DXTre3d. 2.x

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CREDITS and THANKS

Building an unofficial level editor is a hell of a lot of work, and if it wants to cover all TR Versions, (tr1,tr2,tr3,tr4,trc) then it is even more difficult. Add to this that you are working with unofficial file format specs, learning 3d graphic API (Directx or Opengl) and spending all your free time (and sometimes not so free!) will makes you feel like you're going to go crazy.

Happily I used DELPHI language (the best programming language and compiler in the world) and I get help from some people or indirectly from some guys who code free tools and libraries that help poor lonely coders like me to get things get done a lot easier. Although Dxtre3d is signed by me (Turbo Pascal) there are those that contributed in the final code, so these are the credits:

- Designer and Main Programming: **Turbo Pascal**. - cyber_pascal@yahoo.com
- Additional Programming   : **Raider Croft.**-   raider_croft_01@hotmail.com
- English User's Manual v. 1.0   : **Dale Rickert**.- dmrick@netriver.us .
- English User's Manual v. 2.x   : **Turbo Pascal.**

Others Libraries or tools:

DIBUltra - Version 1.3 CopyLeft GPL 5/1999, Sébastien Léon.sleon@magic.fr http://perso.magic.fr/sleon

GraphicsEX, v. .9 Mike Lischke, http://www.lischke-online.de

`Direct3DX 8.1` Delphi adaptation by Alexey Barkovoy E-Mail: clootie@reactor.ru
http://www.delphi-jedi.org/DelphiGraphics/

Ultimate Packer for Executables v. 1.24 Markus F X.J. Oberhumer László Molnár
http://upx.sourceforge.net/

Inno Setup version 2.0.19 Copyright © 1998-2002 Jordan Russell. All rights reserved.Portions by Martijn Laan., http://www.jrsoftware.org/

Well, as usual I want to give some thanks to some specials guys that made possible Dxtre3d gets done:

- **Raider Croft**, for helping me to code some important Dxtre3d modules, like 2d map, 2d grid, Texture Panel and Room linking (official editor look alike way), you have great programming skills. You saved me from lot coding months!, thank you so much.

- **E. Popov,** for helping me and providing me with info about internal tomb raider texture table file format, also I got the general idea about the algorithm for re-arrange the movables, static mesh and sprites textures from his TRVIEWER source code.

- **Roy Goldbold**, for sharing his TRC file format document, awesome works you done!, also he rescued me two times, I was unable to found the solutions about some problems in custom TRc levels, and he take the time to check it out and found what was wrong, *THANK YOU SO MUCH*, there is TRc support in my editor thanks to your effort and kindness.

- **Dale Rickert,** I WAS SO LUCKY that day when I received a email from you offering me your help to write the manual, you became my main Dxtre3d tester, trying every option and founding several important bugs. The manual is awesome and if the editor gets success with new beginner users, that will be thanks to you.

- **Kevin (The Vagrant),** my good old friend, it is amazing how we (you and me) keep enjoying Tomb Raider Game trough all these years, people comes and peoples gone but you still here hanging on, thank you so much.

- **ICEBERG.** , My new partner, when Rgbold leaved the forum long time ago hacking the Tomb Raider file format was not funny anymore, coding and hacking Tomb Raider is hard when you feel that there is no one else to ask when you get stuck, but suddenly you appeared at the forum, with new energy, a new programmer partner (that even also use Delphi like me!!), you push the editor so hard and you provide me all the help to make my tools XP compatible. It's so refreshing to know that I can count and trust on you. Thank you so much.

- **Michiel. Aka TRWAD.** For using my TRC editor for test and document all movables from Chronicles Game, your OCB chart and items catalog is a invaluable help, thank you for share with me and taking the time to found internal stuff inside the Tr file format. I think that if you leave the dark side of the force and abandon those stinky C++ and VB compilers we could be best friends.

- **And finally** to several guys at the Forum to test, found and suggest new Ideas for the editor, but most at all to tolerate my weird behavior and bad mood, I know sometimes is a little hard to interact with me. Thank you so much to those that criticizes my editor and give me the push to code always a better tool.

Turbo Pascal, (July 2004).

System Requirements

- DirectX 8.1 or above.
- A video card with hardware acceleration and at least 4 MB of memory.
- Screen resolution set to 1024 x 768.
- Windows 98 Second Edition or above.
- 3 Buttons Mouse recommended.

- IMPORTANT: In order to use this program, you will need to have a copy of one of the Tomb Raider games that can be played directly from your hard drive instead of your CD drive. One way of achieving this is by using one of the available demos.

If need be, you can download a copy of the Tomb Raider Chronicles demo from the following link: http://www.eidosinteractive.com/downloads/search.html?gmid=103

Under "Demos," click on the Tomb Raider Chronicles demo file name to begin the download. It's a rather large file -- nearly 15 megabytes.

You can also download a selection of textures from the same page. Under "Other Media," click on the textures file name to download them.

The Tomb Raider Chronicles demo and the above mentioned textures will be used in our "hands on" tutorials. and so you may want to download them if only to use them in the tutorials.

If these files are no longer available, check our web site for information on how to acquire them.

Installation

If you got the package from ZIP files then just create a directory and unzip all the files into that directory.

Create a desktop shortcut for the "dxtre3d.exe" program.

Make sure Windows is running in the 1024x768 screen mode with 16 or greater bit colors. Boot the program by double-clicking (or single clicking if your desktop is configured that way) the new program icon.

You should then go to menu "File", "Config" and open the language file (if available) for your native language.

Notation & Terminology

Throughout this manual the following notation will be adhered to:

The names of buttons on the screen that you can click on will be surrounded by square brackets. Thus [OK] and [Geometry] represent an OK button and a Geometry button. [Up arrow] is a button that appears on the screen as an upward facing arrow.
Keys on your keyboard and the mouse buttons will be surrounded by "greater than" and "less than" brackets. Thus <A> would be the "A" key while <Enter> would be the "Enter" key.

When two or more keys are separated by dashes, it means you are to hold down one key while pressing the other key. Thus <Ctrl>-<Shift>-<A> means that you are to hold down the "Control" key and the "Shift" key while pressing the "A" key.

When just the word "click" is encountered, it refers to clicking the mouse's left button. <Left click> means to click the left mouse button while <Shift>-<Left click> means to hold down the "Shift" key and then press the left mouse button.

 <Alt>-<Shift>-<Left click> & drag means to hold down the "Alt" key and the "Shift" key and while holding down the left mouse button, drag the mouse to increase or decrease the size of your selection. This is often used when selecting groups of items.

If when in the editor you move the mouse over a control the pointer turn to this shape: then it means you can use right click to bring a popup menu with additional options.

The following terminology is used:

Block: A standard sized geometric cube that measures 64 pixels in all directions. It can also refer to a distance that's equal to the height or width of a standard 64 pixel block.

Section: Walls, ceilings, and floors are divided into smaller areas referred to as sections. They are usually rectangular but on occasion can also be triangular. When you are texturing walls, floors, and ceilings, individual textures are applies to each individual section.

Static Item: An item placed in a level that's primarily just for looks and does not interact with any of the characters. Such items could be trees and statues and so on.

Objects: Unlike static items, these objects interact with the Characters. They can be items to be picked up, locks and keys, pushable objects, objects that blow up when they're shot, and so on.

Finding us on the Web

Our Official web site can be found at...: http://www.geocities.com/cyber_delphi
Email the author at... Cyber_Pascal@yahoo.com

On-Line Help: The Forums

You can get help and information on using our program on the Web by joining the following on-line forum: http://pub19.ezboard.com/ftreditingzonefrm2

A Word About Saving Files

Anytime you are building a Tomb Raider game, it is extremely important to save your level often. Not only should you save it often, but you should save your program out as different files at different places in its development. There's nothing more upsetting than to spend days working on a terrific level only to find that you did something earlier that now has the level messed up to where you have to go back and start all over.

 If you will save your level into different files you can later back up and restart from some place other than at the beginning. When you save your levels out at various stages of development, at the very least name them in such a way that you will know exactly where you were at when you saved it. You might want to include a text file of the same name and make comments about the level so that you can later read it and know how things are meant to function.

 Once you get into the habit of saving often, make sure you are not just continually overwriting your only existing file. It's upsetting to save your level and then suddenly realize that you've overwritten the only good copy of your level with one that contains an irreversible mistake. All of this applies to the levels that you'll be working on in our hands on tutorials.

SAVE OFTEN !

Included Project Files

Included with the program are several project files. Each of these projects are ones that I created as I built the tutorial level in Chapter 3 and Chapter 4. If you want to see how my level looked and worked at various places in the tutorial, you can load in one of these projects and build it.

Near the right margin of the pages in Chapter 3 and Chapter 4, you will find red numbers with red boxes around them as shown here . . .

3

-

4

This means that the included project named "ch3-4.tre" can be loaded in to see my project at that point. I hope this will help you if your own project doesn't go the way it should.

Before loading any of the projects, you will have to set up two files so that the path to them is the same as it was on my computer. That way the program will find these files when you load in the projects.

The path to the texture file must be...

C:\Program File\Core Design\trle\Extra Textures\tr2\platform.tga

The path to the Base level must be...

C:\Program Files\Core Design\TR5 Demo\data\orig_demo.trc

If your files are in different places on your system, simply create the paths as shown above and place copies of the files in those locations.

Chapter One: Main Windows

A Brief Description of The Main Window Features

The Menu Bar

File View Edit Rooms Help
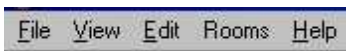
At the top of the screen are 5 different pull-down menus.

The File Menu:

New Project: Discards the current project so that a new one can be started This does not remove the Base level or you available textures.

Open Project: Opens an existing saved project.

Save: Saves the current project using the name already assigned to it.

Save As: Brings up a dialog box that allows you to save your project with a new name.

Open Base Level: Opens an existing Tomb Raider level that can then be used as a source for various objects and items

Open Textures: Opens up a graphics file that can be used as a source for textures. The textures are displayed in the Texture Window on the right side of the Main Window. Numerous graphic file formats are supported.

Do not Open base automatically: Allows you to open a project without a Base level. This allows you to open your level and then load in a different Base level.

<u>Do not Open texture automatically</u>: Allows you to open a project without textures. You can then open a different texture file for your level.

<u>Build Level:</u> Initiates the compiling of your project into a playable level.

<u>Config:</u> Brings up a pop-up window where you can set the mouse sensitivity for Notations, panning, and Zooming.

<u>Exit:</u> Close the DXTre3D program.

At the bottom of the drop-down menu is a list of the last few levels that have been loaded. After booting your program, you can readily click on the name of a level that you have been working on recently and it will be loaded.

The View menu

<u>Hide Ceiling:</u> Hides the ceiling when it possibly obstructs your view.

<u>Hide Floor:</u> Hides the floor and walls when they possibly get in your view.

<u>Hide Ornaments</u>: Used to help speed up rendering of a room.

<u>Hide Items:</u> Used to help speed up rendering of a room

<u>Black Background:</u> For those who would rather have a black background while working on their level.

<u>Draw Light Mesh:</u> When working in Lighting mode, if this option is checked then a sphere mesh is show representing the light distances.

<u>Show texture Attrib:</u> When checked, will show with color those textures with attrib transparent or translucent.

<u>Auto Mode:</u> When checked, Dxtre3d will push automatically the "Enabled" button when you select any toolbar group.

The Edit menu

<u>Undo</u>: Used to cancel the last step performed.

<u>Redo</u>: Used after the Undo command to restore the last action undone.

<u>Copy Block (Ctrl+C)</u>: Makes Copy current marked block section.

<u>Paste Floor Block (Ctrl+V)</u>: Used to paste a floor section that's been copied.

<u>Paste Ceiling Block (ALT+V)</u>: Used to paste a ceiling section that's been copied.

<u>Clear Floor Door (this room only)</u>: Remove portal door to the room below, but keeping the portal info for the ceiling in the room below; that allow you to build one WAY doorway.

<u>Clear Ceiling Door (this room only)</u>: Remove portal door to the room Above, but keeping the portal info for the Floor in the room above; that allow you to build one WAY doorway.

<u>Clear All Objects</u>: Removes all objects, items, triggers, and cameras from your rooms; useful for start a new project re-using an old TRE.

<u>Delete Last Trigger</u>: Used to delete the last created trigger. Use cautiously!

<u>Items List</u>: If you have "Objects" selected and [Enable] active, this brings up a list of objects in your level.

<u>Triggers List</u>: Brings up a list of triggers in your level.

<u>Quick Trigger</u>: Toggles between using quick triggering for add New triggers or for Replace (overwrite) the current one.

Apply Texture Attrib to the floor: Will apply current selected texture attrib to the marked floor sections.

Apply Texture Attrib to the Wall: Will apply current selected texture attrib to the marked wall sections.

Apply Texture Attrib to the Ceiling: Will apply current selected texture attrib to the marked floor sections.

Allow Border Room adjustment: When checked, allow user can adjust room border sections. This is not recommended except for special cases in manual portal linking.

The Rooms menu

New: Brings up the "Add new room" dialog box for creating a new room.

Properties: Brings up the "Rooms Properties" dialog box for changing a room's parameters.

Delete: Used to delete the LAST room from the project. You are not allowed to delete middle rooms; if you decide than a room is not needed anymore then re-use it (rebuild) the room and found a new uses in another position etc.

Clone: Clones the current room. Great when you are creating an "alternate" room.

Copy: Makes a Copy for current room.

Paste: Paste last copied room into the current one.

Send to Front: Places the "current" room in front of the "neighbor" room.

Send to Back: Places the "current" room at the back of the "neighbor" room.

Send to Right: Places the "current" room at the right of the "neighbor" room.

Send to Left: Places the "current" room at the left of the "neighbor" room.

Send to Up: Places the "current" room above the "neighbor" room.

Send to Down: Places the "current" room below the "neighbor" room.

Bound Room: Will change the room width & height with the current marked block sectors and preserving the content in that block.

The Help menu

Read me File: Displays the "Readme" file in a pop-up window.

Keys Guide: Displays a pop-up window listing shortcut keys, etc.

About: Displays information about the author and the program.

Create New LNG file: Build an empty language file module ready to be translated.

Switch Language: Switch Dxtre3d interface between current loaded language file and to English.

Reload LNG file: Will refresh current loaded language module from disk; this is helpful when user is doing the translation module using the Lng editor.

The Speed Button Toolbar

Below the Menu Bar is the Speed Button Toolbar

It is a series of buttons that serve as shortcuts to performing multi-step tasks. The first six buttons appear as arrows pointing in Various directions.

A little bit about room orientation:

As you are viewing a room on the screen, the far wall of the room is considered to be the front of the room with the left wall being the left side and the right wall being the right side. A column is different. The near side is now the front of the column while the left and right remain the left and right sides.

We also need to mention that the "current" room is highlighted in the "Rooms Group" at the bottom of the screen. To the right of that, the "Neighbor" setting tells you which room is the "Neighbor" room.

Remember that <Up arrow> represents the up arrow key on your keyboard while [Up arrow] represents a button on the screen that you can click on.

Now let's get back to the Speed Button Toolbar.

The [Up arrow] button: Clicking this button will place the "Current" room directly in front of the "Neighbor" room.

The [Down arrow] button: Clicking this button will place the "Current" room directly in back of the "Neighbor" room.

The [Right arrow] button: Clicking this button will place the "Current" room adjacent to the right side of the "Neighbor" room.

The [Left arrow] button: Clicking this button will place the "Current" room adjacent to the left side of the "Neighbor" room.

The [Diagonal up arrow] button: Clicking this button will place the "Current" room directly on top of the "Neighbor" room.

The [Diagonal down arrow] button: Clicking this button will place the "Current" room directly below the "Neighbor" room.

The [Double AA] button: Clicking this button swaps which room is the "Current" room with the room that's the "Neighbor" room. If Room #1 is the "Current" room and Room #2 is the "Neighbor" room, then clicking this button will make Room #2 the "Current" room and Room #1 the "Neighbor" room.

The [Checkmark] button: Used at specific times when you want let the program know that you want to copy and paste certain things. Covered in greater detail later.

The [RedX] button: Used to unselect all sections that were selected while not in the "Select Mode." (When the [Select Mode] button is not pressed in.)

The [TFloor] button: Used to quickly texture the floor (or selected portion of it) with the current texture selection.

The [TWall] button: Used to quickly texture the walls (or selected portion of one) with the current texture selection.

The [TCeiling] button: Used to quickly texture the ceiling (or selected portion of it) with the current texture selection.

The [TRoom] button: Used to quickly texture an entire room with the last used [TFloor], [TWall], and [TCeiling] buttons.

The [MkRoom] button: Used to simplify the multi-steps required to create and place a new room directly below a selected area of a floor.

The [FShape] and [CShape] buttons: Used to change blocks of sections into the currently selected geometric shape.

The [FRandom] and [CRandom] buttons: Used to create random shaped sections. Explained in greater detail later.
The [Build] button: A quick way of compile your level. Once the level has been compiled, clicking this button will compile the level without any prompts.

The 2D Grid Box
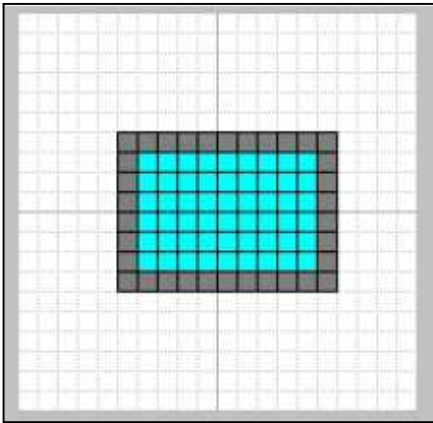
In the upper left corner of the screen you will find a small window that's divided up into a grid. When you have created one or more rooms, the current room will be displayed here in a top-down view. Each square represents one floor section. The blue squares represent the actual floor while the gray border around the room is only there to provide a quick means of creating portals (doors and other openings) between two adjacent rooms.

Tool Group Buttons

Immediately below the 2D Grid Box are several Tool Group buttons. When you click on one of the buttons, the tool groups displayed below the buttons change to the ones for that particular button. When you initially boot the program, the [Geometry] button is pushed and there are two tool groups shown below it. The upper group is the "Geometry" group and the lower group is the "2D Grid" group.

The [Geometry] Group button
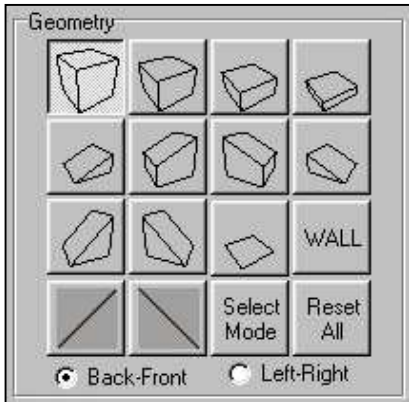
As mentioned above, clicking the [Geometry] button opens two tool groups down below the Tool Group buttons. The "Geometry" group contains numerous buttons with different shaped blocks drawn on them. There are tall blocks, slanted blocks, and a flat one. Selecting one of these buttons makes that shape active and when you click a section in one of the rooms, that shape will be created in that section. (<Shift>-<Click> to change a ceiling section.)

The [Wall] button is used to create a square wall section that goes from the floor to the ceiling.

The [Triangle-/] and [Triangle-\] buttons are used to divide a floor or ceiling section into two triangular sections. Each triangular section can then be individually textured and slanted independently from the other triangular half.

The [Select Mode] button is used to turn on a "Select Mode" where you can then select more than one section for modification.

The [Reset All] button will unselect all the sections made while in the "Select mode."

Below these buttons are two toggle switches. One is "Back-Front" while the other is "Left-Right." The blocks drawn on the "Geometry" buttons come in pairs. With the use of the toggle switches, you can change the shape from sloping from left-to-right to sloping from front-to-back.

The second group is the "2D Grid" group. The various buttons, checkboxes, and switches in this group are primarily used in conjunction with the 2D Grid Box at the top of the screen, however, they can also be used in the 3D View area as well.

The [Door] button is used to create a doorway between two rooms, the doorway can be to side rooms or to below rooms.
When you create a door using this button, all of the steps required to make the doorway are done automatically and Lara can move freely through the opening, there are ways of making openings where Lara can not pass through them (such as windows) that we will discuss later in the manual.

The [Clear Door] button is used to remove one or more sections of a portal.

The [Climb] button is used to change vertical surfaces into climbable surfaces.

The [Floor] button is used to change a wall section back into a floor section.

The [Step S] button is used to assign a particular sound that the floor will make when it's walked on by Lara or other characters.

The [Wall] button is used to convert a floor section into a square wall section.

The [Death] button is used to create areas where Lara will die if she goes there.

The four [Diagonal Portal] buttons centrally located among the above mentioned buttons are used to create diagonal openings in the floor. The "blue" part represents solid floor and the "black" part represents the opening.

The "Climb Walls" group contains a set of checkboxes that are used when you are creating vertical surfaces that you want Lara to be able to climb.

The [Put Zone] button and variable are used to create zones the serve as barriers for "baddies." Each independent zone is assigned an individual number.

The "S Sounds" group contains a set of checkboxes that can be set to alter the sound that Lara and the other characters make when they walk on the floor.

The [Statics] Group button
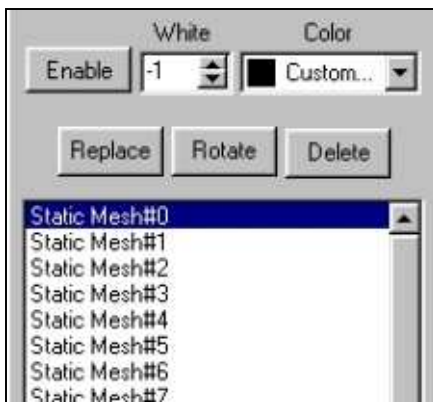
Clicking the [Statics] button brings up a group of buttons and variables as well as a Static Items List window. They are used to place Static items in your level. In order to have items available, you must first open a Base level. Once you have a Base level opened, the Items List window will display all of the Static items available for your level.

The [Enable] button: When you click the [Enable] button, you activate the items in this Group and a Preview window will open, providing you with a 3 dimensional view of the current highlighted item. You can rotate, pan, and zoom in on the item in this window. When the Group is enabled, clicking in a section of a room in the 3D View will place the highlighted item in that sector.

The "White" variable: This value defines how bright the item will be displayed in the game. It can be set from -1 to 31. When set to -1, the item will get its setting from the room's ambient light setting.

The "Color" variable: Provides several predefined colors as well as a "Custom" selection. This color is used to "tint" the object as if lit by a light of that color.

The [Replace] button: Normally clicking the [Replace] button will replace an item's properties with those in the Group settings. Since the Object's ID number is also one of these settings, the [Replace] button serves to replace the current item with the one highlighted in the Group area.

The [Rotate] button: Used to rotate the current item around a section in 45 degree increments.

The [Delete] button: Used to delete the current item.

The "Preview" window: Clicking the [Enable] button opens a Preview window. The highlighted item will be displayed. As mentioned, you can rotate, pan and zoom in on the item the same as you do with rooms in the 3D View.

The [Center] button in the Preview window is used to center the current item in the display so that it's displayed as it was initially.

The "Auto" switch is used to "automatically" center each item in the window as you select them. When this switch is not active, newly displayed items will be seen rotated, panned, and zoomed as the previous item was.

The "No Lights" checkbox is used to show the item with or without a light shining on it.

The [Objects] Group button
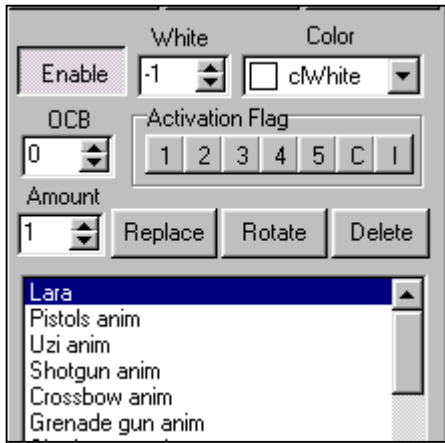
Clicking the [Objects] button brings up a group with various buttons, variables, flags as well as an Object List window. They are used to place objects in your level. Objects are sometimes referred to elsewhere as "movables." In order to have objects available, you must first open a Base level. Once you have a Base level opened, the Object List window will contain a list of all the available objects for your level.

The [Enable] button: When you click the [Enable] button, you activate the items in this Group and a Preview window will open, providing you with a 3 dimensional view of the highlighted object. You can rotate, pan, and zoom in on the object in this window the same as you do with rooms in the 3D View. When this Group is enabled, clicking on a section of a room will place the highlighted object in that section.

The "White" variable: This value defines how bright the object will be displayed in the game. It can be set from -1 to 31. When set to -1, the object will get its setting from the room's ambient light setting.

The "Color" variable: Provides several predefined colors as well as a "Custom" selection that brings up another window for creating custom colors. The color selected here is not the color of the object. It is instead a means of "tinting" the object as if it were illuminated by a light of that color.

The "Amount" variable: Allows you to place more than one object on a single section. This is used primarily when you want to place several objects such as ammo for Lara to pick up at one time.

