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**** IMPOSSIBLE C64 RAYCASTER ****

 64K RAM SYSTEM  138 BYTES FREE

READY.
LOAD"TECH",8,1

SEARCHING FOR TECH
LOADING
READY.
RUN
```

TECH SHEET

FEATURES · SPEED · MEMORY

Impossible C64 Raycaster
October 2026 ● C64 MonsteR
https://c64.monster













> Big: the garden of ruins, under an open sky. Below: the intro's sunset, the open cistern and a warm-lit room of the dungeon, two streets of the city. Every picture in this sheet is a real frame of the game.

"138 bytes free" is no joke: that is all the dungeon has left of its 64 KB.

```
SEARCHING FOR $
LOADING
READY.
LIST

0 "ICRC DEMO DISK" IC 1
6     "ICRC"                PRG
34    "BOOT"                PRG
126   "INTRO"               PRG
135   "TDB"                 PRG
39    "MENU"                PRG
2     "CHAIN2"              PRG
6     "FPLOAD"              PRG
3     "FPC0"                PRG
10    "FPC1"                PRG
3     "FPC2"                PRG
7     "FPC3"                PRG
7     "FPC4"                PRG
7     "FPC5"                PRG
6     "FPC6"                PRG
63    "FPCORE"              PRG
2     "TDBOOT"              PRG
32    "TDBX"                PRG
130   "TD"                  PRG
1     "LOADER BY KRILL"     SEQ
```

> LOAD"$",8 and LIST on the real disk: the files.



> …and when LIST is done: the hero's face.

```
3  --- FEATURES ---
3  "THE INTRO"
4  "THE DUNGEON"
7  "THE CITIES"
9  "THE PICTURE"
10 "THE DISK"
11 "CONTROLS"
```

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12 --- SPEED ---
12 "IN THE DUNGEON"
13 "A WHOLE GAME"
13 "IN THE CITIES"
14 "WHERE TIME GOES"
```

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15 --- MEMORY ---
15 "THE INTRO"
16 "THE DUNGEON"
17 "THE CITY"
17 "THE FLOPPY"
```

The contents: the number in front of each section is its page. Above them, the disk's own directory, as a C64 lists it.

LOAD"FEATURES",8,1

1 FEATURES

What you see, hear and play: on one floppy, on a plain C64.

THE INTRO

A fisherman and the devil sit in a boat at sunset, and talk about making a C64 game. While they talk, the game loads in the background.


> The sea, the gulls.



> Can you help me?



> A C64 Cyberpunk?



> 16 colours, please.



> The devil says no.



> The main villain.



> 7-10 fps, on a C64!



> The devil's answer.

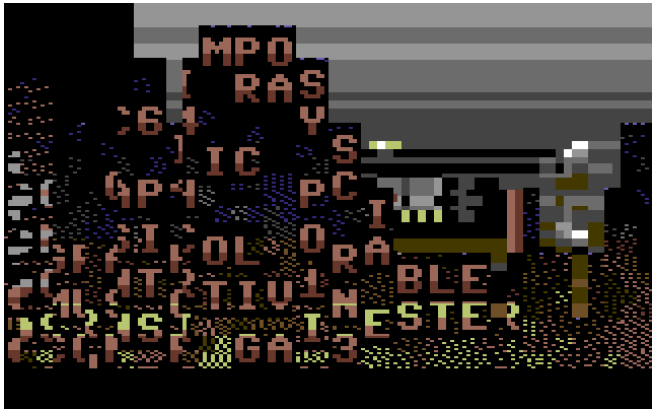
The scene	A boat rocking on the waves, ripples around the floats and the anchor rope, fishing lines that twinkle in the low sun
The gulls	Eight seagulls circling high up, gliding and flapping. The same eight sprites draw the speech bubbles lower down the screen
The talk	21 bubbles in a handwritten font with a little MOS logo, just over two minutes in all
The sound	The sea, the gulls and a song; when the song ends, the sea plays on
Loading	The game loads while you watch. PRESS BUTTON appears as soon as it is ready; if nobody presses, the game goes on by itself
How	Everything runs in raster interrupts timed to the exact CPU cycle: colours change line by line, with not one wrong pixel

THE DUNGEON

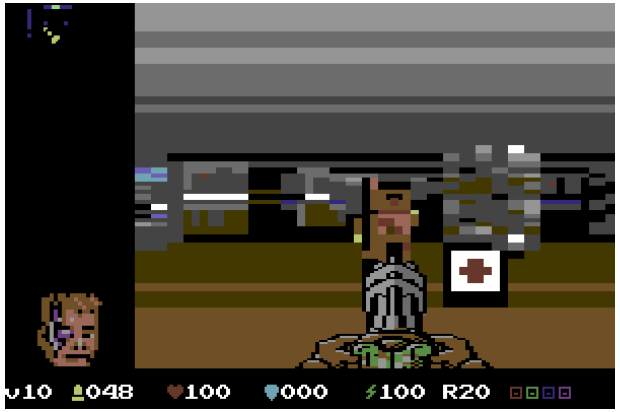
A first-person 3D dungeon in the spirit of Doom: 21 rooms, 35 demons, four keycards and one way out. You turn with the mouse, shoot with the left button and run with SPACE.



> The menu: graphics, music, controls and mouse speed.



> START GAME melts the menu away.

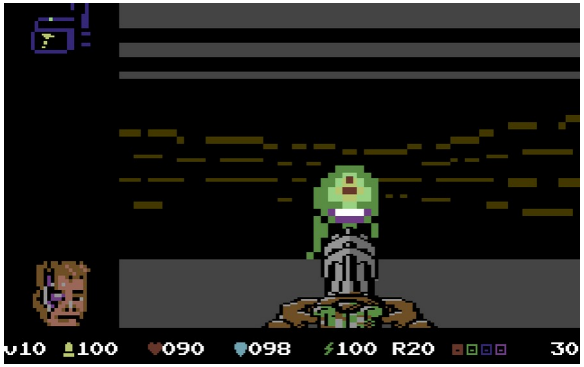


> The lobby: the first imp, and a medkit on the floor.

