

FF_help

COLLABORATORS

	<i>TITLE :</i> FF_help		
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REVISION HISTORY

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Chapter 1

FF_help

1.1 FreeForm Help

- 0. WHATS NEW
- 1. About The Author
- 2. System Required
- 3. Introduction
- 4. Using The Editor
- 5. NURB Tension
- 6. Bones
- 7. Rendering
- 8. Work Spaces
- 9. Keyboard Shortcuts
- 10. Preferences
- 11. Writing your own HELP text

1.2 changes

**** What's changed in this version. ****

** NEW VERSION 1.7 CHANGES **

This is the third update; version 1.7.

**** BUG FIXES ****

- 1. Fixed a bug with saving to ram:. Commodore returned the illegal volume name "Ram Disk" instead of ram: to the program through the file requester.
- 2. Fixed a bug with the buttons. When you were in points mode, and had modified some points, and then swicth to camera; if you didn't use the right mouse button to end the interactive mode,

the buttons would leave themselves on and change orders. If you did use the right mouse button to end the mode, it would have sent you back to the mode you were in before you pressed the camera button, which was what it was designed to do. Now I checked for those of you who press the points button or bones to get back.

3. Fixed the saving to Real3D, gave an error message on workbench but it was nothing bad. Just left some extra code line in by accident. Saving to RPL NURB format now saves the object to Real3D with the tension modifications, as they look in FreeForm.

4. Fixed the close object bug.

***** New Additions *****

1. Added a Build from cross sections function. Its in the Forms menu. See the "explain" drawer on the disk.
2. Added adjustable tension. You can now get tensions in between smooth and sharp, at 0.1 increments. See the Tension menu/Adjustable tension.
3. There's a new function that works in conjunction with the "Only these" function. It's the HIDE (all unpickable sections) function. It won't draw curve sections that contain points that were not set to PICKABLE with the "Only These" function. It's in the "object/POINT functions" menu.

PLEASE REMEMBER TO TURN THESE MODES OFF WHEN YOUR DONE WITH THEM.
IF YOU FIND YOU CAN NOT PICK A POINT FOR SOME REASON, CHECK TO
SEE THAT THESE FUNCTIONS ARE NOT CHECK MARKED.

- 4.

** OLD VERSION 1.6 CHANGES **

1. Changed the drag points function, to a much more accurate, much prettier, and in some cases, faster version.
 2. Added some more explanation on using rail extrude properly. See the help system (forms menu item button);
 3. Added a tween by tween step through of the morphing of an object. A requester comes up letting you access any of the tween objects so you can save them to disk; allowing you to load them in later for conversion or modification or use as a source or target
-

for another morph.

4. Added an "Only these" function. This allows you to pick points and specify that you are only going to work on these points, and they are the only ones that can be dragged when you switch to that mode. This allows you to pick points that you want to work on in one view, and then drag them in that or another view, without accidentally picking other points you didn't want.
5. You can now switch the direction of the Bones, back and forth between the two directions. (solid line direction & dotted line direction)
6. Added a recalculate Bones function. Recalculates the Bones whenever you should need to; after a lot of point pulling into different directions and so on.
7. Added a 90 degree snap rotate function. Just choose an axis and hold down the shift key when you press the rotate button. Your object will be rotated 90 degrees on the axis you chose.
8. Added a drag bones functions. If you switch on bones and then turn the drag button on (lasso-click/drag cycle button), you can pick a bones point and pivot on the joint before it, according to what view you're in.
The rotation is as follows: if you were to bend an arm at the elbow, you would grab the arm at the wrist. This is how it responds. It may work backwards depending on the order of your points (first to last) when you created the object. If it seems to be working backwards, use the "swap bone points order" menu item in the object/BONE functions menu. This function will automatically figure out the appropriate direction to use (SOLID or DOTTED). This can also be done manually, with the "change point order" menu items, in the object/reparameterize menu.
 1. Load in the spout object
 2. Turn on bones
 3. Change the lasso/click cycle gadget to drag
 4. Pick bone point around the middle of the object and while still holding the mouse button down, move the mouse up and down.
 5. Select the swap bone points order menu item, in the object/BONE functions menu
 6. Use that same point again and notice the difference.

To switch the order back, just pick the menu item again (It's a toggle)

1.3 rail_tutor

Rail extrude tutorial.

create a simple airplane wing.

1. Load in the objects in the rail_objects drawer.
You can pick all three and then say load; the file requester is multi-pickable;
2. The objects are labeled as to what they represent.
Pick the cross_sec object, and go to the forms menu and set it to be the cross section.
Do the same with the other objects, set them by their appropriate names. (rail1, rail2)
3. Choose rail extrude from the forms menu. DON'T delete the rail and cross section curves when ask.

Your object should be created.

4. Notice that the parts are all flat in the front view. This is the way you should keep your parts. The only rotation that you may want to do, is on the world Z.
5. Orientation of the cross section affects the final result of your object. To see this:
 - A. Delete the object you just created.
 - B. Pick the cross sec object.
 - C. Turn on the Z button.
 - D. Hold down the shift key and click the rotate button once.
This does a 90 degree rotate for every press.
 - E. Select rail extrude from the menu.
 - F. Look at you object in the Persp view.
 - G. It looks like a sail boat hull now.

This is because your cross section is scaled according to its height. Top of the cross section to the bottom of the cross section; this will try to be scaled to fit in between the rails.

6. A morph rail extrude is the same, except you have a target cross section, that the source cross section will change it's shape to while being extruded along the rails.
The source and target must have the same number of points.
The target should be scaled up to be near the same size(in area) as the source (If is is not already).

