IMPORTANT NOTICE THIS LEVEL IS NEITHER MADE BY NOR SUPPORTED BY 3D REALMS	
Title:	**Der Zorn Gottes**
Author:	**Alex Pistol**
E-mail:	**aleks4duke@gmail.com**
Steam account:	**Ledsbourne**
Duke4.net nick:	**Aleks**
Discord:	**Ledsbourne**
Filename:	**DZG.MAP**
Date released:	**2023-10-20**
My other releases:	• **Small parts in Community Build Projects 3** (2003)**, 4** (2003) **and 6** (2004)**,** • **Alex City 1: Bank Heist** (2003): https://msdn.duke4.net/hotalexcity.php • **Back in Business episode** (2020): https://www.moddb.com/mods/back-in-business • **Submachine** (2021): https://www.moddb.com/mods/submachine • **The Conundrum** (2022): https://www.moddb.com/mods/the-conundrum
Misc. author info:	Civil/wind engineer and researcher from Poland. I have just obtained my PhD degree in structural mechanics, so this map is released to celebrate it! Please contact me if you have any comments or feedback regarding the level, I am always very happy to hear it!
Additional credits to:	Beta-testers: **Aymeric Nocus** (**MRCK/ck3D**), **DNSKILL5**, **Maarten** and **Merlijn van Oostrum** and **Sanek**; **High Treason/DXZeff** for a few ideas and discussions about some of the effects used; EDuke32 developers for all the QoL improvements, such as sloped sprites, TROR and Polymost renderer; Duke's modding community and players for support, feedback and inspiration from their awesome maps and mods.
Other acknowledgements:	I'd also like to thank other mappers who had a strong influence on my style and work over the years (besides my beta-testers, whose impact was also very strong!), mostly: Pascal Rouaud, Billy Boy, Alejandro Glavic, Kevin Cools, Bob Averill, William Gee, Luciano Gallo (Gambini), Mister Sinister, Ryan Rose (Quakis), Artyom Brullov.

INSTALLATION AND COMPATIBILITY INFORMATION	
This level was designed for **EDuke32** – download it at: https://www.eduke32.com/	
Designed and tested on EDuke32 versions:	**r10212** (2023-04-05) – **r10454** (2023-09-11)
Installation:	Unpack the contents of **DER_ZORN_GOTTES.ZIP** into your Duke Nukem 3D directory. It is recommended to also use the EDuke32 version that comes with the release, to ensure the proper compatibility of all the effects and mechanics in this map. Run **EDuke32.exe**, select "**Der Zorn Gottes**" from the **Custom game content directory** and click **Start** to play.
Preferred renderer:	• This level was designed for **Polymost** renderer, which is the recommended way to play it; • The map should be compatible with Classic 8-bit renderer too, as not everyone can run Polymost, but it will not look as good with Classic (mostly due to how the renderer handles sprite clipping and how the smoother sprite rendering under Polymost was abused for some of the effects and details); • Polymer was never considered and is not supported.
Recommended screen resolutions/ FOV setting:	Screen resolutions between **1024x768** to **1920x1080**. This only really affects the viewscreens. The map was designed with default FOV (field of view) setting of **90** and it is highly recommended not to change it.
HRP or 3D models compatibility:	**Not supported.** Might cause visual glitches within the map.
External gameplay mods compatibility:	**Not supported.** The level comes with its own CON files that modify the behavior of some enemies, so playing it with different mods is pointless. Might cause gameplay balance issues, sequencing and progression problems or other errors within the map.
Voxels compatibility:	**Not supported.** There are not that many props in the map, therefore there should not really be that much incentive to use voxels. Furthermore, the level layout/geometry and some of the effects may cause momentarily framerate drops, so using voxels would only exacerbate this issue.

Play Information

Episode and level:	E1L1.
Single player:	Yes – primarily designed for it.
Cooperative 2-8 players:	Yes – up to 8 players, providing all of them have the modified CON files.
DukeMatch 2-8 players:	Yes – up to 8 players. The map is fairly open and of reasonable size. The modified CON files are in no way required for DukeMatch.
Difficulty settings:	Yes – Piece of Cake, (up to 26 enemies), Let's Rock (up to 28 enemies), Come Get Some (up to 30 enemies). The main difference in difficulty is at the beginning of the map.
New sounds:	Yes, some additional quotes from **Duke Nukem: Manhattan Project** for extra diversity. All of the new Duke lines were downloaded from: https://www.101soundboards.com/boards/11219-duke-nukem-manhattan-project-sounds
New music:	Yes, *Ride of the Valkyries* by **Richard Wagner** as the soundtrack for the map and *Thus Spake Zarathustra* by **Richard Strauss** for the main menu music.
New graphics:	No.
New/changed CONs:	Yes.
Demos replaced:	None.

COPYRIGHT / PERMISSIONS

- This level is non-commercial and completely free. As such, it cannot be distributed commercially or as part of any commercial add-on.
- Authors MAY NOT use this level as a base to build additional levels (unless it is for personal use of course). However, I encourage you to explore the map in Mapster32 and break it into pieces for scientific/learning purposes!
- Please do not explicitly copy parts of this map into your own levels – or at least ask me before you do, I can easily be reached via e-mail or on duke4.net forums/Discord.
- You MAY distribute this level through any electronic medium, share it on your website or send it by e-mail as long as you include this ReadMe file, the contents of DER_ZORN_GOTTES.ZIP and anything else that came with it intact with no modifications. If you share it on your website or make a YouTube playthrough video, please tell me, I'd love to see it!
- This level is my own creation.
- Music and sound files are creations of various artists, mentioned explicitly in the section above. They can be downloaded freely from the Internet. Should the authors, performers or legal proprietors of these tracks or sound files not agree with my non-commercial use of them, please contact me and I will cooperate.