The view	Full 3D, 32 columns of 8 pixels, a 90° field of view; colour can change every two lines (more under THE PICTURE)
The rooms	21 rooms in one big level of 72 × 63 cells: a lobby, a hell hall, a garden, a nukage plant, an aqueduct and more, each with its own light
Walls and light	33 textures; light fades with distance in four steps; 8 light schemes; ceiling lamps and light switches you can shoot
Doors	32 doors that slide open with a shot. 9 need the right keycard, the EXIT among them; one wall is not really a wall
Teleports	7 pads; step or run onto one and you are somewhere else. One needs the blue keycard
Enemies	35 of them: 11 imps, 13 soldiers and 11 blobs, taking 3, 4 and 5 hits. 20 wait for you; 15 more wake up in groups when you grab a keycard or open the violet door. They chase you, attack and hurt
Items	4 keycards (red, green, blue, violet, flashing), 4 medkits (+25 life), 4 ammo boxes (+100 rounds; a box comes back a minute after you take it), 4 armour (+50)
You	Life 100, armour up to 100, up to 250 rounds, stamina for running. Your face on the bar turns pale when you are hurt and red near the end
The gun	Sprites for the body and hands, the barrels drawn into the picture; they spin when you fire, behind a muzzle flash
Maps	A small map in the corner from the start, with an arrow for you; M opens a big map of the whole level over the game
Music	“Floor It” by Fjaru, with its own small player



> A soldier, up close.



> A blob: it takes five hits.



> Fire: the muzzle flash.



> A soldier steps out.



> A blob in the open cistern.



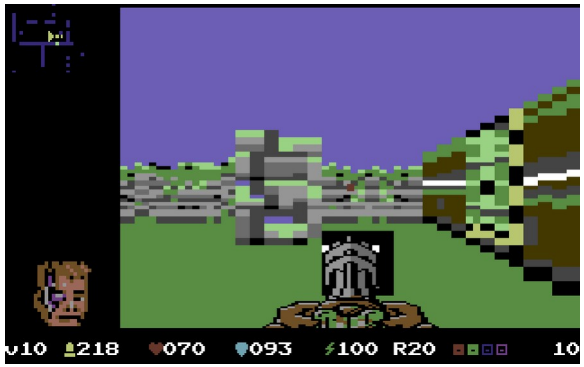
> A blob down the corridor.



> A keycard, flashing.



> Every room has its own light.



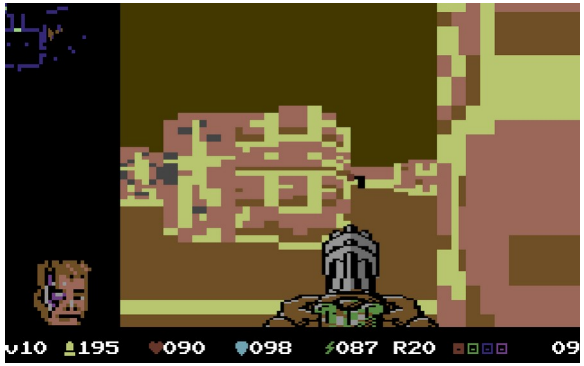
> The garden, under the sky.



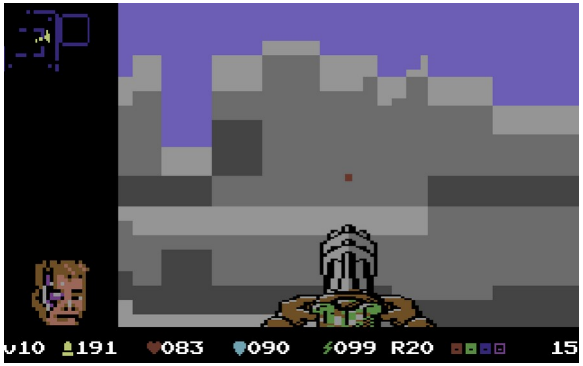
> Water in the aqueduct.



> Bricks: one of 33 textures.



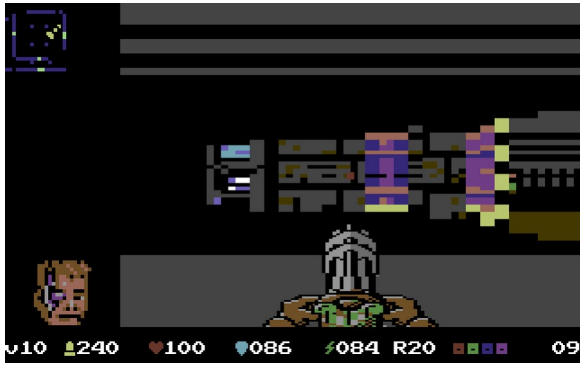
> Another room, another light.



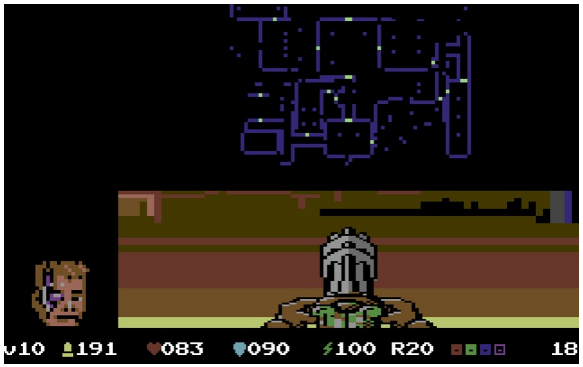
> Teleported to the garden.



> Hell hall, in its red light.



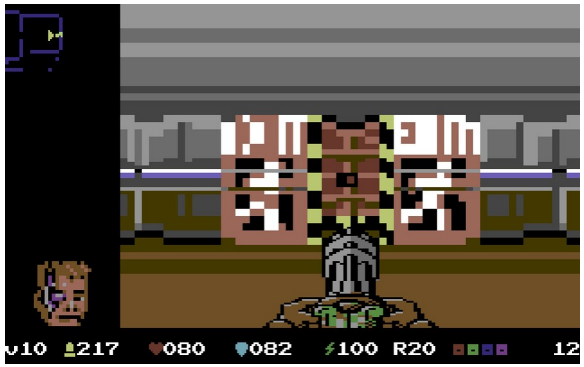
> The gothic keep.



> M: the big map.



> A door slides open.



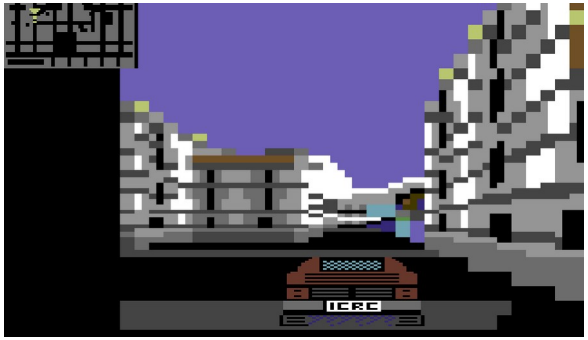
> The way out: the EXIT sign.

THE CITIES

Leave the dungeon through the EXIT and you are in a neon city at the wheel of a car, driving through a whole day and night. Leave the dungeon again and you get a city twice the size.