BE SURE TO CHECK AND SEE IF THE OBJECT THAT IS CREATED IS ROUGHLY WHAT YOU WANT BEFORE YOU DELETE YOUR PARTS. IF YOU ARE HAVING TROUBLE GETTING WHAT YOU WANT TRY THESE CHANGES AND RE-EXTRUDE THE OBJECT.

1. FOR RAIL EXTRUDE

A. ROTATE YOUR CROSS SECTION 90 DEGREES ON WORLD Z

2. FOR MORPH & RAIL EXTRUDE ONLY

A. ROTATE YOUR CROSS SECTION 90 DEGREES ON WORLD Z

ROTAE YOUR TARGET ALSO OR YOUR OBJECT WILL
TWIST AS IT'S EXTRUDED; (YOU MAY WANT TO
USE THIS SIDE EFFECT TO MAKE SOMETHING IN THE
FUTURE)

B. SWAP THE SOURCE AND TARGET

ONCE YOU START USING IT AND EXPERIMENTING WITH IT, YOU'LL
BEGIN TO SEE HOW TO SET THINGS UP AND THE COMPLICATED
AND TRULLY WIERD OBJECTS YOU CAN CREATE. YOU MAY NOT
ALWAYS GET EXACTLY THE SHAPE YOU WANTED EVERY TIME; BUT IT
IS A GOOD WAY TO GET A STARTING SHAPE FOR AN OBJECT
THAT YOU CAN MODIFY WITH POINT PULLING AND BONES LATER.

Your rail objects don't have to be mirror images of each other;
only if the profiles of the object your trying to make are
symetrical. The rail curves can look completely different
from each other. The only requirements are that they have
the same number of points, and that they are not rotated
out of the x,y plane. You can rotate them on the Z, or move
them any distance apart on the X and Y only.

1.4 author

"About The Author"

NAME: Mr. Fori Owurowa

RESIDES: Brooklyn, NY USA

AGE: 26

COMPUTER: 25MHZ A3000

EDUCATION: A. High School Graduate - Computer Science Major
B. C programming - Self taught
C. 3D Graphics - Self taught

WORK STATUS: Currently unemployed

If you like the program, please purchase a copy, so I can
continue to improve on it. I'm sure you will agree that
compared to the price of other 3D software, and what you
get for it, mine is a really good deal. see the Introduction
section for ordering information.

If you intend to review this product for any publication, please take into account the following information;

1. This is my first major C program.
2. I've only learned how to program in C about 2 years ago.
3. I've only learned how to program 3D graphics about 2 years ago.
4. I've only learned how to program using the Commodore libraries 2 years ago;
5. I am not a registered developer. My information is limited to what I can read from anywhere else or figure out on my own.
6. Most of the routines in this program are my own creation, many of the ones that are in books I either could not understand, could not find what I wanted, or they were too slow; so I wrote my own better, faster ones".

1.5 introduction

"Introduction"

If you are interested in distributing this product, all dealer inquiries are welcome.

Please ignore the use of the word DEMO if you have ordered the full version. The files are duplicated as a time saver.

No liability from the use or misuse of this program is expressed or implied. All products mentioned are the trade marks of their respective companies and have no affiliation with FreeForm at this time.

All code of the program is the property of Fori Owurowa and may not be used any other purposes This program may not be copied for sale or free distribution, or any other activity that the author feels would jepordize it's sale. Each disk has it's own unique code which is matched to your name. This code will be accessed by the author on any unauthorized copies, and the person/s responsible will be held accountable in accordance with the law. I have kept the price of the program low, because I understand that not everyone can spend \$400 on these programs. Please respect my kindness.

FreeForm is a Bspline and NURB editor for Real3D2, Aladdin, LightWave, Caligari and
Imagine.

Some example conversions have been done for you to see.

REAL3D2 - spoutbs.rpl
LIGHTWAVE - spoutbs.geo
CALIGARI - spoutbs.geo

↩

IMAGINE - spoutbs.imag

This usable DEMO is provided so you can see some of the functions of the program. Some functions are not accessible, for obvious reasons. Due to the reorganization of functions for the DEMO, you may experience some bugs. Due to the large amount of combinations of button presses and functions, it is impossible to find all of the bugs on my own. If you find any while using the program, please describe them and what you tried to do, and forward the information to my friends BBS address or to me directly at the address below.

This demo contains just part of the abilities of the program. Some prefs and other functions were shortened or left out do to:

1. It's a DEMO
2. Space considerations

There may be some screen shots and a short morphing demo included if time and space allow.

The program includes on_line help through an amiga guide file and phone tech support.

If you wish to order the full program, it is only \$59.95. Please include what type of processor you have. You will receive all future upgrades for only \$5 for each upgrade.

(Please support an Amiga programmer)

\$59.90 + \$5 shipping and handling.

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FreeForm has a realtime Perspective and Parallel view interface, with points picking and bones modification in all views. In the interactive modes, you can choose how your object is displayed on the fly. Choose from

1. Knot- object drawn in realtime by connecting points through the knots. This gives you a more accurate shape and size than Real3D's lines through the control points.
 2. Cntrl Pnt- Same as Real3D's lines drawn through the control points.
 3. BOUNDING BOX - You can toggle this on and off, on the fly, while in
-

any of the two other modes. It is useful if your machine is slower or the number of points on the object is very large.

The following are just some of the features in the program, that I feel are improvements over most of Real3D2's B spline modeling portion.

1. FreeForm IS 20 TIMES FASTER THAN REAL3D2. (Yes, I said 20 times !)
FreeForm renders your objects without having to set any subdivision levels. Your objects are always be smooth. No matter what resolution your in or how close you zoom in to the object, you won't see the polygonal edges that appear on smooth objects in Real3d when you zoom in close and render.

