

OVERHANG CLIMBING PLUGIN MANUAL

Instructions & tips for builders

revised 10th Oct 2021 by Krystian

This is an in-depth guide for using the climbing plugin when designing your levels. With this plugin installed you can designate any 4-click ceiling slope in one of the N, S, W or E directions as a new climbing challenge for Lara.

Note: although below instructions have been made using TE, there's nothing specific to that editor and all the rules and tips will still apply to NGLE. This plugin currently has no associated triggers.

The source code of the plugin is freely available on GitHub:

https://github.com/KrysB4k/Plugin_FreeClimbing

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Prerequisites

This manual assumes that you have already installed the plugin, added the extra climbing animation object to your WAD and used the **AssignSlot=** command to inform the plugin of which slot you have used for the object. If you haven't done all of those things yet, here's a short recap of what needs to be done:

1. Install the plugin through NG Center or TombIDE by selecting the .zip archive or the extracted **Plugin_FreeClimbing_Krystian** folder from the zip.
2. Copy the **ANIMATING1** object from the supplementary wad in the **Climbing Extra** subfolder into a free moveable slot (ANIMATINGs or ANIMATING_MIPs are preferred due to the lack of important game functions. NEW_SLOTS also work).
3. Add the following command to the level script:

AssignSlot= MyUsedSlot, OBJ_LARA_OVERHANG_CLIMB

Where **MyUsedSlot** is the name of the slot to which you copied the extra object.

Please note that extra object in your chosen slot **does not** need to be placed anywhere in the level for the climbing to work, it only needs to exist within in your level WAD.

If all of the above tasks are done, you are ready to use the feature while building your level. In the next few pages there will be a short description on how to make your first climbable slope in a simple room and how to expand on it, but before that, I'll lay out the controls:

Controls

- **UP** key will make Lara go upwards, unless something prevents her from doing so – a ceiling on a different level than before, an incorrect slope type, a wall, a lack of monkey-tile, etc.
- **DOWN** key will make Lara go downwards, with the same rules regarding obstacles.
- When an overhanging slope ends with a ledge above it, Lara can climb up onto the ledge if you press **UP**.
- Pressing **LEFT** or **RIGHT** will engage shimmy mode – Lara can move sideways to avoid obstacles. Pressing **UP** or **DOWN** will make her return to climbing mode.
- Jumping towards the slope and holding **ACTION** will allow Lara to grab it (in shimmy mode).
- Letting go of **ACTION** while hanging onto the slope will make Lara drop down, without a second chance to re-grab it.

Setting up the slopes

Integrating the new climbing feature with your level geometry and platforming ideas should be rather easy. The theory is simple, you create a ceiling slope with a steepness of 4 clicks and add the “monkey” attribute to it – this marks the square as climbable.

However, you need to be strict about a few conditions when designing the climbable slopes, as the precise logic of the animations and how they interact with each other don’t give much room for deviations in geometry requirements.

The necessary conditions to permit climbing on ceiling slopes are listed in the following key points:

- The ceiling slope must be exactly 4 clicks steep (or in other words, be tilted at a 45 degree angle). 3-clicks, 5-clicks and anything else **will not** work.
- The slope can have any of the 4 cardinal (**N, S, W, E**) facings, but it can only slope in **one** of these directions. It cannot e.g. simultaneously be 4 clicks steep in the east direction and 1 click steep in the north direction.
- Related to the above, if there is a triangular slope, Lara will also refuse to climb further, only the parts that are 4 clicks steep can be climbed.
- Finally, the slopes which are intended to be climbable have to be marked with monkey tiles, as if they were monkey-swings. If there is no monkey tile, Lara won’t be able to climb to it (you can exploit this if you want to create an obstacle that Lara must move around).
- Instead of using room geometry, you can also use **BRIDGE_TILT4** for the slopes, but there are a few caveats to this that will be covered in a later part of this manual.

If you followed the outlines about slopes and gave it the monkey property, you should have successfully made the slope climbable in a basic room. Now it would be good to make it accessible for Lara. You can do this by adding a ladder or a monkey-swing that leads to the slope. However, there are a few important rules to remember. We will delve into this matter in the next two paragraphs. In particular, distinctions between types of ladder-slope or monkey-slope junctions will be discussed with descriptions on how to properly handle them, particularly the room design side.

