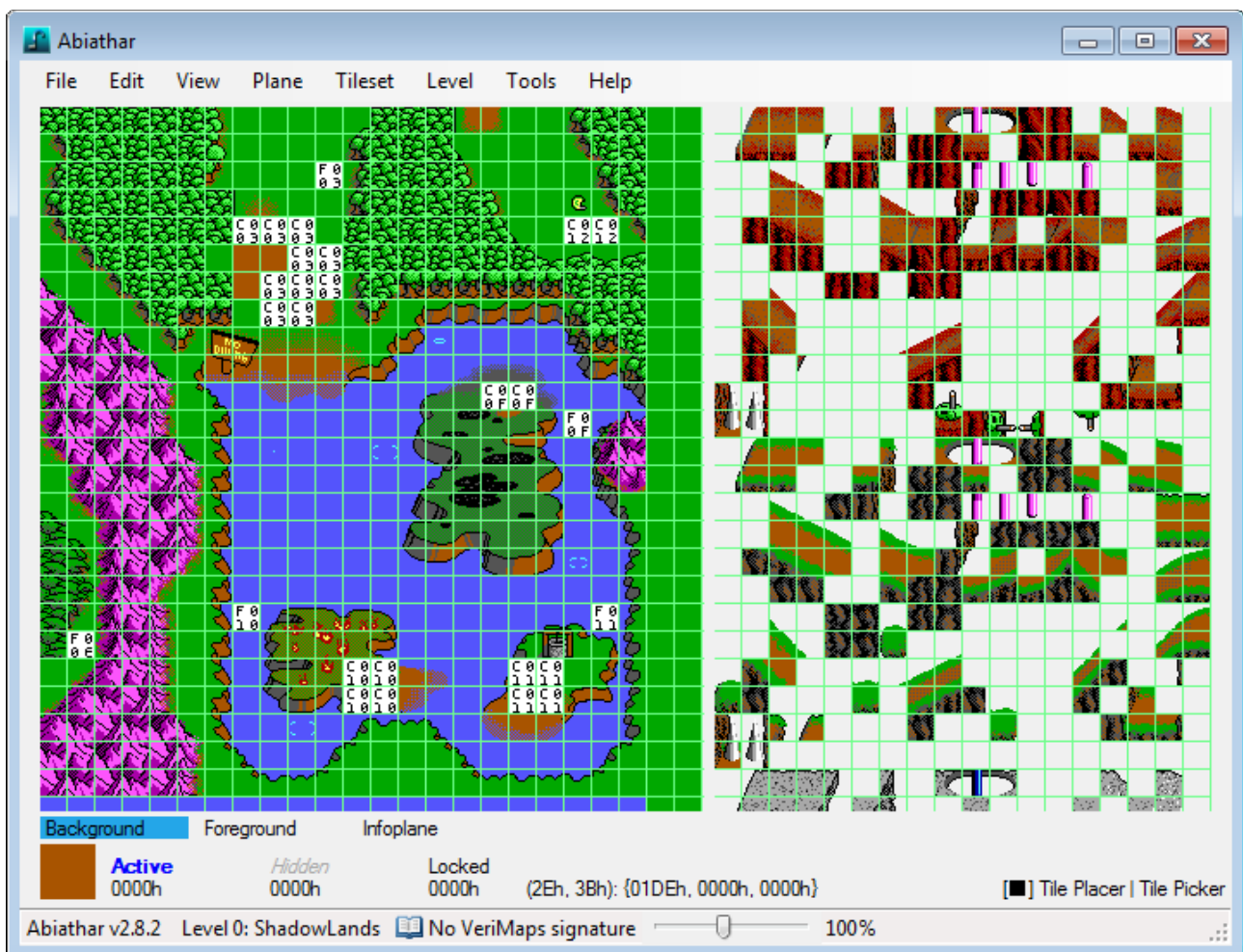


PCKF

- Modding Theory - Level Design



all hints and tips by Public Commander Keen Forum Members
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1. [Level Design](#) (by Ceilick)

Level design incorporates many different ideas: level difficulty, platform placement, types of death hazards, enemy placement, point placement, dealing with Long Hallway Syndrome and other boring areas, how many keys/doors to use, etc.