The "OCB" (Object Code Bits) variable: Used in TR4 and TR5 levels only to cause certain behaviors such as the way Lara picks something up.

The "Activation Flags" buttons: There are 5 Activation Flags used when you want to have more than one trigger set to activate a single event.

The [Replace] button: Normally clicking the [Replace] button will replace the item's properties with those in the Group settings. Since the Mesh number is also one of these properties, the [Replace] button serves to replace the current object with the one highlighted in the Group settings.

The [Rotate] button: Used to rotate the current object about in a section in 45 degree increments.

The [Delete] button: Used to delete the current object.

The "Preview" window: Clicking the [Enable] button opens a Preview window. The highlighted object will be displayed. You can rotate, pan and zoom in on the object the same as you do with rooms in the 3D View.

The [Center] button in the Preview window can be used to center the current object so that it's displayed as it was initially.

The "Auto" switch is used to "automatically" center each object in the window as you select them. When this switch is not active, newly displayed objects will be rotated, panned, and zoomed as the previous object was.
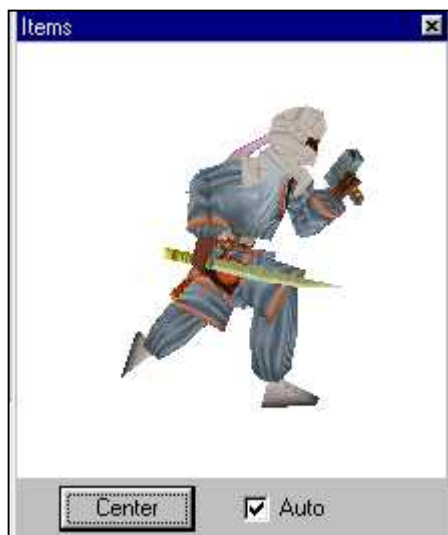
The [Triggers] Group button

Clicking the [Triggers] button opens up 3 different tool groups below the Tool Group buttons. You will find a "Triggers" group, a "Commands" group, and a "Quick Triggers" group.

A few words about how triggers are set up. Before you can trigger something, you have to first create the trigger. With DXTre3D this involves selecting the type of trigger you want along with its properties, and then placing the new trigger into a "slot."

Although you could at this time assign the trigger to one or more floor sections, you haven't yet established what gets triggered. The thing(s) to be triggered are placed in a list of "commands" for each particular trigger. The thing(s) to be triggered can be events such as "baddies" or events such as finding a secret.
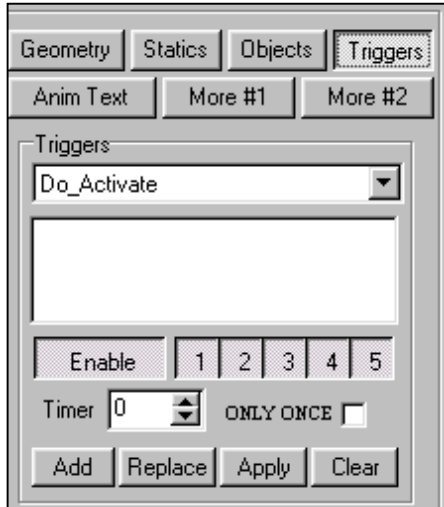
The "Activation" buttons: There are 5 Activation buttons numbered 1 through 5. These are used in combination with an objects activation buttons. It enables you to require more than one trigger to activate and event.

The "Timer" variable: Used to set the number of seconds a trigger will remain active. Use this to keep a door open for only a few seconds, etc.

The "ONLY ONCE" checkbox: Setting this allows the trigger to occur only once for some commands.

The [Add] button: Adds the selected trigger type to a slot. Your new trigger will show up in the Triggers List just below the Trigger Type drop-down menu.

The [Replace] button: Clicking this button will replace a selected trigger's settings with those displayed in the Triggers group.

The [Apply] button: Clicking this button will apply the highlighted trigger to one or more selected floor sections. Some trigger types require a trigger object to be selected first.

The [Clear] button: Use this button to "clear" the trigger from a sector. Select the sector with the trigger (it will turn yellow) and then click [Clear].

Note: If you double-click a trigger in the list, it will bring up a window where you can add a description for that particular trigger. You can also use <Ctrl>-<G> to bring up a list of triggers where you can then view their description or select one from the list.

The "Commands" group.

This is where you will list what gets triggered. The "Commands" drop-down list: You will find the following "commands" to choose from for your triggers. Item: Use this command when you want your trigger to activate an item such as a "baddie." You must select the items and click [Add] to add each item to the command list.

Look_at_Item: Used to get Lara or the camera to focus on a specific item. You must select the item before pressing the [Add] button.

Switch Camera: Used to "switch" the camera view to a different camera. When you click [Add] or [Replace], a dialog window will pop-up where you can set the following information:

> "*Camera Number*" *variable:* Camera number to switch to.
> "*Timer*" *variable:* Number of seconds to keep this camera on.
> value of 0 keeps it on as long as the trigger is being triggered.
> "*Zoom*" variable: In TR1 and TR2 allows camera to zoom out.
> "*Once*" variable: Setting it to 1 will allow the trigger to work
> one time.

Underwater_Flow: Used with sinks to push Lara towards the sink.
      "Sink Number" variable: The sink number to push Lara.

Alternate_ON: Turns on alternate rooms. (Not available in all games.)

Alternate_OFF: Turn off alternate rooms. (Not available in all games.

Alternate_Flag: (unknown at this time)

Play_Soundtrack: Plays a sound track.

Secret_Found: Tells the program the Lara has found a secret.
      "Secret Number" variable: The number of this secret.

Effects: Refer to the Appendix C table of know effects.

End_Level: Brings about the end of this level and boots the next level.
      "Next Level" variable: Use 0 for all games except TR4 where you
      must specify the number of the next level.

The following 3 buttons are those found in the "Commands" group.

The [Add] button: Adds the command shown in the drop-down list to the
list of commands for the current Trigger.

The [Replace] button: Replaces the current command with the one in the
drop-down list.

The [Delete] button: Deletes the current command from the command list.
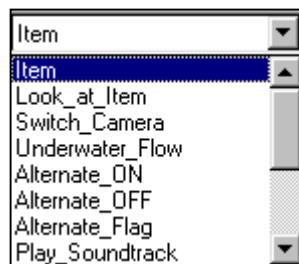
The final Tool Group is the "Quick Triggers" group. The buttons in this group provide shortcuts to creating triggers.

[Do_With_Activate] button: Creates trigger Lara must steps or pass over.

[Lara_on_Ground_Do_Activate] button: Creates trigger Lara must step on.

[Lara_on_Ground_Do_Deactivate] button: Deactivates a trigger when Lara steps on.

[Do_With_Deactivate] button: Deactivates a trigger when Lara steps or pass over.

[If_switch_is_ON] button: Activates a trigger when used a switch item.

[If_key_is_ON] button: Activates a Trigger when used a Key item.

The [Anim Text] Group button
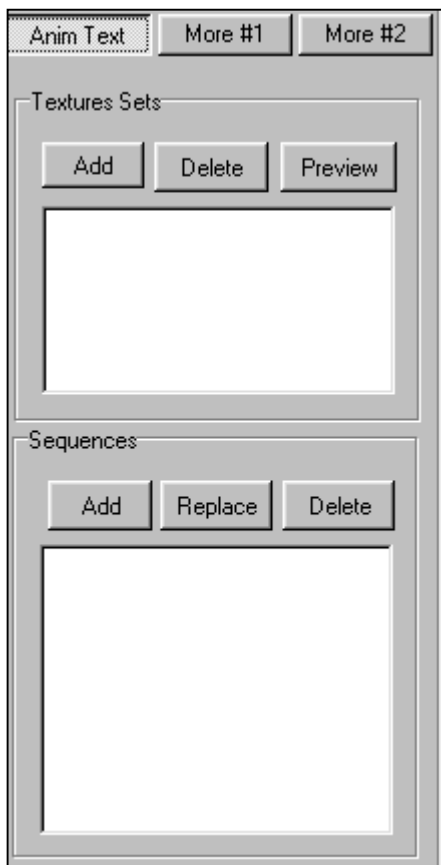
The Animated Texture Tool allow to define animation texture ranges for your level.

The **"texture Set"** lists your current defined animation set.

"ADD" button will add a new empty animated texture set to the list.

"Delete" button will delete selected animated texture set from the list.

"Preview" button will bring a dialog box where you can see a real time animated sample for your selected animated texture set.

The **"Sequences"** lists your frames ranges sequences for your current selected animated texture set.

"Add", "replace", "Delete" are used for manage your frames sequences.

The [More #1] Group button.

Here are stored more tools for different task.

Cameras and Sink: For define Cameras objects used later for show some event are happening, like door getting opened, etc. With this toolbar it is also defined "Sink" objects, used for define water flow into underwater rooms.

Light: Used for place and manage source light objects. For tr1,tr2 level only white light objects can be defined, for tr3,tr4,trc powerful colored light object and special effect like fog can be defined.
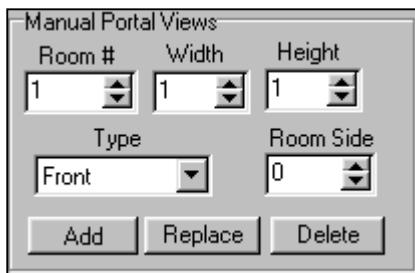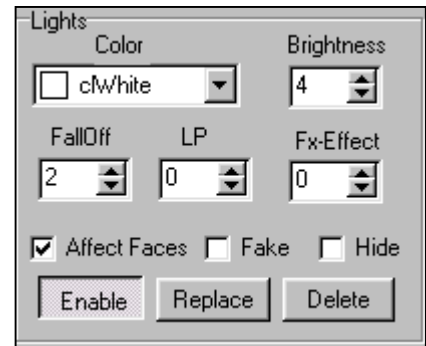
Manual Portal view: This is a special tool group used for allow user to manually place room connections. It is also used to put windows view from current room to the neighbor room and placed into solid wall, floor or ceiling.

The [More #2] Group button.
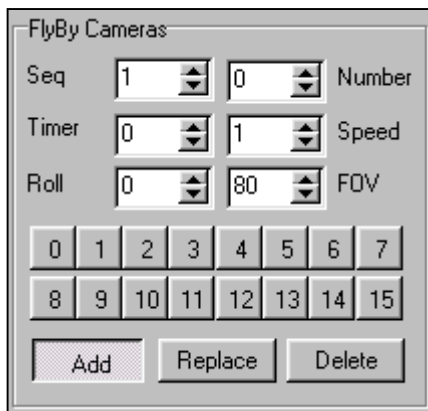
FlyBy Cameras: used for place special camera object sequences along a predefined path, it is used for show some kind cut scene events like enemies approaching; show hints, or a puzzle preview.

This feature only works for tr4 and trc levels version.

Sound sources: Used for place-predefined sounds into rooms, mostly used for put waterfall sounds etc.
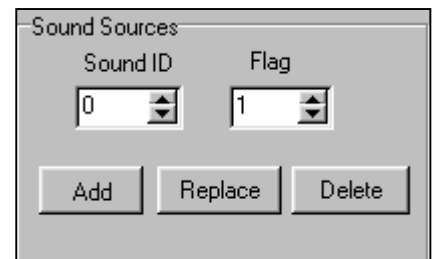
The Rooms Group

At the bottom of the screen is the Rooms group. It contains a set of

buttons, variables, and a list of the rooms you've created for your level with the "Current" room highlighted.
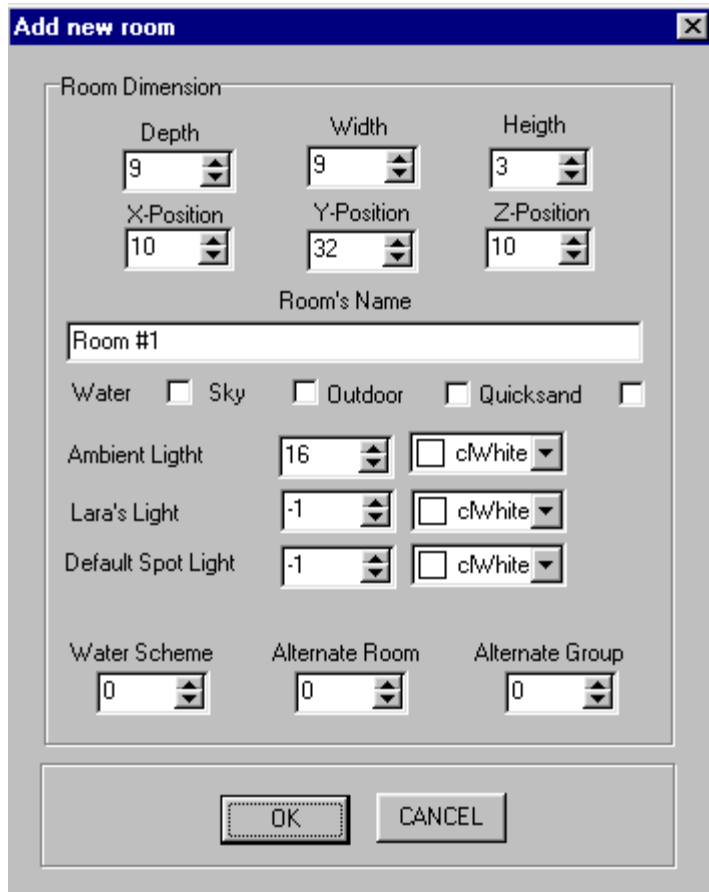
The [New] button: Brings up a dialog window for creating a new room.

The "Depth," "Width," and "Height" variables: Set the dimension of the new room here.

The "X-Position," "Y-Position," and "Z-Position" variables: These define where the front left lower corner of the room will be. The X-Position controls left/right movement. The Y-Position controls the up/down movement. The Z-Position controls the forward and backward movement.

The "Room's Name" variable: You can change a room's default name here to a name that better describes what the room is.

The "Water" checkbox: Check this box to make the room a pool.

The "Sky" checkbox: Check this box to include sky graphics in your level. Do not check this box unless the sky is visible from this particular room.

The "Outdoor" checkbox: Check if this room is part of the outdoors .
The "Quicksand" checkbox: Check this if the room is quicksand.

"Ambient Light" variables: Set the brightness and color of the ambient light.

"Lara's Light" variables: Controls the "tint" applies to Lara and others movables objects in this room.

"Default Spot Light" variable: Set this to a value other than -1 to create a spot light that's centered in the room; similar to having an overhead sun. Use the drop-down menu to select a color.

"Water Scheme", if room defined with water flag enabled then put here the underwater patters value available.

"Alternate Room" variable: Set the number of the room to change to when the "Alternate Room" is set (triggered) to ON. (Not available in TR5)

"Alternate Group" variable: Can define several rooms belong to same alternate group to be enabled at the same time (tr4 only).

The [Properties] button: Brings up the same dialog window as shown above. You can view or change a rooms properties by altering the settings and then pressing [OK].

The [Delete] button: Used to delete the LAST ROOM from your level.

The "X," "Y," and "Z" variables: At the bottom of the Rooms group are three variables. You can use these to change the position of the current room See the [New] button above for an explanation of the X, Y, and Z coordinates of a room.

The "Neighbor" variable: The "current" room and a "neighbor" room can be displayed in the 3D Window. You can change which room the "neighbor" is by altering the number displayed in the "Neighbor" variable.

The "Show more neighbors" button: You can enter room numbers separated by commas in the "Show more Windows" variable area immediately above the [Show more neighbors] button, and then when you press the [Show more neighbors] button, the rooms listed will also be rendered in the 3D Window. (Do not use it for show the whole level!).

The More Options Group.
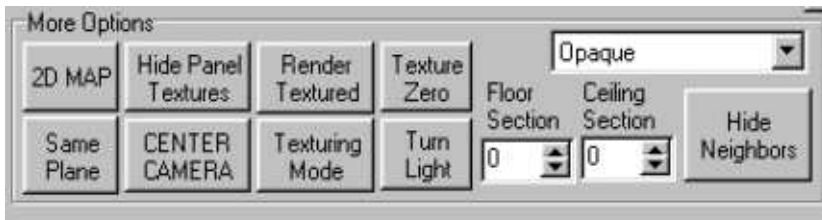
At the bottom of the screen is the "More Options" group. It contains numerous buttons and variables.
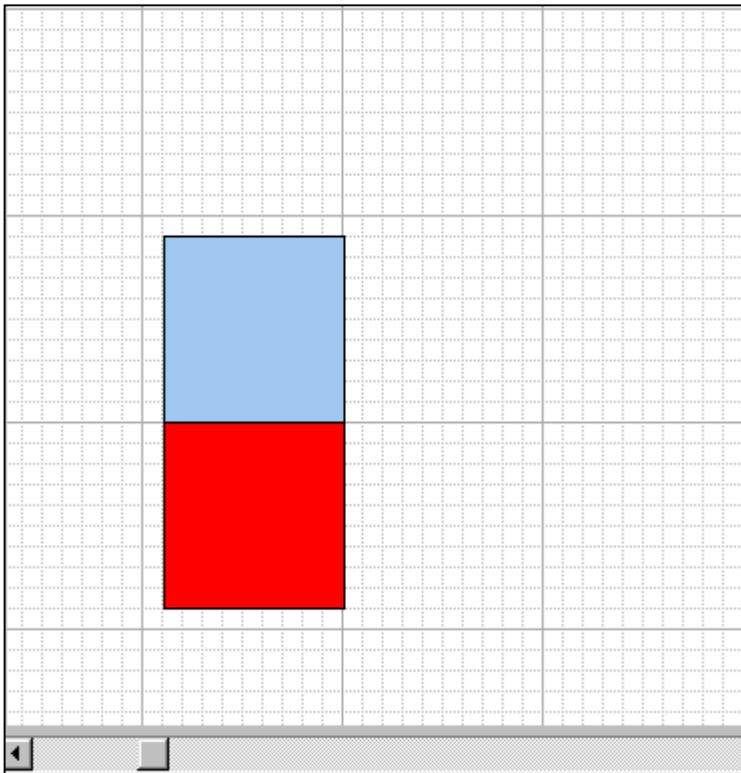
The [2D Map] button: When you click this button, you bring up a large 2 dimensional map that shows all of the rooms that you have created in your level. The current room is colored red while the neighbor is colored sky blue. Each square in the grid represents one section, the same as it does in the 3D Window. Modifying your level using the 2D Map view <Left click> a room to make it the current room. You can <Right click> a room to make it the "Neighbor" room. <Left click> & drag a room to change its horizontal position.

You can create new rooms while you're in this view. Simply <Shift>-<Left click> & drag the mouse. A dotted line will show you the outline of the new room. When you have it the way you want, simply click the [New] button. Make any desired changes in the pop-up property window and then click [OK].
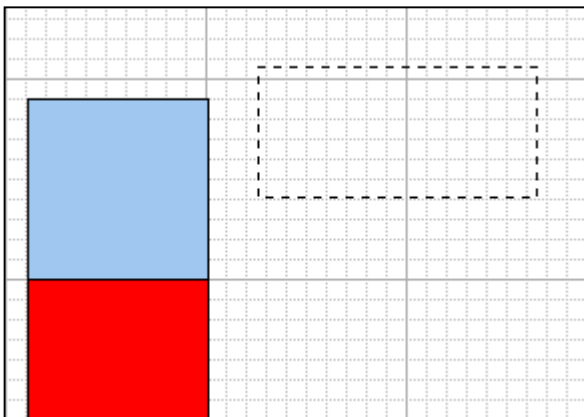
Adding rooms to the "Show More Neighbors" list: If you <Shift>-<Right click> on a room, its room number will be added to the "Show More Neighbors" list.

The [Same Plane] button: While viewing rooms in the 2D Map view, you can click this button and those rooms completely above or below the current room will not be shown.

The [Hide Panel Textures] button: There are times when you may want the 3D Window to show more. If you aren't using the Texture Window, you can click this button to remove it temporarily from the screen, giving that space to the 3D Window.

The [Center Camera] button: While working on your level you will often times get things moved and/or turned to where you lose track of how things are oriented. Clicking this button centers the current room in the 3D Window to its initial orientation.

The [Render Textured] button: Use this button to show all the rooms in the 3D Window with their textures applied. If you haven't textured your rooms yet, they will be rendered white.

You can work on your room's Geometry while viewing it textured.
The [Texturing Mode] button: When you have this button active, clicking on a surface in any room displayed in the 3D Window will apply the selected texture to the section that you click on.

The [Texture Zero] button: If this button is pressed while texturing your room, any section that you click on will be invisible. Uses includes making the upper portion of your room completely invisible as if your room were outdoors. ("Sky" has to be checked in the room's properties for the sky to be visible.)

The [Turn Light] button: Allows you to see the effect of lights placed in a room.
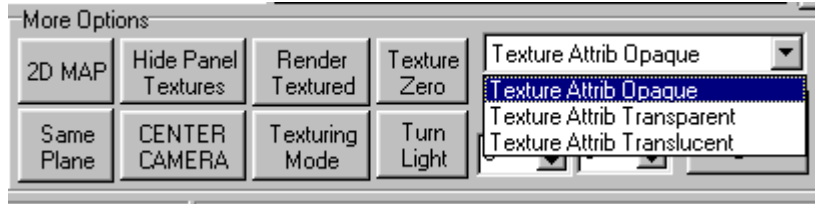
The "Texture Attrib Opaque" drop-down list: In the upper right of the "More Options" group is a drop down list where you can select either "Opaque," "Transparent," or "Translucent." These control the "transparency" of the texture that you've selected. Transparent colors in a texture become transparent in the game when they have been applied with the "Transparent" option selected.

The "Floor Section" and "Ceiling Section" variables: These can be set to the number of "base blocks to add along with the selected geometric shape when you are creating your rooms. If for example you set the "Floor Section" variable to 1, and then click somewhere in your room to place a selected geometric shape there, that shape plus 1 block will be placed on the section when you click it. These values are also used when altering the size of floor and ceiling sections.

The [Hide Neighbors] button: Used to temporarily hide the "neighbor" rooms from view.

The Config dialog:

From menu "File" "Config" you get a dialog box to setup some useful things: **Rotation:** setup how fast is the mouse rotation frame rate in the render window, Lower values mean faster, default is 50. **Pan:** How faster the pan frame rate will be, Higher values mean faster, default is 100. **Zoom:** How fast is the zoom frame rate, lower value mean faster, default is 5.
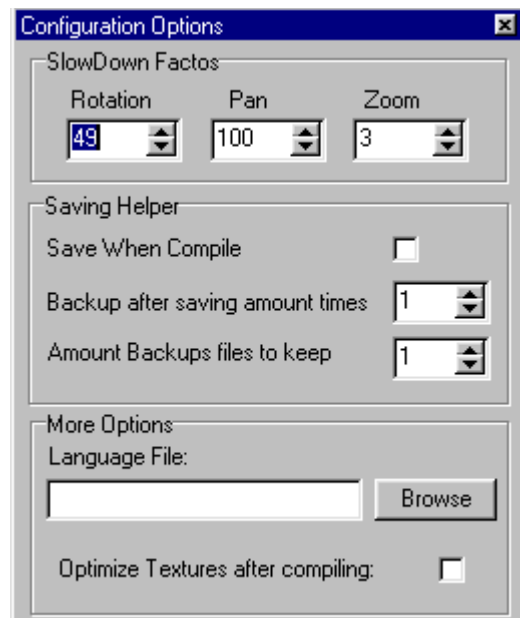
Saving helper: Powerful Automatic backup system, it allow you to keeps up to 16 backups copies of your projects.
"*Save When compile*", when checked the each time you compile the project the editor automatically will save the project before.

"*Backup After saving amount times*" Put value 1 for enable the backup system; the editor will make a backup of your original project before saving the new changes. If you are accustomed to save your project every few minutes then maybe you could consider to increase this value for to make a little more spaced backups, for example value "5" mean the backup will be done once every 5 saves times (in the same session).

"*Amount backup files to keep*" Put here how much backups copies you want to keep up to 16. Each backups copied will have extension ".Bak01", ".bak02"… etc.

Language File: Open here any LNG file available for translate Dxtre3d interface to foreign language. The editor will remember this file and will open it automatically each time you run the program. Leave empty this control for disable any loaded LNG file.

"**Optimize textures after compiling**": When checked the editor will takes extra time to revise the compiled file and discard any texture fragment from the texture set never used in the whole project; this will reduce drastically your final compiled file size. Because this process takes some time to be done, you should use it when you have ready your final level version or if when testing you are getting level overloading problems.

Chapter 2: Simple 2 Room Level

This is our first hands-on tutorial. We'll try and cover as many of the programs tools and features as we can. Some features are not covered simply because they were adequately covered in Chapter 1.

This first tutorial has been designed as an introduction to building your own Tomb Raider levels using the DXTre3d program. In building this simple 2 room level, you'll be introduced to the basic concepts of creating room geometry, texturing your levels, and placing objects in them. When you're ready, go ahead and boot your program and we'll get started.