> ICRC on the number plate.



> Self-driving: hold W.



> 11:54: white houses, clouds.

Two cities	A city of 72 × 63 cells, and a double-size city of 144 × 126 cells: four times the area
The view	Full 3D with 38 colour rows; the horizon sits low, the car rides in front
Buildings	One to nine storeys, 16 kinds of wall; tall towers show over the low houses in front of them
Day and night	A whole day in six minutes: the sky changes in 104 steps, the windows go dark late at night and light up again before dawn
The car	Drawn into the picture, 10 × 5 cells, with working lights; top speed 6.3 cells a second, 0 to 30 in 2.5 s
Self-driving	Hold W and it follows the road; Q or E takes the next street left or right
GPS	Six marks to reach; the status line shows the mark, your split times, the total and the speed. The sixth ends the drive
Music	“Neon Outrun” by C64 MonsteR, D minor, 107 beats a minute



> 14:43: high blocks.



> 16:52: the sky turns.



> 18:11: sunset.



> 20:48: the lights come on.



> 21:39: lit windows.



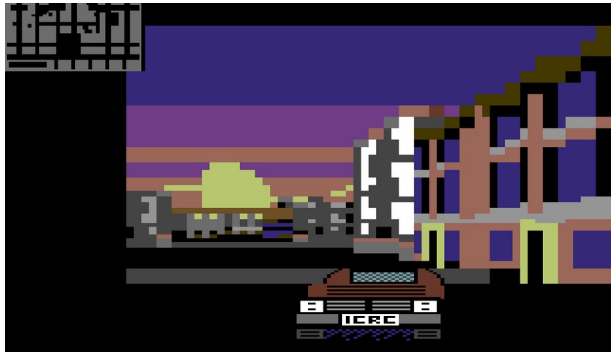
> 23:26: still up.



> 03:28: deep night.



> 05:37: before dawn.



> 06:16: sunrise.



> 08:09: morning.



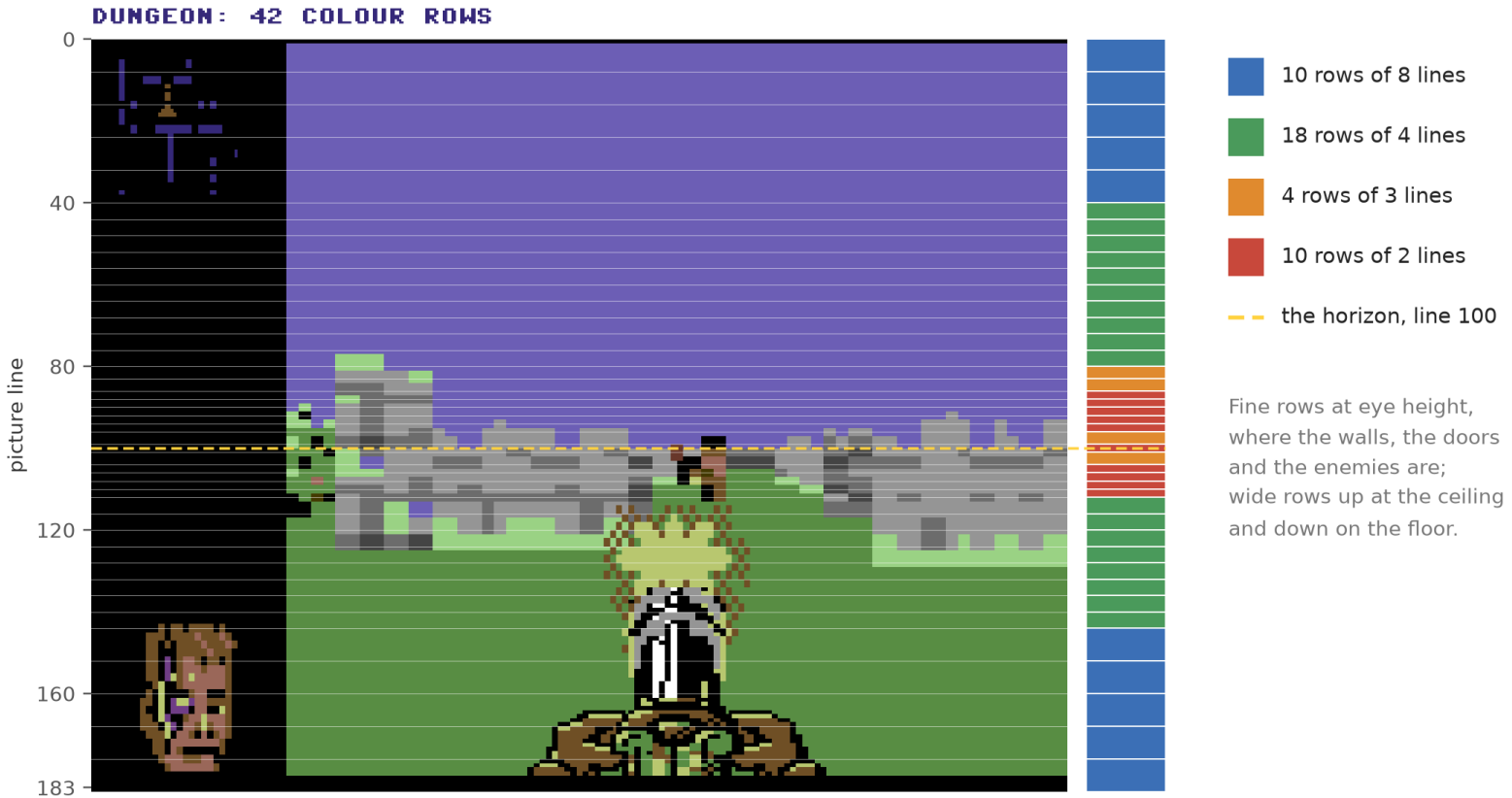
> 12:28: towers behind towers.