1.1 [Level Size](#)

Before beginning level design, think about how many levels your mod will have and think about various themes and level sizes. How many levels will be big levels? How many will be small? How many will guard-posts? How many will be outdoors? How many levels will be required to beat? How many will be extra levels? Which levels will feature which enemies? Mapping out the types of levels and how many of each there will be helpful in keep the gameplay unique and exciting, and will also be helpful in actually creating those levels

1.2 [Level Design Commandments](#)

Here I'll present my 11 commandments of Galaxy level design. These rules are designed to mimic the style of the original Galaxy Keen games and for creating, generally fun levels with visual appeal. Note: some modders prefer a 'puzzle style' over the original gameplay style. Some of these rules still apply to puzzle styles, but some do not.

1. Thou shalt never create a room within a level with no escape, or with no escape but death.

For many players, this is particularly frustrating, especially if they saved in that room thinking they could escape but instead have to restart the level. A player should never be forced to commit suicide unless they run out of ammo.

2. Thou shalt never use more than one of each of the four key gem colors in a single level.

There are two official levels which break this: Bloogton Tower and the Pyramid of the forbidden. Bloogton Tower has only 4 gems, two of which are red. I consider this a mistake; one of those should have been yellow (there are no yellow gems in the level). The pyramid of the forbidden has 5 gems total (two red ones). This does look like the only good reason to have more than 4 gems (the first red gem is used in a very specific, limiting way which forces the player to get it and immediately use it).

Why only 4 gems? Because if a level is using more, that probably indicates it is too long, too hard, or using gem doors in an excessive and pointless manner.

3. Thou shalt never force the player to navigate behind the foreground to reach the exit, unless the exit of the foreground area is within clear sight of the entrance of said area.

This means that Keen should never have to enter a secret passage to finish a level. Keen should never have to go into a secret passage to find a key, or get to a switch, etc. This is because while Keen is in the passage, the player has no idea what is in there or where it will go, or even that the area was there at all.

4. Thou shalt never force the player to navigate invisible platforms to reach the exit. Invisible platforms are only for optional areas. Period.

5. Walls shall never be less than 2 solid tiles thick. Borders shall never be less than 1 solid tile thick unless the border is within the same 'room' as the entrance or exit of the level, in which case the absence of border is permitted.

In Keen galaxy, because of the way the platforms are designed with their tile properties, a wall that is one tile thick results in Keen's hand sticking through the wall. This just doesn't look right visually.

Additionally, it is important to keep a tile between the level and the edge of the screen if Keen is indoors. Otherwise, this can easily confused players as to where the exit of the level is and will leave players wondering why they can't go further to that side. A wall tells the player exactly where the level border is.

6. The first level shall not contain key gem doors, more than one switch, or regular doors unless they lead to optional areas.

First levels in Commander Keen are traditionally the easiest in each episode. Keep with this tradition to help familiarize your audience with what your game looks like and how it plays so that they are not overwhelmed right away.

7. Thou shalt never be more confusing than necessary with doors. This entails, but is not limited to, making door puzzles longer than four rooms, having more than 2 doors in a level when said doors link to areas that otherwise reachable by not entering doors, and using more than two doors to separate any single key gem and corresponding key gem holder more than once in a single level.

Doors can be extremely disorienting for players. The point of doors, generally, should be to take a player from one area to another, either as a shortcut or as the only way into a new area. Rarely should they be used to confuse players, as this can be very frustrating.

In addition, gem doors should never be so far away that a player has to search a large portion of the level both to find the key and to find the door.