Creating A New Room
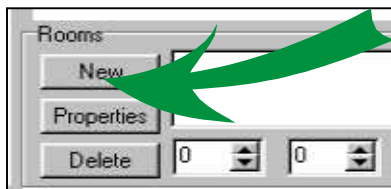
Step1. In the "Rooms" group at the bottom of the page, <Left click> the [New] button. This will bring up the "Add new room" dialog box.

At the very top of the window, set the "Depth" variable to 6. Set the "Width" variable to 7, and set the "Height" variable to 2. Leave the other settings as they are and <Left click> the [OK] button.

In the center of your 3D Window you should now see your new room. The floor and ceiling are blue while the walls are green. In the bottom left corner of the room is a small red box. This represents Lara and unless you physically place her in your level elsewhere as an object, this is where she will start from.

Now <Right click> your mouse near the center of the room and while holding the button down, drag the mouse downwards. Rotate the room until you can see the grid on the floor.

A couple of things to notice. In the 2D Grid Box in the upper left you should now see your room as it appears looking straight down at it. Notice that the number of grid squares is the same as the number shown in the 3D Window. The room is 6 squares deep and 7 squares wide, just as you sat the variables.
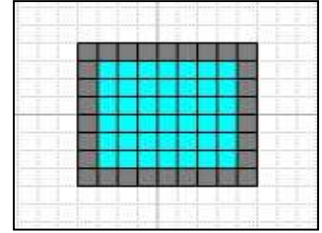
The other thing to notice is that in the "Room" group at the bottom, it now has "Room #1" highlighted. As you add rooms to your levels, they will be listed here with the current room highlighted.

Moving The Room About in The 3D Window

Take a moment and try the following keyboard/mouse movements that can be used to alter the view of rooms in the 3D Window.

<Right click> & drag: Use this to rotate the room about on its various axis. If you get things to confused, you can click the [CENTER CAMERA] button in the "More Options" group at the bottom of the screen.

<Shift>-<Right click> & drag: Use this to pan the room from left to right or from top to bottom.

<Ctrl>-<Right click> & drag: Use this to zoom in and out on your rooms. Remember that in the "Config" option inside the "File" drop-down menu, you can set the sensitivity of your mouse when performing these movements. (Note: The mouse wheel can also be used to zoom in and out.)
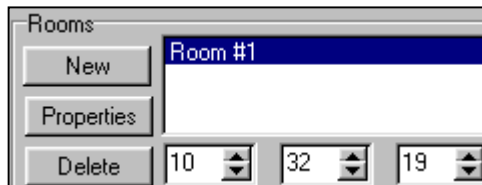
Changing The Shape of The Room -- Adding Geometry

At this point let me explain how floor and ceiling sections are formed. All of these sections consist of a certain number of "base" blocks as well as a final "face" block. Base blocks are always standard 64x64x64 pixel blocks. Face blocks can be anything from a flat surface to a variety of blocks with sloping surfaces. The floor initially has 0 base blocks with a flat face block on it.

Be sure the [Geometry] button is pressed in the "Tool Group" buttons. In the "Geometry" group just below these buttons are buttons with various shapes on them. Initially the button with the large cube on it should be depressed. To show you how these buttons are used to modify your room, <Left click> a section that's part of the floor in your room. That section instantly takes on the same shape as was seen on the button. In this case, it's the standard cube that measures 64x64x64 pixels.

When you first start using DXTre3D, one of the first things that's going to happen is that you're going to click the mouse somewhere in your level only to find that you were supposed to <Right click> instead of <Left clicking>, or you'll forget to have an [Enable] button pressed when you click somewhere. When you make a mistake you can click on the "Undo" selection in the "Edit" drop down menu at the top of the page or use the <Ctrl>-<U> shortcut. Go ahead and press <Ctrl>-<U> on your keyboard and watch as the cube again reverts back to a flat floor section.

Next, <Left click> the button in the second column from the left and in the second row down. It looks like a building with a roof that slants down to the left. In your current room, <Left click> one of the floor sections near the center of the room. You should now have some- thing similar to that shown here on the right.
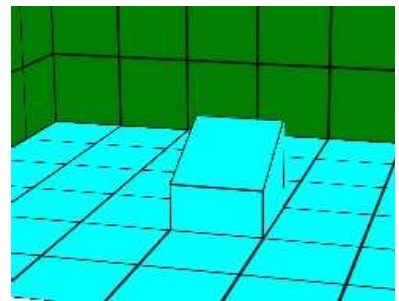
The only other button with a similar shape on it is the one just to the right of the one we just used. If we use it, we will create a section that slopes in the opposite direction. If we want our section to look exactly as the one we chose, yet have it so that it slopes from left to right instead of from front to back, we must first change the "Back-Front" switch just below these buttons to have the "Left-Right" switch active. Go ahead and change it so that "Left-Right" is active and again <Left click> the same floor section. When you're done, select the button with the flat section (third column over and third row down) and again <Left click> the floor section to return it to its original state.
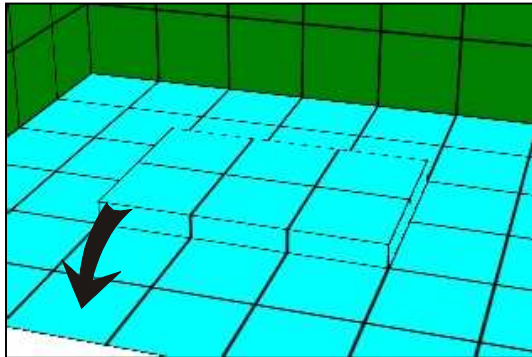
Now that you know how to use some of the shape buttons, lets make modifications to our room.

<Left click> on the button representing a slightly raised floor section. It's the one in the upper right. Then <Left click> on the six floor sections that make up the center of the room as show here on the left

Now we're going to raise the floor up at an angle all around this middle section. First we'll do the sections that are not going to be corners. Select the button with the lowest angled top that's in the second row down and left most column. (Make sure that the "Left-Right" switch is selected.) Now <Left click> the floor section that's just off from the left side of the raised floor. There's an arrow pointing to it in the picture above.

This is the shortest sloped surface in the "Geometry" group and yet it's too tall for what we want. Select the button with the flat square and click the floor section that we just altered to make it flat again.

Raising and Lowering Sections in The Select Mode

In the "Geometry" group, click on the [Select Mode] button. While in the "Select Mode" you can select floor and wall sections by <Left clicking> on them. When a section is selected, it is displayed as red. Go ahead and <Left click> on some of the floor and wall sections in your room. The "Select Mode" allows you to select random sections of your floor and walls. Do <Alt>-<Left click> for unselect floor and wall sections; if you want to unselect all of the sections that you have selected, simply press <ESC> key or click on the [Reset All] button that's just to the right of the [Select Mode] button. Go ahead and do that now.

<Left click> on a floor section that's in the second row back. It should now be red. Now press the <Up arrow> key. Each time you press the up or down arrow, you add or remove a base block from the selected section. Since the current selection's face is a flat floor section, it simply appears as the top of the raised block. Return it to its initial position and then alt-click it to unselect it. Now click on one of the raised floor sections in the middle of the room. Press the <Up arrow>. Notice that it places a base section under the short raised section. Return it as it was and then <alt>-<Left click> it to unselect it.

Now let's raise and lower a section in smaller increments. Click on a floor section to select it. Now press the <Q> key. Each time you press it, you raise the section up 1/4 of a standard block. Since a standard block is 64 pixels high, one quarter of that would be 16 pixels. To lower the section, press the <A> key. Pressing the <W> and <S> keys will raise and lower the ceiling section 1/4 of a block at a time. Return these sections to how you found them. Click the [Reset All] button.
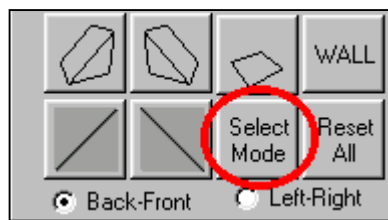
Now let's see if we can raise just one edge of a section so that it will have a sloped surface. Click a floor section to select it. Next do <left Click> on any selected section (or press the <Enter> key). When you do, a white arrow will appear in the middle of the section. Continue doing <Left Click> or pressing the <Enter> key. The arrow points to each edge of the section and then returns to plain red once. With the white arrow pointing at one of the edges, press the <Q> key. When you do, the edge that the arrow is pointing to raises up 1/4 of a block. Use the <A> key to lower that side. Use the <W> and <S> keys to do the same thing to the ceiling. Now return the room back to where there's just the six sections raised in the center. Unselect any sections that you have selected.

While still in the "Select Mode," <Left click> on the floor section that had the arrow pointing to it. Now press <Enter> and continue until you have the arrow pointing at the raised floor section. Now press <Q> to raise that side up to the height of the raised section. It should look as in the image at the right.
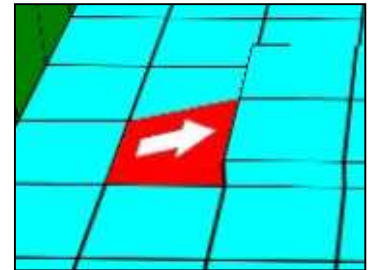
Unselect this section and do the same thing to the section that's touching the last one and touching the raised floor. You should now have two sections side by side leading up onto the raised section. Now lets use the ability to select more than one section to raise the floor on the far side of the raised section. With no other sections selected, select all of the sections that are along the far side of the raised section. These are shown selected in the image at the left. Once again press <Enter> and do it until the arrows are all pointing to the raised section. Press <Q> to raise these sections. Repeat this process for the two sections at the right side of the raised section as well as to the remaining three sections along the near side.
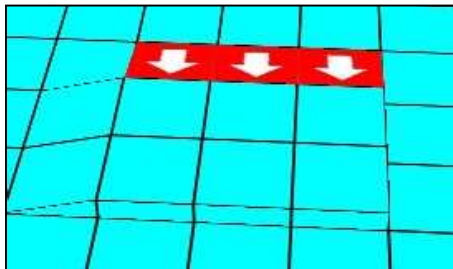
Now we need to do something about the corner sections. Make sure you are still in the "Select Mode," then select the right [Triangle-\] button in the "Geometry" group. Then, <Ctrl>-<Left click> on the floor section that intersects the left and near slanted floor sections. You should create a floor section as shown here on the right. The section is now selected and divided into two triangles. If you selected the wrong [Triangle-\] button, simply click on the proper one and then Ctrl>-<Left click> on the floor section until it is both divided into triangles and selected as shown here.
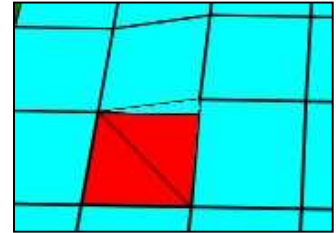
To select which half of the triangle we are going to raise, do <left click> the selected sector or press the <Spacebar> key until a white arrow points towards the raised floor sections. Press the <Q> key to raise that triangle one click. With this corner fixed, <Left click> it to unselect it. Now continue on repeating this with the other four corners.

Press the [Select Mode] button to get out of the "Select Mode."

Adding More Rooms to Your Level

In the same way that you created your first room, again click the [New] button in the "Rooms" group at the bottom of the window. In this "Add new room" dialog box, set the "Depth" variable to 7, the "Width" variable to 5, and the "Height" variable to 3. Click the [OK] button. Notice that in the "Rooms" group, the new room is listed as Room #2 and the "Neighbor" has been set automatically to 1. Now <Right click> & drag the room in the 3D Window to lower the near side of it. Then use <Ctrl>-<Right click> & drag to move the rooms back to where they both fit in the window. Notice that the new room is placed at the "front" of the current room. (The far side.) This is the default placement. You can change the default placement by <Right clicking> the [New] button and making the desired selection.

You can also change the placement of the current room with respect to its neighbor by using the arrows in the "Speed Bar" at the top of the screen. Take a moment and click the [Right arrow] button. When you do, it will move the current room (the one we just created and is highlighted in our list) to the right side of the neighbor room, which is Room #1. Now click the [Up arrow] speed button to place the new room back in front of the original room. Notice also that the floors of the two rooms are at the same level. That's because the front lower left corner of a room is the "origin" for a rooms coordinates. The only coordinate that needs to be changed to place our new room in front of the original room is the "Z" coordinate since it controls the forward and backward movement of the room. The "X" and "Y" coordinates remain the same and so the floor and left side of the rooms remain in the same planes. You can alter the position of the current room by changing the X, Y, and Z variables in the "Rooms" group. For example, with Room #2 still the current room, (highlighted in the list) increase the "Y" value (the middle variable) by two clicks so that it is now 34. You will have raised it so that its floor is now at the same height as the original room's walls. Reset it back to 32.

Connecting Rooms (Portals)

Portals is just a term that includes all opening between two rooms. This can be such things as doors, windows, or openings in the ceiling and floors. As with most tasks, doors can be created in more than one way.

At the bottom of the screen click on "Room #1" in the "Rooms List" of the Rooms group. It will now be highlighted to show that it is the current room. Notice how our Room #2 disappeared from our 3D Window. That's because it is neither the current room nor the neighbor room. Change the "Neighbor" variable to the number 2 and once again both rooms should be displayed.

Selecting One Section or a Block of Sections

You can select single sections or an entire block of sections by using Middle mouse button or doing <Ctrl>-<Shift>-<Left click) & drag. Try this now. (Make sure you're not in the select mode.) Hold down the <Ctrl> key and the <Shift> key. <Left click> on one of the floor sections and while holding the mouse button down, drag the mouse to select a block of sections. To unselect sections selected using this method, press <Esc> key. Go ahead and unselect the ones you just selected.

First Method of Creating a Portal

Use the "block select" method described above to select the three center sections between our two rooms. Look at the picture on the right to see these sections. In the 2D Grid group, click the [Door] button and the three selected sections will be converted into a door. The 3 violet sections show that the opening is a door.
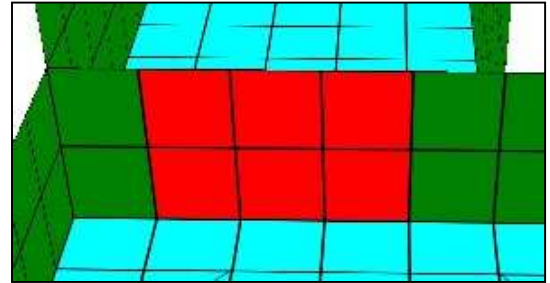
 If you create a door and then decide that you want to get rid of it, use <Ctrl>-<Shift>-<Left click> & drag to select the door's violet sections and then in the "2D Grid" group, click the [Clear Door] button. Go ahead and do that now.

Second Method of Creating a Portal
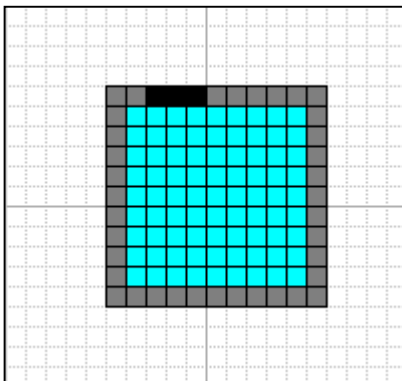
In the 2D Grid Box in the upper left of your window, click one of the border sections that represents one of the sections that is to be made into a door. When you do, a door will instantly be created as will be seen in your 3D Window. Go ahead and click the 3 desired sections. If you click a wrong section by accident, you can use the [Clear Door] button to change it back into a wall section.

Remove each of the doors by <Right clicking> a section in the 2D Grid Box followed by clicking the [Clear Door] button.

Finally we're going to create a door and then we'll leave it in place. This time we are going to use the right mouse button to select a block of sections. In the 2D Grid Box, <Right click> & drag the 3 sections that are to be our door. When you do, the selected sections will have a red line around them. Now click the [Door] button and the door will be created. You can select the black sections representing a door using this method, and then click the [Clear Door] button to remove it.

Using A Selected Block in The Select Mode

After you have selected a block (while not in the select mode) using the <Ctrl>-<Shift>-<Left click> & drag method as was done above, you can later select this block while you are in the "Select Mode." Simply press <spacebar> key, any raising/lowering button or clicking on the [Checkmark] speed button.

More on Raising and Lowering Sections

Next we're going to raise up a section in the middle of our second room. In the "Rooms" group at the bottom of the screen, click on "Room #2" in the rooms list to make it our current room. Leave the "Neighbor" set to number 2. Click the [CENTER CAMERA] button to place our room in the center of the 3D Window and then use <Ctrl>-<Right click> & drag to move the room back a little.

<Right click> & drag the near end of the room down a little so that you can see the floor sections. In the "Geometry" group, click the second button down on the left. It looks like a wedge. Make sure the "Select Mode" button is out and make sure that the "Left-right" switch is selected. It's just below the buttons with the shapes on them. Now click the floor section that's 2 rows in from the left and 4 rows back. The floor section will now look like a slanted shed roof. See the picture on the right. Next press the <Up arrow> key on your keyboard. When you do a "base" block is added under our "face" block. (See "base" and "face" blocks on page 18.) Each time you press the <Up arrow> key, another "base" block is added.
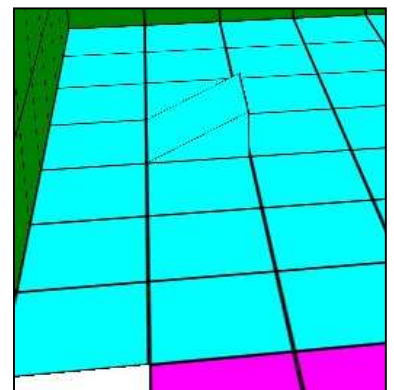
You can add "base" blocks to ceiling sections by holding down the
<Shift> key when you press the arrow keys. Use the <Down arrow> key
to return the floor to just the slanted section.
(Note: If the section becomes unselected, it will not raise and lower
when you press an arrow key. Simply <Ctrl>-<Shift>-<Left click> on
the section to select it and then use the arrow keys.)

One more thing about adding "base" sections. You will notice in the
bottom right corner of the Main window, there are two variables. One is
labeled "Floor Section" and the other is labeled "Ceiling Section." You
can use these variables to determine how many "base"
blocks to automatically add to your "face" block
when you click on a section with one of the Geometry
shapes selected. For example, set the "FloorSection"
variable to the number 2. In your Geometry group
select the top right shape. Now click on one of the
floor sections along the near edge. As shown at the
left, 2 "base" blocks have been added under our
"face" block. Go ahead and press <Ctrl>-U to undo our last creation.
Don't forget to set the "Floor Section" variable back to 0.
You should have a slanted section in Room #2 as shown in the picture at
the bottom of the previous page. Next, select the Geometry button
that's in the top row and third column over from the left. Click the
floor section to the right of our slanted section. You should now have
a floor section that's flat and at the same height as the lanted
section. Select the right most button in the second row. It's the
mirror shape of the button that we used to make our first slanted
section. Now click the floor section to the right of the one we just
raised.
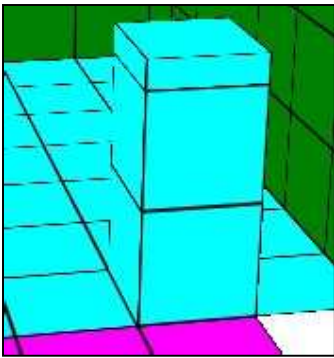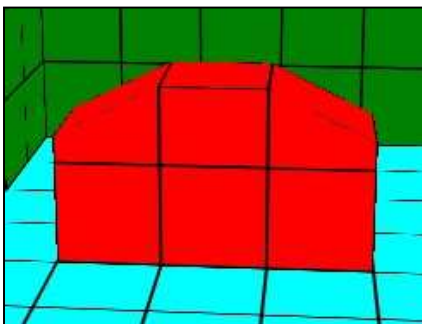
Now that we have the basic shapes for the top
surface of our three sections, lets modify
all three sections at one time. Click the
Select Mode] button in the Geometry group.
Next, select all three of our modified floor
sections. They'll turn red. With them
selected, press the <Q> key. You'll raise all
three sections 1/4 of a block.

The shape we've created on each side of our flat section is one that can't be selected in our group of Geometry buttons. Now press the <Up arrow> once to add a "base" block under all three sections. You should have three sections as shown to the left. Click the [Select Mode] button to get out of the "Select Mode."

Adding Textures to The Rooms

By now you're probably getting tired of looking at your rooms colored with only green and blue. Let's see if we can add some textures and spice things up a little. Before we can apply textures to our rooms, we must first load in a file that contains the textures. Numerous file formats are supported. I'm going to have to assume that you have downloaded the textures as was mentioned earlier in our "System Requirements" section. At the top of the Main window, click on "File" in the Menu Bar. Select "Open Textures." (Or use the <Ctrl>-<T> shortcut.) In the pop-up window, navigate to the folder where you unzipped your textures. You should find several folders that were automatically created when you unzipped the downloaded file. Inside the "tr2" folder, double-click the "platform.tga" file to load in these textures. The Texture Window along the right side of your Main Window will now display a portion of the textures available. You can scroll down to see all of the textures.

The first thing you will want to do when you are texturing is to select a portion of the textures in the window to apply to one or more sections in your room(s). <Left click> anywhere in the Texture Window. When you do, you will select a 64 x 64 pixel section. A selected section will have a green border around it. Notice that the loaded textures are broken down into 64 x 64 pixel areas. These areas are again grouped into areas that are 4 wide and 4 high. These larger areas are separated by a blue line. Since there are 64 pixels in each smaller section, the larger sections are therefore 256 x 256 pixels in size.

You can quickly select any 64 x 64 pixel area by clicking on it, or you can select other sizes by using the <Right click> & drag method. Always <Right click> & drag from upper left to lower right. This method allows you to select sections that are 1/4 the size of the 64 pixel areas. That means that the smallest area selectable is 16 x 16 pixels. This is good to know if you later want to create your textures from scratch. You can NOT select a section across one of the blue lines. You must stay within a 256 x 256 pixel area.

If you want to get rid of the Texture Window and make the 3D Window much larger, you can click the [Hide Panel Textures] button in the "More Options" group.

Since you should have Room #2 displayed in your 3D Window, we'll start by texturing some of it.

The first thing we will texture is our floor. We're going to use the texture in the fifth row down and in the second column from the left. It looks like steel walkway. Click it to select it. There should now be a green line around it. Now we need to let the program know that we want to do texturing on our sections rather than creating geometric shapes. To do that, click the click the [Texturing Mode] button that's in the "More Options" group at the bottom of the window.

If we were to start clicking sections in our room, the textures would be applied, but we wouldn't be able to see them. In order to view your room textured, you must first click the [Render Textured] button that's also in the "More Options" group. Do that now.

Wow! Everything except our violet door sections have turned white. This is how sections are rendered when no texture has been applied to them. Now click on one of the floor sections. That section will now have the selected texture applied to it. We could continue clicking the floor sections one at a time until we had the entire floor textured, however, there's a much simpler method. At the top of your window, click the [TFloor] speed button. This will texture all horizontal floor sections including the ones that have been raised. Notice how the top of our 3 raised sections has also been textured.

Note: It's always wise to texture your entire floor, walls, and ceiling first using the speed buttons even if there will be some sections textured differently. You can then go back and change individual sections one at a time.

Now let's click on the texture that's in the fourth row down and in the third column from the left. It has black and yellow diagonal lines across the top of it. Go ahead and texture all four sides of our raised sections. You'll need to use <Ctrl>-<Right click> & drag to rotate the room about on its axis to see all of the sides.

Notice that the top two sections of our ends look distorted. The program has compressed the entire texture so that it will fit into the short section. To correct this, <Right click> & drag a single height section across the texture that we just used that's just below the yellow diagonal lines. Click the top sections of the ends of our raised sections to fix them.

Now let's texture the top of our raised sections. Select the texture that's in the seventh row and in the third column from the left. It's mostly brown with gray sides. Click on the top of our sections to apply this texture to them. You should now have something like what is shown here on the right.
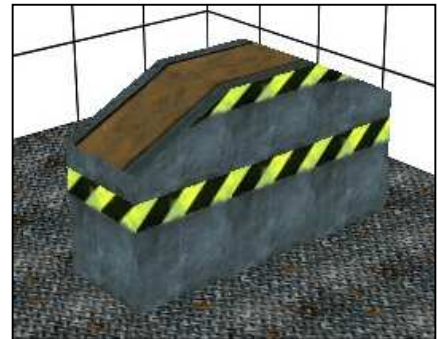
Now select the texture that's in the fifth row and fourth column over from the left. If we were to use the [TWalls] button in the Speed Button Toolbar, we'd apply the texture to the sides of our raised section as well. There's a way around having to texture the walls one section at a time.

First we have to get out of the "Texturing Mode" by clicking the [Texture Mode] button. Also make sure that you are not in the "Select Mode." (Leave the [Render Textured] button active.) Now select an entire wall by using the <Ctrl>-<Shift>-<Left click> & drag method of selecting groups of sections. With the wall now selected, click the [TWall] speed button. Only the selected sections get textured. Go ahead and repeat this for each of the other three walls. All that's left now is the ceiling. Select the top left texture and then click the [TCeiling] speed button.

When you are texturing your rooms, you can apply textures to any room that's displayed in the 3D Window without having to make that room the current room.

