Modding Halo Custom Edition

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What I’m creating?

I’m modifying an existing multiplayer map in Halo Custom Edition with AI bots and other custom vehicles. By modifying the multiplayer map, I can control how the battle would be like.

Little backstory and why I choose this instead

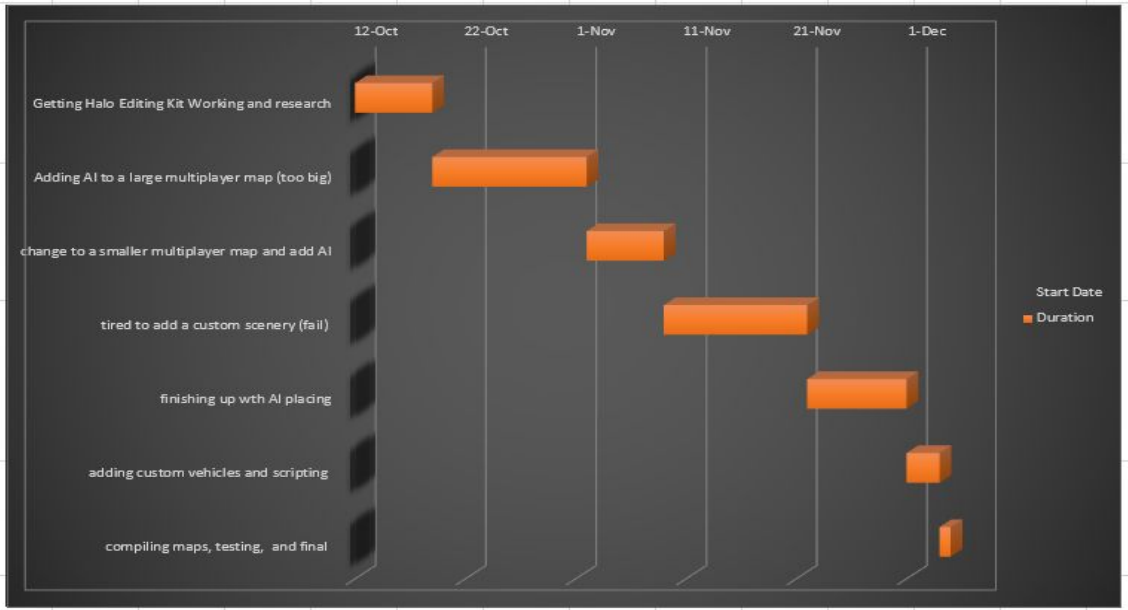
At the beginning of the semester, I was trying to create an FPS game in Unity, but after two months, I realized that this wasn't what interested me all along when I signed up for game design. What I was looking for when I joined game design was that I got to pick, dissect, and learn how to code one of my favorite games as a starting point: things like a visual representation of levels and scripting language the game uses and learn from there.

As soon as I changed my project to modifying Halo Custom Edition map, I felt much more excited, energized, and eager to learn every single bit about Halo CE. I told myself that this is what I want to learn, initially.

It is something that I always want to know and learn, as a kid, how the level designers design those levels in the campaign. Again, it goes back to the eagerness and how it works. As I was modifying Halo CE map, I felt like a “real” developer, dictating how the AI would battle each other.

Timeline

Task	Start Date	End Date	Duration
Getting Halo Editing Kit Working and research	12-Oct	19-Oct	7
Adding AI to a large multiplayer map (too big)	19-Oct	2-Nov	14
change to a smaller multiplayer map and add AI	2-Nov	9-Nov	7
tired to add a custom scenery (fail)	9-Nov	22-Nov	13
finishing up wth AI placing	22-Nov	1-Dec	9
adding custom vehicles and scripting	1-Dec	4-Dec	3
compiling maps, testing, and final	4-Dec	5-Dec	1
		Total Days=	54



