

OnyxTREETM PALM

Manual 6.0

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OnyxTREE PALM 6.0

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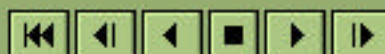
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H 3.85 m S 3.98 m A 0° E 1°



C 24 25 30
5 0



Pseudophoenix S D

19 Random Seed "

1.5 m Trunk Height

Trunk Width

0° Trunk Angle

0° Trunk Twist "

Trunk Curving

Trunk Color

Texture

0.6 m CShaft Height

CShaft Width

CShaft Color



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Introduction

About OnyxTree PALM

OnyxTREE PALM, referred to as **PALM** in this manual, is a procedural palm generator dedicated for modeling and rendering photorealistic palms. Once a palm has been generated, you can save it as a *.PAL file in a custom library of palm parameters, the palm image can be saved as a BMP (PICT on Mac) file and a TGA file, and the palm 3D model exported as a 3DS, C4D, DXF, FAC, LWO, or OBJ file.

Those who inquire about PALM may be confused in thinking that PALM is a library of palms. It is very important to clarify this misconception. Although, the software package comes with extensive libraries of pre-modeled palms, this program is neither a data library nor a procedural library of palms.

PALM is a true palm modeler that allows you to model virtually any kind of palm thanks to the powerful parametric modeling technique that the program implements. The beauty of parametric modeling lies in the presence of precoded knowledge about the anatomy and growth of a palm you are going to model so that you do not have to start from scratch as is the case with conventional modeling.

With PALM, you model a palm by simply manipulating its essential characteristics (parameters) such as the height, the curvature and density of its leaf stems, the type and color of foliage, and many more. By adjusting the values of parameters, you can model a broad range of palms: different species, variations of the same species, palms in differ-



ent stages of growth, palms in different seasons. Each parameter adjustment is recorded on the model instantly so that you have full awareness of the changes during the modeling process.

User Interface

In spite of numerous parameters, it is very easy to command PALM because of its extremely well thought user interface. **The parameters are logically grouped and can be easily accessed on different levels of modeling detail.** The levels of modeling detail (or abstraction) allow you to concentrate on one class of palm elements at a time which, taking into account an inherent complexity of palms, helps tremendously in the modeling process.

The user interface is structured to reflect clearly the PALM's internally encoded principles of modeling so that you can get an understanding of these processes and achieve easily complete control. For all these years of our software developments, we have striven to make the communication between the user and our vegetation creators so fluent that, in the user's mind, it looks as if the interface has almost disappeared.

Meet the Current Technology

A good program is distinguished not only by its features, but also by how well does the program balance its performance with the current technology. This is of particular importance for modeling and rendering palms since high demands on processing power and memory space tend to push a computer to its limits. We have invested tremendous amounts of time and energy in the research to achieve this balance and to make our



vegetation creators truly functional and useful.

PALM can save a created palm as a parametric model, as a rendered image, and as a 3D geometric model depending on the way you wish to use the data. In the parametric model, the palm is described by a set of parameters whose values determine its characteristics. It is **almost like a “DNA file” of the palm**. The palms saved in a parametric form will take the least space thus making it the ideal format for creating your own library of palms. Besides its compact size, the parametric format allows you to create infinite variations of a master palm that will depart slightly or substantially from its original, or you may show the same palm in different seasons. A parameter file can be opened by PALM which then generates the palm's 3D geometry according to the instructions written in the file.

If you wish to use a palm in 2D imaging work, or as a background palm in a complex 3D scene, you would want to use our rendering engine to create the palm image and then save this image as a BMP or TGA file.

By implementing innovative approaches to modeling and rendering, we have substantially speeded up palm generation, lowered memory requirements for both, palm generation and palm storage, and achieved exceptional quality of rendered palms.

The algorithms we have developed for sun lighting are capable of depicting all the nuances of sun reflection, translucency, changes in color, and multiple shadow depths that occur when the sun casts its light on a palm. Our algorithms capture all these natural effects with unmatched fidelity.

And all of this is done in seconds and without any additional RAM requirements.



For animation work, you would want to **use the PALM's 3D polygonal models that are exported in 3DS, C4D, DXF, FAC, LWO, OBJ, and W3O file formats**. When creating a 3D model, PALM gives you complete control over the size of the model. For a given palm, the number of polygons can be adjusted, so that you can achieve the best compromise between the model's size and the level of detail shown without sacrificing the palm's look and feel. Even with the small number of polygons, our models preserve graciousness of natural palms.

The combination of parametric modeling, powerful rendering, and the three different formats (parameter, image, and object) for saving the palms **makes PALM the ultimate palm creator** which successfully balances today's constraints of the computer processing power, and, at the same time, reaches far beyond the current state of technology into the future.

WIN Minimum System Requirements

- Computer with Intel Pentium or equivalent processor
- 10 MB of RAM
- 30 MB of disk space
- 800 x 600 pixels, 24-bit color display support
- Windows XP/2000/NT/98/95 operating system

MAC Minimum System Requirements

- 10 MB of RAM
- 30 MB of disk space



- 800 x 600 pixels, 24-bit color display support
- MacOS X operating system

Registration

OnyxTREE PALM 6 requires a password. Please follow the registration procedure written in Registration.rtf file.

Installation

Installation of OnyxTREE PALM 6 package is a simple process. Please follow the installation procedure written in Installation.rtf file.

Technical Support

To ask a technical question, please send email to:

Support@OnyxTREE.com

The subject line must contain the PALM serial number and the registrant name. The question must be clearly stated and supported with a parameter file and/or screen image if necessary. We will do our best to respond to you in a timely manner. The inquiries that do not contain the PALM serial number and the registrant name will not be responded to.



OnyxTree PALM Overview

OnyxTREE PALM window is divided into four areas:

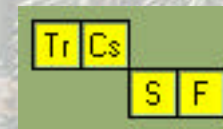
- Preview Panel in the center left area of the window
- Parameters Control Panel on the right
- Wind Time Control Panel in the lower left area of the window
- Communication Panel in the lower right area of the window

Preview Panel - Preview Panel consists of the canvas on which the rendering occurs and a set of buttons and displays.

Structure Selection - The leftmost group of buttons at the bottom called Structural Abstraction buttons enable you to preview a palm on different levels of detail. The letters on these buttons designate different classes of palm elements: **Tr** (trunk), **Cs** (crownshaft), **S** (stems), **F** (foliage).

If you wish a palm rendered in full detail, select all the buttons. By deselecting any of the buttons, the palm will be rendered without the corresponding class of elements. Such selective viewing of the model speeds-up the design process tremendously because one is able to see only those parts of the model that are of interest at the particular moment.

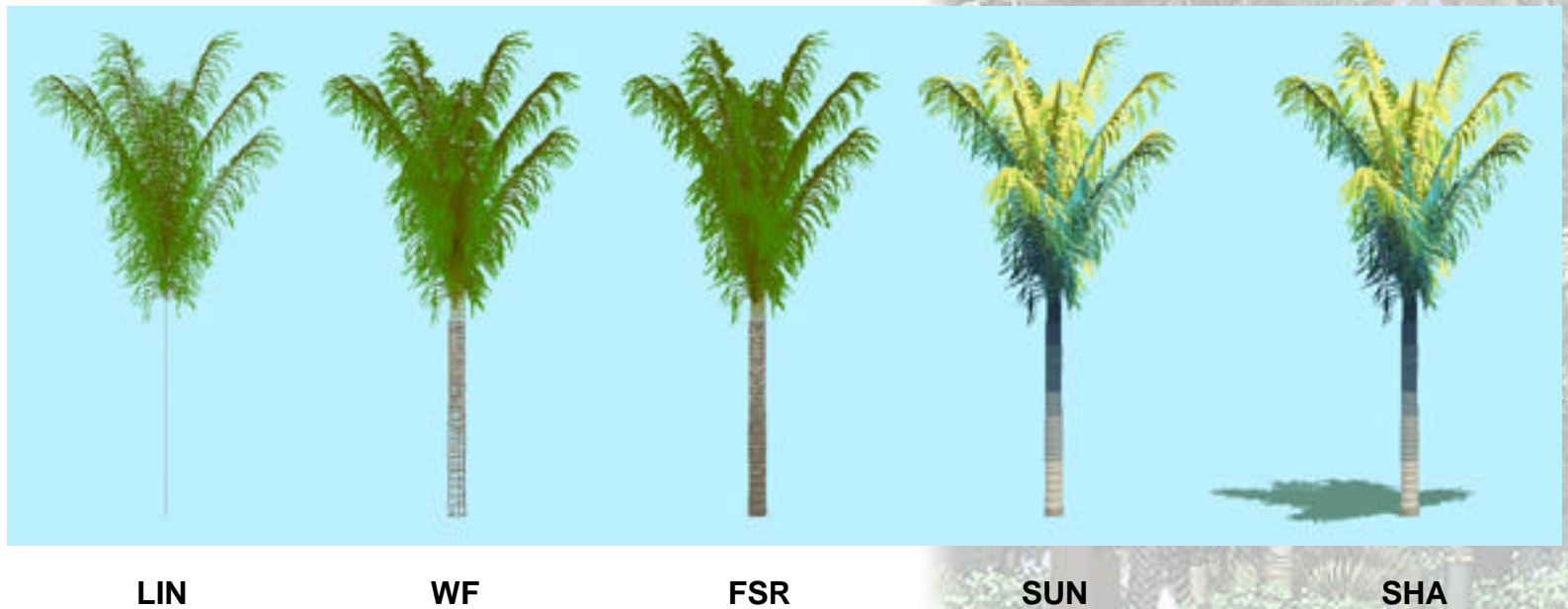
Preview Selection - The four large plus two small buttons in the middle allow you to select the preferred rendering mode. You can choose to preview a palm in **linear** (**LIN**), **wireframe** (**WF**), or **full-shading rendering** (**FSR**) mode. By pressing the small **sun** button, you activate the sun lighting (**SUN**) on the palm and by pressing the small **shadow** button right below the **sun** button, you enable the rendering of shadow (**SHA**).



With the rightmost button called **Envelope (EN)**, you build the palm's crown envelope. You can export 3D palm envelopes as 3DS, C4D, DXF, FAC, LWO, and OBJ objects and use them for preliminary scene setups, preliminary design studies, or for palm massing where the file size is critical and the detail is not important.

Sun - The algorithms we have developed for sun lighting are capable of depicting all the nuances of sun reflection, translucency, changes in color, and multiple shadow depths that occur when the sun casts its light on a palm. Our algorithms capture all these natural effects with unmatched fidelity. And all of this is done in seconds and without any additional RAM requirements.

When rendering with sun light, the user can either select one of five light pre-sets that capture different sun light conditions during the day or choose to customize a light setting to his or her own liking. If you prefer using light presets, bring up **Light**



presets dialog by right clicking the small sun button. There you can select one of five light presets: Early Morning, Late Morning, Early Afternoon, Late Afternoon, and Overcast. If you wish to create your own light setting, pressing **Custom...** while in **Light presets** dialog will get you to the custom light dialog with the following parameters:

Light settings - Load loads a previously saved custom setting LIG file.

Light settings - Save saves a custom setting as a LIG file.

Sun azimuth sets the sun azimuth angle. You adjust the azimuth by rotating the red vector in increments of 1 degree. 0 degrees is east (E), 90 degrees is north (N), etc.

Sun elevation sets the sun elevation angle. You adjust the elevation by rotating the red vector in increments of 1 degree. 0 degrees is a horizon, 90 degrees is a zenith, etc. When the elevation is set below 0 degrees, a palm does not cast any shadow on horizontal surface.

Sun loss/gain sets the amount of light received by the sun. The value is a qualitative one. You can get a pitch-black palm if you set the slider to -50 or overlit palm if you set it to +50. Usual values are somewhere between -5 and +15, these will depict overcast and clear sky, respectively.

Sun color effect swatch and the slider set the sun color and the extent of its contribution on those parts of a palm that are exposed to the sun. The most obvious use of this parameter would be for depicting a palm at dusk on the clear day when objects pick-up the redness of sun.

Sun reflection swatch and the slider set the reflected light color and the



extent of its reflection from the leaves exposed to the sun. It is used for controlling the shimmering effect.

Sky reflection swatch and the slider set the reflected sky color and the extent of its reflection from the leaves in shade.

Shadow depth slider sets the level of darkness of palm elements that are in the deepest shadow. The higher the value, the darker is the deepest shadow of a palm. The palms with denser crowns will have higher shadow depth than the ones with sparse crowns.

Shadow color effect swatch and the slider set the shadow color and the extent of its contribution on those parts of a palm that are in shade.

Haze color effect swatch and the slider set the color and intensity of the haze filter.

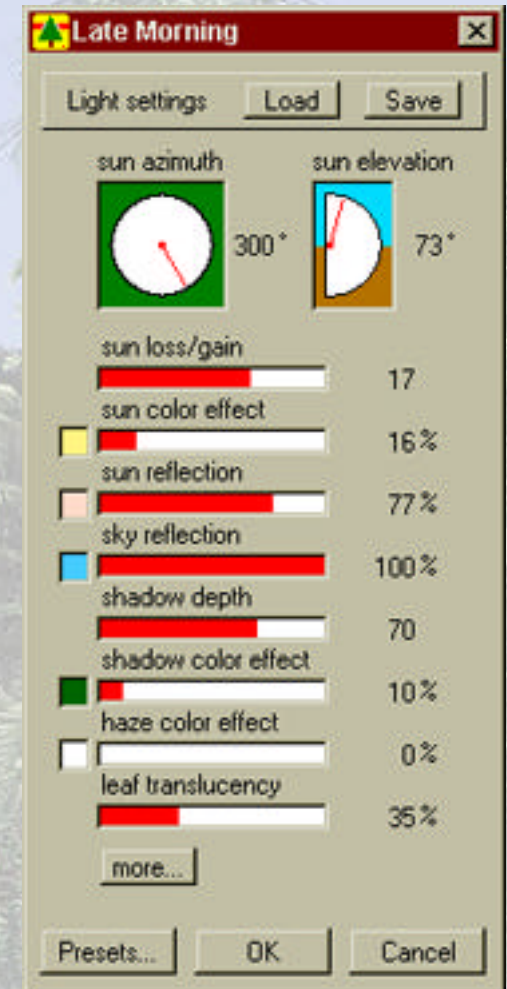
Leaf translucency sets the value of translucency. When zero (0), the leaves are totally opaque, otherwise they will allow certain amount of sun light to pass through.

Presets... button brings you back to five light presets.

More... button opens **Light more...** dialog with additional light parameters.

Shadow resolution sets the shadow map size. The lower the value the larger the map. The most “real situation effects” values are between 5 and 15. The default value of 10 works well for majority of palms.

Shadow depth spread sets the steepness of color transition between the palm elements exposed to the sun and those in the deepest shadow.



Low values of shadow depth spread will sharpen the contrast between the lit and non-lit palm elements considerably. Higher values will result in softer transitions between the lit and non-lit parts of the palm.

Random seed introduces slight variations in the settings of light parameters.

Color noise adds slight variations in color to the parts of palm exposed to the sun.

Shadow noise adds slight variations in color to the parts of palm in shade.

Shadow - To have a palm cast its shadow on the horizontal surface, activate the full shading rendering mode (if not already activated) and press the small shadow button located under the sun button. The shadow size and angle will be governed by the sun and viewpoint angles. By right-clicking the shadow button, you bring up the **Shadow...** dialog with the following parameters:

Color swatch displays the current shadow color. If you wish to change it, click the color swatch and the system's color picker dialog will show up enabling you to choose a desired color.

Shadow intensity is a double slider which controls the intensity of shadow of a particular palm element as a function of its thickness. The further the blue slider is to the right, the lighter is the shadow of thin leaf stems and leaflets. The red slider controls the visibility limit of thin leaf stems. The further it is to the right, the thicker a particular element of a palm has to be in order to cast its shadow. The default setting gives you a shadow casting pattern prevalent in majority of "earthly" palms.



Shadow opacity sets the opacity level of the shadow. The value of 100% will result in a fully opaque shadow and the value of 0% in a fully transparent one.

Leaf color correction is provided so that you can correct the shadow color of thin leaflets on a tall palm. These leaflets are so thin and far away from the ground that, without the color correction, they would cast very light shadow or completely disappear. By increasing the correction value, the shadows of these leaflets become more pronounced.

The rightmost group of buttons includes the **Zoom**, **Drag**, **Chain Saw**, and **Render** buttons.

Zoom (designated with a magnifier icon) allows you to zoom-in and to examine a palm in detail. When you press the Zoom button and position the cursor anywhere on the PALM's canvas, you will see the cursor changing to a magnifier with a plus sign. Press the mouse to zoom-in on a specific part of the palm. To zoom-out, hold the Option key and press the mouse. Please note that when the zoom level is higher than 1 (one), Auto Scale is inactive. Auto Scale will become active again when you zoom all the way out. The display adjacent to the Zoom button shows the current zoom level or magnification factor.

Drag (designated with a hand icon) activates the translate mode which allows you to grab and drag a palm. When you press the Drag button and position the cursor anywhere on the PALM's canvas, you will see the cursor changing to a hand. Press the mouse and drag the palm in any direction. Note that you cannot drag the palm when the zoom level (magnification factor) equals 1.