8. Thou shalt always include SGA letters or an indicator of some kind as to what a switch affects if the affected area is in another room or section of the level.

If you have a switch that affects a platform or bridge in another room, make sure they have matching symbols to indicate this to the player. It might be obvious to you when making the level, but your audience will appreciate these clues and enjoy your levels more.

9. Thou shalt never leave more than three fourths of a screen's area of space devoid of accessibility.

When making Keen Galaxy levels, it's important to use your space wisely. If you have a big section of a level that doesn't have anything in it, such a place that is just covered with ground tiles, add some rooms and paths around this area. This will keep your levels feeling like there is plenty to explore without actually having to make the level dimensions bigger.

The above said, having big open rooms can be great in terms of exploration and just to convey a sense of openness to the player. Just make sure that open space isn't boring! A few small platforms, some poles hanging from the ceiling, some moving goplats, ceiling height variation, etc.

10. Thou shalt never forget to place enough ammo, although too much ammo is an equitable sin.

The player should always be able to come into a level with zero ammo and be able to collect enough ammo in the level to complete it without having to grab ammo, die, and restart with that extra ammo.

Just remember, each level should be possible starting fresh, with no shots or, in the case of Keen 1, no pogo. Evil is fine, but impossible isn't." (Grelphy, 2004)

11. (Apocryphal) Thou shalt never use more than three enemy sprites in a screen sized room, unless they can fly. More may be added as the room size increases.

Too many enemies in a room is a problem. It is, plainly speaking, overwhelming to the player. Too much is going on on the screen at once. Also, if you feel you have to do this, it probably means the area of the level is too boring and needs other fixes (like slopes, variation in the ceiling, etc). The way you shape a room will affect how hard it is, you don't always need more enemies.

Other things to avoid are poles that are too long. Climbing a pole is a slow task and one which can bore the player quickly. Make climbing a pole more interesting by adding side rooms with points that the player can jump into on the way up or down a pole.

Avoid cluttering a level with too much of something. Anything from too much of a particular tile, too many bridge or switches, too much of anything really. Keep the challenges and experiences in a level unique, don't water them down by including too much of them.

Often, a good level will have some kind of theme or a focal point which the player will notice. These themes are often reflected by the level entrance of a level. Often it is easier to build up a level around a theme than to build 'just a level'.

1.3 [Level Theme](#)

Another thing to do is to "theme" your levels, in a limiting way. Something like "This level is going to be blue and red," or "This level isn't going to have any Bap-toads in it. (assuming one of your enemies is a Bap-toad...)" By creating a limited rules set for a level, you can challenge yourself to work around it. The important thing, in my opinion, is defining COLORS, ENEMIES, and GOALS for each level. (XkyRauh, 2004)

The theme of a level will dictate how the platforms are placed. Maybe a lot of jumping across platforms is involved, maybe a series of rooms connected by poles, maybe a long stretch of platform with slopes on it, a building will have walls and ceiling with generally uniform thickness while outdoor areas will appear more variable.

Good levels will have a consistent and logical reason for why rooms are the size they are and for why platforms are placed where they are. The spacing of a single tile's length of space should matter to a level designer.

Sprawling levels with no unifying themes. THEY ARE BORING It's often 16 copies of the same thing: a couple yorps, a couple gargs, a vorticon blocking a bridge tile etc. Each level should have a gimmick. Maybe one is pogoing over butler bots, another is fighting vorticons on ice surfaces. KeenX is a good example of this (e.g., the sparky chase, the mortimer clone room, the friction dispersal pad level). [...]

Platforms should be arranged neatly, not just wherever, and the same goes for items. Often it's just a big mess because the person was just trying to fill space with whatever in that area. (Lemm, 2010)

Levels are designed with different styles in mind. Some levels are long horizontal levels, others are towers. Some involve doors and keys, others involve only dodging enemies and accomplishing certain jumps. Practice specific levels styles and try to analyze different styles, such as those in the original episodes of Keen Galaxy, to improve your design. Give yourself goals to design a certain style of level.