The curves in the editor, also maintain their smoothness at any resolution and zoom, without having to set any subdivision levels.
FREEFORM CAN RENDER CURVES IN CURVE SHADE MODE, FASTER THAN IMAGINE2
RENDERS POLYGONS IN SCANLINE !;

2. Spin open objects at angles of less than 360 degrees, at 1 degree increments.
 4. Easy duplication of control points, by setting the point to be a SINGLE, DOUBLE or TRIPLE type. This way of doing it frees you from having to figure out how many points are already there, and takes away the lengthy task of separating the object into curves, then duplicating or deleting points, (hoping that you didn't add too many or too little), then picking all the right curves in the right orders, and putting the object back together again as in Real3D. (When I brought a computer I wanted it to do most of the work not me !)
 5. Give an edge curve a thickness automatically.
 6. Set Object On Ground function, positions objects on the editors ground for you.
 7. Pick points by dragging, clicking or lassoing. Lasso lets you draw a freehand line encircling points that you want picked. It allows you to weave in and out of spaces that a drag box cannot get to.
 8. Adjust object by Control Points or Knot Points.
 9. Automatic Bones creation for objects, and modification of objects using Bones.
 10. Export objects to Real3D2 (Bsplines and Tension NURBS), LightWave, Caligari and Imagine (Bsplines and Tension NURBS converted to polygons adjustable by you).
 11. Rail extrusion allows easy creation of complexed shapes (Example teapot spout - spoutbs.FreeForm). Rail extrusion automatically aligns the cross section to be extruded for you. Real3D2 does not.
 12. Morph Extrusion allows you to set 2 edge curves, and FreeForm will extrude from one to the other creating the in between sections for you. (Example - a mesh that is a circle at one end, and changes to a square
-

at the other).

13. Screen redraw is 3 times faster than Real3d2.
14. Curves drawn during dragging are complete, and not disconnected from the mesh like Real3D's.
15. Points are highlighted for easy picking; and picked points are shown to you, so you can tell if you have all that you wanted.
16. Tension - allows you to modify the shape of curve sections without it affecting the knot position. This makes your Bsplines NURB like curves and allows you to create objects which are next to impossible in Real3D2.
(In Real3D2, when you triple a point to create a sharp corner, the knot moves away from its original position, changing the size and shape of the object. A result which you may not always want.

Example- Imagine a bottle whose cross section is a smooth circle from the top to the center of the bottle, and changes to a sharp edged octagon from the middle to the bottom. Much like a bottle of Heinz ketchup.
17. Blend - allows you to pick sections and generate a smooth transition from the first sections shape, to the last sections shape. (Blends Tension)
18. Easy Morphing previews - Just pick an object, set it to source. Pick another object, and set it to target. Then select Morph it. That's it !
19. Multi-pick file requester allows you to load in more than one object at one time.
20. Export objects to 9 different workspaces; without any additional memory usage.
21. Taper and twist with easy to use deformation functions.
22. Change the render screen mode and resolution without having to open new environments.

1.6 prefs

"Preferences"

There is a file called configfile where you can change the screen mode if you know the decimal number of it.

1.7 system

"System required"

RAM: 2MB fast

NOTE : FreeForm will run with as little as 1 MB of total ram; but,

you may not be able to use some rendering modes,
and the speed may suffer from it.

PROCESSOR : A 68030 or better and a math co-processor for the DEMO.

If you would like to use the program on another processor;
when you order it, specify what processor and if you have a math chip
and I'll compile a version for you.

1.8 editor

"Using The Editor"

1. Menus
2. Buttons
3. U and V directions
4. Picking Points

1.9 uv

" U and V directions"

Real3d2 uses U and V to distinguish between the 2 directions of a spline patch. The letters U and V are inconsequential, any 2 letters could be used, they signify the width and height directions or the row and column directions on the patch.

I have always had a problem with using the letters u and v for this; first, because when printed on the screen among a jumble of lines, they look too much alike; second, because it is still hard to figure out which lines correspond to which letters in Real3d2.

I have decided to opt for a different method in FreeForm. I think it is much clearer and I hope you will agree. The 2 directions of the patch are shown in different line patterns: a SOLID line for one direction and a DOTTED line for the other. If you create a cylinder shape by spinning a line about an axis, you will see that the circle cross sections are DOTTED and the straight lines are SOLID. If you need to close an object or set tension on points in a specific direction, all you need to know is what kind of lines are the direction you wish to perform the action in, made of. This allows you to more easily identify the direction you want.

If this is still not clear enough for you, there are 2 menu items in the "Display" menu, that will allow you to turn on and off drawing of the SOLID and DOTTED lines. If you are concerned with curves in the DOTTED direction, you can shut off drawing of curves in the SOLID direction and vice-versa. This affects the active object only.

You will see some functions which will give you a choice of what direction.

You can select one or both depending on what you need to do.