Chain Saw Tool (just below the Zoom button, designated with a saw icon) allows you to cut off any element of a palm. People are doing that all the time with street palms and the palms in their garden. With PALM, you can hand prune your palm as well. Simply press the Chain Saw button and position the cursor anywhere on the PALM's canvas, you will see the cursor changing to a saw. Press and drag the mouse over the branch you wish to cut. See the cutting line appearing as you drag the mouse. As soon as you release the mouse, PALM searches for the cut and rerenders the palm without the pruned branch. You can un-cut this branch by holding the Option key and pressing the mouse. There are total of fifty cuts available. The display right to the left of the Chain Saw button shows the current number of cuts performed on the palm.

Render (the rightmost button in the group, designated with DNA icon), when pressed, initiates the rendering. Note that the rendering is initiated also whenever you switch to a different rendering mode or select/deselect any of the Structural Abstraction buttons. The rendering can be stopped by clicking the mouse anywhere in the content area of the window, including the buttons.

Palm Height and Crown Spread - Right above the canvas, there are four displays. The two displays on the left designated as **H** (Height) and **S** (Spread) show the height and spread of the currently rendered palm in meters.

Eye Position - The **A** (Azimuth) and **E** (Elevation) displays on the right show the elevation and azimuth angles of the current viewpoint. The elevation angle is the angular distance of the eye from the horizontal plane.



The azimuth angle is the horizontal angular distance of the eye from Y axis.

Rotational Cursors - You can change the viewpoint by positioning the cursor anywhere on the PALM's canvas, pressing the mouse and moving the cursor to the left, to the right, upwards, or downwards.

As you start moving to the left, for example, the cursor will change to a left arrow, the palm will rotate clockwise around Z-axis (which is the principal direction of the trunk growth), and the A display will continuously update the azimuth angle. If you change the direction of movement from left to right, the cursor changes to a right arrow and the palm rotates counter clockwise.

By pressing the mouse and moving the cursor upwards, the cursor will change to an upward arrow, the palm will rotate around the axis lying in the XY plane (ground plane), and the E display will continuously update the elevation angle. If you change the direction of movement from upwards to downwards, the cursor changes to a downward arrow and the palm rotates in the opposite direction.

If you hold the Option key while you are moving the cursor, the palm will rotate in both directions simultaneously, and the A and E displays will be continuously updated.

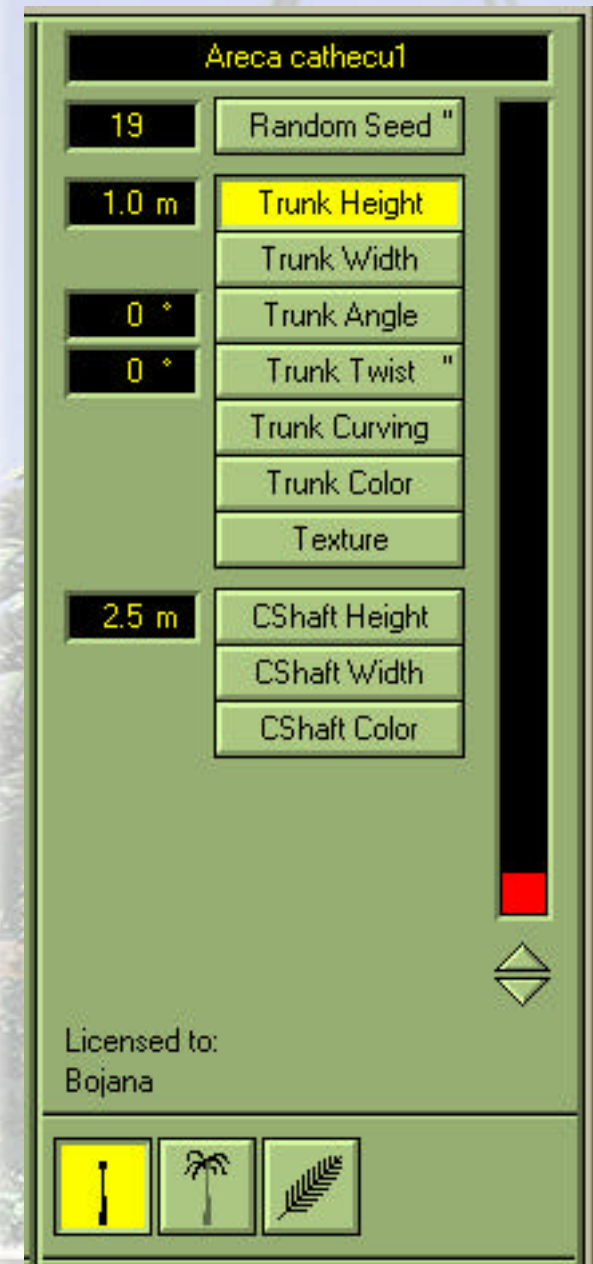


Parameters Panel - Parameters Panel consists of the parameter buttons, the windows for the display of their current values, and the slider that enables you to change these values. Not all of the parameters that describe a palm are displayed at the same time. They are grouped in three main groups: the trunk and crownshaft parameters, the leaf stem parameters, and the leaflet parameters. The buttons at the bottom of the panel set the associated groups of parameters to be the currently active and visible.

The first button from the left enables you to access the parameters that describe the trunk and crownshaft and the second button accesses the parameters for leaf stems. By pressing the third button, you can access the parameters that control the leaflets.

The parameter buttons with double quotation mark at the top right hand corner, as, for example, Trunk Twist, have associated sub-group of parameters and these parameters can be accessed by double clicking the corresponding parent button. The parameter buttons without the window display of their current values as, for example, Trunk Curving, serve only as access buttons to the associated sub-group of parameters.

PALM can create virtually an infinite number of different palms. There is a vast search space in front of you. The key to using PALM most effectively is acquiring a good grasp of its behavior. Begin by playing with the software. Once you comprehend the effects that a parameter or group of parameters have upon the palm, it is much easier to define purposeful actions that will lead to the desired results. Here are some tips for making your exploration of PALM more productive:



1. Use the palms from libraries as templates. It is much easier to grasp PALM's behavior by changing a palm template than by starting from scratch.
2. Concentrate on one group of parameters at a time. Play with the trunk and crownshaft parameters first, and pretend for now that the rest of the parameters do not exist. Once in control of the trunk and crownshaft parameters, proceed to other parameter groups.
3. Examine the trunk, crownshaft, leaf stem and leaflet parameters in the linear mode. The linear mode is the fastest, and it shows most clearly how a parameter affects the palm structure.
4. Read Palm Parameters chapter. It will give you better understanding of the parameters and how they work.
5. Take a photograph of a palm and try to model the same palm by visually referencing the photograph. For most of us, it is easier to model a palm by copying it from the photograph than by visualizing it in our heads.

- 000 -

Wind Time Control Panel - Wind Time Control Panel consists of:

- Wind button
- Wind Parameters button
- Custom Frames Per Second button
- Custom Frames Per Second display
- 24, 25, and 30 Frames Per Second buttons



- Current Frame Number display
- Frame Advance buttons
 - Jump to Beginning, Reverse Step, Reverse,
 - Stop,
 - Forward, Forward Step
- Time Line bar

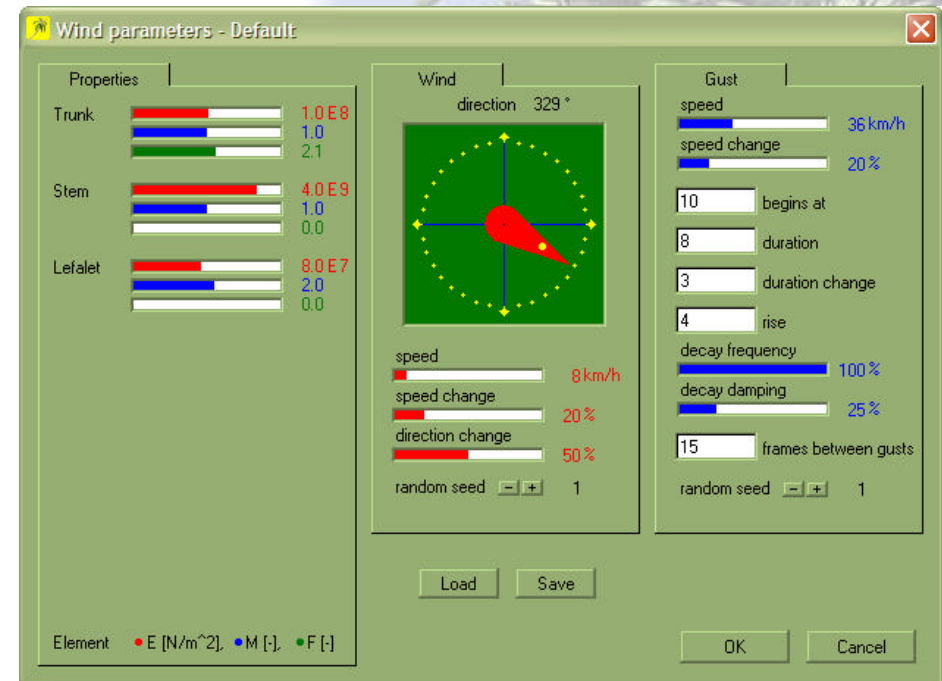
Wind button, when pressed, enables you to see the effect that wind has on a palm.

Wind Parameters button, when pressed brings up Wind Parameters window. The window contains Property, Wind, and Gust parameters in their respective tabs. It also has Load/Save buttons to load previously saved wind parameters or to save the current ones.

Property tab section

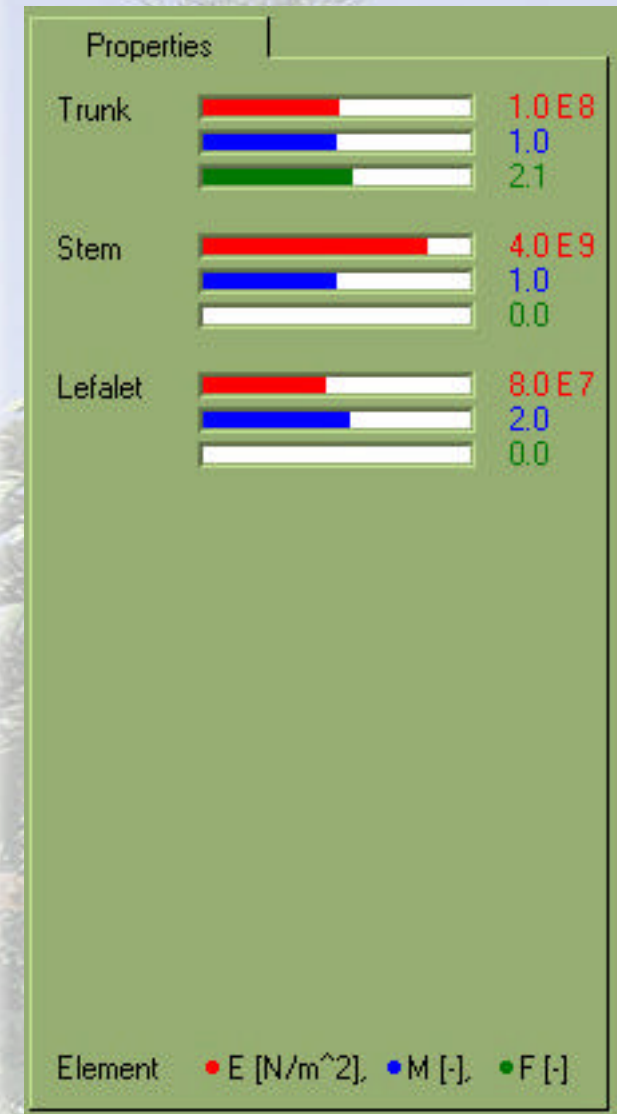
Each in the series of EMF slider triplets in this section controls the elasticity (E), the mass (M), and the force (F) for the corresponding class of tree or palm elements.

The elasticity (E, red slider), measured in Newton per square meter (N/m^2), is the characteristics of a branch that determines the extent of its bending under wind force. The lower the elasticity value, the more the branch will bend under the same wind force. See the EMF table for the recommended elasticity settings.



Each **mass slider (M, blue slider)** enables you to adjust the mass of a particular class of palm elements. If you wish to add more mass to the trunk, for example, you set the corresponding blue slider to the value greater than zero. This value will influence how certain palm element moves on the wind. The higher the mass factor, the slower the movement (movement frequency).

Each **force slider (F, green slider)** enables you to adjust the force on a particular class of palm elements. If you wish to add more force on the trunk, for example, you set the corresponding green slider to the value greater than zero. This value will influence how certain palm element moves on the wind. The higher the force factor, the higher the extent of movement (movement amplitude).



- Elasticity slider 'E' adjusts the characteristic of a branch that determines the extent of its bending under a wind force. Suggested values:

Element	Broadleaf	Conifer	Palm
Trunk	1E8 ... 1E9	5E8 ... 5E9	1E8 ... 1E9
Bough	5E7 ... 5E8	5E7 ... 5E8	-
Branch1	5E7 ... 5E8	5E7 ... 5E8	-
Branch2	5E7 ... 5E8	1E7 ... 1E8	-
Branch3	1E7 ... 1E8	5E6 ... 5E7	-
Twig	1E7 ... 1E8	5E7 ... 1E7	-
Stem	1E6 ... 1E7	-	1E7 ... 1E8
Leaf	-	-	1E7 ... 1E8
Needle	-	1E6 ... 5E6	-

- Mass 'M' slider sets the rate of element movement on the wind. The higher the mass factor, the slower the movement.
- Force 'F' slider sets the extent of element movement on the wind. The higher the force factor, the higher the extent of movement.

EMF table here shows the basic definitions and recommended elasticity, mass, and force settings.

Wind tab section

The series of sliders in this section enable you to set the wind parameters.

Wind direction vane sets the direction the wind is blowing at.

Wind speed sets the speed of wind. See Wind table for various wind speeds and their meaning.

Wind speed change and **Wind direction change** slider set the extent of wind turbulence on a palm.

Wind random seed sets random seed for wind behavior on a particular palm. If two instances of the same palm have the same random seeds, the palms will behave in exactly the same way. Unless you have a specific reason to keep the random seeds the same, it is a good practice to vary random seed for each palm on the scene.

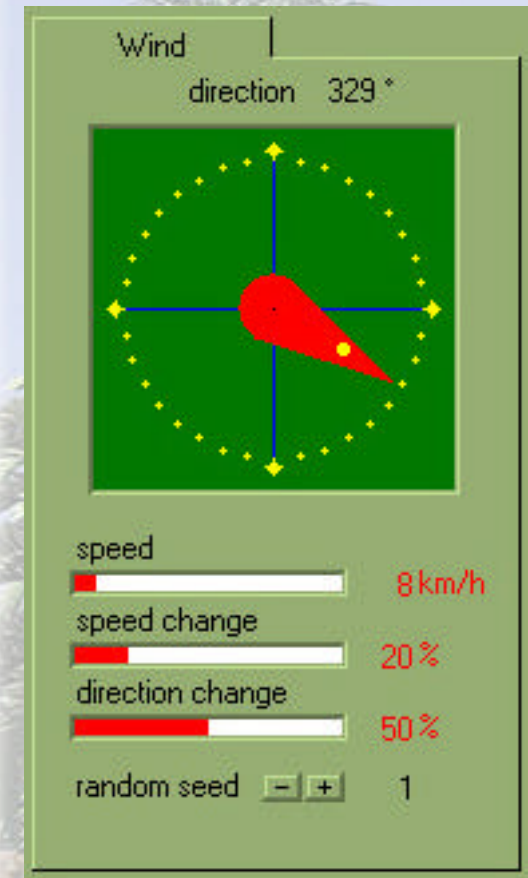
Gust tab section

The series of sliders in this section enable you to set the wind gust parameters.

Gust speed sets the average speed of gusts. If the speed is zero, there are no gusts.

Gust speed change sets the extent of speed variation for the gusts. If the change is zero, all gusts will have the speed set by Gust speed.

Gust begins at field holds the frame number of the first gust occurrence.



Gust duration field holds the number of frames for which the gust duration lasts.

Gust duration change field holds the number of frames for which the duration may vary. If the change is zero, all gusts will have the duration as set in Gust duration field.

Gust rise field holds the number of frames that sets an average gust rise.

Gust decay frequency sets the frequency rate at which the gust decays.

Gust decay damping sets the speed of gust decay.

Frames between gusts field holds average number of frames between the two successive gusts.

Gust random seed sets random seed for gust behavior on a particular palm. If two instances of the same palm have the same gust random seeds, the palms will behave in exactly the same way. If you wish the gusts occurring at the precisely same times on all palms in the scene, keep the random seeds the same.

Wind	Beaufort	km/h	m/s	mph
Calm	0	0.5	0	1
Light air	1	5	1	3
Light breeze	2	10	3	7
Gentle breeze	3	15	5	12
Mod. breeze	4	25	8	18
Fresh breeze	5	35	11	24
Strong breeze	6	45	14	31
Moderate gale	7	55	17	38
Fresh gale	8	70	21	46
Strong gale	9	80	24	53
Whole gale	10	95	28	63
Storm	11	110	33	75
Hurricane	12	160	56	124

Gust

speed

36 km/h

speed change

20 %

10

begins at

8

duration

3

duration change

4

rise

decay frequency

100 %

decay damping

25 %

15

frames between gusts

random seed

-

+

1

FPS buttons and fields.

Custom Frames Per Second [C] button when pressed directs PALM to take FPS number entered in **Custom Frames Per Second** field for wind animation.

24, **25** and **26** buttons when pressed directs PALM to take 24, 25 or 30 frames per second rate for wind animation.

