about them later. To get rid of the arrows, right click once.*

Go back to the PLAN VIEW grid and click one of the gray "wall" squares. Find the corresponding wall section, now highlighted in red, in the model. If it isn't visible, rotate your room using the arrow keys until it comes into view.

You can select multiple squares by right clicking and dragging a selection box around those you wish to select.

To manipulate the squares you have selected, use the CEILING and FLOOR buttons from the ROOM EDIT BUTTONS just below the grid. Try clicking on the "+" or "-" buttons to raise or lower the floor and ceiling accordingly. (One right click = 4 single clicks)

> **CAUTION: The ROOM button raises and lowers the elevation of the entire room.** *You'll use this feature when you begin stacking rooms.*

Get in the habit of occasionally checking the elevation (ceiling and floor height) of the room you are working in. Look in the INFO BOX below the EDITOR WINDOW for the numbers. They should read Floor: 0 Ceiling: 20.

Adding Features to Your Room

Now add some interest to that big empty box! Click on the 2D MAP button then click on the first room in the demo model to select it. Turn off the 2D MAP button (make sure the FACE EDIT button is off, too) and you will see a room with columns, a small ledge around the floor perimeter and a stepped "ziggurat" ceiling. (We'll deal with the light, medium and dark green wall panels in the section about applying textures.)

Okay, go ahead and turn on the FACE EDIT and the LIGHTING buttons (don't forget to turn off 2D MAP) so you can see how great your room will look when you complete this tutorial.   Now, back to your model. (You can select your room from the ROOM SELECTION WINDOW or go the 2D MAP route…it's up to you.)

The Stepped (ziggurat) Ceiling

1. Turn 2D MAP and FACE EDIT buttons **OFF**.

2. Go to the PLAN VIEW grid, select the center 2x2 squares of your room. Now click the CEILING + button twice (or you can press the "W" key on your keyboard). Check the numbers in the ROOM INFO BOX below the EDITOR WINDOW. Your ceiling height should read 22.

3. Select the center 4x4 squares, raise them by 2 clicks.

4. Select the center 6x6 squares, raise them by 2 clicks.

5. You should now have a room with a stepped ceiling 26 clicks tall. That's too tall, so let's reduce it.

6. On the PLAN VIEW grid, select all of the light blue squares. (**DON'T** select any of the gray "wall squares")

7. Press the CEILING "-" button (or the "S" key on your keyboard) 8 times. This will lower the entire ceiling without disturbing the step effect.

8. The height of your room should now be 18 clicks.

Columns

1. On the PLAN VIEW grid, check the demo model's "First Room" to see which floor squares you will change into columns. The column squares will be green.

2. Go back to your "First Room X" and select the square you want to make into a column. Find the green WALL button from the ROOM EDIT BUTTONS below the PLAN VIEW grid and click on it to change the floor/ceiling square into a green wall square, thus creating a column in your model. Click off the 2D MAP button to check it out.

> *NOTE: To change a wall square back to a floor square, select the green wall square then click the light blue FLOOR button.*

Ledges

Now create a ledge around the perimeter of the floor.

1. Go to the PLAN VIEW grid and select a row of floor squares along one side of the room and raise these squares by two clicks.

2. Repeat this process along each wall.

3. To make the path for the door that you will put in later, you need to lower the four middle squares of the ledge along the east (right) wall. If unsure, check the demo model for the exact location.

4. Finally, make a raised "platform". This is where Lara will be standing when the level begins. Select the 4 center squares and raise them by clicking once on the FLOOR + button (or press the "Q" key on your keyboard).

Congratulations! You've finished modeling your first room. You should now have a room with the same construction as the "first room" in the demo model. You are ready to begin applying some textures.

Texturing Your Room

When you first loaded the tut1.prj, not only did you load the 3D model of the level, you also loaded a TGA texture file, comprised of many 64x64 pixel "tiles". The texture tiles are located in the TEXTURE PANEL on the right side of the EDITOR INTERFACE.

Selecting Textures

1. **Left-click** on a tile to select it. Notice that within the red selection box there is a green triangle. Don't worry about the green triangle for now.

2. **Right-click and drag** on a texture to select portions of the individual tiles in increments of 16 pixels (e.g. 16x16, 16x32 and so on)

Applying Textures

1. Make sure your room is selected. (You HAVE saved your project recently, haven't you?)

2. Click **OFF** the 2D MAP button and click on the FACE EDIT button. (You won't see the textures you'll be applying unless this button is on)

3. Use the arrow keys to rotate the model so you are looking down at the floor.

4. Choose an appropriate tile for the floor. Refer to the demo model if you'd like. (**Right clicking on an applied texture automatically selects that texture from the texture file.)** Now left click on any floor square to apply the texture. If you don't see it, you probably forgot to turn on the FACE EDIT button.

5. Now right click on the floor and drag a box over several squares. This will apply the selected texture tile over all of the selected squares.

6. If you want to texture the entire floor in one shot, use the TEXTURE FLOOR button under the EDITOR WINDOW.

*NOTE: **Textures applied in this manner usually look like wallpaper!** You can use the TEXTURE CEILING and TEXTURE WALLS buttons to accomplish the same thing, but you will be happier with your level if you use this method sparingly, if at all.*

7. Now select an appropriate texture for the walls and apply this texture to one square. You'll see that the wall textures look stretched and blurred. That's because a square texture tile is being applied to a rectangular surface. Ideally, you want to place a texture tile on a square surface since textures will stretch or compress to fit the height of the wall segment.

Fixing Stretched Wall Textures
Fortunately there is a solution to this stretched texture problem. Remember the three shades of green you saw on the wall panels of the demo model? These shaded segments are one of the keys to successful texture mapping.

1. Turn off the FACE EDIT button to view your room without textures.

2. Right click and drag your selection over the entire wall, or go to the PLAN VIEW grid and drag select a gray wall (sorry, only one wall at a time). Once selected, the entire wall of your model should appear red.

3. Using the CEILING "-" button click 12 times to bring a line down into the panel. You won't see any movement of the dividing line until the 9th click. The dividing line is coming down from a position 20 clicks above the floor.

4. Using the FLOOR "+" button, click 4 times to bring a line up from the floor. You now have a wall divided into three segments, three shades of green. Take a quick look at the wall panels in the demo model "First Room" to see how your model should look.

5. Now turn on the FACE EDIT button and apply textures to the remaining wall panels.

Using Partial Textures

1. The lowest of the wall panel segment will only be two clicks tall. If you apply a full texture to these the texture will be compressed and not look as smooth as the others. Instead, select and apply only half the texture. (Right click on the texture in the demo model to find the right one.)

2. Now apply partial textures to one side of the raised platform you created for Lara. Go to the appropriate texture tile. Right click to drag a selection 16x64 pixels. (Remember, the editor defaults to increments of 16 - the equivalent of one building block click - so it is easy to make accurate selections.) You will need to do the same thing for the stepped ceiling, but you need to grab one half a texture tile (32x64) instead.

Adding Additional Texture Segments to the Columns

1. Turn off the FACE EDIT button and take a look at the columns. They are taller than the walls so if you divide them into three segments, the textures will appear stretched. This is an easy fix, too.

2. Go ahead and divide the column up as you did the wall panels, but click 6 down from the top and 4 up from the bottom using the CEILING/FLOOR "+" and "-" buttons . Next, use the keyboard "R" and "F" keys (think "**R**OO**F**") to bring another panel down from the ceiling (The "F" key brings it down, the "R" key moves it back up). You'll need to click the "F" key 10 times.

3. The bottoms of the columns need a "kick board" effect to make the column seem like it's sitting on a base. Use the "E" and "D" keys to bring a panel up from the floor (the "E" key brings it up, the "D" key moves it down again). Hit the "E" key 2 times. Again, if in doubt, take a look at the demo model to see what yours should look like.

Segmenting the Blue "Building Blocks"
It is worth mentioning here that you are able to segment the vertical sides of the floor and ceiling blocks for texturing as well, but with one break only. The "R" and "F" keys are used for the ceiling, the "E" and "D" for the floor.

Rotating Textures
You can rotate a texture by right clicking it once you have applied it to the model.

Mirroring Textures
Hold down the Control button as you apply your texture to get a mirrored or horizontally flipped image of your texture square. (If texture has already been applied, hold control and left click to flip it.)

Checking for Untextured Surfaces
Sometimes it is easy to miss texturing a polygon, especially with more complicated models. To help you find these missing textures, use the FIND UNTEXTURED button located below the EDITOR WINDOW.

So there you are. You have the "tools", now the texturing is up to you! Play around with the textures to create different patterns or moods. If you want your model to look exactly like the demo model, refer to it for guidance. Don't forget the neat trick for selecting textures from the model itself. (Right click once to select an applied texture, but be aware if that texture is already selected on the texture panel, one right click will rotate it 90 degrees.)

TAKING A LOOK

Maybe it's time to kick back and check out all your hard work in the PRE-VIEW MODE. (The next best thing to seeing it in the game.)

NOTE: It is always a good idea to save before entering PRE-VIEW MODE; however, the editor does save automatically when you enter this mode.

Lighting Your Room

So now you have a cool room textured the way you like, but it is too bright for the dark and moody tombs Lara explores. This is where proper use of lighting makes all the difference, but before jumping into lighting techniques, some physics!

Light Basics
Light is made up of three colors: red, green and blue (RGB). Equal values of each color create white light. Removing green and blue will create red, removing blue will create yellow, and so on. The lower the numeric value, the darker the color. It can take time to change the RGB values, but there is an easier, quicker way to get the color you want. We'll get to that soon.

Lighting will only affect textured surfaces and lighting effects *will not* be visible unless you click on the LIGHTING BUTTON found in the LIGHTING PANEL. To change an existing light setting, you must have the lighting button activated. The values appear in the boxes next to the various controls beneath the LIGHTING BUTTON. Properties differ with each type of light but values will only appear in the boxes next to the controls pertaining to the selected light.

All types of light in the Tomb Editor can be assigned color values. The color of the light will affect the objects and textures in the room.

NOTE: Light will appear much brighter in the game than in the editor which means you need to set your light a little darker than you wish it to appear in the game!

Types of Light

Lighting can create the mood you want for your level. Tombs can be dark and ominous, while other spaces can be well lighted (to show off your modeling skills!). Lighting effects available in the Tomb Editor fall into two categories. "Ambient light" and "Placed lights."

AMBIENT LIGHT - Every room begins with an AMBIENT RGB default setting of 128,128,128 (equal units of red, green and blue). Ambient light is the general light within the room – without it (RGB at 0,0,0) the room would be pitch black. The brightest setting possible is 255 of each color, but that is extremely bright!

When you load up a project, you will not see any settings. To make them visible, click on one of the RGB value buttons before clicking on the LIGHTING BUTTON. (If you click after turning on the lighting button, it will raise or lower the value and then you will have to reset it.)

It is best to leave the ambient light at the default setting until after you have textured your room or it will be difficult to see what you are doing!

Setting the Ambient Light - With 2DMAP button off go to the LIGHTING PANEL and click on the LIGHTING button (it will automatically turn on the FACE EDIT button). There are two ways to adjust the ambient setting:

1) Click the colored + or - buttons next to the ambient setting readout. Left clicking on the colored RGB buttons will adjust the color by one unit. Right clicking will adjust the color by 16 units. (Remember: equal RGB values create a "white" light, unequal amounts will create colors.)

2) Right click on any of the colored squares located at the bottom of the EDITOR WINDOW PANEL. The ambient light will now take on the color that you clicked. TIP: This is much quicker than manually adjusting the RGB values!

Additional lights placed in your room will be more effective if your ambient light setting is lower - for example, 30,30.30.

> **NOTE:** *When you switch from one room to the next, the ambient light settings* will not *automatically change with each room change. If your ambient light settings differ from room to room and you need to get a reading, click on one of the RGB values to bring up the settings for that particular room.*

PLACED LIGHTS – All other lights fall into this category. There are five "lights": LIGHT, SHADOW, SUN, SPOT and EFFECT. These "lights" can be placed anywhere in a room – their location is indicated by an icon - and they will only appear in your model if you place them there! To place a light, choose the type you want by clicking on one of the five buttons at the bottom of the LIGHTING PANEL, then click on a floor, ceiling or wall square.

Properties and Control Settings **-** To create the right mood, a light usually needs to be adjusted after it is placed. A light must be selected to make any adjustments (a selected light appears red).

LIGHT: *Icon = bluish light bulb.* This is a basic light and behaves a lot like a light bulb, sending light outward in all directions.

If a LIGHT is selected, the SHOW LIGHT MESHES button below the EDITOR WINDOW will enable you to view its "falloff" characteristics (think of "falloff" as how big a light is). The red circles represent the "falloff", or where the light ends. The white circles represent the "hotspot", or the bright part of the light. The greater the distance from the hotspot to the falloff, the softer the transition from light to dark. These distances can be adjusted using the OUT (falloff) and IN (hotspot) buttons located on the LIGHTING PANEL.

Just above the OUT and IN buttons is the INT (intensity) button - this adjusts the brightness of a selected light.

> **NOTE:** *The INTENSITY setting works with* all *placed lights.*

SHADOW: *Icon = purplish gray bulb*. Yes, you can use shadows! Think of a SHADOW as an "anti-light". It will affect very specific areas and works well for darkening corners. It can be adjusted using the same settings as the "light."

SUN: *Icon = Happy Face*. The SUN light casts shadows and works well in outdoor settings. It can be used indoors for special effects; however, only one SUN can be placed in a room at a time or you will get an error message when you go to output the WAD. The SUN can be aimed in a specific direction. With SHOW LIGHT MESHES button on you will see a single white line indicating its direction. To adjust the SUN's direction (along with its cast shadows), use the "X" and "Y" buttons on the LIGHT-ING PANEL

CAUTION: Careful when moving the SUN with Control+arrow keys. If you move it too far outside the room's boundaries, the program will crash.

SPOT: *Icon = upside down light bulb*. The SPOT directs light at a specific place (just like a spot light). With SHOW LIGHT MESHES button on, you will see red and white cones representing its illuminated area. These cones act just like the "hotspot" and "falloff" of a regular light and can be adjusted the same way. To adjust the focal point, the SPOT light has an additional feature: LEN and CUT. The cones must be touching the surface in the direction they are pointing or the light will NOT illuminate that surface. The direction of the SPOT light can be changed using the "X" and "Y" buttons.

EFFECT: *Icon = bulb marked with an "X"*. This light is used to illuminate mainly one square (some light will spread to adjacent squares to create a smoother transition). With SHOW LIGHT MESHES button on, you will NOT see any direction/limit cones/circles.

NOTE: The default intensity for the EFFECT light is 0.00; you will need to adjust this up or down to see any visual effects.

Color Adjustments - To change the color of a placed light, either use the RGB settings above the word "colour" on the right side of the LIGHT-ING PANEL or select a color from the palette at the bottom of the EDITOR WINDOW as you did for the ambient light setting.

Moving Placed Lights - Once placed, you can adjust the distance of the light from the surface of the square by using the CEILING or FLOOR + or - buttons. If you placed a light and want to move it to another square, just hold down the left CONTROL key and move it with the keyboard cursor keys. (Another way to move the selected light is by choosing the "move object" option from "Objects" in the Drop Down Menu, then clicking on the square where you wish your light to be placed.)

Right clicking on the light will move it around the square on which it was placed. Each right click moves it to the edge of the adjacent side of the square and finally back to the center.

Copying and Pasting Placed Lights - This feature can save a good deal of time when you need to place many lights with the same settings or when you want to duplicate an effect from a previous room. Located at the bottom of the LIGHTING PANEL are the COPY and PASTE buttons for the lights. Select the light you wish to copy, hit the COPY button, then the PASTE button. Now click on a square in any room to place the light. It will retain the settings you copied. This is especially helpful for maintaining consistent shadow directions when placing SUN lights!

Deleting Lights - If you place a light and want to get rid of it, just select it and press the DELETE key.

Now take some time to play with each of the different lights to get familiar with what they can do. The lighting is up to you from this point on, but don't forget that you can copy and paste lights from the demo model into your model if you are in a hurry to get through the tutorial!

Creating a Playable Version

You might be interested in creating a playable version of your "level" thus far to see what your work looks like "in-game". If you aren't ready yet, you can skip this section and continue building and check it out later when you have more going on. A detailed description of the process below can be found in the section *Creating Your Own Projects*, but this is enough to get you up an running.

Placing Lara in her World
In order to make a playable version, you need to place Lara in your model. But first you will need to remove her from the demo model…sorry, only one Lara per level!

1. Under "Objects" in the DROP DOWN MENU choose "Find Object". When the menu box appears, select "Lara".

2. If you are in 2DMAP mode, the room where she is placed will appear red. Click off the 2DMAP button so you can see Lara…she should be highlighted in red. Click on your keyboard "delete" key to remove her.

3. Now go to the room you modeled, "First Room X". Check the OBJECT PANEL to confirm that Lara is ready for placement…if she isn't visible in the OBJECT PANEL WINDOW, click on the text box above the window and choose her from the menu. With FACE EDIT off, click the PLACE OBJECT button, then go to the raised platform and click on a square. (If FACE EDIT is left on, when you place your object, it will rotate or place a different texture on the square you touch.) Lara (actually, the dummy model of Lara) will appear on the square you clicked. If you right click on her, she will rotate around in 45 degree increments.

Outputting a WAD
A WAD file automatically loaded with your project when you opened the tut1.PRJ file. This file contains the compressed information about the characters and objects you are using in your level. Another program is required to edit these WAD files, so you will not be able to make any changes to them. However, you have access to numerous different

WAD files so that later on, when you start your own project, you can select the one that best suits your needs.

When you output a WAD file, it combines all the compressed information about the characters and objects with the "environment" you have constructed, the triggers you have set, etc. This new "WAD" of information then gets compressed into the playable TR level file. To output the WAD:

1. Under "Project" in the DROP DOWN MENU choose "Output Wad" (ALT W).

2. A window will appear that should default to your WADS file folder. Choose tut1.TOM and hit "okay". DO NOT rename this file! To rename it involves changing the name of all the files within the WAD - this needs to be done before you output the WAD. Directions for renaming the WAD can be found in *Creating Your Own Project*.

3. You'll see a message "creating rooms – please wait" then a small box will appear that says "room wad output" and you can click the button that says "okay."

4. Save your project then exit the Room Editor to make the playable TR4 file.

Using the Level Converter (Tom2pc.exe)
Your Tomb4 root directory contains a Tom2pc.exe called the Level Converter. This program combines the WAD file with everything you have constructed in your level (the modeled rooms, lights, textures, sounds, cameras, triggers, etc.) and converts the information into a playable TR4 file (These files appear in your data folder with a tr4 file extension.)

1. Open the level converter and in the Edit Script box click the ADD button.

2. From your WADs directory (\Tomb Raider Level Editor\graphics\wads) select the tut1.TOM file, then click "Open".

3. Click on the BUILD ALL button. Text will be displayed in the output window and a blue progress bar will appear below the window.

4. You will know the process has been completed when the bar disappears and "Build all complete" appears as the last line of text.

5. Exit the Level Converter.

"Playing" your Level!

1. When you used the Level Converter, it automatically saved over the tut1.tr4 file in your data directory. (If you want to play the Demo Level again, simply retrieve the tut1.tr4 file from the disc and copy the file back into your data folder or make a "safe" folder and move the original tut1.tr4 into it before using the Level Converter.)

2. Now click on the tomb4.exe icon, select "new game", then "Playable Tutorial Level". Once loaded, you should be standing in the middle of the first room you created. (If not, check the time on your tut1.tr4 file to make sure it is the new file created by the Level Converter.)

Back to the model…..

Timesaving Techniques and Other Tips

It never hurts to have a few tricks up your sleeve for saving time. Some of you may have even figured out by now that you can copy and paste entire rooms, textures included!

Copying Rooms
Copying rooms is simple and can save you a lot of time. From the EDITOR WINDOW select your "First Room X".

1. Go to the PLAN VIEW window and drag a box around the light blue squares (DO NOT select the gray wall squares. This will add another row 20 clicks high to the perimeter of your room).

2. After you have selected your room, press the COPY ROOM button in the ROOM EDIT panel. Bingo, you just made another room. It should appear in the upper left-hand corner of the EDITOR WINDOW. Name this room "Dome Room X".

3. Using the demo model as reference, right click to drag it down and place it about the same distance from your original room. You'll come back to this room later.

Unfortunately, placed lights are not copied along with the room; but fortunately you can copy lights and paste them into your new room. If you have forgotten how, refer to **Copying and Pasting Lights** in the prior section.

Cropping (Bounding) Rooms
Another time saver and also very simple!

1. First, copy your original room again and this time name it "Cropped Room X."

2. Making sure it is still selected, go to the PLAN VIEW window and drag a selection box that is 6 x 10 squares through the center section of the room (don't select the gray wall squares).

3. Press the BOUND ROOM button in the ROOM EDIT panel. Your room has now been cropped to its new size.*

4. Move this new room down to the area between the first and second rooms you made. Take a moment to look at it in the EDITOR WINDOW. Turn off the textures and you'll notice stretched texture panels on the new walls.

5. Adjust the panels as you did previously so that the textures will not be stretched.

*You can also "bound" a room larger in size by selecting squares outside the room you are resizing, but because the "new" areas will have a

ceiling default of 20, it is often more trouble than it is worth! However, there are some instances where this feature can save you time.

Creating a Column to Break the Line of Sight

Just for fun, construct a big column in the center of "Cropped Room X." (Actually, there is good a reason for putting a column here. After about 20 squares, the horizon begins to break up because not all the polygons can be "drawn." The line of sight from the first room through the halls to the last room exceeds this 20 square distance, so breaking it up with the column is a way to resolve this distance limitation.)

Select the four center floor squares and press the green WALL button on the ROOM EDIT panel. You now have a column in the middle of your room. You will need to adjust the wall panels on the column but you're a pro by now, right?

Connecting Rooms (Creating "Doors")

We now have three rooms but what good is it if you can't get from one to the other? Think of a "door" as a connection or portal between two rooms rather than a literal door. "Doors" can be a variety of sizes and openings. For instance, you must use "doors" to create water, mist or cobweb passages and with any use of transparent textures such as window panes, cell bars and cyclone fences. These portal connections can either be on a horizontal or vertical plane. They are simple to make when you follow the rules; but improperly constructed "doors" will give error messages and must be corrected before you can create the playable version of your level.

> *NOTE: "Wafer Thin Walls" Before getting started you should become familiar with the concept of wafer thin walls. To save polygons, outer walls (the gray squares) actually don't have any thickness. Ceilings and floors don't either. This isn't a problem as long as there are no openings because all you see is the inside of these surfaces. However, if you don't connect your rooms properly, you will have created a wafer thin wall that will seriously shatter the nice illusion of reality you have created!*

Horizontal Connections (openings between two walls) Two methods can be used to create horizontal portals:

Method 1 – Demonstrates creating portals using a small connecting room the width of the door opening.

1. Begin by building a new room 2x3 squares and name it "hall 1 X". This new room will default to 20 clicks in height so reduce it to 8. Select the ceiling squares, then use the CEILING "-" button to lower the ceiling. Check the "Ceiling" readout in the ROOM INFO BOX just beneath the EDITOR WINDOW buttons to see when you have reached 8.

2. Texture and light your connecting "Hall 1 X" however you like.

3. Move this hallway to the east (right) side of your "first room" so that the two rooms are touching but not overlapping. Position it half way down the side of the room. (Always refer to the demo model if your are confused about the location**.) Make sure your floor elevations are at the same height**. "First Room" and the "Hall 1 X" floors should read "0".

4. Click on the small hallway to select it. In the PLAN VIEW grid, select the two center gray wall squares on the west (left) side of the hallway (if you select all 4 gray wall squares and try to make a doorway, you will get an error message).

5. Now click the DOOR button in the ROOM EDIT panel . The room in the PLAN VIEW grid will switch to "First Room X" – the room you just became connected with. Notice the two black door squares on the east (right) side of the room. If you don't see the black squares, you did not successfully create a door.

6. Now, turn off the 2D MAP button, turn on the FACE EDIT and DRAW DOORS buttons. You should see your first room with the hallway connection.

3. In the PLAN VIEW select the two center gray squares on the south (bottom) side of "Side Room X." Click the DOOR button to create the portal. You should now be in "Cropped Room X".

4. Click off the 2D MAP button to view your room in 3D. (If you can't see it, you may have to click on the DRAW DOORS button to refresh the view.) Look at the walls between the two rooms. This is a perfect example of wafer thin walls! Not good!

5. In PLAN VIEW left click on your new door opening, then right click to get back to the adjoining room. (You can also use the ALT Z target cursor to move back "Side Room X".)

6. Select a blue square on either side of the two squares in front of the "portal" (door), *inside* the small room. (You can do this from either the PLAN VIEW or the EDITOR WINDOW.) Check the demo model for location if unsure.

7. Click the WALL button on the PLAN VIEW panel. Repeat this process for the other side of the "portal." Check your model to see the newly formed walls – problem solved!

8. Now you need to take care of all the little details:

    a) Adjust the wall texture panels (divide in two)

    b) Texture the walls, floor and ceiling

    c) Adjust the Ambient light setting

Vertical Connections (portals between ceilings or floors) work pretty much the same way except instead of creating a wall around the portal, you raise the floor at least one click or create a ledge by raising one row of squares around it. This will be perfectly clear when you create the water room later on in the tutorial.

> **TIP:** *Go back to the PLAN VIEW grid. Left click once on the black squares. You will see a green outline around the black squares. (You will also notice a line of text in a yellow box. This tells you what the highlighted area is.) Now right click and watch as the editor switches you to the adjoined room. This is a convenient method for navigating between rooms.*

7. Next, position your "Cropped Room X" (the one with the central column) on the east (right) side of "Hall 1 X" that you just connected to your "First Room X". Again, line up the rooms so they are touching, but not overlapping. In the PLAN VIEW grid, select the two center gray wall squares on the east (right) side of the hallway, then click on the DOOR button. You should now be connected with the "Cropped Room X", and it should be displayed on the PLAN VIEW grid.

8. Copy your small hallway, name it "Hall 2 X" and repeat the above process to connect "Cropped Room X" to "Dome Room X".

Method 2 Demonstrates how to avoid the wafer thin wall problem by raising walls next to the connecting portal.

1. Select an empty room by clicking on the SELECT ROOM button and using the BOUNDING button crop it to 3 x 6 squares, 12 clicks in height and name it "Side Room X". Raise the floor up 4 clicks. (Be careful to use the FLOOR "+" button, not the ROOM "+" button!)

2. Move it to the north (top) side of "Cropped Room X", so the rooms are touching but not overlapping.

Tips For Making Vertical Connections

The basic rule for connecting one room on top of another is:

"The highest point of the lower room can not be higher than the lowest point of the upper room."

Below is a **side view** example of this basic rule. You want to connect the lower room "A" with the upper room "B" to make room "C".
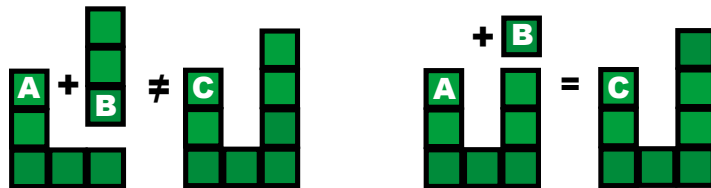
If you try connecting rooms using the above method, you'll get the error message: *"Cannot connect rooms"*. Instead, raise the blocks on the right side of room "A" so they become as high as the highest part of room "A". Then room "B" will connect to room "A". Or you can temporarily lower the highest point of room "A", make the connection, then raise the part you lowered.

Be careful of Random Floor Down/Random Ceiling Up

When using the Random Floor Down and the Random Ceiling Up features, take care to note your rooom's new Floor and Ceiling elevations. If you could see a profile of your model, it would help! Even one single corner of one square lowered beneath the original floor or one ceiling square slightly raised will change the elevation read out. This can cause problems when connecting rooms. If you get the "cannot connect rooms" message, be suspicious – check your elevations!

The elevation of a room is based on the highest and lowest points of the room.
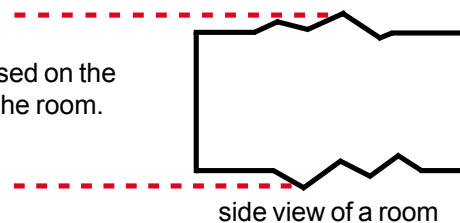
side view of a room

TAKING A LOOK

Time to check out your new additions (if you haven't already) in PREVIEW MODE. Don't forget to save often, and with a different project name!

SUMMARY OF SKILLS

So far you've learned how to build, texture and light a room and create a playable TR4 file so you can check your work "in-game". You also learned how to copy the room you built, modify it to create an additional room and how to connect rooms horizontally by creating doors or "portals". In this next section you will have the opportunity to learn and practice more advanced techniques in a special "practice" room, to better prepare you for SECTION III of the Tutorial.

Section II

SHAPING
THE BLOCKS

Building Your Skills

It is to your advantage to take some time now to learn more details about the "building blocks" and how they can be manipulated and textured. So far you've learned a few basics, but in this section you will learn additional skills for creating a finely tuned model. You will learn and practice these skills in a room called "Block Party". Near the end of this section you will return to your model to put these new skills to the test. Find "Block Party" by using the SELECT ROOM button or click on the room in the upper right corner of the EDITOR WINDOW (the one that isn't connected to anything!). Confirm that you have located the right room by checking the name in the text window above the SELECT ROOM button.

The White Arrows – what is their purpose?
You may have noticed if you click a square or wall section twice that white arrows appear. (One arrow per surface on floor or ceiling squares, one per texture panel on the wall sections. Arrows never appear on the sides of raised/lowered floor or ceiling blocks.)

These white arrows give you more control over modeling and texturing. You can add slope to floor and ceiling squares and you can make subtle but important adjustments to wall panels so that texture maps line up properly and/or are not distorted. You will learn more about these arrows throughout this section. To simplify matters, most of the instructions refer to the floor squares, but you are encouraged to try everything with the ceiling squares, too.

Manipulating Surfaces with Arrows
There are a few ways to create sloped surfaces. Here are the ways to create sloped surfaces using the white arrows.

A Single Square Slope

1. On the floor of "block party" (with FACE EDIT off) select a single square by left clicking once. Now left click on it again to see the arrow. (Notice that the arrow also appears on the highlighted ceiling square directly above) If you continue to click, the arrow will move clockwise 90 degrees. The arrow always points to the edge that will be raised or lowered. The arrow disappears after 4 clicks or you can right click at any time to get rid of it.

2. With the arrow visible, left click the FLOOR + key once to raise by one click the side the arrow is pointing to (a right click raises it 4 clicks) then take a look at the slope you created. Now experiment a little using the + and – keys of both the FLOOR and CEILING buttons. Click more than once to create a steeper slope.

3. Click again on the *sloped* surface of your floor square to rotate the arrow by 90 degrees. Hit the + button a few times, rotate again, and so on. Don't forget to right click the arrow "off" when/if you want to raise the entire block without changing the slope.

Multiple Square Slopes

1. Right click and drag to select a single row of floor squares (5 or 6).

2. Once selected, click on any of the selected squares. Arrows will appear on every square. If you right click, the arrows will disappear but you will also deselect all but the square you clicked. If you want to get rid of the arrows but retain your selection, it is better to click 4 times.

3. With the arrows visible and pointing perpendicular to the length of the row you selected (see illustration), click the FLOOR + button

once to create a uniformly sloped row. Select another row on the up side of the slope. Raise the row by one click then left click to bring up the arrows. Rotate the arrows so they point the same direction the arrows in the previous row pointed. Now raise a one-click slope. You get the idea…

4. Now select an area 6x6 or so. Left click again to bring up the arrows. Click on the FLOOR + button. Deselect and grab the row next to the up side of the sloped row. Without the arrows on, raise it by one click. Raise the next row by two clicks and so on. As you can see, there are any number of ways you can get the same results. By playing around with these features, you will find what works best for you.

Raising Corners – breaking the surface plane (creating "triangles")

1. Select another floor square and left click again to bring up the arrow. Now hold down the control key as you left click…notice that the arrow points to each *corner* on the surface of the square instead of each side. Each click moves the arrow 90 degrees. (To revert back to a side, release the control key and click once.)

2. With the arrow pointing at a corner of a single floor square, click once on the FLOOR + button to raise up the corner. You now have a diagonal line running through your square that has created two triangles. One triangle is sloped, the other is flush with the surface of the floor.

3. Select another square and raise it up several clicks. Now hold down the control key and point the arrow at one corner. Raise the corner one click. Rotate the arrow to the opposite corner and lower that corner by one click. Now you have a smooth slope, without the triangular segments.

Raising Planes – pulling up slopes by elevating surfaces
This is a fast way to get some results! Whenever you raise/lower a corner of a square or an entire square *with the control key held down*, the edges of the squares next to the selected square will remain attached and raise/lower along with the square you are manipulating. The edges of the adjacent squares that are not attached to the square you are manipulating will remain on their original plane.

1. Select a single square; click again holding down the control key in order to point the arrow at a corner. Continuing to hold down the control key, right click on the FLOOR + button. You just made a little pyramid 4 clicks high.

2. Now select nine squares and raise them up two clicks.

3. Deselect, then click once on the center square to highlight it.

4. Holding down the control key, click the FLOOR + button twice.

5. Now select one of the corner squares and left click again to bring up the arrow. Hold down the control key to left click until the arrow points to the outward corner.

6. Click the FLOOR – button twice. Now you have smoothed out the plane and changed the shape of the sides of the block.

7. Try making a lowered or depressed surface by following the directions above but doing the opposite each time (lower instead of raise, etc.)

8. Play, play, play! Using the control key to modify surfaces is a fun feature and a quick way to create undulating surfaces!

NOTE: In the PLAN VIEW grid the selected square will have a single red line on the side of the square where the arrow is pointed. When the arrow is pointing to a corner you will NOT see any red line.

Manipulating Surfaces without using Arrows
(Creating Random Surfaces such as caves, drifted sand, etc.)
Under FEATURES in the Drop Down Menu are numerous options to facilitate creating random surfaces – they are especially useful when dealing with large areas! Below are the basics but please experiment with these features; this manual would be too long if every possibility were outlined!

One note of caution –when selecting these features from the Drop Down Menu it is easy (by slip of the mouse) to accidentally select a square on the PLAN VIEW grid outside the area of the room you are working in. If you have accidentally selected a square and use "Average Floor" or "Average Ceiling" it will cause the program to crash.

TIP: The UNDO and REDO buttons under EDIT in the Drop Down Menu work with all the FEATURE functions!

Random Floor Up/Down and **Random Ceiling Up/Down**
Select the entire floor of the "Block Party" room. (Control Z or "Select All" under EDIT in the Drop Down Menu). Find FEATURES in the Drop Down Menu bar and choose "Random Floor Up" (F1). Now look at the floor…the squares are a random mix of flat and sloped surfaces. With the floor selected if you alternately press F1 and F2 (Random Floor Down) several times, you can better see how this feature works.