Construction	
Base:	New level from scratch.
Build time:	Started working on the level on 2023-07-06, so about 3 months, with some longer breaks due to travelling and other real-life stuff. Spent approximately a total of 150 hours on it.
Editors used:	Mapster32, Notepad++ for CON editing.
Known bugs/problems:	After using the viewscreen inside the helicopter, the player will be dropped out of it, but it should not be a big issue since by then, they already have a jetpack. Some visual glitches might occur here and there, which might be somehow linked to the renderer, EDuke32 revision used or player's hardware/system specifications. This might also cause some framerate drops and lags. In particular, inserting the red keycard may cause a momentary framerate drop, so it might be a good idea to save beforehand. The structure of the level is very complex and thus it might be very fragile, so any attempts at changing something in the editor might result in complete mess. There should be no way of getting stuck or softlocked for the player without an alternative way out.
May not run with:	HRP/Polymer/3D models/custom mods. The level breaks original Build limits of sectors/walls/sprites and uses newer features such as the True Room Over Room, sloped sprites, texture rotation or sprite no-shade, so it will not run properly under original Duke Nukem 3D. This level is not compatible with other mods or custom DUKE3D.GRP files.

Gameplay hints:

- The supplies are rather scarce and you have to prioritize which enemies to kill first.
- You do not have to kill all the monsters to finish the map – in fact, the last fight is completely optional, unless you are aiming for 100% kills.
- Explore around the corners of the map to find extra supplies, taking into account the "true 3D" nature of the location – look above and below as well!
- There is a super secret that hides the shrinker – however, getting into it requires some extra legwork and some practical experience, for example on how to open a window.
- Some of the crates and barrels hold a little surprise inside.
- There are plenty of jetpacks scattered around the map, but remember you need one to fly up to the exit, so watch the fuel!

General description

This map started out as a potential entry for Sanek's *BattleDuke Contest*, but it soon grew too ambitious for the project and I wanted to implement more of my own ideas into it. Nevertheless, it was a refreshing idea to try mapping in a different style than usual for me, which also served as a practical exercise on implementing TROR (True Room Over Room) in a functional layout.


The map is fairly simple and open. It takes place on an oil drilling platform, which is a theme quite rarely used in Duke Nukem levels, but somehow very fitting. The basic idea of Sanek stayed – you will be facing mostly Battlelords (and potentially some other tough monsters), which are a bit stronger than the regular ones (they take about 10 RPG rockets to kill). Additionally, I introduced two extra variants of Battlelords, which shoot different projectiles and have a distinctly different look (a concept that was heavily influenced by *Blast Radius* authored by MRCK).

Accordingly, the player is only provided with heavy weapons, but each encounter is still a battle of its own and requires a clever strategy. The map is fairly straightforward – it takes about **15-25 minutes** to complete, depending on how dilligent you are. You will be exploring the oilrig from above and below, its towers and crane and even get to fly a helicopter!

Story
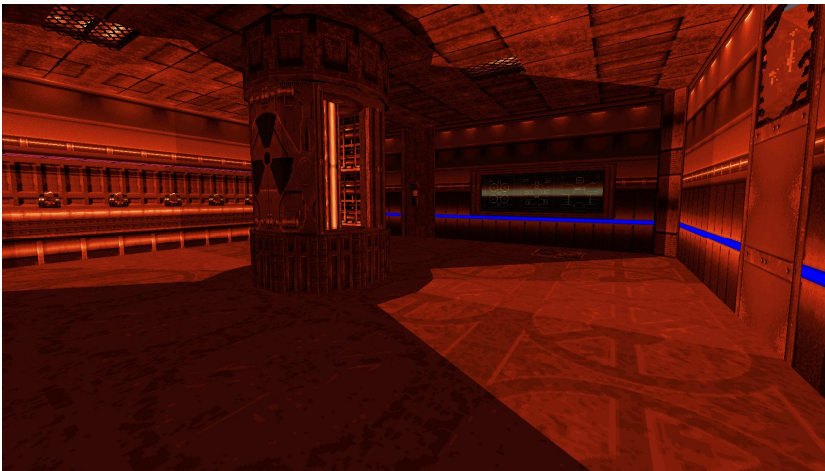
The aliens decided to try a different approach on their war waged on all mankind and took over an oil platform on the Norwegian Sea to use the fossil fuel on their assault spaceships and accelerate the deadly climate change on Earth. As an ecological activist and keen lobbyist for green energy (which might have something to do with being a stakeholder in nuclear power companies), Duke decided he can't allow this to happen and – already envisioning how much of good PR he's going to win here – went right there to once again get rid of the aliens.