Adding variety to the climbing sequences

To describe the possible combinations between slopes, ladders and monkeys, we will use the following graphic:

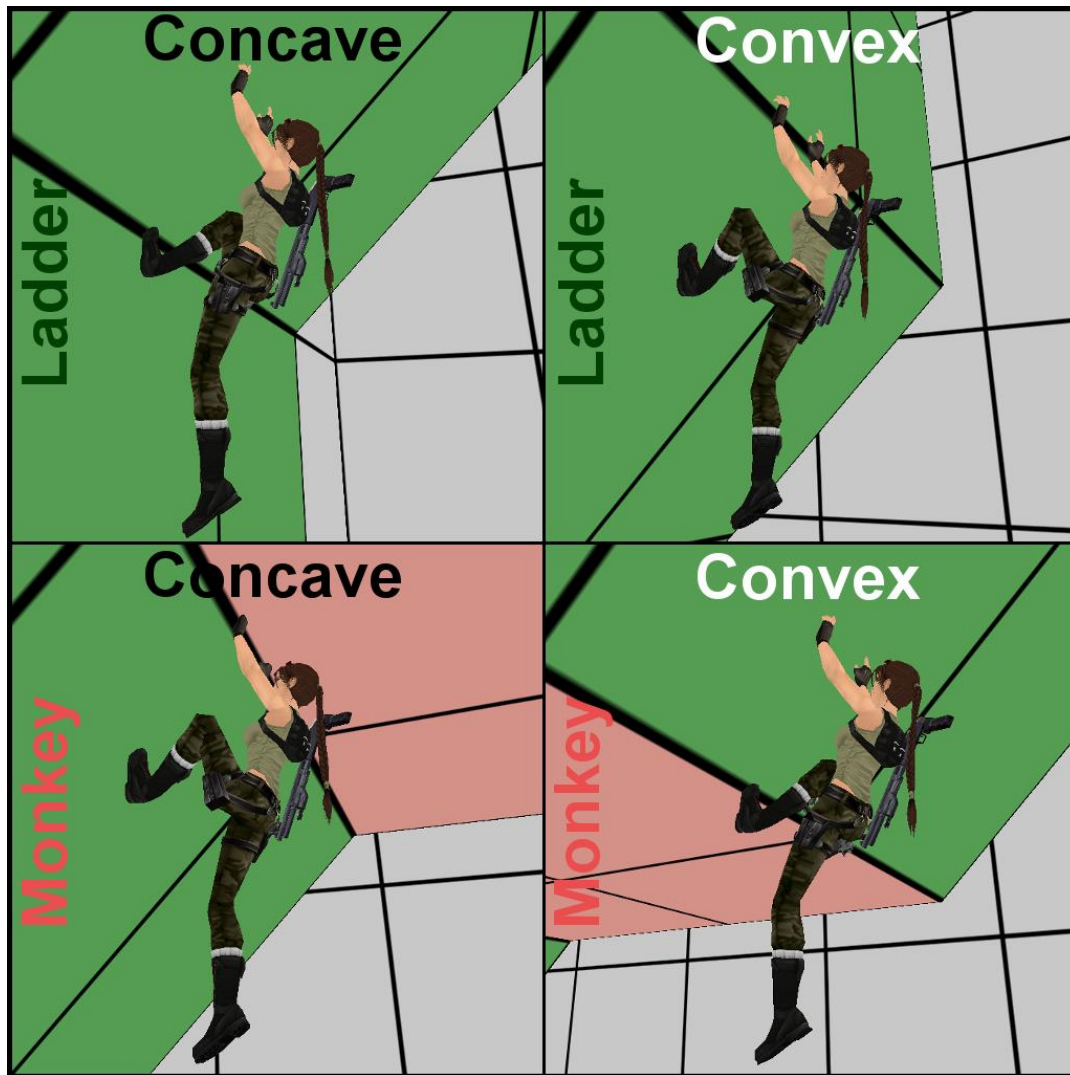


Figure 1. Graphic showing possible junctions which Lara can traverse

It illustrates all the possible junctions, for which there are transitioning animations:

- If a climbable wall is joined with a slope above, it will be referred to as a **concave ladder junction** (top left)
- If the slope is linked to a climbable wall above, it will be referred to as a **convex ladder junction** (top right)
- If the slope is joined with a monkey ceiling, it will be referred to as a **concave monkey junction** (bottom left)
- If a monkey swing is joined to a slope above, it will be referred to as a **convex monkey junction** (bottom right)

Lara can traverse between any of these junctions in both directions. Take note of the names in bold, we will use them to refer to particular situations later on.