Of course you've never seen a floor like this in any Tomb Raider level because Lara would get stuck where the angles are too acute, and besides, there are holes in the world. (All those white spaces are

missing polygons. If you turn on FACE EDIT you won't see textures covering these "holes".) Here's the fix….

Smooth Floor and **Smooth Ceiling** Select the entire floor again (if it isn't still selected). Under FEATURES in the Drop Down Menu choose "Smooth Floor" (F9). An instant fix…well nearly! Notice that some of the ragged edges and steep slopes remain…Here's a good test of your skills. (You will have to use the arrows for the fix.) Choose one of these ragged areas and using what you know about manipulating corners, see if you can make a smooth transition from one polygon to the next.

Create a random ceiling above your random floor; experiment with bringing the areas next to the walls down lower than the central areas. On the floors, bring the areas next to the wall up a little higher. Beginning to look a bit like a cave?

> *NOTE: FIND ILLEGAL SLOPE button. "Smooth Floor/Ceiling" can't always fix all the slopes or angles that will cause problems for Lara. When two steep slopes create an acutely angled "valley", Lara will get stuck and begin to dance an "Irish Jig"! To find out if you have created any such angles, click on the FIND ILLEGAL SLOPE button located below the EDITOR WINDOW. Each successive click of the button will locate a new slope until no more can be found. Of course, you should fix them as they are pointed out.*

Average Floor and **Average Ceiling** You are already familiar with this feature since you used it to smooth out the ziggurat ceiling in the copy of the first room you constructed. When you use this feature, always check the elevation of your floor /ceiling afterwards…you may have to raise or lower it. Remember, these buttons *average* the height and depth of the polygons and you may end up with a different elevation than what you started with.

Go ahead and average your floor and ceiling so you can start with a smooth surface again. Remember, only highlighted areas will be affected by these commands.

Flatten Floor and **Flatten Ceiling** Select the entire floor and modify it using the F1 and F2 keys (Random Floor up and down). Choose the "Flatten Floor" function from FEATURES on the Drop Down Menu. Now look at the floor…Flat tops on all your polygons! You'll see another use for this function in a minute…

> *TIP: Cut and Paste If you have created an area you are really happy with and would like to use it elsewhere or if you have a situation requiring repeated features such as a row of columns, follow these simple steps:*
>
> *1. Select the area you want to copy, then under EDIT in the Drop Down Menu, choose **Cut** or **Control C** (don't worry, it won't "cut" anything out of your model).*
>
> *2. Now select the area where you want to place the copied section, and choose **Paste** or **Control V.***

Try this feature by selecting the area with the column (try nine squares with the column in the center) and press **Control C.** Now go to a corner of the room and select 9 squares and press **Control U.** Nice time saver, huh? You can paste sections of your model into other rooms, too, if you wish. This function will copy the textures on the portion of the model you have selected, but not lights.

Understanding Arrows on Wall Texture Panels

You have more than likely seen the arrows on the wall panels by now. If not, left click twice and you will. You can get rid of them by right clicking or continuing to click as with the floor and ceiling squares. In addition to the arrows, you will see X's on some of the panels. These X's serve two purposes; 1) they behave like locks in that you cannot manipulate a panel containing an X. Two, they help orient you within the room.

1. North wall: all panels display X's on the third click. (Click one highlights the panel in red, click 2 brings up the arrows, click three the X's.)

2. East wall: the top one or two panels display X's on the second click (and X's on the bottom one or two panels on the 4ᵗʰ click)

3. South wall: all panels display X's on the 5ᵗʰ click

4. West wall: the bottom one or two panels display X's on the 2ⁿᵈ click. (and X's on the top one or two panels on the 4ᵗʰ click)

You only need to use the control key with the East and West walls to point the arrow to a corner. When the arrow is pointing to a corner, you can move that corner up or down using the FLOOR/CEILING + or – keys.

There are times when due to some tricky modeling it is necessary to go in and manipulate these panels in order to line up textures or to control distorted textures. If somehow your wall texture panels become distorted, you need to know how to fix them! Experiment with the following:

1. In Plan View, select the entire floor AND all the gray squares.

2. Now hit F1 a few times, then F2 and finally F9 to smooth things out a bit. Do the same with the ceiling. (F3, F4 the F10)

3. Look at your wall texture panels now! Pick out a texture with a distinct horizontal pattern and using the TEXTURE WALLS button,

apply to all the walls. Turn on FACE EDIT to see how bad textures can look if these panels get distorted.

4. Turn off FACE EDIT and select a distorted wall panel. Try to adjust the lines by rotating the arrows and using the FLOOR/CEILING + or – keys. (Point the arrow at a downward corner of one of the distorted panels, then hit the FLOOR + button to lift it up. Sometimes it is trial and error.

5. Don't panic! There is an easier way to at least get the panels horizontal again. Select those you wish to straighten out and click on F5 and F6 (Flatten Floor and Ceiling buttons) and they will snap into horizontal positions again. You will then have to adjust them vertically, but that's a piece of cake.

Texturing Triangles ("Broken" Surfaces)

As you know, a square surface is broken into two triangles when one of the four corners on the square is no longer on the same plane as the other corners. Notice when you click on a texture in the texture panel, the square is divided diagonally by a green triangle within the red outline of the selected square. That green triangle represents the area on the texture that can now be placed on the triangle shape of your "broken" surface. You can left click in each corner of the texture panel square to change the orientation of the triangle, until it corresponds with the diagonal division of the floor or ceiling square you are texturing. If you like puzzles, you'll have fun texturing these triangular segments!

This quick exercise should help clarify the concept:

1. Select a flat floor square and click again to bring up the arrow. (The arrow should be pointing left if your model hasn't been rotated. If the arrow isn't pointing left, rotate your model now.)

2. Holding down the control key, click once to rotate the arrow to point in a Northwesterly direction (up and to the left). Raise the corner one click to break the surface.

3. Find the King Tut head on the TEXTURE PANEL (or any other texture with a distinctive pattern). Left click in the upper left corner of the texture.

4. Turn on the FACE EDIT button and go back to your square and click on the upper left triangle. You should see the top left portion of King Tut's head.

5. Go back to the TEXTURE PANEL and left click on the bottom right corner the texture square.

6. Go back to your square and click on the bottom right triangle. They should match up perfectly.

7. Take a few minutes to rotate each texture triangle on your model so you can see how the textures distort when they aren't placed in the correct direction, and how they kind of visually "snap" into place when they are.

8. Repeat the process above using a texture without such obvious markings.

Time to put your new skills to use….

Creating Sloped Surfaces

Select "Dome Room" using the SELECT ROOM button to take a look at the domed ceiling you are going to make. Turn off the FACE EDIT button (if it is on) for a better view. Go to "Dome Room X" (the copy you made of "First Room X"). Notice how the ceiling is stepped like a terraced pyramid. You can easily transform this inverted ziggurat into a smooth dome by following these steps:

1. From the PLAN VIEW grid, select all of the blue squares of your room.

2. Under FEATURES in the Drop Down Menu, select "Average Ceiling" (or you can press F8). Your ceiling should now be flat and at an elevation of 13. (Check the ROOM INFO BOX for this information)

3. Select the entire ceiling and lower it to a height of 12 clicks.

4. In PLAN VIEW, select the center 2x2 blue squares.

5. **HOLD DOWN THE "CONTROL" KEY** on your keyboard and press the CEILING + button 1 time.

6. Select the inner 4x4 blue squares. *Hold down the Control key* and raise the ceiling by 2 clicks.

7. Select the inner 6x6 blue squares. *Hold down the Control key* and raise the ceiling by 3 clicks. Your room should be 18 clicks tall now and have a smooth domed ceiling.

8. Take out the "Wall" columns by clicking on the green wall squares in the Plan View grid then clicking on the light blue "Floor" button of the Plan View buttons. Lower what remains of the wall columns to the floor elevation.

9. With FACE EDIT on view your dome with textures. Don't be alarmed by the missing textures. If a surface of a square is "broken" up after a square has already been textured, the texture remains on only one triangle of the surface.

10. Check the demo model for lighting effects and place lights in your newly formed dome room. Remember, you can copy and paste the lights if you are in a big hurry!

Finessing the Dome

Time to fix those ceiling triangles and put your newly learned skills to use. First, rotate the room so that you are looking up at the ceiling.

The dome ceiling has a fairly convincing roundness, but the "corners" could use some refinement. A few of the ceiling's corner triangular surfaces are flat (parallel to the floor) and need adjusting in order to smooth out the corners. To make sure you know which triangular ceiling surfaces need adjusting, look at *Illustration #1A*. The left side of the illustration shows the model *before* modification. The right side of the illustration shows what your domed ceiling should look *after* you have modified the triangles. Hold down the control key to get your arrow pointing at the downward corner, then hold down the Control key and use the CEILING – button to lower each of the purple triangles down by one click. (Don't forget to turn off FACE EDIT)
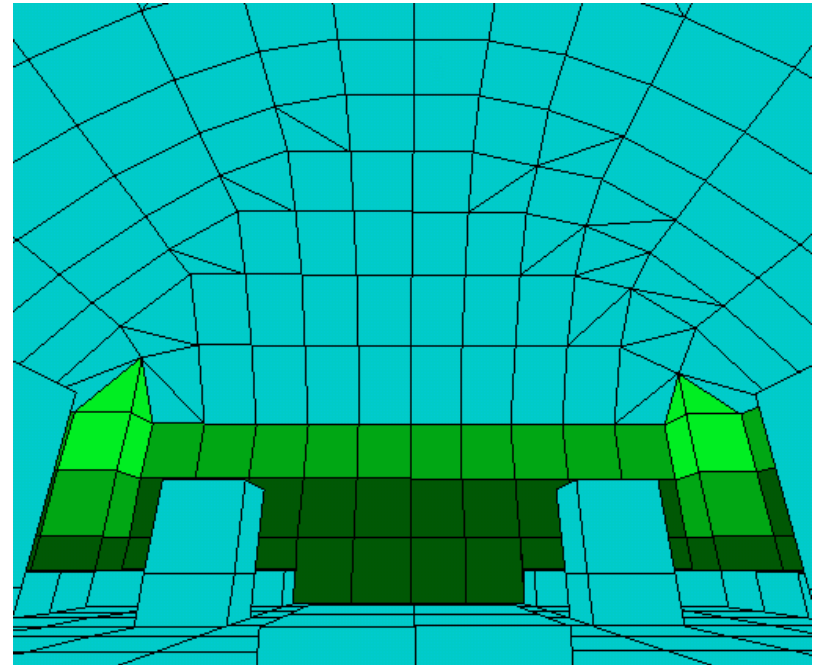
Finessing the Textures

Once you have smoothed out the corners of the ceiling, turn on your textures again. Some of the triangular surfaces are missing textures. Use what you learned in the *Skill Building* section to place textures on these triangles. Remember that sometimes it is necessary to rotate the texture several times to get the right orientation, and if the texture just isn't matching up, double check to make sure you selected the triangle you meant to select from the TEXTURE PANEL…it is easy to grab the wrong one! It can get tricky sometimes, but as with anything, the more you do it, the easier it gets!

#1A
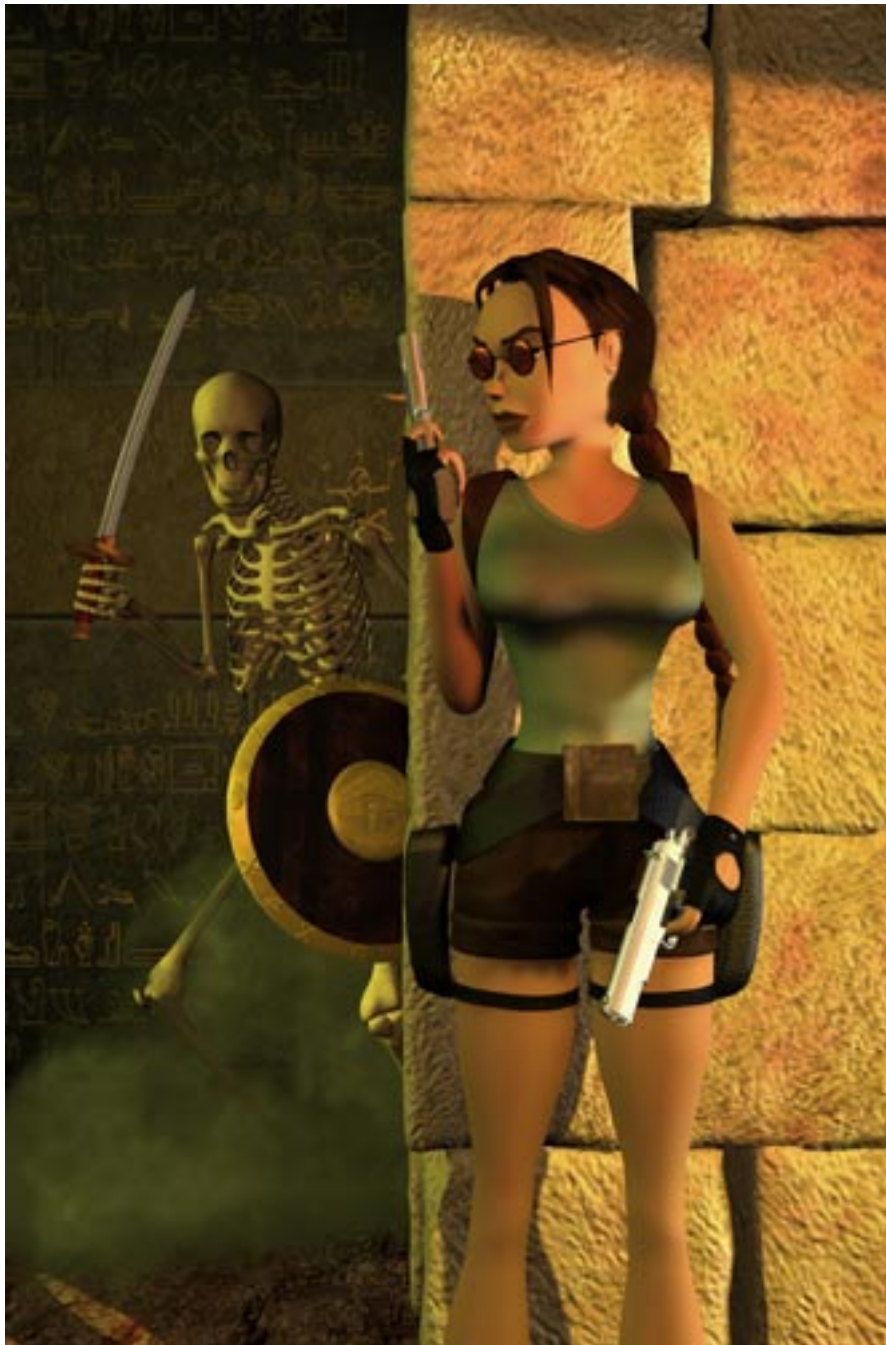
MAKING YOUR LEVEL UNIQUE

Adding Objects to Your Model

Most objects are static and merely for decoration but add a lot to the environment since they are of more highly refined and detailed shapes than the building blocks of the editor. Some objects require triggers to activate, but you need to place a few objects in your model before you can take that step.

You learned earlier a little bit about a WAD file – how it contains the compressed information of the objects you place in your level. If you look in the WADS folder on your C drive, you will see that a WAD is comprised of several different files. Find "tut1.was" and open it in notepad. Print it out if you have access to a printer. Taking a close look at the WAS file will help you understand more about selecting the objects you want to place in your level.

The WAS file is the *list* of everything in the WAD, and shows the different "slots" for the objects and animations in the WAD. It would be easier if items were listed by their names in the OBJECT PANEL menu, but they are not. Sometimes it is easier to refer to the WAS file to find the specific slot name. For example, the pillars you are about to place are in a slot called "Debris 3". If you were looking for something called "pillars" you wouldn't have much luck. Of course you have the option of scrolling through the objects one by one to view them in the OBJECT PANEL window, but sometimes it is hard to see them and it can be time consuming.

Also, there are some items in the Object Menu that even though you can place them in your model, would look ridiculous….for example, the icons for

save and load and Lara's hair, to name a few. For a more information about the WAS file, and WADs in general take a look at "WAD WAS WHAT?" in the *Reference Section*.

Placing Objects

1. You became somewhat familiar with the OBJECT PANEL when you placed Lara in your model in order to make the playable TR4 file. Using the arrows on either side of the OBJECT PANEL text box scroll through the items until you come to "Debris 3." You will see an image of the pillar in the Object View Window. (Sometimes it is faster to select objects by clicking in the Object Text Window to bring up the menu of available objects)

2. Now go to the EDITOR WINDOW PANEL and turn off the 2D MAP and FACE EDIT buttons. If FACE EDIT is left on it will either rotate or place a different texture on the square you touch when you click to place your object.

3. Click the PLACE OBJECT button located on the OBJECT PANEL. Then, in the EDITOR WINDOW, click on the square in your "Dome Room X" where you want to place the object and it will appear. (Check the demo model for location.)

4. Select the square on the ceiling above the pillar and lower it down until it touches the top of the pillar. You will have to adjust the slope back to a flat surface. To do this, select the correct square and lower it a few clicks. Use the flatten ceiling command (F6) to make it a flat plane again. Be sure you have the right square highlighted before you use this command, but don't forget that you can use the Undo (control U) command if you make a mistake!

5. Place the other three pillars and then fix the ceiling squares above them. Use the **CUT** and **PASTE** command you learned in the **Building Your Skills** section to save a little time.

6. Now raise the four central squares 4 clicks to create the platform.

Moving and Deleting Objects
Objects can be moved around the model exactly the same way as lights. (Refer to the section **Moving Lights** if you need guidance) If you want to delete an object, making sure it is selected, use your delete key.

Rotating Objects
In addition to moving an object up and down or from square to square, you can rotate it by 45 degree increments as you did with Lara. Objects that are by default placed on the edge of a square (like the torch object), when rotated will go from one edge of the square to the next edge.

Lighting Objects
An Object has its own light settings and is only partially affected by local light sources. Sometimes it is necessary to adjust these settings in order to create the illusion that an object is being affected by the local light. On the OBJECT PANEL find the RGB settings with the words "Object Tint" above. Click the RGB values to adjust – they jump by 8 with each click. If you have used a strongly colored light or your room is quite dark, you might want to match the object's settings with those of the light. (If the room is dark and you don't adjust the object's lighting, your object will look like it is glowing in the dark.)

> *NOTE: There is a limit to the number of objects you can place in a level! The total is around **245**, which is 10 less than the total number in the information box below the Editor Window. The reason for this is you must leave at least 10 animating slots free for in-game animations.*

Placing the Remaining Objects

Dome Room - You just finished placing the columns and raising a platform in the center of the dome room, so you may as well place the remaining objects while you are here. Go ahead and check the demo model for the location of the other objects. (We'll get to the camera a little later.)

1. To place the statues in "Dome Room X", scroll to the "ARCHITEC-TURE6" slot to choose the "Guard" object; for the ram statues scroll

to "PLANT8" and "PLANT9". (There are front and back pieces to these statues. Place both pieces on the same square. You'll also have to rotate each of the pieces until they match up.)

2.   Find BADDY_1 in the object menu and place him in the corner.

3.   Grab the SMALLMEDI_ITEM to place on top of the platform.

First Room

1.   Choose the wall torch from ANIMATING2 slot in the objects menu.

2.   Place one on each of the floor squares next to the columns as per demo model "First Room". You may need to rotate the torch so it is rests against the column. Do this by right clicking on the object until it reaches the desired position.

3.   Locate "Flame_Emitter2" from the object menu. This is a "Nullmesh" object - one that you can't see in the game but performs a function (in this case, makes a flame). Place the "Flame_Emitter2" object so that it is over the end of the torch. Refer to the original model for the correct rotation. (Make sure you choose the right Flame Emitter object!)

4.   Place the two statues guarding the doorway at the end of the room. They are located in the "ANIMATING7" slot.

5.   To place the three pick-up items in your model, click on a pick-up in the demo model "First Room" to bring up its name. (It will appear in a yellow box in front of the object.) Go to the OBJECT PANEL to select that object to place in your model.

Cropped Room
Place the vases ("SHATTER0" slot from the objects menu) as per demo "Cropped Room". Later in the level you will set up a vase with an object hidden beneath it.

Side Room
The small "Side Room" contains a few pick-ups. Check the demo for name and location.

Hall 1 and **Hall 2**
Now place each of the double doors (objects "Door_Type1" and "Door_Type2") leading from the "First Room" into "Hall1" and from "Cropped Room" into "Hall 2". Because of the direction in which the doors open, they need to be placed in the halls, not the rooms leading into the halls.

Now you are ready to set some triggers…without triggers, you wouldn't be able to get through the doors you just added to your model. This is where the fun begins!

Triggers

Triggers cause events to happen and ultimately have everything to do with how much fun your level is to play! Triggers activate when Lara moves onto a square that has been designated as a trigger. Any trigger placed under Lara at her starting position will activate as the level begins (as illustrated by the torches in the first room). Triggers appear as pink squares and make the square(s) as well as the vertical space above, an active zone. This way, Lara cannot jump to avoid a trigger (unless it is designated as a "Pad trigger"). For a complete list of Triggers and their special features, refer to the Advanced Skills Section.

In the "First Room" of the demo model, locate the pink trigger on the raised platform. This was Lara's starting position before you moved her into your "First Room". The triggers were set beneath her in order to light the torches automatically at the beginning of the level. In the PLAN VIEW window left click twice on the pink trigger square that was Lara's starting position. The yellow box tells you it is the trigger for "Flame Emitter2". Each successive click will display the trigger for the other Flame Emitters (as well as a CD trigger for an audio track). You can place more than one trigger on a square, although there are some special rules that apply when stacking triggers…but you don't need to know about those yet!

Lighting the Torches

1. In your "First Room X" select one of the "Flame Emitter2" nullmesh objects you placed over the torches.

2. Next, select the square Lara is standing on then go to the Room Edit Buttons and click on the pink trigger button. Notice the pink square both in your model and in the PLAN VIEW grid. Now look in the text window next to the pink trigger button…it should read "Trigger for Flame Emitter".

3. Set a trigger for each remaining "Flame Emitter2" nullmesh object by clicking the object, clicking the square on the raised platform, then clicking the pink trigger button.

4. Now check your triggers from the PLAN VIEW window….each click should bring up four separate trigger listings (the number following the "Flame Emitter" will be different with each click)

Opening the Doors

1. Look in the demo model "First Room" and click on the zone of pink triggers in front of the doors. *You can select a group of squares to act as a trigger*. In this case, a "zone" has been created to insure that no matter from what angle Lara approaches the door, she will trigger it to open. If you click twice, you will notice another zone of triggers. Each side of the door requires it's own trigger since each door is a separate object.

2. Setting these triggers is a little trickier because the doors are located in a different room than the triggers, and in order to select an object you must be in the room where it has been placed.

3. Go to your "Hall 1 X" and select one of the doors.

4. Next, with 2Dmap button on, click on your "First Room X" (or use the ALT + Z to get there). The editor will remember the object you selected and is ready for you to select the squares and set the trigger. Now, right click and drag to select the zone of squares in front of the door, then click the pink trigger button to set the trigger.

5. Go back to your "Hall1 X" and select the other door. Repeat the above process, selecting the same zone of squares.

6. Check your work by clicking on the trigger zones in the PLAN VIEW window. You should have two separate triggers – one for Door_type1 and the other for Door_type2.

7. Finally, go to "Hall 2 X" and place the doors and set the triggers.

Giving Life to your Baddies
The cast of bad guys (well, sometimes they're friendly) in Tomb Raider games is diverse. Part of what makes each enemy unique is his AI (artificial intelligence). In most cases, individual baddies have unique AI as well as the capability of having a particular kind of AI assigned to them (guide, guard, patrol, etc.). For more details on AI check the *Advanced Skills* section.

There are many things to consider when placing enemies in your level:

First of all, you need to know what a particular enemy can do…(can he climb walls, jump/climb up on platforms, etc) You wouldn't want to give Lara too many advantages or there would be no challenge involved…

In some cases you will also need to decide what kind of behavior you want to assign to an enemy. Should he be a friendly guide who will only turn hostile if you shoot at him? Do you want him to guard or patrol a specified area?

Never place a baddy in such a way that you will see him appear from thin air (unless this somehow works with your story line!)

Animations eat memory, so you are limited in how many enemies you can trigger at one time. Finding these limits is sometimes a matter of experimentation. You will know you have pushed the limits if your game starts chugging or enemies don't trigger properly. A good rule of thumb is to consider how the experts have done it! Examine their levels before you try to push the limits!

Check the triggers for BADDY_1 in the demo "Dome Room". A trigger zone has been created on top of the platform where Lara will pick up the small medi pack. The AI of BADDY_1 tells him to look for a medi pack or ammo *before* attacking Lara. By triggering him on the platform, you know he will run towards Lara in search of the medi pack she is standing next to. Instead of firing at her as soon as he is triggered, BADDY_1 will run towards Lara as she bends to pick up the medi pak, thus building some suspense! Later you will set up a camera to catch this action from a bird's eye view.

To save on computing power, the bad guys don't show up until they are triggered (and they disappear shortly after their demise!). Setting simple triggers for baddies is just like setting a trigger for any other object:

1. Go to your "Dome Room" and click on the BADDY_1 you placed in the room earlier.

2. Now select the zone of squares on top of the raised platform then click on the pink trigger button. That's it!

TAKING A LOOK

It is probably a good idea at this point to check your work "in-game," just to make sure you've set your triggers properly and that everything is still working the way it should. Save your project, output the WAD, use the Level Converter to create the TR4 file. (If your triggers don't work, before you try to figure out what went wrong, confirm that your TR4 file actually got updated by viewing in detail mode the files in your data folder.) Sometimes when checking your work it is convenient to use the FLYCHEAT mode. Press 'DOZY'

then use the control and arrow keys to move through your level. Later, when you learn how to modify the script, you can disable this mode if you want to.

Now, back to the business of modeling….

Creating the Sloped Hallway

Locate the room called "Hall Up". You're going to create a sloped hallway by raising and adding slope to portions of the floor and ceiling (you did something similar in the SKILL BUILDING section). This hallway will eventually connect up with a higher room…it's time to get Lara off the ground floor!

1. Make a narrow room 2 x 12 squares, 8 clicks (2 "blocks") in height.

2. Select all the blue floor squares with the exception of one vertical row from each end of the hall.

3. Click once on the selected squares to bring up the white arrows and click twice more to point the arrows to the east (right) end of the hall. Click the "Floor +" button twice.

4. Using the arrow keys on your keyboard, position your model so that you can see the ceiling. Because the arrows on the ceiling point the opposite direction from the floor, you will need to click three times on the ceiling to point the arrows to the right. (This assumes you haven't deselected anything.) Now click the "Ceiling +" button twice. You should have a room that looks like illustration #1B.
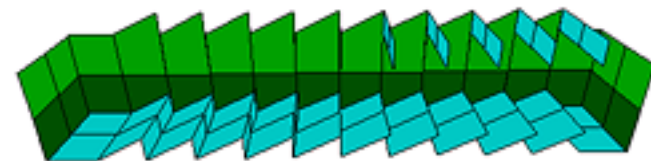
#1B

5. Select all of the floor squares except the two vertical rows on the left end of the hall. With NO arrows visible, hit the Floor + and the Ceiling + buttons twice.

6. You can now see how the hallway will shape up. Continue the process, each time selecting one less row from the left side of the hall. Halfway through your room should look like Illustration #1C. Once you have finished your sloped hallway, the ceiling elevation should be at 28.
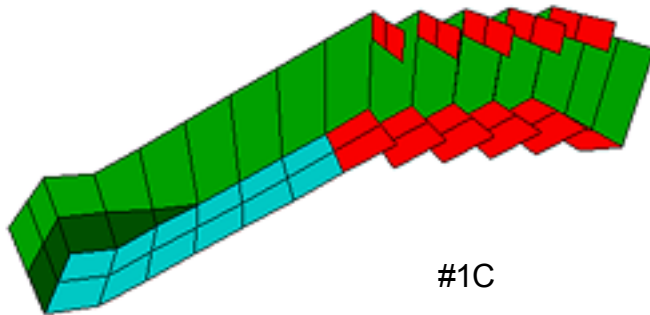
#1C

Popping Up an Alcove from the Hallway Ceiling

1. To hide the balls for the spiked ball trap, pop up a small alcove from the ceiling of your hallway. To do this, start from the east, or right end of the hall, count three squares to the left, then select the two squares to raise vertically.

2. Raise the ceiling to a height of 33, then use "Average Ceiling" (F8) to flatten out the ceiling. It will now have an elevation of 32.

Texturing the Hallway

1. The texture panels on the walls need attention. A texture looks best when it is placed on a square wall panel. Refer to the demo room to see how the panels have been divided. This will be a good test of your skills thus far!

2. Texture and light your new sloped hallway.

3. Now connect the hallway to your dome room. It has been awhile, so if you need a refresher, refer to **Method 1** in the **Connecting Rooms** section. Check the demo model for placement if necessary.

4. Go ahead and place the final set of doors that lead from the "Dome Room" into "Hall Up". They must be placed from the hall side – set the triggers the same way as the others earlier doors.

Gray Splitter Squares
You may have noticed the gray squares at the top of the hallway. Highlight the same two squares in your hallway and click on the gray "BOX" button (one of the "Room Edit" buttons). This creates an invisible barrier that will prevent the baddy (not Lara) from exiting the hallway if don't kill him first. He doesn't have the necessary animations for navigating the next portion of the model, so you have to prevent him from getting into impossible situations! You also use splitter squares in front of closed doors so baddies can't walk through them – once a door is opened, they can walk into a connecting room.

Traps

Traps are set to add challenge and a bit of suspense! The only limit (besides technical) is your imagination. Take a look in the popped up alcove of "Hall Up" in the demo model. There are two rolling spike balls waiting for an unsuspecting Lara. The triggers are set just inside the doors at the bottom of the sloped hall so they will be released the moment she steps through the doors.

1. Find the spiked balls in the "Rollingball" slot in your object menu and place them in the popped up alcove.

2. Check the demo model for the location of the triggers, and set yours accordingly.

TAKING A LOOK

Now go check out your trap "in-game" before *diving* into this next section!

Section IV

GETTING UP
IN THE WORLD

"Stacking" Rooms to Achieve Greater Heights!

Time to learn how to create more diverse features by combining or "stacking" rooms. To make extremely tall spaces, cantilevered ledges and/or water, you must use stacked rooms. You will learn these skills by constructing a tall vertical space using 4 stacked rooms, some ledges and a pool of water. Afterwards, you can connect your sloped hallway to this large room.

Room 1 – The Room at the Top
Rooms taller than 20 clicks begin to stretch the texture panels so it is better to stack several rooms one on top of the other to maintain control over the wall panel size. Begin by building the uppermost portion:

1. Create a new room 8x6 squares with a height of 6 clicks. Name it "Stack Top X" and move it down somewhere next to your ramped hallway.

2. To make the ceiling slightly domed, select the center 6x4 squares. Hold down the Control Key and click the Ceiling + button once.

3. Check the floor elevation - it should be 0 and the ceiling elevation should be 7.

4. Now **raise the elevation of the entire room using the "ROOM +" button**. Because you are raising the entire room (not just the

floor or the ceiling) the distance between the floor and ceiling will remain the same. Select your "Stack Top X" room in the EDITOR WINDOW and press the ROOM + button until the ceiling elevation reads 35 (the floor should be at 28). Check the illustration for a clearer picture!

Elevations of the Stacked Rooms

Below is a side view illustration of the "Stacked Rooms" and the rooms connected to them. The elevations of the ceilings and floors of the rooms have been displayed to help you better visualize their construction.

Green = Ledges
Red = Elevations
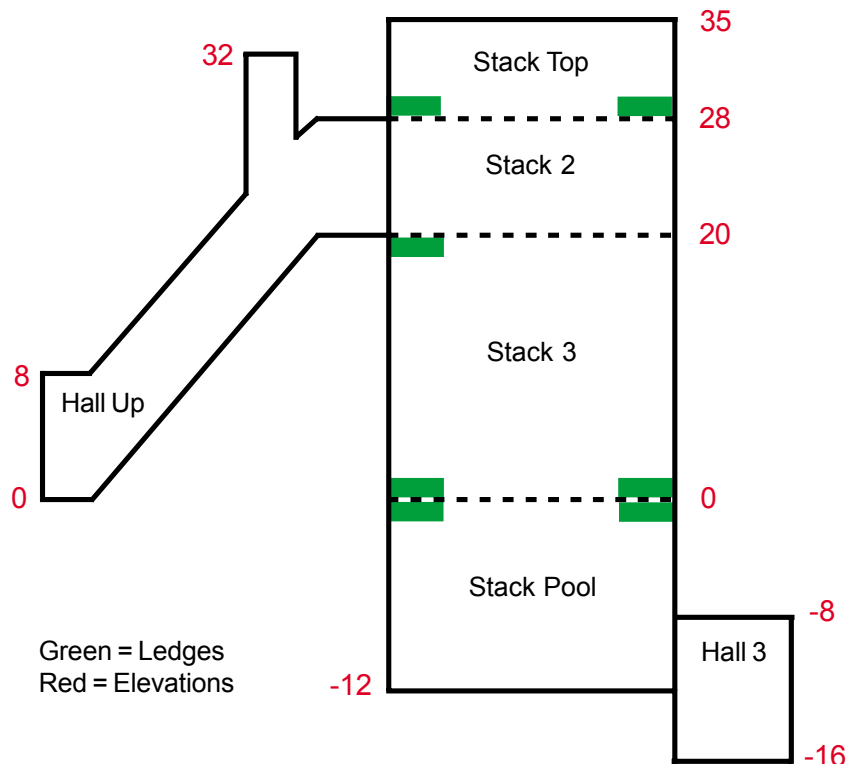
Room 2 – Building a Cantilevered Ledge
The Building Blocks in the Tomb Editor are designed to be raised up from the floor or dropped down from the ceiling, not pulled out from the sides. If you want to make a cantilevered ledge, you will have to create another room above or below it. This will make more sense once you have completed the next few steps.

1. Build a second room 8x6 squares, 8 clicks in height. Name it "Stack2X" and move it next to "Stack Top X" for the time being.

2. Raise the room using the ROOM + button to a ceiling elevation of 28. Note that this elevation corresponds to the floor elevation of the room that will be above it. This is key to understanding how to stack rooms. *The Floor elevation of the room above must be the same as the ceiling elevation of the room below*.

> *NOTE: If the elevations of the floor from the "above" room and the ceiling from the "below" room are not equal when you connect the rooms, the editor will add a wall panel to make up the elevation difference. This might work in some cases, but it doesn't allow you to adjust the wall panels, and besides, it is sloppy modeling!*

3. Now look at "Stack Top" in the demo model to find the location of the ledge squares. Go back to your "Stack Top X", select these squares and raise them by one click.