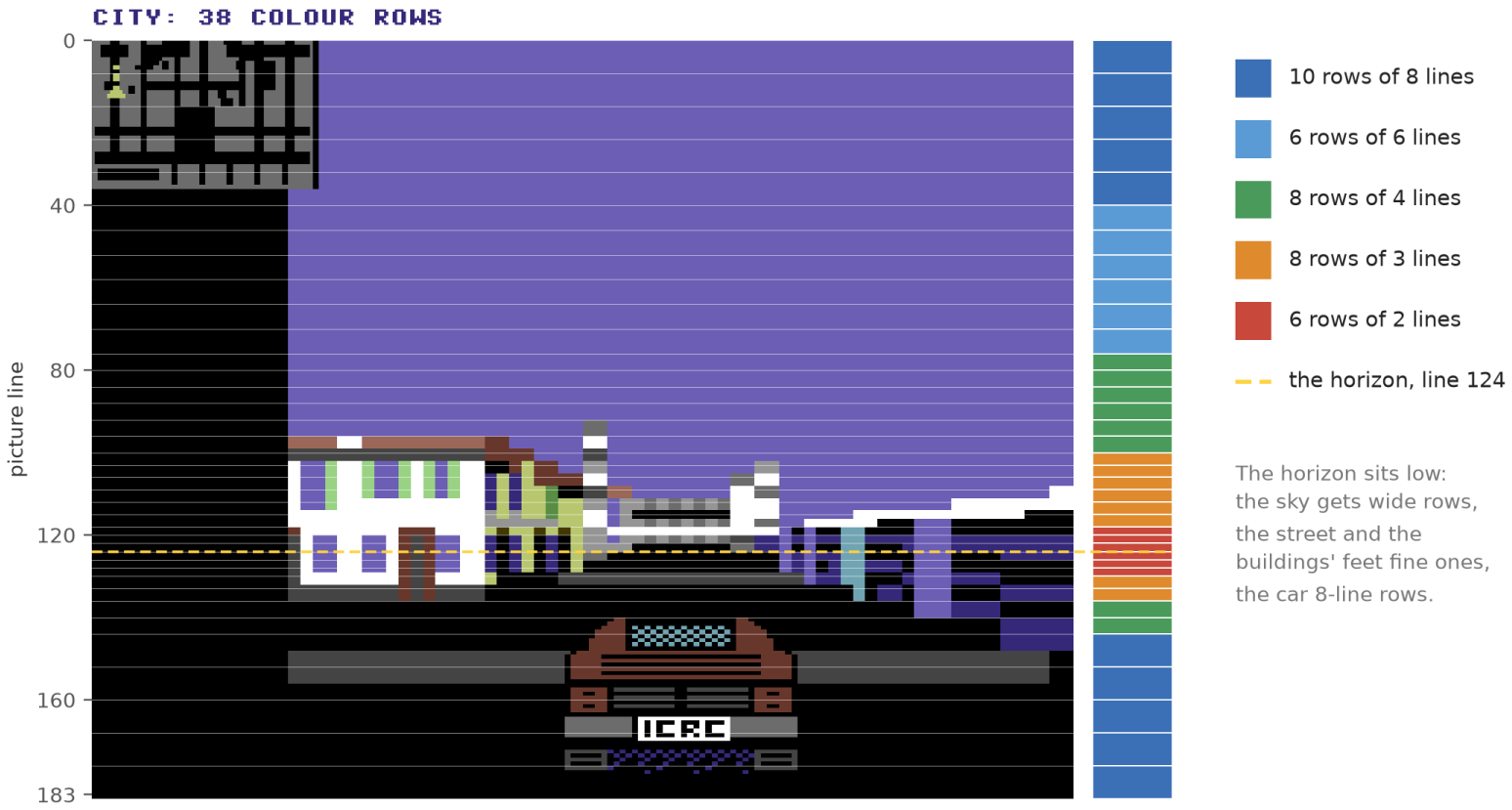
> The double-size city.

THE PICTURE

A normal C64 screen gives each block of 8 × 8 pixels its own few colours. ICRC changes the colours every few lines instead (a trick called FLI), so the 3D view gets fine colour rows where the detail is, at eye height, and wide rows where it isn't. The coloured bar beside each picture shows the rows: the thinner the row, the finer the colour.



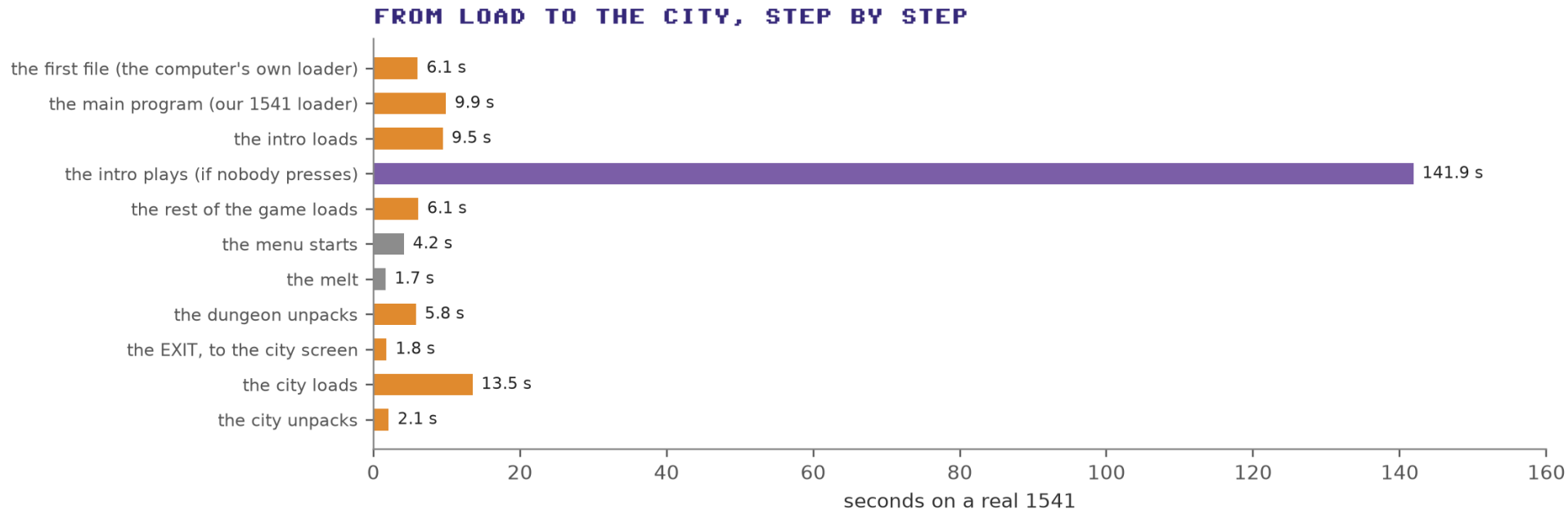
> The dungeon: the 3D view and its colour rows.



> The city: the same idea, the rows placed for the street and the car.

THE DISK

One floppy	Everything fits on one side of a 1541 disk, with 45 blocks to spare; the directory draws the hero's face in PETSCII (page 2)
A quick start	On a 1541 the game sends its own small loader into the drive first: the main program arrives in about 10 seconds
Loading with the lights on	After that Krill's loader takes over: the screen, the music and the sprites keep running while the next part loads, with colour stripes in the border
Any drive	1571, 1581, SD2IEC or JiffyDOS: the same disk still works, with the computer's own loader
Packed	Every part is packed and unpacks itself; the city unpacks in about 2 seconds
The trip	One disk side takes you from the intro to the dungeon, the city, the dungeon again and the double-size city



> From typing LOAD to driving in the city, on a real 1541. The intro plays for as long as nobody presses the button.

