



# Doom Games

**Some games that I tinkered with**

Gerph, May 2024



# 0. Introduction



# Introduction

## How I'll do this talk

I'll be talking about Doom, Heretic and Hexen. There are 7 parts to the talk...

1. Leaked Doom
2. Doom+
3. Heretic
4. Hexen
5. One off pressie
6. Hexen (2024)
7. Heretic (2024)



# Introduction

## Who am I?

- I'm Charles, but known as Gerph in most things online.
- I worked on these games, numerous patches and applications back in the day.
- I worked at RISCOS Ltd, and produced RISC OS Select.
- I've written the only other implementation of RISC OS - RISC OS Pyromaniac.
- Began working on Doom in 1997.





# 1. Doom

Early 1997



# Doom

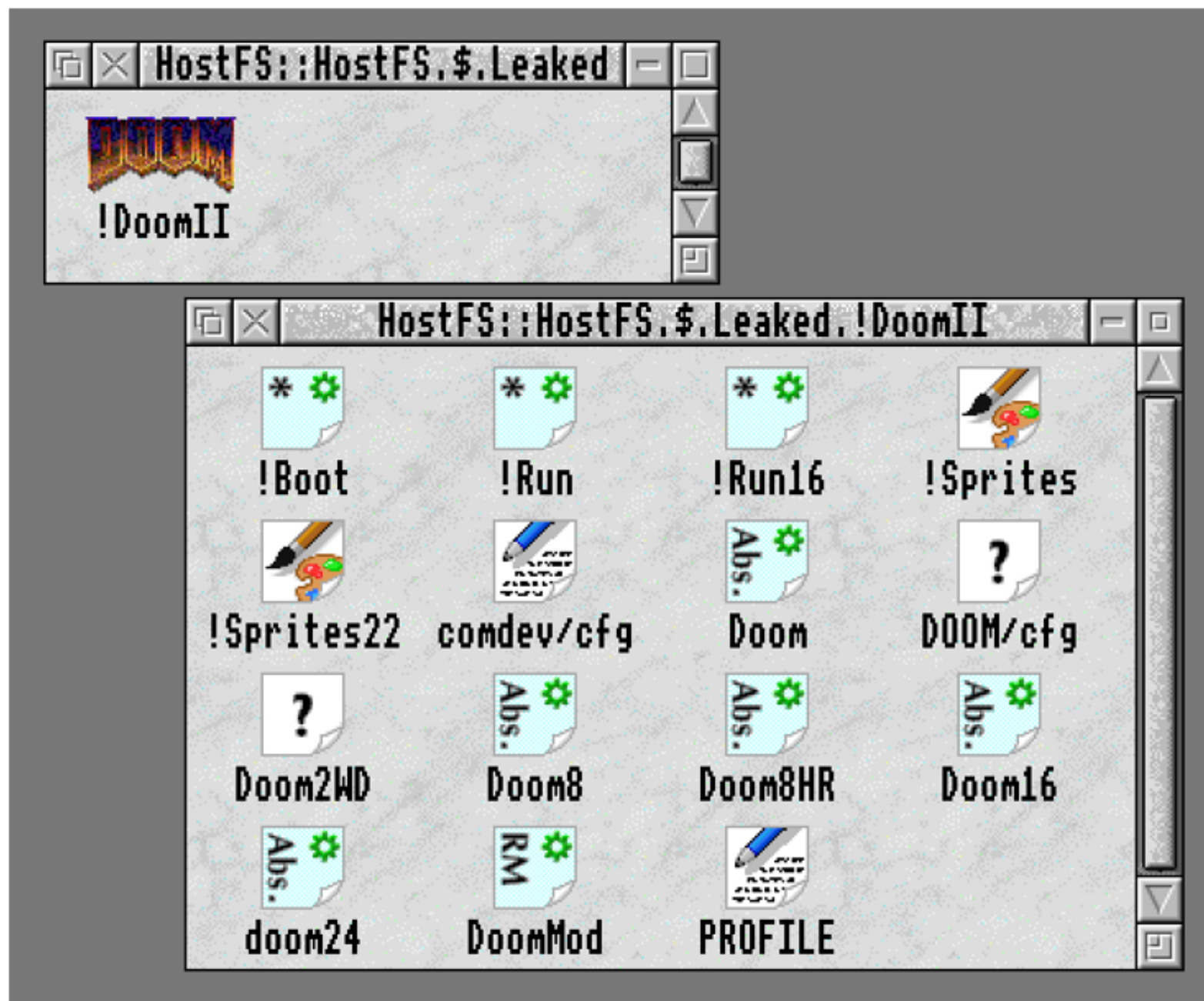
## What is Doom?