However, little did he know that the workers aren't your regular cannon fodder aliens – manning and securing an oilrig requires the strongest bastards out there! Therefore, the platform is crowded with extra-tough Battlelords, who also invited their long-forgotten cousins to the party. Blashyrkh Battlelords have blue skin and will spam Duke

with freeze ray and occasionally shoot barrages of rockets at him, while the red Baphomet Battlelords use deadly laser miniguns, sometimes also resorting to sonic projectiles with quite limited range, but equally lethal. Now it's up to our hero to end their deviant drilling!
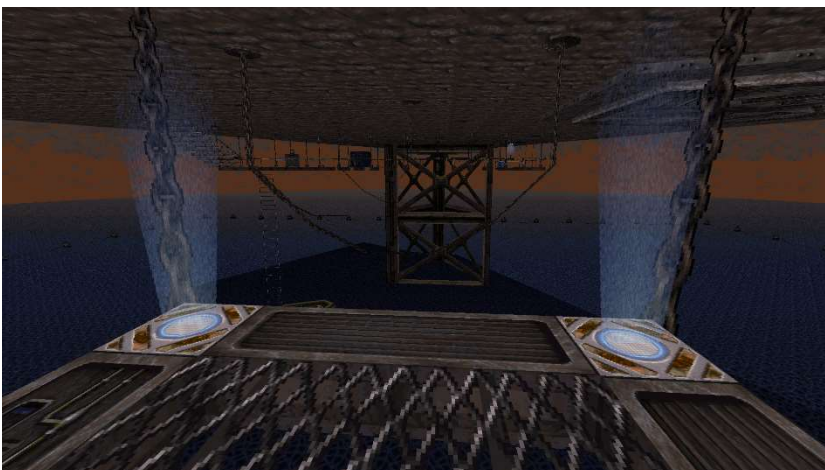

Resources used:

- 740/4 096 sectors,
- 6 563/16 384 walls,
- 5 758/16 384 sprites,
- 48/256 bunches.

Inspirations

The general layout and look of the level was inspired by a generic stock photo circulating around the Internet, authorship of which I was not able to find anywhere. I obviously took some artistic liberties, as I have never been to an oilrig and – as I can imagine the vast majority of people playing this map – have no clue about the functions of most of the structures on it. Below is a comparison of this photo with its re-imagination in the Build engine, taken from a similar perspective:
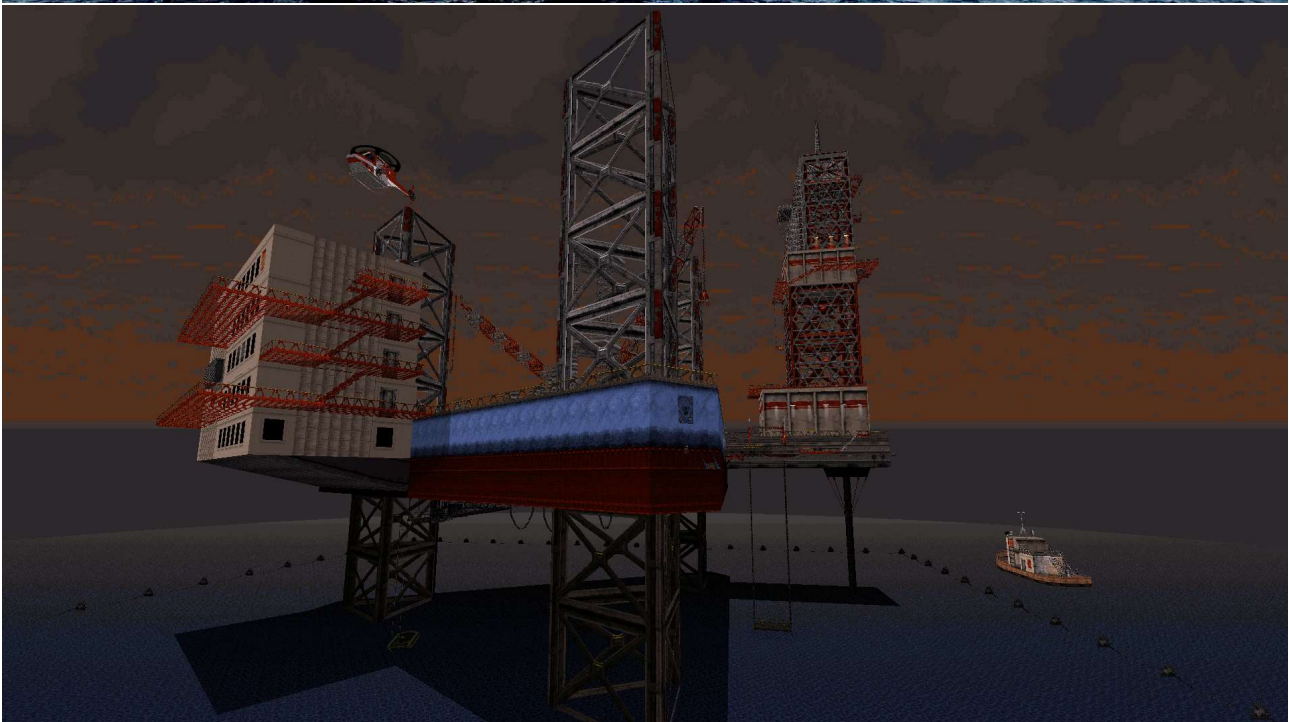
As for the gameplay itself, a huge credit is due to Sanek for his *BattleDuke* mod, which – despite a pretty simple concept – introduces a kind of new type of gameplay into Duke, more oppressive and requiring more strategic thinking from the player, often resorting to techniques such as luring the monsters around or lining them up to incite "infighting" between them.
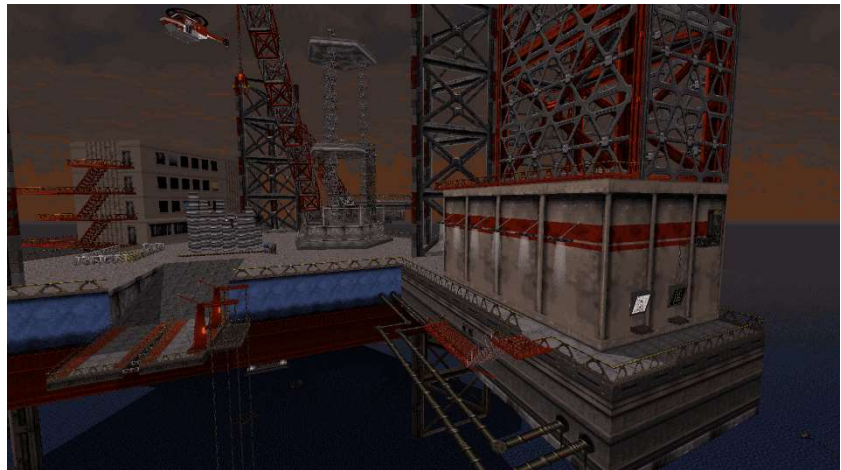
The level's mood, which is mostly dictated by the type of the sky used and its palette, composed together with the strong white mist obstructing the view in the distance – and its sudden change at the culminating point of the map – was inspired by Werner Herzog movie *Lektionen in Finsternis* (1992), a document exploring the burning oil fields in post-Gulf war Kuwait (which I admittedly have not seen yet). Accordingly, the map's title was based on another Werner Herzog movie, *Aguirre, der Zorn Gottes* (1979) and translates

