3D viewer form   F9 Show geometry/pattern in real-time 3D.

The 3D-viewer form is available only for the extended freeware version 4nec2X, and requires a computer system on which the Microsoft DirectX 8.0 or later hardware–acceleration drivers are installed. For further information about how to check for DirectX or how to install, see the _ReadMeFirst.txt file.

The 3D viewer is used to display structure geometry and/or 3D far- and near-field pattern in real-time 3D. Compared with the Geometry-view F3, this viewer shows the structure much more as it is in real-life. It also shows the real wire-radius.
However when the radius becomes too small to be visible, for instance for wire-antennas, a correction is applied on the wire-radius, to keep it visible. A check box is available on the right of the form, which is enabled if it's possible to re-enable the real-radius display.
This way it is very easy to see if wires are overlaid or intersect (at unexpected places) or not. Also at junctions with short fat segments the intersected area should not be more than about 1/3 of the segment length. With some experience it's also possible, for wire grids, to check the 'equal area' rule.

When patches are included in the structure geometry, the 'shiny' side of the patch is the one from where the normal-vector is pointing outwards. This side of the patch should be considered as being part of the NEC calculation process.

Use the structure drop-down box to select different structure-display options.
Use the 'Res' button to reset all zoom-, shift- and/or rotate-actions.

The following key's and mouse-buttons are available to change the viewing-position.

	Key-combination:	Mouse-action:
- Rotate structure	Left/Right or Up/Down arrow	Move mouse with left button pressed
- Move structure	Ctrl+Left/Right-arrow	Move mouse with right button pressed
- Forward/backward	Ctrl+Page-up/down	Move mouse with both button pressed
- Zoom-in/out	Page-up/down	

When the display of currents is enabled, and also a freq-sweep calculation was performed, the function of the cursor/arrow key's is changed from structure movement/rotation to frequency 'movement'.

The upper drop-down box lets you select different types of structure (geometry) display. If 'wires' or 'segments' is selected, the red end is end-1 and the green end is end-2.
If 'currents' is enabled use the 'Log factor' scroll-bar to visualize small currents on gridded/external objects.

If NEC output-data is available the drop-down boxes on the right of the form are enabled. This lets you visualize the 3D far- or near field E/H pattern in 3D. You have the choice between single-color or multi-color mode. In multi-color mode a blue to red scale is applied to the pattern for which the color corresponds to the color-scale on the left of the form.

When, for the far-field, the 2D-slice display option is selected, a 2D-pattern slice is displayed for a certain theta/elevation or phi/azimuth value. You can change the Theta/Elevation or Phi/Azimuth angle for which the slice is displayed, on the 'Pattern (F4)' form while simultaneously watching the 3D form. In the 'Pattern (F4)' form, use the space-bar to switch between horizontal/vertical slice.

When on the Pattern-form multiple far-field patterns are selected to be compared against each other, you can also switch between these patterns on the 3D-viewer form. Use the selection-box in which the file-name is displayed to select one of the patterns. You may also use the '<' and '>' keys (with or without <Shift>)

On certain computer monitors it showed up that color display sometimes is not optimal. To overcome this 'problem', use Ctrl+C to bring-up the color settings window. Select the appropriate structure part and use the

sliders to change color or to alter background- or, directional-light intensity.

When no keys are pressed for a certain amount of time, the structure is rotated automatically. You may maximize the window and use this functionality as a kind of screen-saver. You may use the 'Z' key to start to spinning directly without waiting for the time-out.

When structures are viewed with a large number of (bent)segments and/or junctions, a certain simplification is done when creating the 3D picture. For instance, by default, all wire ends are closed and wire-radius-changes and junctions for more than two segments are smoothened.

For very high-segment structures these actions are not performed. This is represented by the 'Quality' slide bar on the lower right corner. Eventually one can use this slide-bar to change the default 3D structure quality and increase speed, ranging in three steps from left to right.

- Left   :   Show 'simple' structure as a wire-grid.
- Middle   :   Show structure with open ends and none smoothed junctions
- Right   :   Show high-res structure with closed ends and smoothed junctions

FPS   = number of frames (screen refreshes) per second.
Tri's   = number of triangles used to construct the 3D objects

When a large number of far/near-field points is requested or when structures with a large number of segments and with 'high-quality' are viewed, it could be necessary to increase the 'Max-nr of 3D-points' in the setting-menu. If so, a message will inform you about this possibility. However, because this setting also affects the amount of video-card memory used, large values can sometimes result in strange video effects. If so, lower this setting.