- Doom is a first person shooter, by id Software.



# Doom

## Leaked RISC OS Doom

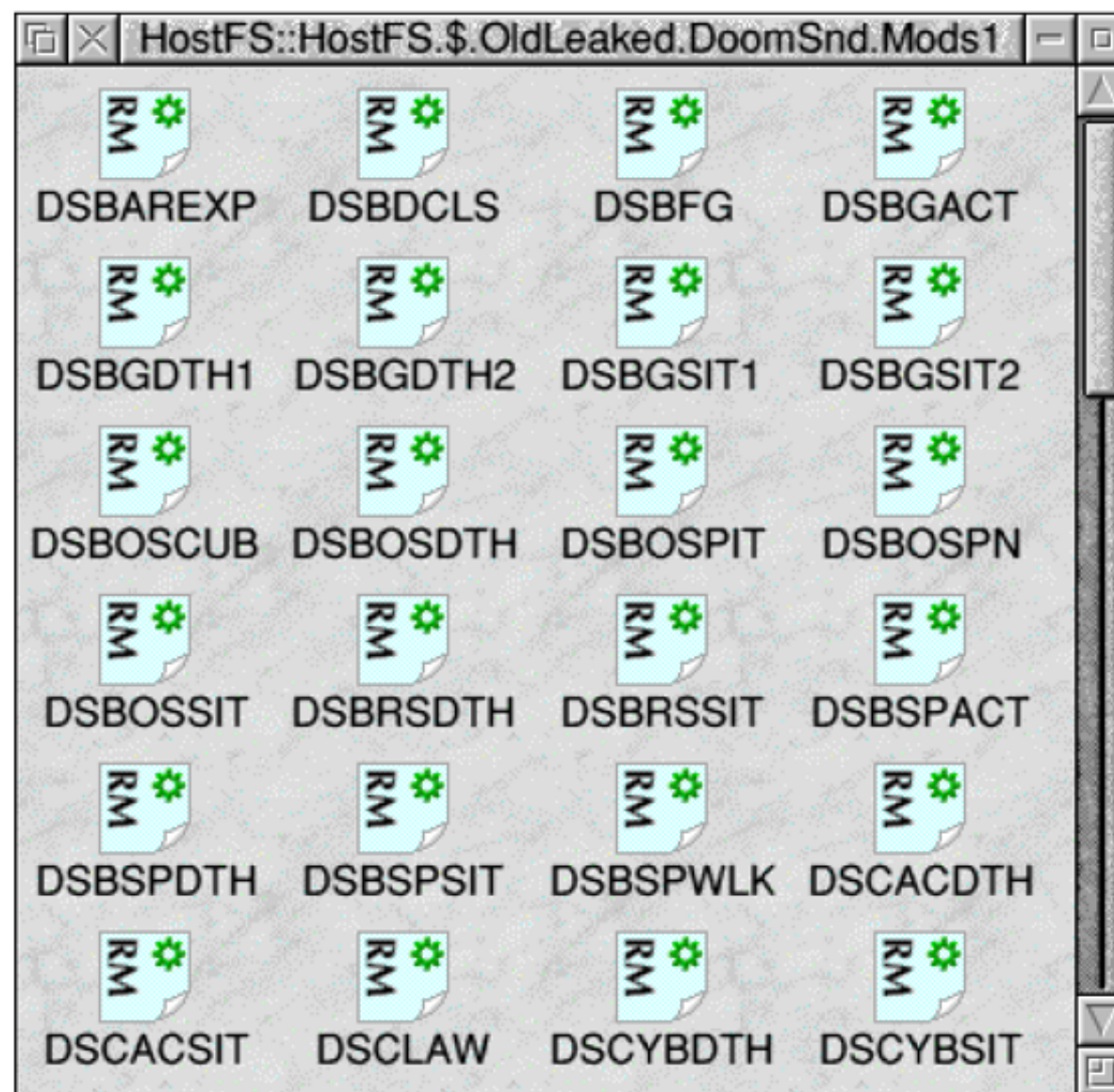


# Doom

## Sound samples



- I created many sound sample modules to play the game's sound.





# Doom

## Networking



- Networking required a separate module to do the communication.
- Initially networking was Econet based.
- Serial and UDP based modules were also created.
- A management tool that could negotiate with other players was created.
- At home, my brothers and I played.
- It was also tested with friends - we organised games over IRC.



# Doom

## DoomWads launcher



# Doom



## R-Comp releases Doom

- R-Comp organised things with Eddie for a proper release, fully licensed.
- I was asked to write proper network drivers - after my final year exams finished.
- I updated the launcher to give it better support for PWADs.





## 2. Doom+

**July 1998 - May 1999**





# Doom+

## What was Doom+? (1)

The goal of Doom+ was to add cool things to the game. But also...

- It got faster.
- It got better PWAD support.
- It got smoothed walls.
- It got an in-game map.
- It got better networking.
- It got fixes.





# Doom+

## What was Doom+? (1)

- Doom+ was meant to add cool things to the game.
- It got faster.
- It got better PWAD support.