1.10 menus

"Menus"

1. Project
2. Display
3. Object
4. Tension
5. Form
6. Primitives
7. Render Mode
8. Work Spaces

1.11 m_project

"Project"

1. QUIT - Allows you to exit FreeForm. You may also press 'q'.

1.12 m_display

"Display"

1. CLEAN SCREEN - Erases the screen only.
 2. VERT SYMMETRY - When you draw a curve edge, you will see a vertical line down the center of the screen. This is the vertical symmetry line, and it is used mainly for creating spun objects. When you draw on one side of the line, the mirror image is drawn on the other to give you an idea about the overall shape and size of the finished object.
 3. REDRAW PICKED - Redraws the currently picked object only. All other objects are not visible.
 4. REDRAW ALL - Redraws all objects.
 5. SET ORIGIN - Returns the world's origin to the center of the screen.
 6. GRID - Sets the grid size.
 7. ASPECT ADJUST - Allows you to adjust the aspect to your monitors size control settings - This is in addition to the normal aspect which is set for you according to Commodore's library functions. Hold down left mouse button and make the rectangle square if it does not already appear to be.
-

1.13 m_object

"Object"

1. LOAD - Loads a FreeForm object.
2. SAVE - Saves a FreeForm object.
3. LOAD REAL3D2 - Load a Real3D2 mesh object.
4. CONVERT TO -
 - A. Videoscape - Allows you to convert your Spline object to polygons.
 - B. R3D2 Bspline - Writes a Real3D2 mesh object as an RPL.
 - C. R3D2 NURB - This is for outputting objects to Real3D2 that have tension set. It will output the patches as a group of meshes, as Real3D2 does not support the single mesh Bezier format.
Your object will look the same in spite of this.
 - D. Imagine - Allows you to convert your Spline object to polygons.

***** FOR VIDEOSCAPE AND IMAGINE *****

The object will be output as separate polygons, each containing there own 4 points. The only thing you will have to do is merge the points how you wish in the program you are outputting to. This is neccessary because your object could contain patches with edges that are curved and straight; and in order to get them to shade right (phong or flat) in the programs your outputting to, they require that flat polygons have there own points, and smooth(phong) polygons share points with there neihboring polygons.

I am trying to find away to take of all of these possssible combinations for you automatically, but it is a pretty complicated thing to do; which might explain why their are so few programs that convert curves to other polygon formats. If the makers of polygon programs would alter their format a bit, it would be quite easy to do this. If instead of just the points and the description of which points are used to make what polygons, they would also have the option to include the surface normal with the points, this would solve the problem; along with making the phong shading alot more accurate.

5. HIDE OBJECT - Object's axis is all that will be visible. The object will return to visible when you select it.
 6. RE-CALC BOUND BOX - If you have an object that is tilted when loaded in and its bounding box is not, you can align the object straight and re_calc the bounding box to
-

match its alignment; so when you tilt it back the box will be titled as well, and the size of the box will more accurately match the object.

7. SET ON GROUND - Sets your object on the editor's ground.
8. MOVE TO ORIGIN - Moves the object to the origin.
9. MOVE AXIS TO OBJECT CENTER - You got it.
10. MOVE AXIS TO FIRST POINT - This is good for ensuring that spun objects have no openings at the top before you spin.
11. MOVE AXIS TO LAST POINT - This is good for ensuring that spun objects have no openings at the bottom before you spin.
12. MIRROR X COMBINE - Takes a curve edge and creates a new edge, which is the combination of the first edge duplicated, flipped over in the X axis direction and combined into one object edge.
13. MAKE EDGE THICK - Creates a thickness to the edge you have picked.
(Make sure your edge is flat in the front view).
- 14.
15. COPY & PASTE - You got it.
- 16.
17. OPEN - Opens an object that is closed.
18. CLOSE - Closes an object that is open.
19. DELETE - Works on objects.

1.14 m_tension

"Tension"

Tension - allows you modify the shape of curve sections without it affecting the knot position. This makes your Bsplines NURB like curves and allows you to create objects which are next to impossible in Real3D2.

Example- Imagine a bottle whose cross section is a smooth circle from the top to the center of the bottle, and changes to a sharp edged octagon from the middle to the bottom. Much like a bottle of Heinz ketchup.

(In Real3D2, when you triple a point to create a sharp corner, the knot moves away from its original position, changing the size and shape of the object. (BAD KNOT ! BAD !)).

You also have to have the same number of knots per section, barring you from creating shapes with blended and varying cross sections

and profiles.

You only have 3 shape choices in Real3D2: a single, double or triple knot.

In FreeForm, With Tension, you can adjust the shape from smooth (single knot) to sharp (triple knot) or any increment in between giving you fine control over the shape with 20 increments.

1. SET TO SHARP - Makes picked sections have sharp points. (Ex. Circle made of 8 points will turn into an octagon).
2. SET TO SMOOTH - Sets the points back to smooth joins - the reverse of the above.
3. ADJUSTABLE TENSION - Allows you to change the tension of picked points at 0.1 increments, between smooth and sharp.
 1. Load in an object.
 2. Turn on points mode.
 3. Hold alt key down, and drag a box around the whole object. This picks all the points.
 4. Go to the tension menu, and choose set to sharp/dotted.
 5. Then choose adjustable tension from the same menu.
 6. Make the dotted lines the only ones that are checked in the requester.
 7. keep pressing the smoother button, and watch your object change.
3. BLEND TENSIONS - Creates smooth transitions between the first and last sections of a group of picked sections. (Ex. A can that has a cross section of a circle from the top to the middle then blends to an octagon from the middle to the bottom.

1.15 m_form

"Form"

**** IMPORTANT ****

FOR RAIL EXTRUDE AND MORPH RAIL EXTRUDE, THE OBJECT WILL BE CREATED USING THE WAY YOUR PARTS LOOK IN THE FRONT VIEW. THE CROSS SECTION AND SOURCE OBJECT THAT WILL BE EXTRUDED MUST FACE THE FRONT VIEW. THERE IS NO NEED TO ALIGN THE CROSS SECTION WITH THE RAILS; THE PROGRAM WILL TAKE CARE OF ALL OF THAT FOR YOU. IF YOU CREATE YOUR PARTS IN THE FRONT VIEW YOU SHOULD HAVE NO PROBLEM WITH THIS.