CONTROLS

	DUNGEON	CITY
Choose (menu)	CONTROL: 1351 MOUSE, JOYSTICK 2 or KEYBOARD; SENSITIVITY: how fast you turn	—
Move	W S walk, A D step sideways (keyboard: A D turn, Q E step sideways)	W gas, S brake and reverse, A D steer; or the joystick
Turn and fire	Mouse: move to turn, left button fires, right button walks. Joystick: left and right, FIRE. Keyboard: SPACE fires	—
Run	SPACE on and off (keyboard: hold LEFT SHIFT)	—
Self-drive	—	Q / E: the next street left / right
Map	M: off, small, big	M: the mini map
Music	N	N
Shortcuts	T the next room, X leaves, RETURN hides the map, the gun and your face	T to the GPS mark, X leaves, RETURN the clouds and the map, C clouds, L road stripes

LOAD"SPEED",8,1

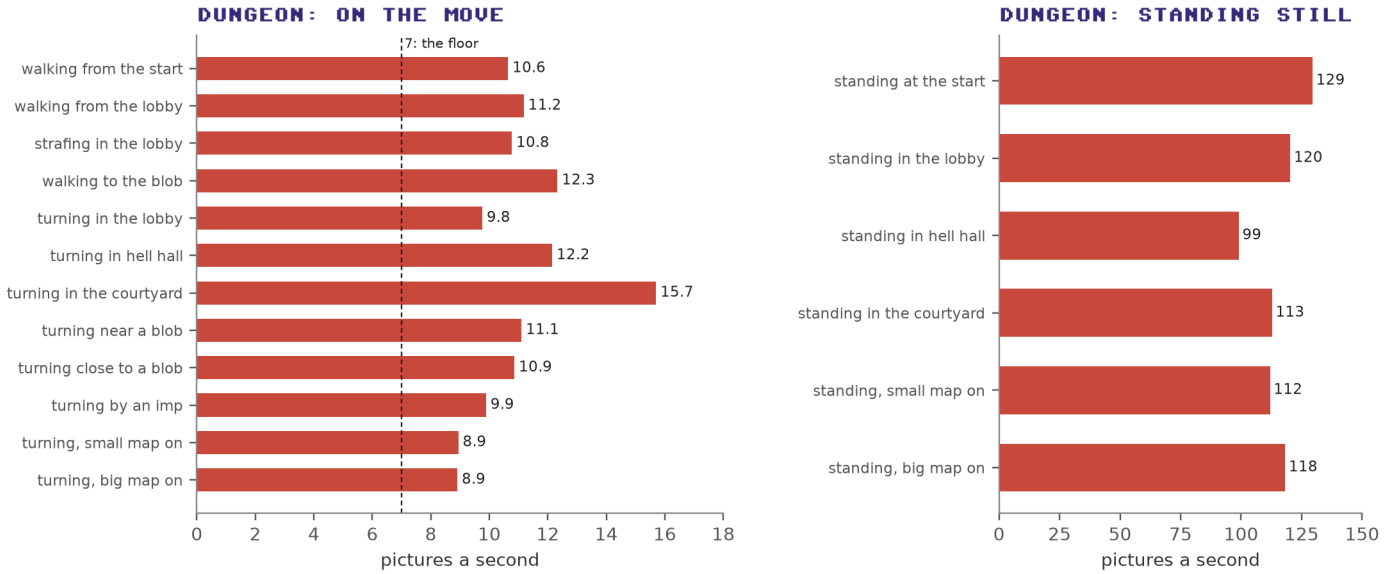
2 SPEED

How many times a second the 3D view is drawn new.

IN THE DUNGEON

A C64 has no graphics card. The 6510 CPU draws every column of the 3D view itself, at about one megahertz. The aim from day one: never fewer than 7 new pictures a second while you move. Standing still is almost free, because a view that doesn't change isn't drawn again.

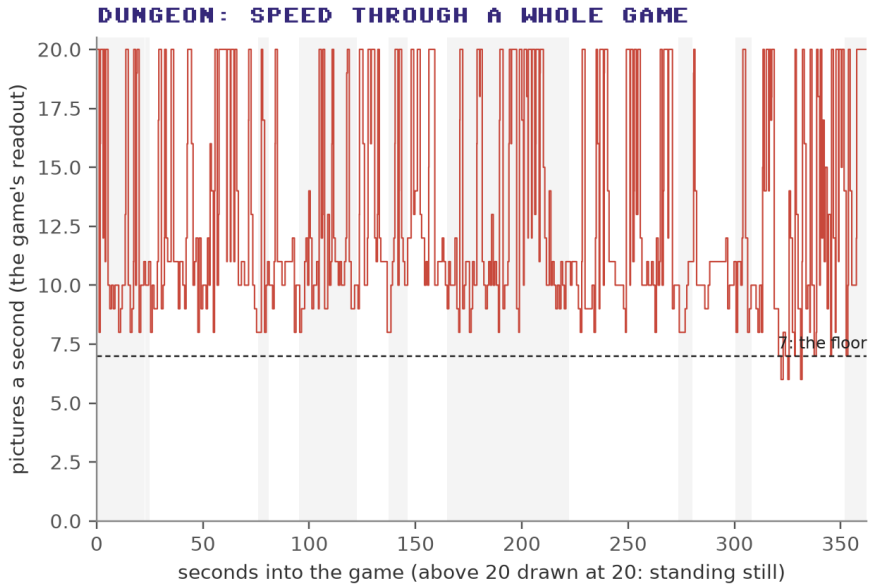
Walking	10.6 to 12.3 pictures a second
Turning	9.8 to 15.7; turning redraws the whole view every time, so this is the hard test