to "The Wrath of God". To complete this chain of German cultural references, the music for both the main menu and the level was picked as two well-known, classical pieces by German composers, both sounding very grandiose, epic and majestic. The use of *Ride of the Valkyries* additionally brings the connection with its probably most well-known incorporation in popular

culture, in the helicopter scene of Francis Ford Coppola *Apocalypse Now* (1979) – considering the fact that in this map you will also get to fly a helicopter. This was also re-used in a similar fashion in *Duke Nukem Forever*, during the chapter *The Mighty Foot*.

Design and effects (WARNING: this section might contain spoilers!)

The main strength of this level lies in its true 3D layout, a feature which is achieved through a combination of various traditional (spriteworks including sloped sprites, sector over sector) and modern (true room over room) techniques, implementation of less-obvious Build engine quirks (sectnum manipulation for sprite "ownerships", joining of non-adjacent sectors, Polymost rendering of sprites that allows for "trimming") down to outright abuse of what modern EDuke32 considers a glitch ("BillyBoy" one-way windows or dropping the upper sector floor below the TROR border in a bunch).
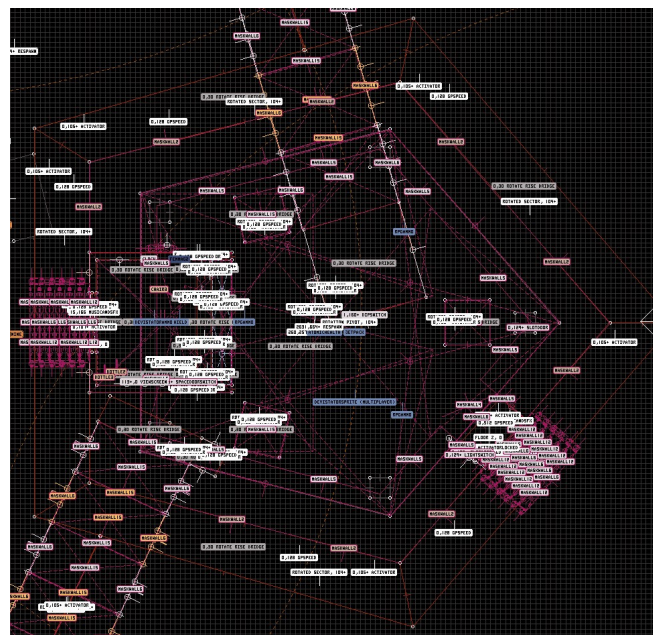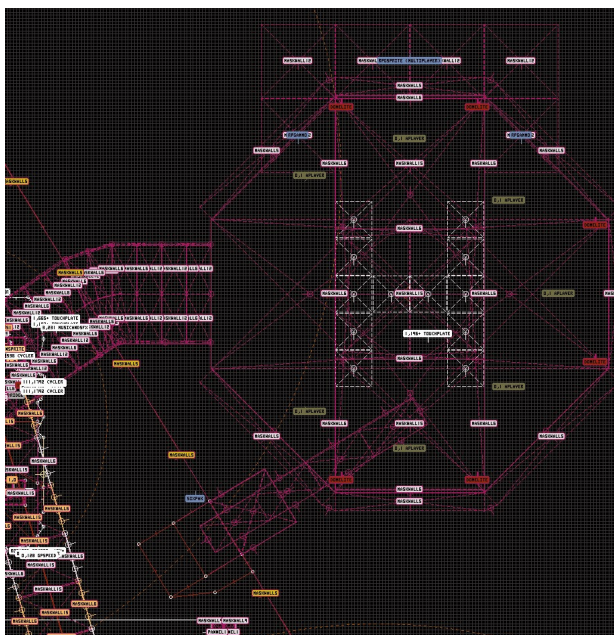
This allows the map to make particular use of the vertical axis and have action happening on many different levels – from down on the water surface, through a system of catwalks and bridges hanging right below the oilrig, to the surface level with the main platform, roofs of the buildings and over the towers, all the way up to the deck of a helicopter flying above all of it. Furthermore, the design goes well beyond the usual "blockiness" and rectangular shapes typically associated with the Build engine, being full of less conservative geometries, angles and diagonal lines in each and every direction. On the top of it, there is plenty of massive moving elements, such as the helicopter, boat or rotating crane – with each of the keycards somehow re-shaping the whole level in one way or another, creating different dimensions for the player to explore.

