



HoverCAD

User's Manual

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Introduction

HoverCAD is the editor used to design HoverRace tracks. This program is the same that was used by GrokkSoft's engineers to design the original HoverRace tracks.

This manual is more a course than a reference manual. There are very few things that you must know to build a track, but these things are very important.

The Course

Starting HoverCAD

In the Windows **Start** menu select the **Programs** option. From there you should see the **HoverRace** folder. The **HoverCAD** program is in that folder. Just click on the **HoverCAD** icon and the program will be launched.

Loading the example track

Files loaded by the HoverCAD program have ".tr" extensions. These files are normally stored in the "...\HoverRace\track_source" directory.

We have included the source file of the "The Alley2" file with the HoverRace package. You will now load this file in HoverCAD. This file will be used for the remainder of the course. It is also a good file to start your own track design.

To load the track, use the menu option **File|Open**. Then go to the "track_source" directory. In that directory, you should see the file "The Alley2.trk". Select the file and click on open. You should now see the Alley track on your screen.

If you have already played this track, then you should recognize its shape. It is also highly recommended that you have tried the game before making a track.

Track components

The track is composed of nodes, sections, anchors, 3D features, walls, objects and starting positions.

Sections are the polygons that you see on the canvas. A track is composed of a set of adjacent *sections*. A section is a 3D polygon having a floor level and a ceiling level. Hovers can only move inside sections, and *sections* are always seen from inside (because hovercrafts circulate inside sections.)

By default, only the edge of sections is drawn. But when a section has been selected, then it is represented by a filled-gray polygon.

3D Features are used to create solid polygonal shapes inside sections. In the alley there is only one *feature*: it is the rail that bridges over the water. You should be careful by using *features* because they can not be optimized at drawing time. Features are always seen from outside because the hovercraft can not enter a feature.

3D Features are represented by yellow polygons in the CAD. When they are selected, they become brighter.

Nodes are the red dots that you see on the screen. *Nodes* are used to create *section's* and *3D feature's* vertices (vertices = plural of vertex) are the corners of a polygon). By default, *nodes* are of a dark red color. When they are selected, they are colored with a brighter red.

Anchors are the blue pie slices that attach *sections* and *3D features* to *nodes*. When selected, *anchors* become brighter.

Walls exist and they can be selected, but they are not clearly identifiable in the current version of HoverCAD. There is a *wall* for each side of a *section*, or for each side of a *3D feature*. *Walls* only have one visible face when they are rendered. For *sections walls*, the visible face is the one that is visible from inside the *section*. For *3D features*, the visible face is the one visible from the outside of the *feature*.

A *wall* is in the selected state when the *anchors* at both of its ends are selected.

When two *sections* share a same side, they do not share the same *walls*. For the shared side, each section has its own wall.

Starting positions and *objects* look the same on the editor canvas. They are both represented by green dots that become brighter when selected.

Presently, there are only 3 kinds of *objects* that you can add to the track. They are "Finish Line", "Fuel Zones" and "Speed zones". These are area objects... They are not visible on the track, but they have an effect when you enter the *section* where they are located.

Interface components

The tools

The tools are the buttons located on the left side of the interface. Tools let you select the way you will manipulate the items on the canvas. Each mode has its corresponding cursor shape.

The *selection tool* lets you select items on the canvas. This tool has two operational modes. The first mode is called pointing. To use that mode, just point on a node or an anchor and click on the left mouse button. That will select the pointed item.

The second mode is called "Region Selection". To use that mode, simply draw a rectangular area by dragging the mouse while holding the left mouse button down. What is inside the created region becomes selected.

The "selection tool" lets you do multiple selections with the help of the SHIFT key. Keep the Shift key pressed while selecting, and the new selection will be added to the previous selection.

The "hammer tool" lets you attach, detach and move nodes. Click on a node and keep the mouse button pressed, and then you can drag that node. If you drag the node on to another node, the two nodes will merge in a single node.