4. Move "Stack Top X" directly over "Stack2X" and select the entire floor in the PLAN VIEW grid.

5. Click on the DOOR button, and presto, the two rooms are connected and you have a cantilevered ledge! Check it out in the EDITOR WINDOW. (Don't forget you may have to re-click DRAW DOORS to refresh the view)

6. Now move the room(s) next to the sloped hallway again. Once connected by a "door", they act as one unit.

> *CAUTION: Even though a "door" connects the rooms, they are not really one room. If you raise the bottom room using the ROOM + button, you'll push it up into the room above. This causes problems and can be a headache to fix, so be warned!*

Room 3 – Another Way to Make a Ledge

You just made a ledge by raising the floor squares of the room above. Another way to make a ledge is by lowering the ceiling of the room below.

1. Make a third room 8x6 squares and leave it 20 clicks in height. Call it "Stack3X" and move it near the others. Select the row of squares running along the west, or left side of the room. Click the "CEILING -" button once to create the ledge area.

2. "Stack3X" has a ceiling elevation of 20. The floor of "Stack2X" should be 20. Move "Stack3X" under the two rooms you connected earlier ("Stack Top X" and "Stack2X").

3. Now to connect these rooms, you need to select the floor of "Stack2X", but how do you get to it? It is directly below "Stack Top X" so you can't click on it in the EDITOR WINDOW as usual. Remember the neat trick you can do in the PLAN VIEW window where you left click a portal once, then right click to go to the adjoining room? That's one way to get to the other room. Another way is to click off 2DMAP and use your "ALT + Z" command to bring up the target cursor, then click on the "Stack2X" room in the EDITOR WINDOW.

4. Now you can select the entire floor of "Stack2X" and hit the DOOR button to connect it with "Stack3X", thus creating your ledge along the west side.

Getting Ready for the Water Room

There is a pool of water at the very bottom of the stacked rooms so Lara can make a big dive from the platforms you created earlier. To avoid a wafer thin floor and to give Lara a nice ledge to help her climb out of the water, do the following:

1. Select the entire floor of "Stack3X" and raise it by one click.

2. Select the center 6x4 squares and lower them by one click. This should leave you with a raised ledge along the perimeter of your room. If you want, raise up the center two squares of the ledge on each side of the room as per demo model.

3. Now click on the "R" button (of the Room Edit Buttons) to the right of the "W" button to set the reflective value of the water for the ledge and walls above. The higher the number, the brighter the reflection. Left click in the box next to the "R" button to raise the number, right click to lower it.

Room 4 – The Water Room

1. Make a 4th room 8x6 squares, 12 clicks in height. Call it "Stack Pool X".

2. Under the PLAN VIEW grid, find the button with a "W" on it. Click it to the number 2. This designates a water room and the amount of movement in the water. Without this button and value, Lara wouldn't kick into her swimming animation.

3. Using the "ROOM –" button, lower "Stack Pool X" until the ceiling elevation reads 0 and place it under all of the other stacked rooms.

4. Again, using the method of your preference, get back into"Stack3X." Select the floor and click on the DOOR button to connect the rooms and create the portal that will soon be the surface of your water.

5. Check the demo model for guidance and lower the ceiling one click beneath the ledge around the top of the pool to give more thickness to the ledge, then raise the supporting columns up on each side.

Creating WATER

1. In the PLAN VIEW left click once on the black area representing the door opening. Notice in the EDITOR WINDOW that the ledge is selected but you have an opening through to the bottom room so there are no selected squares in the portal where you want to place water textures.

2. With the portal selected (in PLAN VIEW there will be a green selection line around the black portal area), click on the TOGGLE OPACITY 2 button beneath the EDITOR WINDOW. The entire opening now appears selected and you can see the squares in the portal area.

3. **Turn on the TRANSPARENT and DOUBLE SIDED buttons located beneath the EDITOR WINDOW**. If the TRANSPARENT button is not turned on, your water will not look like water. If DOUBLE SIDED is not on, you won't see water textures when you are in the water looking up towards the surface.

4. Scroll down to the water textures on the TEXTURE PANEL. Select the first texture in the group of eight. **Do not forget to turn on the FACE EDIT button**.

5. Apply the texture to the surface of your water (not the ledge, even though it is red). If everything is working properly, you should now see a square of transparent water and the room below it. Apply water textures to the rest of the water surface.

TIP: It is best to use ALL the textures from the group of eight water textures and apply them randomly. If you use only one of the textures, all your water squares will animate on the same cycle and your water will look less convincing.

6. The animation range for the water textures should already be set, but you should check it just to become familiar with this function, since you will have to do this once you strike out on your own! At the bottom of the TEXTURE PANEL, click on the ANIMATION RANGES button. This will bring up a window with all the textures. The water textures should have a green line around them. If not, select them and click okay. If the animation range is not set, the water will not be animated!

7. If you haven't already done so, in the room above the water room, you can click on the "R" button located next to the "W" button of the Room Edit buttons. This sets the amount of reflectivity from the water onto the walls above the water room.

8. For the final touch, in your water room, "Stack Pool X", set the ambient light to 0,52,100 to give your water a more bluish cast!

Creating the Water Tunnel Exit from the Stacked Rooms

You need a water passageway connecting the water room with the next series of rooms you will soon build. Real world physics don't apply to water in Lara's world. Water will NOT try to seek an equal level!

Refer to the demo model "Halls 3 and 4" to get an idea of how to construct the passage leading out of the pool at the bottom of the Stacked Rooms. "Hall 4" is 20 clicks in height and has a rounded bottom. If its construction looks intimidating, either copy and paste it from the demo model, or just make it a straight hall, keeping the ceiling elevation at –16. Remember to press the "W" button (from the Room Edit buttons) to assign water characteristics.

"Hall 3" is a small connecting room between "Stack Pool" and "Hall 4". It also needs to be designated a water room. Place a door (Door_Type4) here to prevent Lara from exiting the Stacked Rooms until she has picked up the first puzzle piece you will soon place there. In other words, you will set up the game play using special triggers so that players will not be allowed to nearly finish the level then discover they must backtrack in search of a missing puzzle piece!

"Climbing" Walls

If Lara takes a flying leap into the water before realizing she should have gone for the goodies on the opposite side of the room, she needs a way to climb back up to the ledge. Once back on the ledge, she will need a way to get up to the platform since it is too high for a jump. So, the rooms you just made are going to need some climbing surfaces.

> *NOTE: Climbing textures and climbing surfaces are two separate things. Climbing textures alone won't allow Lara to climb walls! Climbing textures are used along with the climbing surfaces and serve only to let the player know where the climbable surfaces are. Climbing surfaces are assigned to a floor square but you must select the climb button corresponding to the wall you want to make climbable.*

Adding a Climbing Wall to Your Stacked Rooms

1. On the PLAN VIEW grid, look at room "Stack2" in the demo model and note the location of the dark green square on the west ledge of the room (upper left corner) You can see a green line next to the gray wall square.

2. Go to your "Stack2X" room and with 2DMAP and FACE EDIT off select the same square from the model.

3. On the ROOM EDIT panel you'll notice 4 dark green buttons with the word "Climb" in the middle of them.

4. Beginning with the left of the four buttons, click each button on and off and watch in the PLAN VIEW window as the green line changes position around the highlighted square.

   The green line represents the climbing surface and it has to correspond with an actual wall in your room. If you made a column out of a floor square by clicking the WALL button and wanted to climb on all four sides of the column, you would need to select the four adjacent floor squares and assign the climbable surface to the same side of the floor square that touches the column. If you selected just the column square and assigned the climbable surfaces around the inside of it, Lara would not be able to climb it because the climbing surfaces would all be on the *inside* of the column.

5. Go to "Stack2X" and click on the ledge square (the floor of that room) next to the wall section you want to make climbable. Assign the climbing surface to the wall panel by clicking on the left CLIMB button. You should see the green line touching the gray square. When you look at your room in the EDITOR WINDOW the ledge (floor) square will be the dark green color.

NOTE: *A climbing "surface" must be assigned to the floor square in the room where it begins. In a line of stacked rooms it will continue upward in a straight line through the stacked rooms until a ceiling or floor stops it.*

6. Check the "Stack3" room in the demo model for the location of the other climbing surfaces. By assigning the climbing surface to one square at the bottom of "Stack3" room, it makes the surface climbable all the way to the ceiling of "StackTop"! However, with the climbing texture applied, the player will probably only follow the texture since he/she doesn't know the climbing surface continues. Sometimes it is necessary to construct a room in such a way that a climbing surface gets blocked, or Lara could end up in places she is not supposed to be!

The Monkey Swing

Creating the Monkey Swinging surfaces is very simple and somewhat similar to assigning climbing surfaces. Like climbing surfaces, you must use an appropriate texture so the player will know the surface is active; and also like climbing surfaces, the Monkey Swing surface must be assigned to the nearest floor under the intended path.   The demo model provides a good example of a Monkey Swing surface that must be applied in two different rooms (because the floor below is located in two different rooms).

Adding a Monkey Swing to your Stacked Rooms

1. Go to room "Stack Top X" and in the PLAN VIEW grid, select the row of squares for the Monkey Swing. (Remember a selection grabs both floor and ceiling squares.)

2. Now click the peach colored MONKEY button from the Room Edit buttons. You will see a row of peach squares the width of your room.

3. Look at "Stack Top X" in the EDITOR WINDOW. You will see the row of peach squares across the ceiling (except where the dark green square of the wall climbing texture overrides the Monkey Swing…even though it doesn't show up, the Monkey Swing has been applied and will make the ceiling square active). You will also see a peach colored square on the east (right) platform, but because the floor in this room is a portal to another room, you will need to find the corresponding path on the floor below the "missing" section…in this case, the floor in the water room!   Use your target cursor (ALT Z) to get down there to set the path.

    In short, the path must be continuous and it must always be assigned to the closest floor below…in a complex model with many stacked rooms, you might have to set your path in several different rooms, at several different elevations.

    If you haven't assigned a Monkey Swing path correctly, Lara will fall to the floor when she reaches the problem area.

Texturing and Lighting your Stacked Rooms

You are probably beginning to really appreciate all the work that goes into creating a level! At this point, you need to go back into each room (unless you were one step ahead and already did it) and adjust your wall panels so you can get down to the business of applying textures. Make sure you apply the climbing and monkey swing textures appropriately.

Place the lights while you're at it. Check the demo model for reference if you need/want to.

Connecting your Stacked Rooms to "Hall Up"

Move your connected Stacked rooms so they are centered and just to the east, or right side of the sloped hallway. (Make sure the rooms are flush but not overlapping.) Because of the way it was constructed, you CAN NOT

select the squares from the east end of the hallway to create your door connection. Instead, you need to go into "Stack2X" and locate the 2 center panels from the corresponding wall (the west, or left side of "Stack2X"). Now click on the DOOR button - you should be inside your hallway, looking downward. Go into PREVIEW MODE and check out your new real estate!

Placing Objects and Setting Triggers in the Stacked Rooms

Earlier you placed most of the objects, then returned to set the triggers. Now we will list the objects along with instructions for setting triggers - you can decide which way you prefer to work! You are about to learn how to create a Pick-Up trigger – a type of trigger that will allow you more control over how events unfold within your level.

In the Stack Top Room:

Object: **Torches** (Animating2) and flame (Flame Emitter2). If you place the Flame Emitter on the wall, it will actually be "outside" the wall (therefore not visible unless you rotate your model) Use your Control + Cursor Arrow command to bring it back inside and then raise it to the proper height. You can also place it on the "floor" square of the ledge and then position it.

Trigger: The torches need to light before Lara gets into the room - a good place to trigger them is at the bottom of "Hall Up X". Look at the demo model for the exact placement, then select one Flame Emitter at a time and set the triggers.

Object: **Pedestal** ("Furniture2")

Trigger: None

Object: **Puzzle piece** ("Puzzle_Item5_Combo1"). The easiest way to place this on top of the pedestal is to first place it on the square next to the pedestal, raise it up 4 clicks then move it over using the Control + Cursor Arrow. Rotate it 45 degrees with one right click. How will Lara know in-game to not bend over to pick up this puzzle piece, since most

pick-ups are on the ground? YOU must set the special parameters to flag how it is to be retrieved.

1. Select the puzzle piece then press "O" on your keyboard. This will bring up the "Object Code Bit" settings box.

2. In the window just above the OK button, type in the number 68. (Press 'Enter' for the number to stick, then press 'okay'). Why 68? Numbers have been coded to call forth specific actions. 4 is the number that tells Lara to pick something up from a low pedestal rather than the floor. 64 is needed to activate the "pick-up" trigger that you will set for this puzzle item. (A complete list of these numbers and what they do is located in the Reference Section - *General WAD Objects – Special Instructions and Code Bit Settings*)

Trigger: **Special Pick-Up Trigger** Before placing the trigger for the puzzle piece, a little background….When Lara picks up the puzzle piece from the pedestal, a camera is activated that shows not only where she is in relation to the door at the bottom of the pool, but that her action caused the door to open as well. Setting up triggers for sequenced events takes a little time to learn, but it is all quite logical and not so intimidating as long as you remember some basic rules about triggers. You can stack as many simple triggers as you like without a problem, but if you begin mixing in special triggers (such as a pick-up trigger) or start assigning special parameters to triggers, you run into problems since *you cannot overlap special triggers*. (This rule can be used to your advantage sometimes, but more on that when the time comes!)

A pick-up trigger causes another event to happen the moment Lara picks something up. In this case, the camera is triggered. Since the flyby camera takes a few moments to scan the view down to the door, you would miss seeing the door open unless you could somehow delay its opening. However, to put a delay timer on the door would cause an overlap of special triggers! What to do? The flyby camera, which you will learn about soon, has some special capabilities that will make it possible to open the door up at the right time….this involves yet another type of special trigger…..fun, huh?

Setting the Pick-Up Trigger for the Puzzle Piece…

1. Select the puzzle piece then click on the square below the pedestal and press the pink Trigger button.

2. Now click on the "Object Trigger Text Window" next to the trigger button. It should read "PUZZLE_I" in the upper right corner.

3. Click in the box next to the word "Type" and select "pick-up" from the menu, then click "OK".

4. Now hit "OK" in the 'Set Trigger Type' window and you're set.

If you checked the triggers in the demo model, you noticed a few other triggers on this square….you'll get to those soon! All triggers placed on a square with " pick-up" trigger *will not* trigger until Lara picks up the item with the "pick-up" trigger.

Stack 2 Room:

Object: **Statues** ("Animating7") Place on either side of the entrance to the room.

Trigger: None

Stack 3 Room:

Object: **Uzi** ("Uzi_Item") Place on ledge in the corner.

Trigger: None

Stack Pool Room:

Object: **Crossbow Ammo** ("Crossbow_Ammo3_Item") Place anywhere in bottom of pool.

Trigger: None

TAKING A LOOK

Time to check out your new rooms, objects and triggers you set. Of course, the pick-up trigger won't work until you set up the camera, but it is a good time to take a break before beginning the section on cameras.

Section V

SEEING THINGS DIFFERENTLY

Cameras

Camera views are essential to good level design. They can be used as "rewards" for specific actions, to preview, or partially reveal events yet-to-come and/or give clues about the "story" being told, to show "action" from a different perspective, to help guide the way, to build suspense and add drama, to lend a cinematic air…the list goes on! By the end of the tutorial you will have a better feel for the scope of their use as well as the knowledge to set up the three different kinds of cameras available in the Level Editor.

Camera Types:

Basic Camera
When you enter the "Dome Room" and Lara climbs onto the central platform, she activates a basic camera. This type of camera always points to Lara unless otherwise specified (see *Camera Targets* near end of tutorial). By selecting a sequence of squares for the trigger, the camera will hold its position while Lara continues to walk/run on the triggered squares. You may type a number next to Timer in the "Set Trigger Type" window to set the amount of time the camera stays fixed on Lara, but she can break out of the camera view by 1) drawing her weapons, 2) using the "look around" key, or 3) stepping off the trigger square(s).

Basic Cameras will not activate when Lara has a drawn weapon. Bear this in mind when placing cameras. For example, if you trigger the camera in situations where Lara is sure not to have weapons in hand (finishing a climb, picking up items, etc.) you can be certain players will enjoy the effort you took setting up your camera! The best way to learn about placing cameras is to study the example levels and of course, experiment!

Placing the Dome Room Camera

1. Go back to the "Dome Room". Under "Effects" on the Drop Down Menu bar, select "Camera" from the list.

2. Check the demo model for the location, and try to position yours in the same place.

3. In the Plan View window, select the 4 squares on top of the platform and click on the pink trigger button to create the trigger for your camera.

4. Now when Lara climbs on top of the platform to pick up the medi-pak, you will witness some action. (Knowing the AI of BADDY_1 made it possible to set up this scenario.)

5. If you want, you can assign the amount of time the camera will stay on Lara by entering a time in seconds in the "Set Trigger Type" pop up box.

Fixed Cameras
A fixed camera behaves like a basic camera with only a few exceptions: 1) the view cannot be broken until Lara steps off the trigger for the camera, 2) the camera will activate even if Lara has her guns drawn. You will set up a fixed camera towards the end of the level, in the "Test Room".

Using Camera Targets
In order to point the camera at a specific area and not at Lara a camera target is used (it works with either the basic or fixed cameras). You will set up a fixed camera with a target later in the "Mid Room".

Flyby Camera
You can have a lot of fun using this camera (but don't overdo it!) And can even set up cinematic looping flyby cams such as the opening title screen. Again, you can learn a lot by checking these cameras in the example levels.

To create a Flyby Camera you place a sequence of flyby cameras in your model. After placing them, select the first camera in the series, press "O" to bring up a menu, then set the options to achieve the desired results. In addition, there are a number of code-bits to give the flyby's

different modes. A chart with all the settings is located in the Reference Section under *Special Camera Settings*

Setting up the Stacked Room Flyby Camera
There are seven cameras in this Flyby sequence. The first camera in the sequence is in the top room and the last is in the water room in front of the door. To start the flyby only the first camera in the sequence needs to be triggered.

1. First look carefully at the cameras in the demo model. In your "Stack Top X" room place a flyby camera (found under "Effects" in the Drop Down Menu) and point it at Lara.

   Aiming the Camera Once placed, a red cone shows the direction the flyby cam is pointing. To aim the camera in a different direction, hold down the LEFT Alt key, and use the arrow cursor keys to rotate it up, down, left or right by one degree increments. For faster adjustments of 15 degrees, hold down the shift key together with the LEFT Alt key.

2. Set your trigger by selecting the square under the pedestal and clicking on the pink Trigger button.

3. With the camera selected, press the "O" button on your keyboard to bring up the menu to set the camera properties. Type in the following values making sure you hit "Enter" before closing the window:

Seq: 2 (all cams in this setup will have the seq # of 2)

Num: 0 (the first cam in the sequence is 0, the second is 1, the third is 2, etc)

Timer: 0

Speed: 1

FOV: 80

Select a camera, press "O" to bring up the Camera Property Box

Number Buttons: Press the 6,9 and 10 number buttons so the camera will know to snap back to Lara at the end of the sequence (6), disable the Look Breakout Key (9) and disable "Lara control"(10).

4. Place another camera in the next room (Stack2X). Point it at the door in the water room below.

5. Repeat step 3 but set Num to1 and Speed to 3. You don't need to set the "Number Buttons" again.

6. In the next room (Stack3X) place two cameras (check demo level for placement) and point them at the door in the water room also.

7. Repeat step 3 but on the higher of the two cameras set Num to 2 and Speed to 3; on the next camera, set Num to 3 and Speed to 2.

8. Go to "Stack Pool X" and place 3 cameras along the bottom as per demo model.

9. Repeat step 3. On the first of the last three cams, set Num to 4 and Speed to 2. Press the 14 "Number Button" to activate a "Heavy Trigger" (more on this in a few minutes). On the second cam, set Num to 5 and Speed to 1. And on the final cam set Num to 6, Timer to 150 and Speed to 1. Press the 8 number button to tell the camera to hold its view. Whew! Now your cameras are set up for the flyby sequence….you only need to set one last trigger.

Heavy Triggers
A heavy trigger is a trigger that is activated by anything but Lara (enemies, rolling balls, etc.). In this case, one of the flyby cameras will activate the trigger. To set this up do the following:

1. If you haven't already done so, place the door (Door_Type4) in "Hall 3X"

2. Select the door then click the square beneath the flyby cam with the Num set at 4 (and make sure the 14 "Number Button" is on). Click the pink Trigger button to set the trigger.

3. Now click in the text box next to the pink trigger button to bring up the "Set Trigger Type" window and click in the text box next to "Type" to bring up the "Select Trigger Type" menu.

4. Choose "Heavy" and press the "Okay" button to close the window.

5. Press the "Okay" button on the "Set Trigger Type" to close it.

Your heavy door trigger should now be set! When the flyby camera sequence arrives at the camera located above the heavy trigger square, the camera will activate the heavy trigger and the door will open. Now Lara can leave the area with her puzzle piece. Remember, this door would never have opened had she not picked up the puzzle piece that activated the camera that activated the trigger that opened the door!

TAKING A LOOK

You must be anxious to see if your camera works…don't be discouraged if you didn't get it right the first time. If it doesn't work properly, double check that all the sequence numbers are set to Seq:2, that all the Num entries are in order.

Section VI

END OF
THE WORLD

Building the Final Rooms

With the skills you have acquired, you can move ahead and finish the modeling, texturing and lighting without the detailed steps you have had thus far. (i.e. you're pretty much on your own!) If there are new skills involved, details will be given.

Scorpion Room

Select the Scorp Room from the Demo model and look at it in the Plan View panel. The room looks square on the PLAN VIEW grid but in 2DMAP mode in the EDITOR WINDOW it appears to be an irregular shape. If you look closely at the PLAN VIEW you will see that the shapes made by the groups of green squares (walls) correspond to the "missing" areas when viewed in the EDITOR WINDOW. This is because walls appear white or as blank space in the EDITOR WINDOW.

1. Make a room approximately 8x8 squares.

2. Create the organic floor by using "Random Floor Up" (F1), then Smooth Floor" (F9). Fix any illegal slopes.

3. Leave a flat area at least two squares to place the floor switch (check demo for location).

4. Exit doorway must be one block in size - you will later place a door in this opening.

5. Water passage exit/entry needs one click ledge around connecting portal (Don't forget to check elevations before connecting stacked rooms).

6. Adjust wall panels, add textures; set ambient light; place and adjust additional lights.

Scorpion Pit and Mid Room

To construct these rooms, use the demo model as a guide…and if you are in a big hurry, don't forget the cut and paste shortcuts!

Placing Objects and Setting Triggers in the Scorpion Room, Scorp Pit and Mid Room

Scorpion Room:

Object: **Scorpions** (SMALL_SCORPION) - Although it is tempting to cover the floor with scorpions, there are limits! Place no more than 5 or 6 or they won't trigger like they are supposed to and you'll have scorpions appearing out of thin air.

Trigger: Trigger each scorpion to a square at the bottom of "Hall 4X " so Lara will activate them *before* she climbs out of the water. This way they will already be running towards her when she steps onto the sand.

Object: **Switch** (LEVER_SWITCH) - Place in the corner by the door opening on the flat squares.

Trigger: Trigger the switch to the square beneath it. Click in the trigger text box next to the pink button to bring up the "set trigger type" window. After clicking in the text box next to "type" select "switch" to designate the trigger as a switch. Now when you set the trigger for the door to this same square, it won't open until Lara throws the switch.

Object: **Door** (DOOR_TYPE4) - This door actually needs to be placed in the "Mid Room" so it will open properly. Place it and rotate it into position.

Trigger: Set the trigger on the same square as the switch to link the door and switch together.

_____

Scorpion Pit:

Object: **Scorpion** (SMALL_SCORPION) Place the scorpions under the ledge, so they will "materialize" out of view.

Trigger: Be creative with your triggers…maybe set one at the base of the pole...

Object: **"Fire Pole"** (POLEROPE) Lara must be on the same square as the pole to climb up it or jump forward and grab (Control Key) to climb down. The pole is only 12 clicks (3 blocks) tall. If you want a taller pole, you'll have to stack one pole above the other.

Trigger: None required

> ***Creating Secrets*** *Don't make your secrets too easy! Any pick-up can become a secret simply by designating it as such in the "set trigger type" window. Each secret needs a different number or the secret sound will not activate, nor will the item be logged in the level statistics.*

Object: **Sixshooter** (SIXSHOOTER_ITEM) Place somewhere in the middle of the pit.

Trigger: Set a trigger beneath the pick-up, then in the "set trigger type" window click in the box next to "Trigger" to pull up the menu and select "secret". Enter the number 1 in the box in the upper right corner of the window.

Mid Room:

Check the demo model and place the remaining objects and baddies accordingly, or choose your own!

Placing a Camera Using the Camera Target
If you want a camera to show a specific view rather than point at Lara, you can place a camera target (from the object menu) in the location you want the camera to point. In this case, the camera and target are set up to catch the mummy creeping around the corner and show Lara's position at the same time. A fixed camera is used to insure it will be activated whether or not Lara has her weapons drawn. To set up a camera target do the following:

1. First place your camera.

2. Choose the camera target from the object menu and place it where you want the camera to point.

3. Set triggers for both the dummy camera target and the camera on the same square(s). Remember, this camera stays active only as long as Lara is on the trigger – a large trigger zone was set keep the camera active long enough for the mummy to become visible.

4. Call up the "Set Trigger Type Window" for the dummy target and make sure you select "target" from the trigger text box so the camera will know it is supposed to look at the target instead of Lara.

5. Now call up the "Set Trigger Type Window" for the camera trigger and click on the "one shot" button.

The "Test" Room

The Test Room was designed specifically for familiarizing you with exactly what Lara can and can't do in her world. It would be a little difficult to design a good level if you didn't know how far or high Lara can jump…and you can't push limits if you don't know what those limits are!

If you'd like to check some of these guidelines in-game, move Lara to the demo Test Room (unless you want to build your own Test Room first) then build a new TR4 file. When you boot up the game, Lara will be in the test room ready to try all her moves.

How High? Find the set of stairs near the east entry door. Each stair is one click up per step. The top of the stairs is 8 clicks tall…one click beyond Lara's "jump up and grab" limit. The next stair is 7 clicks tall - she can jump up and grab that edge, no problem. It is obvious why you need to know some of these limits…if you want Lara to jump up to find a secret, or make sure she can or can't get out of a space, you have to know how high or low to make the walls.

Above the stairs is a Monkey Swing. Starting at the bottom, stand on each step and jump up to grab the ceiling. When Lara gets to the fifth step she will be able to grab the ceiling, not before. The room is 12 clicks tall, so this means Lara can jump up 7 clicks to grab onto a ceiling.

How Far? In the southeast corner of the room are some ledges 8 clicks high with distances between them of one, two and three squares. Lara can jump the distance of one square easily. A gap of two squares requires her to make a running jump. It is a bit trickier to make the three square gap - in addition to a running jump, Lara must grab the ledge, then pull herself up.

In the southwest corner of the room are two squares that have been raised just two clicks. One of those raised squares is two squares from the west wall, the other is three. Lara won't have a problem jumping the two-square gap, but the three-square jump doesn't work. To make this jump, Lara would need to make a run, jump and grab move and she doesn't have enough vertical space as in the example above.

Another move you should experiment with is the standing jump up. Stand one square away from a 4 click tall block and jump forward. Lara will leap up onto the block. She can also flip backwards or sideways to jump up 4 clicks.

You might want to experiment with diagonal jumps, and build some areas in your test room to push this limit. Distance limitations can depend on different factors, such as the height of the beginning and the ending platforms, as well as the skill of the player! You can include a few really difficult jumps, but unless you're truly mean spirited, you want to keep most of your moves within a reasonable skill level range!

How Steep? When the terrain goes beyond a specific angle, Lara will begin to slide down that surface. To create the angle that will make her slide, you raise one side of a block 3 or more clicks higher than the other side.

Along the south wall is an example of varying sloped surfaces. Walking up the slope, you can tell when it becomes a 3 click slope because Lara will stop. Jump up to the top, turn around and walk down the slope. You slide until you hit the 2 click slope where you come to an abrupt stop. Lara can walk on one and two click slopes but not on 3 or greater.

How Deep? Lara can take a lot of damage but knowing how far she can fall without being hurt will help you build a more challenging level.

At the top of the "How High" steps is a dark crawl space that leads to a long narrow room. Half of the room is a level floor, the other half is a series of descending steps in one click increments from 4 to 21. Drop Lara down the different distances noting how much damage she takes as the distances increase. Repeat the process when Lara is not at full health – the distance she can fall without dying is proportionate to her health status.

Now you create a Test Room. Either copy the demo level Test Room or test the limits with some of your own inventions. The only way to really find out if Lara can handle what you set up for her is to make a TR4 file and try it out "in-game."

Tips for building features in the Test Room and beyond:

The "Lattice" ceiling (How to create multiple openings with one "door").

You may think at first glance 8 portals were made to achieve this effect, but really only one was used. Try this quick method for creating multiple portals:

1. Think of the bottom elevation of the floor as the plane that will eventually become the portal. Raise the floor to create thickness wherever you *don't* want a portal….(use demo model for reference).

2. Raise your "MumRoom" so the floor elevation is the same as the ceiling elevation of the Test Room and position it over the Test Room.

> *CAUTION: If your test room ceiling has an irregular surface, you will run into problems trying to connect the two rooms. For instance, if you copied the demo Test Room you will need to lower the raised portions to the same plane as the area you want to connect up to the MumRoom or you will get an error message when you try to connect the rooms.*

3. Once you've raised your floor areas, select the entire floor of the "MumRoom" then click the DOOR button. You will now have portals wherever you did not raise the floor. (You can create multiple horizontal portals in one click as well…in Plan View, use the WALL button to create a row of columns along the edge of a room. Select the entire wall with the columns and when you click the DOOR button, it will create portals between all the columns.)

The Fire Pit

In the southwest corner of the room are 3 squares with an iron grate. Lara will burn to death if she moves onto these squares. To set up this trap:

1. Build a small room beneath the three squares and create a portal. Then go back to the Test Room to complete the rest of the steps.

2. Select the opening and click "toggle opacity". This will prevent Lara from falling through the opening as well as allowing texture placement.

3. Place the "Flame_Emitter" nullmesh on the squares to create the small flames.

4. To turn the flames on place a trigger at the entrance of the Test Room.

Eye of Horus - The Big Door

This door requires an opening of 3x3 blocks and involves some specific modeling and triggering to work. Take a close look at the demo model to see how to construct it, then:

1. Place the door (AM_HOLE) in the opening. Press "O" and enter 999 in the text field so that Lara will be able to go back through the door opening once it has opened.

2. Set a trigger square directly in front of the door where Lara will stand to insert the "key" (the combined puzzle pieces).

3. Click in the text box next to the pink trigger button to get the "Set Trigger Type" window and click in the "Type" text box and choose "Key" - hit "Okay" . This designation tells the door to open only when Lara uses the combined puzzle pieces.

4. Hit the "Okay" button on the "Set Trigger Type" window to close it.

> *Caution: When the Big Door opens, the door sections need to "disappear" into the surrounding walls. Make sure you build out the walls enough to accommodate these sections or you will see parts of them popping through the walls of the Test Room.*

Placing the Fixed Camera by the Big Door

Before setting up the camera that activates when Lara goes near the big door, check what happens to the door "in-game" (remember you can temporarily place Lara in the Test Room so you don't have to play through the level to check your work). When you get too near the door, the Lara "camera" tries to view her from behind the door. This gives a view of the backside of the door and a bunch of missing polygons…nothing you want anyone to see! By placing the fixed camera, you can control what the camera does when Lara gets near the door, even if she has her weapons drawn.

Hiding Pick-ups Beneath the Vase Shatter object:

1. In the sideroom, at the north end of the Test Room, place the pick-up you want Lara to find when she shoots the vase and click "O" to bring up the object menu. Click on the invisible button and hit "okay". This will make the object invisible until the vase shatters above it.

2. Set a trigger on the same square and bring up the "Set Trigger Type" window to set the trigger type to "Heavy". When the vase shatters, it will trigger the pick-up to become visible.

3. Now place the vase (SHATTER_O) on top of the pick-up.

Triggering a Baddy with a Heavy Trigger:

1. Place a baddy in the Test Room upper left corner (northwest)

2. Set the trigger for the baddy under the shatter vase (the same square as the heavy trigger for the medi-pack). When the vase shatters, it will activate the heavy trigger which in turn will activate the baddy trigger. You may wonder why just stepping on the square does not activate the baddy ….remember, when one special trigger is on a square, all other triggers assume that same status, in this case, a heavy trigger…and a heavy trigger is only activated by something other than Lara.

Taking Advantage of the Baddy AI

1. Place some six shooter ammo on the same square as the above baddy.

2. If a pick-up is placed on the same square as a baddy, it will be left as a pick-up for Lara after he dies. No need to use the invisible setting on the pick-up…when placed with a baddy, it is automatically invisible until the baddy dies.

Using BOXES to Control Your Baddies!

As demonstrated earlier, sometimes it is necessary to set limits for baddies. Notice the gray squares in front of the entrance to the crawl space leading to "Deep Pit1". The gray squares (select a square, click gray BOX button) are used to bar access to anyone other than Lara! If the baddies were to navigate through the crawl space, you'd have laugh. Since they do not have a crawling animation they switch into a monkey swing which looks a little ridiculous in the crawl space!

Setting up the Spiked Pit Trap in the Exit Room

Did you *fall* for the spiked pit trap after the Big Door exit? The spikes used in TR4 are more complicated than those from earlier Tomb Raider games. You now have the options of retracting or stationary spikes delivering death from floors, walls or ceilings!

Spikes are placed like most objects but may need a little more adjusting than usual so a few in-game checks might be required to get them just right.

In the reference section is a chart showing the different settings for the spikes. You'll be able to set the angle of origin and whether or not they remain out or retract. To set the spikes as in the demo model:

1. Place the spikes (TEETH_SPIKES) at the bottom of the pit. Check to see how far they are sticking out from the ground and adjust yours accordingly.

2. Since these spikes don't appear until triggered, set the trigger just after the Big Door. This way, they will already be visible in the bottom of the pit when/if Lara falls. You can also trigger them at the bottom of the pit so they won't shoot up until Lara falls.

3. With spikes selected, press the "O" button to bring up the "Object Code Bit" menu and type in the number 20. This will make the spikes point up and remain stationary.

Creating the Outside World

When Lara's adventure comes to an end, a reward for surviving and completing her ordeal is due! Creating a grand view of the outside world not only serves as a "reward" but as a grand finale for the level (and the tutorial as well!). To make this large outdoor space you will combine six rooms into one.

Lower Desert Room

1. Begin by building the central lower room "Desert1", the room where Lara exits the pyramid. It is 10 x11 squares, and 9 clicks in height. Lower the entire room by using the ROOM - button so the floor is at an elevation of -9. You will be angling up the floor squares on the east (right) and west (left) sides of the room. Refer to illustration ED11 for the proper angle.