Below are two in-editor screenshots, the first showing the "barebones" sector geometry over all the TROR layers and the second, which includes additionally all of the spritework (purple elements, mostly) that compliment it with another depth of detailing. On the first one, it is worth noting the "slicing" of the water/TROR sectors in the player area. This is done to effectively mitigate the potential visual glitches, allowing to create an actually "floating" sector between the TROR layers rather than a simple convex-shaped holes.
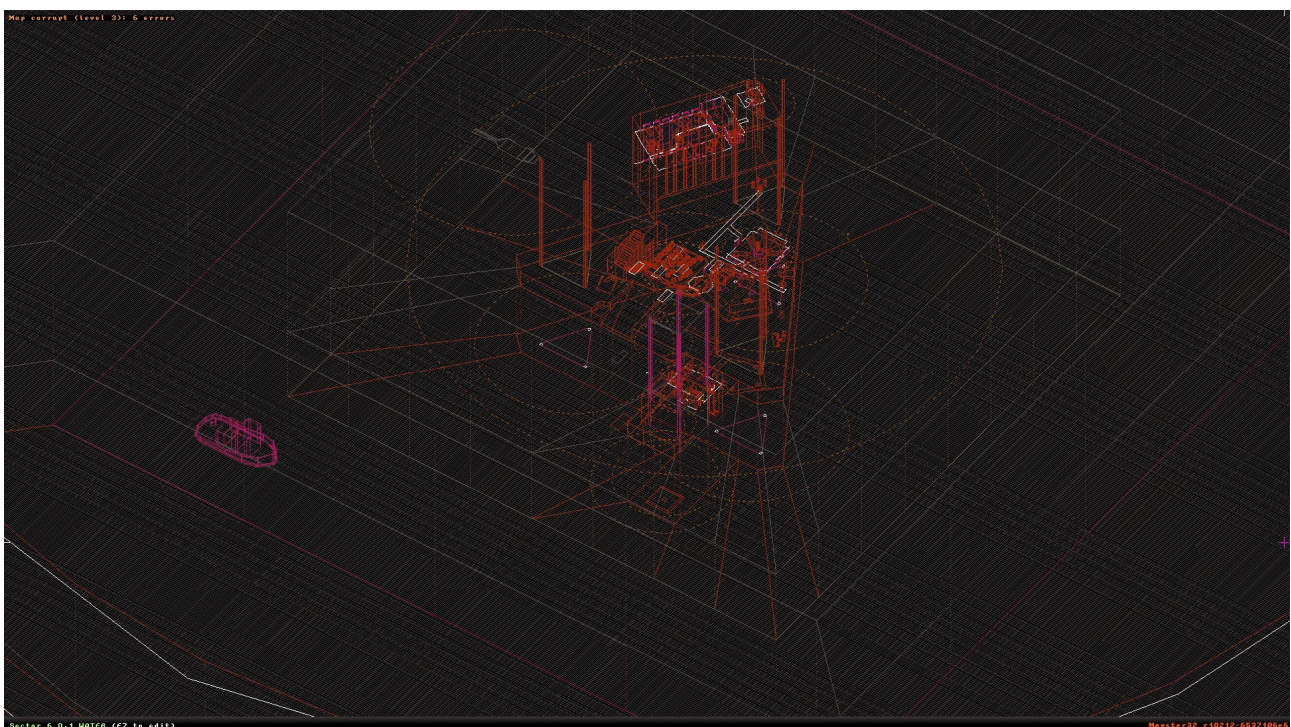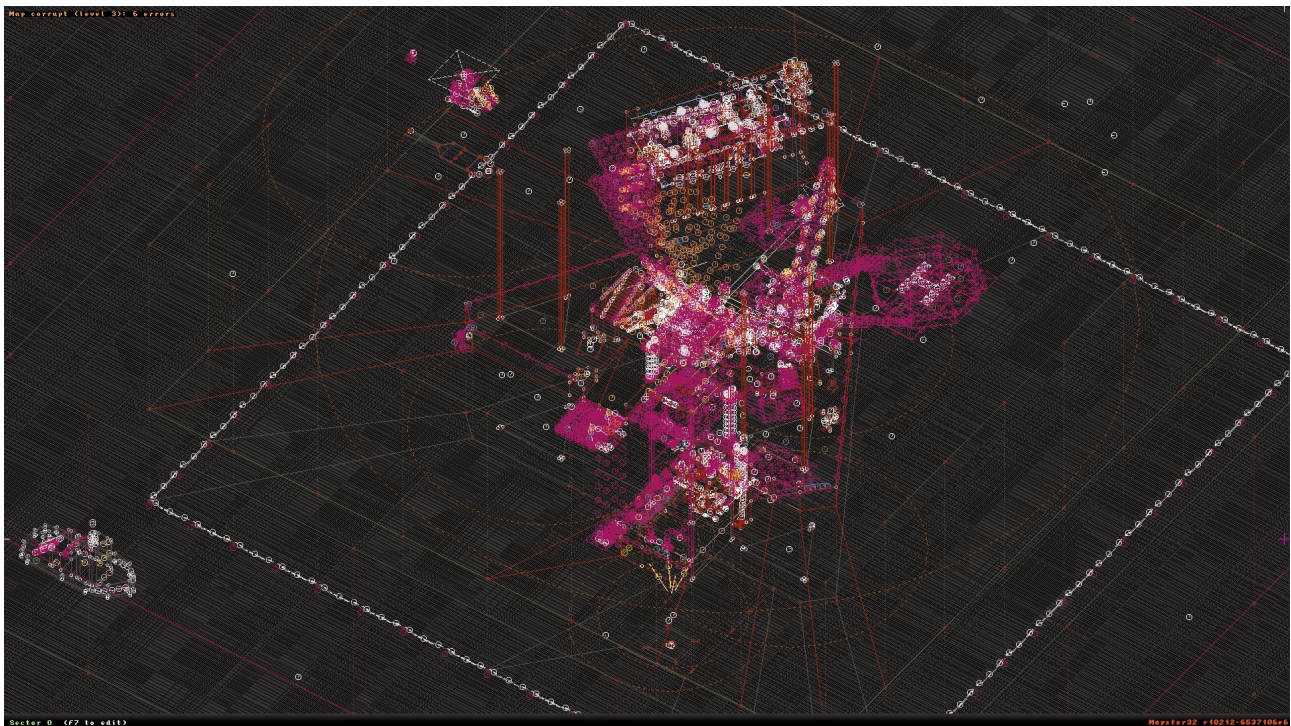
Besides the whole platform shaped as a giant triangle with truncated corners, which in itself dictates a lot of diagonal geometry (such as the crew quarters building), the two particularly unorthodox shapes are the octagonal helipad where Duke starts his adventure and the central, pentagonal crane platform, which rotates around a vertical axis (and with a complimentary elevator below the platform). These shapes are either completely or partially made with sprites rotated at proper angles to form them. Furthermore, the Polymost rendering capabilities were used in order for the complete spriteworks to look like proper structures – each "side" of the floors of these geometric figures is elevated by a few units – invisible for the player – so that their rendering order is correctly set and does not glitch out.