- It got smoothed walls.
- It got an-in game map.
- It got better networking.
- It got fixes.
- It got a CD juke box.

In my notes:

*Doom, one of the few Acorn games with a built in CD jukebox.*



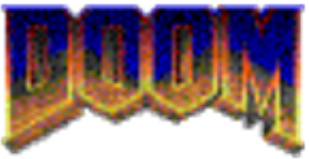
# Doom+



## What was Doom+? (2)

- In-game clock.
- Deathmatch counters for kills.
- Named players in network games.
- Monster and secret counts on screen.
- Translucent fireballs and other effects.
- Bouncing menu titles.





# Doom+

## What was Doom+? (2)

- In-game clock.
- Deathmatch counters for kills.
- Named players in network games.
- Monster and secret counts on screen.
- Translucent fireballs and other effects.
- Bouncing menu titles.

A contemporary note about Acorn...

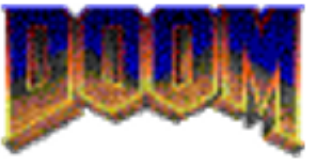
*Lethargy is setting in at the moment. It's so hard to concentrate when you are always wondering what the point is. I know I am continuing on this, but since Acorn isn't Acorn anymore. Well... you get the idea.*





# Doom+

## Release



- Doom+ came second in the Acorn New Service awards for 1999.
- Acorn Arcade's review gave the Doom+ release a rating of 83%.





# 3. Heretic

**October 1998 - February 1999**



# Heretic

## What is Heretic?

- Doom, in a fantasy setting.
- Licensed from Raven software by R-Comp.