Prerequisites

Halo Custom Edition is a PC expansion version of Halo Combat Evolved

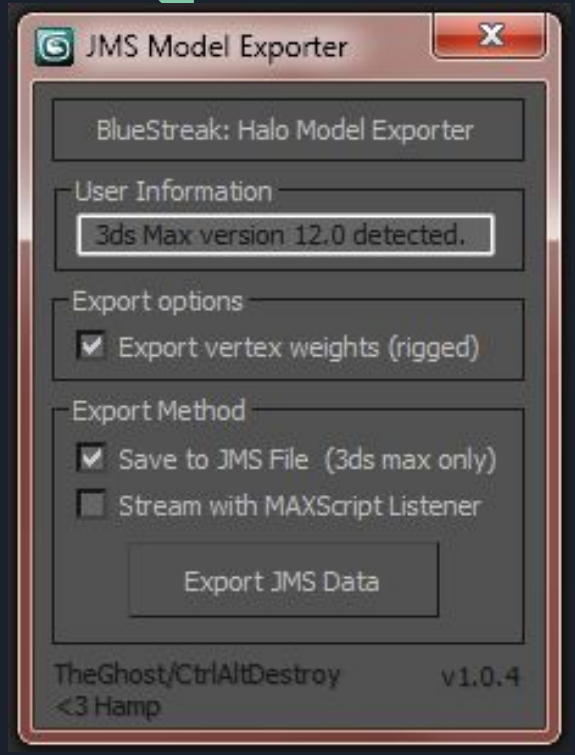
Halo Editing Kit (HEK) is official suite of modding tool for Halo Custom Edition released by Gearbox Software.

Nice to have

3DS Max, preferably 2012 and below in order for a plugin to work