As for the crew quarters building interior, it was created on a regular, rectangular grid, then rotated by the exact amount of "Build degrees" as to match its roof. This allowed to keep – more or less, considering the geometrical approximations of the engine – the orthogonality of the walls and furniture inside. However, this technique required a lot of extra manual labor to match all the floor and ceiling textures – with the relativity bit turned on – to their new, rotated geometry. This required several rather exotic solutions, such as using an extra, non-adjacent joint sectors for the "first wall" manipulation or even creating a very tiny TROR bunches to have different first walls on the floor and ceiling. Needless to say, the whole space was literally sandwiched between the two TROR layers around it.

To make things even more complex, the windows of this building overlooking the platform were made as one-way see-through, which required a pre-TROR abuse of the engine's

sector constructing priorities that essentially resorts to purposely making a glitched wall that is, so to say, "both white and red" at the same time. This technique is often referred to as "BillyBoy window trick" after one of the first authors who used/propagated it, particularly in maps such as *Clearwater* or *Lighthouse,* which essentially took Build's non-Euclidean sector over sector capabilities to a next level by creating buildings that allowed the player to climb on their roofs, access their interiors and look outside to the same area where the roof was accessible from. Picture below shows an example of such a window in 2D and 3D view.
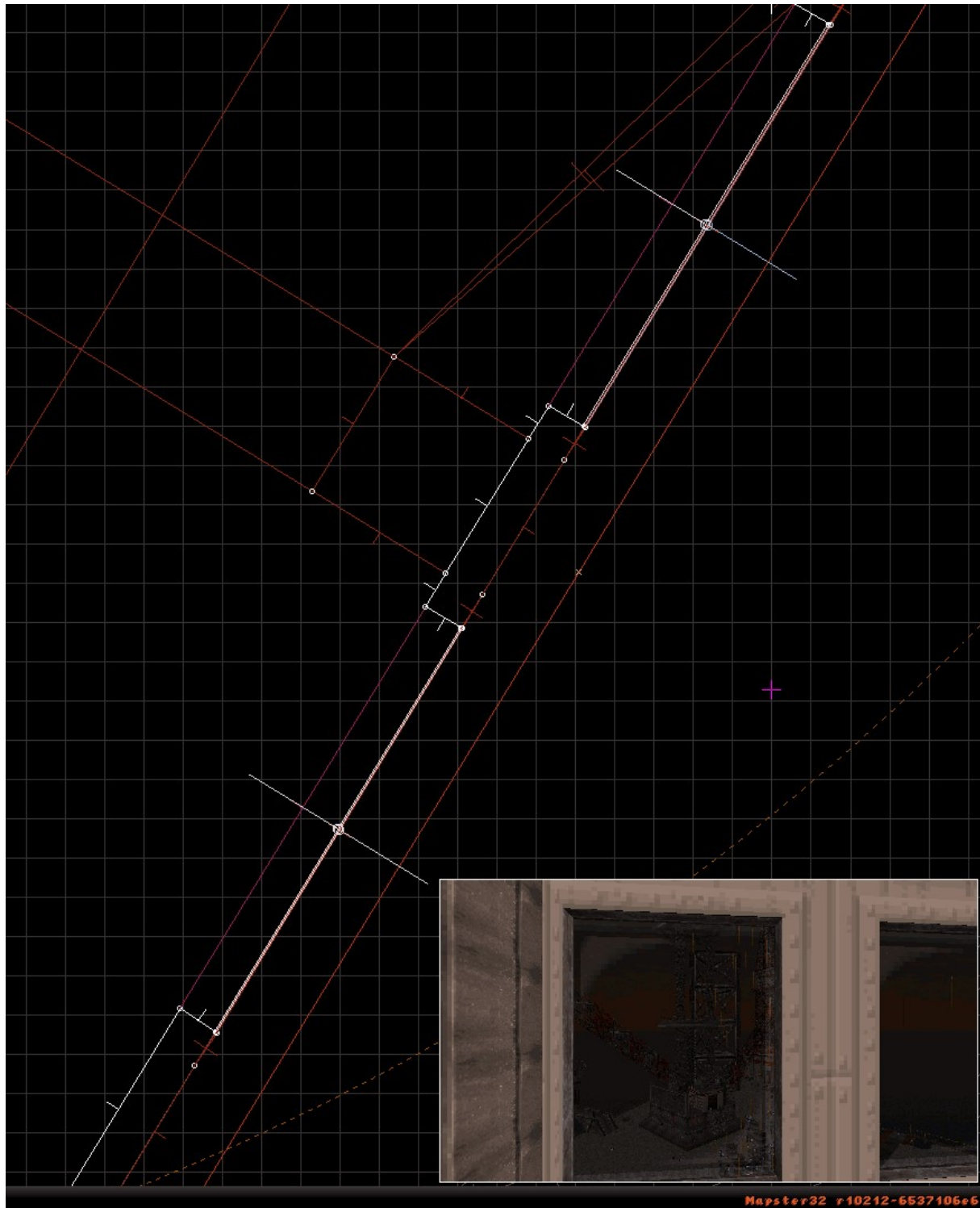
While the construction alone is not so difficult and only requires to follow some basic steps, the actual problem lies in the fact that it is currently recognized as a level 3 map corruption by Mapster and automatically "fixed" upon any manipulation, making it particularly fragile. I have developed a method of mitigating this inconvenience in modern versions of EDuke32 by isolating and copying out a certain, small part of the structure, properly manipulating it in an older build and then carefully copying it back (this is demonstrated in e.g. *Piggish Prison* level of *Back in Business* episode), however this case was more difficult due to additional implementation of TROR. In fact, I basically had to break the TROR connection between the "sky" and "platform" layers before copying back the manipulated geometry with windows, then carefully reconnect it without breaking the construction.