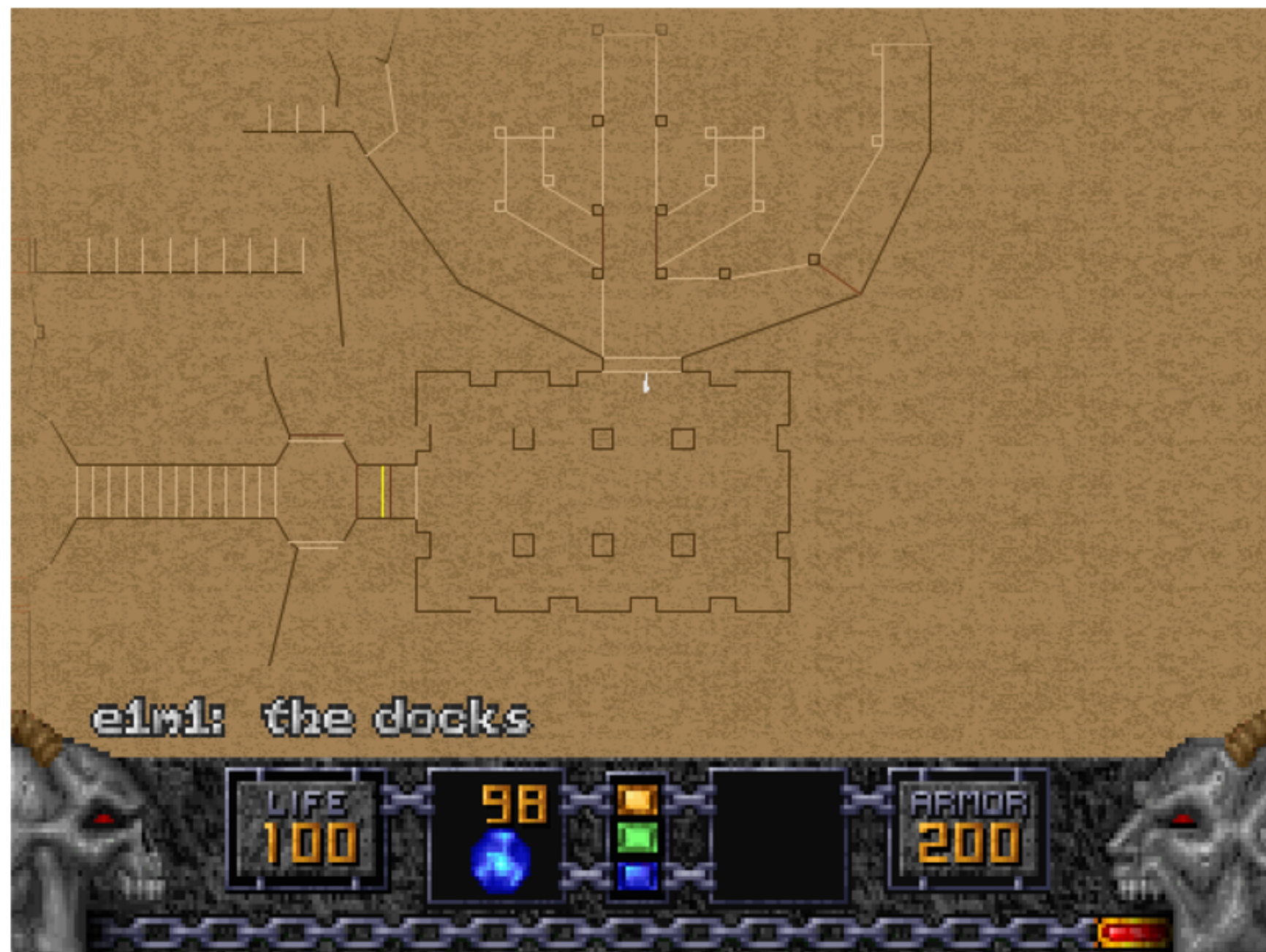


# Heretic Launcher



# Heretic

## New features





# 4. Hexen

**October 1998 - February 1999**



# Hexen

## What is Hexen? (1)

- So much more than Heretic.
- Licensed from Raven Software.