2 [Improving Level Design](#)

Over the years there have been some significant discussions on how to improve Keen level design, particularly in solving issues like excessive difficulty and Long Hallway Syndrome (a term coined by Xky Rauh referring to long, featureless hallways).

While I hope to cover these issues in future articles, I would first like to address a problem which has barely been touched in our community: failure to create good macro-progression.

This is a level design problem but is not limited in scope to any one level; it takes the entirety of the game, all the levels as a whole, into account (hence the 'macro' in macro-progression). This problem is a symptom of the same issue which is largely responsible for levels that are too hard and levels with LHS: levels that are just too long and take too long to complete.

The main focus of this article will be to stress the importance of macro progression and suggest how best to create it. This will be particularly applicable to Keen Vorticons level design, however, I think it will be useful to other Keen games as well.

2.1 [Worldmap vs duration of single levels](#)

Macro-progression is the movement of the player across the world map, and the game as a whole, measured by the completion of levels. It is similar to micro-progression, the movement of the player towards the exit of a specific level. The longer a player spends in a single level with micro-progression, the slower macro-progression takes place. Good macro-progression is characterized by the player's ability to complete one level and move on to the next in reasonable time. What constitutes a reasonable time is highly subjective and dependent on such factors as the player's potential for becoming lost and aimless, the degree of repetition for any in-level action, and the general uniqueness in terms of graphical appearance and gameplay.

2.2 [Real and apparent macro progression](#)

There are two different kinds of macro progression: real and apparent. Real macro-progression is the player's actual progression through the game measured by the number of completed levels to the number of levels total.

Apparent macro-progression is the player's feeling of progression through the game typically measured by levels completed. Apparent progression usually coincides with real progression, although not always. If player A has completed one, twenty minute level in a ten level Keen game, he feels much less progression than player B who completes three levels in the same amount of time in a thirty level Keen game. Even though they are each one tenth of the way through the game, the player who has completed

more, shorter levels feels they have accomplished more because apparent progression has no benchmark for measuring progress other than levels completed.

Macro-progression is important for keeping the player interested in the game and is used to tell the player that their effort is worthwhile. The game as a whole can be thought of as a ladder with each rung as a level. The ladder can only be climbed with each step, there is no level of progression between rungs.

Keeping the player in any single level for too long can be detrimental to the player's experience to an entire game, even if the player is making real progress (as opposed to being lost) in that single level; they're taking too long to climb a single rung on the ladder. Players want to feel like they are accomplishing something, like the effort they put into the game is getting them somewhere. If it's taking too long, they're more likely to get frustrated and not feel like pushing on; it's just too much effort with too little payoff.

2.3 The worth of progression

So how do you go about creating good macro-progression? Good macro is dependent on good micro-progression. As mentioned before, good micro-progression deals with how the player moves to the exit of the level.

There are many aspects of good micro-progression, but the most relevant to macro is the speed at which the player can progress through an individual level. Different types of levels take different amounts of time to complete, so there is no catch-all time for how long your levels should take.

You should, however, create levels that don't leave player's exerting more effort than progression is worth. What is progression worth? It's not as simple as "progress or don't see the game's end". If one level takes too much effort, the player isn't going to want to play the rest of the levels either, even if they turn out a bit easier.

Don't motivate the player to cheat or give up on your work, make the challenges and difficulty in your levels worth overcoming. Make them last a reasonable duration and reward the player with a level victory before throwing the next level at them. If your levels are too long, split them in half, give the player a level victory, a benchmark for progress.

2.4 Leading the player's attention

Macro-progression matters in the design of the world map too. If all the level entrances are lined up in one location, players will feel little progression as they get through the levels, even if the levels are short. Players need to feel that with each level they complete, they're opening up the world map and exploring more and more of it, seeing new things and gaining access to new levels.

