Rend386 for the PowerPC

Rend386 for the PowerPC is a 3-D polygon rendering package based on **REND386**, written by Dave Stampe and Bernie Roehl. I converted REND386 to run on the Macintosh PowerPC so that we could enjoy some of the worlds created by the PC types. Work remains to be done, but I think you may find this entertaining. Some of the worlds I have played with that I know do work are CAR.WLD and CHOPPER.WLD. If you encounter any worlds that do not work, or any other problems, please feel free to drop me a line. More complete documentation for Rend386 can be found in DEMO4.ZIP in the Cyber forum library on CompuServe. I will summarize below the **differences** between **Rend386 for the PowerPC** and **REND386**.

Hardware required is a Macintosh PowerPC, System 7, color monitor and a couple of meg of ram (say about 3).

Special hardware like gloves, joysticks and stereo viewing are NOT supported.

Configuration files are not supported.

'loadpath' is NOT supported. Standard Macintosh file dialogs are used to open desired files. Files (such as PLG files) specified in a WLD file are presumed to reside in the same directory as the WLD file.

Loadable drivers are NOT supported (and not required, thank heavens).

Command-line Parameters are not used.

Viewpoint control and miscellaneous keys

There are three 'keyboard movement modes' supported - normal, spinmode and flymode.

The keys work as follows:

LEFTARROW and SHIFT-LEFTARROW pan to the left (like turning your head to the left)

RIGHTARROW and SHIFT-RIGHTARROW pan to the right

UPARROW:
        if in spinmode
            changes your "latitude"
        otherwise

moves you forward (into the screen)
SEE NOTE ABOUT FLYMODE;

DOWNARROW:
if in spinmode
changes your "latitude"
otherwise
moves you back (out from the screen)
SEE NOTE ABOUT FLYMODE;

SHIFT-DOWNARROW tilts your view downward

SHIFT-UPARROW tilts your view upward

CTRL-LEFTARROW moves you to the left
SEE NOTE ABOUT FLYMODE

CTRL_RIGHTARROW moves you to the right
SEE NOTE ABOUT FLYMODE

PAGEUP and CTRL-UPARROW moves you up
SEE NOTE ABOUT FLYMODE

CTRL-DOWNARROW and PAGEDOWN moves you down
SEE NOTE ABOUT FLYMODE

CTRL PAGEUP rolls your view clockwise

CTRL-PAGEDOWN rolls your view counter-clockwise

'*' levels your view - tilt, roll and pan angles are set to zero

'+' zooms in - i.e. things look bigger

'-' zooms out - i.e. things look smaller

'U' turn you around 180 degrees

HOME returns you to your "home" view (typically the view you had when you loaded the WLD file);

Number keys set the amount of movement or rotation caused by the other keys. 1 is the least and 0 is the most.

'Q' or ESCAPE exit the program

'R' repeats the last arrow command 100 times

'I' displays some status about the view (like position, angles, etc)

'C' displays the color palette

'H' and '?' present some help text

'A' toggles animations on and off

TAB if animation is off, then it is turned on for one cycle

'S' toggles spinmode on and off. When you turn it on, you are asked to select an object to spin around.

Function keys F1 through F10 select alternate views that may be defined by the WLD file (these are like different camera positions for viewing the world)

NOTE ABOUT FLYMODE:
When "flymode" is OFF, movement forward, backwards, up, down left or right ignores the tilt and roll of the view. For example, if you are standing on the floor and have the view tilted up to the ceiling, moving forward means along the floor. When "flymode" is ON (do this through the View menu), moving takes on new meaning. Now if you are on the floor with the view tilted up to the ceiling, moving forward means toward the ceiling.

SECTION 2 -- Clipping and Visibility

The near clipping plane splits polys that transect it, while the yon clipping plane just ignores polys that are beyond it; thus the effects are slightly different. When part of an object gets clipped by the front plane, you can see right through the entire object (i.e. you don't see inside of the far side of the object through the "hole" created by clipping). The same is true if you actually move yourself inside an object; from inside, it's perfectly transparent.

You may find occasional visibility errors with certain combinations of objects; future versions of the software should eliminate these.

SECTION 3 -- Menus

Options menu

"Animation" enables/disables animation (things moving around in the world)

"Background" *NOT USED.*

"Reflection" *NOT USED.*

"Screen clear" allows you to control screen pre-clearing. If the scene you're looking at has no "sky" or "ground" showing, this is a good option to use (since it will increase rendering speed). However, if you have any parts of the screen not obscured by a polygon, you'll get strange and ugly effects.

"Ambient light" allows you to control the overall brightness of the scene. The default value is 76.

"Directional light" allows you to toggle the single light source between "spot" or "point source". The difference is that the spot is at an infinite distance.

"Horizon" allows you to toggle between simple screen clears and a more sophisticated sky/ground horizon clear.

"Compass display" toggles the 3-D compass on or off.

"Frame rate display" toggles the frame rate display on or off.

"Position display" toggles the display of your current (x,y,z) coordinates on or off.

The "motion step size" lets you set the increment to use for space movements or angular movements. This gives you separate control over each, whereas the use of the 0-9 keys controls both together.