Remember: When you have the [Texturing Mode] button On, clicking sections applies textures to those sections rather than applying the current geometry. It's common to forget to turn this mode off.

Another thing to mention is that you can work on your geometry while viewing your rooms textured by leaving the [Render Textured] button active.

You can also make the selected texture one that is on a section in one of your rooms by doing a <Ctrl>-<Left click> on the texture in the room. Once selected, you can then apply it to other sections..

Now, in the "Rooms" group at the bottom of the screen, click "Room #1" in the room list to make it the current room. Click the [CENTER CAMERA] button. Go ahead and use the tools as mentioned above to texture this room. After that we're going to start putting objects in the rooms.

Placing Static Items and Objects in Your Levels

Before we do anything else, it might be a good idea to explain a little about the two different types of things that you can place in your levels. There are "Statics" that will be referred to herein as "items"; and "Objects" that will be referred to herein as "objects." It's always a temptation to refer to "Statics" as static objects rather than static items, but I'll try and keep the distinctions separate.

Statics: These items consist of those things that you can place in a level that are not interactive. They are such things as trees, parts of buildings such as columns and archways, and other things that are primarily for decoration.

Objects: These consist of all the objects that Lara can interact with, including Lara. You will find all the bad guys, weapons, ammo, objects that can be picked up, objects that can be pushed, as well as doors, keys, and so on. You will find some objects that are there only to provide further information for the program, such as the "artificial intelligence" objects that the program uses when it animates the objects. These are automatically added and do not need to be physically placed in the level.

Loading a Base level

Before we can add things to our level, we first have to load in what's referred to as a "Base level." A Base level is nothing more than a level from one of the current Tomb Raider games. These files are normally found in a "data" directory and they have file extensions such as ".pdh" or ".tr2" or "tr4."

Again I will assume that you have downloaded the Tomb Raider Chronicles demo referred to as "Tomb Raider 5" or just "TR5." Minimize the program for a moment and use your Windows Explorer to maneuver to your TR5 Demo directory. Inside it you'll find a sub-directory named "data." Inside that folder you should find a file named "demo.trc." Preserve this original file by renaming it to "orig_demo.trc." The level we'll be creating needs to have the original files name for things to work properly.

To load a Base level, click "File" in the Menu Bar and then select "Open Base level." In the pop-up window, navigate to the folder where we just changed the name of t he file to "orig_demo.trc." Double click on this file and it will load as our Base level. Then, so that we are all viewing the same thing, set the "current" room to Room #1 and the "neighbor" to Room #2.

Placing Static Items in Your Levels

Now that you have a "Base level" loaded, let's see if we can put some items in our rooms.

In the Tool Group buttons, click on the [Statics] button. The Tool Group for that button is now displayed below it. Click the [Enable] button in this group to activate it. When you do, another window will open just above all of this where the items you select are displayed. If you loaded the TR5 Demo as a "Base level," then the item being displayed looks like some sort of a gate or something. The reason that I've described it this way is that Static items are not identified as to what they are. You will notice that down below in the Static Items List, the item selected is simply named "Static Mesh #0." Sometimes items can easily be identified while at other times it can be rather difficult to tell what they are. Although this item appears to be a gate, it cannot be one that opens or closes since if it did, it would be an "object" that Lara or something else could interact with. Remember that "Static" items just sit around doing absolutely nothing.

You can rotate and move items displayed using the same methods used to move and rotate rooms. For example, click on "Static Mesh #9" in the list. What appears to be some sort of pedestal appears in the display window. Use <Right click> & drag to rotate and view this item. If you lose track of how the item was oriented you can click the [Center] button just below the display window. The actual size that this item will be when placed in a level can only be determined by placing it in a room.

To place the selected item in a room, first make sure that the [Enable] button is active. Then simply click the floor section where you want the item placed. Go ahead and place this item somewhere in Room #1.

Note that you can place an item in any room that's displayed in the 3D Window.

The current item in your room is displayed in a "wireframe" mode. Go ahead and place another "pedestal" item in your room. Notice that the new one becomes the current item and is displayed as "wireframe" while the first item is shown fully textured. To make an item in your room the "current" item, simply click on it. Let's get rid of the first pedestal. Click on it to make it the current item. Now click the [Delete] button that's just above the list, or press the <Delete> key.
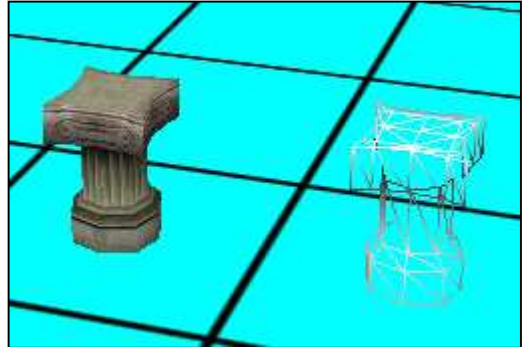
Now let's move an item about. The [Statics] button and the [Enable] button must be on. Press the <Up arrow> and <Down arrow> to raise and lower the item 1/4 of a block in height. (You man have to click the item first.) You can use <Ctrl>-<Up arrow> and <Ctrl>-<Down arrow> to nudge the item up or down about 1/10 of a block in height.

Click on "Static Mesh #0" in the list to select it. Click a section near the center of your room to place the item. What I want you to notice is that this item gets placed along the far edge of the section rather than in the center of it. Now click on the [Rotate] button just above the items list. Each time you click it, the item gets rotated 45 degrees about the center of the section where it was placed. Pressing <Enter> will rotate the item in 90 degree increments.

You can move the current item to another section by holding down the <Shift> key and then clicking where you want the item moved to. If you hold down the <Shift> key and then press one of the arrow keys, you'll nudge the item about horizontally in that direction.

If you place the wrong item somewhere, you can replace that item by first selecting the correct item in the list and then clicking the [Replace] button that's just above the list.

If you want to find one of the items that's already in your room in the list, <Ctrl>-<Left click> the item in the room. That item and its properties become the selected item in the Statics group area. You can then click the room somewhere to place more of that item.

Placing Objects in Your Levels

In the Tool Groups buttons, click the [Objects] button. The Tool Group for that button is now displayed below it. Click the [Enable] button in this group to activate it. When you do, another window will open just above all of this where the objects you select are displayed.

You can rotate and move items displayed using the same methods used to move and rotate rooms. Take a moment to scroll up and down through the objects in the Object list. As I mentioned earlier, many of these objects don't have to be placed in your level. This includes such things as "Lara skin" and "Target graphics."

There are a few more settings here than we had with Static items. We'll mention them briefly:

The "Amount" variable allows you to place more than one object on a section at a time. This is very handy when you want to place a large amount of ammo on the floor for Lara to pick up.

The "OCB" (object code bit) variable is only for TR4 and TR5. It can be used to cause special behaviors, such as the way Lara picks up objects. (See Appendix C) The "Activation Flags" are used when you want to have more than one thing trigger an event. For example you might want it so that Lara will have to push two objects onto two specific floor sections to open a door.

Now let's place an object somewhere in one of the rooms. Scroll down in the Object list and click on "Shotgun." Now click anywhere in one of your rooms to place a shotgun for Lara to pick up. Note how the current object in your room is show in a red wireframe mode. Below the Shotgun in the list, click on "Shotgun shells 1." Above that set the "Amount" variable to 3 and then click your room where you placed the shotgun to leave her some ammo as well. You can leave her some "Shotgun shells 2" if you want. Remember that Lara has two types of shotgun shells to choose from.
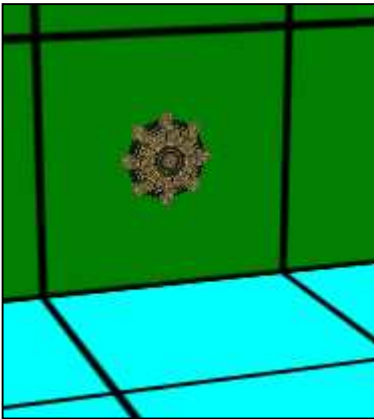
Scroll up or down until you locate the "Slot empty 4" object and select it. Now click on the floor section that's in the far left corner of your room. Notice how this object gets placed in the center of the far side of the section that you clicked. It now appears to be on the far wall. Let's assume that you wanted it placed on the wall to its left. Simply click the [Rotate] button that's above the Object list and you can rotate it about horizontally 45 degrees at a time. Go ahead and do this until it's on the left wall. You can press <Enter> to rotate the current object 90 degrees at a time.

You can raise and lower objects the same way you did with Static items. Use the <Up arrow> and <Down arrow> to raise or lower it 1/4 block in height. Use <Ctrl>-<Up arrow> and <Ctrl>-<Down arrow> to nudge it up or down about 1/10 of a block in height.

You can move the current object by holding down the <Shift> key and then clicking where you want the object moved to, including into a different room. Holding the <Shift> key and pressing the arrow keys nudges the object horizontally in that direction.

Click the [Delete] button or press the <Delete> key to delete the current object. If you already have an object in one of your rooms, and you want to place another object just like it somewhere, you don't have to try and figure out which object it is in the list. Instead <Ctrl>-<Left click> the object. It both selects the object and changes the settings in the Object tool group to that object. You can then click anywhere in one of your rooms to place that object there.

You may have noticed that when you placed the shotgun shells on the floor, they weren't very large. It's sometimes difficult to click on objects that are rather small. You can view and select an object in your level by pressing <Ctrl>-<I>. Pick your object in the list and then click [Normal Select].

Using Triggers

If you've played Tomb Raider then you are familiar with how Lara interacts with a lot of the things in the game. She picks up objects, opens door, trips levers that trigger an event to occur, and she pushes objects about. She may simply walk into some area of a room and find that she's triggered a rolling ball to come down a slope towards her. There are simple tasks that don't require a trigger, such as pushing a block about, but most phenomena that occurs requires a trigger to make it happen.

We're going to start by adding a "baddie" to our level. It won't appear unless something triggers it. We'll also show how to trigger a door to open. These are the simplest types of triggers. Begin by setting up the program so that Room #1 is the current room and Room #2 the neighbor room.

Before we jump into the middle of things, let's first take a closer look at the logic of setting triggers. In the Tool Group buttons, click on the [Triggers] button. There will now be three Tool Groups below the button. Before you can place a trigger in your level, you first have to create it by selecting a trigger "type," giving it its properties, and then add it to a slot. The trigger is then assigned different commands.

In simple terms, selecting a trigger "type" means that you select "What will set off the trigger?" Assigning the trigger "commands" means that you set up "What gets triggered." Follow how this simple explanation works as we place a "baddie" in a room and set up a trigger to activate him.

If you happened to have jumped in at this point, it is assumed that you have a level where you are using the Tomb Raider Chronicles Demo (TR5) loaded as a "Base level."

Let's go get a "baddie" to use in our level. Click on the [Objects] button in the Tool Group buttons. Click the [Enable] button and then scroll down in the objects list to the "Lion". Click it and then click on a floor section behind the raised sections in Room #2 to place the lion there. Click the [Enable] button to turn it off.

Now click on the [Triggers] button in the Tool Group buttons. While you're at it, click on the [Enable] button as well. The first thing we need to do is select a trigger "type." Since we want it so that when Lara crosses over certain floor sections, the lion will be triggered, we need to use the "Do_Activate" type. This is already the one selected in our "Triggers" drop down list. Click the [Add] button in the "Triggers" group. (Not the one in the "Commands" group.)

The next thing we need to do is assign commands to our trigger. This is where we set up what it is that gets triggered. Since our lion is an item, we need to add it as an item to our list of commands. In the "Commands" group we can see that "Item" is already selected in the commands list. In the "Rooms" group at the bottom of the screen, click on "Room #2" in the list of rooms. Now rotate it and click on the lion to select it as our "item." It's now shown in a red wireframe mode. Click "Room #1" in the rooms list and click the [CENTER CAMERA] button to get things shown properly. Our lion is still selected. Add it as an item in our commands by clicking on the [Add] button in the "Commands" group. The item and its number is now placed in the Commands list for this trigger. The lion will be what gets triggered. You could add more items to be triggered if you wanted to do so.

Note that if you select the floor sections for the trigger just prior to adding the trigger "type," the program will place triggers there and you won't have to go back and "apply" the triggers to the floor.

The only thing left to do now is to set up the floor sections where Lara will trigger the lion. We'll set it up so that she can't go into Room #2 without triggering the lion. We've placed the lion behind our raised sections so that when it gets triggered it won't just suddenly materialize before our eyes. Select the three floor sections in front of the doorway by using the <Ctrl>-<Shift>-<Left click> & drag method. With these sections selected, click on the [Apply] button in the "Triggers" group. The sections will turn violet and if you click a violet section that's a trigger, it'll turn yellow. Go ahead and click the [Enbable] button to turn it off. That completes it.

Now let's perform the same task using one of the Quick Trigger buttons in the bottom group of the three Trigger groups. We're going to place another Lion behind the raised floor. Click the [Objects] button and then the [Enable] button. Again select the "Lion." In Room #2, click the floor some place behind the raised floor to place our second lion there. Click off the [Enable] button to turn it off. Now click the [Triggers] button followed by the [Enable] button. Click the Lion that we just put behind the raised floor to select it. In Room #1, click on some floor sections that you want to use to trigger this lion. Now just click the left most Quick Trigger button and everything will be done automatically for us by the program.

Building Your Level

We'll get back to triggers in just a few minutes. I suspect that by now you're anxious to create a playable level with what you've created.

Click "File" in the Menu Bar at the top of the screen. In the drop-down menu, select "Build Level." You can use <F10> as a shortcut if you want. In the pop-up window the only thing we need to be concerned with at this time is the "New Level" text area at the bottom. Click the [Browse] button at the left side of the text area and navigate to where the "orig_demo.trc" file is located. Click that file and then click the [Open] button. You'll now find the complete path list in the text area. Edit the line so that the "orig_demo.trc" name reads "demo.trc."

When you have it that way, click the [Build Level] button. Wait for the program to finish building the level and then exit out of the program. (Don't forget to save your level before exiting.) Go ahead and play your level. You should be able to pick up the shotgun and ammo. Arm yourself with it and go find the lions.

Chapter 3: More Advanced Level

Welcome to our second tutorial. The first tutorial was indeed just an introduction and now that you have a basic understanding of how things work, we're going to jump right into some of the more advanced features of the program. Go ahead and start a new project by either booting the program from scratch, or clicking "File" in the Menu Bar and then selecting "New Project."

Hopefully before you start a project you will have at least a general idea of what you want to create. I can say from experience that you should first create the basic geometry for your first few rooms to make sure things fit together properly. It can be depressing to spend a lot of time refining your first few rooms only to find out that the overall plan isn't going to fit together properly.

In this tutorial we'll be creating an 8 room level. It won't be as complicated as most actual game levels but it will be complicated enough to give us some first hand experience going through the steps that will be necessary to create more complicated levels.

A Few Words About Coordinates

In the first tutorial we touched briefly on how a room is set up using X, Y, Z coordinates. For those of you who are familiar with this, you can skip this and move on.

In 3 dimensional space, we can define where any point is at by first selecting an origin point in that space. We then describe how far we are left or right from that point (usually seen as width) as well as up or down from it (seen as height) and finally how far we are in the other horizontal direction (seen as length). The left to right direction is labeled X. The up and down is labeled Y, while the other horizontal direction is labeled Z. This is show in the picture at the right.
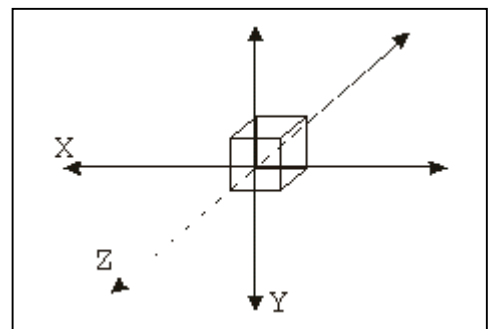
Every room's location in the editor is defined using this system. The X, Y, Z coordinates are normally shown as (X, Y, Z). Thus (2,5,18) would be X=2, Y=5, and Z=18.
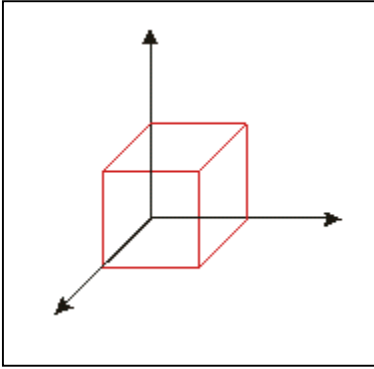
Now look at the diagram at the left. It shows how a room's location is described based on a point in its far lower left corner. We describe a room's location based on how far this corner point is from the origin, where the origin's coordinates are (0, 0, 0).

Inside the editor, the three variables at the bottom of the screen are the X, Y, Z coordinates of the "current" room. When you create a new room or examine a room's properties, you will again see these coordinates.

The only thing left in describing a room is to assign a value to how far the room goes in each of the three directions. We speak of this as depth, width, and height. These three values are determined when you create a room and they can be changed in the room's property window.

Hopefully this will give you as good of an understanding as you will need when creating and moving your rooms.

Creating Rooms in The 2D Map View

Click on the [2D MAP] button in the "More Options" group at the bottom of the screen. When you do, your screen changes to a window with a large grid in it. The grid represents your level as it would be seen if looking straight down at it. The left-to-right direction is the X value in our coordinates and the top-to-bottom direction is the Z coordinate. Since we are looking straight down at our rooms, the Y coordinate representing a rooms distance up and down can not be shown.

Now, <Shift>-<Left click> and drag from some point near the center of this grid to a place about 5 squares down and 5 squares to the right. Let go of the mouse button. You should now have a rectangle that's outlined by a dashed line. Click the [New] button in the "Rooms" group at the bottom of the window. The "Add new room" window pops up.

At the top of this window are 3 variables for the room's coordinates as well as 3 values for its depth, width, and height. Leave them as they are and click the [OK] button. You've just created a new room in your level!. You're going to find that this "2D Map" view is a powerful tool when creating and moving rooms.

Now use the same method to create a second room. Align it so that it's adjacent to the right side of the first room. Finally create a third room so that it's adjacent to the left side of our first room. Now let's have some fun making some changes.

If you get so that you can't see all of your rooms, use the scroll bars to move the window about until you have it the way you want it. The "current" room is shown in red while the "neighbor" room is shown in sky blue. Go ahead and click on each of the three rooms. When you do, you'll change the "current" room to the one that you click on. You'll notice that the "current" room (the one highlighted) in the rooms list at the bottom of the window will change to show the proper "current" room. Now <Right click> each of the rooms. You'll see that this changes the "neighbor" room to the one that you <Right click> on.
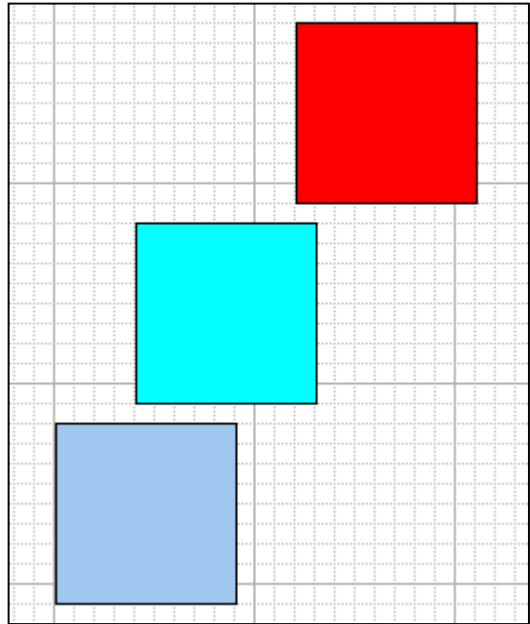
You can easily move a room about by <Left clicking> & dragging the room. Give this a try as well. When you're done, make sure that you leave the rooms with the first one between the other two.

When you are creating a room, if the dashed line enters a square, that square becomes part of the room. What I've found works best is to click in the center of the top left corner square of the desired room and then click and drag until you're at the center of the bottom right square. If you make a mistake and create a room different that the one you wanted, you can easily alter its dimensions.

Click the room that you want to change the size of and then click the [Properties] button in the "Rooms" group. Change the depth and width values as needed and click [OK]. You'll be prompted to make sure you want to make the changes.

Cloning Rooms in The 2D Map View

You can clone a room in both the 2D Map view and the 3D Window view, however, it is much easier to orient the new room if you do it in the 2D Map view. To clone a room, first click on it to make it the current room. Next press <Ctrl>-<K>. A new room of the same dimensions will be created. It will be placed on the first room but offset to the upper right one square. When you click on this new room to move it, be sure to click a square that's not on top of the previous room or you will select the previous room. Everything gets cloned except for the Objects. (Static items will be cloned as will portals.) Use the [Delete] button to delete your cloned room.

Click the [2D MAP] to turn the view off. Set things up so that Room #1 is the current room and set Room #2 as the neighbor. Move things about in the window until you can see both of these rooms. Remember that the Y coordinate determines the height of our room. You should see the value 32 in the middle "Y" variable at the bottom of the screen. Change this value to 35. Look at your rooms closely and you'll see that the bottom of Room #1 is now even with the top of Room #2. Click the [2D MAP] button to go back to that view. Room #1 should still be highlighted in the list and it should be "red" in your 2D Map. Just below the [2D MAP] button is a [Same Plane] button. Click this button to turn it on.

Both Room #2 and Room #3 disappeared from our view. That's because after we raised Room #1, neither of the other rooms were in the "Same Plane." That is, Room #2 and Room #3 were both either completely above or completely below our Room #1. This can be useful since it shows us that neither of these rooms could be joined with our Room #1 with a horizontal portal.

Click the [2D MAP] button to turn it off. Now, with Room #1 still the current room, change the "Y" variable from 35 to 34. Notice that Room #1 could now be joined horizontally to Room #2. Click the [2D MAP] button to return to that view. The [Same Plane] button should still be active and now all three rooms are back in our view. Thus all three rooms are at a height where they could be joined horizontally.

The Show more neighbors Text Window

Reset the [Same Plane] button and the [2D MAP] button so that they are off. Most of the time there are only two rooms shown in the 3D Window -- the current room and the neighbor room. The "Show more neighbors" text window allows us to view numerous rooms at the same time. Simply key in the numbers of the rooms that you want to view in the text window that's just above the [Show more windows] button in the "Rooms" group. Separate each number with a comma. Be sure not to list the same number more than once. Click the [Show more neighbors] button to render them. You may have to move things about to see all of them.

You can also type in just the word "all" to render all of your rooms. Go ahead and delete any room numbers from the text window and click the [Show more neighbors] button to view only the current and neighbor rooms (default setting). Now click the [2D MAP] button to return to that view.

You can add rooms to the "Show more neighbors" text window by <Shift>-<Right clicking> on the desired rooms. Go ahead and give it a try.

A word of caution: Keep in mind that the more rooms you select to display, the longer it will take the program to perform that task which in turn slows the program down. You can get around this by using the [Hide Neighbors] button in the lower right corner of the screen.
The [Double AA] button in the Speedbar can be used to set the neighbor room to the current room and the current room to the neighbor room.

Finally, you can use the speed buttons at the top of the screen to move rooms about in the 2D Map view. You will be moving the current room to one of the locations about the neighbor room. Thus <Right click> the room that will be the neighbor and then <Left click> the room you're going to move to make it the current room. Now click the desired arrow speed button to move the room.

Starting Our New Project

Let's get rid of what we have and start our actual project from scratch. Click "File" in the Menu Bar and select "New project." Confirm that you want to get rid of the old stuff.

In the "More Options" group, click the [2D MAP] button to bring up that view.

Somewhere near the middle of the grid, <Shift>-<Left click> & drag across the small grid to create a 4x4 room. Click [New] to bring up the "Add new room" window. Make sure that the "Depth" and "Width" values are both 4. Change the "Height" to 2. In this tutorial we all need to have identical settings so that you can troubleshoot anything that goes wrong. For that reason, set the X, Y, and Z coordinates to (29, 32, 25). Click [OK]. The next room will be just below this one on the screen. Go ahead and create a 5x4 room. Change its setting so that the depth=5, the width=4, and the height=3. Change the X, Y, Z coordinates to (29, 32, 20).

Go ahead and view these rooms in the 3D Window if you want. Return here to the 2D Map view when you're done.

Our Room #3 will be on the left side of these two rooms. Create a 7x2 room and then change its depth, width, and height to 7, 2, 3. Set the coordinates to (27, 30, 20). If you examine this room in the 3D Window you'll see that it's lower than the other rooms.

Our fourth room is going to be placed under Room #2. Off to the side somewhere create a 4x1 room. Change its depth, width, and height to 4, 1, 3. Set the coordinates to (32, 29,21).

Room #5 will be under Room #1. Create a room somewhere that's 4x4. Set its depth, width, and height to 4, 4, 2. Set the coordinates to (29, 30,25).

Our sixth room is a 2x2 room above Room #3. Create a room and set its depth, width, and height to 2, 2, 2. Set the room's coordinates to (27, 33, 20). Turn off the 2D Map View.