Current Frame Number field shows the current frame for displayed palm. You can also enter the desired frame at which you wish to see the palm and press **Draw** button. Max number that can be entered is 999999.

Frame Advance buttons enable you to view palm affected by wind. There are seven controls in that group:

Jump to Beginning - brings you to the beginning of the animation.

Reverse Step - steps back in time for one frame interval.

Reverse - continuously steps back in time at the given frame interval rate until it reaches the beginning. It can be stopped at any time by pressing the **Stop** button.

Stop - Stops forward and reverse actions.

Forward - continuously steps forward in time at the given frame interval rate. It can be stopped at any time by pressing the **Stop** button.

Forward Step - steps forward in time for one frame interval.

Time Line bar under the Frame Advance buttons gives you a qualitative



information about the time. You can see where on the time line does the currently displayed palm lay.

- 000 -

Communication Panel - Communication Panel consists of:

- Status field
- Polygons button
- Send button
- Cancel button

Note that Communication Panel is active when OnyxTREE PALM modeler is linked to OnyxTREE STORM plugin for EI Universe. When this link is not established, Communication Panel elements are grayed-out.

Status Field displays “Universe Connected” when OnyxTREE PALM is linked to OnyxTREE STORM plugin for EI Universe.

Polygons button, when pressed, opens up Adjust Polygons and Detail window where you can set up modeling detail, resolution, units, etc. prior to sending a palm model to OnyxTREE STORM. These controls are, in essence, the same as Save As FACT window. Thus to find out about its features, go to page 123 and read FACT File Export.

Send button, when pressed, sends a palm model to OnyxTREE STORM.

Cancel button, when pressed, cancels any changes made in OnyxTREE PALM and returns the control to OnyxTREE STORM.



What is on the Menus

Menu bar holds 5 menus (Win only), 6 menus (Mac only):

- OnyxTREE PALM (Mac only)
- File
- Edit
- Background
- Special
- Help

OnyxTREE PALM menu (Mac Only)

OnyxTREE PALM > **About PALM...** - Brings up the title screen.

OnyxTREE PALM > **Hide OnyxTREE PALM...** - Hides the main window.

OnyxTREE PALM > **Quit OnyxTREE PALM...** - Quits PALM application.

File menu

File > **Load Parameters...** - Opens a chosen PAL file and loads its parameter values into PALM modeler.

File > **Save Parameters...** - Saves current palm parameter values on a disk as PAL file.

File > **Save Image as BMP...** - Saves the palm image into a specified BMP file (Win only).



File > **Save Image as PICT...** - Saves the palm image into a specified PICT file (Mac only).

File > **Save Image as TGA...** - Saves the palm image into a specified TGA file.

File > **Save Shadow as TGA...** - Saves the palm shadow into a specified *SH TGA file. It is not grayed out if **Shadow** button is pressed.

File > **Save Model as 3DS...** - Saves the palm model into a specified 3DS file.

File > **Save Model as C4D...** - Saves the palm model into the a specified C4D file.

File > **Save Model as DXF...** - Saves the palm model into a specified DXF file.

File > **Save Model as FAC...** - Saves the palm model into a specified FAC file.

File > **Save Model as LWO...** - Saves the palm model into a specified LWO file.

File > **Save Model as OBJ...** - Saves the palm model into a specified OBJ file.

File > **Save Model Part** - Enables you to select a part of the palm you wish to export out as a 3DS, C4D, DXF, FAC, LWO, OBJ model. Simply select Save Model Part and position the cursor anywhere on the PALM's canvas, you will see the cursor changing to a cross. Note that, in order



for the cross to show, the Zoom, Drag, and Chain Saw have to be unselected. Press and drag the mouse over this part of the palm you wish to export. See the rectangle enclosing the selection area as you drag the mouse. As soon as you release the mouse, the **Save Model Part** dialog appears allowing you to select the desired file format. If you do not wish to save this palm part, just press **Cancel**, the Model Part dialog will disappear and you will find yourself on the PALM's canvas. You can exit the Save Model Part mode by unchecking Save Model Part on the File menu. Note that Save Model Part is automatically disabled if you select Save Model as 3DS...OBJ.

File > **Quit** - Quits PALM application (Win only).

Edit menu

Edit > **Copy** - Copies palm image from the canvas onto the clipboard.

Background menu

Background > **Sunny skies blue** - Sets the background color to R187, G240, B255.

Background > **New England blue** - Sets the background color to R15, G201, B255.

Background > **Joshua desert beige** - Sets the background color to R201, G170, B114.

Background > **Woodlands green** - Sets the background color to R30, G100, B10.



Background > **Overcast** - Sets the background color to R153, G153, B153.

Background > **White** - Sets the background color to R255, G255, B255.

Background > **Black** - Sets the background color to R0, G0, B0.

Background > **Other...** - Pick your custom color.

Special menu

Special > **Auto Draw** - If checked, then the rendering is auto-initiated after each parameter adjustment.

Special > **Auto Scale** - When checked, Auto Scale fits the image to the PALM's canvas. The scaling factor for the palm image is auto-adjusted to that of the last palm image. If unchecked, the scaling factor is constant and has the value of the last palm image rendered with Auto Scale checked.

***TIP** If you want to see the whole palm on the canvas do the following:*

- 1. set Zoom to 1*
- 2. set Auto Scale to active*
- 3. press Draw button and wait for it to bounce back*
- 4. press Draw button again*

Result -- the whole palm is being redrawn and fits the canvas.

Special > **Continuous Update** - If checked, the palm image will be continuously updated as you rotate (change the viewpoint) or drag the palm. This will work only with smaller palms and on fast computers. As the technology progresses further and computers become more powerful,



this feature will become much more useful.

Help menu

Help > **Manual...** - Starts Adobe Acrobat Reader and displays PALM's manual title page.

Help > **Palm Nursery...** - Starts a web browser and displays the OnyxNursery chapter web site.

Help > **ONYX Web Site...** - Starts a web browser and displays www.OnyxTree.com web site.

Help > **Email Us...** - Starts an email application.

Help > **About PALM...** - Displays the PALM's title screen (Win only).



Palm Parameters

Basic Definitions

In order to help you out in better understanding of the palm model and to facilitate learning process, we have found it necessary to present a brief summary of those principal characteristics of palms that are important for modeling.

The principal elements of a palm are:

- Roots
- Trunk
- Crownshaft
- Leaves
- Inflorescence and flowers
- Fruits

Out of these six elements, you can model the trunk, crownshaft, and leaves in the current version of the palm model so we will concentrate on these elements.

Trunk

The trunk is the most dominant element of a palm and may look very different in different species. It varies in length and width from very short and robust all the way to very long and slender. The short and robust trunks tend to grow upright, and the longer and slender trunks may be inclined and usually curve in a variety of ways. Curving of the trunk varies considerably even in the palms of the same species. In some



species, the trunk is swollen to various degrees due to the swelling of cells which expand by the uptake of water. Some palms do not have the trunk above the ground. Their leaves seem to grow directly from the ground.

The surface of the palm trunk may be smooth, ringed in various degrees of roughness, and with the old leaf bases attached. In ringed trunks, the rings, which are the scars of the fallen leaves, may be more or less pronounced. The distance between the rings varies in different palms and may even vary on the same palm depending on the pattern of palm growth. The trunk surface may be covered with the fibers from the bases of fallen leaves, or there may be spines protruding from the old leaf scars.

Crownshaft

In some palms, the trunk carries a cylinder called crownshaft which is composed of tightly packed, tubular leaf bases and it protects the meristem. The color and surface of the crownshaft may vary in different species. The crownshaft is most often bright green, but it may be tinged with shades of red or yellow. The surface may be smooth, or covered with spines or hair.

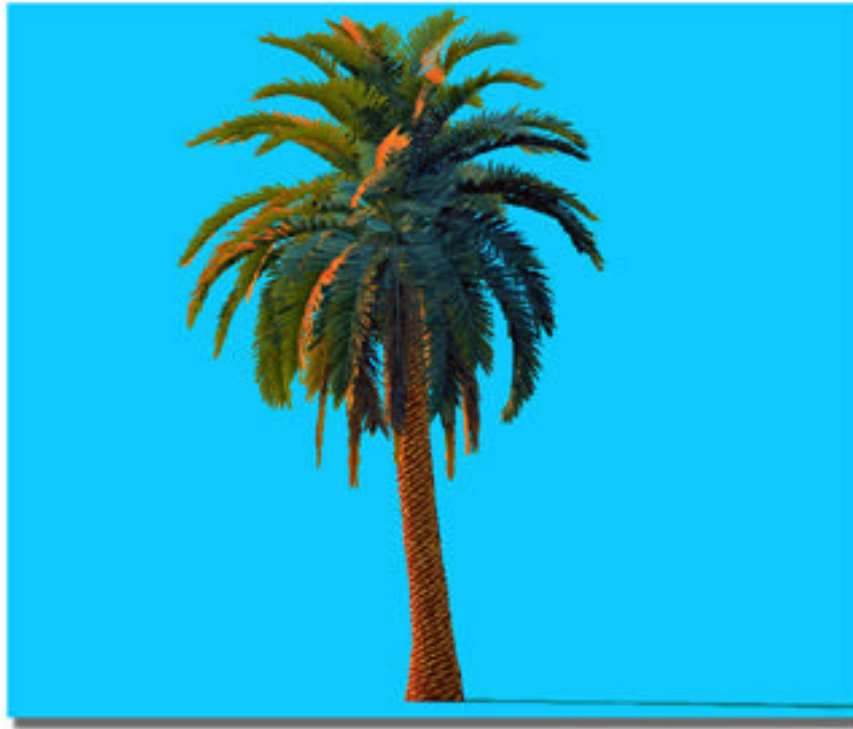
Leaves

A palm leaf grows from the trunk. The principal elements of the leaf are: the stem and the leaflets. The stem has two parts which are called the petiole and the rachis. The petiole is the part between the stem base (or leaf base) and the point where the first leaflet is attached to the stem. The rachis is that part of the stem with the leaflets. The leaflets are the divisions of the leaf. They vary in length, number, spacing and arrange-



ment, and in color and form. Some are short and stiff, and some long and slender. Some are straight, and some are curved. Some are wide and soft, and some needle-like and thin.

Palm leaves are classified into two types: pinnate (or feather-shaped) and palmate (or fan-shaped). In pinnate leaves, the leaflets are attached to the stem at intervals. In palmate leaves, the leaflets (called segments) fan out from the end-point of the stem.





Trunk Parameters

Random Seed sets the randomization pattern for trunk parameters. On double click this button, the Random Seed dialog box appears.

Check boxes in the dialog allow you to randomize corresponding trunk parameters selectively. For example, if you check the Trunk Height check box, each subsequently generated instance of the palm will have slightly different height of the trunk.

Equalize rand. seeds equalizes the values of random seeds for the trunk, stems, and leaflets. If you want to change random seeds for the trunk, stems, and leaflets selectively, you will leave this check box unchecked.



Trunk Height sets the height of the trunk.



Trunk Width allows you the access to the parameters that enable you to mold the trunk form. Trunk Width button brings up the Trunk Width dialog box.

Hs (heights) value slider defines the positions of six, characteristic widths along the trunk.

Widths value sliders allow you to set these six, characteristic widths. Each width value and its corresponding position are designated by the same color.

Equalize cshaft to trunk check box equalizes the bottom width of the crownshaft with the currently set top width of the trunk.



Trunk Angle sets angle of the trunk from the vertical (Z-axes).

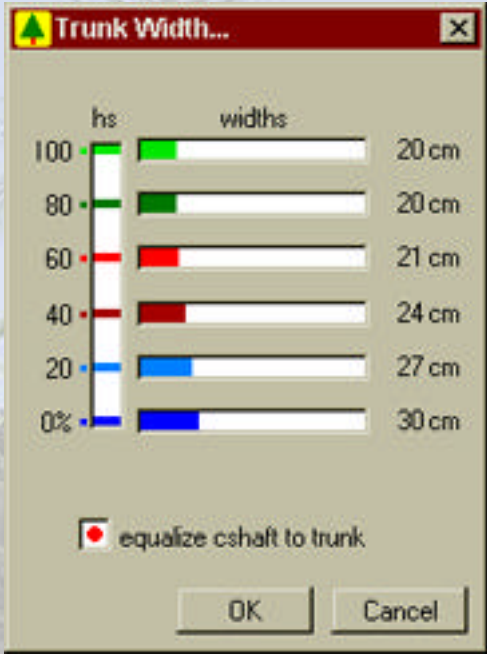


Trunk Twist sets the angle of rotation of the trunk around the vertical (Z-axes). On double click this button, the Trunk Twist dialog box appears.

Twist change sets the pattern of twist change along the trunk.



Trunk Curving button brings up the Trunk Curving dialog box.



Hs (heights) value slider defines the three distinct curving regions along the trunk.

Angles value sliders allow you to set the angles which define the extent of trunk curving in each region. Each angle and the region to which it applies are designated by the same color.

Curving resolution sets the number of segments (longitudinal resolution) for the trunk. Measured in degrees, it defines the maximum allowable angle between two neighboring segments. Smaller angle means higher curving resolution and will result in smoother curvatures.

Trans. resolution sets the number of polygons (transversal resolution) for each cylindrical segment of the trunk.

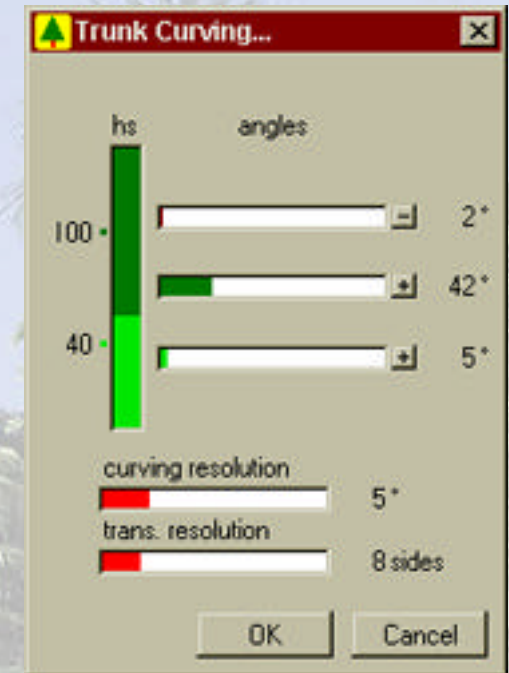


Trunk Color button brings up the Trunk Color dialog box.

Here is where you set the color palette for the palm trunk. The current palette is displayed in the top of the window.

The **primary color slider** that slides along the palette sets the value of the primary color for the trunk. This color is displayed in the box on the left side of the palette. The trunk assumes the primary color if no contrast is set. If set, the primary color defines the upper boundary of the contrast.

The **five color sliders** - red, green, blue, black and white which are dis-



played below are the principal tools for composing the palette. You get the resulting color palette by mixing the chosen amounts of red, green, blue, black, and white color components for each entry of the palette. The two vertical sliders set the amounts of corresponding color component in the mixture for the two boundary entries of the palette. The amounts for all other entries in the palette are calculated automatically. The two horizontal sliders define this part of the palette which will be affected by the chosen amounts of the particular color component.

Longitudinal contrast check box activates or deactivates color change along the trunk in longitudinal direction. If active, the trunk color will change from the leftmost color in the palette at the bottom of the trunk to the primary color at the top of the trunk.

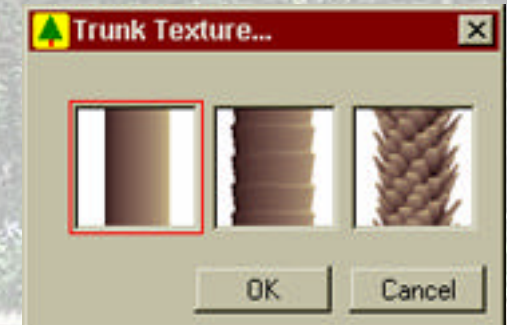
Transversal contrast check box activates or deactivates color change along the trunk in transversal direction. If active, the trunk color will change from the leftmost color in the palette to the primary color around its perimeter.

Transversal contrast slider allows you to set the position of the primary color on the perimeter of the trunk.



Texture brings up the Trunk Texture dialog box.

You can choose three distinct types of trunk texture:





smooth



ringed

Ring length sets the length of each ring.

Length change region sets the region of the trunk that will be affected by the ring length change.

Length change sets the extent to which the ring lengths will change across the designated region of the trunk.

Random length sets the variation of the ring length.

Random slope sets the variation of the ring slope.

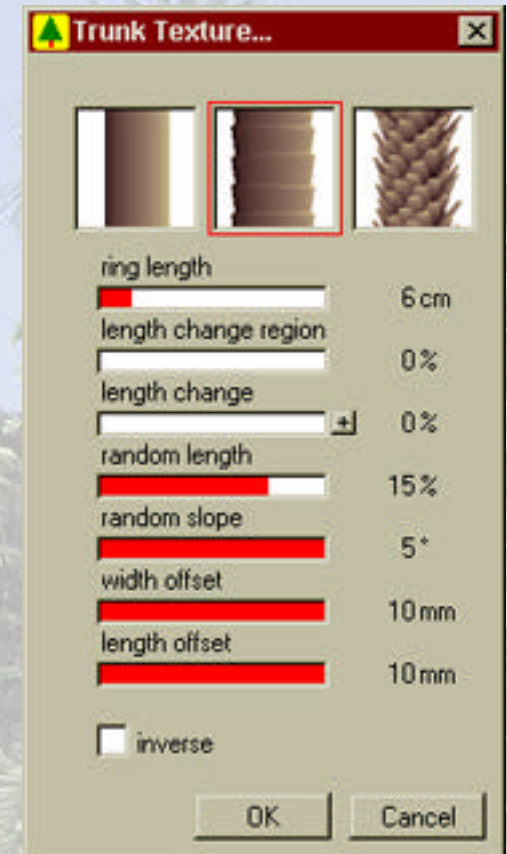
Width offset sets the positive offset of the ring from the perimeter of the trunk.