Creating good macro-progression is all about letting the player sit down, start up the mod, and beat a few levels in a reasonable amount of time. This doesn't mean that levels need to be cake walks. I'll get into difficulty and micro-progression in a future article, but these things must ultimately serve macro-progression. If the only way players can measure their progress is through completing levels, level designers who want to keep the player's attention will pace the levels accordingly. Good macro-progression is a necessity to the playability of your levels.

3. Methods used by other modders

I find it much easier to design levels based on the idea of "scenes" or "rooms." Work with an area that is about one screen in size, and make it look snazzy enough to deserve a screenshot. Then, move to another part of the level--someplace hopefully at a different height, maybe even a different size, and do the same thing. Once you've got two scenes you like, figure a way to weave them together. Slope a hill, make a series of platforms, dig a trench, put in a river, sprinkle enemies, whatever it takes... larger levels need more defining scenes, while smaller levels can focus with just "Point A" and "Point B."

(XkyRauh Apr 21, 2006)

As anyone who'd played my Galaxy mod would see, my levels in it were basic 'head in that direction until you find an exit' style. Many Keen Galaxy levels follow this pattern (Hillville for example, and almost all levels in Biomenace.) and plenty of others have a 'do this section then move on' (Most obviously the pyramid of the forbidden, which is just one long set of hard tasks.)

(Levellass, 2007)

I do my best not to engage in repetitive puzzles (ie. opening a door, collecting another card hidden behind it (in front of yet another door), navigating through three passages that end up six tiles above, opening another door, collecting a card behind it (which has another door behind it, returning to the other door, and continuing the process until finally all the doors are open.

(Commander Spleen, 2003)

Keeping things organic I find important also. Long passageways with little activity lead to stagnation of any interest the player once had in solving a puzzle, yet excessive bonuses or enemies unbalances things and leaves the player becoming bored and/or frustrated. I try to work sub-storylines into my levels (not necessarily communicated to the player, but definitely guiding my decisions in what I'm putting into the

level), giving each one, and their respective puzzles, a reason for existing. Putting in a puzzle just for gameplay's sake seems too superficial. Just as a novel or movie is more convincing when each event, and each characters' decisions, have a reason within the story, so I believe a game should have a convincing storyline, and either the game moulded to the storyline or vice versa if certain parts don't match up.

(Commander Spleen, 2003)

Don't be afraid to edit your levels significantly from your original designs. Sometimes things look better in the editor than they actually play. Sometimes it's better to dump a level and start a new one from scratch than to try to salvage the level you started.

If you're playtesting levels you made, and you're getting bored or frustrated... something's wrong. if you've been working on it for 6 hours and are just plain sick of it, back off and take a break--but if it's stale when you get back to it, re-think things. friends are good. let friends playtest areas extensively.

(XkyRauh, 2003)

It's the attention to detail that holds back B-level vorticons mods from becoming A-level mods: Level design. By far the biggest problem.

- a) A lot of blind jumps, obviously the result of lack of play testing and designing at 1000x1000 res.
- b) Tiles that don't look like they should kill you, kill you! At least put a warning sign before it or put that tile in an unescapable pit or something.
- c) Sprawling levels with no unifying themes. THEY ARE BORING It's often 16 copies of the same thing: a couple yorps, a couple gargs, a vorticon blocking a bridge tile etc. Each level should have a gimmick. Maybe one is pogoing over butler bots, another is fighting vorticons on ice surfaces. KeenX is a good example of this (e.g., the sparky chase, the mortimer clone room, the friction dispersal pad level).
- d) Item and platform tiles placement. Platforms should be arranged neatly, not just wherever, and the same goes for items. Often it's just a big mess because the person was just trying to fill space with whatever in that area. eg, this sort of thing: <http://www.shikadi.net/wiki/keen/images/d/d8/KeenQLLevel12.png>

(Lemm, 2010)