In the "Show more neighbors" text box, put in 1,2,3,4,5,6. Click the [Show more neighbors] button. When you look at the rooms in the 3D Window, you should see something similar to what is shown here on the right.
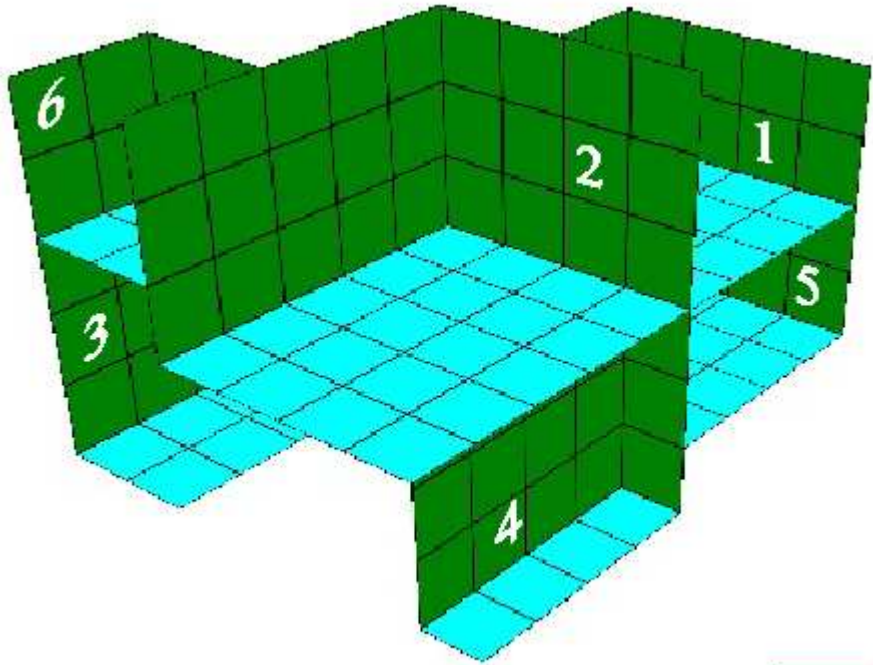
3-1

Notice that we haven't even created any of the doors. All that should be done later. At first just concentrate on getting the rooms laid out to where they'll match each other as needed.

Room #1 and Room #5

For the moment we want to start Lara in Room #5 rather than Room #1. There's two ways of setting where Lara will start. You can <Alt>-<Ctrl>-<Shift>-<Left click> on a section in any room to move the red box that represents Lara to that spot. You can also place the actual Lara object in a room. Delete the numbers in the "Show more neighbors" text box and click the [Show more neighbors] button. Make Room #5 the current room and then click the [CENTER CAMERA] button. Move Lara to this room by doing an <Alt>-<Ctrl>-<Shift>-<Left click> on the near right floor section.

The next thing we're going to do is to put a portal between Room #1 and Room #5. Make Room #5 the current room and Room #1 the neighbor.

There's a 2 block height from the floor of Room #1 to the floor of Room #5. In order for Lara to jump and pull up onto the floor of Room #1, that distance needs to be 1 click (1/4 block) less. Also, if we create a portal between these two rooms as they are, the floor between them would be paper thin and that wouldn't look realistic. We can correct this by raising the floor of Room #1 by 1 click. Then we'll raise the floor below the portal 2 clicks so Lara can jump and grab the floor above.

The shape of the portal that we're going to create is shown on the right. The portal is shown in yellow. One of the sections will be triangular. The red square represents where the floor will be raised down below. We've kept the section where Lara will jump up from away from the angular edge since the Tomb Raider game engine will not allow her to grab the angular edges of openings.
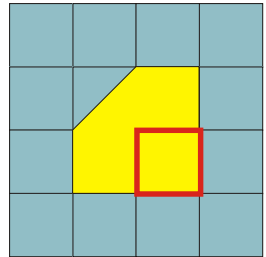
With Room #5 still the current room, let's raise the floor section that corresponds to the red square in the view above. Either select the Geometry button that's third over from the left in the top row and then click on that floor section, or do as I'm going to do. Get into the Select Mode and click the floor section to select it. Press the <Q> key twice to raise it 2 clicks (1/2 block), then click it to unselect it.

Once you have that done, make Room #1 the current room and Room #5 the neighbor. Get into the Select Mode and click in Room #1 on each floor section that's on the outside edge of the room. Now press the <Q> key to raise these sections one click and then click the [Reset All] button to unselect them.

Let's create the 3 square sections of the portal. We'll do the upper left triangular section in a minute. In the 2D Grid Box in the upper left corner of the screen, <Left click> the sections that correspond to the three square yellow sections as seen on the previous page. You'll notice in the 3D Window how each of the three sections changes into transparent portals.

Now we'll create the triangular portal section. In the 2D Grid tool section, click on the upper left [Diagonal Portal] button to select it.
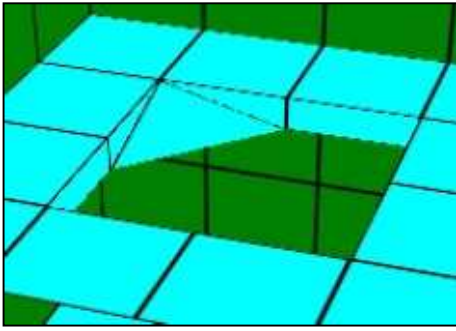
 Now click on the corresponding section in the 2D Grid Box. Our portal is almost finished. We don't want the triangular floor section to be paper thin and so we'll raise the back corner of it. With the Select Mode active, click on the blue part of the triangular floor section. Press the <Spacebar> until a white arrow points to the back corner. Then press <Q> to raise it one click. Unselect the section and you should have a portal that looks like the one here on the left.

Now let's move on to our next room.

3-2

Room #1 and Room #2

Room #2 is primarily a passage from Room #1 to Room #6. (Look at the rooms in the picture on page 41.) Set Room #2 up as the current room and Room #1 as the neighbor.
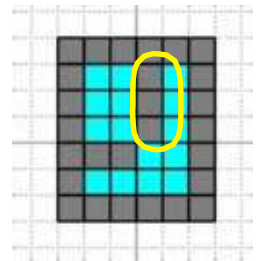
In the 2D Grid Box at the top of the screen, <Right click> & drag to select the three sections inside the yellow oval shown here on the right. Then down below in the 2D Grid group, click the [Wall] button.

In the 2D Grid Box, <Right click> & drag to select the two sections Shown in the next picture. Again click the [Wall] button in the 2D Grid group.
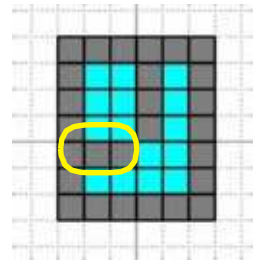
These sections are now walls and we've created a passage from the Upper right of the room to the lower left corner. Go ahead and Rotate it to see it.

Next we're going to change the passage so that the corner makes a gradual turn rather than jagged square sections.
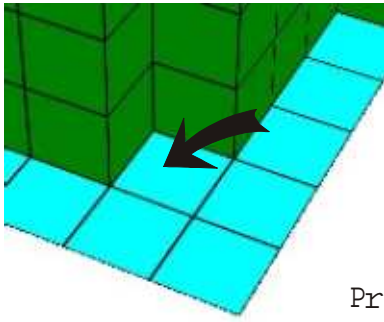
Turn on the Select Mode. Click the [Triangle-/] button in the lower left corner of the Geometry buttons. Then, while holding down the <Ctrl> key, click on the square that has a black arrow pointing to it as shown here on the left.

Press the <Spacebar> until there's a white arrow pointing into the corner between the two green wall sections. Next press the <Q> key 15 times to raise the back triangle until it turns into a diagonal wall section. Click the section to unselect it.

<Right click> & drag the room about to see how we now have a passage that makes a gentle turn.

Next we'll create a doorway between Room #1 and Room #2
In the 2D Grid Box in the upper left, click the gray section that's at the top and second in from the right side. It's just above the section that's blue. You should now have a passage as shown here on the right.
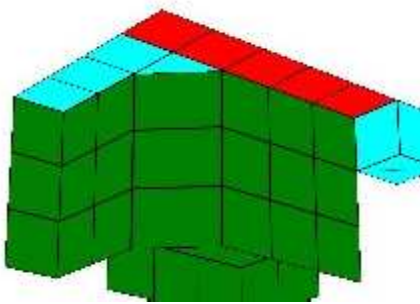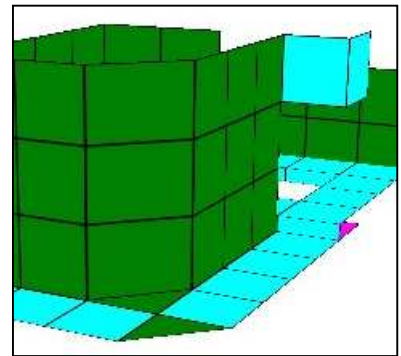
We need to lower some of the ceiling. While in the Select mode, select the ceiling squares as shown here on the left. Then press <S> key four times to lower these sections one block in distance. Click the [Reset All] button to unselect the sections.

Now let's move on to Room 4.

3-3

Room #2 and Room #4

Room #4 is right under Room#2. All we're going to do at the moment is to create a portal between the two rooms. Make Room #2 the current room and Room #4 the neighbor.

Turn off the Select Mode. Do a <Ctrl>-<Shift>-<Left click> & drag to select the 4 floor sections as shown here on the right. Then click the [Door] button in the 2D Grid group to create a portal into the room below.

Adding Some Textures

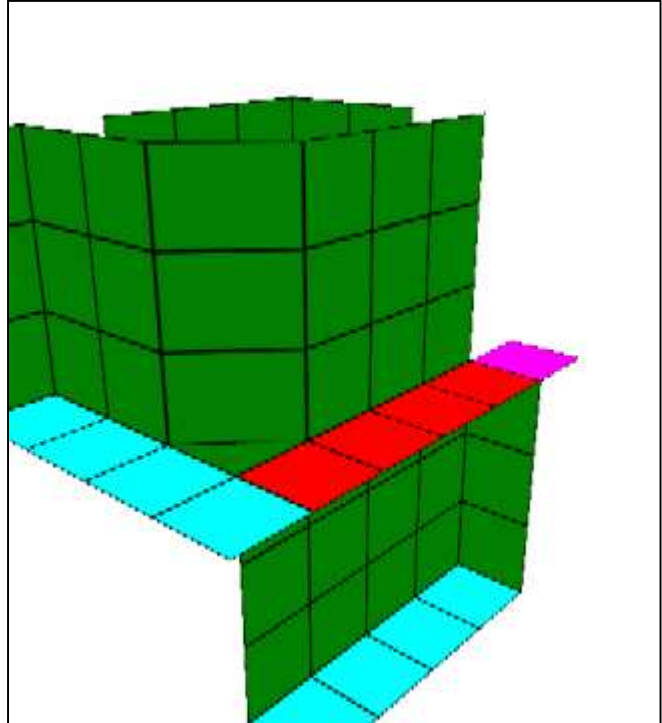One of the things that you're going to want to do often is Compiling and testing your levels. The only way to really know if things are going to look and act right is to build it and test it. Before you build your level, you'll want to put some textures in the rooms that you're testing. Also, the program cannot build your level without a "Base" level loaded.

Just the way we did in the first tutorial, click "File" in the Menu Bar and select "Open Textures." Navigate to the "tr2" folder and double-click the "platform.tga" file. Next load in a Base file. Click "File" in the Menu Bar and select "Open Base level." Navigate to your "data" folder and double click on the "orig_demo.trc" file. (You should have renamed your "demo.trc" file to "orig_demo.trc." back in the first tutorial.) Make Room #5 the current room and click the [Hide Neighbors] button. Go ahead and texture the room. At this time you might want to avoid using the Speed Buttons to apply textures to your walls, floors, etc.

For example, if you use the [TCeiling] speed button, you'll apply textures to the portal as well as to the ceiling. When you finish texturing Room #5, make Room #1 the current room and texture it. Do not texture the pink section. It's only there to indicate that the opening is a door.

The next thing we're going to do is make it so Lara has to monkey swing through the first part of Room #2. Room #4 will be made into a pit that will cause Lara's death if she falls into it. Lara will stand in the doorway in Room #1 and jump up and grab the monkey swing ceiling. We need to texture that ceiling section in a way that will suggest she can use it as such. There's a couple of textures that look something like what one might use to monkey swing on. Select one and texture the ceiling just before you go out through the doorway.

Now switch to Room #2 and texture it. Remember to texture those ceiling sections that we lowered so that they too look like monkey swings. Don't bother to texture surfaces that won't be visible. At the end of this passage Lara will come to the wall that's straight ahead of her. She'll be climbing this so you can texture it as if it is something that can be climbed.

Now set Room #4 as the current room and texture it. Remember that it will represent a pit that Lara can fall into. Go ahead and click the [Hide Neighbors] button to turn it off.

That's all the texturing that we're going to do for a little bit. Now that we have our pit for Lara to fall into, we need to set up the monkey swing above it. Make Room #1 the current room. Turn off the [Texturing Mode] and the [Render Textured] buttons.
<Ctrl>-<Shift>-<Left click> on the section that's in front of the doorway to the pit. Now, with that selected, unselect all of the items in the "Climb Walls" group in the bottom left corner of the screen and select only the "Ceiling" checkbox. In the "2D Grid" group just above this, click the [Climb] button.

 If you rotate the room to where you can see the ceiling, you'll see that the ceiling is grey in color where we now have it set to climbable. (A section that Lara can monkey swing across is said to be "climbable.")

Now to make the ceiling above the pit climbable. Before we get into the nuts and bolts of doing this, I want to explain something about monkey swing sections above portals. If you have a portal in the floor below a ceiling that is to be climbable, do not try and create the monkey swing by marking the ceiling sections. Instead, mark the first solid floor sections below the monkey swing sections as climbable even if this happens to be several rooms down.

Following this rule, set the current room to Room #4. Now <Ctrl>-<Shift>-<Left click> & drag to select the 4 floor sections. Again with only "Ceiling" checked, click the [Climb] button. Since the ceiling of this room is a portal, you won't be able to see the gray squares, however, Lara will now be able to monkey swing across the ceiling in Room #2 above.

<Ctrl>-<Shift>-<Left click> & drag to select the floor again. Click the [Death] button in the 2D Grid group. Now if Lara falls into the pit, it will cause her death.
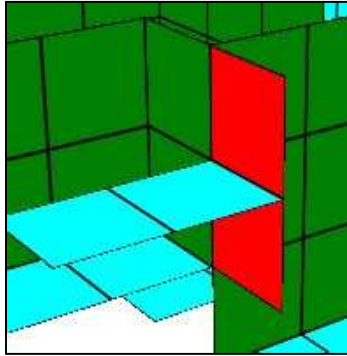
Finally, make Room #2 the current room. <Ctrl>-<Shift>-<Left click> the rectangle section as show here on the right. Then click the [Climb] button to make the next section past the pit climbable. In this way she can monkey swing past the pit.
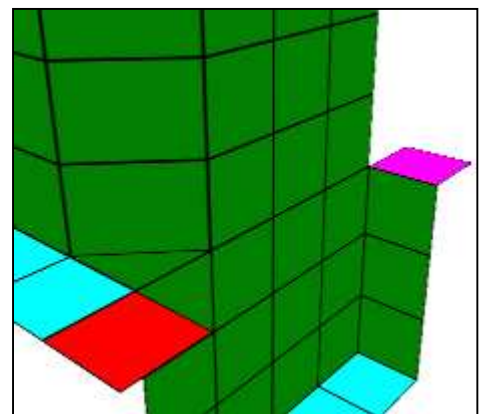
Room #2 and Room #6

Make Room #6 the current room and Room #2 the neighbor. Click the

[CENTER CAMERA] button to make sure the rooms are oriented properly and then select the upper left Geometry button (the one with the large block on it) and click on the two closest sections to raise them up. Still in Room #6, use <Ctrl>-<Shift>-<Left click> to select the wall section at the right side of the raised blocks. See the picture at the left. Now press the [Door] button to create a door between this room and Room #2.

Now make Room #2 the current room. You should see the pink square of our door as shown here on the right.
Now <Ctrl>-<Shift>-<Left click> the sector prior to the pink square and then press the <Up arrow> two times, you will get somting like the left.
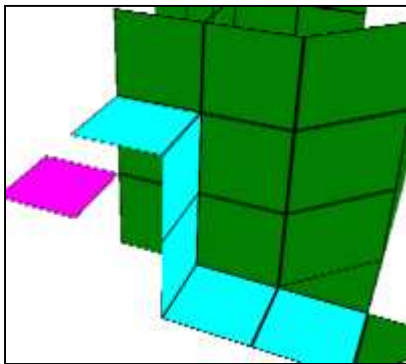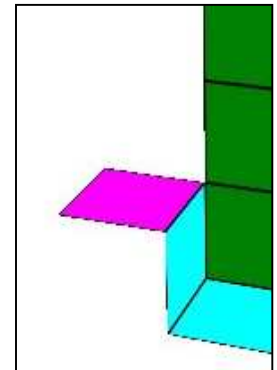
With Room #2 still the current room, <Ctrl>-<Shift>-<Left click> that 2 sector wall. In the "Climb Walls" group, clear all checkmarks except for the "Right" one. With it checked, click on the [Climb] button. The 2 sectors wall should turn grey showing that it's now climbable.

Now let's texture Room #6. Set the current room to Room #6. Click the [Hide Neighbors] button to keep the other rooms out of the way.

When I originally textured this room, I did it one section at a time. Sometimes it gets confusing in a room as to what shows or what gets textured. What I do when I'm not sure is to start by selecting a texture that's going to be what most of the wall is. Next I click the [TWall] speed button to texture all the walls. After that I re-texture sections that aren't the way I wanted.

When you click the [TWall] button with the [Render Textured] button active, you'll notice that the program also textures the end of the raised bock where the climbable wall is at. Select the texture that you used to represent a climbable wall and re-texture that section.

Go ahead and texture the top of the raised blocks and the ceiling. Don't bother with the two floor sections. Get out of the texture mode. Click the [Hide Neighbors] button to turn it off.

Room #3 and Room #6

Set Room #6 as the current room and Room #3 as the neighbor. In the 2D Grid Box in the upper left corner of the screen click on the two upper blue sections to create the door. Rotate the rooms if you want to see the door better.

Make Room #3 the current room. Press the [CENTER CAMERA] button and then rotate and move the room until you can see it from the side with the opening in the ceiling on your right.

<Ctrl>-<Shift>-<Left click> & drag to select the floor sections show at the right. In the speed buttons at the top of the screen, click the [MkRoom] button.
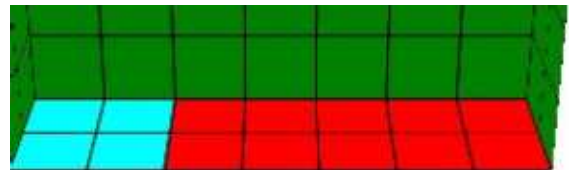
In the "Add new room" window set the length, width, and height to 5, 2, 2. Below these make sure that "Water" is checked. Also because this new room is going to be water room, is good idea to select from the "ambient Light" control the Aqua color. Then press the [OK] button. This new room is now a pool of water. Go ahead and texture Room #3 and Room #7. Try and make Room #7 look like it's supposed to have water in it. Do not texture the surface of the water.

Connecting Room #3 and Room #5

Now we're going to have a chance to do a little remodeling. We're going to add a door into a room that we've already built and textured. That means that you'll very likely have to go back and do some re-texturing where things don't look right.

Make Room #3 your current room and Room #5 your neighbor room. Get so that you can see the end of Room #3 where Lara can pull up out of the water as well as the wall that separates the two rooms. <Ctrl>-<Shift>-<Left click> on the wall section that's between the two rooms and next to the pool. Click the [Door] button to create a doorway. The opening is two blocks high and we only want it one block high.

Click the [Hide Neighbors] button (or set the neighbor to #0) so that only Room #3 is seen. Get in the Select Mode and click on sectors prior to the violet section. With that selected, press the <S> key four times. Press <Esc> key to unselect it. The door is now 1 block in height. Go ahead and texture the two sections above the doorway.
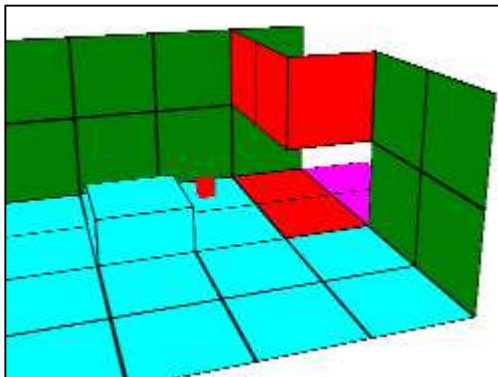
With our opening created, we're now going to put a door in it. We'll be setting up a trigger to open it and then we'll change it so that Lara will have to open the door with a key in a lockbox. Don't forget to get out of the texturing mode.

Placing and Setting Up a Door

With Room #5 still the current room, get so that you can see the door opening. Click the [Objects] button in the Tool Group buttons and then click the [Enable] button. Scroll down until you find Door 1 and click it to select it. Now click on the section that's in front of our door opening. You'll have to click on the [Rotate] button until the door is sitting properly in the opening.

IMPORTANT! Save your project here. We need to return to how it is at
this point two times.   3-5

Click off the [Enable] button and then click on the [Triggers] button
in the Tool Group buttons. Click the [Enable] button and then click on
our newly placed door. It should now be shown in a red wireframe mode.
With the door still selected, set the current room to Room #3.

Click on the floor section in front of the door opening. We now have
both the door (our item) and the section where we want the trigger
placed selected. Now simply click on the left most button in the
"Quick Triggers" group in the bottom left corner of the screen. Our
door will now open if Lara steps on or passes over the floor in front
of the door. Go ahead and build your level and test it to make sure
that it works.

Now that we've seen how to open a door this way, we'll do it with
a key and lock. Reboot the program and reload the project. Don't
forget that we need to load it again after this once more.

Make sure that the [Texturing Mode] and the [Render Textured] buttons
are off. We're going to need two new objects. A lock box and a key. The
lock box will go near the door in the room with the pool and you can
place the key where ever you want as long as it's somewhere in Room #3
or Room #7. It is important that when you create a level that you
always make it possible for someone to retrace their steps should they
miss picking up something like a key.

If we had placed the key to the door in our first room, we couldn't
get back to it once we drop into the pool. We'd be stuck at that point
in the game. Click the [Objects] button and then the [Enable] button.
Scroll down until you find "Key 1." Click it to select it. Set the
current room to Room #7 and then click a section at the bottom of the
pool to place the key there, or set the current room to Room #3 and
place the key on the landing.

Now make Room #3 your current room. Scroll down in the list of objects to "Lock 1." Click it to select it. Now click the floor section to the left of our door. We want the lock box on the wall beside the door so click the [Rotate] button until the lock box is on that wall. Click the [Enable] button to unselect it and then click the [Triggers] button. While you're at it, click the [Enable] button.

Realize now that we have two things to be concerned with. Our door is an "item" that needs to be triggered while the lock box has to be selected when we set the trigger type.

Click the drop down list of trigger types in the "Trigger" group. Select "Key_is_ON" for the type. Now <Alt>-<Left click> the lock box to select it.

Remember that you simply <Left click> an object when setting triggers, but you <Alt>-<Left click> a lock or other object that's required to trigger the main object. You can tell the difference by the color of the wireframe when the object is selected. <Left clicking> an object turns it into a red wireframe while <Alt>-<Left clicking> will turn it into a violet wireframe.

Your lock box should now be a violet wireframe. Click the [Add] button in the "Triggers" group. (Not the one in the "Commands" group.) Notice that the floor below the lock box turns violet showing that the lock box will be the trigger.

Now we need to let it know which object gets triggered when a key is put into the lock box. Make Room #5 the current room. Click on the door to select it. It should turn into a red wireframe. In the "Commands" group (not in the "Triggers" group) click the [Add] button. That should have your door ready to be opened. Go ahead and build the level and give it a try.

We're now going to once again set opening the door using a key and lock, however, this time we're going to do it using one of the Quick Triggers.

Reboot the program and load the level back in. Click the [Objects] button and then the [Enable] button. Again get "Key 1" and place it in either Room #3 or Room #7. Next set the current room to Room #3.

Once again place the "Lock 1" object on the wall next to the door. Click the [Enable] button to turn it off. Click the [Triggers] button and then the [Enable] button. <Alt>-<Left click> the lock box and then set the current room to Room #5. Click the door to select it. We now have the lock and the door selected. Down in the Quick Triggers group, click the far right button that looks like a key in a lock.

That's all there is to it. The program sets all the other things for you automatically. Go ahead and save the program and then build and try.

3-6

Chapter 4: More stuffs

In this chapter I'm going to try and cover those program features that have not been adequately covered yet. This will not necessarily be in the form of a tutorial, but rather in separate exercises that you can do.

Modifying The Vertical Height of Sections

Go ahead and boot your program. Click the [New] button and create a room that's 9x9x4. Next, in the Menu Bar at the top, click on "File" and then select "Open Textures." (You can also use the <Ctrl>-<T> shortcut.) Navigate to your new textures and open the "tr3" folder. In that folder double click on the "cathdrl.tga" file.