The main idea is that you can add as many of these transitions as you want in a climbing sequence, however there are certain rules to follow, especially if the slope climbing sequence spans across multiple rooms or stacked rooms. I've prepared a short "tutorial" for you to follow along. It's an example of a climbing sequence involving various junctions, describing the specifics of room geometry, planning portal (door) placement and placing monkey / ladder attributes to ensure that Lara will properly climb the slope and traverse between ladders and monkey-swings.

Complex climbing sequence tutorial

As an example, we will try to (very roughly) replicate the climbing sequence known from the end of the **Hall of Seasons** level of **TR – Angel of Darkness**. While getting to the top of the level (where you go off to the Brother Obscura boss) you have a nice little sequence on the dome roof that consists of the following segments:

1. a short climbable wall, leading to
2. an upwards slope section, which goes to
3. a monkey-swing (there is a small platform where Lara can drop onto and regain her strengths), at the end of which there is yet another obscured (pun ~~not~~ intended):
4. upwards slope, which leads to:
5. a final climbable wall, that Lara must quickly get off of before she loses her grip strength (there is just barely enough gripping energy left to do that, definitely made me rage when I played the game).

This is a particularly good example because it involves all of the transitions at once, thus it will allow to explain the facets of how you must shape room geometry, create room portals and set the floor attributes (climb wall, monkey) in order to make everything work properly.

Obviously, you don't have to follow this tutorial 1:1. Again these are just guidelines to illustrate how you should handle the different junctions involved with climbable slopes and portals between rooms.

We start off in a single, regular room without any portals yet. Pick one of the walls of the room and give it the climbing attribute. Now, as you may remember, back in AOD the ladder first went to a slope section. In our terms, this is a **concave ladder junction** (refer to [Figure 1](#) above). Lower the edge of the ceiling above the ladder so it forms a 4 click slope towards it. Next, add monkey tiles onto the slope sectors. You should have something like this:

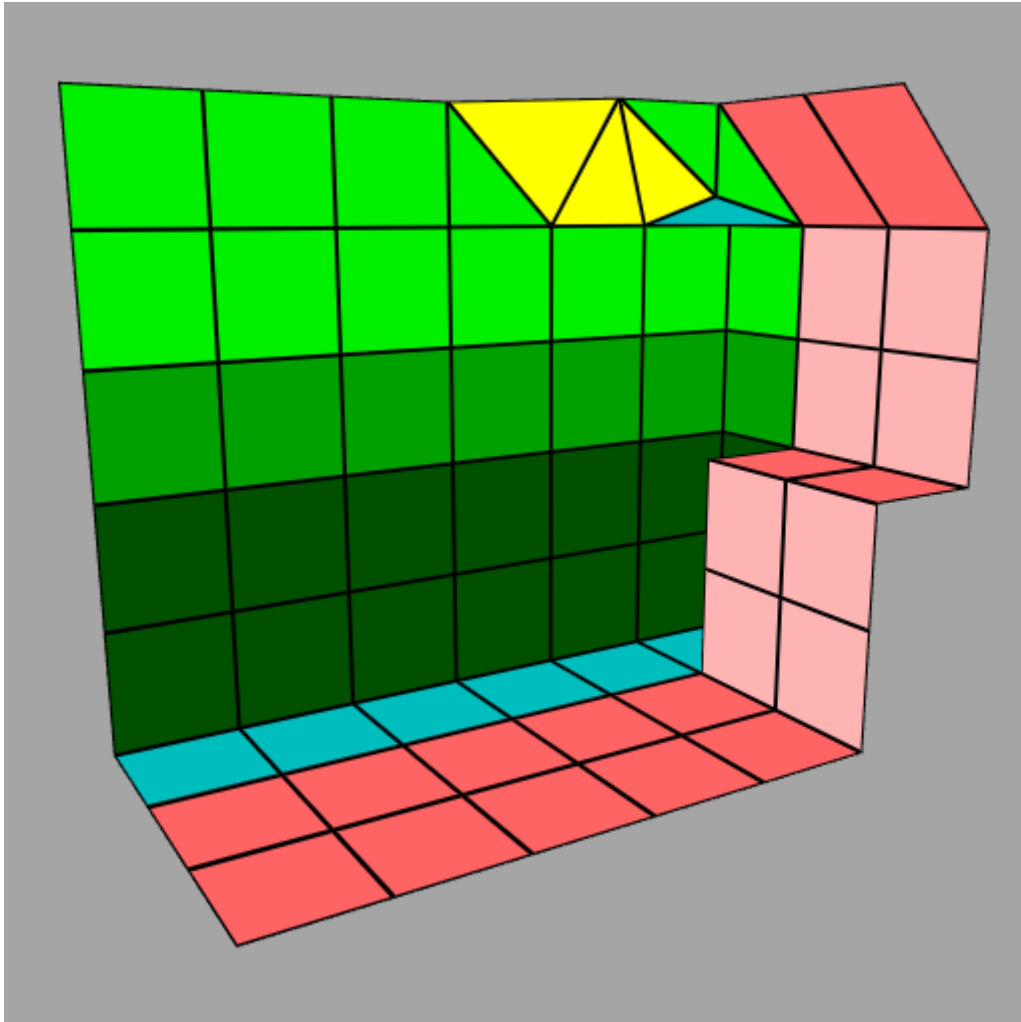


Figure 2. The first ladder room beginning the climbing sequence, with the first section of the upwards slope.

This slope section will lead to a monkey-ceiling above, resulting in a **concave monkey junction**. While it's technically possible to have everything all in one room, with practical texturing considerations in mind, there is a limit to how much you can grid the walls to ensure proper texturing. So we're going to leave one half of the slope section in the climb wall room and the other half will go to the room with the monkey-swing. Splitting slopes like this is allowed between vertical or horizontal room portals, even across several rooms. There are no restrictions associated with it.

We move to the next room. In AOD this monkey-swing then leads to a hidden further upwards slope (**convex monkey junction**), where Lara did the twist-and-grab move to reach it from the monkey-swing. Again, we're going to put one part of that ceiling in the same room as the monkey-swing. You should get something like this:

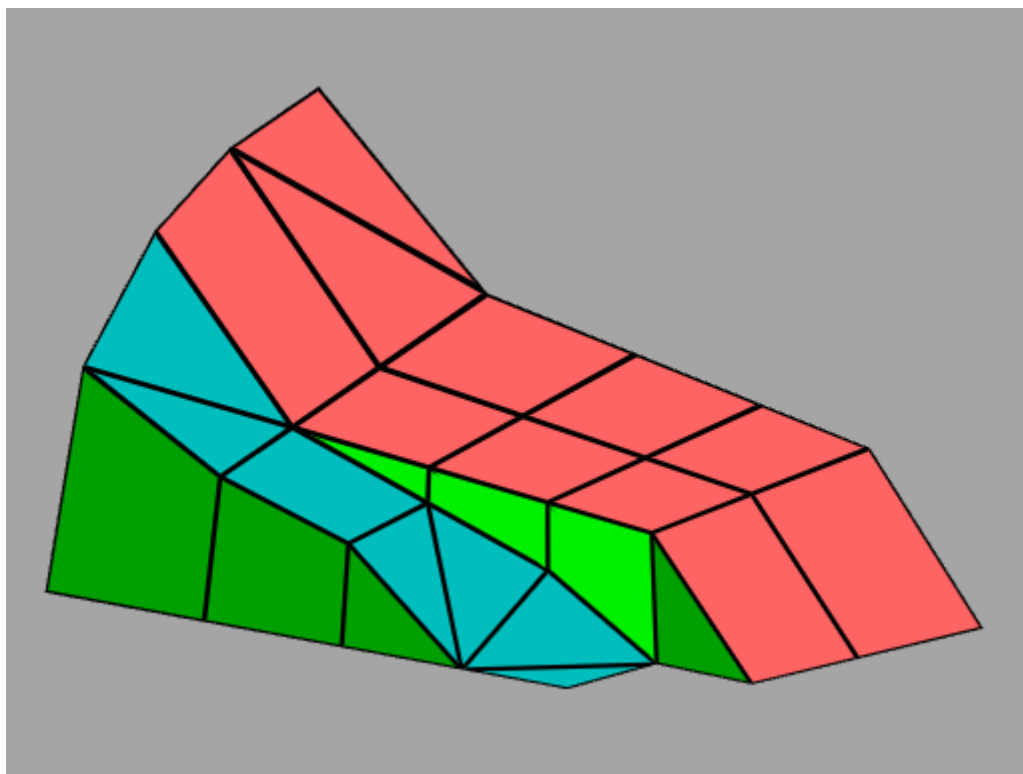


Figure 3. Monkey-swing section. Make notice of the fact that fragments of both the lower and the upper slope junctions are included in the room.

Before we will create the next room with the upwards slope, we must ensure that all the places which have the monkey tiles in the upper room also have the monkey tiles on the solid floor. This very important rule for classic monkey-swinging is also true for this new application of monkey tiles – **the places where they're placed on the ceiling must match these same places on the first solid floor in the room stack.** If using NGLE, this is an important matter to take care of, but if you are using recent versions of TE, it should automatically take care of this for you.

Anyway, to carry on upwards, we create the room with the second part of the slope that continues from the monkey-ceiling room. This room will also lead to the top-most ladder section. Here's how this **convex ladder junction** must be done. You must have at least 3 clicks of ladder still in the same room before you move to the next room. Having less than this (or none at all) may cause Lara to not recognize that there is indeed a climbable slope below the ladder and she will instead drop into the hanging animation. Also, the rules of making ladder sectors in stacked rooms apply here – to make them climbable, the ladder tile (with

correct facing) should be placed on the first solid floor below in the room stack or else it won't be climbable/detectable by Lara. (Again, newer TE versions do this automatically by default).