# Hexen

## What is Hexen? (2)





# Hexen

## Development

- Initial work was done at the start of Heretic development - proving it worked.
- Focused on Heretic before returning to Hexen.
- Initial version only got 20 frames per second at 320x200.
- Very slow startup.
- Having learnt a lot from Heretic, Hexen then became easier.
- Lots of optimisations to apply from Doom and Heretic.



# Hexen

## New Features

| *WTF is a PolyObject ?!*



# Hexen

## New Features



| *WTF is a PolyObject ?!*



# Hexen

## New Features



| *WTF is a PolyObject ?!*



# Hexen

## New Features



| *WTF is a PolyObject ?!*



# Hexen

## New Features



| *WTF is a PolyObject ?!*



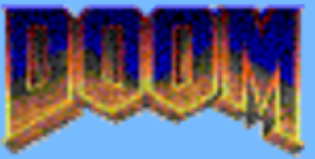
# Heretic and Hexen

## Release



- My notes say a StrongARM got 15.4 FPS at 640x480 in 256 colours.
- Heretic and Hexen were released together in a pack.
- An Acorn Gaming review back in '99, they were given a 5 out of 5 rating.
- An Acorn Arcade review gave the pack an 80% rating.





# 5. One-off pressie

**December 1999**

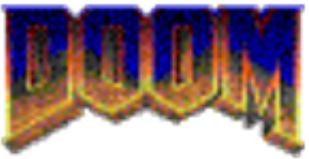




# One-off pressie

## Christmas release

- Only went to a few testers.
- Had falling snowflakes.
- Introduced the jump key.





# 6. Hexen (2024)

**January 2024 - February 2024**



# Hexen (2024)

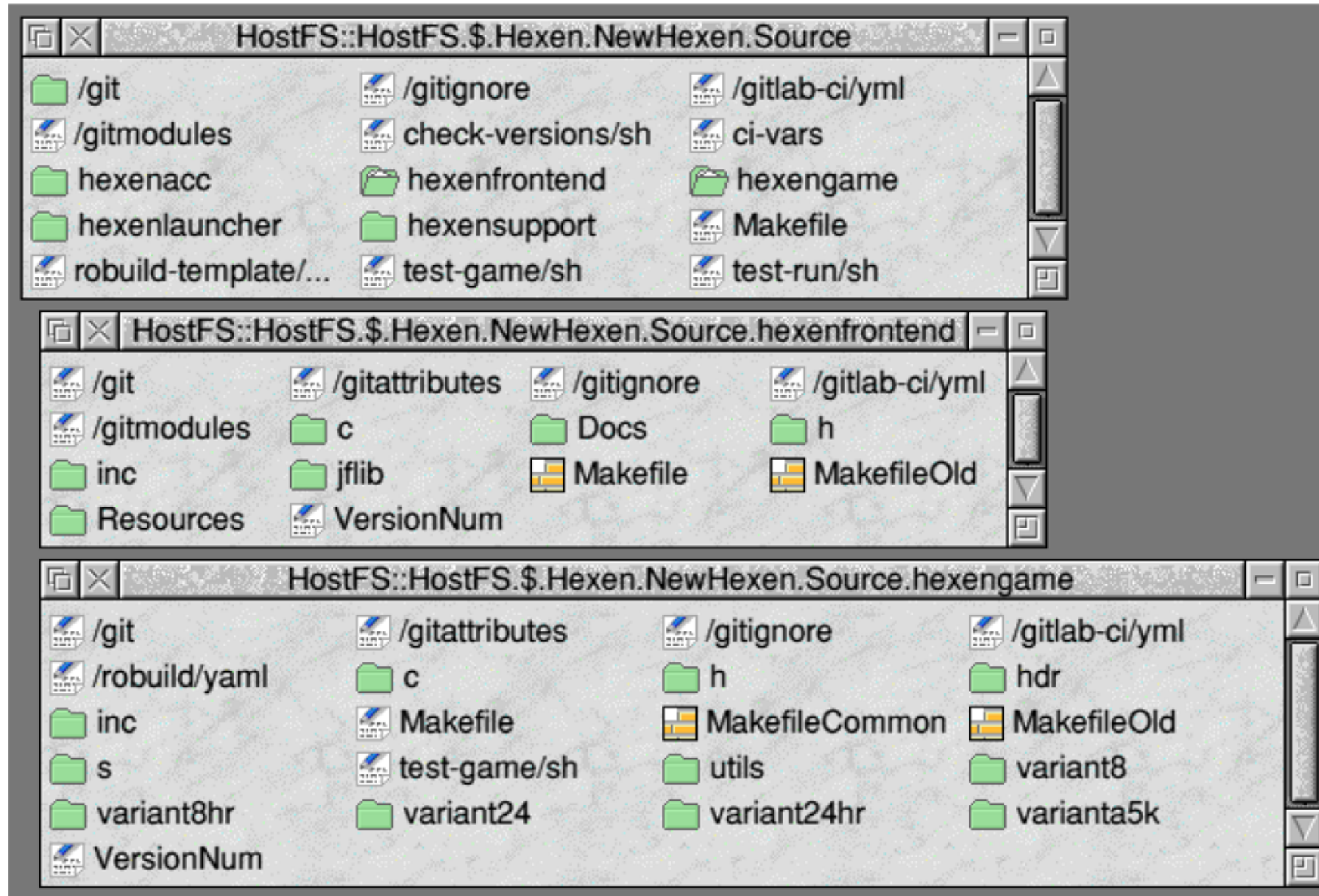
## Why go back to Hexen?