You can also drag anchors in that mode. If you drag an anchor, the anchor will be detached from its original node. You can then drag the anchor where you want.

The "hand tool" lets you drag a selection. Click on the selected object and then move it to the desired position while keeping the mouse button pressed.

The "section creation tool" lets you create new sections. Each time you click on the mouse, a new node is created. When you click on the first node of the sequence, the shape is closed and the new section is created.

If you create nodes at a position where a node already exist, the 2 nodes automatically merge.

The "3D features tool" works exactly the same way at the "section creation tool" except that it creates 3D features.

The "starting position and object creator tool" is used to create new starting positions or objects. Click at the position where you want to create a new starting position or a new object, and a new green dot will be added. The attributes of these green dots can be changed with the help of the properties editor.

"Node path" tool. This helper tool is not available yet.

"Cut selection" button. By pressing on this button, you delete the selection. This is equivalent to the DEL key.

"Split wall" button. This button is used to insert a node to an existing section or 3D feature. This function works if only one wall is selected.

"Zoom slider". This slider lets you resize the canvas image. It does not affect the track size. It just change the way the track is displayed in HoverCAD.

The Properties Editors

The "properties editors" are located on the right side of the screen. The first set of attributes let you change the attributes of the selection. The second set of attributes let you modify attributes that are global to a track.

Depending on what is selected on the canvas, some attributes may not be available. When they are not, the attributes edition boxes appear gray.

Usually, the properties editing box contains the current attribute value of the selected item. When several items are selected, some properties edition boxes may remain blank. This means that not all the selected items have the same value for the corresponding attribute. Even if the properties box is blank you can select a new attribute value for the selection.

All the measurements displayed in these fields are in meters. A meter is approximately equal to a yard (39 inches, to be exact). 1 km is equivalent to 1000m (approx. 0.6 miles).

Fields that you will find in the properties editors are:

Wall Texture:

Lets you change the texture of selected walls.

Ceiling Texture:

Lets you change the ceiling texture of selected sections or 3D features.

Floor Texture:

Lets you change the floor texture of selected sections or 3D features.

Ceiling Level:

Absolute ceiling level (in meters) of selected sections and 3D features.

Floor Level:

Absolute floor level (in meters) of selected sections and 3D features.

X:

Absolute X position (in meters) of selected nodes, starting positions, or objects.

Y:

Absolute Y position (in meters) of selected nodes, starting positions or objects.

Z:

Elevation (in meters) of selected starting positions or objects. This position is relative to the floor level of the sections where they are located.

Angle:

Orientation of the selected starting positions or objects. The value of this field must be in the range from 0 to 360 degrees.

Item type:

Use this box to assign a type to a selected green dot.

Background image:

Let you assign a background image to the track. You can not assign just any image to the background of a track. See the "Background image" section for more information.

Track description:

Textual description associated to the track.

Compiling a track

Once you have designed your track in the hoverCAD, you must compile the track to be able to use it. Use the **File Compile** menu option (**F7**) to compile a track. You will be asked to provide a name and a directory location for the compiled track. Always save your created tracks in the "HoverRace/Tracks" directory to be able to use them.

When you press on the SAVE button, a DOS box will appear and you should see the output of compiling process appearing in it. Once compilation is finished, this box will automatically close (should take less than a minute on most computers).

It is also highly suggested to often compile and try your track while designing it.

Rules and limitations

- Sections and 3D features must have a convex shape.

If you do not use convex shapes you may see rendering errors, or your Hovercraft may get stuck when hitting a wall or when crossing the boundary between 2 sections.

- Sections must be kept small.

If you use sections that are too large, your Hovercraft may get stuck when hitting a wall or when crossing the boundary between 2 sections.

- 3D features must be totally enclosed within a single section

Background image specifications

The background image must be a PCX image (version 5) having between 17 and 128 colors. The image must have a resolution of 2048x256.