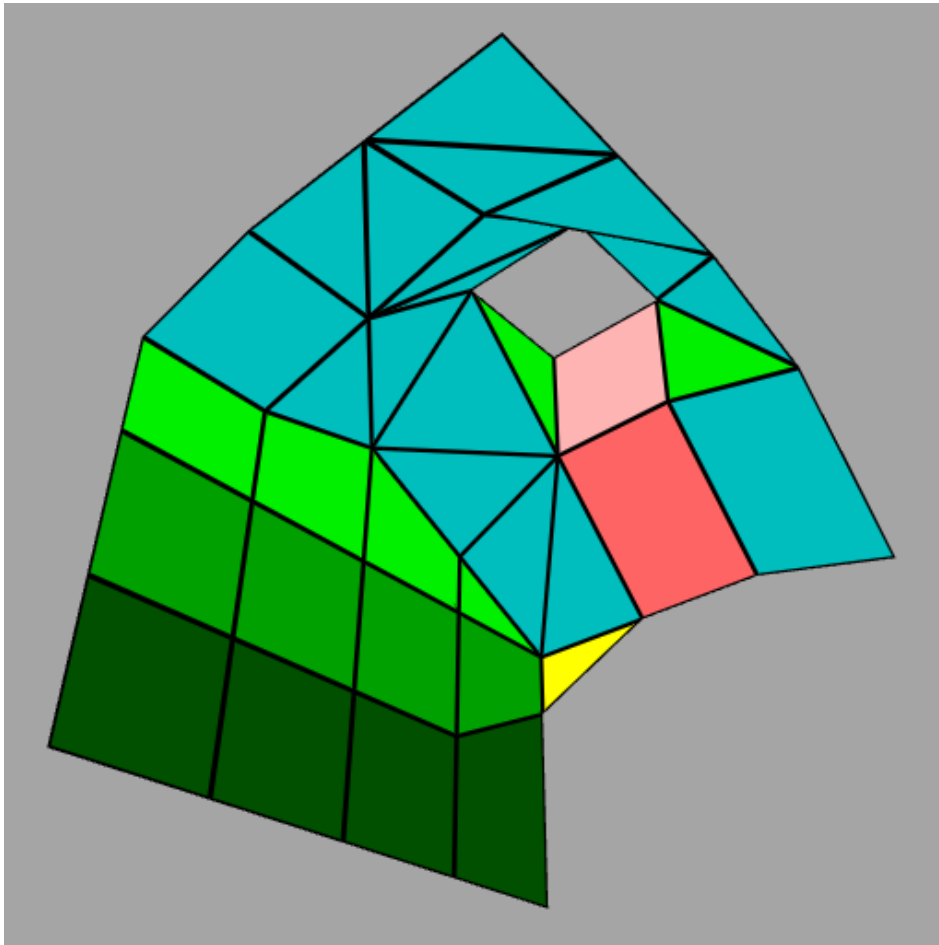


Figure 4. The room with the upper junction to the final ladder section

After you've made the ladder section above the slope, you can then move into the next room and do whatever you want there. This concludes the tutorial. I've included a small project for TE in the **ClimbingExtra** folder, so you can open it and inspect how everything is put together. Now I'll mention some key points to take away from this:

- Slopes can be split indefinitely as sections in different rooms, both vertically and horizontally. Lara will always register that there is a slope continuing into the next room
- When you're making monkey junctions, you should contain both the monkey-ceiling and sloped ceiling involved in that connection in the same room. In our example we had both junctions (concave and convex) in the same room. We could also split the monkey room in half and have the concave junction in one half, while the convex

junction in the other half. But the parts that make up the junction should be in the same room.

- With ladder junctions the first 3 clicks (at minimum) of the ladder part must be included in the same room as the slope to which it connects. Not doing so will likely result in bugs, such as Lara not detecting the slopes from the ladders or ladders from the slopes.
- Last but not least, we apply the same rules monkey-swings and ladders as usual – monkey tiles must be on the first solid ceiling and the first solid floor for that sector (spanning across all rooms in the stack). For ladders, it has to be the first solid floor. This shouldn't be of concern for you when using TE, however.

Using bridges in place of room geometry

As you might be aware, bridge objects have the property of copying the monkey attribute from the ceiling above them to their own “ceiling” properties, enabling Lara to monkey-swing at the bottom of the bridges, as long as they are activated with dummy or regular triggers. It's an interesting feature that opens up many possibilities. Sometimes it's more convenient to use a bridge instead of an actual room ceiling, other times it's absolutely necessary for the implementation of your gameplay idea (since bridges can be moved vertically with scripts).