- Returning to things that I've enjoyed is good for my mood.
- A different sort of challenge.
- I actually get to see something concrete that I've achieved!



# Hexen (2024)

## Anatomy of a game





# Hexen (2024)

## Converting to 32bit (1)

- For C code, add `-apcs 3/32` and link with StubsG.
- For assembler, also add `-apcs 3/32` but then the code needs updating.

Instead of:

```
LDMFD fp, {v1-v2, fp, sp, pc}^  
LDMFD sp!, {r0-r4, pc}^  
MOVS pc, lr
```

You use:

```
LDMFD fp, {v1-v2, fp, sp, pc}  
LDMFD sp!, {r4-r5, pc}  
MOV pc, lr
```



# Hexen (2024)

## Converting to 32bit (2)



# Hexen (2024)



## Video limitations

- Low resolution modes might not be available - using sprites allows them to work.
- Low colour depths (like 256 colours) might not be available - using ColourTrans allows them to work.
- VSync events may not work reliably - using the OS\_Byte 19 to wait for the VSync allows that.
- Multiple screen banks might not be available - we can use single buffering.
- Higher resolutions than before are available - Hexen supports up to 8192x8192.
- Widescreen modes (16:9 or 16:10) are possible - Hexen moves weapons around to make them better fit these modes.



# Hexen (2024)

Rock 4 C+ at 1920x1080





# Hexen (2024)

## Fixing the lighting



# Hexen (2024)



## Automated testing

- Builds the whole release on macOS (Front end, game \* 5, module, ACC tool) in about 24 seconds.
- Builds on Linux (two sets of the above release) when pushed to source control in about 2 minutes.
- Tests on Linux by sending to the build service with a WAD file and running like:

```
WimpSlot 4800K
echo Run Hexen with the WAD file
/<Hexen$Dir>.Bin.Hexen8HR -file <Here$Dir>.Hexen/WAD -x 320 -y 256
  -startmessages -fastdemostart -fpsmeter -fpsticker -warp 1 -timer 10s
echo Exited ok
```

- Tests through the build service in different combinations take around 7 minutes.
- Emails are sent to notify me whether it worked or not.