IF YOU DO JUST A MORPH EXTRUDE, YOU CAN HAVE YOUR SOURCE AND TARGET ALIGNED IN ANY WAY YOU WANT.

**** newly added ****

You must forget what you know about other programs that may use

the same or a similar function as this. There is no need to do any exact aligning of the cross section with the rails; FreeForm will do virtually all the work for you.

Think of it as a 2D program where you design your parts in the front view. Your rails, and cross section/s should be in the front view, flat like you drew them on a piece of paper. If you notice whenever you go to draw a curve edge, and make it into an object; its always in the front view; even if you were in another view when you turned on the draw curve button. It was done that way to keep your parts flat in the front view for Rail extrusion. The only rotating that you may need to do is on the Z axis. Just like in a 2D drawing program you can only rotate your curves clockwise and counter clockwise.

The only thing you have concern yourself with is; are the rails aligned with each other how you want them to be. They can be any distance apart (MOVEMENT ON THE X and Y ONLY) and at any rotation angle to each other. (ROTATION ON THE Z ONLY).

The cross section/s don't even need to be anywhere near the ends of the rails; FreeForm will take care of all of that for you.

Once you understand what FreeForm will do to your cross section you will understand if you have to rotate on the Z or not. FreeForm will do the same thing that you would do, if you were going to do all of the alignment work yourself.

FreeForm will take your cross section and rotate it on the Y so that your cross section is now facing in the proper direction to be extruded along the direction of the rails. Then FreeForm will make copies of your cross section and align each one with the matching points on both rails (THAT'S WHY YOUR RAILS NEED TO HAVE THE SAME NUMBER OF POINTS AS EACH OTHER). If you notice when your object is complete, that the number of cross sections matches the number of points on any one rail.

Once you study this and practice with it a couple of times you will start to understand what to do, and some of the truly bizzare things that you can create with it. It is one of the most powerful features for creating certain types of objects, as well as giving you a good starting shape for more complexed ones.

@{ " Press here for Rail tutorial example " link rail_tutor }

Form - Creates complexed combinations of cross sections and profiles.

SET Source or CROSS SECTION - Sets the currently picked object to be the cross section that will be extruded.

SET RAIL 1 - Sets the currently picked object to be Rail 1

SET RAIL 2 - Sets the currently picked object to be Rail 2

- SET TARGET - Sets the currently picked object to be target. This is for morph extrude and morphed rail extrusion.
- SWAP SOURCE & TARGET - Swaps the source and the target objects for. The object is always extruded in the (first point to last point) direction of the rail curves. The source will start at the first point and end at the last point. If you think about this you will understand the need for it.
- RAIL EXTRUDE - Creates an object by extruding the cross section along 2 rails and scaling the size of the cross section to try and match the distance between the rails.
- MORPH EXTRUDE - Creates an object by extruding from the source edge to the target edge and generating the in between shape changes. (Ex. Object that is a circle at one end a changes to a square at the other.)
- MORPH & RAIL EXTRUDE - Just like rail extrusion, except the shape of the object is changed as it is extruded along the rails from, what the source looks like, to what the target looks like. RAILS must have the same number of points. SOURCE and TARGET must have the same number of points.
- SET STARTING BUILD OBJECT - Sets the currently picked object, to the starting point for a build.
- BUIL FROM CROSS SECTIONS - Creates an object by skinning, from the build start object to the last object that was made.
- SEA SHELL - Creates sea shell shapes by spinning an edge curve around the axis. The size of the curve and how far away it is from the axis determines the results.

Try these settings in the requester.
SECTIONS = 56
DEGREE = 2520

1.16 m_primitives

"Primitives"

1. CIRCLE OR ARC - Allows you to create an edge that is a full circle or some part of a circle, at 1 degree increments. The number of sections can be set by you. (Unlike Real3D2 which gives you only a whole circle with no choice of the number of sections.)

You can create the standard polygon shapes (Hexagon, Octagon ...) with this,

by setting the number of sections to what you want, and when the object is generated, pick all the points and set the tension to sharp. This generates corners at the points.

2. FLAT PLANE - Creates a flat sheet divided into the number of sections you specify in the solid and dotted line directions.
 - A. Select from the menu.
 - B. Drag out a box with left button held down.
 - C. Answer the requesters questions.

1.17 m_render

"Render Mode"

1. AGA - Changes to 256 shade rendering for AGA machines.
2. FULL SCREEN - You got it.
3. QUARTER SCREEN You got it.
4. WIRE - Wire frame render.
5. DRAFT - Polygonal make-shift interpolated shade.
6. CURVE SHADE (QUICK) - Low resolution quick render - shading is smooth with no polygonal artifacts.

THIS IS NOT A PHONG or any other type of interpolated shading. The shade is calculated directly from the curve surface, and no polygonal edges will be seen no matter how close you zoom int the object.

7. CURVE SHADE - High resolution render - shading is smooth with no polygonal artifacts.

THIS IS NOT A PHONG or any other type of interpolated shading. The shade is calculated directly from the curve surface, and no polygonal edges will be seen no matter how close you zoom int the object.

8. PICASSO TEST - This is only a test function, and will open up a 24bit PICASSO screen and render your object to it, giving each patch a ramdom color; provding that you have a PICASSO board.

1.18 m_morph

"Morph"

1. SET SOURCE OBJECT - You got it.
-

2. SET TARGET OBJECT - You got it.
3. PREVIEW MORPH - Shows you the morph animation in wireframe
(Not saved to disk).
4. RENDER MORPH - Generates rendered frames to a chosen file based
on the render mode.