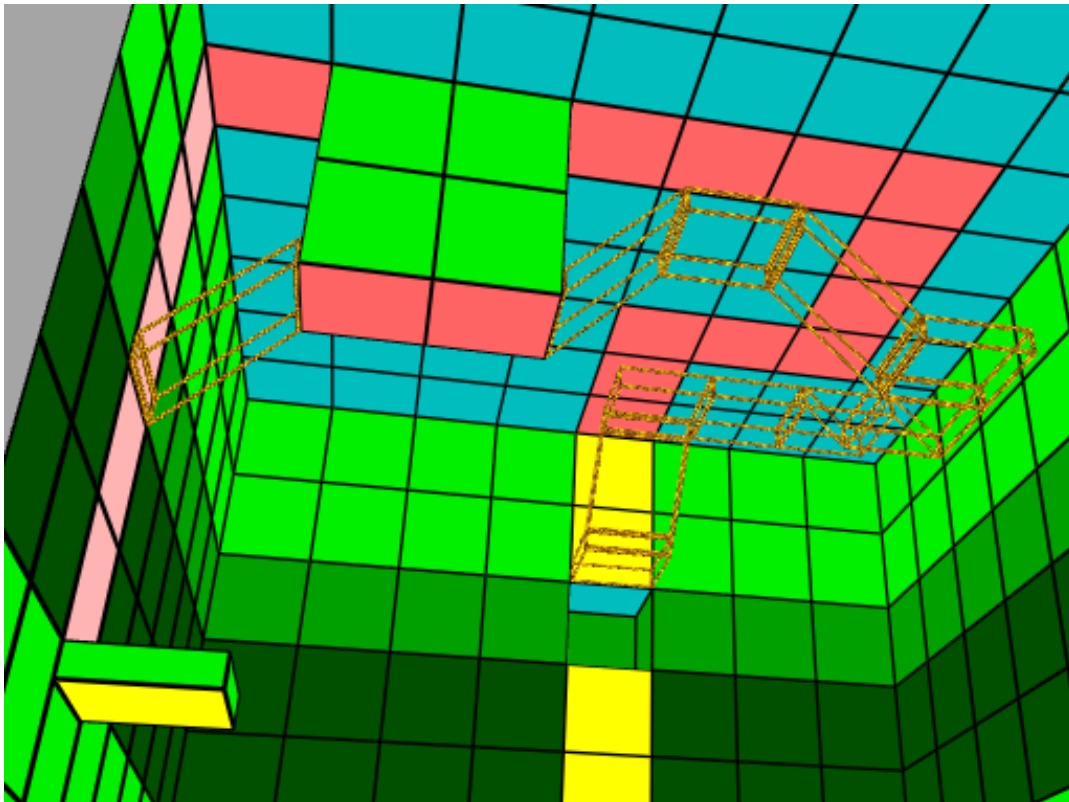
Taking the above conveniences into account, I made this new climbing feature work with bridges as well. The bridge types you can use are **BRIDGE_FLAT** and **BRIDGE_TILT1** – for monkey-swing, and the new TRNG addition by Paolone: **BRIDGE_TILT4**. You can use these bridges the same way you'd use room geometry. Just line them up properly with each other, put dummy/normal triggers on the solid floor below the bridges, assign monkey tiles on the floor and ceiling and presto – Lara will climb them just like regular room geometry! This will also work accordingly with the **depth OCB** for that bridge. By default the depth of bridges is always 1 click, but with the proper OCB you can change it to 2, 3, 4 or more clicks.

Those are the advantages of using bridges, but there are unfortunately disadvantages:

- Bridges, like any other moveable objects, contribute to object limits.
- To activate the solid collision of bridges, you must use triggers (either normal or dummy), which are also a limited resource and can cause troubles with some setups (e.g. overlapping triggers).

- There can only be one “active” bridge per given sector. It doesn’t matter if you place a bridge in each room and stack all these rooms together or put however many bridge triggers. Only the bottom bridge will have correct collision, always (so forget about crossing bridge paths).
- For technical reasons I would discourage moving the bridges vertically in sub-click increments – the detection is guaranteed to work only for 1 click increments. There is a tolerance for small deviations in bridges/geometry height, but it’s meant to be a safety margin, not a feature to be exploited.
- For the same reasons, I don’t recommend setting the bridge depth to sub-click values if you want to make it climbable. Always use increments of 1 click for the bridge depth OCB calculation.
- If you have a monkey-slope above a bridge, some of the characteristics of that slope will be copied over to the bridge, which can result in buggy behavior. As a rule of thumb, it’s best to avoid placing bridges where the ceiling above also has a 4 click tilt and monkey property.

With those remarks out of the way, have fun and don’t get too carried away so you end up running into limits!



Credits & Special Thanks

AkyV – beta testing

ChocolateFan – code inspection, helpful tips, beta testing

Delca – alpha testing

Lore – alpha testing

A big special thanks to **MarlenaCrystal**, for supporting me in finishing this plugin. I wouldn't be able to do this without you!

Q&A (some questions I assumed could be asked and my answers)

Q: I think I found a bug with this plugin, which hasn't been mentioned above. Where can I report it?

A: You can reach me in 3 places:

- [Tomb Raider Forums](#), where my username is **Krystian** (send a personal message (PM) or make a post in [the dedicated thread](#)), I'll try to respond ASAP. You must be a member of the forums to post or message other members.
- On YouTube: My channel is called [Krys' TRLE Workshop](#), where I post TRLE related content. Leave a comment under a relevant video or message me directly on my **Discussions** page.
- Discord (by far the fastest way) – I'm present in Gh0stBlade's Tomb Raider server (ask in the **#trle** channel) as well as Klona's TRLE (Tomb Raider Level Editor) server (ask in the **#trng** channel). You can also DM me, my handle is **Krys#1002**.