Halo Editing Kit Plus, is a third party program that’s able to extract existing maps and its tags. It’s also able to encrypted map with a passcode so someone else won't be able to extract from the map without a passcode.

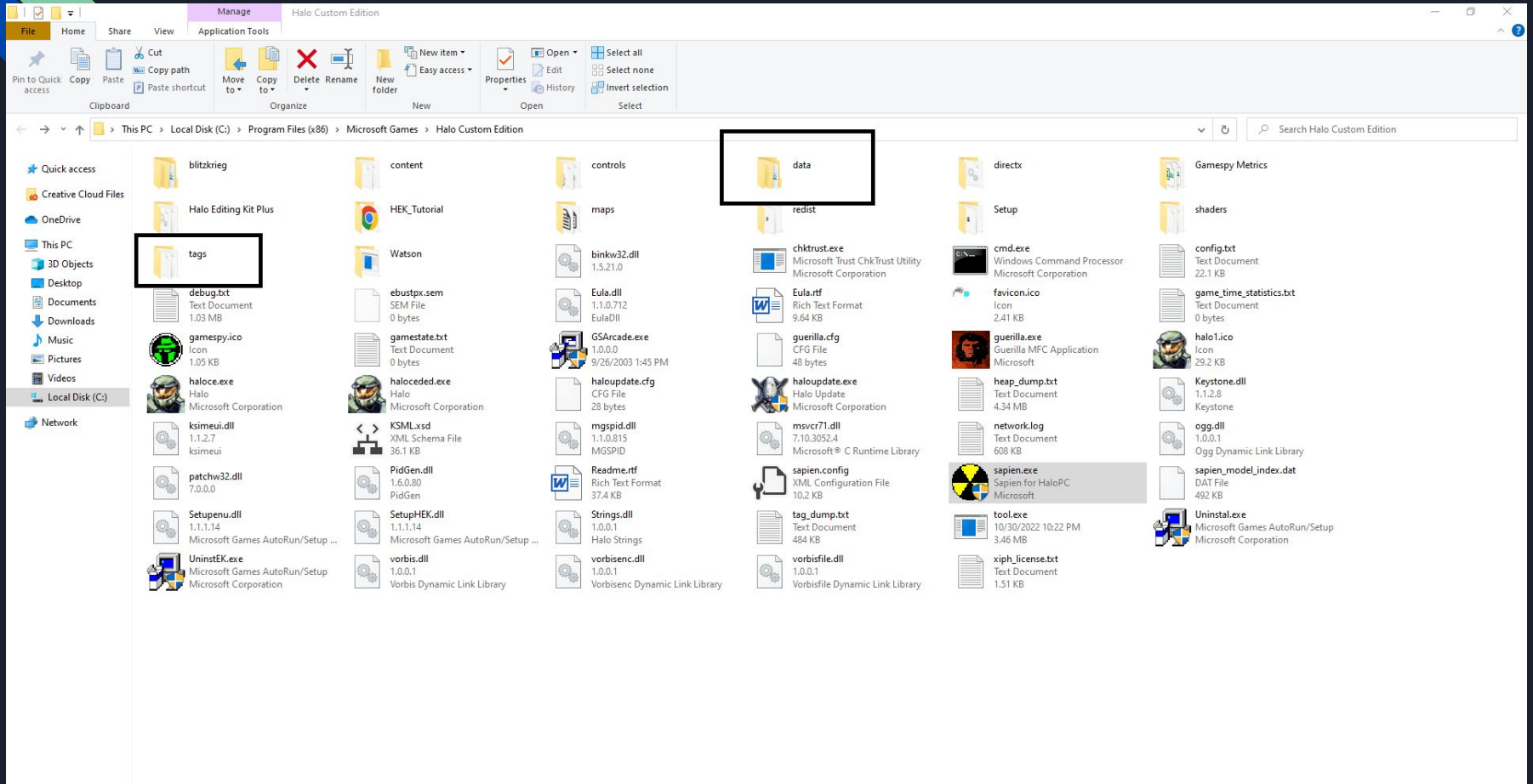
Nice to have cont’