Length offset sets the distance between two neighboring rings.

Inverse check box inverses direction of the ring length change.



dry petiole



Stem width sets the width of dry, pruned stems.

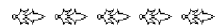
Stem length sets the length of dry, pruned stems.

Length change region sets the region of the trunk that will be affected by the stem length change.

Length change sets the extent to which the lengths of dry stems will change across the designated region of the trunk.

Stem angle sets the angle of dry stems to the trunk.

Stem density sets the density of dry stems across the trunk.



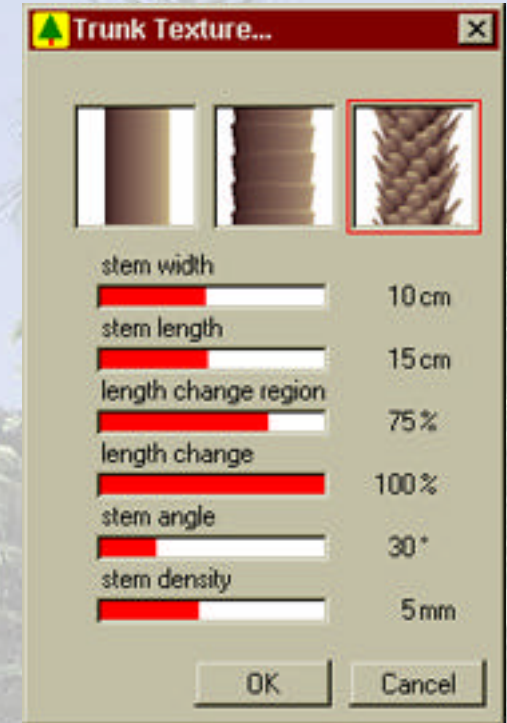
CShaft Height sets the height of the crownshaft.



CShaft Width button brings up the Crownshaft Width dialog box.

Hs (heights) value slider defines the positions of six, characteristic widths along the crownshaft.

Widths value sliders allow you to set these six, characteristic widths. Each width value and its corresponding position are designated by the same color.



Equalize trunk to cshaft check box equalizes the top width of the trunk with the currently set bottom width of the crownshaft.

Trans. resolution sets the number of polygons (transversal resolution) for each cylindrical segment of the crownshaft.



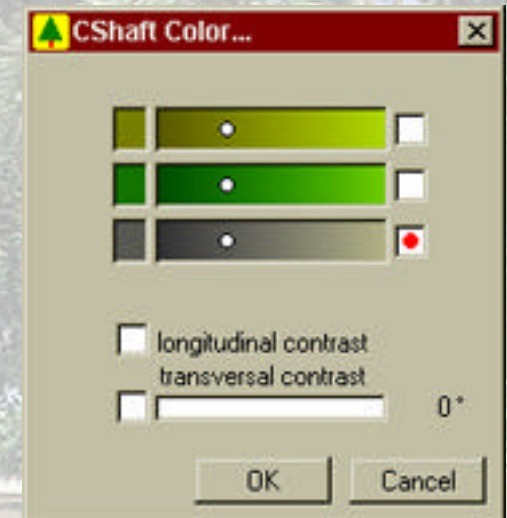
CShaft Color brings up the Crownshaft Color dialog box.

Here is where you select the color palette for the crownshaft. The trunk, and two stem/leaflet palettes are displayed in the top of the window. You select any of the three by checking the corresponding check box on the right side of each palette.

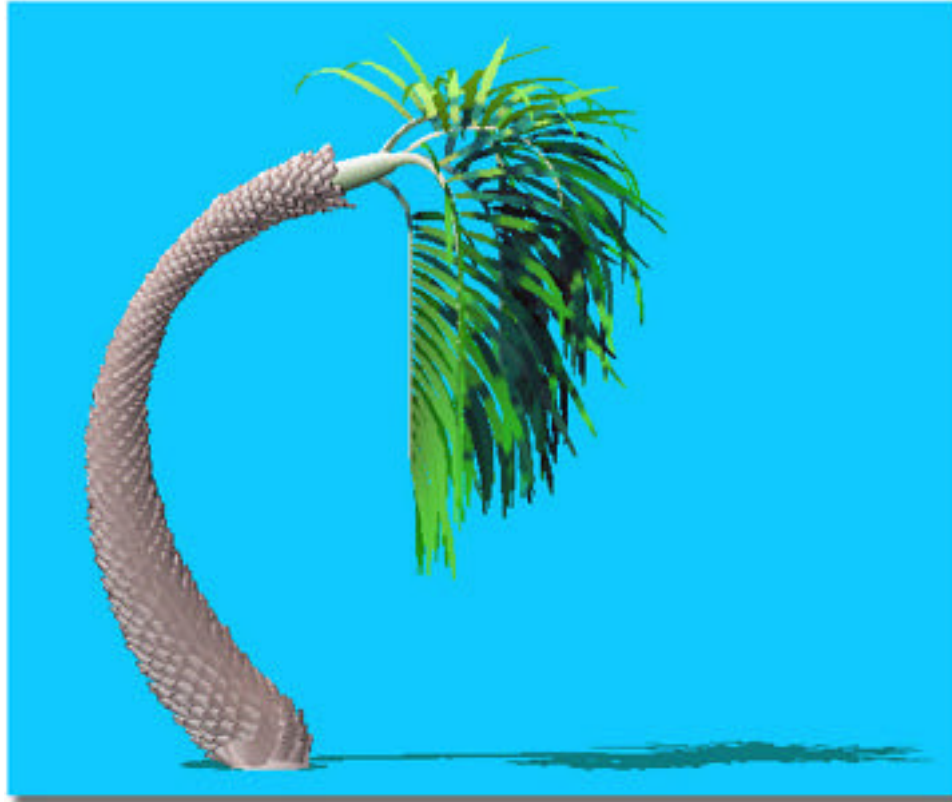
The **primary color sliders** that slide along each palette set the value of the primary color for the crownshaft. These colors are displayed in the boxes on the left side of the palettes. The crownshaft assumes the primary color if no contrast is set. If set, the primary color defines the upper boundary of the contrast.

Longitudinal contrast check box activates or deactivates color change along the crownshaft in longitudinal direction. If active, the crownshaft color will change from the leftmost color in the palette at the bottom of the crownshaft to the primary color at the top of the crownshaft.

Transversal contrast check box activates or deactivates color change along the crownshaft in transversal direction. If active, the crownshaft color will change from the leftmost color in the palette to the primary color around its perimeter.



Transversal contrast slider allows you to set the position of the primary color on the perimeter of the crownshaft.





Stem Parameters

Random Seed sets the randomization pattern for stem parameters. On double click this button, the Random Seed dialog box appears.

Check boxes in the dialog allow you to randomize corresponding stem parameters selectively. For example, if you check the Stem Length check box, each stem on the palm will have slightly different length.

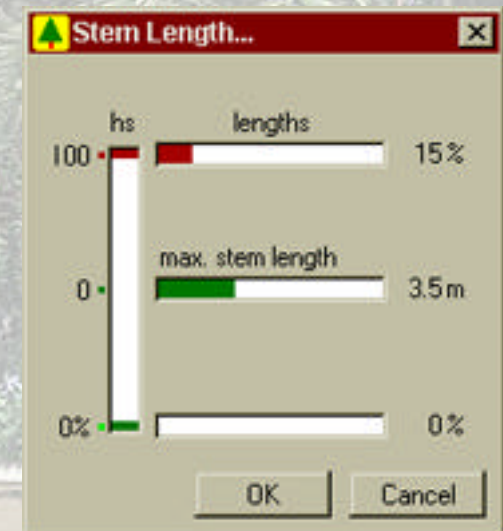
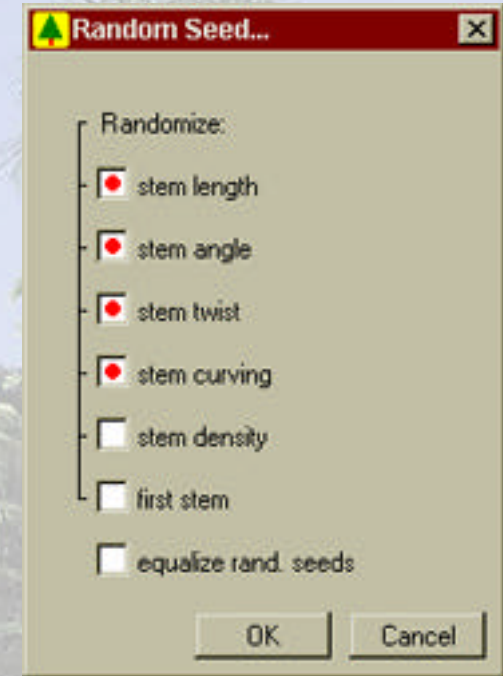
Equalize rand. seeds equalizes the values of random seeds for the trunk, stems, and leaflets. If you want to change random seeds for the trunk, stems, and leaflets selectively, you will leave this check box unchecked.



Stem Length sets the maximum length for stems. On double click this button, the Stem Length dialog box appears.

Hs (heights) value slider defines the positions of three, characteristic stem lengths along the crownshaft.

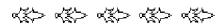
Lengths value sliders allow you to set these three, characteristic lengths. Each length value and its corresponding stem position are designated by the same color.



Stem Width sets the maximum base width for stems. On double click this button, the Stem Width dialog box appears.

Hs (heights) value slider defines the positions of two, characteristic widths along the stem.

Widths value sliders allow you to set these two, characteristic widths. Each width value and its corresponding position are designated by the same color.



Stem Angle sets the maximum stem-to-crownshaft angle for stems. On double click this button, the Stem Angle dialog box appears.

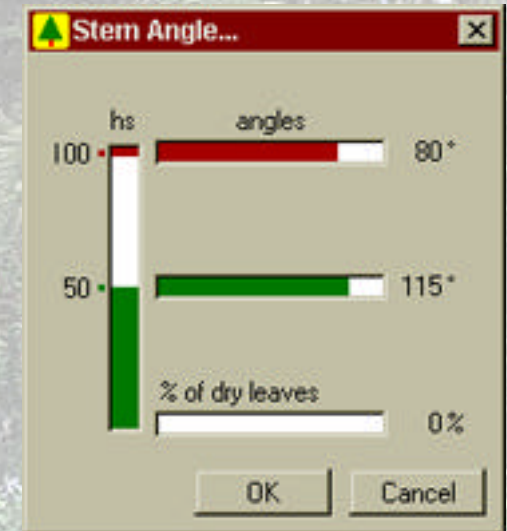
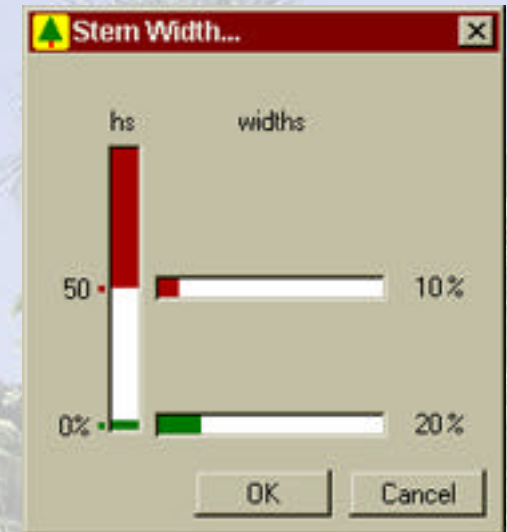
Hs (heights) value slider defines the positions of two, characteristic stem angles along the crownshaft.

Angles value sliders allow you to set these two, characteristic angles. Each angle value and its corresponding position are designated by the same color.

% of dry leaves sets the percentage of hanging, dry leaves from the bottom of the crownshaft.



Stem Twist sets the angle of rotation of the first stem around the trunk. On double click this button, the Stem Twist dialog box appears.



Hs (heights) value slider defines the horizontal curving region (twist change) along the stem.

Horizontal curving slider allows you to set the angle which defines the extent of horizontal curving of this region. The angle and the region to which it applies are designated by the same color.

Stem twist slider allows you to set the angle of rotation of the first stem around the trunk. The twist value and the region to which it applies are designated by the same color.



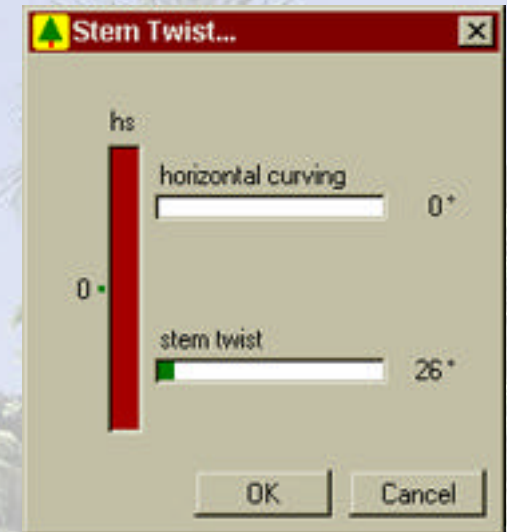
Stem Curving button brings up the Stem Curving dialog box.

Hs (heights) value slider defines the three distinct curving regions along the stem.

Angles value sliders allow you to set the angles which define the extent of stem curving in each region. Each angle value and its corresponding region are designated by the same color.

Change value sliders allow you to set the extent and direction of curving change along the crownshaft for each region. Each change value and its corresponding region are designated by the same color.

Curving resolution sets the number of segments (longitudinal resolution) for the stems. Measured in degrees, it defines the maximum allowable angle between two neighboring segments. Smaller angle means higher curving resolution and will result in smoother curvatures.



Trans. resolution sets the number of polygons (transversal resolution) for each cylindrical segment of the stem.



Stem Density sets the density of the stems along the crownshaft. On double click this button, the Stem Density dialog box appears.

Stem density sets the density of the stems along the crownshaft.

Pruning sets the amount of pruned stems from the bottom of the crownshaft.

Random pruning sets the amount of random pruning along the crownshaft.

Pruning length sets the length of pruned stems. Pruning length + check box allows you to specify the length change direction for pruned stems.

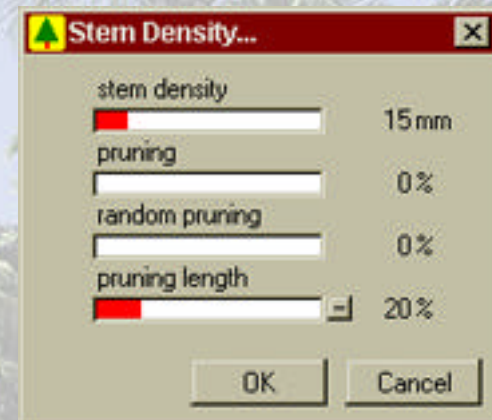


First Stem sets the position of the first stem along the crownshaft.



Color button brings up the Stem Color dialog box.

Here is where you set the color palettes for the stems. The current palettes are displayed in the top of the window. You choose to work on



either of the two palettes by checking the corresponding check box on the right side of each palette.

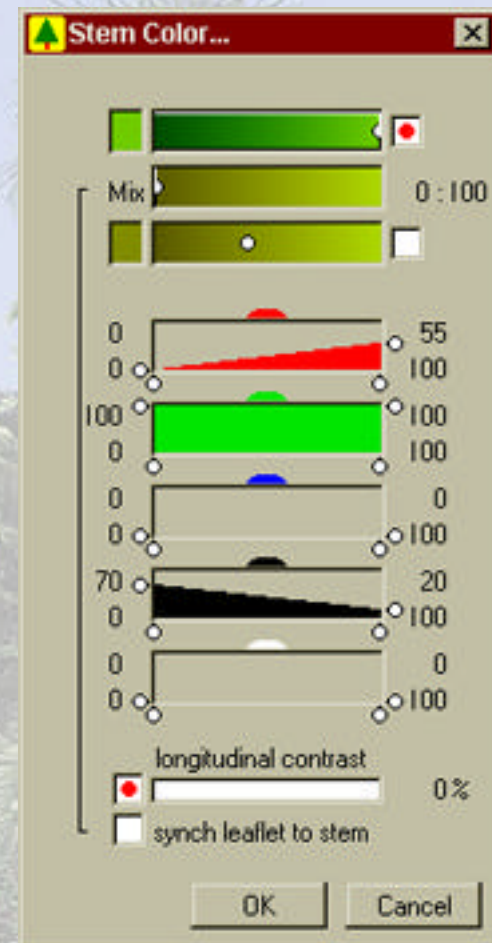
The **primary color sliders** that slide along each palette set the values of the primary colors for the stems. These colors are displayed in the boxes on the left side of the palettes. The stems assume the primary colors if no contrast is set. If set, the primary colors define the upper boundaries of the contrasts.

Mix allows you to assign the two color palettes to different groups of stems in designated proportions.

The **five color sliders** - red, green, blue, black and white which are displayed below are the principal tools for composing the palette. You get the resulting color palette by mixing the chosen amounts of red, green, blue, black, and white color components for each entry of the palette. The two vertical sliders set the amounts of corresponding color component in the mixture for the two boundary entries of the palette. The amounts for all other entries in the palette are calculated automatically. The two horizontal sliders define this part of the palette which will be affected by the chosen amounts of the particular color component.