1.19 m_work

"Work Spaces"

Work Spaces are different drawing areas that you can send objects to to reduce clutter or work on a specific group of objects, without others getting into the way.

You can render a specific object or group of objects by sending them to another workspace; then change the current workspace to that one, and render;

- SENDING OBJECTS TO WORKSPACES -
1. Pick the object you want to send to a workspace by clicking on its axis center. It will become White to show you that it is picked.
 2. Press one of the number keys, and the object will be sent to the workspace number of your key choice.

SWITCHING BETWEEN WORKSPACES - Select the number of the work space you wish to be displayed, from the workspace menu.

1. Workspace 1 is the one that you start out in when the program is loaded.
 - 2.
 - 3.
 - 4.
 - 5.
 - 6.
 - 7.
 - 8.
 - 9.
10. ALL OBJECTS TO CURRENT SPACE - This takes all the objects in memory and moves them to the workspace your currently in.

1.20 buttons

"Buttons"

IMPORTANT: You can end the interactive modes, (Move, Rotate, Scale, Zoom....), and return to the curve display by clicking the right mouse button. It is a faster alternative than shutting of the actual Move, Rotate, Scale.... buttons.

1. Move
2. Rotate
3. Scale
4. Zoom
5. X
6. Y
7. Z
8. Axis Only
9. Obj
10. Cam
11. Pnts
12. Bones
13. Draw Edge
14. Sketch
15. Mirror
16. Grid
17. Front
18. Top
19. Side
20. Persp

21. Lasso / Click/ Drag
22. World / Local
23. Together / Separate
24. Knots / Cntrl Pnts

25. Spin
26. Extrude
27. Multiply Points
28. Fit / Unfit
29. Render
30. UNDO

1.21 move

"Move"

HOW: Hold left mouse button down and move mouse around.

WORKS ON: Objects, points, bones, camera

WORKS IN: All views

ALTERNATE FUNCTION : When the Camera button is on, this will move the Camera.

AFFECTED BY: x,y,z buttons

1.22 rotate

"Rotate"

HOW: Hold left mouse button down, move mouse up and down or left to right depending on the axis you've selected.

WORKS ON: Objects, points, bones, camera

WORKS IN: All views

ALTERNATE FUNCTION : When the Camera button is on, this will cause you to encircle the world.

AFFECTED BY: x,y,z buttons

1.23 scale

"Scale"

HOW: Hold left mouse button down, move mouse up and down

WORKS ON: Objects, points, bones

WORKS IN: All views

AFFECTED BY: x,y,z buttons

1.24 zoom

"Zoom"

HOW: Hold left mouse button down, move mouse up and down
If you hold the SHIFT key down and click the mouse, it will move where you clicked on screen, to the center of the screen, before it zooms.

WORKS ON: Camera

WORKS IN: All views

1.25 x

"x"

HOW: Click button or with "x" key

WORKS ON:

WORKS IN: All views

ALTERNATE FUNCTION : Shift and "x" key will turn on the X direction exclusively

1.26 y

"y"

HOW: Click button or with "y" key

WORKS ON:

WORKS IN: All views

ALTERNATE FUNCTION : Shift and "y" key will turn on the Y direction exclusively

1.27 z

"z"

HOW: Click button or with "z" key

WORKS ON:

WORKS IN: All views

ALTERNATE FUNCTION : Shift and "z" key will turn on the Z direction exclusively

1.28 axis

"Axis Only"

HOW: Click button - actions are performed on the axis only (Move, Rotate)

WORKS ON: objects

WORKS IN: All views

1.29 object

"Object"

HOW: 1. Click button - actions are performed on the object
2. Pick objects by clicking on their axis center point

WORKS ON: objects

WORKS IN: All views

1.30 camera

"Camera"

HOW: Click button - actions are performed on the camera

WORKS ON: camera

WORKS IN: All views

1.31 points

"Points"

HOW: PICKING POINTS

1. Use the mouse to click drag or lasso the points you want to use.
 - A. You can pick points by lasso, click or by drag box.
Hold down the ALT key for drag box else you'll be lassoing.

MANIPULATING points

1. After you have picked the points you want to manipulate,
select an action to perform on them (Move, Rotate, Scale...)
2. If you have the drag button on, the only action you can do on points is move. You can also lock an axis direction to drag on by turning on and of the x,y,z buttons.

WORKS ON: points - allows picking points and actions on points

WORKS IN: All views

AFFECTED BY: 1. Lasso/Click button - Sets the pick method
2. Knots/Cntrl point button - Sets what type of point to use
3. x,y,z buttons

1.32 bones

"Bones"

Bones in freeform can be thought of as local center points for each section of an object which you can use to move rotate or scale a particular section or sections.

If you take a simple cylinder with 2 circle sections, one at the top and one at the bottom, and you wish to modify the whole circle section; you would normally have to go and pick every single point. With the bones, all you have to do is pick the joint that corresponds to that section. You can bend, expand and displace a section or sections, in almost any way that you like.

If you are not in BOUNDING BOX display mode, you will be able to see the

object being modified in real time along with the bones.
In BOUNDING BOX mode, you just see the bones moving or rotating.

HOW:

PICKING BONES

1. The first point you pick will act as an axis if you plan to rotate or scale using bones.
2. Multiple points are picked by holding the shift key down
3. IF YOU PLAN TO ROTATE OR SCALE USING THE BONES, THE FIRST POINT YOU PICK WILL BE YOUR AXIS AND IT SHOULD BE PICKED WITHOUT THE SHIFT KEY. ANY POINTS YOU WISH TO BE PICKED ALONG WITH THIS SHOULD BE PICKED BY HOLDING DOWN THE SHIFT KEY. THIS IS FOR CLICK PICKING AS WELL AS LASSO PICKING.