JMS* Exporter, an plugin for 3DS Max for creating Halo Custom Edition blueprints

*JMS stands for Jointed Model Skeleton

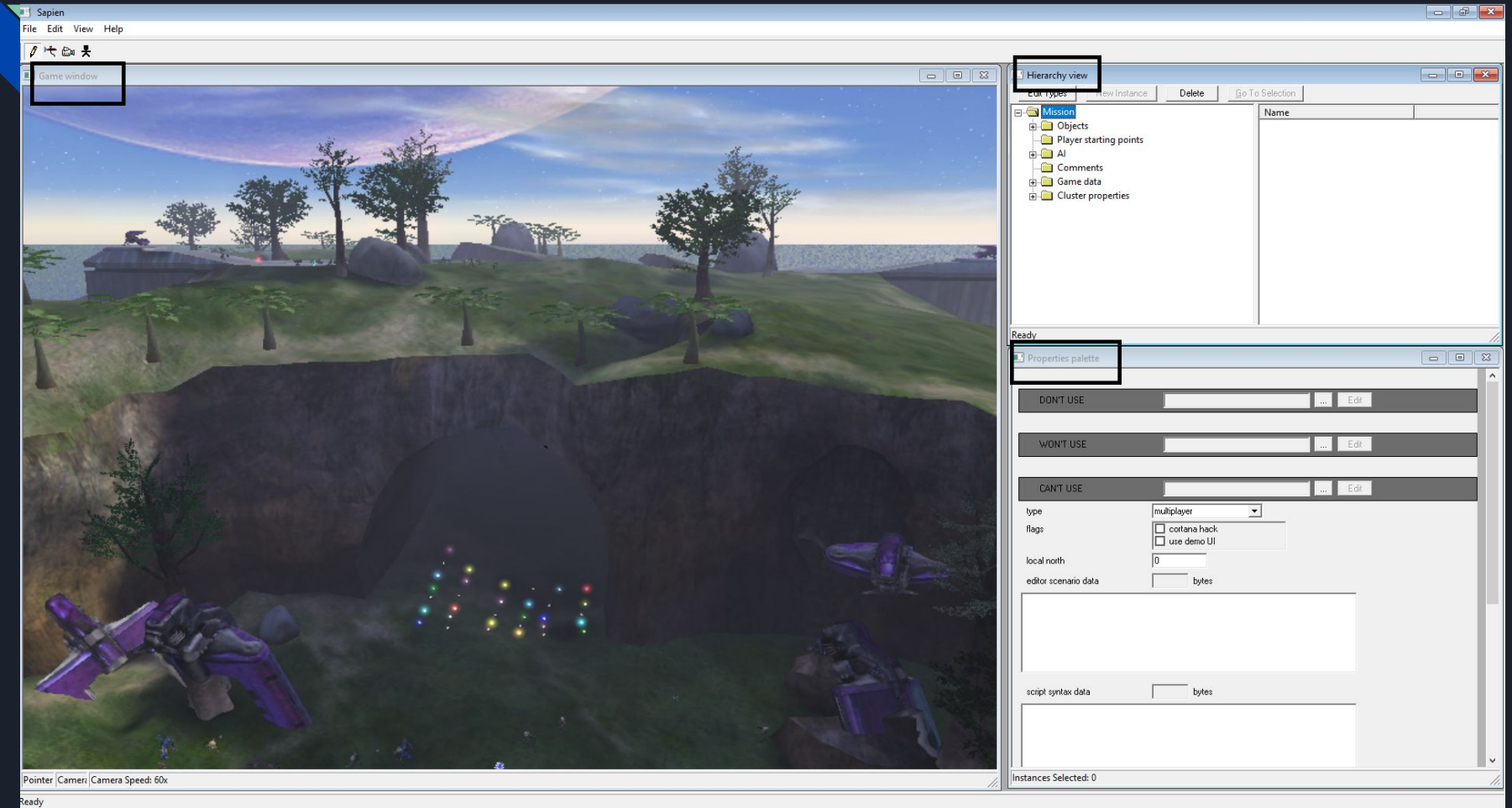
Halo Custom Edition Important folders



Sapien

Sapien is a visual representation of the final map in the game. This is the primary program for placing trigger volumes, add vehicles, AI bots, spawn points and anything else that's physically be positioned (weapons, flag bases, camera position for cutscenes) is done here