Another parts with fancy geometry are the crane arms, which are made with heavy use of sloped sprites for the top and bottom truss layers. Furthermore, they had to be placed at a proper angle (as seen in the picture to the right) – which was fairly easy to do with the use of free rotation of selected sprites. Now the tricky part was having the cranes rotate along with the central structure, correctly render and be solid so that Duke can traverse them. This was achieved with a long and tiny sector (seen as a red line in the image) that does not *physically contain* all of the sprites that form the crane, which was done with manual (or scripted, to be precise – would be a nightmare without it!) sectnum manipulation to change the owner sector of every sprite. This also ensures that the movement of these sectors does not affect (visually) the floor below it. These two cranes are parts of a large rotating structure, which also includes a door and elevator operating on their own, separately from the rotation itself – but also rotating together with it. This required some counter-intuitive thinking – separating the *sector* from its *walls* or, to be more exact, *vertices*. This is also the first example of the whole level receiving a major facelift after inserting one of the keycards.
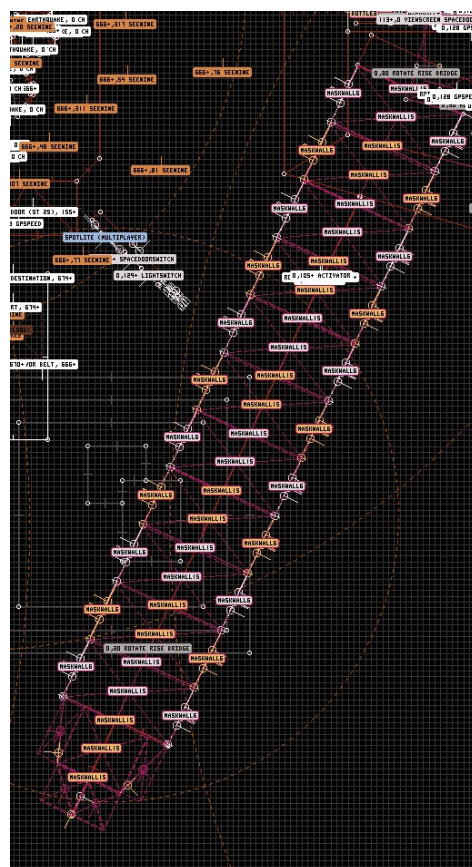
Another two large moving objects in the map are the tug boat and the helicopter. While the boat is pretty simple and contains a lot less details, as it travels the waters outside of the player area, the helicopter plays a vital role in the gameplay and is probably the most satisfying Build vehicle I have created thus far. Its geometry itself is pretty hardcore, playing with parallaxed sky effects, slopes (including sloped sprites), diagonals and unorthodox angles – and all this within pretty constrained regime of working properly with the "subway" effect, allowing it to travel through a designed path. This effect requires that all the sprites which move have to be located in the main subway sector and all the vertices need to "touch" this sector. A particularity related to parallaxed sky is exploited at the front of the helicopter (at the corners of the windshield) to avoid a visual glitch when looking at the helicopter from the layer below it.