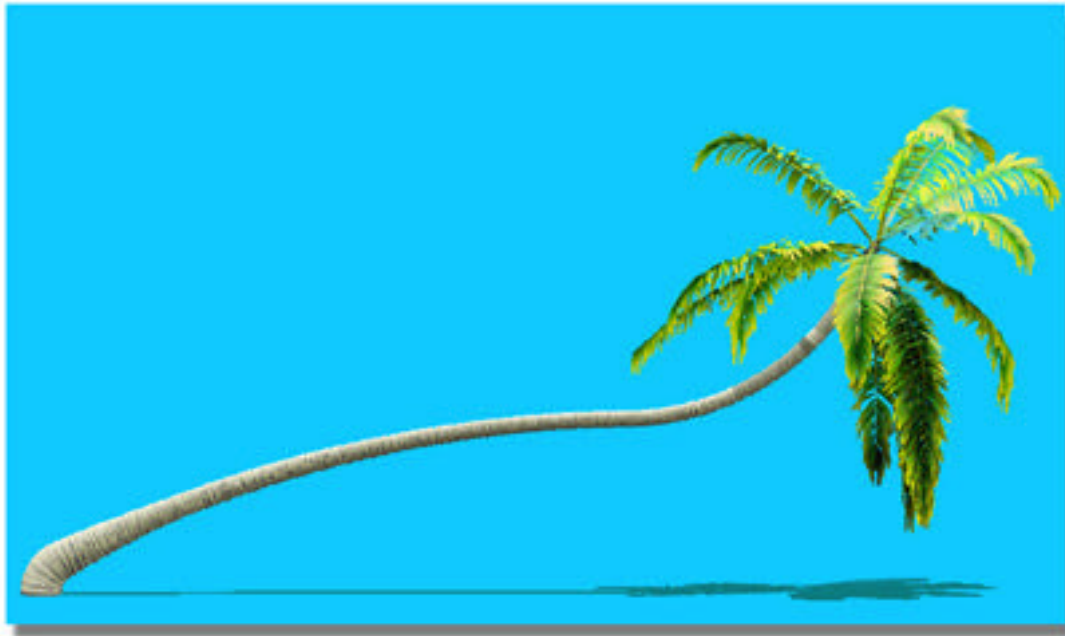
Longitudinal contrast check box activates or deactivates color change along the stem in longitudinal direction. If active, the stem color will change from the leftmost color in the corresponding palette at the stem base to the primary color at its top.

Longitudinal contrast slider sets the extent of change in longitudinal contrast. The change starts affecting the first stem and reaches maxi-



mum on the stems at the top of the crownshaft.

Synch leaflet to stem check box synchronizes the value of palette mix for leaflets with the palette mix for stems. If active, the palette mix for the leaflets will be automatically adjusted with the change of the palette mix for the stems so that the same groups of stems and leaflets will always share the same palette.





Foliage Parameters

Random Seed sets the randomization pattern for foliage parameters. On double click this button, the Random Seed dialog box appears.

Check boxes in the dialog allow you to randomize corresponding leaflet parameters selectively. For example, if you check the Petiole Length check box, each leaf on the palm will have slightly different petiole length.

Equalize rand. seeds equalizes the values of random seeds for the trunk, stems, and leaflets. If you want to change random seeds for the trunk, stems, and leaflets selectively, you will leave this check box unchecked.



Leaf Type button brings up the Leaf Type dialog box.

Choose the leaf type by clicking any of the two top icons.



palmate leaf



pinnate leaf



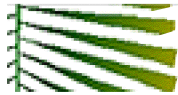
Select the leaflet type by clicking any of the four bottom icons.



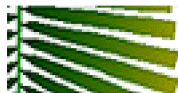
simple diamond shaped leaflet



elliptical diamond shaped leaflet



simple fan shaped leaflet



elliptical fan shaped leaflet

Leaflet width sets the maximum width of the leaflet.

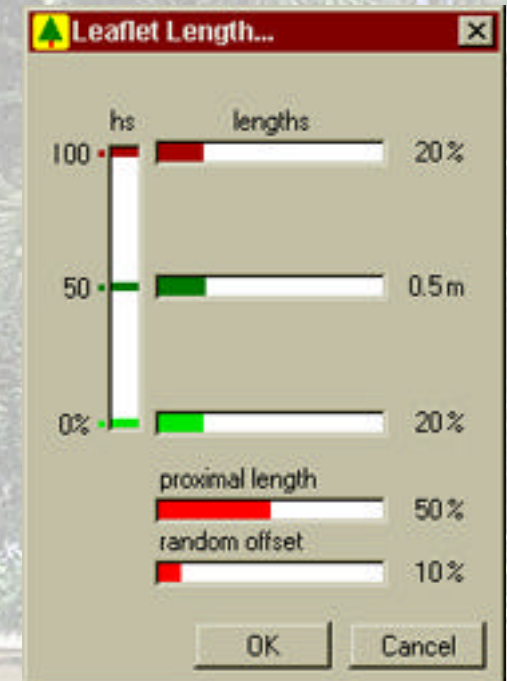
Leaflet resolution sets the number of segments (longitudinal resolution) for the leaflets.



Leaf Length sets the maximum length for leaflets. On double click this button, the Leaflet Length dialog box appears.

Hs (heights) value slider defines the positions of three, characteristic leaflet lengths along the stem.

Lengths value sliders allow you to set these three, characteristic

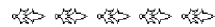


lengths. Each length value and its corresponding leaflet position are designated by the same color.

Proximal length* sets the position of the maximum width along the leaflet.

*We have borrowed the botanical term to name this parameter. The above definition does not adhere strictly to the botanical definition of the term which refers to unsegmented portion of the palm leaf.

Random offset sets the extent of variation in the lengths of leaflets.

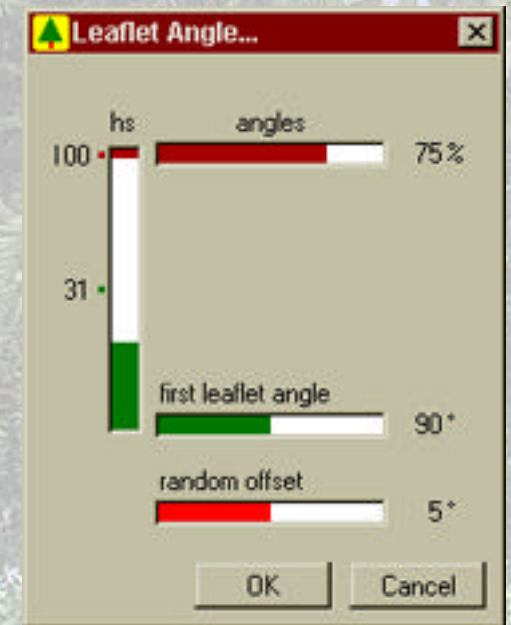


Leaflet Angle sets the maximum leaflet-to-parent stem angle for leaflets. On double click this button, the Leaflet Angle dialog box appears. Note that Leaflet Angle dialog will appear only if pinate leaves are selected..

Hs (heights) value slider defines the positions of two, characteristic leaflet angles along the stem.

Angles value sliders allow you to set these two, characteristic angles. Each angle value and its corresponding position are designated by the same color.

Random offset sets the extent of variation in the angles of leaflets.



Leaflet Twist sets the angle of rotation of the first leaflet around the parent stem. On double click this button, the Leaflet Twist dialog box appears.

First leaflet twist sets the angle of rotation of the first leaflet around the parent stem.

Random offset sets the extent of variation in the twists of leaflets.

TC - mirrored stands for the mirrored twist change. This parameter sets the amount of the mirrored twist change where each subsequent leaflet is rotated around its parent stem so that it mirrors the previous leaflet. Many palms exhibit this characteristic, and the variations of popularly named "Bottle Palm" are among the ones where this type of twist change is the most apparent (see "Bottle Palm" from Palm Library).

Hs (heights) value slider defines the leaflet rolling region along the stem (dark green area).

% of rolled leaves sets the amount of rolled leaves on the palm.

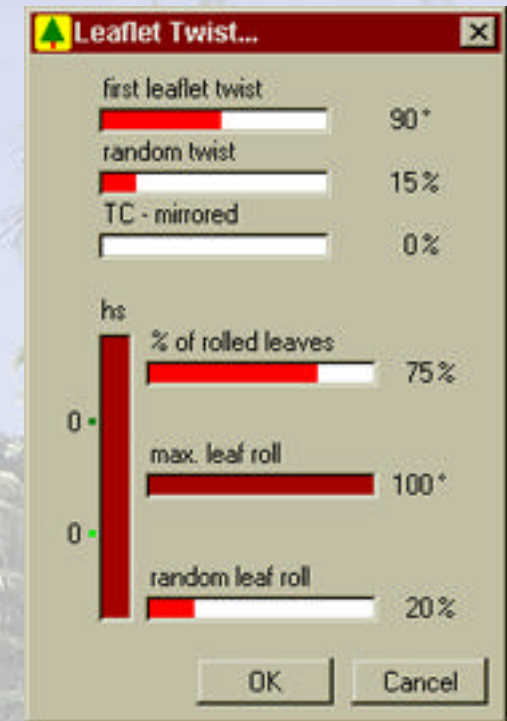
Max. leaf roll sets the maximum rolling angle for the leaves.

Random leaf roll sets the extent of variation in the amount of rolling.



Leaflet Curving button brings up the Leaflet Curving dialog box.

Hs (heights) value slider defines the three distinct curving regions along



the leaflet.

Angles value sliders allow you to set the angles which define the extent of leaflet curving in each region. Each angle value and its corresponding region are designated by the same color.

Change value sliders allow you to set the extent and direction of curving change along the crownshaft for each region. Each change value and its corresponding region are designated by the same color.

Random regions sets the extent of variation for the curving regions.

Random angles sets the extent of variation for the curving angles.

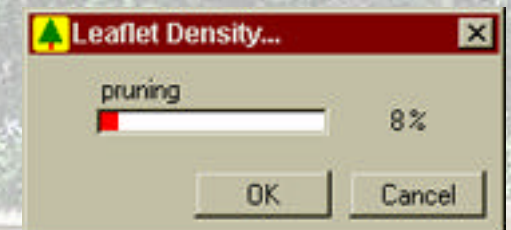
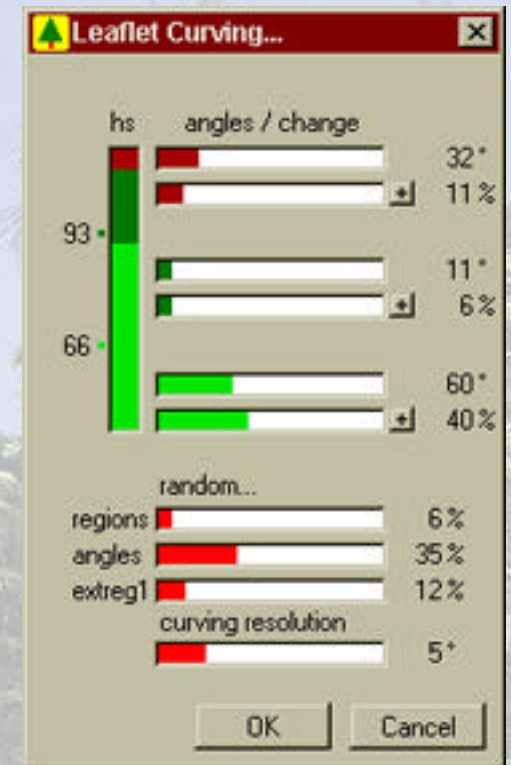
Random extreg1 sets the amount of leaflets whose current setting for the regions will be overridden by extending the first region across the length of the leaflet. Extreg1 stands for “extend region 1”.

Curving resolution sets the number of segments (longitudinal resolution) for the leaflets. Measured in degrees, it defines the maximum allowable angle between two neighboring segments. Smaller angle means higher curving resolution and will result in smoother curvatures.



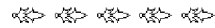
Leaflet Density sets the density of the leaflets along the stem. On double click this button, the Leaflet Density dialog box appears.

Pruning sets the amount of leaflets to be pruned.





Petiole Length sets the position of the first leaflet along the stem.



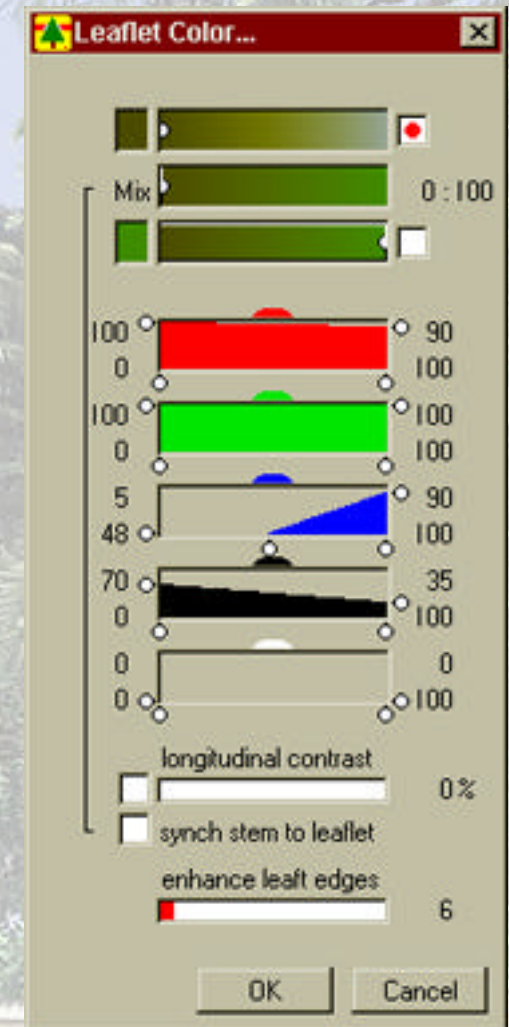
Color button brings up the Leaflet Color dialog box.

Here is where you set the color palettes for the leaflets. The current palettes are displayed in the top of the window. You choose to work on either of the two palettes by checking the corresponding check box on the right side of each palette.

The **primary color sliders** that slide along each palette set the values of the primary colors for the leaflets. These colors are displayed in the boxes on the left side of the palettes. The leaflets assume the primary colors if no contrast is set. If set, the primary colors define the upper boundaries of the contrasts.

Mix allows you to assign the two color palettes to different groups of leaflets in designated proportions.

The **five color sliders** - red, green, blue, black and white which are displayed below are the principal tools for composing the palette. You get the resulting color palette by mixing the chosen amounts of red, green, blue, black, and white color components for each entry of the palette. The two vertical sliders set the amounts of corresponding color component in the mixture for the two boundary entries of the palette. The



amounts for all other entries in the palette are calculated automatically. The two horizontal sliders define this part of the palette which will be affected by the chosen amounts of the particular color component.

Longitudinal contrast check box activates or deactivates color change along the leaflet in longitudinal direction. If active, the leaflet color will change from the leftmost color in the corresponding palette at the leaflet base to the primary color at its top.

Longitudinal contrast slider sets the extent of change in longitudinal contrast. The change starts affecting the first leaflet and reaches maximum on the leaflets at the top of the crownshaft.

Synch stem to leaflet check box synchronizes the value of palette mix for stems with the palette mix for leaflets. If active, the palette mix for the stems will be automatically adjusted with the change of the palette mix for the leaflets so that the same groups of stems and leaflets will always share the same palette.

Enhance leaf edges slider enables you to accentuate the edges of palm leaflets in rendering.



3D Model Export

PALM exports a 3D model of a palm with structural layers. Once a palm is imported into a 3D application these layers may be represented in different ways.

A **palm type** has up to 13 layers, their respective names are:

1. **Trunk1** (**TR1** in DXF) carries the main trunk.
2. **Trunk2** (**TR2** in DXF) carries the cut stems of the complex trunk or rings of the ringed trunk.
3. **Trunk3** (**TR3** in DXF) carries the tips of cut stems of the complex trunk.
4. **Crownshaft** (**CRS** in DXF) carries the crownshaft.
5. **Stem1** (**ST1** in DXF) carries dry stems or L color group of stems.
6. **Stem2** (**ST2** in DXF) carries live stems or R color group of stems.
7. **Leaf1** (**LF1** in DXF) carries dry leaflets or L color group leaflets.
8. **Leaf2** (**LF2** in DXF) carries live leaflets or R color group leaflets
9. **Cuts_TR** (**T1C** in DXF) carries the trunk cut.
10. **Cuts_CS** (**CSC** in DXF) carries the crownshaft cut.
11. **Cuts_ST1** (**S1C** in DXF) carries cuts of dry stems or L color group of stems.
12. **Cuts_ST2** (**S2C** in DXF) carries cuts of live stems or R color group of stems.
13. **Envelope** (**EV** in DXF) carries the palm crown's envelope.