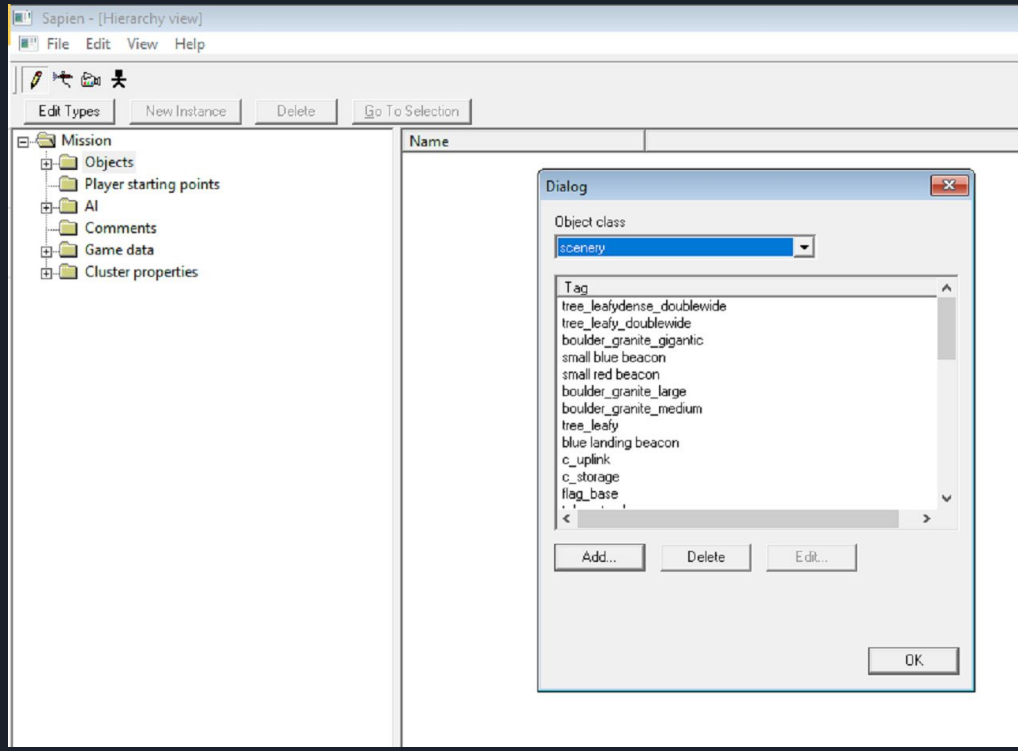
Sapien’s development environment



Hierarchy View

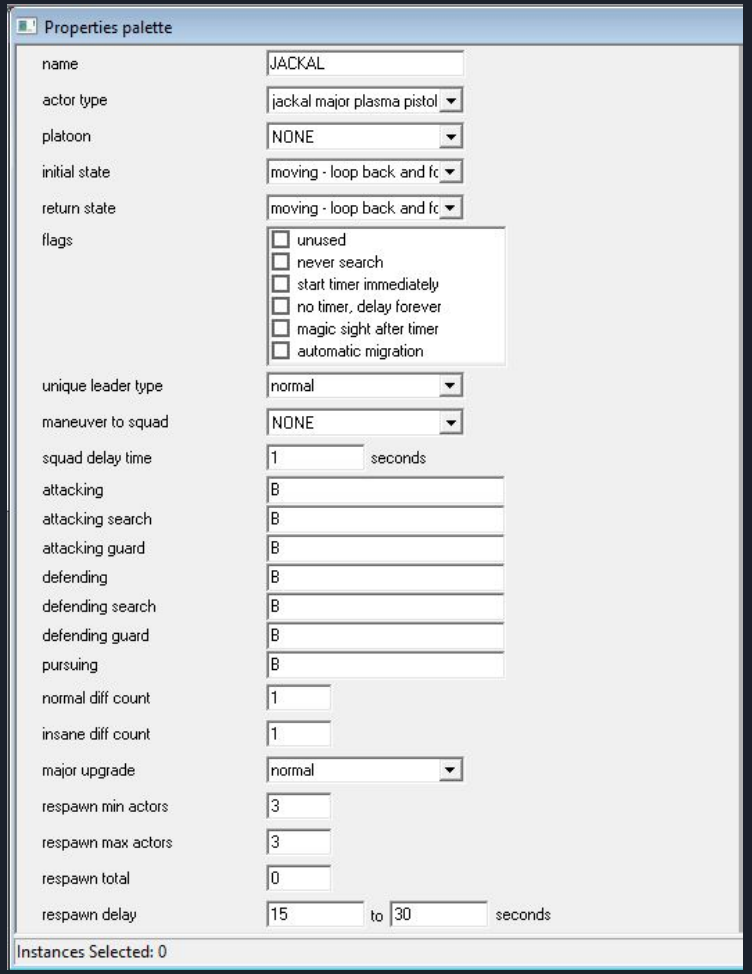
Click on Edit Type to bring up the Dialog window which shows everything that's already loaded

Object Class are as follows:



Properties Palette for (AI)