Use <Ctrl>-<Right click> & drag to zoom in on the far wall. So far each of the four sections that make up a vertical section are all the same size. Turn on the Select Mode (press the [Select Mode] button) and then select any two sections that are side by side.

With the sections selected, press the <Ctrl>-<Up arrow> once and watch what happens. The height of the bottom section increases by one click and the section above that compensates by getting smaller. Press the <Ctrl>-<Up arrow> again and you can move it even higher. In order to move the joint between the next blocks up, increment the "Floor section" variable in the bottom right part of your screen from 0 to 1. Now when you press the <Ctrl>-<Up arrow>, the second block up increases in size and the block above it compensates by getting smaller. To move the joint above this one, simply increment the "Floor section" variable from 1 to 2. Now put the sections back as they were.

Using the methods explained above, raise the second joint (the one between the second and third blocks) up until it's even with the bottom of the top block. Raise the bottom joint up so that it too is at the bottom of the top block. You should now have your wall looking like what's shown here on the right.
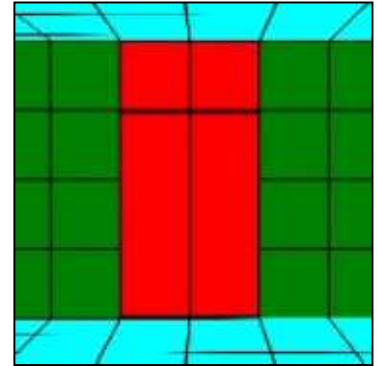
Now scroll your Texture Window down all the way to the bottom of the textures. You should now see a set of 6 textures that make up one picture. It's two sections wide by 3 sections high and appears to be leaded glass panes from a cathedral window. Normally you would have to select each section one at a time and place each one in an individual section. Because of the way we've altered the wall, you can now select three vertical sections all at one time and place them into the wall.

Go ahead and select each half and place them in the wall. (Don't forget to turn on the "Texturing Mode.") Even though this takes the same amount of time, it saves on system resources. Note that you can alter the size of the sections while the "Render Textured" mode is on. This lets you to see the stretching and distorting of the texture so that you can get it the way you want it to look.

Rotating and Flipping Textures

While we're at it, let's do some more manipulation of our texturing. Notice that our wall (from our work above) seems to be missing something from the right hand side. In the Texture Window click on the upper left texture of the painting. Place this texture in the section just to the right of the top of our textured sections.. Get the next texture down and place it under this one. Then get the last one down and place it at the bottom. You're right... they still don't look right. Now hold down the <Shift> key and click on each of the three sections that we just textured. This will flip each texture horizontally. There. That looks much better.

Holding down the <Alt> key while clicking on a textured section will rotate the section 90 degrees. Remember that you must be in the "Texturing Mode" to flip and rotate textures.

Adding Geography to Large Sections

So far when we've changed the geometry of our room using the buttons in the "Geometry" group, we've done it one section at a time. We've raised and lowered more than one section at a time while we were in the Select Mode, but we didn't change their general shape.

Make sure you are not in the Select Mode and that your [Texturing Mode] and [Render Textured] buttons are off. Now use <Ctrl>-<Shift>-<Left click> & drag to select all of the floor sections to the left of our textured sections. The selected area should be 2 or 3 wide and 9 deep. Now, in the Geography buttons, click on the one that's three over from the left in the top row. In the Speed Button Toolbar at the top of the screen, click the [FShape] speed button. All of our selected floor sections now have this shape. The [CShape] speed button works the same except it does this to the ceiling.

One More Texturing Button

We've used the TFloor, TWall, and TCeiling speed buttons to texture either the entire surface or those portions of the surfaces that were selected using the <Ctrl>-<Shift>-<Left click> & drag method. There's also the TRoom button that textures an entire room. Do not use this button until you fully understand how it works. Before you use it, it is important that you have already used the TFloor, TCeiling, and TWall buttons. That's because the TRoom button uses the textures that these other buttons last used when it applies textures to the current room. Once you have used the TFloor, TCeiling, and TWall buttons, the TRoom button makes it simple to create and texture a new room the same as the last room was done.

Random Geometry

You will notice two more buttons in the Speed Button Toolbar. These are the [FRandom] and [CRandom] buttons. These are the only two Speed Buttons that can be <Right clicked> to bring up another small menu where you can select how the button is to function. This menu is the same for both buttons and making a selection in one menu automatically changes the other button's menu. The [CRandom] button works the same as the [FRandom] button except it's for the ceiling instead of the floor. The term "Random Geometry" refers to the random raising and possibly tilting of floor and ceiling sections. You can also select whether you want triangles as part of the structure. Do NOT use any triangles in a Tr1 or Tr2 level since their game engines do not support triangles, except to place them in place never accessible by Lara.

When you <Right click> either of these buttons, you can select one of the following 3 choices:

> Random-1: Selecting this option will produce raised sections that are both raised and tilted.
> Random-2: Selecting this option will produce raised sections that are all flat on top.
> Terrain: Selecting this option will produce random raised sections that are no more than a click in height. The reason for this height limitation is that it still enables "enemies" to move about on the surface.

You can also turn on or off the use of triangles by selecting or unselecting the "Include Triangles" option at the bottom of the list. In our room that we've been working on, or in a new room, first get into the Select Mode. Now click floor sections until you have a group selected that's 4 or 5 blocks square. <Right click> the [FRandom] button and select "Random-1." <Left click> the [FRandom] button.

What you should find is that the selected sections have been raised with some of the surfaces slanting. If the "Include Triangles" option at the bottom of the list was selected, you will find that the top surface of those blocks containing triangles have been randomly raised. Now change the "Floor Section" variable at the bottom of the screen to 2 and click the [FRandom] button. The height of the modified sections is now higher. Set the "Floor Section" variable back to 0. (Note that you can use the "Ceiling Section" variable to control the maximum distance that the ceiling gets randomly lowered.)

Right click the [FRandom] button and select "Random-2." Click the [FRandom] button. The selected sections have been randomly raised, but the tops are kept flat. Since the tops are kept flat, there won't be any triangle sections. The "Floor Section" variable works the same as before.

Next <Right click> the [FRandom] button and select "Terrain." Note: The "Terrain" option only works when you are not in the Select Mode. Click the [Reset All] button and then turn off the "Select Mode." Now use <Ctrl>-<Shift>-<Left click> & drag to select a section of the floor. Click the [FRandom] button. The change is not necessarily very random, but this does create a floor that can easily be driven over with vehicles, and "baddies" won't be prevented from crossing over it. Realize that if it's not as "random" as you would like, you can still make further changes to it using the tools that we've already covered.

The [Arch#1] button also brings a popup menu when doing right click on in, it allow you to select the Arch#1, Arch #2, and Vault options.

When you have **Arch #1** option selected, then clicking the button automatically will re-draw the ceiling using an arch from Left-to-Right direction.
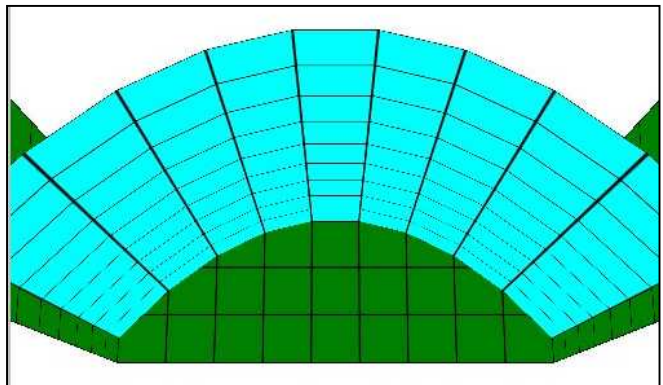
When you have **Arch #2** option selected, then clicking the button automatically will re-draw the ceiling using an arch from Front-to-Back direction.

When you have **Vault** option Selected, then clicking the button automatically will draw a kind vault ceiling.
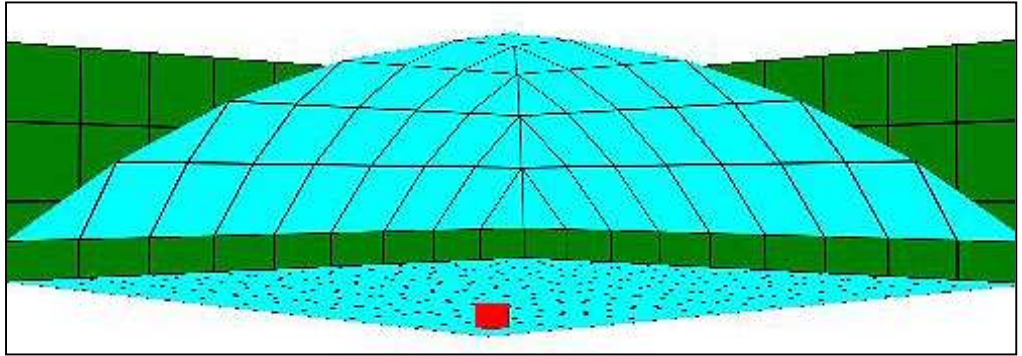
Please note that at compiling level time, Dxtre3d will discard unnecessary wall faces behind arch or vault ceiling, so don't waste your time trying to discard those faces your self using texture zero or transparent black textures.
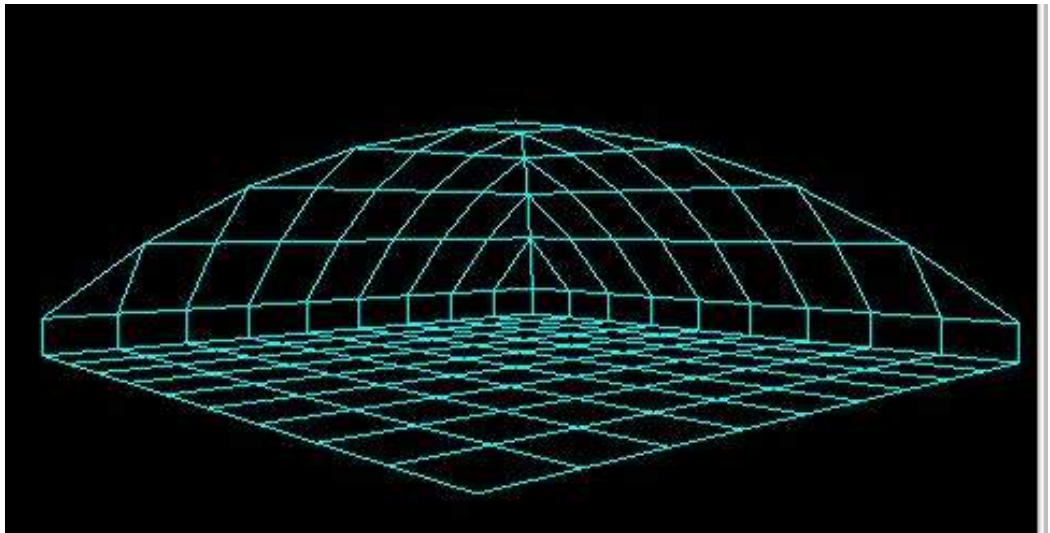
"Arch" and **"Vault"** features works best in standard 10x10x3 rooms, for different rooms dimensions you will need to adjust the arch/vault angle using the "Floor Section" and "Ceiling section" controls (default they have value 0). "Floor section" will control the angle from left to center room (arch#1), and "Ceiling section" will control angle from right to center room (arch#1). For arch #2 they control the angle from front to center and from back to center.

The [Build] Speed Button

At the far right is the [Build] button. After you have built your level at least once, you can click this button and the program will build your level unprompted. If you click it before you have built your level, it will simply open the "Building new playable level" window.

Copying and Pasting Single Sections and Blocks of Sections

To copy and paste a single section, use <Ctrl>-<Left click> to select an individual block and then simply perform an <Alt>-<Left click> where ever you want to paste it. This copies both the shape and textures of that section. As usual, use a <Shift>-<Alt>-<Left click> to paste the ceiling.

To copy and paste a block of sections, <Ctrl>-<Shift>-<Left click> & drag to select the block. Once you have the desired section selected, press <CTRL>-<C> keys. This tells the program that you want to copy the block. Once you have done this, simply <Left click> where you want to have the far left corner of your block pasted, (in any room visible in the 3D Window) and then press <Ctrl>-<V> to paste the block. You can also use <ALT>-<V> to paste a ceiling block.

Floor Sounds

With the Select Mode turned off, you can use the <Ctrl>-<Shift>-<Left click> & drag to select one or more floor sections. With the floor sections selected this way, you can then select a type of sound in the "S. Sounds" group and then click on the [Steps S] button in the 2D Grid group so that when Lara or someone walks or runs on that section, it will make that sound.
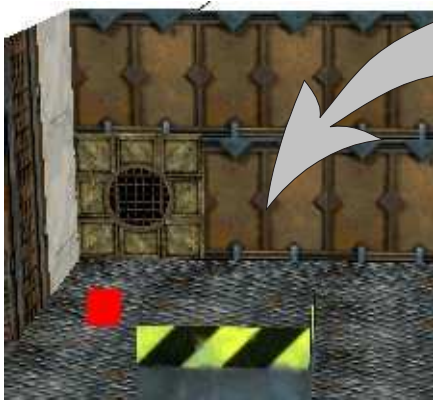
Windows and Other Transparent Portals

What we're going to do now is to make another modification to our tutorial level. Go ahead and load it in and make Room #5 the current room. We're going to add a window to the section shown by the grey arrow here on the left. Lara will be able to see into the room with the pool, but she won't be able to get there except by going the long way around.

We need to make a change in Room #3 (the one we'll be looking into) before we put in the window so make Room #3 the current room. Rotate the room and zoom in until you have a good view of the lock on the wall and the wall to its left.

Click the [Objects] button in the Tool Group buttons and then click
the [Enable] button. Next click the lock to select it. It should turn
into a red wireframe. Now click the [Rotate] button until the lock has
rotated around onto the wall on the left. That should get it out of
the way of our window. Turn off the
[Enable] button.

Make Room #5 the current room. Scroll
down in your textures to the bottom and
you should find a texture that looks
like the one shown in the wall here on
the right Select it and in the
properties drop down menu below the
textures, set it to "Transparent." With
both the [Render Textured] and [Texturing Mode] buttons on, click the
section to the right of the door. You should now have something
similar to what you see here on the right.
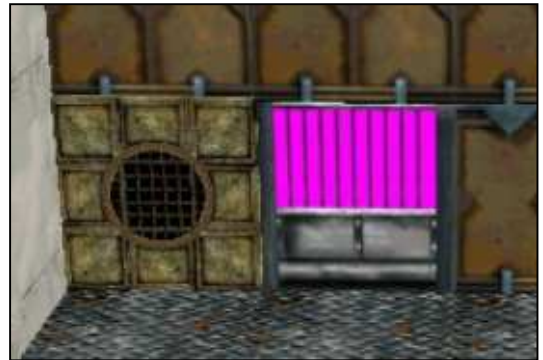
Now click the [More #1] button in the Tool Group buttons. In the
"Manual Portals View" group we need to set the "Room #" variable to
the Room number that our window will be looking into, so set it to #3.
Since our opening needs to be 1 x 1, set the "Width" and "Height"
variables both to #1.

Next, click the [CENTER CAMERA] button to orient the room properly. You
will see that the new window is in the left wall, so set the "Type" to
"Left." Now click the [Add] button so that when we click, it will add
our portal. Now that everything is set, click the wall section that
has the window in it. You should instantly see a colored square above
the wall. Use the <Down arrow> key to move the square down onto our
window section. Click the [Add] button to turn it off. Now, repeat the
same exact process to put a window on the opposite side of the wall in
Room #3. The "Room" variable will now be "5" and the "Type" will be
"right." There. You're done. Go ahead and build the level to see how it
looks in actual game play.

Using Animated Textures

Let's do some more work on our tutorial level. In this exercise we're going to put some texture on the water's surface to make it look more real. Then we're going to put a computer panel on the wall and make it look real with blinking lights.

Go ahead and load in the tutorial level. Make Room #5 the current room. In the Texture Window, scroll down until you come to a row of control panels. Each will have a greenish colored section in it's upper right corner. Decide where on the wall that you can put this control panel but don't do anything to the wall yet.

Click the [Animated Textures] button in the Tool Group buttons. Click the [Preview] button in the "Textures Sets" group. Now click the [Add] button just to the left of the [Delete] button. This will add another animated set to our level.
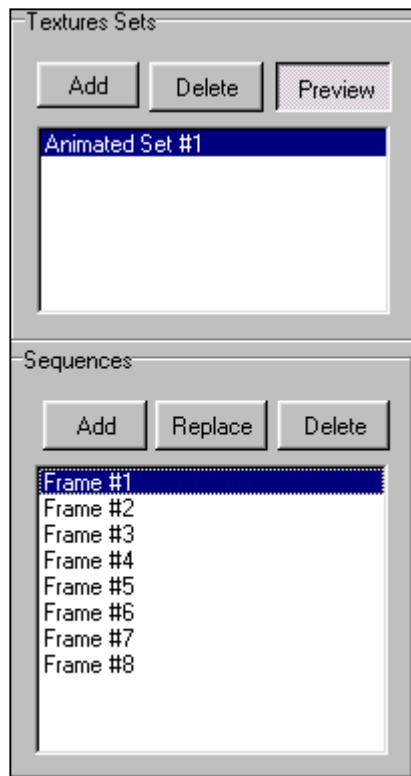
Now click on the left most control panel texture . Next click the [Add] button in the "Sequences" group. It will now show "Frame #1" in the list and the texture will be displayed in the "Preview" window above. Each time we place a texture in the list, that texture will be displayed in our animation for a set period of time. With the same texture selected, click the [Add] button in the "Sequences" group again to place it as the second frame in our sequence. That way this frame will be displayed twice as long as normal. Now click the next texture over to the right. It looks almost the same as the first one, except for some minor differences. Click the [Add] button twice to place it in our sequence twice. Look in the Preview window and watch our animation as it unfolds.

Select the next texture to the right and again click the [Add] button twice. Finally, click the last texture over and again click the [Add] button twice. You can now see how the final animation will look in our Preview window.

Now let's put this animation on our wall. With the [Render Textured] and [Texturing Mode] buttons pressed in, click on "Frame #1" in our sequence list to select it. You could select any of the textures in the list since the animation rotates through all of the textures.

Knowing that we've selected the first one lets us start with a different one if we wanted two of the panels on the wall. That way their lights would blink differently. Click on the wall section to place the control panel. That's all there is to it. Go ahead and build the level to see how it looks when you actually play the game.

Our next animation exercise involves texturing water so that it looks more like water. Load in your tutorial level and make Room #7 the current room. This is the pool room.

Look at your textures. You'll see that there are 4 textures in the second row that look pink in color with white zig-zag lines in them. We're going to use these to animate the surface of our pool. The pink will become transparent. Rotate and position your room so that you can see the ceiling opening from below. Go ahead and click the [Render Textured] and [Texturing Mode] buttons. Now click the [Animated Textures] button in the Tool Group buttons. Click the [Preview] button so you can see your animation as you build it.

Click the [Add] button in the "Textures Sets" group to add a new animation sequence. Over in the Textures window, click on the left most texture in the second row. Directly below the Texture window, select "Transparent" in the drop-down menu. Now click the [Add] button in the "Sequences" group to add this texture to our sequence. Back in the Texture window, click on the next texture over to the right. Click the [Add] button to add this texture to our sequence. Click on the next texture to the right and then click the [Add] button to add it. Finally click the last texture in the row and then click the [Add] button to add it to our sequence.

Click on "Frame #1" in our sequence list and then even though it can't be seen at the moment, click on a ceiling section to place the texture on the underside of our water surface. (You always texture the ceiling of the room that's full of water.) Now select the next frame in your sequence and click on another ceiling sections. Continue selecting different frames while texturing the ceiling in a random sort of way. When you have the entire surface textured, go ahead and build the level and take a look at the surface of the pool from above and from underwater.

You can NOT use the same texture in more than one animation sequence, however, you can use the same texture more than once in a single animation. As seen above, we used the same texture more than once to vary the length of time a frame within an animation gets displayed during the animation cycle. If you apply one frame of an animation to numerous sections, they will appear to be one large picture changing all at one time to the next frame, etc.. It's usually best to place the frames of your animation randomly to the desired sections in your room.

Using Cameras to Enhance a Game

Anyone who's played Tomb Raider is well familiar with how the "camera" that displays what we see on the screen follows along behind Lara, making the game more real and entertaining. There are places in the game where the camera changes to show us Lara from another angle, or even a view of something happening in another room such as a door opening. The wise use of these camera views can make your game much more professional looking. Use them to give the player hints about where to go next.

In this exercise we will place a camera that will simply track Lara. It's a simple setup that's triggered by Lara being on (or over) one or more floor sections. Load in a level to use or create a new one.

First we need to place the camera at the desired location. Click the [More #1] button in the Tool Group buttons. Then, in the "Cameras and Sinks" group, click the [Add] button. Now click the desired camera location in your room. Move it up and down 1/2 block at a time by using the arrow keys. Hold the <Shift> down to move it up and down 1 block at a time. If you place it in the wrong section you can <Shift>-<Left click> a different section to move it there. Click off the [Add] button.
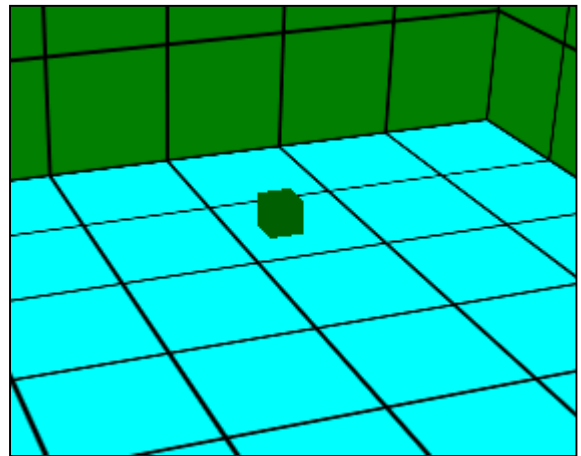
Next we need to set up the trigger to activate the camera. Click the [Triggers] button in the Tool Group buttons and then click [Enable]. Since we want the camera to be triggered by Lara on or over a section, we need to set the type in the "Triggers" drop-down box to "Do Activate." With that set, click the [Add] button that's in the same "Triggers" group.

If we do not override where the camera is pointing, it will follow Lara. Down in the "Commands" group we need to select "Switch_Camera" as a command. This command will turn on our camera. Click the [Add] button in the "Commands" group and a pop-up window will appear. Since this is our first camera, set the "Camera#" to 1. Set the "Timer" to the number of seconds for the camera to stay on. A value of 0 leaves the camera on as long as she's standing on the section. Click [OK].

All that's left now is to place the trigger on the desired sections. Click the sections that you where Lara to trigger the camera and then click [Apply] in the "Triggers" group. That does it. Give it a test if you want.

In the next example we will set up a camera so that when Lara uses a key to open a door, the camera will switch and show the door opening.

Create a new level with two adjacent rooms. Create a portal between the rooms and place a door between them as we did preciously in the tutorial.

Make the current room the one with the door. We'll go ahead and place the camera that will show the door opening. Click the [More #1] button in the Tool Groups buttons. In the "Cameras and Sinks" group, click the [Add] button. Click the desired camera location in your room. Move it up and down1/2 block at a time by using the arrow keys. Hold the <Shift> down to move it up and down 1 block at a time. If you place it in the wrong section you can <Shift>-<Left click> a different section to move it there. Click off the [Add] button.

Now set the current room to the one where the lock will be. Select and place the key and the lock on the wall the same as we did previously, don't go beyond just placing the items.

Setting the triggers for a keyed door and camera can seem complicated
at first, but once you start to understand the logic of what you have
to do, it will become quite simple. I'll try and explain it in such a
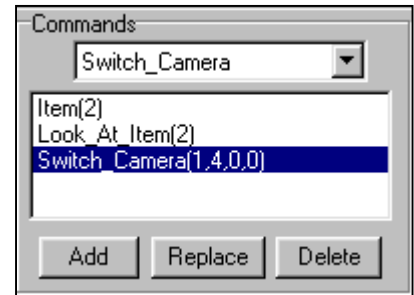way that you can pick up on the logic.

Remember that there's three phases to setting a trigger. First you set
the type. Next you set up a list of commands. Finally, if needed,
place triggers in the desired floor sections.

Click the [Triggers] button in the Tool Group buttons. Click the
[Enable] button. In the drop-down list select "Key_is_ON" as our
type. With keys, you must have the lock selected when you add the
type, so <Alt>-<Left click> on the lock. It should now be violet and
wireframe. Click the [Add] button in the "Triggers" group. The floor
below the lock will turn violet showing that there's now a trigger
there. That completes the first phase as mentioned above. Now on to
the command list.