With a map open	8.9
Standing still	99 to 129

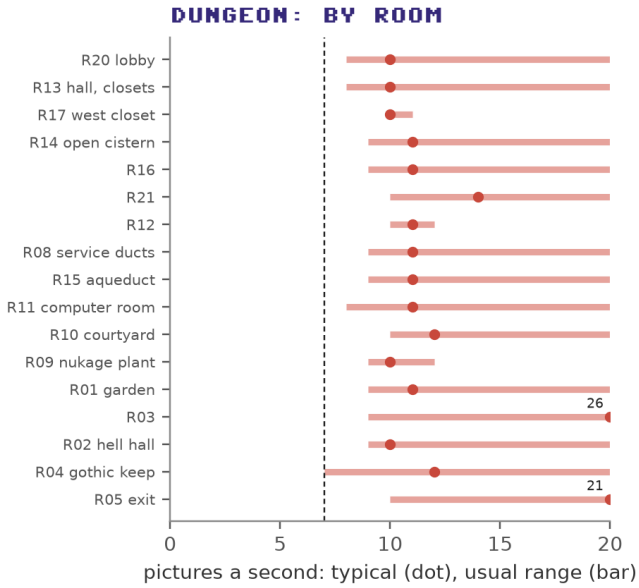


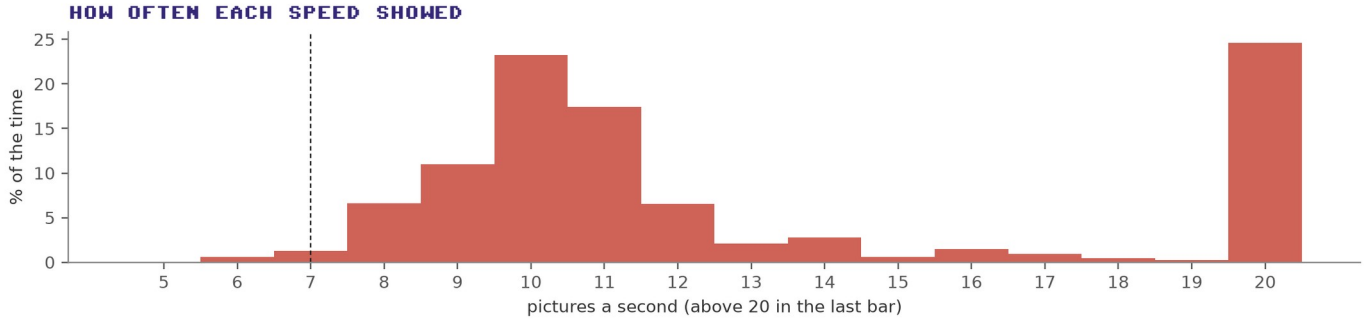
> The dungeon at different places, moving and standing. The dashed line is 7.

A WHOLE GAME

The dungeon shows its own speed on the status bar. Over a whole game, all 35 demons and the EXIT in six minutes, it read **11 pictures a second** most of the time, and below 7 for only **0.6 %** of it, never below 6. The tall spikes are the moments you stop: standing still costs almost nothing.





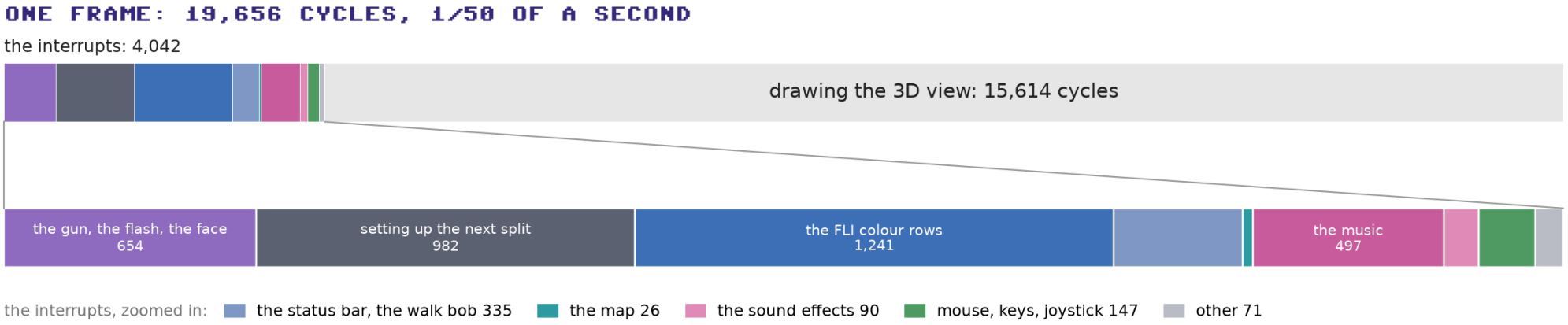


IN THE CITIES

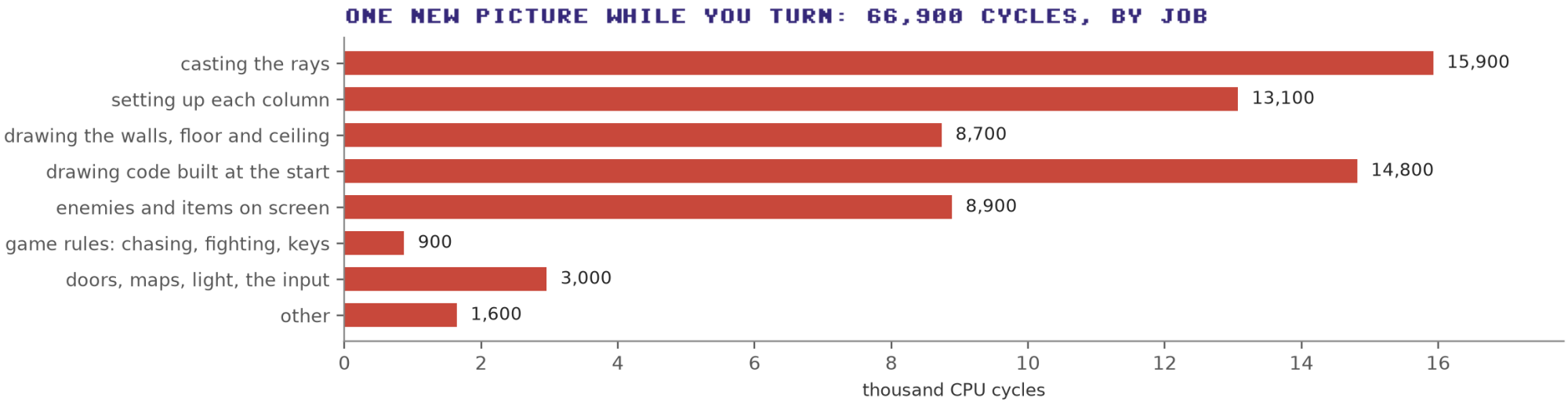
The city	Driving about 9.5 pictures a second, steering 13.6, turning on the spot 8.5, standing about 230
The double-size city	Driving about 9.6, steering 9.6, turning on the spot 8.3, standing about 230

WHERE THE TIME GOES

The C64 shows 50 frames a second, and each frame gives the CPU 19,656 cycles. The interrupts that build the colour rows, the bar and the sound come first, every frame: about 4,000 cycles. The rest, about 15,600, goes to drawing. One new picture while you turn costs about 67,000 cycles, so it takes four to five frames; a picture that changes less is cheaper (on average 56,000 cycles for a new view, 35,000 when most of it stays).