# Hexen Demo!





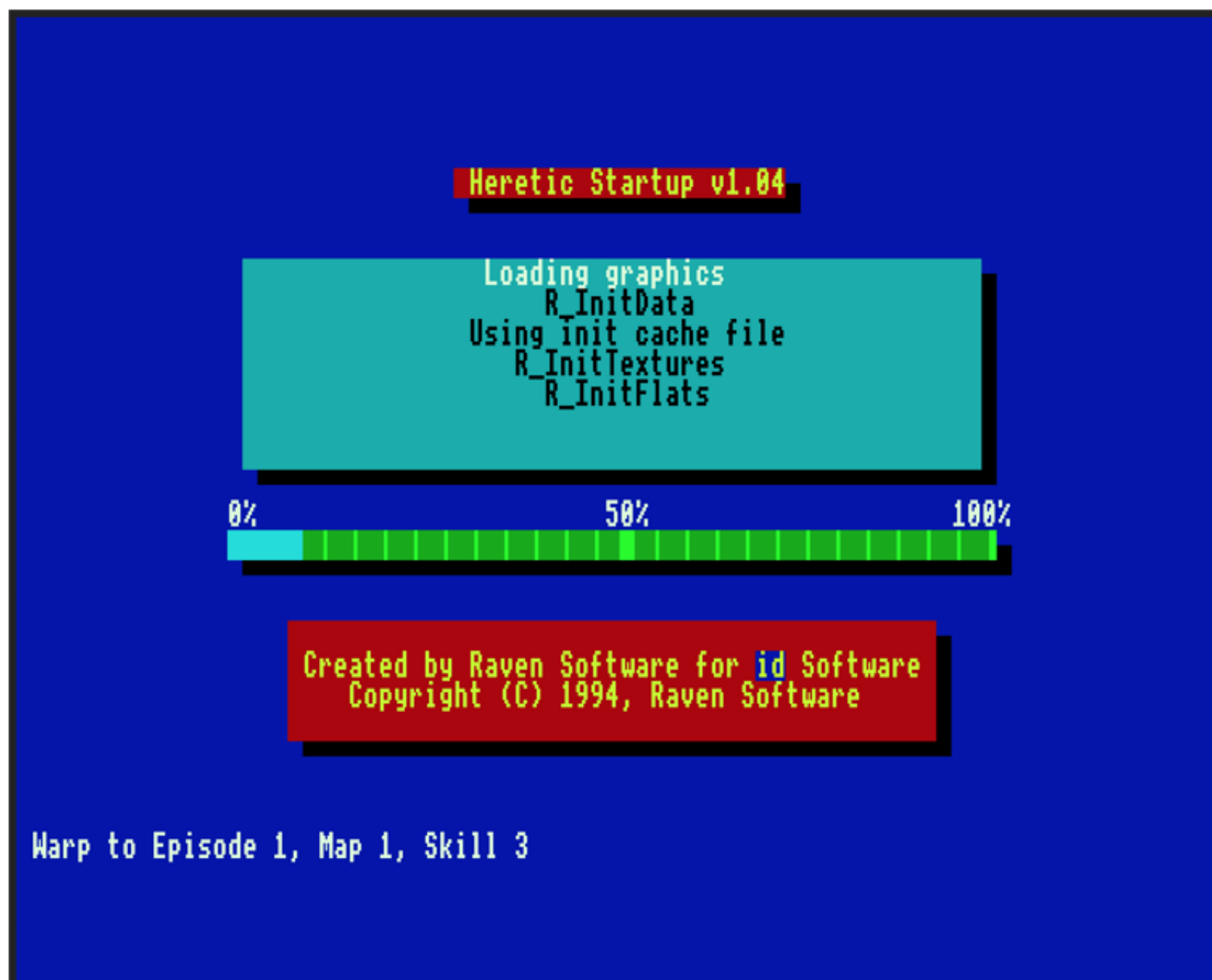
# 8. Heretic (2024)