ED11
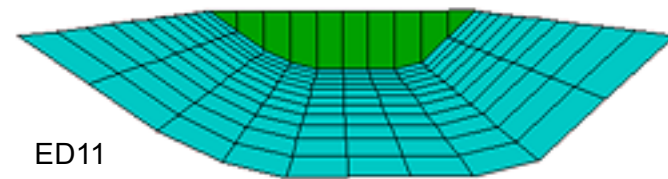
2. To build the passageway where Lara exits the tomb, select the floor square that is on the east (right) row of "Desert 1" and 6 squares down from the top. Pointing the white arrow to the east (right), lower the edge down 4 clicks to a flat position. Illustration ED12 will show you exactly which floor square to adjust.

Passageway Exit

ED12
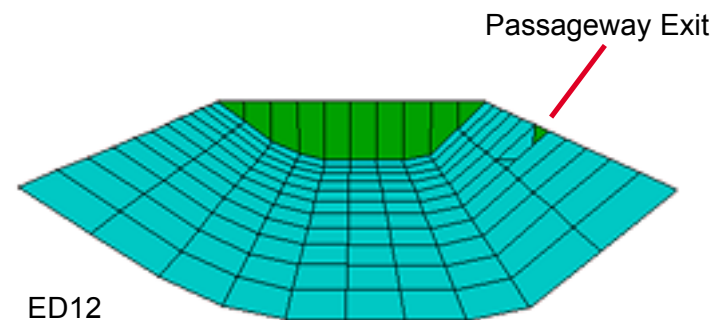
Upper Desert Room

1. To build the upper half of the outside world, make a room 17 x 11 squares, and 20 clicks in height. Call it "Desert Top1". Make sure the *floor* elevation is at 0 (to match up with the *ceiling* of "Desert 1" which is 0 elevation).

2. Select the five east (right) rows of "Desert Top1". Pointing the arrows to the right side of the selected floor squares, raise the edges up 4 clicks. Now raise each row of angled floor squares up to form a slope. Select the two west (left) rows of floor tiles and raise the left edge of those squares by 3 clicks. Raise the western most row up 3 clicks to form another slope. Refer to illustration ED 13 to check your slopes.
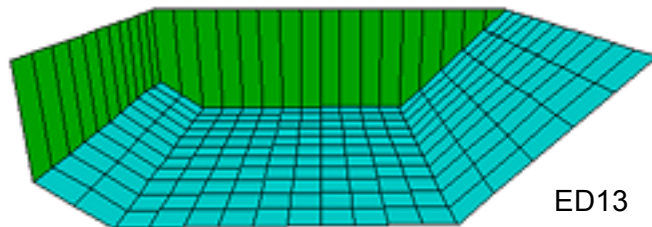
ED14

ED13
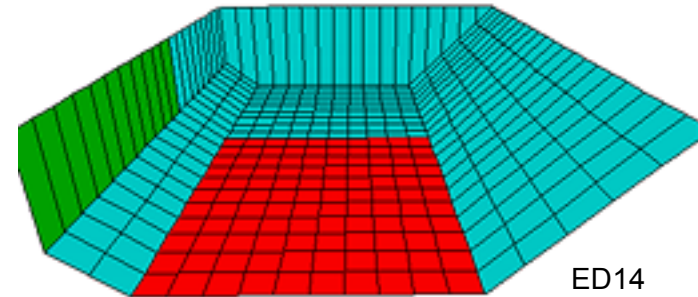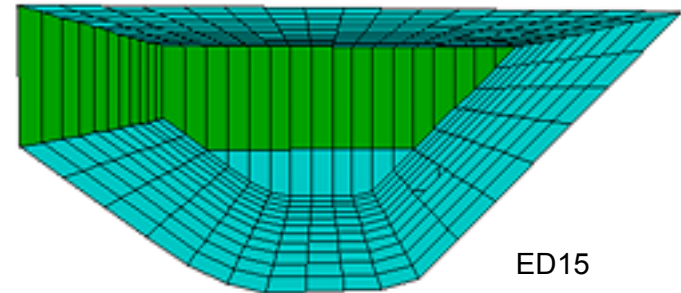
ED15

Combining the Rooms

Position "Desert Top1" which is 7 rows wider over "Desert1" so the two left rows of "Desert Top1"overlap on the left side of the lower room and the 5 right rows overlap on the right side.

To connect the rooms, select (from the model) **ONLY** the flat floor squares of "Desert Top1" (illustration ED14) Press the DOOR button to create the portal between the rooms. Compare your model to illustration ED15.

TIP: Using the X,Y coordinates to line up stacked rooms. Sometimes when the room on top is larger than the room below, it is difficult to get them positioned correctly. Using the X,Y coordinates can make life a lot simpler...Click on a square in the Plan View Grid, look in the Text Info box below the Editor Window next to "Selected Block" to see the X,Y coordinates of the selected square. If you select the entire room, the X,Y coordinates will default to the upper left square of the selected room. Using the Plan View grid with "Desert Top1" selected, figure out where the upper left corner of the lower room needs to be positioned and click on that square to get the X,Y coordinates. Now drag the lower room into position by moving it until it has the correct X,Y coordinates.

The Sand Dunes

The eastern sides of the rooms form the pyramid so you don't need to adjust these slopes, but all the other sloping floor squares need to be randomized to form the sand dunes opposite the pyramid.

1. In "Desert1" select the entire west (left) *sloping* floor squares EX-CEPT the top row next to the "portal."

2. Randomize the selected floor squares by pressing F1 three or four clicks to create a fairly rough surface. Hit F9 to smooth things out a little.

3. In "DesertTop1", do the same, making sure you don't select the row next to the portal…unless you want to adjust all the tiles that don't match the "portal" edge of your lower room!

4. Now fix all the rough edges and holes, using what you know about manipulating squares with the control key and the white arrows! Notice that the row next to the "portal" in "DesertTop1" was unaltered – when you used the random button it didn't lift any corners of the squares next to the "portal".

5. To give some shape to this flat row select random squares and to each, point the arrow into the corner (use control key) *away* from the "portal" side, then with FLOOR + (and control key) raise up portions of the flat row and adjoining squares. The edges next to the portal will remain flat.

Your two rooms should look something like illustration ED16*,* but not exactly, given the *random* nature of these procedures!

The End Rooms

This outside desert room needs to be large to create the feeling of being outdoors! The easiest way to do this is to copy the upper and lower desert rooms to use on both ends of the center rooms. To get the slopes and random floors to line up, flip the rooms using the "Flip Room" feature under "Room" in the Drop Down Menu (or you can press ALT+Y).

> **Note:** *When you "flip" a room the north (top) side of the room becomes the south (bottom). When you "mirror" a room (Alt+X), the west (left) side becomes the east (right) side. Don't confuse "Flipping a room" with a "Flip Map". Flip Maps are used to trigger a change in a room during game-play. Flip Maps are covered in the advanced section.*

1. Now make a copy of the upper and lower desert rooms and remove the exit passageway from the copy of the lower desert room by selecting the floor square at the exit and sloping it up again to match the surrounding floor squares.

2. Flip (ALT + Y) the copied lower room. Reduce it in size by using the BOUND button to remove the four top rows. Move it to the north (top) side of the central rooms, so that the edges are flush. Flip the copied upper room, reduce it in size by removing the two top rows and position it over the copied lower room so that it lines up with the existing rooms.

3. Combine the upper and lower end rooms using the DOOR button. Refer to illustration ED16 to see which squares to select.

4. Now create doors between the lower central and end rooms and the upper central and end rooms. Work from the PLAN VIEW grid, selecting the gray squares along the appropriate walls before hitting the DOOR button.
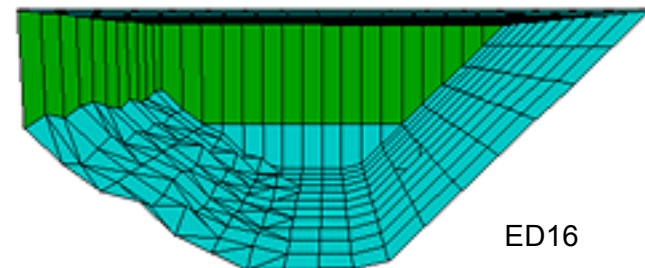
ED16

5. After creating these connecting portals, you will want to slope and randomize the floor squares along the north (top) end of both rooms in order to wrap the dunes around the horizon. This task will definitely put your modeling skills to test. You will need to use the control and arrow keys extensively.

6. Once you've accomplished that, copy the upper and lower end rooms and flip them. Place the two newly copied and flipped rooms south of the two central (original) rooms. Join the rooms to the central rooms and there you have your 6 combined rooms.

Adding Transparency to the Upper Walls and Ceilings

In order to see beyond the wall and ceiling squares out to the horizon and sky graphics, you must make them transparent. First, turn FACE EDIT on. From the COLOR PALETTE (located beneath the EDITOR WINDOW), select the black color square in the upper left corner. Now click on all of the walls and ceiling squares above the "Dune" line. The transparent color will appear white in the EDITOR WINDOW and you won't see anything beyond the walls until you look at your room "in-game." (Not even in Preview Mode!)

Placing the Objects and Camera

By this time, you know what to do! Click on the objects in the demo model to get their slot name and proceed as usual! When investigating how triggers are set up, the Object to Trigger and Trigger to Object buttons are extremely useful, and remember to click on triggers in the PLAN VIEW grid to cycle through each trigger on one square.

Lighting the Outside World

You have created an outside environment so you will want use the SUN light. You will need to place one SUN in each room because lights do not shine from one room into another, even when they are joined. (Placing more than one sun per room will cause an error message when you got to output the WAD.) Play around with the settings until you are happy with the direction your SUN is pointing or copy and paste from the demo model. It is a good idea to try to place them in the same location within each room, too. All connected outside rooms should have the same Ambient setting.

After placing the jeep in "desert1" you can put a shadow beneath it to help make it appear more "grounded". This is an instance where the blue "ON" button (its default position) should be clicked OFF so that the shadow will not darken the jeep, but only the "sand" textures beneath it. To turn the button off, you need to have the shadow selected and the LIGHTING button ON.

Final Touches – Adding Audio Tracks to Your Level

Available audio tracks can be found in the Audio folder of your Tomb4 root folder. After you have selected the track you want (you need the number of the track), do the following to set the trigger:

1. Select the square you wish to be the trigger for the music clip and click on the pink Trigger button.

2. Click in the text box next to the trigger button to bring up the "Set Trigger Type" window.

3. Click in the window next to "Trigger" and choose "CD" from the list and click "OK"

4. In the window next to "CD" click the number of the audio track.

For information on creating your own audio tracks, refer to the section *Creating Your Own Project.*

Triggering the End of the Level

All good things must end…Because there are limits as to how many triggers you can set and how many objects you can place (245) you are somewhat forced to bring things to a close, and move on to a new level! That's the purpose of the "finish trigger".

1. Put some thought behind where you want to kick into the next level. The big view from the door of the pyramid is an end-of-the-level treat….you don't really want Lara running around down there; you only want her to think she can. Sliding down the side of the pyramid is a good place to set the triggers. Make sure you create a zone she can't somehow miss!

2. Once the trigger zone is set, bring up the "Set Trigger Type" window and click in the text box next to "Trigger". Select "Finish" and put a number 2 in the box next to it. The level corresponding to the number in the box will automatically load when Lara steps on the trigger.

Connecting Your Level with the Demo Model

You have already discovered that you can move your entire model as one unit. Experiment with positioning yours next to the demo model, looking for a good spot to make the connection. If you decide to combine them, make sure you remove the finish triggers from one of the exits.

CONGRATULATIONS, You've done it! You are now equipped with the basic skills needed to make some pretty decent levels.   However, there is more behind creating an engaging level than just the ability to build and texture a model and place some objects and triggers in a few strategic locations. Not much has been said to this point about game-play and overall level design so kick back, grab a snack, and delve into the next section on *Designing Tomb Raider.*

DESIGNING TOMB RAIDER

By Philip Campbell

Philip Campbell has spent a lot of time designing for Miss Lara Croft! - 15 levels in total, from his first over three years ago to his latest, and last, "Reunion", in Tomb Raider: The Lost Artifact… Here, he speaks of some of the tricks and techniques he's deployed over the years in search for the perfect level…

Traps and Illusions

Consider this; the first "trap" I ever designed, way back in Tomb Raider: Return to Atlantis, wasn't really even a trap at all. It was a warning, a fore-shadowing of things to come - little did I realize that three years later I'd still be making Lara jump… this was the situation, way back when - Lara was returning to Atlantis, and I was her guide, even her nemesis. She'd just dropped into the typical Tomb Raider "long dark tunnel", and I felt it was time to break out the timeless Rolling Ball trick, probably the most classic of all Lara's obstacles. Now Rolling balls usually mean one thing - instant "death", until you work out the pattern, or are fast enough to proceed - I didn't want "instant death", in terms of design it is rarely satisfying, and certainly not at the very beginning of a level. All I wanted was…a little "scare", a note to the player that the level designer was on board. As Lara walked up a short rise, suddenly a rolling ball would drop from the ceiling, and unerringly trundle towards her. A perfect opportunity to panic, to fall forward into a pit, to run away "screaming". But if the player held
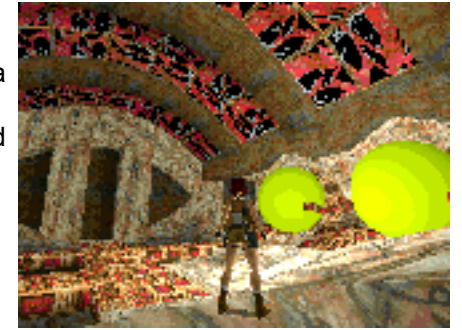
their nerve, stood perfectly still, the ball rolled to within a few feet and then dropped harmlessly into the aforementioned pit…just a warning.

Instant Death

I guess this is the starting point for Tomb raider 101 - instant death is usually bad, but the "threat" of instant death can be enough to get the adventure "juices" flowing. Puzzles that require much trial and error, or offer only "death" to the repetitive routine of starting over until you time it just right, usually end up being very unsatisfying. The "clever" player should always be able to figure it out the first time, and feel the tangible "glow" of success, the feeling of "beating the designer"… of course, sometimes the designer can be simply "in a bad mood" and 'instant death' is the only recourse. Designer revenge is sweet!
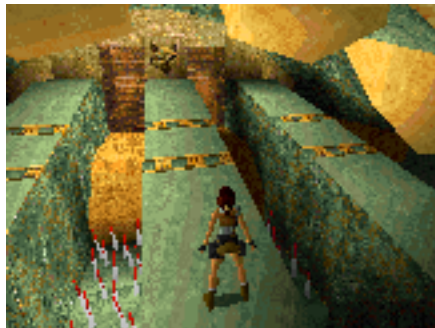
In "Shadow of the Cat", I make a "death room", one in which there is no possible hope of escape - but I warned you, the entrance and the room were completely draped in skulls and bones, a very potent and decorative "Keep Out" sign. "Don't bother to come in here," I said (and fittingly, because this was indeed the god Seth's room, so death was the only possibility), "but of course, you had to look, right?" This evokes the designer's "told you so", and can be very satisfying technique!

Foreshadowing

Let's go "Back to Atlantis", for our next example, illustrating the concept of "foreshadowing". "Foreshadowing", in it's simplest terms, is the previewing, or partial revealing, of the events yet-to-come. In the first major sequence of rooms in "Return to Atlantis", I placed a large window, wrapped in the gooey organic textures of that strange Atlantian style of architecture.

This "window" actually looked into the very end of the level, your final destination, there revealed - but not in "all it's glory", very dark, just a glimpse ahead…

Further to this, I also activated the end-of-level baddy, a half man half horse Atlantian of the species known affectionately by us here as a "Streaky Bacon Centaur". If you looked carefully, you might just catch sight of him charging about, frustrated that there was no way he could get to Lara, only just beginning her adventure. An added bonus was the unearthly sound he made, a sound that would accompany and unnerve Lara throughout this first scenario.

So here's a thought; don't be afraid to show too much, sometimes you can show too little - more on this later…and don't be afraid to "waste" a bad guy in a non-combat situation - just the mere sound, or fleeting glimpse of an enemy can enrich the adventure experience. In fact, this is a technique I've used many times, from the patrolling panthers on high ledges in "Shadow of the Cat", to the battling enemies in the arena in "Kingdom". To some, those patrolling panthers were just cannon fodder, but others recognized that they set the cat-like tone for that whole scenario - this was their domain we were invading. I had imagined the effect being similar to "Wolfen", where the Wolves appeared on the building's steps. Finally, foreshadowing can also help immeasurably in the "story-telling" aspect of the adventure, setting up aims and goals for the player and enriching the experience.

Showing Too Much

The central "pyramid" area of the Atlantian city I built has two additional design requirements (additional to the basic necessity of providing good gameplay, and being interesting visually). These additional requirements were maximum visibility of what lay ahead, and a logical sequence of built architecture. The player could see the exact structure through many levels of building, and through many layers of gameplay. This gave the player a chance to feel clever (always a good thing), by understanding the structure and exactly where they had to go. I can't stress enough my dislike for hidden switches placed randomly in structureless, and meaningless architecture. Don't do it! Unless you mean to do it! Here, in Atlantis, the players could

make intelligent decisions about the direction she had to go, and get a hint of what she might face - the placement of another Centaur in the depths of the structure provide an early view of an enemy who "Couldn't wait to meet you", the question was "When?!"

The huge hole, the giant gash in the Earth in "Shakespeare's Cliff" (Tomb Raider: The Lost Artifact), is a clear example of "showing it all". Lara could freely peer down into the depths of the level, seeing something of what lay in wait, but of course the problem remained of getting down there. And, as an additional surprise, when you think you've seen it all in a particular area, maybe you haven't - witness the sudden flood and the gateway to the "Forgotten World" later in the level.

Secrets

The "Forgotten World", is one of the secret areas in Lost Artifact, where I tried as a designer to give a satisfying "secret" experience. I didn't want to over use the traditional form of Tomb Raider secret - the difficult - to - access square requiring the dexterity of a monkey to access. This is fine for an instant challenge, and a quick reward, but I wanted to create more than that. I also did not want to create the kind of illogical secret that only a mind reader would find (or those that prefer a well-thumbed copy of the commercially available hints guides).

Instead, I opted to create "secret locations", often with a wildly different look to their encompassing levels and often with entirely new bad guys. Thus, the

"Secret Glen" the "Forgotten World" and the "Zoo Seashore" were born. It is work devoting unique bad guys and textures to these locations as they add replayability, satisfying "mini-quest" and enjoyable surprises. As long as your level has enough normal playable substance, then players will enjoy the "expert" feeling of hunting out these hard-to-access areas. You'll find no gratuitous back

flips and double-cling drops here! There's nothing wrong with a quick and dirty secret, though. I often like to sneak in one early in the level, before the player is really expecting it - always gets them tearing their hair out! Secrets that can be seen clearly, in plain slight, but are difficult to access, also can work - The Golden Secret guarded by dogs in "Fools Gold" is one of these - and when you felt you were on the trail of the secret, you knew those dogs would be there, too. Alternately, finding the dogs helped you resolve that the secret was near.

Physical dexterity secrets I had little time for, I preferred to create a secret relying on a physical timed event - perhaps a guard would close a gate if you were too slow, or a monkey may disappear with your prize. I always tried to save a weapon or two for a particularly juicy secret.

Weapon Placement

If you were designing a series of levels, then be sure to provide your weapons in a logical order, or the challenge of the level may not be what you expected. Remember that weapons are amongst the few unique "pick-ups" that you can place, so make the most of them, don't just leave them lying in the corridor. Maybe it's the "UZI showcase" in Atlantis, or the sneaky Inuit Warrior Rocket Launcher in "Kingdom", always try to up the challenge for a quality weapon. Often, though I would work out a specific order of weapon "finds" throughout my levels, I would drop in a seemingly inaccessible UZI here and there… its seems very little is inaccessible or impossible, in Tomb Raider, and it's always worth throwing a bone to those crazy super-experts out there! The thrill of getting the Uzi's a level or two before I intended is worth the slight imbalance in gameplay it caused.

Happy Accidents

Sometimes, those seemingly inaccessible places that players get to were not meticulously planned and plotted. Generally, I would have very little organized before I started building a level; a quick napkin sketch or two, an "A to B" idea of plotting and a couple of cool effects I wanted to try out. I tended to block out the main "action" or "effect" rooms and then work out the smaller, less dramatic journeys between them. Building in initial broad strokes also helps you to keep control over the number of characters, objects and traps you are using in your level, as it's very easy to overload. As you connect from place to place, this is what happens - "happy accidents" (and some tragically unhappy ones, too!). Sometimes, for example, you may find that getting from A to B involves a huge drop of hundreds of feet - hey presto, an immense waterfall appears. Or you may have the problem of getting up six floors quickly to the outside "air" again, and there's nothing worse then a long boring climb, so a giant golden cat is born. Let the ideas flow, and don't stick too rigidly to your original plan - as long as you cover the correct sequence of "bases", and incorporate your required "plot points", then experiment in-between. This has been the source of numerous alligator pits, Yeti hide-aways, sunken U-bouts and Monkey Islands!

Getting from 'A' to 'B' and then onto 'C'…

Easing the connection between your levels, especially without the aid of cut-scenes, is very difficult, and I always try to employ some kind of bridging device. Often extra textures can be used in the transition, a simple "tromp l'oeil" as in the "Kingdom" or a bridging area of the following level in the current level, like the underwater corridor in "Shakespeare's Cliff", or the bones and wall paintings prior to entering "The Furnace". The simple linking device of the helicopter got us from Scotland to Dover in Lost Artifact, and a rubber raft had us ending up on the coast of France. You do take a risk here,

often you are asking a player's imagination to "fill in the blanks". So be careful when jetting Lara to very diverse locations, because you can lose the strong thread entirely. I've been accused of that on more that one occasion! I've tried never to let this limit me!

Sacred Cows…

Don't think that there is one method for designing Tomb Raider Levels, one ambience you must keep, a set of rigid rules you must follow. If you want to have Lara go to Vegas, meet Elvis, and fight King Kong, Godzilla and the T-Rexes, then go for it! There are only so many tombs… If you do have a limiting factor, and it may be that the range of characters available is limited, or the adventure must "just be in Egypt", then delve into your history books. The history and legends of Egypt are rich enough for countless unique adventures. For example, it's up to you how much or how little you draw the modern world into this - it's always easy to delineate rival gangs of adventures, strange modern cults, weird implosions in time to help you achieve your design aims. Maybe your Egyptian "experience" is simply a Grand Exhibition taking place in a major, modern city - the juxtaposition of ancient enemies and modern setting, or vice versa, can always be a dynamic relationship.

Save Early, Save Often, and Test the Darn Thing!

Using the editor can become a frustrating experience, and it pays to be cautious when trying effects or traps that are new to you. I save a huge a huge amount of multiple copies to go back to on sudden crashes or an unexpected breakdown of programming logic! Sometimes your levels growth will spiral out of control, so don't be afraid to split your levels and end up with two for the price of one! I had a "growth problem" with my Scotland level in "Lost Artifact", which I solved with a quick copy, and "Willard's Lair" was born. Having

some of the architecture in place helped to define this level's scope early, meaning I could throw in a huge number of traps and devices. Often there is a trade off between size of built environment, number of enemies, and number of traps, so figure out early what the 'nature' of your level may be. Willard's Lair had about 45 "slot"' for traps and devices, and relatively few "baddies" - compare this to the Tomb Raider "norm" of about 7 trap items.

Experiment with your traps, your rolling balls and spiky walls. This is how the Atlantian "ballroom" emerged, and the spike-filled prison in "Willard's Lair", Just because you've got them to work one way doesn't mean that there isn't a clever alternative use, often more by accident than design.

The Illusion of Life

The default behavior of most of the characters in TR is this: They see you, they come and get you. Using the AI triggers can frequently get you better results and better "illusion of life". I tend to trigger enemies early, give the player a chance to make a 'reaction decision'. Avoid triggering baddies invisibly from empty corners, and behind the players, unless you have established a "logic". There is nothing wrong with having Lara walk past a closed door knowing that eventually it will trigger open, and baddies will pour out. Using the AI triggers will allow you to have Lara secretly survey enemies patrolling or guarding something important, or running off to do some seem-

ingly meaningful thing. This adds immensely to their "life quotient", as you can trigger them to run to a door, grab a pickup or pull a switch. With your bad guys appearing more intelligent, you will feel more intelligent when you kick their arses, too! An interesting option here is to trigger two enemies, visible from a long way off, from two different directions. The sense of anticipation and a difficult

choice can be thrilling, witness the club-thugs climbing down from the mountain, and the other stepping out from the warehouse in "Fools Gold". Having triggers and therefore actions occurring in "clumps" rather than in a singular, linear fashion develops the player's sense of decision-making, and tough choices must be made.

Finally, HAVE FUN!!!! "Rome wasn't built in a day" etc, etc….!!!

I'd like to thank some people who helped me to achieve the levels that I wanted to make, the stories I wanted to tell, and ultimately to "kill off" Lara many thousands of times over the years!! So, stand up Rebecca Shearin, Mike Schmitt, Gary LaRochelle, Kris Renkewitz and all the folks at CORE Design who allowed us to create, continue and enjoy the Tomb Raider Gold Franchise.

Philip Campbell

September '00
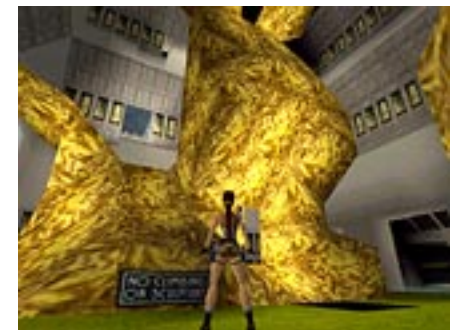
"Why aren't ye playin' me levels?"

CREATING YOUR OWN PROJECTS

The Tomb Raider Level Editor provides involvement for just about every *level* of interest. If you want to create an entire level from scratch, including making your own textures in the paint program of your choice, go for it! If you feel intimidated by modeling an entire level, begin with one of the example levels keeping only your favorite bits - then build new rooms to connect them all. And if modeling and texturing don't interest you as much as fooling around with game-play, use an existing model, remove all the baddies, pick-ups, puzzles and triggers and set up your own.

If you haven't read the *Designing Tomb Raider* section, do so now before going any further! Many of the tips and techniques discussed in that section will help you formulate the concepts for designing and building your own levels. You need to have some basic ideas about what you want to do and what you can do before creating your own project.

What to consider before starting your project:

Choosing a WAD (Object Set)

You learned earlier that the WAD contains all the information for the animations and objects in a particular level. The WAS (rhymes with OZ) file is the list of what the WAD contains. (Refer to *Wad Was What?* for a closer look at how to "read" these files.) Each example level has a unique WAD associated with it – this means you have a total of 7 different WADS from which to choose. By loading up one of the example level projects, you can scroll through the available objects or using Notepad, open the WAS file for each level to see what it contains. (The WAS files are located in the Tomb Raider Level Editor\Graphics\WADS folder.) How you set your priorities will help determine which WAD to choose.

You might want to consider the following before making a selection:

Outside and Inside

Outside - There are four WADS with outdoor capabilities: tut1.was, karnak.was, coastal.was, and city.was. You cannot really edit the sky graphics but there is one exception - you can change the color of the top portion of the night sky in City of the Dead, as long as black is the background color. Check the *City.was WAD Reference* for instructions.

Inside – settomb.was, cleopal.was and catacombs.was do not have horizon graphics…if you were to create an outdoor area using any of these WADs, the horizon would appear black.

The Baddies Which enemies are available? If you want a dog baddy in your level, choose settomb.was…it is the only WAD containing a dog. If you prefer a crocodile, you have two choices….karnak.was or coastal.was, and so on. Again, for a quick look at what is available in each WAD, refer *to WADS – A Quick Guide* in the Reference Section.

Puzzles, Keys, Traps, etc. What kinds of puzzles and traps do you want?   Do they fit with the general idea of your level(s)? Some of the same puzzles appear in more than one WAD which provides more flexibility in how you set up your puzzles. (i.e. If you want to spread the pieces out among different levels, you either have to select WADs that contain the same puzzles or use the same WAD for the different levels.)

Props and Architectural Elements   Probably less of a determining factor for most but may be important   to some. The distinctive features found in the various WADs are definitely worth considering! These static objects occupy several different slots in the WAS script…namely Debris, Plant, Furniture, Rock and Architecture. To view what is available a) load the example levels and scroll through the object menu or b) open the Room Editor and under "Objects" in the Drop Down Menu, load a .WAS file from the WADs folder and scroll through to view the objects.

Choosing a Texture Set

In addition to the textures associated with each example level, you will find a folder called EXTRAS with maps from other Tomb Raider levels. Choosing a WAD will help dictate your choice of textures since you cannot edit the textures of the baddies and objects. However, you CAN change the lighting and color of light on baddies and objects (as demonstrated in the tutorial) which allows some control should you want to use texture sets varying in overall color from the objects in a particular WAD. Sometimes you will find it necessary to edit the texture set you have *selected (Tips for Creating/Modifying Texture Sets* in the 'Advanced Skills' section). You might consider whether or not you will need:

- ◆   Water textures? Mist? Lava?
- ◆   Outdoor textures like rock, sand, foliage?
- ◆   Specialty textures such as the beetle in Cleopatra's Palaces?
- ◆   Any other textures with special signs or symbols?

Setting Up

Just to keep everything neat and orderly and to insure minimal problems and error messages later on, set up your project folders with the same structure as the existing projects. For example, create a new folder in the Maps folder, and name it whatever you are going to call your project. You will develop your own system for keeping track of files, but it helps if everything associated with a project has a related name! Make a copy of the texture file you want to use and move it into this folder…rename it according to your project. If you want to change the name of your WAD file, see *Customizing your Levels* later on in this section.

Putting Your Project Together

Load the Texture File

Once you've opened the editor you will need to load up your Texture file. (Use Drop Down Menu under "Textures" and choose "Load TGA" or the LOAD TGA button below the Editor Window.) You can only use one texture map per level….if you like textures from different maps, you'll need to create a new map. (See 'Advanced Skills' *Tips for Creating/ Modifying Textures*) Once a project is saved, it remembers the path and location of the texture file. That means if you move the texture map later on, you will get an error message when the project is loaded. (Arg list too big) If this happens, reload the texture map and save your project,

and then don't move it again unless you enjoy creating extra work for yourself! Check *Tips for Creating/ Modifying Textures* for instructions on setting animation ranges, assigning sounds and bump maps to textures.

Load in the Objects (the .WAS file)

Look in the WADs folder (\Tomb Raider Level Editor\graphics\wads), the folder where all WAD files reside. View these files in Window's detail mode and click "Name" so that all the files comprising your WAD will be together. Notice that about ten files comprise a WAD (including one with a WAD file extension). You may deal with some of these files later, but for now it is enough to know their location. To view a list of what is in a particular WAD, open the .WAS file, using Notepad or MS Word. (Check the FILE FLOW CHART for a clearer idea of what these files do)

To load the WAD, go to "Objects" in the Drop Down Menu and select "Load Objects" or use the "Load Objects" button below the Editor Window. Only files with the .WAS extension are visible. You can load objects before you begin modeling or later when you are ready to begin placing them. Once a WAD is loaded and the project saved, the WAD will always load with the project (providing the file structure remains the same!).

> *IMPORTANT: After loading the objects and placing some in your project, if you load in a different WAD, all objects not in the same .WAS file "slot" will disappear from your project…along with all their triggers. Make sure the WAD you choose has everything you want before getting too far along!*

Saving Your Project

In the tutorial the importance of saving your project using different iterations was stressed. You'd hate to spend weeks on a project, then lose everything! Remember, when you enter the preview mode or output a WAD, the editor will automatically save y our project, but when you quit out of the Room Editor, the autosave.prj is automatically removed.

Making a Playable Level

The Level Converter (tom2pc.exe) converts the .TOM file into a playable TR4 file. When you convert the .TOM file to the playable TR4 file, it automatically writes over the existing TR4 file in your data folder. To

preserve earlier versions or other projects made using the same WAD file name, you can either rename the existing TR4 file before using the Level Converter or move it into a "safe" folder**.**

Customizing Your Levels

Making Script Changes

The **script.txt** file is used to create another file - Script.dat. This file dictates what order the levels are in, what their names are, etc.   At some point you might want to change the names of the levels, add more level slots, add a text line at the beginning of your level, and so on. To make any of these changes, you will have to edit the Script.txt file as well as the English.txt file and execute a few DOS commands. (Need help? Go to DOS 101 in the *Reference Section*)

Each level in Tomb Raider has it's own block of information in the script.txt file. Here is an example of a "block" of information for the Temple of Karnak example level:

```
[Level]

Name=          Temple Of Karnak
Horizon=       ENABLED
Layer1=        128,96,64,7
Puzzle=        2,Canopic Jar 1,     $0001,$0320,$0000,$0000,$0000,$0002
Puzzle=        3,Canopic Jar 2,     $0001,$0320,$0000,$0000,$0000,$0002
Puzzle=        1,Sun Talisman,      $0000,$0500,$0000,$0000,$0000,$0002
PuzzleCombo=   1,1,Sun Disk,        $0000,$0180,$0000,$0000,$0000,$0002
PuzzleCombo=   1,2,SunGoddess,      $0000,$04b0,$0000,$0000,$0000,$0002
Puzzle=        5,Golden  Vraeus,    $0003,$0300,$0000,$0000,$0000,$0002
Puzzle=        7,Guardian Key,      $0009,$0300,$0000,$0000,$0000,$0002
Key=           2,Hypostyle  Key,    $0000,$0400,$0000,$c000,$0000,$0002
LoadCamera=    89366,-258,48077,88372,-1300,45701,0
Level=         DATA\KARNAK,110
```

Changing the NAME of a Level To change the name of the Level that appears on the "Select Level" screen, open the script.txt file (found in the Script folder), and type in the new name after the first line, Name = XXX. Anything that will be displayed such as a title name or a "legend" must also be included in the English.txt file.

Editing the English.txt file Open the English.txt file and type in the new name EXACTLY the same as it is written in the script.txt file on or just beneath the name you are changing. *You can't change the order of text in this file*. (The names are found in the "Generic Strings" section.)

Adding Additional Levels In the Script.txt file, find the level containing the WAD file that you chose for your new level. Cut and paste the entire block, then insert it where you want. Type in the level name as per above. Don't forget to make the necessary changes in the English.txt file as well.

Changing a TR4 File Name Look at the entry after Level=DATA\ ….it *must match the name of the WAD file used for that level* . If you have used CITY.WAS, then you must enter CITY after DATA. What if you want to use the same WAD file for several different levels? You then must rename your wad file (all ten files!) and enter the new name into the script. (Make sure you use the section of script for the WAD file you copied or your puzzles won't work) So, if you change the name of all the files in the CITY WAD file to CITY2, when you make your playable TR4 file using the Level Converter, the TR4 file will become CITY2.TR4, and will be playable only when you add the new name to the script. The new WAD file names don't have to be included in the English.txt file.

Disabling Certain Functions You've gone to a lot of trouble to create your levels, and you don't want your friends using cheat mode to get out of a tough situation! You can disable this mode simply by typing DISABLED after "flycheat". The same goes for "play any level"…if you want players to finish a level before they can move on to the next level, type DISABLED after this function.