Q: This plugin works for 4 click slopes. That's great and all, but would it be possible to also add other slopes, like 2, 3, 5, 6, etc?

A: I've only focused on 4 click slopes. The reason is simple – they were the easiest to implement. If you move 1 click along the slope horizontally, you also move 1 click vertically, so it's easy to keep track of Lara's position this way. Then it's also convenient to set up conditions and other logic. Introducing different tilts changes this simple relation between the horizontal and vertical movement, and so will involve more complex code. On top of that, I'd either need to make more animations for every tilt grade or find a way to modify them procedurally at real time to match the slope tilt. For now I'll leave it at 4 clicks because I think it's overall the most practical in terms of room geometry and was the easiest to deal with.

Q: Can I edit or modify the animations to suit my own needs – for example I have different (ladder / monkey) animations and would like to adjust them to match.

A: Yes, I give permission for modifying the animations, as long as you give appropriate credit if you use any part of them. Simply editing the poses to adapt them to different monkey/ladder animations should be easily done. For more extensive modifications, some of the animations have a specific or even hardcoded setup. This would require you to inspect the exact way the animations are split up, the animation commands involved and (most importantly) the plugin source to fully understand it. I initially wanted to offer more customizability here, but recently, I have lessened interest in continuing TRNG plugin development. You are free to inspect the plugin source and make any modifications to it (under a GNU license). The plugin repository link is given on the first page of this document.

Q: Would it be possible to add my own extra animations to the already existing ones, with Animation= scripts for instance? For example I want to add this and that ...

A: I haven't really planned such customization. As mentioned above, the animation logic is mostly handled on the plugin side and some aspects of it are hardcoded. If you have the ability, you can make modifications to the plugin code yourself. Other than that, you could perhaps use **Animation=** scripts, checking for the newly introduced climbing states (stateIDs 130-138), but the possibilities would be rather limited.

Q: You've added all connections from TR AOD, but there are other kinds of connections that could be made. Are you going to add them?

A: Yes, I do recognize that from a geometric point of view, there are a few more possibilities in how the slopes could interact, e.g. an upwards "arch". I don't know if I will have a clear concept for such animations. However, if I would add this, it would likely be done in Tomb Engine, a new engine for level building purposes, based on the Tomb Raider Chronicles engine ([thread on TRF](#))

Q: Now that climbing ceiling slopes is possible, what about climbing FLOOR slopes! That would be an awesome addition!

A: Again, it could come to Tomb Engine, eventually :)

Final notes and disclaimers

This plugin has been made to introduce a new type of moves (heavily inspired by the ones in **TRAOD**) that will hopefully give more intricate platforming abilities at the disposal of level builders. Keep in mind that this plugin, though tested thoroughly by other people, is only the work of one hobbyist, done in spare time, so some overlooked issues are possible. Bugs could still remain, in which case you should inform of encountering them (the way to reach me is described above in the **Q&A** section), I'll do my best to fix them, if possible. As far as I know, this plugin is the first in its kind. Adding an entirely new, robust category of moves to TRLE is mostly unseen still. Therefore, you should treat this plugin as something experimental and novel.

Even though this concept was inspired by AOD, it is not a “port” in any conventional sense, as no piece of code was used from AOD. It's merely replicating the behavior seen in that game as closely as possible with the utilities and possibilities of the TR4/TRNG engine. As such, this plugin is simply nothing more than a new “hardcoded” feature associated with monkey tiles on sloped ceilings.

Many hours went into coding these features and many, many more hours went into making the appropriate animations – all of which were hand animated in 3ds Max using the AOD animations merely as reference material, none of them were ripped/copied directly from the game. On top of making the animations, I also needed to configure them for TRLE, adding appropriate animation commands and splitting them into smaller parts. Many problems came along the way which needed to be solved, several ideas were tested, then scrapped over and over again, until this final version was eventually conceived. So please keep it in mind and don't take any part of this plugin (of which the animations are an integral part) and claim it as your own work. Even though the animations are derivative from already existing properties, I spent a long time trying to recreate and make them work for TRLE, so please, be respectful.

Have fun and happy building / raiding,

Krys :)