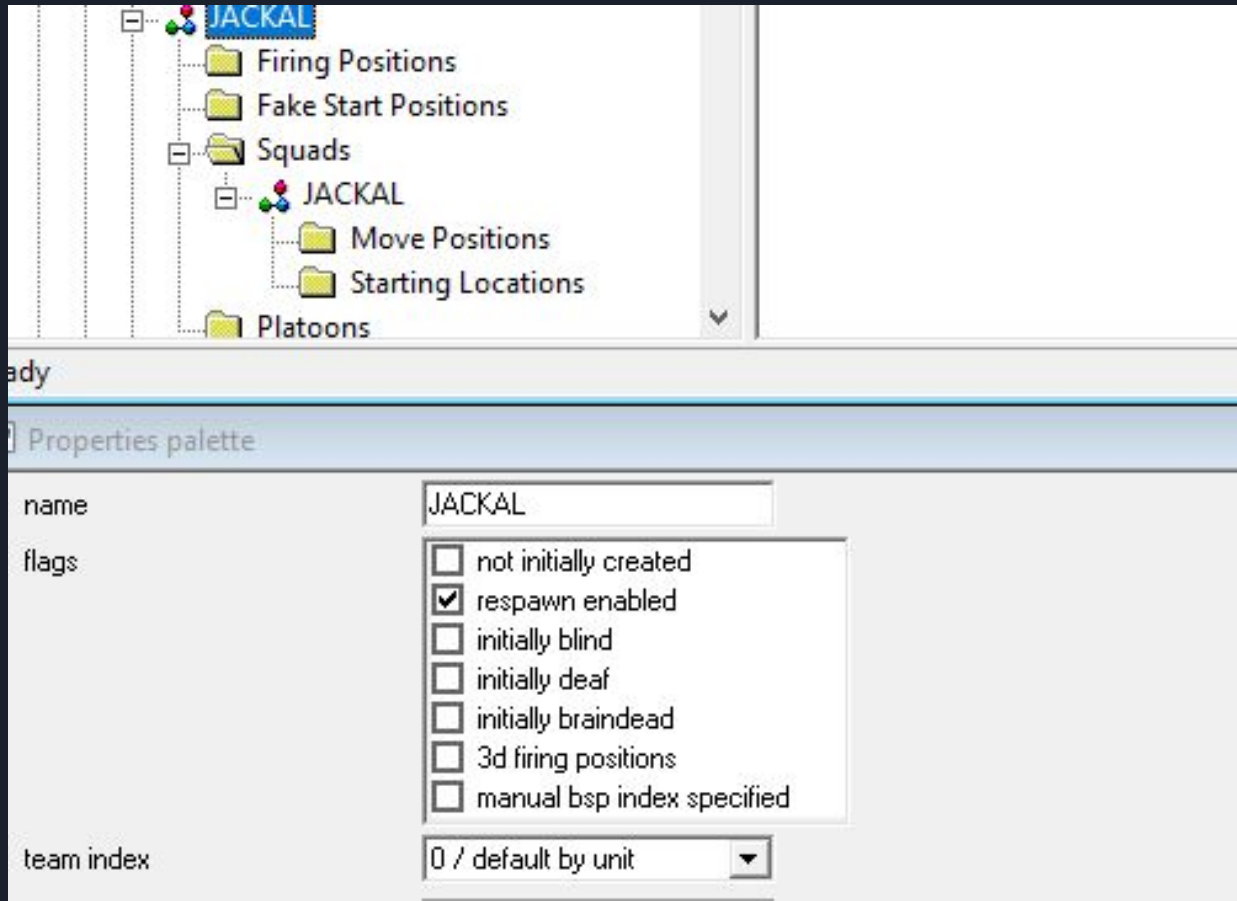
Name: naming convention (for yourself)
Actor type: what kind of ai enemy or ally
Platoon: no documentation on this one
Initial state: spawn with this state (sleeping, moving back and forth, fleeing and etc
Return state: after initial state had been met
Flags: no documentation on this too
Unique leader type: only apply to marines
Maneuver to squad: no documentation
Squad delay time: time delay for the squad
And the rest are the properties of the ai engagement , spawn time, number of lives (spawn total = 0 = infinity lives)



Properties Palette for (AI) cont'

In order for the AI to spawn, user need to place starting locations (aka spawns) and make sure the respawn enable flag is checked. Or else the AI won't spawn.
Move Positions: makes the AI move to that point you have placed on the map.
Fire Positions: the place where they would fire their weapons*

*Of course there are exception to this however



Halo Scripting

```
(<void> object_pvs_set_object <object>)
```

Sets the specified object as the special place that activates everything it sees.

```
(<void> object_set_collideable <object> <boolean>)
(object_set_collideable (player0) true)
(object_set_collideable (player0) false)
```

`false` prevents any object from colliding with the given object

```
(<void> object_set_facing <object> <cutscene_flag>)
(object_set_facing (player0) blue_base_flag)
```

Turns the specified object in the direction of the specified flag

```
(<void> object_set_melee_attack_inhibited <object> <boolean>)
(object_set_melee_attack_inhibited (player0) true)
(object_set_melee_attack_inhibited (player0) false)
```