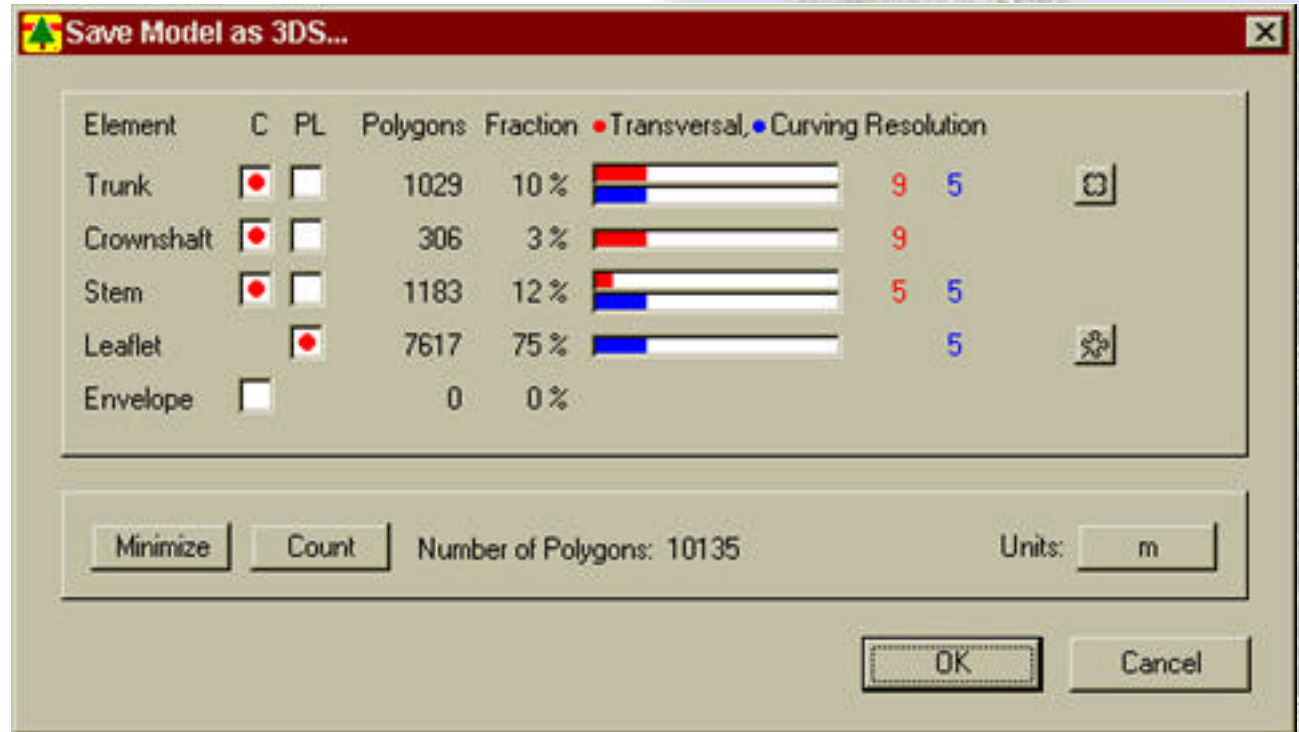


3DS File Export

3DS is the AutoDesk 3D Studio binary file format widely used for transferring 3D data among CAD and other 3D graphic applications including rendering and animation programs. The PALM's 3DS files carry full 3D geometry, the color per material information and the UV information for these materials.

PALM is building the polygonal model as it is saving it in a 3DS file. Thus, the rendering on the canvas is just a preview. Once you have the correct parameter settings for a particular palm, you can interrupt the rendering anytime and proceed with saving the palm as a 3DS file, or you can skip the rendering all together and proceed directly with the saving.

Detail and Resolution - Each class of palm elements can be modeled at up to two different levels of detail, or it can be excluded from the model all together. For example, if you check **C** (complex) for the trunk, the trunk will be modeled as a sequence of cylindrical segments of the chosen transversal and curving resolutions. By checking **PL** (polyline), the trunk will be modeled as a sequence of one-polygon segments. If



Palm 3DS dialog

both check boxes are unchecked, the trunk will not be modeled.

When you select any of the modeling options for any class of palm elements, you get an instant feedback on the number of polygons for this particular layer (**Polygons** column) and its fraction relative to the overall size of the file (**Fraction** column). Thus you see not only the size of this layer in terms of absolute polygon numbers, but also its impact on the overall size of the file. And this information will help you to choose the most effective strategy in lowering the number of polygons for a particular palm.

By pressing **Minimize** button, all the relevant export parameters will be adjusted automatically to give you the smallest number of polygons for a given palm.

Count button commands PALM to count the polygons for a particular palm model and displays the overall size of the file in polygon numbers.

Transversal Resolution defines for each cylindrical segment of a particular class of palm elements the number of polygons it is composed of. You can adjust the transversal resolution of each class of palm elements independently (red sliders). The transversal resolution may vary depending on the fidelity requirements for a particular palm model.

Curving Resolution sets the number of segments (longitudinal resolution) for a particular class of palm elements. Measured in degrees, it defines the maximum allowable angle between two neighboring segments. Smaller angle means higher curving resolution and will result in smoother curvatures. You can adjust the curving resolution of each class



of palm elements independently (blue sliders).



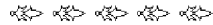
Simplify Trunk

Simplify Trunk, when pressed, will cause a molded trunk to be modeled as unmolded thus saving a substantial number of polygons. If the trunk is not molded, Simplify Trunk is disabled.



Simplify Leaf

Simplify Leaf, when pressed, will cause the leaf type to be changed to a simple diamond or fan shape, with the smallest number of polygons. If the leaves are already in a simple diamond or fan shape, Simplify Leaf button is disabled.



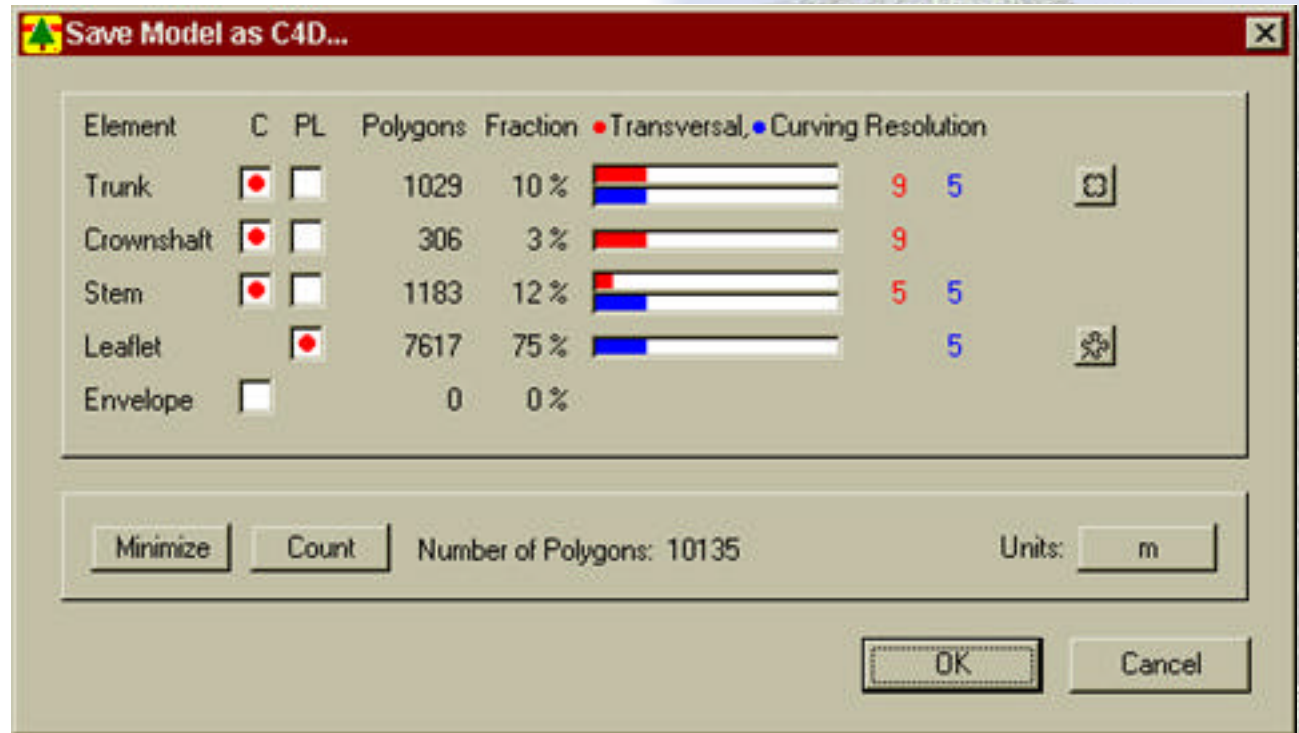
Units button brings up the Scene units floating menu which allows you to choose the units in which your palm will be exported out.



C4D File Export

C4D is Maxon Computer Cinema 4D file format. It is used for transferring 3D data to and from Cinema 4D modeling, rendering and animation program. The PALM's C4D files carry full 3D geometry, layers, color per layer information, and UV information for these layers.

PALM is building the polygonal model as it is saving it in a C4D file. Thus, the rendering on the canvas is just a preview. Once you have the correct parameter settings for a particular palm, you can interrupt the rendering any-time and proceed with saving the palm as a C4D file, or you can skip the rendering all together and proceed directly with the saving.



Palm C4D dialog

Detail and Resolution - Each class of palm elements can be modeled at up to two different levels of detail, or it can be excluded from the model all together. For example, if you check **C** (complex) for the trunk, the trunk will be modeled as a sequence of cylindrical segments of the chosen transversal and curving resolutions. By checking **PL** (polyline), the trunk will be modeled as a sequence of one-polygon segments. If

both check boxes are unchecked, the trunk will not be modeled.

When you select any of the modeling options for any class of palm elements, you get an instant feedback on the number of polygons for this particular layer (**Polygons** column) and its fraction relative to the overall size of the file (**Fraction** column). Thus you see not only the size of this layer in terms of absolute polygon numbers, but also its impact on the overall size of the file. And this information will help you to choose the most effective strategy in lowering the number of polygons for a particular palm.

By pressing **Minimize** button, all the relevant export parameters will be adjusted automatically to give you the smallest number of polygons for a given palm.

Count button commands PALM to count the polygons for a particular palm model and displays the overall size of the file in polygon numbers.

Transversal Resolution defines for each cylindrical segment of a particular class of palm elements the number of polygons it is composed of. You can adjust the transversal resolution of each class of palm elements independently (red sliders). The transversal resolution may vary depending on the fidelity requirements for a particular palm model.

Curving Resolution sets the number of segments (longitudinal resolution) for a particular class of palm elements. Measured in degrees, it defines the maximum allowable angle between two neighboring segments. Smaller angle means higher curving resolution and will result in smoother curvatures. You can adjust the curving resolution of each class



of palm elements independently (blue sliders).



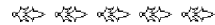
Simplify Trunk

Simplify Trunk, when pressed, will cause a molded trunk to be modeled as unmolded thus saving a substantial number of polygons. If the trunk is not molded, Simplify Trunk is disabled.

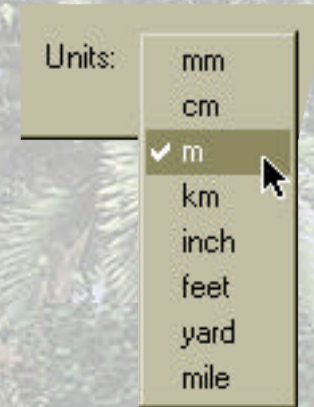


Simplify Leaf

Simplify Leaf, when pressed, will cause the leaf type to be changed to a simple diamond or fan shape, with the smallest number of polygons. If the leaves are already in a simple diamond or fan shape, Simplify Leaf button is disabled.



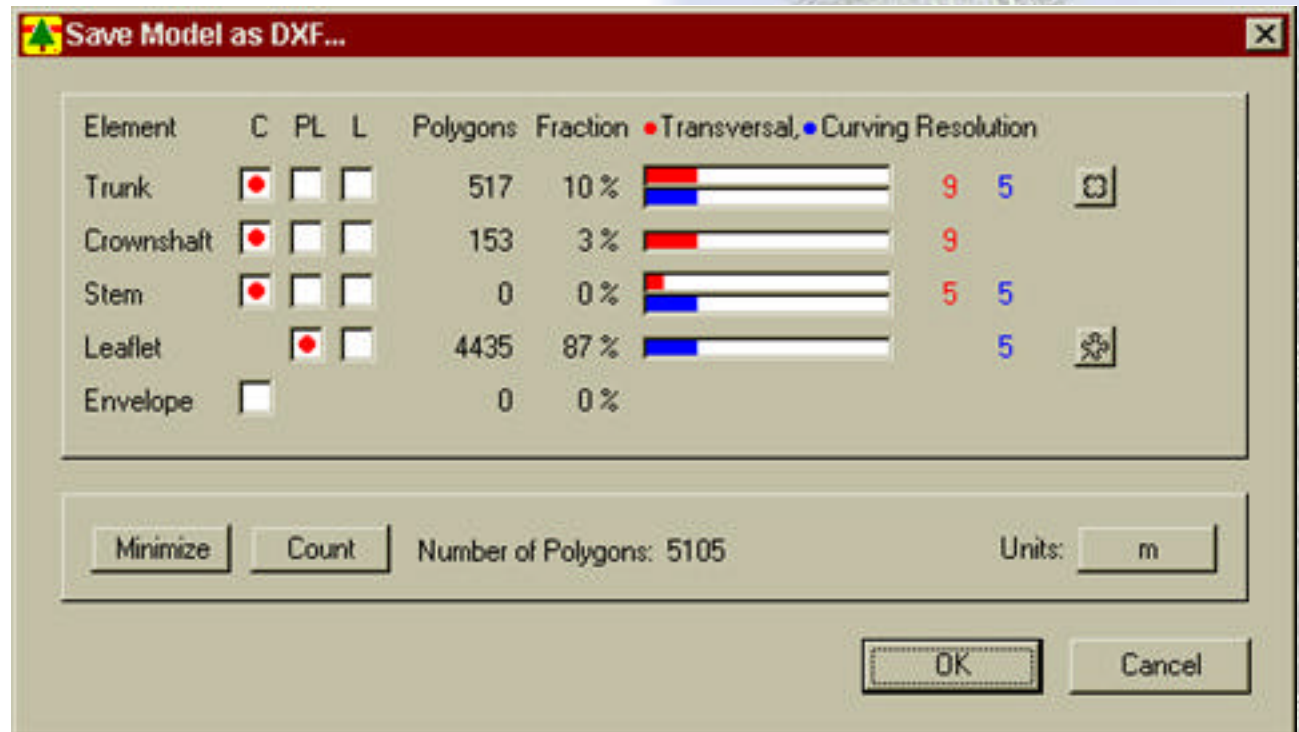
Units button brings up the Scene units floating menu which allows you to choose the units in which your palm will be exported out.



DXF File Export

DXF or Drawing Interchange File is a standard ASCII text file format widely used for transferring 3D data among CAD and other 3D graphic applications including rendering and animation programs. The PALM's DXF files carry full 3D geometry and color information on up to fifteen (15) structural layers.

PALM is building the polygonal model as it is saving it in a DXF file. Thus, the rendering on the canvas is just a preview. Once you have the correct parameter settings for a particular palm, you can interrupt the rendering anytime and proceed with saving the palm as a DXF file, or you can skip the rendering all together and proceed directly with the saving.



Palm DXF dialog

Detail and Resolution - Each class of palm elements can be modeled at up to three different levels of detail, or it can be excluded from the model all together. For example, if you check **C** (complex) for the trunk, the trunk will be modeled as a sequence of cylindrical segments of the chosen transversal and curving resolutions. By checking **PL** (polyline), the trunk will be modeled as a sequence of one-polygon segments. By

checking **L** (line), the trunk will be modeled as a sequence of line segments. If three trunk check boxes are unchecked, the trunk will not be modeled.

When you select any of the modeling options for any class of palm elements, you get an instant feedback on the number of polygons for this particular layer (**Polygons** column) and its fraction relative to the overall size of the file (**Fraction** column). Thus you see not only the size of this layer in terms of absolute polygon numbers, but also its impact on the overall size of the file. And this information will help you to choose the most effective strategy in lowering the number of polygons for a particular palm.

By pressing **Minimize** button, all the relevant export parameters will be adjusted automatically to give you the smallest number of polygons for a given palm.

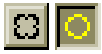
Count button commands PALM to count the polygons for a particular palm model and displays the overall size of the file in polygon numbers.

Transversal Resolution defines for each cylindrical segment of a particular class of palm elements the number of polygons it is composed of. You can adjust the transversal resolution of each class of palm elements independently (red sliders). The transversal resolution may vary depending on the fidelity requirements for a particular palm model.

Curving Resolution sets the number of segments (longitudinal resolution) for a particular class of palm elements. Measured in degrees, it defines the maximum allowable angle between two neighboring seg-

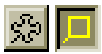


ments. Smaller angle means higher curving resolution and will result in smoother curvatures. You can adjust the curving resolution of each class of palm elements independently (blue sliders).



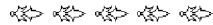
Simplify Trunk

Simplify Trunk, when pressed, will cause a molded trunk to be modeled as unmolded thus saving a substantial number of polygons. If the trunk is not molded, Simplify Trunk is disabled.

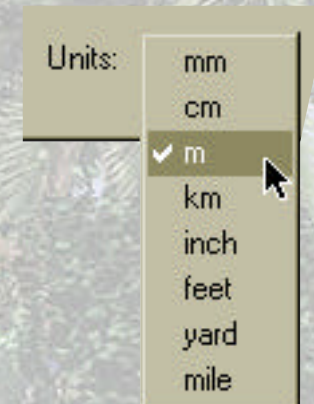


Simplify Leaf

Simplify Leaf, when pressed, will cause the leaf type to be changed to a simple diamond or fan shape, with the smallest number of polygons. If the leaves are already in a simple diamond or fan shape, Simplify Leaf button is disabled.