The next phase is setting up the commands for our trigger. Looking at
what must happen when things get triggered, we know first of all that
the door must open, and the door is an item. Set the current room to
the room with the door. (The Triggers group must still have the
[Enable] button active.) Click the door. It should be both wireframe
and red. With "Item" showing in the drop-down list, click the [Add]
button in the "Commands" group. That sets the door up to be opened.
Next we want to set up the camera.

We are going to override having the camera automatically pointing at
Lara. We do this by using a "Look_at_Item" command. Make sure the
[Triggers] button and the [Enable] button are both active. In the
drop-down command list, select the "Look_at_item" command. Click the
door as the "item" to look at. Now click the [Add] button in the
"Commands" group to add this command to our list.

We have the camera set to look at the door, but we still haven't switched to this camera. In the drop- down command list, select the "Switch_Camera" command. Click the [Add] button down below. In the pop-up window, set the "Camera#" to 1. Set the "Timer" to say 4 seconds. Go ahead and click [OK]. In this case the third phase (setting triggers on floor sections) is not necessary since the floor section trigger was automatically set when we set the trigger type. Our door should open now when you put the key in the lock, and our camera should show it opening. Go ahead and give it a try.
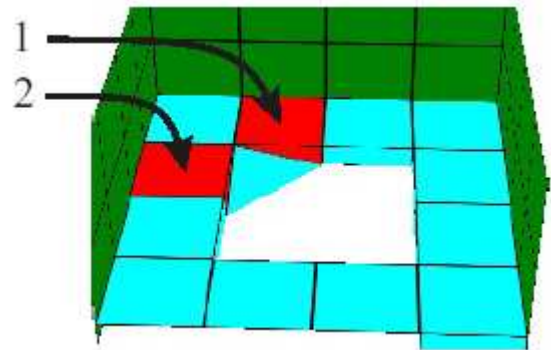
Two Blocks -- Two Triggers -- and a New Location

Yes, that heading is confusing. It'll all be cleared up in the next example. When I was coming up with ideas for this manual, I had wanted to use the "Alternate" room feature. That's where you switch back and forth between two rooms that in essence occupy the same geographical space. Then found out that the Tomb Raider 5 game engine doesn't support "Alternate" rooms so I came up with something similar in nature and yet different in how it's created.

In this next example we're going to place two movable boxes in a room in such a way that each box has to be moved onto its own section in order trigger one event, and that event is going to transport Lara to a new location in a new room. In this case the new room will look identical to the current room and so to the player, it will seem like they're still in the same room with some changes having taken place. We're going to be once again modifying our tutorial level so go ahead and load it in. With Room #1 the current room, click the [2D MAP] button in the "More Options" group. Now press <Ctrl>-<K> to clone Room #1. The new room will be Room #8. Click and drag the new room (the red one) off to the side where it's not touching any other room. Click the [2D MAP] button again to turn it off. Notice that the current room is now Room #8.

Our new cloned room is no longer joined to any other room and so we need to get rid of the doors. In the 2D Grid Box in the upper right,<Right click> & drag to select all four sections in the middle of the room that make up the portal. Then down below in the "2D Grid" group, click the [Floor] button. Three sections will still look like they're a door, but they're not. They're just textured with "Texture 0" which is transparent.

In the "Geometry" group, click on the upper right button that has the short raised section on it. Click on all four sections where the portal was to raise the floor to where it's all the same height. The ones that are transparent will look a bit strange as you do this. Now click the [Render Textured] button and the [Texturing Mode] buttons. Select a texture and change the transparent sections to where they look like the floor. You might want to make the four sections look like there could possibly be a closed opening.

Now let's get rid of the door. In the 2D Grid Box, right click on the black square that represents the door and then click on the [Wall] button in the "2D Grid" group. Click the [Render Textured] and [Texturing Mode] buttons along with the [Texture Zero] buttons. Click the wall where we just put the door to make it transparent. Reset the three buttons. Notice where the diagonal section is in the picture on the right. The two red sections are numbered 1 & 2. I'll be referring to these sections in our new room. To locate these sections, press the [CENTER CAMERA] button and refer back to this picture.

In order for Lara to reveal her exit from the room, she will have to push two blocks onto their own specific floor sections. When covering both floor sections with the boxes, if you put the wrong box on the wrong section, nothing gets triggered. When the boxes are both placed on their sections, a trigger will send Lara from our cloned Room #8 back into Room #1.

 Since we want it to seem as though she's still in the same room, she needs to be standing in same place in Room #8 as where she'll be transported to in Room #1.
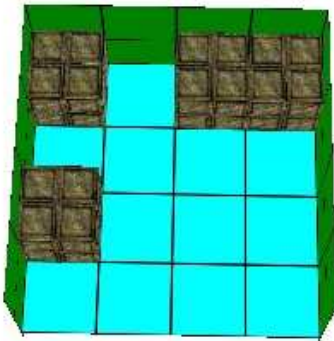
Click the [Objects] button in the Tool Groups buttons and then click the [Enable] button. In the drop-down object list, select "Box 1." Looking at the picture on the right, place boxes as shown. The first time you place a box you'll have to press the <Up arrow> twice to raise the bottom of it up to the height of the floor.

Once you have all four placed, scroll and find "Door 4" in the object list. Select it and then click the lower right corner floor section. This door is only there because it will also be there in Room #1. We also need to put a lock box on the wall, again only for looks. Scroll down and select "Lock 2." Click the floor in front of the door to place the lock and then click the [Rotate] button a couple of times to rotate the lock onto the wall to the left of the door. The only objects left to be placed in the room are the two pushable boxes. Before we start with them, it's probably best if I stop and explain something about "Activation Flags."
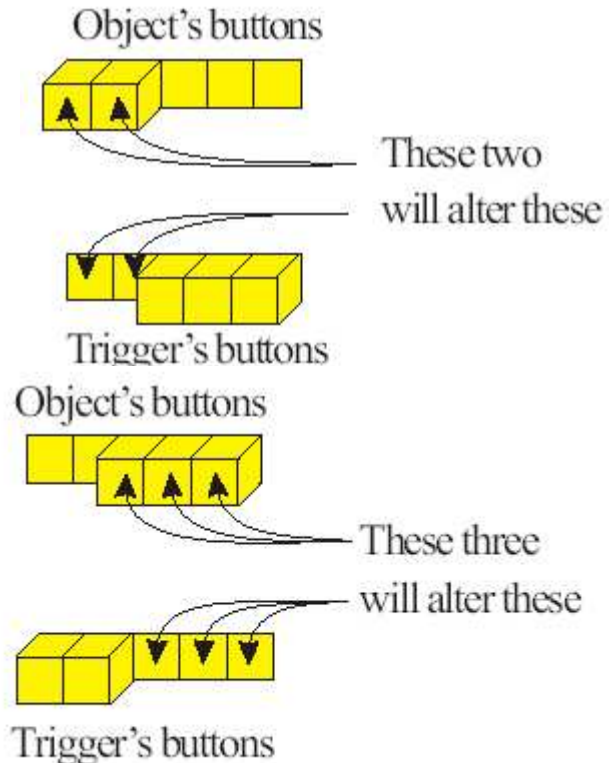
All objects have "Activation Flags." When you click on the [Objects] button, one of the things you'll see in the tool group is a set of Activation Flags (buttons) numbered from 1 through 5. Notice that they are initially all in an "out" position. That means that if the item happens to be something like a door, its initial state will be closed. If the object is not going to be triggered, but is instead an object that's going to be used to do the triggering, then the "Activation flags" will play a different role. If you click the [Triggers] button, you'll find a second set of "Activation Flags." Notice that they are initially all in an "in" position. These activation flags are used hand in hand with the object's activation flags when you want to use more than one trigger to cause an event to happen.

When an object is used to do the triggering, like when a box gets pushed onto a specific section, then the state of these buttons is used to determine what takes place. If an object's button is "out" then it can alter the state of a trigger's corresponding button if that button is "in."

What this means is that if you have one object with say buttons 1 and 2 "out" while 3, 4 and 5 are "in," then it can alter buttons 1 and 2 of a trigger provided that those buttons are "in" on the trigger.

Object's buttons

These two will alter these

Trigger's buttons

Object's buttons

These three will alter these

Trigger's buttons

If a second object is set up with its buttons 1 and 2 "in" while buttons 3, 4 and 5 are "out," it can alter buttons 3,4, and 5 of a trigger that has buttons 3, 4 and 5 "in. Note that since the first object has its buttons 3, 4 and 5 in, it can not alter the second trigger even though that trigger has those same buttons in. This means that if both of these triggers were set to trigger an event such as the opening of a door, the two objects would have to be placed on the proper trigger in order to get the door to open. This is exactly what we're going to be doing with our boxes.

Now a little about the activation flags in the object to be triggered. If that object is something like a door, the initial state of its buttons determines whether the door is initially open or closed. If they are all initially out (default state) then the door will be closed. If some of the buttons are in while others are out, then the door will still be closed and the buttons that are "out" must be triggered before the door will open. If all of the buttons are initially "in," then the door's initial state will be open and when triggered, the door will close. Now back to our level.

With the [Objects] button pressed, make sure the [Enable] button is also pressed in. Scroll down in the objects list and select "Box 3." Above the list, click "Activation Flags" 3, 4 and 5 so that they are pressed in. As described earlier, this box will only affect buttons 1 and 2 of its trigger. If you've rotated the room, click the [CENTER CAMERA] button. Now place the box by clicking the floor section that's second in from the left and in the row closest to you. Click each of the activation buttons to change them opposite to how they now are. This will set them up so that the next box will only affect buttons 3, 4 and 5 of its trigger. Now click the floor section to the right of our other box. Now let's set up the triggers. The box on the left will be moved onto section 1 as shown on page 66. We need to set its trigger on that section. Click off the [Enable] button and then click the [Triggers] button. Click the [Enable] button. Since it's going to be an object other than Lara that sets off our trigger, we need to set the trigger type to "Item_At_Sector." Click the drop-down trigger type list and select "Item_At_Sector." As mentioned earlier, set up the activation buttons so that buttons 3, 4 and 5 are out.

Now click the [Add] button that's in the "Triggers" group. Now for the second box. Click each of the activation buttons in the "Triggers" group to reverse their current settings. Now only buttons 1 and 2 should be out. <Alt>-<Left click> on the box that's on the right and then click on the [Add] button in the "Triggers" group. The next thing we need to do is to place our "Lara position changer" object where we want her in Room #1. Click off the [Enable] in our "Triggers" group and then set the current room to Room #1. Click the [CENTER CAMERA] button to bring it into view. If you look at our sections 1 and 2 you will notice how Lara must be standing on the section with the diagonal opening in order to push either of the boxes into their positions.

This is where we will send her to. Click the [Objects] button and then the [Enable] button. Scroll down in the object list to "Lara position changer" and select it. Now click the section with the diagonal portal to place the object there. Click off the [Enable] button. Click on the [Triggers] button and click the [Enable] button. Click the first "Item_At_Sector" trigger in the "Triggers" list to select it and then click the "Lara position changer" object. Now click the [Add] button down in the "Commands" group. Select the other "Item_At_Sector" trigger and again click the "Lara position changer." Click the [Add] button in the "Commands" group. Both triggers are now set to activate the "Lara position changer." Now all we have to do is set our triggers on the proper floor sections. Go ahead and make Room #8 the current room again. (Use the [CENTER CAMERA] button to bring the room into view.) Both the [Triggers] button and the [Enable] button should still be active.

With the first "Item_At_Sector" trigger selected, click on floor section #1. (See page 66.) With this section selected, click the [Apply] button in your "Triggers" group. Click on the second "Item_At_Sector" trigger to select it and then click on floor section #2. With this section selected, click the [Apply] button in your "Triggers" group.

Click off the [Enable] button and then do an <Alt>-<Ctrl>-<Shift>-<Left click> on the section in front of the door to change Lara's start position to this room. Now let's go set up Room #1. Make Room #1 the current room. We need to make it look the same as Room #8 looks when we get transported into Room #1. Click on the [Objects] button and then the [Enable] button. Scroll down in the objects list and select "Box 1." Look at page 67 and again place these boxes in this room just as you did in Room #8. Select "Box 3" in the list and place it on sections 1 and 2. These are the sections where we placed the triggers.

Now select "Lock 2" in the object list and click on the square in front of the door. Rotate it as you did earlier onto the side wall. Change the current room to Room #5. This is the room below Room #1. Select "Key 2" and place it somewhere in this room.

Set the current room to Room #1. In the object list select "Door 4" and then click the floor section in front of the door opening. Use the [Rotate] button to place the door properly. Don't worry about how the top of it goes up through the ceiling. Now we need to set up the lock to open the door.

Click the [Enable] button and then click the [Triggers] button. Click the [Enable] button. Reset the "Activation Flags" so that they are all pressed in. Set the trigger type to "Key_is_ON."

<Alt>-<Click> the lock box and then click the [Add] button in the "Triggers" group.
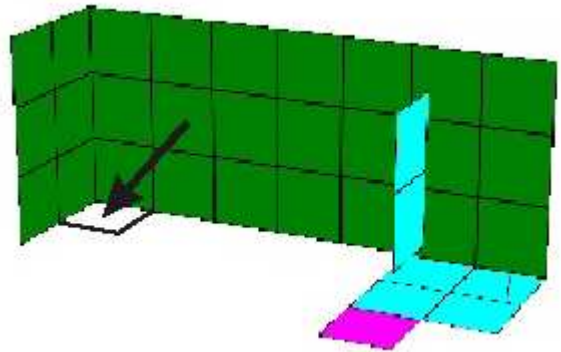
Click the door to select it and then click the [Add] button in the "Commands" group.

Picking Up and Placing Objects

Some objects can be placed about in your level for Lara to retrieve. Depending on the object and how it's set up, you may find that it can be placed on the floor, on a low or high pedestal, on a wall to be pried off with a crowbar, or even hidden inside a wall. Another option is placing objects on the same section as a baddie.

For the most part, how an object can be placed is not documented. Only by experimentation can you determine if you can achieve the desired result. I'll show you a couple of alternative ways of placing objects and leave it up to you to figure out more. The official level editor documentation contains some information that can possibly help, or you can watch the online forum mentioned in the front of this manual for posts containing information that others have managed to figure out.

Go ahead and load in the tutorial level. Set the current room to Room #3. Look at the picture at the right. The section with the arrow pointing to it is the one that we want to modify but you won't find any lines around it as our drawing has. In the 2D Grid Box, <Right click> on the lower left black square that represents this section. Then click the [Floor] button down below. The room will look the same but the 2D Grid view will show a blue floor square there now. Click the upper right Geometry button and click this section in the 3D Window.

Click the [Render Textured] and [Texturing Mode] buttons. Go ahead and apply textures to the top and side sections. Make Room #7 the current room and then texture the ceiling section that's the bottom of our new floor section.

Now that we have a new place for Lara to climb up onto, let's put a couple of objects there. Click off the [Texturing Mode] button.

Make Room #3 the current room and click the [Statics] button followed by the [Enable] button. Select "Static Mesh#9" and then click our new floor section to place a pedestal there. Click the [Enable] button to turn it off.

Click the [Objects] button followed by the [Enable] button. Scroll down in the objects list and select the "Gold Rose" object. Change the "OCB" variable to number 4. Now click the floor where the pedestal is. You won't see the object because it's hidden by the pedestal. Click the <Up arrow> twice to get the rose (secret) to the correct height. Click off the [Enable] button.

Click the [Triggers] button, then the [Enable] button. Set the trigger type to "Item_is_Picked_Up." <Alt>-<Click> on the rose to select it and then press the [Add] button in the "Triggers" group. Then in the "Commands" group, select "Secret_Found." Press [Add] at the bottom. In the pop-up window, set the secret number to 1. Click off the window and your secret is ready to be found.

Object OCB Settings

When you place an object, the following information may help you. It may or may not be valid in the particular game that you're working on.

OCB	Object Location
0	Object is on the floor
1	Object is hidden in a wall hole
2	Object is on the wall (use a crowbar to remove it)
3	Object is on a high pedestal
4	Object is on a low pedestal

As an exercise that you can do yourself, place the "Crowbar" object somewhere for Lara to pick up. Then select "Pick up item 1" and set the OCB variable to 2. Place this object on a sector along a wall and rotate it until it's against the wall. In the game you should be able to use the crowbar to pry the object off from the wall.

Another thing to mention about placing objects in your level. If you place an object(s) on the same section as a "baddie," the object(s) won't show up until you kill the "baddie," and then the object(s) appear where he dies. This is a handy way of adding ammo, weapons, and medipacks to your game.

For Pick-able objects: if they are placed with activation flag "I" (invisible) ON, then in game the item will not show up until it gets triggered as any other normal object.

BADDIES and Their AI

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 null-mesh 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_PATROL 1 & 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.

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* baddy will not fire grenades).

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).

Do not activate several items at the same time, having too much enemies awake will cause some enemies flickering, bad behavior or weird engine problems. Some animated objects accept to be deactivated so once they are not used anymore you can deactivate them, try to get actives only necessary objects, you can activate fires when Lara is approaching to that zone and you can deactivate those fires when Lara is going away from that zone.

For tr3 game engine, the "kill all trigger" null mesh is very useful for "clean" your level zone from all remain actives items that the player could have left actives in the previous zone (enemies not killed, fires, etc), that will a sure you that your level will get back in a "fresh" state at that point.
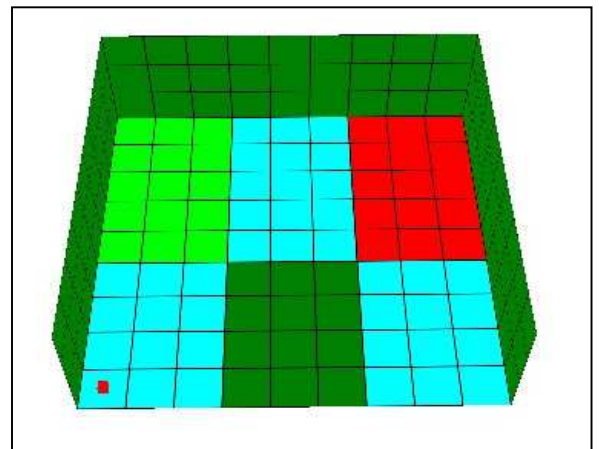
Setting Up Zones

Zones might best be looked at as being fenced in areas in your level where "baddies" can not cross over the fence. If a "baddie" is in a zone (fenced in area) then it can not get out, and if it's outside one of these areas, it can not get in.

Not only do zones prevent "baddies" from going where they will get into trouble, but they also set up areas where they only pay attention to Lara when she enters their zone. Otherwise they wander around peacefully doing nothing. (Depending on which game engine you're using, this may or may not happen in your level.), some animals from tr1, tr2, tr3 (wolf, bears, tigers, lions etc) looks more realistic when zones are applied to sectors where Lara is inaccessible for them.

To see how these zones work in actual practice, go ahead and boot your program. Create a new room that is 9x9x3. Load the TR5 Demo level as a base level and load in some textures. Go ahead and texture the room as desired. Now use <Ctrl>-<Shift>-<Click> & drag to select the floor area shown as dark green in the picture here on the right. Then in the 2D Grid group in the bottom left corner of the screen, set the ZoneID variable to number 1. Click the [Put Zone] button. Next select the area show as light green and after setting the ZoneID to the number 2, click the [Put Zone] button.

Finally select the floor area that's show as red. Set the ZoneID to the number 3 and click the [Put Zone] button. We now have three different zones as well as areas that are not part of any zone. You might want to texture each zone differently so that it will be obvious when you play the game as to where each zone is at.

Using the techniques as we did back, place a lion in each of the zones. Set up a trigger in front of Lara to trigger all three lions. Go ahead and build the level. What you will find is that the lions will ignore Lara as long as she doesn't go into their specific zones.

You can use zones in your level so that when Lara climbs onto a block or something, the animal will go away and leave her alone.

The ZonesID numbers are used just for put different zones in the same room, you can keep using same zoneid number in others rooms.

Lighting and Effects.

Most the time the trick of doing good lighting is done defining a dark color room and them placing brighter color "light objects" that will "lights" some sections in the room.

When you define the color parameter you can get it from a palette dialog or typing manually the full RGB values from 0 to 255 for each component. Notice that using full RGB values allow you to choose dark or bright colors; you will define dark colors for the whole room and a bright colors for the "light objects".

But the problem about working with full RGB value colors is that is hard to calculate the equivalent RGB value if you need the same color but darkest or brightest, it is even worst if you want for example put a orange light into a yellow room; if both colors does not have the correct equivalent intensity then they don't looks right, one of them could looks too dark or too bright.

In Dxtre3d all related to lights is defined using a color parameter (red, magenta, blue, yellow, etc) and how dark the color is (intensity parameter) using a value from 0 to 31, where 31 is maximum darkness, that way for any color you choose you can play later with the intensity value for defining the dark/bright equivalent with not need to worry about RGB components equivalents.

For tr1, trii game version, only white light color is available, for TR3-TRc game version any color is supported.

Lighting in Tomb Raider projects is mainly done using 3 elements:

Ambient rooms intensity & Color: This is the starting setup for the whole room. Wall, floor and ceiling faces will have this initial color and intensity; you normally will use a dark color here.

Lara's Light intensity & Color: This is the color and intensity that Lara, baddies and Objects that move (movables) will have in this room when they are not affected by externals lights objects. For good effects normally you will use dark colors here.

Object lights: These are external light objects placed in the room and with properties that define the color, intensity and how much sectors the light will cover. You will normally use here brighter colors than the ones used with the ambient room intensity element.

Look the picture at the right, the _ambient room intensity_ define the default dark for whole room, the _Lara's light intensity_ define the dark Lara body side which is not getting any light from any object, _the light Object_ for define the color and intensity to the lightened Body side and room faces.

Walls with ambient room intensity

Lara's light intensity

Light object color & intensity

"Ambient Room" and "Lara's light" are defined in the room properties, choose the color and the intensity to be used in the room.

Selecting the right color/intensity for your ambient room depends on the textures you used within the room; already dark or colored textures will produce different final color combination with your ambient color. Sometimes you will need to try different ambient light intensities values until your color combination looks right in game with your textures.

Notice that in the "Lara's light" control you can define the intensity value as "-1" (default), when so it mean you want Lara's light value gets same value as defined in the "Ambient light" control. For TR1-TR3 levels only white color can be used with Lara's light control, for tr4 and TRC you can use any color.

The Light manager tool:

"Light Objects" are defined from the Light manager found in the "More #1" tool group.

Because you most likely will want to try with different room ambient intensity values until you gets the right looks with your textures; in Dxtre3d 2.x the *light objects* intensities values are RELATIVES to the current room ambient intensity value, for example, if light object intensity value is "4" then it mean the light object intensity will be 4 units brighter than the current ambient room intensity; this way increasing/decreasing the ambient room light intensity in your room automatically will increase/decrease all light object's intensities in the room so the smooth light transition will be kept.

Color: Select the color you want for light object, (ignored in tr1-trii levels).

Brightness: Object Light brightness relative to the current ambient light value, negative values mean **Shadow,** for example a -6 value mean a darkest shadow than a -2 shadow value.
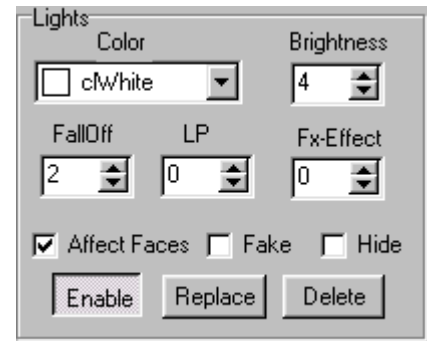
Falloff: Coverage (Sphere light radius), press F2 to enable/disable Visual Sphere mesh.

LP: This value can be used to increase the light brightness seen on Lara and movables objects but without affecting the current room mesh lighting brightness.

FX-Effect. Lighting effect feature used in tr2-trc levels.

Affect Faces: Uncheck this if you want this object doesn't affect room meshes but just Lara & movables objects.

Fake: When checked then light objects will affect room meshes object only but not to Lara and Objects, recommended on places never accessible by Lara or movables (high in the ceiling for example) for save REAL light object resources.

Hide: Object lights takes time to calc some ray tracing and mixing finals colors, when the room is bigger and when you have many light objects then showing the result takes some time, you can check this option to Hide all objects light except the last one than you are placing; that will speed up your place lighting process.