**February 2024 - April 2024**



# Heretic (2024)

## Converting to 32bit



# Heretic (2024)

## More testing (1)



justin > heretic > heretic\_top > Jobs

All 64 Pending 0 Running 0 Finished 59

Status	Job	Pipeline	Stage	Name	Duration
<span>passed</span>	#25744 Y master -> ae0947a9 riscos	#9138 by	test	test-riscos	00:05:07 4 days ago
<span>passed</span>	#25743 Y master -> ae0947a9 riscos	#9138 by	build	build-riscos	00:01:42 4 days ago
<span>passed</span>	#25731 Y master -> 918de674 riscos	#9130 by	test	test-riscos	00:05:07 5 days ago
<span>passed</span>	#25730 Y master -> 918de674 riscos	#9130 by	build	build-riscos	00:01:53 5 days ago
<span>passed</span>	#25723 Y master -> 578aef29 riscos	#9125 by	test	test-riscos	00:05:10 6 days ago
<span>passed</span>	#25722 Y master -> 578aef29 riscos	#9125 by	build	build-riscos	00:01:44 6 days ago
<span>skipped</span>	#25716 Y master -> fe0f90d4 riscos	#9121 by	test	test-riscos	
<span>failed</span>	#25715 Y master -> fe0f90d4 riscos	#9121 by	build	build-riscos	00:01:15 6 days ago



# Heretic (2024)

## More testing (2)



```
1153 +++ START: Release: BMR
1154 Obtain build client
1155 Obtain shareware WAD file
1156 Create .robuild.yaml file
1157 Zip up the source to send
1158 /builds/justin/heretic/heretic_top
1159 Run on the build service
1160 System: RISC OS Build System version 2.0.143-0.56.4545
1161 Server: Source loaded
1162 Server: Started build
1163 Build: Build tool selected: ROBuild YAML
1164 Output:
1165 Boot Heretic
1166 Load the Support module
1167 Run Heretic with the WAD file
1168
Heretic Startup v1.04 Loading Status
0% 50% 100% Create
d by Raven Software for id Software Copyright (C) 1994, Raven Software
Warp to Episode 1, Map -3, Skill 3 External Wadfiles: <Here$Dir>.Heretic1/WAD
MW_Init: Init menu system.
R_Init: Hereic refresh daemon.Loading raphic
R_InitData
Buildinginitcachefile R_InitTextures
R_InitFlats
R_InitSpriteLumps
R_InitPointToAngle
Building i cache file R_IntTextures
R_InitFlats R_InitSpriteLumps
R_InitPointToAngle R_InitTables R_IntTextures R_InitFlats R_InitSpr
iteLumpsR_InitPointToAngle R_InitTables Plan R_InitFlats R_InitSpriteLumpsR_InitPointToAngle R_InitTables PlanR_InitLightTablesR_Init
SpriteLumpsR_InitPointToAngle R_InitTables PlanR_InitLightTables R_InitSkyMp P_Init: Playloop tate.
Init game engne.
I_Init: Setting up machine state.
S_Init:Initialisingsoundssystem0_CheckNetGame: Checking network game status.
Checking network game status.
SB_Init: Loading patches.
Exited ok
1169 RC: 0
1170 Build: Return code: 0
1171 Server: Build complete
1172 +++ PASSED: Release: BMR
```



# Heretic (2024)

Release







# Heretic Demo!



# 7. Conclusion



# Conclusion

## How did it go?

- It's fun doing the old games.
- Testing with RISC OS Pyromaniac has been very useful.
- I've had a chance to play with modern hardware.

## Where to now?

- Not sure - it's beginning to feel a lot like work.
- Probably get Doom+ finished at some point.



# Conclusion

Finally...

| *How does it feel to be nearly 50 and be revisiting the games you did over 20 years ago?*



# Conclusion

## Finally...

| *How does it feel to be nearly 50 and be revisiting the games you did over 20 years ago?*

- A bit old.
- Some things have faded through disuse.
- Definitely don't have the same energy from back then.
- But in others, experience really helps.
- Things were still very familiar.
- Still fun to do.



# Questions

I'll take any questions that people have.

Slides and Info: <http://presentation.riscos.online/doom-games/>