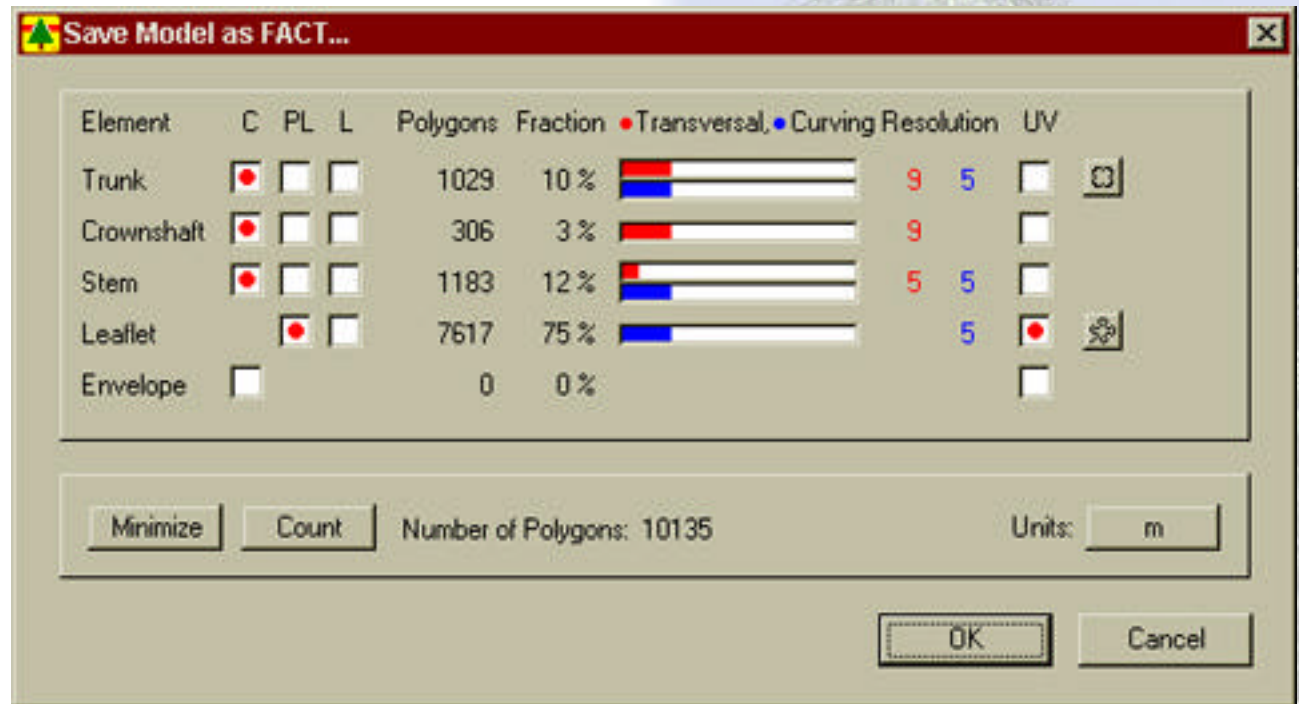
Units button brings up the Scene units floating menu which allows you to choose the units in which your palm will be exported out.



FACT File Export

FAC or FACT is a 3D file format specified by ElectricImage. It is used for transferring 3D data to and from ElectricImage modeling, rendering and animation program. The PALM's FACT files carry full 3D geometry, layers, color per vertex information, and UV information for these layers.

PALM is building the polygonal model as it is saving it in a FACT file. Thus, the rendering on the canvas is just a preview. Once you have the correct parameter settings for a particular palm, you can interrupt the rendering any-time and proceed with saving the palm as a FACT file, or you can skip the rendering all together and proceed directly with the saving.



Palm FACT dialog

Detail and Resolution - Each class of palm elements can be modeled at up to three different levels of detail, or it can be excluded from the model all together. For example, if you check **C** (complex) for the trunk, the trunk will be modeled as a sequence of cylindrical segments of the chosen transversal and curving resolutions. By checking **PL** (polyline), the trunk will be modeled as a sequence of one-polygon segments. By checking **L** (line), the trunk will be modeled as a sequence of line seg-

ments. If three trunk check boxes are unchecked, the trunk will not be modeled.

When you select any of the modeling options for any class of palm elements, you get an instant feedback on the number of polygons for this particular layer (**Polygons** column) and its fraction relative to the overall size of the file (**Fraction** column). Thus you see not only the size of this layer in terms of absolute polygon numbers, but also its impact on the overall size of the file. And this information will help you to choose the most effective strategy in lowering the number of polygons for a particular palm.

By pressing **Minimize** button, all the relevant export parameters will be adjusted automatically to give you the smallest number of polygons for a given palm.

Count button commands PALM to count the polygons for a particular palm model and displays the overall size of the file in polygon numbers.

Transversal Resolution defines for each cylindrical segment of a particular class of palm elements the number of polygons it is composed of. You can adjust the transversal resolution of each class of palm elements independently (red sliders). The transversal resolution may vary depending on the fidelity requirements for a particular palm model.

Curving Resolution sets the number of segments (longitudinal resolution) for a particular class of palm elements. Measured in degrees, it defines the maximum allowable angle between two neighboring segments. Smaller angle means higher curving resolution and will result in



smoother curvatures. You can adjust the curving resolution of each class of palm elements independently (blue sliders).

UV column of buttons are here to, when checked, replace Color-Per-Vertex texture with custom texture guided by UV information. If you wish to apply a bark texture onto a trunk, check UV mark for the trunk.



Simplify Trunk

Simplify Trunk, when pressed, will cause a molded trunk to be modeled as unmolded thus saving a substantial number of polygons. If the trunk is not molded, Simplify Trunk is disabled.



Simplify Leaf

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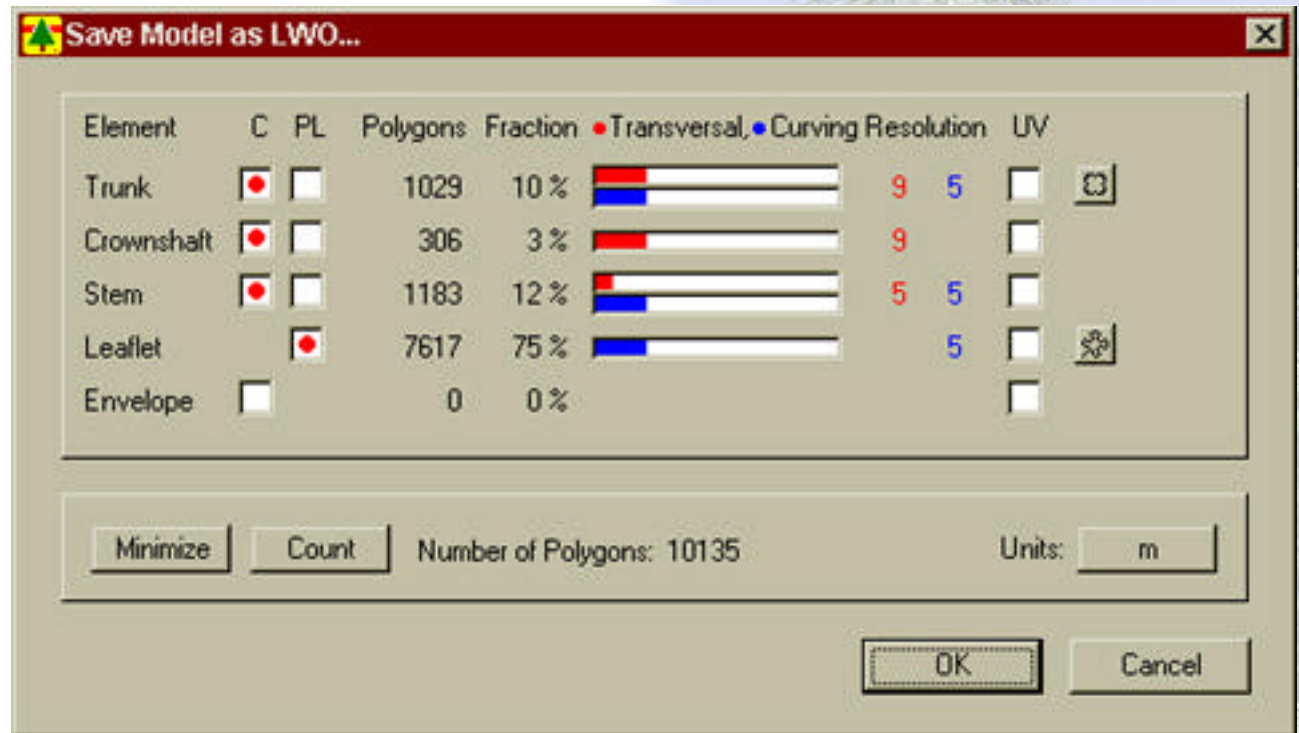
Units button brings up the Scene units floating menu which allows you to choose the units in which your palm will be exported out.



LWO File Export

LWO is the NewTek 3D file format. It is used for transferring 3D data to and from Lightwave6 or newer modeling, rendering and animation program. The PALM's LWO files carry full 3D geometry, layers, color per vertex information, and UV information for these layers.

PALM is building the polygonal model as it is saving it in a LWO file. Thus, the rendering on the canvas is just a preview. Once you have the correct parameter settings for a particular palm, you can interrupt the rendering any-time and proceed with saving the palm as a FACT file, or you can skip the rendering all together and proceed directly with the saving.



Palm LWO dialog

Detail and Resolution - Each class of palm elements can be modeled at up to two different levels of detail, or it can be excluded from the model all together. For example, if you check **C** (complex) for the trunk, the trunk will be modeled as a sequence of cylindrical segments of the chosen transversal and curving resolutions. By checking **PL** (polyline), the trunk will be modeled as a sequence of one-polygon segments. If two trunk check boxes are unchecked, the trunk will not be modeled.

When you select any of the modeling options for any class of palm elements, you get an instant feedback on the number of polygons for this particular layer (**Polygons** column) and its fraction relative to the overall size of the file (**Fraction** column). Thus you see not only the size of this layer in terms of absolute polygon numbers, but also its impact on the overall size of the file. And this information will help you to choose the most effective strategy in lowering the number of polygons for a particular palm.

By pressing **Minimize** button, all the relevant export parameters will be adjusted automatically to give you the smallest number of polygons for a given palm.

Count button commands PALM to count the polygons for a particular palm model and displays the overall size of the file in polygon numbers.

Transversal Resolution defines for each cylindrical segment of a particular class of palm elements the number of polygons it is composed of. You can adjust the transversal resolution of each class of palm elements independently (red sliders). The transversal resolution may vary depending on the fidelity requirements for a particular palm model.

Curving Resolution sets the number of segments (longitudinal resolution) for a particular class of palm elements. Measured in degrees, it defines the maximum allowable angle between two neighboring segments. Smaller angle means higher curving resolution and will result in smoother curvatures. You can adjust the curving resolution of each class of palm elements independently (blue sliders).



UV column of buttons are here to, when checked, replace Color-Per-Vertex texture with custom texture guided by UV information. If you wish to apply a bark texture onto a trunk, check UV mark for the trunk.



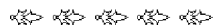
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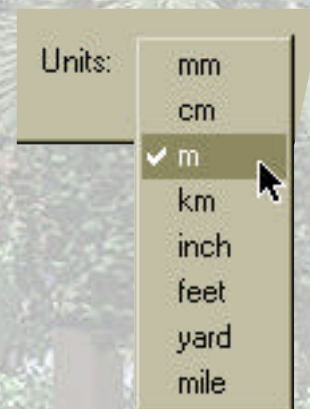


Simplify Leaf

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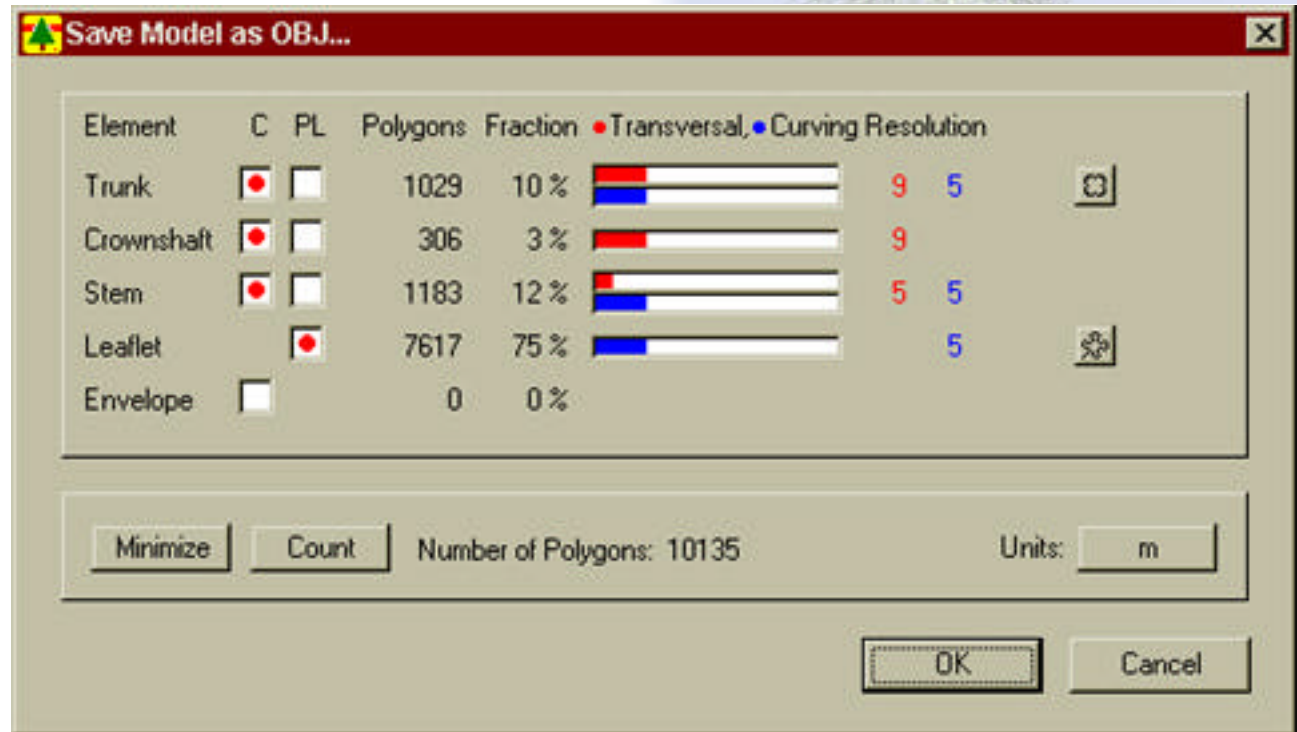
Units button brings up the Scene units floating menu which allows you to choose the units in which your palm will be exported out.



OBJ File Export

OBJ is the Alias|Wavefront 3D file format. It is used for transferring 3D data to Maya and to and from other modeling, rendering and animation programs. The PALM's OBJ files carry full 3D geometry, layers, color per layer information, and UV information for these layers.

PALM is building the polygonal model as it is saving it in a OBJ file. Thus, the rendering on the canvas is just a preview. Once you have the correct parameter settings for a particular palm, you can interrupt the rendering any-time and proceed with saving the palm as a OBJ file, or you can skip the rendering all together and proceed directly with the saving.



Palm OBJ dialog

Detail and Resolution - Each class of palm elements can be modeled at up to two different levels of detail, or it can be excluded from the model all together. For example, if you check **C** (complex) for the trunk, the trunk will be modeled as a sequence of cylindrical segments of the chosen transversal and curving resolutions. By checking **PL** (polyline), the trunk will be modeled as a sequence of one-polygon segments. If two trunk check boxes are unchecked, the trunk will not be modeled.

When you select any of the modeling options for any class of palm elements, you get an instant feedback on the number of polygons for this particular layer (**Polygons** column) and its fraction relative to the overall size of the file (**Fraction** column). Thus you see not only the size of this layer in terms of absolute polygon numbers, but also its impact on the overall size of the file. And this information will help you to choose the most effective strategy in lowering the number of polygons for a particular palm.

By pressing **Minimize** button, all the relevant export parameters will be adjusted automatically to give you the smallest number of polygons for a given palm.

Count button commands PALM to count the polygons for a particular palm model and displays the overall size of the file in polygon numbers.

Transversal Resolution defines for each cylindrical segment of a particular class of palm elements the number of polygons it is composed of. You can adjust the transversal resolution of each class of palm elements independently (red sliders). The transversal resolution may vary depending on the fidelity requirements for a particular palm model.

Curving Resolution sets the number of segments (longitudinal resolution) for a particular class of palm elements. Measured in degrees, it defines the maximum allowable angle between two neighboring segments. Smaller angle means higher curving resolution and will result in smoother curvatures. You can adjust the curving resolution of each class of palm elements independently (blue sliders).





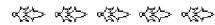
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Simplify Leaf

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Units button brings up the Scene units floating menu which allows you to choose the units in which your palm will be exported out.