The "keyboard mode" option lets you switch between the "default" mode and the "spherical" mode (both described above).

Figure menu

"Load figure..." not tested.

"Information" shows information about the currently selected figure that is similar to object information.

"Select all" selects all objects that are part of the currently selected figure.

"Unselect all" unselects all currently selected objects.

"Hack off" disconnects a segment from its parent segment.

"Join to" joins a segment to another segment, which becomes its parent

"Attach viewpoint" changes your viewpoint to that of the selected object. For fun, load CHOPPER.WLD and attach your viewpoint to one of the rotors to find out what a spinning helicopter looks like.

"Detach viewpoint" disconnects your viewpoint from its parent, but leaves it unchanged otherwise.

View menu

"Information" displays view information as the "I" key.

"Spin about object" sets spinmode so that you spin about an object (as "S" key).

"Fly mode toggle" toggles flymode on and off.

"Floor mode toggle" toggles floormode on and off. Floormode ON causes your view to move up and down to remain a constant height above the floor (I haven't tried this).

"Return to start" restores your original view (like HOME key).

"Move step size" allows you to type in a step size (similar in effect to number keys).

"Turn step set" allows you to type in the amount to turn for each press of a turning key (similar to number keys).

"Go to (x,y,z) location" allows you to type in a specific location to go to.

"Look angle " allows you to type in specific pan, tilt and roll angles.

"Hither clipping depth" allows you to specify a depth. Objects closer than this depth will not be visible.

"Yon clipping depth" - objects more distant than this will not be seen.

"PCX screen dump" - not presently working

"Write state to file" - not tested

"Load world file..." loads a new world file. You will probably do this at least once (unless you just want to look at the sky and ground).

Object menu

"Load object..." loads an object from a file (typically a .PLG file).

"Save object..." saves the selected object to a file.

"Information"gives you information about the selected object, including the the total number of vertices and the total number of polygons.

"Delete object" deletes the selected object.

"Unselect all" unselects all currently selected objects.

"First representation" switches to the first representation of an object. Objects can have different representations specified for different resolutions - e.g. if the object is far away and thus very small on the screen, a simpler representation may be moore recognizable, but when it is closer, a more complex representation will provide richer detail. Note that objects need not have more than one representation and I'm not sure I have seen a file with multiple representations.

"Next representation" causes the next representation for an object to be used.

Surface menu

"Absolute" selects a constant-color surface for the next painting operation.

"Cosine Lit" selects the surface type whose brightness varies with its orientation to the light source.

"Metal" selects the pseudo-metal surface type.

"Glass" selects a transparent surface.

Paint menu

"Choose Color" presents the color palette for you to choose the next paint color from.

"Get poly color" gets the next paint color from the currently selected polygon (the polygon where the mouse was when you selected the current object).

"Paint Polys" applies the current paint color and surface type to polygons as you click on them with the mouse. Press a key to stop painting.

"Paint All" applies the current paint and surface to all polygons in the selected object.

"Resurface" presently not operational.

In order to manipulate objects and figures in the scene, use the mouse to select an object by clicking on it; it will be highlighted to indicate that it has been selected. If you click on it again, the object will be de-selected.

There are two ways to "paint" objects in the demo: you can paint one polygon at a time, or paint the entire object. To select a paint color and surface type, you use the Paint and Surface menus; the surface type and paint color can be selected independently, but the interpretation of the paint color will be different depending on the surface type (see colors.doc for details). From the Paint menu you can also select Paint Polys, which allows you to paint individual polygons simply by clicking on them. To leave this polygon-painting mode, just press a key. To paint a number of objects the same color, just select the objects and use Paint All from the Paint menu. They will all be painted with the current surface type and color.

Mouse menu

"Move" -- moves an object around in 3D, tracking the mouse. Moving the mouse horizontally or vertically moves the selected object in the same direction; moving the mouse vertically while holding down the mouse button moves the selected object away from you or towards you. Pressing a key "places" the object, but leaves it selected.

"Rotate" -- rotates the object around in 3D, tracking the mouse (much as for the 'M' operation described above).

"Twirl" -- "twirl" is similar to rotate, but instead of controlling the actual rotation the mouse now controls the speed of rotation about each of the three axes.

"Grasp" attaches the selected object to you. When you move, it moves with you.

"Ungrasp" releases the selected object. Now it remains stationary when you move.

SECTION 5 -- Figures and Scenes

This version of REND386 contains support for segmented figures. Note that figures are composed of objects, and that movement operations performed on objects that are part of a figure behave slightly differently than operations on "plain" objects.

Moving an object that is a descendant of another object moves it relative to its parent, and also affects any descendents it may have. In the case of body.fig, the pelvis is the "root" object; moving it moves the entire figure as a unit. However, if you select the chest instead of the pelvis, only the upper half of the body will rotate; if you select only the left upper arm, only it and the left lower arm will rotate, and so on.

You almost never want to move a segment object relative to its parent; the correct position should be set in the original figure file. Of course, rotating a child segment relative to its parent is something you do a lot.

This reflects the "real world"; you rotate your body segments at joints, but you rarely remove your arm from your shoulder and flail it about.

Comments are welcome

Bob Arning
70347,705