MANIPULATING BONES

1. After you have picked the bones you want to manipulate, select an action to perform on them (Move, Rotate, Scale...). Use the right mouse button to return to the curve display mode.
2. When moving bones, the objects sections which are attached to the bones can also be seen moving. This gives you a true sense of what is going on when you change the bones. If this becomes too slow, because of your machine's speed or the number of points on the object, you can use the "Knots/Cntrl Pnts" button to switch to a faster display object; or you can press the 'b' key and switch to BOUNDING BOX mode, where only the bones will be shown moving.

WORKS ON: bones - allows picking bones and actions on bones

WORKS IN: All views

AFFECTED BY: 1. Lasso/Click button - Pick method
2. Knots/Cntrl point button - What type of point to use

1.33 draw

"Draw Edge"

- HOW:
1. Left mouse button lays down points
 2. Right mouse button lays down the last point and ends the rubber line.
 3. FIRST AND LAST POINTS ARE AUTOMATICALLY TRIPLED FOR YOU, there is no need to lay down three points for these or any other points. Use the "Multipl Pnt" button to set double and triple points, after you have turned your edge curve into an edge object (See #4 below)
 4. When you are done moving points around, shut this button off and you will be asked if you want to make your drawing into an actual edge object.
-

IMPORTANT NOTE:

If you haven't shut it off, you will notice a vertical line down the center of the screen. This is for when you create edges that you are going to spin or mirror & merge. It shows you the mirror image of your drawing. IT CAN BE TURNED OFF AND ON BY PRESSING THE "v" KEY.

1. When moving points around, you can lock the X or Y direction by turning of whatever button you don't want. This allows you to move a point in one direction, without effecting the other.
2. You can snap to grid by holding down the shift key while you move or click a point.
3. ADDING and DELETING POINTS

ADDING - Click on the point with the mouse and press the 'a' key while still holding the mouse button down.

THE POINT IS ADDED RIGHT AFTER THE ONE YOU PICKED the added point becomes the currently picked one, can be moved at this time by moving the mouse.

4. DELETING - Click on the point with the mouse and press the 'd' key while still holding the mouse button down.

WORKS IN: front view

AFFECTED BY: 1. Grid - snaps to grid points
2. Shift - you can move points around with the mouse after you have laid them down. If you hold the shift key down, the point will snap to a grid point as you move, or you can click on a point with the shift key down and it will snap to a grid point.

1.34 sketch

"Sketch"

HOW: 1. Left mouse button
2. Allows you to sketch on the screen

WORKS IN: All views

1.35 mirror

"Mirror"

HOW: 1. Click button after setting X,Y,Z buttons to directions you

want to mirror on.

2. To flip left to right in the front view, use X axis. The X direction is from left to right in the front and top view.
3. To flip top to bottom in the front view, use Y axis. The Y direction is from top to bottom in the front and side view. (Get it ?)

WORKS IN: All views

WORKS ON: objects, points ,bones

AFFECTED BY: 1. X,Y and Z buttons

1.36 grid

"Grid"

HOW: 1. Click button

WORKS IN: All views- but your curve edge be be in the front view after creation.

WORKS ON: Drawing curve edges

ALTERNATE FUNCTIONS: Right amiga 'g' will bring up a requester to change the grid size;

1.37 lasso

"Lasso/Click/Drag"

HOW: 1. Click button

2. Sets the pick method to be used
3. Lasso picks points by drawing a freehand line around them while holding the left mouse button down. This allows you to weave in and out of spaces that are not easily gotten to by a drag box.
4. If you click and release the left mouse button, when lasso click is on this is just a click pick.

WORKS IN: All views

WORKS ON: points, bones

AFFECTED BY: together/separate button

1. If together is on, all points at the mouse position will be picked.
 2. If separate is on, only one point, the first one it finds, that meets the criteria will be picked.
-

1.38 world

"World/Local"

HOW: 1. Click button
2. This is for rotation, and will cause rotation to occur based on the objects axis instead of the world axis.

WORKS IN: All views

WORKS ON: objects, points, bones

1.39 unnamed.1

"Together/Separate"

HOW: 1. Click button
2. This controls whether all points at this position should be picked or only one point.

WORKS IN: All views

WORKS ON: points, bones

1.40 knots

"Knots/Cntrl Pnts"

HOW: 1. Click button
2. This controls the look as well as the point type for picking.

- A. Knots - Draws object by connecting lines through the knot points. (More accurate shape than control points)
- B. Cntrl Pnts - Draws object by connecting lines through the control points. (faster than knots but less accurate in look)
- C. BOUNDING BOX - This is a toggle by pressing the 'b' key.

It is used if the interactive frame rate is to slow on your machine to use the other two modes above; Due either to the speed of your machine or the number of points on the object.

Its nice to have a choice that's up to you any easily changed at any moment.

WORKS IN: All views

WORKS ON: objects, points, bones

1.41 spin

"Spin"

HOW: 1. Click button

2. A requester will ask you for the numbers of sections and to what degree to spin (also known as lathe or freeform rotate).
3. Yes, you can spin open objects at less than 360 degrees, in 1 degree increments.

NOTE: Real3d2 does not spin correctly, the object created does not match the profile of the edge curve from which it was made. They tell you to use more sections, but this will not solve the problem; all it does is force you to use more sections, more memory, and a slower drawing time.

It will never match the profile no matter how many sections you use the way that they do it.

I have developed a formula that corrects this problem in my program; so you do not have to use a large amount of sections to get your objects to look right. Any number you use should correctly match the profile.