GAMA FEATURE: It is included a option that allow you to increase how it look the light brightness INTO THE EDITOR, press <PageUp>, <PageDown> keys to increase/decrease light brightness, look the status bar for check current gama value. This gama light intensity affect only HOW LIGHT INTENSITY LOOKS INTO DXTRE3D; the light intensity seen in Game is not affected; this will help you to tune your monitor/editor light intensity to match closely how it look in Game.
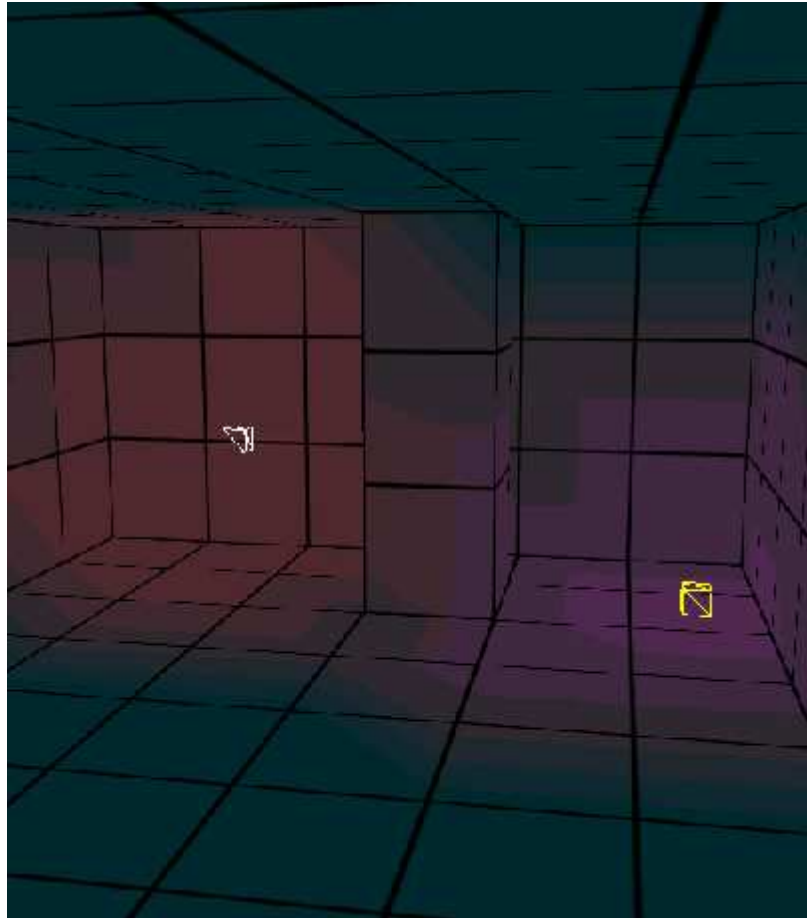
Let's try an example in the editor, boot the program, and open your origdemo.trc as base level and platform.tga as texture set. Add a 9x9x3 room; use the texture for the floor, wall and ceiling like in the picture in the right. Add two pillars like in the picture.
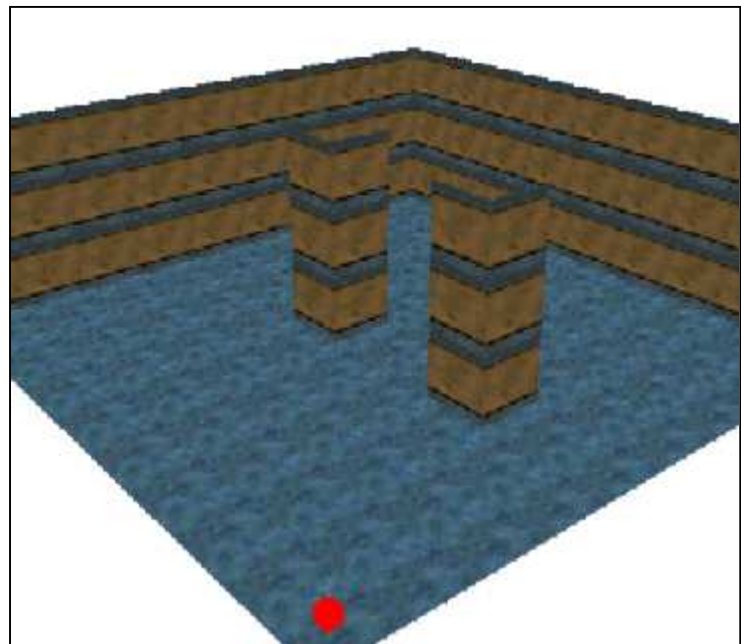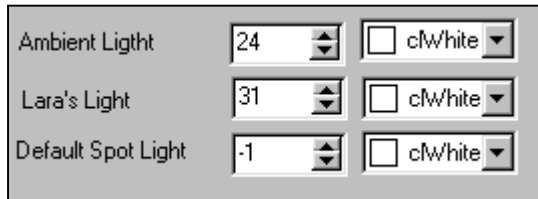
From the room properties, set the values like in the left picture, 24 as ambient light, 31 as Lara's light, use white color.

From the <More Option> group click the "Turn Light" button, and disable the "Render textured" mode, if the room looks too dark you can press <pageUp> few times for increase the gama.

Now go to "More #1" tool group and be sure the "Enable" button from the "Light" manager is down, you are ready now to put object light into the room.

Now click the "color" control and select "Yellow", put value "3" at the "falloff" control, and now click the sector in the room like in the picture to the right:
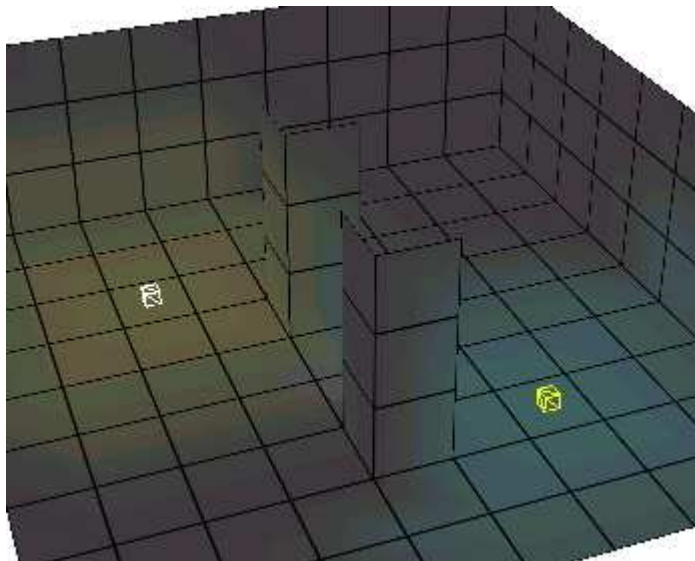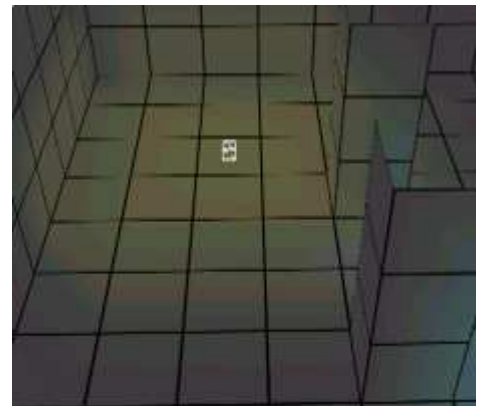
Now click the "color" control and select "Aqua", and now click the sector in the room like in the picture to the left:

Now compile your level and then go run the game, the room will looks something like the picture below.

TRII Blinking and Fading light effect.

In TRII game, two very interesting light effect was implemented in the engine; Blinking and Fading. You can enable these effects using the "Water scheme" control in the room property; put value "1" for enable the Blinking effect; put value "2" for enable the Fading effect.

Then in the Light module, place some lights objects with the "FX-effect" value to "1"; in game the faces affected by that light object will Blink or Fade.

Positive FX-effect values controls how Light-to-Dark will be the effect, bigger values mean darker effect.

Negatives FX-effect values controls how Light-to-Bright will be the effect, lower values (going down negative) mean brighter effect.

TR3 TR4 FX EFFECTS:

For Tr3 and Tr4 game engine, the Fx-effects values mean that the lightened faces will have next effect:

Value "1": Water light modulation.
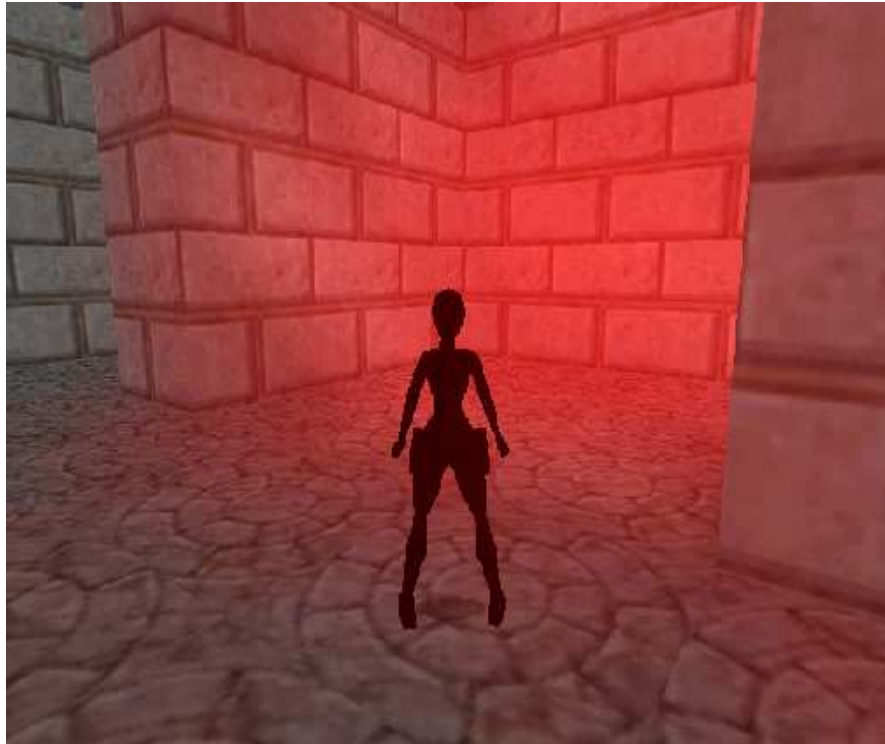Value "2": Water wave movement.
Value "3": Both effects combined.
Value "4": Remove water light modulation and wave movement effects in water rooms.
Value "-1": OVERWRITE color light, this means that lightened faces color will not be mixed with any prior light color from a prior light object.
Value "-2": The color light will be mixed using XOR method.

TR4 FOG FX EFFECT

For Tr4 game engine placing value "-3" at the Fx-effect control will convert the light object into FOG OBJECT, the BRIGHTNESS field controls how dense the fog is. You have to enable the "Volumetric FX" option in the game setup to enable fog effect into the game engine.

You can put in your level a trigger with the command EFFECT and parameter 28, that define the Fog color in the level for all fog objects placed, type at the "TIMER" field the fog value color you want using the next table:

Fog Lighting Chart

RGB	"Timer" Value	COLOR
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	

Sea wave water effect:

In TR3 and Tr4 game engine you can apply a strong wave movement to the water surface (like seen in the tr3 south pacific level), you can apply that effect using follow process:

- First, DO NOT textures the ceiling in the underwater room.
- Texture the water surface in the top room with the double side option enabled.
- Now for top room select the room properties and type in the "WATER SCHEME" control value "15" (15 mean max wave strong).
- Now you need to "Light" the top water surface using a light object with fx-effect = "2", all faces affected by this light will have wave effect. Use F2 keys for toggle on/off the light mesh sphere.
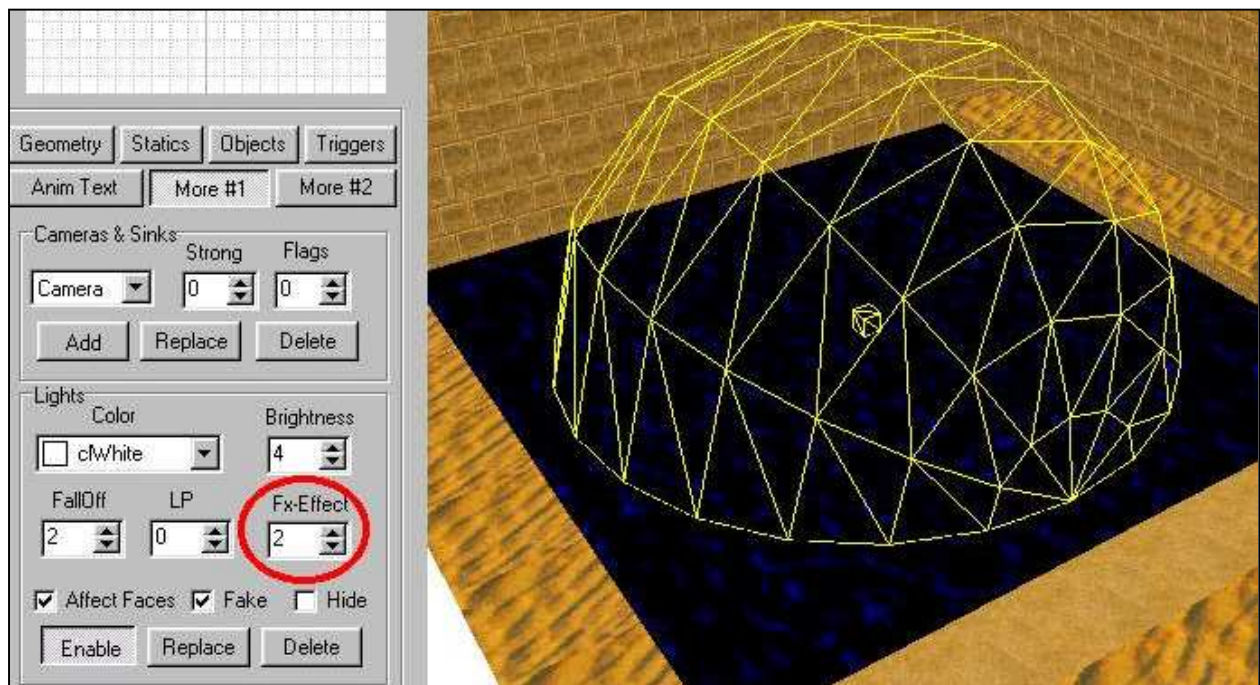
Just to be clear, please note texturing the water surface can be done in two ways:

1.-Texturing the ceiling in the underwater room, the editor automatically will double side the ceiling, the water surface will be seen with the underwater room properties.

2.-Texturing the water surface in the Top room with the "double side" option checked, the water surface will be seen with the top room properties.

For tr1, tr2,TRC levels it is recommended the option #1, for tr3,tr4 it is recommended Option #2.

Default Spot Light:
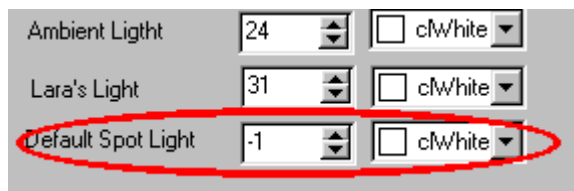
Maybe you are wondering for what the "default spot light" control found in the room properties is used; this is just a helper, placing individuals light objects in the room for light Lara and objects could take some time, also the process described above works best when you are doing in-door rooms, but for outdoor rooms, sometimes is better if you include a "default spot light" control, select a color and not dark intensity (values about 16-20), this will add automatically top-centered in the room a light object with enough power for light nicely to Lara and object anywhere in the room.

This "default" light object is only noted in game and it doesn't affect room meshes, you can light your room meshes using individual light object with the "**Fake**" property enabled, this will give you a nice light working in the room using just one real light object resource!! .

FLYBY CAMERAS

For Tr4 and Tr5 game engine it is implemented a Flyby cameras module, they are a sequence of cameras following a defined path that can be later triggered.
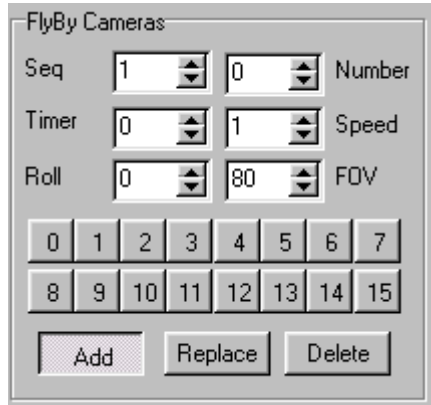
The module works the same as others modules, you enable the module pushing the "Add" button, fill the flyby cameras properties and then:

Click sector: Place a flyby camera.

Shift + click: Move a flyby camera.

Cursor keys: Rotate flyby camera aim.

Shift + cursor keys: Fine tune rotate flyby camera aim.

Ctrl + click: Select flyby camera and gets properties.

"Q","A" keys: to move Up/Down the current flyby camera.

Each camera belong to a group id defined in the "SEQ" property, you can use several cameras in the group but seem there is limit about max 7 group in the level.
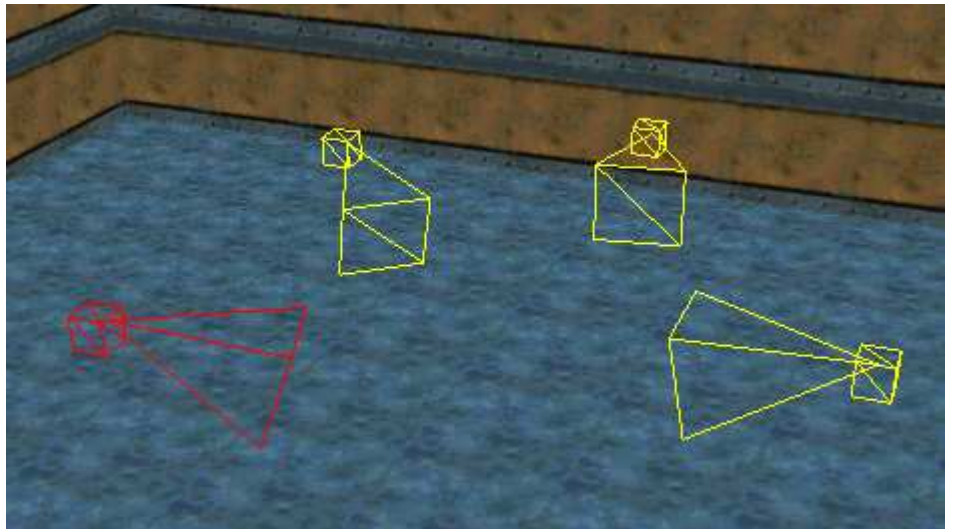
Properties:

Seq: Sequence number.

Num: Camera number increments up from the first camera in each sequence.

Timer: Similar to the standard camera timer, has special features on some flyby camera modes.

Speed: The initial speed that the camera sequence moves at.

Roll: 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: 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.
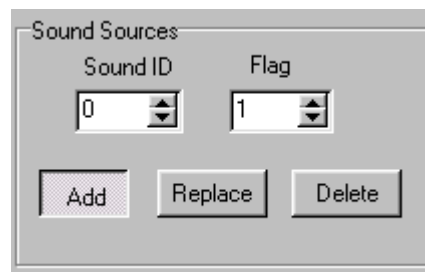
11 = Enable Lara control.

12 = Not used.

13 = Not used.

**14** = Activate heavy trigger.

15 = No used.

Sound Sources:

For Tr1-TR5 it is implemented "sound sources" module. These are objects that represent a selected sound that can be heard at that level position; generally they are used with waterfall or similar sounds; not any trigger is required.

The module works same as others modules, you enable the module pushing the "Add" button, specify the SoundID and then:

- Click sector: Place a Sound source.
- Shift + click: Move a Sound source.
- Cursor Up/Down: Move Source sound to Up/Down.
- Ctrl + click: Select Sound Source and gets properties.

SoundID available are only those included into the internal sound map into the TR base file you are using, you can use Trviewer to known the sound id available in your base.
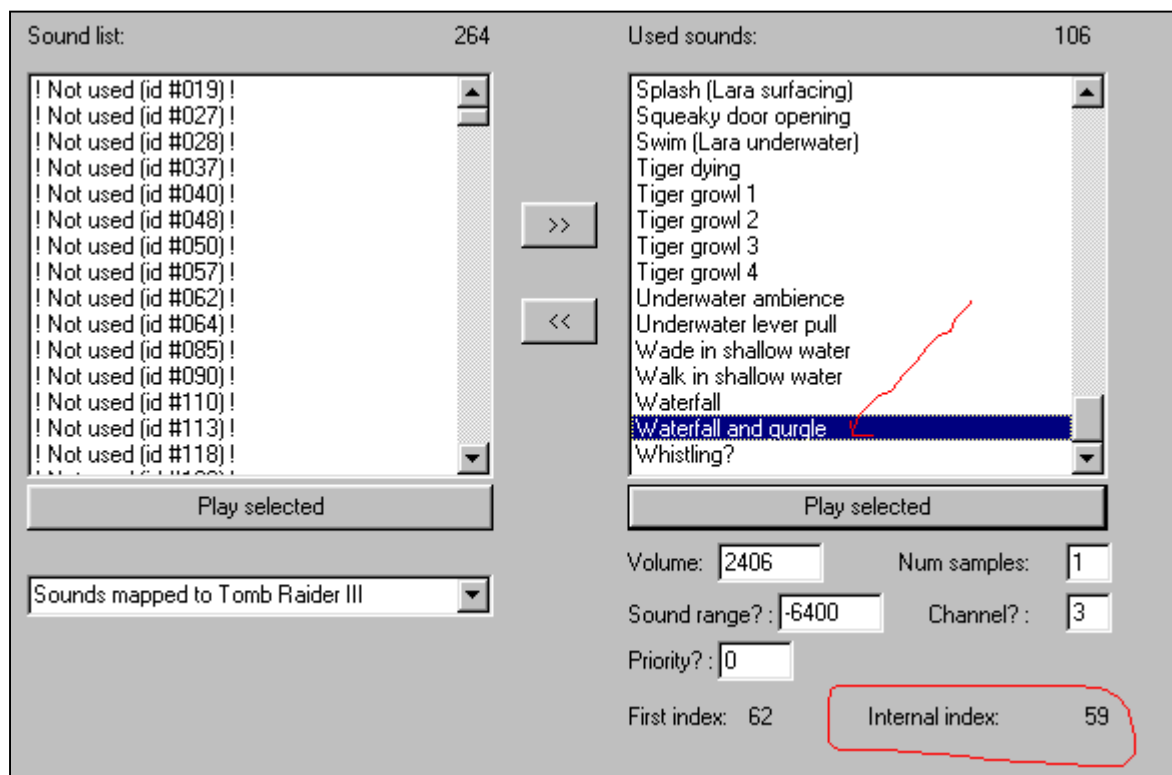
Tr1,Tr2,TR3,Trc null mesh.

For tr1,tr2,tr3,trc there are some null mesh objects which provide some special effects and behaviors, the tr1-Trc game engine lack the OCB control, but sometimes the "timer" control in the trigger to assign a especial behavior.Y suggest to use FEXINSPECT tool for revise how some items/puzzles are setuped in the originals levels, some objects has pretty obvious usage but some need some especial setup.I can't describe all of them in this manual, but here are some interesting ones I have observed:

TR1

Camera target: used for aim the camera at empty spots, normally you aim the camera at actives items but if you need to show a empty area (like when flipping a normal with water room) then you need to use this dummy invisible item.

Waterfall Mist: Used to tell the game engine to show in that place a waterfall splash sprites, also automatically it will attach a waterfall sound.

Gold Maker: Used for convert Lead bar objects into Gold bar objects from Lara's Inventory. If Lara steps in that sector she will turn into gold statue and will die.

Mummy-Mutant (can Fire): It is like placing the Winged mummy-mutant object, but in game the baddy will not have wings and can fire shoot.

Mummy-Mutant: It is like placing the Winged mummy-mutant object, but in game the baddy will not have wings and it is not fire shoot capable.

Sparkles: It show a nice sparkle sprites, used with lava object, and death sectors.

Earth Quake: When triggered then an earthquake effect is used until the item gets anti-triggered.

TR2:

Door bell sound: Nice soft door bell sound, can be used when Lara open a door, the item is placed at the same sector where the trigger is. The sound longs about two secs.

Birds Sound: This will attach in that sector a nice permanent littlie bird's sounds.

Waterfall Mist: Used to tell the game engine to show in that place a waterfall splash sprites, also automatically it will attach a waterfall sound.

Alarm Sound: This will attach in that sector a permanent alarm sound.

Water Drop Sound: This will attach in that sector a nice permanent water drop sound.
Sparkles: It shows a nice sparkle sprites, used with lava textures and death sectors.
Earth Quake: When triggered then an earthquake effect is used until the item gets anti-triggered.

TR3:

Waterfall Mist: Used to tell the game engine to show in that place a waterfall mist effect, also it will attach a waterfall sound.
Fire, Flames emitters, etc: There are several fire and flames particle system effects.
Pulsating lights effects, etc: There are several color and blinking light effects.
Kill All Triggers: Used to turn off any current active item, used after finishing an area in your level and you want to continue in a fresh state anti-triggering all enemies/objects that the player could have left actives in prior area.

TRC:

Bats: Particle system effect, put in the OCB the amount bats you want to see when the item gets triggered.

Heavy Dummy Item: It is placed into a sector, then setup in this sector an "if Item at sector" trigger, then when you trigger this dummy item, the heavy trigger is executed too.

Flame Emitter with spark: Flame emitter with some spark effects, OCB values used: 14, 15, 31, 41.

Fade Light: Fading lights effect, use OCB value 31.

Beatles: Particle system effect, put in the OCB the amount beetles you want to see when the item gets triggered.

Laser 3 and Laser 4: Lasers effects, use OCB values 44.

THIS IS ALL, NO MORE INFO INCLUDED IN THIS MANUAL.

****** MANUAL END ******