Changing Load Camera Coordinates You can replace the Level Load screen and the level reload screen by relocating the camera and changing its angle. Here's what to do:

- Temporarily place Lara in the room you want to use for the load screen.

- Make a playable TR4 file.

- While in-game, use the "look around" key to find the camera angle that best displays the view.

- Press the F1 key - the coordinates for the position, target and room of the camera will appear in the upper left corner of your screen. *These coordinates will only appear with "Flycheat" enabled* in the script! Now type the coordinates into the script and don't forget to add the room number! This information is required in the script for loading the images between levels.

Changing the Initial Audio Track The last line of the script for each level segment is, for example, Level = DATA \ CITY, 105. The number refers to the background audio loop for that level – you can change this by entering the number of the new track you wish to play, after the level name as in the example.

Using DOS commands to create the .Dat files In order for any of these Script changes to become effective, you will have to create new DAT files that you must copy over the existing files in your Tomb Raider Level Editor root directory.

- Go to your DOS window via the MS-DOS prompt on the Start Bar.

- Get into the directory containing the script.exe (C:\Program Files\Core Design\Tomb Raider Level Editor\Script) then use the following command: script script.txt

- You should now have three new files (Script.dat, English.dat and Strings.H) in your Script folder. Move these into your root directory and your new changes will be effective the next time you play.

Editing Sound

You may want to change some of the sound files (be nice!). There are two different locations for the different sound files used in the game. The "Samples" folder (in "Sounds") contains mostly all the sounds associated with Lara, the baddies and any of the animated traps, puzzles and props. The Audio folder contains those used with the CD trigger as well as the background audio loops.

Samples Folder (standard 22khz wav files) To change these, name the new files **the same names** as the ones you want to replace and copy over the existing files. You will then need to make new SAM and SFX files for the level(s) affected by the change.

- Go to your DOS window

◆ From the LevelSFX Creator directory type the following DOS command: pcwadsfx settomb c Of course, use the WAD (along with its associated letter) you wish to change. The letters associated with the different WADs are as follows:

tut1	Tu (upper and lower case)
settomb	c (lower case)
karnak	h (lower case)
coastal	p (lower case)
cleopal	r (lower case)
catacomb	s (lower case)
city	w (lower case)

◆ Two new files (with SFX and SAM extensions) will be generated in your LevelSFX Creator folder. Move these into the WADs directory. You will have to make a new TR4 file before the changes will take effect.

Audio Folder Audio tracks (MS-ADCPM 44khz wav files) from 0 – 111. Copy over existing files to change the Audio tracks. Changes become effective as soon as you open the game, since these sounds are not integrated into the TR4 file.

Changing Load Screen Graphics
You have several options here.

The First Load Screen Simply replace the load.bmp file in your root directory with the image of your choice. Make sure it is the same size and format as the existing file. The change becomes effective the next time you open the game.

The Front End Logo Title and Text To change this, you need to use another DOS command.

◆ Create your new uklogo.BMP image and save one as a .RAW file. Copy these over the existing files in the Logo folder. (C:\Program Files\Core Design\Tomb Raider Level Editor\Logo)

◆ Go to your DOS window and from the Logo directory, type the command: packer uklogo.raw

◆ Now move the newly created uklogo.DAT file into the Data folder. Change becomes effective next time you open the game.

Level Load Screens See "Changing Load Camera Coordinates"

Modifying the Title Flyby

Title.prj In the MAPS folder you'll find the title flyby project. It loads like any other project. You can modify it or create an entirley new one. If you use a different WAD, you must remember to enter it in the script. Don't forget that you can change the background audio track by entering a different track number on the last line of the TITLE entry in the script.

You have all the information you need to strike out on your own. The next sections of the manual introduce skills not covered in the tutorial and include the object specific parameters needed in order to use many of the items in the object sets. It is to your advantage to take a look at everything so you at least have an idea where you can find the information you need!

ADVANCED SKILLS

You now have a good foundation for building a level but there is more to learn. Surprise! It would be impossible to explain everything at the same *level* of detail as the tutorial so it will be up to you to do some investigating and reverse engineering. Instructions for many skills not covered in the tutorial are given below, along with reference to those same techniques used in the example levels. The Tomb Raider Last Revelation levels provided with the tutorial are not finished levels and not intended to be played as such. They have been included to provide examples of the various skills and also to be used as a springboard for those who do not wish to build their own "worlds", but would rather spend their time designing game-play.

A few important tips before you begin your sleuthing…

◆ Get familiar with the "find object" function under "Objects" in the Drop Down Menu and use it to go directly to an object in a level so you can see just how it is set up.

◆ Use the "Object to Trigger" and "Trigger to Object" buttons to find linked triggers and objects. When you highlight an object then press "Object to Trigger" it will take you to the trigger and vice versa.

◆ When you are looking at an object, don't forget to use the "O" key to bring up its the "Object Code Bits" window. Many special functions are flagged in this window, and you will need to check to see if there are any. A good example is a pick-up item placed on a pedestal - it needs a specific number entered into the "Object Code Bits" window in order to activate the right pick-up animation…you did this when you set the trigger for the puzzle pieces in the tutorial level.

◆ Click on the triggers you see in the Plan View Grid. Each click cycles through everything from objects to triggers on a single square or zone of squares. If there is a special trigger in the stack, remember this affects all others triggers.

◆ Click on the trigger text box next to the pink trigger button to see if there are any special trigger settings. Don't forget to take note of the one shot button and the code bit buttons.

Instructions for more advanced skills with reference to examples are provided below:

Modeling Tips
Large outdoor spaces

The biggest drawback here is the distance limitation, which is about 18 squares. Check both the Karnak and Coastal Ruins levels to see how the illusion of a large space was created and how clever use of walls and terrain were employed to minimize the problem with the black horizon color. Remember to use the "O" button (beneath the Plan View grid) which stands for "Outside". This button will move Lara's ponytail in the breeze!

You might want to change the background audio track when you move from inside to outside or vice versa. You remember from *Creating Your Own Project* that every level has an initial audio loop assigned to it. (You can find out what it is by looking in the script.txt file.) Look at the Karnak level, room 23. Just outside the door leading inside is a trigger for the same background loop assigned in the script. Just inside the door is a trigger for the indoor sound loop, which once triggered, overrides the other. If Lara turns around to go outside again, the outdoor loop will be reactivated.

Diagonal corners –" No collision" and transparency assigned to Triangle "vestiges"

You learned most of the modeling basics in the tutorial except for one…creating diagonal corners between vertical portals. Portal openings are "cut" around the blue squares at right angles, so when a portal is created between two rooms where diagonal corners are involved, triangular halves will be left sticking out into the portal, thus necessitating the use of transparency and "no collision". Without these settings Lara would appear to be walking on water or standing in thin air. The best way to understand how to accomplish this task is to take a look at the model *before* and *after* reading about "No Collision".

In Tomb of Seth room 15, go to the underside of one of these triangles (they will appear gray with FACE EDIT "on" and maroon with FACE EDIT "off"), and highlight the slope beneath one such triangle. Move it down one or two clicks so you can see the ceiling square above it. You will notice its back corner turned down one click, thus breaking it into two separate triangular surfaces.

No Collision You might ask what is so difficult about assigning "No Collision" to a square. First of all, in order to assign "no collision" properly and avoid getting an error message when you output the WAD, you must assign it to a triangular segment of a square with a "broken" surface - it cannot be assigned to a flat square. This is not a problem with the floor triangle sticking out into the portal from the room above a connecting angled slope, because the square's surface was "broken" when the slope was created. It's a different story with the slope in the room below. The square building block creating that slope is actually a floor square that meets up with the ceiling square. (Remember, a square with a broken surface can touch the ceiling unlike a flat square that stops one click short of the ceiling.) So, you are left with a flat ceiling square, kind of sandwiched between the top and the bottom of the two slopes - its triangular half is sticking out into the portal (right under the one from the room above). You cannot assign "no collision" to it properly because it is still a flat surface (the other triangle "half" is actually hiding between the bottom and top of the two slopes). What you must do is select the flat ceiling square in question, then point the arrow towards the corner of the "hidden" portion and bend it down (or up) one click (CEILING "-") to break its surface into two triangles. "No Collision" can now be legally assigned to the triangular portion left sticking out into the portal. The triangle will turn maroon once "No Collision" has been assigned.

Transparency Color These triangular pieces need to be assigned a transparent color in order to hide them from view. When applying a transparent color to squares in between rooms you use the gray transparency color (next to the black one in the top left corner of the palette

below the Editor Window). Of course, if your portal has a water surface, you would apply the water texture with the transparency button on! When you view a room with the lighting button on, the transparent gray color appears white or "invisible".

Transparency Between "Doors"
Toggle Opacity 2…again!

Cobwebs
You learned successfully to create water using Toggle Opacity 2. If you recall, this allowed the placement of textures on an opening, yet Lara could still pass through it. The cobweb effects are created about the same way as water, but they are on horizontal (well, most of them!) rather than vertical openings. Check room 36 in Tomb of Seth to decode some of these spooky passages. Remember, to toggle opacity, from the Plan View grid you click on the portal opening to select it (the green highlight), then press the "Toggle Opacity 2" button. After this, you can apply the textures with the TRANSPARENT and DOUBLESIDED buttons ON.

If you have checked out these cobwebby portals already, you noticed the gray transparency color again….the areas of the portal that don't require the cobweb texture would appear opaque if you didn't assign transparency...and just as with the triangle "vestiges" you must use the gray transparency color between rooms.

Mist
By now you can probably guess how to create the mist in room 56 of City of the Dead. Again, this takes some planning ahead since you must build a separate room beneath in order to create the "portal" to which you apply the mist textures (TOGGLE OPACITY 2 with the TRANSPARENT and DOUBLE-SIDED buttons ON). The mist room (akin to the water room) must be fairly shallow since Lara would look a little odd walking through eye level mist. If you make a larger area of mist and want to poke some "islands" through it, you build the top portions of the "islands" on the upper of the two rooms *before* you make your portal opening. And, to create an effect of mist over water build a shallow mist

room above the water room…some effects are worth the extra work! Click on the "M" (mist) button and assign a value for special "mist" effects. (Check citytext.tga to see what the mist textures look like.)

Toggle Opacity

Windows, floor grates and such
You might think you can just throw on a texture with transparent background to create a window effect between two rooms, but not so! When you want to create a transparency effect between two rooms such as barred windows, fences, floor grates, etc., but don't want Lara to pass through the opening, use "TOGGLE OPACITY". This will allow transparency but NO passage. You must apply it from both sides, unless it is a situation where she can only pass through from one direction. Check Catacombs room 125 and 38, Tomb of Seth room 36.

Additional Effects Menu Features

Flyby Camera – Find full instructions and chart with special parameters in Reference Section. For good examples of this "fun to use but don't abuse" camera, check Tomb of Seth, rooms109, 17, 29; Coastal Ruins, rooms 128, 16 and Cleopatra's Palaces, room 128.

Fog Bulb – You can create some great volumetric fog with this special effect, but it *will not* show up at all unless you have the "Volumetric FX" setting turned on in your initial game Setup menu. The Fog Bulb is used in conjunction with Flipeffects only. You must enter the number 28 in the upper right box of the trigger window for the fog effect and a number in the "Timer" box for a specific color from the Flipeffects Fog Color Chart (found in the Reference Section). The flipeffect trigger is used in Tomb of Seth, room 30 (activated by the flyby camera) to turn on all the fog in the level. This fog effect works well with light shafts as seen in room 36.

Sinks – Sinks are used in water rooms exclusively to create currents to either pull Lara to a different spot or prevent access to areas not intended for her to go. Once placed, you can set a sink's strength by calling up the "O" menu and clicking on the numbered buttons 1,2,4,8 or 16. You can combine buttons to set different strengths. Triggers must be set and most often, a zone of triggers is used. You can stack triggers on one square to increase the strength. Check the sinks in Karnak, rooms 47, 41,120 and Coastal Ruins, rooms 40 and 12.

Sound – You can place any of the sounds available in the window that pops up when you choose this option from the "Effects" menu. When placed on the map, a small sound icon will appear. These placed sounds do not need to be triggered but are programmed to activate on a proximity basis. There is one catch, however. Whatever sound you choose from this menu must be in the sound files in your WAD. How do you find out if it is? You must look in the sound.txt file (Tomb Raider Level Editor\sound\LevelSFX Creator) and check to see if the associated letter for your WAD (see "Creating Your Own Project", *Editing Sound*) is next to the sound you want to use. If it is not, you must enter the letter for your project's WAD next to the sound file you want in your level and then create the new .sfx and .sam files as described in the *Editing Sound* section. If you are adding additional sounds to your WAD, be selective and don't add too many. Adding sound increases file sizes. It is a good idea to write down file sizes before and after making changes …then if something "breaks", you have a better shot at fixing it. Using these placed sounds can sometimes cause the Editor to crash, so it is advisable to save just prior to placing them in your map. Check Cleopatra's Palaces, room 70. Several "fountain loop" sounds have been placed around the fountain.

BADDIES and Their AI

"Giving a behavior to a baddy" You placed and triggered a few baddies in the tutorial project and learned a little bit about the individual AI (artificial intelligence) of the baddies available in that particular WAD. For the specifics on how to use the baddies in each WAD, refer to the specific WADs in the *Reference Ssection*.

If baddies aren't given a special behavior they just go after Lara as soon as they are triggered. To give a baddy a special behavior you need to place an AI object on the square with the baddy whose behavior you are modifying. The baddies 'pick up' their instructions from these nullmesh AI "dummies". Not all baddies are programmed to work with all the AI available…a little experimenting is required. The following is a rough guide only. The various AI work mostly with Baddy_1, Baddy_2 and the SAS guard:

AI_GUARD – Makes the guard move his head about, looking left and right, with a 180 degree field of view. Drop an *AI_MODIFY* on the block as well, to make the guard

look straight ahead only. Guards begin attacking once Lara shoots at them, or in some cases, when she comes into their view and gets within one block of them.

AI_AMBUSH – Makes the baddy run to a designated square by dropping an ambush object on his square and another on the square where you want him to go.

AI_PATROL1 & 2 – To make a baddy run a patrol between two points, drop an *AI_PATROL1* object on his square, drop another *AI_PATROL1* object somewhere else on the map, and finally an *AI_PATROL2* in another location. The baddy will go from the (second) *AI_PATROL1* to the *AI_PATROL2* and back again. Conditions for chasing Lara are the same as the Guard behavior.

AI_MODIFY – Drop an *AI_MODIFY* on the block with the *AI_GUARD*, to make the guard look straight ahead

AI_FOLLOW – Baddies with this behavior are probably "goodies". To make a baddy wait for Lara to follow him to a specified point on the map, drop an *AI_FOLLOW* object on its block, and drop another *AI_FOLLOW* on the map where you want the baddy to go. Use this to get "baddies" to show Lara a switch or a secret room. If Lara attacks the baddy, he will immediately forget about the follow behavior and attack her instead (except with the Guide in "Tomb of Seth", Lara can't kill him and he will not attack her).

AI_X1 – AI_X2 – Drop one of these on the SAS Guard baddy square to make him fire grenades (if you drop an *AI_X1* on a different Baddy, and he is triggered first, the *AI_X2* badddy will not fire grenades).

> **NOTE:** *If you put a HEAVY trigger under an AMBUSH or PATROL AI point, the baddy will trigger it when he gets there.*

General rules about Baddies:

◆ A baddy is never visible until triggered.

◆ A baddy's **zone** is basically the area that he can get to and is dependent on what animatioins he has.

◆ The AI in Tomb Raider in principle allows any baddy to follow Lara from one end of the map to the other. However, for game play and memory reasons, most baddies do not have the animations for climbing up or down blocks or for jumping very far. In fact, the "average" baddy can only go up or down 1-click changes in height.

◆ With a slope, if the change in average height from one block to the next is more than 1-click, then most baddies won't be able to go up or down it.

◆ Baddies can *never* (even if they're jumping or flying) pass over an illegal slope (i.e. one that Lara would not be able to stand on).

◆ Box zones (splitter boxes) are placed where you want to stop baddies from traveling. These squares appear gray once assigned (use them sparingly!). NOTE: Flying enemies cannot be stopped this way.

◆ You can place a pick-up item (ammo, weapons, medi-paks) on the same square as a baddy, and a pick-up will be left on the same square where he dies. This method could be overused and of course, it wouldn't make a lot of sense to shoot a scorpion and watch it turn into a large medi-pak…or would it!?

Puzzles and Keys

Each WAD contains several different puzzles…some more than others. It isn't recommended to use every single puzzle available, but numerous have been provided to give you a variety of choices, especially if you want to use different WADs with puzzle pieces spread over several levels. Unfortunately, without the advantages of hard coding, you won't be able to use any pre-made cut scenes as a reward for completing a puzzle, but with a little ingenuity and the flyby camera at your disposal, you can invent your own!

Check *Using Trigger Code Bits* in the "Trigger Tips and Tricks" section below to find out how to set up more complex puzzles requiring multiple actions to activate.

A few general tips:

◆ Always study the puzzle pieces before placing any to make sure you are clear on how many parts are used…some puzzles have pieces that are combined, in which case, you never place the combined image of both pieces. Generally you only place the pieces Lara needs to find and then the puzzle "hole". Never place "puzzle_done" on your map.

◆ In the tutorial you learned how to set it up so the player could not leave the area until the puzzle piece was found. Try not to create a situation where the player can get to the end of the level and not be able to finish a puzzle (therefore not finish the level) without having to retrace steps….especially if it is a long distance. BORING!

◆ As with pick-ups, you can leave puzzle pieces or keys on the same squares as the baddies for Lara to pick up once the baddies "vanish". Again, use good judgement and don't overdo.

◆ You may need special code settings in the OCB for a puzzle to work properly. For example, special settings are needed in order to pick a item up from a pedestal or to pry a scarab off the wall with the crowbar. Refer to **"**General Wad Object**",** *Settings for PICK-UPS & PUZZLE ITEMS* for a list of these settings.

Trigger Tips and Tricks

Before taking a closer look at the different Triggers and what they can do, check the Trigger Triggerer!

TT - The Trigger Triggerer You may have read about the trigger triggerer while navigating through the Editor Interface Section or you may have seen it in while browsing through the object menu. The "TT" is a nullmesh dummy item that is placed on the map. You highlight the square where you placed it and press the "T" button (next to the "B" button below the Plan View grid). This will border the square with a dark blue line, visible in the Plan View grid only. Now put a trigger for it on a switch or anywhere you want the "TT" to become activated. Triggers placed on the square with this nullmesh *will not* become active until the "TT" nullmesh is triggered. This way you can place triggers for enemies, traps, whatever under the "TT" and Lara can walk over the "frozen" triggers without activating them until you want her to. This is convenient when Lara has ventured into a room at the end of a hallway and you want her to trigger baddies on her way back out….

You will find good examples throughout the levels – use the "find object" feature to locate the nullmesh, then use "Object to Trigger" to locate the trigger, or check room 76 in "Tomb of Seth". Notice there are two rooms with the number 76, one containing the "TT" nullmesh and the other with the trigger for the "TT". You can give rooms the same name if it helps you keep track of things (the real number is always next to the name in parentheses).

Kill all Triggers – This is nullmesh dummy object found in the objects menu is no longer used.

Set Trigger Type Window – Trigger Options

The default setting for the TRIGGER options is "object" because most of the time you are setting up a trigger for a specific object. However, you have the means to create some truly amazing effects. Click in the text window next to TRIGGER to pull up a menu with the following options:

Flipmaps (not to be confused with Flipeffects)

Flipmaps are used to create events or changes of state. They are great for floods, earthquakes, changing water currents, making doors disappear, turning lights on or off, and so on. Flipped rooms are basically copies of an existing room that can be triggered to turn on and off. Generally the triggers for flipmaps are set up out of sight of the actual flipmap room because you don't want to see the map flip from one state to the other.

To create a flipmap room, click on the "F" button under the PLAN VIEW grid or choose "flipmap" from the Drop Down Menu under "Rooms". The white background of the Editor Window turns black when you are in the flipped room. Make whatever changes you want, then use the ALT + F key to get back to the un-flipped room. Select a square where you want to set the trigger and click on the trigger button. Set the trigger to "flipmap". You can type a number in the box next to the "F" to control which flipmaps turn on at what time (make sure the same number is entered next to "flipmap" in the "set trigger type" window). All corresponding flipmaps will turn on when activated by one trigger.

The following are some tips for building flipmap rooms:

◆ Always totally build, texture and light a room or rooms that are intended to be flipmap rooms, it saves a lot of time.

◆ Make sure that the entrance and exit rooms have been connected before you flip the rooms - you won't be able to link doors from an un-flipped room into a flipped room.

◆ In a flipped room, opacities can be freely changed, as also can "water room" status.

◆ Only non-static objects can be placed in a flipped room…this means basically you can only place things found in the plant, rock, architecture and debris slots. However, you can place enemies and other types of animated objects such as flame emitters in the regular room and then trigger them from the flipped room. They will appear in the flipped room once triggered.

◆ Enemies sometimes don't work very well around flipmap rooms - they can be placed but sometimes the collision gets confused. A bit of trial and error is required.

◆ To delete a flipmap simply press the "F" button while in the flipped room. A box will pop up asking if you really want to delete the room. This deletes the flipped room only.

There are plenty of great examples of flipmaps throughout the levels. When you go to check them, remember, you can't directly select a flipped room using the "select" button. You'll see the flipped room listed but you must go to the original room then use the ALT + F key to get to the flipped room version. "Tomb of Seth" rooms 109 and 107 provide good examples of water turning to lava and room 72 creates the illusion of a sand "fall" filling up a room.

FLIP ON and **FLIP OFF -** These triggers are used in conjunction with FLIPMAPS but aren't used that often. They are useful when, upon occasion, it is necessary to turn a flipmap on then off again. Make sure you type the corresponding flip map number in the box next to FLIP ON or FLIP OFF. Check out room 159 for Flip On and Flip Off triggers.

TARGET - Use the camera target for pointing a camera (basic or fixed) at something other than Lara. A Camera Target nullmesh (from the object's menu) is placed where you want the camera to point and both are triggered to the same square. The Camera Target nullmesh trigger is then assigned the "target" option so the camera will know to point at it instead of Lara. Example levels are full of camera targets…use "find object" to locate the Camera Target nullmesh.

FINISH – Use this trigger to end the level or jump from one level to another.

> **End the level** Use this to trigger the end of the level. You must include the number of the level you want to load up next in the box next to FINISH. Check Tomb of Seth, room 57

> **Jump between levels** FINISH is also used in conjunction with the "Lara Start Position" nullmesh to go back and forth between maps. Finish triggers and "Lara Start Positions" with the same assigned numeric value are placed in each Exit/Entry point.

CD – Activates an audio track from the Audio folder in the root directory. Trigger different ambient sounds for different locations using CD triggers on either side of the door as Lara moves in or out. The track number must be entered in the box next to CD. Sound triggers use the code bits in the Trigger box to allow you to play a track more than once. (Before TR3 you could only play an audio track one time!) A track can be played 6 times by setting the code bits as follows.

	1	2	3	4	5	6
Bit 1	ON	ON	OFF	OFF	OFF	OFF
Bit 2	ON	OFF	ON	OFF	OFF	OFF
Bit 3	ON	OFF	OFF	ON	OFF	OFF
Bit 4	ON	OFF	OFF	OFF	ON	OFF
Bit 5	ON	OFF	OFF	OFF	OFF	ON

FLIPEFFECT Flipeffects are a way of triggering things without having a specific controller. They are one offs - e.g. Shaking the screen or playing a sound effect on a particular frame of a baddy's animation. However, many of these effects are "hard-coded" and not able to be set up from within the Level Editor. Like the CD trigger, you have to assign the flilpeffect number. Enter it in the box next to FLIPEFFECT. The list of flip effects are in the Reference Section. For a complete list of flipeffects, go to *Trigger Type Settings* in the Reference Section.

Effect Number	Description.
2	Plays a flooding sound effect (providing the sound is assigned to the level)
4	Used for ending the level.
7	Activates any earthquakes on the level.
10	Will play the sound effect number that's in the 'timer' field.
11	Will play an explosion sound effect.
28	Set's the RGB color of the fog in the PC version to the value in the "timer" field - (see table in reference section) This effect can only be seen when "Volumetric FX" is turned on in the game Setup menu.
30	Used in the training level and with the GUIDE to track Lara's "progress."
31	Kills any scarab beetles that are currently active.

There are plenty of examples of flipeffects…check Cleopatra's Palaces, rooms 124, 125, 39; Catacombs rooms 167,143, 40; Tomb of Seth, rooms 30,121,147.

SECRET – This designation calls up the "secret" sound. You must enter a different number for each secret in that level. Make sure you click on the "one shot" button!!   Check Tomb of Seth, rooms 48, 158 and 34.

BODY BAG – not used

FLYBY – used only when creating a title screen.

CUT SCENE – not used

Set Trigger Type Window – Trigger Types

Generally, straightforward triggers are used, hence the default setting of "trigger". The following are options that provide ways of setting up a variety of special and sequenced events. Here are some basic things to keep in mind when setting triggers:

- Special triggers such as pad, switch, key, antitrigger and antipad cannot be stacked (no more than one of these types per square)..one of these triggers overrides all other triggers.

- Basically any trigger with a timer set cannot be placed on the same block as another trigger with a different timer.

- If any of the trigger fields are set to anything other than the default "TRIGGER", they too cannot be overlapped.

- If you set a trigger to "HEAVY", all triggers on that block are also set to HEAVY even though their fields are still set as normal.

PAD – A pad trigger must be walked or stood upon to activate. Lara can jump over a square with a pad trigger and it will not be activated…check room 69 in Coastal Ruins for good use of pad triggers. In order to place two pad triggers on the same square (since special triggers can't be overlapped), a regular trigger is placed with the pad trigger.

SWITCH – When a switch is used to open a door, the trigger must be set for on the same square for the switch and the door, and the switch trigger designated as such. Often additional triggers are stacked on switch triggers because they will not activate until the switch is "flipped". This is a good way to illicit an event in response to an action – i.e. the switch is "flipped" and you get a camera view, a flip map, a

baddy….Check Catacombs, room 13; Karnak, room 69; Tomb of Seth, room 55.

KEY – Any type of puzzle or key hole requires a trigger with this designation in order for its correlative action to occur; such as a door opening as a result of Lara using a key from her inventory, an animated effect after inserting a puzzle piece into a receptacle, and so on. This is another opportunity for stacking triggers and setting up other events as mentioned above. Check Karnak, room 56; Coastal Ruins, rooms 140 and 129.

PICKUP – Makes the action of picking up an object such as a medi-pack or ammo become a trigger for an event like a rolling ball. Check Karnak, room 88; Cleopatra's Palaces, rooms 128,149 and 159 and Tomb of Seth, room 3.

HEAVY – Heavy triggers are activated by anything but Lara such as an enemy, guide, pushable object or shatter object. Once a heavy trigger is placed on a square, all other triggers become heavy and will not be activated by Lara. Check City of the Dead, room 144; Catacombs rooms 183,41,50; Tomb of Seth, rooms 109 and 30

ANTIPAD – Turns off whatever was activated by a pad trigger. (see antitrigger)

COMBAT – Not currently used.

DUMMY – Bridges and raising floors…any placed object Lara walks across must have a "dummy" trigger set beneath it to prevent her from actually falling through the "opening". A good example of the dummy trigger is room 58 in Tomb of Seth, used with the sand trap.

ANTITRIGGER – Turns off whatever was activated by a corresponding trigger. It cannot be used on timed doors. Since one of these triggers overrides all other triggers, use it to your advantage. If two antitriggers are needed on the same square, use one antitrigger and one normal trigger – the normal trigger automatically becomes an antitrigger, thus creating two antitriggers…a neat way of getting around the "no two special triggers on one square" rule.

HEAVY SWITCH – A switch designated to be activated by someone/thing other than Lara.

HEAVY ANTITRIGGER – Deactivates a heavy trigger.

MONKEY – A trigger that only becomes active when Lara is Monkey Swinging – nice if you want a different camera or a trap only to be triggered when Lara is "swinging." Check Catacombs room 27.

Using Trigger Code Bits – the series of numbered buttons below the "one shot" button default to all five buttons in the on position. The settings were given above for allowing you to play a CD track multiple times, but trigger code bits can also be used to set up multiple triggers for one event. This means Lara will have to perform more than one action to get a response. For instance, a door could have two separate triggers, one that feeds bits 1 & 2 and the other supplying 3,4 & 5, so that only when both triggers are active will the door open. (All code bits must be fed by the multiple triggers for one event, so if you have 3 triggers for one event, one trigger would be set to 1, the next to 2, and the last to 3,4 and 5)

Using code bits for multiple items can be difficult to set up but very useful! Check Catacombs, room 147 for a good use of trigger code bits. Five sets of shatter bones have been placed around several rooms with each trigger set to one of the five code bits. Each set of shatter bones has a heavy trigger set for the Raising Block, which will not activate until all five sets of bones are shot.

Other Cool Features Worth the Trouble

Creating a mirror effect - You probably remember the mirror room in Coastal Ruins – quite a cool effect! You can re-create this in any level, with a few modifications. The coastal.was is the only one containing the transparent objects used in front of the mirror wall, but they aren't essential for creating the effect. If you want to set your mirror room up like the one in Coastal Ruins, check out room 69. Here are the basic steps involved, but first, make sure you point your rooms in an east/west direction….the mirror, which divides the room, needs to be on the X axis, which runs north and south…and remember, only Lara will be reflected by the mirror:

1) Create a room, but keep it simple because you'll need to create a mirror image if you want the final results to be convincing. Keeping things fairly simple will cut down on the work involved. This is a good time to use the "mirror room" command, even though it has nothing to do with creating the reflection of Lara!

Remember, any lights or objects must be placed in the opposing room, so you'll want to use symmetrical objects.

2) After mirroring your room, joint them with one big "portal", then use Toggle Opacity' and apply the mirror texture remembering to turn on the transparency button before applying! (If you are using a different texture map than coastext.tga, you can always cut and paste the glass texture tile into your map)

3) Now the fun part. Click on the right (east) room (it will be the main room, the one Lara will actually run around in). In Plan View, click on the upper most left square of the room to get the X" coordinate in the info box below the editor window. Add 1 to the X coordinate then multiply by 1024. Take this number and using your Windows calculator, select the scientific mode and change the number into its hexadecimal equivalent by typing the number into the window then hitting the "hex" button.

4) Add the hexadecimal to the script.txt file - look at the lines of script for the Coastal Ruins level. If you are not using that WAD, cut and past the "mirror" line into your level. You must add the room number, then the hexadecimal as per Coastal Ruins. Run your DOS commands then check out your mirror!

5) To create the "magical" crossbow pick-up, place two opposing crossbows; enter 256 in the object code bit window for the crossbow in the main room. It will be invisible but Lara can position herself to pick it up by looking in the mirror. Have fun!

Level Jumping - moving back and forth between levels Being able to "jump" from one level to another can be a great way to slip into a 'secret' level, using a different WAD for variety. Or maybe your level has become too big, and you need to divide it into two levels, but want it to keep the feel of one big level.   It takes some forethought to create good gameplay using this feature (i.e. you don't want Lara running around in circles nor missing half the level). Be aware that sometimes inventory items disappear when jumping levels, so test a lot and plan accordingly!

To jump back and forth between levels, place "finish" triggers and "Lara Start Positions" with the same numeric values in each Exit/Entry point - the

"finish" triggers will need the number of the level you are jumping to and a value in the "timer" text window (it's best to start with number one). Enter the same value in the Object Code Bit menu of the "Lara Start Position". The large end of the nullmesh item points the direction Lara will be facing when she makes her "jump". Check Catacombs, Room 2 and Coastal, Room 154 for details.

Creating/Modifying Textures

Adding features to texture maps:

(1) Setting Animation Ranges – At the bottom of the texture panel are two buttons (if you can't see them, press Alt + Enter). Click on the ANIMATION RANGES button to bring up an additional texture window. Make a selection (it appears red) around those textures you want to animate (usually water or lava) then press okay. This will close the window. If you reopen it, you will see a green selection around the tiles of your newly set animation range. Textures WILL NOT animate until you set the animation range.

(2) Assigning Sounds to textures – Next to the ANIMATION RANGES button is the TEXTURE SOUNDS button. Press this to bring up another window with a column of buttons listing different sounds down the right side of the panel. To assign sounds to your textures, select the texture, then press the appropriate sound button. The sounds don't always get saved with the project file so it is a good idea to save them separately using the SAVE TEXTURE SNDS button. When you save texture sounds, type a name for the file – a TFX extension will automatically be added. Another window will appear with a TBM file extension – type in the same name and this will save any Bump Map information you assigned. (see below) If the texture sounds did not load with your project or if you begin a new project and use the same texture map, you can load the sounds in using the LOAD TEXTURES button instead or reassigning them all. Another time saver!

(3) Assigning Bump Maps to textures – The two buttons in the lower right corner of the Texture Sounds window BMP LV1 and BMP LV2 are used to assign bump mapping to selected textures. NOTE: You will not see the bump map effects unless you turn this option on in the game Setup menu. Use the SAVE TEXTURE SNDS button to save Bump Map designations.

> **NOTE:** *You will not see the bump map effects unless you turn this option on in the game Setup menu, and unless you have a pretty powerful system, it will seriously affect your frame rate.*

Creating/Modifying Texture Sets

Even the most cleverly designed level will lack something if the textures don't support and/or enhance it. Textures help set the mood of the level as well as further define architectural features. Sometimes they offer clues and hints for finding secrets and facilitate navigation within the level. There is an art to applying textures and practice does lead to perfecting the skill, but if the texture set is not good to begin with, no amount of finessing will get rid of the problem.

 The easiest way to create a new texture set is to start with one of the texture maps provided on the disc. The background transparency color is already set and all the squares are positioned properly. You can even use some of the existing textures, such as water, to save a lot of time…why reinvent the wheel?

Textures must be saved in a 24-bit color TGA file format (the individual texture tiles are 64x64 pixels). It is not a good idea to add more texture tiles than the maximum numbers on the maps included on this disc. There is a limit to the amount of "texture memory" per level…can't give exact numbers, but economy of use should always be at the forefront! If you reach this memory limit, when you try to apply a new texture or a portion of a texture that hasn't been previously applied, you will not get the texture you selected! And if you run short on "texture memory" new animation ranges will not activate.

 When you zoom in on the textures used in Tomb Raider, you'll be amazed at the detail squeezed into a 64x64pixel tile.You will have to experiment with the best way to achieve this same level of detail. Often when a large image is reduced down to such a small size, the detail becomes blurred – this blur becomes magnified when viewed in-game! If you are scanning images to use, it is best to scan them at a small size. 'Sharpen' filters help to some degree.

Finding "scrap" – Photographing your own textures is one good way to create original textures! If you use a paint program to create textures from scratch, you should experiment first to see how they will look in-game before investing too much energy. It is time consuming to achieve the necessary degree of detail with such a small format, and you run into the same blur problems mentioned above. Don't forget to use the Internet as a good source for both images and textures. Numerous web sites provide free textures.