> A frame: the interrupts first, the rest of it for drawing.



> One new picture while you turn, by what the CPU is doing.

LOAD"MEMORY",8,1

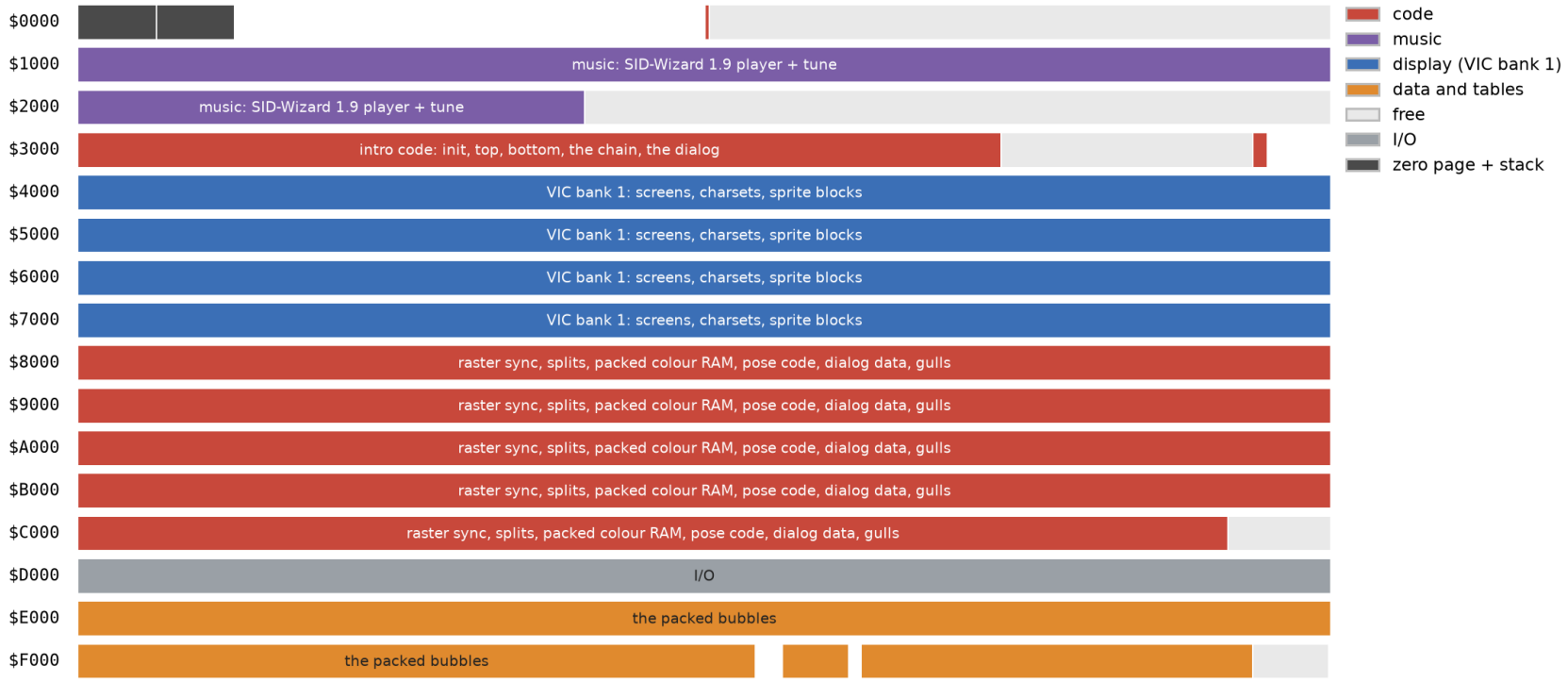
3 MEMORY

Everything in 64 KB.

THE MEMORY MAPS

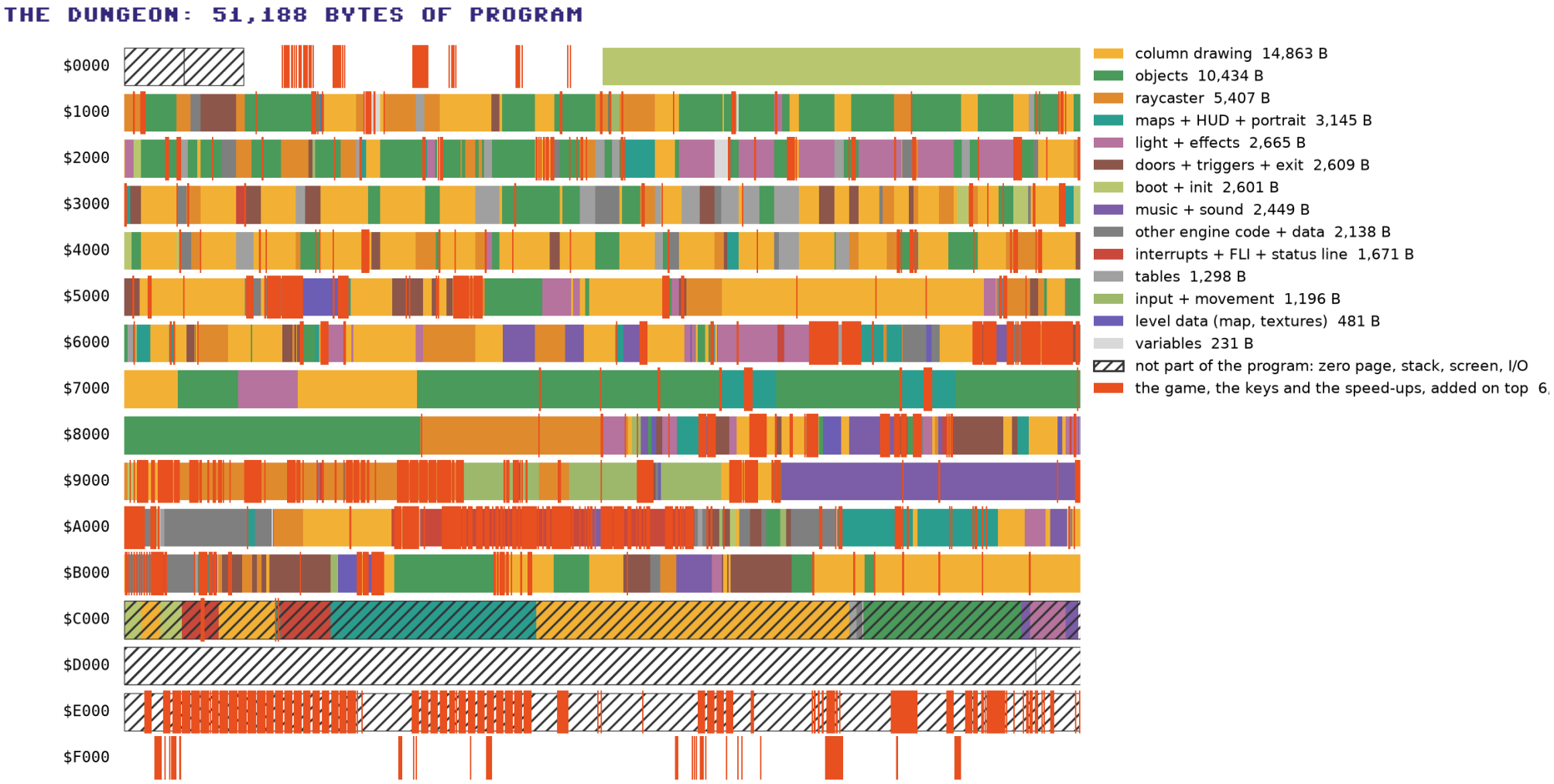
A C64 has 65,536 bytes. Each map shows them as 16 rows of 4 KB, coloured by what lives there. Each part of the game has the whole machine to itself while it runs, and loads the next part when it is done.