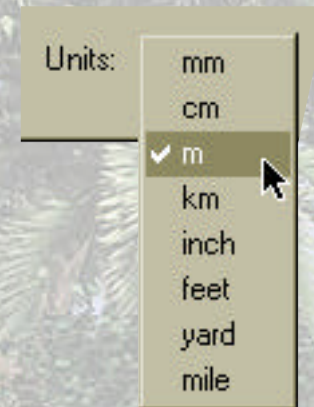


Task:

*Import a palm into **Maya** - an Alias|WF program. Take for example a palm named Pseudophoenix palm saved in PALM as Pseudophoenix.obj.*

Solution:

- File > Import "Pseudophoenix.obj";
- Outliner window shows five palm objects: Trunk1, Trunk2, Crownshaft, Stem2, and Leaf2;
- To parent the palm, in Outliner window click Leaf2;



- Press and hold [Shift] key;
- Click Trunk1;
- All five palm objects become highlighted gray;
- Under Modeling main menu > Edit > Parent;
- in Outliner window there is a parent named Trunk1 with children named Leaf2, Stem2, Crownshaft, and Trunk2;

At the time of this writing Maya did not tolerate obj file names with spaces. Therefore, when you import, for example, Acer palmatum.obj, Maya will import the palm and change its name to Acer_palmatum.obj.



How to Make a 3D File Smaller

Once you create a palm you like, you will want to save it as a 3D model. Upon polygon counting, if you find that the model is too big, there are numerous ways to cut down the number of polygons. The strategy you take will depend greatly on your priorities with respect to the model. You may have to compromise on, at least, one of the two fronts: the modeling quality and detail, and the number of stems and leaves.

Keep in mind that the effectiveness of any of the moves you make to reduce the size of your file will depend greatly on the polygon spread in your model. Thus, if your biggest problem are the leaves, it will be prudent to concentrate on them as opposed on, for example, stems, and vice versa.

Below are our general recommendations on how one might go about making the given palm 3D file with smaller number of polygons.

1. Generally, the most of the polygons you will find on palm leaves. To reduce the polygon count, set leaf Curving Resolution to higher value, and/or prune some leaves.
2. To reduce polygon count of stems, set stem Curving Resolution to higher value, and/or reduce stem Transversal Resolution.
3. For the minimum number of polygons of the trunk, model the trunk with the Smooth Texture. On the other hand, Dry Petiole texture, will give you the most polygons, but the result is infinitely better then any 2D image mapped trunk.



Image Export

BMP/PICT Palm Image Export

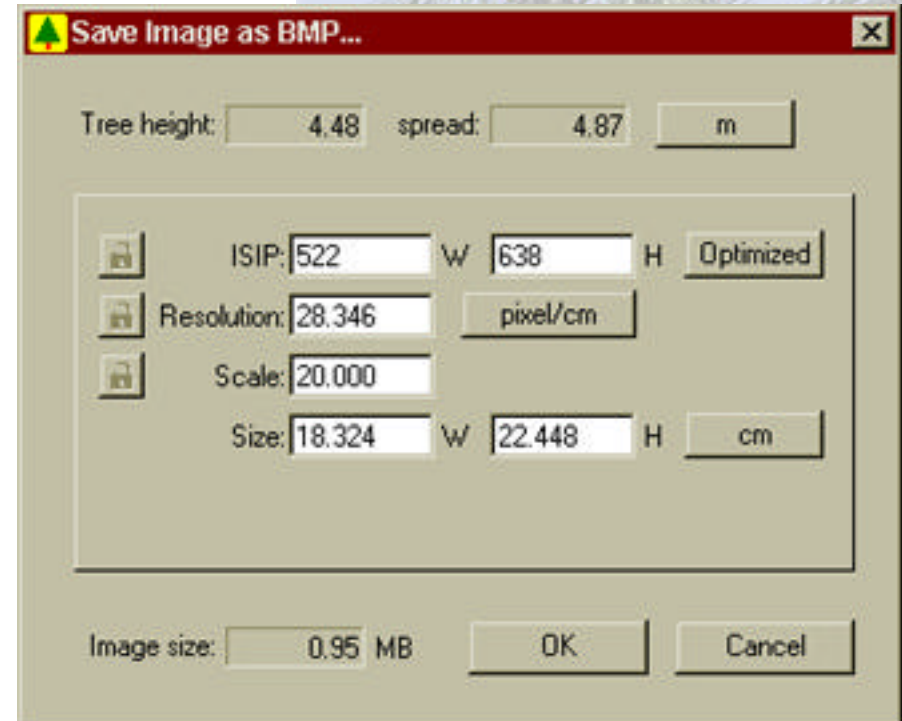
You can save an image of the whole palm, at the elevation and azimuth angles as previewed on the canvas, as a 24bit BMP file on Win or PICT file on Mac by selecting “Save Image as BMP...” or “Save Image as PICT...” respectively, under File menu. The dialog box “Save image as BMP...” contains the following fields and buttons:

Palm height and **spread** fields are non editable and they display the current palm height and palm spread in meters. The height and spread can be displayed in **m** - meters or **ft** - feet.

You can set the size of the image or **ISIP** (Image Size In Pixels) to up to 30,000 by 30,000 pixels. The **W** (width) and **H** (height) fields are linked by the palm image aspect ratio. Thus if you change the **W** value, the **H** value will follow proportionally and vice versa.

The **Optimize** button calculates the final aspect ratio of the image. Press this button to optimize the image. The button remains down while PALM calculates the size and when it is done, the button bounces back and reads **Optimized**.

Why the **Optimize** button? If you change any of the palm's parameters



and do not wait for the palm to be redrawn fully, the image size for this palm will not be calculated correctly. Therefore you must optimize the image size before saving it. Otherwise the image ratio applied to this particular palm image will be the one of the previously created palm so the image might be clipped or with too much white border.

When opening “Save Image as BMP...” dialog, you will immediately know whether the image you are going to save needs to be optimized or not. If the image is already optimized, the optimize button will display **Optimized** and if it is not, the button will display **Optimize**. In the latter case, press the button to optimize the image size.

The **Resolution** field allows you to enter the resolution for the image. The resolution units are selectable to be **pixels/cm** or **pixels/inch**. The default resolution is 28.364 pixels/cm or 72 pixels/inch.

The **Scale** and **Size** fields are interlinked. They enable you to set the physical size of the image in **cm** or **inches**.

Image size field is non editable and it displays approximate file size in MB.

Task:

Save the top view (0 degrees azimuth and 90 degrees elevation) of “Pseudophoenix” palm as a BMP image (PICT on MAC). The image height should be 2000 pixels and the desired image resolution should be 300 pixels/inch;

Solution:

- Load “Pseudophoenix.pal”;



- Change the elevation angle by pressing the mouse on the palm and pulling it down until the E displays 90 degrees;
- Select "Save Image as BMP..." under File menu;
- Click "Optimize" button;
- Click the mouse in the H "ISIP" field, notice that the lock buttons are activated and the Resolution is locked (the lock on the left of the Resolution field). Type in 2000;
- Change the resolution units from pixels/cm to pixels/in;
- Click the mouse in the Resolution field and lock the ISIP (by pressing the lock on the left of the ISIP field). Type 300 in the Resolution field;
- Now we have an image that is 2171 pixels wide by 2000 pixels high, at 300 pixels/in. The physical size at this resolution will be 18.330cm by 16.900 cm and it will occupy approximately 12 MB of disk space;
- Press "OK" and select the location where you want this file to be saved; The file "Ulmus americana 2.bmp" will be saved in the desired location after several seconds.

When saving a palm as a BMP or PICT file you have the following six possibilities.

- IRS** Adjust ISIP while the resolution is locked and the scale/size slides.
- ISR** Adjust ISIP while the scale/size is locked and the resolution slides.
- RIS** Adjust the resolution while ISIP is locked and the scale/size slides.
- RSI** Adjust the resolution while the scale/size is locked and ISIP slides.
- SIR** Adjust the scale/size while ISIP is locked and the resolution slides.
- SRI** Adjust the scale/size while the resolution is locked and ISIP slides.



TGA Palm Image Export

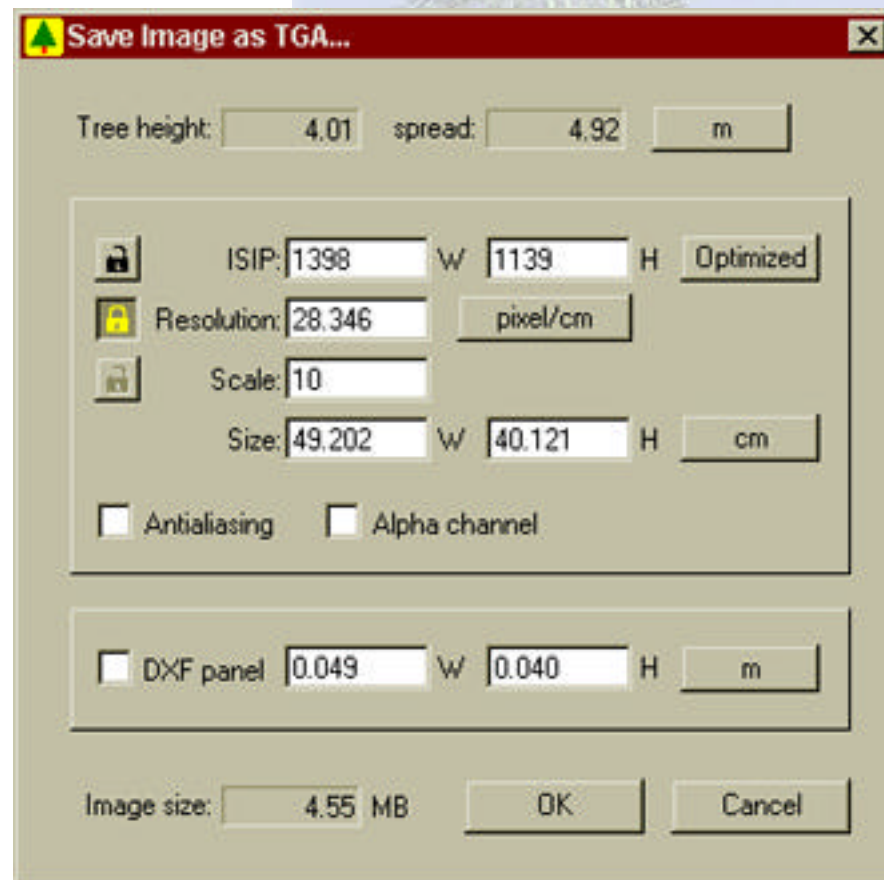
You can save an image of the whole palm, at the elevation and azimuth angles as previewed on the canvas, as a 24bit TGA file by selecting “Save Image as TGA...” under File menu. The dialog box “Save image as TGA...” contains the following fields and buttons.

Palm height and **spread** fields are non editable and they display the current palm height and palm spread in meters. The height and spread can be displayed in **m** - meters or **ft** - feet.

You can set the size of the image or **ISIP** (Image Size In Pixels) to up to 30,000 by 30,000 pixels. The **W** (width) and **H** (height) fields are linked by the palm image aspect ratio, thus if you change the **W** value, the **H** value will follow proportionally and vice versa.

The **Optimize** button calculates the final aspect ratio of the image. Press this button to optimize the image. The button remains down while PALM calculates the size and when it is done, the button bounces back and reads **Optimized**.

Why the **Optimize** button? If you change any of the palm's parameters and do not wait for a palm to be redrawn fully, the image size for this palm will not be calculated correctly. Therefore you must optimize the image size before saving it. Otherwise the image ratio applied to this par-



ticular palm image will be the one of the previously created palm so the image might be clipped or with too much white border.

When opening “Save Image as TGA...” dialog, you will immediately know whether the image you are going to save needs to be optimized or not. If the image is already optimized, the optimize button will display **Optimized** and if it is not, the button will display **Optimize**. In the latter case, press the button to optimize the image size.

The **Resolution** field allows you to enter the resolution for the image. The resolution units are selectable to be **pixels/cm** or **pixels/inch**. The default resolution is 28.364 pixels/cm or 72 pixels/inch.

The **Scale** and **Size** fields are interlinked. They enable you to set the physical size of the image in **cm** or **inches**.

The **Antialiasing** checkbox allows you to choose the antialiasing for the image. The antialiasing will smooth-out sharp edges in the image.

The **Alpha channel** checkbox, when set, commands PALM to create an 8 bit black and white channel where the pixels of the palm are white and the pixels of the background are black. The resulting image looks like a palm silhouette in negative. The alpha channel allows you to put the palm image on a scene without having to worry about its background. If the palm image has been antialiased then its alpha channel file, besides consisting of black and white pixels, will also have gray pixels which will occupy antialiased portions of the image.

The **DXF panel** check box allows you to export a one polygon DXF



panel for the palm image you are going to save. This will assure a perfect fit of the image and the polygon if you wish to place this palm as a “panel palm” on your scene. This way you can generate beautiful single polygon palms - “panel palms” - for your CAD renderings and animation. Utilizing one polygon palms has been a proven technique for minimizing the polygon size of scenes with a lot of vegetation and we are sure that many of you will wish to do that if a palm is in the background and/or if it is simply not feasible to use the 3D model. If **DXF panel** is checked, PALM will generate two files, one will be a TGA image file and the other a DXF panel file. Both files will have the same name with different extensions, i.e. *.tga and *.dxf respectively.

Image size field is non editable and it displays approximate file size in MB.

Task:

Load the palm “Areca cathecu 1” from the library and save its front view (0 degrees azimuth and 0 degrees elevation) as an antialiased TGA image with alpha channel and a DXF panel. The image should be 1024 pixels high, the desired image resolution is 28.354 pixels/cm, the DXF panel should have the same height as the palm.

Solution:

- Load “Areca cathecu 1.pal”
- Select “Save Image as TGA...” under File menu;
- Click “Optimize” button;
- Click the mouse in the H “ISIP” field, notice that the lock buttons are activated and the Resolution is locked (the lock on the left of the Resolution field). Type in 1024;
- Click the mouse in the Resolution field and lock the ISIP (by pressing



the lock on the left of the ISIP field). Type 28.354 in the Resolution field;

- Now we have an image that is 567 pixels wide by 1024 pixels high and it will occupy approximately 2 MB of disk space;*
- Check Antialiasing;*
- Check Alpha channel;*
- Check DXF panel and enter palm height of 3.29 m into the DXF panel H field;*
- Press “OK” and select the location where you want the file to be saved;*
- The files “Areca cathecu 1.tga” and “Areca cathecu 1.dxf” will be saved in the desired location after several seconds. During the saving process the cursor changes indicating the tasks being executed..*

When saving a palm as a TGA file you have the following six possibilities.

- IRS** Adjust ISIP while the resolution is locked and the scale/size slides.
- ISR** Adjust ISIP while the scale/size is locked and the resolution slides.
- RIS** Adjust the resolution while ISIP is locked and the scale/size slides.
- RSI** Adjust the resolution while the scale/size is locked and ISIP slides.
- SIR** Adjust the scale/size while ISIP is locked and the resolution slides.
- SRI** Adjust the scale/size while the resolution is locked and ISIP slides.



TGA Palm's Shadow Image Export

You can save an image of the palm's shadow, at the elevation and azimuth angles as previewed on the canvas, as a 24bit TGA file by selecting "Save Shadow as TGA..." under File menu. The dialog box "Save Shadow as TGA..." contains the following fields and buttons.

Palm height and **spread** fields are non editable and they display the current palm height and palm spread in meters. The height and spread can be displayed in **m** - meters or **ft** - feet.

You can set the size of the image or **ISIP** (Image Size In Pixels) to up to 30,000 by 30,000 pixels. The **W** (width) and **H** (height) fields are linked by the palm's shadow image aspect ratio, thus if you change the **W** value, the **H** value will follow proportionally and vice versa.

The **Optimize** button calculates the final aspect ratio of the image. Press this button to optimize the image. The button remains down while PALM calculates the size and when it is done, the button bounces back and reads **Optimized**.

Why the **Optimize** button? If you change any of the palm's parameters and do not wait for a palm to be redrawn fully, the image size for this palm shadow will not be calculated correctly. Therefore you must optimize the image size before saving it. Otherwise the image ratio applied to this particular palm's shadow image will be the one of the previously

Save Shadow as TGA...

Tree height: 3.85 spread: 3.98 m

☐ ISIP: 255 W 107 H Optimized

☐ Resolution: 72.000 pixel/inch

☐ Scale: 40.586 Size: 8.784 W 3.620 H cm

☐ Antialiasing ☒ Alpha channel

☐ DXF panel 3.565 W 1.469 H cm

Image size: 0.10 MB OK Cancel

created palm so the image might be clipped or with too much white border.

When opening “Save Image as TGA...” dialog, you will immediately know whether the image you are going to save needs to be optimized or not. If the image is already optimized, the optimize button will display **Optimized** and if it is not, the button will display **Optimize**. In the latter case, press the button to optimize the image size.

The **Resolution** field allows you to enter the resolution for the image. The resolution units are selectable to be **pixels/cm** or **pixels/inch**. The default resolution is 28.364 pixels/cm or 72 pixels/inch.

The **Scale** and **Size** fields are interlinked. They enable you to set the physical size of the image in **cm** or **inches**.

The **Antialiasing** checkbox allows you to choose the antialiasing for the image. The antialiasing will smooth-out sharp edges in the image.

The **Alpha channel** checkbox is always enabled.

The **DXF panel** check box allows you to export a one polygon DXF panel for the palm’s shadow image you are going to save. This will assure a perfect fit of the image and the polygon. If **DXF panel** is checked, PALM will generate two files, one will be a TGA image file of the shadow and the other a DXF panel file. Both files will have the same name with different extensions, i.e. *_SH.tga and *_SH panel.dxf respectively.

Image size field is non editable and it displays approximate file size in MB.



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