Making sure your tiles are lined up properly can be a pain. The best and quickest way to insure you are cutting and pasting into the exact position is to set up a 64x64 grid and then use the snap-to-grid function (assuming your paint program has one). Even so, if you are not zoomed in enough, your textures can be off by one or more pixels. So, it is best to work in layers and "save as" to create your TGA file, then when you discover your mistake, it will be much easier to fix.

Also, you can divide your grid into 16, 16x16 pixel segments…this way, you can tell whether or not your textures will line up with one, two and three click block heights in the model. (Remember, 16 pixels equal one click in the editor). Note how some of the texture tiles have a fairly distinct division a quarter, midway or three-quarters down the tile...these purposely segmented textures work great for creating borders and the illusion of ledges and so on.

If you are creating an entire mini set of textures (rocks, trees, etc.) it is easier to make them in a separate file and then paste them into your main texture map when you are sure they are all working together. There is an offset filter in many graphics programs that works well for testing whether or not individual textures tile smoothly...there is definitely an art to creating good tiling effects!

You do need to plan in advance about what will be required in your texture map. It is convenient to have like textures placed together but sometimes this isn't possible. You may discover later on that you need additional tiles for one "micro-set" - maybe you need a transition tile that you did not anticipate, or you decide to add another tile or two for variety (anything to avoid the dreaded wallpaper effect!). For obvious reasons, you cannot relocate textures on your texture map once you have already applied them to your model. (Unless you would enjoy re-texturing those rooms you spent hours perfecting.) This is the reason you sometimes see similar textures in such different locations on one texture map.

Whatever you do, try to make your textures all look as though they are from the same "world". Take some time to study the texture sets from the example levels. Note how each one follows a general color idea – the colors work well together no matter which tiles end up side by side. Also, most of the tiles are of a similar overall value (lightness and darkness). The colors in the texture set from City of the Dead are fairly dark and subdued since that level takes place during the night. Contrast those to The Temple of Karnak or Alexandria, both of which take place during the day and with large outdoor areas.

> *Warning: Developing texture sets can be a permanent mind altering experience! You can possibly become obsessed with this endeavor - once you "go there" you will never* look *at a crumbling brick wall, old weathered wood, rusty tin siding or just about anything architectural, old or new, in the same way ever again!*

REFERENCE
SECTION

Tomb Raider Level Editor

- **Audio**
- **Data**
- **Graphics**
  - **Wads**
- **Logo**
- **Maps**
  - **Project Folder(s)**
    (Your Levels)
- **Script**
- **Sound**
  - **LevelSFX Creator**
  - **Samples**

LOOSE FILES
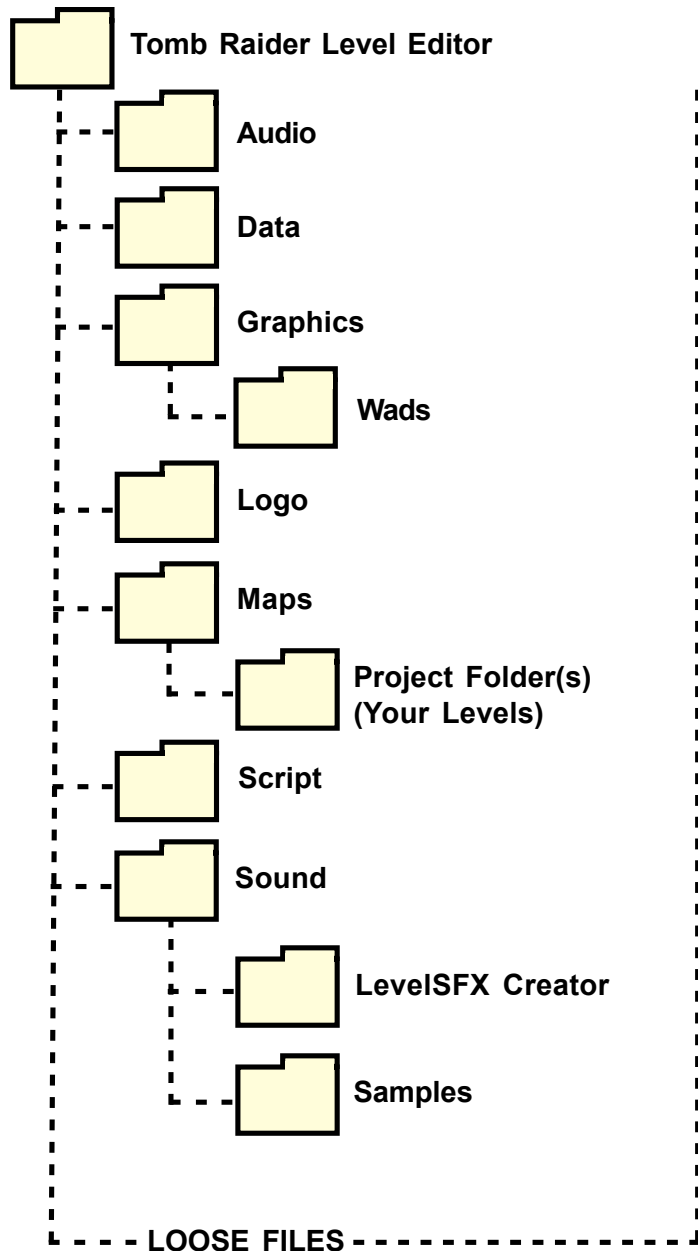
Autosave.prj* = Last autosaved project

Box.log* = Various log files from Roomedit

Edgeptr.pcx = Graphic for tile manipulation arrows

English.dat = Datfile containing English text for the game

Error.log* = Log files created after running the program

Load.bmp = Graphic for Load screen

Objects.h = List of objects in the game

Savegame.0* = Saved game file(s)

Script.dat = List of Levels

Setup tomb4 = Shortcut to setup program

Tom.log* = Log files created after running the program

Levelconverter.exe = Evecutable for compressing level information

Tomb4.exe = Executable for playing the game

Uninst.isu= Uninstall information

Winroomedit.exe = Executable to run Level Editor

zone.log* = Log files created after running the program

* = Generated after a level/game has been made and saved

START HERE

WINROOMEDIT.EXE

Create/Open Projects (.PRJ)

Load Textures (.TGA)
Load Objects (.WAS)

WINROOMEDIT.EXE looks here for...

MAPS

Contains:
.PRJ Project Files
.TGA Texture Files

OUTPUT WAD
Creates a new .TOM file which is placed in the WADS folder

WINROOMEDIT.EXE looks here for...

WADS (inside the GRAPHICS Folder)

.SXF = Sound File
.SAM = Sound File
.SWD = Sprite WAD
.LAR = Lara's Animations
.CD = List of CD tracks in Level
.RAW = Sky Graphics
.WAS = List of Objects/Animations in WAD
.WAD = Compressed info of Objects/Animations
.TOM = File Output from Project contains WAD, model, trigger, etc. info

PCWADSFX.EXE

Generates new sound files

LEVELSFX CREATOR

Contains:
PCWADSFX.EXE

SOUNDS.TXT

LEVELCONVERTER.EXE

Compresses .TOM File, Sounds and Sky Data into Playable .TR4 File

DOS4CW.EXE

Program for running DOS

SCRIPT.EXE

Edit Script for level names and order of play

SCRIPT

Instructions for Level order, Level names, etc.

Writes over current .TR4 file in DATA Folder

SAMPLES

Game Sounds

AUDIO

Audio Tracks

TR4.EXE looks here for...

TR4.EXE

PLAY YOUR LEVELS!!!!

TR4.EXE looks here for...

DATA

Contains:
Playable .TR4 Files

SOUNDS

Contains:
Samples Folder

LevelSFX Creator Folder

WAD WAS WHAT?

The WAS (rhymes with OZ) file or script lists what is in the WAD. Getting familiar with the components in the WAD – what can and can't be used - will save time and frustration later on. Many items are the same in each WAD, however, baddies, traps, doors and static objects usually differ, giving a WAD its unique characteristics. This sample WAS script shows what comprises a WAD.

For a 3D visual representation of each object, use the View Objects window in the editor. Each line in the script begins with a "slot" name and ends with a project file. Objects are listed by their slot name in the menu, so it is not always apparent what an item is since many of the slots have general category names such as puzzle, door, switch, animating, plant, debris, etc. The same slot name can have a different project file in a different WAS script. It is much easier to identify nullmesh items because each has a unique slot name.

To get a better idea of what is what, items have been grouped into color categories. The light gray represents those items that cannot or should not be placed in the model. For instance, you wouldn't place puzzle_done - the image you will see once all the puzzle pieces are put together - but it needs to be in the WAD so the image can be swapped out at the right moment. You can find out more about the objects in each WAD in the reference following this sample WAS file.

■ Bad Guys, Good Guys, Vehicles

■ DO NOT place in model (already programmed for use)

■ Traps (Always harmful to Lara)

■ Nullmesh items (invisible "dummy" items performing specific functions) RED = Can kill Lara   BLUE = Lara interacts with

■ Props – Non-static animated and/or "interactive" items (Some static items are placed in animating slots when too "large" for other slots.)

■ Puzzles and Keys

■ Inventory pick-up items (weapons, ammo, medi paks, etc.)

■ Props – Static items (found in Plant, Furniture, Rock, Architecture and Debris slots)

LARA:Z:\TOMB4\GRAPHICS\ANIMS\LARA\J_LARAST.PRK
PISTOLS_ANIM:Z:\TOMB4\TOMB21\ANIMS\LARA\GUN.PRK
UZI_ANIM:Z:\TOMB4\TOMB21\ANIMS\LARA\UZIS.PRK
SHOTGUN_ANIM:Z:\TOMB4\TOMB21\ANIMS\LARA\SHOTGUN.PRK
CROSSBOW_ANIM:Z:\TOMB4\GRAPHICS\ANIMS\LARA\CROSSBOW.PRK
GRENADE_GUN_ANIM:Z:\TOMB4\TOMB21\ANIMS\LARA\GRENGUN.PRK
SIXSHOOTER_ANIM:Z:\TOMB4\GRAPHICS\ANIMS\LARA\REVOLVER.PRK
FLARE_ANIM:Z:\TOMB4\TOMB21\ANIMS\LARA\FLARE.PRK
LARA_SKIN:Z:\TOMB4\GRAPHICS\ANIMS\LARA\SKIN\Skin.prk
LARA_SKIN_JOINTS:Z:\TOMB4\GRAPHICS\ANIMS\LARA\SKIN\Bits.prk
LARA_SCREAM:Z:\TOMB4\GRAPHICS\ANIMS\LARA\SKIN\SCREAM.PRK
LARA_CROSSBOW_LASER:Z:\TOMB4\GRAPHICS\ANIMS\LARA\CROS-LAS.PRK
LARA_REVOLVER_LASER:Z:\TOMB4\GRAPHICS\ANIMS\LARA\REVOL-LS.PRK
LARA_HOLSTERS:Z:\TOMB4\GRAPHICS\ANIMS\LARA\STANDARD\D_HOLST.PRK
LARA_HOLSTERS_PISTOLS:Z:\TOMB4\GRAPHICS\ANIMS\LARA\HOLSTERS\GUNS.PRK
LARA_HOLSTERS_UZIS:Z:\TOMB4\GRAPHICS\ANIMS\LARA\HOLSTERS\UZI.PRK
LARA_HOLSTERS_SIXSHOOTER:Z:\TOMB4\GRAPHICS\ANIMS\LARA\HOLSTERS\REVOL.PRK
HAIR:Z:\TOMB4\GRAPHICS\ANIMS\LARA\SKIN\Hair.prk
BADDY_2:Z:\TOMB4\GRAPHICS\ANIMS\RAGHEAD\Rag_red.PRK
CROCODILE:Z:\TOMB4\GRAPHICS\ANIMS\NEWCROC\newcroc.PRK
SMALL_SCORPION:Z:\TOMB4\GRAPHICS\ANIMS\SCORPION\smlscorp.PRK
DART_EMITTER:Z:\TOMB4\GRAPHICS\ANIMS\NULL\Nullmesh.prk
HOMING_DART_EMITTER:Z:\TOMB4\GRAPHICS\ANIMS\NULL\Nullmesh.prk
ROLLINGBALL:Z:\TOMB4\GRAPHICS\SETSTOMB\OBJECTS\spikebal.PRK
TEETH_SPIKES:Z:\TOMB4\GRAPHICS\SETSTOMB\OBJECTS\Teeth.PRK
SLICER_DICER:Z:\TOMB4\GRAPHICS\SETSTOMB\OBJECTS\dicer.PRK
FLAME:Z:\TOMB4\GRAPHICS\ANIMS\NULL\Nullmesh.prk
FLAME_EMITTER:Z:\TOMB4\GRAPHICS\ANIMS\NULL\Nullmesh.prk
FLAME_EMITTER2:Z:\TOMB4\GRAPHICS\ANIMS\NULL\Nullmesh.prk
FLAME_EMITTER3:Z:\TOMB4\GRAPHICS\ANIMS\NULL\Nullmesh.prk
ROPE:Z:\TOMB4\GRAPHICS\ANIMS\NULL\Nullmesh.prk
FIREROPE:Z:\TOMB4\GRAPHICS\ANIMS\NULL\Nullmesh.prk
RAISING_BLOCK2:Z:\TOMB4\GRAPHICS\KARNAK\OBJECTS\Twoblck2.PRK
PUSHABLE_OBJECT2:Z:\TOMB4\GRAPHICS\ALEXAND0\OBJECTS\Ceilprop.prk
PUZZLE_ITEM1:Z:\TOMB4\GRAPHICS\ANIMS\OBJECTS\SUN_GEM\sun_comp.PRK
PUZZLE_ITEM2:Z:\TOMB4\GRAPHICS\KARNAK\JARS\birdjar.PRK
PUZZLE_ITEM3:Z:\TOMB4\GRAPHICS\KARNAK\JARS\lionjar.prk
PUZZLE_ITEM5:Z:\TOMB4\GRAPHICS\KARNAK\OBJECTS\wingamu.PRK
PUZZLE_ITEM7:Z:\TOMB4\GRAPHICS\KARNAK\OBJECTS\pyrakey.PRK
PUZZLE_ITEM1_COMBO1:Z:\TOMB4\GRAPHICS\ANIMS\OBJECTS\SUN_GEM\sun_gem.PRK
PUZZLE_ITEM1_COMBO2:Z:\TOMB4\GRAPHICS\ANIMS\OBJECTS\SUN_GEM\sun_stat.PRK
KEY_ITEM2:Z:\TOMB4\GRAPHICS\KARNAK\OBJECTS\Key.PRK
PUZZLE_HOLE2:Z:\TOMB4\GRAPHICS\KARNAK\JARS\birdhole.prk
PUZZLE_HOLE3:Z:\TOMB4\GRAPHICS\KARNAK\JARS\lionhole.prk
PUZZLE_HOLE5:Z:\TOMB4\GRAPHICS\KARNAK\OBJECTS\winghole.PRK
PUZZLE_HOLE7:Z:\TOMB4\GRAPHICS\KARNAK\OBJECTS\pyrahole.PRK
PUZZLE_DONE2:Z:\TOMB4\GRAPHICS\KARNAK\JARS\birddone.prk
PUZZLE_DONE3:Z:\TOMB4\GRAPHICS\KARNAK\JARS\liondone.prk
PUZZLE_DONE5:Z:\TOMB4\GRAPHICS\KARNAK\OBJECTS\wingdone.PRK
PUZZLE_DONE7:Z:\TOMB4\GRAPHICS\KARNAK\OBJECTS\pyradone.PRK

SWITCH_TYPE1:Z:\TOMB4\GRAPHICS\KARNAK\OBJECTS\Hidwall.prk
SWITCH_TYPE2:Z:\TOMB4\ANDREA\SWITCH\Switch.PRK
DOOR_TYPE1:Z:\TOMB4\ANDREA\DOOR\Door.PRK
DOOR_TYPE2:Z:\TOMB4\ANDREA\DOOR\Doorr.PRK
DOOR_TYPE3:Z:\TOMB4\ANDREA\DOOR\Door3.PRK
UNDERWATER_DOOR:Z:\TOMB4\GRAPHICS\KARNAK\OBJECTS\UnwatDor3.PRK
BRIDGE_FLAT:Z:\TOMB4\ANDREA\BRIDGE_A\Bridge_a.PRK
PISTOLS_ITEM:Z:\TOMB4\ANDREA\OBJECTS\PISTOLS\PISTOLS.PRK
PISTOLS_AMMO_ITEM:Z:\TOMB4\ANDREA\OBJECTS\PISTOLS-\PISTOL-A.PRK
UZI_ITEM:Z:\TOMB4\ANDREA\OBJECTS\UZI\UZI.PRK
UZI_AMMO_ITEM:Z:\TOMB4\ANDREA\OBJECTS\UZ-CLIPS\UZ-CLIPS.PRK
SHOTGUN_ITEM:Z:\TOMB4\ANDREA\OBJECTS\SHOTGUN\SHOTGUN.PRK
SHOTGUN_AMMO1_ITEM:Z:\TOMB4\ANDREA\OBJECTS\SGUN-AM\SGUN-AMM.PRK
SHOTGUN_AMMO2_ITEM:Z:\TOMB4\ANDREA\OBJECTS\SGUN-AM2\SGUN-AM2.PRK
CROSSBOW_ITEM:Z:\TOMB4\ANDREA\OBJECTS\CROSSBOW\CROSSBOW.PRK
CROSSBOW_AMMO1_ITEM:Z:\TOMB4\ANDREA\OBJECTS\BOLT-STA\BOLT-STA.PRK
CROSSBOW_AMMO2_ITEM:Z:\TOMB4\ANDREA\OBJECTS\BOLT-POI\BOLT-POI.PRK
CROSSBOW_AMMO3_ITEM:Z:\TOMB4\ANDREA\OBJECTS\BOLT-EXP\BOLT-EXP.PRK
CROSSBOW_BOLT:Z:\TOMB4\GRAPHICS\ANIMS\LARA\crosbolt.PRK
GRENADE_GUN_ITEM:Z:\TOMB4\ANDREA\OBJECTS\G-LAUNCH\G-LAUNCH.PRK
GRENADE_GUN_AMMO1_ITEM:Z:\TOMB4\ANDREA\OBJECTS\G-AMMO\STANDARD\G-STAND.PRK
GRENADE_GUN_AMMO2_ITEM:Z:\TOMB4\ANDREA\OBJECTS\G-AMMO\SMOKE\G-SMOKE.PRK
GRENADE_GUN_AMMO3_ITEM:Z:\TOMB4\ANDREA\OBJECTS\G-AMMO\STUN\G-STUN.PRK
GRENADE:Z:\TOMB4\GRAPHICS\ANIMS\OBJECTS\Shell.PRK
SIXSHOOTER_ITEM:Z:\TOMB4\ANDREA\OBJECTS\REVOLVER\REVOLVER.PRK
SIXSHOOTER_AMMO_ITEM:Z:\TOMB4\ANDREA\OBJECTS\REVOLVE0\REV-AMMO.PRK
BIGMEDI_ITEM:Z:\TOMB4\ANDREA\OBJECTS\MEDI-BIG\MEDI-BIG.PRK
SMALLMEDI_ITEM:Z:\TOMB4\ANDREA\OBJECTS\MEDI-SMA\M-SMALL.PRK
LASERSIGHT_ITEM:Z:\TOMB4\ANDREA\OBJECTS\LASER\LASER.PRK
BINOCULARS_ITEM:Z:\TOMB4\ANDREA\OBJECTS\BINOCULA\BINOC.PRK
FLARE_ITEM:Z:\TOMB4\TOMB21\ANIMS\OBJECTS\FLARE.PRK
FLARE_INV_ITEM:Z:\TOMB4\ANDREA\OBJECTS\FLARES\FLARES.PRK
COMPASS_ITEM:Z:\TOMB4\ANDREA\OBJECTS\COMPASS\COMPASS.PRK
MEMCARD_LOAD_INV_ITEM:z:\tomb4\andrea\objects\m-card-l\m-card-l.prk
MEMCARD_SAVE_INV_ITEM:z:\tomb4\andrea\objects\m-card-s\m-card-s.prk
SMOKE_EMITTER_WHITE:Z:\TOMB4\GRAPHICS\ANIMS\NULL\Nullmesh.prk
SMOKE_EMITTER_BLACK:Z:\TOMB4\GRAPHICS\ANIMS\NULL\Nullmesh.prk
STEAM_EMITTER:Z:\TOMB4\GRAPHICS\ANIMS\NULL\Nullmesh.prk
EARTHQUAKE:Z:\TOMB4\GRAPHICS\ANIMS\NULL\Nullmesh.prk
WATERFALLMIST:Z:\TOMB4\GRAPHICS\ANIMS\NULL\Nullmesh.prk
GUNSHELL:Z:\TOMB4\TOMB21\ANIMS\BULLETS\BULLET.PRK
SHOTGUNSHELL:Z:\TOMB4\GRAPHICS\ANIMS\BULLETS\Shell.PRK
GUN_FLASH:Z:\TOMB4\TOMB21\ANIMS\OBJECTS\GUNFLASH.PRK
AI_GUARD:Z:\TOMB4\GRAPHICS\ANIMS\NULL\Nullmesh.prk
AI_AMBUSH:Z:\TOMB4\GRAPHICS\ANIMS\NULL\Nullmesh.prk
AI_PATROL1:Z:\TOMB4\GRAPHICS\ANIMS\NULL\Nullmesh.prk
AI_MODIFY:Z:\TOMB4\GRAPHICS\ANIMS\NULL\Nullmesh.prk
AI_FOLLOW:Z:\TOMB4\GRAPHICS\ANIMS\NULL\Nullmesh.prk
AI_PATROL2:Z:\TOMB4\GRAPHICS\ANIMS\NULL\Nullmesh.prk
AI_X1:Z:\TOMB4\GRAPHICS\ANIMS\NULL\Nullmesh.prk

AI_X2:Z:\TOMB4\GRAPHICS\ANIMS\NULL\Nullmesh.prk
LARA_START_POS:Z:\TOMB4\GRAPHICS\ANIMS\NULL\Nullmesh.prk
KILL_ALL_TRIGGERS:Z:\TOMB4\GRAPHICS\ANIMS\NULL\Nullmesh.prk
TRIGGER_TRIGGERER:Z:\TOMB4\GRAPHICS\ANIMS\NULL\Nullmesh.prk
MESHSWAP2:Z:\TOMB4\GRAPHICS\ANIMS\RAGHEAD\red_swap.PRK
CAMERA_TARGET:Z:\TOMB4\GRAPHICS\ANIMS\NULL\Nullmesh.prk
WATERFALL1:Z:\TOMB4\GRAPHICS\KARNAK\OBJECTS\statwat2.PRK
ANIMATING1:Z:\TOMB4\ANDREA\STATUE\Statue_a.PRK
ANIMATING2:Z:\TOMB4\ANDREA\STATUE1\Statue1.PRK
ANIMATING3:Z:\TOMB4\ANDREA\STATUE\Statue_b.PRK
ANIMATING4:Z:\TOMB4\GRAPHICS\KARNAK\OBJECTS\Bowlanim.prk
ANIMATING5:Z:\TOMB4\GRAPHICS\KARNAK\OBJECTS\bowlpil.prk
HORIZON:Z:\TOMB4\ANDREA\BACKG\BackG1.PRK
SKY_GRAPHICS:SPRITE0 TO SPRITE3 z:\tomb4\graphics\anims\flatsky\trainsky.tga
BINOCULAR_GRAPHICS:Z:\TOMB4\GRAPHICS\ANIMS\MENUS\BINOVIEW\BINORIMS.PRK
TARGET_GRAPHICS:Z:\TOMB4\GRAPHICS\ANIMS\MENUS\TARGETVW\TARGETVW.PRK
DEFAULT_SPRITES:SPRITE0 TO SPRITE99 z:\tomb4\graphics\sprites\DEFAULT.TGA
PLANT0:Z:\TOMB4\GRAPHICS\KARNAK\OBJECTS\tree.PRK
FURNITURE1:Z:\TOMB4\ANDREA\DOORFRM\Doorfrm.PRK
FURNITURE2:Z:\TOMB4\ANDREA\DOORFRM\DoorL.PRK
FURNITURE3:Z:\TOMB4\ANDREA\DOORFRM\DoorR.PRK
FURNITURE4:Z:\TOMB4\GRAPHICS\KARNAK\OBJECTS\Bowlstil.prk
FURNITURE5:Z:\TOMB4\ANDREA\VASE2\Vase2.PRK
FURNITURE6:Z:\TOMB4\GRAPHICS\KARNAK\OBJECTS\box.PRK
FURNITURE7:Z:\TOMB4\ANDREA\PEDESTAL\Pede2.PRK
ROCK0:Z:\TOMB4\ANDREA\COLUMNS\column1.PRK
ROCK1:Z:\TOMB4\ANDREA\COLUMNS\column2.PRK
ROCK2:Z:\TOMB4\ANDREA\COLUMNS\columntp.PRK
ROCK3:Z:\TOMB4\ANDREA\STATUE\statpipe.PRK
ROCK4:Z:\TOMB4\ANDREA\STATUEN\Statuen1.PRK
ROCK5:Z:\TOMB4\ANDREA\STATUEN\Statuen2.PRK
ROCK6:Z:\TOMB4\ANDREA\COLNEW\colnew.PRK
ROCK9:Z:\TOMB4\ANDREA\SEMI_PIL\Semi_pil.PRK
ARCHITECTURE0:Z:\TOMB4\ANDREA\OBELISK\Obelisk1.PRK
ARCHITECTURE1:Z:\TOMB4\ANDREA\OBELISK\Obelisk2.PRK
ARCHITECTURE7:Z:\TOMB4\ANDREA\BIG-PILL\Big-pill.PRK
ARCHITECTURE8:Z:\TOMB4\ANDREA\ARCH\Arch.PRK
ARCHITECTURE9:Z:\TOMB4\ANDREA\ARCH1\Arch1.PRK
SHATTER0:Z:\TOMB4\ANDREA\VASE1\Vase1.PRK

WAD	BADDIES/GOODIES	TRAPS	PUZZLES/KEYS	ANIMATED PROPS
Tut1	Baddy1 (White Robe) Mummy Red Scorpion	Rollingball (Spiked) Teeth Spikes Dart Emitter	Cartouche Eye Of Horus The Hand Of Orion The Hand Of Sirius	Pushable Object
Settomb	Bat Dog Red Scorpion Guide	Dart Emitter Rollingball (Spiked) Teeth Spikes Slicer Dicer Seth Blade	Eye Of Horus Timeless Sands Ba Cartouche Ra Cartouche Guardian Key	Raising Block Single Sandfall Rising Sand Floor
Karnak	Baddy2 (Red Robe) Crocodile Black Scorpion	Dart Emitter Bird Blades	Canopic Jar 1 Canopic Jar 2 Golden Vraeus Guardian Key Hypostyle Key	Rising Platform Pouring Water Tipping Bowl Rising Pillar w/Bowl
Coastal	Skeleton Crocodile Wild Boar	Dart Emitter Rollingball (Stone Block) Teeth Spikes	Portal Guardian Golden Star Horseman's Gem Pharos Knot Pharos Pillar Black Beetle Token Gate Key	Coin and Coin Head Fake Mummy Charmmer Seaweed Rope Basket Rising Rope Shatter Props
Catacomb	Skeleton (w/Armour) Mummy Beetle Swarm Wraith3	Dart Emitter Rollingball (Spiked) Teeth Spikes	Portal Guardian Horseman's Gem Token Pharos Pillar Pharos Knot Black Beetle Clockwork Beetle Gate Key	Raising Sand Floor Raising Block Expanding Platform Waterfall Raising Walls Pushable Object Shatter Bones and Vases
Cleopal	Skeleton (Egyptian) Harpy Demigod3 Beetle Swarm	Dart Emitter Bird Blade Teeth Spikes	Music Scroll Portal Guardian Horseman's Gem Pharos Knot Black Beetle Broken Glasses Pyramid	Raising Block Sarcophagas Lid Water Fountain Spiral Glow Shatter Treasure Chest
City	Wraith2 Bat SAS Locust Swarm Motorbike	Locust Swarm Sentry Gun	Nitrous Oxide Feeder Car-Jack Roof Key Mine Detonator	Smashable Bike Wall Smashable Bike Floor Raising Block Running Rat Clothesline Shatter Gas Tank

GENERAL WAD DATA - All WADS

Note:

◆ *OCB stands for Object Code Bit menu – press the letter "O" to bring up this menu.*

◆ *Only objects requiring special instructions or code bits are listed below. For a complete list of objects in a particular WAD, print out the WAS file (found in the WADS folder) and/or refer to WAD DATA – Specific WADs following this section.*

> **WARNING** You must leave a minimum of 10 empty slots for in-game animations – don't place more than 245 objects in a level.

Settings for PICKUPS & PUZZLE_ITEMS

Each instance of these objects flags shows how they are retrieved. Enter the appropriate number in the OCB:

0 – the object is on the floor (pickup in an old style)

1 – the object is "hidden" (Lara plays a stick hand in wall type animation)

2 – the object is attached to a wall (Lara has to use the crowbar)

3 – the object is on a high pedestal

4 – the object is on a low pedestal

Add 64 to any of the above if you want the item to activate a pickup trigger.

Objects Common to all WADS

(Entered with SLOT name in order of appearance in WAS file)

DART_EMITTER
Place a Dart Emitter on either side of the area you want firing darts back and forth (you can place many of these nullmesh items opposite one another along a long hall, for instance). You will need to create a texture or devise something the darts are being emitted from since the nullmesh is not visible. There is no need to place "DARTS" – it only needs to be in the script in order for your emitter to spit out the darts. **Will cause death**

HOMING_DART_EMITTER
Same as above but fires the darts at a much faster rate. **Will cause death**

TEETH SPIKES
Type in one of the following digits in the OCB:

Vertical in Room Edit above view	Horizontal
0 = Pointing south	8 = Pointing south
1 = Pointing south west	9 = Pointing south west
2 = Pointing west	10 = Pointing west
3 = Pointing north west	11 = Pointing north west
4 = Pointing north	12 = Pointing north
5 = Pointing north east	13 = Pointing north east
6 = Pointing east	14 = Pointing east
7 = Pointing south east	15 = Pointing south east

You can also add a value of 16 to the above to make the spikes stick out constantly (like the old TR spikes) Adding 32 to the above will force the spikes out once and then retract forever.

For example: To create a spike that will shoot out downward from the ceiling and retract back in forever you would do the following sum - 0 +32 = 32 so type in 32 on the bit field.

It may seem a little complex but play around with it, try building an octagonal tunnel and place spikes around the walls so you get a ring of spikes to shoot out. The two sets of values (one for Vertical, one for Horizontal) will become obvious when you try to put Vertical spikes in a horizontal tunnel.

FLAME
The trigger causes Lara to burst into flames (like the green death square) **Will cause death**

FLAME_EMITTER
This is a larger flame than FLAME_EMITTER2. Used with FireRope trap to light torch. **Will cause death**

FLAME_EMITTER2
Enter 2 in OCB to make the flame move along in the direction the cone is pointing. 1 will make the flame half the size of normal and 3 makes a very small light. Will not cause death.

FLAME_EMITTER3
Without the code number, it is the flame used on the special "oil" water in the palace levels. **Will cause death**

Entering 1, 2, 3 or 4 in the OCB will change the flame into the blue "lightning" as in the Karnak level. (no death)

ROPE
A nullmesh item placed on the square where you want the swinging rope. Specific length; if you want a longer rope, place one on top of the other. Requires a trigger.

FIREROPE
Nothing too tricky here, just make sure you use all the necessary parts. You must also provide the torch and the flame. Take a look at the setup in Coastal Ruins, room 108 and adjoining rooms.

POLEROPE
Actual pole object (firepole) placed in model for Lara to slide down or climb up. If you want a taller pole, place one on top of the other.

CROWBAR_ITEM
Important to remember to place this in a level BEFORE it is needed for a door type, wall beetle, etc.

SMOKE_EMITTER_WHITE Emits smoke in "puffs".

SMOKE_EMITTER_BLACK Emits smoke in "puffs".

STEAM_EMITTER
Enter 888 in the OCB to make steam escape sideways in the direction of the cone. **Will cause death**

EARTHQUAKE
Nullmesh object placed and triggered to create earthquake effects – rumbling and shaking. Enter 888 in the OCB for a 5 second quake, 333 for 16 seconds.

WATERFALLMIST
Nullmesh object placed and triggered to create waterfall mist.

LARA_START_POS
Nullmesh object used to mark Lara's start position when creating a "level jump"

KILL_ALL_TRIGGERS
This nullmesh is no longer used.

TRIGGER_TRIGGERER
Nullmesh object used to create "frozen triggers" – triggers placed beneath a TT will not become active until after the TT has been triggered.

CAMERA_TARGET
Nullmesh object placed to get the camera to look at a specific view rather than Lara.

ARCHITECTURE (STEPS and STAIRS)
Before placing steps you need to create a slope that matches the pitch of the steps you are using. These steps, usually in an **ARCHITECTURE** slot, must be placed **upside down** or you will not get them to rest on the slope beneath them. Place the stairs on the ceiling of the room then use the FLOOR + button to lower them back down. Texture the squares beneath the steps with the 0 black transparency color (upper left corner of the palette beneath the Editor Window).

SHATTER Objects
Shatter Objects vary in size and shape but all behave pretty much the same. Place medi paks, ammo, etc. under a shatter object. Mark them invisible in their OCB (this saves CPU power) and place a heavy trigger to make them visible once the object is shattered. If you want baddies (scarabs, wraiths, scorpions, whatever) to come out of a shatter object, put the creature on the square with the shatter object then place a HEAVY trigger under the shatter object to trigger the creatures. (Since Baddies are invisible until triggered it isn't necessary to press the invisible button in the OCB) The skeleton will smash all the shatter objects in its path.

Playable Tutorial Level

Note:

- *OCB stands for Object Code Bit menu – press the letter "O" to bring up this menu.*

- *With the exception of the baddies, if an object is not listed, it is because it does not require any special settings or instructions. If you want a full list, print out the .was file.*

BADDIES

BADDY_1

Can climb up or down up to 4-clicks (1 block), jump 1 or 2 block gaps (start and landing need to be roughly same height). You can set up the initial animation for Baddy_1 when first triggered by setting the trigger flags in his OCB:

- **1** = Roll Right. He rolls about a block so this is good for triggering as Lara comes up to a doorway
- **2** = Jump Left. As above
- **3** = Ducked
- **4** = Climb up 4 clicks. Make sure the origin of the baddy is 4 clicks below the block he's about to enter

During the game baddies will pick up small medi-packs and uzi ammo which is in the same room as they are*, before they will go after Lara*, even if she shoots at them first.

Refer to *More about Objects – Baddie AI* in the Advanced Section for using different AI behaviors.