(If you have Real3D2 try this and you will see what I mean.)
Spin a curve in real3d2 4 sections and check its profile against the original curve. Not only does it not match, but the object is not the right size you wanted it to be.

Then, do the same in my program and note the difference.
I imagine that they will correct this in some future version, so this is for the first version only.

WORKS IN: front view - spins around the Y axis

WORKS ON: objects (Whole objects and edge curves)

If you choose an object the has already been made, either by spin or extrude or whatever, pressing the spin button will use the first curve edge on the object as it looks in the front view, as a profile to create the spun object.

1.42 extrude

"Extrude"

HOW: 1. Click button

2. A requester will ask you for the numbers of sections

WORKS IN: front view - extrudes in the z direction

WORKS ON: objects (Whole objects and edge curves)

If you choose an object the has already been made, either by spin or extrude or whatever, pressing the extrude button will use the first

curve edge on the object as it looks in the front view, as a profile to create the extruded object.

1.43 fit

"Fit/Unfit"

HOW: 1. Click button - toggles between fit and unfit

2. Centers the object and zooms in as close as possible, while keeping the object within the bounds of the screen;
3. If you haven't switched views or picked a new object, you can set things back to the way they looked before you did the fit, by pressing the button again.

WORKS IN: All views

WORKS ON: the view

1.44 render

"Render"

HOW: 1. Click button

WORKS IN: perspective view

WORKS ON: all objects

AFFECTED BY: render mode menu settings;

1.45 usingrender

"Using the renderer"

1. This is a greyscale preview render like in Real3d2, it is designed to be a marriage between quality and speed.
2. IT IS 20 TIMES FASTER THAN REAL3D2.(Yes, I said 20 times !)
Real3d2 converts your bsplines to polygons, so if you zoom in close to an object and then render it, you'll see poly edges. You have to adjust the subdiv level up to 4 to come close to FreeForms smoothness.

FreeForm will render your Bsplines smooth no matter what the resolution or zoom level; and will do it 20 times faster than Real3D2.

3. You can switch between render modes and sizes using the menu.
4. If you have an AGA capable machine, you can use 256 color grey scale by selecting AGA from the menu.
5. The time that the render took will be displayed when it is done.

If you have Real3d2 you may test my speed claims using the object called SPOUTBS.FREEFORM in the objects draw. It was created in FreeForm using the Rail Extrude and converted to a Real3D2 RPL file called SPOUTBS.RPL

Zoom it up in Real3D2 to fit the screen, and render it.
Get out your clock and wait and wait.

My test was done on a 25Mhz A3000.

1. Enter FreeForm and load in the spoutbs.FreeForm object using the object menu.
2. Press the persp button and then the fit/unfit button.
3. Choose Curve Shade (NOT curve shade(quick)).
4. Press Render button.

1.46 undo

"Undo"

HOW: 1. Click button

WORKS IN: All views

WORKS ON: objects,points,bones

AFFECTED BY: The last action performed before you pressed undo

1.47 multiple

"Mutiply Points"

HOW: 1. Select a point or points

2. Click button

3. A requester will appear asking you what type of point do you want it to be (single, double, triple) it also tells you what action it will have on the way the curve looks.

Doing it this way frees you from having to know how many points are already there to begin with, as in real3d2. You are only concerned with how many do you want to be there, and the program will take care of the rest.

NOTE: SEE INFORMATION ON SETTING TENSIONS AS AN ALTERNATIVE, AND MORE POWERFUL METHOD OF MODIFYING CURVES AT POINTS.

WORKS IN: All views

WORKS ON: points

AFFECTED BY: Being in points mode and having some points picked

1.48 Keyboard shortcuts

- a. Add a point in drawcurve mode.
 - b. Toggles bounding box display mode on and off.
 - c. Creates an object out of the curve you drew.
 - d. Delete a point in drawcurve mode.
 - e.
 - f.
 - g.
 - h. Help - If your reading this you probably figured that out.
 - i.
 - j.
 - k.
 - l.
 - m. Move.
 - n. Toggles display of object names on/off;
 - o.
 - p.
 - q. Quits the program.
 - r. Rotate.
 - s. Scale.
 - t. Sets points picked on an edge curve to sharp.

If in drawcurve mode, toggles between sharp and smooth for the picked point;
 - T. Sets points picked on an edge curve to smooth.
 - u.
-

v. Toggles vertical symmetry line that appears in draw curve mode, on and off. Turns mirror image off and on.

W.

x. Turn on X button.

y. Turn on Y button.

z. Turn on Z button.

X. Turn on X button ONLY !

Y. Turn on Y button ONLY !

Z. Turn on Z button ONLY !

Space Bar. Hide and show button screen toggle.

1. Send picked object to workspace 1.

2. Send picked object to workspace 2.

3. Send picked object to workspace 3.

4. Send picked object to workspace 4.

5. Send picked object to workspace 5.

6. Send picked object to workspace 6.

7. Send picked object to workspace 7.

8. Send picked object to workspace 8.

9. Send picked object to workspace 9.

Enter key. Redraw

. Smooth tension in draw curve mode.(incremental)

, Sharpen tension in draw curve mode.(incremental)

1.49 write_help

WRITING YOUR OWN HELP TEXT

If you examine this help file in an editor, you will see that it is in ACSII. You can write your own help text or change anything written here to what is more understandable to you. To create the actual text you only have to write it and enclose it in a @node - @endnode structure.

node name you want to call it

text in here

endnode

To create a button to access this text, stick this inside of one of the nodes:

```
{ " text for the button here " link the name you put after the node}
```

Look at mine and you'll get it. I had to leave the "at" symbol at the begining off so the system didn't try to access my example.