`false` prevents object from using melee attack

In order to compile scripts, the Tag and Data folder path have to be identical

Script is in .hsc file format which is Blam Language

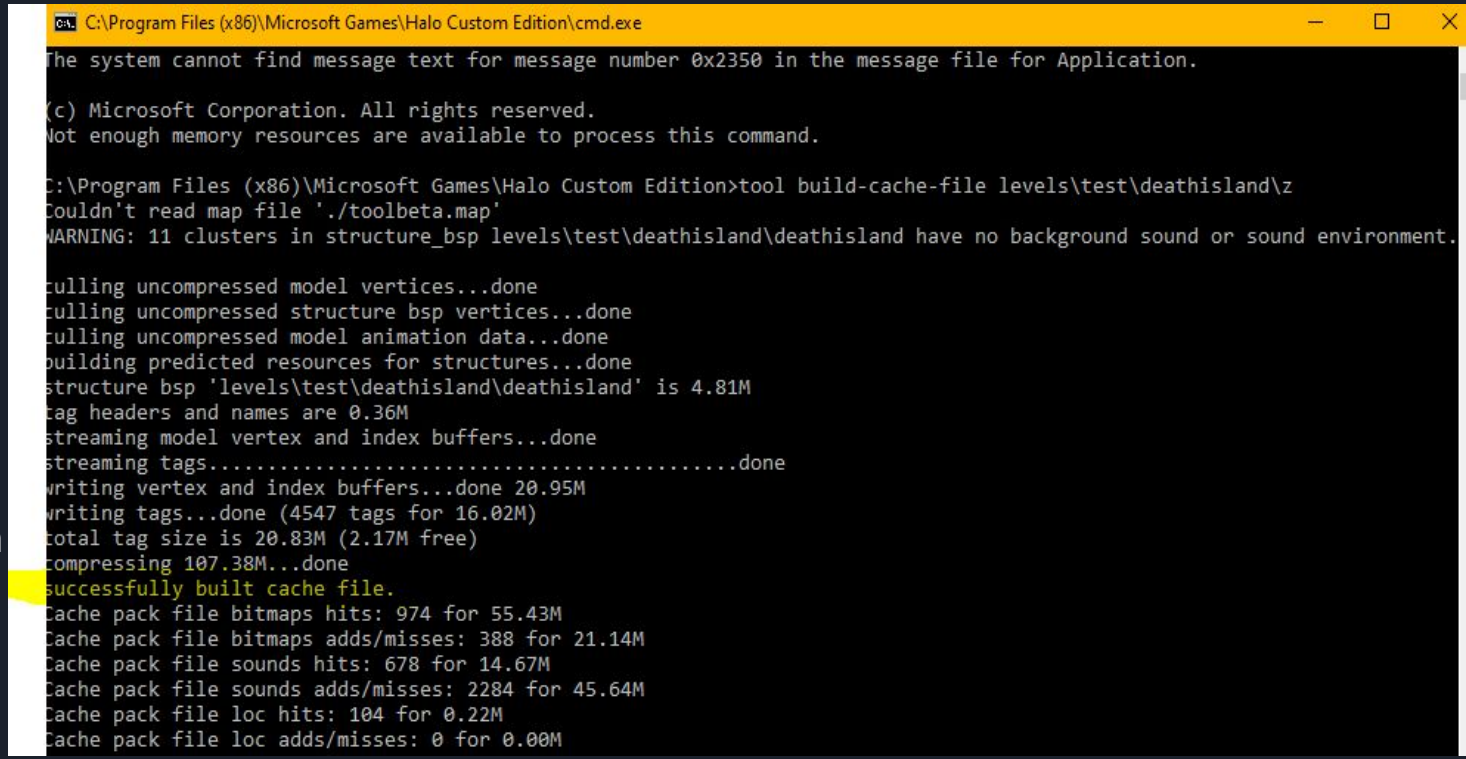
Guerilla

Guerilla is a second program that lets user edit and create properties of AI. Properties like accuracy, how far the AI can shoot and see, damage, hitpoints, and other attributes. This is also the program that let us create new ai properties and add them to existing biped that has no ai yet. And other capability which I do not know due to limited documentation.

Tool

Maximum file size for multiplayer is 128MB* Any file over that size would crash the game.

The only exception is single player which can go up to 3 times the multiplayer file size



In order to play the things the user see in Sapien, the user must type in this command into cmd: “tool build-cache-file levels\namefolder1\namefolder2\name.scenario”*

Challenges

- Unfortunately there's so little documentation of creating new maps
- User created map with AI bots (not possible due to tool.exe not creating the required resources)
- When running into problems creating map(s), it is completely unsolvable; Tool.exe is painful to use as it doesn't let me create shaders.
- An old engine (I don't mind)
- File size limit of 128MB (Multiplayer)
- Vehicles not spawning
- gathering exception data (game crash)

Overcome some of the challenges

- Due to the limited time, I didn't try to troubleshoots why tool wasn't creating my map. Instead, I decided to modify an existing map with AI bots and how I want them to play out.
- Because of the file size limit, I was forced to a smaller existing map to edit and add AI
- Found a script that spawns vehicles
- Trial and error and some research help me solve gathering exception data (crash ingame)

Thank You