MUMMY
Can only go up or down 1-click

SMALL_SCORPION
Small red scorpion. Can only go up or down 1-click

TRAPS

TEETH_SPIKES
These spikes vary in color and shape from those in the other WADs. To make them behave as they do in the tutorial level, enter 20 in the OCB and raise them up off the floor several clicks. In-game they will appear on the floor. (see *General WAD Objects Reference* for additional settings)

PUZZLES Remember, generally you only place puzzle pieces and their "holes"…

Eye of Horus (Puzzle door)

PUZZLE_ITEM5_COMBO1 – puzzle half

PUZZLE_ITEM5_COMBO2– puzzle half

PUZZLE_HOLE5

Make sure walls are built out enough to hide door when it retracts.

Enter 999 in the OCB – this turns off "collision" from the "puzzle done" object. Without it, an "invisible" door would prevent Lara from re-entering the "Test Room"

PROPS - animated and/or "interactive" items

ANIMATING6
does not animate, but was put in animating slot because of it's size and number of "nodes"

ANIMATING7
same as above

The Tomb of Seth

Note:

- *OCB stands for Object Code Bit menu – press the letter "O" to bring up this menu.*

- *With the exception of the baddies, if an object is not listed, it is because it does not require any special settings or instructions. If you want a full list, print out the .was file.*

BADDIES

GUIDE

The Guide must be used with the "Follow AI" or he will run around in circles. He has an extremely complex AI. These are extremely advanced concepts – don't give up if it doesn't work the first time. A lot of this is trial and error!

Load up the Tomb of Seth project and starting in the beginning room with Lara, look at the Trigger Flag and Code Bits values of all the AI Follow points (these tell the guard where to go and what to do when he gets there). The early AI points in the level are all set to get him to light torches. When he gets to an AI point, he also triggers any HEAVY triggers there.

The "Lara Location" triggers are set around the level and are the other key to the Guide's movements. These actually appear as "FlipEffect 30" triggers with a value set to show how far through the level Lara is. If Lara's Location (set by the last FlipEffect 30 trigger she passed over) is less than the Trigger Flags of the next AI point, then the Guard will wait for her.

The Code Bit settings on the AI point to get the Guard to act as follows are:

code bit 1...Light Torch
code bit 5...Grab Torch
code bit 3 + 5... Read Inscription (put a heavy trigger under the AI point if you want something to happen when he reads it)
code bit 4... Light Petrol (as above)
code bit 2... Activate Trap (as above)
All code bits... Make him disappear

BAT
Remember, flying baddies cannot fly over "illegal slopes"

DOG
Can only go up or down 1-click

SMALL_SCORPION
Small red scorpion. Can only go up or down 1-click

TRAPS

TEETH_SPIKES
Enter 20 in OCB and press all five bit buttons. (see *General WAD Objects Reference* for additional settings)

SETH_BLADE
Enter negative number on OCB to delay triggering. Adding increments of 10 will delay by one second for each 10 units.

PUZZLES Remember, generally you only place puzzle pieces and their "holes"…

Eye of Horus (Puzzle door)

PUZZLE_ITEM5_COMBO1 – puzzle half

PUZZLE_ITEM5_COMBO2– puzzle half

PUZZLE_HOLE5

Make sure walls are built out enough to hide door when it retracts.

Enter 999 in the OCB – this turns off "collision" from the "puzzle done" object. Without it, an "invisible" door would prevent Lara from re-entering the "Test Room"

PROPS - animated and/or "interactive" items

TWOBLOCK_PLATFORM
Enter 132 in OCB to elevate. Set trigger type to "Dummy".

RAISING_BLOCK1
Enter 1-5 in OCB to elevate.

SWITCH_TYPE1
Enter -1 in OCB to make this a "reach in the hole" to find a pick-up.
Enter -1 *to the item in the hole* to make it a "reach in the hole" pick-up.

PULLEY
Use with **Furniture0**– place both on same square, trigger door to open.

DOOR_TYPE2
Enter 1-5 in OCB to make door close

WATERFALL1
WATERFALL2
Enter 668 in OCB

ANIMATING10 (Sandtrap)
Must set trigger type to "Dummy" to prevent Lara from "falling through" the object.

The Temple of Karnak

Note:

- *OCB stands for Object Code Bit menu – press the letter "O" to bring up this menu.*

- *With the exception of the baddies, if an object is not listed, it is because it does not require any special settings or instructions. If you want a full list, print out the .was file.*

BADDIES

BADDY_2

Can climb up or down up to 4-clicks (1 block), jump 1 or 2 block gaps (start and landing need to be roughly same height). You can set up the initial animation for Baddy_2 when first triggered by setting the trigger flags in his OCB:

- **1** = Roll Right. He rolls about a block so this is good for triggering as Lara comes up to a doorway
- **2** = Jump Left. As above
- **3** = Ducked
- **4** = Climb up 4 clicks. Make sure the origin of the baddy is 4 clicks below the block he's about to enter

During the game baddies will pick up small medi-packs and uzi ammo which is in the same room as they are, *before they will go after Lara*, even if she shoots at them first.

Refer to *More about Objects – Baddie AI* in the Advanced Section for using different AI behaviors.

CROCODILE

Can only go up or down 1-click, and can go in and out of water (with a slope).

SMALL_SCORPION

Small black scorpion. Can only go up or down 1-click

PROPS - animated and/or "interactive" items

FLAME_EMITTER3

Enter 1,2,3,4 in OCB to make blue electrical arch. Check setup in model, room XXX

RAISING_BLOCK2

Enter "2" in OCB to lower the block

SWITCH_TYPE1

"Reach in hole, open a door" switch. Enter 2 in OCB to activate.

SWITCH_TYPE2

Enter 3 in OCB to make this a push button switch.

BRIDGE_FLAT

Set trigger type to "Dummy" to prevent Lara from falling through the bridge object.

Coastal Ruins

Note:

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- *With the exception of the baddies, if an object is not listed, it is because it does not require any special settings or instructions. If you want a full list, print out the .was file.*

BADDIES

SKELETON
You can change the initial animations by setting the trigger flags as listed below. If you don't set trigger flags the skeleton will come up out of the ground as normal. When placed, he is 20 clicks below the floor elevation. The skeleton can only go up or down 1-click, and can jump 1 or 2 block gaps (start and landing need to be roughly same height).

- **1** = Jump Right. He jumps about a block
- **2** = Jump Left. As above
- **3** = Playing dead. This skeleton is visible (lying down) before being triggered and only gets up when triggered

Put an AI_GUARD object on the skeleton to put him on guard.

CROCODILE
Can only go up or down 1-click, and can go in and out of water (with a slope).

WILD_BOAR
Small red scorpion. Can only go up or down 1-click

TRAPS

TEETH_SPIKES
Enter 36 in OCB to make spikes come out of floor. (see *General WADS Object Reference* for additional settings)

PUZZLES - Remember, generally you only place puzzle pieces and their "holes"…

KEY_HOLE10 is placed on **DOOR_TYPE3,** to act as the receptacle for **KEY_ITEM10**.

PROPS - animated and/or "interactive" items

TRAPDOOR1
Enter 1-5 to make door open then close.

Set trigger timer to amount of seconds for door to be open

MISC.

For instruction on how to achieve the really cool mirror effect in room 69, refer to the "Advanced Section" *Other Cool Features Worth the Trouble…*

The Catacombs

Note:

- ◆ *OCB stands for Object Code Bit menu – press the letter "O" to bring up this menu.*

- ◆ *With the exception of the baddies, if an object is not listed, it is because it does not require any special settings or instructions. If you want a full list, print out the .was file.*

BADDIES

SKELETON
You can change the initial animations by setting the trigger flags as listed below. If you don't set trigger flags the skeleton will come up out of the ground as normal. When placed, he is 20 clicks below the floor elevation. The skeleton can only go up or down 1-click, and can jump 1 or 2 block gaps (start and landing need to be roughly same height).

- **1** = Jump Right. He jumps about a block
- **2** = Jump Left. As above
- **3** = Playing dead. This skeleton is visible (lying down) before being triggered and only gets up when triggered

Put an AI_GUARD object on the skeleton to put him on guard.

MUMMY
Can only go up or down 1-click

LITTLE_BEETLE (Small Scarab Beetle Swarm)
See Cleopal.was

WRAITH3
Make "Invisible" in the OCB. Remember, flying baddies cannot fly over "illegal slopes" but they can fly through walls. To watch the wraith get sucked into the statue, set up the two statue pieces, **FURNITURE8** and **FURNITURE9** then place **ANIMATING10** over the pedestal and trigger it somewhere Lara is sure to step on it. After triggered, when she stands near the stature, the wraith will be sucked into the "dummy" object.

PUZZLES Remember, generally you only place puzzle pieces and their "holes"…

CLOCKWORK_BEETLE
See Cleopal.was

PUZZLE_ITEM12 (Wall Scarab)
Placed on walls with the typed OCB setting of 2. Often used with the scarab beetle swarm and also can be part of 4 large beetles needed for the Pyramid Puzzle in Cleopatra's Palaces. Don't forget about placing the crowbar!

PROPS - animated and/or "interactive" items

TWOBLOCK_PLATFORM
Press 1-5 in the OCB to make it slowly go down when Lara stands on it.

Enter 207 in OCB to make it rise.

SWITCH_TYPE1
Enter 3 in OCB to make Lara do the "push wall switch animation".

SHATTER0

Five sets of shatter bones have been placed around several rooms (check 147) with each trigger set to one of the five code bits. Each set of shatter bones has a heavy trigger set for the Raising_Block1, which will not activate until all five sets of bones are shattered.

Cleopatra's Palaces

Note:

- ◆ *OCB stands for Object Code Bit menu – press the letter "O" to bring up this menu.*

- ◆ *With the exception of the baddies, if an object is not listed, it is because it does not require any special settings or instructions. If you want a full list, print out the .was file.*

BADDIES

SKELETON
You can change the initial animations by setting the trigger flags as listed below. If you don't set trigger flags the skeleton will come up out of the ground as normal. When placed, he is 20 clicks below the floor elevation. The skeleton can only go up or down 1-click, and can jump 1 or 2 block gaps (start and landing need to be roughly same height).

- **1** = Jump Right. He jumps about a block
- **2** = Jump Left. As above
- **3** = Playing dead. This skeleton is visible (lying down) before being triggered and only gets up when triggered

Put an AI_GUARD object on the skeleton to put him on guard.

HARPY
Will not fly over "illegal slopes".

DEMIGOD3
Can only go up or down 1-click

LITTLE_BEETLE (Small Scarab Beetle Swarm)
The number of scarabs and where (and how) they appear depends on the trigger flags in the OCB. Set the total number of scarabs you want (up to 128) plus a value to say where and how you want them to appear:

- **+1000** = from the floor
- **+2000** = from the ceiling
- **+4000** = slow release followed by a gush

For example: if you want 64 scarabs to come out of the wall slowly at first, set trigger flags to 4064. If the scarabs come from the floor or ceiling, they come from the middle of the block and spray in all directions; otherwise they appear at the back of the square where you placed the *LITTLE_BEETLE*, and come out in the direction the scarab is facing. To clear all active scarabs, use a Flipeffect trigger with a value of 31.

The beetle swarm was used in conjunction with either *PUZZLE_ITEM12* or *PICKUP_ITEM1*, both of which are scarabs that attach to the wall and require a crowbar to pick off. The swarm of beetles sometimes shoots out of the "hole" behind the wall scarab. A special texture tile is used to create the illusion that they come from the hole in the wall. To do this you simply designate the trigger for *PUZZLE_ITEM12* or *PICKUP_ITEM1* as a key trigger (and type in an OCB setting of 2 to position it on the wall in-game), then trigger the *LITTLE_BEETLE* to the same square. (Raise *LITTLE_BEETLE* up to the height of the "hole") Make sure you have the correct settings in the OCB menu for the *LITTLE_BEETLE* and that you have left a crowbar somewhere as a pick up!

LARA_DOUBLE
Merely a statue, used in the middle of the large animating spiral in room 128.

TRAPS

TEETH_SPIKES
Type in 36 in OCB. (see *General WAD Objects Reference* for additional settings)

PUZZLES Remember, generally you only place puzzle pieces and their "holes"…

CLOCKWORK_BEETLE_COMBO1
CLOCKWORK_BEETLE_COMBO2
MAPPER The mapper is used in conjunction with the **TEETH_SPIKES** (OCB typed setting of 4) and the **CLOCKWORK_BEETLE**. You must place the **MAPPER** nullmesh object on squares at either end of the row of spikes so they are pointing at each other. The **CLOCKWORK_BEETLE** can only by used 3 times, then it breaks into pieces.

PYRAMID PUZZLE The following 7 items for the PYRAMID PUZZLE all work together. Refer to the room 167 if confused about how to assemble. In TR4 the beetle half of **CLOCKWORK_BEETLE** was hidden inside the pyramid, but you can put whatever pick-up you like in there. Don't forget that four **Wall Scarabs** must be placed in the level or previous levels, as well as a crowbar to pry them from the wall.

ANIMATING2 Top of the pyramid

ANIMATING3 Positioned over top of pedestal

ANIMATING4 Center pedestal

WATERFALL1 Animated glow from top of plinth. Make "invisible" in OCB until triggered.

PUZZLE_HOLE12 Place on all four sides of the pyramid.

FURNITURE0 Place the four corners of the pyramid

PUZZLE_ITEM12 (Wall Scarab) Lara must find four of these beetles (Placed on walls with the typed OCB setting of 2) in order to get into the Pyramid. Don't forget the crowbar!

Here are some extra clues for setting up this complicated puzzle ….the basic idea is to get Lara to open all four doors before she can activate the central "fountain" and gain access to the clockwork beetle. First set up the '"fountain" and the beetle – don't forget to type the number 4 into the beetle OCB. Use the trigger triggerer to "freeze" the triggers for the center animation until all four doors have been opened. Place the TT on the center square, and triggers for it in front of each of the four "doors" of the pyramid. Trigger each door to the same four squares, designating each a "key" trigger. Remember the trick for setting multiple triggers for one event – set the trigger code bits on the door "key" triggers at 1; 2; 3; and 4,5. By setting the code bits, Lara must place all four beetles in the doors before she can activate the gold fountain. (The doors actually activate the trigger for the TT which then "unfreezes" the triggers for the center animation.)

PROPS - animated and/or "interactive" items

RAISING_BLOCK2
Press all five buttons in OCB to lower.

SWITCH_TYPE1
Enter -1 in OCB to make this a "reach in the hole" to find a pick-up.

Enter 1 to the item in the hole to make it a "reach in the hole" pick-up.

JUMP_SWITCH
Usually placed 7 clicks above the floor.

PULLEY
Use with **Furniture0** – place both on same square - trigger door to open

DOOR_TYPE3
Type the number 2 in OCB to open with a crowbar.

SARCOPHAGUS
Used with **Furniture5 -** does not need a trigger**.** Can hide pick-ups inside sarcophagus

ANIMATING16 (large spiral)
Click "invisible" in the OCB then set trigger – object will become visible when triggered.

SHATTERO
"Treasure chest" shatter object – Lara must kneel and shoot to activate.

The City of the Dead

Note:

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- *With the exception of the baddies, if an object is not listed, it is because it does not require any special settings or instructions. If you want a full list, print out the .was file.*

BADDIES (and 'Goodies')

MOTORBIKE
The motorbike will explode when it hits water. Check the project for slope limitations. If the slope is too steep, the bike just won't go! Using the bike will require some extra experimentation; it is not always possible to tell if you have created an area that will cause problems…test and adjust!

WRAITH2
Another flying "ghost" – can go through walls. Dies on contact with water providing you type a 2 in the OCB menu.

BAT
Remember, flying baddies cannot fly over "illegal slopes"

SAS Guard
Can only go up or down 1-click (use an AI_MODIFY on the same square to get him to stay where he is... this is very important if in a small area with no exit, otherwise he'll run around in circles.) Other AI objects can be used with the guard – AI_patrol and AI_Ambush…check "Giving Life to Baddies" in the *Advanced Skills Section* for more options.

SAS_DRAG_BLOKE
Was a baddy! Now just a prop, but good for hiding trap doors – adding interest.

FISH
It says "fish" but it is really the locust swarm – can be deadly if you enter a high enough value in the OCB data field…somewhere around 96 is the limit. Can set heavy triggers in motorbike path or release a swarm from a shatter object.

TRAPS

SENTRY_GUN
Enter 1 in OCB to jam the gun, no entry and the gun fires at Lara as long as she is "in range". Place a **SMOKE_EMMITER_BLACK** on the same square for added effect (no trigger necessary).

MINE
Enter 1 in OCB of the helicopter. To make it explode, use **SHATTER3** and set it up as per room 73. The fuel can does not sit directly on the trigger – it won't activate the heavy trigger if it does.

PUZZLES The puzzles in this WAD either require cut scenes or pieces from WADs not accessible at this time. For example:

PUZZLE_ITEM1_COMBO1
This part of the combo puzzle is unable to be picked up, therefore combined with **COMBO1**. To get around the problem, just use the "combined" puzzle piece, **PUZZLE_ITEM1,** and treat it as a one piece puzzle.

Use your creative genius to make the available items work for you!

PROPS - animated and/or "interactive" items

SMASHABLE_BIKE_WALL
Press buttons 1 through 5 in OCB to activate.

SMASHABLE_BIKE_FLOOR

Press buttons 1 through 5 in OCB to activate.

SWITCH_TYPE7
Press buttons 1 through 5 in OCB.

KICK_DOOR1
Must be used with "Debris6" to work. Examine model carefully (room 101) to see how the door frame is placed and that the trigger is actually placed on the opposite side of approach.

ANIMATING5 (Running Rats)
These rats won't harm Lara, they are for effect only…they disappear after a three block distance. Triggers required.

ANIMATING6 (Clothesline)
Effect only…trigger required.

SHATTER1
Won't "shatter" unless Lara is in kneeling position.

SHATTER3
Won't activate a heavy trigger if it is on the same square as the trigger – must be offset.

MISC. NOTES

SKY TEXTURE
You can modify the sky texture in this particular WAD as long as the background color remains black. Find **CITY.RAW** in the WADS folder, change the color then copy it back into the WADS folder. Use the Level Converter to make a new TR4 file and check out your new sky!

DART EMMITTERS
The dart emitters DO NOT cause damage in this WAD

DOS COMMANDS

You may be a little rusty or maybe you've never had to use DOS – these few basic commands will see you through any of the script changes outlined in the manual.

From your Windows Start Bar, bring up the MS-DOS Prompt Window (under Programs). To get to your C Drive type:

cd.. and hit ENTER Repeat this command until you are at C:\> Next type:

dir and hit ENTER. Next type:

cd progra~1 ENTER you'll see C:\Program Files> Again, type:

dir and hit ENTER. Next, type:

cd corede~1 ENTER – this added \Core Design to the above path.

Continue using the cd and dir commands until you are in the directory you need to be as specified in the manual. For making script changes, you must get into the script directory. The full path names and commands are:

To make script changes:

C:\Program Files\Core Design\Tomb Raider Level Editor\script **script script.txt**

To create new sound files:

C:\Program Files\Core Design\Tomb Raider Level Editor\sound\LevelSFX Creator **pcwadsfx settomb c**

To change the front end Logo title and text:

C:\Program Files\Core Design\Tomb Raider Level Editor\Logo **packer uklogo.raw**

FLYBY CAMERA

The FLYBY cam is used for moving sequences of cameras. Place a sequence
of flybycams down on the map and select the first camera in the sequence. To
adjust the direction the camera is pointing click on the camera, hold down
ALT and use the cursor keys. (For large steps, hold down shift and ALT)
Pressing "O" will bring up a menu with the following options on it :

Seq 0   Sequence number

Num 0   Camera number increments up from the first camera in
each sequence

Timer 0   Similar to the standard camera timer. Has special fea
tures on some flyby camera modes

Speed 1   The initial speed that the camera sequence moves at

Roll 0   Used to rotate the camera for barrel roll effects,

                         A + number is given to rotate the cam clockwise,

                         A - number is given to rotate anti-clockwise

FOV 80   Alters the field of view for each camera in the sequence

There are also a number of new code-bits to give the flyby's different
modes

0 = Snap to start of sequence from Lara cam

1 = Not used

2 = Loop for infinity

3 = Track Lara cam

4 = Target Lara's last position before camera trigger

5 = Target Lara's current moving position

6 = Snap back to Lara at end of sequence

7 = Cut-Cam, Jumps to a specified camera in the same sequence
     (Timer = cam number to jump to)

8 = Hold camera (timer = 30 X Number of seconds)

9 = Disable look key break out.

10 = Disable Lara control

11 = Enable Lara control

12 = Not used

13 = Not used

14 = Activate heavy trigger

15 = Not used

Flip Effects

Flip effects are set in the "set trigger type" window and are a way of triggering things without having a specific controller. They are one offs - e.g. Shaking the screen or playing a sound effect on a particular frame of a baddie's animation. However, many of these effects are "hard-coded" and not able to be set up from within the Room editor. Those that can be used are listed below.

Effect Number	Description.
2	Plays a flooding sound effect (providing the sound is assigned to the level)
4	Used for ending the level.
7	Activates any earthquakes on the level.
10	Will play the sound effect number that's in the 'timer' field.
11	Will play an explosion sound effect.
28	Set's the RGB color of the fog in the PC version to the value in the "timer" field - (see table in reference section) This effect can only be seen when "Volumetric FX" is turned on in the game Setup menu.
30	Used in the training level and with the GUIDE to track Lara's "progress."
31	Kills any scarab beetles that are currently activ

FOG COLOUR TABLE

Red Green Blue	"Timer" value.
0,0,0	0
245, 200, 60	1
120, 196, 112	2
202, 204, 230	3
128, 64, 0	4
64, 64, 64	5
243, 232, 236	6
0, 64, 192	7
0, 128, 0	8
150, 172, 157	9
128, 128, 128	10
204, 163, 123	11
177, 162, 140	12
0, 223, 191	13
111, 255, 223	14
244, 216, 152	15
248, 192, 60	16
252, 0, 0	17
198, 95, 87	18
226, 151, 118	19
248, 235, 206	20
0, 30, 16	21
250, 222, 167	22
218, 175, 117	23
225, 191, 78	24
77, 140, 141	25
4, 181, 154	26
255, 174, 0	27

Features

Random Floor Up ----------------------------------- **F1**
Random Floor Down ------------------------------- **F2**
Random Ceiling Up ------------------------------- **F3**
Random Ceiling Down ------------------------------- **F4**
Flatten Floor ----------------------------------- **F5**
Flatten Ceiling ----------------------------------- **F6**
Average Floor ----------------------------------- **F7**
Average Ceiling ----------------------------------- **F8**
Smooth Floor ----------------------------------- **F9**
Smooth Ceiling ----------------------------------- **F10**

Textures

Select next room square -------------------------- **1**
Looks for untexture faces -------------------------- **2**
Finds Illegal Slopes ----------------------------- **3**
"Trigger to Object" ----------------------------- **4**
"Object to Trigger" ----------------------------- **5**
Texture Floor ----------------------------------- **6**
Texture Ceiling ----------------------------------- **7**
Texture Walls ----------------------------------- **8**
Goes to center of texture file ----------------------- **9**

Project

Load project ----------------------------------- **L+ Alt**
Save ----------------------------------- **S+ Alt**
Output WAD ----------------------------------- **W+ Alt**
Quit ----------------------------------- **Q+ Alt**

Edit

Cut ----------------------------------- **C+ Ctrl**
Paste ----------------------------------- **V+ Ctrl**
Select All ----------------------------------- **Z+ Ctrl**
Undo ----------------------------------- **U+ Ctrl**
Redo ----------------------------------- **R+ Ctrl**

Room

Mirror room ----------------------------------- **X+ Alt**
Flip room ----------------------------------- **Y+ Alt**
Rotate ----------------------------------- **R+ Alt**
Place target ----------------------------------- **Z+ Alt**
Bound Room ----------------------------------- **B+ Alt**
Copy ----------------------------------- **C+ Alt**
Preview Room ----------------------------------- **P+ Alt**
Flip Map ----------------------------------- **F+ Alt**

Raises floor square(s) ---------------------------- **Q**
Lowers floor square(s) ---------------------------- **A**

Raises ceiling square(s) -------------------------- **W**
Lowers ceiling square(s) -------------------------- **S**

Raises lower wall section(s) ----------------------- **Q**
Lowers lower wall section(s) ----------------------- **A**

Raises upper wall section(s) ----------------------- **W**
Lowers upper wall section(s) ----------------------- **S**

Raises sub-divided lower wall section(s) ---------- **E**
Lowers sub-Divided lower wall section(s) -------- **D**

Raises sub-divided upper wall section(s) --------- **R**
Lowers sub-divided upper wall section(s) -------- **F**

Raises object/light --------------------------- **Q** or **W**
Lowers object/light --------------------------- **A** or **S**

Lights On/Off ----------------------------------- **L**
Brings up "Object Code Bits" box ---------------- **O**
On/Off Transparent button -------------------------- **T**

Delete ----------------- Deletes selected object/light
Page Up ----------------------------------- Zoom In
Page Down ----------------------------------- Zoom Out

Arrow Cursor Keys ------------------- Rotates room
+ LEFT Ctrl ------------- moves selected object/light

Space Bar ------------- Turns On/Off room textures
TAB ----------------------------------- On/Off 2D Map

[-------------------- Moves texture file to next 5 rows

' ------------- Moves texture files to previous 5 rows

- ------------------------- Selects previous texture tile

+ ----------------------------- Selects next texture tile

Ctrl + clicking on a placed texture will mirror the texture

Right Clicking on an object rotates the object

Ctrl + Cursor Keys -------------- Points the camera

PROJECT

Load
Loads a project. Must be PRJ file format (the file created by the editor when you save your project.)

Save
Frequently! Save multiple copies and always before a big operation. (If a problem develops within your project, it is often easier to return to an earlier version than trying to find and fix the problem)

Output WAD
IMPORTANT FUNCTION   This is the beginning step in preparation for viewing your project "in-game." The wad file is needed in order to create the final TR file for your levels. WAD files are located in Tomb Raider Level Editor\graphics\wads.

Quit
Exit out of the Level Editor

EDIT

Cut
Copies (doesn't actually "cut") areas of the model, not lights or objects.

Paste
Pastes copied areas of the model. You can use this to paste copied bits of the model from one room to another.

Select All
Selects the entire floor space in the current room.

Undo
Works with all the "Feature" functions. Mainly used for actual modeling mistakes such as raising and lowering blocks, putting a wrong texture down, etc.

Redo
Can be used with anything you can "Undo"

FEATURES

(NOTE: the undo feature works with all "Feature" functions)

Random Floor Up F1
Creates random floors (or ceilings). Used in conjunction with SMOOTH. Care is needed around edges of room, and if you have connected rooms, a lot of touching up is required.

Random Floor Down F2
See above

Random Ceiling Up F3
See above

Random Ceiling Down F4
See above

Flatten Floor F5
 If you have created a random surface, this will flatten off the tops and sides of your geometry.

Flatten Ceiling F6
Same as "flatten floor"

Average Floor F7
Will completely level the floor. It will raise the "elevation" of the floor depending on how rough the surface was before averaging.

Average Ceiling F8
 Will completely level the ceiling. It will lower the "elevation" of the ceiling depending on how rough the surface was before averaging.

Smooth Floor F9
Smooths out ragged surfaces; angles perpendicular planes. Good to use with Random Floor function.

Smooth Ceiling F10
Smooths out ragged surfaces; angles perpendicular planes. Good to use with Random Ceiling function.

ROOM

Mirror
Highlight room and use this function to flip room horizontally. Textures will need touching up!

Flip
Highlight room and use this function to flip room vertically. Textures will need touching up!

Rotate
Highlight room to rotate in 90 degree increments. WARNING Textures DO NOT rotate with the model. Best to use BEFORE texturing.

Place target
CRITICAL TO LEARN. Can be used as keyboard shortcut (Alt-Z). Valuable to keep active and successively click around rooms to examine. Can click on both 2D plan and 3D view. Can click to adjoining rooms on 3D view, but must have a clear line-of-sight. Used to get into difficult corners.

Centre
Good for recovering from place target, re-centers room

Bound
The MOST important room manipulating command. Better to use when making a room smaller rather than bigger (creates awkward edges).

Copy
Copy an entire room or portions of a room. Textures will not be affected.

Split
Used when you have created a maze of corridors within one room (using the wall feature). You should split all other areas around the room so that NO rooms overlap.

Delete
Deletes a room. Make sure this is what you want to do because you can't undo the delete function!

Preview
Invaluable, use to "fly" around your model. Closest thing to playing the game in the editor. WARNING – can cause crashes, so save before using. If you get stuck in corner, just exit by hitting ESC or SPACE BAR and then re-enter. You can fly from room to room and exit to preview - the room you end up in becomes the 3D view. This is good for finding rooms in heavily stacked areas.

Flip Map
Flipmaps are used to create events, changes of state. Flipped rooms are basically copies of the existing room that can be triggered to turn on and off. Flip maps are great for floods, earthquakes, changing water currents and so forth.

TEXTURE

Load TGA
This loads the texture map file. It must be in the TGA file format and will appear in the texture panel on the right side of the editor.

Load PCX
Not used

Save PCX
Not Used

Clear Room
DANGER…are you sure? Wipes a room clear of textures! Cannot UNDO!

Load Depth Cue
Not Used

Save Depth Cue
Not Used

Fix Textures
Not Used

EFFECTS

Camera
The basic camera used to track Lara's movements or give special views of places and/or enemies. This camera view can be broken out of using the LOOK key.

Fixed Camera
Does everything the basic camera does but the view cannot be broken until Lara steps off the trigger for the camera.

Flyby Camera
A series of cameras places to create a "flyby" or "flythrough" effect.

Fog Bulb
Used to create volumetric fog. Used often in conjunction with flipeffects. Only works with Volumetric FX turned on in the Setup menu.

Sink
For use in water rooms to create currents. Good in flipmaps to open or close access to Lara in areas underwater. Sink strengths can be set using the "O" menu.

Sound
Very rarely used for anything except water noises, can crash game if correct sound is not available. Used mainly for water surface sounds. Generally works on proximity and not triggered.

Copy
Copies effect with its settings. Saves time!

Paste
Pastes copies of effects.

OBJECTS

Find Object
A useful function when trying to find a specific object. A window pops up for selecting the object you wish to find; if the object is in the project it will appear highlighted in the room where it is located. If it is not in the project you will get a dialog box telling you "no such object found in map"

Edit Object
A window pops up for selecting the object you wish to edit. Once selected, the Edit Object box appears. You can set a block collision (in quarter block increments) on the object selected allowing Lara to stand on the object.

Place Object
Select object from pop up window and place in model. (This can also be accomplished in the Object Panel)

Move Object
Allows you to move object to another location within the model. Object must be highlighted before using this function. When new location is clicked on, object is moved there. (You can also move the object within the room by using the control key along with the arrow keys.)

Change Object
Allows you to change the object. Object must be highlighted before using this function. A window will pop up so you can choose the new object. When the existing object is clicked on, the newly selected object replaces it.

Delete Object
Object must be highlighted to delete when you select this function. (It is easier just to highlight the object then use the delete key!)

Load Objects
IMPORTANT FUNCTION! When you begin a new project you must "load objects" before you can place any enemies or objects in your project. The file extension for this compressed information is WAS. These files are located in the Tomb Raider Level Editor\graphics\WADS folder.

Plan View Grid

A top down view of the selected room will appear blue on this grid. The surrounding gray squares represent the walls of the room, and are not counted as part of the actual room dimensions (the gray squares do not represent wall thickness). Doors or "portals" to adjacent rooms are indicated in black. Within the room, walls appear as green squares, triggers appear as pink, etc.
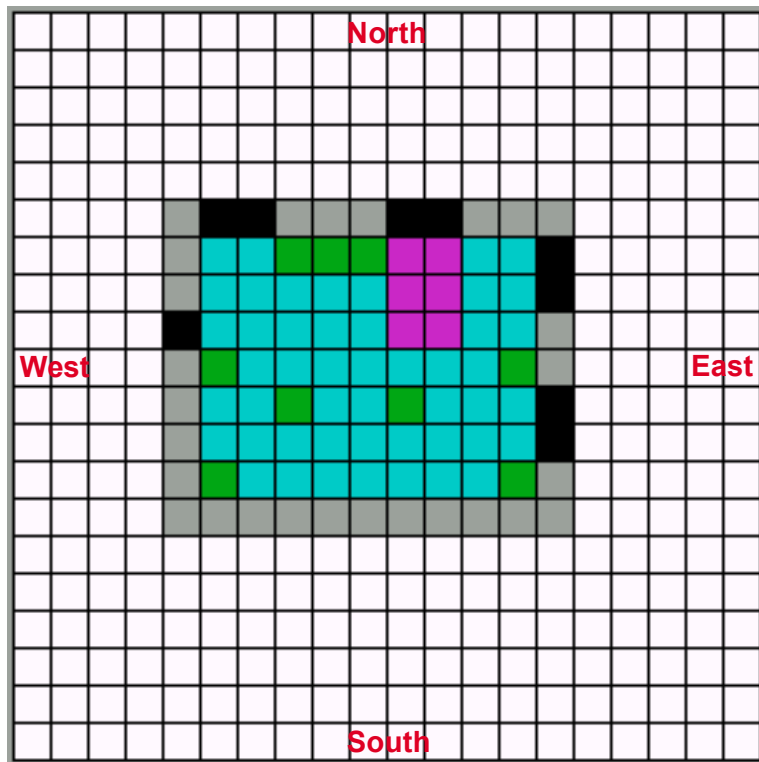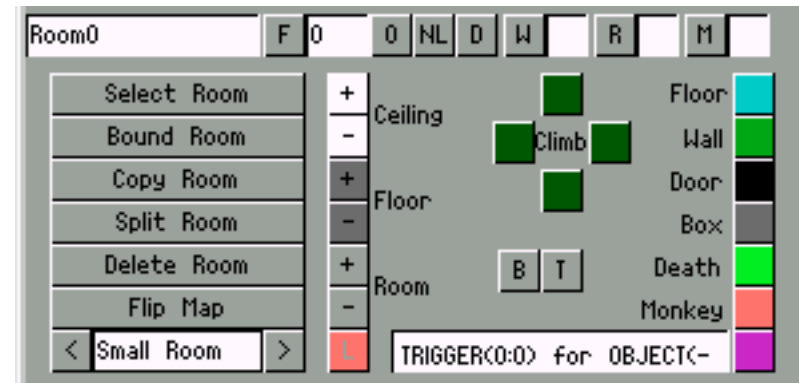
Room Edit Buttons and Text Windows

Room x
(Room name window) The selected room will appear in this window. To give a specific name to a room type the name of the room in this window and hit return.

F [ ]
Flip Map button and number window.

O
OUTSIDE button, makes room perform as outside space (Lara hair moves etc)

NL
Not currently used

D
Not used

W [ ]
Water room button and degree of intensity window

R [ ]
Reflection button and degree of intensity window

M [ ]
MIST button and degree of intensity window

Select Room
Pops up list of empty and existing rooms

Bound Room
Adjusts room size as per selection in grid

Copy Room
Copies selected room

Split Room
Used when you have created a maze of corridors within one room (using the wall feature). You should split all other areas around the room so that NO rooms overlap.