THE INTRO: 16 ROWS OF 4 KB

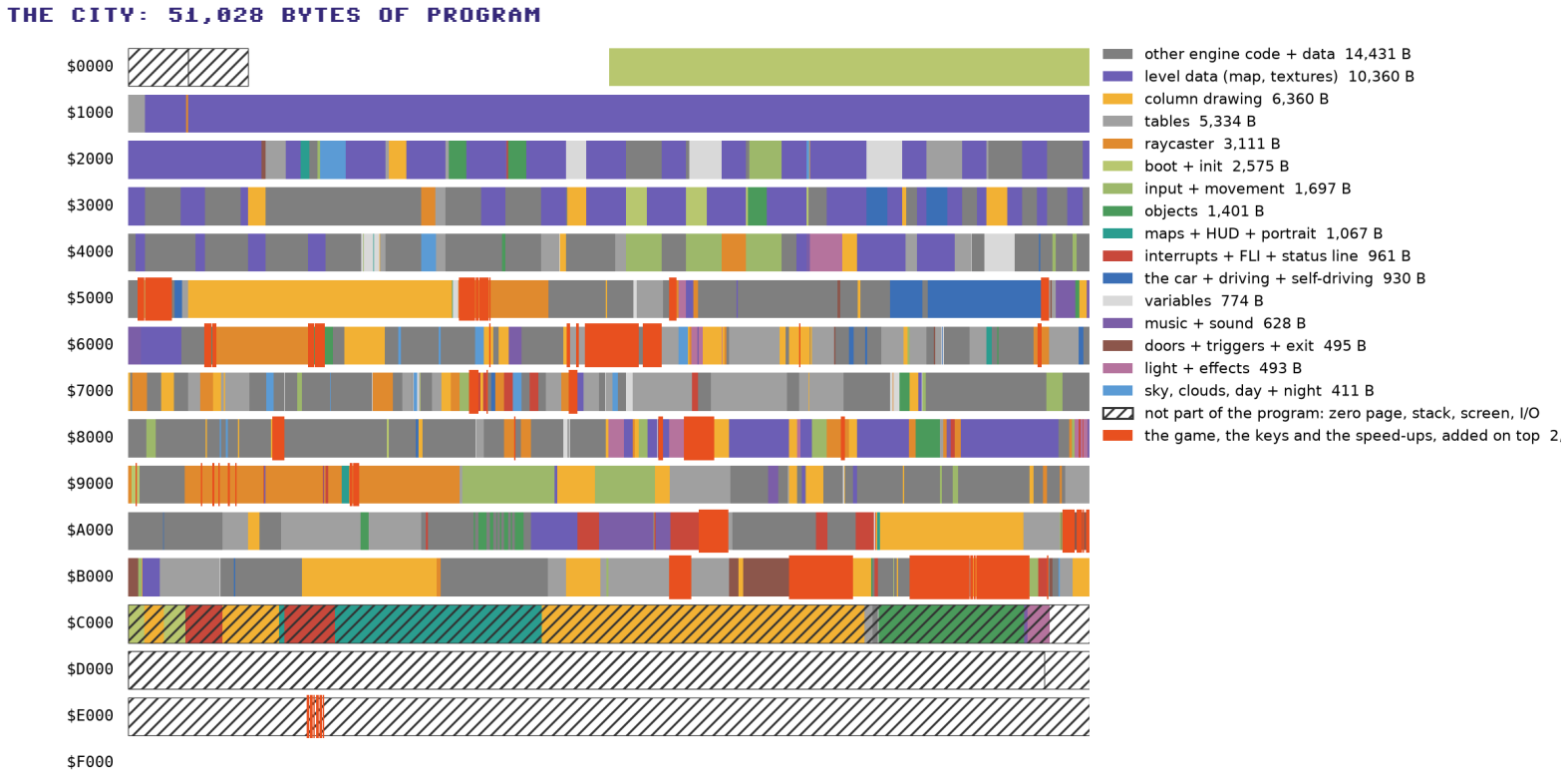


> The intro: the music low, the screens in the middle, the speech bubbles packed at the top.

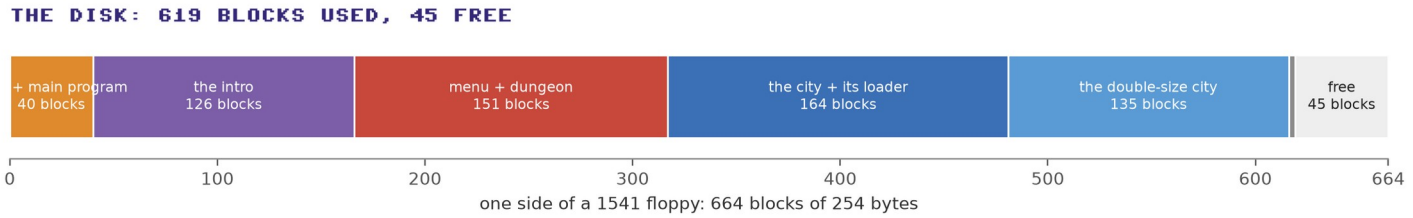
The dungeon is a 51,188-byte program. Its screens and picture use the top of memory, the drawing code fills the rest, and after the game, the keys and the speed-ups (in orange) have found their places, 138 bytes are left. Packed together with the menu and the music it is 36,325 bytes on the disk.



The city is a 51,028-byte program: a fifth of it is the city's own map and textures. About 2 KB are still free, in the double-size city 2.5 KB.



> The city, 16 rows of 4 KB.



> The floppy: 19 files in 619 blocks, the rest of the 664 free.

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