Other moving elements that are worth noting are the elevators – particularly the ones below the platform. They seem like fairly simple effects, but were slightly difficult to make due to the need of "locking" Duke from falling below the floor level and getting softlocked while the elevator is going down. This was done with arranging a "dummy" TROR layer just few units below the regular floor and "punching" the main sector's floor through this layer – which is recognized as another map corruption by EDuke32 – during its descent. Then we are just left with a simple task of masking the hole with some water tiles. Another interesting elevator allows the player for a small lift up the main drilling tower – it is operated by a roll and chains on which the platform hangs that "decrease in length" during the ascent – which is a trick (similar to the prison doors I made before in *Piggish Prison* (4th level of *Back in Business*) and *Length Padding* (3rd level of *The Conundrum*), possible by using multiple SE31.
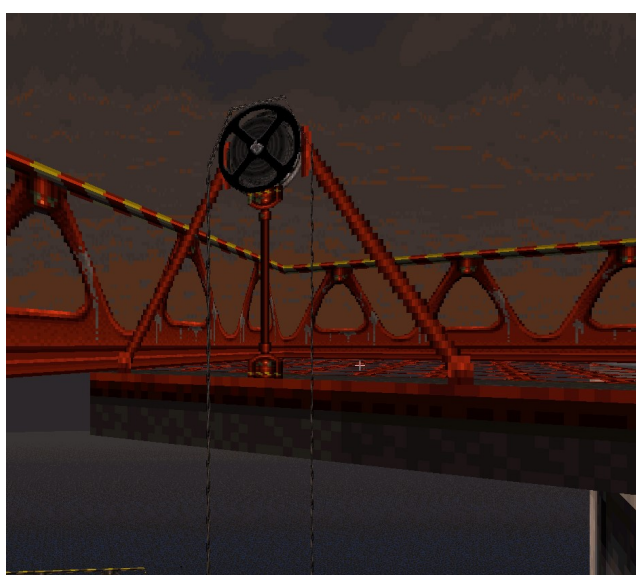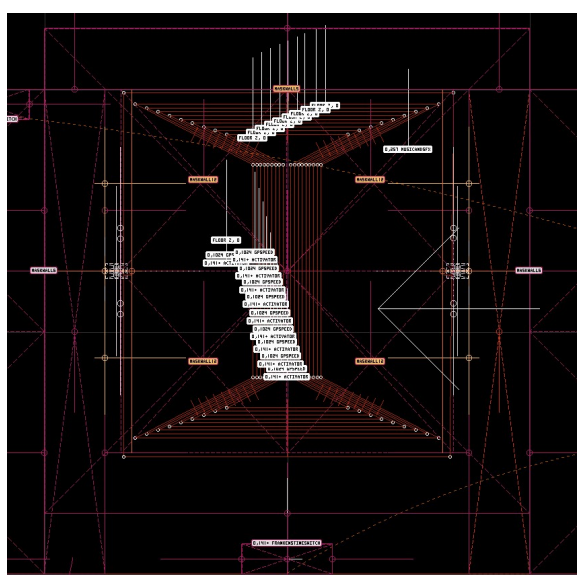
Speaking of doors, while this map barely has any, let's look at the entryway to the super secret. You have to enter it by one of the two roof windows (both can be separately opened

after unlocking them), which will just slide, like on the images below. This is done by using several sandwiched layers of TROR and a conveyor belt that moves the glass panel.

Conveyor belts are also used to spawn the large fires during the *grand finale* – a technique introduced by High Treason/DXZeff and explained in one of his *Mapping Taboo* advanced tutorial videos, with a slight modification from me that allows for a more free distribution of the effect over the level's layout. However, this whole set piece is more remarkable by two other effects – the sky turning into majestic crimson tone and the oil barrels exploding. The first is made possible with the simple SE12 lightswitch effect, paired with the fact that the map consists of several TROR layers, so it is easy to avoid changing the palettes/shades of other

objects. The exploding barrels are made with massive – bordering on the maximum number of simultaneously moving objects – earthquake, an effect which allows to slope a previously unsloped sector (with a side effect of having to move it, which had to be somehow concealed with other major destruction) combined with SE13 explosions. Now the explosion itself – a very late addition to the map – was entirely designed separately, crafting every slight randomness in the timing and positioning of every explosion cell, and then overlaid within the map to compose the effect.

File list – contents of DER_ZORN_GOTTES.GRP

Level

Filename	Description	File size	Last modification
DZG.MAP	User map "Der Zorn Gottes"	482 KB	2023-10-17

Music

Filename	Description	File size	Last modification
VALKYRIES.MID	Level soundtrack: "Ride of the Valkyries" by Richard Wagner	40 KB	2020-12-03
ZARATHUSTRA.MID	Main menu music: "Thus Spake Zarathustra" by Richard Strauss	18 KB	2020-12-03

Sound files

Filename	Description	File size	Last modification
AMAZE.OGG	Custom Duke's line from DNMP	77 KB	2023-10-11
BENEFITS.OGG	Custom Duke's line from DNMP	90 KB	2023-10-11
LASTSTOP.OGG	Custom Duke's line from DNMP	77 KB	2023-10-11
OILRIG.OGG	Custom Duke's line from DNMP	35 KB	2023-10-11
WWO.OGG	Custom Duke's line from DNMP	153 KB	2023-10-11

Data

Filename	Description	File size	Last modification
DEFS.CON	Definitions for sound and tile names, with new sounds added	36 KB	2023-10-11
GAME.CON	Main CON file, altered to fix the warnings and change/add the behavior of some enemies	150 KB	2023-10-14
USER.CON	User CON file, with some basic definitions	43 KB	2023-10-15