Delete Room
Deletes room...remember, no undo for this function!!!

Flip Map
Flipmaps are used to create events, changes of state. Flipped rooms are basically copies of the existing room that can be triggered to turn on and off. Flipmaps are great for floods, earthquakes, changing water currents and so forth.

< ["X" Room] >
not used in PC version

Ceiling
[+] raises selected area of ceiling

[-] lowers selected area of ceiling

Floor
[+] raises selected area of floor

[-] lowers selected area of floor

Room
[+] raises entire room

[-] lowers entire room

L Button
Locks a room to a place in the map so you can't move it in the 2D view.

Climb
Climb direction buttons, always check orientation to map

B Button
Mark for clockwork beetle

T Button
Used to designate a Trigger Triggerer

Floor
Changes a selected wall (but not gray squares) back to a floor surface

Wall
Changes a selected square(s) into a wall. Walls are always shades of green and able to be segmented for texturing purposes.

Door
Creates either a vertical or horizontal portal between rooms

Box
Prevents enemies from passing over squares with this designation

Death
Makes a death by fire square(s). Good to use with lava texture!

Monkey
Creates monkey swing squares. Always must be placed on lowest elevation below the "swing" textures. (ie. If water is below, you must designate the squares at the bottom of the water room)
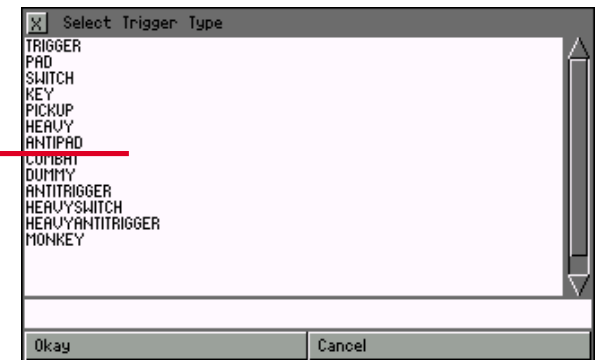
Pink Trigger Button

Used to set triggers that activate objects events, sounds flipmaps, the end of a level , etc. Click in [Trigger <0:0> for OBJECT<-] to call up "Set Trigger Type" window for setting special triggers.
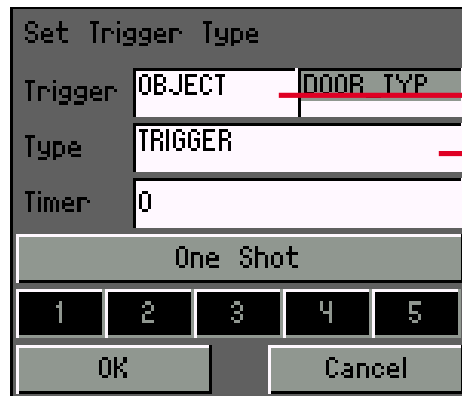
"Set Trigger Type" Window
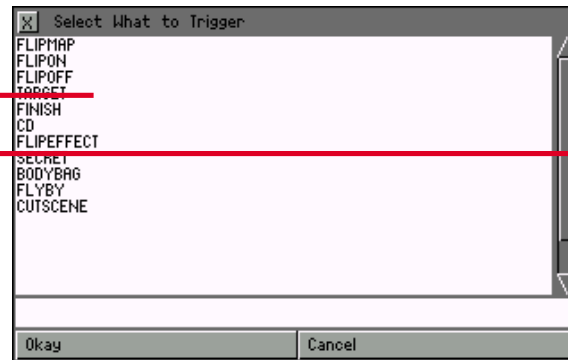
"Select What to Trigger" Window

"Select Trigger Type" Window
(Details on next page)

TRIGGER:
"Object" is default setting. Click text window for "Select What to Trigger" window.

TYPE:
"Trigger" is the default setting. Click in the text box window to bring up "Select Trigger Type" window.

TIMER:
A time interval can be assigned to the triggering of events or to the duration of an event. A negative integer will assign an interval of time PRECEDING an event. With cameras, a number in this box limits the camera view to the specified time.

ONE SHOT BUTTON
This button does pretty much what it says click on it if you want the event to occur only one time.

NUMBERS 1 THRU 5 Buttons
These buttons default to their required settings with a few exceptions.

"Select What to Trigger" window

Flipmap
Used to trigger a flipmap. Must type the flipmap number in the adjacent box

Flipon
Turns flipmap on. Must type the flipmap number in the adjacent box

Flipoff
Turns flipmap off. Must type the flipmap number in the adjacent box

Target
Used with the camera - tells camera to look at dummy target, not Lara.

Finish
When triggering a square for the end of the level, you must include a number in the text box next to "finish"

CD
This will activate an audio track – track number must be included in text box nest to "CD"

Flipeffect
Flip effects are a way of triggering things without having a specific controller. They are "one offs" - e.g. Shaking the screen or playing a sound effect.

Secret
This creates the "secret" sound.   Make sure you click on the "one shot" button!

Body Bag
Not used

Flyby
Only used when creating title screen

Cut Scene
Not used

"Select Trigger Type" window

Trigger
The default setting. Triggers objects and events. Creates an active zone
vertically above the trigger.

Pad
A pad trigger must be walked or stood upon to activate. In other words, Lara
can jump over a square with a pad trigger and it will not be activated. (There is
no vertical activation zone such as with a normal trigger)

Switch
Used to activate a switch

Key
Used to activate a key

Pickup
The action of picking up an object (e.g. medipak) becomes a trigger for an
event (eg. Rolling ball)

Heavy
Trigger type not activated by Lara. Activated by an enemy or guide or by an
object (e.g. pushed block, rolling ball, etc.) that comes into contact with the
triggered square.

Antipad
Turns off whatever was activated by the pad trigger

Combat
Not used

Dummy
Bridges, raising floors and such must have this setting to prevent Lara from
falling through the "floor".

Antitrigger
Turns off whatever was activated by a corresponding trigger. It cannot be used
on timed doors! Special triggers such as pad, switch, key, antitrigger and
antipad cannot be stacked (no more than one of these types per square)…one
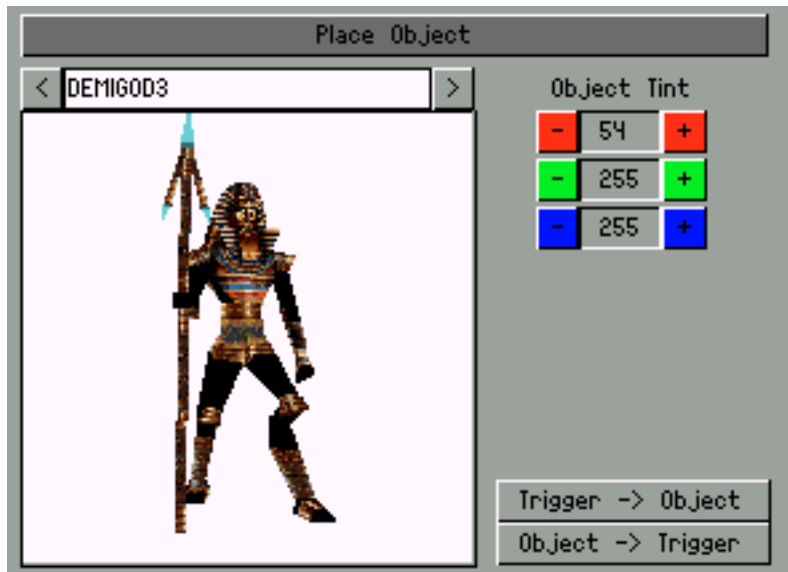of these triggers overrides all other triggers.

Heavy Switch
A switch designated to be activated by something/someone other than Lara

Heavy Antitrigger
Deactivates heavy trigger

Monkey
A trigger that only becomes active when Lara is Monkey swinging – nice if
you want a different camera or a trap only to be triggered when Lara is "swing-
ing."

Place Object
After choosing object from object text window click this button then place object by clicking on a square.

<["object name"]>
Object text window – click to activate Select Object Menu.

Object Tint RGB
Adjusts RGB value and brightness of object.

Trigger -> Object
Highlight trigger square then click this button. Editor will take you to the object it triggers.

Object -> Trigger

Highlight object then click this button. Editor will take you to the trigger square.

Viewing the Objects

Rotate the object by Left clicking in the object window.

Move the object up in the window by holding down the right mouse button and moving the mouse to the left, **lower the object** by moving the mouse to the right.

Zoom in on the object by holding down the right mouse button and moving the mouse away from you. **Zoom out** by moving the mouse towards you.

If you don't see an object in the window, it may be that you are looking at the back of a flat object (in which case you can rotate it to bring it into view) or the object may have been moved outside of the viewing window. Use the mouse to bring it back in to view.

The Select Object Menu shows the list of all of the objects available in this WAD (object set).

It's a good idea to print out the WAS file (located in the Tomb Raider Level Editor\graphics\WADS folder). The WAS file is a list of all the object "slots" (as they appear in the Select Object Menu) as well as their project names. In most cases, this makes it easier to identify the objects you are seeking. The WAS file for the tutorial level is *tut1.was*.
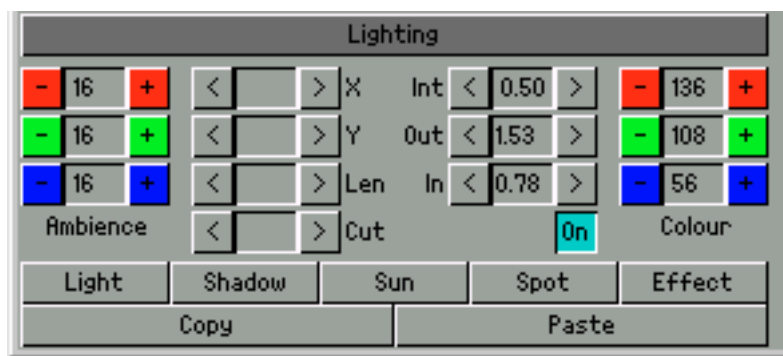
Lighting
Turns light effects on and off in editor preview window. Must be on in order to edit lighting effects.

Ambience RGB
Sets the degree of ambient light within a room. Set RGB values for color effects.

X ,Y, Len, Cut X,Y
move light around X,Y coordinates; Len adjusts fall off, Cut adjusts the hotspot.

Int, Out, In
Int = Intensity,   Out = Falloff,   In = Hotspot

[On]
Defaults to the ON position (it appears blue). Click OFF (with LIGHTING button ON and placed light selected) when you don't want the light to affect Lara or any of the placed objects. Good for creating special color or lighting effects.

RGB Colour
Set color for any light or shadow effect.

Light Placement Buttons

Light
Places a light in a room. Adjust Intensity, Out (fall off) and In (hot spot). Can assign color

Shadow
Places a shadow in a room. Int, Out and In to adjust. Can assign color.

Sun
Places a sun in the room. Only one sun per room, please! X and Y coordinates used to change orientation, enabling some really nice lighting effects, including cast shadows. Can assign color.

Spot
Places a spot light in a room. Helpful to turn on "show light meshes" to set parameters X,Y coordinates, Lens, Cut, Int, Out, In all adjust the spot. Can assign color.

Effect
Places an effect light in a room. Only affects square where it is placed. Int, Out and In to adjust. Can assign color.

Copy
Copies a light effect along with its settings.

Paste
Pastes the copied light and its settings.

Adjusting the Lights Value
Adjustments must be made using the buttons located on either side of the readout boxes - you cannot click in the readout boxes to type in a new number value.

Refer to the chart below to see just how much the values can be changed with each mouse click. Left click for smaller increments, right click for greater increments.

Button	Left Click	Right Click
Ambience	1	16
X	1	10
Y	1	10
Len	.1	1.0
Cut	.1	1.0
INT	3	12.5
Out	1	10
In	1	10
Colour	1	16

Editor Window

Main working window for modeling, texturing and viewing in 2D, 3D and Preview modes.
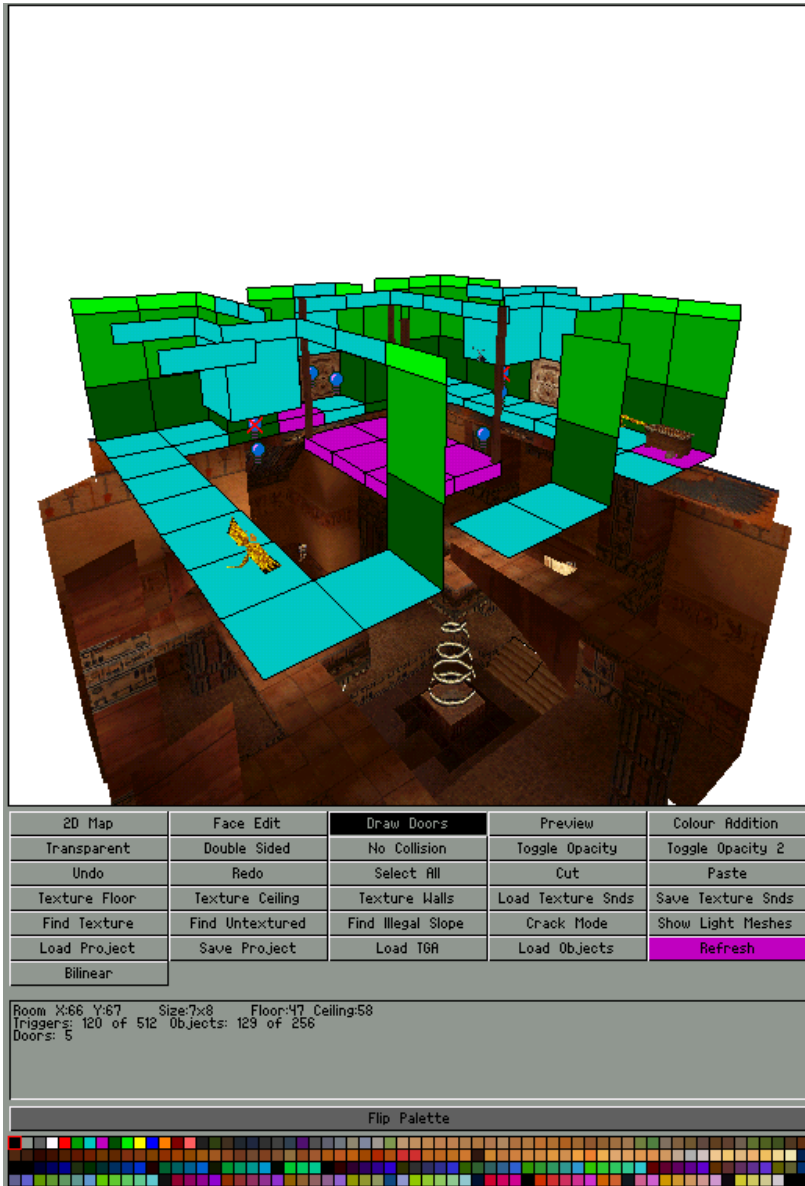
2D Map	Face Edit	Draw Doors	Preview	Colour Addition
Transparent	Double Sided	No Collision	Toggle Opacity	Toggle Opacity 2
Undo	Redo	Select All	Cut	Paste
Texture Floor	Texture Ceiling	Texture Walls	Load Texture Snds	Save Texture Snds
Find Texture	Find Untextured	Find Illegal Slope	Crack Mode	Show Light Meshes
Load Project	Save Project	Load TGA	Load Objects	Refresh
Bilinear				

Editor Window Buttons

2D Map
Displays top down view of your entire project in the editor window.

Face Edit
Displays the room you have selected with the textures on. Click off to view without textures.

Draw Doors
Displays the adjoining rooms.

Preview
The preview mode allows you to "fly" through the model and get a better idea of what it will look like in the game. Autosave is activated when you enter this mode. Exit or space bar are used to exit.

Colour Addition
This option is for the editor only - sometimes it's hard to see what is going on with colour and transparent faces. If you are trying to texture a water surface and you don't have doors switched on, it is sometimes easier to switch from colour addition to transparent.

Transparent
Must be active when applied to make textures, such as water, transparent.

Double Sided
Activate to apply textures to both sides of the polygon. It also must be used to create water so the water texture can be seen from above as well as below the surface.

No Collision
Assigned to the triangles "hanging in space" between portals when you model angled corners. Without its use, Lara would be able to "walk on water" and appear to stand in mid air.

Toggle Opacity
When creating a transparency in a "portal", this button is used to allow texturing of the "portal" and to PREVENT passage through that opening. (eg. You want to create a cage effect or a window looking through into another area) Must be applied from both sides of opening.

Toggle Opacity 2
When creating a transparency in a "portal", this button is used to allow texturing of the opening and to ALLOW passage through it (e.g. Used to create water and cobweb effects).

Undo
Works with the "Feature" functions. Also works with texture placement.

Redo
Allows multiple redos with all the functions under "Features" in the Drop Down Menu. Also works with texture placement.

Select All
Selects the entire floor of a selected room

Cut
Allows you to copy areas from an existing room. (Doesn't actually cut them from the map)

Paste
Pastes the areas that were copied (cut) into another room or another area within the same room.

Texture Floor
Places textures over entire floor of selected room.

Texture Ceiling
Places textures over entire ceiling of selected room.

Texture Walls
Places textures over walls of selected room.

Load Texture Snds and Save Texture Snds
These functions are useful if you have applied sounds to individual textures in the TEXTURE SOUNDS window (click on the Texture Sounds button at the bottom of the Texture Panel to bring up this window). When you save your project sometimes the texture sounds get erased; if so, load the sounds back into your project using the LOAD TEXTURE SNDS button.

NOTE: These are also the buttons used for saving and loading bump maps (use the buttons at the bottom of the TEXTURE SOUNDS window to assign bump mapping. Bump mapping is only visible if you have turned on the option in the Setup Menu). Every time you save either a sound or bump map designation, you save with two separate default file extensions.

Find Texture
Useful for finding where a particular texture is applied in the model. With FACE EDIT clicked, select a texture from the texture panel then click this button, the editor will locate it.

Find Untextured
Finds untextured polygons within model.

Find Illegal Slope
Finds slopes that create places where Lara can get stuck.

Crack Mode
Not used

Show Light Meshes
This makes the light "cones" visible. Very helpful when creating spotlights and aiming lights.

Load Project
Loads a project. Must be a PRJ file format – the file created by the editor when you save your project.

Save Project
Frequently! Save multiple copies and always before a big operation. (If a problem develops within your project, it is often easier to return to an earlier version than trying to find and fix the problem.)

Load TGA
This loads your texture map file which must be in the TGA file format. It appears in the texture panel on the right side of the editor.

Load Objects
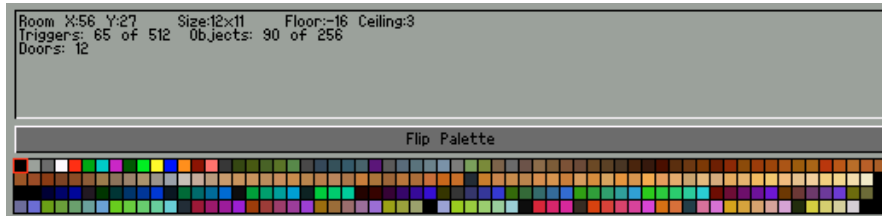IMPORTANT FUNCTION! When you begin a new project you must load objects. These objects are in a WAS file format.

Refresh
Redraws lighting effects between adjoining rooms. Often after modifying a placed light, a hard line will be created between adjoining rooms. Refresh redistributes the light to eliminate this line.

Bilinear
The Bi-linear option smooths out pixels by emulating what a 3D card does to your textures.

```
Room X:56  Y:27    Size:12x11     Floor:-16 Ceiling:3
Triggers: 65 of 512  Objects: 90 of 256
Doors: 12
```

Flip Palette

Flip Palette Button

In 2D map view, when you click this button, all rooms at an elevation above a selected room disappear from view, those below are gray. Click again, the rooms above reappear. Good for finding "hidden" rooms.

Color Palette

Provides colors used for transparency. Also a quick way to assign color to a light by selecting the light then clicking a color square - the light will assume the RGB values of the square.

Window Info Box (directly below window buttons)

Room XY
Indicates the X and Y coordinates of the selected room. Helpful when stacking rooms.

Selected Block X and Y
coordinates for a selected block appear only when you click on a square in the Plan View grid

Size
Tells you how many squares long and wide your room is (the unit of measure being that represented on the grid in the Plan View Panel).

Floor
Shows floor elevation. Important when aligning rooms vertically.

Ceiling
Shows ceiling elevation. Important when aligning rooms vertically.

Triggers
 Keeps track of how many triggers you have used in the entire project.

Objects
Keeps track of how many objects you have used in the entire project.

Doors
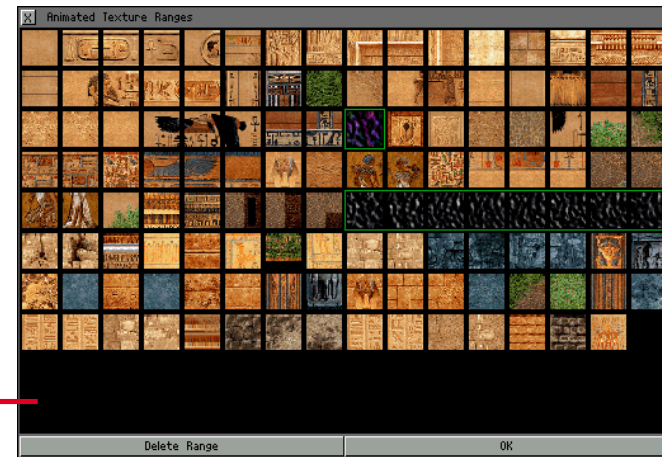Tells how many "door" openings there are in the selected room.

Texture Map
TGA file, 24bit color. Each tile is 64x64 pixels. You can make your own texture maps - lay them out either four or eight tiles across. See "Creating/ Modifying Textures" in the *Advanced Skills* section for more details on creating your own maps.

Animation Ranges
Brings up window for setting animation ranges. Animated textures will not work until these ranges are set.
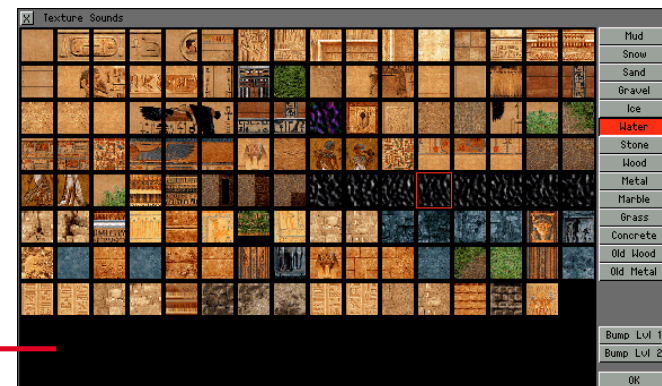
Texture Sounds
Brings up window for assigning the right sound to the textures.

Bump Level1 and Bump Level2
Used to assign bump mapping to any texture. You must have Bump Mapping turned on in the Setup Menu in order to see these effects. You also must use the Save Texture Sounds button to save the assigned bump maps – you will always have to save two files (each has a default file extension - one for sound (TFX) and the other (TBM) for the bump map).

AI (Artificial Intelligence) - programmed behavior characteristics - different kinds of AI can be assigned to baddies to modify their behaviors.

Ambient Light - the general light within a room with default setting of RGB 128,128,128

Animation Range - a designated sequence of textures that comprise an animated texture when viewed in-game.

Arrows - arrows and X's appear in white on red highlighted wall panels, arrows only on floor and ceiling squares. Used to fine-tune model and wall texture panels

Average Ceiling - Sets (or flattens if random surface) the ceiling to an average height of the selected ceiling squares

Average Floor - sets (or flattens if random surface) the floor to an average height of the selected floor squares

Bilinear - the Bi-linear option emulates what a 3D card does to your textures.

Block - the basic building block of the editor created when you raise or lower surface squares

Bound Room - crops room to a selected size

Box - a feature assigned to a floor square that prevents baddies from getting into places they should not.

Broken Surface - term used to help clarify what happens to a square whose corner has been raised or lowered (the surface is "broken" into two triangular sections)

Bump Map - can be assigned to textures to make them appear more three dimensional. To see effects, the bump map setting must be turned on in the game Setup menu.

Camera - used to "force" a view, triggered by Lara standing on a camera trigger square

Centre - (English spelling) returns view and rotation axis to the center of a room

Cheat Mode – see "Flycheat"

Climb - four green climb buttons, used to make a wall surface climbable

Collision - or "no collision" is assigned to the triangular corners sticking out into portals when diagonal slopes have been modeled. Without this, Lara would appear to stand on water or in mid air

Copy - different copy features in the editor are used to copy lights or rooms and portions of rooms, but not objects

Copy Room - makes a copy of a room (the lights of the room will not be copied with it)

Crack Mode - Not used in developing for the PC

Cut - the hotspot of a spotlight

Death - type of square that will cause Lara to burst into flames and die.

Delete - removes rooms, lights, objects from project.

Delete Room - removes a room, caution, no undo!

Demo Model - the example model in the Level Editor tutorial project, tut1.prj

Door - sometimes called "portal", the open horizontal or vertical connection between two rooms. Vary in size according to room size and purpose of opening

Draw Doors - draws adjoining rooms in addition to the room you are in

Effect Light - a light assigned to affect just one square

Falloff - the part of the emanating light that fades off into darkness

Face Edit - textures are turned on when this button is pressed

Fixed Camera - a fixed camera cannot be broken until Lara steps off the trigger for the camera – activates even when weapons are drawn

Flatten Ceiling - makes selected ceiling tiles flat

Flatten Floor - makes selected floor tiles flat

Flip Room - Highlight room and use this function to flip room vertically. This will NOT flip your textures.

Flip Effect - special flag set on triggers to cause specific actions

Flip Map - used to create events and changes of state such as floods and earthquakes.

Flip Palette - used in 2D navigation in the Editor Window. Makes all rooms above selected room "disappear"

Floor - the bottom plane of a room

Flyby Camera - a series of cameras used to create a "flyby" effect

Flycheat - the cheat mode; used to move around in level without having to play the game by pressing the keyboard letters DOZY, then using the control and arrow keys to navigate. Can be disabled by editing script.txt

Heavy Trigger - a trigger that is activated by something other than Lara

Horizon Graphics - appears in the WAD of levels with outdoor capabilities. Does not need to be placed in model – gets incorporated in Level Converter

Horizontal Connection - any portal (created using the DOOR button) connecting rooms side by side

Hotspot - the brightest part of a light's emanation

Illegal Door - a door or "portal" that is not connected properly. Usually indicates an overlap – will cause error message when outputting WAD

Illegal Slope - slopes causing in-game navigational problems at their junctions; any slope over which a baddy cannot fly (any 3-click slope or greater)

Len - the falloff of a spotlight

Level - one in a series, the total of which comprise a game; the model with gameplay designed in conjunction with a particular WAD (object set)

Level Converter - Tom2pc.exe program used to make the playable TR4 file

Level Design - includes all aspects of "design" from layout of environments to gameplay

Light Meshes - the visual representation of a light's characteristics

Mirror - Highlight room and use this function to flip room horizontally. Does NOT mirror textures.

Monkey Swing - a "climb" across a ceiling in the hanging position

Nullmesh - a "dummy" object placed to perform a function in the playable level (e.g. flames)

Object - any item placed in a level

OCB - Object Code Bit, press "O" to bring this box up

Output WAD - a major step in creating the playable TR4 file – combines WAD information with "level" information to create a .TOM file which is then converted to the playable TR4 file

Pick-up - item Lara can pick up in the game

Place Target - (Alt Z) can move you to a specific spot in a room or into another room – good navigation tool. Changes rotational axis

Placed Lights - Any light able to be placed in the model, including shadows

Plan View Grid - the grid where a selected room is displayed in a top down (plan) view

Polygon Dropout - the failure of polygons (therefore their textures) to be "drawn" in-game causing "voids" in the field of view.

Portal - the vertical or horizontal opening created when two rooms are connected using the DOOR button. Vary in size according to room size and purpose

Preview - a 3D fly-through of the model. Closest thing in editor to "in-game" viewing

Random Ceiling Down - a quick way to create ragged "organic" surfaces on a ceiling

Random Ceiling Up - a quick way to create ragged "organic" surfaces on ceiling

Random Floor Down - a quick way to create ragged "organic" surfaces on floor

Random Floor Up - a quick way to create ragged "organic" surfaces on floor

RGB Colour - the red, green and blue values of color. Lights and objects can be assigned different RGB values

Redo - will "redo" anything you can "undo" (mostly functions under "Features" in the Drop Down Menu

Rotate - rotates room 90 degrees clockwise

Select Room - button used to find a particular room or select an "empty" room to add to the level

Sink - used to create currents in a water room

Slope - a floor or ceiling square at an angle not parallel to the horizon

Smooth Ceiling - Smooths out ragged surfaces; angles perpendicular planes. Good to use with Random Ceiling function.

Smooth Floor - Smooths out ragged surfaces; angles perpendicular planes. Good to use with Random Floor function.

Split Room - Split is used when you have created a maze of corridors within one room (using the wall feature). You should split all other areas around the room so that NO rooms overlap

Splitter - refers to feature assigned to a floor square that prevents baddies from getting into places they should not (use BOX button – makes square gray)

Square - refers to the basic building block 2D surface. Squares are raised or lowered in the modeling process to create form. One full texture tile (64x64 pixels) is equal to one "square"

Texture Tile - a 64x64 pixel image placed on squares to "define" the model. Squares are not visible in-game until textures are placed

Texture Map - a collection of texture tiles used to define the environment of the level

Texture Sounds - assigned to the texture tiles so they will give off the appropriate sounds when walked upon (crunching sand, clanking metal, etc.)

Toggle Opacity - used when creating transparency in a portal - it allows texturing of the "door" and PREVENTS passage through that "door." (e.g. You want to create a cage effect or a window looking through into another area) Must be applied from both sides of opening to prevent passage from either side.

Toggle Opacity 2 - used when creating a transparency in a portal - it allows texturing of the "door" and ALLOWS passage through the "door". (e.g. Used to create water and cobweb effects)

Traps - animated objects set up to kill Lara such as rolling balls, spikes, swinging blades, etc.

Transparency Colors - colors from the color palette assigned to squares with 1) openings between rooms (gray) and 2) areas looking outside to the horizon graphics (black)

Trigger - assigned to a floor square using pink trigger button to "trigger" an event

Trigger triggerer - a dummy object set with a trigger - it freezes any triggers under it until it has been triggered

Trigger Zone - a group of squares all triggered to the same object

Tom file - the file created when you "output wad" in the Room Editor. It contains the information of the WAD file in addition to everything in the level. It is the file that gets converted to a playable TR4 file

Undo - used to "Undo" particular functions, mostly those found under "features" in the Pull Down Menu. Will "undo" misplaced textures.

Vertical Connection - any portal (created using the DOOR button) connecting rooms above and below

WAD file - contains the compressed information of all the objects and animations for a particular level

Wall - green WALL button is used to create walls; walls appear as green squares in the Plan View Grid, but appear as blank space in the Editor Window in 2Dmap mode. In 3D, walls appear in 3 shades of green (for texturing purposes)

Wallpaper Effect - an undesirable condition resulting from poorly designed textures and/or their improper application

WAS file - the list of all the objects and animations in a particular level.

White Arrows - see arrows

TROUBLESHOOTING

Level Editor Error Messages

System Request "Arg list too big"

When you save a project, the paths for the WAD file and the texture map are remembered by the Editor. If you move any of these files or folders, when you load your project again, you will get the above error message. When you hit cancel (you're only option), you will get another message:

System Request: "Warning: texture file (path name) not found".

When you hit okay, a "load object file" window will pop up. Load your WAD file (Tomb Raider Level Editor\ Graphics\Wads), then load your texture (Tomb Raider Level Editor\Maps). Save your project and the next time you load it up, you'll be set (unless you move the files again!). There is another message you can get during this process but you will only get it if you load the wrong WAD file into the project in which you have already placed objects. This message is:

System Request: Retain all Triggers (Remap to Lara?)

Always hit cancel. It will tell you how many objects were *removed* from the map. Don't save this project! You need to reload your project and load in the correct WAD file if you want to make sure you don't lose any of your work.

Windows Error Messages

I get a Windows error message when I try to open the editor:

Make sure you are operating in 16 bit color. The editor WILL NOT run in 24bit color!

The game won't boot up, the screen is black and I get a "Failed to Set Up Direct X" message:

Just reboot your system.

Editor Interface

The buttons along the bottom of the interface screen are not visible:

Press Alt + Enter to fit the interface to your screen. Make sure you are in 1024x768 screen resolution.

The interface screen (or parts of it) turned black:

Restore the image by minimizing the window, then opening it again (you may have to press Alt + Enter to regain the Windows bar).

Editor Window

The Editor Window is completely white after I load a project.

Press the 2D button on and then off, this will make the project visible.

The room and objects I'm working on partially disappear in the Editor Window.

The Editor in some instances has slight compatibility problems with gForce Video cards. Turning off the "Draw Doors" button fixes this.

I loaded in a new project and texture map and all the objects have strange colors:

Once you save and reload the project, the colors will return to normal.

Crashes

The Editor freezes up before I can get started.

When the Editor starts up, a box will ask "Load in last autosaved?" You must press "OKAY" or "Cancel" before doing anything else (like clicking on the Windows Minimize/Maximize buttons) or the Editor will freeze up.

I built my level and output it, but it crashes when I start to play it.

Make sure Lara has been placed in the level!

When I use "Average Floor" or "Average Ceiling" sometimes the program freezes.

If you accidentally highlighted a white square on the Plan View grid then use this command, the program will crash.

General Problems Using the Editor and/or Level Converter

Editor seems to "chug" when I go into certain rooms.

Be careful! You are probably pushing the limits! Large rooms with loads of lights and objects will bog down your system! Turning off "Draw Doors" will help.

While using the Level Converter, no data is displayed and I'm not sure if is converting my files.

For some reason, probably having to do with the size of the project, the level converter sometimes does not display the data as it is converting the files. Usually you will see the blue progress bar and you will know the Level Converter has finished its job when you can move the window on your desktop. Also, if you want to be certain, check what time the TR4 file was created. There are two sample levels that have this problem….Catacombs and Coastal Ruins.

In-Game" Problems

Frame rate is poor – game not running smoothly like it usually does.

A reboot will usually solve this problem.

Lara gets stuck and does the "jig"

Always use the illegal slope checker before playing your level, this will stop Lara from getting stuck in the map. Common illegal slopes are when you have a three-click slope running down to a wall or two, three-click slopes facing each other.

I placed the fog bulb but I can't see any effects.

Make sure volumetric FX is turned on in the Setup Menu. The fog bulbs work in conjunction with FlipEffects - make sure you set the trigger properly.

I assigned bump map features to some textures but they don't look any different.

Make sure Bump-mapping is turned on in the Setup Menu. If you reloaded a texture map but didn't "save texture sounds" you will lose the bump-map settings.

There are "holes" in my level.

Any surface without a texture on it will appear transparent in-game. Use the "Find Untextured" button to locate untextured polygons.

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